

Residential System Sizing Calculation

Summary

Project Title:
Bedenbaugh

, FL

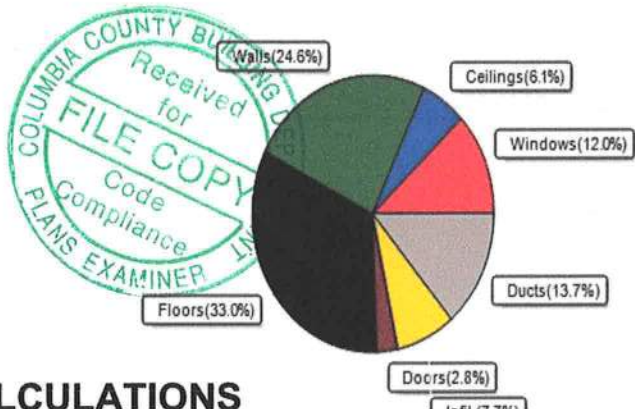
8/19/2021

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(51gr.)			
Winter design temperature(TMY3 99%)	30 F	Summer design temperature(TMY3 99%)	94 F
Winter setpoint	70 F	Summer setpoint	75 F
Winter temperature difference	40 F	Summer temperature difference	19 F
Total heating load calculation	22857 Btuh	Total cooling load calculation	16075 Btuh
Submitted heating capacity	% of calc Btuh	Submitted cooling capacity	% of calc Btuh
Total (Electric Heat Pump)	157.5 36000	Sensible (SHR = 0.85)	226.5 30600
Heat Pump + Auxiliary(0.0kW)	157.5 36000	Latent	210.5 5400
		Total (Electric Heat Pump)	223.9 36000

WINTER CALCULATIONS

Winter Heating Load (for 1500 sqft)

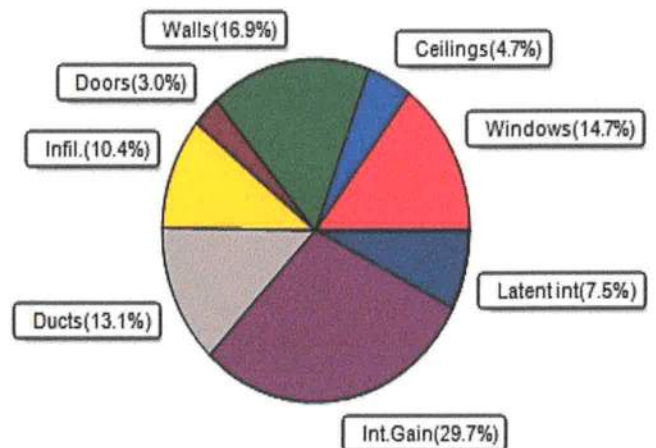
Load component		Load	
Window total	114 sqft	2736	Btuh
Wall total	1446 sqft	5626	Btuh
Door total	40 sqft	640	Btuh
Ceiling total	1500 sqft	1399	Btuh
Floor total	1500 sqft	7552	Btuh
Infiltration	40 cfm	1770	Btuh
Duct loss		3134	Btuh
Subtotal		22857	Btuh
Ventilation	0 cfm	0	Btuh
TOTAL HEAT LOSS		22857	Btuh



SUMMER CALCULATIONS

Summer Cooling Load (for 1500 sqft)

Load component		Load	
Window total	114 sqft	2359	Btuh
Wall total	1446 sqft	2715	Btuh
Door total	40 sqft	480	Btuh
Ceiling total	1500 sqft	762	Btuh
Floor total		0	Btuh
Infiltration	30 cfm	631	Btuh
Internal gain		4780	Btuh
Duct gain		1784	Btuh
Sens. Ventilation	0 cfm	0	Btuh
Blower Load		0	Btuh
Total sensible gain		13510	Btuh
Latent gain(ducts)		319	Btuh
Latent gain(infiltration)		1046	Btuh
Latent gain(ventilation)		0	Btuh
Latent gain(internal/occupants/other)		1200	Btuh
Total latent gain		2565	Btuh
TOTAL HEAT GAIN		16075	Btuh



8th Edition

EnergyGauge® System Sizing

PREPARED BY: _____

DATE: _____

8-19-21

System Sizing Calculations - Summer

Residential Load - Whole House Component Details

Project Title:
Bedenbaugh

, FL

8/19/2021

Reference City: Gainesville, FL

Temperature Difference: 19.0F(TMY3 99%) Humidity difference: 51gr.

