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# Residential System Sizing Calculation

## Summary

Project Title:  
Lot 9 Kimberly Oaks

Lake City, FL



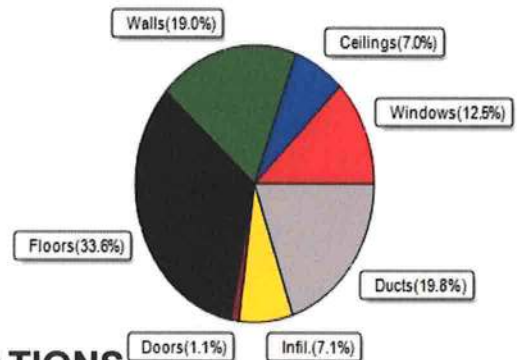
3/23/2022

|                                                                                                       |              |             |                                       |              |             |
|-------------------------------------------------------------------------------------------------------|--------------|-------------|---------------------------------------|--------------|-------------|
| 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           |
| <b>Total heating load calculation</b>                                                                 | <b>32107</b> | <b>Btuh</b> | <b>Total cooling load calculation</b> | <b>25580</b> | <b>Btuh</b> |
| Submitted heating capacity                                                                            | % of calc    | Btuh        | Submitted cooling capacity            | % of calc    | Btuh        |
| Total (Electric Heat Pump)                                                                            | 99.8         | 32057       | Sensible (SHR = 0.70)                 | 80.7         | 17009       |
| Heat Pump + Auxiliary(0.0kW)                                                                          | 99.8         | 32057       | Latent                                | 161.8        | 7290        |
|                                                                                                       |              |             | Total (Electric Heat Pump)            | 95.0         | 24299       |

## WINTER CALCULATIONS

Winter Heating Load (for 2105 sqft)

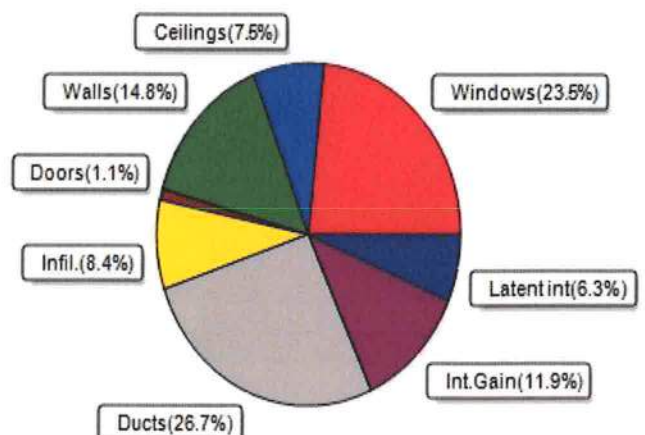
| Load component         |           | Load              |
|------------------------|-----------|-------------------|
| Window total           | 278 sqft  | 4003 Btuh         |
| Wall total             | 1717 sqft | 6097 Btuh         |
| Door total             | 20 sqft   | 368 Btuh          |
| Ceiling total          | 2210 sqft | 2244 Btuh         |
| Floor total            | 2105 sqft | 10777 Btuh        |
| Infiltration           | 52 cfm    | 2272 Btuh         |
| Duct loss              |           | 6347 Btuh         |
| <b>Subtotal</b>        |           | <b>32107 Btuh</b> |
| Ventilation            | 0 cfm     | 0 Btuh            |
| <b>TOTAL HEAT LOSS</b> |           | <b>32107 Btuh</b> |



## SUMMER CALCULATIONS

Summer Cooling Load (for 2105 sqft)

