

Residential System Sizing Calculation

Summary

Project Title:
Highlands Model

Gainesville, FL

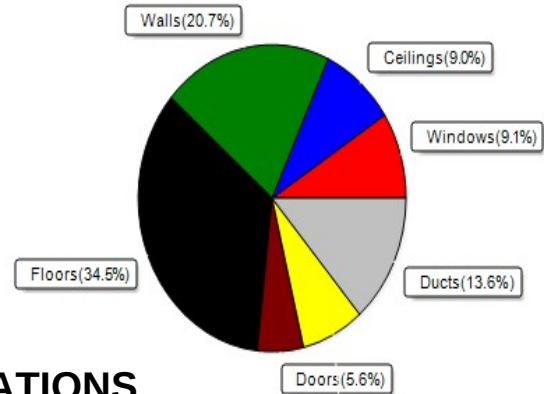
12/17/2021

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	40845 Btuh	Total cooling load calculation	31479 Btuh
Submitted heating capacity	% of calc Btuh	Submitted cooling capacity	% of calc Btuh
Total (Electric Heat Pump)	102.8 42000	Sensible (SHR = 0.85)	130.6 35700
Heat Pump + Auxiliary(0.0kW)	102.8 42000	Latent	151.7 6300
		Total (Electric Heat Pump)	133.4 42000

WINTER CALCULATIONS

Winter Heating Load (for 2895 sqft)

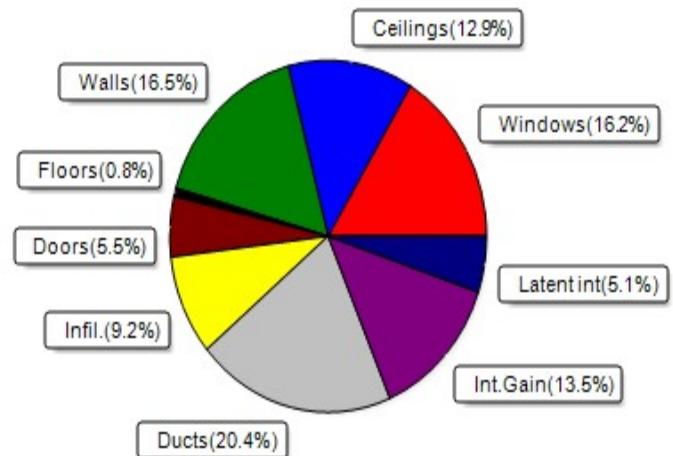
Load component		Load	
Window total	356 sqft	3702	Btuh
Wall total	2452 sqft	8455	Btuh
Door total	144 sqft	2297	Btuh
Ceiling total	2895 sqft	3688	Btuh
Floor total	See detail report	14106	Btuh
Infiltration	69 cfm	3043	Btuh
Duct loss		5553	Btuh
Subtotal		40845	Btuh
Ventilation	0 cfm	0	Btuh
TOTAL HEAT LOSS		40845	Btuh



SUMMER CALCULATIONS

Summer Cooling Load (for 2895 sqft)

Load component		Load	
Window total	356 sqft	5111	Btuh
Wall total	2452 sqft	5195	Btuh
Door total	144 sqft	1723	Btuh
Ceiling total	2895 sqft	4057	Btuh
Floor total		245	Btuh
Infiltration	52 cfm	1084	Btuh
Internal gain		4240	Btuh
Duct gain		5672	Btuh
Sens. Ventilation	0 cfm	0	Btuh
Blower Load		0	Btuh
Total sensible gain		27326	Btuh
Latent gain(ducts)		754	Btuh
Latent gain(infiltration)		1799	Btuh
Latent gain(ventilation)		0	Btuh
Latent gain(internal/occupants/other)		1600	Btuh
Total latent gain		4153	Btuh
TOTAL HEAT GAIN		31479	Btuh



