

Residential System Sizing Calculation

Summary

1700 Model

Project Title:

190926 1700

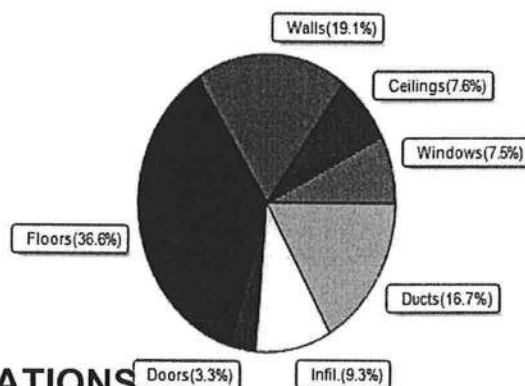
2019-09-03

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	23501 Btuh	Total cooling load calculation	20475 Btuh
Submitted heating capacity	% of calc Btuh	Submitted cooling capacity	% of calc Btuh
Total (Electric Heat Pump)	119.1 28000	Sensible (SHR = 0.75)	125.3 21000
Heat Pump + Auxiliary(0.0kW)	119.1 28000	Latent	188.3 7000
		Total (Electric Heat Pump)	136.8 28000

WINTER CALCULATIONS

Winter Heating Load (for 1757 sqft)

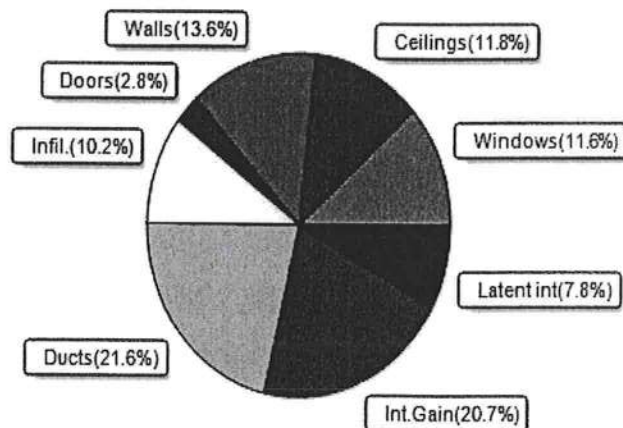
Load component		Load
Window total	146 sqft	1752 Btuh
Wall total	1262 sqft	4481 Btuh
Door total	48 sqft	764 Btuh
Ceiling total	1757 sqft	1784 Btuh
Floor total	1757 sqft	8590 Btuh
Infiltration	50 cfm	2197 Btuh
Duct loss		3932 Btuh
Subtotal		23501 Btuh
Ventilation	0 cfm	0 Btuh
TOTAL HEAT LOSS		23501 Btuh



SUMMER CALCULATIONS

Summer Cooling Load (for 1757 sqft)

Load component		Load
Window total	146 sqft	2375 Btuh
Wall total	1262 sqft	2775 Btuh
Door total	48 sqft	573 Btuh
Ceiling total	1757 sqft	2408 Btuh
Floor total	0	0 Btuh
Infiltration	38 cfm	783 Btuh
Internal gain		4240 Btuh
Duct gain		3603 Btuh
Sens. Ventilation	0 cfm	0 Btuh
Blower Load		0 Btuh
Total sensible gain		16757 Btuh
Latent gain(ducts)		819 Btuh
Latent gain(infiltration)		1299 Btuh
Latent gain(ventilation)		0 Btuh
Latent gain(internal/occupants/other)		1600 Btuh
Total latent gain		3717 Btuh
TOTAL HEAT GAIN		20475 Btuh



8th Edition

EnergyGauge® System Sizing
 PREPARED BY: Evan Beamsley
 DATE: 2019-09-03

System Sizing Calculations - Winter

Residential Load - Whole House Component Details

Project Title:
190926 1700
Building Type:

2019-09-03

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	Metal	0.30	E	40.0		12.0	480 Btuh
2	2, NFRC 0.20	Metal	0.30	E	23.3		12.0	280 Btuh
3	2, NFRC 0.20	Metal	0.30	E	6.0		12.0	72 Btuh
4	2, NFRC 0.20	Metal	0.30	S	30.0		12.0	360 Btuh
5	2, NFRC 0.20	Metal	0.30	W	6.7		12.0	80 Btuh
6	2, NFRC 0.20	Metal	0.30	W	40.0		12.0	480 Btuh
	Window Total					146.0(sqft)		1752 Btuh
Walls	Type	Ornt.	Ueff.	R-Value (Cav/Sh)	Area	X	HTM=	Load
1	Frame - Wood	- Ext	(0.089)	13.0/0.0	393		3.55	1394 Btuh
2	Frame - Wood	- Ext	(0.089)	13.0/0.0	226		3.55	802 Btuh
3	Frame - Wood	- Adj	(0.089)	13.0/0.0	142		3.55	505 Btuh
4	Frame - Wood	- Ext	(0.089)	13.0/0.0	32		3.55	114 Btuh
5	Frame - Wood	- Ext	(0.089)	13.0/0.0	245		3.55	871 Btuh
6	Frame - Wood	- Ext	(0.089)	13.0/0.0	224		3.55	795 Btuh
	Wall Total					1262(sqft)		4481 Btuh
Doors	Type	Storm	Ueff.		Area	X	HTM=	Load
1	Insulated - Exterior, n		(0.400)		10		16.0	160 Btuh
2	Insulated - Exterior, n		(0.400)		20		16.0	320 Btuh
3	Insulated - Garage, n		(0.400)		18		16.0	284 Btuh
	Door Total					48(sqft)		764Btuh
Ceilings	Type/Color/Surface		Ueff.	R-Value	Area	X	HTM=	Load
1	Vented Attic/D/Shing		(0.025)	38.0/0.0	1757		1.0	1784 Btuh
	Ceiling Total					1757(sqft)		1784Btuh
Floors	Type		Ueff.	R-Value	Size	X	HTM=	Load
1	Slab On Grade		(1.180)	0.0	182.0 ft(perim.)		47.2	8590 Btuh
	Floor Total					1757 sqft		8590 Btuh
	Envelope Subtotal:							17372 Btuh
Infiltration	Type	Wholehouse	ACH	Volume(cuft)	Wall Ratio	CFM=		Load
	Natural		0.21	14056	1.00	50.2		2197 Btuh
Duct load	Average sealed, R6.0, Supply(Att), Return(Con)					(DLM of 0.201)		3932 Btuh
All Zones	Sensible Subtotal All Zones							23501 Btuh

