

# Residential System Sizing Calculation

## Summary

Project Title:  
Ryan Residence



, FL

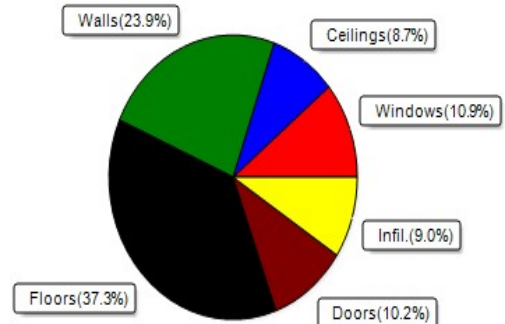
9/13/2024

|                                                                                                       |                   |                                       |                    |
|-------------------------------------------------------------------------------------------------------|-------------------|---------------------------------------|--------------------|
| 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>28126 Btuh</b> | <b>Total cooling load calculation</b> | <b>19696 Btuh</b>  |
| Submitted heating capacity                                                                            | % of calc Btuh    | Submitted cooling capacity            | % of calc Btuh     |
| Total (Electric Heat Pump)                                                                            | 106.7 30000       | Sensible (SHR = 0.75)                 | 132.3 22500        |
| Heat Pump + Auxiliary(0.0kW)                                                                          | 106.7 30000       | Latent                                | 278.8 7500         |
|                                                                                                       |                   | <b>Total (Electric Heat Pump)</b>     | <b>152.3 30000</b> |

## WINTER CALCULATIONS

Winter Heating Load (for 2239 sqft)

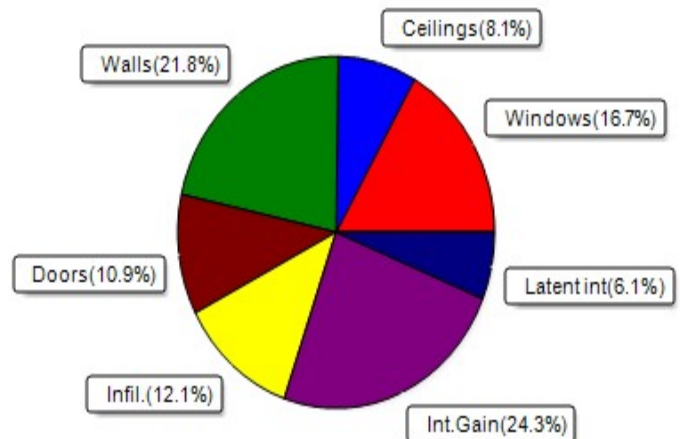
| Load component                  | Load              |
|---------------------------------|-------------------|
| Window total 295 sqft           | 3068 Btuh         |
| Wall total 1897 sqft            | 6734 Btuh         |
| Door total 156 sqft             | 2870 Btuh         |
| Ceiling total 2239 sqft         | 2454 Btuh         |
| Floor total See detail report   | 10478 Btuh        |
| Infiltration 57 cfm             | 2521 Btuh         |
| Duct loss                       | 0 Btuh            |
| <b>Subtotal</b>                 | <b>28126 Btuh</b> |
| Ventilation Ex:0 cfm; Sup:0 cfm | 0 Btuh            |
| <b>TOTAL HEAT LOSS</b>          | <b>28126 Btuh</b> |



## SUMMER CALCULATIONS

Summer Cooling Load (for 2239 sqft)

| Load component                        | Load              |
|---------------------------------------|-------------------|
| Window total 295 sqft                 | 3286 Btuh         |
| Wall total 1897 sqft                  | 4293 Btuh         |
| Door total 156 sqft                   | 2153 Btuh         |
| Ceiling total 2239 sqft               | 1595 Btuh         |
| Floor total                           | 0 Btuh            |
| Infiltration 43 cfm                   | 898 Btuh          |
| Internal gain                         | 4780 Btuh         |
| Duct gain                             | 0 Btuh            |
| Sens.Ventilation Ex:0 cfm; Sup:0 cfm  | 0 Btuh            |
| Blower Load                           | 0 Btuh            |
| <b>Total sensible gain</b>            | <b>17005 Btuh</b> |
| Latent gain(ducts)                    | 0 Btuh            |
| Latent gain(infiltration)             | 1491 Btuh         |
| Latent gain(ventilation)              | 0 Btuh            |
| Latent gain(internal/occupants/other) | 1200 Btuh         |
| <b>Total latent gain</b>              | <b>2691 Btuh</b>  |
| <b>TOTAL HEAT GAIN</b>                | <b>19696 Btuh</b> |



