

Residential System Sizing Calculation

Summary

N/A

Project Title:
Hartsville Model

LC, FL 32025-

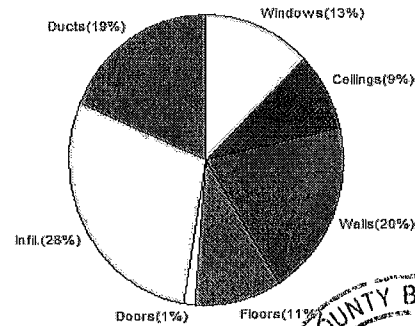
9/18/2013

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	29501 Btuh	Total cooling load calculation	38454 Btuh
Submitted heating capacity	% of calc Btuh	Submitted cooling capacity	% of calc Btuh
Total (Electric Heat Pump)	143.4 42300	Sensible (SHR = 0.75)	105.1 31725
Heat Pump + Auxiliary(0.0kW)	143.4 42300	Latent	127.9 10575
		Total (Electric Heat Pump)	110.0 42300

WINTER CALCULATIONS

Winter Heating Load (for 2012 sqft)

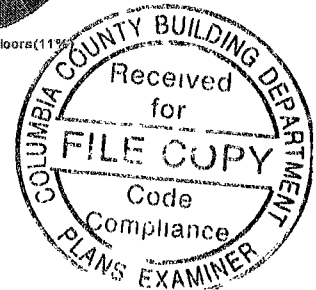
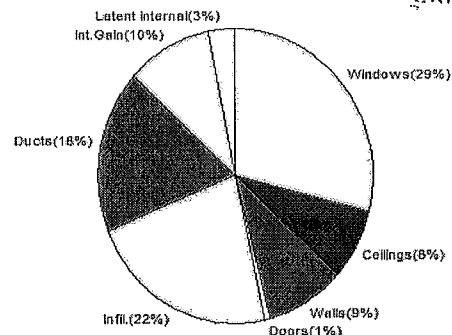
Load component		Load	
Window total	339 sqft	3767	Btuh
Wall total	1759 sqft	5777	Btuh
Door total	20 sqft	340	Btuh
Ceiling total	2213 sqft	2608	Btuh
Floor total	2012 sqft	3121	Btuh
Infiltration	207 cfm	8367	Btuh
Duct loss		5522	Btuh
Subtotal		29501	Btuh
Ventilation	0 cfm	0	Btuh
TOTAL HEAT LOSS		29501	Btuh



SUMMER CALCULATIONS

Summer Cooling Load (for 2012 sqft)

Load component		Load	
Window total	339 sqft	11185	Btuh
Wall total	1759 sqft	3462	Btuh
Door total	20 sqft	258	Btuh
Ceiling total	2213 sqft	2960	Btuh
Floor total		0	Btuh
Infiltration	155 cfm	2883	Btuh
Internal gain		3780	Btuh
Duct gain		5678	Btuh
Sens Ventilation	0 cfm	0	Btuh
Blower Load		0	Btuh
Total sensible gain		30187	Btuh
Latent gain(ducts)		1406	Btuh
Latent gain(infiltration)		5662	Btuh
Latent gain(ventilation)		0	Btuh
Latent gain(internal/occupants/other)		1200	Btuh
Total latent gain		8268	Btuh
TOTAL HEAT GAIN		38454	Btuh



8th Edition

EnergyGauge® System Sizing

PREPARED BY _____

DATE _____

System Sizing Calculations - Winter

Residential Load - Whole House Component Details

N/A

LC, FL 32025-

Project Title:
Hartsville Model
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	36.0		11.1	400 Btuh
3	2, NFRC 0.50	Metal	0.30	E	13.3		11.1	148 Btuh
4	2, NFRC 0.50	Metal	0.30	N	36.0		11.1	400 Btuh
5	2, NFRC 0.50	Metal	0.30	W	72.0		11.1	799 Btuh
6	2, NFRC 0.50	Metal	0.30	W	80.0		11.1	888 Btuh
7	2, NFRC 0.50	Metal	0.30	S	36.0		11.1	400 Btuh
8	2, NFRC 0.50	Metal	0.30	E	15.0		11.1	166 Btuh
9	2, NFRC 0.50	Metal	0.30	E	15.0		11.1	166 Btuh
Window Total					339.3(sqft)			3767 Btuh
Walls	Type	Ornt	Ueff	R-Value (Cav/Sh)	Area	X	HTM=	Load
1	Frame - Wood	- Ext	(0.089)	13.0/0.0	206		3.28	678 Btuh
2	Frame - Wood	- Ext	(0.089)	13.0/0.0	471		3.28	1546 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	336		3.28	1102 Btuh
5	Frame - Wood	- Adj	(0.089)	13.0/0.0	218		3.28	717 Btuh
6	Frame - Wood	- Adj	(0.089)	13.0/0.0	140		3.28	460 Btuh
Wall Total					1759(sqft)			5777 Btuh
Doors	Type	Storm	Ueff		Area	X	HTM=	Load
1	Insulated - Garage, n		(0.460)		20		17.0	340 Btuh
Door Total					20(sqft)			340Btuh
Ceilings	Type/Color/Surface		Ueff.	R-Value	Area	X	HTM=	Load
1	Vented Attic/L/Shing		(0.032)	30.0/0.0	2213		1.2	2608 Btuh
Ceiling Total					2213(sqft)			2608Btuh
Floors	Type		Ueff.	R-Value	Size	X	HTM=	Load
1	Slab On Grade		(0.442)	5.0	190.8 ft(perim)		16.4	3121 Btuh
Floor Total					2012 sqft			3121 Btuh
Envelope Subtotal								15612 Btuh
Infiltration	Type	Wholehouse	ACH	Volume(cuft)	Wall Ratio		CFM=	
	Natural		0.62	20120	1.00		206.6	8367 Btuh
Duct load	Average sealed, R6.0, Supply(Att), Return(Att) (DLM of 0.230)							5522 Btuh
All Zones	Sensible Subtotal All Zones							29501 Btuh

