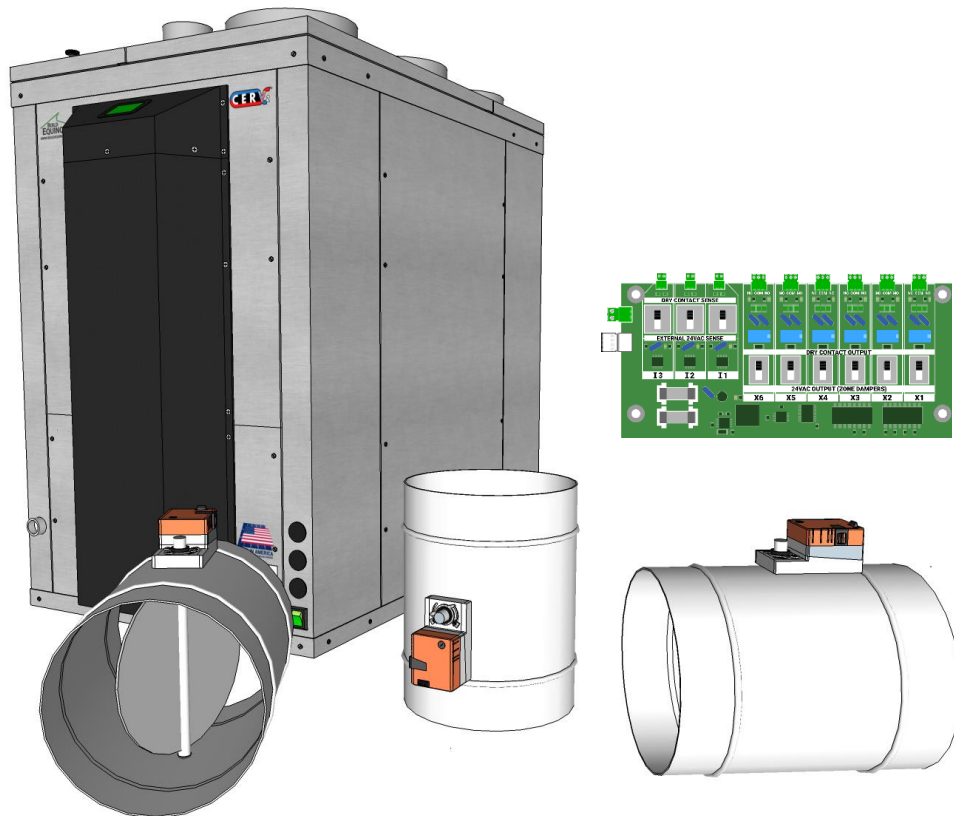




## CERV2 Zone Option Manual



Build Equinox  
support@bildequinox.com  
(773)-492-1893

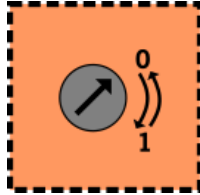
Rev 1.3 - 11/03/2020

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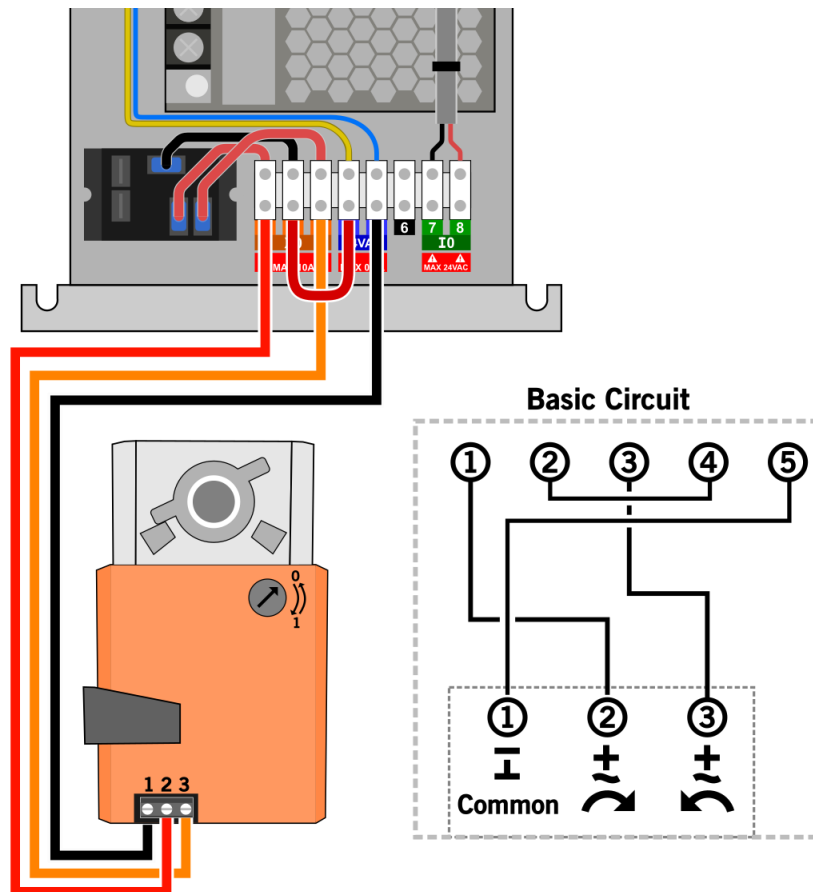
# Zone Damper Wiring

There are two ways to physically control the Zone Damper motors – With the CERV’s integrated X0 Auxiliary Output, or with the optional IO Expansion Board. Both options require 3 conductor wire capable of carrying 24VAC at 0.5A (thermostat wire is acceptable).

The standard damper motor terminal block is three positions, with the first as a common, while the second and third activate the damper motor to turn clockwise or counterclockwise when voltage is applied. This may vary if other damper motors, such as spring return, are used. Rotation of the damper motor can sometimes be confusing when wiring the terminals, so the damper motor has an integrated switch to reverse the rotation direction. If you apply system power and find that the damper motor is rotating the wrong way, you can simply toggle the switch with a small flathead screwdriver.

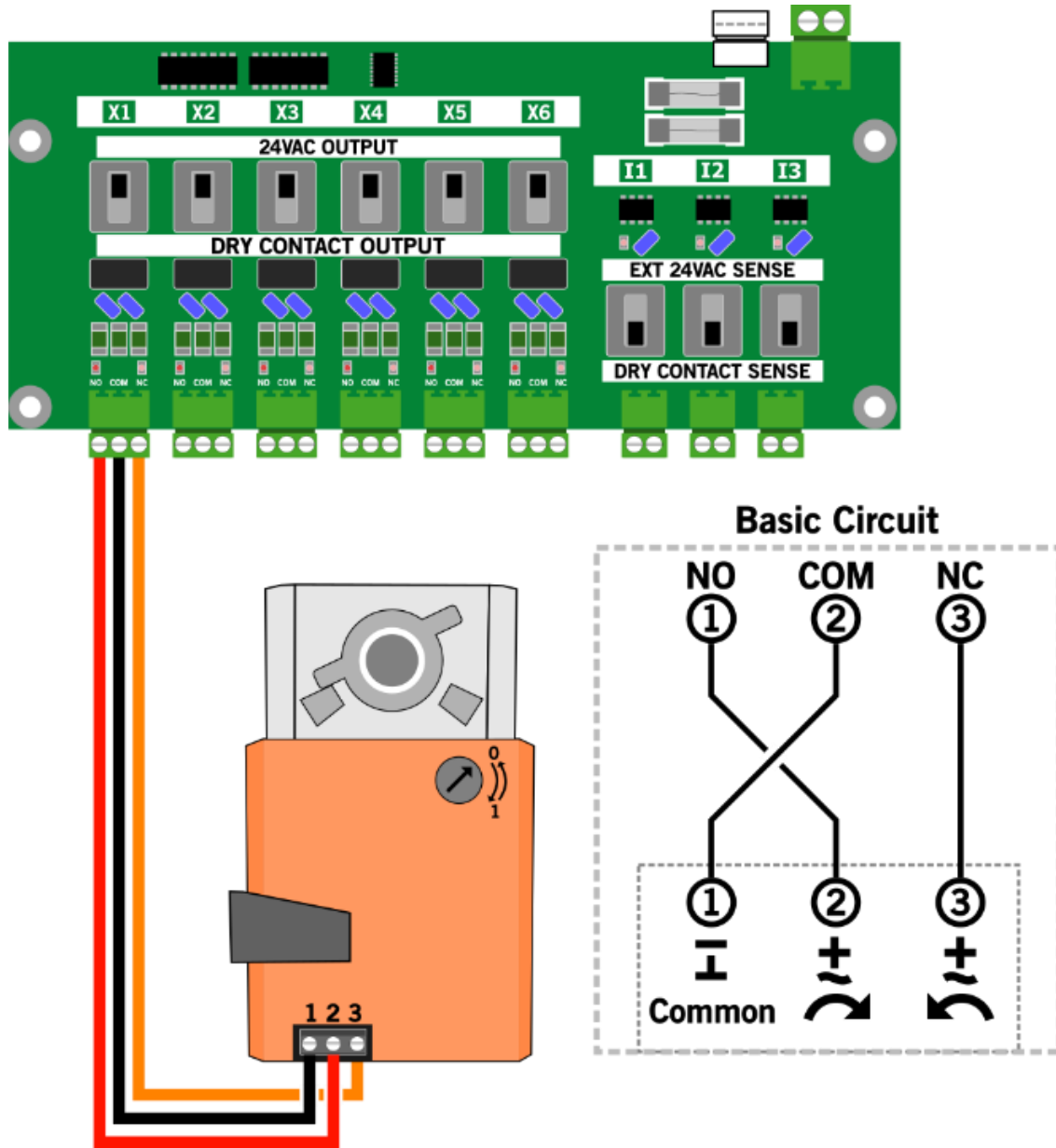


## Integrated X0 Auxiliary Output



The terminal block for the X0 Auxiliary Output is located in the bottom section of the CERV2 (**see appendix at end of document for access instructions**). Because the X0 is a standard dry contact with Normally Open (1), Common (2), and Normally Closed (3) terminals, it must be used in conjunction with the 24VAC output terminals (4, 5) as seen above.

## IO Expansion Board, X1-X6 Auxiliary Outputs

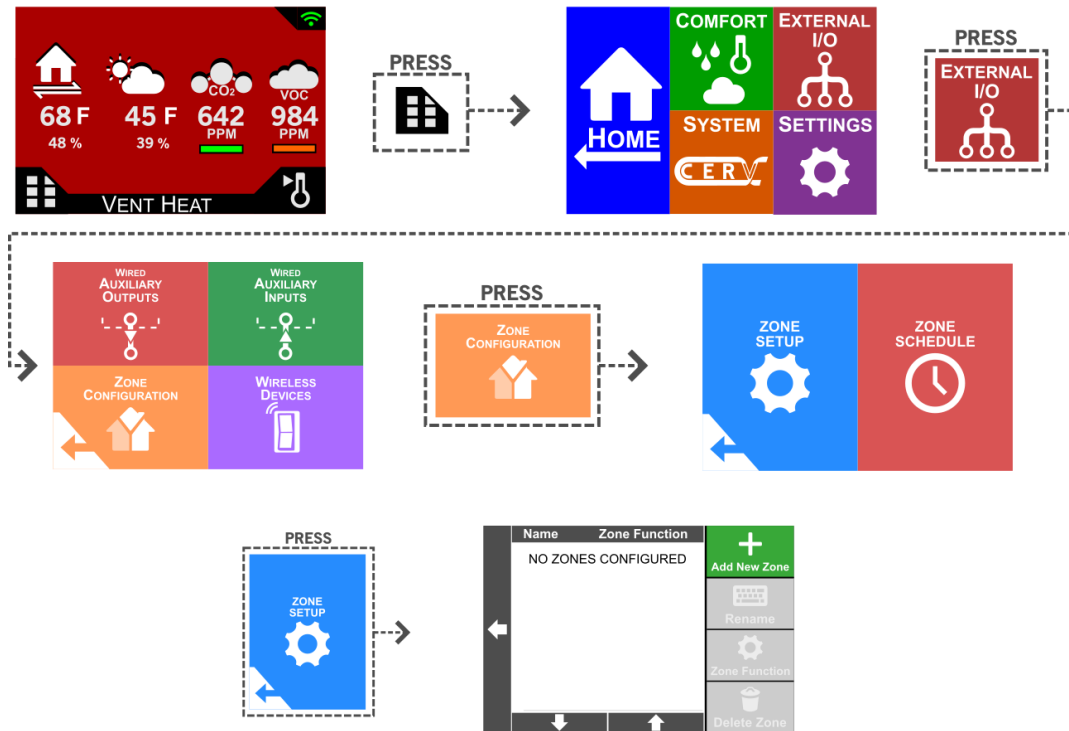


In addition to the integrated X0 Auxiliary output, the I/O Expansion Board is capable of directly outputting 24VAC through its terminals without requiring connection to an external 24VAC source. NOTE: for this configuration, you must move the slide-switch above the terminal block towards the 24VAC OUTPUT label. LED indicators on the I/O Expansion Board will light up above either the NO or NC terminals, to indicate which is active. Up to six zone dampers may be connected to the I/O Expansion Board. See the I/O Expansion Board manual for more information on installing and configuring the expansion board.

