

Residential System Sizing Calculation

Summary

Hutcherson Res
498 NW Levi Glen
Lake City, FL

Project Title:
210830 Hutcherson

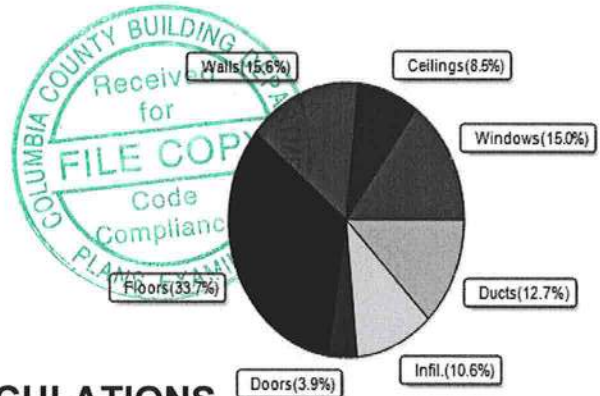
2021-06-07

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	33803 Btuh	Total cooling load calculation	29565 Btuh
Submitted heating capacity	% of calc Btuh	Submitted cooling capacity	% of calc Btuh
Total (Electric Heat Pump)	109.5 37000	Sensible (SHR = 0.75)	114.6 27750
Heat Pump + Auxiliary(0.0kW)	109.5 37000	Latent	172.9 9250
		Total (Electric Heat Pump)	125.1 37000

WINTER CALCULATIONS

Winter Heating Load (for 2881 sqft)

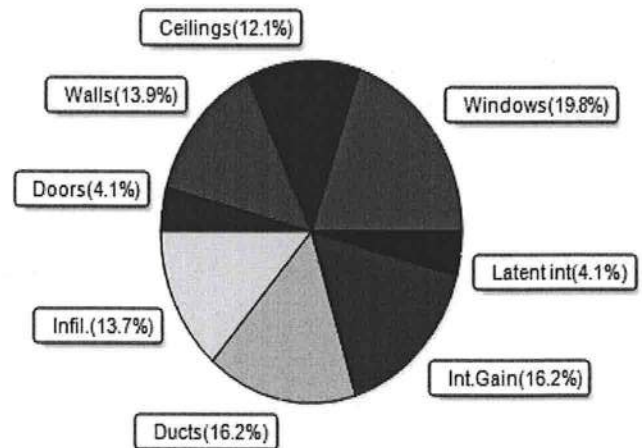
Load component		Load	
Window total	381 sqft	5072	Btuh
Wall total	1564 sqft	5275	Btuh
Door total	87 sqft	1317	Btuh
Ceiling total	2979 sqft	2872	Btuh
Floor total	2881 sqft	11389	Btuh
Infiltration	86 cfm	3569	Btuh
Duct loss		4309	Btuh
Subtotal		33803	Btuh
Ventilation	0 cfm	0	Btuh
TOTAL HEAT LOSS		33803	Btuh



SUMMER CALCULATIONS

Summer Cooling Load (for 2881 sqft)

Load component		Load	
Window total	381 sqft	5866	Btuh
Wall total	1564 sqft	4099	Btuh
Door total	87 sqft	1213	Btuh
Ceiling total	2979 sqft	3590	Btuh
Floor total		0	Btuh
Infiltration	64 cfm	1690	Btuh
Internal gain		4780	Btuh
Duct gain		2978	Btuh
Sens. Ventilation	0 cfm	0	Btuh
Blower Load		0	Btuh
Total sensible gain		24216	Btuh
Latent gain(ducts)		1797	Btuh
Latent gain(infiltration)		2351	Btuh
Latent gain(ventilation)		0	Btuh
Latent gain(internal/occupants/other)		1200	Btuh
Total latent gain		5349	Btuh
TOTAL HEAT GAIN		29565	Btuh



