

Residential System Sizing Calculation

Summary

Project Title:
Townsend



, FL

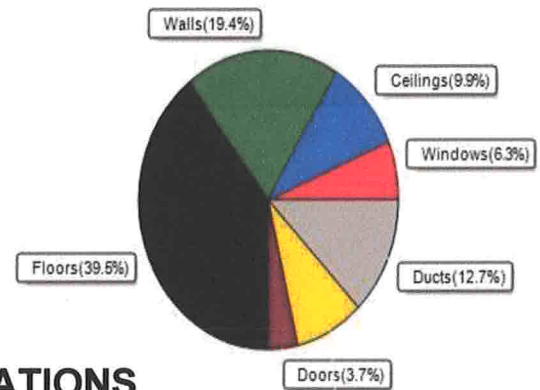
12/17/2021

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	25897 Btuh	Total cooling load calculation	18804 Btuh
Submitted heating capacity	% of calc Btuh	Submitted cooling capacity	% of calc Btuh
Total (Electric Heat Pump)	139.0 36000	Sensible (SHR = 0.80)	182.9 28800
Heat Pump + Auxiliary(0.0kW)	139.0 36000	Latent	235.5 7200
		Total (Electric Heat Pump)	191.5 36000

WINTER CALCULATIONS

Winter Heating Load (for 2016 sqft)

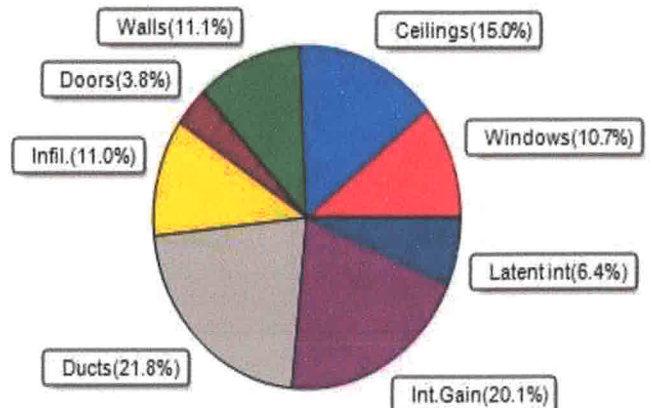
Load component		Load	
Window total	157 sqft	1636 Btuh	
Wall total	1875 sqft	5026 Btuh	
Door total	60 sqft	960 Btuh	
Ceiling total	2016 sqft	2568 Btuh	
Floor total	2016 sqft	10242 Btuh	
Infiltration	50 cfm	2176 Btuh	
Duct loss		3289 Btuh	
Subtotal		25897 Btuh	
Ventilation	0 cfm	0 Btuh	
TOTAL HEAT LOSS		25897 Btuh	



SUMMER CALCULATIONS

Summer Cooling Load (for 2016 sqft)

Load component		Load	
Window total	157 sqft	2019 Btuh	
Wall total	1875 sqft	2093 Btuh	
Door total	60 sqft	720 Btuh	
Ceiling total	2016 sqft	2825 Btuh	
Floor total		0 Btuh	
Infiltration	37 cfm	775 Btuh	
Internal gain		3780 Btuh	
Duct gain		3534 Btuh	
Sens. Ventilation	0 cfm	0 Btuh	
Blower Load		0 Btuh	
Total sensible gain		15746 Btuh	
Latent gain(ducts)		572 Btuh	
Latent gain(infiltration)		1286 Btuh	
Latent gain(ventilation)		0 Btuh	
Latent gain(internal/occupants/other)		1200 Btuh	
Total latent gain		3058 Btuh	
TOTAL HEAT GAIN		18804 Btuh	



