

P-200

P-300

Installation instructions For

The 200/300 Series Arzel Zoning System

Available

200 - 2 - Zone System 300 - 3 - Zone System

FEATURES

- ⓪ Single stage heating, cooling & fan operation from all zones.
- ⓪ LED lights for each zone to indicate heating, compressor & fan call.
- ⓪ Round and Rectangular blade damper system.
- ⓪ Slave zone (s) can be added for additional control.
- ⓪ Dampers remain open in the last zone that called for heating/cooling to take advantage of additional energy savings from blower overrun features provided on all heating equipment and some cooling equipment.
- ⓪ Heating, cooling and fan priority systems.

NOTE: The Arzel zoning system uses very low pressure air from built in micro pumps to activate dampers , which provides long life and economical operation.

GENERAL OPERATION INFORMATION

A call from any zone will turn on the HVAC equipment, energize the solenoid air valve and open the dampers for its zone. Both pumps, vacuum and pressure, are energized at the same time to position the dampers in their open or closed position as required. When the thermostat is satisfied, the air pumps, the HVAC equipment and the solenoid air valve are turned off. Dampers will remain in whatever position they were in when the last thermostat call was finished. Leaving the last zone dampers open allows the HVAC system to utilize the residual energy in the system in both the heating and cooling cycles.

PRIORITY SYSTEM

The logic board allows heating to have priority over cooling and cooling to have priority over fan operation. Any zone calling for heating will be served immediately. Any zone calling for cooling will be served immediately providing no other zone wants heating. Any zone can have constant fan providing no other zone wants either heating or cooling.

24 VOLT POWER SUPPLY

The Arzel 24 volt AC transformer (provided with the system) powers all the thermostats plus the Arzel equipment.

The HVAC system transformer provides power for the heating and air-conditioning equipment only. Be sure to bring the Hot ("R") side of the HVAC system transformer to the ("R C/R H") terminal on the Arzel PC board. Connect common wire from HVAC transformer to "O" terminal on relay. See attached wiring diagram.

LOCATING & MOUNTING THE CONTROL PANEL

Locate the control panel on a wall area near the HVAC air handling equipment (furnace - fan coil , etc.) 5ft. above the floor. Do not mount on duct work or HVAC equipment.

IDENTIFYING THE ZONES

The largest zone in the home or building should be designated as Zone #1. This is usually the living area. To avoid zone mix-ups, mark all supply ducts clearly with room designation and proper zone number.

CONTROL BOARD **CAUTION !**

WHEN INSTALLING THIS PRODUCT.....

1. **Disconnect power supply before making wiring connections to prevent electrical shock and equipment damage.**
2. Read these instructions carefully. Failure to follow them could damage the product or cause a hazardous condition.
3. After installation is complete, check out system operation.
4. All wiring must comply with applicable electrical codes, ordinances and regulations.
5. Save these instructions for future use.

WIRING NOTES

(See wiring layout for 200/300 on Last 2 Pages)

- #1. **On/Off Switch.** The Arzel System is powered by a 40VA 24 -VAC transformer (provided). The switch should always be in the "Off" position when connecting wires to any of the terminals.
- #2. **24 VAC Terminals.** The Arzel 40VA transformer should be connected to these terminals.
- #3. **Pressure and Vacuum Pumps.** These terminals provide power for the pressure and vacuum pumps.
- #4. **R C/ R H Terminals.** Connect Hot (+) side of appliance transformer to this terminal.
- #5. **O Terminal.** Connect Common (-) side of appliance transformer to this terminal.
- #6. **G Terminal.** Connect this terminal to the equipment fan relay.
- #7. **Y Terminal.** Connect this terminal to compressor contactor or relay.
- #8. **W Terminal.** Connect this terminal to gas valve or heat relay.

THERMOSTATS

"Heat/Cool and Fan-Auto-On" sub-base switching is available from any zone thermostat. Use any good thermostat programmable/Non programamble/ auto Change over.

SINGLE STAGE HEATING AND COOLING

All zones, #1 through #3, provide single stage heating and cooling. Use any good single stage heating and cooling thermostat.

TERMINALS FOR EACH ZONE

Connect each zone thermostat to its respective terminal as required.

BY-PASS DAMPER

Barometric or pressure switch operated bypass damper systems are installed to relieve excess air pressure that is sometimes caused by the zoning system. Excess air pressure may create high air velocity and air noise.

HVAC SYSTEM PROTECTION

All zoning systems must have over-heating and freeze protection. A number of controllers are available from Arzel for this purpose.

OVERHEATING-OVERCOOLING CONTROLS "LAT"

During the 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). Leaving Air Temperature (LAT) controls are used to cycle the AC compressor or the heating equipment to correct these temperatures.

There are a number of (LAT) controls that can be used. The Arzel Company sells either a Johnson A350 Electronic Temperature Control or a Honeywell remote bulb control to be used for this purpose.

WIRING THE JOHNSON CONTROL #A350 (for Arzel 200/300 System.)

