45924

Residential System Sizing Calculation

Summary

Rik Dietel

, FL

Project Title:
211596 Dietel

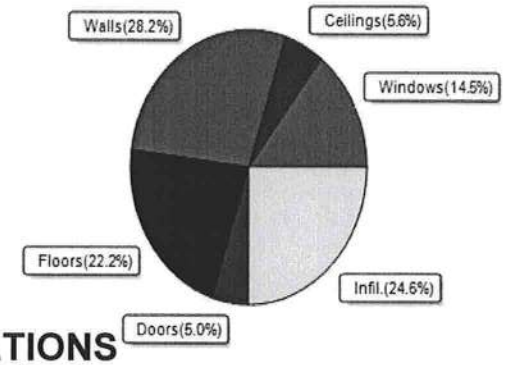
2022-08-17

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	**37900**	**Btuh**	**Total cooling load calculation**	**27938**	**Btuh**
Submitted heating capacity	% of calc	Btuh	Submitted cooling capacity	% of calc	Btuh
Total (Electric Heat Pump)	108.2	41000	Sensible (SHR = 0.75)	142.2	30750
Heat Pump + Auxiliary(0.0kW)	108.2	41000	Latent	162.4	10250
			Total (Electric Heat Pump)	146.8	41000

WINTER CALCULATIONS

Winter Heating Load (for 3520 sqft)

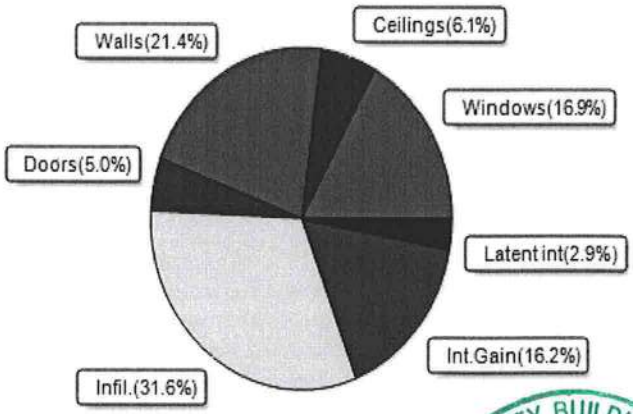
Load component			Load	
Window total	394	sqft	5509	Btuh
Wall total	3086	sqft	10672	Btuh
Door total	117	sqft	1877	Btuh
Ceiling total	1770	sqft	2114	Btuh
Floor total	See detail report		8402	Btuh
Infiltration	213	cfm	9327	Btuh
Duct loss			0	Btuh
Subtotal			**37900**	**Btuh**
Ventilation	0	cfm	0	Btuh
TOTAL HEAT LOSS			**37900**	**Btuh**



SUMMER CALCULATIONS

Summer Cooling Load (for 3520 sqft)

Load component			Load	
Window total	394	sqft	4716	Btuh
Wall total	3086	sqft	5968	Btuh
Door total	117	sqft	1408	Btuh
Ceiling total	1770	sqft	1691	Btuh
Floor total			0	Btuh
Infiltration	160	cfm	3323	Btuh
Internal gain			4520	Btuh
Duct gain			0	Btuh
Sens. Ventilation	0	cfm	0	Btuh
Blower Load			0	Btuh
Total sensible gain			**21625**	**Btuh**
Latent gain(ducts)			0	Btuh
Latent gain(infiltration)			5513	Btuh
Latent gain(ventilation)			0	Btuh
Latent gain(internal/occupants/other)			800	Btuh
Total latent gain			**6313**	**Btuh**
TOTAL HEAT GAIN			**27938**	**Btuh**



Powered by ACCA MANUAL J8 8th Edition

EnergyGauge® System Sizing
PREPARED BY: Evan Beamsley
DATE: 2022-08-17

COLUMBIA COUNTY BUILDING DEPARTMENT
Received for FILE COPY
Code Compliance
PLANS EXAMINER

