Models with 2, 3, 4, 6 and 8 Zones

Comfort, Reliability and Easy Installation

Arzel Zoning Technology, Inc.
4801 Commerce Parkway
Cleveland, Ohio 44128

Toll Free 800-611-8312
(216) 831-6068
Fax (216) 831-6074

Rev. 5/1/01
For just a few dollars a month
You can extend your warranty for 10 years

Your Arzel Zoning System comes with a 5 year parts and labor warranty at no additional cost.
You may choose to purchase extended protection for up to 10 years.

Please ask your installing contractor for details.

This offer expires 180 days from the purchase date of your Arzel Zoning Equipment.

Purchaser Name: ____________________________________________
Date of Purchase: __________________________________________
Date Installed: ______________________________________________
Model#: __________________ Serial#: __________________________
Address: ___________________________________________________
__________________________________________________________________

NOTES:

Warranty Brought to you by:

Arzel® Zoning Technology, Inc.  EQUIGUARD®, INC.
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Arzel Series - AirBoss™ Zoning System
Zoning Glossary

**Air Pump:** The Arzel® Zoning System uses self-contained, low-pressure micro pumps to open and close dampers. They provide noiseless, long-life and economical service. P. 12

**Automatic Bypass Control:** Pressure-switch operated bypass control is available. (Must be ordered separately.) P. 16

**Compressor Lockout "Timed Off Delay":** When the compressor is turned off, it cannot restart for 4 minutes. This feature allows the refrigerant pressure to balance before restarting. P. 9

**Damper Positioning Delay:** On a call for Heat, the damper closure will delay for 1 minute to allow the air handler to start before any dampers are positioned. This provides for a SofStart™.

**Damper Position Indicator:** External indicator of the damper position. Makes troubleshooting and system check-out easy. P. 15

**Emergency Heat:** A changeover switch (manual or remote) is located on the PC board for heat pump operation only. P. 7

**Energy Conservation Cycle (ECC™):** Dampers remain open for 2 minutes, in the last zone that called for heating or cooling, to take advantage of additional energy savings from residual heating and cooling in the HVAC system. P. 9

**EzySlide™ Damper Installation:** Round and rectangular dampers are available from 4" to 40". P. 13

**Fan-On-Heat:** In the "ON" position, the fan starts immediately with any call for heating at the HVAC Output terminals. P. 9

**Fossil Fuel Back-up Switch:** Switches customize the system operation for a Fossil Fuel backup furnace when used with a heat pump. This eliminates the need for a fossil fuel kit. P. 8

**Heat Pump:** All AirBoss™ systems are fully heat pump compatible. P. 7, 8

**Leaving Air Temperature Control (LAT):** Easily set with rotary switches; range is 40°F to 56°F for cooling, and 110°F to 180°F for heating. LAT sensor kit with 15-ft. cable is included. P. 10, 11

**Manual Pump Switch (MPS™):** Opens all dampers during emergency or test operations by switching “MPS” to “ON” and “PWR” switch to “OFF”. P. 12

**Master Zone Control (MZC™):** Can be set-up either by a programmable thermostat, manual switch or a time clock. It gives control of the entire HVAC system to the Zone 1 thermostat. Use for occupied/unoccupied set-back, or set-up programs. P. 10

**Self-Testing LAT Circuit:** LAT control will indicate, with LED flashes, when the sensor is shorted or open. P. 10

**Sensor Verification:** Easy conversion of LAT (DC Voltage) reading to monitor temperatures in the supply duct. P. 11

**Smart Slave Zones (SSZ™):** A Smart Slave Zone thermostat controls dampers only. It does not control the HVAC equipment, and only opens its dampers when the conditioned air in the ducts matches its requirements. Any number of thermostats (programmable/ non-programmable or autochangeover) can be used. P. 11

**Thermostat Selection:** Any standard thermostat, programmable/non-programmable or auto-changeover over can be used. Heat pump thermostats are required on all zones for heat pump installation. P. 5

