

Residential System Sizing Calculation

Summary

Covenant School
2019 SW Main Blvd
Lake City, FL 32025

Project Title:
Covenant School classroom

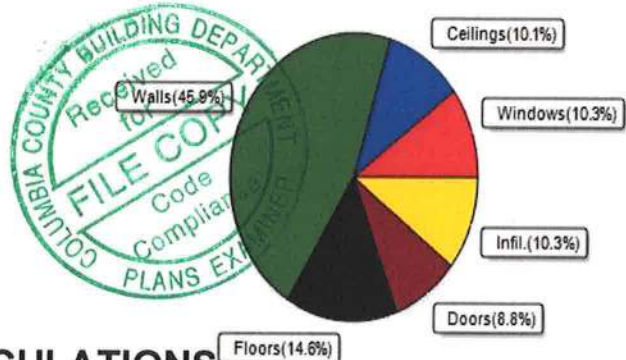
7/5/2022

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	8410 Btuh	Total cooling load calculation	24574 Btuh
Submitted heating capacity	% of calc Btuh	Submitted cooling capacity	% of calc Btuh
Total (Electric Heat Pump)	100.0 8410	Sensible (SHR = 0.70)	94.4 17043
Heat Pump + Auxiliary(0.0kW)	100.0 8410	Latent	112.2 7304
		Total (Electric Heat Pump)	99.1 24347

WINTER CALCULATIONS

Winter Heating Load (for 800 sqft)

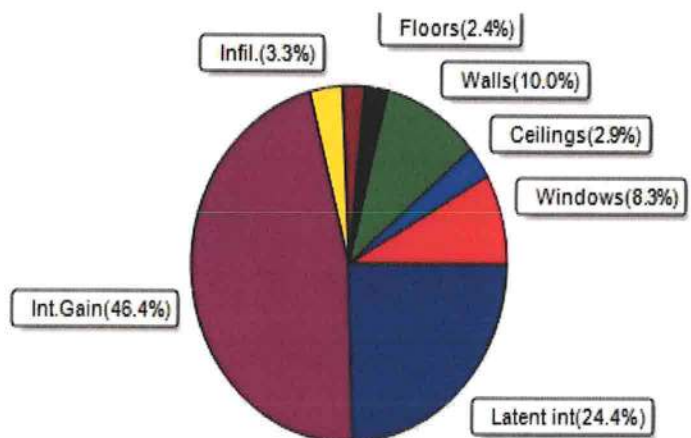
Load component		Load	
Window total	60 sqft	864	Btuh
Wall total	1088 sqft	3863	Btuh
Door total	40 sqft	736	Btuh
Ceiling total	840 sqft	853	Btuh
Floor total	800 sqft	1231	Btuh
Infiltration	20 cfm	863	Btuh
Duct loss		0	Btuh
Subtotal		8410	Btuh
Ventilation	0 cfm	0	Btuh
TOTAL HEAT LOSS		8410	Btuh



SUMMER CALCULATIONS

Summer Cooling Load (for 800 sqft)

Load component		Load	
Window total	60 sqft	2028	Btuh
Wall total	1088 sqft	2463	Btuh
Door total	40 sqft	552	Btuh
Ceiling total	840 sqft	725	Btuh
Floor total		588	Btuh
Infiltration	15 cfm	308	Btuh
Internal gain		11400	Btuh
Duct gain		0	Btuh
Sens. Ventilation	0 cfm	0	Btuh
Blower Load		0	Btuh
Total sensible gain		18063	Btuh
Latent gain(ducts)		0	Btuh
Latent gain(infiltration)		510	Btuh
Latent gain(ventilation)		0	Btuh
Latent gain(internal/occupants/other)		6000	Btuh
Total latent gain		6510	Btuh
TOTAL HEAT GAIN		24574	Btuh



