

Residential System Sizing Calculation

Summary

Dorcas Res

Project Title:
210000 Dorcas

Lake City, FL

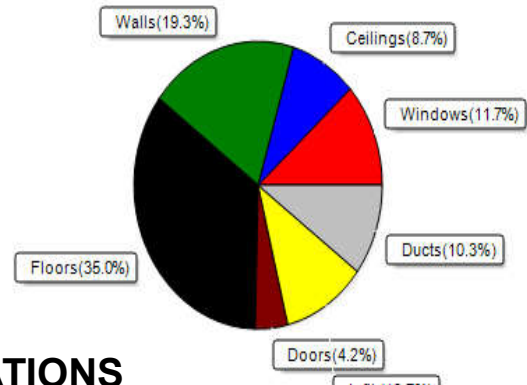
2021-01-13

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	27224 Btuh	Total cooling load calculation	21842 Btuh
Submitted heating capacity	% of calc Btuh	Submitted cooling capacity	% of calc Btuh
Total (Electric Heat Pump)	106.5 29000	Sensible (SHR = 0.75)	122.1 21750
Heat Pump + Auxiliary(0.0kW)	106.5 29000	Latent	179.9 7250
		Total (Electric Heat Pump)	132.8 29000

WINTER CALCULATIONS

Winter Heating Load (for 1868 sqft)

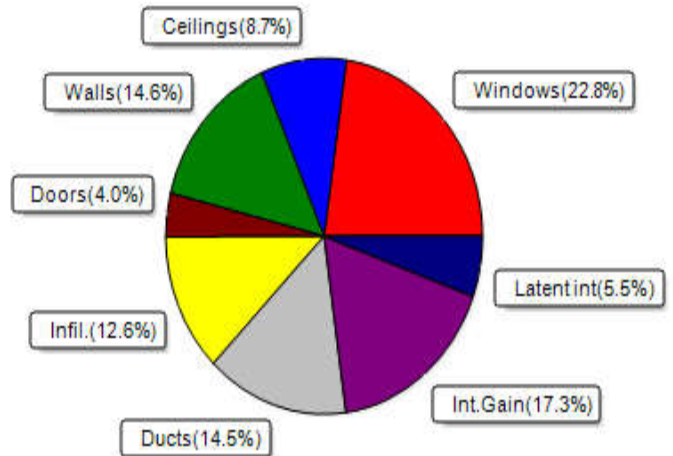
Load component		Load	
Window total	266 sqft	3192	Btuh
Wall total	1483 sqft	5265	Btuh
Door total	72 sqft	1152	Btuh
Ceiling total	1973 sqft	2377	Btuh
Floor total	1868 sqft	9534	Btuh
Infiltration	66 cfm	2911	Btuh
Duct loss		2792	Btuh
Subtotal		27224	Btuh
Ventilation	0 cfm	0	Btuh
TOTAL HEAT LOSS		27224	Btuh



SUMMER CALCULATIONS

Summer Cooling Load (for 1868 sqft)

Load component		Load	
Window total	266 sqft	4971	Btuh
Wall total	1483 sqft	3197	Btuh
Door total	72 sqft	864	Btuh
Ceiling total	1973 sqft	1902	Btuh
Floor total		0	Btuh
Infiltration	50 cfm	1037	Btuh
Internal gain		3780	Btuh
Duct gain		2061	Btuh
Sens. Ventilation	0 cfm	0	Btuh
Blower Load		0	Btuh
Total sensible gain		17811	Btuh
Latent gain(ducts)		1110	Btuh
Latent gain(infiltration)		1721	Btuh
Latent gain(ventilation)		0	Btuh
Latent gain(internal/occupants/other)		1200	Btuh
Total latent gain		4031	Btuh
TOTAL HEAT GAIN		21842	Btuh



8th Edition

EnergyGauge® System Sizing
PREPARED BY: Evan Beamsley
DATE: 2021-01-13

System Sizing Calculations - Winter

Residential Load - Whole House Component Details

Dorcas Res
Lake City, FL

Project Title:
210000 Dorcas
Building Type: User

2021-01-13

Reference City: Gainesville, FL (Defaults) Winter Temperature Difference: 40.0 F (TMY3 99%)
This calculation is for Worst Case. The house has been rotated 225 degrees.