**ThreeWay Priority™ System:** Provides a selection of “Heating”, “Cooling” or “Automatic” Priority Systems. In Automatic mode, the first call establishes priority. Heating and Cooling calls always override fan-only operation. Under any priority, an opposing call, after waiting 20 minutes, will take control of the system and serve its zone for up to 20 minutes. All zone thermostats have equal, full-function heating, cooling, and fan capability. P. 8

**Transformer:** A single 24 Volt AC Transformer (40 or 100 VA) is included to power all Arzel equipment, dampers and thermostats. P. 4

**Two-Stage:** Heating and/or cooling is available from all zones with either 2-stage or single-stage thermostats. Second-stage time delay can be adjusted from 2 to 30 minutes if a single-stage thermostat is used. Second-stage (both heating and cooling) is delayed by 30 seconds to prevent starting both stages simultaneously. P. 7

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### WHEN INSTALLING THIS PRODUCT...

1. **Read these instructions carefully.** Failure to follow them could damage the Arzel® Zoning System and/or cause a hazardous condition.

2. **Disconnect the power supply** to the HVAC system and the Zoning System before making any wiring connections to prevent the danger of electrical shock or equipment damage.

3. The Arzel System is designed for indoor use only.

4. You must touch a grounded metal object before handling the Control Panel to avoid potential loss of internal programs due to electrostatic discharge.

5. Install in ambient temperature between 40°F and 95°F in a non-condensing area.

6. Be sure the HVAC manufacturer’s operating specifications are compatible with the Arzel Zoning System.

7. Check all system operations after installation is complete.

8. All wiring must comply with applicable electrical codes, ordinances and regulations.

9. Use properly grounded tools, safety glasses and gloves, when drilling or cutting sheet-metal ducts, fiberglass or any hard objects.

10. The damper blade gently wipes the inside of the ductwork. Insert a sleeve inside any fiber-glass, or abraidable ductwork, so the blade does not abrade the materials into the air.

11. Leave these instructions with the installed system for future use.

12. There are both AC and DC Terminals on the circuit board. Do not intermingle wires.

13. All LAT limit controls are to be used as secondary controls only. The LAT control setting must be below/above your primary factory protection level.

### GENERAL SYSTEM OPERATION:

A call from any zone thermostat will call on the HVAC equipment, position the solenoid air valve and open the dampers for its zone. Both micro pumps are energized to automatically position the dampers, either open or closed, as required. The vacuum pump opens the dampers, and the pressure pump closes the dampers. When the thermostat is satisfied, a 3-minute Energy Conservation Cycle™ (ECC) is initiated and the dampers are held in place for 2 minutes. This will deliver the residual conditioned air to the last zone(s) served. In the third minute, the micro pump continues to operate to open all the zone dampers for a SofStart™ on the next cycle. See ECC Bypass (Fig. 9d) if you wish to eliminate the third minute of the ECC cycle.

### LOCATING AND MOUNTING THE CONTROL PANEL:

Locate the control panel on a wall area near the HVAC air-handling equipment (furnace, fan, coil, etc.) 5-feet above the floor. Do not mount the control panel on ductwork or HVAC equipment. Panels should be installed in non-condensing areas at an ambient temperature range between 40°F to 150°F.

