Residential System Sizing Calculation

Summary

Spec House

Project Title:
210183 Spec - Lot 32 Fort White Park

Fort White, FL

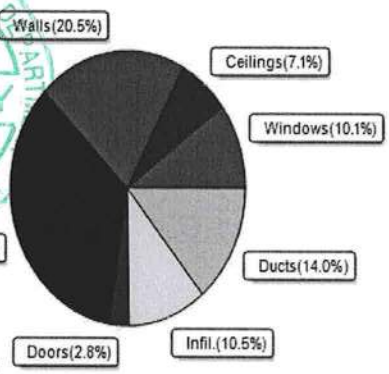
2021-02-15

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	**23593**	**Btuh**	**Total cooling load calculation**	**20255**	**Btuh**
Submitted heating capacity	% of calc	Btuh	Submitted cooling capacity	% of calc	Btuh
Total (Electric Heat Pump)	106.0	25000	Sensible (SHR = 0.75)	111.2	18750
Heat Pump + Auxiliary(0.0kW)	106.0	25000	Latent	184.3	6250
			Total (Electric Heat Pump)	123.4	25000

WINTER CALCULATIONS

Winter Heating Load (for 1526 sqft)

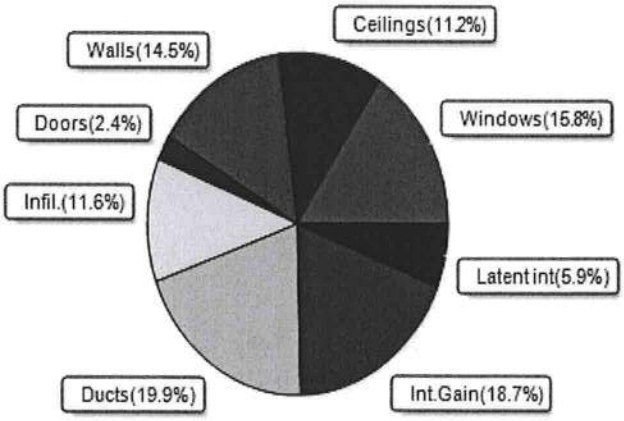
Load component			Load	
Window total	171	sqft	2389	Btuh
Wall total	1360	sqft	4829	Btuh
Door total	41	sqft	658	Btuh
Ceiling total	1650	sqft	1675	Btuh
Floor total	1526	sqft	8260	Btuh
Infiltration	57	cfm	2487	Btuh
Duct loss			3294	Btuh
Subtotal			**23593**	**Btuh**
Ventilation	0	cfm	0	Btuh
TOTAL HEAT LOSS			**23593**	**Btuh**



SUMMER CALCULATIONS

Summer Cooling Load (for 1526 sqft)

Load component			Load	
Window total	171	sqft	3207	Btuh
Wall total	1360	sqft	2931	Btuh
Door total	41	sqft	493	Btuh
Ceiling total	1650	sqft	2261	Btuh
Floor total			0	Btuh
Infiltration	43	cfm	886	Btuh
Internal gain			3780	Btuh
Duct gain			3306	Btuh
Sens. Ventilation	0	cfm	0	Btuh
Blower Load			0	Btuh
Total sensible gain			**16865**	**Btuh**
Latent gain(ducts)			721	Btuh
Latent gain(infiltration)			1470	Btuh
Latent gain(ventilation)			0	Btuh
Latent gain(internal/occupants/other)			1200	Btuh
Total latent gain			**3391**	**Btuh**
TOTAL HEAT GAIN			**20255**	**Btuh**



