

Residential System Sizing Calculation

Summary

Stephan Res
234 SW Grassy Lane
Ft White, FL 32038

Project Title:
210654 Stephan CMU

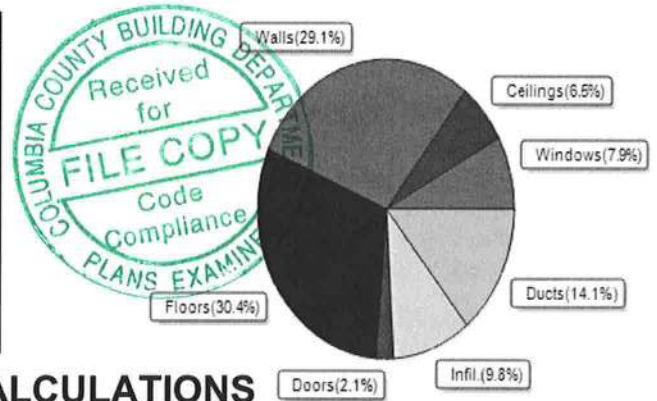
2021-08-26

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	31797 Btuh	Total cooling load calculation	26862 Btuh
Submitted heating capacity	% of calc Btuh	Submitted cooling capacity	% of calc Btuh
Total (Electric Heat Pump)	110.1 35000	Sensible (SHR = 0.75)	117.8 26250
Heat Pump + Auxiliary(0.0kW)	110.1 35000	Latent	191.2 8750
		Total (Electric Heat Pump)	130.3 35000

WINTER CALCULATIONS

Winter Heating Load (for 1962 sqft)

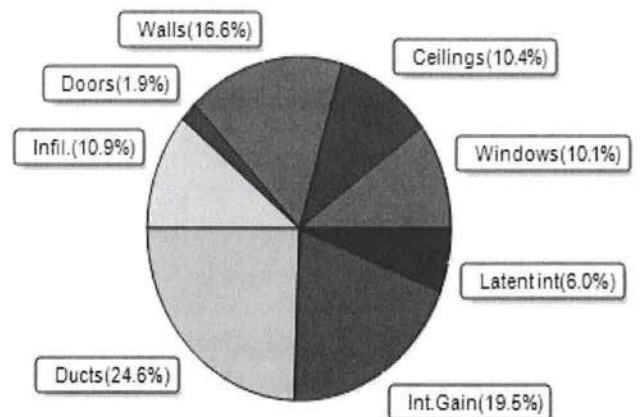
Load component		Load	
Window total	191 sqft	2526	Btuh
Wall total	1628 sqft	9260	Btuh
Door total	42 sqft	668	Btuh
Ceiling total	2044 sqft	2075	Btuh
Floor total	1962 sqft	9676	Btuh
Infiltration	71 cfm	3104	Btuh
Duct loss		4488	Btuh
Subtotal		31797	Btuh
Ventilation	0 cfm	0	Btuh
TOTAL HEAT LOSS		31797	Btuh



SUMMER CALCULATIONS

Summer Cooling Load (for 1962 sqft)

Load component		Load	
Window total	191 sqft	2715	Btuh
Wall total	1628 sqft	4461	Btuh
Door total	42 sqft	501	Btuh
Ceiling total	2044 sqft	2801	Btuh
Floor total		0	Btuh
Infiltration	53 cfm	1106	Btuh
Internal gain		5240	Btuh
Duct gain		5461	Btuh
Sens. Ventilation	0 cfm	0	Btuh
Blower Load		0	Btuh
Total sensible gain		22285	Btuh
Latent gain(ducts)		1141	Btuh
Latent gain(infiltration)		1835	Btuh
Latent gain(ventilation)		0	Btuh
Latent gain(internal/occupants/other)		1600	Btuh
Total latent gain		4576	Btuh
TOTAL HEAT GAIN		26862	Btuh



