Residential System Sizing Calculation

Summary

Project Title:
King Residence

, FL

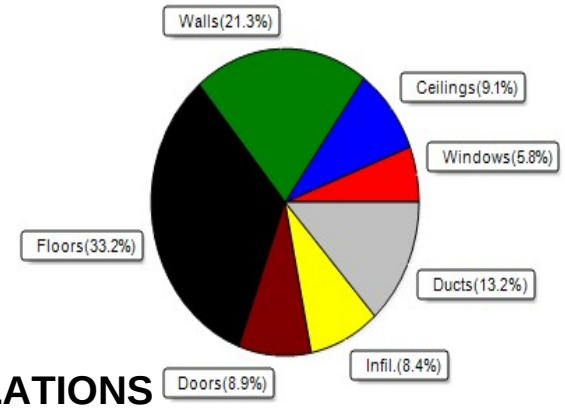
6/17/2022

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	**27448**	**Btuh**	**Total cooling load calculation**	**23857**	**Btuh**
Submitted heating capacity	% of calc	Btuh	Submitted cooling capacity	% of calc	Btuh
Total (Electric Heat Pump)	131.2	36000	Sensible (SHR = 0.85)	147.2	30600
Heat Pump + Auxiliary(0.0kW)	131.2	36000	Latent	175.9	5400
			Total (Electric Heat Pump)	150.9	36000

WINTER CALCULATIONS

Winter Heating Load (for 1964 sqft)

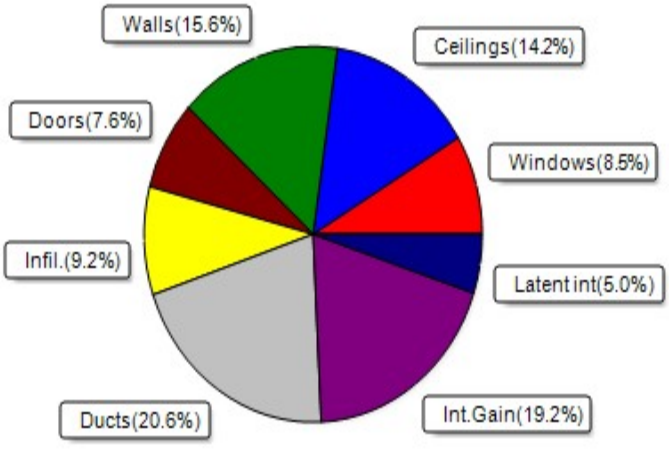
Load component			Load	
Window total	154	sqft	1602	Btuh
Wall total	1697	sqft	5851	Btuh
Door total	152	sqft	2432	Btuh
Ceiling total	1964	sqft	2502	Btuh
Floor total	1964	sqft	9110	Btuh
Infiltration	53	cfm	2317	Btuh
Duct loss			3635	Btuh
Subtotal			**27448**	**Btuh**
Ventilation	0	cfm	0	Btuh
TOTAL HEAT LOSS			**27448**	**Btuh**



SUMMER CALCULATIONS

Summer Cooling Load (for 1964 sqft)

Load component			Load	
Window total	154	sqft	2034	Btuh
Wall total	1697	sqft	3730	Btuh
Door total	152	sqft	1824	Btuh
Ceiling total	1964	sqft	3378	Btuh
Floor total			0	Btuh
Infiltration	40	cfm	826	Btuh
Internal gain			4580	Btuh
Duct gain			4415	Btuh
Sens. Ventilation	0	cfm	0	Btuh
Blower Load			0	Btuh
Total sensible gain			**20787**	**Btuh**
Latent gain(ducts)			501	Btuh
Latent gain(infiltration)			1370	Btuh
Latent gain(ventilation)			0	Btuh
Latent gain(internal/occupants/other)			1200	Btuh
Total latent gain			**3070**	**Btuh**
TOTAL HEAT GAIN			**23857**	**Btuh**



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EnergyGauge® System Sizing
PREPARED BY: _____
DATE: 6-16-22

