Residential System Sizing Calculation

Summary

N/A

Project Title:
The Bristol

LC, FL 32025-

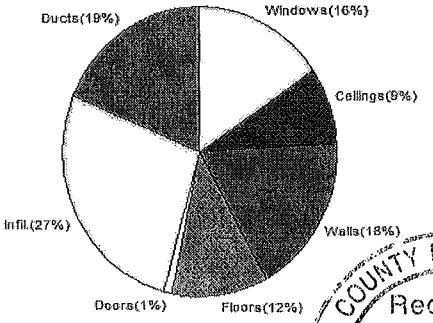
9/18/2013

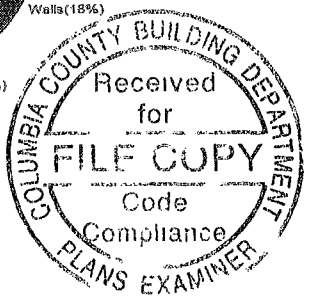
Location for weather data Gainesville, FL - Defaults. Latitude(29 7) Altitude(152 ft) Temp Range(M)					
Humidity data Interior RH (50%) Outdoor wet bulb (77F) Humidity difference(54gr)					
Winter design temperature(MJ8 99%)	33	F	Summer design temperature(MJ8 99%)	92	F
Winter setpoint	70	F	Summer setpoint	75	F
Winter temperature difference	37	F	Summer temperature difference	17	F
Total heating load calculation	**32400**	**Btuh**	**Total cooling load calculation**	**41751**	**Btuh**
Submitted heating capacity	% of calc	Btuh	Submitted cooling capacity	% of calc	Btuh
Total (Electric Heat Pump)	141 7	45900	Sensible (SHR = 0 75)	103 7	34425
Heat Pump + Auxiliary(0.0kW)	141.7	45900	Latent	134.0	11475
			Total (Electric Heat Pump)	109 9	45900

WINTER CALCULATIONS

Winter Heating Load (for 2182 sqft)

Load component			Load	
Window total	454	sqft	5039	Btuh
Wall total	1758	sqft	5774	Btuh
Door total	18	sqft	303	Btuh
Ceiling total	2400	sqft	2828	Btuh
Floor total	2182	sqft	3745	Btuh
Infiltration	213	cfm	8620	Btuh
Duct loss			6090	Btuh
Subtotal			**32400**	**Btuh**
Ventilation	0	cfm	0	Btuh
TOTAL HEAT LOSS			**32400**	**Btuh**

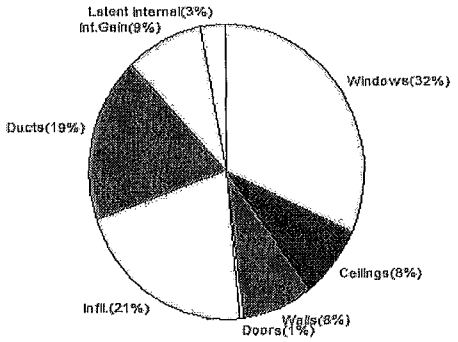




SUMMER CALCULATIONS

Summer Cooling Load (for 2182 sqft)

Load component			Load	
Window total	454	sqft	13280	Btuh
Wall total	1758	sqft	3470	Btuh
Door total	18	sqft	229	Btuh
Ceiling total	2400	sqft	3210	Btuh
Floor total			0	Btuh
Infiltration	160	cfm	2971	Btuh
Internal gain			3780	Btuh
Duct gain			6248	Btuh
Sens Ventilation	0	cfm	0	Btuh
Blower Load			0	Btuh
Total sensible gain			**33187**	**Btuh**
Latent gain(ducts)			1530	Btuh
Latent gain(infiltration)			5833	Btuh
Latent gain(ventilation)			0	Btuh
Latent gain(internal/occupants/other)			1200	Btuh
Total latent gain			**8564**	**Btuh**
TOTAL HEAT GAIN			**41751**	**Btuh**



8th Edition

EnergyGauge® System Sizing
PREPARED BY _____
DATE _____

System Sizing Calculations - Winter

Residential Load - Whole House Component Details

N/A

Project Title:
The Bristol

LC, FL 32025-

Building Type. User

9/18/2013

Reference City· Gainesville, FL (Defaults) Winter Temperature Difference. 37.0 F (MJ8 99%)

