

Residential System Sizing Calculation

Summary

McDermott

Project Title:
211095 McDermott

Lake City, FL

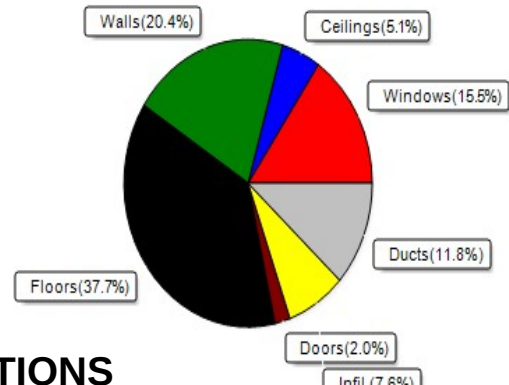
2021-08-04

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	15916 Btuh	Total cooling load calculation	16253 Btuh
Submitted heating capacity	% of calc Btuh	Submitted cooling capacity	% of calc Btuh
Total (Electric Heat Pump)	113.1 18000	Sensible (SHR = 0.75)	94.5 13500
Heat Pump + Auxiliary(0.0kW)	113.1 18000	Latent	228.9 4500
		Total (Electric Heat Pump)	110.8 18000

WINTER CALCULATIONS

Winter Heating Load (for 798 sqft)

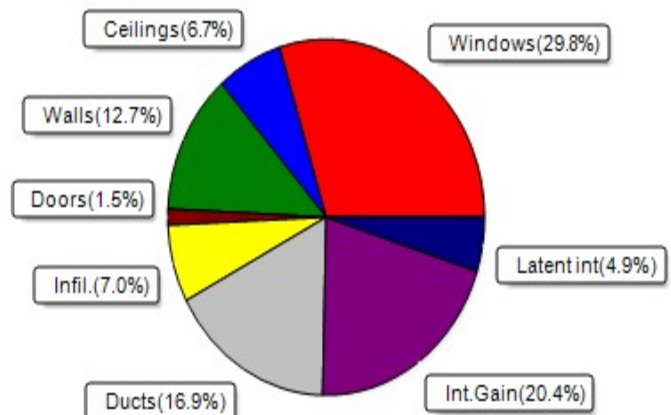
Load component		Load	
Window total	205 sqft	2460	Btuh
Wall total	915 sqft	3249	Btuh
Door total	20 sqft	320	Btuh
Ceiling total	798 sqft	810	Btuh
Floor total	798 sqft	5994	Btuh
Infiltration	28 cfm	1206	Btuh
Duct loss		1877	Btuh
Subtotal		15916	Btuh
Ventilation	0 cfm	0	Btuh
TOTAL HEAT LOSS		15916	Btuh



SUMMER CALCULATIONS

Summer Cooling Load (for 798 sqft)

Load component		Load	
Window total	205 sqft	4838	Btuh
Wall total	915 sqft	2071	Btuh
Door total	20 sqft	240	Btuh
Ceiling total	798 sqft	1094	Btuh
Floor total		0	Btuh
Infiltration	21 cfm	430	Btuh
Internal gain		3320	Btuh
Duct gain		2294	Btuh
Sens. Ventilation	0 cfm	0	Btuh
Blower Load		0	Btuh
Total sensible gain		14287	Btuh
Latent gain(ducts)		453	Btuh
Latent gain(infiltration)		713	Btuh
Latent gain(ventilation)		0	Btuh
Latent gain(internal/occupants/other)		800	Btuh
Total latent gain		1966	Btuh
TOTAL HEAT GAIN		16253	Btuh



