

EcoNet Zoning Panel by EWC Controls Inc.

Installation Instructions

The EcoNet® Zoning System is designed to streamline the installation experience and optimize precision comfort control. The EWC-produced EcoNet Zoning Panel is specially designed to work with EcoNet Enabled HVAC systems, and can accommodate up to six (6) zones and support up to five (5) modulating dampers wired in parallel per zone. Each constructed zone should support the minimum airflow of the installed HVAC equipment.

The system leverages EWC power-open / power-close modulating dampers helping maximize comfort by delivering required airflow to calling zones. A bypass damper, external transformer or leaving air temperature sensor is not required in most applications, as the unique EcoNet system algorithms monitor airflow and make necessary adjustments to protect the heating / cooling equipment and regulate air flow noise into the zones.

EcoNet Zoning System Overview and Required Components

Zoning Panel	The EcoNet Zoning Panel, part number: REPNL700ZON, is the main control that communicates between the dampers, thermostats and the HVAC system. When there is a call for heating or cooling the Zone Panel receives a signal from the EcoNet Smart Thermostat and modulates the dampers accordingly. Each zone panel will accommodate up to three (3) zones, or up to six (6) zones when two control panels are connected together. A dip switch located on the zone panel will identify it as zones 1-3 or 4-6.
Modulating Dampers	The EcoNet Zoning System is compatible with EWC® Ultra-Zone® models URD (ducted round), ND (rectangular louvered) or SID (slip-in round) dampers. They are all 24 VAC power-open and-close allowing for full modulation to one of 35 positions. These devices are wired to the zone panel with each zone being able to support up to five (5) dampers. Depending on what zones require conditioning, the dampers automatically open and close to the appropriate position. NOTE: <i>If more than five dampers in total are used then it is recommended to use an external transformer.</i>
Compatible HVAC Systems	EcoNet Enabled HVAC systems with ECM variable speed (constant CFM) blower motors are supported. EcoNet systems with a constant torque (X13 type) blower motor are NOT supported (E.G. model H2T series air handlers). Refer to the EcoNet Zoning Specification Sheet for the full list of compatible equipment.
EcoNet Smart Thermostat	The EcoNet Smart Thermostat, part number ETST700SYS, serves as the master control of the zoning system and must be used as the zone 1 thermostat control. Only the EcoNet Smart Thermostat contains the necessary programs and algorithms needed to operate the EcoNet Zone System. It allows the user to configure the HVAC equipment, zoning settings, operate and monitor the system. Additionally, the EcoNet Smart Thermostat provides a single interface for users to view the status of each zone.
EcoNet Zone Control	EcoNet Zone Controls, part number - RECTL700ZON, must be used as the control / sensor in zones 2-6. The zone control will display the zone temperature and allows the user to adjust zone set points, fan speed, schedule and other settings for each individual zone. These controls do not have to be home-run back to the EcoNet Zoning Panel; they can be daisy chained to any device on the EcoNet communication bus.
Bypass-less System	A bypass damper is not required. The EcoNet HVAC system monitors the airflow going into every zone, and will make any needed adjustments to protect against coil freezing, limit trips and uncomfortable leaving-air temperatures. Additionally the user can adjust the airflow setting for every zone from the EcoNet Smart Thermostat or directly from each zone's EcoNet Zone Control. A leaving-air temperature sensor is also not needed, as the system will ensure proper and efficient airflow for the equipment.
Intelligent Bypass	A bypass damper can be optionally installed on 4 or 5 zone systems as zone 6, where it will be known that one of the zones has small ductwork. When used the bypass damper will be another EWC Ultra-Zone power-open / power-close modulating damper and not a spring or barometric type damper. The zone 6 damper output shall be designated as a bypass using dip switch 2 on the EcoNet Zoning Panel. The Intelligent Bypass opens at system start up for 60 seconds to provide soft start and increase leaving air temperature (LAT) in heat mode, or lower LAT in cool mode faster.