Manual J Winter Calculations

Residential Load - Component Details (continued)

N/A

LC, FL 32025-

Project Title
Hartsville Model
Building Type. User

9/18/2013

WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss	29501 Btuh
	Ventilation Sensible Heat Loss	0 Btuh
	Total Heat Loss	29501 Btuh

EQUIPMENT

1 Electric Heat Pump	#	42300 Btuh
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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.
Hartsville Model

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*						Overhang		Window Area(sqft)			HTM		Load	
	Panes	SHGC	U	InSh	IS	Ornt	Len	Hgt	Gross	Shaded	Unshaded	Shaded	Unshaded		
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	1.5ft	36.0	28.3	7.7	16	53	851 Btuh	
3	2 NFRC	0.50, 0.30	No	No	E		7.5ft	1.5ft	13.3	9.4	3.9	16	53	355 Btuh	
4	2 NFRC	0.50, 0.30	No	No	N		1.5ft	1.5ft	36.0	0.0	36.0	16	16	562 Btuh	
5	2 NFRC	0.50, 0.30	No	No	W		1.5ft	1.5ft	72.0	0.0	72.0	16	53	3838 Btuh	
6	2 NFRC	0.50, 0.30	No	No	W		8.5ft	1.5ft	80.0	66.7	13.3	16	53	1752 Btuh	
7	2 NFRC	0.50, 0.30	No	No	S		1.5ft	1.5ft	36.0	36.0	0.0	16	20	562 Btuh	
8	2 NFRC	0.50, 0.30	No	No	E		1.5ft	1.5ft	15.0	0.0	15.0	16	53	800 Btuh	
9	2 NFRC	0.50, 0.30	No	No	E		7.5ft	1.5ft	15.0	14.2	0.8	16	53	265 Btuh	
	Excursion													262 Btuh	
	Window Total								339 (sqft)					11165 Btuh	
Walls	Type						U-Value		R-Value		Area(sqft)		HTM		Load
									Cav/Sheath						
	1	Frame - Wood - Ext					0.09		13.0/0.0		206.3		2.1	430 Btuh	
	2	Frame - Wood - Ext					0.09		13.0/0.0		470.7		2.1	982 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		335.7		2.1	700 Btuh	
	5	Frame - Wood - Adj					0.09		13.0/0.0		218.3		1.5	329 Btuh	
	6	Frame - Wood - Adj					0.09		13.0/0.0		140.0		1.5	211 Btuh	
		Wall Total									1759 (sqft)				3462 Btuh
Doors	Type								Area (sqft)		HTM		Load		
	1	Insulated - Garage							20.0		12.9		258 Btuh		
		Door Total								20 (sqft)				258 Btuh	
Ceilings	Type/Color/Surface						U-Value		R-Value		Area(sqft)		HTM	Load	
	1	Vented Attic/Light/Shingle					0.032		30.0/0.0		2213.0		1.34	2960 Btuh	
		Ceiling Total									2213 (sqft)				2960 Btuh
Floors	Type								R-Value		Size		HTM	Load	
	1	Slab On Grade							5.0		2012 (ft-perimeter)		0.0	0 Btuh	
		Floor Total									2012.0 (sqft)				0 Btuh
	Envelope Subtotal													17845 Btuh	
Infiltration	Type						Average ACH		Volume(cuft)		Wall Ratio		CFM=	Load	
	Natural						0.46		20120		1		154.9	2883 Btuh	
Internal gain							Occupants		Btuh/occupant		Appliance		Load		
							6		X 230		+		2400	3780 Btuh	
	Sensible Envelope Load:													24509 Btuh	
Duct load	Average sealed,Supply(R6.0-Attic), Return(R6.0-Attic) (DGM of 0.232)													5678 Btuh	
	Sensible Load All Zones													30187 Btuh	

Manual J Summer Calculations

Residential Load - Component Details (continued)

N/A

Project Title: Climate FL_GAINESVILLE_REGIONAL_A
Hartsville Model

LC, FL 32025-

9/18/2013

WHOLE HOUSE TOTALS		
Whole House Totals for Cooling	Sensible Envelope Load All Zones	24509 Btuh
	Sensible Duct Load	5678 Btuh
	Total Sensible Zone Loads	30187 Btuh
	Sensible ventilation	0 Btuh
	Blower	0 Btuh
	Total sensible gain	30187 Btuh
	Latent infiltration gain (for 54 gr humidity difference)	5662 Btuh
	Latent ventilation gain	0 Btuh
	Latent duct gain	1406 Btuh
	Latent occupant gain (60 people @ 200 Btuh per person)	1200 Btuh
	Latent other gain	0 Btuh
	Latent total gain	8268 Btuh
	TOTAL GAIN	38454 Btuh

EQUIPMENT		
1 Central Unit	#	42300 Btuh

*Key Window types (Panels - 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