8th Edition

EnergyGauge® System Sizing
PREPARED BY: Evan Beamsley
DATE: 2021-08-04

System Sizing Calculations - Winter

Residential Load - Whole House Component Details

McDermott
Lake City, FL

Project Title:
211095 McDermott
Building Type: User

2021-08-04

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 0.22	Vinyl	0.30	NW	15.0		12.0	180 Btuh
2	2, NFRC 0.22	Vinyl	0.30	NW	36.0		12.0	432 Btuh
3	2, NFRC 0.22	Vinyl	0.30	NW	26.7		12.0	320 Btuh
4	2, NFRC 0.22	Vinyl	0.30	NW	24.0		12.0	288 Btuh
5	2, NFRC 0.22	Vinyl	0.30	NE	13.3		12.0	160 Btuh
6	2, NFRC 0.22	Vinyl	0.30	SE	72.0		12.0	864 Btuh
7	2, NFRC 0.22	Vinyl	0.30	SW	3.0		12.0	36 Btuh
8	2, NFRC 0.22	Vinyl	0.30	SW	15.0		12.0	180 Btuh
	Window Total				205.0(sqft)			2460 Btuh
Walls	Type	Ornt.	Ueff.	R-Value (Cav/Sh)	Area	X	HTM=	Load
1	Frame - Wood	- Ext	(0.089)	13.0/0.0	99		3.55	351 Btuh
2	Frame - Wood	- Ext	(0.089)	13.0/0.0	63		3.55	224 Btuh
3	Frame - Wood	- Ext	(0.089)	13.0/0.0	122		3.55	433 Btuh
4	Frame - Wood	- Ext	(0.089)	13.0/0.0	151		3.55	536 Btuh
5	Frame - Wood	- Ext	(0.089)	13.0/0.0	264		3.55	937 Btuh
6	Frame - Wood	- Ext	(0.089)	13.0/0.0	216		3.55	767 Btuh
	Wall Total				915(sqft)			3249 Btuh
Doors	Type	Storm	Ueff.		Area	X	HTM=	Load
1	Insulated - Exterior, n		(0.400)		13		16.0	213 Btuh
2	Insulated - Exterior, n		(0.400)		7		16.0	107 Btuh
	Door Total				20(sqft)			320Btuh
Ceilings	Type/Color/Surface		Ueff.	R-Value	Area	X	HTM=	Load
1	Vented Attic/D/Shing		(0.025)	38.0/0.0	798		1.0	810 Btuh
	Ceiling Total				798(sqft)			810Btuh
Floors	Type		Ueff.	R-Value	Size	X	HTM=	Load
1	Slab On Grade		(1.180)	0.0	127.0 ft(perim.)		47.2	5994 Btuh
	Floor Total				798 sqft			5994 Btuh
	Envelope Subtotal:							12833 Btuh
Infiltration	Type	Wholehouse	ACH	Volume(cuft)	Wall Ratio	CFM=		Load
	Natural		0.23	7182	1.00	27.5		1206 Btuh
Duct load	Average sealed, R6.0, Supply(Att), Return(Att) (DLM of 0.134)							1877 Btuh
All Zones	Sensible Subtotal All Zones							15916 Btuh

Manual J Winter Calculations

Residential Load - Component Details (continued)

McDermott
Lake City, FL

Project Title:
211095 McDermott
Building Type: User

2021-08-04

WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss	15916 Btuh
	Ventilation Sensible Heat Loss	0 Btuh
	Total Heat Loss	15916 Btuh

