Residential System Sizing Calculation

Summary

Bullard

Lake City, FL 32024

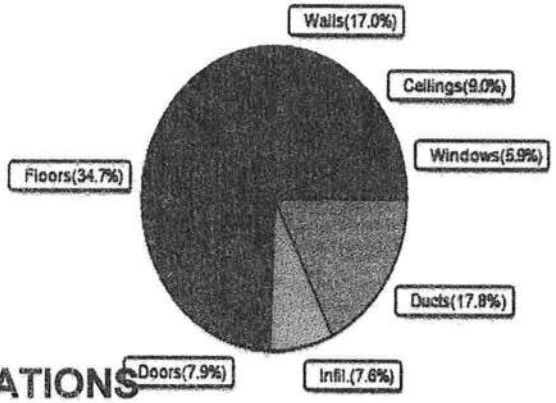
Project Title:
B&B Bullard

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(54gr.)					
Winter design temperature(MJ8 99%)	33	F	Summer design temperature(MJ8 99%)	92	F
Winter setpoint	70	F	Summer setpoint	75	F
Winter temperature difference	37	F	Summer temperature difference	17	F
Total heating load calculation	**25895**	**Btuh**	**Total cooling load calculation**	**19486**	**Btuh**
Submitted heating capacity	% of calc	Btuh	Submitted cooling capacity	% of calc	Btuh
Total (Electric Heat Pump)	185.4	48000	Sensible (SHR = 0.75)	239.2	36000
Heat Pump + Auxiliary(0.0kW)	185.4	48000	Latent	270.5	12000
			Total (Electric Heat Pump)	246.3	48000

WINTER CALCULATIONS

Winter Heating Load (for 1984 sqft)

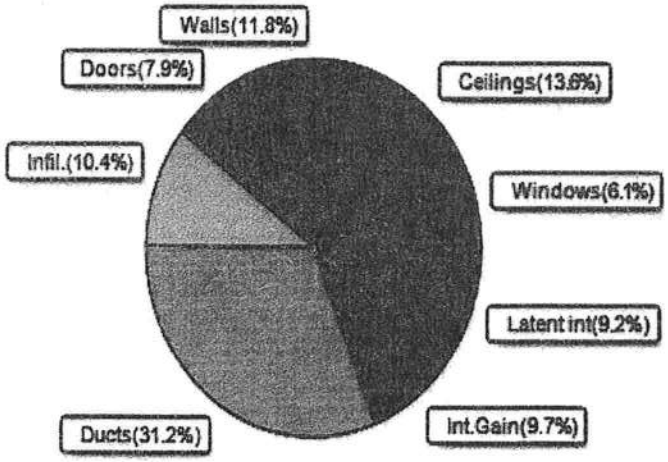
Load component			Load	
Window total	126	sqft	1538	Btuh
Wall total	1608	sqft	4403	Btuh
Door total	120	sqft	2042	Btuh
Ceiling total	1984	sqft	2338	Btuh
Floor total	1984	sqft	8994	Btuh
Infiltration	49	cfm	1981	Btuh
Duct loss			4599	Btuh
Subtotal			**25895**	**Btuh**
Ventilation	Ex:0 cfm; Sup:0 cfm		0	Btuh
TOTAL HEAT LOSS			**25895**	**Btuh**



SUMMER CALCULATIONS

Summer Cooling Load (for 1984 sqft)

Load component			Load	
Window total	126	sqft	1191	Btuh
Wall total	1608	sqft	2309	Btuh
Door total	120	sqft	1546	Btuh
Ceiling total	1984	sqft	2654	Btuh
Floor total			0	Btuh
Infiltration	37	cfm	683	Btuh
Internal gain			1890	Btuh
Duct gain			4778	Btuh
Sens.Ventilation	Ex:0 cfm; Sup:0 cfm		0	Btuh
Blower Load			0	Btuh
Total sensible gain			**15049**	**Btuh**
Latent gain(ducts)			1296	Btuh
Latent gain(infiltration)			1340	Btuh
Latent gain(ventilation)			0	Btuh
Latent gain(internal/occupants/other)			1800	Btuh
Total latent gain			**4437**	**Btuh**
TOTAL HEAT GAIN			**19486**	**Btuh**



