

Residential System Sizing Calculation

Summary

Randel & Lilian Dutton

Project Title:
Dutton Res

Lake City, FL 32025

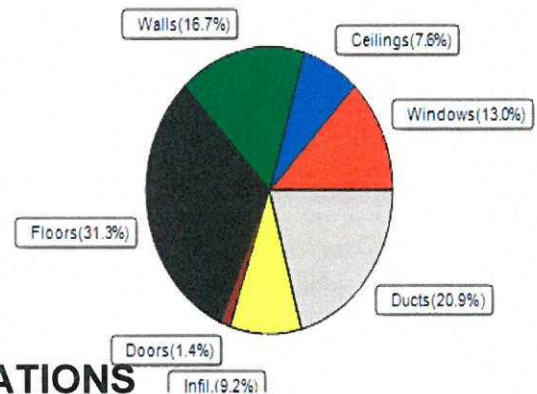
7/25/2020

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	27026 Btuh	Total cooling load calculation	21655 Btuh
Submitted heating capacity	% of calc Btuh	Submitted cooling capacity	% of calc Btuh
Total (Electric Heat Pump)	100.0 27026	Sensible (SHR = 0.70)	84.5 15025
Heat Pump + Auxiliary(0.0kW)	100.0 27026	Latent	166.3 6439
		Total (Electric Heat Pump)	99.1 21465

WINTER CALCULATIONS

Winter Heating Load (for 1918 sqft)

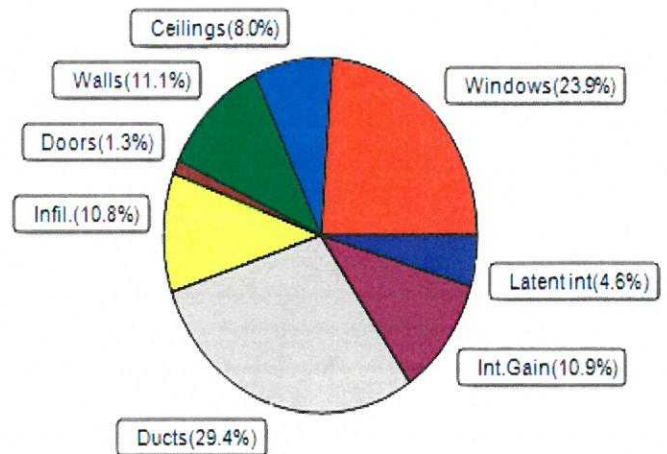
Load component		Load	
Window total	244 sqft	3512	Btuh
Wall total	1457 sqft	4502	Btuh
Door total	20 sqft	368	Btuh
Ceiling total	2014 sqft	2045	Btuh
Floor total	1918 sqft	8472	Btuh
Infiltration	57 cfm	2478	Btuh
Duct loss		5649	Btuh
Subtotal		27026	Btuh
Ventilation	0 cfm	0	Btuh
TOTAL HEAT LOSS		27026	Btuh



SUMMER CALCULATIONS

Summer Cooling Load (for 1918 sqft)

Load component		Load	
Window total	244 sqft	5173	Btuh
Wall total	1457 sqft	2409	Btuh
Door total	20 sqft	276	Btuh
Ceiling total	2014 sqft	1738	Btuh
Floor total		0	Btuh
Infiltration	42 cfm	883	Btuh
Internal gain		2350	Btuh
Duct gain		4956	Btuh
Sens. Ventilation	0 cfm	0	Btuh
Blower Load		0	Btuh
Total sensible gain		17784	Btuh
Latent gain(ducts)		1406	Btuh
Latent gain(infiltration)		1465	Btuh
Latent gain(ventilation)		0	Btuh
Latent gain(internal/occupants/other)		1000	Btuh
Total latent gain		3871	Btuh
TOTAL HEAT GAIN		21655	Btuh



8th Edition

EnergyGauge® System Sizing

PREPARED BY: _____

DATE: _____

7/25/2020

System Sizing Calculations - Winter

Residential Load - Whole House Component Details

Randel & Lilian Dutton

Project Title:

Dutton Res

Lake City, FL 32025

Building Type: User

7/25/2020

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	N	72.0		14.4	1037 Btuh
2	2, NFRC 0.25	Vinyl	0.36	E	36.0		14.4	518 Btuh
3	2, NFRC 0.25	TIM	0.36	E	6.7		14.4	96 Btuh
4	2, NFRC 0.25	Vinyl	0.36	S	36.0		14.4	518 Btuh
5	2, NFRC 0.25	Vinyl	0.36	W	36.0		14.4	518 Btuh
6	2, NFRC 0.25	Vinyl	0.36	S	17.3		14.4	248 Btuh
7	2, NFRC 0.25	TIM	0.36	W	40.0		14.4	576 Btuh
Window Total					243.9(sqft)			3512 Btuh
Walls	Type	Ornt.	Ueff.	R-Value (Cav/Sh)	Area	X	HTM=	Load
1	Frame - Wood	- Ext	(0.077)	19.0/0.0	318		3.09	984 Btuh
2	Frame - Wood	- Ext	(0.077)	19.0/0.0	106		3.09	326 Btuh
3	Frame - Wood	- Ext	(0.077)	19.0/0.0	23		3.09	72 Btuh
4	Frame - Wood	- Ext	(0.077)	19.0/0.0	29		3.09	91 Btuh
5	Frame - Wood	- Ext	(0.077)	19.0/0.0	23		3.09	72 Btuh
6	Frame - Wood	- Ext	(0.077)	19.0/0.0	249		3.09	769 Btuh
7	Frame - Wood	- Ext	(0.077)	19.0/0.0	336		3.09	1037 Btuh
8	Frame - Wood	- Ext	(0.077)	19.0/0.0	372		3.09	1150 Btuh
Wall Total					1457(sqft)			4502 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		2014		1.0	2045 Btuh
Ceiling Total					2014(sqft)			2045Btuh
Floors	Type	Ueff.	R-Value		Size	X	HTM=	Load
1	Slab On Grade	(1.180)	0.0		179.5 ft(perim.)		47.2	8472 Btuh
Floor Total					1918 sqft			8472 Btuh
Envelope Subtotal:								18900 Btuh
Infiltration	Type	Wholehouse	ACH	Volume(cuft)	Wall Ratio	CFM=		
	Natural		0.19	17895	1.00	56.6		2478 Btuh
Duct load	Average sealed, R6.0, Supply(Att), Return(Att) (DLM of 0.264)							5649 Btuh
All Zones	Sensible Subtotal All Zones							27026 Btuh

