(31)

Residential System Sizing Calculation

Summary

Project Title:
1680 Model

Lake City, FL 32024

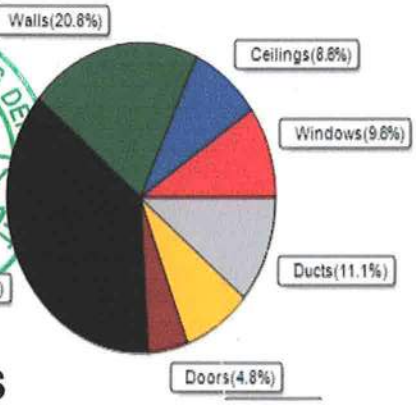
4/3/2020

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	**24959**	**Btuh**	**Total cooling load calculation**	**18339**	**Btuh**
Submitted heating capacity	% of calc	Btuh	Submitted cooling capacity	% of calc	Btuh
Total (Electric Heat Pump)	120.2	30000	Sensible (SHR = 0.85)	163.4	25500
Heat Pump + Auxiliary(0.0kW)	120.2	30000	Latent	164.4	4500
			Total (Electric Heat Pump)	163.6	30000

WINTER CALCULATIONS

Winter Heating Load (for 1680 sqft)

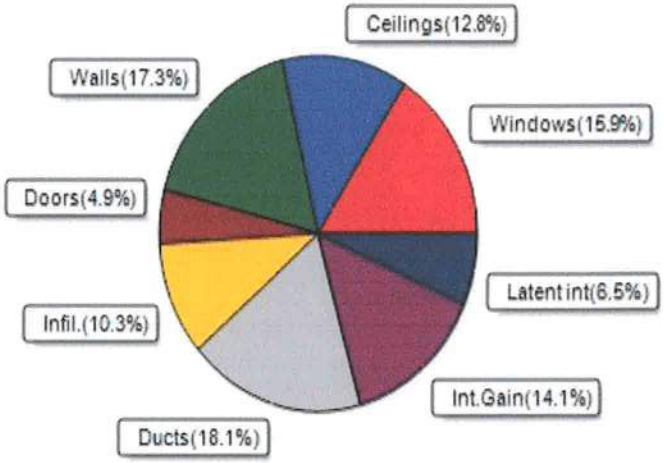
Load component			Load	
Window total	182	sqft	2402	Btuh
Wall total	1501	sqft	5198	Btuh
Door total	68	sqft	1203	Btuh
Ceiling total	1680	sqft	2140	Btuh
Floor total	1680	sqft	9251	Btuh
Infiltration	45	cfm	1991	Btuh
Duct loss			2773	Btuh
Subtotal			**24959**	**Btuh**
Ventilation	0	cfm	0	Btuh
TOTAL HEAT LOSS			**24959**	**Btuh**



SUMMER CALCULATIONS

Summer Cooling Load (for 1680 sqft)

Load component			Load	
Window total	182	sqft	2912	Btuh
Wall total	1501	sqft	3180	Btuh
Door total	68	sqft	902	Btuh
Ceiling total	1680	sqft	2354	Btuh
Floor total			0	Btuh
Infiltration	34	cfm	709	Btuh
Internal gain			2580	Btuh
Duct gain			2964	Btuh
Sens. Ventilation	0	cfm	0	Btuh
Blower Load			0	Btuh
Total sensible gain			**15602**	**Btuh**
Latent gain(ducts)			360	Btuh
Latent gain(infiltration)			1177	Btuh
Latent gain(ventilation)			0	Btuh
Latent gain(internal/occupants/other)			1200	Btuh
Total latent gain			**2737**	**Btuh**
TOTAL HEAT GAIN			**18339**	**Btuh**



Powered by ACCA MANUAL J 8th Edition

EnergyGauge® System Sizing
PREPARED BY: _____
DATE: _____

System Sizing Calculations - Summer

Residential Load - Whole House Component Details

Project Title:
1680 Model

Lake City, FL 32024

4/3/2020

Reference City: Gainesville, FL Temperature Difference: 19.0F(TMY3 99%) Humidity difference: 51gr.