8th Edition

EnergyGauge® System Sizing

PREPARED BY: _____

DATE: _____ 12-17-21

System Sizing Calculations - Summer

Residential Load - Whole House Component Details

Project Title:
Highlands Model

Gainesville, FL

12/17/2021

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	0.20, 0.26	No	No	N		1.5ft	2.3ft	4.0	0.0	4.0	9	9	37	Btuh
2	2 NFRC	0.20, 0.26	No	No	N		11.5f	2.3ft	80.0	0.0	80.0	9	9	732	Btuh
3	2 NFRC	0.20, 0.26	No	No	N		11.5f	2.3ft	16.0	0.0	16.0	9	9	146	Btuh
4	2 NFRC	0.20, 0.26	No	No	W		1.5ft	2.3ft	36.0	0.0	36.0	9	24	872	Btuh
5	2 NFRC	0.20, 0.26	No	No	N		1.5ft	2.3ft	36.0	0.0	36.0	9	9	329	Btuh
6	2 NFRC	0.20, 0.26	No	No	E		1.5ft	2.3ft	20.0	0.0	20.0	9	24	484	Btuh
7	2 NFRC	0.20, 0.26	No	No	E		1.5ft	2.3ft	8.0	0.0	8.0	9	24	194	Btuh
8	2 NFRC	0.20, 0.26	No	No	S		1.5ft	2.3ft	10.0	10.0	0.0	9	11	91	Btuh
9	2 NFRC	0.20, 0.26	No	No	S		9.5ft	2.3ft	72.0	72.0	0.0	9	11	659	Btuh
10	2 NFRC	0.20, 0.26	No	No	W		1.5ft	2.3ft	4.0	0.0	4.0	9	24	97	Btuh
11	2 NFRC	0.20, 0.26	No	No	W		1.5ft	2.3ft	15.0	0.0	15.0	9	24	363	Btuh
12	2 NFRC	0.20, 0.26	No	No	W		1.5ft	2.3ft	4.0	0.0	4.0	9	24	97	Btuh
13	2 NFRC	0.20, 0.26	No	No	E		1.5ft	2.3ft	6.0	0.0	6.0	9	24	145	Btuh
14	2 NFRC	0.20, 0.26	No	No	E		1.5ft	2.3ft	30.0	0.0	30.0	9	24	727	Btuh
15	2 NFRC	0.20, 0.26	No	No	S		1.5ft	2.3ft	15.0	15.0	0.0	9	11	137	Btuh
	Window Total								356 (sqft)					5111 Btuh	
Walls	Type						U-Value	R-Value	Area(sqft)		HTM		Load		
							Cav/Sheath								
1	Frame - Wood - Ext						0.09	13.0/0.6	116.0		2.2		255 Btuh		
2	Frame - Wood - Ext						0.09	13.0/0.6	92.4		2.2		203 Btuh		
3	Frame - Wood - Ext						0.09	13.0/0.6	192.3		2.2		423 Btuh		
4	Frame - Wood - Ext						0.09	13.0/0.6	142.0		2.2		312 Btuh		
5	Frame - Wood - Ext						0.09	13.0/0.6	198.0		2.2		435 Btuh		
6	Frame - Wood - Ext						0.09	13.0/0.6	242.0		2.2		532 Btuh		
7	Frame - Wood - Adj						0.09	13.0/0.6	349.0		1.6		572 Btuh		
8	Frame - Wood - Ext						0.09	13.0/0.6	80.0		2.2		176 Btuh		
9	Frame - Wood - Ext						0.09	13.0/0.6	60.0		2.2		132 Btuh		
10	Frame - Wood - Ext						0.09	13.0/0.6	240.0		2.2		528 Btuh		
11	Frame - Wood - Ext						0.09	13.0/0.6	54.0		2.2		119 Btuh		
12	Frame - Wood - Ext						0.09	13.0/0.6	45.0		2.2		99 Btuh		
13	Frame - Wood - Ext						0.09	13.0/0.6	225.5		2.2		496 Btuh		
14	Frame - Wood - Ext						0.09	13.0/0.6	43.5		2.2		96 Btuh		
15	Frame - Wood - Ext						0.09	13.0/0.6	84.5		2.2		186 Btuh		
16	Frame - Wood - Ext						0.09	13.0/0.6	45.3		2.2		100 Btuh		
17	Frame - Wood - Ext						0.09	13.0/0.6	94.7		2.2		208 Btuh		
18	Frame - Wood - Ext						0.09	13.0/0.6	45.3		2.2		100 Btuh		
19	Frame - Wood - Ext						0.09	13.0/0.6	102.3		2.2		225 Btuh		
	Wall Total								2452 (sqft)					5195 Btuh	
Doors	Type								Area (sqft)		HTM		Load		
1	Insulated - Exterior								15.6		12.0		187 Btuh		
2	Insulated - Exterior								40.0		12.0		480 Btuh		
3	Insulated - Exterior								20.0		12.0		240 Btuh		
4	Insulated - Garage								20.0		12.0		240 Btuh		
5	Insulated - Exterior								48.0		12.0		576 Btuh		
	Door Total								144 (sqft)					1723 Btuh	

