

Residential System Sizing Calculation

Summ

Review for Code Compliance
Universal Engineering Science

Project Title:
Mcleod Residence

PX2707

10/24/2024

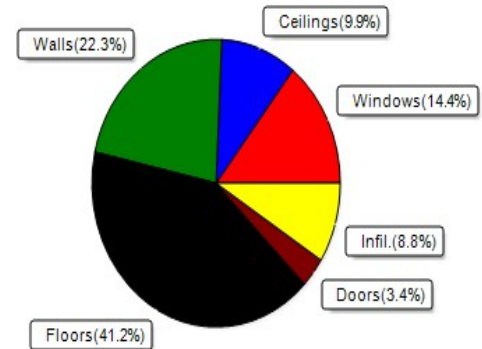
7/10/2024

Location for weather data: Gainesville, FL - Defaults: Latitude(29.7) Altitude(100 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	10813 Btuh	Total cooling load calculation	13214 Btuh
Submitted heating capacity	% of calc Btuh	Submitted cooling capacity	% of calc Btuh
Total (Electric Heat Pump)	166.5 18000	Sensible (SHR = 0.75)	117.9 13500
Heat Pump + Auxiliary(0.0kW)	166.5 18000	Latent	255.3 4500
		Total (Electric Heat Pump)	136.2 18000

WINTER CALCULATIONS

Winter Heating Load (for 840 sqft)

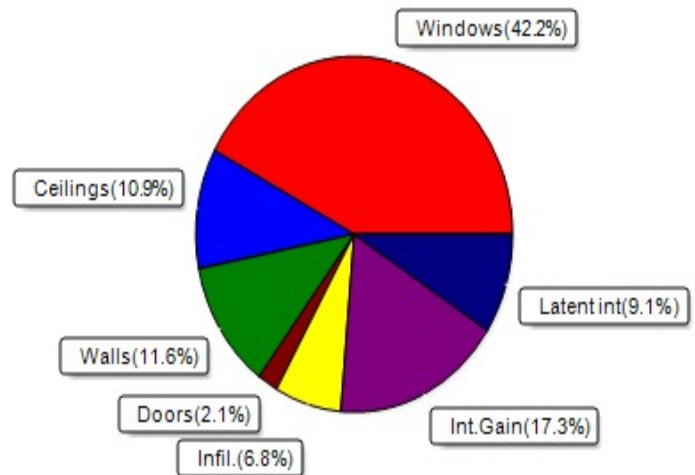
Load component	Load
Window total 150 sqft	1560 Btuh
Wall total 679 sqft	2411 Btuh
Door total 20 sqft	368 Btuh
Ceiling total 840 sqft	1070 Btuh
Floor total 840 sqft	4452 Btuh
Infiltration 22 cfm	952 Btuh
Duct loss	0 Btuh
Subtotal	10813 Btuh
Ventilation Ex:0 cfm; Sup:0 cfm	0 Btuh
TOTAL HEAT LOSS	10813 Btuh



SUMMER CALCULATIONS

Summer Cooling Load (for 840 sqft)

Load component	Load
Window total 150 sqft	5575 Btuh
Wall total 679 sqft	1537 Btuh
Door total 20 sqft	276 Btuh
Ceiling total 840 sqft	1445 Btuh
Floor total	0 Btuh
Infiltration 16 cfm	339 Btuh
Internal gain	2280 Btuh
Duct gain	0 Btuh
Sens.Ventilation Ex:0 cfm; Sup:0 cfm	0 Btuh
Blower Load	0 Btuh
Total sensible gain	11451 Btuh
Latent gain(ducts)	0 Btuh
Latent gain(infiltration)	563 Btuh
Latent gain(ventilation)	0 Btuh
Latent gain(internal/occupants/other)	1200 Btuh
Total latent gain	1763 Btuh
TOTAL HEAT GAIN	13214 Btuh



8th Edition

EnergyGauge® System Sizing

PREPARED BY: _____

DATE: _____

7-10-24

System Sizing Calculations - Summer

Residential Load - Whole House Component Details

Project Title:
McLeod Residence

, FL

7/10/2024

Reference City: Gainesville, FL (Defaults)
Humidity difference: 51gr.

Temperature Difference: 19.0F(TMY3 99%)
Summer Setpoint: 75 °F (Required Manual J default)

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	0.33	0.26	No	No	W	1.5ft	2.3ft	60.0	0.0	60.0	12	37	2205 Btuh
2	2 NFRC	0.33	0.26	No	No	E	1.5ft	2.3ft	90.0	0.0	90.0	12	37	3308 Btuh
	Excursion													62 Btuh
	Window Total								150 (sqft)					5575 Btuh
Walls	Type							U-Value	R-Value	Area(sqft)			HTM	Load
									Cav/Sheath					
1	Frame - Wood - Ext							0.09	13.0/0.0	236.5			2.3	535 Btuh
2	Frame - Wood - Ext							0.09	13.0/0.0	216.0			2.3	489 Btuh
3	Frame - Wood - Ext							0.09	13.0/0.0	226.5			2.3	513 Btuh
	Wall Total								679 (sqft)					1537 Btuh
Doors	Type									Area (sqft)			HTM	Load
1	Insulated - Exterior									20.0			13.8	276 Btuh
	Door Total								20 (sqft)					276 Btuh
Ceilings	Type/Color/Surface							U-Value	R-Value	Area(sqft)			HTM	Load
1	Vented Attic/DarkShingle							0.032	30.0/0.0	840.0			1.72	1445 Btuh
	Ceiling Total								840 (sqft)					1445 Btuh
Floors	Type								R-Value	Size			HTM	Load
1	Slab On Grade								0.0	840 (ft-perimeter)			0.0	0 Btuh
	Floor Total								840.0 (sqft)					0 Btuh
	Envelope Subtotal:													8832 Btuh
Infiltration	Type							Average ACH	Volume(cuft)		Wall Ratio	CFM=	Load	
	Natural							0.13	7560	1	16.3	339 Btuh		
Internal gain							Occupants	Btuh/occupant		Appliance		Load		
							6	X	230	+	900	2280 Btuh		
	Sensible Envelope Load:													11451 Btuh
Duct load	NA, Supply(R0.0-None), Return(R0.0-None)													0 Btuh
	Sensible Load All Zones													11451 Btuh