Preparing for Installation

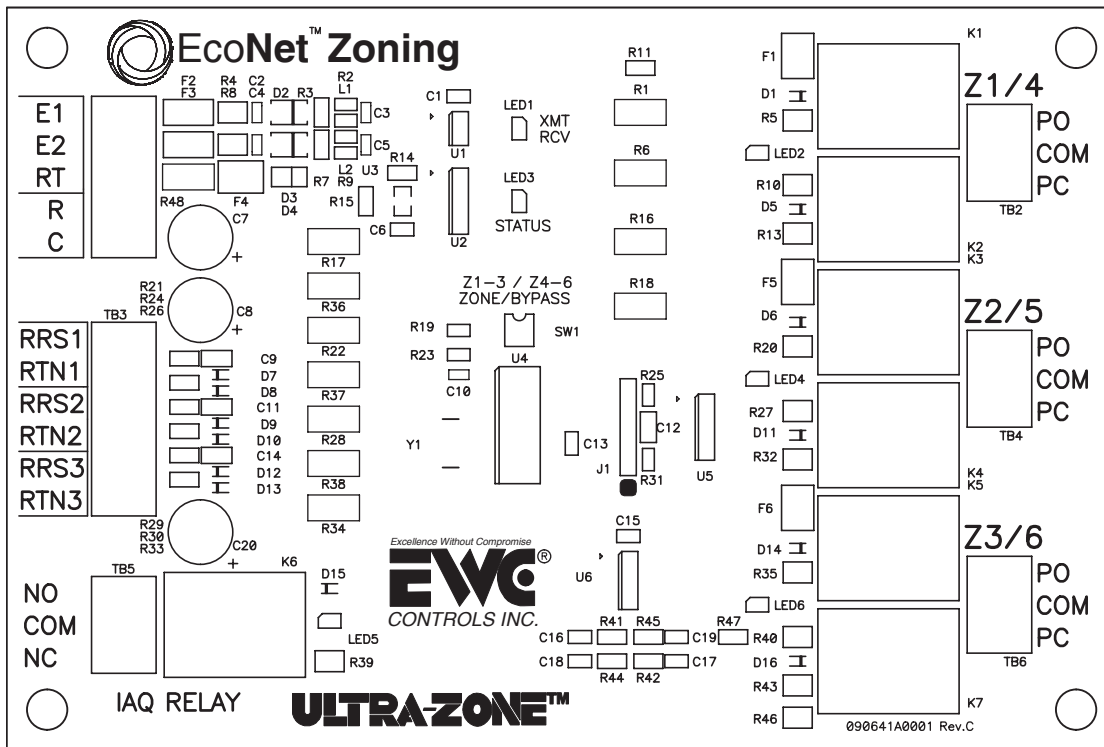
Before you begin installation, group together rooms that have similar usage, occupancy, and heat load. Different levels in a home should always be separate zones. Each level may be further divided into additional zones as required. If energy saving is desired, areas which will be unoccupied at different times should be separated so they can be set back as needed. If precision comfort is desired, areas with different heat loss / gain as well as different levels should be separated.

The EcoNet Smart Thermostat is required to operate the HVAC equipment and must serve as the zone 1 control. An EcoNet Zone Control is required for each additional zone (2-6). Up to five dampers may be used in a given zone by wiring them in parallel. EWC Ultra-Zone models ND (ducted round), URD (rectangular louvered) or SID (slip-in round) dampers may be used in any arrangement.

Zone 1 should be the main zone, and should typically be the largest.

Figure 1 is a close up of the zone panel and all of the connection points.

Figure 1



- | | |
|------------------------|--|
| E1, E2 | EcoNet communication |
| R, C | 24 VAC power |
| Z1: PO, COM, PC | Zone 1 damper: Power Open, Power Common, Power Close |
| Z2: PO, COM, PC | Zone 2 damper: Power Open, Power Common, Power Close |
| Z3: PO, COM, PC | Zone 3 damper: Power Open, Power Common, Power Close |

NOTE:

The RRS/RTN terminals are not used.
The IAQ Relay, NO, COM, NC are not used.