8th Edition

EnergyGauge® System Sizing
PREPARED BY: **Evan Beamsley**
DATE: **2021-08-26**

EnergyGauge® / USRCZB v7.0.00

System Sizing Calculations - Winter

Residential Load - Whole House Component Details

Stephan Res
234 SW Grassy Lane
Ft White, FL 32038

Project Title:
210654 Stephan CMU
Building Type: User

2021-08-26

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 0.23	Metal	0.33	N	15.0		13.2	198 Btuh
2	2, NFRC 0.23	Metal	0.33	N	18.0		13.2	238 Btuh
3	2, NFRC 0.23	Metal	0.33	N	13.3		13.2	176 Btuh
4	2, NFRC 0.23	Metal	0.33	N	12.0		13.2	158 Btuh
5	2, NFRC 0.23	Metal	0.33	N	30.0		13.2	396 Btuh
6	2, NFRC 0.23	Metal	0.33	E	16.0		13.2	211 Btuh
7	2, NFRC 0.23	Metal	0.33	S	30.0		13.2	396 Btuh
8	2, NFRC 0.23	Metal	0.33	S	24.0		13.2	317 Btuh
9	2, NFRC 0.23	Metal	0.33	S	15.0		13.2	198 Btuh
10	2, NFRC 0.23	Metal	0.33	W	15.0		13.2	198 Btuh
11	2, NFRC 0.23	Metal	0.33	W	3.0		13.2	40 Btuh
Window Total					191.3(sqft)			2526 Btuh
Walls	Type	Ornt.	Ueff.	R-Value (Cav/Sh)	Area	X	HTM=	Load
1	Conc Blk,Hollow	- Ext	(0.151)	4.0/0.0	155		6.06	936 Btuh
2	Conc Blk,Hollow	- Ext	(0.151)	4.0/0.0	80		6.06	482 Btuh
3	Conc Blk,Hollow	- Ext	(0.151)	4.0/0.0	139		6.06	843 Btuh
4	Conc Blk,Hollow	- Ext	(0.151)	4.0/0.0	161		6.06	973 Btuh
5	Conc Blk,Hollow	- Ext	(0.151)	4.0/0.0	203		6.06	1230 Btuh
6	Frame - Wood	- Adj	(0.089)	13.0/0.0	29		3.55	101 Btuh
7	Frame - Wood	- Adj	(0.089)	13.0/0.0	33		3.55	117 Btuh
8	Frame - Wood	- Adj	(0.089)	13.0/0.0	156		3.55	555 Btuh
9	Frame - Wood	- Adj	(0.089)	13.0/0.0	23		3.55	80 Btuh
10	Conc Blk,Hollow	- Ext	(0.151)	4.0/0.0	79		6.06	480 Btuh
11	Conc Blk,Hollow	- Ext	(0.151)	4.0/0.0	45		6.06	273 Btuh
12	Conc Blk,Hollow	- Ext	(0.151)	4.0/0.0	18		6.06	109 Btuh
13	Conc Blk,Hollow	- Ext	(0.151)	4.0/0.0	134		6.06	809 Btuh
14	Conc Blk,Hollow	- Ext	(0.151)	4.0/0.0	104		6.06	627 Btuh
15	Conc Blk,Hollow	- Ext	(0.151)	4.0/0.0	21		6.06	127 Btuh
16	Conc Blk,Hollow	- Ext	(0.151)	4.0/0.0	251		6.06	1518 Btuh
Wall Total					1628(sqft)			9260 Btuh
Doors	Type	Storm	Ueff.		Area	X	HTM=	Load
1	Insulated - Exterior,	n	(0.400)		8		16.0	128 Btuh
2	Insulated - Garage,	n	(0.400)		18		16.0	284 Btuh
3	Insulated - Exterior,	n	(0.400)		16		16.0	256 Btuh
Door Total					42(sqft)			668Btuh
Ceilings	Type/Color/Surface	Ueff.	R-Value		Area	X	HTM=	Load
1	Vented Attic/D/Shing	(0.025)	38.0/0.0		2044		1.0	2075 Btuh
Ceiling Total					2044(sqft)			2075Btuh
Floors	Type	Ueff.	R-Value		Size	X	HTM=	Load
1	Slab On Grade	(1.180)	0.0		205.0 ft(perim.)		47.2	9676 Btuh
Floor Total					1962 sqft			9676 Btuh

