

Arzel® Zoning Technology

(AirBoss™ and 1200 Series Panels)

Troubleshooting Guide

1) VOLTAGE TEST

a) 24 Volt AC

- i) Check AC voltage at 24-VAC R & C terminals, no less than **21.6 Volts A/C** should be present from Arzel supplied Transformer
(40 VA for 2, 3, and 4 zone panels)
(100 VA for 6 and 8 zone panels)

b) 24 Volt DC

- i) Generate a call for “Y1”, “Y2” & “G” at zone 1 only (use jumpers if needed), and set all other zones to “Auto Fan” and “Off”. (This will energize all but one solenoid and put the board under its heaviest load)
- ii) With board under full load, there should be no less than **24 Volts DC** between (SOLENOID “+”) and (BYPASS “D”) terminals
- iii) If 24 Volts AC is present at **24VAC** terminals and the **DC Volts** is less than **24**, the board will need replaced

2) TESTING BOARD “OUTPUT” (EQUIPMENT FUNCTION) RELAYS.

- a) Turn “**Power**” switch “**ON**” (Red LED On) and call for Heat from one or more thermostats;

i) **Is the Red “W1” LED lit at the “HVAC OUTPUT” terminal?**

(1) **Yes!** LED is on

- (a) Check for continuity (0 Ohms) between the “R” and “W1” terminals at the “HVAC OUTPUT” terminal strip on Arzel board (wires removed).
- (b) If no continuity (∞ ohms), the board must be replaced.
- (c) If continuity is present (0 ohms), the board is OK and the problem is with the HVAC equipment or a faulty wire between panel and equipment.
 - (i) Turn panel Power switch “OFF” and Check voltage (A/C) between HVAC Output “R” & “W” terminals (wires connected).
 - (ii) **No Voltage** indicates problem with equipment control power or wiring.

(2) **No!** LED is not lit - **Check** for 24v ac between “W1” and “C” terminals at the calling zone terminals.

(“W1” with an “O” is an illegal call and will be ignored)
(“W2” without a “W1” is an illegal call and will be ignored)

- (a) **24 vac present** -- If the “W1” LED (*top red*) is lit at the zone calling, replace the board
*(Try resetting the power switch on the board in case of power interference trip-up)
 (Check to make sure that the Master Zone Control function switch is “Off”)*
- (b) **No 24vac present** --Problem is with the Thermostat or wiring from thermostat to the Arzel panel.
- ii) Repeat the above procedure for any function demand that does not work properly, i.e.
 Cooling (Y1 G), Fan (G), 2ND Stg Heat (W2).

3) **DAMPER OPERATION.**

- a) To verify proper pressure or vacuum to a damper, insert a tee in the tube connected to that damper actuator and read with a Magnehelic or Digital pressure gauge. (Normal press/vac reading will be approximately 30 in. to 40 in. wc. Or (1 to 2) psi)
- b) To close a damper it must see a positive pressure of at least 25” wc.
 - i) An open-ended “Airflow Indicator” (*available through Arzel*) connected from the bottom of the indicator to the solenoid port should show pressure by lifting the ball to the top of the indicator.
- c) To open a damper it must see a vacuum of at least -25” wc.
 - i) An open-ended “Airflow Indicator” connected from the top of the indicator to the solenoid port should show vacuum by lifting the ball to the top of the indicator.

4) **SOLENOID TESTING**

- a) With **Zone 1** calling for Fan (**G**) and all other zones off, make the following test;
 - i) 24 V **DC** should be present between solenoid terminals (+) and (2, 3, & 4)
 - (1) An open-ended “Airflow Indicator” connected from the bottom of the indicator to the solenoid (2, 3, & 4) port should show pressure by holding the ball to the top of the Indicator.
 (Solenoids are energized (pressure) to close dampers)
 - ii) 0 V **DC** should be present between solenoid terminals (+) and (1)
 - (1) An open-ended “Airflow Indicator” connected from the top of the indicator to the solenoid port should show vacuum by holding the ball to the top of the cylinder.
 (Solenoids are de-energized (vacuum) to open dampers)
- b) Ohm Test
 - i) Disconnect the solenoid lead from its numbered “**SOLENOID**” terminal.
 - ii) Set Ohmmeter @ 1K or higher, read across the loose lead and “ + “ terminal.
 - iii) Ohms should be between **850** and **950 ohms**
- c) If reading low pressure and/or vacuum readings at all zones (dampers not moving fully open and/or closed) check solenoid as follows.
 Test each solenoid individually for “Bleed Through” by removing the vacuum hose (n/o port) and plugging the disconnected tube and the open port, if remaining zones commence to operate properly the solenoid is faulty.