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EnergyGauge® System Sizing
PREPARED BY:
DATE: 1/4/2021

System Sizing Calculations - Winter

Residential Load - Whole House Component Details

Bullard

Lake City, FL 32024

Project Title:
B&B Bullard
Building Type: User

1/5/2022

Reference City: Gainesville, FL (Defaults) Winter Temperature Difference: 37.0 °F (MJ8 99%)
Winter Setpoint: 70 °F (Required Manual J default)

Component Loads for Whole House

Window	Panes/Type	Frame	U	Orientation	Area(sqft) X	HTM=	Load
1	2, NFRC 0.21	Metal	0.33	N	15.0	12.2	183 Btuh
2	2, NFRC 0.21	Metal	0.33	N	9.0	12.2	110 Btuh
3	2, NFRC 0.21	Metal	0.33	E	20.0	12.2	244 Btuh
4	2, NFRC 0.21	Metal	0.33	S	12.0	12.2	147 Btuh
5	2, NFRC 0.21	Metal	0.33	S	40.0	12.2	488 Btuh
6	2, NFRC 0.21	Metal	0.33	S	30.0	12.2	366 Btuh
	Window Total				126.0(sqft)		1538 Btuh

Walls	Type	Ornt.	Ueff.	R-Value (Cav/Sh)	Area X	HTM=	Load
1	Frame - Wood	- Ext	(0.074)	19.0/1.0	434	2.74	1188 Btuh
2	Frame - Wood	- Ext	(0.074)	19.0/1.0	349	2.74	956 Btuh
3	Frame - Wood	- Ext	(0.074)	19.0/1.0	234	2.74	641 Btuh
4	Frame - Wood	- Ext	(0.074)	19.0/1.0	369	2.74	1010 Btuh
5	Frame - Wood	- Ext	(0.074)	19.0/1.0	222	2.74	608 Btuh
	Wall Total				1608(sqft)		4403 Btuh

Doors	Type	Storm	Ueff.	Area X	HTM=	Load
1	Insulated - Exterior,	n	(0.460)	20	17.0	340 Btuh
2	Insulated - Exterior,	n	(0.460)	40	17.0	681 Btuh
3	Insulated - Exterior,	n	(0.460)	40	17.0	681 Btuh
4	Insulated - Exterior,	n	(0.460)	20	17.0	340 Btuh
	Door Total			120(sqft)		2042Btuh

Ceilings	Type/Color/Surface	Ueff.	R-Value	Area X	HTM=	Load
1	Vented Attic/L/Shing	(0.032)	30.0/0.0	1984	1.2	2338 Btuh
	Ceiling Total			1984(sqft)		2338Btuh

Floors	Type	Ueff.	R-Value	Size X	HTM=	Load
1	Slab On Grade	(1.180)	0.0	206.0 ft(perim.)	43.7	8994 Btuh
	Floor Total			1984 sqft		8994 Btuh

	Envelope Subtotal:	19316 Btuh

Infiltration	Type	Wholehouse ACH	Volume(cuft)	Wall Ratio	CFM=	
	Natural	0.16	17856	1.00	48.9	1981 Btuh

Duct load	Average sealed, R6.0, Supply(Att), Return(Att) (DLM of 0.216)	4599 Btuh
All Zones	**Sensible Subtotal All Zones**	**25895 Btuh**

Manual J Winter Calculations

Residential Load - Component Details (continued)

Bullard

Lake City, FL 32024

Project Title:
B&B Bullard
Building Type: User

1/5/2022

WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss Ventilation Sens. Heat Loss (Ex:0 cfm; Sup:0 cfm) Total Heat Loss	25895 Btuh 0 Btuh 25895 Btuh

EQUIPMENT

1. Electric Heat Pump	#	48000 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)

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System Sizing Calculations - Summer

Residential Load - Whole House Component Details

Bullard

Lake City, FL 32024

Project Title:
B&B Bullard

1/5/2022

Reference City: Gainesville, FL (Defaults)
Humidity difference: 54gr.

