



*Innovative Zoning Solutions*  
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## Contents:

|   |       |
|---|-------|
| * AirBoss Sensor Verification Test                | p. 2  |
| * Airflow Indicator Instructions                  | p. 3  |
| * Basic Troubleshooting Procedures for all Panels | p. 4  |
| * Bypass Sizing Chart                             | p. 6  |
| * Damper Troubleshooting with a Digital Manometer | p. 7  |
| * HeatPumPro Troubleshooting Guide                | p. 8  |
| * Pump Integrity Test                             | p. 11 |
| * Temporary panel "Work-Around" Procedures        | p. 12 |
| * Warranty Information                            | p. 13 |



## Spare Parts Contents

| <b>Part</b>                   | <b>Part Number</b> | <b>Quantity</b> |
|-------------------------------|--------------------|-----------------|
| Airflow Indicator             | AIRFLOW            | 1               |
| Black Couplings               | FIT-TC025          | 25              |
| Black Elbows                  | FIT-TE025          | 25              |
| Black Plugs                   | FIT-TP025          | 25              |
| Black Ts                      | FIT-TT025          | 25              |
| 20 amp Fuses                  | PAN-FUSE2          | 5               |
| Modulating Bypass Transmitter | MOD-BYPAS1         | 1               |
| Panel Pump                    | PMP-PUMP1          | 1               |
| Red Caps                      | N/A                | 12              |
| Sensor                        | SEN-RESPRO         | 1               |
| Sensor                        | SEN-UPS12          | 1               |
| Solenoid                      | PAN-SOLO4          | 1               |
| Solenoid                      | PAN-SOLO5          | 1               |
| Transformer                   | TRANS-40VARS       | 1               |

# AirBoss

## Sensor Verification Test

Proceed as follows:

### With LAT sensor connected to PC Board:

1. Insert test thermometer into duct as near to LAT sensor as possible.
2. Measure DC voltage across two LAT terminals.
3. Voltage reading should indicate the same temperature as test thermometer reading shown on chart (Fig. 11a), plus or minus 3° F.
4. If voltage reading is different than chart voltage, proceed to the following sensor check.

### With LAT sensor disconnected from PC Board:

1. Measure resistance across sensor at 100k to 200k Ohm scale. Ohm reading should indicate the same temperature as test thermometer chart below. (Fig. 11a)
2. If Ohm reading does not match chart (+ or - 10 %), replace the sensor.
3. If Ohm reading matches the chart, check for 5 volts DC at LAT terminals.
4. If voltage is not 5 Volt DC, replace PC Board.

### LAT - TEMPERATURE / OHMS / DC VOLTAGE RELATIONSHIP CHART

| <u>Temp</u> | <u>Ohms (k)</u> | <u>DC Volts</u> | <u>Temp</u> | <u>Ohms (k)</u> | <u>DC Volts</u> |
|-------------|-----------------|-----------------|-------------|-----------------|-----------------|
| 40          | 26.1            | 3.82            | 76          | 10.2            | 2.85            |
| 42          | 24.7            | 3.77            | 80          | 9.3             | 2.72            |
| 44          | 23.4            | 3.72            | 90          | 7.3             | 2.42            |
| 46          | 22.1            | 3.69            | 100         | 5.8             | 2.14            |
| 48          | 20.9            | 3.63            | 110         | 4.7             | 1.88            |
| 50          | 19.9            | 3.57            | 120         | 3.8             | 1.63            |
| 52          | 18.8            | 3.52            | 130         | 3.0             | 1.41            |
| 54          | 17.9            | 3.46            | 140         | 2.5             | 1.22            |
| 56          | 16.9            | 3.40            | 150         | 2.0             | 1.05            |
| 58          | 16.1            | 3.35            | 160         | 1.7             | 0.90            |
| 61          | 14.5            | 3.28            | 170         | 1.4             | 0.77            |
| 70          | 11.8            | 2.98            | 180         | 1.2             | 0.66            |

(Fig. 11a)

## **SMART SLAVE ZONE (SSZ™) Thermostat**

Any number of Smart Slave Zones may be added to all Arzel panels. The Smart Slave Zone thermostat does not control the HVAC equipment. It will only open its zone dampers if the air temperature in the duct is compatible with the thermostat call. Smart Slave Zone operation is indicated by the LED on its PC board. If the LED is lit, the damper is in the open position. Do not use a Heat Pump thermostat for the Smart Slave Zones.

### **SMART SLAVE ZONE (SSZ™) WIRING AND TUBE CONNECTIONS (Fig.12a)**

Smart Slave Zone thermostats do not need a heating-cooling sub-base to operate but could be used to lock out cooling calls in the heating season or heating calls in the cooling season. Connect "R", "W" and "Y" thermostat wires to "R", "W" and "Y" terminals on the Smart Slave Zone PC board.