# Touchscreen Zone Configuration

The first step in setting up your zone damper system is to define Zone areas. The following examples describe how to access the Zone Configuration screen, as well as how to create a new zone, rename a zone, and delete a zone.

## Zone Setup



## Creating a New Zone

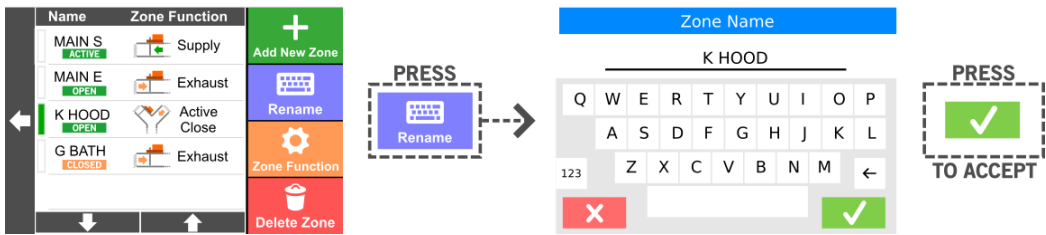


When a new zone is created, the first selection gives you the option of choosing whether the zone is an Exhaust Zone, Supply Zone, or Active Close zone. Descriptions of the zone types are as follows:

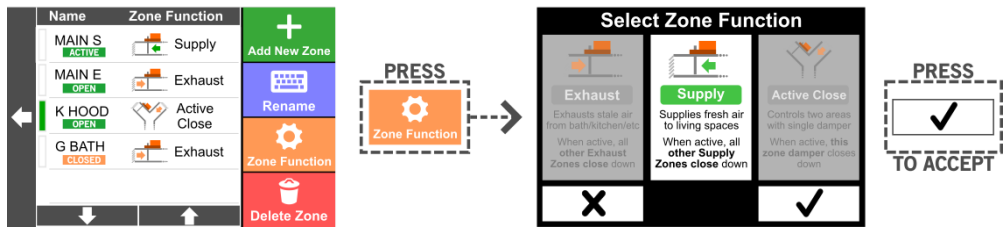
- 1. Exhaust Zone:** Exhausts stale air from bathroom, kitchen, or other area with stale air. When this zone is activated (through a paired wireless ventilation switch, auxiliary input, etc.), all other zones configured as Exhaust Zones will close down ensure maximum flow to this zone. Zones configured as Supply or Active Close will not be influenced by activity in Exhaust Zones.
- 2. Supply Zone:** Supplies fresh air to living spaces. When this zone is activated (through a paired wireless ventilation switch, auxiliary input, etc.), all other zones configured as Supply Zones will close down ensure maximum flow to this zone. Zones configured as Exhaust or Active Close will not be influenced by activity in Exhaust Zones.
- 3. Active Close Zone:** For use when only one zone damper is used to control two spaces. An example of this zone configuration can be seen in the Appendix under Single Damper, Single Zone (Active Close Configuration).

For examples of each zone type, please see the Appendix at the end of this document.

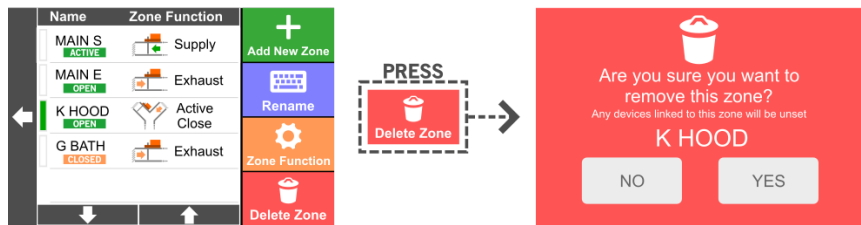
## Renaming a Zone



## Changing a Zone Type



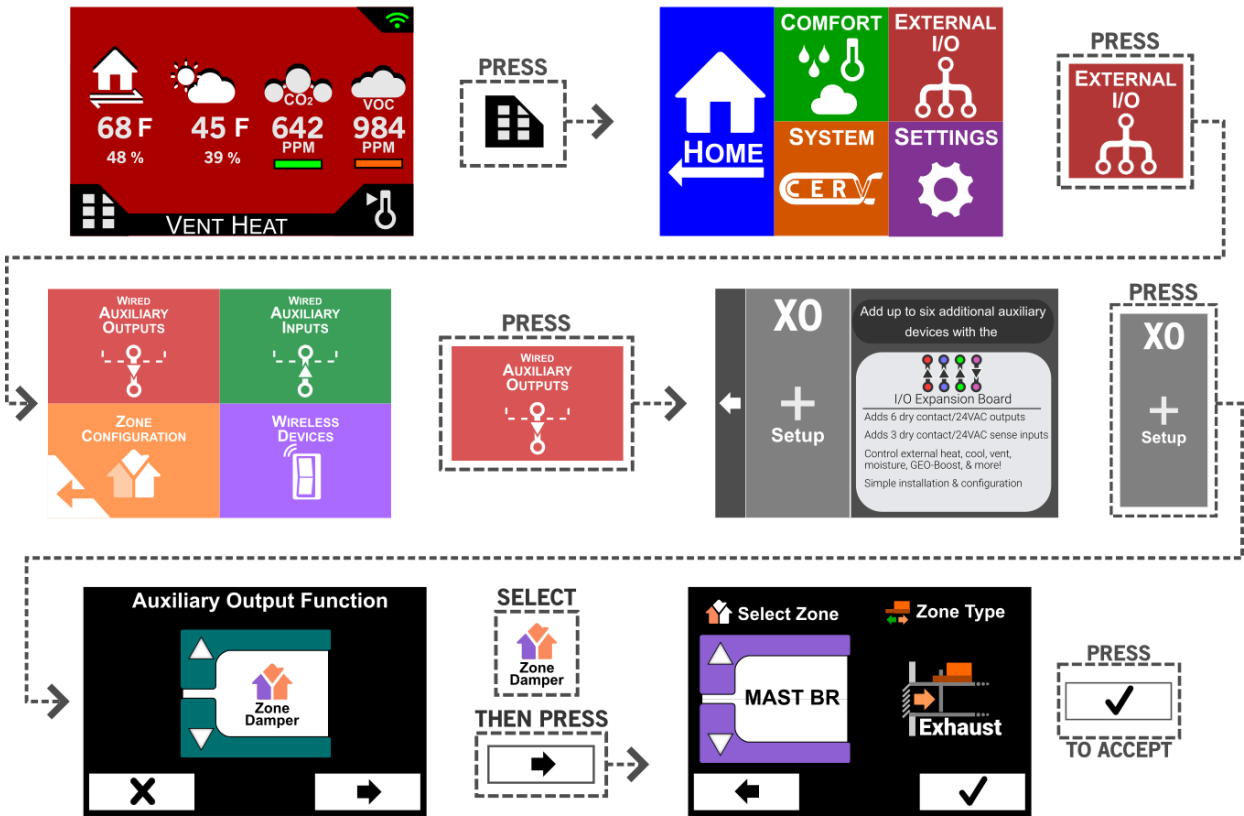
## Deleting a Zone



Note: when deleting a zone, any auxiliary inputs or wireless devices linked to this zone will revert to controlling the CERV as a whole (i.e. triggering a ventilation switch would ventilate the whole home instead of the previous zone). Any auxiliary outputs configured as Zone Dampers linked to this zone will be unset.

The next step after creating the Zone, is to set up an auxiliary output which will be connected to a zone damper.

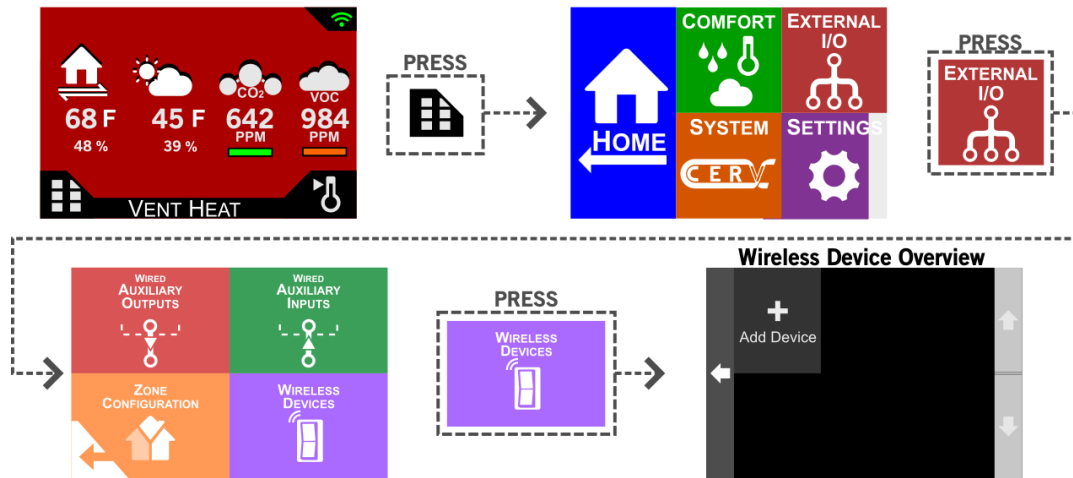
## Linking a Damper to a Zone



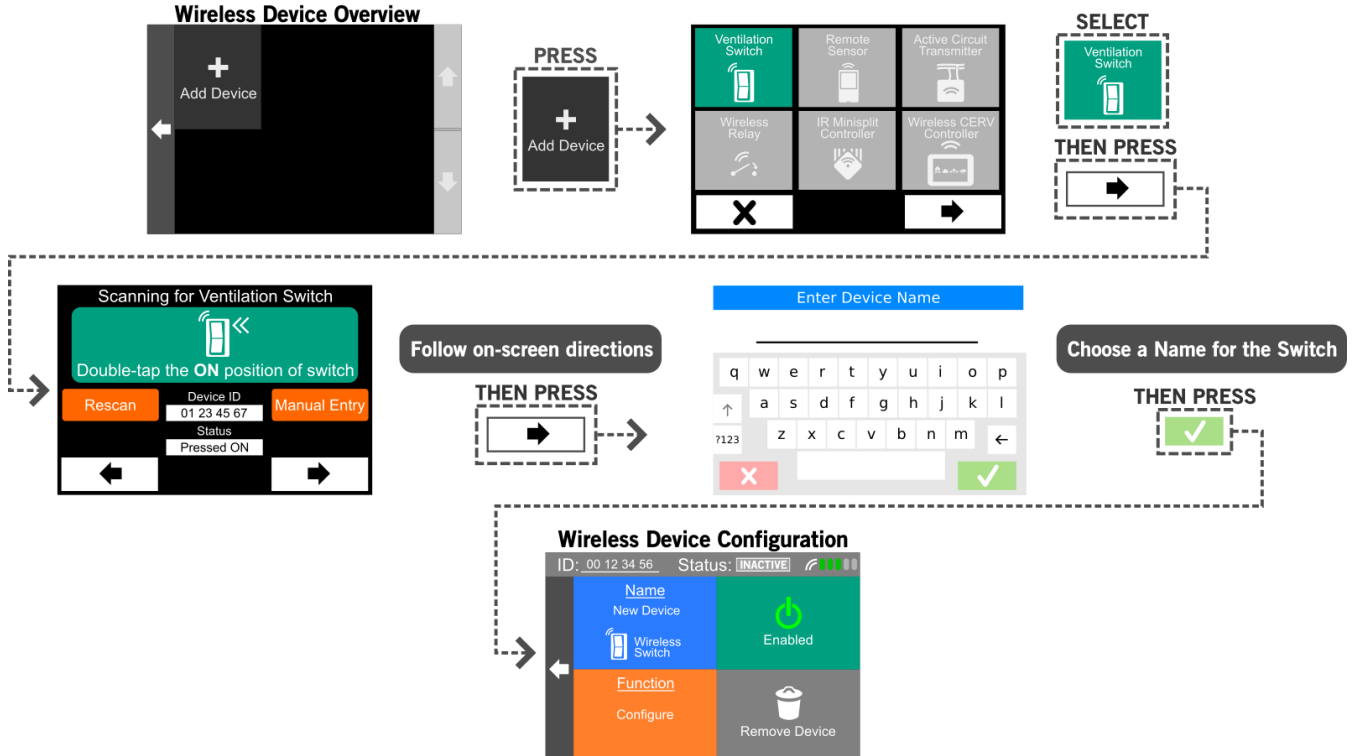
## Pairing a Wired Input to Activate a Zone