Manual J Winter Calculations

Residential Load - Component Details (continued)

Stephan Res
234 SW Grassy Lane
Ft White, FL 32038

Project Title:
210654 Stephan CMU
Building Type: User

2021-08-26

	Envelope Subtotal:						24205 Btuh
Infiltration	Type	Wholehouse	ACH	Volume(cuft)	Wall Ratio	CFM=	
	Natural		0.23	18247	1.00	70.9	3104 Btuh
Duct load	Average sealed, R6.0, Supply(Att), Return(Att)				(DLM of 0.164)		4488 Btuh
All Zones	Sensible Subtotal All Zones						31797 Btuh

WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss	31797 Btuh
	Ventilation Sensible Heat Loss	0 Btuh
	Total Heat Loss	31797 Btuh

EQUIPMENT

1. Electric Heat Pump	#	35000 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

Stephan Res
234 SW Grassy Lane
Ft White, FL 32038

Project Title:
210654 Stephan CMU

2021-08-26

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	0.23, 0.33	No	No	N	1.5ft	2.0ft	15.0	15.0	0.0	11	13	167	Btuh	
2	2 NFRC	0.23, 0.33	No	No	N	8.5ft	0.3ft	18.0	18.0	0.0	11	13	200	Btuh	
3	2 NFRC	0.23, 0.33	No	No	N	8.5ft	0.3ft	13.3	13.3	0.0	11	13	148	Btuh	
4	2 NFRC	0.23, 0.33	No	No	N	8.5ft	0.3ft	12.0	12.0	0.0	11	13	133	Btuh	
5	2 NFRC	0.23, 0.33	No	No	N	1.5ft	2.0ft	30.0	30.0	0.0	11	13	333	Btuh	
6	2 NFRC	0.23, 0.33	No	No	E	1.5ft	2.0ft	16.0	0.0	16.0	11	28	455	Btuh	
7	2 NFRC	0.23, 0.33	No	No	S	6.0ft	0.3ft	30.0	0.0	30.0	11	11	333	Btuh	
8	2 NFRC	0.23, 0.33	No	No	S	8.0ft	1.0ft	24.0	0.0	24.0	11	11	267	Btuh	
9	2 NFRC	0.23, 0.33	No	No	S	1.5ft	2.0ft	15.0	0.0	15.0	11	11	167	Btuh	
10	2 NFRC	0.23, 0.33	No	No	W	1.5ft	2.0ft	15.0	0.0	15.0	11	28	427	Btuh	
11	2 NFRC	0.23, 0.33	No	No	W	1.5ft	2.0ft	3.0	0.0	3.0	11	28	85	Btuh	
Window Total								191 (sqft)					2715 Btuh		
Walls	Type	U-Value	R-Value	Area(sqft)		HTM		Load							
1	Concrete Blk,Hollow - Ext	0.15	4.0/0.0	154.5		2.9	452	Btuh							
2	Concrete Blk,Hollow - Ext	0.15	4.0/0.0	79.5		2.9	232	Btuh							
3	Concrete Blk,Hollow - Ext	0.15	4.0/0.0	139.2		2.9	407	Btuh							
4	Concrete Blk,Hollow - Ext	0.15	4.0/0.0	160.5		2.9	469	Btuh							
5	Concrete Blk,Hollow - Ext	0.15	4.0/0.0	203.0		2.9	594	Btuh							
6	Frame - Wood - Adj	0.09	13.0/0.0	28.5		1.7	48	Btuh							
7	Frame - Wood - Adj	0.09	13.0/0.0	33.0		1.7	56	Btuh							
8	Frame - Wood - Adj	0.09	13.0/0.0	156.2		1.7	263	Btuh							
9	Frame - Wood - Adj	0.09	13.0/0.0	22.5		1.7	38	Btuh							
10	Concrete Blk,Hollow - Ext	0.15	4.0/0.0	79.2		2.9	231	Btuh							
11	Concrete Blk,Hollow - Ext	0.15	4.0/0.0	45.0		2.9	132	Btuh							
12	Concrete Blk,Hollow - Ext	0.15	4.0/0.0	18.0		2.9	53	Btuh							
13	Concrete Blk,Hollow - Ext	0.15	4.0/0.0	133.5		2.9	390	Btuh							
14	Concrete Blk,Hollow - Ext	0.15	4.0/0.0	103.5		2.9	303	Btuh							
15	Concrete Blk,Hollow - Ext	0.15	4.0/0.0	21.0		2.9	61	Btuh							
16	Concrete Blk,Hollow - Ext	0.15	4.0/0.0	250.5		2.9	732	Btuh							
Wall Total				1628 (sqft)		4461 Btuh									
Doors	Type	Area (sqft)		HTM		Load									
1	Insulated - Exterior	8.0		12.0		96 Btuh									
2	Insulated - Garage	17.8		12.0		213 Btuh									
3	Insulated - Exterior	16.0		12.0		192 Btuh									
Door Total		42 (sqft)				501 Btuh									
Ceilings	Type/Color/Surface	U-Value	R-Value	Area(sqft)	HTM		Load								
1	Vented Attic/DarkShingle	0.025	38.0/0.0	2044.0	1.37		2801 Btuh								
Ceiling Total				2044 (sqft)		2801 Btuh									
Floors	Type	R-Value		Size	HTM		Load								
1	Slab On Grade	0.0		1962 (ft-perimeter)	0.0		0 Btuh								
Floor Total				1962.0 (sqft)		0 Btuh									
Envelope Subtotal:							10479 Btuh								