System Sizing Calculations - Winter

Residential Load - Whole House Component Details

Rik Dietel
, FL

Project Title:
211596 Dietel
Building Type: User

2022-08-17

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	Metal	0.35	N	32.0	14.0	448 Btuh
2	2, NFRC 0.25	Metal	0.35	S	21.3	14.0	299 Btuh
3	2, NFRC 0.25	Metal	0.35	S	48.0	14.0	672 Btuh
4	2, NFRC 0.25	Metal	0.35	W	48.0	14.0	672 Btuh
5	2, NFRC 0.25	Metal	0.35	W	22.5	14.0	315 Btuh
6	2, NFRC 0.25	Metal	0.35	W	30.0	14.0	420 Btuh
7	2, NFRC 0.25	Metal	0.35	N	30.0	14.0	420 Btuh
8	2, NFRC 0.25	Metal	0.35	S	80.0	14.0	1120 Btuh
9	2, NFRC 0.25	Metal	0.35	W	40.0	14.0	560 Btuh
10	2, NFRC 0.25	Metal	0.35	W	26.7	14.0	373 Btuh
11	2, NFRC 0.25	Metal	0.35	W	15.0	14.0	210 Btuh
	Window Total				393.5(sqft)		5509 Btuh

Walls	Type	Ornt.	Ueff.	R-Value (Cav/Sh)	Area X	HTM=	Load
1	Frame - Wood	- Ext	(0.077)	19.0/0.0	349	3.09	1078 Btuh
2	Frame - Wood	- Adj	(0.089)	13.0/0.0	113	3.55	402 Btuh
3	Frame - Wood	- Adj	(0.089)	13.0/0.0	42	3.55	148 Btuh
4	Frame - Wood	- Adj	(0.089)	13.0/0.0	35	3.55	125 Btuh
5	Frame - Wood	- Adj	(0.089)	13.0/0.0	38	3.55	135 Btuh
6	Frame - Wood	- Adj	(0.089)	13.0/0.0	369	3.55	1310 Btuh
7	Frame - Wood	- Ext	(0.077)	19.0/0.0	268	3.09	829 Btuh
8	Frame - Wood	- Ext	(0.089)	13.0/0.0	466	3.55	1655 Btuh
9	Frame - Wood	- Ext	(0.089)	13.0/0.0	250	3.55	888 Btuh
10	Frame - Wood	- Adj	(0.089)	13.0/0.0	513	3.55	1823 Btuh
11	Frame - Wood	- Ext	(0.089)	13.0/0.0	200	3.55	710 Btuh
12	Frame - Wood	- Ext	(0.089)	13.0/0.0	443	3.55	1571 Btuh
	Wall Total				3086(sqft)		10672 Btuh

Doors	Type	Storm	Ueff.	Area X	HTM=	Load
1	Insulated - Exterior,	n	(0.400)	16	16.0	256 Btuh
2	Insulated - Garage,	n	(0.400)	20	16.0	320 Btuh
3	Insulated - Garage,	n	(0.400)	24	16.0	384 Btuh
4	Insulated - Exterior,	n	(0.400)	24	16.0	384 Btuh
5	Insulated - Garage,	n	(0.400)	20	16.0	320 Btuh
6	Insulated - Exterior,	n	(0.400)	13	16.0	213 Btuh
	Door Total			117(sqft)		1877Btuh

Ceilings	Type/Color/Surface	Ueff.	R-Value	Area X	HTM=	Load
1	Unvent Attic/L/Metal	(0.050)	19.0/30.0	20	0.3	5 Btuh
2	Unvent Attic/L/Metal	(0.241)	0.0/30.0	1750	1.2	2109 Btuh
	Ceiling Total			1770(sqft)		2114Btuh