### 24-VOLT POWER SUPPLY AND GROUNDING:

One 24-Volt AC transformer (provided with the system) powers all zone thermostats, and the Arzel Control Panel. The HVAC system transformer provides power for the heating and air-conditioning equipment outputs only. Do not mix HVAC and Arzel transformer outputs. A positive ground terminal is provided for grounding connection. (Fig. 5a)
THERMOSTATS

Wires coming from the zone thermostats must be connected to the input terminals in the panel for their respective zones (Fig. 5b). Use any standard thermostat: "Heat/Cool" and "Fan-Auto-On" sub-base switching, Programmable/Non-programmable or Auto-changeover. "R" and "C" terminals are available for all zones from the 24V AC circuit. Staging can be accomplished either with two-stage thermostats or single-stage thermostats in combination with the built-in Arzel Delay Timer (ADT™). Be sure to set heating anticipator to the shortest or lowest setting (if adjustable). Heating operation is indicated by red LEDs (W1 and W2). Compressor operation is indicated by yellow LEDs (Y1 and Y2). Fan operation is indicated by green LEDs. Heat pump thermostats are required on all zones for heat pump operation.

Locate the thermostats for each zone in a central area within the zone on an inside wall, five feet from an outside wall and five feet from the floor. Avoid areas near register outlets, lights and other equipment that could cause a false reading.

(Fig. 5a)

Arzel Panel

(Fig. 5b)

EQUIPMENT TYPE SET UP ( FURNACE / HEAT PUMP )

The Arzel AirBoss™ System is factory set for furnace applications. Any time the board PWR switch is turned ON, the system will automatically check itself and flash the appropriate LED to indicate the type of equipment it is set up to handle. For Heat Pump use, you MUST turn the PWR switch OFF and move the "Furnace/Heat Pump" switch to the "Heat Pump" position (Fig. 5c). Turn the PWR switch back to ON and the panel will respond to Heat Pump demands.

• Furnace mode: TDO-2 (DS18 LED) will flash once on power-up. (See p.9, Fig.9b)
• Heat Pump mode: TDO-1 (DS17 LED) will flash once on power-up. (See p.9, Fig. 9b)

(Fig. 5c)

(Fig. 5c)

Arzel Panel

Rev. 5/01/01

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U.S. and Foreign Patents & patents pending.
HVAC Output

The AirBoss™ controls the HVAC equipment through a set of six “dry contact” output relays. When a thermostat calls for equipment operation, the AirBoss™ closes the appropriate output relays, sending the “R” signal from the HVAC Transformer back to the appropriate equipment terminals.

There are LEDs directly below the HVAC output terminal strip. When the output relays close, the corresponding LEDs are illuminated (Fig. 6a).

<table>
<thead>
<tr>
<th>Signal</th>
<th>LED Indication</th>
<th>Service Provided</th>
</tr>
</thead>
<tbody>
<tr>
<td>W1, W2</td>
<td>Red</td>
<td>first and second stage heat</td>
</tr>
<tr>
<td>Y1, Y2</td>
<td>Yellow</td>
<td>first and second stage compressor</td>
</tr>
<tr>
<td>G</td>
<td>Green</td>
<td>fan</td>
</tr>
<tr>
<td>O</td>
<td>Yellow</td>
<td>reversing valve (energized in cooling)</td>
</tr>
<tr>
<td>B</td>
<td>No LED</td>
<td>reversing valve (energized in heating)</td>
</tr>
</tbody>
</table>

Bring the Equipment transformer R and C to the corresponding terminals on the HVAC Terminal strip.

Fig 6a

Fig 6b

Zone Solenoids

Damper positioning is controlled by a bank of 24VDC solenoids (one per zone) mounted along the top of the box. When a zone is to be served, the solenoid is de-energized and a vacuum passes through the valve, opening all the dampers in that zone. The zones not calling will energize their solenoids allowing a pressure to pass through the valves, closing all the dampers in those zones. The zones that are open for service are identified by a green lit LED below the “Zone Solenoid” terminal block (Fig. 6b).

REMEMBER:
Vacuum Opens the Dampers
Pressure Closes the Dampers

The solenoids are 24VDC.
Do not connect thermostat or transformer wires to the solenoid terminals. Damage will occur.
STAGING WITH SINGLE-STAGE OR TWO-STAGE THERMOSTATS

Staging can be accomplished with either single-stage or two-stage thermostats.