Manual J Summer Calculations

Residential Load - Component Details (continued)

Stephan Res
234 SW Grassy Lane
Ft White, FL 32038

Project Title: Climate:FL_GAINESVILLE_REGIONAL_A
210654 Stephan CMU

2021-08-26

Infiltration	Type Natural	Average ACH 0.17	Volume(cuft) 18247	Wall Ratio 1	CFM= 53.2	Load 1106 Btuh
Internal gain		Occupants 8	Btuh/occupant X 230	+	Appliance 3400	Load 5240 Btuh
	Sensible Envelope Load:					16825 Btuh
Duct load	Average sealed, Supply(R6.0-Attic), Return(R6.0-Attic)			(DGM of 0.325)		5461 Btuh
	Sensible Load All Zones					22285 Btuh

Manual J Summer Calculations

Residential Load - Component Details (continued)

Stephan Res
234 SW Grassy Lane
Ft White, FL 32038

Project Title: Climate:FL_GAINESVILLE_REGIONAL_A
210654 Stephan CMU

2021-08-26

WHOLE HOUSE TOTALS

Whole House Totals for Cooling	Sensible Envelope Load All Zones	16825 Btuh
	Sensible Duct Load	5461 Btuh
	Total Sensible Zone Loads	22285 Btuh
	Sensible ventilation	0 Btuh
	Blower	0 Btuh
	Total sensible gain	22285 Btuh
	Latent infiltration gain (for 51 gr. humidity difference)	1835 Btuh
	Latent ventilation gain	0 Btuh
	Latent duct gain	1141 Btuh
	Latent occupant gain (8.0 people @ 200 Btuh per person)	1600 Btuh
	Latent other gain	0 Btuh
	Latent total gain	4576 Btuh
	TOTAL GAIN	26862 Btuh

EQUIPMENT

1. Central Unit	#	35000 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