

# Residential System Sizing Calculation

## Summary

Project Title:  
DIY Magnolia Model

, FL

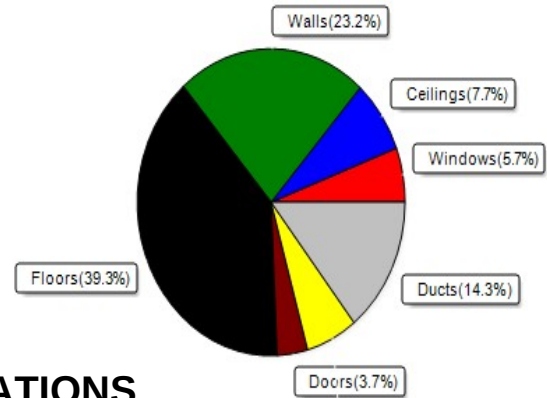
7/25/2023

|                                                                                                       |                   |                                       |                    |
|-------------------------------------------------------------------------------------------------------|-------------------|---------------------------------------|--------------------|
| Location for weather data: Gainesville, FL - Defaults: Latitude(29.7) Altitude(100 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>17166 Btuh</b> | <b>Total cooling load calculation</b> | <b>16029 Btuh</b>  |
| Submitted heating capacity                                                                            | % of calc Btuh    | Submitted cooling capacity            | % of calc Btuh     |
| Total (Electric Heat Pump)                                                                            | 139.8 24000       | Sensible (SHR = 0.85)                 | 150.4 20400        |
| Heat Pump + Auxiliary(0.0kW)                                                                          | 139.8 24000       | Latent                                | 146.2 3600         |
|                                                                                                       |                   | <b>Total (Electric Heat Pump)</b>     | <b>149.7 24000</b> |

## WINTER CALCULATIONS

Winter Heating Load (for 1032 sqft)

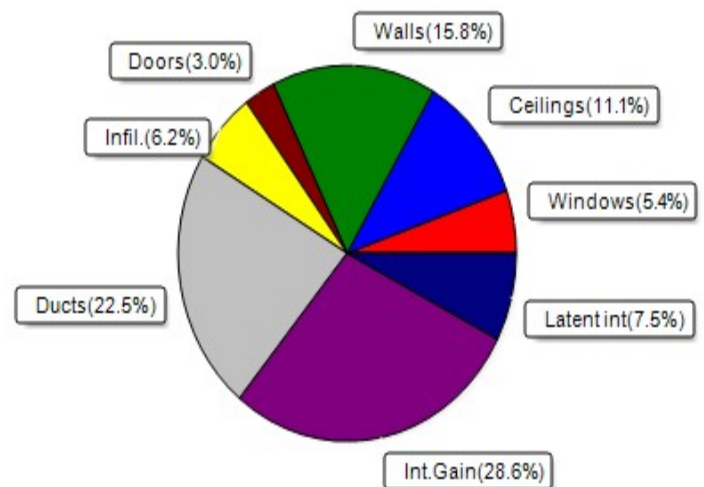
| Load component                  | Load              |
|---------------------------------|-------------------|
| Window total 94 sqft            | 978 Btuh          |
| Wall total 1153 sqft            | 3976 Btuh         |
| Door total 40 sqft              | 640 Btuh          |
| Ceiling total 1032 sqft         | 1315 Btuh         |
| Floor total 1032 sqft           | 6750 Btuh         |
| Infiltration 24 cfm             | 1055 Btuh         |
| Duct loss                       | 2453 Btuh         |
| <b>Subtotal</b>                 | <b>17166 Btuh</b> |
| Ventilation Ex:0 cfm; Sup:0 cfm | 0 Btuh            |
| <b>TOTAL HEAT LOSS</b>          | <b>17166 Btuh</b> |



## SUMMER CALCULATIONS

Summer Cooling Load (for 1032 sqft)

| Load component                        | Load              |
|---------------------------------------|-------------------|
| Window total 94 sqft                  | 860 Btuh          |
| Wall total 1153 sqft                  | 2535 Btuh         |
| Door total 40 sqft                    | 480 Btuh          |
| Ceiling total 1032 sqft               | 1775 Btuh         |
| Floor total                           | 0 Btuh            |
| Infiltration 18 cfm                   | 376 Btuh          |
| Internal gain                         | 4580 Btuh         |
| Duct gain                             | 2960 Btuh         |
| Sens.Ventilation Ex:0 cfm; Sup:0 cfm  | 0 Btuh            |
| Blower Load                           | 0 Btuh            |
| <b>Total sensible gain</b>            | <b>13566 Btuh</b> |
| Latent gain(ducts)                    | 639 Btuh          |
| Latent gain(infiltration)             | 624 Btuh          |
| Latent gain(ventilation)              | 0 Btuh            |
| Latent gain(internal/occupants/other) | 1200 Btuh         |
| <b>Total latent gain</b>              | <b>2463 Btuh</b>  |
| <b>TOTAL HEAT GAIN</b>                | <b>16029 Btuh</b> |



8th Edition

EnergyGauge® System Sizing

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

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

7-25-23

# System Sizing Calculations - Summer

## Residential Load - Whole House Component Details

Project Title:  
DIY Magnolia Model

, FL

7/25/2023

Reference City: Gainesville, FL (Defaults)  
Humidity difference: 51gr.