Temperature Difference: 17.0F(MJ8 99%)
Summer Setpoint: 75 °F (Required Manual J default)

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	0.21,	0.33	B-L	No	N	9.0ft	2.0ft	15.0	0.0	15.0	8	8	115 Btuh
2	2 NFRC	0.21,	0.33	B-L	No	N	9.0ft	2.0ft	9.0	0.0	9.0	8	8	69 Btuh
3	2 NFRC	0.21,	0.33	B-L	No	E	2.0ft	2.0ft	20.0	0.0	20.0	8	19	377 Btuh
4	2 NFRC	0.21,	0.33	B-L	No	S	2.0ft	2.0ft	12.0	12.0	0.0	8	9	92 Btuh
5	2 NFRC	0.21,	0.33	B-L	No	S	2.0ft	2.0ft	40.0	40.0	0.0	8	9	307 Btuh
6	2 NFRC	0.21,	0.33	B-L	No	S	6.0ft	2.0ft	30.0	30.0	0.0	8	9	230 Btuh
	Window Total								126 (sqft)					1191 Btuh

Walls	Type	U-Value	R-Value Cav/Sheath	Area(sqft)	HTM	Load
1	Frame - Wood - Ext	0.07	19.0/1.0	434.0	1.4	623 Btuh
2	Frame - Wood - Ext	0.07	19.0/1.0	349.0	1.4	501 Btuh
3	Frame - Wood - Ext	0.07	19.0/1.0	234.0	1.4	336 Btuh
4	Frame - Wood - Ext	0.07	19.0/1.0	369.0	1.4	530 Btuh
5	Frame - Wood - Ext	0.07	19.0/1.0	222.0	1.4	319 Btuh
	Wall Total			1608 (sqft)		2309 Btuh

Doors	Type	Area (sqft)	HTM	Load
1	Insulated - Exterior	20.0	12.9	258 Btuh
2	Insulated - Exterior	40.0	12.9	515 Btuh
3	Insulated - Exterior	40.0	12.9	515 Btuh
4	Insulated - Exterior	20.0	12.9	258 Btuh
	Door Total	120 (sqft)		1546 Btuh

Ceilings	Type/Color/Surface	U-Value	R-Value	Area(sqft)	HTM	Load
1	Vented Attic/Light/Shingle	0.032	30.0/0.0	1984.0	1.34	2654 Btuh
	Ceiling Total			1984 (sqft)		2654 Btuh

Floors	Type	R-Value	Size	HTM	Load
1	Slab On Grade	0.0	1984 (ft-perimeter)	0.0	0 Btuh
	Floor Total		1984.0 (sqft)		0 Btuh

	Envelope Subtotal:	7699 Btuh

Infiltration	Type	Average ACH	Volume(cuft)	Wall Ratio	CFM=	Load
	Natural	0.12	17856	1	36.7	683 Btuh

Internal gain		Occupants	Btuh/occupant		Appliance	Load
		3	X 230	+	1200	1890 Btuh
				Sensible Envelope Load:		10271 Btuh
Duct load	Average sealed, Supply(R6.0-Attic), Return(R6.0-Attic)			(DGM of 0.465)		4778 Btuh
				Sensible Load All Zones		**15049 Btuh**

Manual J Summer Calculations

Residential Load - Component Details (continued)

Bullard

Project Title: B&B Bullard

Climate:FL_GAINESVILLE_REGIONAL_A

Lake City, FL 32024

1/5/2022

WHOLE HOUSE TOTALS

Whole House Totals for Cooling	**Sensible Envelope Load All Zones**	**10271 Btuh**
	Sensible Duct Load	4778 Btuh
	Total Sensible Zone Loads	**15049 Btuh**
	Sensible ventilation (Ex:0 cfm; Sup:0 cfm)	0 Btuh
	Blower	0 Btuh
	Total sensible gain	**15049 Btuh**
	Latent infiltration gain (for 54 gr. humidity difference)	1340 Btuh
	Latent ventilation gain	0 Btuh
	Latent duct gain	1296 Btuh
	Latent occupant gain (3.0 people @ 200 Btuh per person)	600 Btuh
	Latent other gain	1200 Btuh
	Latent total gain	**4437 Btuh**
	TOTAL GAIN	**19486 Btuh**

EQUIPMENT

1. Central Unit	#	48000 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)

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