

# Residential System Sizing Calculation

## Summary

Project Title:  
Meredith Residence

, FL

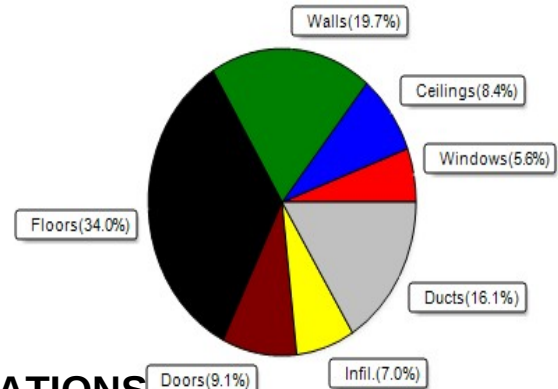
9/7/2023

|                                                                                                       |                   |                                       |                    |
|-------------------------------------------------------------------------------------------------------|-------------------|---------------------------------------|--------------------|
| 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>36113 Btuh</b> | <b>Total cooling load calculation</b> | <b>29072 Btuh</b>  |
| Submitted heating capacity                                                                            | % of calc Btuh    | Submitted cooling capacity            | % of calc Btuh     |
| Total (Electric Heat Pump)                                                                            | 132.9 48000       | Sensible (SHR = 0.85)                 | 166.4 40800        |
| Heat Pump + Auxiliary(0.0kW)                                                                          | 132.9 48000       | Latent                                | 158.3 7200         |
|                                                                                                       |                   | <b>Total (Electric Heat Pump)</b>     | <b>165.1 48000</b> |

## WINTER CALCULATIONS

Winter Heating Load (for 2384 sqft)

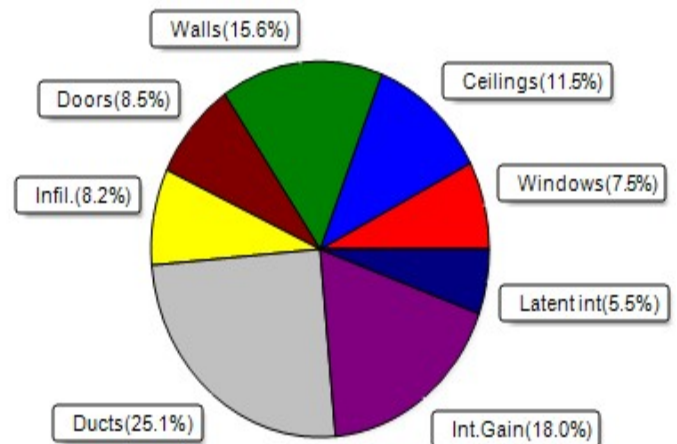
| Load component                  | Load              |
|---------------------------------|-------------------|
| Window total 196 sqft           | 2038 Btuh         |
| Wall total 2008 sqft            | 7129 Btuh         |
| Door total 206 sqft             | 3292 Btuh         |
| Ceiling total 2384 sqft         | 3037 Btuh         |
| Floor total 2384 sqft           | 12272 Btuh        |
| Infiltration 57 cfm             | 2521 Btuh         |
| Duct loss                       | 5823 Btuh         |
| <b>Subtotal</b>                 | <b>36113 Btuh</b> |
| Ventilation Ex:0 cfm; Sup:0 cfm | 0 Btuh            |
| <b>TOTAL HEAT LOSS</b>          | <b>36113 Btuh</b> |



## SUMMER CALCULATIONS

Summer Cooling Load (for 2384 sqft)

| Load component                        | Load              |
|---------------------------------------|-------------------|
| Window total 196 sqft                 | 2185 Btuh         |
| Wall total 2008 sqft                  | 4545 Btuh         |
| Door total 206 sqft                   | 2469 Btuh         |
| Ceiling total 2384 sqft               | 3341 Btuh         |
| Floor total                           | 0 Btuh            |
| Infiltration 43 cfm                   | 898 Btuh          |
| Internal gain                         | 5240 Btuh         |
| Duct gain                             | 5847 Btuh         |
| Sens.Ventilation Ex:0 cfm; Sup:0 cfm  | 0 Btuh            |
| Blower Load                           | 0 Btuh            |
| <b>Total sensible gain</b>            | <b>24525 Btuh</b> |
| Latent gain(ducts)                    | 1457 Btuh         |
| Latent gain(infiltration)             | 1490 Btuh         |
| Latent gain(ventilation)              | 0 Btuh            |
| Latent gain(internal/occupants/other) | 1600 Btuh         |
| <b>Total latent gain</b>              | <b>4547 Btuh</b>  |
| <b>TOTAL HEAT GAIN</b>                | <b>29072 Btuh</b> |



