Residential System Sizing Calculation

Summary

Gootee Res

, FL

Project Title:
1308061

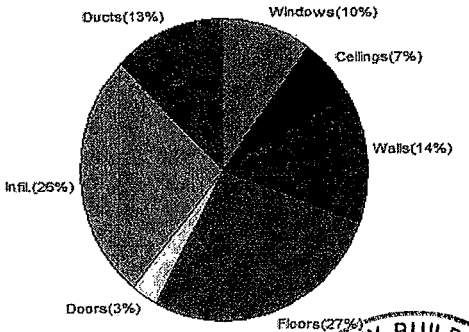
2013-08-23

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	**26819**	**Btuh**	**Total cooling load calculation**	**29036**	**Btuh**
Submitted heating capacity	% of calc	Btuh	Submitted cooling capacity	% of calc	Btuh
Total (Electric Heat Pump)	126.8	34000	Sensible (SHR = 0.75)	115 1	25500
Heat Pump + Auxiliary(0 0kW)	126 8	34000	Latent	123.6	8500
			Total (Electric Heat Pump)	117 1	34000

WINTER CALCULATIONS

Winter Heating Load (for 1508 sqft)

Load component			Load	
Window total	144	sqft	2735	Btuh
Wall total	1146	sqft	3765	Btuh
Door total	53	sqft	789	Btuh
Ceiling total	1508	sqft	1777	Btuh
Floor total	1508	sqft	7335	Btuh
Infiltration	173	cfm	7024	Btuh
Duct loss			3395	Btuh
Subtotal			**26819**	**Btuh**
Ventilation	0	cfm	0	Btuh
TOTAL HEAT LOSS			**26819**	**Btuh**



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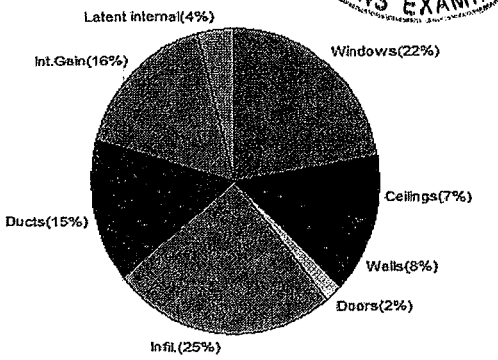
SUMMER CALCULATIONS

Summer Cooling Load (for 1508 sqft)

Load component			Load	
Window total	144	sqft	6487	Btuh
Wall total	1146	sqft	2301	Btuh
Door total	53	sqft	597	Btuh
Ceiling total	1508	sqft	2017	Btuh
Floor total			0	Btuh
Infiltration	130	cfm	2420	Btuh
Internal gain			4780	Btuh
Duct gain			3558	Btuh
Sens. Ventilation	0	cfm	0	Btuh
Blower Load			0	Btuh
Total sensible gain			**22161**	**Btuh**
Latent gain(ducts)			923	Btuh
Latent gain(infiltration)			4753	Btuh
Latent gain(ventilation)			0	Btuh
Latent gain(internal/occupants/other)			1200	Btuh
Total latent gain			**6876**	**Btuh**
TOTAL HEAT GAIN			**29036**	**Btuh**



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EnergyGauge® System Sizing
PREPARED BY ERIN BEAMSLEY
DATE 2013-08-23

System Sizing Calculations - Winter

Residential Load - Whole House Component Details

Gootee Res
, FL

Project Title:
1308061
Building Type: User

2013-08-23

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 0.35	Metal	0.35	E	30.0	12.9	388 Btuh
2	2, NFRC 0.35	Metal	0.35	E	6.0	12.9	78 Btuh
3	2, NFRC 0.35	Metal	0.35	E	26.7	12.9	345 Btuh
4	2, NFRC 0.35	Metal	0.35	S	30.0	12.9	388 Btuh
5	2, NFRC 0.66	Metal	0.87	W	45.0	32.2	1449 Btuh
6	2, NFRC 0.35	Metal	0.35	W	6.7	12 9	86 Btuh
	Window Total				144.3(sqft)		2735 Btuh

Walls	Type	Ornt.	Ueff.	R-Value (Cav/Sh)	Area X	HTM=	Load
1	Frame - Wood	- Ext	(0.089)	13.0/0.0	216	3.28	710 Btuh
2	Frame - Wood	- Ext	(0.089)	13.0/0.0	178	3.28	585 Btuh
3	Frame - Wood	- Ext	(0.089)	13.0/0.0	388	3.28	1274 Btuh
4	Frame - Wood	- Ext	(0.089)	13.0/0.0	208	3.28	683 Btuh
5	Frame - Wood	- Adj	(0.089)	13.0/0.0	156	3.28	512 Btuh
	Wall Total				1146(sqft)		3765 Btuh

Doors	Type	Storm	Ueff.	Area X	HTM=	Load
1	Insulated - Exterior,	n	(0.400)	20	14.8	296 Btuh
2	Insulated - Exterior,	n	(0.400)	13	14.8	197 Btuh
3	Insulated - Garage,	n	(0.400)	20	14.8	296 Btuh
	Door Total			53(sqft)		789Btuh

Ceilings	Type/Color/Surface	Ueff.	R-Value	Area X	HTM=	Load
1	Vented Attic/L/Shing	(0.032)	30 0/0.0	1508	1.2	1777 Btuh
	Ceiling Total			1508(sqft)		1777Btuh

