

Residential System Sizing Calculation

Summary

Foster Model at Woodborough

Project Title:
230146 Foster

Lake City, FL

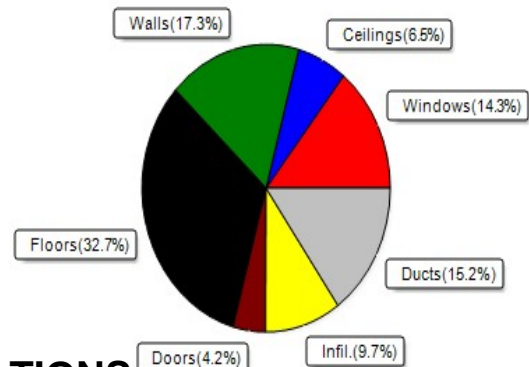
2023-02-08

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	39943	Btuh	Total cooling load calculation	34824	Btuh
Submitted heating capacity	% of calc	Btuh	Submitted cooling capacity	% of calc	Btuh
Total (Electric Heat Pump)	107.7	43000	Sensible (SHR = 0.75)	106.7	32250
Heat Pump + Auxiliary(0.0kW)	107.7	43000	Latent	233.2	10750
			Total (Electric Heat Pump)	123.5	43000

WINTER CALCULATIONS

Winter Heating Load (for 2450 sqft)

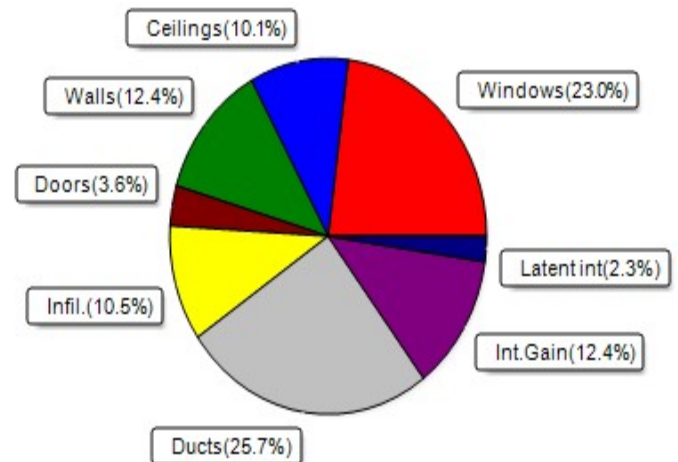
Load component	Load	
Window total	433 sqft	5716 Btuh
Wall total	1948 sqft	6917 Btuh
Door total	106 sqft	1692 Btuh
Ceiling total	2557 sqft	2596 Btuh
Floor total	2450 sqft	13074 Btuh
Infiltration	89 cfm	3876 Btuh
Duct loss		6072 Btuh
Subtotal		39943 Btuh
Ventilation	0 cfm	0 Btuh
TOTAL HEAT LOSS		39943 Btuh



SUMMER CALCULATIONS

Summer Cooling Load (for 2450 sqft)

Load component	Load	
Window total	433 sqft	8001 Btuh
Wall total	1948 sqft	4312 Btuh
Door total	106 sqft	1269 Btuh
Ceiling total	2557 sqft	3505 Btuh
Floor total		0 Btuh
Infiltration	66 cfm	1381 Btuh
Internal gain		4320 Btuh
Duct gain		7427 Btuh
Sens. Ventilation	0 cfm	0 Btuh
Blower Load		0 Btuh
Total sensible gain		30215 Btuh
Latent gain(ducts)		1518 Btuh
Latent gain(infiltration)		2291 Btuh
Latent gain(ventilation)		0 Btuh
Latent gain(internal/occupants/other)		800 Btuh
Total latent gain		4609 Btuh
TOTAL HEAT GAIN		34824 Btuh



8th Edition

EnergyGauge® System Sizing
PREPARED BY: Evan Beamsley
DATE: 2023-02-08

System Sizing Calculations - Winter

Residential Load - Whole House Component Details

Foster Model at Woodborough

Project Title:

230146 Foster

Lake City, FL

Building Type: User

2023-02-08

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

This calculation is for Worst Case. The house has been rotated 315 degrees.

