

# Residential System Sizing Calculation

## Summary

Project Title:  
Cruce Residence

, FL

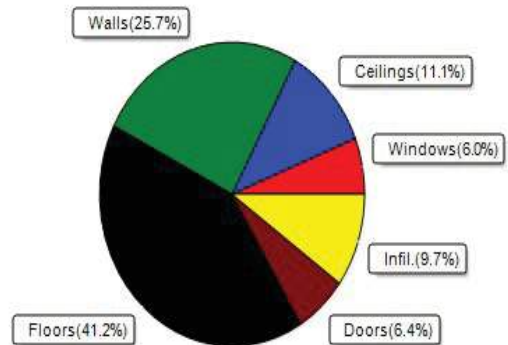
8/18/2023

|                                                                                                       |                   |                                       |                    |
|-------------------------------------------------------------------------------------------------------|-------------------|---------------------------------------|--------------------|
| 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>18334 Btuh</b> | <b>Total cooling load calculation</b> | <b>12050 Btuh</b>  |
| Submitted heating capacity                                                                            | % of calc Btuh    | Submitted cooling capacity            | % of calc Btuh     |
| Total (Electric Heat Pump)                                                                            | 196.4 36000       | Sensible (SHR = 0.85)                 | 288.6 30600        |
| Heat Pump + Auxiliary(0.0kW)                                                                          | 196.4 36000       | Latent                                | 372.9 5400         |
|                                                                                                       |                   | <b>Total (Electric Heat Pump)</b>     | <b>298.7 36000</b> |

## WINTER CALCULATIONS

Winter Heating Load (for 1500 sqft)

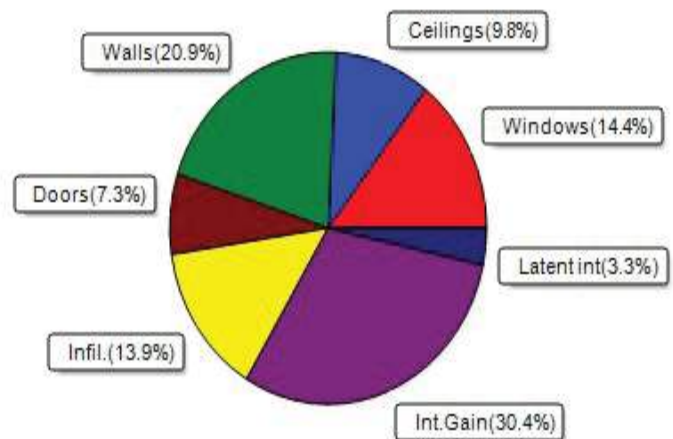
| Load component                  | Load              |
|---------------------------------|-------------------|
| Window total 105 sqft           | 1092 Btuh         |
| Wall total 1522 sqft            | 4703 Btuh         |
| Door total 73 sqft              | 1173 Btuh         |
| Ceiling total 1500 sqft         | 2040 Btuh         |
| Floor total 1500 sqft           | 7552 Btuh         |
| Infiltration 40 cfm             | 1773 Btuh         |
| Duct loss                       | 0 Btuh            |
| <b>Subtotal</b>                 | <b>18334 Btuh</b> |
| Ventilation Ex:0 cfm; Sup:0 cfm | 0 Btuh            |
| <b>TOTAL HEAT LOSS</b>          | <b>18334 Btuh</b> |



## SUMMER CALCULATIONS

Summer Cooling Load (for 1500 sqft)

| Load component                        | Load              |
|---------------------------------------|-------------------|
| Window total 105 sqft                 | 1729 Btuh         |
| Wall total 1522 sqft                  | 2516 Btuh         |
| Door total 73 sqft                    | 880 Btuh          |
| Ceiling total 1500 sqft               | 1185 Btuh         |
| Floor total                           | 0 Btuh            |
| Infiltration 30 cfm                   | 632 Btuh          |
| Internal gain                         | 3660 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>10602 Btuh</b> |
| Latent gain(ducts)                    | 0 Btuh            |
| Latent gain(infiltration)             | 1048 Btuh         |
| Latent gain(ventilation)              | 0 Btuh            |
| Latent gain(internal/occupants/other) | 400 Btuh          |
| <b>Total latent gain</b>              | <b>1448 Btuh</b>  |
| <b>TOTAL HEAT GAIN</b>                | <b>12050 Btuh</b> |