- d) Tube Port Restriction- Check inside the top solenoid port for object restricting airflow to dampers.

5) **AIR SIDE INTEGRITY CHECK**

- a) Use the Arzel “ **Air Flow Indicator** “ to determine if and what zones are leaking air through tubing or damper actuators. Refer to instructions sent with the “Air Flow Indicator”.
- b) To check individual damper actuators for leakage
 - i) Disconnect tube from actuator and remove damper from duct
 - ii) Move damper blade to the closed position
 - iii) Hold finger over tube port.
 - iv) Move damper blade to the open position with finger still over port
 - v) The pressure build up in the actuator should impede the opening motion for as long as you continue to push in the open direction.
 - vi) If the pressure subsides and the damper easily moves to the open position, the actuator is leaking and the damper must be replaced.
 - vii) If the pressure holds, the damper is OK and the leak is in another damper or a tube has come loose from a fitting.

6) **LAT OPERATION**

- a) If furnace is cycling on internal limit or if LAT is cycling equipment Off & On too often, check the following:
 - i) Oversized bypass duct depleting return air and raising discharge air temperature. *(A bypass duct is used strictly to minimize excessive static pressure and is a detriment to heat transfer across the heat exchanger)*
 - ii) **Heating “LAT”**, set point is too low; adjust to maintain supply air temperatures within furnace manufacturers specifications.
 - (1) Note furnace manufacturers specified “Temperature Rise” on Equipment Rating Label.
 - (2) Add 70 deg to the “**maximum**” temperature rise; Example- If the specified temperature rise is “35 to **60 deg**”, Add **70 deg** (typical return air temperature) to the maximum 60 deg Rise. Your Htg LAT setting should be **130 deg**. If nuisance tripping occurs, raise the setting to eliminate tripping without reaching the limit temperature of the furnace.
- b) If Air Conditioning coil is freezing up or LAT is cycling compressor off to often, check the following:
 - i) Oversized bypass duct depleting return air and lowering coil temperature. *(A bypass duct is used strictly to minimize excessive static pressure and is a detriment to heat transfer across the coil)*
 - ii) **Set Cooling LAT** set-point per the following guidelines

- (1) Start with a setting of 42 deg and raise 2 deg at a time if DX Coil shows signs of icing. Remember that it takes more than 20 min of run time to ice up a coil. Because zoning increases the effectiveness of the a/c system it will most likely satisfy the calling thermostat prior to icing the coil.
- (2) Locate the LAT Sensor in the supply duct (not in the plenum), prior to any trunk dampers and in a duct common to all zones. If you have to locate the sensor in one side of a teed duct, place it in the side with the Bypass or smallest cooling Zone.
- c) To Verify Sensor calibration and LAT voltage.
 - i) With sensor disconnected from board, you should read approximately 11,000 – 13,000 ohms at 72 to 66 deg.
 - ii) With sensor disconnected from board you should read approximately 4.9 volts DC (+/- .2 volts)
 - iii) With sensor connected to board, voltage should be approximately 3 volts DC @ 70 supply air temperature.

7) **MASTER ZONE CONTROL FUNCTION.**

- a) With the Master Zone Control switch in the “On” position.
 - i) Only the #1 zone will call for a system function (heat, cool or fan operation).
 - ii) The LED at the zone calling (other than zone #1) will illuminate but will not illuminate the LED at the HVAC OUTPUT or the Zone Solenoid LED.
 - iii) All zone solenoid LED’s will illuminate and dampers will open whenever zone #1 calls

8) **Bypass Operation and Remedies**

- a) Air surging noise with smaller zone open.
 - i) Bypass most likely oversized, (Refer to Arzel Bypass Sizing Chart).
 - ii) Install orifice in pressure tube feeding bypass solenoid valve in panel. (Orifice available through Arzel Zoning Technology).
 - iii) If bypass is proven to be too large, install a volume damper in the duct and reduce airflow until operation is satisfactory.
- b) Fan Operation Issues
 - i) ICM Variable speed motor is ramping up and down.
 - (1) Bypass is possibly oversized and/or not properly adjusted
 - (a) Refer to Arzel Bypass Sizing chart, add volume damper to decrease capacity.
 - (b) Adjust bypass to open only when air noise exceeds tolerable levels.
 - (2) Blower speed is set too high for system capacity
 - (a) Check and adjust CFM output of blower (400 to 300 cfm / ton).

