

DETAILED Step By Step for Kwik Model® with EnergyGauge® Loads

- Start Kwik Model
 - Read and accept EULA

- A. Project Tab
 1. Enter Project Name. This is required
 2. Enter other information, as needed. This is just informational data. The design city will be specified in EnergyGauge.
 3. “CondFloorPlansArea” is what you expect the floor area to be, based on the architectural plans or other information. “From Drawing” shows the conditioned floor area of the Kwik Model 3D house. When you are done building the house. These two numbers should be close to each other.

- B. Libraries Tab
 1. Specify your default surface types in each table. Modify one of the rows as needed, highlight it, then click “Set Type as Default” and it will have a green highlight.
 - Make sure the name is accurately representative of the surface. Avoid using performance values in the name that might change (U-factor, SHGC, R-value, etc.). It can lead to confusion if the name is not reflective of the accurate performance values. (e.g., calling a wall “R-13Wall” but the performance value is set to R-19.)
 - Each new surface created will be of the default type. You can change this at any time.
 - You can go in and change individual surfaces later. If you modify the information in a row, all surfaces with that name type will reflect those changes.
 - If you change the type name, surfaces with the old type name will be assigned the new type name and any other changes.
 - If you delete a type, surfaces of that type will be changed to the default.
 - You cannot delete the row designated as the default, unless you make a different row the default.
 - Note that on a multi story house, you will probably want to change the default floor type after you complete the first floor.

- C. Floor Plan Tab
 1. Elevations
 - a. Start with first floor. Avoid changing these values after you have placed rooms. It can cause rooms not to align properly. Room ceiling heights can be changed individually on each room by dragging the green handle.
 - b. Set default floor thicknesses (default = 0.5’)
 1. Slab on grade, use 0.5’ (6”)
 2. Floor over crawlspace, use height of crawlspace plus height of floor framing (typically 1’) or just use height of floor framing.
 3. 2nd and 3rd level floors, use height of floor framing
 - c. Set default room height, aka plate height (default = 8’)
 - d. Set default roof truss heal height (default = 0’) Note: raised heal trusses are not common.
 2. Import Floor Plan – select file.
 3. Scale Floor Plan. We recommend using 2D mode and Top view for this step.

- a. Scale left to right by aligning the ends of the red arrow with some known dimension. (longer dimensions are more accurate)
 - b. Scale top to bottom. Repeat previous step with blue arrow.
 - c. Double-check any dimensions with yellow ruler arrows. Adjust as necessary.
4. Move Floor Plan – line up a main reference corner of house with grid
 5. Set orientation by dragging North arrow to correct position.
- D. Rooms Tab
1. Start on lowest story (turn off other stories using view controls in bottom right corner of screen)
 2. Place boxes to cover all rooms, vaulted ceilings, etc.
 3. Group boxes into rooms (each room will need at least one register, spaces without a register such as closets and hallways will need to be grouped with a room)
 4. Indicate any **unconditioned** rooms (e.g., garage)
 5. For below grade rooms, create “Earth” boxes adjacent to them.
 6. “Check Alignment” will check for boxes that are very close, but not touching. Adjust as necessary.
- E. Windows Tab
1. Place all windows, skylights and exterior doors

<<Repeat steps C – E for additional stories (floors)>>

- F. HVAC Draw Tab
1. Place at least one air handler
 2. If you place more than one air handler, you will need to assign rooms to the appropriate “System/Block” in the “Rooms” table.
- G. Roof Tab
1. Place roofs as needed. This is **Optional**. Currently roofs are only visual and do not affect any calculations.
- H. Data Tab
1. Go to “Rooms” Table first.
 - a. Name all rooms, which can consist of one or more grouped boxes.
 - b. Double check that all boxes are associated with a named room. (Unconditioned rooms do not show in table unless the “unconditioned” box is checked at bottom of table.)
 - c. If more than one air handler was placed, assign rooms to air handlers in “System/Block” column (air handler names can be changed in the “Systems/Block” table)
 - d. Assign a “Room Type” to each room. New types can be created in “Library” tab. Only kitchens and bedrooms affect loads. All other rooms can be “Other”.
 - e. Enter # of occupants in each room (Used for internal cooling loads. Total number of people typically equals number of bedrooms plus 1. Put people where they are likely to be during the late afternoon. Family room, kitchen, etc.)
 2. Windows Table
 - a. Window names can be changed, if desired. Default names are F = front, L = left, B = Back, R = right, BR = back right, etc.