8th Edition

EnergyGauge® System Sizing
PREPARED BY: Evan Beamsley
DATE: 2021-06-07

System Sizing Calculations - Winter

Residential Load - Whole House Component Details

Hutcherson Res
498 NW Levi Glen
Lake City, FL

Project Title:
210830 Hutcherson
Building Type: User

2021-06-07

Reference City: Gainesville, FL (Defaults) Winter Temperature Difference: 38.0 F (MJ8 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	12.0		13.3	160 Btuh
2	2, NFRC 0.25	Metal	0.35	W	24.0		13.3	319 Btuh
3	2, NFRC 0.25	Metal	0.35	N	48.0		13.3	638 Btuh
4	2, NFRC 0.25	Metal	0.35	E	22.2		13.3	296 Btuh
5	2, NFRC 0.25	Metal	0.35	N	44.4		13.3	591 Btuh
6	2, NFRC 0.25	Metal	0.35	N	13.3		13.3	177 Btuh
7	2, NFRC 0.25	Metal	0.35	N	11.1		13.3	148 Btuh
8	2, NFRC 0.25	Metal	0.35	N	30.0		13.3	399 Btuh
9	2, NFRC 0.25	Metal	0.35	E	20.0		13.3	266 Btuh
10	2, NFRC 0.25	Metal	0.35	S	6.0		13.3	80 Btuh
11	2, NFRC 0.25	Metal	0.35	W	8.0		13.3	106 Btuh
12	2, NFRC 0.25	Metal	0.35	S	60.0		13.3	798 Btuh
13	2, NFRC 0.25	Metal	0.35	S	22.2		13.3	296 Btuh
14	2, NFRC 0.25	Metal	0.35	S	60.0		13.3	798 Btuh
Window Total					381.3(sqft)			5072 Btuh
Walls	Type	Omt.	Ueff.	R-Value (Cav/Sh)	Area	X	HTM=	Load
1	Frame - Wood	- Ext	(0.089)	13.0/0.0	80		3.37	270 Btuh
2	Frame - Wood	- Ext	(0.089)	13.0/0.0	92		3.37	310 Btuh
3	Frame - Wood	- Ext	(0.089)	13.0/0.0	113		3.37	382 Btuh
4	Frame - Wood	- Ext	(0.089)	13.0/0.0	39		3.37	132 Btuh
5	Frame - Wood	- Ext	(0.089)	13.0/0.0	148		3.37	498 Btuh
6	Frame - Wood	- Ext	(0.089)	13.0/0.0	49		3.37	166 Btuh
7	Frame - Wood	- Ext	(0.089)	13.0/0.0	291		3.37	980 Btuh
8	Frame - Wood	- Ext	(0.089)	13.0/0.0	107		3.37	360 Btuh
9	Frame - Wood	- Ext	(0.089)	13.0/0.0	32		3.37	108 Btuh
10	Frame - Wood	- Ext	(0.089)	13.0/0.0	142		3.37	478 Btuh
11	Frame - Wood	- Ext	(0.089)	13.0/0.0	40		3.37	135 Btuh
12	Frame - Wood	- Ext	(0.089)	13.0/0.0	182		3.37	614 Btuh
13	Frame - Wood	- Ext	(0.089)	13.0/0.0	16		3.37	54 Btuh
14	Frame - Wood	- Adj	(0.089)	13.0/0.0	233		3.37	787 Btuh
Wall Total					1564(sqft)			5275 Btuh
Doors	Type	Storm	Ueff.		Area	X	HTM=	Load
1	Insulated - Exterior,	n	(0.400)		13		15.2	203 Btuh
2	Insulated - Exterior,	n	(0.400)		27		15.2	405 Btuh
3	Insulated - Exterior,	n	(0.400)		7		15.2	101 Btuh
4	Insulated - Exterior,	n	(0.400)		7		15.2	101 Btuh
5	Insulated - Exterior,	n	(0.400)		13		15.2	203 Btuh
6	Insulated - Garage,	n	(0.400)		20		15.2	304 Btuh
Door Total					87(sqft)			1317Btuh

Manual J Winter Calculations

Residential Load - Component Details (continued)