Connect Smart Slave Zone damper tubing to the Smart Slave Zone solenoid bulkhead fitting on top of the panel.

Do not use a heat pump thermostat for any Smart Slave Zone, in Heat Pump applications.

## "Air Flow Indicator" Instructions

The **Air Flow Indicator** is used to quickly test the integrity of the air tubes and damper actuators by indicating air movement between the panel and dampers . System integrity is proven when the floating balls drop, indicating air flow has ceased due to pressure/ vacuum is at pump limits. If balls continues to float 2 minutes after solenoid switches, a pressure or vacuum loss is evident in that zone.

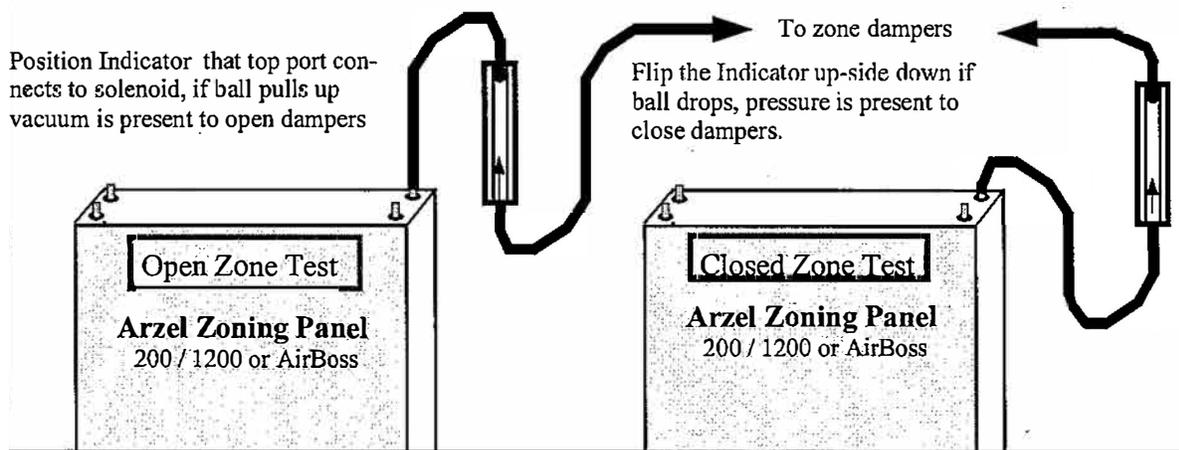
### Testing procedure

#### Solenoid Position Test

- Check zone solenoid position by connecting the "Air Flow Indicator" to the solenoid valve port only. The movement of the ball "up", indicates a pressure is present to close dampers in that zone. If the ball moves up when the indicator is turned upside down, that indicates a vacuum is present to open dampers in that zone.

#### Damper and Tubing Integrity Test

- Turn the power switch "Off" at the upper right corner of the Arzel panel and move the "MPS" switch on the lower left corner of the board to the "On" position.
- The pump will operate and the de-energized zone solenoids will pull a vacuum on all zones, opening the dampers.
- Connect the Zone damper tube to the bottom of the "Air Flow Indicator", initially the red ball will float indicating air movement from the dampers to the pump.
- Within two minutes the ball should drop indicating the pump has pulled all air from the damper actuators and tubing and no leakage is present.
- If a damper or tubing is leaking, the red ball on that zone will continue to float after several minutes of pump operation.



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Drawing #  
Tool-AFI-0001  
08/04/04 - jcr

# Basic Troubleshooting Steps for all Panels

## **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)
    - (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.

## **AIR SIDE LEAKAGE 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

## **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 all HPPro panels)

## Testing a Boards "Output" Relays

- a) Turn "Power" switch "ON" and call for Heat, Cool or Fan from one or more thermostats;
  - i) Is the appropriate output indicator (W, Y1, and or G) present at the "HVAC OUT" text box on the main screen?
    - (1) **Yes!**
      - (a) Check for continuity (Ohms) between the appropriate "R" and "W, Y1, and or G" terminals at the "HVAC OUTPUT" terminal strip on Arzel board (wires removed).
      - (b) If no continuity ( $\infty$  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, Y1, and or G" terminals (wires connected).
        - (ii) **No Voltage** indicates problem with equipment control power or wiring.
    - (2) **No!**
      - (a) Check for 24v ac between "W, Y1, and or G" and "C" terminals at the calling zone terminals. (*an "Ill" after the text indicates an illegal call*)
      - (b) **24 vac present** – The thermostat is sending a legal call, replace the board
- b) Repeat the above procedure for any function demand that does not work properly, i.e. Heat call (Y1, G or W) or Cooling (Y1, O, G) or Fan (G).