Single-stage thermostats: W1 and Y1 are controlled by the thermostat. W2 and Y2 are brought on by the Arzel Heating and Cooling Delay Timer (see paragraph below).

Two-stage thermostats: W1, W2, Y1, and Y2 are all controlled by the thermostat. W2 and Y2 are always delayed by 30 seconds to prevent both stages from coming on simultaneously.

SECOND-STAGE HEATING AND COOLING DELAY AND TIMER SETTINGS

Second-stage heating and second-stage cooling delay can be activated by the ON or OFF switches provided. You may select either or both. If you want to control the second-stage heat and/or cooling with a single-stage thermostat, set the HTG-DELAY and/or CLG-DELAY slide switches to ON and set the rotary Delay Timer for the desired delay time. The delay time will be the same for heating and cooling. The timer is activated by a W1 or Y1 signal at the HVAC Output (Fig. 7a).

HEAT PUMP CONTROL OPERATION:
EMERGENCY HEAT OPERATION (HEAT PUMP ONLY)

All Arzel AirBoss™ system boards have emergency or backup heat capability. When the Emergency heat mode is activated it will convert all “Y” signals to “W” signals, thus bypassing heat pump operation and activating backup heat. Emergency heat mode can be initiated either with the “Emergency Heat” switch on the panel, a remote (outdoor) thermostat or a call for “W1” in the Fossil Fuel mode. The Emergency Heat Mode can also be initiated by using a 24V AC relay energized by a designated thermostat’s “E” terminal. The relay Com-N/O contacts will provide closure to the Emergency Heat Remote circuit.

Emergency heat mode is indicated by a red LED located to the right of the manual switch.
HEAT PUMP WITH FOSSIL FUEL BACK-UP HEAT
(DUAL FUEL SYSTEMS)

Fossil Fuel Switch: The Arzel AirBoss™ Series lets you customize the system for fossil fuel backup heat, without the need for a fossil fuel kit. When switched to “Fossil Fuel” and the system is operated in emergency heat mode, the Arzel board will add 50° F to the “HTG. LAT” set-point (up to a safety maximum of 190° F). *NOTE* Arzel controls must be used as secondary controls only.

The control setting must be below your primary factory protection level.

This accommodates the higher temperatures required for the fossil fuel backup furnace (Fig. 7b).

Fossil Fan Switch: Will break the “G” circuit, allowing the furnace to control the fan cycle when the system is operated in emergency heat (Fossil Fuel) mode (Fig. 7b).

*If you are not using a fossil fuel backup furnace, you must leave these switches in the Off position!*

THREE WAY PRIORITY™ SYSTEM

PROVIDES A CHOICE OF HEATING, COOLING OR AUTOMATIC PRIORITY (FIG. 8A)

In Heating Priority: Heating priority allows heating to have priority over cooling and cooling to have priority over constant fan operation. Any zone calling for heating will be served immediately. Any zone calling for cooling will be served immediately if no other zone wants heating. Any zone can have constant fan, if no other zone wants either heating or cooling. Heating operation is indicated by red LEDs (W1 and W2).

In Cooling Priority: Cooling priority allows cooling to have priority over heating and heating to have priority over constant fan operation. Any zone calling for cooling will be served immediately. Any zone calling for heating will be served immediately if no other zone wants cooling. Any zone can have constant fan, if no other zone wants cooling or heating. Compressor operation is indicated by yellow LEDs (Y1 and Y2).

In Automatic Priority: Auto priority will allow the first call (either heating or cooling) to establish the priority sequence for this cycle. A heating or cooling call will always override fan-only operation. Any zone can have constant fan if no other zone wants either heating or cooling.

In Fan ON Operation: Constant fan operation is available unless other zones call for heating or cooling. Any thermostat in the Fan ON position will start the fan and open its zone dampers for air circulation. All other zone dampers will be closed automatically. Fan operation is indicated by a green LED (G).

