

Residential System Sizing Calculation

Summary

Project Title:
Harlow Residence

, FL

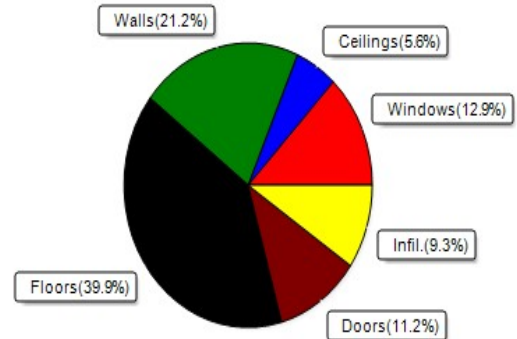
3/25/2024

Location for weather data: Gainesville, FL - Defaults: Latitude(29.7) Altitude(100 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	31017 Btuh	Total cooling load calculation	21106 Btuh
Submitted heating capacity	% of calc Btuh	Submitted cooling capacity	% of calc Btuh
Total (Electric Heat Pump)	154.8 48000	Sensible (SHR = 0.75)	197.8 36000
Heat Pump + Auxiliary(0.0kW)	154.8 48000	Latent	413.2 12000
		Total (Electric Heat Pump)	227.4 48000

WINTER CALCULATIONS

Winter Heating Load (for 2439 sqft)

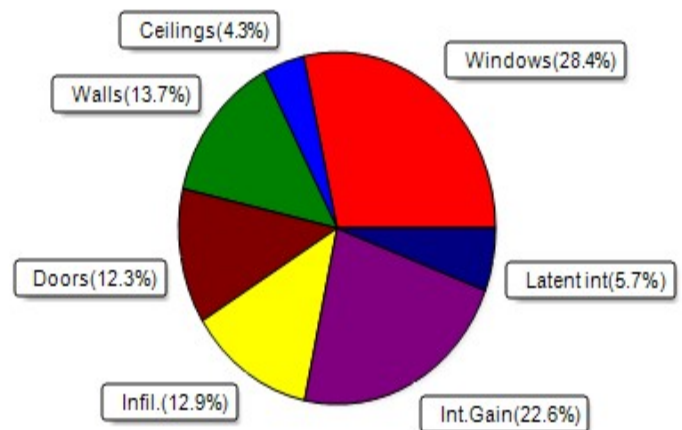
Load component	Load
Window total 385 sqft	4004 Btuh
Wall total 2378 sqft	6578 Btuh
Door total 188 sqft	3459 Btuh
Ceiling total 2439 sqft	1727 Btuh
Floor total 2439 sqft	12366 Btuh
Infiltration 66 cfm	2883 Btuh
Duct loss	0 Btuh
Subtotal	31017 Btuh
Ventilation Ex:0 cfm; Sup:0 cfm	0 Btuh
TOTAL HEAT LOSS	31017 Btuh



SUMMER CALCULATIONS

Summer Cooling Load (for 2439 sqft)

Load component	Load
Window total 385 sqft	6001 Btuh
Wall total 2378 sqft	2895 Btuh
Door total 188 sqft	2594 Btuh
Ceiling total 2439 sqft	905 Btuh
Floor total	0 Btuh
Infiltration 49 cfm	1027 Btuh
Internal gain	4780 Btuh
Duct gain	0 Btuh
Sens.Ventilation Ex:0 cfm; Sup:0 cfm	0 Btuh
Blower Load	0 Btuh
Total sensible gain	18202 Btuh
Latent gain(ducts)	0 Btuh
Latent gain(infiltration)	1704 Btuh
Latent gain(ventilation)	0 Btuh
Latent gain(internal/occupants/other)	1200 Btuh
Total latent gain	2904 Btuh
TOTAL HEAT GAIN	21106 Btuh



8th Edition

EnergyGauge® System Sizing

PREPARED BY: _____

DATE: _____

3-25-24

System Sizing Calculations - Summer

Residential Load - Whole House Component Details

Project Title:
Harlow Residence

, FL

3/25/2024

Reference City: Gainesville, FL (Defaults)
Humidity difference: 51gr.

