

Residential System Sizing Calculation

Summary

Ingrid Cox
River Rise Park
, FL

Project Title:
Cox Residence

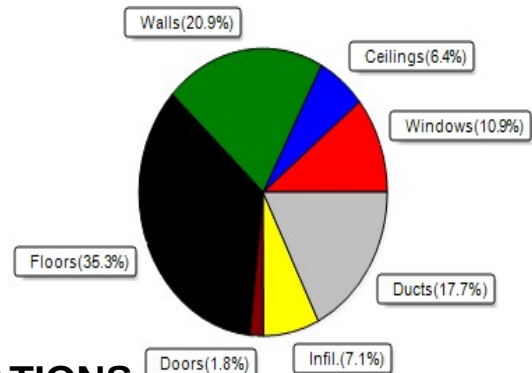
1/5/2021

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	20692 Btuh	Total cooling load calculation	15359 Btuh
Submitted heating capacity	% of calc Btuh	Submitted cooling capacity	% of calc Btuh
Total (Electric Heat Pump)	100.0 20692	Sensible (SHR = 0.70)	85.3 10751
Heat Pump + Auxiliary(0.0kW)	100.0 20692	Latent	166.9 4608
		Total (Electric Heat Pump)	100.0 15359

WINTER CALCULATIONS

Winter Heating Load (for 1244 sqft)

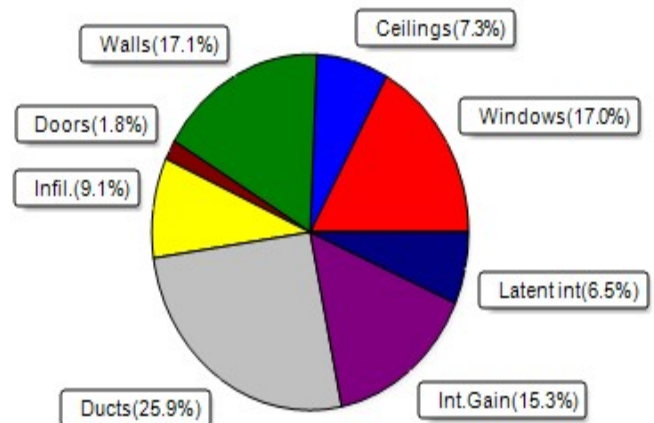
Load component		Load	
Window total	156 sqft	2246	Btuh
Wall total	1216 sqft	4317	Btuh
Door total	20 sqft	368	Btuh
Ceiling total	1306 sqft	1326	Btuh
Floor total	1244 sqft	7300	Btuh
Infiltration	34 cfm	1474	Btuh
Duct loss		3660	Btuh
Subtotal		20692	Btuh
Ventilation	0 cfm	0	Btuh
TOTAL HEAT LOSS		20692	Btuh



SUMMER CALCULATIONS

Summer Cooling Load (for 1244 sqft)

Load component		Load	
Window total	156 sqft	2610	Btuh
Wall total	1216 sqft	2628	Btuh
Door total	20 sqft	276	Btuh
Ceiling total	1306 sqft	1127	Btuh
Floor total		0	Btuh
Infiltration	25 cfm	525	Btuh
Internal gain		2350	Btuh
Duct gain		3081	Btuh
Sens. Ventilation	0 cfm	0	Btuh
Blower Load		0	Btuh
Total sensible gain		12597	Btuh
Latent gain(ducts)		890	Btuh
Latent gain(infiltration)		872	Btuh
Latent gain(ventilation)		0	Btuh
Latent gain(internal/occupants/other)		1000	Btuh
Total latent gain		2761	Btuh
TOTAL HEAT GAIN		15359	Btuh



8th Edition

EnergyGauge® System Sizing

PREPARED BY: _____

DATE: _____

System Sizing Calculations - Winter

Residential Load - Whole House Component Details

Ingrid Cox
River Rise Park
, FL

Project Title:
Cox Residence
Building Type: User

1/5/2021

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 0.25	Vinyl	0.36	S	30.0		14.4	432 Btuh
2	2, NFRC 0.25	TIM	0.36	S	6.7		14.4	96 Btuh
3	2, NFRC 0.25	Vinyl	0.36	S	15.0		14.4	216 Btuh
4	2, NFRC 0.25	Vinyl	0.36	E	30.0		14.4	432 Btuh
5	2, NFRC 0.25	Vinyl	0.36	E	5.3		14.4	77 Btuh
6	2, NFRC 0.25	Vinyl	0.36	N	10.0		14.4	144 Btuh
7	2, NFRC 0.25	Vinyl	0.36	N	9.0		14.4	130 Btuh
8	2, NFRC 0.25	Metal	0.36	N	40.0		14.4	576 Btuh
9	2, NFRC 0.25	Vinyl	0.36	SW	10.0		14.4	144 Btuh
	Window Total					156.0(sqft)		2246 Btuh
Walls	Type	Ornt.	Ueff.	R-Value (Cav/Sh)	Area	X	HTM=	Load
1	Frame - Wood	- Ext	(0.089)	13.0/0.0	123		3.55	438 Btuh
2	Frame - Wood	- Ext	(0.089)	13.0/0.0	108		3.55	383 Btuh
3	Frame - Wood	- Ext	(0.089)	13.0/0.0	123		3.55	437 Btuh
4	Frame - Wood	- Ext	(0.089)	13.0/0.0	343		3.55	1217 Btuh
5	Frame - Wood	- Ext	(0.089)	13.0/0.0	259		3.55	920 Btuh
6	Frame - Wood	- Adj	(0.089)	13.0/0.0	216		3.55	767 Btuh
7	Frame - Wood	- Ext	(0.089)	13.0/0.0	44		3.55	156 Btuh
	Wall Total					1216(sqft)		4317 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	Vented Attic/L/Shing		(0.025)	38.0/0.0	1306		1.0	1326 Btuh
	Ceiling Total					1306(sqft)		1326Btuh
Floors	Type		Ueff.	R-Value	Size	X	HTM=	Load
1	Slab On Grade		(1.180)	0.0	154.7 ft(perim.)		47.2	7300 Btuh
	Floor Total					1244 sqft		7300 Btuh
	Envelope Subtotal:							15558 Btuh
Infiltration	Type	Wholehouse	ACH	Volume(cuft)	Wall Ratio		CFM=	Load
	Natural		0.18	11196	1.00		33.7	1474 Btuh
Duct load	Average sealed, R6.0, Supply(Att), Return(Att) (DLM of 0.215)							3660 Btuh
All Zones	Sensible Subtotal All Zones							20692 Btuh