CALL WAITING:

In heating, cooling or automatic priority mode, an opposing call (i.e. a cooling call when in heating mode) after waiting 20 mins. will be served as follows: The waiting call will shut down the existing service, go through the Energy Conservation Cycle (ECC) and serve itself for up to 20 minutes. If after this 20 mins. the earlier call is still there, the service will revert to the original call after completing an Energy Conservation Cycle. This feature eliminates the problem of opposing service calls waiting too long to be served.
ENERGY CONSERVATION CYCLE (ECC™)

After every cycle completion, dampers will be held in place for two minutes and supply residual conditioned air to the last zone served. After two minutes, the micro pumps continue to operate for another minute to open all the zone dampers for a SofStart™ on the next cycle. The momentary Energy Conservation Override (ECO) switch (Fig. 9a) will override the cycle during test or set-up operation.

ECC BYPASS

In some applications, where smaller zones tend to overheat during the third (last) minute of the Energy Conservation cycle, the ECC Bypass can be switched OFF, eliminating the third minute and leaving dampers in the last call position (Fig. 9d).

COMPRESSOR LOCKOUT TDO 1 (STAGE 1) AND TDO 2 (STAGE 2)

All Arzel® circuit boards have a 4-minute compressor lockout timer (delay on break) on the compressor circuit. When the compressor is turned off, it will stay locked out for 4 minutes. This allows the refrigerant pressures to equalize. Time delay lockout is indicated by 2 yellow LEDs, TDO 1 (Stage 1) and TDO 2 (Stage 2).

NOTE: Two momentary-contact Time Delay Override (TDO) switches, one for each stage, are provided on the PC board (Fig. 9b) to speed the checkout of the HVAC system. Before using the TDO switches you must disconnect the HVAC “R” wire to avoid short-cycling the compressor.

FAN-ON-HEAT OPERATION

Use the Fan-On-Heat switch if immediate fan operation is desired on a call for heating, such as with electric furnaces, hot-water coils, steam coils, etc., (Fig. 9c). Fan operation is also indicated by a green LED (G) at the zone calling and at the HVAC Output LED.
MASTER ZONE CONTROL (MZC®)

Moving this switch to the ON position or closing a circuit across the "Set-Back" terminals, establishing Zone 1 as the "Master Zone" and allows automatic (occupied/ unoccupied) set-back or set-up control. The "Master Zone Control" mode operates as a single zone system: all zone dampers open and the equipment is cycled based on Zone 1 thermostat settings. Master Zone operation may be initiated by manual operation of the switch or it may be operated by a time clock or programmable thermostat with dry contacts that close in the unoccupied mode (wired across the MZC Remote terminals). The switch and the remote terminal are electrically parallel. You may use either one or both (Fig. 10b).

LAT™ (Leaving Air Temperature) Limit Controls for Heating and Cooling

During normal operation of zoning equipment, the amount of air passing through the air conditioning coil or over the heat exchanger may be reduced to a point that undesirable air temperatures may develop in the duct system (too cold or too hot). The Leaving Air Temperature (LAT) system is used to cycle the AC compressor or heating system to prevent evaporator coil freeze-up or overheating of the heat exchanger. Install the Sensor into the supply duct just around the corner from the Plenum and connect to the "LAT Sensor" terminals (Fig. 10b). Connect the Green grounding lead to the ground terminal at the 24 VAC terminals (Fig. 5a) along with the mechanical ground wire. Add no more than 25 ft. of wire to LAT Sensor.

NOTE: All LAT limit controls must be used as secondary controls only.
The LAT control setting must be above/below your primary factory protection level.

LAT SYSTEM SET-UP

Set both rotary switches(Heating LAT and Cooling LAT) to the desired heating and cooling limits (Fig.10a). Heating LAT settings range from 100° F to 180° F and OFF. Cooling LAT settings range from 40° F to 56° F and OFF.