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	0.27	0.60	No	No	N	1.0ft.	3.3ft.	30.0	0.0	30.0	17	17	512 Btuh
2	2 NFRC	0.27	0.60	No	No	N	1.0ft.	3.3ft.	9.0	0.0	9.0	17	17	154 Btuh
3	2 NFRC	0.27	0.60	No	No	S	9.0ft.	3.3ft.	60.0	60.0	0.0	17	19	1025 Btuh
4	2 NFRC	0.27	0.60	No	No	W	1.0ft.	3.3ft.	15.0	0.0	15.0	17	37	561 Btuh
	Excursion													106 Btuh
	Window Total								114 (sqft)					2359 Btuh
Walls	Type	U-Value				R-Value		Area(sqft)			HTM		Load	
1	Frame - Steel - Ext					0.10	21.0/0.0		441.0			1.9	828 Btuh	
2	Frame - Steel - Ext					0.10	21.0/0.0		300.0			1.9	563 Btuh	
3	Frame - Steel - Ext					0.10	21.0/0.0		420.0			1.9	789 Btuh	
4	Frame - Steel - Ext					0.10	21.0/0.0		285.0			1.9	535 Btuh	
	Wall Total								1446 (sqft)					2715 Btuh
Doors	Type	U-Value				R-Value		Area (sqft)			HTM		Load	
1	Insulated - Exterior								20.0			12.0	240 Btuh	
2	Insulated - Exterior								20.0			12.0	240 Btuh	
	Door Total								40 (sqft)					480 Btuh
Ceilings	Type/Color/Surface	U-Value				R-Value		Area(sqft)			HTM		Load	
1	Cath/Sngl Assem/Light/Metal					0.023	21.0/21.0		1500.0			0.51	762 Btuh	
	Ceiling Total								1500 (sqft)					762 Btuh
Floors	Type	U-Value				R-Value		Size			HTM		Load	
1	Slab On Grade						0.0		1500 (ft-perimeter)			0.0	0 Btuh	
	Floor Total								1500.0 (sqft)					0 Btuh
	Envelope Subtotal:													6316 Btuh
Infiltration	Type	Average ACH				Volume(cuft)		Wall Ratio		CFM=		Load		
	Natural					0.12	15000		1		30.3	631 Btuh		
Internal gain		Occupants				Btuh/occupant			Appliance		Load			
						6	X	230	+		3400	4780 Btuh		
	Sensible Envelope Load:													11726 Btuh
Duct load	Extremelysealed, Supply(R6.0-Exter), Return(R6.0-Condi)										(DGM of 0.152)		1784 Btuh	
	Sensible Load All Zones													13510 Btuh

Manual J Summer Calculations

Residential Load - Component Details (continued)

Project Title:
Bedenbaugh

Climate:FL_GAINESVILLE_REGIONAL_A

, FL

8/19/2021

WHOLE HOUSE TOTALS

Whole House Totals for Cooling	Sensible Envelope Load All Zones	11726 Btuh
	Sensible Duct Load	1784 Btuh
	Total Sensible Zone Loads	13510 Btuh
	Sensible ventilation	0 Btuh
	Blower	0 Btuh
	Total sensible gain	13510 Btuh
	Latent infiltration gain (for 51 gr. humidity difference)	1046 Btuh
	Latent ventilation gain	0 Btuh
	Latent duct gain	319 Btuh
	Latent occupant gain (6.0 people @ 200 Btuh per person)	1200 Btuh
	Latent other gain	0 Btuh
	Latent total gain	2565 Btuh
	TOTAL GAIN	16075 Btuh

EQUIPMENT

1. Central Unit	#	36000 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

System Sizing Calculations - Winter

Residential Load - Whole House Component Details

Project Title:
Bedenbaugh
Building Type: User

, FL

8/19/2021

Reference City: Gainesville, FL (Defaults) Winter Temperature Difference: 40.0 F (TMY3 99%)

Component Loads for Whole House								
Window	Panes/Type	Frame	U	Orientation	Area(sqft)	X	HTM=	Load
1	2, NFRC 0.27	Vinyl	0.60	N	30.0		24.0	720 Btuh
2	2, NFRC 0.27	Vinyl	0.60	N	9.0		24.0	216 Btuh
3	2, NFRC 0.27	Vinyl	0.60	S	60.0		24.0	1440 Btuh
4	2, NFRC 0.27	Vinyl	0.60	W	15.0		24.0	360 Btuh
	Window Total				114.0(sqft)			2736 Btuh
Walls	Type	Ornt.	Ueff.	R-Value (Cav/Sh)	Area	X	HTM=	Load
1	Frame - Steel	- Ext	(0.097)	21.0/0.0	441		3.89	1716 Btuh
2	Frame - Steel	- Ext	(0.097)	21.0/0.0	300		3.89	1167 Btuh
3	Frame - Steel	- Ext	(0.097)	21.0/0.0	420		3.89	1634 Btuh
4	Frame - Steel	- Ext	(0.097)	21.0/0.0	285		3.89	1109 Btuh
	Wall Total				1446(sqft)			5626 Btuh
Doors	Type	Storm	Ueff.		Area	X	HTM=	Load
1	Insulated - Exterior, n		(0.400)		20		16.0	320 Btuh
2	Insulated - Exterior, n		(0.400)		20		16.0	320 Btuh
	Door Total				40(sqft)			640Btuh
Ceilings	Type/Color/Surface		Ueff.	R-Value	Area	X	HTM=	Load
1	Cathedral/L/Metal		(0.023)	21.0/21.0	1500		0.9	1399 Btuh
	Ceiling Total				1500(sqft)			1399Btuh
Floors	Type		Ueff.	R-Value	Size	X	HTM=	Load
1	Slab On Grade		(1.180)	0.0	160.0 ft(perim.)		47.2	7552 Btuh
	Floor Total				1500 sqft			7552 Btuh
	Envelope Subtotal:							17953 Btuh
Infiltration	Type	Wholehouse	ACH	Volume(cuft)	Wall Ratio	CFM=		
	Natural		0.16	15000	1.00	40.4		1770 Btuh
Duct load	Extremely sealed, R6.0, Supply(Ext), Return(Con)					(DLM of 0.159)		3134 Btuh
All Zones	Sensible Subtotal All Zones							22857 Btuh

Manual J Winter Calculations

Residential Load - Component Details (continued)

, FL

Project Title:
Bedenbaugh
Building Type: User

8/19/2021

WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss Ventilation Sensible Heat Loss Total Heat Loss	22857 Btuh 0 Btuh 22857 Btuh
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EQUIPMENT

1. Electric Heat Pump	#	36000 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