The A350 temperature control module is primarily used to turn equipment on. However, when the control module is used with an Arzel system its function is to turn the HVAC equipment off should temperature in the duct get too high (heating cycle) or too low (cooling cycle). This means that the jumper blocks in the A350 must be reversed as outlined. (See Page 2--Fig 2 & 3 Johnson Control A350 Bulletin). Compressor circuit will break at differential setting on temperature fall (Heating mode for the A350 jumper). Heating valve or relay circuit will break at differential setting on temperature rise (Cooling mode for the A350 jumper). Circuits are energized again at set point temperatures.

Note: The cover of the A350 control must be removed to set the Jumper and the Differential.

A. Cooling

(To use this control to de-energize the compressor during the cooling cycle)

1. Place the jumper blocks on the A350 circuit board to the "Heating" position.
2. Connect "Common and "Normally Closed" contact on the A350 relay terminals to the "Y" wire in series from the Arzel PC board to the compressor.
3. Connect 24 Volt AC from the Arzel transformer to the 24 Volt AC terminals on the A350 control..
4. Connect the sensor to sensor terminals on the A350 control and insert the sensor probe into the duct near the AC coil and down stream from the coil. The correct sensor terminals on the A350 control are "COM" and "SEN."

Temperature Setting

For example: Set point at 55 deg. with a differential of 5 deg. In this setting the relay will energize at 50 deg. and de-energize the compressor. (55 deg. less 5 deg differential = 50 deg). The compressor will re-start at set point (55 deg.) when the temperature rises.

The LED on the A350 control will light only when the cooling circuits are de-energized.

B. Heating

(Use this A350 control to de-energize the heating relay or gas valve during the heating cycle):

1. Place the jumper blocks on the A350 board to the "cooling" position.
2. Connect "Common" and "Normally closed" contacts on the A350 relay terminals to the "W" wire in series from the Arzel PC board to the heating valve or relay.
3. Connect 24 Volt AC from the Arzel Transformer to the 24 Volt AC terminals on the A350 control.
4. Connect the sensor to the sensor terminals of the A350 control and insert the sensor probe into the duct near the plenum. The correct sensor terminals on the A 350 control are "COM" and "SEN".

Temperature Setting:

For example: Set point at 140 deg. with a differential of 15 deg. In this setting the relay will energize at 155 deg. breaking the heating relay or gas valve circuit. (140 deg. +15 deg. = 155 deg). The heating valve or relay circuit will energize at set point (140 deg.) when the temperature falls.

The LED's on the A350 control will light only when the heating circuits are de-energized.

INSTALLING THE ROUND DAMPERS - BDR TYPE

The BDR damper is designed to be inserted in existing round ducts without cutting or removing sections of the duct. A "stick-on" type pattern is provided with each damper. Remove backing paper and place pattern on duct observing direction of air flow arrow on the pattern. Cut out required triangle. Insert damper blade with blade facing the long side of triangle. Rotate damper so that the flat side of the blade (opposite side with connecting rods) is positioned to face air flow. Secure with four sheet metal screws.

INSTALLING THE RECTANGULAR DAMPERS - BDS TYPE

The BDS damper is designed to be inserted in existing rectangular duct from the side or the bottom of the duct. A 5 inch wide by 6 1/2" high opening is required to place a side mount damper in an 8" high rectangular duct. The 6 1/2" high dimension should be centered on the 8" high duct to avoid having to cut into the "Pittsburgh Lock" in the duct. Place damper into duct. Position flat side of blade (opposite side with connecting rods) facing the air stream. Fasten with sheet metal screws. Bottom mount dampers require a 3" slot across bottom of the duct. Slot should be cut to within 3/4" of each corner. Place damper into duct. Position flat side of blade (opposite side with connecting rods) facing the air stream. Fasten with sheet metal screws.

INSTALLING AIR LINES TO DAMPERS

Dampers are located in air ducts that supply conditioned air to each zone. The dampers in each zone must be connected to the air line that provides vacuum and pressure as needed to open and close the dampers. Each zone has one air line coming from the ARZEL unit. 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 nozzle.

LOCATIONS FOR THERMOSTATS

Locate the thermostats for each zone in a central area within the zone on an inside wall, 5ft. from an outside wall and 5ft. from the floor. Avoid areas near register outlets, lights and other equipment that could cause a false reading.

SOLENOID AIR VALVES

The Solenoids are energized by the thermostats. Solenoids are energized to open the dampers (vacuum position). The solenoids for the closed dampers are not energized (pressure position).

THERMOSTATS, APPLIANCES & ACCESSORY WIRING

Wires coming from the zone thermostats connect to input terminals in its respective zones. Output terminals are connected to the HVAC Equipment.

HEATING CYCLE

Heating has priority over cooling and fan operation. A thermostat call for heating in any zone will open its zones dampers and start the heating cycle. The last zone(s) served stays open.

COOLING CYCLE

Cooling has priority over fan operation. If there are no heating calls a cooling call from a thermostat will energize the cooling cycle and will open the zone dampers. The last zone(s) served stays open.

FAN OPERATION

Unless other zones call for heating or cooling, any thermostat in the Fan "ON" position will open its zone dampers for air circulation. All other zone dampers will be closed automatically.

