

Residential System Sizing Calculation

Summary

Mr & Mrs Smith

Project Title
Smith Residence

LC, FL 32055-

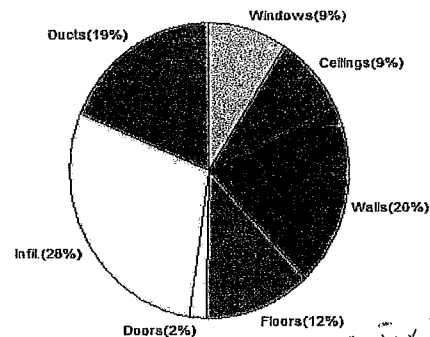
8/26/2013

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	36132 Btuh	Total cooling load calculation	42296 Btuh
Submitted heating capacity	% of calc Btuh	Submitted cooling capacity	% of calc Btuh
Total (Electric Heat Pump)	128.7 46500	Sensible (SHR = 0.75)	107.8 34875
Heat Pump + Auxiliary(0.0kW)	128.7 46500	Latent	117.0 11625
		Total (Electric Heat Pump)	109.9 46500

WINTER CALCULATIONS

Winter Heating Load (for 2470 sqft)

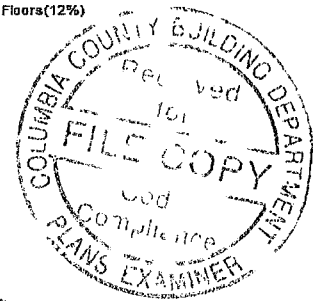
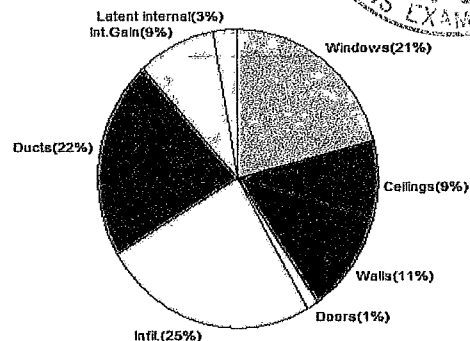
Load component		Load	
Window total	305 sqft	3384	Btuh
Wall total	2218 sqft	7286	Btuh
Door total	40 sqft	681	Btuh
Ceiling total	2717 sqft	3202	Btuh
Floor total	2470 sqft	4481	Btuh
Infiltration	254 cfm	10272	Btuh
Duct loss		6828	Btuh
Subtotal		36132	Btuh
Ventilation	0 cfm	0	Btuh
TOTAL HEAT LOSS		36132	Btuh



SUMMER CALCULATIONS

Summer Cooling Load (for 2470 sqft)

Load component		Load	
Window total	305 sqft	8835	Btuh
Wall total	2218 sqft	4627	Btuh
Door total	40 sqft	515	Btuh
Ceiling total	2717 sqft	3634	Btuh
Floor total		0	Btuh
Infiltration	190 cfm	3540	Btuh
Internal gain		3780	Btuh
Duct gain		7427	Btuh
Sens. Ventilation	0 cfm	0	Btuh
Blower Load		0	Btuh
Total sensible gain		32358	Btuh
Latent gain(ducts)		1788	Btuh
Latent gain(infiltration)		6951	Btuh
Latent gain(ventilation)		0	Btuh
Latent gain(internal/occupants/other)		1200	Btuh
Total latent gain		9938	Btuh
TOTAL HEAT GAIN		42296	Btuh



8th Edition

EnergyGauge® System Sizing

PREPARED BY

DATE

8/26/13

System Sizing Calculations - Winter

Residential Load - Whole House Component Details

Mr & Mrs Smith

LC, FL 32055-

Project Title:
Smith Residence
Building Type: User

8/26/2013

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	30.0		11.1	333 Btuh
2	2, NFRC 0.50	Metal	0.30	E	60.0		11.1	666 Btuh
3	2, NFRC 0.50	Metal	0.30	E	13.3		11.1	148 Btuh
4	2, NFRC 0.50	Metal	0.30	E	6.0		11.1	67 Btuh
5	2, NFRC 0.50	Metal	0.30	N	30.0		11.1	333 Btuh
6	2, NFRC 0.50	Metal	0.30	W	30.0		11.1	333 Btuh
7	2, NFRC 0.50	Metal	0.30	W	45.0		11.1	500 Btuh
8	2, NFRC 0.50	Metal	0.30	W	80.0		11.1	888 Btuh
9	2, NFRC 0.50	Metal	0.30	S	4.5		11.1	50 Btuh
10	2, NFRC 0.50	Metal	0.30	S	6.0		11.1	67 Btuh
Window Total					304.8(sqft)			3384 Btuh
Walls	Type	Ornt	Ueff	R-Value (Cav/Sh)	Area	X	HTM=	Load
1	Frame - Wood	- Ext	(0.089)	13.0/0.0	674		3.28	2213 Btuh
2	Frame - Wood	- Ext	(0.089)	13.0/0.0	447		3.28	1467 Btuh
3	Frame - Wood	- Ext	(0.089)	13.0/0.0	648		3.28	2129 Btuh
4	Frame - Wood	- Ext	(0.089)	13.0/0.0	450		3.28	1476 Btuh
Wall Total					2219(sqft)			7286 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)		20		17.0	340 Btuh
Door Total					40(sqft)			681 Btuh
Cellings	Type/Color/Surface		Ueff.	R-Value	Area	X	HTM=	Load
1	Vented Attic/L/Shing		(0.032)	30.0/0.0	2717		1.2	3202 Btuh
Ceiling Total					2717(sqft)			3202 Btuh
Floors	Type		Ueff.	R-Value	Size	X	HTM=	Load
1	Slab On Grade		(0.442)	5.0	274.0 ft(perim.)		16.4	4481 Btuh
Floor Total					2470 sqft			4481 Btuh
Envelope Subtotal:								19033 Btuh
Infiltration	Type	Wholehouse	ACH	Volume(cuft)	Wall Ratio	CFM=		Load
	Natural		0.62	24700	1.00	253.6		10272 Btuh
Duct load	Average sealed, R6.0, Supply(Att), Return(Att) (DLM of 0.233)							6828 Btuh
All Zones	Sensible Subtotal All Zones							36132 Btuh