| Load component                        |           | Load              |
|---------------------------------------|-----------|-------------------|
| Window total                          | 278 sqft  | 6001 Btuh         |
| Wall total                            | 1717 sqft | 3784 Btuh         |
| Door total                            | 20 sqft   | 276 Btuh          |
| Ceiling total                         | 2210 sqft | 1907 Btuh         |
| Floor total                           |           | 0 Btuh            |
| Infiltration                          | 39 cfm    | 809 Btuh          |
| Internal gain                         |           | 3040 Btuh         |
| Duct gain                             |           | 5258 Btuh         |
| Sens. Ventilation                     | 0 cfm     | 0 Btuh            |
| Blower Load                           |           | 0 Btuh            |
| <b>Total sensible gain</b>            |           | <b>21075 Btuh</b> |
| Latent gain(ducts)                    |           | 1562 Btuh         |
| Latent gain(infiltration)             |           | 1343 Btuh         |
| Latent gain(ventilation)              |           | 0 Btuh            |
| Latent gain(internal/occupants/other) |           | 1600 Btuh         |
| <b>Total latent gain</b>              |           | <b>4505 Btuh</b>  |
| <b>TOTAL HEAT GAIN</b>                |           | <b>25580 Btuh</b> |



8th Edition

EnergyGauge® System Sizing

PREPARED BY: *Will C. Smith*

DATE: 3 / 23 / 2022

# System Sizing Calculations - Winter

## Residential Load - Whole House Component Details

Lake City, FL

Project Title:  
Lot 9 Kimberly Oaks  
Building Type: User

3/23/2022

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    | E                   | 16.0             |   | 14.4 | 230 Btuh   |
| 2                               | 2, NFRC 0.25          | TIM        | 0.36    | E                   | 15.0             |   | 14.4 | 216 Btuh   |
| 3                               | 2, NFRC 0.25          | Vinyl      | 0.36    | E                   | 36.0             |   | 14.4 | 518 Btuh   |
| 4                               | 2, NFRC 0.25          | Vinyl      | 0.36    | S                   | 15.0             |   | 14.4 | 216 Btuh   |
| 5                               | 2, NFRC 0.25          | Vinyl      | 0.36    | S                   | 15.0             |   | 14.4 | 216 Btuh   |
| 6                               | 2, NFRC 0.25          | Vinyl      | 0.36    | W                   | 45.0             |   | 14.4 | 648 Btuh   |
| 7                               | 2, NFRC 0.25          | TIM        | 0.36    | N                   | 20.0             |   | 14.4 | 288 Btuh   |
| 8                               | 2, NFRC 0.25          | Vinyl      | 0.36    | W                   | 60.0             |   | 14.4 | 864 Btuh   |
| 9                               | 2, NFRC 0.25          | Vinyl      | 0.36    | W                   | 30.0             |   | 14.4 | 432 Btuh   |
| 10                              | 2, NFRC 0.25          | Vinyl      | 0.36    | N                   | 20.0             |   | 14.4 | 288 Btuh   |
| 11                              | 2, NFRC 0.25          | Vinyl      | 0.36    | N                   | 6.0              |   | 14.4 | 86 Btuh    |
|                                 | Window Total          |            |         |                     | 278.0(sqft)      |   |      | 4003 Btuh  |
| Walls                           | Type                  | Ornt.      | Ueff.   | R-Value<br>(Cav/Sh) | Area             | X | HTM= | Load       |
| 1                               | Frame - Wood          | - Ext      | (0.089) | 13.0/0.0            | 89               |   | 3.55 | 316 Btuh   |
| 2                               | Frame - Wood          | - Ext      | (0.089) | 13.0/0.0            | 75               |   | 3.55 | 266 Btuh   |
| 3                               | Frame - Wood          | - Ext      | (0.089) | 13.0/0.0            | 101              |   | 3.55 | 357 Btuh   |
| 4                               | Frame - Wood          | - Adj      | (0.089) | 13.0/0.0            | 178              |   | 3.55 | 632 Btuh   |
| 5                               | Frame - Wood          | - Ext      | (0.089) | 13.0/0.0            | 333              |   | 3.55 | 1182 Btuh  |
| 6                               | Frame - Wood          | - Ext      | (0.089) | 13.0/0.0            | 114              |   | 3.55 | 405 Btuh   |
| 7                               | Frame - Wood          | - Ext      | (0.089) | 13.0/0.0            | 69               |   | 3.55 | 245 Btuh   |
| 8                               | Frame - Wood          | - Ext      | (0.089) | 13.0/0.0            | 90               |   | 3.55 | 320 Btuh   |
| 9                               | Frame - Wood          | - Ext      | (0.089) | 13.0/0.0            | 70               |   | 3.55 | 249 Btuh   |
| 10                              | Frame - Wood          | - Ext      | (0.089) | 13.0/0.0            | 95               |   | 3.55 | 337 Btuh   |
| 11                              | Frame - Wood          | - Ext      | (0.089) | 13.0/0.0            | 81               |   | 3.55 | 288 Btuh   |
| 12                              | Frame - Wood          | - Ext      | (0.089) | 13.0/0.0            | 102              |   | 3.55 | 362 Btuh   |
| 13                              | Frame - Wood          | - Ext      | (0.089) | 13.0/0.0            | 321              |   | 3.55 | 1138 Btuh  |
|                                 | Wall Total            |            |         |                     | 1717(sqft)       |   |      | 6097 Btuh  |
| Doors                           | Type                  | Storm      | Ueff.   |                     | Area             | X | HTM= | Load       |
| 1                               | Insulated - Garage, 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            | 2210             |   | 1.0  | 2244 Btuh  |
|                                 | Ceiling Total         |            |         |                     | 2210(sqft)       |   |      | 2244Btuh   |
| Floors                          | Type                  |            | Ueff.   | R-Value             | Size             | X | HTM= | Load       |
| 1                               | Slab On Grade         |            | (1.180) | 0.0                 | 228.3 ft(perim.) |   | 47.2 | 10777 Btuh |
|                                 | Floor Total           |            |         |                     | 2105 sqft        |   |      | 10777 Btuh |
|                                 | Envelope Subtotal:    |            |         |                     |                  |   |      | 23489 Btuh |
| Infiltration                    | Type                  | Wholehouse | ACH     | Volume(cuft)        | Wall Ratio       |   | CFM= |            |
|                                 | Natural               |            | 0.16    | 18945               | 1.00             |   | 51.9 | 2272 Btuh  |

