

# Residential System Sizing Calculation

## Summary

Michael Woods  
422 Steedley Drive  
Lake City, FL

Project Title:  
Woods - Addition

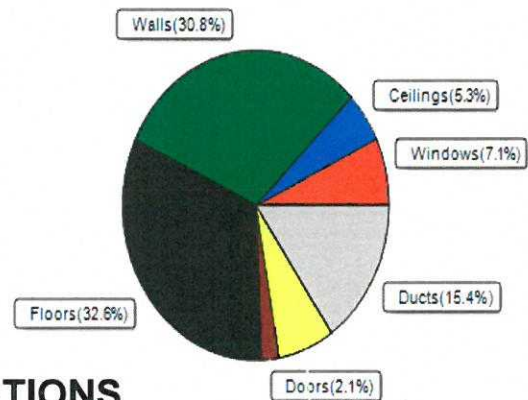
4/21/2020

|                                                                                                       |              |             |                                       |              |             |
|-------------------------------------------------------------------------------------------------------|--------------|-------------|---------------------------------------|--------------|-------------|
| 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           |
| <b>Total heating load calculation</b>                                                                 | <b>17355</b> | <b>Btuh</b> | <b>Total cooling load calculation</b> | <b>10691</b> | <b>Btuh</b> |
| Submitted heating capacity                                                                            | % of calc    | Btuh        | Submitted cooling capacity            | % of calc    | Btuh        |
| Total (Electric Heat Pump)                                                                            | 100.3        | 17400       | Sensible (SHR = 0.70)                 | 87.0         | 7451        |
| Heat Pump + Auxiliary(0.0kW)                                                                          | 100.3        | 17400       | Latent                                | 150.5        | 3193        |
|                                                                                                       |              |             | Total (Electric Heat Pump)            | 99.6         | 10644       |

## WINTER CALCULATIONS

Winter Heating Load (for 900 sqft)

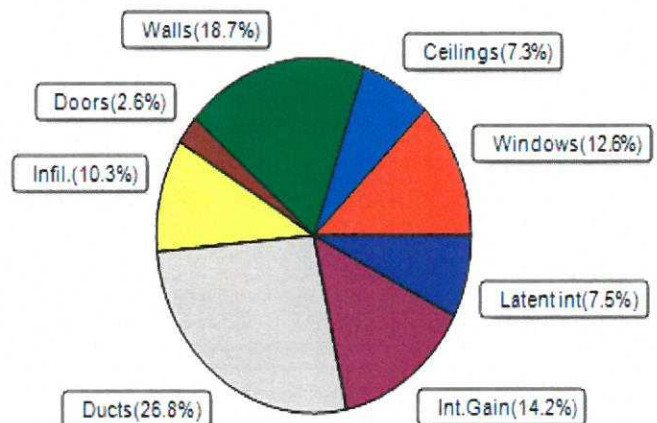
| Load component         |           | Load              |
|------------------------|-----------|-------------------|
| Window total           | 85 sqft   | 1228 Btuh         |
| Wall total             | 1015 sqft | 5340 Btuh         |
| Door total             | 20 sqft   | 368 Btuh          |
| Ceiling total          | 900 sqft  | 914 Btuh          |
| Floor total            | 900 sqft  | 5664 Btuh         |
| Infiltration           | 27 cfm    | 1163 Btuh         |
| Duct loss              |           | 2679 Btuh         |
| <b>Subtotal</b>        |           | <b>17355 Btuh</b> |
| Ventilation            | 0 cfm     | 0 Btuh            |
| <b>TOTAL HEAT LOSS</b> |           | <b>17355 Btuh</b> |



## SUMMER CALCULATIONS

Summer Cooling Load (for 900 sqft)

| Load component                        |           | Load              |
|---------------------------------------|-----------|-------------------|
| Window total                          | 85 sqft   | 1346 Btuh         |
| Wall total                            | 1015 sqft | 2003 Btuh         |
| Door total                            | 20 sqft   | 276 Btuh          |
| Ceiling total                         | 900 sqft  | 777 Btuh          |
| Floor total                           |           | 0 Btuh            |
| Infiltration                          | 20 cfm    | 414 Btuh          |
| Internal gain                         |           | 1520 Btuh         |
| Duct gain                             |           | 2234 Btuh         |
| Sens. Ventilation                     | 0 cfm     | 0 Btuh            |
| Blower Load                           |           | 0 Btuh            |
| <b>Total sensible gain</b>            |           | <b>8569 Btuh</b>  |
| Latent gain(ducts)                    |           | 634 Btuh          |
| Latent gain(infiltration)             |           | 687 Btuh          |
| Latent gain(ventilation)              |           | 0 Btuh            |
| Latent gain(internal/occupants/other) |           | 800 Btuh          |
| <b>Total latent gain</b>              |           | <b>2122 Btuh</b>  |
| <b>TOTAL HEAT GAIN</b>                |           | <b>10691 Btuh</b> |