**If all else Fails, Call the Arzel Tech Support Hot Line
1-800-611-8312**

www.arzelzoning.com

Arzel® Zoning Technology

Preventive Maintenance Guide

(AirBoss™, 200 and 1200 Series Panels)

9) SOLENOID/PUMP OPERATION.

- a) To verify proper pressure or vacuum to a damper, insert a tee in the tube connected to that damper actuator and read with a Magnehelic or Digital gauge. (Normal press/vac reading will be approximately 30 in. to 40 in. wc. (2 psi).
- b) To close a damper it must see a positive pressure of at least 25" wc.
 - i) An "Airflow Indicator" connected from the bottom of the Indicator to the solenoid port should show pressure by lifting the ball to the top of the Indicator (with the top port left open).
- c) To open a damper it must see a vacuum of at least -25" wc.
 - i) An "Airflow Indicator" connected from the top of the Indicator to the solenoid port should show vacuum by lifting the ball to the top of the Indicator (with the bottom port left open).

10) AIR SIDE INTEGRITY CHECK

- a) Use the Arzel " Air Flow Indicator " to determine if any damper actuators, tubing or fittings are leaking air. Refer to instructions sent with the "Air Flow Indicator". If a zone shows air leakage, disconnect all but the first damper from the air tube and continue adding dampers to the tube until the problem reappears.
- b) To check damper actuators for leakage with out the Arzel "Air Flow Indicator".
 - i) Disconnect tube from actuator and remove damper from duct
 - ii) Move damper blade to the closed position
 - iii) Hold finger over tube port.
 - iv) Move damper blade to the open position with finger still over port
 - v) The pressure build up in the actuator should impede the opening motion for as long as you continue to push in the open direction.
 - vi) If the pressure subsides and the damper easily moves to the open position, the actuator is leaking and the damper must be replaced.
 - vii) If the pressure holds, the damper is OK and the leak is in another damper or a tube has come loose from a fitting.

11) LAT OPERATION

- a) If furnace is cycling on internal limit or if LAT is cycling equipment off & on unnecessarily, check the following:
 - i) Oversized bypass duct depleting return air and raising discharge air temperature. (*A bypass duct is used strictly to minimize excessive static pressure and is a detriment to heat transfer across the heat exchanger*)
 - ii) Set Heating "LAT" set point to maintain supply air temperatures within furnace manufacturers specifications.

- (1) Determine Furnace manufacturers specified “Temperature Rise” on Equipment Rating Label.
 - (2) Add 70 deg to the **maximum** temperature rise; Example- If the specified temperature rise is “35 to **60 deg**”, Add 70 deg (average return air temperature) to the maximum **60 deg** Rise. Your Htg LAT setting should be 130 deg. If nuisance tripping occurs, raise the setting to eliminate tripping without reaching the limit temperature of the furnace.
- b) If coil is freezing up or LAT is cycling “Y1” off to often, check the following:
- i) Oversized bypass duct depleting return air and lowering coil temperature.
(A bypass duct is used strictly to minimize excessive static pressure and is a detriment to heat transfer across the coil)
 - ii) Set Cooling LAT set-point per the following guidelines
 - (1) Start with a setting of 42 deg and raise 2 deg at a time if DX Coil shows signs of icing. Remember that it takes more than 30 min of run time to ice up a coil. Because zoning increases the effectiveness of the a/c system it will most likely satisfy the calling thermostat prior to icing the coil.
 - (2) Locate the LAT Sensor in the supply duct (not in the plenum), prior to any trunk dampers and in a duct common to all zones. If you have to locate the sensor in one side of a Teed duct, place it in the side with the Bypass or smallest cooling Zone.

12) Bypass Operation and Remedies

- a) Check Bypass operation with smallest zone calling and largest zone calling.
 - i) Bypass should only be open if air noise is an issue when the smallest zone is calling for cooling with all other zone satisfied.
- b) Air surging noise with smaller zone open.
 - i) Bypass most likely oversized, (Refer to Arzel Bypass Sizing Chart).
 - ii) If not present, install orifice in pressure tube feeding bypass solenoid valve in panel. *(Orifice available through Arzel Zoning Technology).*
 - iii) If bypass is proven to be too large, install a volume damper in the duct and reduce airflow until operation is satisfactory.
- c) Fan Operation Issues
 - i) ICM Variable speed motor is ramping up and down.
 - (1) Bypass is possibly oversized and/or not properly adjusted
 - (a) Refer to Arzel Bypass Sizing chart, add volume damper to decrease capacity.
 - (b) Adjust bypass to open only when air noise exceeds tolerable levels.
 - (2) Blower speed is set to high for system capacity
 - (a) Check and adjust CFM output of blower (400 cfm / ton).

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