Temperature Difference: 19.0F(TMY3 99%)  
Summer Setpoint: 75 °F (Required Manual J default)

### 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                                                                | 0.20, 0.26  | No | No   | N       | 1.5ft         | 2.3ft        | 15.0              | 0.0                 | 15.0     | 9      | 9         | 137        | Btuh |
| 2             | 2 NFRC                                                                | 0.20, 0.26  | No | No   | N       | 7.5ft         | 2.3ft        | 9.0               | 0.0                 | 9.0      | 9      | 9         | 82         | Btuh |
| 3             | 2 NFRC                                                                | 0.20, 0.26  | No | No   | N       | 7.5ft         | 2.3ft        | 10.0              | 0.0                 | 10.0     | 9      | 9         | 91         | Btuh |
| 4             | 2 NFRC                                                                | 0.20, 0.26  | No | No   | S       | 1.5ft         | 2.3ft        | 30.0              | 30.0                | 0.0      | 9      | 11        | 274        | Btuh |
| 5             | 2 NFRC                                                                | 0.20, 0.26  | No | No   | S       | 7.5ft         | 2.3ft        | 30.0              | 30.0                | 0.0      | 9      | 11        | 274        | Btuh |
|               | Window Total                                                          |             |    |      |         |               |              | 94 (sqft)         |                     |          |        |           | 860 Btuh   |      |
| Walls         | Type                                                                  | U-Value     |    |      |         |               | R-Value      |                   | Area(sqft)          |          | HTM    |           | Load       |      |
|               |                                                                       |             |    |      |         |               | Cav/Sheath   |                   |                     |          |        |           |            |      |
| 1             | Frame - Wood - Ext                                                    | 0.09        |    |      |         |               | 13.0/0.6     |                   | 114.0               |          | 2.2    |           | 251 Btuh   |      |
| 2             | Frame - Wood - Ext                                                    | 0.09        |    |      |         |               | 13.0/0.6     |                   | 54.0                |          | 2.2    |           | 119 Btuh   |      |
| 3             | Frame - Wood - Ext                                                    | 0.09        |    |      |         |               | 13.0/0.6     |                   | 228.0               |          | 2.2    |           | 501 Btuh   |      |
| 4             | Frame - Wood - Ext                                                    | 0.09        |    |      |         |               | 13.0/0.6     |                   | 193.5               |          | 2.2    |           | 425 Btuh   |      |
| 5             | Frame - Wood - Ext                                                    | 0.09        |    |      |         |               | 13.0/0.6     |                   | 204.0               |          | 2.2    |           | 448 Btuh   |      |
| 6             | Frame - Wood - Ext                                                    | 0.09        |    |      |         |               | 13.0/0.6     |                   | 112.0               |          | 2.2    |           | 246 Btuh   |      |
| 7             | Frame - Wood - Ext                                                    | 0.09        |    |      |         |               | 13.0/0.6     |                   | 247.5               |          | 2.2    |           | 544 Btuh   |      |
|               | Wall Total                                                            |             |    |      |         |               |              | 1153 (sqft)       |                     |          |        | 2535 Btuh |            |      |
| Doors         | Type                                                                  | U-Value     |    |      |         |               | R-Value      |                   | Area (sqft)         |          | HTM    |           | Load       |      |
|               |                                                                       |             |    |      |         |               |              |                   |                     |          |        |           |            |      |
| 1             | Insulated - Exterior                                                  |             |    |      |         |               |              |                   | 20.0                |          | 12.0   |           | 240 Btuh   |      |
| 2             | Insulated - Exterior                                                  |             |    |      |         |               |              |                   | 20.0                |          | 12.0   |           | 240 Btuh   |      |
|               | Door Total                                                            |             |    |      |         |               |              | 40 (sqft)         |                     |          |        | 480 Btuh  |            |      |
| Ceilings      | Type/Color/Surface                                                    | U-Value     |    |      |         |               | R-Value      |                   | Area(sqft)          |          | HTM    |           | Load       |      |
|               |                                                                       |             |    |      |         |               |              |                   |                     |          |        |           |            |      |
| 1             | Vented Attic/DarkShingle                                              | 0.032       |    |      |         |               | 30.0/0.0     |                   | 1032.0              |          | 1.72   |           | 1775 Btuh  |      |
|               | Ceiling Total                                                         |             |    |      |         |               |              | 1032 (sqft)       |                     |          |        | 1775 Btuh |            |      |
| Floors        | Type                                                                  | U-Value     |    |      |         |               | R-Value      |                   | Size                |          | HTM    |           | Load       |      |
|               |                                                                       |             |    |      |         |               |              |                   |                     |          |        |           |            |      |
| 1             | Slab On Grade                                                         |             |    |      |         |               | 0.0          |                   | 1032 (ft-perimeter) |          | 0.0    |           | 0 Btuh     |      |
|               | Floor Total                                                           |             |    |      |         |               |              | 1032.0 (sqft)     |                     |          |        | 0 Btuh    |            |      |
|               | Envelope Subtotal:                                                    |             |    |      |         |               |              |                   |                     |          |        |           | 5649 Btuh  |      |
| Infiltration  | Type                                                                  | Average ACH |    |      |         |               | Volume(cuft) |                   | Wall Ratio          |          | CFM=   |           | Load       |      |
|               | Natural                                                               | 0.12        |    |      |         |               | 9288         |                   | 1                   |          | 18.0   |           | 376 Btuh   |      |
| Internal gain | Occupants                                                             |             |    |      |         | Btuh/occupant |              | Appliance         |                     | Load     |        |           |            |      |
|               | 6                                                                     |             |    |      |         | X 230         |              | +                 |                     | 3200     |        | 4580 Btuh |            |      |
|               | Sensible Envelope Load:                                               |             |    |      |         |               |              |                   |                     |          |        |           | 10605 Btuh |      |
| Duct load     | Average sealed, Supply(R6.0-Attic), Return(R6.0-Attic) (DGM of 0.279) |             |    |      |         |               |              |                   |                     |          |        |           | 2960 Btuh  |      |
|               | Sensible Load All Zones                                               |             |    |      |         |               |              |                   |                     |          |        |           | 13566 Btuh |      |