8th Edition

EnergyGauge® System Sizing

PREPARED BY: \_\_\_\_\_

DATE: \_\_\_\_\_

4/21/2020

# System Sizing Calculations - Winter

## Residential Load - Whole House Component Details

Michael Woods  
422 Steedley Drive  
Lake City, FL

Project Title:  
Woods - Addition  
Building Type: User

4/21/2020

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                   | 36.0             |      | 14.4 | 518 Btuh   |
| 2                  | 2, NFRC 0.25                                                  | Vinyl      | 0.36    | N                   | 11.3             |      | 14.4 | 162 Btuh   |
| 3                  | 2, NFRC 0.25                                                  | Vinyl      | 0.36    | W                   | 20.0             |      | 14.4 | 288 Btuh   |
| 4                  | 2, NFRC 0.25                                                  | Vinyl      | 0.36    | S                   | 18.0             |      | 14.4 | 259 Btuh   |
| Window Total       |                                                               |            |         |                     | 85.3(sqft)       |      |      | 1228 Btuh  |
| Walls              | Type                                                          | Ornt.      | Ueff.   | R-Value<br>(Cav/Sh) | Area             | X    | HTM= | Load       |
| 1                  | Conc Blk,Hollow - Ext                                         |            | (0.132) | 5.0/0.0             | 213              |      | 5.26 | 1120 Btuh  |
| 2                  | Conc Blk,Hollow - Ext                                         |            | (0.132) | 5.0/0.0             | 260              |      | 5.26 | 1368 Btuh  |
| 3                  | Conc Blk,Hollow - Ext                                         |            | (0.132) | 5.0/0.0             | 262              |      | 5.26 | 1379 Btuh  |
| 4                  | Conc Blk,Hollow - Ext                                         |            | (0.132) | 5.0/0.0             | 280              |      | 5.26 | 1474 Btuh  |
| Wall Total         |                                                               |            |         |                     | 1015(sqft)       |      |      | 5340 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            | 900              |      | 1.0  | 914 Btuh   |
| Ceiling Total      |                                                               |            |         |                     | 900(sqft)        |      |      | 914Btuh    |
| Floors             | Type                                                          |            | Ueff.   | R-Value             | Size             | X    | HTM= | Load       |
| 1                  | Slab On Grade                                                 |            | (1.180) | 0.0                 | 120.0 ft(perim.) |      | 47.2 | 5664 Btuh  |
| Floor Total        |                                                               |            |         |                     | 900 sqft         |      |      | 5664 Btuh  |
| Envelope Subtotal: |                                                               |            |         |                     |                  |      |      | 13513 Btuh |
| Infiltration       | Type                                                          | Wholehouse | ACH     | Volume(cuft)        | Wall Ratio       | CFM= |      |            |
|                    | Natural                                                       |            | 0.19    | 8397                | 1.00             | 26.6 |      | 1163 Btuh  |
| Duct load          | Average sealed, R6.0, Supply(Att), Return(Att) (DLM of 0.183) |            |         |                     |                  |      |      | 2679 Btuh  |
| All Zones          | Sensible Subtotal All Zones                                   |            |         |                     |                  |      |      | 17355 Btuh |

### WHOLE HOUSE TOTALS

| Totals for Heating | Subtotal Sensible Heat Loss<br>Ventilation Sensible Heat Loss<br>Total Heat Loss | 17355 Btuh<br>0 Btuh<br>17355 Btuh |
|--------------------|----------------------------------------------------------------------------------|------------------------------------|
|--------------------|----------------------------------------------------------------------------------|------------------------------------|

# Manual J Winter Calculations

## Residential Load - Component Details (continued)

Michael Woods  
422 Steedley Drive  
Lake City, FL

Project Title:  
Woods - Addition  
Building Type: User

4/21/2020

### EQUIPMENT

|                       |   |            |
|-----------------------|---|------------|
| 1. Electric Heat Pump | # | 17400 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