Component Loads for Whole House

Window	Panes/Type	Frame	U	Orientation	Area(sqft) X	HTM=	Load
1	2, NFRC 0.50	Metal	0 30	E	36 0	11 1	400 Btuh
2	2, NFRC 0.50	Metal	0 30	E	40 0	11.1	444 Btuh
3	2, NFRC 0.50	Metal	0 30	E	51 0	11 1	566 Btuh
4	2, NFRC 0.50	Metal	0 30	N	6.0	11 1	67 Btuh
5	2, NFRC 0 50	Metal	0 30	N	15 0	11 1	166 Btuh
6	2, NFRC 0 50	Metal	0 30	N	36 0	11 1	400 Btuh
7	2, NFRC 0 50	Metal	0 30	W	72 0	11 1	799 Btuh
8	2, NFRC 0 50	Metal	0 30	W	144 0	11 1	1598 Btuh
9	2, NFRC 0 50	Metal	0.30	S	54 0	11 1	599 Btuh
	Window Total				454 0(sqft)		5039 Btuh

Walls	Type	Ornt	Ueff.	R-Value (Cav/Sh)	Area X	HTM=	Load
1	Frame - Wood	- Ext	(0.089)	13.0/0 0	212	3 28	696 Btuh
2	Frame - Wood	- Ext	(0.089)	13 0/0 0	342	3.28	1123 Btuh
3	Frame - Wood	- Ext	(0.089)	13 0/0.0	391	3.28	1285 Btuh
4	Frame - Wood	- Ext	(0 089)	13 0/0 0	471	3 28	1547 Btuh
5	Frame - Wood	- Adj	(0.089)	13 0/0.0	198	3 28	650 Btuh
6	Frame - Wood	- Adj	(0 089)	13 0/0 0	144	3 28	474 Btuh
	Wall Total				1758(sqft)		5774 Btuh

Doors	Type	Storm	Ueff	Area X	HTM=	Load
1	Insulated - Garage, n		(0 460)	18	17 0	303 Btuh
	Door Total			18(sqft)		303Btuh

Ceilings	Type/Color/Surface	Ueff	R-Value	Area X	HTM=	Load
1	Vented Attic/L/Shing	(0 032)	30 0/0 0	2400	1 2	2828 Btuh
	Ceiling Total			2400(sqft)		2828Btuh

Floors	Type	Ueff	R-Value	Size X	HTM=	Load
1	Slab On Grade	(0.442)	5 0	229 0 ft(perim.)	16 4	3745 Btuh
	Floor Total			2182 sqft		3745 Btuh

	Envelope Subtotal	17689 Btuh

Infiltration	Type	Wholehouse ACH	Volume(cuft)	Wall Ratio	CFM=	
	Natural	0 62	20729	1 00	212 8	8620 Btuh

Duct load	Average sealed, R6 0, Supply(Att), Return(Att) (DLM of 0 231)	6090 Btuh
All Zones	**Sensible Subtotal All Zones**	**32400 Btuh**

Manual J Winter Calculations

Residential Load - Component Details (continued)

N/A

Project Title:
The Bristol
Building Type: User

LC, FL 32025-

9/18/2013

WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss	32400 Btuh
	Ventilation Sensible Heat Loss	0 Btuh
	Total Heat Loss	32400 Btuh

EQUIPMENT

1 Electric Heat Pump	#	45900 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

System Sizing Calculations - Summer

Residential Load - Whole House Component Details

N/A

Project Title
The Bristol

LC, FL 32025-

9/18/2013

Reference City. Gainesville, FL Temperature Difference: 17 0F(MJ8 99%) Humidity difference 54gr