8th Edition

EnergyGauge® System Sizing

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

DATE: 9-12-24

# System Sizing Calculations - Summer

## Residential Load - Whole House Component Details

Project Title:  
Ryan Residence

, FL

9/13/2024

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       | 1.3ft      | 18.0              | 0.0                 | 18.0          | 9      | 9        | 165   | Btuh |      |
| 2        | 2 NFRC             | 0.20, 0.26                    | No | No   | E       | 1.5ft       | 1.3ft      | 4.5               | 0.0                 | 4.5           | 9      | 24       | 109   | Btuh |      |
| 3        | 2 NFRC             | 0.20, 0.26                    | No | No   | E       | 1.5ft       | 1.3ft      | 18.0              | 0.0                 | 18.0          | 9      | 24       | 436   | Btuh |      |
| 4        | 2 NFRC             | 0.20, 0.26                    | No | No   | S       | 1.5ft       | 1.3ft      | 36.0              | 36.0                | 0.0           | 9      | 11       | 329   | Btuh |      |
| 5        | 2 NFRC             | 0.20, 0.26                    | No | No   | N       | 1.5ft       | 1.3ft      | 30.0              | 0.0                 | 30.0          | 9      | 9        | 274   | Btuh |      |
| 6        | 2 NFRC             | 0.20, 0.26                    | No | No   | S       | 1.5ft       | 1.3ft      | 30.0              | 30.0                | 0.0           | 9      | 11       | 274   | Btuh |      |
| 7        | 2 NFRC             | 0.20, 0.26                    | No | No   | W       | 1.5ft       | 1.3ft      | 12.0              | 0.0                 | 12.0          | 9      | 24       | 291   | Btuh |      |
| 8        | 2 NFRC             | 0.20, 0.26                    | No | No   | W       | 1.5ft       | 1.3ft      | 4.5               | 0.0                 | 4.5           | 9      | 24       | 109   | Btuh |      |
| 9        | 2 NFRC             | 0.20, 0.26                    | No | No   | N       | 1.5ft       | 1.3ft      | 30.0              | 0.0                 | 30.0          | 9      | 9        | 274   | Btuh |      |
| 10       | 2 NFRC             | 0.20, 0.26                    | No | No   | N       | 1.5ft       | 1.3ft      | 56.0              | 0.0                 | 56.0          | 9      | 9        | 512   | Btuh |      |
| 11       | 2 NFRC             | 0.20, 0.26                    | No | No   | S       | 1.5ft       | 1.3ft      | 56.0              | 56.0                | 0.0           | 9      | 11       | 512   | Btuh |      |
|          | Window Total       |                               |    |      |         |             |            |                   | 295 (sqft)          |               |        |          |       | 3286 | Btuh |
| Walls    | Type               |                               |    |      |         | U-Value     | R-Value    | Area(sqft)        |                     |               | HTM    |          | Load  |      |      |
|          |                    |                               |    |      |         |             | Cav/Sheath |                   |                     |               |        |          |       |      |      |
|          | 1                  | Frame - Wood - Ext            |    |      |         | 0.09        | 13.0/0.0   | 216.0             |                     |               | 2.3    |          | 489   | Btuh |      |
|          | 2                  | Frame - Wood - Ext            |    |      |         | 0.09        | 13.0/0.0   | 303.0             |                     |               | 2.3    |          | 686   | Btuh |      |
|          | 3                  | Frame - Wood - Ext            |    |      |         | 0.09        | 13.0/0.0   | 150.0             |                     |               | 2.3    |          | 340   | Btuh |      |
|          | 4                  | Frame - Wood - Ext            |    |      |         | 0.09        | 13.0/0.0   | 305.5             |                     |               | 2.3    |          | 691   | Btuh |      |
|          | 5                  | Frame - Wood - Ext            |    |      |         | 0.09        | 13.0/0.0   | 84.0              |                     |               | 2.3    |          | 190   | Btuh |      |
|          | 6                  | Frame - Wood - Ext            |    |      |         | 0.09        | 13.0/0.0   | 269.0             |                     |               | 2.3    |          | 609   | Btuh |      |
|          | 7                  | Frame - Wood - Ext            |    |      |         | 0.09        | 13.0/0.0   | 84.0              |                     |               | 2.3    |          | 190   | Btuh |      |