Temperature Difference: 19.0F(TMY3 99%)
Summer Setpoint: 75 °F (Required Manual J default)

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	1.3ft	30.0	0.0	30.0	9	9	274	Btuh	
2	2 NFRC	0.20, 0.26	No	No	N	1.5ft	1.3ft	15.0	0.0	15.0	9	9	137	Btuh	
3	2 NFRC	0.20, 0.26	No	No	S	1.5ft	1.3ft	16.0	16.0	0.0	9	11	146	Btuh	
4	2 NFRC	0.20, 0.26	No	No	E	1.5ft	1.3ft	20.0	0.0	20.0	9	24	484	Btuh	
5	2 NFRC	0.20, 0.26	No	No	S	1.5ft	1.3ft	40.0	40.0	0.0	9	11	366	Btuh	
6	2 NFRC	0.20, 0.26	No	No	W	1.5ft	1.3ft	24.0	0.0	24.0	9	24	581	Btuh	
7	2 NFRC	0.20, 0.26	No	No	S	1.5ft	1.3ft	48.0	48.0	0.0	9	11	439	Btuh	
8	2 NFRC	0.20, 0.26	No	No	E	1.5ft	1.3ft	24.0	0.0	24.0	9	24	581	Btuh	
9	2 NFRC	0.20, 0.26	No	No	S	1.5ft	1.3ft	40.0	40.0	0.0	9	11	366	Btuh	
10	2 NFRC	0.20, 0.26	No	No	W	1.5ft	1.3ft	20.0	0.0	20.0	9	24	484	Btuh	
11	2 NFRC	0.20, 0.26	No	No	W	1.5ft	1.3ft	6.0	0.0	6.0	9	24	145	Btuh	
12	2 NFRC	0.20, 0.26	No	No	W	1.5ft	1.3ft	30.0	0.0	30.0	9	24	727	Btuh	
13	2 NFRC	0.20, 0.26	No	No	N	1.5ft	1.3ft	18.0	0.0	18.0	9	9	165	Btuh	
14	2 NFRC	0.20, 0.26	No	No	E	1.5ft	1.3ft	18.0	0.0	18.0	9	24	436	Btuh	
15	2 NFRC	0.20, 0.26	No	No	S	1.5ft	1.3ft	18.0	18.0	0.0	9	11	165	Btuh	
16	2 NFRC	0.20, 0.26	No	No	W	1.5ft	1.3ft	18.0	0.0	18.0	9	24	436	Btuh	
	Excursion												68	Btuh	
	Window Total							385 (sqft)						6001	Btuh
Walls	Type					U-Value	R-Value	Area(sqft)			HTM		Load		
							Cav/Sheath								
1	Concrete Blk,Hollow - Ext					0.06	13.0/0.0	156.7			1.0		161	Btuh	
2	Concrete Blk,Hollow - Ext					0.06	13.0/0.0	133.3			1.0		137	Btuh	
3	Concrete Blk,Hollow - Ext					0.06	13.0/0.0	134.0			1.0		137	Btuh	
4	Concrete Blk,Hollow - Ext					0.06	13.0/0.0	113.3			1.0		116	Btuh	
5	Concrete Blk,Hollow - Ext					0.06	13.0/0.0	225.0			1.0		231	Btuh	
6	Frame - Wood - Adj					0.09	13.0/0.0	256.0			1.7		432	Btuh	
7	Concrete Blk,Hollow - Ext					0.06	13.0/0.0	117.3			1.0		120	Btuh	
8	Concrete Blk,Hollow - Ext					0.06	13.0/0.0	156.7			1.0		161	Btuh	
9	Concrete Blk,Hollow - Ext					0.06	13.0/0.0	126.7			1.0		130	Btuh	
10	Concrete Blk,Hollow - Ext					0.06	13.0/0.0	36.0			1.0		37	Btuh	
11	Concrete Blk,Hollow - Ext					0.06	13.0/0.0	127.3			1.0		131	Btuh	
12	Concrete Blk,Hollow - Ext					0.06	13.0/0.0	36.0			1.0		37	Btuh	
13	Concrete Blk,Hollow - Ext					0.06	13.0/0.0	126.7			1.0		130	Btuh	
14	Concrete Blk,Hollow - Ext					0.06	13.0/0.0	400.7			1.0		411	Btuh	
15	Frame - Wood - Ext					0.09	13.0/0.0	64.0			2.3		145	Btuh	
16	Frame - Wood - Ext					0.09	13.0/0.0	52.0			2.3		118	Btuh	
17	Frame - Wood - Ext					0.09	13.0/0.0	64.0			2.3		145	Btuh	
18	Frame - Wood - Ext					0.09	13.0/0.0	52.0			2.3		118	Btuh	
	Wall Total							2378 (sqft)						2895	Btuh
Doors	Type					Area (sqft)			HTM		Load				
1	Insulated - Exterior					96.0			13.8		1325	Btuh			
2	Insulated - Exterior					20.0			13.8		276	Btuh			
3	Insulated - Garage					24.0			13.8		331	Btuh			
4	Insulated - Exterior					48.0			13.8		662	Btuh			
	Door Total					188 (sqft)					2594	Btuh			