8th Edition

EnergyGauge® System Sizing

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

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

8-18-23

# System Sizing Calculations - Summer

## Residential Load - Whole House Component Details

Project Title:  
Cruce Residence

, FL

8/18/2023

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      | 6.0                 | 0.0    | 6.0        | 9      | 9          | 55 Btuh   |
| 2             | 2 NFRC                                   | 0.20, 0.26 | No | No   | N       | 1.5ft       | 2.3ft      | 9.0                 | 0.0    | 9.0        | 9      | 9          | 82 Btuh   |
| 3             | 2 NFRC                                   | 0.20, 0.26 | No | No   | E       | 1.5ft       | 2.3ft      | 6.0                 | 0.0    | 6.0        | 9      | 24         | 145 Btuh  |
| 4             | 2 NFRC                                   | 0.20, 0.26 | No | No   | E       | 1.5ft       | 2.3ft      | 30.0                | 0.0    | 30.0       | 9      | 24         | 727 Btuh  |
| 5             | 2 NFRC                                   | 0.20, 0.26 | No | No   | S       | 1.5ft       | 2.3ft      | 30.0                | 30.0   | 0.0        | 9      | 11         | 274 Btuh  |
| 6             | 2 NFRC                                   | 0.20, 0.26 | No | No   | S       | 1.5ft       | 2.3ft      | 9.0                 | 9.0    | 0.0        | 9      | 11         | 82 Btuh   |
| 7             | 2 NFRC                                   | 0.20, 0.26 | No | No   | W       | 1.5ft       | 2.3ft      | 15.0                | 0.0    | 15.0       | 9      | 24         | 363 Btuh  |
| Window Total  |                                          |            |    |      |         |             |            | 105 (sqft)          |        |            |        |            | 1729 Btuh |
| Walls         | Type                                     |            |    |      |         | U-Value     | R-Value    | Area(sqft)          |        | HTM        |        | Load       |           |
|               |                                          |            |    |      |         |             | Cav/Sheath |                     |        |            |        |            |           |
| 1             | Frame - Wood - Ext                       |            |    |      |         | 0.08        | 19.0/0.0   | 265.0               |        | 1.7        |        | 438 Btuh   |           |
| 2             | Frame - Wood - Ext                       |            |    |      |         | 0.08        | 19.0/0.0   | 564.0               |        | 1.7        |        | 933 Btuh   |           |
| 3             | Frame - Wood - Ext                       |            |    |      |         | 0.08        | 19.0/0.0   | 227.7               |        | 1.7        |        | 376 Btuh   |           |
| 4             | Frame - Wood - Ext                       |            |    |      |         | 0.08        | 19.0/0.0   | 465.0               |        | 1.7        |        | 769 Btuh   |           |
| Wall Total    |                                          |            |    |      |         |             |            | 1522 (sqft)         |        |            |        |            | 2516 Btuh |
| Doors         | Type                                     |            |    |      |         |             |            | Area (sqft)         |        | HTM        |        | Load       |           |
|               |                                          |            |    |      |         |             |            |                     |        |            |        |            |           |
| 1             | Insulated - Exterior                     |            |    |      |         |             |            | 20.0                |        | 12.0       |        | 240 Btuh   |           |
| 2             | Insulated - Exterior                     |            |    |      |         |             |            | 33.3                |        | 12.0       |        | 400 Btuh   |           |
| 3             | Insulated - Exterior                     |            |    |      |         |             |            | 20.0                |        | 12.0       |        | 240 Btuh   |           |
| Door Total    |                                          |            |    |      |         |             |            | 73 (sqft)           |        |            |        |            | 880 Btuh  |
| Ceilings      | Type/Color/Surface                       |            |    |      |         | U-Value     | R-Value    | Area(sqft)          |        | HTM        |        | Load       |           |
|               | SnglAsmb no airsp/Light/Metal            |            |    |      |         | 0.034       | 30.0/0.0   | 1500.0              |        | 0.79       |        | 1185 Btuh  |           |
| Ceiling Total |                                          |            |    |      |         |             |            | 1500 (sqft)         |        |            |        |            | 1185 Btuh |
| Floors        | Type                                     |            |    |      |         | R-Value     |            | Size                |        | HTM        |        | Load       |           |
|               | Slab On Grade                            |            |    |      |         | 0.0         |            | 1500 (ft-perimeter) |        | 0.0        |        | 0 Btuh     |           |
| Floor Total   |                                          |            |    |      |         |             |            | 1500.0 (sqft)       |        |            |        |            | 0 Btuh    |
|               | Envelope Subtotal:                       |            |    |      |         |             |            |                     |        |            |        | 6311 Btuh  |           |
| Infiltration  | Type                                     |            |    |      |         | Average ACH |            | Volume(cuft)        |        | Wall Ratio |        | CFM=       | Load      |
|               | Natural                                  |            |    |      |         | 0.12        |            | 15000               |        | 1          |        | 30.3       | 632 Btuh  |
| Internal gain |                                          |            |    |      |         | Occupants   |            | Btuh/occupant       |        | Appliance  |        | Load       |           |
|               |                                          |            |    |      |         | 2           |            | X 230               | +      | 3200       |        | 3660 Btuh  |           |
|               | Sensible Envelope Load:                  |            |    |      |         |             |            |                     |        |            |        | 10602 Btuh |           |
| Duct load     | NA, Supply(R0.0-None), Return(R0.0-None) |            |    |      |         |             |            |                     |        |            |        | 0 Btuh     |           |
|               | Sensible Load All Zones                  |            |    |      |         |             |            |                     |        |            |        | 10602 Btuh |           |