## Damper Options

- 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.



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## Bypass Sizing Chart

Trunk Dampers

| Smallest Zone CFM | Blower Tonnage |     |     |     |     |    | Round Bypass Size |
|-------------------|----------------|-----|-----|-----|-----|----|-------------------|
|                   | 2              | 2.5 | 3   | 3.5 | 4   | 5  |                   |
| 100               | 8              | 10  | 10  | 12  | 12  | 14 |                   |
| 200               | 8              | 10  | 10  | 12  | 12  | 14 |                   |
| 300               | *              | *   | 8   | 10  | 10  | 12 |                   |
| 400               | N/A            | *   | *   | 8   | 10  | 12 |                   |
| 500               | N/A            | N/A | *   | *   | 8   |    |                   |
| 600               | N/A            | N/A | N/A | *   | *   | 10 |                   |
| 700               | N/A            | N/A | N/A | N/A | *   | 8  |                   |
| 800               | N/A            | N/A | N/A | N/A | N/A | *  |                   |
| 900               | N/A            | N/A | N/A | N/A | N/A | *  |                   |
| 1000              | N/A            |     |     |     |     |    |                   |

N/A = No Bypass Required

\* Boderline case, check other bypass sizing considerations

## Other Bypass Sizing Considerations

**Flex Duct** - Down-size the bypass by one size due to increased friction loss inherent in flex duct.

**Distant Zones** - Duct length greater than 200 ft. may require a one size decrease due to increased friction loss.

**Close Zones** - Duct length less than 50 ft. may require a one size increase.

**Special Purpose Zones** - Usage patterns may require an increase in bypass size.

- Calculate bypass from low stage CFM tonnage when combining 2-stage split systems with HeatPumpPro or GTPro panels and using zone weight.
- Keep the bypass as small as possible.
- Bypass should be at least 8 ft. from the return drop when possible.



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## Bypass Sizing Chart

Branch Dampers

| Smallest Zone CFM | Blower Tonnage |     |     |     |     |    | Round Bypass Size |
|-------------------|----------------|-----|-----|-----|-----|----|-------------------|
|                   | 2              | 2.5 | 3   | 3.5 | 4   | 5  |                   |
| 100               | *              | 8   | 8   | 10  | 10  | 12 |                   |
| 200               | *              | *   | 8   | 8   | 10  | 10 |                   |
| 300               | N/A            | N/A | *   | *   | 8   | 10 |                   |
| 400               | N/A            | N/A | N/A | *   | *   | 8  |                   |
| 500               | N/A            | N/A | N/A | N/A | *   | 8  |                   |
| 600               | N/A            | N/A | N/A | N/A | N/A | *  |                   |
| 700               | N/A            |     |     |     |     |    |                   |
| 800               | N/A            |     |     |     |     |    |                   |
| 900               | N/A            |     |     |     |     |    |                   |
| 1000              | N/A            |     |     |     |     |    |                   |