Component Loads for Whole House

Window	Type* Panes	SHGC	U	InSh	IS	Ornt	Overhang Len	Hgt	Window Area(sqft) Gross	Shaded	Unshaded	HTM Shaded	Unshaded	Load
1	2 NFRC	0.22, 0.33		No	No	N	1.5ft	1.3ft	72.0	0.0	72.0	11	11	785 Btuh
2	2 NFRC	0.22, 0.33		No	No	N	7.5ft	1.3ft	36.0	0.0	36.0	11	11	392 Btuh
3	2 NFRC	0.22, 0.33		No	No	W	1.5ft	1.3ft	12.0	0.0	12.0	11	27	330 Btuh
4	2 NFRC	0.22, 0.33		No	No	S	1.5ft	1.3ft	18.0	18.0	0.0	11	13	196 Btuh
5	2 NFRC	0.22, 0.33		No	No	S	1.5ft	1.3ft	18.0	18.0	0.0	11	13	196 Btuh
6	2 NFRC	0.22, 0.33		No	No	W	1.5ft	1.3ft	8.0	0.0	8.0	11	27	220 Btuh
7	2 NFRC	0.22, 0.33		No	No	W	1.5ft	1.3ft	18.0	0.0	18.0	11	27	495 Btuh
	Excursion													298 Btuh
	Window Total								182 (sqft)					2912 Btuh

Walls	Type	U-Value	R-Value Cav/Sheath	Area(sqft)	HTM	Load
1	Frame - Wood - Ext	0.09	13.0/0.6	213.0	2.2	468 Btuh
2	Frame - Wood - Ext	0.09	13.0/0.6	30.0	2.2	66 Btuh
3	Frame - Wood - Ext	0.09	13.0/0.6	84.0	2.2	185 Btuh
4	Frame - Wood - Ext	0.09	13.0/0.6	42.0	2.2	92 Btuh
5	Frame - Wood - Ext	0.09	13.0/0.6	205.5	2.2	452 Btuh
6	Frame - Wood - Ext	0.09	13.0/0.6	27.0	2.2	59 Btuh
7	Frame - Wood - Ext	0.09	13.0/0.6	60.0	2.2	132 Btuh
8	Frame - Wood - Ext	0.09	13.0/0.6	75.0	2.2	165 Btuh
9	Frame - Wood - Ext	0.09	13.0/0.6	64.5	2.2	142 Btuh
10	Frame - Wood - Ext	0.09	13.0/0.6	87.0	2.2	191 Btuh
11	Frame - Wood - Ext	0.09	13.0/0.6	380.5	2.2	836 Btuh
12	Frame - Wood - Adj	0.09	13.0/0.0	232.0	1.7	391 Btuh
	Wall Total			1501 (sqft)		3180 Btuh

Doors	Type	Area (sqft)	HTM	Load
1	Insulated - Exterior	24.0	13.8	331 Btuh
2	Insulated - Exterior	24.0	13.8	331 Btuh
3	Insulated - Garage	20.0	12.0	240 Btuh
	Door Total	68 (sqft)		902 Btuh

Ceilings	Type/Color/Surface	U-Value	R-Value	Area(sqft)	HTM	Load
1	Vented Attic/Light/Shingle	0.032	30.0/0.0	1680.0	1.40	2354 Btuh
	Ceiling Total			1680 (sqft)		2354 Btuh

Floors	Type	R-Value	Size	HTM	Load
1	Slab On Grade	0.0	1680 (ft-perimeter)	0.0	0 Btuh
	Floor Total		1680.0 (sqft)		0 Btuh

		Envelope Subtotal:	9348 Btuh

Manual J Summer Calculations

Residential Load - Component Details (continued)

Project Title: 1680 Model

Climate:FL_GAINESVILLE_REGIONAL_A

Lake City, FL 32024

4/3/2020

Infiltration	Type Natural	Average ACH 0.14	Volume(cuft) 15120	Wall Ratio 1		CFM= 34.1	Load 709	Btuh
Internal gain		Occupants 6	Btuh/occupant X 230		+	Appliance 1200	Load 2580	Btuh
					Sensible Envelope Load:		12638	Btuh
Duct load	Extremely sealed, Supply(R6.0-Attic), Return(R6.0-Attic)				(DGM of 0.235)		2964	Btuh
					Sensible Load All Zones		**15602**	**Btuh**

Manual J Summer Calculations

Residential Load - Component Details (continued)

Project Title: 1680 Model

Climate:FL_GAINESVILLE_REGIONAL_A

Lake City, FL 32024

4/3/2020

WHOLE HOUSE TOTALS

	Sensible Envelope Load All Zones	**12638 Btuh**
	Sensible Duct Load	2964 Btuh
	Total Sensible Zone Loads	**15602 Btuh**
	Sensible ventilation	0 Btuh
	Blower	0 Btuh
Whole House	**Total sensible gain**	**15602 Btuh**
Totals for Cooling	Latent infiltration gain (for 51 gr. humidity difference)	1177 Btuh
	Latent ventilation gain	0 Btuh
	Latent duct gain	360 Btuh
	Latent occupant gain (6.0 people @ 200 Btuh per person)	1200 Btuh
	Latent other gain	0 Btuh
	Latent total gain	**2737 Btuh**
	TOTAL GAIN	**18339 Btuh**