8th Edition

EnergyGauge® System Sizing

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

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

9-7-23

# System Sizing Calculations - Summer

## Residential Load - Whole House Component Details

Project Title:  
Meredith Residence

, FL

9/7/2023

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     | 54.0              | 0.0         | 54.0      | 9          | 9         | 494 Btuh |           |
| 2        | 2 NFRC                   | 0.20, 0.26  | No | No                  | N          | 1.5ft      | 2.3ft     | 16.0              | 0.0         | 16.0      | 9          | 9         | 146 Btuh |           |
| 3        | 2 NFRC                   | 0.20, 0.26  | No | No                  | E          | 1.5ft      | 2.3ft     | 18.0              | 0.0         | 18.0      | 9          | 24        | 436 Btuh |           |
| 4        | 2 NFRC                   | 0.20, 0.26  | No | No                  | S          | 1.5ft      | 2.3ft     | 6.0               | 6.0         | 0.0       | 9          | 11        | 55 Btuh  |           |
| 5        | 2 NFRC                   | 0.20, 0.26  | No | No                  | S          | 1.5ft      | 2.3ft     | 18.0              | 18.0        | 0.0       | 9          | 11        | 165 Btuh |           |
| 6        | 2 NFRC                   | 0.20, 0.26  | No | No                  | S          | 1.5ft      | 2.3ft     | 8.0               | 8.0         | 0.0       | 9          | 11        | 73 Btuh  |           |
| 7        | 2 NFRC                   | 0.20, 0.26  | No | No                  | S          | 1.5ft      | 2.3ft     | 36.0              | 36.0        | 0.0       | 9          | 11        | 329 Btuh |           |
| 8        | 2 NFRC                   | 0.20, 0.26  | No | No                  | S          | 1.5ft      | 2.3ft     | 8.0               | 8.0         | 0.0       | 9          | 11        | 73 Btuh  |           |
| 9        | 2 NFRC                   | 0.20, 0.26  | No | No                  | S          | 1.5ft      | 2.3ft     | 18.0              | 18.0        | 0.0       | 9          | 11        | 165 Btuh |           |
| 10       | 2 NFRC                   | 0.20, 0.26  | No | No                  | S          | 1.5ft      | 2.3ft     | 6.0               | 6.0         | 0.0       | 9          | 11        | 55 Btuh  |           |
| 11       | 2 NFRC                   | 0.20, 0.26  | No | No                  | W          | 1.5ft      | 2.3ft     | 8.0               | 0.0         | 8.0       | 9          | 24        | 194 Btuh |           |
|          | Window Total             |             |    |                     |            |            |           |                   | 196 (sqft)  |           |            |           |          | 2185 Btuh |
| Walls    | Type                     | U-Value     |    | R-Value             |            | Area(sqft) |           | HTM               |             | Load      |            |           |          |           |
|          |                          |             |    |                     | Cav/Sheath |            |           |                   |             |           |            |           |          |           |
| 1        | Frame - Wood - Ext       | 0.09        |    | 13.0/0.0            |            | 81.0       |           | 2.3               |             | 183 Btuh  |            |           |          |           |
| 2        | Frame - Wood - Ext       | 0.09        |    | 13.0/0.0            |            | 115.5      |           | 2.3               |             | 261 Btuh  |            |           |          |           |
| 3        | Frame - Wood - Ext       | 0.09        |    | 13.0/0.0            |            | 262.3      |           | 2.3               |             | 594 Btuh  |            |           |          |           |
| 4        | Frame - Wood - Ext       | 0.09        |    | 13.0/0.0            |            | 55.7       |           | 2.3               |             | 126 Btuh  |            |           |          |           |
| 5        | Frame - Wood - Ext       | 0.09        |    | 13.0/0.0            |            | 205.0      |           | 2.3               |             | 464 Btuh  |            |           |          |           |
| 6        | Frame - Wood - Ext       | 0.09        |    | 13.0/0.0            |            | 174.0      |           | 2.3               |             | 394 Btuh  |            |           |          |           |
| 7        | Frame - Wood - Ext       | 0.09        |    | 13.0/0.0            |            | 51.0       |           | 2.3               |             | 115 Btuh  |            |           |          |           |
| 8        | Frame - Wood - Ext       | 0.09        |    | 13.0/0.0            |            | 99.0       |           | 2.3               |             | 224 Btuh  |            |           |          |           |
| 9        | Frame - Wood - Ext       | 0.09        |    | 13.0/0.0            |            | 155.5      |           | 2.3               |             | 352 Btuh  |            |           |          |           |