System Sizing Calculations - Summer

Residential Load - Whole House Component Details

Project Title:
King Residence

, FL

6/17/2022

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	0.20, 0.26		No	No	N	1.5ft.	2.3ft.	15.0	0.0	15.0	9	9	137 Btuh
2	2 NFRC	0.20, 0.26		No	No	N	11.5f	2.3ft.	10.0	0.0	10.0	9	9	91 Btuh
3	2 NFRC	0.20, 0.26		No	No	E	1.5ft.	2.3ft.	10.0	0.0	10.0	9	24	242 Btuh
4	2 NFRC	0.20, 0.26		No	No	E	1.5ft.	2.3ft.	8.0	0.0	8.0	9	24	194 Btuh
5	2 NFRC	0.20, 0.26		No	No	E	1.5ft.	2.3ft.	20.0	0.0	20.0	9	24	484 Btuh
6	2 NFRC	0.20, 0.26		No	No	S	1.5ft.	2.3ft.	12.5	12.5	0.0	9	11	114 Btuh
7	2 NFRC	0.20, 0.26		No	No	S	1.5ft.	2.3ft.	15.0	15.0	0.0	9	11	137 Btuh
8	2 NFRC	0.20, 0.26		No	No	S	9.5ft.	2.3ft.	60.0	60.0	0.0	9	11	549 Btuh
9	2 NFRC	0.20, 0.26		No	No	W	1.5ft.	2.3ft.	3.5	0.0	3.5	9	24	85 Btuh
	Window Total								154 (sqft)					2034 Btuh

Walls	Type	U-Value	R-Value Cav/Sheath	Area(sqft)	HTM	Load
1	Frame - Wood - Ext	0.09	13.0/0.6	108.3	2.2	238 Btuh
2	Frame - Wood - Ext	0.09	13.0/0.6	174.7	2.2	384 Btuh
3	Frame - Wood - Ext	0.09	13.0/0.6	43.3	2.2	95 Btuh
4	Frame - Wood - Ext	0.09	13.0/0.6	155.0	2.2	341 Btuh
5	Frame - Wood - Ext	0.09	13.0/0.6	265.3	2.2	583 Btuh
6	Frame - Wood - Ext	0.09	13.0/0.6	184.2	2.2	405 Btuh
7	Frame - Wood - Ext	0.09	13.0/0.6	336.0	2.2	739 Btuh
8	Frame - Wood - Ext	0.09	13.0/0.6	178.3	2.2	392 Btuh
9	Frame - Wood - Ext	0.09	13.0/0.6	43.3	2.2	95 Btuh
10	Frame - Wood - Ext	0.09	13.0/0.6	164.8	2.2	362 Btuh
11	Frame - Wood - Ext	0.09	13.0/0.6	43.3	2.2	95 Btuh
	Wall Total			1697 (sqft)		3730 Btuh

Doors	Type	Area (sqft)	HTM	Load
1	Insulated - Exterior	20.0	12.0	240 Btuh
2	Insulated - Exterior	72.0	12.0	864 Btuh
3	Insulated - Exterior	20.0	12.0	240 Btuh
4	Insulated - Exterior	40.0	12.0	480 Btuh
	Door Total	152 (sqft)		1824 Btuh

Ceilings	Type/Color/Surface	U-Value	R-Value	Area(sqft)	HTM	Load
1	Vented Attic/DarkShingle	0.032	30.0/0.0	1964.0	1.72	3378 Btuh
	Ceiling Total			1964 (sqft)		3378 Btuh

Floors	Type	R-Value	Size	HTM	Load
1	Slab On Grade	0.0	1964 (ft-perimeter)	0.0	0 Btuh
	Floor Total		1964.0 (sqft)		0 Btuh

	Envelope Subtotal:	10966 Btuh

Manual J Summer Calculations

Residential Load - Component Details (continued)

Project Title: King Residence
Climate:FL_GAINESVILLE_REGIONAL_A

, FL

6/17/2022

Infiltration	Type	Average ACH		Volume(cuft)		Wall Ratio		CFM=	Load	
	Natural	0.12		19640		1		39.7	826	Btuh
Internal gain		Occupants		Btuh/occupant				Appliance	Load	
		6	X	230	+			3200	4580	Btuh
							Sensible Envelope Load:		16371	Btuh
Duct load	Extremely sealed, Supply(R6.0-Attic), Return(R6.0-Attic)						(DGM of 0.270)		4415	Btuh
							Sensible Load All Zones		**20787**	**Btuh**

Manual J Summer Calculations

Residential Load - Component Details (continued)

Project Title: King Residence
Climate:FL_GAINESVILLE_REGIONAL_A

, FL

6/17/2022

WHOLE HOUSE TOTALS

Whole House Totals for Cooling	**Sensible Envelope Load All Zones**	**16371**	**Btuh**
	Sensible Duct Load	4415	Btuh
	Total Sensible Zone Loads	**20787**	**Btuh**
	Sensible ventilation	0	Btuh
	Blower	0	Btuh
	Total sensible gain	**20787**	**Btuh**
	Latent infiltration gain (for 51 gr. humidity difference)	1370	Btuh
	Latent ventilation gain	0	Btuh
	Latent duct gain	501	Btuh
	Latent occupant gain (6.0 people @ 200 Btuh per person)	1200	Btuh
	Latent other gain	0	Btuh
	Latent total gain	**3070**	**Btuh**
	TOTAL GAIN	**23857**	**Btuh**