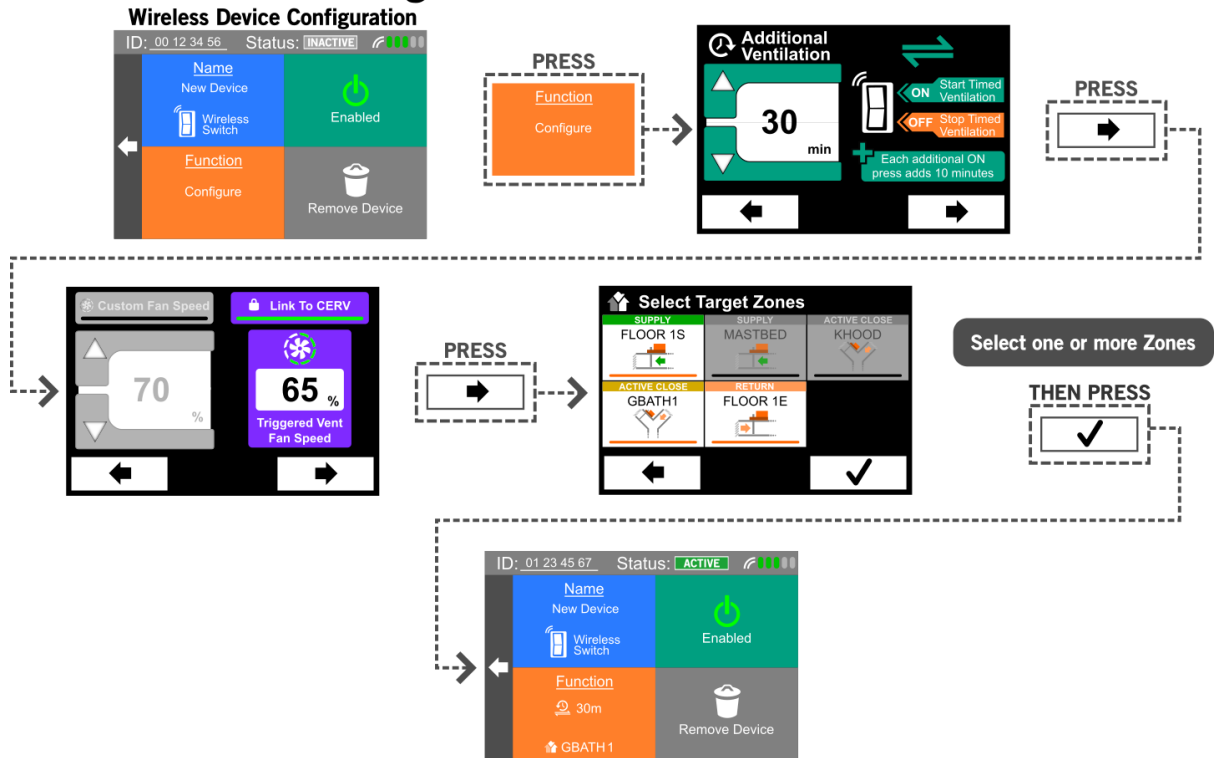
## Pairing a Wireless Switch / ACT to Activate a Zone



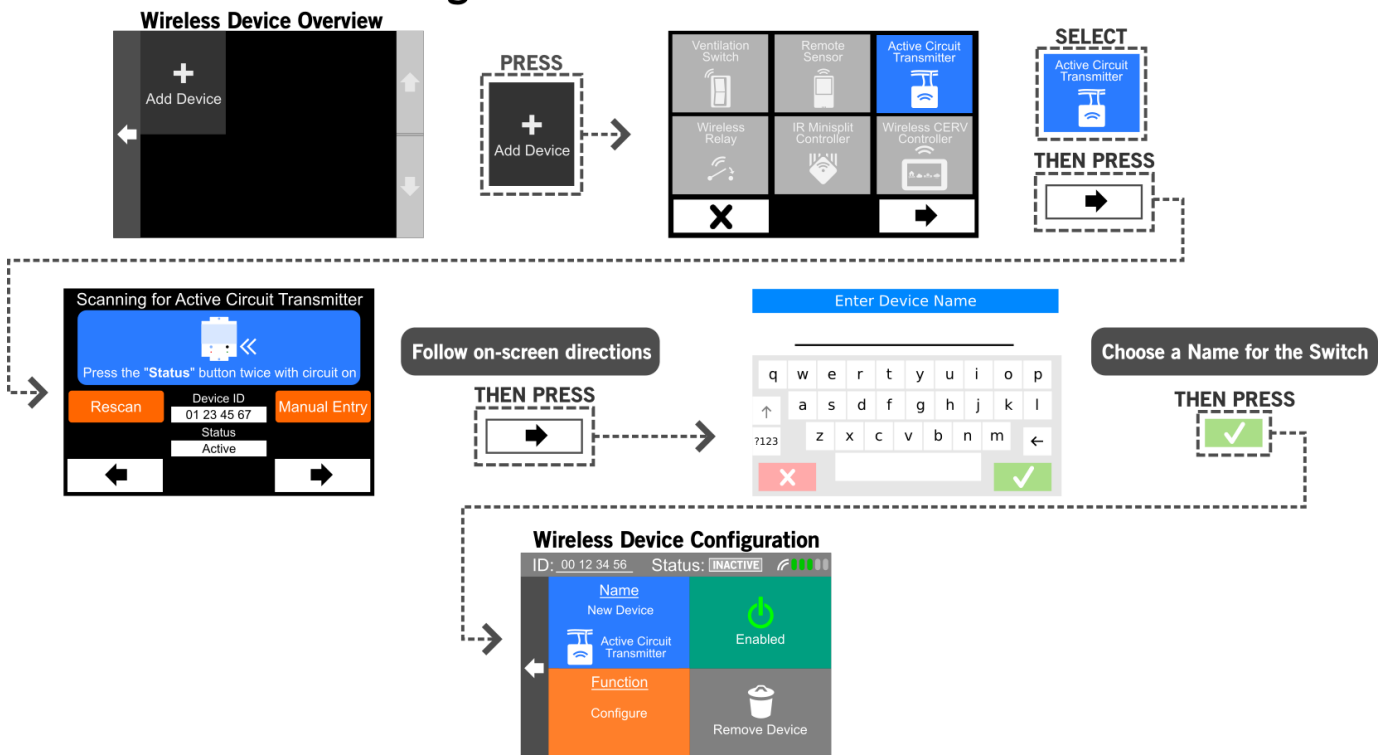
## Adding a New Wireless Switch



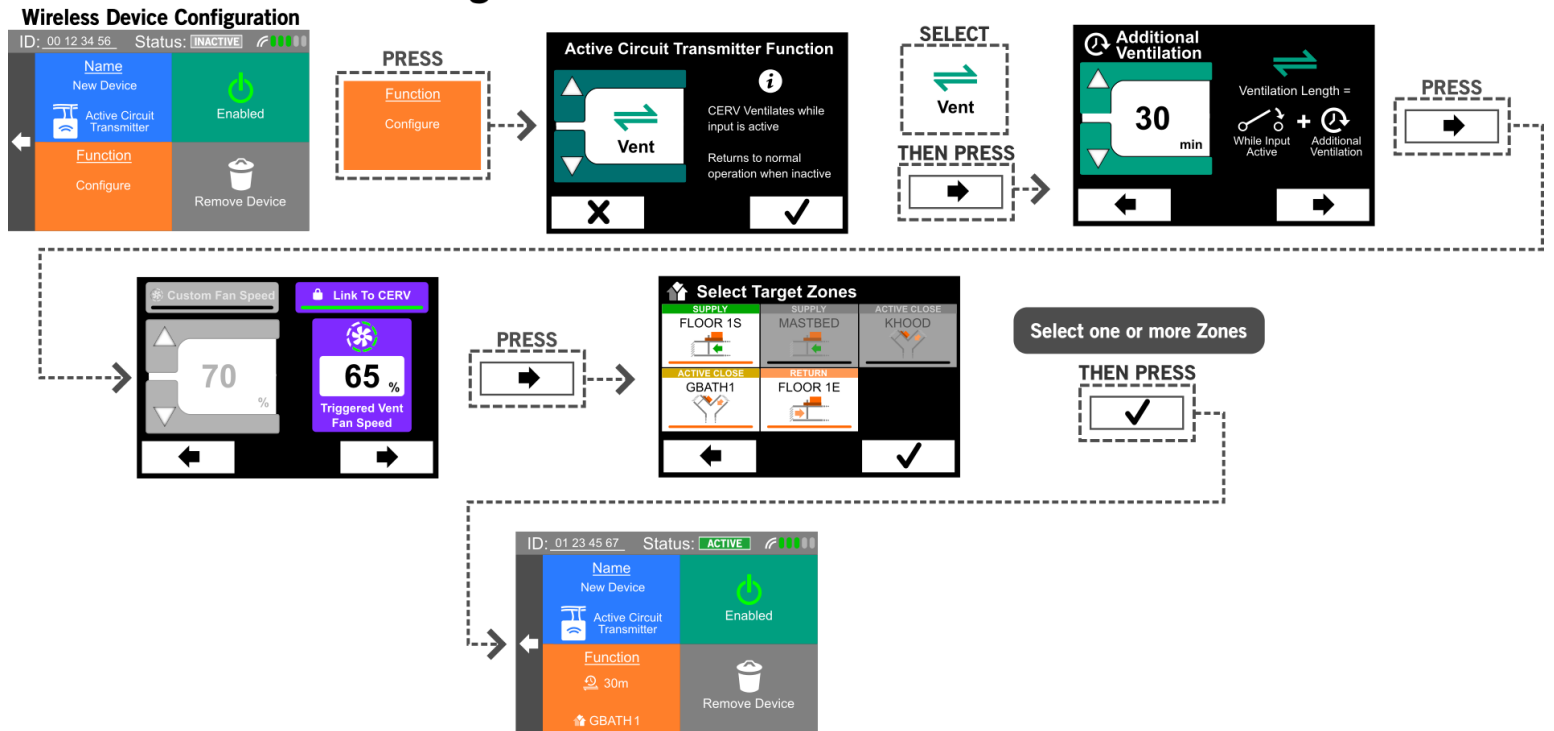
## Configure Wireless Ventilation Switch