| 10       | Frame - Wood - Ext       | 0.09        |    | 13.0/0.0            |            | 45.0       |           | 2.3               |             | 102 Btuh  |            |           |          |           |
| 11       | Frame - Wood - Ext       | 0.09        |    | 13.0/0.0            |            | 216.0      |           | 2.3               |             | 489 Btuh  |            |           |          |           |
| 12       | Frame - Wood - Ext       | 0.09        |    | 13.0/0.0            |            | 45.0       |           | 2.3               |             | 102 Btuh  |            |           |          |           |
| 13       | Frame - Wood - Ext       | 0.09        |    | 13.0/0.0            |            | 133.0      |           | 2.3               |             | 301 Btuh  |            |           |          |           |
| 14       | Frame - Wood - Ext       | 0.09        |    | 13.0/0.0            |            | 36.0       |           | 2.3               |             | 81 Btuh   |            |           |          |           |
| 15       | Frame - Wood - Ext       | 0.09        |    | 13.0/0.0            |            | 45.0       |           | 2.3               |             | 102 Btuh  |            |           |          |           |
| 16       | Frame - Wood - Ext       | 0.09        |    | 13.0/0.0            |            | 289.0      |           | 2.3               |             | 654 Btuh  |            |           |          |           |
|          | Wall Total               |             |    |                     |            |            |           |                   | 2008 (sqft) |           |            | 4545 Btuh |          |           |
| Doors    | Type                     | Area (sqft) |    | HTM                 |            | Load       |           |                   |             |           |            |           |          |           |
|          |                          |             |    |                     |            |            |           |                   |             |           |            |           |          |           |
| 1        | Insulated - Exterior     | 120.0       |    | 12.0                |            | 1440 Btuh  |           |                   |             |           |            |           |          |           |
| 2        | Insulated - Exterior     | 17.8        |    | 12.0                |            | 213 Btuh   |           |                   |             |           |            |           |          |           |
| 3        | Insulated - Exterior     | 20.0        |    | 12.0                |            | 240 Btuh   |           |                   |             |           |            |           |          |           |
| 4        | Insulated - Exterior     | 48.0        |    | 12.0                |            | 576 Btuh   |           |                   |             |           |            |           |          |           |
|          | Door Total               |             |    |                     |            | 206 (sqft) | 2469 Btuh |                   |             |           |            |           |          |           |
| Ceilings | Type/Color/Surface       | U-Value     |    | R-Value             |            | Area(sqft) |           | HTM               |             | Load      |            |           |          |           |
|          |                          |             |    |                     |            |            |           |                   |             |           |            |           |          |           |
| 1        | Vented Attic/Med/Shingle | 0.032       |    | 30.0/0.0            |            | 2384.0     |           | 1.40              |             | 3341 Btuh |            |           |          |           |
|          | Ceiling Total            |             |    |                     |            |            |           |                   | 3341 Btuh   |           |            |           |          |           |
| Floors   | Type                     | R-Value     |    | Size                |            | HTM        |           | Load              |             |           |            |           |          |           |
|          |                          |             |    |                     |            |            |           |                   |             |           |            |           |          |           |
| 1        | Slab On Grade            | 0.0         |    | 2384 (ft-perimeter) |            | 0.0        |           | 0 Btuh            |             |           |            |           |          |           |
|          | Floor Total              |             |    |                     |            |            |           |                   | 0 Btuh      |           |            |           |          |           |
|          | Envelope Subtotal:       |             |    |                     |            |            |           |                   |             |           | 12540 Btuh |           |          |           |