Hutcherson Res
498 NW Levi Glen
Lake City, FL

Project Title:
210830 Hutcherson
Building Type: User

2021-06-07

Ceilings 1	Type/Color/Surface Unvent Attic/D/Shing Ceiling Total	Ueff. (0.241)	R-Value 0.0/22.0	Area X 2979 2979(sqft)	HTM= 1.0	Load 2872 Btuh 2872Btuh
Floors 1	Type Slab On Grade Floor Total	Ueff. (1.180)	R-Value 0.0	Size X 254.0 ft(perim.) 2881 sqft	HTM= 44.8	Load 11389 Btuh 11389 Btuh
Envelope Subtotal:						25925 Btuh
Infiltration	Type Natural	Wholehouse ACH 0.22	Volume(cuft) 23336	Wall Ratio 1.00	CFM= 85.8	3569 Btuh
Duct load	Average sealed, R6.0, Supply(Att), Return(Att) (DLM of 0.146)					4309 Btuh
All Zones	Sensible Subtotal All Zones					33803 Btuh

WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss Ventilation Sensible Heat Loss Total Heat Loss	33803 Btuh 0 Btuh 33803 Btuh
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EQUIPMENT

1. Electric Heat Pump	#	37000 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

Hutcherson Res
498 NW Levi Glen
Lake City, FL

Project Title:
210830 Hutcherson

2021-06-07

Reference City: Gainesville, FL

Temperature Difference: 24.0F(MJ8 99%)

Humidity difference: 54gr.

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		1.5ft	0.3ft	12.0	12.0	0.0	14	16	164	Btuh	
2	2 NFRC	0.25, 0.35	No	No	W		1.5ft	0.3ft	24.0	5.5	18.5	14	33	677	Btuh	
3	2 NFRC	0.25, 0.35	No	No	N		1.5ft	0.3ft	48.0	48.0	0.0	14	16	656	Btuh	
4	2 NFRC	0.25, 0.35	No	No	E		33.6f	0.0f	22.2	22.2	0.0	14	33	304	Btuh	
5	2 NFRC	0.25, 0.35	No	No	N		13.5f	0.0f	44.4	44.4	0.0	14	16	607	Btuh	
6	2 NFRC	0.25, 0.35	No	No	N		13.5f	0.0f	13.3	13.3	0.0	14	16	182	Btuh	
7	2 NFRC	0.25, 0.35	No	No	N		13.5f	0.0f	11.1	11.1	0.0	14	16	152	Btuh	
8	2 NFRC	0.25, 0.35	No	No	N		1.5ft	0.3ft	30.0	30.0	0.0	14	16	410	Btuh	
9	2 NFRC	0.25, 0.35	No	No	E		1.5ft	0.3ft	20.0	3.6	16.4	14	33	581	Btuh	
10	2 NFRC	0.25, 0.35	No	No	S		1.5ft	0.3ft	6.0	0.0	6.0	14	14	82	Btuh	
11	2 NFRC	0.25, 0.35	No	No	W		99.0f	0.0f	8.0	8.0	0.0	14	33	109	Btuh	
12	2 NFRC	0.25, 0.35	No	No	S		6.5ft	0.0f	60.0	0.0	60.0	14	14	820	Btuh	
13	2 NFRC	0.25, 0.35	No	No	S		6.5ft	0.0f	22.2	0.0	22.2	14	14	304	Btuh	
14	2 NFRC	0.25, 0.35	No	No	S		1.5ft	0.3ft	60.0	0.0	60.0	14	14	820	Btuh	
Window Total									381 (sqft)					5866 Btuh		
Walls	Type					U-Value	R-Value		Area(sqft)		HTM		Load			
							Cav/Sheath									
1	Frame - Wood - Ext						0.09		13.0/0.0		80.0		2.7		217 Btuh	
2	Frame - Wood - Ext						0.09		13.0/0.0		92.0		2.7		249 Btuh	
3	Frame - Wood - Ext						0.09		13.0/0.0		113.3		2.7		307 Btuh	
4	Frame - Wood - Ext						0.09		13.0/0.0		39.1		2.7		106 Btuh	
5	Frame - Wood - Ext						0.09		13.0/0.0		147.8		2.7		400 Btuh	
6	Frame - Wood - Ext						0.09		13.0/0.0		49.3		2.7		134 Btuh	
7	Frame - Wood - Ext						0.09		13.0/0.0		290.7		2.7		787 Btuh	
8	Frame - Wood - Ext						0.09		13.0/0.0		106.7		2.7		289 Btuh	
9	Frame - Wood - Ext						0.09		13.0/0.0		32.0		2.7		87 Btuh	
10	Frame - Wood - Ext						0.09		13.0/0.0		141.8		2.7		384 Btuh	
11	Frame - Wood - Ext						0.09		13.0/0.0		40.0		2.7		108 Btuh	
12	Frame - Wood - Ext						0.09		13.0/0.0		182.0		2.7		493 Btuh	
13	Frame - Wood - Ext						0.09		13.0/0.0		16.0		2.7		43 Btuh	
14	Frame - Wood - Adj						0.09		13.0/0.0		233.3		2.1		497 Btuh	
Wall Total									1564 (sqft)					4099 Btuh		
Doors	Type								Area (sqft)		HTM		Load			
1	Insulated - Exterior								13.3		14.0		187 Btuh			
2	Insulated - Exterior								26.7		14.0		373 Btuh			
3	Insulated - Exterior								6.7		14.0		93 Btuh			
4	Insulated - Exterior								6.7		14.0		93 Btuh			
5	Insulated - Exterior								13.3		14.0		187 Btuh			
6	Insulated - Garage								20.0		14.0		280 Btuh			
Door Total									87 (sqft)					1213 Btuh		
Ceilings	Type/Color/Surface					U-Value	R-Value		Area(sqft)		HTM		Load			
1	Unvented Attic/DarkShingle						0.241		0.0/22.0		2979.0		1.20		3590 Btuh	
Ceiling Total									2979 (sqft)					3590 Btuh		
Floors	Type						R-Value		Size		HTM		Load			
1	Slab On Grade						0.0		2881 (ft-perimeter)		0.0		0 Btuh			
Floor Total									2881.0 (sqft)					0 Btuh		