DOE ENERGY SAVING REQUIREMENT (DOE-Department of Energy)

The last zone(s) that received heating, cooling or fan service will remain open. Leaving the last zone dampers open allows the HVAC System to use the residual energy in the system in both the heating and cooling cycles. The fan continues to run for a few minutes after a heating call (also after a cooling call on some cooling equipment) to deliver this residual energy.

PUMP OPERATION

- * Both pumps will start when service is required for heating, cooling or fan operation.
- * Both pumps will stop when the cycle is completed. Pumps will restart for any call for heating or cooling from any thermostat.

SLAVE ZONES **(Slave Thermostat)**

Slave zones may be added to any Arzel unit. The slave thermostat will only open and close the zone dampers. The slave thermostat does not control the HVAC equipment. When it needs service, the slave zone will open its dampers and wait to get conditioned air from any zone that calls for service. When the slave zone is satisfied, it will close its dampers.

An air solenoid and a thermostat are needed for each slave zone addition.

SLAVE ZONE WIRING AND TUBE CONNECTIONS

- 1.) Jumper the W and Y terminals in the slave thermostat.
- 2.) Connect the Y-W wire from slave thermostat to one lead of the slave solenoid.
- 3.) Connect the R wire of the slave thermostat to any R terminal in the Arzel terminal board.
- 4.) Connect the remaining wire of the slave solenoid to the common side of the Arzel transformer.
- 5.) Slave thermostat must have heating-cooling sub base switch if both heating and cooling services are used.
- 6.) Connect pressure and vacuum tubing to slave solenoid.
 - A.) Pressure tube to N.O. port.
 - B.) Vacuum tube to N.C. port.
 - C.) Common tube port, connect to slave dampers.
- 7.) A slave zone functions only when another zone is operating.

CHECKING OUT THE ARZEL SYSTEM

Place all zone thermostats in the "off" position before the Arzel power switch is turned on.

FAN CHECK - OUT:

- (1.) Turn the Arzel power switch "on" and **Zone-1** thermostat fan switch "on." The LED light will come on for **Zone-1**. The fan in HVAC system will turn on. The pressure and vacuum pumps will position the dampers. Check all register outlets to determine that **Zone-1** dampers are open and all other dampers are closed
- (2.) Follow the above procedure for all other zones

HEATING & COOLING CHECK - OUT:

- (1). Shut off all Fan/On switches before starting heating system check out.
- (2). Set thermostat for **Zone-1** to the Heat position. Turn thermostat up so that the thermostat is calling for heat. The LED light will light come on for **Zone #1**. The pressure and vacuum pumps will position all the dampers. Check to see that the heating valve or relay is energized
HEAT ANTICIPATOR : Thermostat anticipator setting if adjustable should be checked on every installation. Thermostat load on the Arzel System is very low (.12 or less).
- (3). Set thermostat for **Zone #1** to the Cool position. Turn thermostat down so that the thermostat is calling for cooling. The LED light will come on for **Zone #1**. The pressure and vacuum pumps will position all the dampers. Check to see that the cooling relay or contactor is energized.
- (4). Place **Zone #1** thermostat in the "off " position
- (5). Follow the above procedure for all other zones.

Damper Position Indicator

Observe the movements of the damper position indicator.

- (1) In the damper closed position, the indicator is long.
- (2) In the damper open position, the indicator is short.

TROUBLE-SHOOTING CHART

Symptoms	Possible Causes	Corrective Action
No Power to System	Switch in "Off" Position	Turn on Switch
No Power to System	Transformer shorted out	Replace Transformer
No Power to System	Transformer disconnected	Check Transformer Connection
Insufficient pressure in system	Leakage in system	Plug up unused zones
Insufficient pressure in system	End of air line open	Check air lines
_____	_____	_____
_____	_____	_____
_____	_____	_____