Manual J Summer Calculations

Residential Load - Component Details (continued)

Project Title: Climate:FL_GAINESVILLE_REGIONAL_A
Harlow Residence

, FL

3/25/2024

Ceilings	Type/Color/Surface	U-Value	R-Value	Area(sqft)	HTM	Load
1	SnglAsmb w airsp/Light/Metal	0.018	30.0/30.0	2439.0	0.37	905 Btuh
	Ceiling Total			2439 (sqft)		905 Btuh
Floors	Type		R-Value	Size	HTM	Load
1	Slab On Grade		0.0	2439 (ft-perimeter)	0.0	0 Btuh
	Floor Total			2439.0 (sqft)		0 Btuh
	Envelope Subtotal:					12395 Btuh
Infiltration	Type	Average ACH	Volume(cuft)	Wall Ratio	CFM=	Load
	Natural	0.12	24390	1	49.3	1027 Btuh
Internal gain		Occupants	Btuh/occupant	Appliance		Load
		6	X 230	+	3400	4780 Btuh
	Sensible Envelope Load:					18202 Btuh
Duct load	Extremely sealed, Supply(R6.0-Condi), Return(R6.0-Condi) (DGM of 0.000)					0 Btuh
	Sensible Load All Zones					18202 Btuh

Manual J Summer Calculations

Residential Load - Component Details (continued)

Project Title: Climate:FL_GAINESVILLE_REGIONAL_A
Harlow Residence

, FL

3/25/2024

WHOLE HOUSE TOTALS

Whole House Totals for Cooling	Sensible Envelope Load All Zones	18202 Btuh
	Sensible Duct Load	0 Btuh
	Total Sensible Zone Loads	18202 Btuh
	Sensible ventilation (Ex:0 cfm; Sup:0 cfm)	0 Btuh
	Blower	0 Btuh
	Total sensible gain	18202 Btuh
	Latent infiltration gain (for 51 gr. humidity difference)	1704 Btuh
	Latent ventilation gain	0 Btuh
	Latent duct gain	0 Btuh
	Latent occupant gain (6.0 people @ 200 Btuh per person)	1200 Btuh
	Latent other gain	0 Btuh
	Latent total gain	2904 Btuh
	TOTAL GAIN	21106 Btuh

EQUIPMENT

1. Central Unit	#	48000 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:
Harlow Residence
Building Type: User

, FL

3/25/2024

Reference City: Gainesville, FL (Defaults) Winter Temperature Difference: 40.0 °F (TMY3 99%)
Winter Setpoint: 70 °F (Required Manual J default)