# Manual J Summer Calculations

## Residential Load - Component Details (continued)

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

, FL

8/18/2023

### WHOLE HOUSE TOTALS

|                                   |                                                           |                   |
|-----------------------------------|-----------------------------------------------------------|-------------------|
| Whole House<br>Totals for Cooling | <b>Sensible Envelope Load All Zones</b>                   | <b>10602 Btuh</b> |
|                                   | Sensible Duct Load                                        | 0 Btuh            |
|                                   | <b>Total Sensible Zone Loads</b>                          | <b>10602 Btuh</b> |
|                                   | Sensible ventilation (Ex:0 cfm; Sup:0 cfm)                | 0 Btuh            |
|                                   | Blower                                                    | 0 Btuh            |
|                                   | <b>Total sensible gain</b>                                | <b>10602 Btuh</b> |
|                                   | Latent infiltration gain (for 51 gr. humidity difference) | 1048 Btuh         |
|                                   | Latent ventilation gain                                   | 0 Btuh            |
|                                   | Latent duct gain                                          | 0 Btuh            |
|                                   | Latent occupant gain (2.0 people @ 200 Btuh per person)   | 400 Btuh          |
|                                   | Latent other gain                                         | 0 Btuh            |
|                                   | <b>Latent total gain</b>                                  | <b>1448 Btuh</b>  |
|                                   | <b>TOTAL GAIN</b>                                         | <b>12050 Btuh</b> |

### EQUIPMENT

|                 |   |            |
|-----------------|---|------------|
| 1. Central Unit | # | 36000 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