8th Edition

EnergyGauge® System Sizing

PREPARED BY: _____

DATE: _____

12-17-21

System Sizing Calculations - Summer

Residential Load - Whole House Component Details

Project Title:
Townsend

, FL

12/17/2021

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	0.20, 0.26	No	No	N	1.5ft	2.3ft	30.0	0.0	30.0	9	9	274	Btuh	
2	2 NFRC	0.20, 0.26	No	No	S	12.5f	2.3ft	20.0	20.0	0.0	9	11	183	Btuh	
3	2 NFRC	0.20, 0.26	No	No	W	1.5ft	2.3ft	15.0	0.0	15.0	9	24	363	Btuh	
4	2 NFRC	0.20, 0.26	No	No	N	1.5ft	2.3ft	3.0	0.0	3.0	9	9	27	Btuh	
5	2 NFRC	0.20, 0.26	No	No	N	1.5ft	2.3ft	15.0	0.0	15.0	9	9	137	Btuh	
6	2 NFRC	0.20, 0.26	No	No	S	7.5ft	2.3ft	30.0	30.0	0.0	9	11	274	Btuh	
7	2 NFRC	0.20, 0.26	No	No	W	13.5f	2.3ft	13.3	13.3	0.0	9	24	122	Btuh	
8	2 NFRC	0.20, 0.26	No	No	E	7.5ft	2.3ft	15.0	11.7	3.3	9	24	187	Btuh	
9	2 NFRC	0.20, 0.26	No	No	E	1.5ft	2.3ft	16.0	0.0	16.0	9	24	388	Btuh	
	Excursion												63	Btuh	
	Window Total							157 (sqft)						2019	Btuh
Walls	Type	U-Value		R-Value		Area(sqft)			HTM		Load				
						Cav/Sheath									
1	Concrete Blk,Hollow - Adj		0.06		13.0/0.6	106.9				1.2	125 Btuh				
2	Concrete Blk,Hollow - Ext		0.06		13.0/0.6	11.0				1.0	11 Btuh				
3	Concrete Blk,Hollow - Ext		0.06		13.0/0.0	255.1				1.0	262 Btuh				
4	Concrete Blk,Hollow - Ext		0.06		13.0/0.0	87.7				1.0	90 Btuh				
5	Concrete Blk,Hollow - Ext		0.06		13.0/0.0	103.3				1.0	106 Btuh				
6	Concrete Blk,Hollow - Ext		0.06		13.0/0.0	372.0				1.0	382 Btuh				
7	Frame - Wood - Adj		0.09		13.0/0.0	234.4				1.7	395 Btuh				
8	Concrete Blk,Hollow - Ext		0.06		13.0/0.0	85.8				1.0	88 Btuh				
9	Concrete Blk,Hollow - Ext		0.06		13.0/0.0	42.7				1.0	44 Btuh				
10	Concrete Blk,Hollow - Ext		0.06		13.0/0.0	57.6				1.0	59 Btuh				
11	Concrete Blk,Hollow - Ext		0.06		13.0/0.0	41.0				1.0	42 Btuh				
12	Concrete Blk,Hollow - Ext		0.06		13.0/0.0	147.8				1.0	152 Btuh				
13	Concrete Blk,Hollow - Ext		0.06		13.0/0.0	329.3				1.0	338 Btuh				
	Wall Total							1875 (sqft)					2093	Btuh	
Doors	Type	Area (sqft)			HTM		Load								
1	Insulated - Exterior	20.0			12.0		240 Btuh								
2	Insulated - Exterior	20.0			12.0		240 Btuh								
3	Insulated - Exterior	20.0			12.0		240 Btuh								
	Door Total					60 (sqft)			720 Btuh						
Ceilings	Type/Color/Surface	U-Value		R-Value		Area(sqft)			HTM		Load				
1	Vented Attic/Light/Wood shing	0.032		30.0/0.0		2016.0			1.40		2825 Btuh				
	Ceiling Total					2016 (sqft)			2825 Btuh						
Floors	Type	R-Value			Size			HTM		Load					
1	Slab On Grade	0.0			2016 (ft-perimeter)			0.0		0 Btuh					
	Floor Total					2016.0 (sqft)			0 Btuh						
	Envelope Subtotal:												7657 Btuh		

Manual J Summer Calculations

Residential Load - Component Details (continued)

Project Title:
Townsend

Climate:FL_GAINESVILLE_REGIONAL_A

, FL

12/17/2021

Infiltration	Type Natural	Average ACH 0.12	Volume(cuft) 18144	Wall Ratio 1	CFM= 37.3	Load 775 Btuh
Internal gain		Occupants 6	Btuh/occupant X 230	Appliance +	2400	Load 3780 Btuh
					Sensible Envelope Load:	12212 Btuh
Duct load	Extremely sealed, Supply(R8.0-Attic), Return(R8.0-Attic)				(DGM of 0.289)	3534 Btuh
					Sensible Load All Zones	15746 Btuh

Manual J Summer Calculations

Residential Load - Component Details (continued)

Project Title:
Townsend

Climate: FL_GAINESVILLE_REGIONAL_A

, FL

12/17/2021

WHOLE HOUSE TOTALS

Whole House Totals for Cooling	Sensible Envelope Load All Zones	12212 Btuh
	Sensible Duct Load	3534 Btuh
	Total Sensible Zone Loads	15746 Btuh
	Sensible ventilation	0 Btuh
	Blower	0 Btuh
	Total sensible gain	15746 Btuh
	Latent infiltration gain (for 51 gr. humidity difference)	1286 Btuh
	Latent ventilation gain	0 Btuh
	Latent duct gain	572 Btuh
	Latent occupant gain (6.0 people @ 200 Btuh per person)	1200 Btuh
	Latent other gain	0 Btuh
	Latent total gain	3058 Btuh
	TOTAL GAIN	18804 Btuh