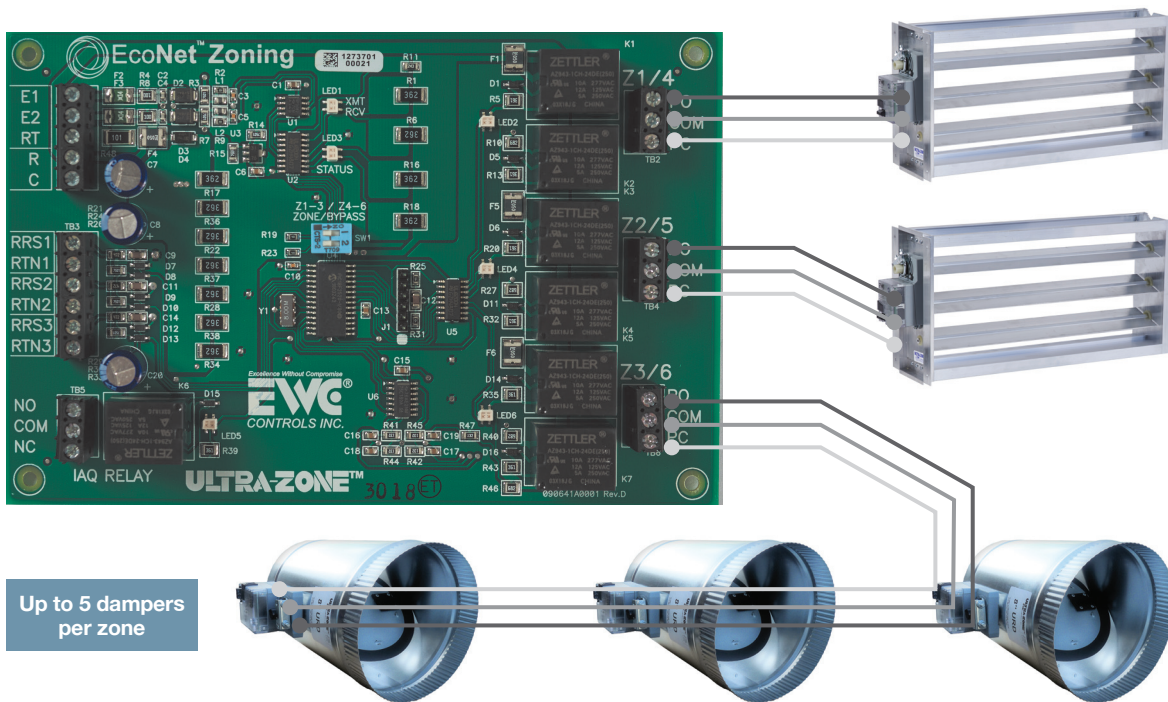
EcoNet Zoning Panel Location:

The EcoNet Zoning Panel, part number - REPNL700ZON, housing can accommodate two (2) zone panels. Choose a suitable location to mount the EcoNet Zoning Panel housing. Likely locations are a nearby wall or convenient studs where plywood can be installed to support the housing. Avoid mounting the control on the return or supply duct. Do not mount directly to any Air-Handler, Furnace, Hot Water Coil or Evaporator Cabinet to avoid damage to these devices. The zone panel may be installed in an unconditioned attic, basement, or crawl space. Follow National and / or Local Mechanical Code.

Follow the installation instructions supplied with the EcoNet Smart Thermostat or EcoNet Zone Control for proper mounting and configuring of controls.

DAMPERS:

EWC Ultra-Zone models URD (ducted round), ND (rectangular louvered) or SID (slip-in round) can be used. Up to five (5) dampers per zone (wired in parallel) are supported.



WIRING:

Ordinary thermostat wire is recommended. Use 18 AWG or larger for normal wiring applications. Wiring length should not exceed 125 feet between communicating controls. The maximum wire length from end to end is 500 feet.

NOTE:

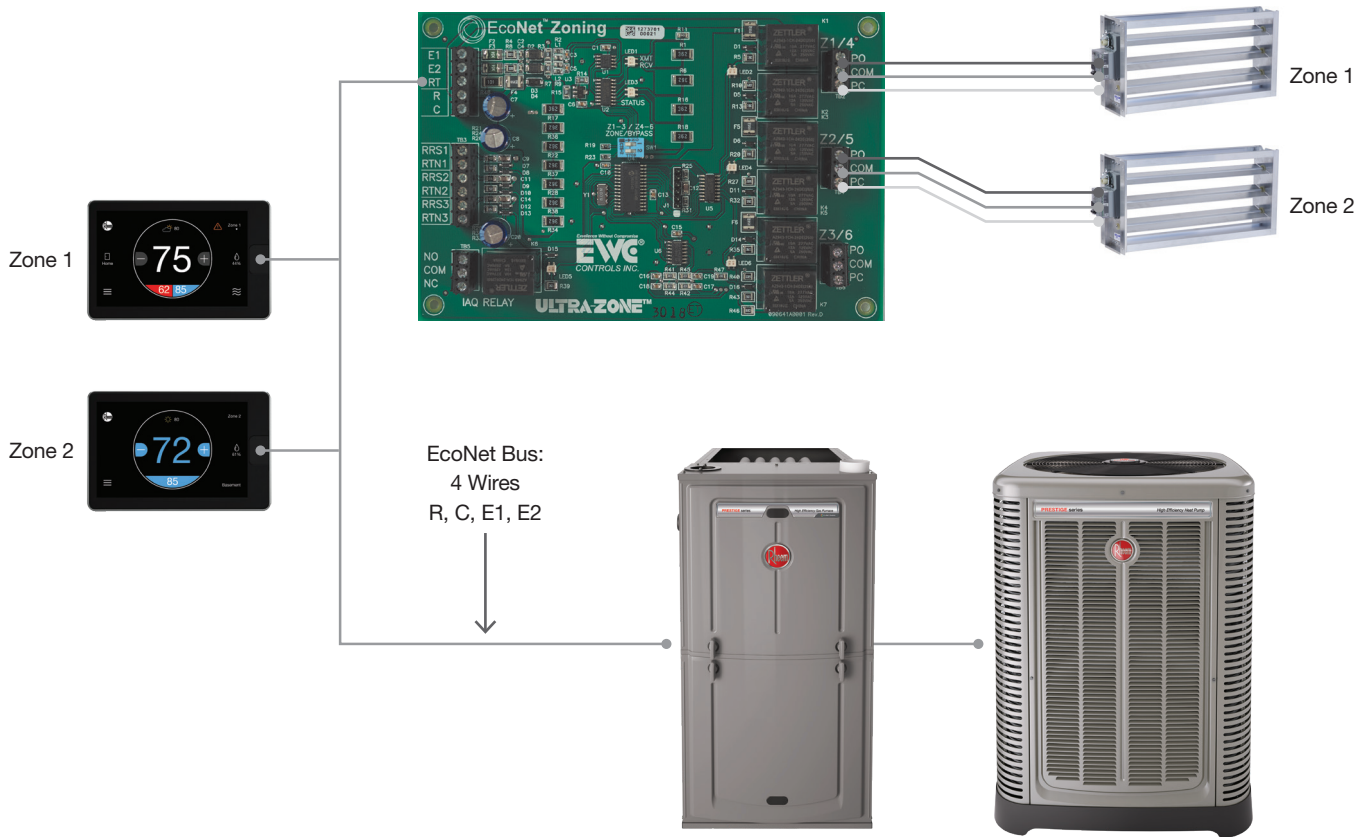
Four (4) wires are required. However, it is good practice to run thermostat cable having more than four wires in the event of a damaged or broken wire during installation. Mark each Damper and Zone Control Center wire at the Damper Control end so they do not become mixed up. The units should be wired in a "daisy chain" and NOT in a "star" configuration. To "daisy chain" the units on the network, each unit should have a set of wires coming into it and one set going out of it except the two communicating devices that are at the ends of the network, which will only have one set of wires to it. The EcoNet Smart Thermostat and outdoor condensing unit should always be at the end of the network.