# Manual J Winter Calculations

## Residential Load - Component Details (continued)

Lake City, FL

Project Title:  
Lot 9 Kimberly Oaks  
Building Type: User

3/23/2022

|                  |                                                               |                   |
|------------------|---------------------------------------------------------------|-------------------|
| <b>Duct load</b> | Average sealed, R6.0, Supply(Att), Return(Att) (DLM of 0.246) | 6347 Btuh         |
| <b>All Zones</b> | <b>Sensible Subtotal All Zones</b>                            | <b>32107 Btuh</b> |

### WHOLE HOUSE TOTALS

|                           |                                                                                  |                                    |
|---------------------------|----------------------------------------------------------------------------------|------------------------------------|
| <b>Totals for Heating</b> | Subtotal Sensible Heat Loss<br>Ventilation Sensible Heat Loss<br>Total Heat Loss | 32107 Btuh<br>0 Btuh<br>32107 Btuh |
|---------------------------|----------------------------------------------------------------------------------|------------------------------------|

### EQUIPMENT

|                       |   |            |
|-----------------------|---|------------|
| 1. Electric Heat Pump | # | 32057 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

Project Title:  
Lot 9 Kimberly Oaks

Lake City, FL

3/23/2022

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    |           |
| 1        | 2 NFRC                       | 0.25, 0.36  | No        | No      | E                   | 1.5ft.     | 1.0ft.        | 16.0              | 1.0    | 15.0   | 12         | 31        | 477 Btuh  |
| 2        | 2 NFRC                       | 0.25, 0.36  | No        | No      | E                   | 4.0ft.     | 1.0ft.        | 15.0              | 7.0    | 8.0    | 12         | 31        | 333 Btuh  |
| 3        | 2 NFRC                       | 0.25, 0.36  | No        | No      | E                   | 1.5ft.     | 1.0ft.        | 36.0              | 1.5    | 34.5   | 12         | 31        | 1086 Btuh |
| 4        | 2 NFRC                       | 0.25, 0.36  | No        | No      | S                   | 1.5ft.     | 1.0ft.        | 15.0              | 15.0   | 0.0    | 12         | 14        | 181 Btuh  |
| 5        | 2 NFRC                       | 0.25, 0.36  | No        | No      | S                   | 1.5ft.     | 1.0ft.        | 15.0              | 15.0   | 0.0    | 12         | 14        | 181 Btuh  |
| 6        | 2 NFRC                       | 0.25, 0.36  | No        | No      | W                   | 1.5ft.     | 1.0ft.        | 45.0              | 1.8    | 43.2   | 12         | 31        | 1358 Btuh |
| 7        | 2 NFRC                       | 0.25, 0.36  | No        | No      | N                   | 6.0ft.     | 1.0ft.        | 20.0              | 0.0    | 20.0   | 12         | 12        | 242 Btuh  |
| 8        | 2 NFRC                       | 0.25, 0.36  | No        | No      | W                   | 10.5f      | 1.0ft.        | 60.0              | 60.0   | 0.0    | 12         | 31        | 726 Btuh  |
| 9        | 2 NFRC                       | 0.25, 0.36  | No        | No      | W                   | 1.5ft.     | 1.0ft.        | 30.0              | 1.5    | 28.5   | 12         | 31        | 901 Btuh  |
| 10       | 2 NFRC                       | 0.25, 0.36  | No        | No      | N                   | 1.5ft.     | 1.0ft.        | 20.0              | 0.0    | 20.0   | 12         | 12        | 242 Btuh  |
| 11       | 2 NFRC                       | 0.25, 0.36  | No        | No      | N                   | 1.5ft.     | 1.0ft.        | 6.0               | 0.0    | 6.0    | 12         | 12        | 73 Btuh   |
|          | Excursion                    |             |           |         |                     |            |               |                   |        |        |            |           | 201 Btuh  |
|          | Window Total                 |             |           |         |                     |            |               | 278 (sqft)        |        |        |            |           | 6001 Btuh |
| Walls    | Type                         | U-Value     |           | R-Value |                     | Area(sqft) |               | HTM               |        | Load   |            |           |           |
|          |                              |             |           |         |                     |            |               |                   |        |        |            |           |           |