EQUIPMENT

1. Central Unit	#	36000 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:
King Residence
, FL Building Type: User

6/17/2022

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	15.0	10.4	156 Btuh
2	2, NFRC 0.20	Vinyl	0.26	N	10.0	10.4	104 Btuh
3	2, NFRC 0.20	Vinyl	0.26	E	10.0	10.4	104 Btuh
4	2, NFRC 0.20	Vinyl	0.26	E	8.0	10.4	83 Btuh
5	2, NFRC 0.20	Vinyl	0.26	E	20.0	10.4	208 Btuh
6	2, NFRC 0.20	Vinyl	0.26	S	12.5	10.4	130 Btuh
7	2, NFRC 0.20	Vinyl	0.26	S	15.0	10.4	156 Btuh
8	2, NFRC 0.20	Vinyl	0.26	S	60.0	10.4	624 Btuh
9	2, NFRC 0.20	Vinyl	0.26	W	3.5	10.4	36 Btuh
	Window Total				154.0(sqft)		1602 Btuh

Walls	Type	Ornt.	Ueff.	R-Value (Cav/Sh)	Area X	HTM=	Load
1	Frame - Wood	- Ext	(0.086)	13.0/0.6	108	3.45	374 Btuh
2	Frame - Wood	- Ext	(0.086)	13.0/0.6	175	3.45	602 Btuh
3	Frame - Wood	- Ext	(0.086)	13.0/0.6	43	3.45	149 Btuh
4	Frame - Wood	- Ext	(0.086)	13.0/0.6	155	3.45	535 Btuh
5	Frame - Wood	- Ext	(0.086)	13.0/0.6	265	3.45	915 Btuh
6	Frame - Wood	- Ext	(0.086)	13.0/0.6	184	3.45	635 Btuh
7	Frame - Wood	- Ext	(0.086)	13.0/0.6	336	3.45	1159 Btuh
8	Frame - Wood	- Ext	(0.086)	13.0/0.6	178	3.45	615 Btuh
9	Frame - Wood	- Ext	(0.086)	13.0/0.6	43	3.45	149 Btuh
10	Frame - Wood	- Ext	(0.086)	13.0/0.6	165	3.45	568 Btuh
11	Frame - Wood	- Ext	(0.086)	13.0/0.6	43	3.45	149 Btuh
	Wall Total				1697(sqft)		5851 Btuh

Doors	Type	Storm	Ueff.	Area X	HTM=	Load
1	Insulated - Exterior,	n	(0.400)	20	16.0	320 Btuh
2	Insulated - Exterior,	n	(0.400)	72	16.0	1152 Btuh
3	Insulated - Exterior,	n	(0.400)	20	16.0	320 Btuh
4	Insulated - Exterior,	n	(0.400)	40	16.0	640 Btuh
	Door Total			152(sqft)		2432Btuh

Ceilings	Type/Color/Surface	Ueff.	R-Value	Area X	HTM=	Load
1	Vented Attic/D/Shing	(0.032)	30.0/0.0	1964	1.3	2502 Btuh
	Ceiling Total			1964(sqft)		2502Btuh

Floors	Type	Ueff.	R-Value	Size X	HTM=	Load
1	Slab On Grade	(1.180)	0.0	193.0 ft(perim.)	47.2	9110 Btuh
	Floor Total			1964 sqft		9110 Btuh

	Envelope Subtotal:	21496 Btuh

Infiltration	Type	Wholehouse	ACH	Volume(cuft)	Wall Ratio	CFM=	
	Natural		0.16	19640	1.00	52.9	2317 Btuh

Manual J Winter Calculations

Residential Load - Component Details (continued)

Project Title:
King Residence
, FL Building Type: User

6/17/2022

Duct load	Extremely sealed, R6.0, Supply(Att), Return(Att) (DLM of 0.153)	3635 Btuh
All Zones	**Sensible Subtotal All Zones**	**27448 Btuh**

WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss Ventilation Sensible Heat Loss Total Heat Loss	27448 Btuh 0 Btuh 27448 Btuh

EQUIPMENT

1. Electric Heat Pump	#	36000 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