Manual J Winter Calculations

Residential Load - Component Details (continued)

Ingrid Cox
River Rise Park
, FL

Project Title:
Cox Residence
Building Type: User

1/5/2021

WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss	20692 Btuh
	Ventilation Sensible Heat Loss	0 Btuh
	Total Heat Loss	20692 Btuh

EQUIPMENT

1. Electric Heat Pump	#	20692 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

Ingrid Cox
River Rise Park
, FL

Project Title:
Cox Residence

1/5/2021

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	0.25, 0.36	No	No	S		9.5ft.	1.0ft.	30.0	30.0	0.0	12	14	363	Btuh		
2	2 NFRC	0.25, 0.36	No	No	S		9.5ft.	1.0ft.	6.7	6.7	0.0	12	14	81	Btuh		
3	2 NFRC	0.25, 0.36	No	No	S		1.0ft.	3.0ft.	15.0	8.0	7.0	12	14	195	Btuh		
4	2 NFRC	0.25, 0.36	No	No	E		1.5ft.	1.0ft.	30.0	1.5	28.5	12	31	901	Btuh		
5	2 NFRC	0.25, 0.36	No	No	E		1.5ft.	1.0ft.	5.3	1.0	4.4	12	31	147	Btuh		
6	2 NFRC	0.25, 0.36	No	No	N		1.5ft.	1.0ft.	10.0	0.0	10.0	12	12	121	Btuh		
7	2 NFRC	0.25, 0.36	No	No	N		1.5ft.	1.0ft.	9.0	0.0	9.0	12	12	109	Btuh		
8	2 NFRC	0.25, 0.36	No	No	N		1.5ft.	1.0ft.	40.0	0.0	40.0	12	12	484	Btuh		
9	2 NFRC	0.25, 0.36	No	No	SW		1.5ft.	1.0ft.	10.0	2.9	7.1	12	25	210	Btuh		
	Window Total									156 (sqft)					2610 Btuh		
Walls	Type					U-Value	R-Value	Area(sqft)			HTM		Load				
							Cav/Sheath										
1	Frame - Wood - Ext						0.09	13.0/0.0	123.3			2.3		279 Btuh			
2	Frame - Wood - Ext						0.09	13.0/0.0	108.0			2.3		244 Btuh			
3	Frame - Wood - Ext						0.09	13.0/0.0	123.0			2.3		278 Btuh			
4	Frame - Wood - Ext						0.09	13.0/0.0	342.7			2.3		776 Btuh			
5	Frame - Wood - Ext						0.09	13.0/0.0	259.0			2.3		586 Btuh			
6	Frame - Wood - Adj						0.09	13.0/0.0	216.0			1.7		364 Btuh			
7	Frame - Wood - Ext						0.09	13.0/0.0	44.0			2.3		100 Btuh			
	Wall Total									1216 (sqft)					2628 Btuh		
Doors	Type					U-Value	R-Value	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/Light/Shingle/RB						0.025	38.0/0.0	1306.0			0.86		1127 Btuh			
	Ceiling Total									1306 (sqft)					1127 Btuh		
Floors	Type					U-Value	R-Value	Size			HTM		Load				
1	Slab On Grade							0.0	1244 (ft-perimeter)			0.0		0 Btuh			
	Floor Total									1244.0 (sqft)					0 Btuh		
	Envelope Subtotal:													6641 Btuh			
Infiltration	Type					Average ACH		Volume(cuft)		Wall Ratio		CFM=		Load			
	Natural						0.14		11196		1		25.3		525 Btuh		
Internal gain							Occupants		Btuh/occupant		Appliance		Load				
							5		X 230		+		1200		2350 Btuh		
	Sensible Envelope Load:													9516 Btuh			
Duct load	Average sealed, Supply(R6.0-Attic), Return(R6.0-Attic)													(DGM of 0.324)		3081 Btuh	
	Sensible Load All Zones													12597 Btuh			

Manual J Summer Calculations

Residential Load - Component Details (continued)

Ingrid Cox
River Rise Park
, FL

Project Title:
Cox Residence

Climate:FL_GAINESVILLE_REGIONAL_A

1/5/2021

WHOLE HOUSE TOTALS

Whole House Totals for Cooling	Sensible Envelope Load All Zones	9516 Btuh
	Sensible Duct Load	3081 Btuh
	Total Sensible Zone Loads	12597 Btuh
	Sensible ventilation	0 Btuh
	Blower	0 Btuh
	Total sensible gain	12597 Btuh
	Latent infiltration gain (for 51 gr. humidity difference)	872 Btuh
	Latent ventilation gain	0 Btuh
	Latent duct gain	890 Btuh
	Latent occupant gain (5.0 people @ 200 Btuh per person)	1000 Btuh
	Latent other gain	0 Btuh
	Latent total gain	2761 Btuh
	TOTAL GAIN	15359 Btuh

EQUIPMENT

1. Central Unit	#	15359 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