# Manual J Summer Calculations

## Residential Load - Component Details (continued)

Project Title: Climate:FL\_GAINESVILLE\_REGIONAL\_A  
DIY Magnolia Model

, FL

7/25/2023

### WHOLE HOUSE TOTALS

|                                   |                                                           |                   |
|-----------------------------------|-----------------------------------------------------------|-------------------|
| Whole House<br>Totals for Cooling | <b>Sensible Envelope Load All Zones</b>                   | <b>10605 Btuh</b> |
|                                   | Sensible Duct Load                                        | 2960 Btuh         |
|                                   | <b>Total Sensible Zone Loads</b>                          | <b>13566 Btuh</b> |
|                                   | Sensible ventilation (Ex:0 cfm; Sup:0 cfm)                | 0 Btuh            |
|                                   | Blower                                                    | 0 Btuh            |
|                                   | <b>Total sensible gain</b>                                | <b>13566 Btuh</b> |
|                                   | Latent infiltration gain (for 51 gr. humidity difference) | 624 Btuh          |
|                                   | Latent ventilation gain                                   | 0 Btuh            |
|                                   | Latent duct gain                                          | 639 Btuh          |
|                                   | Latent occupant gain (6.0 people @ 200 Btuh per person)   | 1200 Btuh         |
|                                   | Latent other gain                                         | 0 Btuh            |
|                                   | <b>Latent total gain</b>                                  | <b>2463 Btuh</b>  |
|                                   | <b>TOTAL GAIN</b>                                         | <b>16029 Btuh</b> |

### EQUIPMENT

|                 |   |            |
|-----------------|---|------------|
| 1. Central Unit | # | 24000 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

# System Sizing Calculations - Winter

## Residential Load - Whole House Component Details

Project Title:  
DIY Magnolia Model  
Building Type: User

, FL

7/25/2023

Reference City: Gainesville, FL (Defaults) Winter Temperature Difference: 40.0 °F (TMY3 99%)  
Winter Setpoint: 70 °F (Required Manual J default)