N/A = No Bypass Required

\* Boderline case, check other bypass sizing considerations

## Other Bypass Sizing Considerations

**Flex Duct** - Down-size the bypass by one size due to increased friction loss inherent in flex duct.

**Distant Zones** - Duct length greater than 200 ft. may require a one size decrease due to increased friction loss.

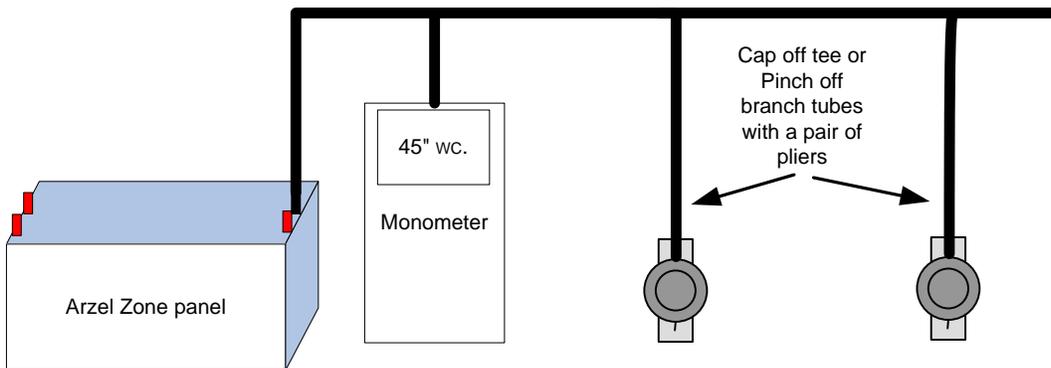
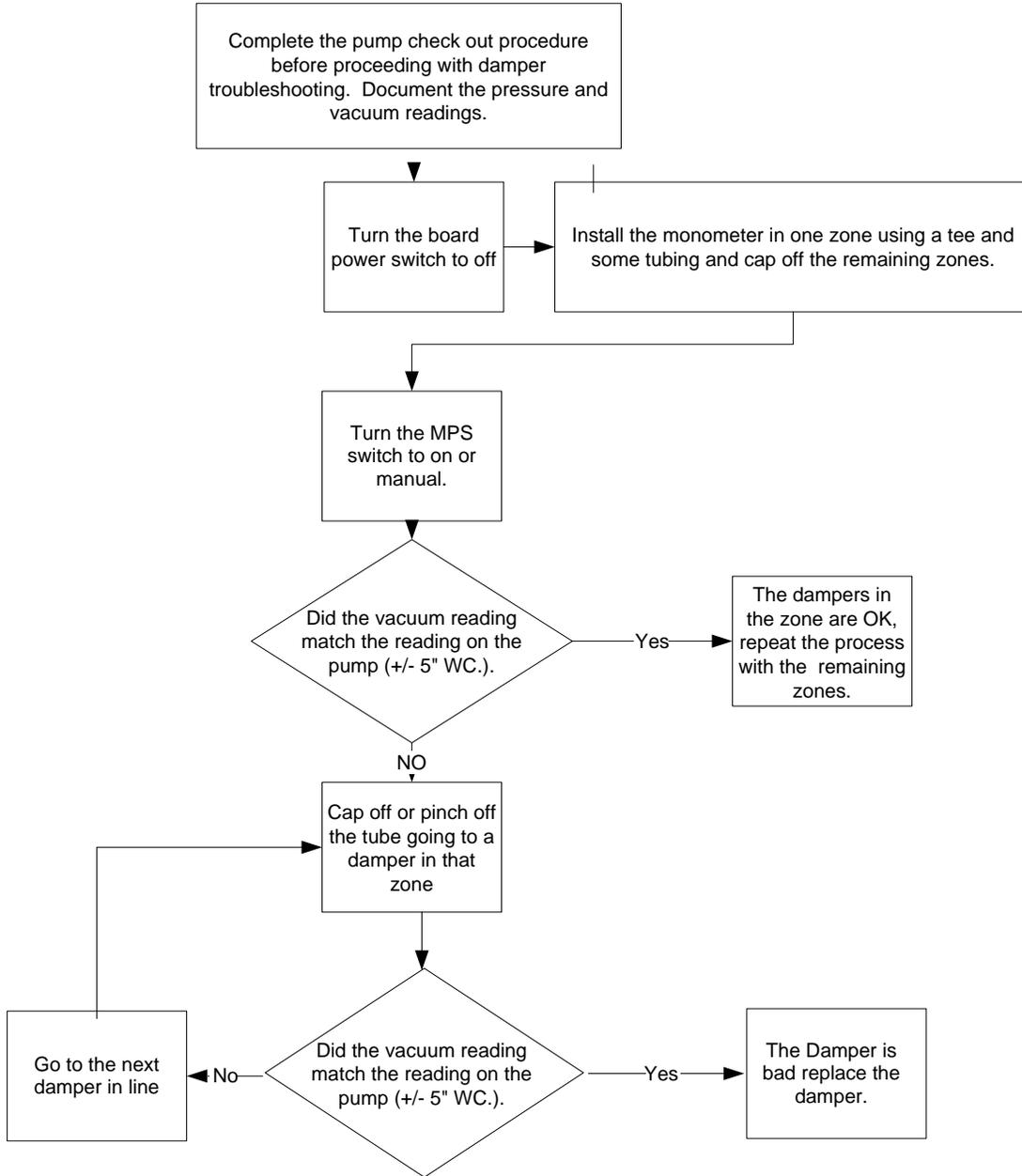
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**Special Purpose Zones** - Usage patterns may require an increase in bypass size.

- Calculate bypass from low stage CFM tonnage when combining 2-stage split systems with HeatPumpPro or GTPro panels and using zone weight.
- Keep the bypass as small as possible.
- Bypass should be at least 8 ft. from the return drop when possible.