, FL

Project Title:  
Cruce Residence  
Building Type: User

8/18/2023

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                   | 6.0              |      | 10.4           | 62 Btuh    |
| 2                               | 2, NFRC 0.20                 | Vinyl      | 0.26    | N                   | 9.0              |      | 10.4           | 94 Btuh    |
| 3                               | 2, NFRC 0.20                 | Vinyl      | 0.26    | E                   | 6.0              |      | 10.4           | 62 Btuh    |
| 4                               | 2, NFRC 0.20                 | Vinyl      | 0.26    | E                   | 30.0             |      | 10.4           | 312 Btuh   |
| 5                               | 2, NFRC 0.20                 | Vinyl      | 0.26    | S                   | 30.0             |      | 10.4           | 312 Btuh   |
| 6                               | 2, NFRC 0.20                 | Vinyl      | 0.26    | S                   | 9.0              |      | 10.4           | 94 Btuh    |
| 7                               | 2, NFRC 0.20                 | Vinyl      | 0.26    | W                   | 15.0             |      | 10.4           | 156 Btuh   |
|                                 | Window Total                 |            |         |                     | 105.0(sqft)      |      |                | 1092 Btuh  |
| Walls                           | Type                         | Ornt.      | Ueff.   | R-Value<br>(Cav/Sh) | Area             | X    | HTM=           | Load       |
| 1                               | Frame - Wood                 | - Ext      | (0.077) | 19.0/0.0            | 265              |      | 3.09           | 819 Btuh   |
| 2                               | Frame - Wood                 | - Ext      | (0.077) | 19.0/0.0            | 564              |      | 3.09           | 1743 Btuh  |
| 3                               | Frame - Wood                 | - Ext      | (0.077) | 19.0/0.0            | 228              |      | 3.09           | 704 Btuh   |
| 4                               | Frame - Wood                 | - Ext      | (0.077) | 19.0/0.0            | 465              |      | 3.09           | 1437 Btuh  |
|                                 | Wall Total                   |            |         |                     | 1522(sqft)       |      |                | 4703 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) |                     | 33               |      | 16.0           | 533 Btuh   |
| 3                               | Insulated - Exterior, n      |            | (0.400) |                     | 20               |      | 16.0           | 320 Btuh   |
|                                 | Door Total                   |            |         |                     | 73(sqft)         |      |                | 1173Btuh   |
| Ceilings                        | Type/Color/Surface           |            | Ueff.   | R-Value             | Area             | X    | HTM=           | Load       |
| 1                               | Single as/L/Metal            |            | (0.034) | 30.0/0.0            | 1500             |      | 1.4            | 2040 Btuh  |
|                                 | Ceiling Total                |            |         |                     | 1500(sqft)       |      |                | 2040Btuh   |
| Floors                          | Type                         |            | Ueff.   | R-Value             | Size             | X    | HTM=           | Load       |
| 1                               | Slab On Grade                |            | (1.180) | 0.0                 | 160.0 ft(perim.) |      | 47.2           | 7552 Btuh  |
|                                 | Floor Total                  |            |         |                     | 1500 sqft        |      |                | 7552 Btuh  |
|                                 | Envelope Subtotal:           |            |         |                     |                  |      |                | 16561 Btuh |
| Infiltration                    | Type                         | Wholehouse | ACH     | Volume(cuft)        | Wall Ratio       | CFM= |                |            |
|                                 | Natural                      |            | 0.16    | 15000               | 1.00             | 40.4 |                | 1773 Btuh  |
| Duct load                       | NA, R0.0, Supply(), Return() |            |         |                     |                  |      | (DLM of 0.000) | 0 Btuh     |
| All Zones                       | Sensible Subtotal All Zones  |            |         |                     |                  |      |                | 18334 Btuh |

# Manual J Winter Calculations

## Residential Load - Component Details (continued)

, FL

Project Title:  
Cruce Residence  
Building Type: User

8/18/2023

### WHOLE HOUSE TOTALS

|                           |                                                   |            |
|---------------------------|---------------------------------------------------|------------|
| <b>Totals for Heating</b> | Subtotal Sensible Heat Loss                       | 18334 Btuh |
|                           | Ventilation Sens. Heat Loss (Ex:0 cfm; Sup:0 cfm) | 0 Btuh     |
|                           | Total Heat Loss                                   | 18334 Btuh |

### EQUIPMENT

|                       |   |            |
|-----------------------|---|------------|
| 1. Electric Heat Pump | # | 36000 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