# Manual J Summer Calculations

## Residential Load - Component Details (continued)

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

, FL

9/7/2023

|                      |                                                                       |                     |                        |                 |              |                   |
|----------------------|-----------------------------------------------------------------------|---------------------|------------------------|-----------------|--------------|-------------------|
| <b>Infiltration</b>  | Type<br>Natural                                                       | Average ACH<br>0.12 | Volume(cuft)<br>21456  | Wall Ratio<br>1 | CFM=<br>43.1 | Load<br>898 Btuh  |
| <b>Internal gain</b> |                                                                       | Occupants<br>8      | Btuh/occupant<br>X 230 | Appliance<br>+  | 3400         | Load<br>5240 Btuh |
|                      | Sensible Envelope Load:                                               |                     |                        |                 |              | 18678 Btuh        |
| <b>Duct load</b>     | Average sealed, Supply(R6.0-Attic), Return(R6.0-Attic) (DGM of 0.313) |                     |                        |                 |              | 5847 Btuh         |
|                      | <b>Sensible Load All Zones</b>                                        |                     |                        |                 |              | <b>24525 Btuh</b> |

# Manual J Summer Calculations

## Residential Load - Component Details (continued)

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

, FL

9/7/2023

### WHOLE HOUSE TOTALS

|                                           |                                                           |                   |
|-------------------------------------------|-----------------------------------------------------------|-------------------|
| <b>Whole House<br/>Totals for Cooling</b> | <b>Sensible Envelope Load All Zones</b>                   | <b>18678 Btuh</b> |
|                                           | Sensible Duct Load                                        | 5847 Btuh         |
|                                           | <b>Total Sensible Zone Loads</b>                          | <b>24525 Btuh</b> |
|                                           | Sensible ventilation (Ex:0 cfm; Sup:0 cfm)                | 0 Btuh            |
|                                           | Blower                                                    | 0 Btuh            |
|                                           | <b>Total sensible gain</b>                                | <b>24525 Btuh</b> |
|                                           | Latent infiltration gain (for 51 gr. humidity difference) | 1490 Btuh         |
|                                           | Latent ventilation gain                                   | 0 Btuh            |
|                                           | Latent duct gain                                          | 1457 Btuh         |
|                                           | Latent occupant gain (8.0 people @ 200 Btuh per person)   | 1600 Btuh         |
|                                           | Latent other gain                                         | 0 Btuh            |
|                                           | <b>Latent total gain</b>                                  | <b>4547 Btuh</b>  |
|                                           | <b>TOTAL GAIN</b>                                         | <b>29072 Btuh</b> |

### EQUIPMENT

|                 |   |            |
|-----------------|---|------------|
| 1. Central Unit | # | 48000 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:  
Meredith Residence  
Building Type: User

, FL

9/7/2023

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                   | 54.0        |   | 10.4 | 562 Btuh  |
| 2                               | 2, NFRC 0.20            | Vinyl | 0.26    | N                   | 16.0        |   | 10.4 | 166 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                   | 6.0         |   | 10.4 | 62 Btuh   |
| 5                               | 2, NFRC 0.20            | Vinyl | 0.26    | S                   | 18.0        |   | 10.4 | 187 Btuh  |
| 6                               | 2, NFRC 0.20            | Vinyl | 0.26    | S                   | 8.0         |   | 10.4 | 83 Btuh   |
| 7                               | 2, NFRC 0.20            | Vinyl | 0.26    | S                   | 36.0        |   | 10.4 | 374 Btuh  |
| 8                               | 2, NFRC 0.20            | Vinyl | 0.26    | S                   | 8.0         |   | 10.4 | 83 Btuh   |
| 9                               | 2, NFRC 0.20            | Vinyl | 0.26    | S                   | 18.0        |   | 10.4 | 187 Btuh  |
| 10                              | 2, NFRC 0.20            | Vinyl | 0.26    | S                   | 6.0         |   | 10.4 | 62 Btuh   |
| 11                              | 2, NFRC 0.20            | Vinyl | 0.26    | W                   | 8.0         |   | 10.4 | 83 Btuh   |
| Window Total                    |                         |       |         |                     | 196.0(sqft) |   |      | 2038 Btuh |
| Walls                           | Type                    | Ornt. | Ueff.   | R-Value<br>(Cav/Sh) | Area        | X | HTM= | Load      |
| 1                               | Frame - Wood            | - Ext | (0.089) | 13.0/0.0            | 81          |   | 3.55 | 288 Btuh  |
| 2                               | Frame - Wood            | - Ext | (0.089) | 13.0/0.0            | 116         |   | 3.55 | 410 Btuh  |
| 3                               | Frame - Wood            | - Ext | (0.089) | 13.0/0.0            | 262         |   | 3.55 | 931 Btuh  |
| 4                               | Frame - Wood            | - Ext | (0.089) | 13.0/0.0            | 56          |   | 3.55 | 198 Btuh  |
| 5                               | Frame - Wood            | - Ext | (0.089) | 13.0/0.0            | 205         |   | 3.55 | 728 Btuh  |
| 6                               | Frame - Wood            | - Ext | (0.089) | 13.0/0.0            | 174         |   | 3.55 | 618 Btuh  |
| 7                               | Frame - Wood            | - Ext | (0.089) | 13.0/0.0            | 51          |   | 3.55 | 181 Btuh  |
| 8                               | Frame - Wood            | - Ext | (0.089) | 13.0/0.0            | 99          |   | 3.55 | 351 Btuh  |
| 9                               | Frame - Wood            | - Ext | (0.089) | 13.0/0.0            | 156         |   | 3.55 | 552 Btuh  |
| 10                              | Frame - Wood            | - Ext | (0.089) | 13.0/0.0            | 45          |   | 3.55 | 160 Btuh  |
| 11                              | Frame - Wood            | - Ext | (0.089) | 13.0/0.0            | 216         |   | 3.55 | 767 Btuh  |
| 12                              | Frame - Wood            | - Ext | (0.089) | 13.0/0.0            | 45          |   | 3.55 | 160 Btuh  |
| 13                              | Frame - Wood            | - Ext | (0.089) | 13.0/0.0            | 133         |   | 3.55 | 472 Btuh  |
| 14                              | Frame - Wood            | - Ext | (0.089) | 13.0/0.0            | 36          |   | 3.55 | 128 Btuh  |
| 15                              | Frame - Wood            | - Ext | (0.089) | 13.0/0.0            | 45          |   | 3.55 | 160 Btuh  |
| 16                              | Frame - Wood            | - Ext | (0.089) | 13.0/0.0            | 289         |   | 3.55 | 1026 Btuh |
| Wall Total                      |                         |       |         |                     | 2008(sqft)  |   |      | 7129 Btuh |
| Doors                           | Type                    | Storm | Ueff.   |                     | Area        | X | HTM= | Load      |
| 1                               | Insulated - Exterior, n |       | (0.400) |                     | 120         |   | 16.0 | 1920 Btuh |
| 2                               | Insulated - Exterior, n |       | (0.400) |                     | 18          |   | 16.0 | 284 Btuh  |
| 3                               | Insulated - Exterior, n |       | (0.400) |                     | 20          |   | 16.0 | 320 Btuh  |
| 4                               | Insulated - Exterior, n |       | (0.400) |                     | 48          |   | 16.0 | 768 Btuh  |
| Door Total                      |                         |       |         |                     | 206(sqft)   |   |      | 3292Btuh  |
| Ceilings                        | Type/Color/Surface      |       | Ueff.   | R-Value             | Area        | X | HTM= | Load      |
| 1                               | Flat ceil/M/Shing       |       | (0.032) | 30.0/0.0            | 2384        |   | 1.3  | 3037 Btuh |
| Ceiling Total                   |                         |       |         |                     | 2384(sqft)  |   |      | 3037Btuh  |