Manual J Summer Calculations

Residential Load - Component Details (continued)

Project Title: Climate:FL_GAINESVILLE_REGIONAL_A
Highlands Model

Gainesville, FL

12/17/2021

Ceilings	Type/Color/Surface	U-Value	R-Value	Area(sqft)	HTM	Load
1	Vented Attic/Light/Shingle	0.032	30.0/0.0	2406.0	1.40	3371 Btuh
2	Vented Attic/Light/Shingle	0.032	30.0/0.0	489.0	1.40	685 Btuh
	Ceiling Total			2895 (sqft)		4057 Btuh
Floors	Type		R-Value	Size	HTM	Load
1	Slab On Grade		0.0	2406 (ft-perimeter)	0.0	0 Btuh
2	Raised Wood - Adj		30.0	489 (sqft)	0.5	245 Btuh
	Floor Total			2895.0 (sqft)		245 Btuh
	Envelope Subtotal:					16330 Btuh
Infiltration	Type	Average ACH	Volume(cuft)	Wall Ratio	CFM=	Load
	Natural	0.12	25566	1	52.1	1084 Btuh
Internal gain		Occupants	Btuh/occupant	Appliance		Load
		8	X 230	+	2400	4240 Btuh
	Sensible Envelope Load:					21654 Btuh
Duct load	Extremely sealed, Supply(R6.0-Attic), Return(R6.0-Attic)				(DGM of 0.262)	5672 Btuh
	Sensible Load All Zones					27326 Btuh

Manual J Summer Calculations

Residential Load - Component Details (continued)

Project Title: Climate:FL_GAINESVILLE_REGIONAL_A
Highlands Model

Gainesville, FL

12/17/2021

WHOLE HOUSE TOTALS

Whole House Totals for Cooling	Sensible Envelope Load All Zones	21654 Btuh
	Sensible Duct Load	5672 Btuh
	Total Sensible Zone Loads	27326 Btuh
	Sensible ventilation	0 Btuh
	Blower	0 Btuh
	Total sensible gain	27326 Btuh
	Latent infiltration gain (for 51 gr. humidity difference)	1799 Btuh
	Latent ventilation gain	0 Btuh
	Latent duct gain	754 Btuh
	Latent occupant gain (8.0 people @ 200 Btuh per person)	1600 Btuh
	Latent other gain	0 Btuh
	Latent total gain	4153 Btuh
	TOTAL GAIN	31479 Btuh