BYPASS DAMPER CHECK - OUT

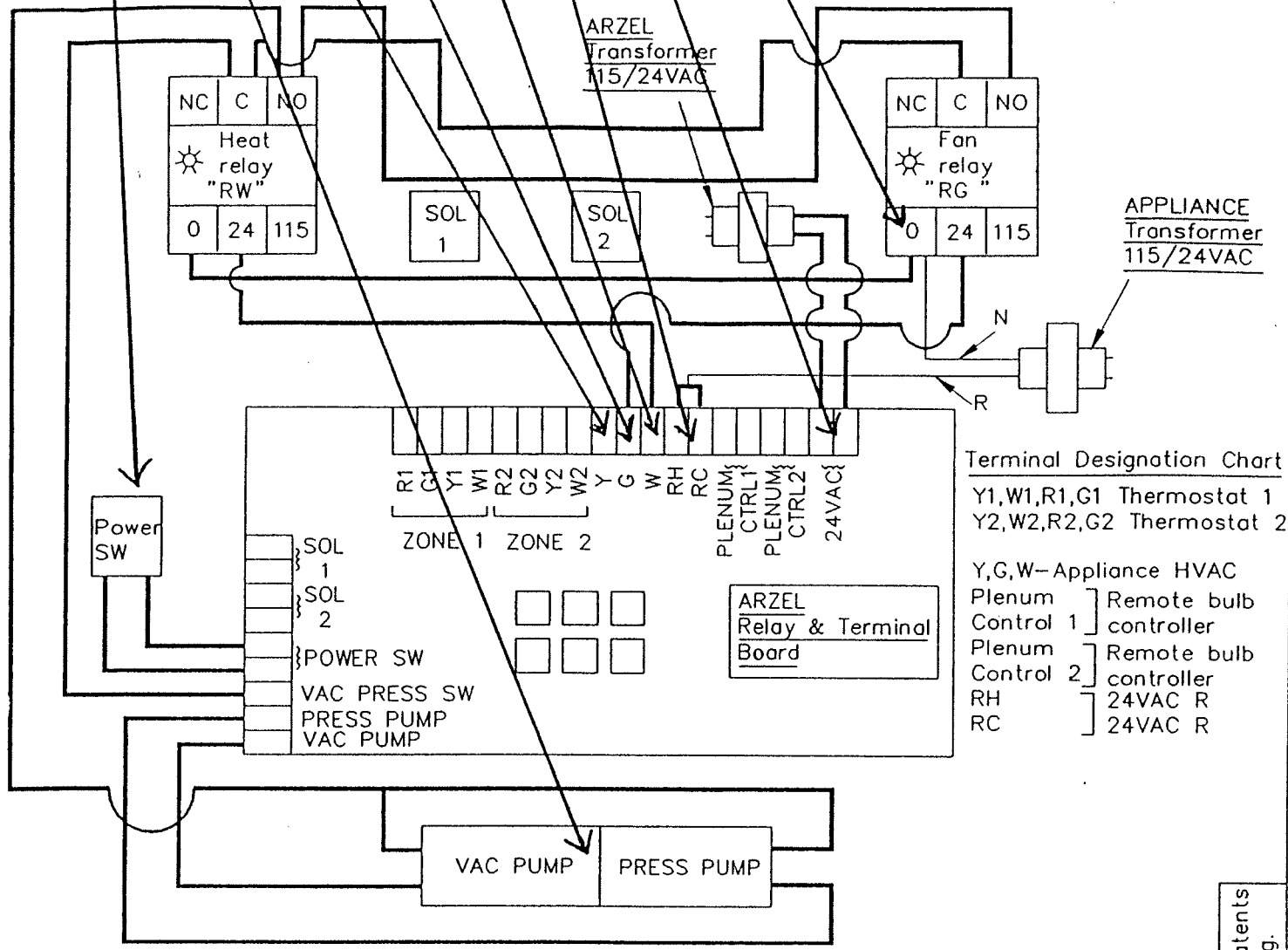
- 1.) Minimum pressure required to activate bypass damper is .017 in. WC.
- 2.) NORMALLY OPEN and COMMON terminals are used on the pressure switch.
- 3.) For manual check, blow into tube leading to pressure switch to activate relay which will open the damper.

L.A.T CONTROL CHECK - OUT

- 1.) Move temperature set knob up and down to determine if relay is functioning properly.
- 2.) Set temperature to desired setting.

WIRING DIAGRAM ARZEL-200A

(ARZEL TECHNOLOGY, INC.)



Terminal Designation Chart

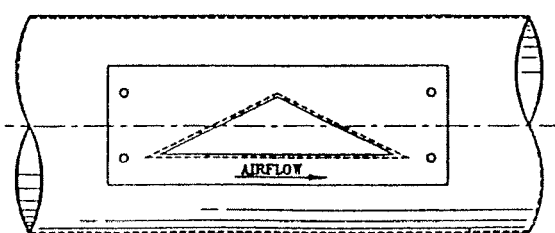
Y1, W1, R1, G1	Thermostat 1
Y2, W2, R2, G2	Thermostat 2
Y, G, W	Appliance HVAC
Plenum Control 1	} Remote bulb controller
Plenum Control 2	
RH	} 24VAC R
RC	

Notes:

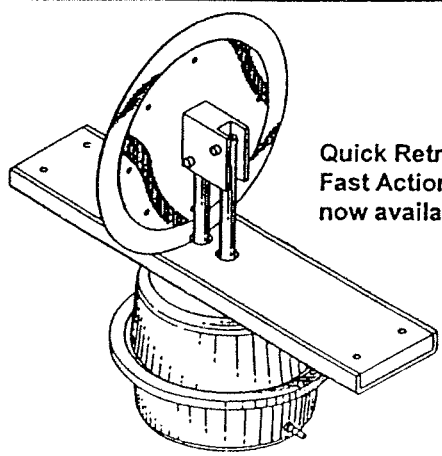
1. This unit is designed for blade type mechanical dampers.
2. Both a neutral and hot wire must be brought from the HVAC transformer. The neutral "N" wire is to be connected to the "0" terminal on the Fan relay. The hot "R" wire is to be connected to the RC/RH terminals.
3. If separate transformers for heating & cooling are used, remove jumper between RH & RC.
4. The last zone served stays open until the next call.
5. Pumps only run when thermostat calls for Htg-Clg or Fan service.

U.S. and Foreign patents and patents pending.

Arzel's™ New Blade Damper



Installation through a small slit in the existing duct makes it the fastest-installed damper in the market.