## Adding a New Active Circuit Transmitter

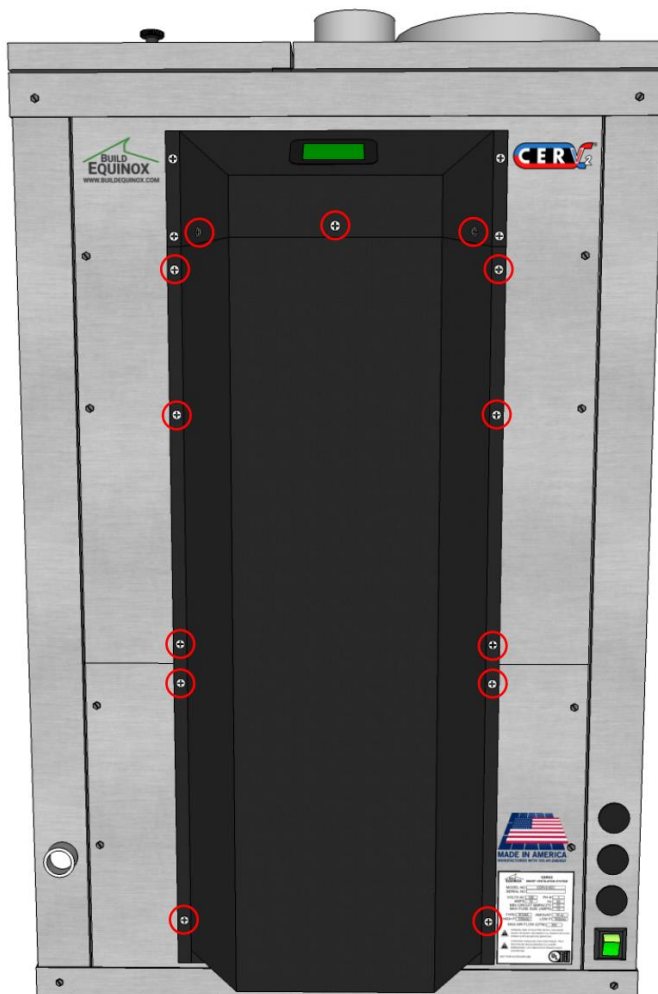


# Configure Active Circuit Transmitter

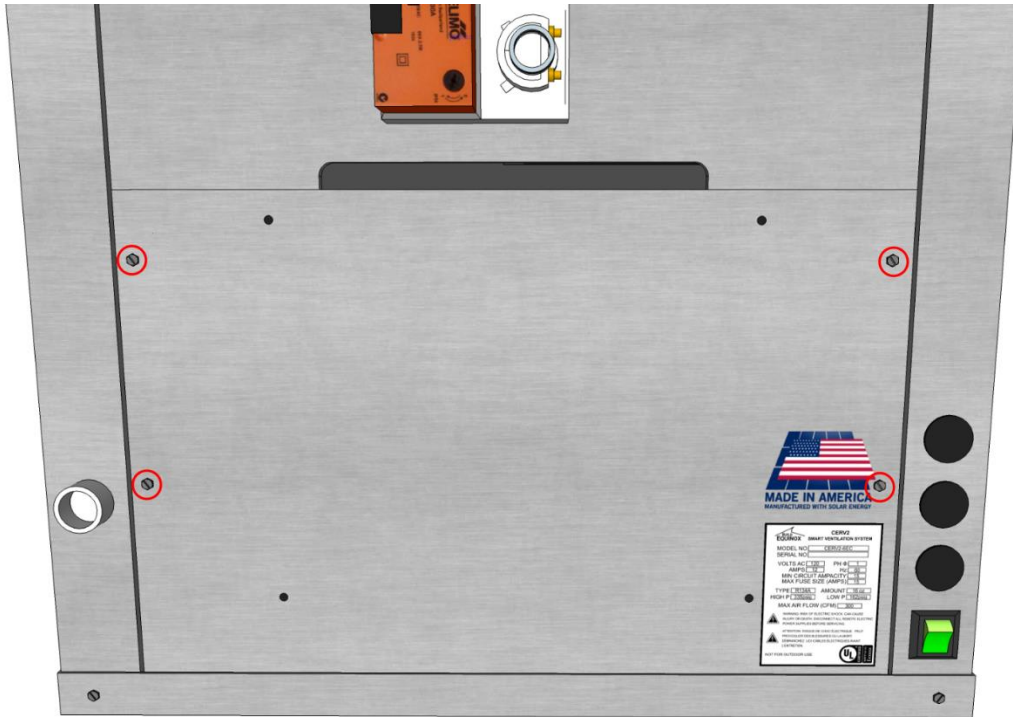


## **Appendix: Front Panel Removal and Auxiliary Input/Output (X0 and I0) Access**

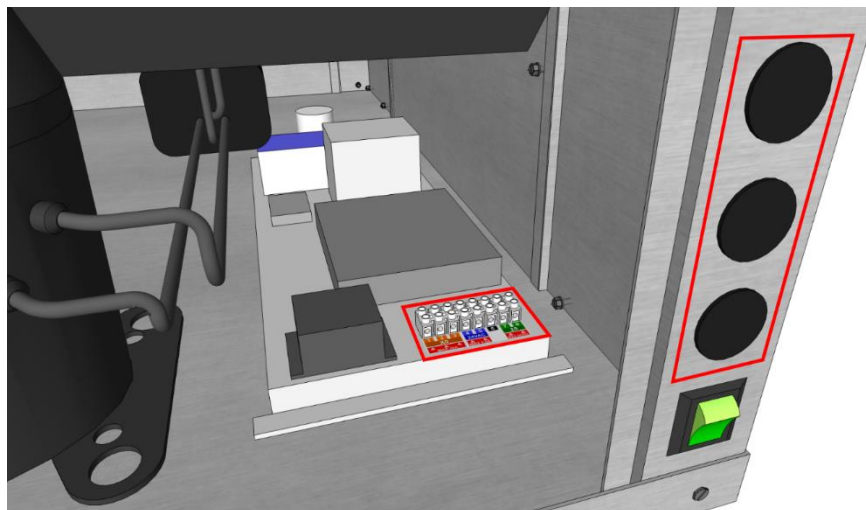
These instructions show how to access the internal input/output connections in the CERV2. Before removing any access covers, power to the CERV2 should be turned off and the unit either unplugged or the electric breaker switched off. Remove the lower front plastic cover by removing the 13 screws shown below.



Once the lower front cover is off, the four screws for the lower access panel can be removed. Screw locations are shown below. With the screws removed, the panel will be free to come out. **Note:** If using the I/O Expansion Board, the module will be accessible on this panel. Wiring should be run through the knockout holes and panel slot for the I/O Expansion Board.

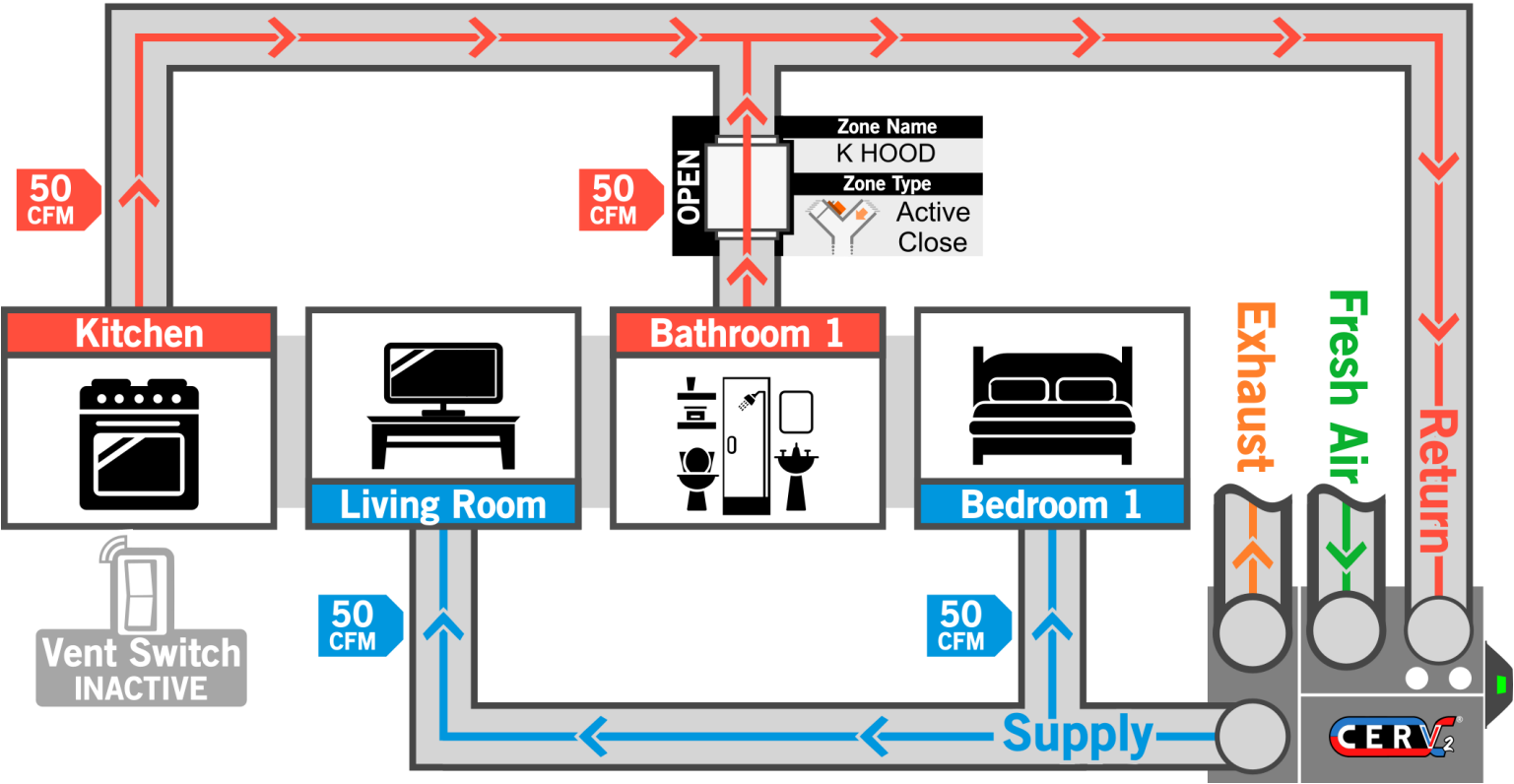


On the right side is the power conditioning and distribution electronics assembly. The I/O terminals are located at the front of this assembly. Three 3/4" knockouts are provided for running wires to the I/O terminals. Conduit or wire strain relief fittings should be used in these knockouts.



Appendix: Zone Configuration Examples

Single Damper, Single Zone (Active Close Configuration)  
Normal Operation



CERV Configuration Screens

**Zone Configuration**

Name	Zone Function
K HOOD OPEN	Active Close

Create a zone with Active Close function. When zone is triggered, zone closes.

**Wired Auxiliary Outputs**

XO  
OPEN

Zone  
Damper

Active Close  
K HOOD

Add up to six additional auxiliary devices with the I/O Expansion Board. Adds 6 dry contact/24VAC outputs. Adds 3 dry contact/24VAC sense inputs. Control external heat, cool, vent, moisture, GEO-Boost, & more! Simple installation & configuration.

**Wireless Devices**

KitchenSw  
Wireless Switch  
INACTIVE  
30m

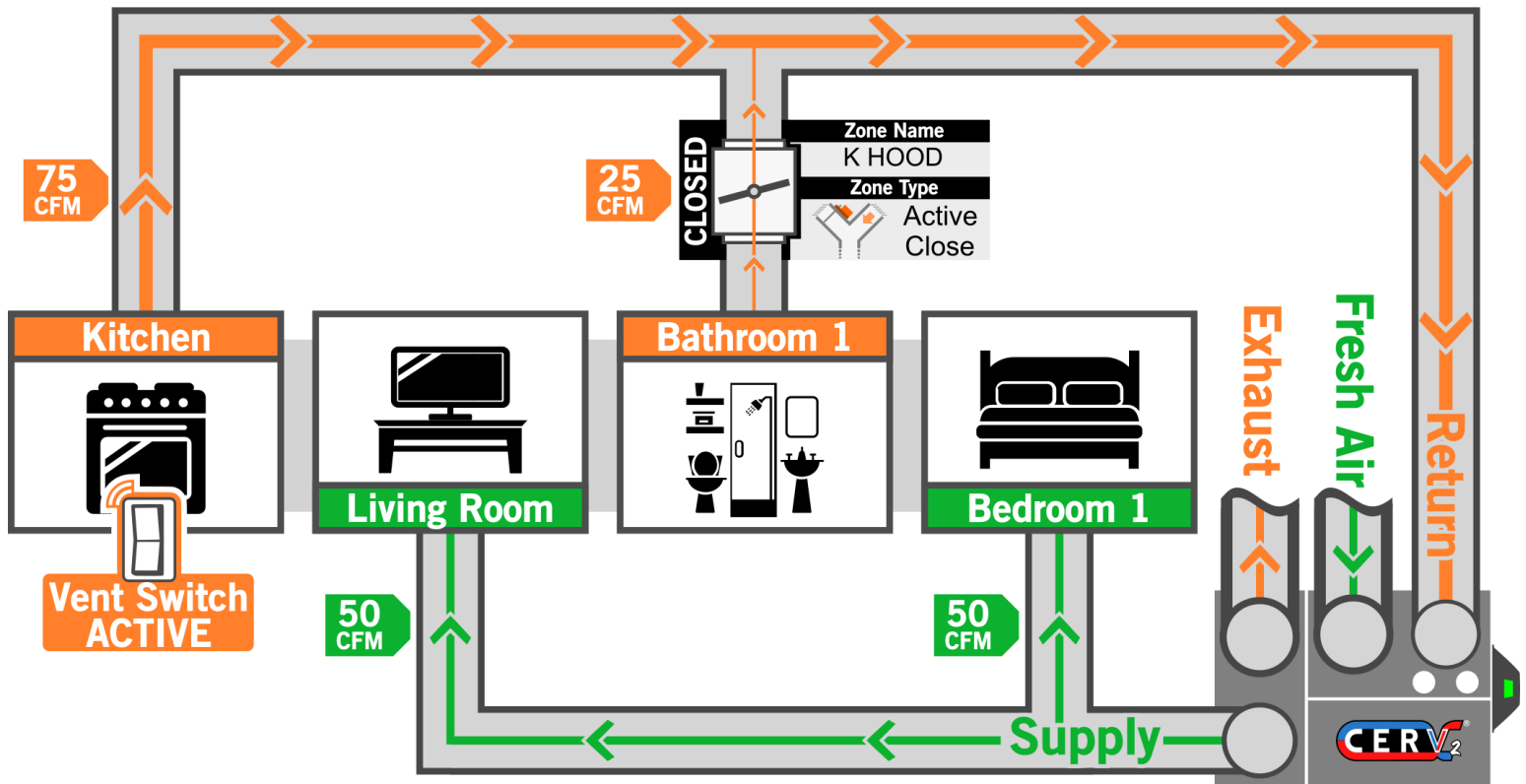
K HOOD

Add Device

Pair a wireless switch, set the time length and fan speed (if desired), and associate the switch with the zone.