EQUIPMENT

1. Central Unit	#	36000 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

System Sizing Calculations - Winter

Residential Load - Whole House Component Details

Project Title:
Townsend
Building Type: User

, FL

12/17/2021

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 0.20	Vinyl	0.26	N	30.0		10.4	312 Btuh
2	2, NFRC 0.20	Vinyl	0.26	S	20.0		10.4	208 Btuh
3	2, NFRC 0.20	Vinyl	0.26	W	15.0		10.4	156 Btuh
4	2, NFRC 0.20	Vinyl	0.26	N	3.0		10.4	31 Btuh
5	2, NFRC 0.20	Vinyl	0.26	N	15.0		10.4	156 Btuh
6	2, NFRC 0.20	Vinyl	0.26	S	30.0		10.4	312 Btuh
7	2, NFRC 0.20	Vinyl	0.26	W	13.3		10.4	139 Btuh
8	2, NFRC 0.20	Vinyl	0.26	E	15.0		10.4	156 Btuh
9	2, NFRC 0.20	Vinyl	0.26	E	16.0		10.4	166 Btuh
	Window Total				157.3(sqft)			1636 Btuh
Walls	Type	Ornt.	Ueff.	R-Value (Cav/Sh)	Area	X	HTM=	Load
1	Conc Blk,Hollow - Adj		(0.062)	13.0/0.6	107		2.47	264 Btuh
2	Conc Blk,Hollow - Ext		(0.062)	13.0/0.6	11		2.47	27 Btuh
3	Conc Blk,Hollow - Ext		(0.064)	13.0/0.0	255		2.56	654 Btuh
4	Conc Blk,Hollow - Ext		(0.064)	13.0/0.0	88		2.56	225 Btuh
5	Conc Blk,Hollow - Ext		(0.064)	13.0/0.0	103		2.56	265 Btuh
6	Conc Blk,Hollow - Ext		(0.064)	13.0/0.0	372		2.56	954 Btuh
7	Frame - Wood - Adj		(0.089)	13.0/0.0	234		3.55	832 Btuh
8	Conc Blk,Hollow - Ext		(0.064)	13.0/0.0	86		2.56	220 Btuh
9	Conc Blk,Hollow - Ext		(0.064)	13.0/0.0	43		2.56	109 Btuh
10	Conc Blk,Hollow - Ext		(0.064)	13.0/0.0	58		2.56	148 Btuh
11	Conc Blk,Hollow - Ext		(0.064)	13.0/0.0	41		2.56	105 Btuh
12	Conc Blk,Hollow - Ext		(0.064)	13.0/0.0	148		2.56	379 Btuh
13	Conc Blk,Hollow - Ext		(0.064)	13.0/0.0	329		2.56	844 Btuh
	Wall Total				1875(sqft)			5026 Btuh
Doors	Type	Storm	Ueff.		Area	X	HTM=	Load
1	Insulated - Exterior, n		(0.400)		20		16.0	320 Btuh
2	Insulated - Exterior, n		(0.400)		20		16.0	320 Btuh
3	Insulated - Exterior, n		(0.400)		20		16.0	320 Btuh
	Door Total				60(sqft)			960Btuh
Ceilings	Type/Color/Surface		Ueff.	R-Value	Area	X	HTM=	Load
1	Vented Attic/L/Wood		(0.032)	30.0/0.0	2016		1.3	2568 Btuh
	Ceiling Total				2016(sqft)			2568Btuh
Floors	Type		Ueff.	R-Value	Size	X	HTM=	Load
1	Slab On Grade		(1.180)	0.0	217.0 ft(perim.)		47.2	10242 Btuh
	Floor Total				2016 sqft			10242 Btuh
	Envelope Subtotal:							20433 Btuh

Manual J Winter Calculations

Residential Load - Component Details (continued)

, FL

Project Title:
Townsend
Building Type: User

12/17/2021

Infiltration	Type Natural	Wholehouse ACH 0.16	Volume(cuft) 18144	Wall Ratio 1.00	CFM= 49.7	2176 Btuh
Duct load	Extremely sealed, R8.0, Supply(Att), Return(Att)				(DLM of 0.145)	3289 Btuh
All Zones	Sensible Subtotal All Zones					25897 Btuh

WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss	25897 Btuh
	Ventilation Sensible Heat Loss	0 Btuh
	Total Heat Loss	25897 Btuh

EQUIPMENT

1. Electric Heat Pump	#	36000 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