Manual J Winter Calculations

Residential Load - Component Details (continued)

1700 Model

Lake City, FL

Project Title:

190926 1700 - 190926 1700

Building Type: User

2019-09-03

WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss	23501 Btuh
	Ventilation Sensible Heat Loss	0 Btuh
	Total Heat Loss	23501 Btuh

EQUIPMENT

1. Electric Heat Pump	#	28000 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

1700 Model

Project Title:

190926 1700

Lake City, FL

2019-09-03

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, 0.30	No	No	E		1.5ft.	0.5ft.	40.0	6.0	34.0	10	25	909	Btuh
2	2 NFRC	0.20, 0.30	No	No	E		1.5ft.	0.5ft.	23.3	2.6	20.7	10	25	544	Btuh
3	2 NFRC	0.20, 0.30	No	No	E		1.5ft.	0.5ft.	6.0	1.5	4.5	10	25	127	Btuh
4	2 NFRC	0.20, 0.30	No	No	S		1.5ft.	0.5ft.	30.0	30.0	0.0	10	11	297	Btuh
5	2 NFRC	0.20, 0.30	No	No	W		6.5ft.	0.0ft.	6.7	5.4	1.3	10	25	85	Btuh
6	2 NFRC	0.20, 0.30	No	No	W		6.5ft.	0.0ft.	40.0	40.0	0.0	10	25	396	Btuh
Excursion														16	Btuh
Window Total									146 (sqft)					2375 Btuh	
Walls	Type		U-Value		R-Value		Area(sqft)		HTM		Load				
					Cav/Sheath										
1	Frame - Wood - Ext		0.09		13.0/0.0		392.7		2.3		889 Btuh				
2	Frame - Wood - Ext		0.09		13.0/0.0		226.0		2.3		512 Btuh				
3	Frame - Wood - Adj		0.09		13.0/0.0		142.2		1.7		240 Btuh				
4	Frame - Wood - Ext		0.09		13.0/0.0		32.0		2.3		72 Btuh				
5	Frame - Wood - Ext		0.09		13.0/0.0		245.3		2.3		555 Btuh				
6	Frame - Wood - Ext		0.09		13.0/0.0		224.0		2.3		507 Btuh				
Wall Total									1262 (sqft)			2775 Btuh			
Doors	Type		Area (sqft)		HTM		Load								
1	Insulated - Exterior		10.0		12.0		120 Btuh								
2	Insulated - Exterior		20.0		12.0		240 Btuh								
3	Insulated - Garage		17.8		12.0		213 Btuh								
Door Total									48 (sqft)			573 Btuh			
Ceilings	Type/Color/Surface		U-Value		R-Value		Area(sqft)		HTM		Load				
1	Vented Attic/DarkShingle		0.025		38.0/0.0		1757.0		1.37		2408 Btuh				
Ceiling Total									1757 (sqft)			2408 Btuh			
Floors	Type		R-Value		Size		HTM		Load						
1	Slab On Grade		0.0		1757 (ft-perimeter)		0.0		0 Btuh						
Floor Total									1757.0 (sqft)			0 Btuh			
Envelope Subtotal:														8131 Btuh	
Infiltration	Type		Average ACH		Volume(cuft)		Wall Ratio		CFM=		Load				
	Natural		0.16		14056		1		37.6		783 Btuh				
Internal gain	Occupants		Btuh/occupant		Appliance		Load								
	8		X 230		+		2400		4240 Btuh						
Sensible Envelope Load:														13154 Btuh	
Duct load	Average sealed, Supply(R6.0-Attic), Return(R6.0-Condi)							(DGM of 0.274)			3603 Btuh				
	Sensible Load All Zones														16757 Btuh

Manual J Summer Calculations

Residential Load - Component Details (continued)

1700 Model
Lake City, FL

Project Title: Climate:FL_GAINESVILLE_REGIONAL_A
190926 1700

2019-09-03

WHOLE HOUSE TOTALS

Whole House Totals for Cooling	Sensible Envelope Load All Zones	13154 Btuh
	Sensible Duct Load	3603 Btuh
	Total Sensible Zone Loads	16757 Btuh
	Sensible ventilation	0 Btuh
	Blower	0 Btuh
	Total sensible gain	16757 Btuh
	Latent infiltration gain (for 51 gr. humidity difference)	1299 Btuh
	Latent ventilation gain	0 Btuh
	Latent duct gain	819 Btuh
	Latent occupant gain (8.0 people @ 200 Btuh per person)	1600 Btuh
	Latent other gain	0 Btuh
	Latent total gain	3717 Btuh
	TOTAL GAIN	20475 Btuh

EQUIPMENT

1. Central Unit	#	28000 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))
(Omt - compass orientation)



Version 8