# Damper troubleshooting using A digital monometer

The monometer must be capable of reading up to 40" WC.  
Pressure and vacuum

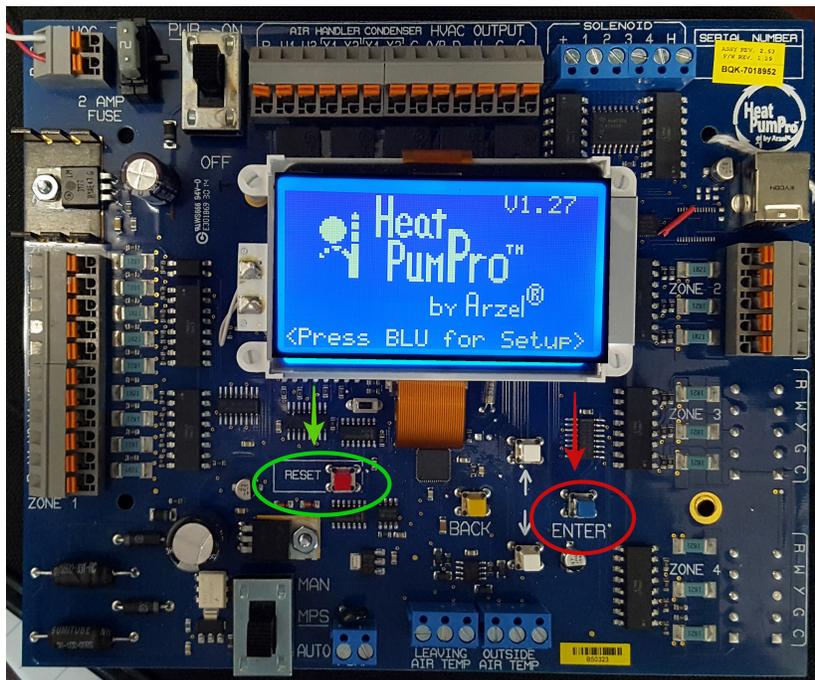




## HeatPumPro Panel Troubleshooting Overview

### HeatPumPro's LCD Display Set-Up

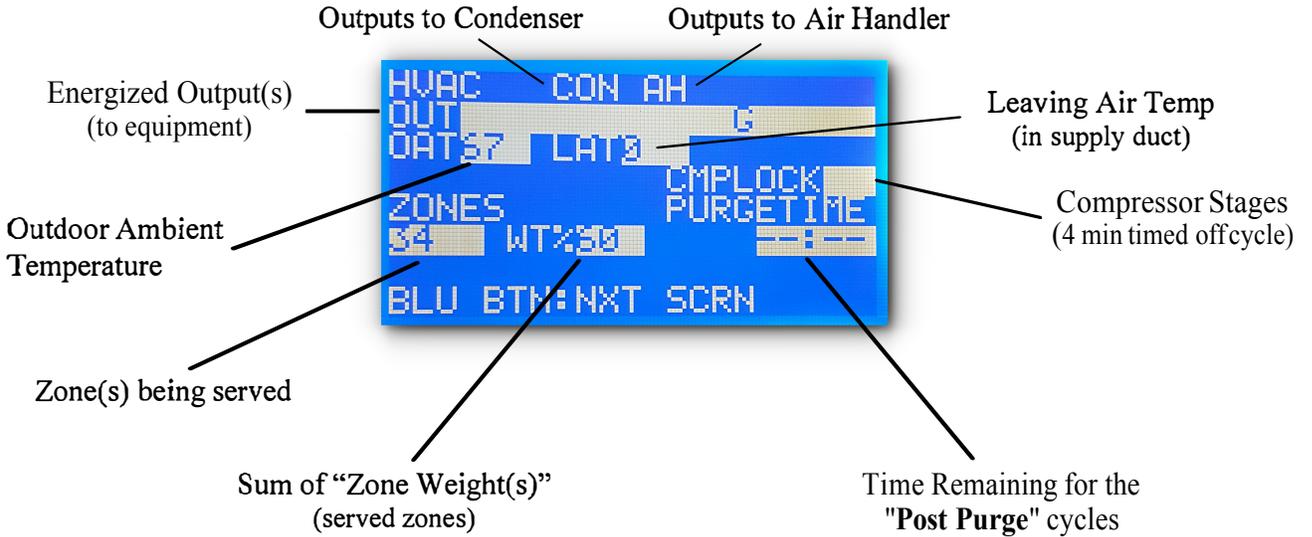
The Liquid Crystal Display (LCD) on the HeatPumPro panel is your portal to customizing the zoning installations. The set-up options allow for easy system set up and is design to utilize the control sequence that is the best fit for your customer. The HeatPumPro set-up Wizard will balancing energy usage while maintaining safe equipment operation.



To turn on the LCD display for the first time, push the red **"Reset"** button on the board just beneath the LCD display.

To Accesses the **"Set-Up Wizard"** from the welcome screen, locate the blue **"ENTER"** button on the board below the LCD display screen.