- b. Assign window Types, as needed. New types can be created in “Library” mode.
 - c. Double check windows against plans. Windows have a very big impact on load calculations.
 - 3. Walls Table
 - a. Wall names can be changed, if desired.
 - b. Assign wall Types, as needed. New types can be created in “Library” mode.
 - c. Double check walls against plans.
 - 4. Doors Table
 - a. Doors names can be changed, if desired.
 - b. Assign Doors Types, as needed. New types can be created in “Library” mode.
 - c. Double check Doors against plans.
 - 5. Ceilings Table
 - a. Ceilings names can be changed, if desired.
 - b. Assign Ceilings Types, as needed. New types can be created in “Library” mode.
 - c. Double check Ceilings against plans.
 - 6. Floors Table
 - a. Floors names can be changed, if desired.
 - b. Assign Floors Types, as needed. New types can be created in “Library” mode.
 - c. Double check Floors against plans.
- I. Energy Gauge Loads – This button opens “EnergyGauge Loads” NOTE: Occasionally, EnergyGauge will not completely close and may cause I/O errors. This can usually be resolved by going into “Task Manager” (CTRL-ALT-DEL) and closing EnergyGauge (End Task) and starting it again from Kwik Model.
 - 1. Confirm that you want to save your work to this point.
 - 2. Save it under the same name or a new name. A new name will create a new project folder under the current project folder. It is recommended that if you change the name, go up one folder level first (parent folder of current folder).
 - 3. Click “Change Climate”
 - a. Select State
 - b. Select City that is closest to location of project
 - c. Confirm design conditions with the local jurisdiction having authority.
 - d. Click “Return to MJ System Loads and Inputs”
 - 4. Click “Change Cooling” Note: “Systems/blocks” created in Kwik Model are called “Blocks” in EnergyGauge. A block is a group of rooms or spaces that is served by a single system, therefore a system name and a block name are essentially synonymous. EnergyGauge can handle up to five blocks. Houses with more than 5 systems may need multiple files for different parts of the house, each with 5 or less systems.
 - a. Add a cooling system by clicking the red “+”.
 - b. Select “Type”
 - c. Select “Subtype”, if needed
 - d. Select the block served by this cooling system (top right corner of screen)
 - e. Check box if cooling system is ductless.

- f. Select compressor type from drop down list
- g. Click "Return to System Loads and Inputs"
- 5. Click "Change Heating"
 - a. Add a heating system by clicking the red "+".
 - b. Select "Type"
 - c. Select "Subtype", if needed
 - d. Select the block served by this heating system (top right corner of screen)
 - e. Check box if heating system is ductless.
 - f. Click "Return to System Loads and Inputs"
- 6. Click "Change Ducts"
 - a. Add a duct system by clicking the red "+".
 - b. Specify supply and return duct R-values
 - c. Specify supply and return duct locations
 - d. Specify air handler location
 - e. Specify duct condition
 - f. Specify a leakage type.
 - g. Assign duct system to a heating system and a cooling system
 - h. Indicate blower heat added to air stream (usually not needed)
 - i. Click "Return to System Loads and Inputs"
- 7. Click "Mechanical Ventilation"
 - a. Add a mechanical ventilation system by clicking the red "+".
 - b. Specify type and complete all infor as needed.
 - c. Specify which block is served by this mechanical system.
 - d. Click "Return to System Loads and Inputs"
- 8. Confirm set points (68 and 75 are standard)
- 9. Confirm Infiltration method (Default is recommended)
- 10. Confirm window peak load option (summer is recommended)
- 11. Confirm Internal Gains (leave checked)
- 12. Click "Calculate ACCA MJ8 Loads"
 - a. A summary page of the **total house** loads opens up
 - b. Click on "Reports" tab at top. Review all reports.
- 13. Click "Continue to Manual S Equipment Selection ==>" – this opens a Manual S summary showing all systems/blocks
- 14. Click "Edit Block 1" under step 2
 - a. Review Outdoor Conditions
 - b. Review Room Conditions
 - c. Review Manual J Design Loads
 - d. Review heating and cooling targets
 - e. Check box accepting responsibility to determine correct performance values for equipment to be selected.
 - f. Click "+ Step 2. AHRI Heating and Cooling Equipment"
 - 1. Select equipment according to Manual S
 - 2. Enter AHRI number (use 0000000 if generic)
 - 3. Enter other equipment information, if known
 - g. Click "+ Step 3. AHRI Heating and Cooling Capacities and Efficiencies at AHRI Test Conditions"
 - 1. Enter information, if known
 - h. Click "+ Step 4. HVAC Fan Specifications"