Component Loads for Whole House									
Window	Panes/Type	Frame	U	Orientation	Area(sqft)	X	HTM=	Load	
1	2, NFRC 0.20	Metal	0.33	NW	36.0		13.2	475 Btuh	
2	2, NFRC 0.20	Metal	0.33	NE	13.3		13.2	176 Btuh	
3	2, NFRC 0.20	Metal	0.33	NW	72.0		13.2	950 Btuh	
4	2, NFRC 0.20	Metal	0.33	SW	46.7		13.2	616 Btuh	
5	2, NFRC 0.20	Metal	0.33	NW	48.0		13.2	634 Btuh	
6	2, NFRC 0.20	Metal	0.33	NW	28.0		13.2	370 Btuh	
7	2, NFRC 0.20	Metal	0.33	NW	24.0		13.2	317 Btuh	
8	2, NFRC 0.20	Metal	0.33	NE	16.5		13.2	218 Btuh	
9	2, NFRC 0.20	Metal	0.33	NE	18.7		13.2	246 Btuh	
10	2, NFRC 0.20	Metal	0.33	NE	20.0		13.2	264 Btuh	
11	2, NFRC 0.20	Metal	0.33	NE	3.0		13.2	40 Btuh	
12	2, NFRC 0.20	Metal	0.33	SE	4.0		13.2	53 Btuh	
13	2, NFRC 0.20	Metal	0.33	SW	13.3		13.2	176 Btuh	
14	2, NFRC 0.20	Metal	0.33	SE	16.5		13.2	218 Btuh	
15	2, NFRC 0.20	Metal	0.33	SE	32.0		13.2	422 Btuh	
16	2, NFRC 0.20	Metal	0.33	SE	16.5		13.2	218 Btuh	
17	2, NFRC 0.20	Metal	0.33	SW	4.0		13.2	53 Btuh	
18	2, NFRC 0.20	Metal	0.33	SW	16.5		13.2	218 Btuh	
19	2, NFRC 0.20	Metal	0.33	SW	4.0		13.2	53 Btuh	
	Window Total					433.0(sqft)			5716 Btuh
Walls	Type	Ornt.	Ueff.	R-Value (Cav/Sh)	Area	X	HTM=	Load	
1	Frame - Wood	- Ext	(0.089)	13.0/0.0	81		3.55	288 Btuh	
2	Frame - Wood	- Ext	(0.089)	13.0/0.0	141		3.55	499 Btuh	
3	Frame - Wood	- Ext	(0.089)	13.0/0.0	30		3.55	107 Btuh	
4	Frame - Wood	- Ext	(0.089)	13.0/0.0	20		3.55	70 Btuh	
5	Frame - Wood	- Ext	(0.089)	13.0/0.0	62		3.55	220 Btuh	
6	Frame - Wood	- Ext	(0.089)	13.0/0.0	128		3.55	453 Btuh	
7	Frame - Wood	- Ext	(0.089)	13.0/0.0	98		3.55	348 Btuh	
8	Frame - Wood	- Ext	(0.089)	13.0/0.0	383		3.55	1359 Btuh	
9	Frame - Wood	- Adj	(0.089)	13.0/0.0	114		3.55	406 Btuh	
10	Frame - Wood	- Adj	(0.089)	13.0/0.0	54		3.55	192 Btuh	
11	Frame - Wood	- Ext	(0.089)	13.0/0.0	56		3.55	199 Btuh	
12	Frame - Wood	- Ext	(0.089)	13.0/0.0	21		3.55	73 Btuh	
13	Frame - Wood	- Ext	(0.089)	13.0/0.0	128		3.55	453 Btuh	
14	Frame - Wood	- Ext	(0.089)	13.0/0.0	63		3.55	224 Btuh	
15	Frame - Wood	- Ext	(0.089)	13.0/0.0	122		3.55	431 Btuh	
16	Frame - Wood	- Ext	(0.089)	13.0/0.0	450		3.55	1596 Btuh	
	Wall Total					1948(sqft)			6917 Btuh

Manual J Winter Calculations

Residential Load - Component Details (continued)