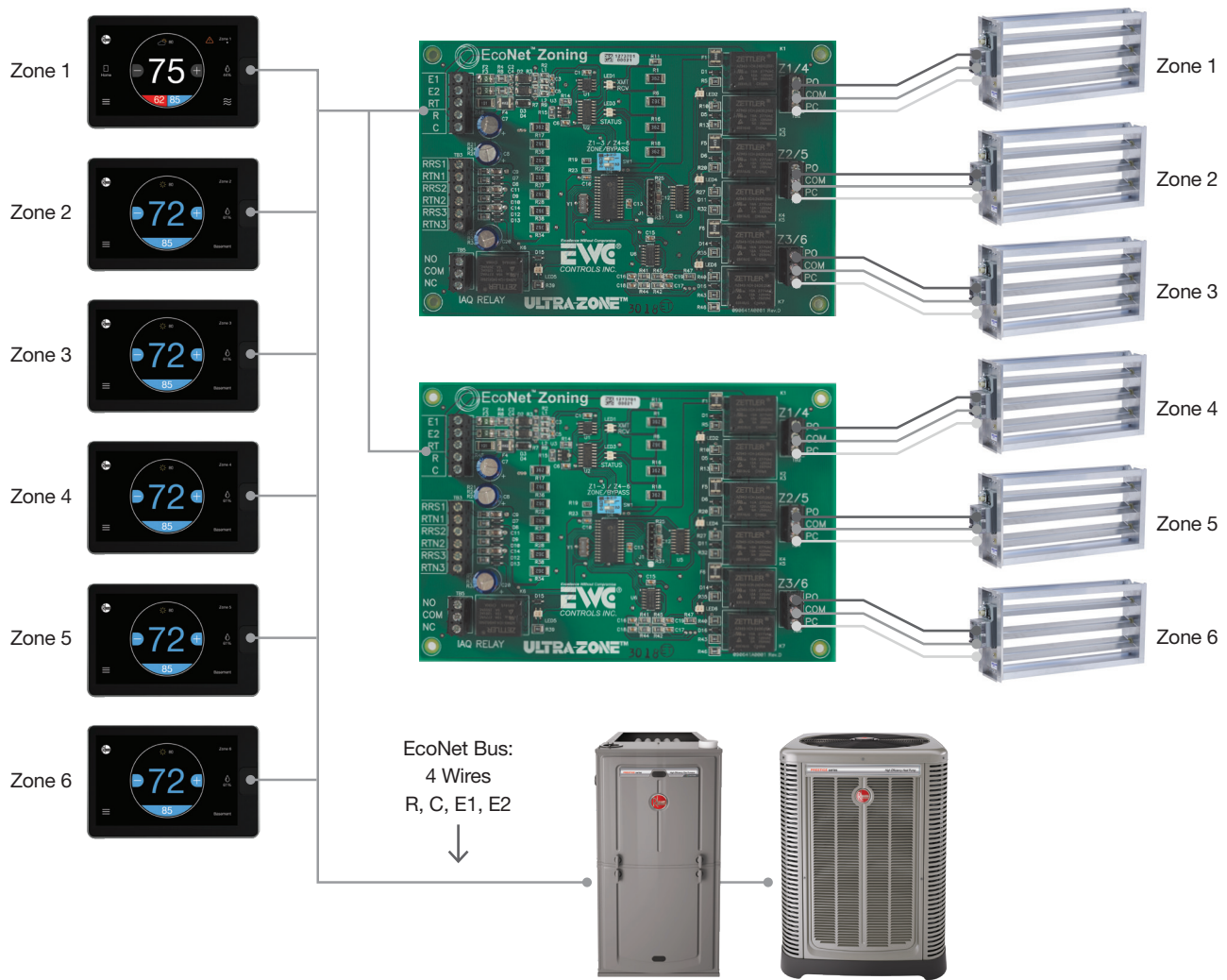
SHIELDED WIRE:

If the thermostat wiring will be located near or in parallel with high voltage wiring, cable TV, Ethernet, or radio frequency equipment, then shielded thermostat wire can be used to reduce or eliminate potential interference. The shield wire should be connected to the C terminal, or ground, at the indoor unit only. The shield wire from all of the thermostat runs should be attached together and only grounded at the indoor unit. The shield wire should NOT be connected to any terminal at the zone panel. Connecting the shield to ground at more than one location can cause current loops in the shield, reducing shield effectiveness.

The EcoNet Zone Panel has a five-terminal connector labeled E1, E2, RT, R, and C

- E1** connect to the E1 terminal of the EcoNet equipment.
- E2** connect to the E2 terminal of the EcoNet equipment.
- RT** typically, no connection here is needed. Provides a communication ground. Must NOT be connected to the C terminal of the indoor unit. Can be connected to a true ground on the indoor unit if an external transformer is used.
- R** connect to R of the indoor unit, or to an external 24 VAC transformer.
- C** connect to C of the indoor unit, or to an external 24 VAC transformer. If a separate transformer is used, please make sure to connect the C terminal of the control to the C terminal of the indoor unit, to ensure proper ground.





