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## Introduction

RHEIA Verify is a web-enabled phone app which walks a service technician through the verification and airflow balancing of a Rheia HVAC system.

## Key Concepts – Value and Function

- RHEIA Verify is a quality control application to maximize consistency and clearly document results.

## Roles

### Technician

An HVAC service technician will be responsible to complete the Verify process for each Rheia home. Tasks include setting the balancing dampers, and verifying system parameters. The technician is essentially “Signing Off” that an installed system is performing according to the intent of the designer.

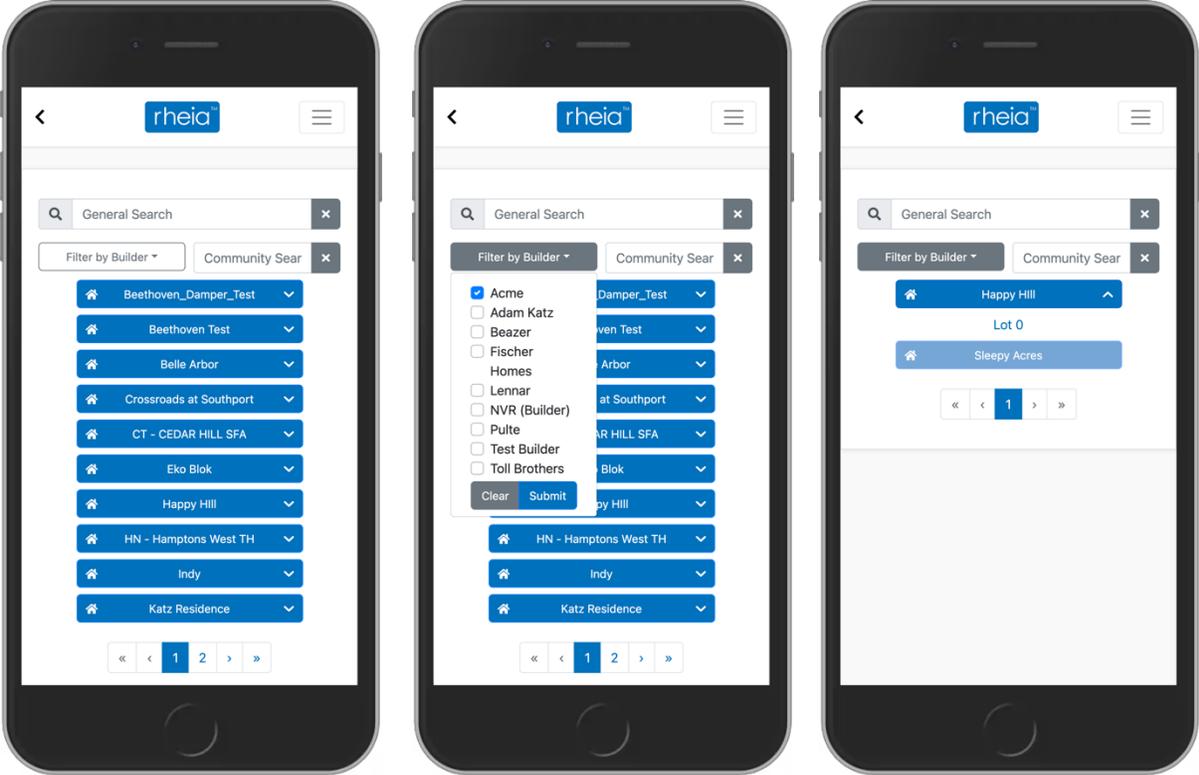
## Process

### 1. Select the Lot

The property search screen is used to locate the lot being commissioned. The technician will see a search bar at the top of the screen and if they know the name of the community or builder they can type that in to filter the results below. Optionally, they can filter by builders or search by community name with the fields below the general search bar.

Note: If the technician has not yet been added to an organization, the administrator will need to add the user so they can see their lots.

1. After filtering the list, the technician can select the community and it will expand to show the lots within that community.
2. Locate the lot where commissioning is focused and the app will proceed to the next screen.
  - a. If unable to find the lot, reach out to the design manager who is responsible for inputting the data.



