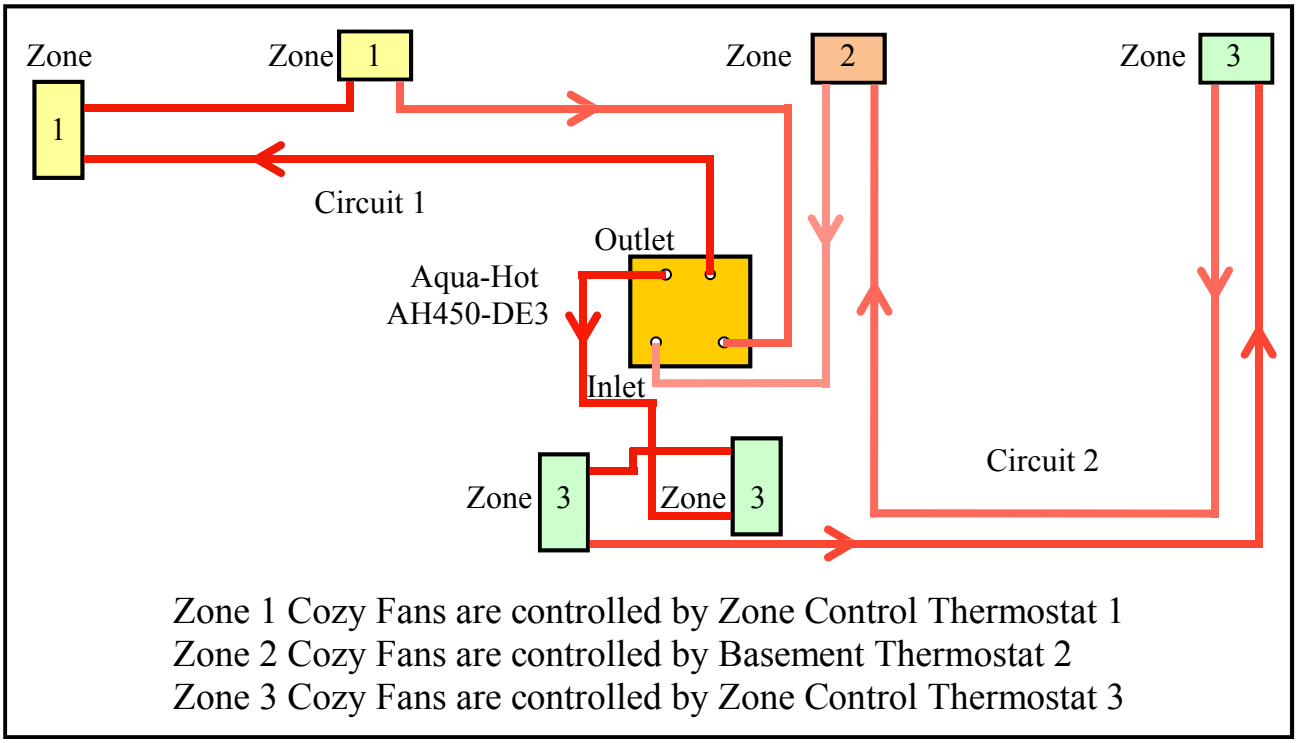
69 – FYI - 2010 43QGP Allegro Bus Aqua-Hot & Locations of the Cozy Heat Exchangers



Special Note: Zone 2 Cozy Heat Exchanger is located above the Water Black and Gray tanks in the wet bay compartment the Zone 2 Cozy Heat Exchanger Fans are controlled by the zone 2 thermostat located in the basement.