Floors	Type	Ueff.	R-Value	Size X	HTM=	Load
1	Slab On Grade	(1.180)	0 0	168.0 ft(perim.)	43.7	7335 Btuh
	Floor Total			1508 sqft		7335 Btuh

	Envelope Subtotal:	16401 Btuh

Infiltration	Type	Wholehouse ACH	Volume(cuft)	Wall Ratio	CFM=	
	Natural	0.86	12064	1.00	173.4	7024 Btuh

Duct load	Average sealed, R6.0, Supply(Att), Return(Att) (DLM of 0.145)	3395 Btuh
All Zones	**Sensible Subtotal All Zones**	**26819 Btuh**

Manual J Winter Calculations

Residential Load - Component Details (continued)

Gootee Res
, FL

Project Title:
1308061
Building Type: User

2013-08-23

WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss	26819 Btuh
	Ventilation Sensible Heat Loss	0 Btuh
	Total Heat Loss	26819 Btuh

EQUIPMENT

1. Electric Heat Pump	#	34000 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

Gootee Res

Project Title:
1308061

, FL

2013-08-23

Reference City. Gainesville, FL Temperature Difference: 17.0F(MJ8 99%) Humidity difference: 54gr.

Component Loads for Whole House

	Type*					Overhang		Window Area(sqft)			HTM		Load
Window	Panes	SHGC	U	InSh	IS	Ornt	Len	Hgt	Gross	Shaded	Unshaded	Shaded	Unshaded	
1	2 NFRC	0 35, 0.35		No	No	E	1.5ft	1 0ft	30.0	1 5	28 5	13	40	1152 Btuh
2	2 NFRC	0 35, 0 35		No	No	E	1 5ft	1 0ft	6.0	0 5	5 5	13	40	225 Btuh
3	2 NFRC	0 35, 0 35		No	No	E	1 5ft	1 0ft	26 7	1 0	25 7	13	40	1033 Btuh
4	2 NFRC	0 35, 0 35		No	No	S	1 5ft	1 0ft	30 0	30 0	0 0	13	16	399 Btuh
5	2 NFRC	0 66, 0 87		No	No	W	1 5ft	1 0ft	45 0	2 2	42 8	29	78	3419 Btuh
6	2 NFRC	0 35, 0 35		No	No	W	1 5ft	1 0ft	6.7	0.2	6 4	13	40	258 Btuh
	Window Total								144 (sqft)					6487 Btuh

Walls	Type	U-Value	R-Value	Area(sqft)	HTM	Load
			Cav/Sheath			
1	Frame - Wood - Ext	0 09	13 0/0 0	216 3	2 1	451 Btuh
2	Frame - Wood - Ext	0 09	13 0/0 0	178 0	2 1	371 Btuh
3	Frame - Wood - Ext	0 09	13 0/0 0	388 0	2 1	809 Btuh
4	Frame - Wood - Ext	0 09	13 0/0 0	208 0	2 1	434 Btuh
5	Frame - Wood - Adj	0 09	13 0/0 0	156.0	1 5	235 Btuh
	Wall Total			1146 (sqft)		2301 Btuh

Doors	Type	Area (sqft)	HTM	Load
1	Insulated - Exterior	20 0	11 2	224 Btuh
2	Insulated - Exterior	13.3	11 2	149 Btuh
3	Insulated - Garage	20.0	11 2	224 Btuh
	Door Total	53 (sqft)		597 Btuh

Ceilings	Type/Color/Surface	U-Value	R-Value	Area(sqft)	HTM	Load
1	Vented Attic/Light/Shingle	0 032	30 0/0 0	1508 0	1 34	2017 Btuh
	Ceiling Total			1508 (sqft)		2017 Btuh

Floors	Type	R-Value	Size	HTM	Load
1	Slab On Grade	0 0	1508 (ft-perimeter)	0 0	0 Btuh
	Floor Total		1508.0 (sqft)		0 Btuh

	Envelope Subtotal:	11402 Btuh

Infiltration	Type	Average ACH	Volume(cuft)	Wall Ratio	CFM=	Load
	Natural	0.65	12064	1	130.0	2420 Btuh

Internal gain	Occupants		Btuh/occupant		Appliance	Load
	6	X	230	+	3400	4780 Btuh

	Sensible Envelope Load:	18602 Btuh
Duct load	Average sealed, Supply(R6 0-Attic), Return(R6 0-Attic) (DGM of 0.191)	3558 Btuh
	Sensible Load All Zones	**22161 Btuh**

Manual J Summer Calculations

Residential Load - Component Details (continued)

Gootee Res

, FL

Project Title: 1308061

Climate:FL_GAINESVILLE_REGIONAL_A

2013-08-23

WHOLE HOUSE TOTALS

Whole House Totals for Cooling	**Sensible Envelope Load All Zones**	**18602 Btuh**
	Sensible Duct Load	3558 Btuh
	Total Sensible Zone Loads	**22161 Btuh**
	Sensible ventilation	0 Btuh
	Blower	0 Btuh
	Total sensible gain	**22161 Btuh**
	Latent infiltration gain (for 54 gr. humidity difference)	4753 Btuh
	Latent ventilation gain	0 Btuh
	Latent duct gain	923 Btuh
	Latent occupant gain (6.0 people @ 200 Btuh per person)	1200 Btuh
	Latent other gain	0 Btuh
	Latent total gain	**6876 Btuh**
	TOTAL GAIN	**29036 Btuh**

EQUIPMENT

1. Central Unit	#	34000 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