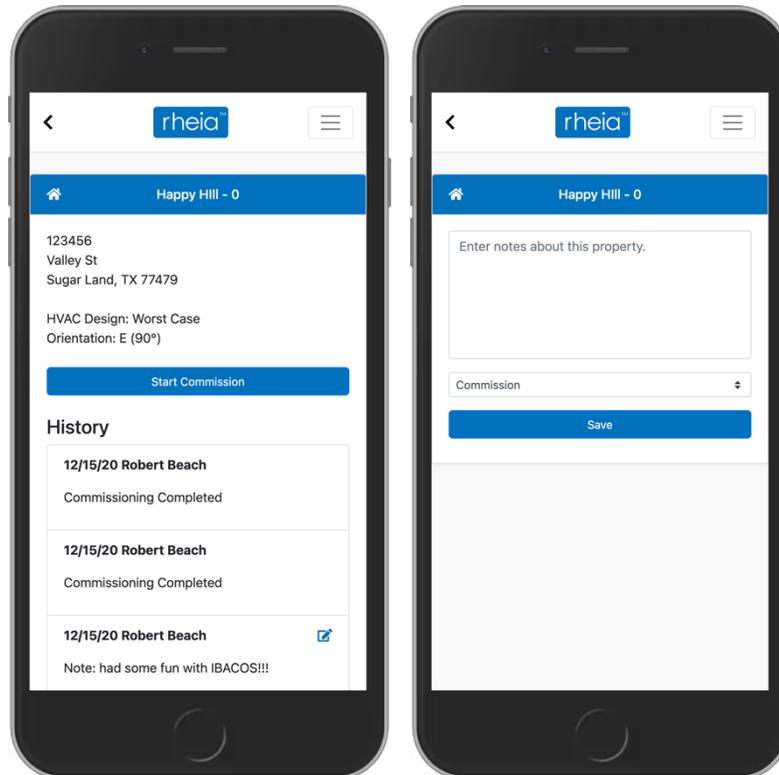
### 2. Verify Lot Parameters

Once a lot is selected, a summary screen will appear. This screen summarizes the basic information about the lot and all information should be confirmed before proceeding.

1. Confirm the information displayed is accurate.

2. The technician can add notes by clicking on 'Add Notes' at the bottom of the screen. Any notes information will be stored for future reference.
3. Once the information is verified, click "Start Commission" to proceed to the next step.

*Note: All subsequent steps must be completed for each system in the home.*

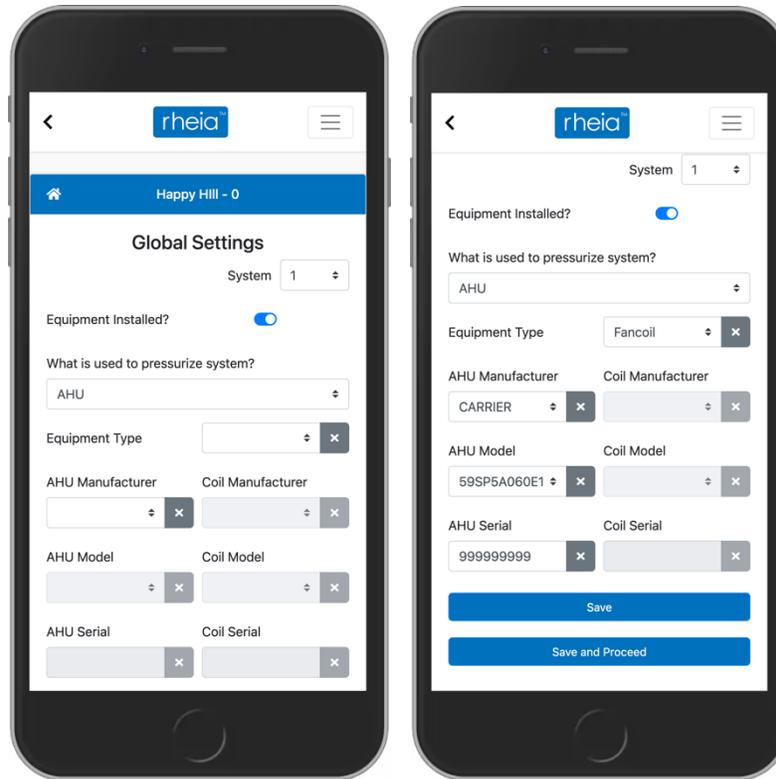


### 3. Global Settings – Equipment

In this screen the task is to review and verify the existing equipment that is installed (if applicable).