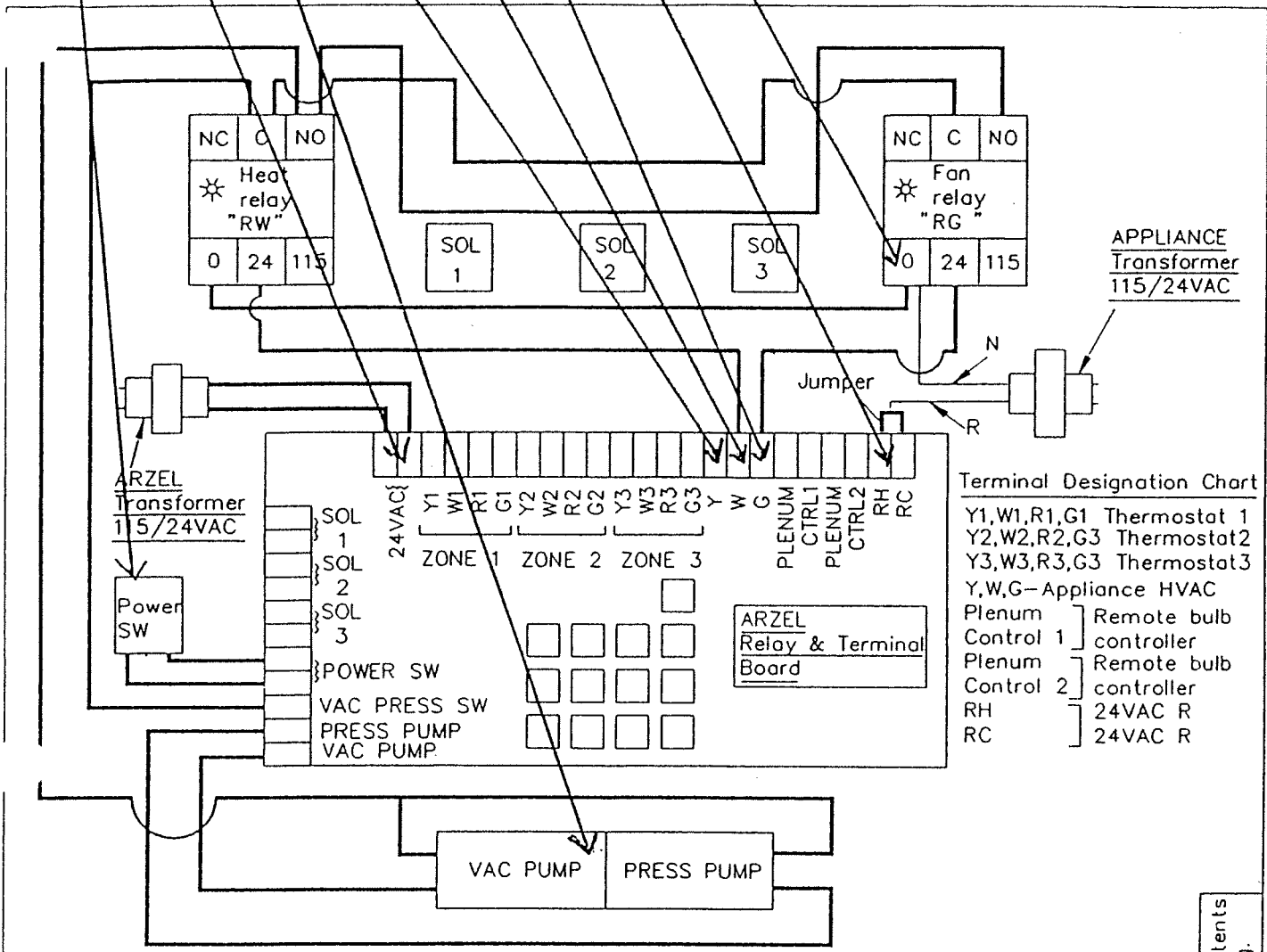


Quick Retrofit,
Fast Action Blade Dampers
now available. (From 5" to 14")

Note: All Arzel™ Systems are Patented and Patent Pending.

WIRING DIAGRAM ARZEL-300A.

(ARZEL TECHNOLOGY, INC. P/N 300A)



Terminal Designation Chart

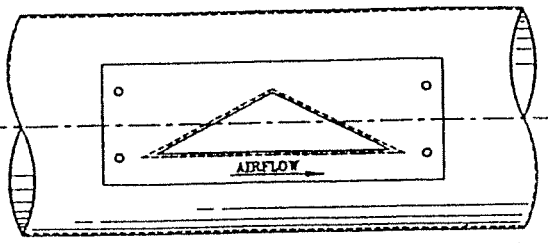
Y1, W1, R1, G1	Thermostat 1
Y2, W2, R2, G2	Thermostat 2
Y3, W3, R3, G3	Thermostat 3
Y, W, G	Appliance HVAC
Plenum Control 1	Remote bulb controller
Plenum Control 2	
RH	24VAC R
RC	24VAC R

Notes:

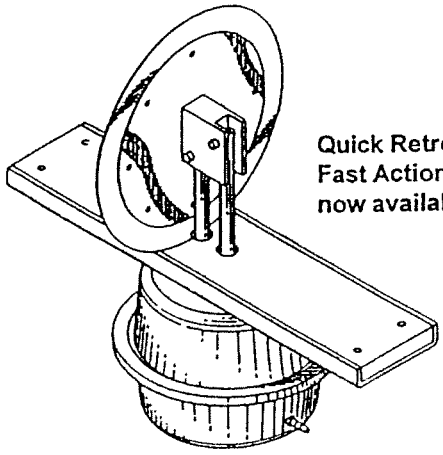
1. This unit is designed for blade type mechanical dampers.
2. Both a neutral and hot wire must be brought from the HVAC transformer. The neutral "N" wire is to be connected to the "0" terminal on the Fan relay. The hot "R" wire is to be connected to the RC/RH terminals.
3. If separate transformers for heating & cooling are used, remove jumper between RH & RC.
4. The last zone served stays open until the next call.
5. Pumps only run when thermostat calls for Htg-Clg or Fan service.

U.S. and Foreign patents and patents pending.

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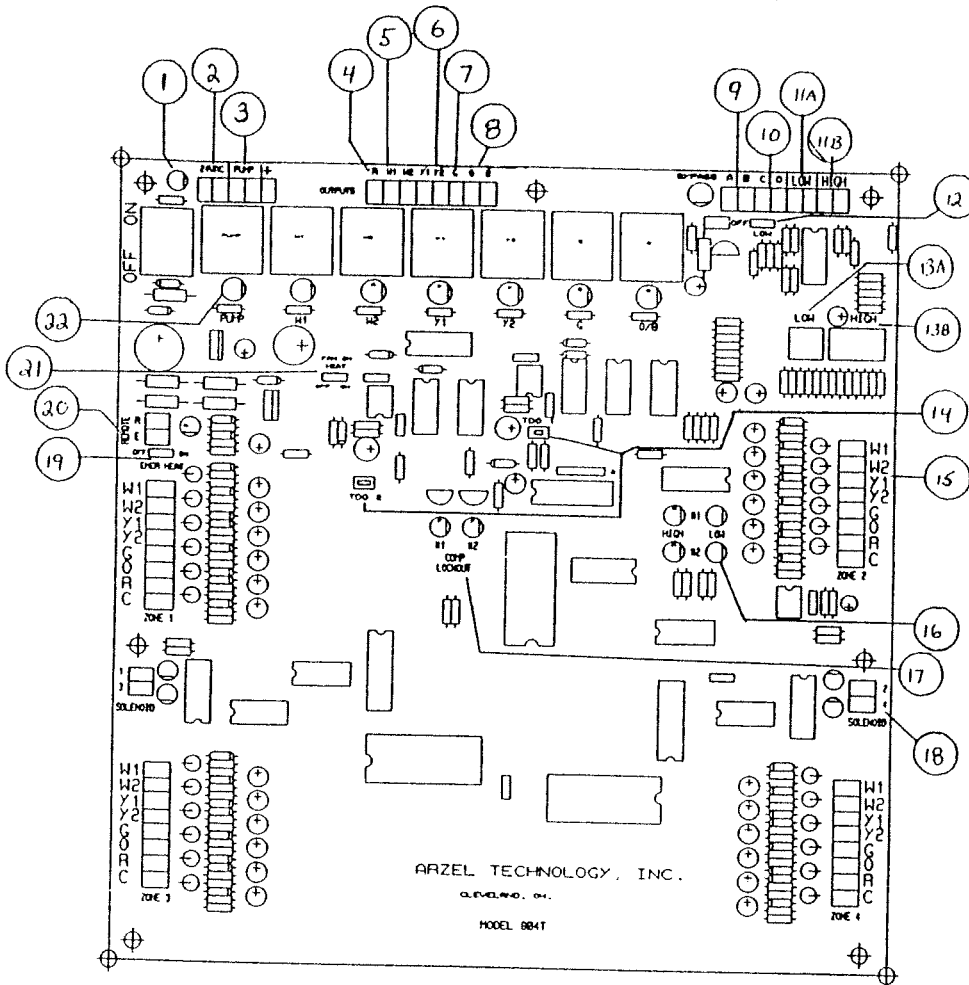


Quick Retrofit, Fast Action Blade Dampers now available. (From 5" to 14")

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WIRING LAYOUT & NOTES

804 Systems (Typical)



- | | |
|---------------------------|--|
| 1. On/Off Switch
W/LED | The Arzel System is powered by a 40 VA 24-VAC transformer (provided). This switch and the HVAC power switch must always be in the "Off" position when connecting wires to any terminals. (See control panel DANGER-SECTION). Control panel has a 20 second warm up period, when PC board is turned on. |
| 2. 24 VAC Terminals | The Arzel 40 VA transformer (provided) must be connected to these two terminals. |
| 3. Pump terminals | Factory connection for the miniature pressure and vacuum pumps. The pumps operate only when a thermostat calls for Heat/Cool or Fan operation. |
| 4. R Terminal | Connect Hot or + side of HVAC equipment transformer (24 VAC) to this terminal. |
| 5. W1 & W2 Terminals | Connect to gas valve or heat relay. Stage 1. & Stage 2. (Back-up-heat terminal if Heat-Pump is installed). |
| 6. Y1 & Y2 Terminals | Connect to compressor contactor or relay. Stage 1. & Stage 2. |
| 7. G Terminal | Connect to equipment fan relay. |
| 8. O and B Terminals | (For heat pump installation only) Connect either "O" or "B" to heat pump reversing valve, as required by heat pump manufacturer. |