If you do not wish to use either or both, place the unused rotary switch pointer to the Off position.

You must install the sensor or place both rotary switches to the Off position.

Self Test: The Arzel Panel automatically detects an open or shorted LAT sensor and locks out the equipment accordingly.
- Both Red LED’S at Heating LAT flashing indicates a shorted sensor wire or probe.
- Both Yellow LED’S at Cooling LAT flashing indicates an open sensor wire or probe.

High LAT: The temperature setting cycles the first-stage heating at set point temperature. Second-stage heating is automatically cycled 10° lower than high temperature setting. Both stages will re-connect after a 15° temperature drop.

Low LAT: The temperature setting cycles the first-stage cooling at set point temperature. Second-stage cooling is automatically cycled 5° higher than set point temperature. Y1 will reconnect after a 4-minute time delay if the duct temperature is above set point. Y2 will reconnect after a 4-minute time delay, if the duct temperature is 5° above set point.

NOTE: All LAT limit controls are to be used as secondary controls only.
The LAT control setting must be above/below your primary factory protection level.
**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**

<table>
<thead>
<tr>
<th>Temp</th>
<th>Ohms (k)</th>
<th>DC Volts</th>
<th>Temp</th>
<th>Ohms (k)</th>
<th>DC Volts</th>
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<tr>
<td>40</td>
<td>26.1</td>
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<td>42</td>
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<td>2.98</td>
<td>180</td>
<td>1.2</td>
<td>0.66</td>
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</table>

(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 PUMP OPERATION

Both pumps will start and position up to 50 dampers any time there is a call for heating, cooling or fan operation. Both pumps will stop three minutes after the last thermostat is satisfied. Pumps will restart for any call for heating, cooling or fan from any thermostat. Pump operation is indicated by a red LED (Pump). Both pumps are delayed one minute on a call for heat (fossil fuel) to allow the blower to start before any dampers close. Pumps are designed for continuous duty.

MANUAL PUMP SWITCH (MPS™):

The Manual Pump Switch (MPS) (Fig. 12b) is provided to test the damper system and to bypass the zoning system in case of a board emergency. This switch will start the pumps manually and with the “Power” switch in the OFF position, all the zone dampers will open. This will aid in troubleshooting by allowing the operation of the HVAC system independent of the Arzel panel, if you suspect a PC board failure.

YOU CAN BYPASS THE ZONING SYSTEM BY FOLLOWING STEPS BELOW:

1. Turn the Arzel PWR switch off. You must keep this switch in Off position to block ALL zone thermostats from calling for service and placing all the zone dampers in the normally open position.
2. Disconnect the wires from any one zone thermostat terminal and connect them to the HVAC Output terminals.
3. Turn the MPS switch ON.

The HVAC equipment will now be controlled by the one thermostat connected to the Output terminals. The pumps will run continuously, holding ALL the dampers open. Only the pump LED will be on. All other LEDs will be off in this mode of operation.
The EzySlide “R” damper is designed to be inserted from the bottom, top or side of round ducts without cutting off or removing sections of the duct. An adhesive template is provided with each damper. Remove backing paper and place template on duct (Fig. 13a), observing direction of airflow arrow on the template. Cut out required triangle (Fig. 13b). Insert damper blade with blade facing the long side of the triangle (Fig. 13c). Rotate damper so that the flat side of the blade is positioned to face airflow (not the side with the connecting rods) and fasten with four sheet-metal screws (Fig. 13d).

(Fig. 13a)  (Fig. 13b)  (Fig. 13c)  (Fig. 13d)
INSTALLING SQUARE AND RECTANGULAR DAMPERS -
EzySlide™ TYPE “S”

The EzySlide “S” damper is designed to be inserted in an existing or new rectangular duct from the bottom, top, or side of the duct. Cut a slot 5 inches wide by any required length. The slot should be cut to 3/4-inch from each duct corner (Fig 14a). This will avoid the need to cut into the “Pittsburgh Lock” in the duct and leave sheet metal for the mounting plate screws. Slide the damper into the duct at an angle to avoid cutting the gasket (Fig. 14b). Position the flat side of the blade to face airflow (not the side with the connecting rods). Fasten with sheet-metal screws (Fig. 14c).