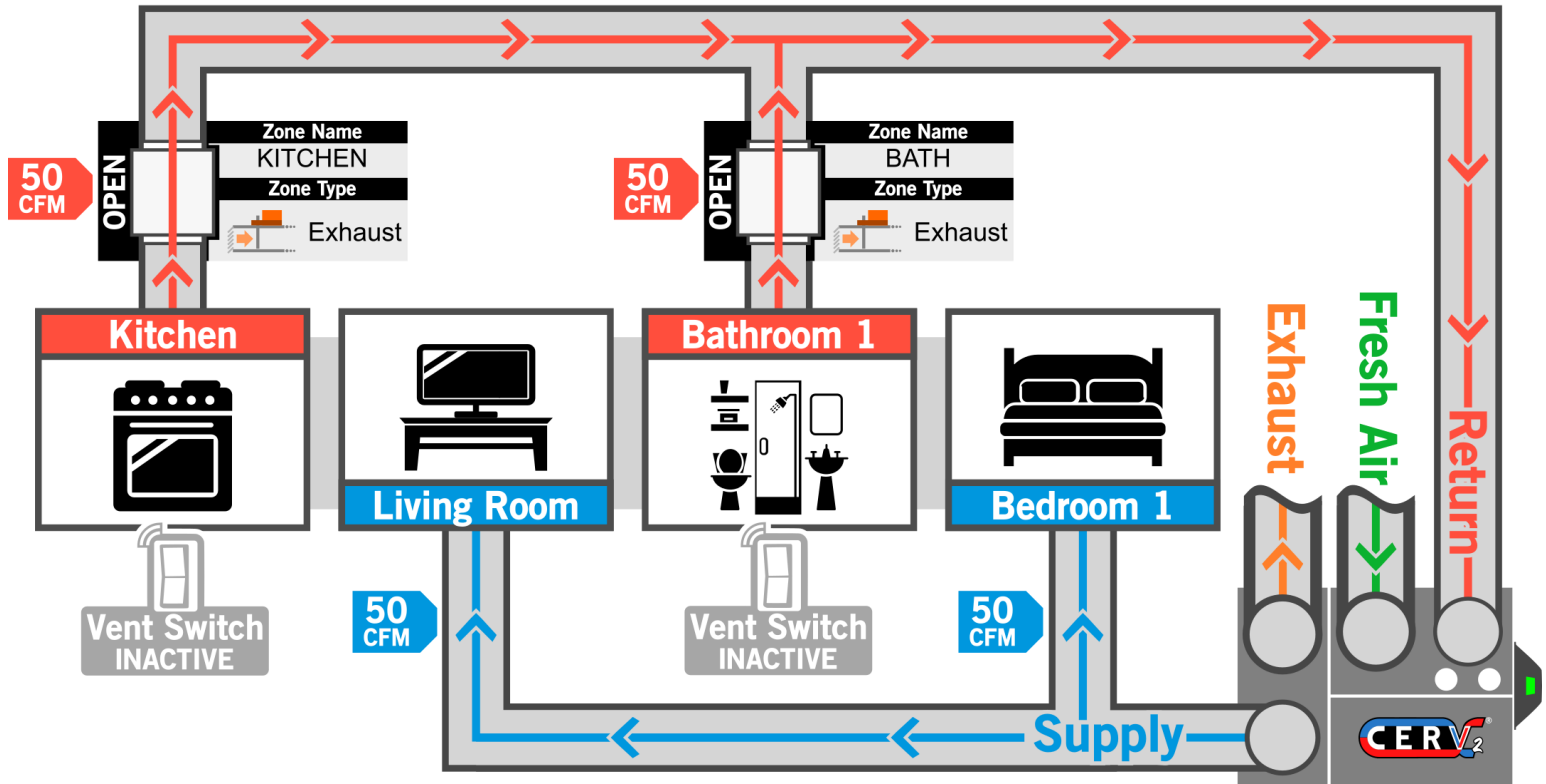
In the Active Close Zone configuration, a single damper may be used to separate two or more return areas. In this scenario, the active close zone damper is installed in the return line of the bathroom, so that when the zone is “activated” (i.e. paired wireless ventilation switch is pressed) the bathroom return airflow is reduced, and the kitchen airflow is increased. This is a simple example of what may be done to meet localized kitchen ventilation requirements. Additionally, the wireless ventilation switch can be set to increase the ECM fan speed in the CERV for even more effective pollutant removal.

## Single Damper, Single Zone (Active Close Configuration) Ventilation Switch Triggered - Zone Damper Active



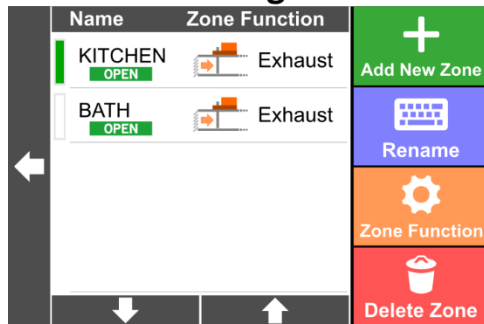
When the Wireless Ventilation Switch is activated, the Active Close damper in the bathroom return line closes down, reducing the airflow from 50 to 25 CFM, while the kitchen return is now favored, producing 75 CFM.

## Dual Damper, Dual Zone (Exhaust Configuration) Normal Operation



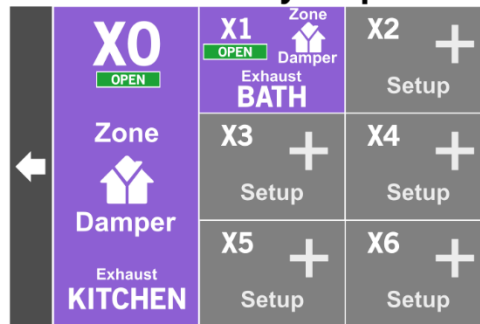
## CERV Configuration Screens

### Zone Configuration



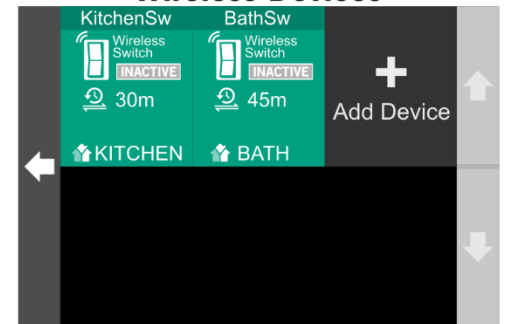
Create two zones with Exhaust functionality.  
When one zone is triggered, the other zone closes.

### Wired Auxiliary Outputs



Set up a wired Auxiliary Output for each damper electrical connection.

### Wireless Devices



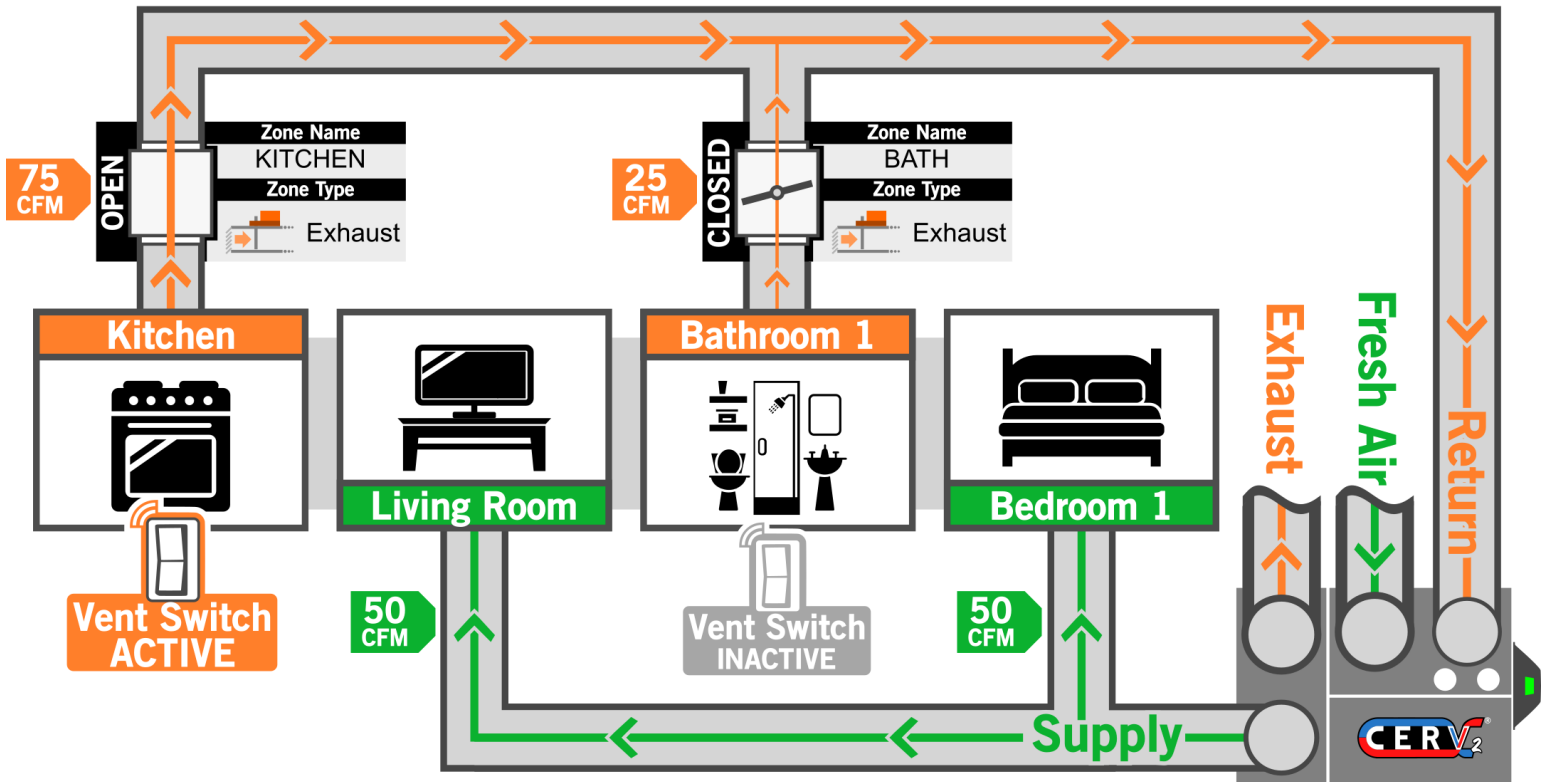
Pair wireless both switches, set the time length and fan speed (if desired), and associate each switch with the appropriate zone.

With this Dual Damper, Dual Zone configuration, zone dampers are installed in the return of both the kitchen and bathroom. This allows both areas to be independently favored if their associated wireless ventilation switches are triggered. Triggering the kitchen switch will cause the bathroom zone damper to close down, while triggering the bathroom switch will close the kitchen damper. If both switches are active at the same time, both zone dampers will open.

Example: both switches are hit at the same time. The kitchen switch is configured for 30 minutes of ventilation, while the bathroom switch is configured for 45 minutes. After the switches are both triggered, both kitchen and bathroom zone dampers remain open. After 30 minutes, the kitchen switch timer expires, leaving only the bathroom ventilation switch active. For the next 15 minutes, the kitchen damper will be closed and bathroom damper will be open. After the last timer expires, both dampers fully open.

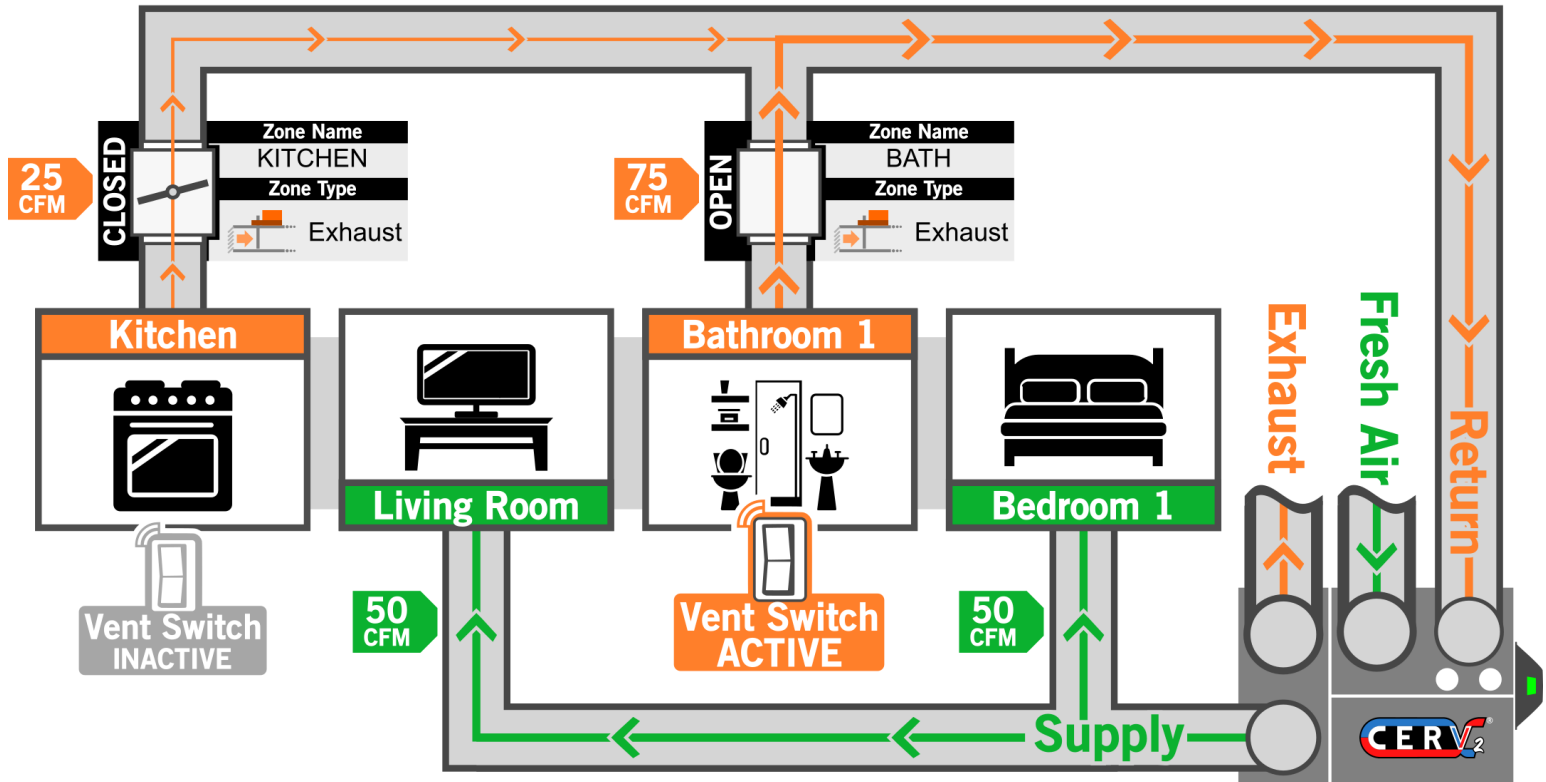
## Dual Damper, Dual Zone (Exhaust Configuration)