Manual J Summer Calculations

Residential Load - Component Details (continued)

Hutcherson Res
498 NW Levi Glen
Lake City, FL

Project Title:
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Climate: FL_GAINESVILLE_REGIONAL_A

2021-06-07

	Envelope Subtotal:					14768 Btuh
Infiltration	Type Natural	Average ACH 0.17	Volume(cuft) 23336	Wall Ratio 1	CFM= 64.3	Load 1690 Btuh
Internal gain		Occupants 6	Btuh/occupant X 230	Appliance +	3400	Load 4780 Btuh
	Sensible Envelope Load:					21239 Btuh
Duct load	Average sealed, Supply(R6.0-Attic), Return(R6.0-Attic)				(DGM of 0.140)	2978 Btuh
	Sensible Load All Zones					24216 Btuh

Manual J Summer Calculations

Residential Load - Component Details (continued)

Hutcherson Res
498 NW Levi Glen
Lake City, FL

Project Title:
210830 Hutcherson

Climate: FL_GAINESVILLE_REGIONAL_A

2021-06-07

WHOLE HOUSE TOTALS

Whole House Totals for Cooling	Sensible Envelope Load All Zones	21239 Btuh
	Sensible Duct Load	2978 Btuh
	Total Sensible Zone Loads	24216 Btuh
	Sensible ventilation	0 Btuh
	Blower	0 Btuh
	Total sensible gain	24216 Btuh
	Latent infiltration gain (for 54 gr. humidity difference)	2351 Btuh
	Latent ventilation gain	0 Btuh
	Latent duct gain	1797 Btuh
	Latent occupant gain (6.0 people @ 200 Btuh per person)	1200 Btuh
	Latent other gain	0 Btuh
	Latent total gain	5349 Btuh
	TOTAL GAIN	29565 Btuh

EQUIPMENT

1. Central Unit	#	37000 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