Fig. 14a

Fig. 14b

Fig. 14c

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CONNECTING AIR TUBES TO DAMPERS

Each zone has one air line bulkhead fitting on the top of the Arzel® panel. Each air line provides vacuum and pressure, as needed, to open and close the dampers. All additional dampers in each zone must be connected with a "T" fitting to its main zone air line. For example: Zone #1 air line must be connected to all the dampers in Zone #1. A cap or plug must be placed on any unused zone fittings or tubes. Tubing is available in eight colors to easily identify each zone.

IDENTIFYING THE ZONES

Tubing is available in eight colors for easy tracing and identification of dampers. To avoid zone mix-ups, mark all supply ducts clearly with room designation and proper zone number. The Arzel Duct-Finder™ makes duct tracing easy.

DAMPER POSITION INDICATOR

Observe the movements of the damper position indicator (Fig. 15a):
- The damper indicator pointing up (short) means the damper is open.
- The damper indicator pointing straight (out) means the damper is closed.

Fig. 15a

Damper OPEN Position

Damper CLOSED Position
BYPASS DAMPER INSTALLATION and ADJUSTMENT

Automatic pressure switch operated or barometric Bypass damper systems are installed to relieve excess air pressure that is sometimes caused by zoning. Excess air pressure may create high air velocity and air noise. Install a bypass duct directly between the supply air trunk line and the return air trunk line. The bypass supply air takeoff must be installed before any trunk line dampers. We recommend the bypass be connected to the return duct as far away from the air handler as possible for optimum performance. This will allow for the supply air to mix with the maximum amount of return air. One of the benefits of zoning is the ability to increase the static pressure in a zone that is difficult to condition (2nd floor, long ranch homes, etc.). Don’t waste needed energy by over-sizing or prematurely opening the Bypass damper.

Automatic Bypass Control, Adjustment and Checkout:

1. Connect the pressure switch NORM OPEN and COMMON terminals (Fig. 16a) to terminals A and B on the Arzel board (Fig. 16b) with standard 18-2 wire. The pressure switch must be mounted in a vertical position with the pressure tap at the bottom.

2. Start a fan call for the smallest zone only. Adjust the pressure switch to open the Bypass damper when air noise at the registers approaches the level you determine would be objectionable to the customer. This is usually found when only the smallest zone is calling. Minimum pressure required to activate the Bypass damper is 0.05 in. WC.

3. Open the remaining zones and verify that the bypass closes with all zones calling.

Barometric Bypass:

1. Locate the bypass duct per recommendations above and adjust counter weight to bypass enough air to eliminate unwanted air noise at registers with only the smallest zone open by itself.

2. Call for “Fan On” at the remaining zones and verify that the bypass closes with all zones open.

Dual Bypass:

When using two bypass ducts due to larger CFM needs, control one duct with the Automatic Bypass Control, and the other with a Barometric Bypass Control. Set up the bypasses so that the Barometric damper opens first, followed by the Automatic damper once the Barometric is fully open. This set-up will provide multiple levels of bypass capacity to fit the needs of a zoning system with varied bypass needs, i.e. 2 or more small zones.
SYSTEM CHECKOUT:

1. Set all thermostats to the “Off” position and all fan switches to the “Auto” position before starting the checkout procedure.
2. Turn power ON to the Arzel panel and the HVAC equipment, the green LED next to the “Power” switch will come on.
3. Turn Zone 1 thermostat to Fan “On”. The following LED’s will light: Zone 1– G, Zone 1 solenoid, Pump & “G” @ HVAC Output.
4. Check air flow at all registers to verify that only zone 1 is open, and all others are closed.
5. Repeat the same procedure for the remaining zones.