9. Terminals A & B Bypass Damper Control Terminals for pressure switch operated Bypass damper. Use the NORMALLY OPEN (NO) and the COMMON (C) terminals on the pressure switch. Pressure switch must be mounted in a vertical position. Pressure switch is included if factory-installed Bypass option is ordered.
10. Terminals C & D Factory installed Bypass damper solenoid. This solenoid is included if Bypass option is ordered.
11. LAT Sensors (2)
11 A. Low
11 B. High Drill a 1/4" hole in duct for each sensor. Carefully push the solid state sensor through the hole, snap the locking bushing into place. Connect the two wires from each sensor to these terminals. Run LAT wires separate from other wires. **Caution, use Arzel sensor only.** Sensors come with-15 ft. leads. Thermostat wire may be added to extend sensor lead wires up to 30 ft. Sensors should be placed downstream and as close to the AC coil and heat exchanger as possible. On Heat Pump installations, be sure that the LAT sensor is located between the refrigeration coil and the Backup electric heat coils. Sensors are interchangeable.
12. LAT ON/OFF Switch for cooling only When using the LAT sensor the cooling **LAT switch must be in ON position.** If LAT sensor is not used for cooling, the sensor switch must be in the OFF position, and the LAT leads must NOT be connected to the sensor terminals. There is no LAT switch for heating. If LAT sensor is not used for Heating, you must remove the two high sensor leads from terminals.
13. LAT Temperature settings
13 A. low
13 B. High See example & chart. Select your desired high and low temperature "DIP SWITCH" setting.
- LAT Test During the 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). Leaving Air Temperature (LAT) controls are used to cycle the AC compressor or the heating equipment to correct these temperature levels.
- For Example: A low temp setting of 50° will break the Y circuit at 50°. The compressor will restart after 4 to 5 minutes delay. A high temperature setting of 150° degrees for gas/oil furnace will break the (W) circuit at 150°. The high temperature setting has a built-in non-adjustable 15° differential. In this example, the gas valve or heating relay will re-energize at 135°. (150° - 15° = 135°).
- To verify LAT Sensor temperature readings, measure DC Voltage across respective LAT terminals. (See dip switch & LAT temperature setting conversion table). (Page 5).
14. (2) Time Delay Overrides T.D.O. Note: These two momentary contact, time delay override switches are provided on the P.C. board to speed the checkout of the compressor system. Before using this T.D.O. switches, you must disconnect the HVAC "R" wire, in order to avoid short cycling the equipment.
15. Thermostat Terminals Connect thermostats to these terminals. A common "C" terminal is available, if needed. The "O" terminal of all heat pump thermostats must be used for heat pump operation. (Typical).
16. LAT Flash Flashing LAT High & Low LED for stage 1 & 2. Flashing LED indicates lockout in. Effect each stage has its own LED.
17. Comp. Lockout Flashing Comp lockout LED's, Stage 1 & Stage 2.
18. Solenoid terminals Factory connection for zone solenoids. (Typical).
19. Emergency Heat Manual Switch Emergency Heat Change-over switch, to be used for heat pump application only. (Manual Switching).
20. Emergency Heat Remote Switch Emergency or, Back-up-Heat Change-over terminals, for remote switching by outdoor thermostat. This switch will allow change from Heat Pump operation to back-up heat or fossil fuel.
21. Fan-On-Heat Switch This switch in "ON" position will start the fan if immediate fan operation is desired on a call for heating, such as electric furnace, hot water coils, steam coils, etc.
22. LED lights for output Relays LED light on, means relay is energized. O/B light off means B is energized.

FAN CHECK-OUT

1. Set all thermostats to the OFF position and all fan switches to AUTO before starting the fan system check out.
2. Turn the HVAC system and the ARZEL system power switch ON. The LED light above the switch will come on .
3. Turn Zone 1 thermostat fan switch ON. The Zone 1 Solenoid, the Fan and Pump output LED lights will come on. The fan in the HVAC system will turn on. The pressure and vacuum pumps will position all the dampers. Check all register outlets to determine that only Zone 1 dampers are open and all other dampers are closed.
4. Follow the above procedure for all other zones.

HEATING & COOLING CHECK-OUT

1. Set all thermostats to the OFF position and all fan switches to AUTO before starting heating system check out.
2. Set Zone 1 thermostat to the HEAT position. Turn thermostat up so that the thermostat is calling for heat. The Zone 1 Solenoid, the W output and the Pump LED lights will come on. Check both stages of heating, if installed. The pressure and vacuum pumps will position all the dampers. Check to see that the heating valve or relay is energized. Check operation of Emergency Back-up heating, if heat pump is installed. Turn the thermostat down until the thermostat is satisfied. The LED lights will go out and the pumps will stop. Dampers will remain open in the last zone that called.
3. Set thermostat for Zone 1 to the COOL position. Turn thermostat down so that the thermostat is calling for cooling. The Zone 1 Solenoid, the Y and G and the pump output LED lights will come on. Check both stages of cooling, if installed. The pressure and vacuum pumps will position all the dampers. Check to see that the compressor relay or contactor is energized. Rapid cycle each zone to see that 4 to 5 minute lockout takes place.
4. Place Zone 1 thermostat in the OFF position.
5. Follow the above procedure for all other zones.