Foster Model at Woodborough

Project Title:
230146 Foster
Building Type: User

Lake City, FL

2023-02-08

Doors	Type	Storm Ueff.		Area X	HTM=	Load
1	Insulated - Exterior, n	(0.400)		8	16.0	128 Btuh
2	Insulated - Exterior, n	(0.400)		24	16.0	384 Btuh
3	Insulated - Exterior, n	(0.400)		16	16.0	256 Btuh
4	Insulated - Exterior, n	(0.400)		16	16.0	256 Btuh
5	Insulated - Garage, n	(0.400)		18	16.0	284 Btuh
6	Insulated - Exterior, n	(0.400)		8	16.0	128 Btuh
7	Insulated - Exterior, n	(0.400)		16	16.0	256 Btuh
	Door Total			106(sqft)		1692Btuh
Ceilings	Type/Color/Surface	Ueff.	R-Value	Area X	HTM=	Load
1	Vented Attic/D/Shing	(0.025)	38.0/0.0	2475	1.0	2513 Btuh
2	Knee Wall/D/Shing	(0.025)	38.0/0.0	82	1.0	83 Btuh
	Ceiling Total			2557(sqft)		2596Btuh
Floors	Type	Ueff.	R-Value	Size X	HTM=	Load
1	Slab On Grade	(1.180)	0.0	277.0 ft(perim.)	47.2	13074 Btuh
	Floor Total			2450 sqft		13074 Btuh
Envelope Subtotal:						29995 Btuh
Infiltration	Type	Wholehouse ACH	Volume(cuft)	Wall Ratio	CFM=	Load
	Natural	0.23	22785	1.00	88.5	3876 Btuh
Duct load	Average sealed, R6.0, Supply(Att), Return(Att)				(DLM of 0.179)	6072 Btuh
All Zones	Sensible Subtotal All Zones					39943 Btuh

WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss	39943 Btuh
	Ventilation Sensible Heat Loss	0 Btuh
	Total Heat Loss	39943 Btuh

EQUIPMENT

1. Electric Heat Pump	#	43000 Btuh
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Manual J Winter Calculations

Residential Load - Component Details (continued)

Foster Model at Woodborough

Project Title:

230146 Foster

Lake City, FL

Building Type: User

2023-02-08

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

Manual J Summer Calculations

Residential Load - Component Details (continued)

Foster Model at Woodborough

Project Title:
230146 Foster

Climate:FL_GAINESVILLE_REGIONAL_A

Lake City, FL

2023-02-08

Doors	Type			Area (sqft)	HTM	Load
1	Insulated - Exterior			8.0	12.0	96 Btuh
2	Insulated - Exterior			24.0	12.0	288 Btuh
3	Insulated - Exterior			16.0	12.0	192 Btuh
4	Insulated - Exterior			16.0	12.0	192 Btuh
5	Insulated - Garage			17.8	12.0	213 Btuh
6	Insulated - Exterior			8.0	12.0	96 Btuh
7	Insulated - Exterior			16.0	12.0	192 Btuh
	Door Total			106 (sqft)		1269 Btuh
Ceilings	Type/Color/Surface	U-Value	R-Value	Area(sqft)	HTM	Load
1	Vented Attic/DarkShingle	0.025	38.0/0.0	2475.0	1.37	3392 Btuh
2	Knee Wall/DarkShingle	0.025	38.0/0.0	82.0	1.37	112 Btuh
	Ceiling Total			2557 (sqft)		3505 Btuh
Floors	Type		R-Value	Size	HTM	Load
1	Slab On Grade		0.0	2450 (ft-perimeter)	0.0	0 Btuh
	Floor Total			2450.0 (sqft)		0 Btuh
				Envelope Subtotal:		17087 Btuh
Infiltration	Type	Average ACH	Volume(cuft)	Wall Ratio	CFM=	Load
	Natural	0.17	22785	1	66.4	1381 Btuh
Internal gain		Occupants	Btuh/occupant	Appliance		Load
		4	X 230	+ 3400		4320 Btuh
				Sensible Envelope Load:		22788 Btuh
Duct load	Average sealed, Supply(R6.0-Attic), Return(R6.0-Attic)			(DGM of 0.326)		7427 Btuh
				Sensible Load All Zones		30215 Btuh

Manual J Summer Calculations

Residential Load - Component Details (continued)

Foster Model at Woodborough

Project Title:
230146 Foster

Climate:FL_GAINESVILLE_REGIONAL_A

Lake City, FL

2023-02-08

WHOLE HOUSE TOTALS

Whole House Totals for Cooling	Sensible Envelope Load All Zones	22788 Btuh
	Sensible Duct Load	7427 Btuh
	Total Sensible Zone Loads	30215 Btuh
	Sensible ventilation	0 Btuh
	Blower	0 Btuh
	Total sensible gain	30215 Btuh
	Latent infiltration gain (for 51 gr. humidity difference)	2291 Btuh
	Latent ventilation gain	0 Btuh
	Latent duct gain	1518 Btuh
	Latent occupant gain (4.0 people @ 200 Btuh per person)	800 Btuh
	Latent other gain	0 Btuh
	Latent total gain	4609 Btuh
	TOTAL GAIN	34824 Btuh

EQUIPMENT

1. Central Unit	#	43000 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