**Kitchen Vent Switch Triggered**



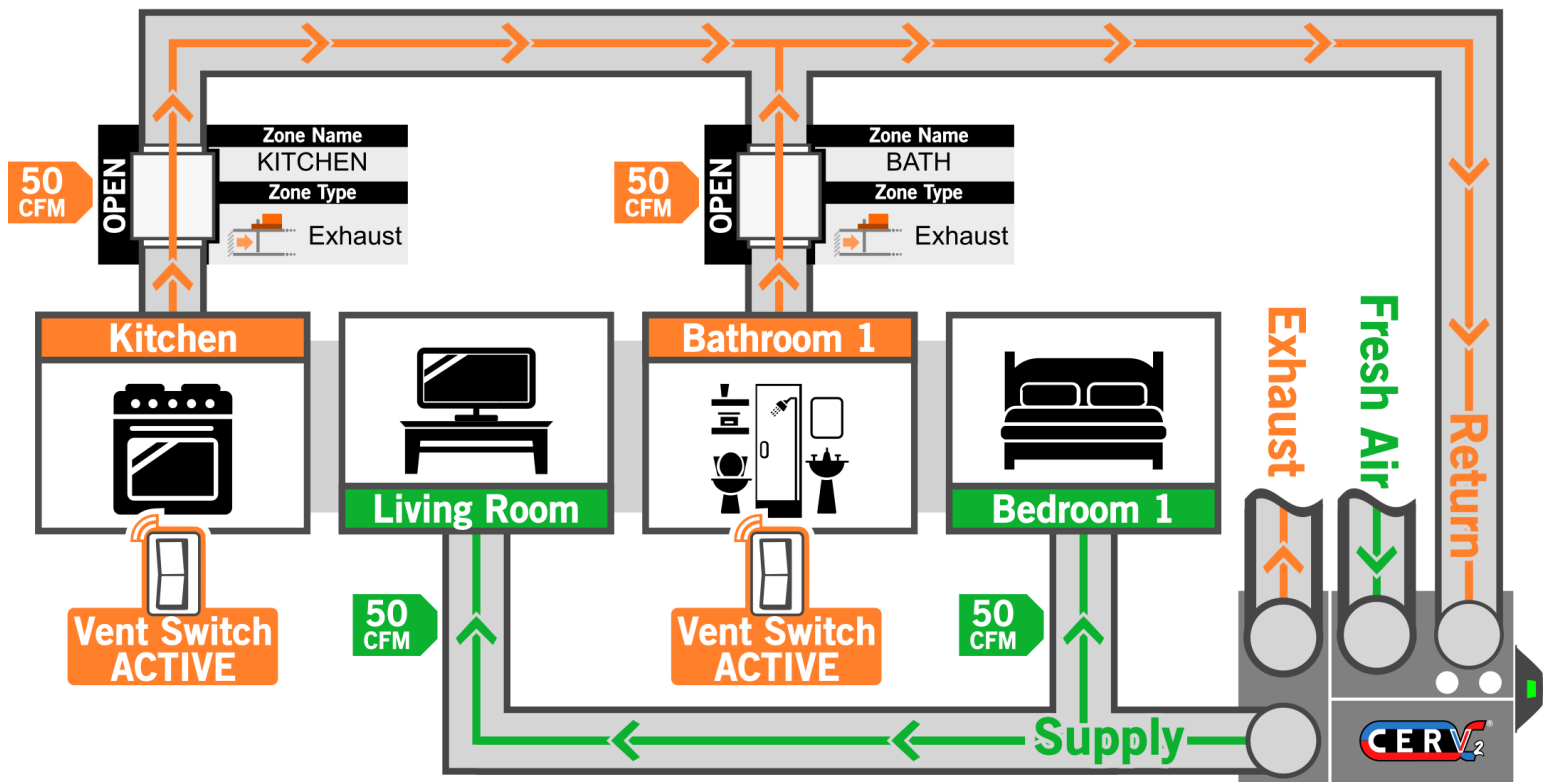
## Dual Damper, Dual Zone (Exhaust Configuration)

### Bathroom Vent Switch Triggered

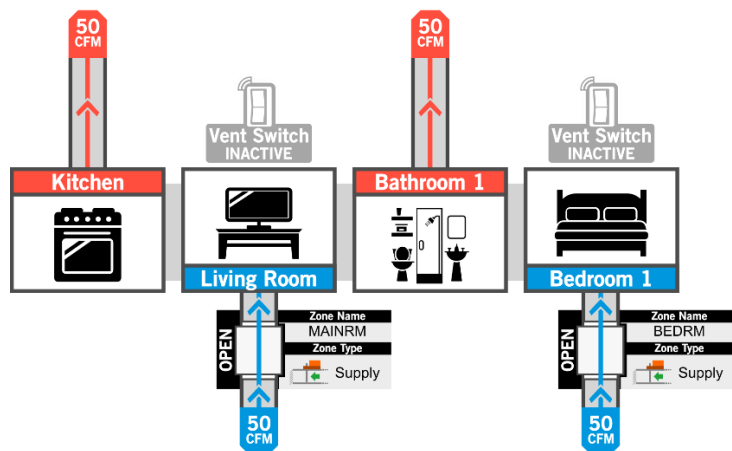


## Dual Damper, Dual Zone (Exhaust Configuration)

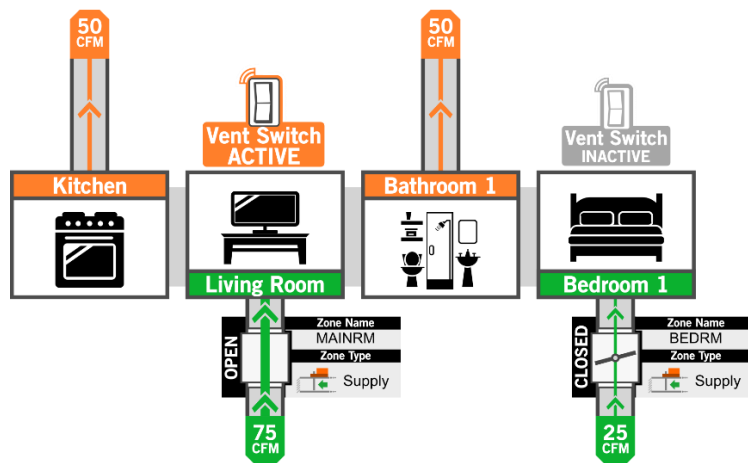
### Kitchen and Bathroom Vent Switches Triggered



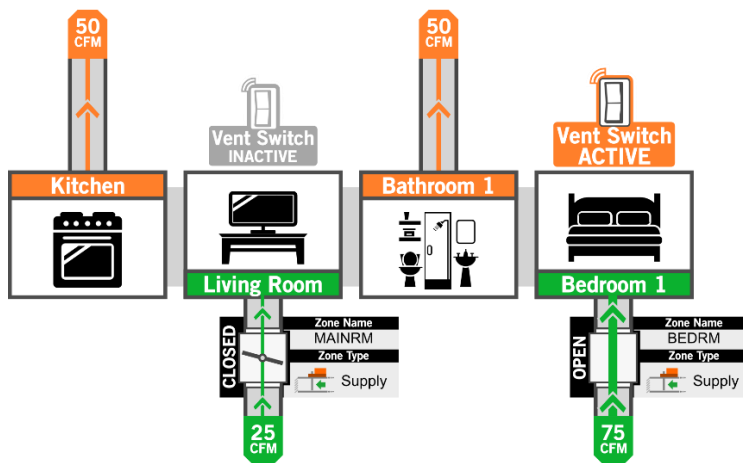
## Dual Damper, Dual Zone (Supply Configuration) Normal Operation



## Dual Damper, Dual Zone (Supply Configuration) Living Room Vent Switch Triggered

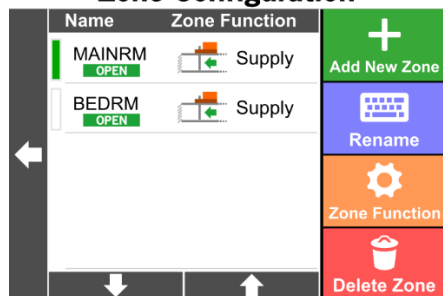


## Dual Damper, Dual Zone (Supply Configuration) Bedroom Vent Switch Triggered



## CERV Configuration Screens

### Zone Configuration



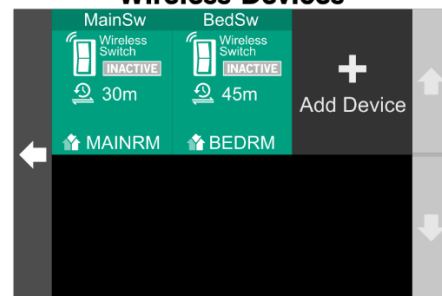
Create two zones with Exhaust functionality. When one zone is triggered, the other zone closes.

### Wired Auxiliary Outputs



Set up a wired Auxiliary Output for each damper electrical connection.

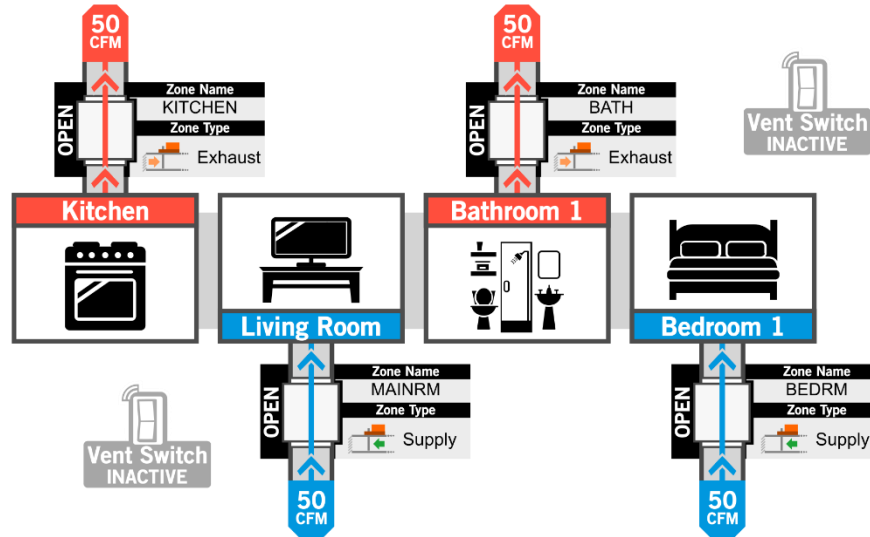
### Wireless Devices



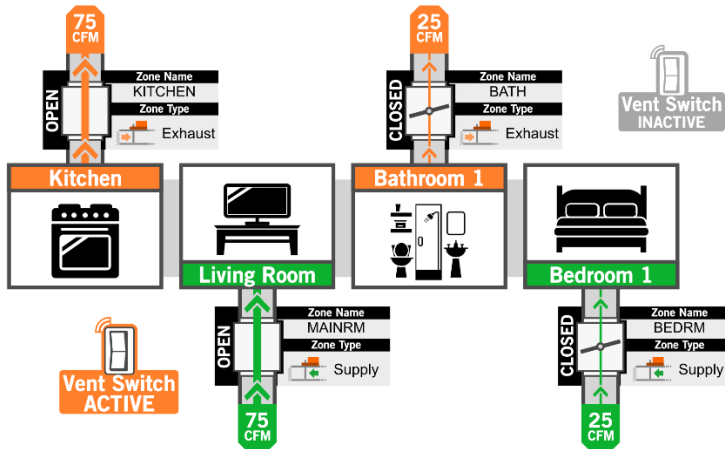
Pair wireless both switches, set the time length and fan speed (if desired), and associate each switch with the appropriate zone.