When there are two systems, pull down in the upper right of the screen is used to select the system being verified. All subsequent steps will need to be completed for each system.

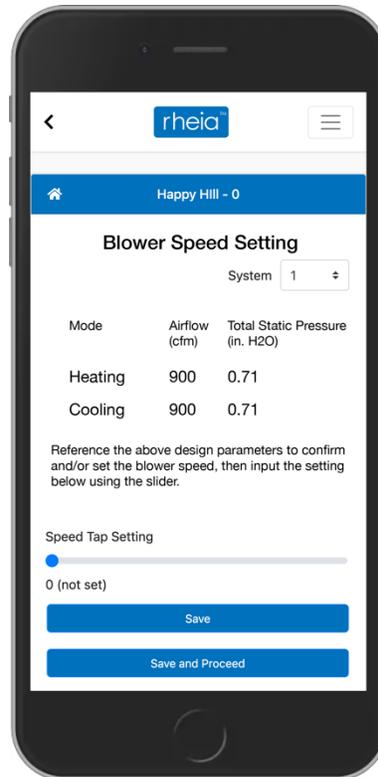
1. Indicate with the "Equipment Installed?" button whether it is installed.
2. Select what is being used to pressurize the system for this test: the Air Handling Unit (AHU) or a Duct Blaster. Either is appropriate for balancing the system.
3. Review the pre-populated information about the equipment and enter any missing information.
4. Click "Save" to save changes if moving on to the next system, or
5. "Save and Proceed" to continue to the next step.



#### 4. Confirm and Set the Blower Speed

The total airflow of the system needs to be set to match the airflow specified by the designer. The designer will have selected the equipment to supply the correct amount of conditioned air to meet the loads, and the equipment will have a wide array of airflows it can provide at each of its speed settings. The blower speed is typically set using speed taps (a.k.a. dip switches) according to the manufacturer's documentation. The equipment manufacturer provides the corresponding airflow for a series of static pressure values at each speed tap setting.

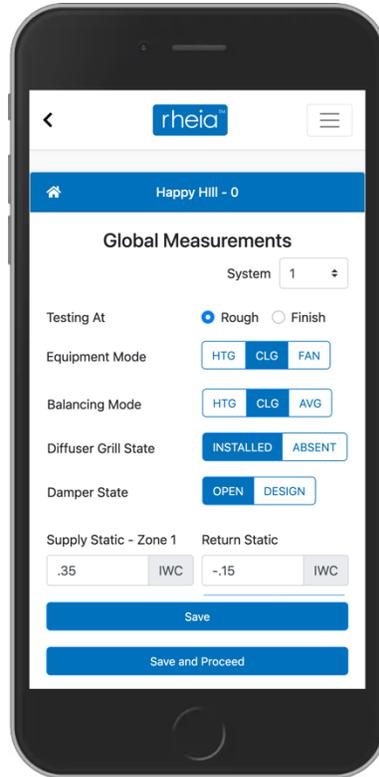
1. Referencing the displayed airflow target for each of heating and cooling modes, the technician will determine which speed tap setting will yield the airflow closest to each mode.
2. The technician will set the speed for both heating and cooling according to their assessment, and log the setting into the Verify app.
  - a. The app screen will display the total static pressure and airflow for each of heating and cooling.
  - b. Cross-reference the design data with the blower data provided by the manufacturer to determine the airflow that corresponds to the static pressure and airflow values displayed by the app.
3. Once the speed has been set, the static pressure is taken for the manifold and return and logged into the app.
4. "Save and Proceed" to continue to the next step.