|          | 8                  | Frame - Wood - Ext            |    |      |         | 0.09        | 13.0/0.0   | 292.5             |                     |               | 2.3    |          | 662   | Btuh |      |
|          | 9                  | Frame - Wood - Ext            |    |      |         | 0.09        | 13.0/0.0   | 100.7             |                     |               | 2.3    |          | 228   | Btuh |      |
|          | 10                 | Frame - Wood - Ext            |    |      |         | 0.09        | 13.0/0.0   | 46.0              |                     |               | 2.3    |          | 104   | Btuh |      |
|          | 11                 | Frame - Wood - Ext            |    |      |         | 0.09        | 13.0/0.0   | 46.0              |                     |               | 2.3    |          | 104   | Btuh |      |
|          | Wall Total         |                               |    |      |         |             |            |                   | 1897 (sqft)         |               |        |          |       | 4293 | Btuh |
| Doors    | Type               |                               |    |      |         | Area (sqft) |            |                   | HTM                 |               | Load   |          |       |      |      |
|          | 1                  | Insulated - Exterior          |    |      |         | 48.0        |            |                   | 13.8                |               | 662    | Btuh     |       |      |      |
|          | 2                  | Insulated - Exterior          |    |      |         | 20.0        |            |                   | 13.8                |               | 276    | Btuh     |       |      |      |
|          | 3                  | Insulated - Exterior          |    |      |         | 20.0        |            |                   | 13.8                |               | 276    | Btuh     |       |      |      |
|          | 4                  | Insulated - Exterior          |    |      |         | 20.0        |            |                   | 13.8                |               | 276    | Btuh     |       |      |      |
|          | 5                  | Insulated - Exterior          |    |      |         | 24.0        |            |                   | 13.8                |               | 331    | Btuh     |       |      |      |
|          | 6                  | Insulated - Exterior          |    |      |         | 24.0        |            |                   | 13.8                |               | 331    | Btuh     |       |      |      |
|          | Door Total         |                               |    |      |         |             |            |                   | 156 (sqft)          |               |        |          |       | 2153 | Btuh |
| Ceilings | Type/Color/Surface |                               |    |      |         | U-Value     | R-Value    | Area(sqft)        |                     |               | HTM    |          | Load  |      |      |
|          | 1                  | SnglAsmb no airsp/DarkShingle |    |      |         | 0.027       | 0.0/40.0   | 1706.0            |                     |               | 0.71   |          | 1215  | Btuh |      |
|          | 2                  | SnglAsmb no airsp/DarkShingle |    |      |         | 0.027       | 0.0/40.0   | 533.0             |                     |               | 0.71   |          | 380   | Btuh |      |
|          |                    | Ceiling Total                 |    |      |         |             |            |                   |                     | 2239 (sqft)   |        |          |       |      | 1595 |
| Floors   | Type               |                               |    |      |         | R-Value     |            |                   | Size                |               |        | HTM      |       | Load |      |
|          | 1                  | Slab On Grade                 |    |      |         | 0.0         |            |                   | 1706 (ft-perimeter) |               |        | 0.0      |       | 0    | Btuh |
|          | 2                  | Interior                      |    |      |         | 0.0         |            |                   | 533 (sqft)          |               |        | 0.0      |       | 0    | Btuh |
|          |                    | Floor Total                   |    |      |         |             |            |                   |                     | 2239.0 (sqft) |        |          |       |      | 0    |
|          | Envelope Subtotal: |                               |    |      |         |             |            |                   |                     |               |        |          | 11327 |      | Btuh |