Component Loads for Whole House

Window	Panes/Type	Frame	U	Orientation	Area(sqft)	X	HTM=	Load
1	2, NFRC 0.20	Metal	0.30	SW	16.0		12.0	192 Btuh
2	2, NFRC 0.20	Metal	0.30	SW	32.0		12.0	384 Btuh
3	2, NFRC 0.20	Metal	0.30	SW	9.0		12.0	108 Btuh
4	2, NFRC 0.20	Metal	0.30	SW	80.0		12.0	960 Btuh
5	2, NFRC 0.20	Metal	0.30	NW	15.0		12.0	180 Btuh
6	2, NFRC 0.20	Metal	0.30	NW	6.0		12.0	72 Btuh
7	2, NFRC 0.20	Metal	0.30	NE	36.0		12.0	432 Btuh
8	2, NFRC 0.20	Metal	0.30	NE	32.0		12.0	384 Btuh
9	2, NFRC 0.20	Metal	0.30	NE	36.0		12.0	432 Btuh
10	2, NFRC 0.20	Metal	0.30	SE	4.0		12.0	48 Btuh
	Window Total				266.0(sqft)			3192 Btuh
Walls	Type	Ornt.	Ueff.	R-Value (Cav/Sh)	Area	X	HTM=	Load
1	Frame - Wood	- Ext	(0.089)	13.0/0.0	78		3.55	276 Btuh
2	Frame - Wood	- Ext	(0.089)	13.0/0.0	284		3.55	1009 Btuh
3	Frame - Wood	- Ext	(0.089)	13.0/0.0	290		3.55	1028 Btuh
4	Frame - Wood	- Ext	(0.089)	13.0/0.0	87		3.55	309 Btuh
5	Frame - Wood	- Ext	(0.089)	13.0/0.0	45		3.55	160 Btuh
6	Frame - Wood	- Ext	(0.089)	13.0/0.0	15		3.55	53 Btuh
7	Frame - Wood	- Ext	(0.089)	13.0/0.0	45		3.55	160 Btuh
8	Frame - Wood	- Ext	(0.089)	13.0/0.0	77		3.55	272 Btuh
9	Frame - Wood	- Adj	(0.089)	13.0/0.0	20		3.55	72 Btuh
10	Frame - Wood	- Adj	(0.089)	13.0/0.0	125		3.55	442 Btuh
11	Frame - Wood	- Adj	(0.089)	13.0/0.0	24		3.55	85 Btuh
12	Frame - Wood	- Adj	(0.089)	13.0/0.0	36		3.55	128 Btuh
13	Frame - Wood	- Adj	(0.089)	13.0/0.0	24		3.55	85 Btuh
14	Frame - Wood	- Adj	(0.089)	13.0/0.0	48		3.55	170 Btuh
15	Frame - Wood	- Ext	(0.089)	13.0/0.0	286		3.55	1016 Btuh
	Wall Total				1483(sqft)			5265 Btuh
Doors	Type	Storm	Ueff.		Area	X	HTM=	Load
1	Insulated - Exterior, n		(0.400)		16		16.0	256 Btuh
2	Insulated - Exterior, n		(0.400)		16		16.0	256 Btuh
3	Insulated - Exterior, n		(0.400)		16		16.0	256 Btuh
4	Insulated - Garage, n		(0.400)		24		16.0	384 Btuh
	Door Total				72(sqft)			1152Btuh
Ceilings	Type/Color/Surface		Ueff.	R-Value	Area	X	HTM=	Load
1	Unvent Attic/D/Shing		(0.241)	0.0/22.0	1973		1.2	2377 Btuh
	Ceiling Total				1973(sqft)			2377Btuh
Floors	Type		Ueff.	R-Value	Size	X	HTM=	Load
1	Slab On Grade		(1.180)	0.0	202.0 ft(perim.)		47.2	9534 Btuh
	Floor Total				1868 sqft			9534 Btuh

Manual J Winter Calculations

Residential Load - Component Details (continued)

Dorcas Res
Lake City, FL

Project Title:
210000 Dorcas
Building Type: User

2021-01-13

	Envelope Subtotal:	21521 Btuh
Infiltration	Type Wholehouse ACH Volume(cuft) Wall Ratio CFM= Natural 0.23 17186 1.00 66.5	2911 Btuh
Duct load	Average sealed, R6.0, Supply(Att), Return(Att) (DLM of 0.114)	2792 Btuh
All Zones	Sensible Subtotal All Zones	27224 Btuh

WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss Ventilation Sensible Heat Loss Total Heat Loss	27224 Btuh 0 Btuh 27224 Btuh
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EQUIPMENT

1. Electric Heat Pump	#	29000 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

Dorcas Res

Project Title:
210000 Dorcas

Lake City, FL

2021-01-13

Reference City: Gainesville, FL

Temperature Difference: 19.0F(TMY3 99%)

Humidity difference: 51gr.

This calculation is for Worst Case. The house has been rotated 225 degrees.