BYPASS DAMPER INSTALLATION, SIZES, ADJUSTMENT & CHECK-OUT

Barometric or pressure switch operated 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.

1. If a barometric Bypass damper is used instead of a pressure switch operated damper, set counter weight and adjust to suit the installation.
2. If a pressure switch operated Bypass damper system is used, connect the pressure switch to terminals A and B on PC board. Use NORMALLY OPEN and COMMON terminals on the pressure switch. Pressure switch must be mounted in a vertical position (See PC board wiring Note #11)
3. The Bypass solenoid is connected to terminals C & D (See Note terminals C & D, Factory Connection).
4. Minimum pressure required to activate the Bypass damper is 0.05 in. WC.
5. Adjust Bypass pressure switch setting to open Bypass damper to eliminate air noise. This is usually found when only the smallest zone is calling. A call for heating/cooling or fan must exist to operate the air pump during this check out.

Recommended pressure switch operated Bypass Damper - In Round Sizes:

2-Tons	6" Bypass
4-Tons	8" Bypass
6-Tons	10" Bypass
7 1/2-Tons	12" Bypass
12 Tons	14" Bypass

Note: Tap into return duct at some point removed from the supply plenum, if possible. This will allow bypass air to mix with normal return air.

INSTALLING ROUND DAMPERS - TYPE R

The "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, observing direction of air flow arrow on the template. Cut out required triangle. Insert damper blade with blade facing the long side of triangle. Rotate damper so that the flat side of the blade (not the side with the connecting rods) is positioned to face air flow. Fasten with four sheet metal screws.

INSTALLING SQUARE & RECTANGULAR DAMPERS - TYPE S

The "S" damper is designed to be inserted in existing or new rectangular duct from the side, bottom or the top of the duct. Cut a slot 5" wide by any required length. The slot should be cut to 3/4 inch from each corner. This will avoid having to cut into the "Pittsburgh Lock" in the duct and leave sheet metal for the mounting plate screws. Place the damper in the duct. Position flat side of blade (not the side with the connecting rods) to face air flow. Fasten with sheet metal screws.

DAMPER POSITION INDICATOR

Observe the movements of the damper position indicator:

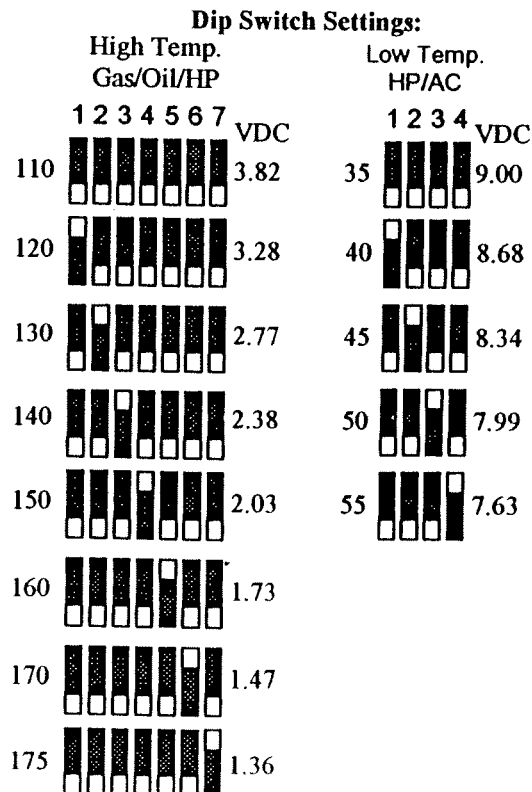
1. The damper indicator pointing down means the damper is closed.
2. The damper indicator pointing up means the damper is open.

CONNECTING AIR TUBES TO DAMPERS

Each zone has one air line bulkhead fitting on the top of the Arzel panel. All additional dampers in each zone must be connected with a "T" fitting to its zone air line. The air line provides vacuum and pressure, as needed, to open and close the dampers. 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.

LAT OVERHEATING - OVERCOOLING CONTROLS

(See wiring Notes # 11, 12, & 13, for 800 systems).



LAT Temperature Setting & D.C. Voltage Reading Chart

To Compare existing Duct Temperature With Voltage Reading:

Proceed as follows:

1. Insert test thermometer into duct as near to LAT sensor as possible.
2. Measure DC Voltage across two respective LAT terminals, 13A or 13 B.
3. Voltage reading (chart on left) should indicate the same temperature as test thermometer, plus or minus 2 degrees.
4. Voltage readings for LAT temperatures between dip Switch Settings are as follows:

Degree F°	Voltage DC
65	6.81
70	6.52
75	6.15
80	5.78
85	5.49
90	5.08
95	4.74

**Hi temp setting cycles the first stage heating.
Second stage heating is automatically cycled
10 degrees lower than high temp setting.**

**Low temp setting cycles the first stage cooling.
Second stage cooling is automatically cycled
5 degrees higher than the low temp setting.**