| 1        | Frame - Wood - Ext           |             | 0.09      |         | 13.0/0.0            |            | 89.0          |                   | 2.3    |        | 201 Btuh   |           |           |
| 2        | Frame - Wood - Ext           |             | 0.09      |         | 13.0/0.0            |            | 75.0          |                   | 2.3    |        | 170 Btuh   |           |           |
| 3        | Frame - Wood - Ext           |             | 0.09      |         | 13.0/0.0            |            | 100.7         |                   | 2.3    |        | 228 Btuh   |           |           |
| 4        | Frame - Wood - Adj           |             | 0.09      |         | 13.0/0.0            |            | 178.0         |                   | 1.7    |        | 300 Btuh   |           |           |
| 5        | Frame - Wood - Ext           |             | 0.09      |         | 13.0/0.0            |            | 333.0         |                   | 2.3    |        | 754 Btuh   |           |           |
| 6        | Frame - Wood - Ext           |             | 0.09      |         | 13.0/0.0            |            | 114.0         |                   | 2.3    |        | 258 Btuh   |           |           |
| 7        | Frame - Wood - Ext           |             | 0.09      |         | 13.0/0.0            |            | 69.0          |                   | 2.3    |        | 156 Btuh   |           |           |
| 8        | Frame - Wood - Ext           |             | 0.09      |         | 13.0/0.0            |            | 90.0          |                   | 2.3    |        | 204 Btuh   |           |           |
| 9        | Frame - Wood - Ext           |             | 0.09      |         | 13.0/0.0            |            | 70.0          |                   | 2.3    |        | 158 Btuh   |           |           |
| 10       | Frame - Wood - Ext           |             | 0.09      |         | 13.0/0.0            |            | 95.0          |                   | 2.3    |        | 215 Btuh   |           |           |
| 11       | Frame - Wood - Ext           |             | 0.09      |         | 13.0/0.0            |            | 81.0          |                   | 2.3    |        | 183 Btuh   |           |           |
| 12       | Frame - Wood - Ext           |             | 0.09      |         | 13.0/0.0            |            | 102.0         |                   | 2.3    |        | 231 Btuh   |           |           |
| 13       | Frame - Wood - Ext           |             | 0.09      |         | 13.0/0.0            |            | 320.5         |                   | 2.3    |        | 725 Btuh   |           |           |
|          | Wall Total                   |             |           |         |                     |            |               | 1717 (sqft)       |        |        |            | 3784 Btuh |           |
| Doors    | Type                         | Area (sqft) |           | HTM     |                     | Load       |               |                   |        |        |            |           |           |
|          |                              |             |           |         |                     |            |               |                   |        |        |            |           |           |
| 1        | Insulated - Garage           |             | 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            |            | 2210.0        |                   | 0.86   |        | 1907 Btuh  |           |           |
|          | Ceiling Total                |             |           |         |                     |            | 2210 (sqft)   |                   |        |        | 1907 Btuh  |           |           |
| Floors   | Type                         | R-Value     |           | Size    |                     | HTM        |               | Load              |        |        |            |           |           |
|          |                              |             |           |         |                     |            |               |                   |        |        |            |           |           |
| 1        | Slab On Grade                |             | 0.0       |         | 2105 (ft-perimeter) |            | 0.0           |                   | 0 Btuh |        |            |           |           |
|          | Floor Total                  |             |           |         |                     |            | 2105.0 (sqft) |                   |        | 0 Btuh |            |           |           |
|          | Envelope Subtotal:           |             |           |         |                     |            |               |                   |        |        | 11968 Btuh |           |           |