1. Indicate fan type
 2. Indicate fan speed for heating
 3. Indicate fan speed for cooling
 4. Enter HVAC fan airflow for heating
 5. Enter HVAC fan airflow for cooling
 6. Enter external static pressure for heating
 7. Enter external static pressure for cooling
 - i. Click "+ Step 5. Estimate Airflow Temperatures entering equipment"
 1. Enter values or click show suggestions/use suggestions
 - j. Click "+ Step 6. OEM Specs at Design Conditions"
 1. Enter values, if known.
 - k. Click "+ Step 7. Print Manual S Report"
 1. Review and revise if needed.
 2. Exit by clicking "X Quit"
 - l. Click "Close/Return"
 1. Confirm that data entered will be used for equipment previously entered.
 - m. Repeat this section for other systems, if any.
 - n. Click "<= Close Page/Return to Manual S Overview"
 15. Click "^ Save Work and Return to Kwik Model"
 16. Click "Save and Return to Kwik Model"
 17. Click "OK"
- J. You will return to the Data Tab
1. Go to Rooms Table.
 - a. Confirm that room loads and room airflows look reasonable.
- K. Duct Draw Mode
1. Place at least one register in every room. If more than one in a room, airflow will be split evenly. Change register size, if desired. (has no effect on calculations)
 2. Place at least one return grille. If more that one return in system, supply registers will need to be assigned to a return grille in duct table. Change size, if desired. (has no effect on calculations)
 3. Draw ducts.
- L. Friction Rate Mode
1. Use TEL table to calculate total equivalent lengths. Kwik Model will automatically fill this table in based on how the ducts are drawn, but you need to confirm that the values used are correct. You can edit these values. You can also enter additional miscellaneous equivalent lengths in the row called "Extra Effective Length".
 2. Use Friction rate table to calculate friction rate.
 - a. The ESP and CFM you entered in the "+ Step 4. HVAC Fan Specifications" part of Manual S shows up here.
 - b. Step 2: enter all of the static pressure drops
 - c. The friction rate will be automatically calculated.
 - d. You can check the box to use the worst case TEL for all runs (not recommended)
 - e. You can look at the friction rate calculation for each run by selecting it in the drop down menu.
- M. Data Tab

1. Go to Duct table
 - a. If more than one return was drawn, assign supply branches to returns.
 - b. Assign duct types. New types can be created in “Library” mode.
 - c. If there is more than one system, other systems can be viewed by selecting system in drop down menu at bottom of table.
 - d. Click “Auto Size Ducts”. Duct sizes will change in table. Ducts will be drawn to scale in drawing.
 - e. If you get an error about the friction rate being too high or too low, you will have to adjust the static pressure drops or the equivalent lengths.

Review everything! Recalculate loads and resize ducts if you make **any** changes.

Step By Step for Kwik Model with EnergyGauge Loads

- Start Kwik Model
 - A. Project Tab
 1. Enter Project Name. This is required
 2. Enter other information, as needed.
 3. Enter “CondFloorPlansArea”
 - B. Libraries Tab
 1. Specify your default surface types in each table.
 - C. Floor Plan Tab
 1. Elevations
 - a. Start with first floor.
 - b. Set default floor thicknesses (default = 0.5’)
 2. Import Floor Plan – select file.
 3. Scale Floor Plan.
 - a. Scale left to right
 - b. Scale top to bottom.
 - c. Double-check dimensions with yellow ruler arrows.
 4. Move Floor Plan as needed
 5. Set orientation by dragging North arrow to correct position.
 - D. Rooms Tab
 1. Start on lowest story
 2. Place boxes to cover all rooms, vaulted ceilings, etc.
 3. Group boxes into rooms
 4. Indicate any **unconditioned** rooms (e.g., garage)
 5. For below grade rooms, create “Earth” boxes adjacent to them.
 6. Click “Check Alignment”
 - E. Windows Tab
 1. Place all windows, skylights and exterior doors
- <<Repeat steps C – E for additional stories (floors)>>
- F. HVAC Draw Tab
 1. Place at least one air handler
 - G. Roof Tab
 1. Place roofs as needed. This is **Optional**.
 - H. Data Tab
 1. Go to “Rooms” Table.
 - a. Name all rooms
 - b. Double check that all boxes are associated with a named room.
 - c. If more than one air handler was placed, assign rooms to air handlers in “System/Block” column
 - d. Assign a “Room Type” to each room.
 - e. Enter # of occupants in each room
 2. Windows Table
 - a. Window names can be changed, if desired.
 - b. Assign window Types, as needed.
 - c. Double check windows against plans.
 3. Walls Table
 - a. Wall names can be changed, if desired.
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 - a. Doors names can be changed, if desired.
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 - a. Ceilings names can be changed, if desired.
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- I. Energy Gauge Loads – This button is only visible in “Data Mode”.
 1. Confirm that you want to save your work to this point.
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 - d. Click “Return to MJ System Loads and Inputs”
 4. Click “Change Cooling”
 - a. Add a cooling system by clicking the red “+”.
 - b. Select “Type”
 - c. Select “Subtype”, if needed
 - d. Select the block served by this cooling system (top right corner of screen)
 - e. Check box if cooling system is ductless.
 - f. Select compressor type from drop down list
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14. Click "Edit Block 1" under step 2
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