# Manual J Summer Calculations

## Residential Load - Component Details (continued)

Project Title: Climate:FL\_GAINESVILLE\_REGIONAL\_A  
Ryan Residence

, FL

9/13/2024

|                      |                                                                         |                     |                        |                 |              |                   |
|----------------------|-------------------------------------------------------------------------|---------------------|------------------------|-----------------|--------------|-------------------|
| <b>Infiltration</b>  | Type<br>Natural                                                         | Average ACH<br>0.13 | Volume(cuft)<br>19618  | Wall Ratio<br>1 | CFM=<br>43.1 | Load<br>898 Btuh  |
| <b>Internal gain</b> |                                                                         | Occupants<br>6      | Btuh/occupant<br>X 230 | Appliance<br>+  | 3400         | Load<br>4780 Btuh |
|                      | Sensible Envelope Load:                                                 |                     |                        |                 |              | 17005 Btuh        |
| <b>Duct load</b>     | Extremely sealed, Supply(R6.0-Condi), Return(R6.0-Condi) (DGM of 0.000) |                     |                        |                 |              | 0 Btuh            |
|                      | <b>Sensible Load All Zones</b>                                          |                     |                        |                 |              | <b>17005 Btuh</b> |

# Manual J Summer Calculations

## Residential Load - Component Details (continued)

Project Title: Climate:FL\_GAINESVILLE\_REGIONAL\_A  
Ryan Residence

, FL

9/13/2024

### WHOLE HOUSE TOTALS

|                                   |                                                           |                   |
|-----------------------------------|-----------------------------------------------------------|-------------------|
| Whole House<br>Totals for Cooling | <b>Sensible Envelope Load All Zones</b>                   | <b>17005 Btuh</b> |
|                                   | Sensible Duct Load                                        | 0 Btuh            |
|                                   | <b>Total Sensible Zone Loads</b>                          | <b>17005 Btuh</b> |
|                                   | Sensible ventilation (Ex:0 cfm; Sup:0 cfm)                | 0 Btuh            |
|                                   | Blower                                                    | 0 Btuh            |
|                                   | <b>Total sensible gain</b>                                | <b>17005 Btuh</b> |
|                                   | Latent infiltration gain (for 51 gr. humidity difference) | 1491 Btuh         |
|                                   | Latent ventilation gain                                   | 0 Btuh            |
|                                   | Latent duct gain                                          | 0 Btuh            |
|                                   | Latent occupant gain (6.0 people @ 200 Btuh per person)   | 1200 Btuh         |
|                                   | Latent other gain                                         | 0 Btuh            |
|                                   | <b>Latent total gain</b>                                  | <b>2691 Btuh</b>  |
|                                   | <b>TOTAL GAIN</b>                                         | <b>19696 Btuh</b> |

### EQUIPMENT

|                 |   |            |
|-----------------|---|------------|
| 1. Central Unit | # | 30000 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:  
Ryan Residence  
Building Type: User