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	N	15.0		10.4	156 Btuh
3	2, NFRC 0.20	Vinyl	0.26	S	16.0		10.4	166 Btuh
4	2, NFRC 0.20	Vinyl	0.26	E	20.0		10.4	208 Btuh
5	2, NFRC 0.20	Vinyl	0.26	S	40.0		10.4	416 Btuh
6	2, NFRC 0.20	Vinyl	0.26	W	24.0		10.4	250 Btuh
7	2, NFRC 0.20	Vinyl	0.26	S	48.0		10.4	499 Btuh
8	2, NFRC 0.20	Vinyl	0.26	E	24.0		10.4	250 Btuh
9	2, NFRC 0.20	Vinyl	0.26	S	40.0		10.4	416 Btuh
10	2, NFRC 0.20	Vinyl	0.26	W	20.0		10.4	208 Btuh
11	2, NFRC 0.20	Vinyl	0.26	W	6.0		10.4	62 Btuh
12	2, NFRC 0.20	Vinyl	0.26	W	30.0		10.4	312 Btuh
13	2, NFRC 0.20	Vinyl	0.26	N	18.0		10.4	187 Btuh
14	2, NFRC 0.20	Vinyl	0.26	E	18.0		10.4	187 Btuh
15	2, NFRC 0.20	Vinyl	0.26	S	18.0		10.4	187 Btuh
16	2, NFRC 0.20	Vinyl	0.26	W	18.0		10.4	187 Btuh
Window Total					385.0(sqft)			4004 Btuh
Walls	Type	Ornt.	Ueff.	R-Value (Cav/Sh)	Area	X	HTM=	Load
1	Conc Blk,Hollow	- Ext	(0.064)	13.0/0.0	157		2.56	402 Btuh
2	Conc Blk,Hollow	- Ext	(0.064)	13.0/0.0	133		2.56	342 Btuh
3	Conc Blk,Hollow	- Ext	(0.064)	13.0/0.0	134		2.56	344 Btuh
4	Conc Blk,Hollow	- Ext	(0.064)	13.0/0.0	113		2.56	291 Btuh
5	Conc Blk,Hollow	- Ext	(0.064)	13.0/0.0	225		2.56	577 Btuh
6	Frame - Wood	- Adj	(0.089)	13.0/0.0	256		3.55	909 Btuh
7	Conc Blk,Hollow	- Ext	(0.064)	13.0/0.0	117		2.56	301 Btuh
8	Conc Blk,Hollow	- Ext	(0.064)	13.0/0.0	157		2.56	402 Btuh
9	Conc Blk,Hollow	- Ext	(0.064)	13.0/0.0	127		2.56	325 Btuh
10	Conc Blk,Hollow	- Ext	(0.064)	13.0/0.0	36		2.56	92 Btuh
11	Conc Blk,Hollow	- Ext	(0.064)	13.0/0.0	127		2.56	326 Btuh
12	Conc Blk,Hollow	- Ext	(0.064)	13.0/0.0	36		2.56	92 Btuh
13	Conc Blk,Hollow	- Ext	(0.064)	13.0/0.0	127		2.56	325 Btuh
14	Conc Blk,Hollow	- Ext	(0.064)	13.0/0.0	401		2.56	1027 Btuh
15	Frame - Wood	- Ext	(0.089)	13.0/0.0	64		3.55	227 Btuh
16	Frame - Wood	- Ext	(0.089)	13.0/0.0	52		3.55	185 Btuh
17	Frame - Wood	- Ext	(0.089)	13.0/0.0	64		3.55	227 Btuh
18	Frame - Wood	- Ext	(0.089)	13.0/0.0	52		3.55	185 Btuh
Wall Total					2378(sqft)			6578 Btuh

Manual J Winter Calculations

Residential Load - Component Details (continued)

, FL

Project Title:
Harlow Residence
Building Type: User

3/25/2024

Doors 1 2 3 4	Type	Storm Ueff.		Area X	HTM=	Load
	Insulated - Exterior, n	(0.460)		96	18.4	1766 Btuh
	Insulated - Exterior, n	(0.460)		20	18.4	368 Btuh
	Insulated - Garage, n	(0.460)		24	18.4	442 Btuh
	Insulated - Exterior, n	(0.460)		48	18.4	883 Btuh
	Door Total			188(sqft)		3459Btuh
Ceilings 1	Type/Color/Surface	Ueff.	R-Value	Area X	HTM=	Load
	Single as/L/Metal	(0.018)	30.0/30.0	2439	0.71	1727 Btuh
	Ceiling Total			2439(sqft)		1727Btuh
Floors 1	Type	Ueff.	R-Value	Size X	HTM=	Load
	Slab On Grade	(1.180)	0.0	262.0 ft(perim.)	47.2	12366 Btuh
	Floor Total			2439 sqft		12366 Btuh
	Envelope Subtotal:					28134 Btuh
Infiltration	Type	Wholehouse	ACH	Volume(cuft)	Wall Ratio	CFM=
	Natural		0.16	24390	1.00	65.7
						2883 Btuh
Duct load	Extremely sealed, R6.0, Supply(Con), Return(Con) (DLM of 0.000)					0 Btuh
All Zones	Sensible Subtotal All Zones					31017 Btuh

WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss	31017 Btuh
	Ventilation Sens. Heat Loss (Ex:0 cfm; Sup:0 cfm)	0 Btuh
	Total Heat Loss	31017 Btuh

EQUIPMENT

1. Electric Heat Pump	#	48000 Btuh
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Manual J Winter Calculations

Residential Load - Component Details (continued)

Project Title:
Harlow Residence
Building Type: User

, FL

3/25/2024

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