The LCD screen on the HeatPumPro provides a simple way to view system operations. Once the operating parameters are set in the Set-Up Wizard, the LCD display will default to the "Main Operations" screen shown below.



## Using the LCD screen as a Troubleshooting aid

The Heat PumPro provides some very useful information that makes troubleshooting simple. The Heat PumPro has the ability to detect input signals from zone thermostats that do not make sense and provide a visual "ILL" (illegal) call indicator on the LCD screen. Figure 2

By pushing the blue "Enter" button on the board you can see what each zone is calling for and if that signal falls into the illegal category. Pushing the blue "Enter" button past the last zone will show you any "Messages" regarding staging occurrences, Balance Point status and LAT limit functions. Figure 3

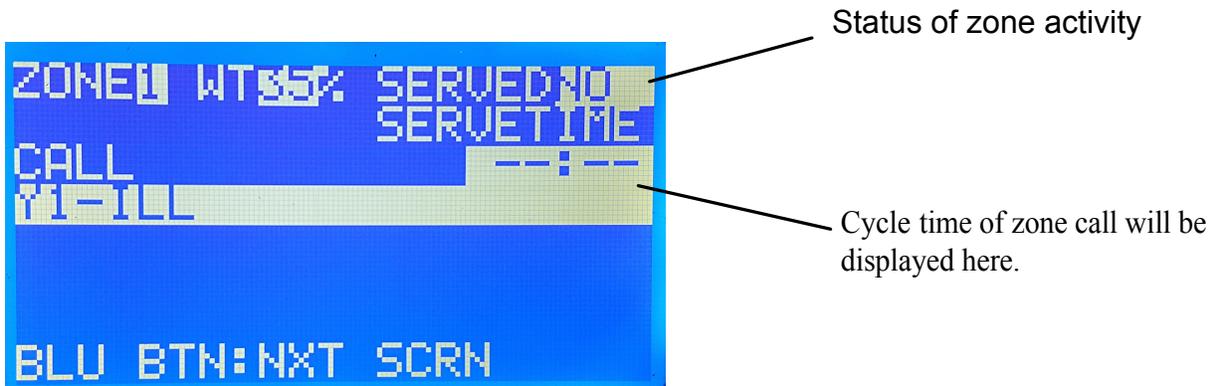
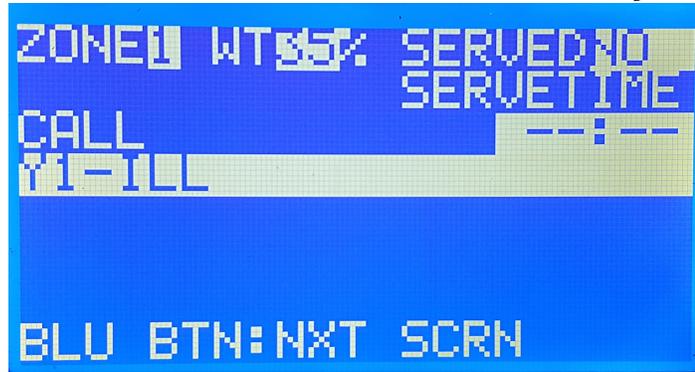


Figure 2

Legal call from  
Zone-1 Thermostat



"Zone 1" screen showing an illegal (YI-ILL) call,  
not being served and having a zone weight of 35%