Floors	Type	Ueff.	R-Value	Size X	HTM=	Load
1	Slab On Grade	(1.180)	0.0	178.0 ft(perim.)	47.2	8402 Btuh
2	Interior	(1.180)	0.0	1750.0 sqft	0.0	0 Btuh
	Floor Total			3520 sqft		8402 Btuh

Manual J Winter Calculations

Residential Load - Component Details (continued)

Rik Dietel
, FL

Project Title:
211596 Dietel
Building Type: User

2022-08-17

				Envelope Subtotal:			28574 Btuh
Infiltration	Type Natural	Wholehouse	ACH 0.33	Volume(cuft) 38814	Wall Ratio 1.00	CFM= 213.0	9327 Btuh
Duct load	Average sealed, R6.0, Supply(Con), Return(Con)				(DLM of 0.000)		0 Btuh
All Zones				**Sensible Subtotal All Zones**			**37900 Btuh**

WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss Ventilation Sensible Heat Loss Total Heat Loss	37900 Btuh 0 Btuh 37900 Btuh

EQUIPMENT

1. Electric Heat Pump	#	41000 Btuh

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)

Powered by ACCA MANUAL J8

Version 8

System Sizing Calculations - Summer

Residential Load - Whole House Component Details

Rik Dietel

, FL

Project Title:
211596 Dietel

2022-08-17

Reference City: Gainesville, FL Temperature Difference: 19.0F(TMY3 99%) Humidity difference: 51gr.

Component Loads for Whole House

Window	Type* Panes	SHGC	U	InSh	IS	Ornt	Overhang Len	Hgt	Window Area(sqft) Gross	Shaded	Unshaded	HTM Shaded	Unshaded	Load
1	2 NFRC	0.25, 0.35	No	No	N	8.0ft	11.3f	32.0	32.0	0.0	12	14	381	Btuh
2	2 NFRC	0.25, 0.35	No	No	S	12.0f	2.0ft	21.3	0.0	21.3	12	12	254	Btuh
3	2 NFRC	0.25, 0.35	No	No	S	12.0f	2.0ft	48.0	0.0	48.0	12	12	572	Btuh
4	2 NFRC	0.25, 0.35	No	No	W	12.0f	2.0ft	48.0	48.0	0.0	12	31	572	Btuh
5	2 NFRC	0.25, 0.35	No	No	W	12.0f	2.0ft	22.5	22.5	0.0	12	31	268	Btuh
6	2 NFRC	0.25, 0.35	No	No	W	12.0f	2.0ft	30.0	30.0	0.0	12	31	357	Btuh
7	2 NFRC	0.25, 0.35	No	No	N	0.7ft	1.3ft	30.0	14.7	15.3	12	14	387	Btuh
8	2 NFRC	0.25, 0.35	No	No	S	13.5f	0.5ft	80.0	0.0	80.0	12	12	953	Btuh
9	2 NFRC	0.25, 0.35	No	No	W	13.5f	0.5ft	40.0	40.0	0.0	12	31	476	Btuh
10	2 NFRC	0.25, 0.35	No	No	W	13.5f	0.5ft	26.7	26.7	0.0	12	31	318	Btuh
11	2 NFRC	0.25, 0.35	No	No	W	13.5f	0.5ft	15.0	15.0	0.0	12	31	179	Btuh
	Window Total								394 (sqft)					4716 Btuh