# Manual J Summer Calculations

## Residential Load - Component Details (continued)

Project Title: Climate:FL\_GAINESVILLE\_REGIONAL\_A  
 Lot 9 Kimberly Oaks

Lake City, FL

3/23/2022

|                      |                                                       |                     |                        |                 |                                |                   |
|----------------------|-------------------------------------------------------|---------------------|------------------------|-----------------|--------------------------------|-------------------|
| <b>Infiltration</b>  | Type<br>Natural                                       | Average ACH<br>0.12 | Volume(cuft)<br>18945  | Wall Ratio<br>1 | CFM=<br>38.9                   | Load<br>809 Btuh  |
| <b>Internal gain</b> |                                                       | Occupants<br>8      | Btuh/occupant<br>X 230 | Appliance<br>+  | 1200                           | Load<br>3040 Btuh |
|                      |                                                       |                     |                        |                 | Sensible Envelope Load:        | 15817 Btuh        |
| <b>Duct load</b>     | Average sealed,Supply(R6.0-Attic), Return(R6.0-Attic) |                     |                        |                 | (DGM of 0.332)                 | 5258 Btuh         |
|                      |                                                       |                     |                        |                 | <b>Sensible Load All Zones</b> | <b>21075 Btuh</b> |

# Manual J Summer Calculations

## Residential Load - Component Details (continued)

Project Title: Climate:FL\_GAINESVILLE\_REGIONAL\_A  
Lot 9 Kimberly Oaks

Lake City, FL

3/23/2022

### WHOLE HOUSE TOTALS

|                                           |                                                           |                   |
|-------------------------------------------|-----------------------------------------------------------|-------------------|
| <b>Whole House<br/>Totals for Cooling</b> | <b>Sensible Envelope Load All Zones</b>                   | <b>15817 Btuh</b> |
|                                           | Sensible Duct Load                                        | 5258 Btuh         |
|                                           | <b>Total Sensible Zone Loads</b>                          | <b>21075 Btuh</b> |
|                                           | Sensible ventilation                                      | 0 Btuh            |
|                                           | Blower                                                    | 0 Btuh            |
|                                           | <b>Total sensible gain</b>                                | <b>21075 Btuh</b> |
|                                           | Latent infiltration gain (for 51 gr. humidity difference) | 1343 Btuh         |
|                                           | Latent ventilation gain                                   | 0 Btuh            |
|                                           | Latent duct gain                                          | 1562 Btuh         |
|                                           | Latent occupant gain (8.0 people @ 200 Btuh per person)   | 1600 Btuh         |
|                                           | Latent other gain                                         | 0 Btuh            |
|                                           | <b>Latent total gain</b>                                  | <b>4505 Btuh</b>  |
|                                           | <b>TOTAL GAIN</b>                                         | <b>25580 Btuh</b> |

### EQUIPMENT

|                 |   |            |
|-----------------|---|------------|
| 1. Central Unit | # | 24299 Btuh |
|-----------------|---|------------|

\*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