# Manual J Winter Calculations

## Residential Load - Component Details (continued)

, FL

Project Title:  
Meredith Residence  
Building Type: User

9/7/2023

|                     |                                                               |                        |                       |                                         |              |                                  |
|---------------------|---------------------------------------------------------------|------------------------|-----------------------|-----------------------------------------|--------------|----------------------------------|
| <b>Floors</b><br>1  | Type<br>Slab On Grade<br>Floor Total                          | Ueff.<br>(1.180)       | R-Value<br>0.0        | Size X<br>260.0 ft(perim.)<br>2384 sqft | HTM=<br>47.2 | Load<br>12272 Btuh<br>12272 Btuh |
|                     | Envelope Subtotal:                                            |                        |                       |                                         |              | 27769 Btuh                       |
| <b>Infiltration</b> | Type<br>Natural                                               | Wholehouse ACH<br>0.16 | Volume(cuft)<br>21456 | Wall Ratio<br>1.00                      | CFM=<br>57.5 | 2521 Btuh                        |
| <b>Duct load</b>    | Average sealed, R6.0, Supply(Att), Return(Att) (DLM of 0.192) |                        |                       |                                         |              | 5823 Btuh                        |
| <b>All Zones</b>    | Sensible Subtotal All Zones                                   |                        |                       |                                         |              | <b>36113 Btuh</b>                |

### WHOLE HOUSE TOTALS

|                           |                                                                               |                       |                                    |
|---------------------------|-------------------------------------------------------------------------------|-----------------------|------------------------------------|
| <b>Totals for Heating</b> | Subtotal Sensible Heat Loss<br>Ventilation Sens. Heat Loss<br>Total Heat Loss | (Ex:0 cfm; Sup:0 cfm) | 36113 Btuh<br>0 Btuh<br>36113 Btuh |
|---------------------------|-------------------------------------------------------------------------------|-----------------------|------------------------------------|

### EQUIPMENT

|                       |   |            |
|-----------------------|---|------------|
| 1. Electric Heat Pump | # | 48000 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