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 50, 0 30		No	No	E	1 5ft	1 5ft	36 0	0 0	36 0	16	53	1919 Btuh
2	2 NFRC	0 50, 0 30		No	No	E	7 5ft	1 0ft	40 0	31 3	8 7	16	53	951 Btuh
3	2 NFRC	0 50, 0 30		No	No	E	11 5f	1 5ft	51 0	48 3	2 7	16	53	899 Btuh
4	2 NFRC	0 50, 0 30		No	No	N	1 0ft	8 0ft	6 0	0 0	6 0	16	16	94 Btuh
5	2 NFRC	0 50, 0 30		No	No	N	1 0ft	8 0ft	15 0	0 0	15 0	16	16	234 Btuh
6	2 NFRC	0 50, 0 30		No	No	N	1 5ft	1 5ft	36 0	0 0	36 0	16	16	562 Btuh
7	2 NFRC	0 50, 0 30		No	No	W	1 5ft	1 5ft	72 0	0 0	72 0	16	53	3838 Btuh
8	2 NFRC	0 50, 0 30		No	No	W	9 5ft	1 5ft	144 0	114 9	29 1	16	53	3344 Btuh
9	2 NFRC	0 50, 0 30		No	No	S	1 5ft	1 5ft	54 0	54 0	0 0	16	20	843 Btuh
	Excursion													595 Btuh
	Window Total								454 (sqft)					13280 Btuh

Walls	Type	U-Value	R-Value Cav/Sheath	Area(sqft)	HTM	Load
1	Frame - Wood - Ext	0 09	13 0/0 0	211 8	2 1	442 Btuh
2	Frame - Wood - Ext	0 09	13 0/0 0	342 0	2 1	713 Btuh
3	Frame - Wood - Ext	0 09	13 0/0 0	391 3	2 1	816 Btuh
4	Frame - Wood - Ext	0 09	13 0/0 0	471 0	2 1	982 Btuh
5	Frame - Wood - Adj	0 09	13 0/0 0	198 0	1 5	299 Btuh
6	Frame - Wood - Adj	0 09	13 0/0 0	144 2	1 5	218 Btuh
	Wall Total			1758 (sqft)		3470 Btuh

Doors	Type	Area (sqft)	HTM	Load
1	Insulated - Garage	17 8	12 9	229 Btuh
	Door Total	18 (sqft)		229 Btuh

Ceilings	Type/Color/Surface	U-Value	R-Value	Area(sqft)	HTM	Load
1	Vented Attic/Light/Shingle	0 032	30 0/0 0	2400 0	1 34	3210 Btuh
	Ceiling Total			2400 (sqft)		3210 Btuh

Floors	Type	R-Value	Size	HTM	Load
1	Slab On Grade	5 0	2182 (ft-perimeter)	0 0	0 Btuh
	Floor Total		2182 0 (sqft)		0 Btuh

			Envelope Subtotal.		20189 Btuh
Infiltration	Type	Average ACH	Volume(cuft)	Wall Ratio	CFM=	Load
	Natural	0.46	20729	1	159.6	2971 Btuh
Internal gain		Occupants	Btuh/occupant		Appliance	Load
		6	X 230	+	2400	3780 Btuh
			Sensible Envelope Load			26940 Btuh
Duct load	Average sealed,Supply(R6 0-Attic), Return(R6 0-Attic)			(DGM of 0.232)		6248 Btuh
			Sensible Load All Zones			**33187 Btuh**

Manual J Summer Calculations

Residential Load - Component Details (continued)

N/A | Project Title. The Bristol | Climate FL_GAINESVILLE_REGIONAL_A

LC, FL 32025-

9/18/2013

WHOLE HOUSE TOTALS

Whole House Totals for Cooling	**Sensible Envelope Load All Zones**	**26940 Btuh**
	Sensible Duct Load	6248 Btuh
	Total Sensible Zone Loads	**33187 Btuh**
	Sensible ventilation	0 Btuh
	Blower	0 Btuh
	Total sensible gain	**33187 Btuh**
	Latent infiltration gain (for 54 gr humidity difference)	5833 Btuh
	Latent ventilation gain	0 Btuh
	Latent duct gain	1530 Btuh
	Latent occupant gain (6.0 people @ 200 Btuh per person)	1200 Btuh
	Latent other gain	0 Btuh
	Latent total gain	**8564 Btuh**
	TOTAL GAIN	**41751 Btuh**

EQUIPMENT

1 Central Unit	#	45900 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