Most recent  
status message



**Status Message Options Displayed in Menu**

**Below balance Point** (OAT is below the set "Balance Point", Fossil Fuel will be utilized)

**Capacity Stage-Up** (Board logic has staged up to the next level of capacity)

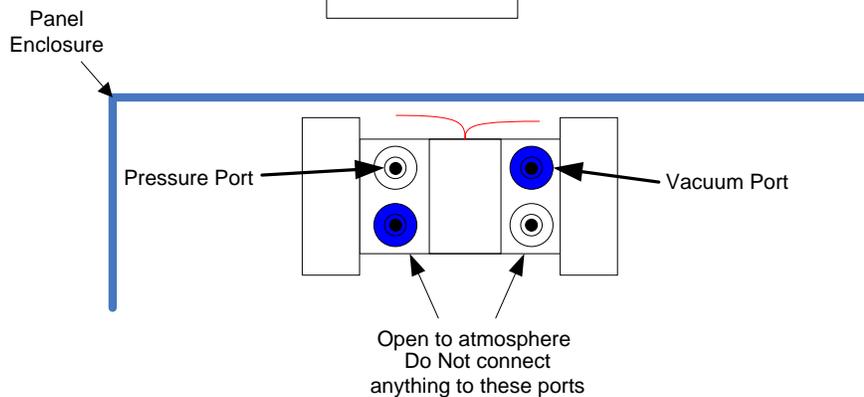
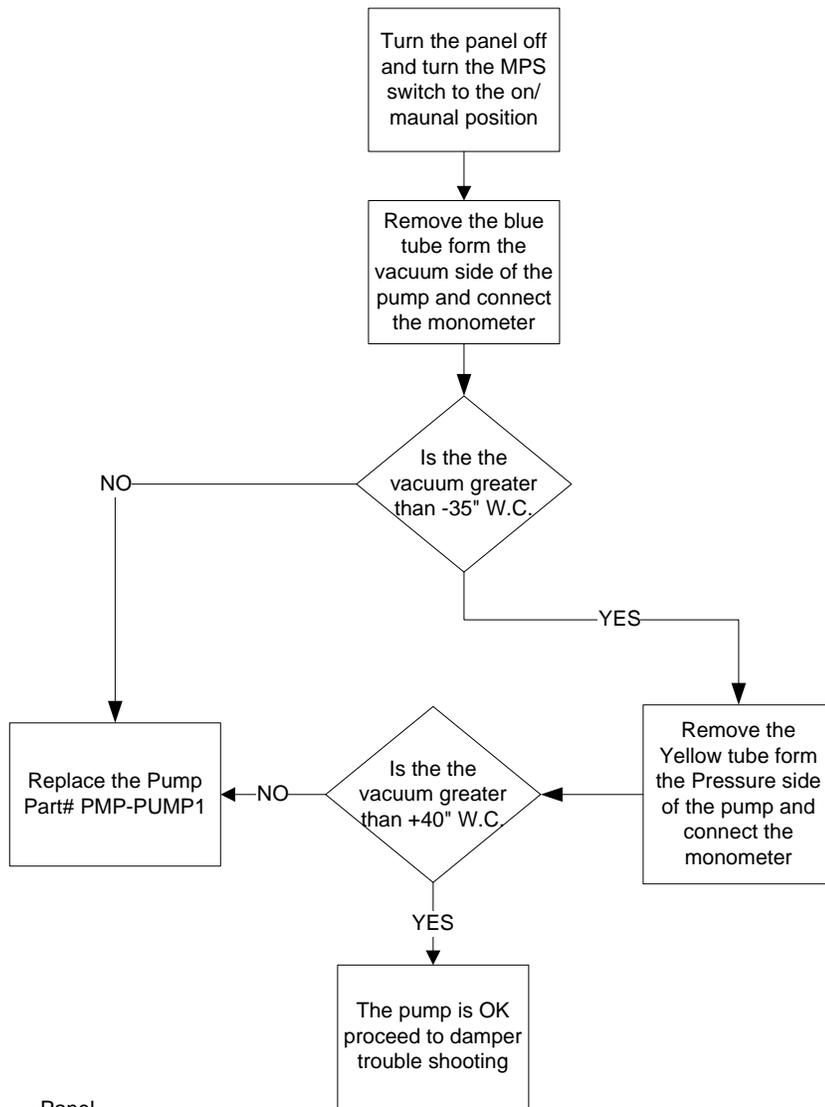
**Aux Lockout OAT** (OAT is below the "Aux Lock" temperature setting, Aux Heat is locked out) **LAT**

**Stage Down** (LAT above "HP LAT:Htg Limit", staged down one level of capacity)

**Dehum Off Cycle** (Dehumidification cycle is in a "timed off period" to prevent overcooling of space)

# Pump Pressure/Vacuum test

A digital monometer that will measure at least 40" W.C. pressure and vacuum is required to properly test the pump.



Top View

## How to Temporarily Bypass an Arzel Zoning Panel

*The following instructions will create a “Non Zoned” system*

- 1) Turn power switch off located on top left of every Arzel zoning panel.
- 2) Turn MPS (Manual Pump Switch) located at the bottom of the panel to the “On or Manual” position. This will start the pump and open up all of the dampers in the system.
- 3) Remove the thermostat wires from the zone that you would care to have operate the system and connect them directly to the HVAC output terminals along with the existing equipment wires.

## How to Temporarily Bypass a Defective Power Switch on a Circuit Board

*The following instructions will bypass a defective power switch  
until the circuit board can be replaced*

- 1) Either unplug the Arzel 40 VA transformer from the duplex receptacle, or turn off line voltage to the 100VA transformer. Whichever may apply.
- 2) Remove the wires from the “R and the C” terminals to the left of the power switch on the circuit board coming from the Arzel transformer.
- 3) Connect the “R and the C” wires that were removed to the “R and the C” terminals on any one the zones, along with the existing wires that are already on the terminals.
- 4) Reapply power to the Arzel transformer.