Manual J Winter Calculations

Residential Load - Component Details (continued)

Randel & Lilian Dutton

Project Title:

Dutton Res

Lake City, FL 32025

Building Type: User

7/25/2020

WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss	27026 Btuh
	Ventilation Sensible Heat Loss	0 Btuh
	Total Heat Loss	27026 Btuh

EQUIPMENT

1. Electric Heat Pump	#	27026 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

Randel & Lilian Dutton

Project Title:

Dutton Res

Lake City, FL 32025

7/25/2020

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	N		1.5ft.	1.0ft.	72.0	0.0	72.0	12	12	871	Btuh
2	2 NFRC	0.25, 0.36	No	No	E		1.5ft.	1.0ft.	36.0	1.5	34.5	12	31	1086	Btuh
3	2 NFRC	0.25, 0.36	No	No	E		9.0ft.	1.0ft.	6.7	6.5	0.2	12	31	84	Btuh
4	2 NFRC	0.25, 0.36	No	No	S		1.5ft.	1.0ft.	36.0	36.0	0.0	12	14	436	Btuh
5	2 NFRC	0.25, 0.36	No	No	W		1.5ft.	1.0ft.	36.0	1.5	34.5	12	31	1086	Btuh
6	2 NFRC	0.25, 0.36	No	No	S		1.5ft.	1.0ft.	17.3	17.3	0.0	12	14	209	Btuh
7	2 NFRC	0.25, 0.36	No	No	W		1.5ft.	1.0ft.	40.0	1.5	38.5	12	31	1210	Btuh
	Excursion													191	Btuh
	Window Total								244 (sqft)					5173 Btuh	
Walls	Type						U-Value	R-Value	Area(sqft)			HTM		Load	
								Cav/Sheath							
1	Frame - Wood - Ext						0.08	19.0/0.0	318.4			1.7		527 Btuh	
2	Frame - Wood - Ext						0.08	19.0/0.0	105.6			1.7		175 Btuh	
3	Frame - Wood - Ext						0.08	19.0/0.0	23.3			1.7		39 Btuh	
4	Frame - Wood - Ext						0.08	19.0/0.0	29.3			1.7		49 Btuh	
5	Frame - Wood - Ext						0.08	19.0/0.0	23.3			1.7		39 Btuh	
6	Frame - Wood - Ext						0.08	19.0/0.0	248.9			1.7		412 Btuh	
7	Frame - Wood - Ext						0.08	19.0/0.0	335.6			1.7		555 Btuh	
8	Frame - Wood - Ext						0.08	19.0/0.0	372.0			1.7		615 Btuh	
	Wall Total								1457 (sqft)					2409 Btuh	
Doors	Type								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 AtticLight/Shingle/RB						0.025	38.0/0.0	2014.0			0.86		1738 Btuh	
	Ceiling Total								2014 (sqft)					1738 Btuh	
Floors	Type							R-Value	Size			HTM		Load	
1	Slab On Grade							0.0	1918 (ft-perimeter)			0.0		0 Btuh	
	Floor Total								1918.0 (sqft)					0 Btuh	
	Envelope Subtotal:													9596 Btuh	
Infiltration	Type						Average ACH		Volume(cuft)	Wall Ratio		CFM=	Load		
	Natural						0.14		17895	1		42.4	883 Btuh		
Internal gain							Occupants		Btuh/occupant		Appliance	Load			
							5	X	230	+	1200	2350 Btuh			
	Sensible Envelope Load:													12828 Btuh	
Duct load	Average sealed,Supply(R6.0-Attic), Return(R6.0-Attic)										(DGM of 0.386)		4956 Btuh		
	Sensible Load All Zones													17784 Btuh	

Manual J Summer Calculations

Residential Load - Component Details (continued)

Randel & Lilian Dutton

Project Title:
Dutton Res

Climate:FL_GAINESVILLE_REGIONAL_A

Lake City, FL 32025

7/25/2020

WHOLE HOUSE TOTALS

Whole House Totals for Cooling	Sensible Envelope Load All Zones	12828 Btuh
	Sensible Duct Load	4956 Btuh
	Total Sensible Zone Loads	17784 Btuh
	Sensible ventilation	0 Btuh
	Blower	0 Btuh
	Total sensible gain	17784 Btuh
	Latent infiltration gain (for 51 gr. humidity difference)	1465 Btuh
	Latent ventilation gain	0 Btuh
	Latent duct gain	1406 Btuh
	Latent occupant gain (5.0 people @ 200 Btuh per person)	1000 Btuh
	Latent other gain	0 Btuh
	Latent total gain	3871 Btuh
	TOTAL GAIN	21655 Btuh

EQUIPMENT

1. Central Unit	#	21465 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