, FL

9/13/2024

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                   | 18.0             |   | 10.4 | 187 Btuh   |
| 2                               | 2, NFRC 0.20          | Vinyl | 0.26    | E                   | 4.5              |   | 10.4 | 47 Btuh    |
| 3                               | 2, NFRC 0.20          | Vinyl | 0.26    | E                   | 18.0             |   | 10.4 | 187 Btuh   |
| 4                               | 2, NFRC 0.20          | Vinyl | 0.26    | S                   | 36.0             |   | 10.4 | 374 Btuh   |
| 5                               | 2, NFRC 0.20          | Vinyl | 0.26    | N                   | 30.0             |   | 10.4 | 312 Btuh   |
| 6                               | 2, NFRC 0.20          | Vinyl | 0.26    | S                   | 30.0             |   | 10.4 | 312 Btuh   |
| 7                               | 2, NFRC 0.20          | Vinyl | 0.26    | W                   | 12.0             |   | 10.4 | 125 Btuh   |
| 8                               | 2, NFRC 0.20          | Vinyl | 0.26    | W                   | 4.5              |   | 10.4 | 47 Btuh    |
| 9                               | 2, NFRC 0.20          | Vinyl | 0.26    | N                   | 30.0             |   | 10.4 | 312 Btuh   |
| 10                              | 2, NFRC 0.20          | Vinyl | 0.26    | N                   | 56.0             |   | 10.4 | 582 Btuh   |
| 11                              | 2, NFRC 0.20          | Vinyl | 0.26    | S                   | 56.0             |   | 10.4 | 582 Btuh   |
|                                 | Window Total          |       |         |                     | 295.0(sqft)      |   |      | 3068 Btuh  |
| Walls                           | Type                  | Ornt. | Ueff.   | R-Value<br>(Cav/Sh) | Area             | X | HTM= | Load       |
| 1                               | Frame - Wood          | - Ext | (0.089) | 13.0/0.0            | 216              |   | 3.55 | 767 Btuh   |
| 2                               | Frame - Wood          | - Ext | (0.089) | 13.0/0.0            | 303              |   | 3.55 | 1076 Btuh  |
| 3                               | Frame - Wood          | - Ext | (0.089) | 13.0/0.0            | 150              |   | 3.55 | 533 Btuh   |
| 4                               | Frame - Wood          | - Ext | (0.089) | 13.0/0.0            | 306              |   | 3.55 | 1085 Btuh  |
| 5                               | Frame - Wood          | - Ext | (0.089) | 13.0/0.0            | 84               |   | 3.55 | 298 Btuh   |
| 6                               | Frame - Wood          | - Ext | (0.089) | 13.0/0.0            | 269              |   | 3.55 | 955 Btuh   |
| 7                               | Frame - Wood          | - Ext | (0.089) | 13.0/0.0            | 84               |   | 3.55 | 298 Btuh   |
| 8                               | Frame - Wood          | - Ext | (0.089) | 13.0/0.0            | 293              |   | 3.55 | 1038 Btuh  |
| 9                               | Frame - Wood          | - Ext | (0.089) | 13.0/0.0            | 101              |   | 3.55 | 357 Btuh   |
| 10                              | Frame - Wood          | - Ext | (0.089) | 13.0/0.0            | 46               |   | 3.55 | 163 Btuh   |
| 11                              | Frame - Wood          | - Ext | (0.089) | 13.0/0.0            | 46               |   | 3.55 | 163 Btuh   |
|                                 | Wall Total            |       |         |                     | 1897(sqft)       |   |      | 6734 Btuh  |
| Doors                           | Type                  | Storm | Ueff.   |                     | Area             | X | HTM= | Load       |
| 1                               | Insulated - Exterior, | n     | (0.460) |                     | 48               |   | 18.4 | 883 Btuh   |
| 2                               | Insulated - Exterior, | n     | (0.460) |                     | 20               |   | 18.4 | 368 Btuh   |
| 3                               | Insulated - Exterior, | n     | (0.460) |                     | 20               |   | 18.4 | 368 Btuh   |
| 4                               | Insulated - Exterior, | n     | (0.460) |                     | 20               |   | 18.4 | 368 Btuh   |
| 5                               | Insulated - Exterior, | n     | (0.460) |                     | 24               |   | 18.4 | 442 Btuh   |
| 6                               | Insulated - Exterior, | n     | (0.460) |                     | 24               |   | 18.4 | 442 Btuh   |
|                                 | Door Total            |       |         |                     | 156(sqft)        |   |      | 2870Btuh   |
| Ceilings                        | Type/Color/Surface    |       | Ueff.   | R-Value             | Area             | X | HTM= | Load       |
| 1                               | Single as/D/Shing     |       | (0.027) | 0.0/40.0            | 1706             |   | 1.1  | 1870 Btuh  |
| 2                               | Single as/D/Shing     |       | (0.027) | 0.0/40.0            | 533              |   | 1.1  | 584 Btuh   |
|                                 | Ceiling Total         |       |         |                     | 2239(sqft)       |   |      | 2454Btuh   |
| Floors                          | Type                  |       | Ueff.   | R-Value             | Size             | X | HTM= | Load       |
| 1                               | Slab On Grade         |       | (1.180) | 0.0                 | 222.0 ft(perim.) |   | 47.2 | 10478 Btuh |
| 2                               | Interior              |       | (1.180) | 0.0                 | 533.0 sqft       |   | 0.0  | 0 Btuh     |
|                                 | Floor Total           |       |         |                     | 2239 sqft        |   |      | 10478 Btuh |

# Manual J Winter Calculations

## Residential Load - Component Details (continued)

, FL

Project Title:  
Ryan Residence  
Building Type: User

9/13/2024

|                     |                                                                 |            |      |              |            |      |                   |
|---------------------|-----------------------------------------------------------------|------------|------|--------------|------------|------|-------------------|
|                     | Envelope Subtotal:                                              |            |      |              |            |      | 25604 Btuh        |
| <b>Infiltration</b> | Type                                                            | Wholehouse | ACH  | Volume(cuft) | Wall Ratio | CFM= |                   |
|                     | Natural                                                         |            | 0.18 | 19618        | 1.00       | 57.5 | 2521 Btuh         |
| <b>Duct load</b>    | Extremely sealed, R6.0, Supply(Con), Return(Con) (DLM of 0.000) |            |      |              |            |      | 0 Btuh            |
| <b>All Zones</b>    | <b>Sensible Subtotal All Zones</b>                              |            |      |              |            |      | <b>28126 Btuh</b> |

### WHOLE HOUSE TOTALS

|                           |                                                   |  |  |  |  |  |            |
|---------------------------|---------------------------------------------------|--|--|--|--|--|------------|
| <b>Totals for Heating</b> | Subtotal Sensible Heat Loss                       |  |  |  |  |  | 28126 Btuh |
|                           | Ventilation Sens. Heat Loss (Ex:0 cfm; Sup:0 cfm) |  |  |  |  |  | 0 Btuh     |
|                           | Total Heat Loss                                   |  |  |  |  |  | 28126 Btuh |

### EQUIPMENT

|                       |   |            |
|-----------------------|---|------------|
| 1. Electric Heat Pump | # | 30000 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