EQUIPMENT

1. Central Unit	#	42000 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

System Sizing Calculations - Winter

Residential Load - Whole House Component Details

Gainesville, FL

Project Title:
Highlands Model
Building Type: User

12/17/2021

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 0.20	Vinyl	0.26	N	4.0		10.4	42 Btuh
2	2, NFRC 0.20	Vinyl	0.26	N	80.0		10.4	832 Btuh
3	2, NFRC 0.20	Vinyl	0.26	N	16.0		10.4	166 Btuh
4	2, NFRC 0.20	Vinyl	0.26	W	36.0		10.4	374 Btuh
5	2, NFRC 0.20	Vinyl	0.26	N	36.0		10.4	374 Btuh
6	2, NFRC 0.20	Vinyl	0.26	E	20.0		10.4	208 Btuh
7	2, NFRC 0.20	Vinyl	0.26	E	8.0		10.4	83 Btuh
8	2, NFRC 0.20	Vinyl	0.26	S	10.0		10.4	104 Btuh
9	2, NFRC 0.20	Vinyl	0.26	S	72.0		10.4	749 Btuh
10	2, NFRC 0.20	Vinyl	0.26	W	4.0		10.4	42 Btuh
11	2, NFRC 0.20	Vinyl	0.26	W	15.0		10.4	156 Btuh
12	2, NFRC 0.20	Vinyl	0.26	W	4.0		10.4	42 Btuh
13	2, NFRC 0.20	Vinyl	0.26	E	6.0		10.4	62 Btuh
14	2, NFRC 0.20	Vinyl	0.26	E	30.0		10.4	312 Btuh
15	2, NFRC 0.20	Vinyl	0.26	S	15.0		10.4	156 Btuh
Window Total					356.0(sqft)			3702 Btuh
Walls	Type	Ornt.	Ueff.	R-Value (Cav/Sh)	Area	X	HTM=	Load
1	Frame - Wood	- Ext	(0.086)	13.0/0.6	116		3.45	400 Btuh
2	Frame - Wood	- Ext	(0.086)	13.0/0.6	92		3.45	319 Btuh
3	Frame - Wood	- Ext	(0.086)	13.0/0.6	192		3.45	663 Btuh
4	Frame - Wood	- Ext	(0.086)	13.0/0.6	142		3.45	490 Btuh
5	Frame - Wood	- Ext	(0.086)	13.0/0.6	198		3.45	683 Btuh
6	Frame - Wood	- Ext	(0.086)	13.0/0.6	242		3.45	835 Btuh
7	Frame - Wood	- Adj	(0.086)	13.0/0.6	349		3.45	1204 Btuh
8	Frame - Wood	- Ext	(0.086)	13.0/0.6	80		3.45	276 Btuh
9	Frame - Wood	- Ext	(0.086)	13.0/0.6	60		3.45	207 Btuh
10	Frame - Wood	- Ext	(0.086)	13.0/0.6	240		3.45	828 Btuh
11	Frame - Wood	- Ext	(0.086)	13.0/0.6	54		3.45	186 Btuh
12	Frame - Wood	- Ext	(0.086)	13.0/0.6	45		3.45	155 Btuh
13	Frame - Wood	- Ext	(0.086)	13.0/0.6	226		3.45	778 Btuh
14	Frame - Wood	- Ext	(0.086)	13.0/0.6	44		3.45	150 Btuh
15	Frame - Wood	- Ext	(0.086)	13.0/0.6	85		3.45	291 Btuh
16	Frame - Wood	- Ext	(0.086)	13.0/0.6	45		3.45	156 Btuh
17	Frame - Wood	- Ext	(0.086)	13.0/0.6	95		3.45	326 Btuh
18	Frame - Wood	- Ext	(0.086)	13.0/0.6	45		3.45	156 Btuh
19	Frame - Wood	- Ext	(0.086)	13.0/0.6	102		3.45	353 Btuh
Wall Total					2452(sqft)			8455 Btuh

Manual J Winter Calculations

Residential Load - Component Details (continued)

Gainesville, FL

Project Title:
Highlands Model
Building Type: User

12/17/2021

Doors	Type	Storm Ueff.		Area X	HTM=	Load	
	1	Insulated - Exterior, n	(0.400)	16	16.0	249 Btuh	
	2	Insulated - Exterior, n	(0.400)	40	16.0	640 Btuh	
	3	Insulated - Exterior, n	(0.400)	20	16.0	320 Btuh	
	4	Insulated - Garage, n	(0.400)	20	16.0	320 Btuh	
	5	Insulated - Exterior, n	(0.400)	48	16.0	768 Btuh	
	Door Total			144(sqft)		2297Btuh	
Ceilings	Type/Color/Surface	Ueff.	R-Value	Area X	HTM=	Load	
	1	Vented Attic/L/Shing	(0.032)	30.0/0.0	2406	1.3	3065 Btuh
	2	Vented Attic/L/Shing	(0.032)	30.0/0.0	489	1.3	623 Btuh
	Ceiling Total			2895(sqft)		3688Btuh	
Floors	Type	Ueff.	R-Value	Size X	HTM=	Load	
	1	Slab On Grade	(1.180)	0.0	284.0 ft(perim.)	47.2	13405 Btuh
	2	Raised Wood - Adj	(0.036)	30.0	489.0 sqft	1.4	701 Btuh
	Floor Total			2895 sqft		14106 Btuh	
	Envelope Subtotal:					32249 Btuh	
Infiltration	Type	Wholehouse ACH	Volume(cuft)	Wall Ratio	CFM=		
	Natural	0.16	25566	1.00	69.5	3043 Btuh	
Duct load	Extremely sealed, R6.0, Supply(Att), Return(Att) (DLM of 0.157)					5553 Btuh	
All Zones	Sensible Subtotal All Zones					40845 Btuh	

WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss Ventilation Sensible Heat Loss Total Heat Loss	40845 Btuh 0 Btuh 40845 Btuh
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EQUIPMENT

1. Electric Heat Pump	#	42000 Btuh
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Manual J Winter Calculations

Residential Load - Component Details (continued)

Gainesville, FL

Project Title:
Highlands Model
Building Type: User

12/17/2021

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