## How to Temporarily Bypass a Defective Sensor on a HeatPumPro or GTPro

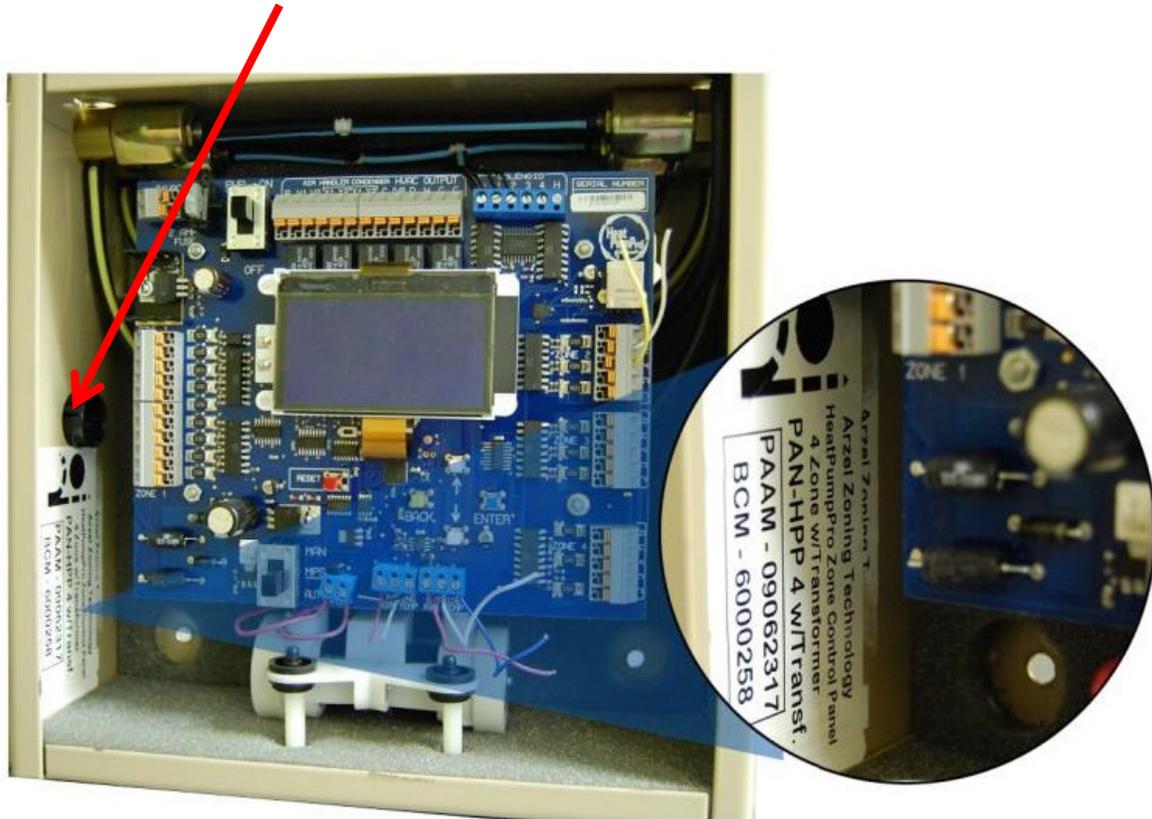
*The following instructions will bypass a defective LAT, OAT or Loop sensor  
until the sensor can be replaced*

- 1) Remove all three wires (R W B) from the defective sensor terminals that is registering 0 degrees. Place a small piece of thermostat wire as a jumper between the “R and the W” terminals. The display will now register 200 degrees.
- 2) Remove the wire “R” wire from the defective sensor terminals that is registering 200 degrees. The display will now register 0 degrees.

# Three Step Warranty Process

1. Call (800) 611-8312 to diagnose failed parts and continue the warranty process
2. Any diagnosis of failed parts must be verified by Arzel Technical Support to receive an RMA (Return Material Authorization)
3. All warranty claims must include the serial number of the panel

## Panel Serial Number Location





## Arzel Product Registration & Warranty Claim Process

### Product Registration:

[www.arzelzoning.com/warranty/](http://www.arzelzoning.com/warranty/)

### Warranty Claims:

To receive an RMA, technicians must call while on site (no call no warranty). Warranties returned to distributors without prior authorization may be denied or subject to 20% processing fee.

Call 800-611-8312 while on the job site to diagnose failed parts and continue the warranty process.

Any diagnosis of failed parts must be verified by Arzel® Technical Support to receive an RMA (Return Material Authorization).

All warranty claims must include the serial number of the panel (see image on page 13.)

Arzel® will ship warranty parts directly to licensed contractors via UPS ground.

Next day air available at additional cost.

Arzel® Technical Support is available 7 days a week from 8am-9pm EST