8th Edition

EnergyGauge® System Sizing

PREPARED BY: _____

DATE: _____

7 / 5 / 2022

System Sizing Calculations - Winter

Residential Load - Whole House Component Details

Covenant School
2019 SW Main Blvd
Lake City, FL 32025

Project Title:
Covenant School classroom
Building Type: User

7/5/2022

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 0.25	Vinyl	0.36	W	60.0		14.4	864 Btuh
	Window Total				60.0(sqft)			864 Btuh
Walls	Type	Ornt.	Ueff.	R-Value (Cav/Sh)	Area	X	HTM=	Load
1	Frame - Wood	- Ext	(0.089)	13.0/0.0	124		3.55	440 Btuh
2	Frame - Wood	- Ext	(0.089)	13.0/0.0	390		3.55	1385 Btuh
3	Frame - Wood	- Ext	(0.089)	13.0/0.0	124		3.55	440 Btuh
4	Frame - Wood	- Ext	(0.089)	13.0/0.0	450		3.55	1598 Btuh
	Wall Total				1088(sqft)			3863 Btuh
Doors	Type	Storm	Ueff.		Area	X	HTM=	Load
1	Insulated - Exterior, n		(0.460)		20		18.4	368 Btuh
2	Insulated - Exterior, n		(0.460)		20		18.4	368 Btuh
	Door Total				40(sqft)			736Btuh
Ceilings	Type/Color/Surface		Ueff.	R-Value	Area	X	HTM=	Load
1	Vented Attic/L/Shing		(0.025)	38.0/0.0	840		1.0	853 Btuh
	Ceiling Total				840(sqft)			853Btuh
Floors	Type		Ueff.	R-Value	Size	X	HTM=	Load
1	Stem/Crawlsp(Carpet)(v)		(0.049)	19.0/0.0	800.0 sqft		1.5	1231 Btuh
	Floor Total				800 sqft			1231 Btuh
	Envelope Subtotal:							7547 Btuh
Infiltration	Type	Wholehouse	ACH	Volume(cuft)	Wall Ratio	CFM=		
	Natural		0.16	7200	1.00	19.7		863 Btuh
Duct load	NA, R0.0, Supply(), Return() (DLM of 0.000)							0 Btuh
All Zones	Sensible Subtotal All Zones							8410 Btuh

WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss	8410 Btuh
	Ventilation Sensible Heat Loss	0 Btuh
	Total Heat Loss	8410 Btuh

Manual J Winter Calculations

Residential Load - Component Details (continued)

Covenant School
2019 SW Main Blvd
Lake City, FL 32025

Project Title:
Covenant School classroom
Building Type: User

7/5/2022

EQUIPMENT

1. Electric Heat Pump	#	8410 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

Covenant School
2019 SW Main Blvd
Lake City, FL 32025

Project Title:
Covenant School classroom

7/5/2022

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	0.25, 0.36	No	No	W		1.5ft.	1.0ft.	60.0	2.9	57.1	12	31	1801 Btuh	
	Excursion													227 Btuh	
	Window Total								60 (sqft)					2028 Btuh	
Walls	Type	U-Value			R-Value			Area(sqft)			HTM		Load		
					Cav/Sheath										
1	Frame - Wood - Ext	0.09			13.0/0.0			124.0			2.3		281 Btuh		
2	Frame - Wood - Ext	0.09			13.0/0.0			390.0			2.3		883 Btuh		
3	Frame - Wood - Ext	0.09			13.0/0.0			124.0			2.3		281 Btuh		
4	Frame - Wood - Ext	0.09			13.0/0.0			450.0			2.3		1019 Btuh		
	Wall Total								1088 (sqft)					2463 Btuh	
Doors	Type	U-Value			R-Value			Area (sqft)			HTM		Load		
1	Insulated - Exterior							20.0			13.8		276 Btuh		
2	Insulated - Exterior							20.0			13.8		276 Btuh		
	Door Total								40 (sqft)					552 Btuh	
Ceilings	Type/Color/Surface	U-Value			R-Value			Area(sqft)			HTM		Load		
1	Vented AtticLight/Shingle/RB	0.025			38.0/0.0			840.0			0.86		725 Btuh		
	Ceiling Total								840 (sqft)					725 Btuh	
Floors	Type	U-Value			R-Value			Size			HTM		Load		
1	Stem/Crawlsp(Carpet)(v)				19.0			800 (sqft)			0.7		588 Btuh		
	Floor Total								800.0 (sqft)					588 Btuh	
	Envelope Subtotal:													6356 Btuh	
Infiltration	Type	Average ACH			Volume(cuft)			Wall Ratio		CFM=		Load			
	Natural	0.12			7200			1		14.8		308 Btuh			
Internal gain		Occupants			Btuh/occupant			Appliance				Load			
		30			X 230			+		4500		11400 Btuh			
	Sensible Envelope Load:													18063 Btuh	
Duct load	NA, Supply(R0.0-None), Return(R0.0-None)										(DGM of 0.000)		0 Btuh		
	Sensible Load All Zones													18063 Btuh	

Manual J Summer Calculations

Residential Load - Component Details (continued)

Covenant School
2019 SW Main Blvd
Lake City, FL 32025

Project Title: Climate:FL_GAINESVILLE_REGIONAL_A
Covenant School classroom

7/5/2022

WHOLE HOUSE TOTALS

Whole House Totals for Cooling	Sensible Envelope Load All Zones	18063 Btuh
	Sensible Duct Load	0 Btuh
	Total Sensible Zone Loads	18063 Btuh
	Sensible ventilation	0 Btuh
	Blower	0 Btuh
	Total sensible gain	18063 Btuh
	Latent infiltration gain (for 51 gr. humidity difference)	510 Btuh
	Latent ventilation gain	0 Btuh
	Latent duct gain	0 Btuh
	Latent occupant gain (30.0 people @ 200 Btuh per person)	6000 Btuh
	Latent other gain	0 Btuh
	Latent total gain	6510 Btuh
	TOTAL GAIN	24574 Btuh

EQUIPMENT

1. Central Unit	#	24347 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