Powered by ACCA MANUAL J8 8th Edition

EnergyGauge® System Sizing
PREPARED BY: Evan Beamsley
DATE: 2021-02-15

System Sizing Calculations - Winter

Residential Load - Whole House Component Details

Spec House

Fort White, FL

Project Title:
210183 Spec - Lot 32 Fort White Park
Building Type: User

2021-02-15

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	9.0	14.0	126 Btuh
2	2, NFRC 0.25	Metal	0.35	N	20.0	14.0	280 Btuh
3	2, NFRC 0.25	Metal	0.35	N	30.0	14.0	420 Btuh
4	2, NFRC 0.25	Metal	0.35	E	30.0	14.0	420 Btuh
5	2, NFRC 0.25	Metal	0.35	S	6.7	14.0	93 Btuh
6	2, NFRC 0.25	Metal	0.35	S	45.0	14.0	630 Btuh
7	2, NFRC 0.25	Metal	0.35	W	30.0	14.0	420 Btuh
	Window Total				170.7(sqft)		2389 Btuh

Walls	Type	Ornt.	Ueff.	R-Value (Cav/Sh)	Area X	HTM=	Load
1	Frame - Wood	- Ext	(0.089)	13.0/0.0	138	3.55	489 Btuh
2	Frame - Wood	- Ext	(0.089)	13.0/0.0	102	3.55	362 Btuh
3	Frame - Wood	- Ext	(0.089)	13.0/0.0	186	3.55	660 Btuh
4	Frame - Wood	- Ext	(0.089)	13.0/0.0	303	3.55	1076 Btuh
5	Frame - Wood	- Adj	(0.089)	13.0/0.0	198	3.55	704 Btuh
6	Frame - Wood	- Adj	(0.089)	13.0/0.0	57	3.55	202 Btuh
7	Frame - Wood	- Ext	(0.089)	13.0/0.0	118	3.55	420 Btuh
8	Frame - Wood	- Ext	(0.089)	13.0/0.0	258	3.55	916 Btuh
	Wall Total				1360(sqft)		4829 Btuh

Doors	Type	Storm	Ueff.	Area X	HTM=	Load
1	Insulated - Exterior,	n	(0.400)	13	16.0	213 Btuh
2	Insulated - Garage,	n	(0.400)	18	16.0	284 Btuh
3	Insulated - Exterior,	n	(0.400)	10	16.0	160 Btuh
	Door Total			41(sqft)		658Btuh

Ceilings	Type/Color/Surface	Ueff.	R-Value	Area X	HTM=	Load
1	Vented Attic/D/Shing	(0.025)	38.0/0.0	1650	1.0	1675 Btuh
	Ceiling Total			1650(sqft)		1675Btuh

Floors	Type	Ueff.	R-Value	Size X	HTM=	Load
1	Slab On Grade	(1.180)	0.0	175.0 ft(perim.)	47.2	8260 Btuh
	Floor Total			1526 sqft		8260 Btuh

	Envelope Subtotal:	17811 Btuh

Infiltration	Type	Wholehouse ACH	Volume(cuft)	Wall Ratio	CFM=	
	Natural	0.24	14497	1.00	56.8	2487 Btuh

Duct load	Average sealed, R6.0, Supply(Att), Return(Con) (DLM of 0.162)	3294 Btuh
All Zones	**Sensible Subtotal All Zones**	**23593 Btuh**

Manual J Winter Calculations

Residential Load - Component Details (continued)

Spec House

Fort White, FL

Project Title:
210183 Spec - Lot 32 Fort White Park
Building Type: User

2021-02-15

WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss Ventilation Sensible Heat Loss Total Heat Loss	23593 Btuh 0 Btuh 23593 Btuh

EQUIPMENT

1. Electric Heat Pump	#	25000 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)

Version 8

System Sizing Calculations - Summer

Residential Load - Whole House Component Details

Spec House

Project Title:
210183 Spec - Lot 32 Fort White Park

Fort White, FL

2021-02-15

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		12.8f	1.5ft	9.0	9.0	0.0	12	31	107 Btuh
2	2 NFRC	0.25, 0.35	No	No	N		12.8f	1.5ft	20.0	20.0	0.0	12	31	238 Btuh
3	2 NFRC	0.25, 0.35	No	No	N		1.5ft	1.5ft	30.0	0.0	30.0	12	31	923 Btuh
4	2 NFRC	0.25, 0.35	No	No	E		1.5ft	1.5ft	30.0	0.0	30.0	12	12	357 Btuh
5	2 NFRC	0.25, 0.35	No	No	S		9.5ft	1.5ft	6.7	6.4	0.3	12	31	85 Btuh
6	2 NFRC	0.25, 0.35	No	No	S		9.5ft	1.5ft	45.0	45.0	0.0	12	31	536 Btuh
7	2 NFRC	0.25, 0.35	No	No	W		1.5ft	1.5ft	30.0	30.0	0.0	12	14	357 Btuh
	Excursion													604 Btuh
	Window Total								171 (sqft)					3207 Btuh