This configuration is similar to the previous Dual Damper, Dual Zone (Exhaust Configuration), but with the dampers on the supply side. This configuration could be used when you want to direct more fresh air into specific living spaces.

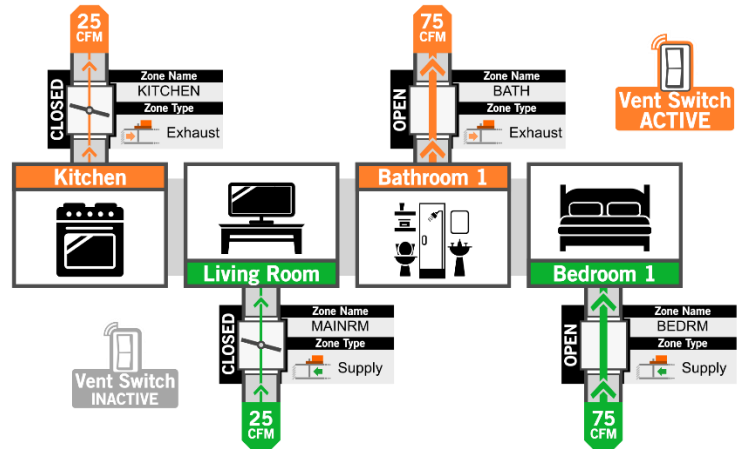
## Multi Damper, Multi Zone (Supply & Exhaust Configuration) Normal Operation



### Multi Damper, Multi Zone (Supply & Exhaust Configuration) Kitchen/Living Room switch triggered



### Multi Damper, Multi Zone (Supply & Exhaust Configuration) Bedroom/Bathroom switch triggered



## CERV Configuration Screens

Zone Configuration		
Name	Zone Function	
MAINRM	Supply	<div>+</div> Add New Zone <div>⌨</div> Rename <div>⚙</div> Zone Function <div>🗑</div> Delete Zone
BEDRM	Supply	
KITCHEN	Exhaust	
BATH	Exhaust	

Create two zones with Exhaust functionality, and two with Supply.

Wired Auxiliary Outputs		
X0	Zone	Zone
OPEN	Supply	Exhaust
BEDRM	BEDRM	KITCHEN
X3	Zone	
OPEN	Exhaust	
BATH	BATH	
X5	Setup	X6
Setup		Setup

Set up a wired Auxiliary Output for each damper electrical connection.

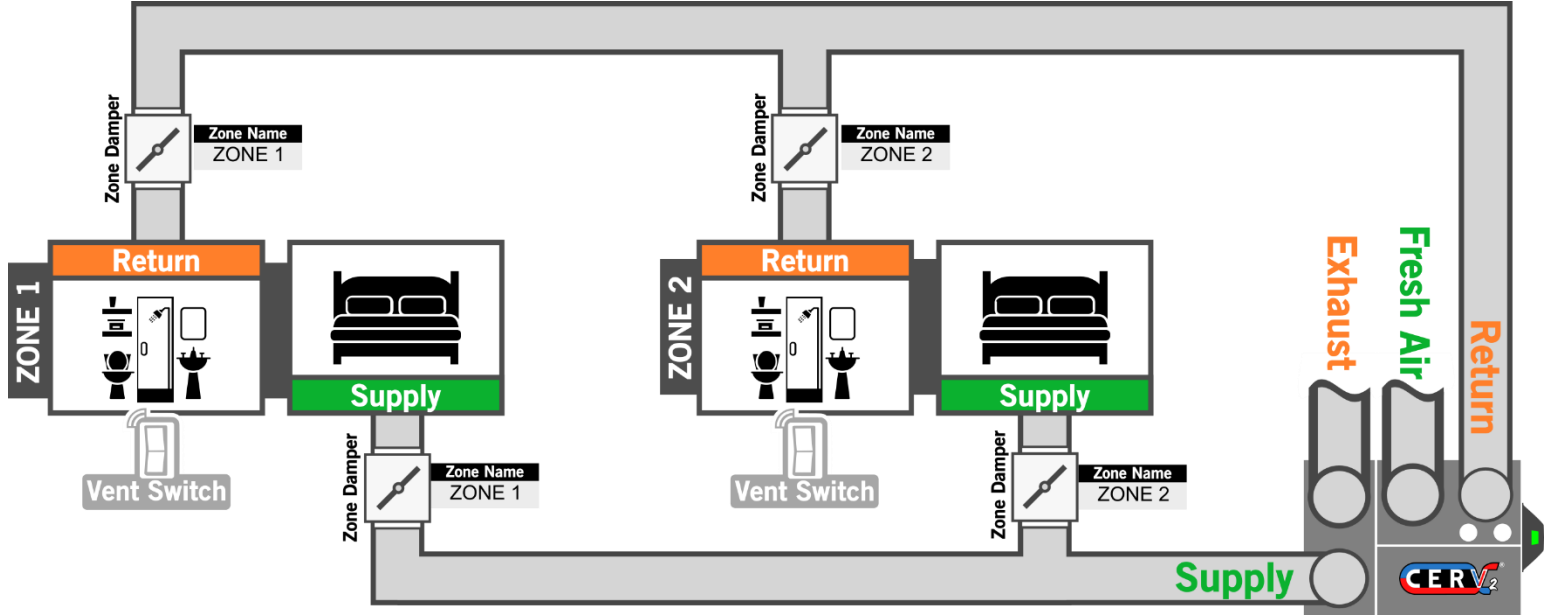
Wireless Devices		
MainKitch	BedBath	
Wireless Switch	Wireless Switch	<div>+</div> Add Device <div>↑</div>
INACTIVE	INACTIVE	
30m	45m	
KITCHEN	BATH	
MAINRM	BEDRM	

Pair wireless both switches, set the time length and fan speed (if desired). The first switch activates both Kitchen and Living room Zones, while the second activates the bedroom and bath.

In this unique configuration, the home has zone dampers installed in both supply and return ducts. Two wireless switches are used, each one controlling multiple zones. When the first ventilation switch is triggered, it signals the CERV to close down the bedroom and bathroom, while favoring the living room and kitchen. This directs the most fresh air into the living room space, while removing the most air from the kitchen (an ideal operation, say, if you were hosting a large party). The other ventilation switch triggers the CERV to instead favor the bedroom and bathroom supply and returns.

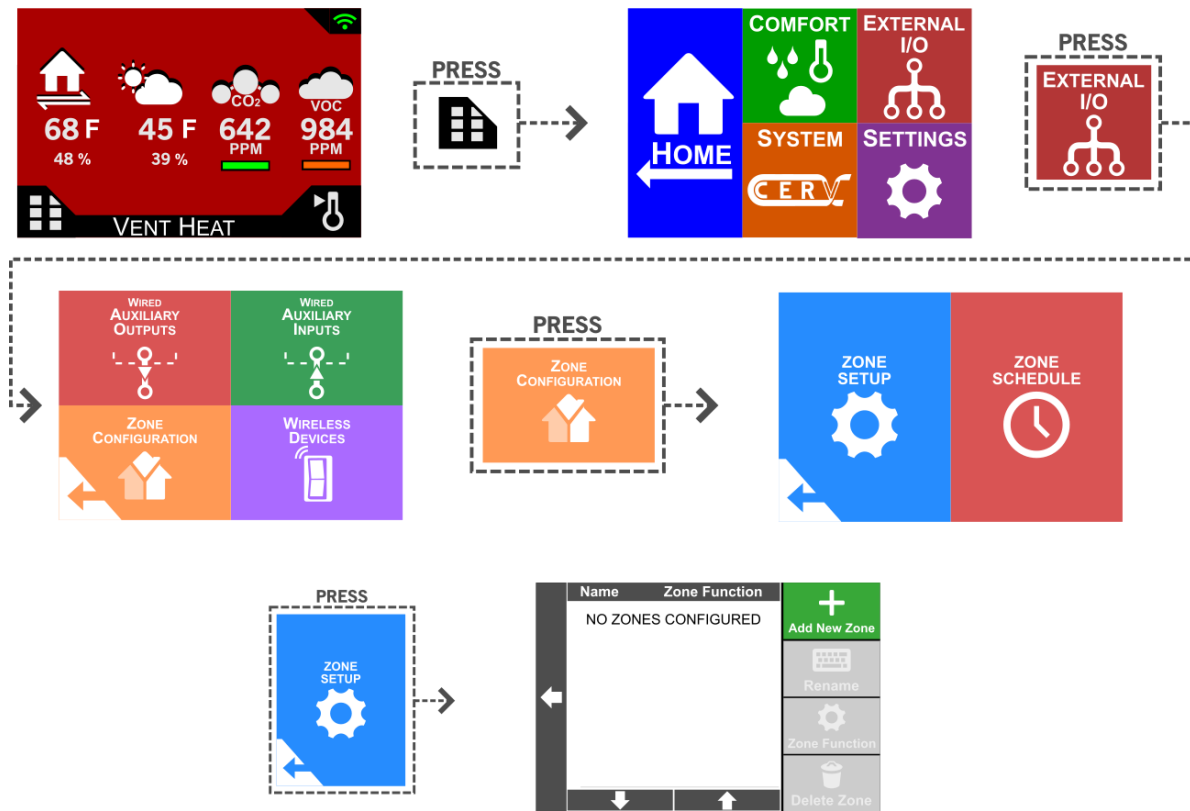
## Appendix: Zone Scheduling Examples

Zone damper scheduling may be used in scenarios where multiple discrete areas share a single CERV (in this example, a duplex). In this scenario, it is desired for the CERV to manage the indoor air quality of the two Zones while keeping the two completely separate (no recirculation between the two). The diagram below represents the layout of these two separate zones. Each zone has two zone dampers, one on the supply, and one on the return. Each supply/return damper pair may be electrically wired together, as to open and close together.

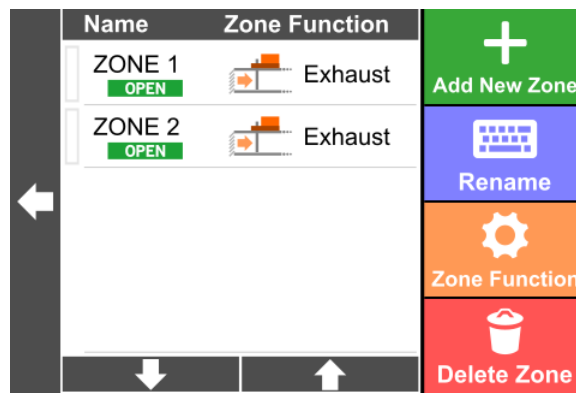


For the first step, the two Zones must be defined. Follow the path below to reach the Zone Setup screen.

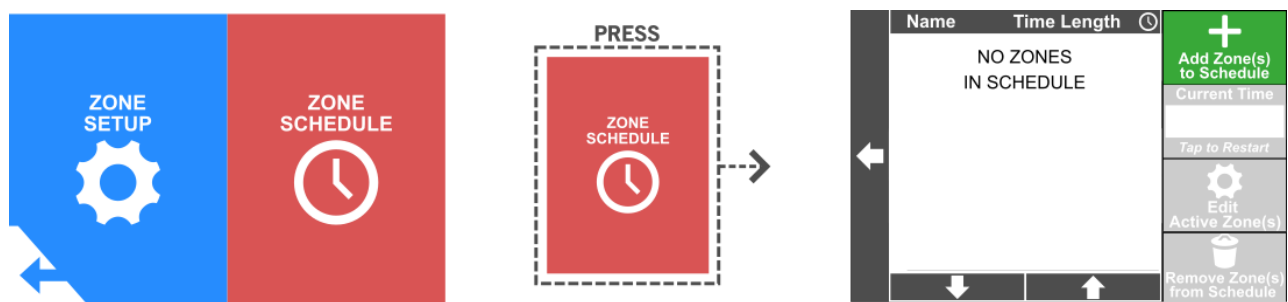
## Zone Setup



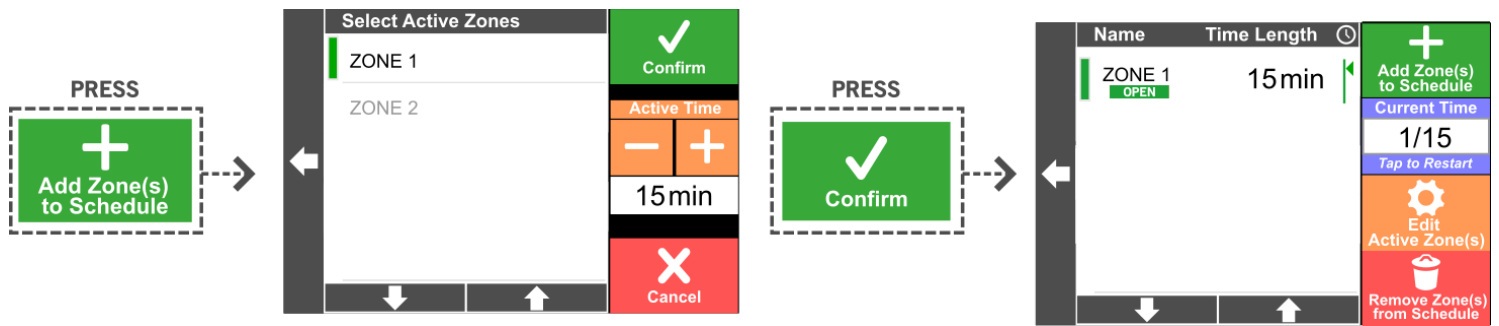
Next, add two new exhaust zones, by pressing the “Add New Zone” button.