HEATING CHECKOUT:

1. Set all thermostats to the “Off” position and all fan switches to “AUTO” before starting heating system checkout.
2. Set Zone 1 thermostat to the HEAT position. Turn thermostat up so that the thermostat is calling for heat.
3. The following LEDs will come on: Zone 1– W1, Solenoid for calling zone, Pump & W1 @ output.
4. Check and set heating LAT and second-stage heating and cooling delay timer settings.
5. The pressure and vacuum pumps will automatically position all the dampers.
6. Check to see that the heating valve or relay is energized.
7. If heat pump is installed, check operation of emergency backup heating.
8. Turn the thermostat down until the thermostat is satisfied. The dampers and system will go through its Energy Conservation Cycle (ECC) for 3 minutes. The LED lights will go out and the pumps will stop. If you wish to save checkout time, you can push the Energy Conservation Override (ECO) switch to skip this automatic cycle.

COOLING CHECKOUT:

1. Set thermostat for Zone 1 to the Cool position. Turn thermostat down so that the thermostat is calling for cooling. The following LEDs will come on: Zone 1- Y1 and G, Solenoid, Pump, & Y1 & G @ HVAC Output.
2. Check and set cooling LAT and heating and cooling second-stage delay timer settings.
3. The pressure and vacuum pumps will automatically position all the dampers.
4. Check to see that the compressor relay or contactor is energized. Rapid cycle Zone 1 to see that the 4-minute lockout takes place. If you wish to save checkout time, you can push TDO 1 and TDO 2 to skip the delay.
5. Place Zone 1 thermostat in the “Off” position. The dampers and system will go through its Energy Conservation Cycle™ (ECC). If you wish to save checkout time, you can push the Energy Conservation Override (ECO) switch to skip this automatic cycle.
6. Follow the above procedure for all other zones.
How many rooms in this building/house?
- 5 to 8
- 9 to 15
- 16 or more

What is your occupation?
- Professional
- Executive
- Management
- Physician / Dentist
- Tradesman
- Clerical / Service Worker
- Sales Marketing
- Military
- Homemaker
- Retired
- Other

$________ Established yearly heating bill
$________ Estimated yearly cooling bill
__________ Total sq. ft. of building/house

Type of building/house:
- Single story
- 2 story
- Bi level
- Tri level
- Room Addition
- Finished basement
- Other

What is the brand name of your A/C?

Type of System:
- Gas
- LP Gas
- Oil
- Heat Pump
- Electric

Total household income:
- Up to $34,999
- $35,000 - $74,999
- $75,000 - $149,999
- $150,000 - $249,999
- $250,000 and over

Head of household age:
- Under 30
- 31 - 40
- 41 - 50
- 51 - 64
- 65 and over

What influenced your selection of the Arzel Zoning System?
- Uncomfortable Rooms
- Energy Conservation
- Easy to use
- Guarantee
- Simple Installation
- Other

Which feature appealed the most?
- Simplicity
- Comparable price
- Guarantee
- Overall comfort

What other selections are installed in this building/house?
- Humidifiers
- High efficiency Air Cleaners
- Air Purifiers (U/V Lights)
- Ozone generators
- Home Automation

Comments?
Features?
We’d like to thank you for choosing Arzel.

At Arzel, we’re committed to quality, innovation and performance. We design products for comfort and energy conservation. Our reputation depends on the ability to better understand your comfort needs. So we can continue in this effort, please fill out this survey card and return it to us. Comfort makes a house a home. Comfort also makes a commercial environment more productive. Your decision to install an Arzel Zoning System not only provides you the comfort you deserve but also energy savings. Please feel free to let others know about your experiences with Arzel or have them contact us at our website (www.arzelzoning.com).

Please tape closed on this edge before mailing.