EQUIPMENT

1. Electric Heat Pump	#	18000 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

McDermott

Project Title:
211095 McDermott

Lake City, FL

2021-08-04

Reference City: Gainesville, FL Temperature Difference: 19.0F(TMY3 99%) Humidity difference: 51gr.
This calculation is for Worst Case. The house has been rotated 315 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	0.22, 0.30	No	No	NW	1.5ft	1.5ft	15.0	0.0	15.0	10	20	307	Btuh
2	2 NFRC	0.22, 0.30	No	No	NW	8.5ft	1.5ft	36.0	0.0	36.0	10	20	737	Btuh
3	2 NFRC	0.22, 0.30	No	No	NW	8.5ft	1.5ft	26.7	0.0	26.7	10	20	546	Btuh
4	2 NFRC	0.22, 0.30	No	No	NW	8.5ft	1.5ft	24.0	0.0	24.0	10	20	492	Btuh
5	2 NFRC	0.22, 0.30	No	No	NE	5.5ft	1.5ft	13.3	0.0	13.3	10	20	273	Btuh
6	2 NFRC	0.22, 0.30	No	No	SE	1.5ft	2.0ft	72.0	5.6	66.4	10	21	1483	Btuh
7	2 NFRC	0.22, 0.30	No	No	SW	1.5ft	6.0ft	3.0	0.0	3.0	10	21	64	Btuh
8	2 NFRC	0.22, 0.30	No	No	SW	1.5ft	6.0ft	15.0	0.0	15.0	10	21	322	Btuh
	Excursion												614	Btuh
	Window Total							205 (sqft)					4838 Btuh	
Walls	Type	U-Value					R-Value		Area(sqft)		HTM		Load	
							Cav/Sheath							
1	Frame - Wood - Ext					0.09	13.0/0.0		99.0		2.3		224	Btuh
2	Frame - Wood - Ext					0.09	13.0/0.0		63.0		2.3		143	Btuh
3	Frame - Wood - Ext					0.09	13.0/0.0		122.0		2.3		276	Btuh
4	Frame - Wood - Ext					0.09	13.0/0.0		151.0		2.3		342	Btuh
5	Frame - Wood - Ext					0.09	13.0/0.0		264.0		2.3		598	Btuh
6	Frame - Wood - Ext					0.09	13.0/0.0		216.0		2.3		489	Btuh
	Wall Total								915 (sqft)				2071 Btuh	
Doors	Type								Area (sqft)		HTM		Load	
1	Insulated - Exterior								13.3		12.0		160	Btuh
2	Insulated - Exterior								6.7		12.0		80	Btuh
	Door Total								20 (sqft)				240 Btuh	
Ceilings	Type/Color/Surface	U-Value					R-Value		Area(sqft)		HTM		Load	
1	Vented Attic/DarkShingle					0.025	38.0/0.0		798.0		1.37		1094	Btuh
	Ceiling Total								798 (sqft)				1094 Btuh	
Floors	Type						R-Value		Size		HTM		Load	
1	Slab On Grade						0.0		798 (ft-perimeter)		0.0		0	Btuh
	Floor Total								798.0 (sqft)				0 Btuh	
	Envelope Subtotal:												8243 Btuh	
Infiltration	Type	Average ACH					Volume(cuft)		Wall Ratio		CFM=		Load	
	Natural						0.17	7182	1		20.7		430	Btuh
Internal gain		Occupants					Btuh/occupant		Appliance		Load			
							4	X 230	+	2400		3320	Btuh	
	Sensible Envelope Load:												11993 Btuh	
Duct load	Average sealed, Supply(R6.0-Attic), Return(R6.0-Attic)										(DGM of 0.191)		2294 Btuh	
	Sensible Load All Zones												14287 Btuh	

Manual J Summer Calculations

Residential Load - Component Details (continued)

McDermott
Lake City, FL

Project Title:
211095 McDermott

Climate:FL_GAINESVILLE_REGIONAL_A

2021-08-04

WHOLE HOUSE TOTALS

Whole House Totals for Cooling	Sensible Envelope Load All Zones	11993 Btuh
	Sensible Duct Load	2294 Btuh
	Total Sensible Zone Loads	14287 Btuh
	Sensible ventilation	0 Btuh
	Blower	0 Btuh
	Total sensible gain	14287 Btuh
	Latent infiltration gain (for 51 gr. humidity difference)	713 Btuh
	Latent ventilation gain	0 Btuh
	Latent duct gain	453 Btuh
	Latent occupant gain (4.0 people @ 200 Btuh per person)	800 Btuh
	Latent other gain	0 Btuh
	Latent total gain	1966 Btuh
	TOTAL GAIN	16253 Btuh

EQUIPMENT

1. Central Unit	#	18000 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