The 450-DE3 Aqua-Hot was built with **TWO HEATING CIRCUITS.** I show the Aqua-Hot heating system having three zones. Looking at the above schematic will help you understand how the Aqua-Hot control system operates. Zone 1 is pretty much self-explanatory. After the Diesel Burner **AND/OR** the 120 VAC electric element **AND/OR** the coach engine has heated the boiler coolant, with the zone 1 thermostat turned ON and the zone 1 thermostat set point set high enough to call for heat. The coolant is pumped thru circuit (1) one's tubing leaving the OUTLET fitting going first to the coach cab area then back to the living area before returning by the INLET fitting on the boiler. At this point the heated coolant in circuit one is flowing around in circles. This is only one part of what is needed the second part is air it needs to be pushed across the heat exchangers. The fans mounted on the heat exchanger are the second part, the fans push air thru the heat exchangers then into the heater hoses located throughout the coach. Zones 2 and 3 are both plumbed to heating circuit two (2). Tiffin installs a basement located thermostat

wired to the Aqua-Hot control panel's thermostat 2 input. Because the Aqua-Hot has ONLY two heating circuits zone's 2 and 3 cozy heat exchangers are plumbed thru the Aqua-Hot's heating circuit two (2). ZC thermostat 3 controls the second Aqua-Hot heating circuit this circuit is almost a duplicate of the heating circuit one (1), after the Diesel Burner **AND/OR** the 120 VAC electric element **AND/OR** the coach engine has heated the boiler coolant, with zone 3 thermostat turned ON thermostat 3 set point set high enough to call for heat the coolant is pumped thru the heating circuit two's (2) tubing, leaving by the OUTLET fitting going first to the two central coach and bedroom area heat exchangers. Next the coolant flows to the rear bathroom heat exchanger then to the cozy heat exchanger located in the tank compartment finally returning by the INLET fitting on the boiler. As in zone 1 the zone 3 thermostat is controlling the zone 3 heat exchanger fans, the zone 2 heat exchanger fans will not be running UNLESS the basement zone thermostat is calling for heat. The basement thermostat (zone 2) on our coach has settings ranging from 0 ° to 50 ° (F) the thermostat in the basement of our coach is set for 40 °.

Based on past experience Tiffin does not maintain any standard practice for more than a few years, where our coach was built with **ONE** zone control thermostat more recent Tiffin coaches have been built with three individual thermostats.

I'll briefly explain how our coach's thermostat is wired. Our coach has three AC/HP units with the zone control (ZC) thermostat set for **ELECT HEAT** on zone's 1, 2, 3 the system will operate the Heat Pumps as long as the heat set point (thermostat setting) is not set more than three degrees above the ambient temperature. If the set point is set TOO high the **GAS HEAT** (Diesel in this case) attempts to heat the coach because the Heat Pumps alone cannot raise the temperature of the coach as fast as the system thinks you want the heating to occur. To keep the heating system from becoming confused if the coach is cold and you want faster heating, turn ON the Aqua-Hot system and warm up the coach with the Zone Control thermostat set for **GAS HEAT**, for ZC thermostat's 1 and 3. But what happened to thermostat 2 you say? The Zone Control thermostat is not wired to provide GAS HEAT for zone 2. The thermostat mounted in the basement is wired to control the Aqua-Hot zone 2 heat exchanger fans.

Confused yet? Just remember the Zone Control thermostat in our 2010 vintage coach has three zones wired to control three AC's and HP's, however the same Zone Control thermostat is wired for **ONLY** Zone's 1 and 3 for the GAS HEAT (Diesel) option, zone 2 on the (ZC) zone control thermostat is not wired for GAS HEAT (Diesel).

Adding one more element to the confusion, the Aqua-Hot heating circuit two when operational is pumping heated coolant around in a continuous circle. Heat contained in the coolant when pumped thru the cozy heater exchangers is ONLY given up when the basement thermostat (zone 2) AND/OR ZC thermostat zone 3 is turned ON controlling the heat exchanger FANS pushing air over the heat exchanger and into the heater hoses. If the basement thermostat is OFF and some form of heat (diesel, electric or engine) is heating the coolant even though the tubing contains the heated coolant flowing in a closed circle the heat is not being effectively transferred to the basement unless a FAN is pushing air over the basement heat exchanger, driving transferred heat into a heater hose.