Manual J Winter Calculations

Residential Load - Component Details (continued)

Mr & Mrs Smith

LC, FL 32055-

Project Title.
Smith Residence
Building Type: User

8/26/2013

WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss	36132 Btuh
	Ventilation Sensible Heat Loss	0 Btuh
	Total Heat Loss	36132 Btuh

EQUIPMENT

1 Electric Heat Pump	#	46500 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

Mr & Mrs Smith

Project Title:
Smith Residence

LC, FL 32055-

8/26/2013

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	30.0	0.0	30.0	16	53	1599 Btuh
2	2 NFRC	0.50	0.30	No	No	E	10.0f	1.5ft	60.0	60.0	0.0	16	53	937 Btuh
3	2 NFRC	0.50	0.30	No	No	E	10.0f	3.0ft.	13.3	10.6	2.7	16	53	311 Btuh
4	2 NFRC	0.50	0.30	No	No	E	1.5ft	1.5ft.	6.0	0.0	6.0	16	53	320 Btuh
5	2 NFRC	0.50	0.30	No	No	N	1.0ft	8.0ft	30.0	0.0	30.0	16	16	469 Btuh
6	2 NFRC	0.50	0.30	No	No	W	1.5ft	1.5ft.	30.0	0.0	30.0	16	53	1599 Btuh
7	2 NFRC	0.50	0.30	No	No	W	9.0ft.	1.5ft	45.0	45.0	0.0	16	53	703 Btuh
8	2 NFRC	0.50	0.30	No	No	W	9.0ft.	1.5ft	80.0	71.6	8.4	16	53	1564 Btuh
9	2 NFRC	0.50	0.30	No	No	S	1.0ft.	8.0ft	4.5	0.0	4.5	16	20	88 Btuh
10	2 NFRC	0.50	0.30	No	No	S	1.0ft	8.0ft.	6.0	0.0	6.0	16	20	117 Btuh
	Excursion													1127 Btuh
	Window Total								305 (sqft)					8835 Btuh
Walls	Type	U-Value					R-Value		Area(sqft)			HTM		Load
							Cav/Sheath							
1	Frame - Wood - Ext	0.09					13.0/0.0		674.0			2.1		1406 Btuh
2	Frame - Wood - Ext	0.09					13.0/0.0		446.7			2.1		932 Btuh
3	Frame - Wood - Ext	0.09					13.0/0.0		648.3			2.1		1352 Btuh
4	Frame - Wood - Ext	0.09					13.0/0.0		449.5			2.1		938 Btuh
	Wall Total								2218 (sqft)					4627 Btuh
Doors	Type								Area (sqft)			HTM		Load
1	Insulated - Exterior								20.0			12.9		258 Btuh
2	Insulated - Exterior								20.0			12.9		258 Btuh
	Door Total								40 (sqft)					515 Btuh
Ceilings	Type/Color/Surface	U-Value					R-Value		Area(sqft)			HTM		Load
1	Vented Attic/Light/Shingle	0.032					30.0/0.0		2717.0			1.34		3634 Btuh
	Ceiling Total								2717 (sqft)					3634 Btuh
Floors	Type						R-Value		Size			HTM		Load
1	Slab On Grade						5.0		2470 (ft-perimeter)			0.0		0 Btuh
	Floor Total								2470.0 (sqft)					0 Btuh
	Envelope Subtotal:													17611 Btuh
Infiltration	Type	Average ACH					Volume(cuft)		Wall Ratio		CFM=		Load	
	Natural	0.46					24700		1		190.2		3540 Btuh	
Internal gain		Occupants					Btuh/occupant		Appliance		Load			
		6					X 230		+		2400		3780 Btuh	
	Sensible Envelope Load:													24931 Btuh
Duct load	Average sealed,Supply(R6.0-Attic), Return(R6.0-Attic)								(DGM of 0.298)				7427 Btuh	
	Sensible Load All Zones													32358 Btuh

Manual J Summer Calculations

Residential Load - Component Details (continued)

Mr & Mrs Smith

Project Title:
Smith Residence

Climate:FL_GAINESVILLE_REGIONAL_A

LC, FL 32055-

8/26/2013

WHOLE HOUSE TOTALS

Whole House Totals for Cooling	Sensible Envelope Load All Zones	24931 Btuh
	Sensible Duct Load	7427 Btuh
	Total Sensible Zone Loads	32358 Btuh
	Sensible ventilation	0 Btuh
	Blower	0 Btuh
	Total sensible gain	32358 Btuh
	Latent infiltration gain (for 54 gr humidity difference)	6951 Btuh
	Latent ventilation gain	0 Btuh
	Latent duct gain	1788 Btuh
	Latent occupant gain (6.0 people @ 200 Btuh per person)	1200 Btuh
	Latent other gain	0 Btuh
	Latent total gain	9938 Btuh
	TOTAL GAIN	42296 Btuh

EQUIPMENT

1. Central Unit	#	46500 Btuh
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*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