Walls	Type	U-Value	R-Value Cav/Sheath	Area(sqft)	HTM	Load
1	Frame - Wood - Ext	0.08	19.0/0.0	348.7	1.7	577 Btuh
2	Frame - Wood - Adj	0.09	13.0/0.0	113.3	1.7	191 Btuh
3	Frame - Wood - Adj	0.09	13.0/0.0	41.6	1.7	70 Btuh
4	Frame - Wood - Adj	0.09	13.0/0.0	35.1	1.7	59 Btuh
5	Frame - Wood - Adj	0.09	13.0/0.0	37.9	1.7	64 Btuh
6	Frame - Wood - Adj	0.09	13.0/0.0	368.9	1.7	622 Btuh
7	Frame - Wood - Ext	0.08	19.0/0.0	268.3	1.7	444 Btuh
8	Frame - Wood - Ext	0.09	13.0/0.0	466.2	2.3	1055 Btuh
9	Frame - Wood - Ext	0.09	13.0/0.0	250.0	2.3	566 Btuh
10	Frame - Wood - Adj	0.09	13.0/0.0	513.3	1.7	866 Btuh
11	Frame - Wood - Ext	0.09	13.0/0.0	200.0	2.3	453 Btuh
12	Frame - Wood - Ext	0.09	13.0/0.0	442.5	2.3	1002 Btuh
	Wall Total			3086 (sqft)		5968 Btuh

Doors	Type	Area (sqft)	HTM	Load
1	Insulated - Exterior	16.0	12.0	192 Btuh
2	Insulated - Garage	20.0	12.0	240 Btuh
3	Insulated - Garage	24.0	12.0	288 Btuh
4	Insulated - Exterior	24.0	12.0	288 Btuh
5	Insulated - Garage	20.0	12.0	240 Btuh
6	Insulated - Exterior	13.3	12.0	160 Btuh
	Door Total	117 (sqft)		1408 Btuh

Ceilings	Type/Color/Surface	U-Value	R-Value	Area(sqft)	HTM	Load
1	Unvented Attic/Light/Metal	0.050	19.0/30.0	20.0	0.20	4 Btuh
2	Unvented Attic/Light/Metal	0.241	0.0/30.0	1750.0	0.96	1687 Btuh
	Ceiling Total			1770 (sqft)		1691 Btuh

Floors	Type	R-Value	Size	HTM	Load
1	Slab On Grade	0.0	1770 (ft-perimeter)	0.0	0 Btuh
2	Interior	0.0	1750 (sqft)	0.0	0 Btuh
	Floor Total		3520.0 (sqft)		0 Btuh

	Envelope Subtotal:	13782 Btuh

Manual J Summer Calculations

Residential Load - Component Details (continued)

Rik Dietel
, FL

Project Title: 211596 Dietel
Climate:FL_GAINESVILLE_REGIONAL_A

2022-08-17

Infiltration	Type Natural	Average ACH 0.25	Volume(cuft) 38814	Wall Ratio 1		CFM= 159.7	Load 3323	Btuh
Internal gain		Occupants 4	Btuh/occupant X 230		+	Appliance 3600	Load 4520	Btuh
					Sensible Envelope Load:		21625	Btuh
Duct load	Average sealed, Supply(R6.0-Condi), Return(R6.0-Condi)				(DGM of 0.000)		0	Btuh
					Sensible Load All Zones		**21625**	**Btuh**

Manual J Summer Calculations

Residential Load - Component Details (continued)

Rik Dietel
, FL

Project Title: 211596 Dietel
Climate:FL_GAINESVILLE_REGIONAL_A

2022-08-17

WHOLE HOUSE TOTALS

Whole House Totals for Cooling	**Sensible Envelope Load All Zones**	**21625 Btuh**
	Sensible Duct Load	0 Btuh
	Total Sensible Zone Loads	**21625 Btuh**
	Sensible ventilation	0 Btuh
	Blower	0 Btuh
	Total sensible gain	**21625 Btuh**
	Latent infiltration gain (for 51 gr. humidity difference)	5513 Btuh
	Latent ventilation gain	0 Btuh
	Latent duct gain	0 Btuh
	Latent occupant gain (4.0 people @ 200 Btuh per person)	800 Btuh
	Latent other gain	0 Btuh
	Latent total gain	**6313 Btuh**
	TOTAL GAIN	**27938 Btuh**

EQUIPMENT

1. Central Unit	#	41000 Btuh

*Key: Window types (Panes - 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)

Powered by ACCA MANUAL J8

Version 8