Michael Woods  
422 Steedley Drive  
Lake City, FL

Project Title:  
Woods - Addition

4/21/2020

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             |      | 2.0ft.             | 0.5ft. | 36.0              | 0.0    | 36.0      | 12        | 12       | 436 Btuh  |
| 2             | 2 NFRC                                                               | 0.25, 0.36  | No | No   | N             |      | 2.0ft.             | 0.5ft. | 11.3              | 0.0    | 11.3      | 12        | 12       | 136 Btuh  |
| 3             | 2 NFRC                                                               | 0.25, 0.36  | No | No   | W             |      | 2.0ft.             | 0.5ft. | 20.0              | 5.8    | 14.2      | 12        | 31       | 510 Btuh  |
| 4             | 2 NFRC                                                               | 0.25, 0.36  | No | No   | S             |      | 2.0ft.             | 0.5ft. | 18.0              | 18.0   | 0.0       | 12        | 14       | 218 Btuh  |
|               | Excursion                                                            |             |    |      |               |      |                    |        |                   |        |           |           |          | 47 Btuh   |
|               | Window Total                                                         |             |    |      |               |      |                    |        | 85 (sqft)         |        |           |           |          | 1346 Btuh |
| Walls         | Type                                                                 | U-Value     |    |      | R-Value       |      | Area(sqft)         |        |                   | HTM    |           | Load      |          |           |
|               |                                                                      |             |    |      | Cav/Sheath    |      |                    |        |                   |        |           |           |          |           |
| 1             | Concrete Blk,Hollow- Ext                                             | 0.13        |    |      | 5.0/0.0       |      | 212.8              |        |                   | 2.0    |           | 420 Btuh  |          |           |
| 2             | Concrete Blk,Hollow- Ext                                             | 0.13        |    |      | 5.0/0.0       |      | 260.0              |        |                   | 2.0    |           | 513 Btuh  |          |           |
| 3             | Concrete Blk,Hollow- Ext                                             | 0.13        |    |      | 5.0/0.0       |      | 262.0              |        |                   | 2.0    |           | 517 Btuh  |          |           |
| 4             | Concrete Blk,Hollow- Ext                                             | 0.13        |    |      | 5.0/0.0       |      | 280.0              |        |                   | 2.0    |           | 553 Btuh  |          |           |
|               | Wall Total                                                           |             |    |      |               |      | 1015 (sqft)        |        |                   |        |           | 2003 Btuh |          |           |
| Doors         | Type                                                                 | U-Value     |    |      | R-Value       |      | 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      |      | 900.0              |        |                   | 0.86   |           | 777 Btuh  |          |           |
|               | Ceiling Total                                                        |             |    |      |               |      | 900 (sqft)         |        |                   |        |           | 777 Btuh  |          |           |
| Floors        | Type                                                                 | U-Value     |    |      | R-Value       |      | Size               |        |                   | HTM    |           | Load      |          |           |
| 1             | Slab On Grade                                                        |             |    |      | 0.0           |      | 900 (ft-perimeter) |        |                   | 0.0    |           | 0 Btuh    |          |           |
|               | Floor Total                                                          |             |    |      |               |      | 900.0 (sqft)       |        |                   |        |           | 0 Btuh    |          |           |
|               | Envelope Subtotal:                                                   |             |    |      |               |      |                    |        |                   |        |           |           |          | 4401 Btuh |
| Infiltration  | Type                                                                 | Average ACH |    |      | Volume(cuft)  |      | Wall Ratio         |        | CFM=              |        | Load      |           |          |           |
|               | Natural                                                              | 0.14        |    |      | 8397          |      | 1                  |        | 19.9              |        | 414 Btuh  |           |          |           |
| Internal gain |                                                                      | Occupants   |    |      | Btuh/occupant |      | Appliance          |        | Load              |        |           |           |          |           |
|               |                                                                      | 4           |    |      | X 230         |      | +                  |        | 600               |        | 1520 Btuh |           |          |           |
|               | Sensible Envelope Load:                                              |             |    |      |               |      |                    |        |                   |        |           |           |          | 6335 Btuh |
| Duct load     | Average sealed,Supply(R6.0-Attic), Return(R6.0-Attic) (DGM of 0.353) |             |    |      |               |      |                    |        |                   |        |           |           |          | 2234 Btuh |
|               | Sensible Load All Zones                                              |             |    |      |               |      |                    |        |                   |        |           |           |          | 8569 Btuh |

# Manual J Summer Calculations

## Residential Load - Component Details (continued)

Michael Woods  
422 Steedley Drive  
Lake City, FL

Project Title: Woods - Addition

Climate: FL\_GAINESVILLE\_REGIONAL\_A

4/21/2020

### WHOLE HOUSE TOTALS

|                                           |                                                           |                   |
|-------------------------------------------|-----------------------------------------------------------|-------------------|
| <b>Whole House<br/>Totals for Cooling</b> | <b>Sensible Envelope Load All Zones</b>                   | <b>6335 Btuh</b>  |
|                                           | Sensible Duct Load                                        | 2234 Btuh         |
|                                           | <b>Total Sensible Zone Loads</b>                          | <b>8569 Btuh</b>  |
|                                           | Sensible ventilation                                      | 0 Btuh            |
|                                           | Blower                                                    | 0 Btuh            |
|                                           | <b>Total sensible gain</b>                                | <b>8569 Btuh</b>  |
|                                           | Latent infiltration gain (for 51 gr. humidity difference) | 687 Btuh          |
|                                           | Latent ventilation gain                                   | 0 Btuh            |
|                                           | Latent duct gain                                          | 634 Btuh          |
|                                           | Latent occupant gain (4.0 people @ 200 Btuh per person)   | 800 Btuh          |
|                                           | Latent other gain                                         | 0 Btuh            |
|                                           | <b>Latent total gain</b>                                  | <b>2122 Btuh</b>  |
|                                           | <b>TOTAL GAIN</b>                                         | <b>10691 Btuh</b> |

### EQUIPMENT

|                 |   |            |
|-----------------|---|------------|
| 1. Central Unit | # | 10644 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