ZONES 4-6:

If there are two zone panels installed, the dip switch on the second EcoNet Zoning Panel needs to be switched to the “4-6” position.

ZONE PANEL LED

- LED 1 = Pulses “green” to indicate DATA is being “Transmitted / Received” on the EcoNet bus.
- LED 3 = Blinks “green” at a “Steady ON / OFF Heart Beat” to indicate proper CPU / Clock function.

LED’s 2, 4, 6 = Will illuminate solid GREEN to indicate “Full Open” Zone Damper Position OR Will illuminate solid RED to indicate “Full Closed” Zone Damper Position OR No LED indicates “Floating” or moving Zone Damper Position

INTELLIGENT BYPASS

An intelligent bypass is recommended when the total airflow capacity of the smallest zone is smaller than the lowest capacity of the system.

If a bypass damper is to be used, it must be wired to Zone 6 damper output of the second zone panel. The dip switch 2 (labeled Bypass) on the zone 4-6 panel must be set to On. This only allows up to 5 zones of control. The EcoNet Zoning System will bypass only the excess air that the zones cannot absorb. The intelligent bypass is only used as a last resort, after the system has exhausted available alternatives (blower reduction, capacity reduction, set back zone dumping).

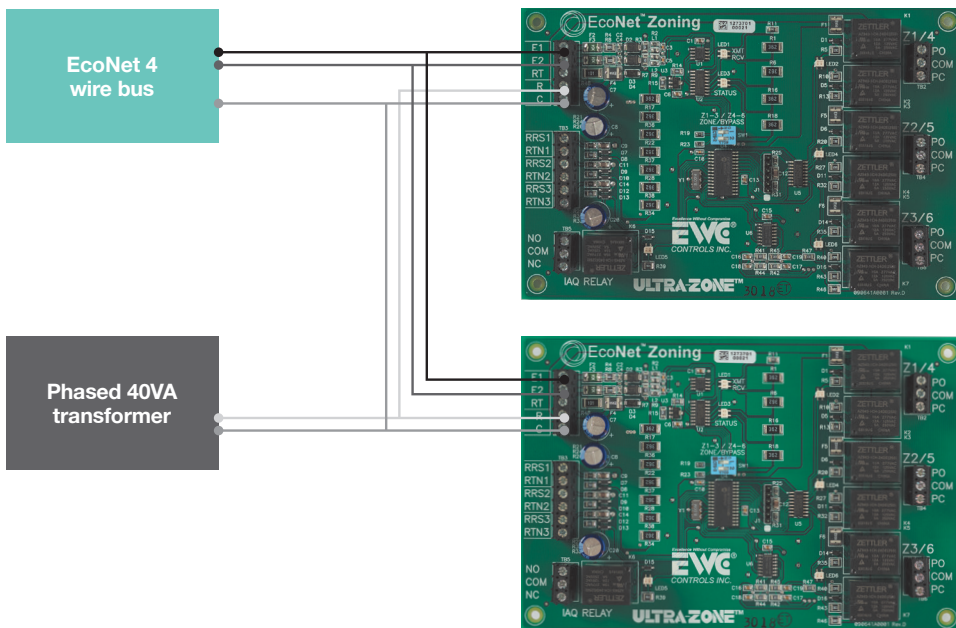
A leaving air temperature sensor (LAT) is required when an intelligent bypass is installed. The LAT should be wired to the indoor unit's control board.

EcoNet ZONE CONTROL

Zone 1 must use an EcoNet Smart Thermostat, part number - ETST700SYS. Zones 2 through 6 must use the EcoNet Zone Control, part number - RECTL700ZON.

EXTERNAL TRANSFORMER

If more than five dampers in total are used, or if two EcoNet Zone Panels are used, an external 24VAC / 40VA transformer should be used. Connect the C terminal from the indoor unit to the zone panel(s). Do NOT connect the R terminal from the indoor unit to the zone panel(s). The external transformer must be in phase with the indoor unit's transformer. With an AC voltmeter, measure between the R and C terminals of the zone panel. If 48 volts is measured, the transformer is out of phase, swap the transformer's wiring to the R and C terminals. Close to 0v is in phase.