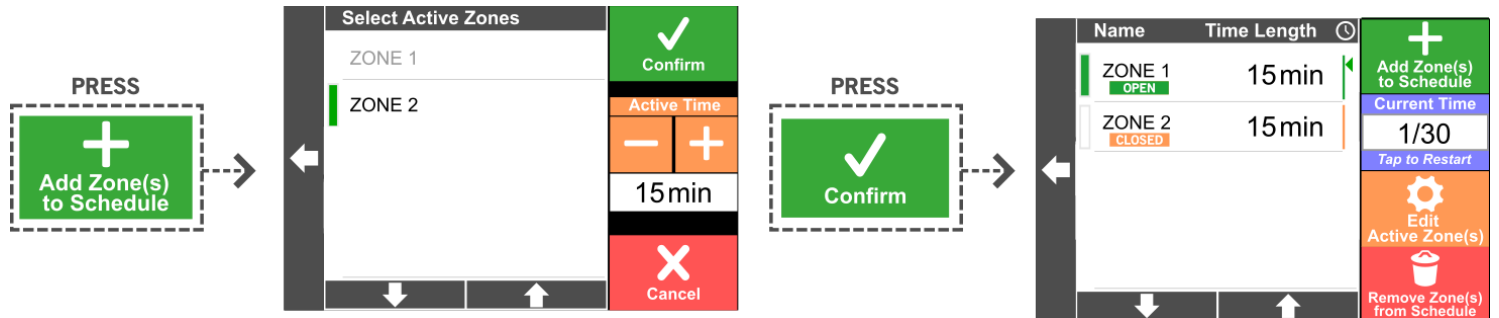
Now that the two distinct zones are defined, we will create a zone schedule. Press the Back arrow, and then select “Zone Schedule”, as seen below.



In this example, we would like to cycle between the two zones on a 15-minute interval. Press the “Add Zone(s) to Schedule” button



Select *only* the Zone 1 entry, and then press Confirm. For a more complex configuration, it would be possible to group multiple zones into a single block of scheduled time, but in this example we will keep it simple. Again, press the “Add Zone(s) to Schedule” to add the second zone to the schedule.



Lastly, the Wired Auxiliary Output channels of the CERV must be configured to these two zones, to match as seen below.

## Wired Auxiliary Outputs Screen

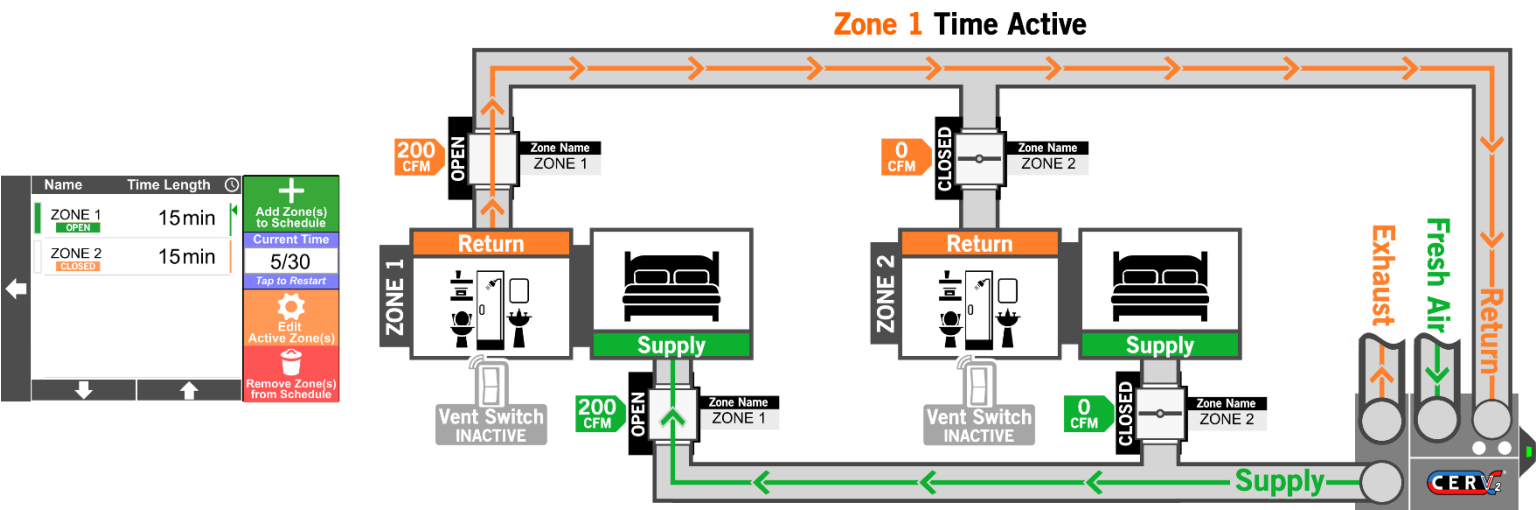


### Operation

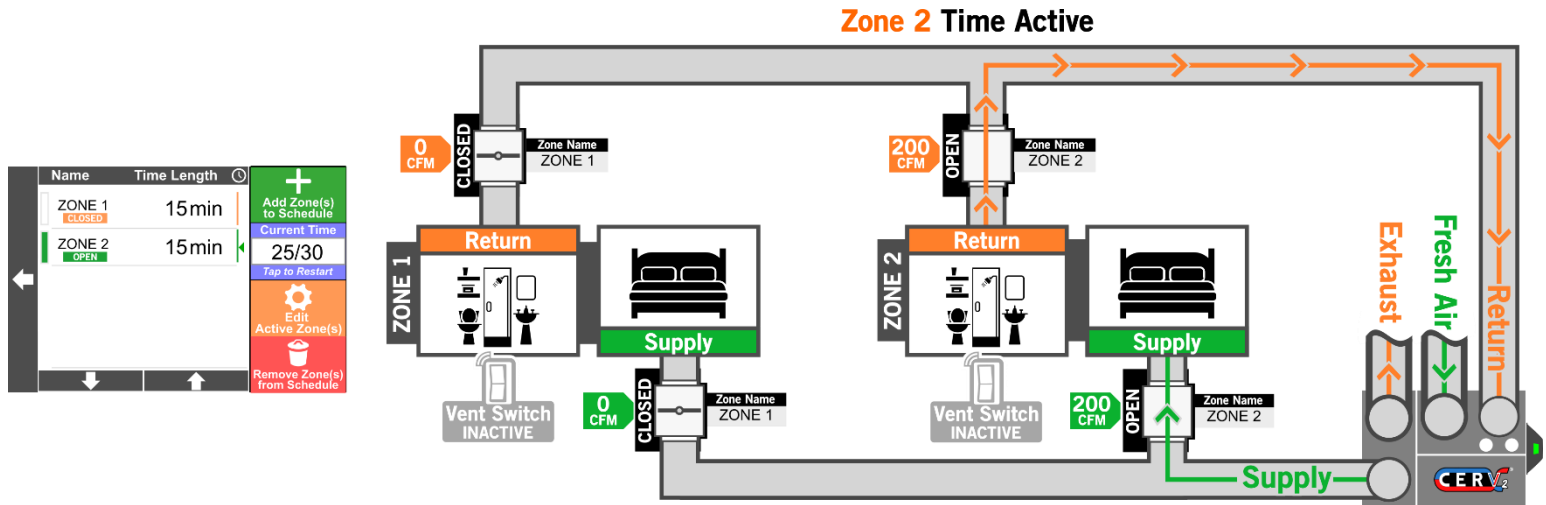
Now that the configuration is complete, lets see how this configuration will operate

### Zone Schedule Times

In this zone schedule, Zone 1 and Zone 2 are both configured to have 15 minutes of operation time. This means that for the first 15 minutes (out of the 30 minute overall period), the CERV will spend its time managing the first Zone. The CERV will operate as normal in this zone. If pollutants rise above the pollutant setpoint, the CERV will ventilate to bring them back down. If the temperature goes above or below the heating and cooling setpoints, the CERV will heat or cool. During this period, Zone 2 is completely sealed off by the Zone 2 dampers.



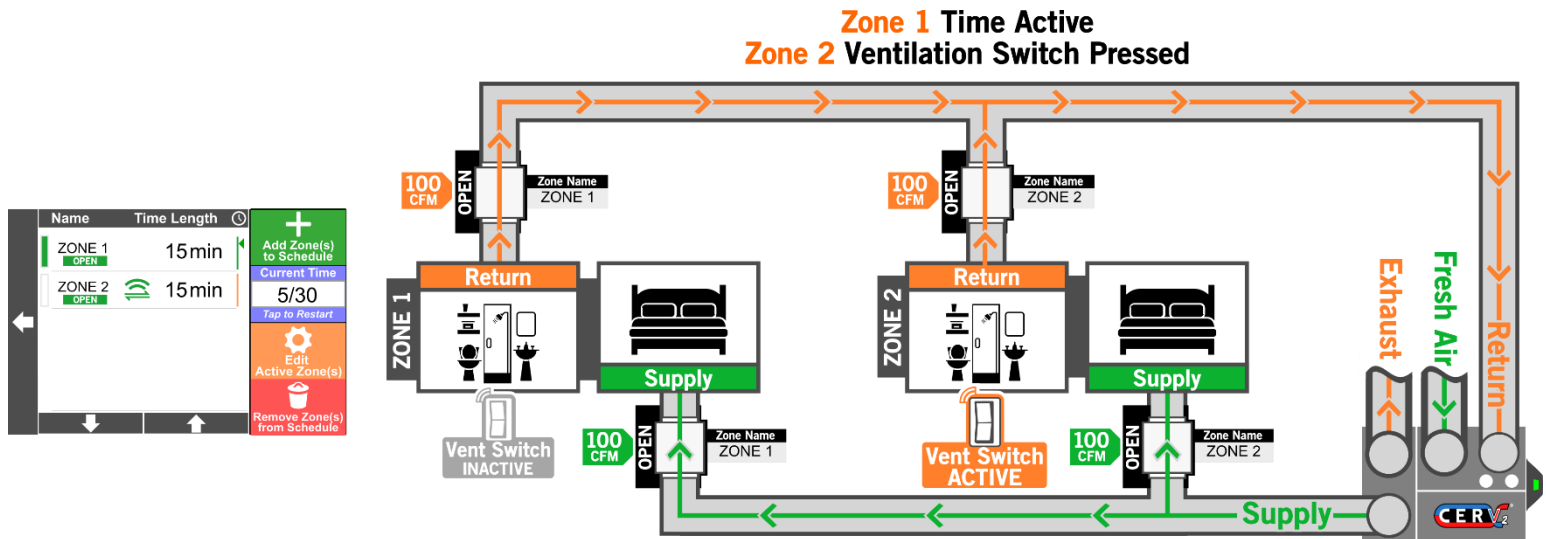
After the first 15 minutes have passed, it will be time for Zone 2. Zone 1's dampers will shut, and the CERV will operate in Zone 2 as it did in the first zone. After the 30 minute total period is complete, it will return to Zone 1 again and start the cycle over.



### Operation Special Cases – Ventilation Switch

It is important for the CERV to be reactive to the needs of both Zones, therefore there are some special cases of operation where the CERV may operate in both zones at once. In these cases, the CERV will **NEVER** recirculate air between the two zones, but it will ventilate both at the same time.

For the first example, the CERV is 5 minutes into the first zone's time, but an occupant of Zone 2 triggers the CERV to ventilate with a Wireless Ventilation Switch.



When the Wireless Ventilation Switch is triggered, both sets of zone dampers will open, and the CERV will ventilate both zones at the same time, regardless of what was happening in Zone 1. The Zone Schedule screen on the CERV will indicate this activity with the Wireless Ventilation Switch icon next to the zone with the active switch.

## Operation Special Cases – High Pollutants in Zone

If a zone has high pollutants, the CERV will make sure it still works to improve the air quality, while also giving proper attention to the other zone. In this scenario, the CERV has been cycling through Zone 1 and Zone 2. During Zone 2's period, high CO<sub>2</sub> or VOC levels trigger the CERV into ventilation mode. After Zone 2's period has completed, it would normally close Zone 2 and return to Zone 1, but because the pollutant levels remain high, the CERV will continue to ventilate Zone 2 and ALSO ventilate Zone 1. This ensures that Zone 1 is not ignored. Once the indoor air quality in BOTH zones is back below the indoor air quality setpoint, the CERV will return to its regularly scheduled programming.