## 5. Input Initial Measurements and Test Parameters

The Global Measurements screen is used to input measurements taken at the unit and to set the test parameters such as balancing mode

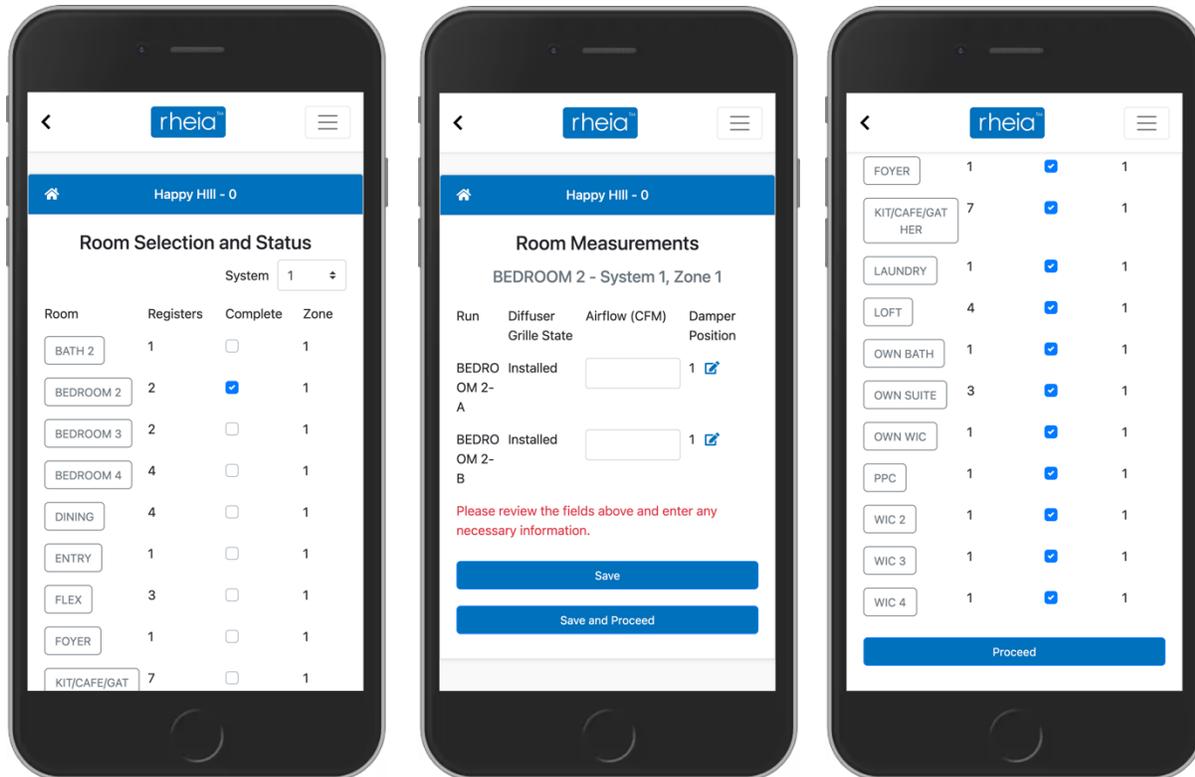
1. Indicate whether the system is being tested at rough or finish.
2. Indicate the balancing mode which sets the target airflows. Typically the current season should be used as the balancing mode. For example, if it is the summer use the “CLG” balancing mode. This setting will also be pre-set by the designer in most cases.
3. Indicate the diffuser grill state: “Installed” or “Absent”. Typically, if testing at rough they will be absent and if testing at finish they will be installed.
4. Indicate the damper state as “Open” or “Design”. The installer will have pre-set the dampers either to fully open or to the position predicted by the designer. Either option will work but must be indicated. This parameter will be further verified during the room airflow measurement step.
5. After pressurizing the system, indicate the supply and return static pressures in inches of water column (IWC). Note, if there is more than one zone, there will be field for each zone to input a pressure value.



## 6. Room Measurements

This step involves inputting the airflows measured in each room's register.