EQUIPMENT

1. Central Unit	#	30000 Btuh

*Key: Window types (Panes - 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

Project Title:
1680 Model
Lake City, FL 32024 Building Type: User

4/3/2020

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	Vinyl	0.33	N	72.0	13.2	950 Btuh
2	2, NFRC 0.22	Vinyl	0.33	N	36.0	13.2	475 Btuh
3	2, NFRC 0.22	Vinyl	0.33	W	12.0	13.2	158 Btuh
4	2, NFRC 0.22	Vinyl	0.33	S	18.0	13.2	238 Btuh
5	2, NFRC 0.22	Vinyl	0.33	S	18.0	13.2	238 Btuh
6	2, NFRC 0.22	Vinyl	0.33	W	8.0	13.2	106 Btuh
7	2, NFRC 0.22	Vinyl	0.33	W	18.0	13.2	238 Btuh
	Window Total				182.0(sqft)		2402 Btuh

Walls	Type	Ornt.	Ueff.	R-Value (Cav/Sh)	Area X	HTM=	Load
1	Frame - Wood	- Ext	(0.086)	13.0/0.6	213	3.45	735 Btuh
2	Frame - Wood	- Ext	(0.086)	13.0/0.6	30	3.45	103 Btuh
3	Frame - Wood	- Ext	(0.086)	13.0/0.6	84	3.45	290 Btuh
4	Frame - Wood	- Ext	(0.086)	13.0/0.6	42	3.45	145 Btuh
5	Frame - Wood	- Ext	(0.086)	13.0/0.6	206	3.45	709 Btuh
6	Frame - Wood	- Ext	(0.086)	13.0/0.6	27	3.45	93 Btuh
7	Frame - Wood	- Ext	(0.086)	13.0/0.6	60	3.45	207 Btuh
8	Frame - Wood	- Ext	(0.086)	13.0/0.6	75	3.45	259 Btuh
9	Frame - Wood	- Ext	(0.086)	13.0/0.6	65	3.45	222 Btuh
10	Frame - Wood	- Ext	(0.086)	13.0/0.6	87	3.45	300 Btuh
11	Frame - Wood	- Ext	(0.086)	13.0/0.6	381	3.45	1312 Btuh
12	Frame - Wood	- Adj	(0.089)	13.0/0.0	232	3.55	824 Btuh
	Wall Total				1501(sqft)		5198 Btuh

Doors	Type	Storm	Ueff.	Area X	HTM=	Load
1	Insulated - Exterior,	n	(0.460)	24	18.4	442 Btuh
2	Insulated - Exterior,	n	(0.460)	24	18.4	442 Btuh
3	Insulated - Garage,	n	(0.400)	20	16.0	320 Btuh
	Door Total			68(sqft)		1203Btuh

Ceilings	Type/Color/Surface	Ueff.	R-Value	Area X	HTM=	Load
1	Vented Attic/L/Shing	(0.032)	30.0/0.0	1680	1.3	2140 Btuh
	Ceiling Total			1680(sqft)		2140Btuh

Floors	Type	Ueff.	R-Value	Size X	HTM=	Load
1	Slab On Grade	(1.180)	0.0	196.0 ft(perim.)	47.2	9251 Btuh
	Floor Total			1680 sqft		9251 Btuh

	Envelope Subtotal:	20195 Btuh

Infiltration	Type	Wholehouse	ACH	Volume(cuft)	Wall Ratio	CFM=	
	Natural		0.18	15120	1.00	45.5	1991 Btuh

Duct load	Extremely sealed, R6.0, Supply(Att), Return(Att)	(DLM of 0.125)	2773 Btuh

Manual J Winter Calculations

Residential Load - Component Details (continued)

Project Title:
1680 Model
Lake City, FL 32024 Building Type: User

4/3/2020

All Zones	**Sensible Subtotal All Zones**	**24959 Btuh**

WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss Ventilation Sensible Heat Loss Total Heat Loss	24959 Btuh 0 Btuh 24959 Btuh

EQUIPMENT

1. Electric Heat Pump	#	30000 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