Walls	Type	U-Value	R-Value Cav/Sheath	Area(sqft)	HTM	Load
1	Frame - Wood - Ext	0.09	13.0/0.0	137.7	2.3	312 Btuh
2	Frame - Wood - Ext	0.09	13.0/0.0	102.0	2.3	231 Btuh
3	Frame - Wood - Ext	0.09	13.0/0.0	186.0	2.3	421 Btuh
4	Frame - Wood - Ext	0.09	13.0/0.0	303.0	2.3	686 Btuh
5	Frame - Wood - Adj	0.09	13.0/0.0	198.2	1.7	334 Btuh
6	Frame - Wood - Adj	0.09	13.0/0.0	57.0	1.7	96 Btuh
7	Frame - Wood - Ext	0.09	13.0/0.0	118.3	2.3	268 Btuh
8	Frame - Wood - Ext	0.09	13.0/0.0	258.0	2.3	584 Btuh
	Wall Total			1360 (sqft)		2931 Btuh

Doors	Type	Area (sqft)	HTM	Load
1	Insulated - Exterior	13.3	12.0	160 Btuh
2	Insulated - Garage	17.8	12.0	213 Btuh
3	Insulated - Exterior	10.0	12.0	120 Btuh
	Door Total	41 (sqft)		493 Btuh

Ceilings	Type/Color/Surface	U-Value	R-Value	Area(sqft)	HTM	Load
1	Vented Attic/DarkShingle	0.025	38.0/0.0	1650.0	1.37	2261 Btuh
	Ceiling Total			1650 (sqft)		2261 Btuh

Floors	Type	R-Value	Size	HTM	Load
1	Slab On Grade	0.0	1526 (ft-perimeter)	0.0	0 Btuh
	Floor Total		1526.0 (sqft)		0 Btuh

	Envelope Subtotal:	8893 Btuh

Infiltration	Type	Average ACH	Volume(cuft)	Wall Ratio	CFM=	Load
	Natural	0.18	14497	1	42.6	886 Btuh
Internal gain		Occupants	Btuh/occupant		Appliance	Load
		6	X 230	+	2400	3780 Btuh
				Sensible Envelope Load:		13559 Btuh
Duct load	Average sealed, Supply(R6.0-Attic), Return(R6.0-Condi)			(DGM of 0.244)		3306 Btuh
				Sensible Load All Zones		**16865 Btuh**

Manual J Summer Calculations

Residential Load - Component Details (continued)

Spec House

Project Title: 210183 Spec - Lot 32 Fort White Park

Climate:FL_GAINESVILLE_REGIONAL_A

Fort White, FL

2021-02-15

WHOLE HOUSE TOTALS

Whole House Totals for Cooling	**Sensible Envelope Load All Zones**	**13559 Btuh**
	Sensible Duct Load	3306 Btuh
	Total Sensible Zone Loads	**16865 Btuh**
	Sensible ventilation	0 Btuh
	Blower	0 Btuh
	Total sensible gain	**16865 Btuh**
	Latent infiltration gain (for 51 gr. humidity difference)	1470 Btuh
	Latent ventilation gain	0 Btuh
	Latent duct gain	721 Btuh
	Latent occupant gain (6.0 people @ 200 Btuh per person)	1200 Btuh
	Latent other gain	0 Btuh
	Latent total gain	**3391 Btuh**
	TOTAL GAIN	**20255 Btuh**

EQUIPMENT

1. Central Unit	#	25000 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