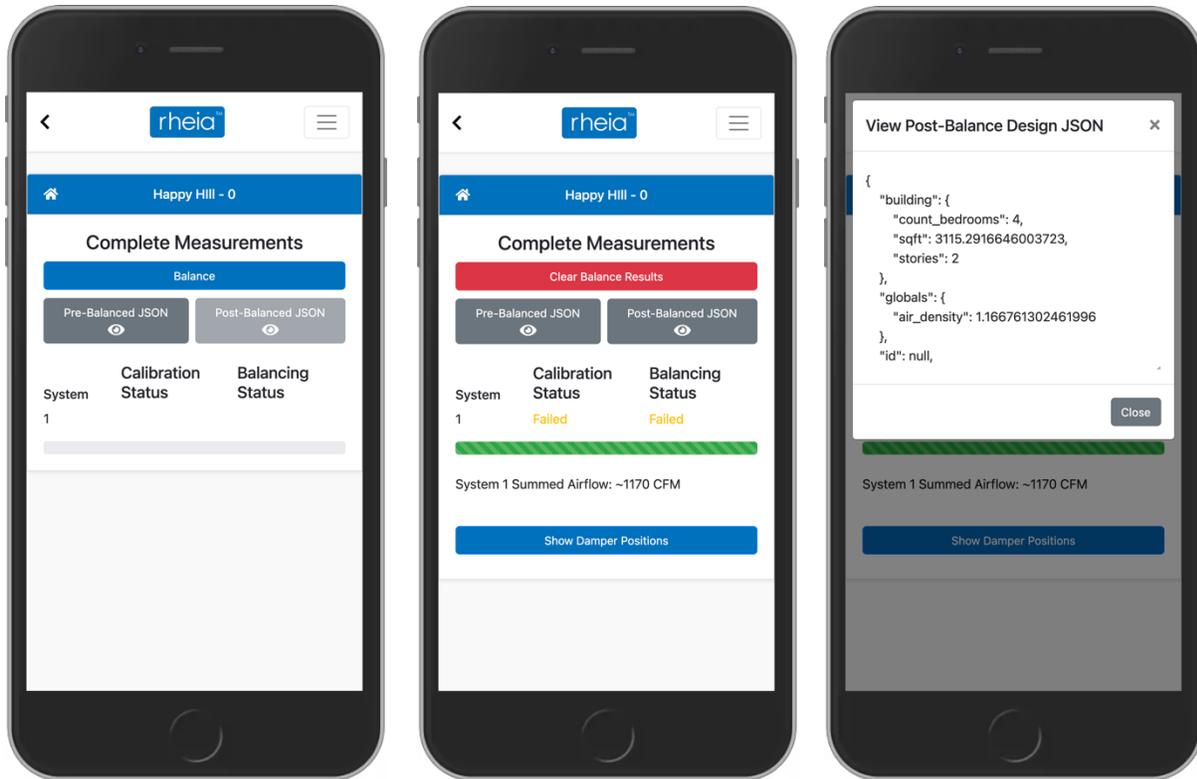
1. There is a list of rooms presented with the number of registers indicated as well as which zone that room belongs to. Click on the first room.
2. In each room there is a list of registers. Reference the printed floor plan to know which register is which. If there is no plan available with labeled registers, stop and locate one before proceeding.
3. Note the damper position and verify that it matches the boot. Refer to the installer documentation for how to adjust the damper. If the damper setting does not match, edit the setting by clicking on the small edit button and make the adjustment.
4. Verify the "Diffuser Grille State" matches the installed condition.
5. Input the airflow measured in each input field. Note that entering a value of 0 will throw an error.
6. Click "Save" to save the results and continue with this room, or
7. Click "Save and Proceed" to go back to the Room selection screen.
8. Indicate that the previous room is complete by clicking the "Complete" check box in the room's row.
9. Proceed to the next room and repeat steps 1 through 7 until all rooms for each system has been complete.
10. Once all rooms are complete, click "Proceed"



## 7. Complete Measurements

The complete measurements screen is where the software takes the information input by the technician and determines if the balancing dampers need to be adjusted.