Review for Code Compliance
Universal Engineering Science

Lawrence Pennell
Examiner-License No.

PX2707

10/24/2024

Manual J Summer Calculations

Residential Load - Component Details (continued)

Project Title: Climate:FL_GAINESVILLE_REGIONAL_A
Mcleod Residence

, FL

7/10/2024

WHOLE HOUSE TOTALS

Whole House Totals for Cooling	Sensible Envelope Load All Zones	11451 Btuh
	Sensible Duct Load	0 Btuh
	Total Sensible Zone Loads	11451 Btuh
	Sensible ventilation (Ex:0 cfm; Sup:0 cfm)	0 Btuh
	Blower	0 Btuh
	Total sensible gain	11451 Btuh
	Latent infiltration gain (for 51 gr. humidity difference)	563 Btuh
	Latent ventilation gain	0 Btuh
	Latent duct gain	0 Btuh
	Latent occupant gain (6.0 people @ 200 Btuh per person)	1200 Btuh
	Latent other gain	0 Btuh
	Latent total gain	1763 Btuh
	TOTAL GAIN	13214 Btuh

EQUIPMENT

1. Central Unit	#	18000 Btuh
-----------------	---	------------

*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



Review for Code Compliance
Universal Engineering Science

Lawrence Pennell
Examiner-License No.

PX2707

10/24/2024

System Sizing Calculations - Winter

Residential Load - Whole House Component Details

, FL

Project Title:
McLeod Residence
Building Type: User

7/10/2024

Reference City: Gainesville, FL (Defaults) Winter Temperature Difference: 40.0 °F (TMY3 99%)
Winter Setpoint: 70 °F (Required Manual J default)

Component Loads for Whole House								
Window	Panes/Type	Frame	U	Orientation	Area(sqft)	X	HTM=	Load
1	2, NFRC 0.33	Vinyl	0.26	W	60.0		10.4	624 Btuh
2	2, NFRC 0.33	Vinyl	0.26	E	90.0		10.4	936 Btuh
	Window Total				150.0(sqft)			1560 Btuh
Walls	Type	Ornt.	Ueff.	R-Value (Cav/Sh)	Area	X	HTM=	Load
1	Frame - Wood	- Ext	(0.089)	13.0/0.0	237		3.55	840 Btuh
2	Frame - Wood	- Ext	(0.089)	13.0/0.0	216		3.55	767 Btuh
3	Frame - Wood	- Ext	(0.089)	13.0/0.0	227		3.55	804 Btuh
	Wall Total				679(sqft)			2411 Btuh
Doors	Type	Storm	Ueff.		Area	X	HTM=	Load
1	Insulated - Exterior, n		(0.460)		20		18.4	368 Btuh
	Door Total				20(sqft)			368Btuh
Ceilings	Type/Color/Surface		Ueff.	R-Value	Area	X	HTM=	Load
1	Flat ceil/D/Shing		(0.032)	30.0/0.0	840		1.3	1070 Btuh
	Ceiling Total				840(sqft)			1070Btuh
Floors	Type		Ueff.	R-Value	Size	X	HTM=	Load
1	Slab On Grade		(1.180)	0.0	94.3 ft(perim.)		47.2	4452 Btuh
	Floor Total				840 sqft			4452 Btuh
	Envelope Subtotal:							9861 Btuh
Infiltration	Type	Wholehouse	ACH	Volume(cuft)	Wall Ratio		CFM=	
	Natural		0.17	7560	1.00		21.7	952 Btuh
Duct load	NA, R0.0, Supply(), Return() (DLM of 0.000)							0 Btuh
All Zones	Sensible Subtotal All Zones							10813 Btuh

WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss Ventilation Sens. Heat Loss Total Heat Loss	(Ex:0 cfm; Sup:0 cfm)	10813 Btuh 0 Btuh 10813 Btuh
--------------------	---	-----------------------	------------------------------------



Review for Code Compliance
Universal Engineering Science

EnergyGauge® / USRCZB v8.1.02

Lawrence Parnell
Examiner-License No.

PX2707

10/24/2024

Manual J Winter Calculations

Residential Load - Component Details (continued)

, FL

Project Title:
Mcleod Residence
Building Type: User

7/10/2024

EQUIPMENT

1. Electric Heat Pump	#	18000 Btuh
-----------------------	---	------------

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



Review for Code Compliance
Universal Engineering Science

Lawrence Parnell
Examiner-License No.

PX2707

10/24/2024