| Component Loads for Whole House |                                                |            |         |                     |                  |      |                |            |
|---------------------------------|------------------------------------------------|------------|---------|---------------------|------------------|------|----------------|------------|
| Window                          | Panes/Type                                     | Frame      | U       | Orientation         | Area(sqft)       | X    | HTM=           | Load       |
| 1                               | 2, NFRC 0.20                                   | Vinyl      | 0.26    | N                   | 15.0             |      | 10.4           | 156 Btuh   |
| 2                               | 2, NFRC 0.20                                   | Vinyl      | 0.26    | N                   | 9.0              |      | 10.4           | 94 Btuh    |
| 3                               | 2, NFRC 0.20                                   | Vinyl      | 0.26    | N                   | 10.0             |      | 10.4           | 104 Btuh   |
| 4                               | 2, NFRC 0.20                                   | Vinyl      | 0.26    | S                   | 30.0             |      | 10.4           | 312 Btuh   |
| 5                               | 2, NFRC 0.20                                   | Vinyl      | 0.26    | S                   | 30.0             |      | 10.4           | 312 Btuh   |
|                                 | Window Total                                   |            |         |                     | 94.0(sqft)       |      |                | 978 Btuh   |
| Walls                           | Type                                           | Ornt.      | Ueff.   | R-Value<br>(Cav/Sh) | Area             | X    | HTM=           | Load       |
| 1                               | Frame - Wood                                   | - Ext      | (0.086) | 13.0/0.6            | 114              |      | 3.45           | 393 Btuh   |
| 2                               | Frame - Wood                                   | - Ext      | (0.086) | 13.0/0.6            | 54               |      | 3.45           | 186 Btuh   |
| 3                               | Frame - Wood                                   | - Ext      | (0.086) | 13.0/0.6            | 228              |      | 3.45           | 786 Btuh   |
| 4                               | Frame - Wood                                   | - Ext      | (0.086) | 13.0/0.6            | 194              |      | 3.45           | 667 Btuh   |
| 5                               | Frame - Wood                                   | - Ext      | (0.086) | 13.0/0.6            | 204              |      | 3.45           | 703 Btuh   |
| 6                               | Frame - Wood                                   | - Ext      | (0.086) | 13.0/0.6            | 112              |      | 3.45           | 386 Btuh   |
| 7                               | Frame - Wood                                   | - Ext      | (0.086) | 13.0/0.6            | 248              |      | 3.45           | 853 Btuh   |
|                                 | Wall Total                                     |            |         |                     | 1153(sqft)       |      |                | 3976 Btuh  |
| Doors                           | Type                                           | Storm      | Ueff.   |                     | Area             | X    | HTM=           | Load       |
| 1                               | Insulated - Exterior, n                        |            | (0.400) |                     | 20               |      | 16.0           | 320 Btuh   |
| 2                               | Insulated - Exterior, n                        |            | (0.400) |                     | 20               |      | 16.0           | 320 Btuh   |
|                                 | Door Total                                     |            |         |                     | 40(sqft)         |      |                | 640Btuh    |
| Ceilings                        | Type/Color/Surface                             |            | Ueff.   | R-Value             | Area             | X    | HTM=           | Load       |
| 1                               | Flat ceil/D/Shing                              |            | (0.032) | 30.0/0.0            | 1032             |      | 1.3            | 1315 Btuh  |
|                                 | Ceiling Total                                  |            |         |                     | 1032(sqft)       |      |                | 1315Btuh   |
| Floors                          | Type                                           |            | Ueff.   | R-Value             | Size             | X    | HTM=           | Load       |
| 1                               | Slab On Grade                                  |            | (1.180) | 0.0                 | 143.0 ft(perim.) |      | 47.2           | 6750 Btuh  |
|                                 | Floor Total                                    |            |         |                     | 1032 sqft        |      |                | 6750 Btuh  |
|                                 | Envelope Subtotal:                             |            |         |                     |                  |      |                | 13658 Btuh |
| Infiltration                    | Type                                           | Wholehouse | ACH     | Volume(cuft)        | Wall Ratio       | CFM= |                |            |
|                                 | Natural                                        |            | 0.16    | 9288                | 1.00             | 24.1 |                | 1055 Btuh  |
| Duct load                       | Average sealed, R6.0, Supply(Att), Return(Att) |            |         |                     |                  |      | (DLM of 0.167) | 2453 Btuh  |
| All Zones                       | Sensible Subtotal All Zones                    |            |         |                     |                  |      |                | 17166 Btuh |

# Manual J Winter Calculations

## Residential Load - Component Details (continued)

, FL

Project Title:  
DIY Magnolia Model  
Building Type: User

7/25/2023

### WHOLE HOUSE TOTALS

|                           |                                                   |            |
|---------------------------|---------------------------------------------------|------------|
| <b>Totals for Heating</b> | Subtotal Sensible Heat Loss                       | 17166 Btuh |
|                           | Ventilation Sens. Heat Loss (Ex:0 cfm; Sup:0 cfm) | 0 Btuh     |
|                           | Total Heat Loss                                   | 17166 Btuh |

### EQUIPMENT

|                       |   |            |
|-----------------------|---|------------|
| 1. Electric Heat Pump | # | 24000 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