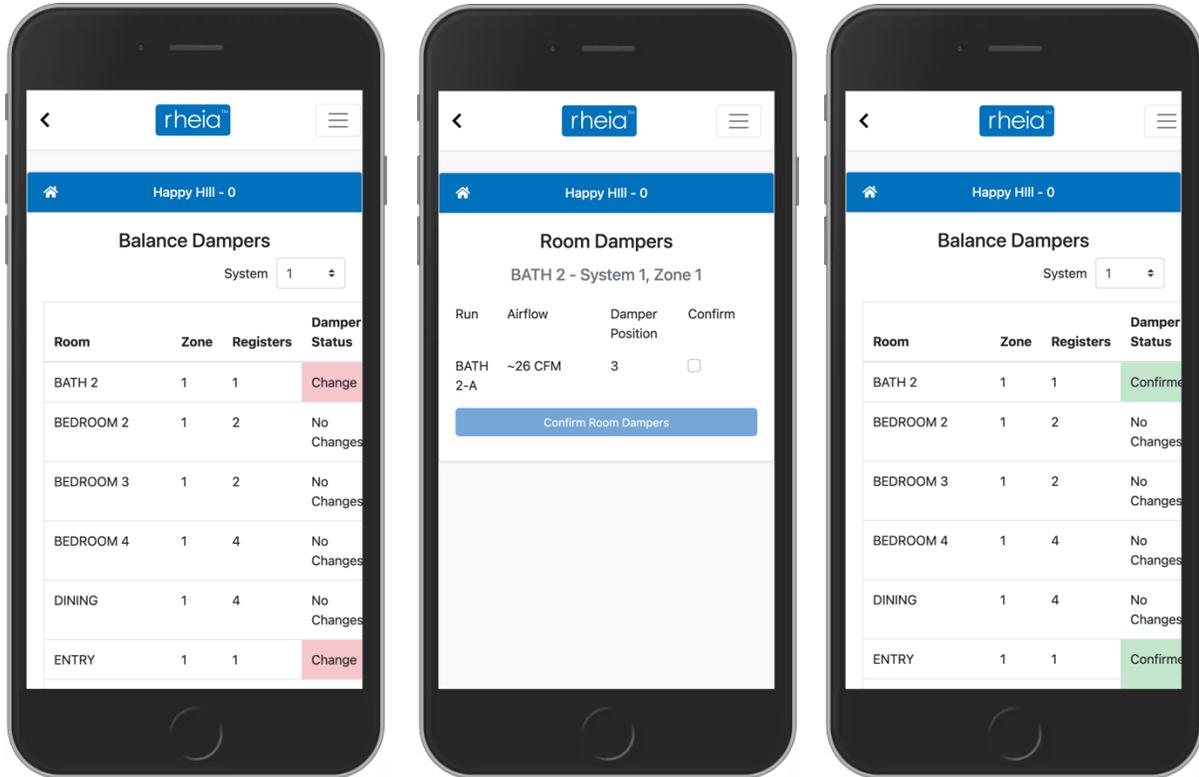
1. Click “Balance” and the software will calculate new damper positions.
2. The pre- and post-Balanced input file (JSON) is available for review and debugging purposes.
3. The bar across the bottom of the screen will indicate balancing progress.
4. Once complete, success or failure will be indicated for both calibration and balancing.
5. Click “Show Damper Positions” to proceed to balancing damper adjustment



## 8. Balancing Dampers

This screen lists all the rooms that require balancing damper adjustment

1. Click a room name and a list of boots will be shown for that room
2. Make the adjustment to each boot in the list and indicate in the app by clicking the checkbox
3. Once all the dampers have been adjusted to match the app, click “Confirm Room Dampers”
4. The app will navigate back to the list and the room will show a damper status as green and “Confirmed”
5. Repeat steps 1-4 for all rooms.
6. Once all the rooms have been adjusted and confirmed, click “Balance Adjustments Completed”



## 9. Complete Commission

This screen allows final submission of the results to the Rheia database.

1. Input the final supply and return pressures (in IWC) into the fields
2. Optionally, input any notes for future reference.
3. Click "Save and Submit" to finalize the commissioning process and save the results to the cloud.
4. Success!