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	0.20, 0.30	No	No	SW	7.5ft	0.0ft	16.0	16.0	0.0	10	20	159 Btuh
2	2 NFRC	0.20, 0.30	No	No	SW	7.5ft	0.0ft	32.0	32.0	0.0	10	20	317 Btuh
3	2 NFRC	0.20, 0.30	No	No	SW	13.0f	0.0ft	9.0	9.0	0.0	10	20	89 Btuh
4	2 NFRC	0.20, 0.30	No	No	SW	13.0f	1.0ft	80.0	80.0	0.0	10	20	793 Btuh
5	2 NFRC	0.20, 0.30	No	No	NW	1.5ft	4.5ft	15.0	0.0	15.0	10	19	287 Btuh
6	2 NFRC	0.20, 0.30	No	No	NW	1.5ft	10.0f	6.0	0.0	6.0	10	19	115 Btuh
7	2 NFRC	0.20, 0.30	No	No	NE	7.0ft	0.0ft	36.0	0.0	36.0	10	19	689 Btuh
8	2 NFRC	0.20, 0.30	No	No	NE	12.0f	0.0ft	32.0	0.0	32.0	10	19	612 Btuh
9	2 NFRC	0.20, 0.30	No	No	NE	7.0ft	0.0ft	36.0	0.0	36.0	10	19	689 Btuh
10	2 NFRC	0.20, 0.30	No	No	SE	1.5ft	10.0f	4.0	0.0	4.0	10	20	80 Btuh
	Excursion												1141 Btuh
	Window Total							266 (sqft)					4971 Btuh
Walls	Type					U-Value	R-Value	Area(sqft)		HTM		Load	
							Cav/Sheath						
1	Frame - Wood - Ext					0.09	13.0/0.0	77.8		2.3		176 Btuh	
2	Frame - Wood - Ext					0.09	13.0/0.0	284.3		2.3		643 Btuh	
3	Frame - Wood - Ext					0.09	13.0/0.0	289.5		2.3		655 Btuh	
4	Frame - Wood - Ext					0.09	13.0/0.0	87.0		2.3		197 Btuh	
5	Frame - Wood - Ext					0.09	13.0/0.0	45.0		2.3		102 Btuh	
6	Frame - Wood - Ext					0.09	13.0/0.0	15.0		2.3		34 Btuh	
7	Frame - Wood - Ext					0.09	13.0/0.0	45.0		2.3		102 Btuh	
8	Frame - Wood - Ext					0.09	13.0/0.0	76.5		2.3		173 Btuh	
9	Frame - Wood - Adj					0.09	13.0/0.0	20.3		1.7		34 Btuh	
10	Frame - Wood - Adj					0.09	13.0/0.0	124.5		1.7		210 Btuh	
11	Frame - Wood - Adj					0.09	13.0/0.0	24.0		1.7		40 Btuh	
12	Frame - Wood - Adj					0.09	13.0/0.0	36.0		1.7		61 Btuh	
13	Frame - Wood - Adj					0.09	13.0/0.0	24.0		1.7		40 Btuh	
14	Frame - Wood - Adj					0.09	13.0/0.0	48.0		1.7		81 Btuh	
15	Frame - Wood - Ext					0.09	13.0/0.0	286.3		2.3		648 Btuh	
	Wall Total							1483 (sqft)				3197 Btuh	
Doors	Type							Area (sqft)		HTM		Load	
1	Insulated - Exterior							16.0		12.0		192 Btuh	
2	Insulated - Exterior							16.0		12.0		192 Btuh	
3	Insulated - Exterior							16.0		12.0		192 Btuh	
4	Insulated - Garage							24.0		12.0		288 Btuh	
	Door Total							72 (sqft)				864 Btuh	
Ceilings	Type/Color/Surface					U-Value	R-Value	Area(sqft)		HTM		Load	
1	Unvented Attic/DarkShingle					0.241	0.0/22.0	1973.0		0.96		1902 Btuh	
	Ceiling Total							1973 (sqft)				1902 Btuh	
Floors	Type						R-Value	Size		HTM		Load	
1	Slab On Grade						0.0	1868 (ft-perimeter)		0.0		0 Btuh	
	Floor Total							1868.0 (sqft)				0 Btuh	
	Envelope Subtotal:											10934 Btuh	

Manual J Summer Calculations

Residential Load - Component Details (continued)

Dorcas Res

Project Title:
210000 Dorcas

Climate:FL_GAINESVILLE_REGIONAL_A

Lake City, FL

2021-01-13

Infiltration	Type Natural	Average ACH 0.17	Volume(cuft) 17186	Wall Ratio 1	CFM= 49.9	Load 1037 Btuh
Internal gain		Occupants 6	Btuh/occupant X 230	Appliance +	2400	Load 3780 Btuh
					Sensible Envelope Load:	15751 Btuh
Duct load	Average sealed, Supply(R6.0-Attic), Return(R6.0-Attic)				(DGM of 0.131)	2061 Btuh
					Sensible Load All Zones	17811 Btuh

Manual J Summer Calculations

Residential Load - Component Details (continued)

Dorcas Res
Lake City, FL

Project Title:
210000 Dorcas

Climate:FL_GAINESVILLE_REGIONAL_A

2021-01-13

WHOLE HOUSE TOTALS

Whole House Totals for Cooling	Sensible Envelope Load All Zones	15751 Btuh
	Sensible Duct Load	2061 Btuh
	Total Sensible Zone Loads	17811 Btuh
	Sensible ventilation	0 Btuh
	Blower	0 Btuh
	Total sensible gain	17811 Btuh
	Latent infiltration gain (for 51 gr. humidity difference)	1721 Btuh
	Latent ventilation gain	0 Btuh
	Latent duct gain	1110 Btuh
	Latent occupant gain (6.0 people @ 200 Btuh per person)	1200 Btuh
	Latent other gain	0 Btuh
	Latent total gain	4031 Btuh
	TOTAL GAIN	21842 Btuh

EQUIPMENT

1. Central Unit	#	29000 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