Start-Up

After the entire EcoNet Zoning System has been installed, apply power to the HVAC equipment. At this time the EcoNet Smart Thermostat will proceed through its normal auto configuration process and discover the zone controls. EcoNet Zone Controls must be assigned their zone identification number. From each Zone Control tap Menu > Settings > Zone ID Assignment and change the zone number accordingly.

After assigning the zone numbers to each zone control, go to the EcoNet Smart Thermostat, zone 1 control, and tap Menu > Status > Zoning. All discovered zones will be listed along with the respective set point, zone temperature, humidity, damper position, and airflow. If a zone is missing, check the wiring to the specific zone control.

Zone Duct Measurement

After start-up, it is recommended you run the zone duct measurement. To initiate from the EcoNet Smart Thermostat tap Menu > Service > Zoning Checkout. Highlight 'Off' and then use the adjustment arrows to select Duct Measurement and tap 'Start Test.' The system will close all dampers, run the blower at a constant low airflow to measure duct leakage. The system will then open each zone one at a time and finally open all zones measuring duct airflow to establish and assign the relative size of each zone including any leakage. The test will take approximately one minute per zone to complete. A follow up duct measurement will automatically be performed once per week to identify any changes in ductwork or zone registers.

NOTE: *If the ductwork is sensed to be over one inch of static pressure, an alert will be triggered (A004_S Static Pressure High (greater than 1 in.). This alert will not prohibit equipment operation, it is to inform the installer of restrictive ductwork and / or filter.*

The zone duct measurement should be performed after the system has been commissioned (equipment checks out and any AC/HP refrigerant charging tests have been completed).

Airflow Linearization

The airflow through the zone damper is inherently nonlinear in relation to the damper shape, size and position. To overcome this and provide much more consistent airflow and temperature control the EcoNet system can run an algorithm to linearize airflow. From the EcoNet Smart Thermostat tap Menu > Service > Zoning Checkout. Highlight 'Off' and then use the adjustment arrows to select 'Damper Linearization' and begin the test. This process will incrementally step each zone damper and learn the airflow change. This process will take approximately five minutes per zone.

System Control

The EcoNet Smart Thermostat control is responsible for operating the heating and cooling equipment. From here users will be able to configure zoning system settings and see a status readout for each zone. To ensure the EcoNet system is zoning enabled, tap Menu > Settings > Zoning and ensure zoning is enabled. On the zoning settings screen, the user can configure humidity detection and set airflow limits for each zone.

From Each Zone Control Users Can:

- Adjust zone set points and continuous fan operation
- Program a daily schedule
- Set unique away and vacation settings
- Receive equipment alerts and alarms

Over-Current Protection:

- 500mA on each Damper Motor Terminal Block
- 140mA on each Communicating Thermostat and HVAC System Terminal Block
- v140mA on each Regular 24V Thermostat Terminal Block
- MAXIMUM CURRENT DRAW = .5 Amp

Zone Panel Specifications:

- Temperature: -20° to 160°F (-29° to 71°C)
- Humidity: 0–95% RH Non-Condensing
- Suitable for unconditioned attic or basement installation

Zoning Troubleshooting

Airflow coming out of registers is too loud / too much.

On the main control thermostat go to Menu > Settings > Zone Settings, or on the Zone Control thermostat select Menu > Settings. Select 'Zone Airflow Limit' and adjust to a lower level while the zone is exhibiting the issue. The airflow should drop with each reduced selection. Select the highest airflow limit that you find comfortable.

I see in the Alarm History code: T00x_Z Zone x Airflow Alert - Caused Shutdown.

The system is shutting down because the airflow limit for that zone has been reached. Either increase the 'Zone Airflow Limit' for the zone, or adjust the 'Over-Conditioning' setting for the other zones to a higher number. Both settings are found on the EcoNet Smart Thermostat under Menu > Settings > Zone Settings.

I see in the Alarm History code: T007_Z Blower Cutback - Caused Shutdown.

The system tried to run the blower at the required speed, but duct restriction or decreased zoning demand prevented adequate operation. If a Zone Airflow Limit setting is set to 'Unlimited' (Menu > Settings > Zoning on the EcoNet Smart Thermostat, or Menu > Settings on the Zone Control thermostat), change the setting to 'High'. Also check for a possible dirty filter to resolve issue.