

AZ-4CP / AZ-6CP ZONE VALVE CONTROLS

Argo



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P/N 240005386, Rev. 1.3 [10/06]

INSTALLATION MANUAL AND OPERATING INSTRUCTIONS

P/N 240005386, Rev. 1.3 [10/06]

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RETAIN THIS MANUAL FOR FUTURE REFERENCE



SAFETY SYMBOLS AND WARNINGS

The following defined symbols are used throughout this manual to notify the reader of potential hazards of varying risk levels.



DANGER



Indicates an imminently hazardous situation which, if not avoided, **WILL** result in death or serious injury.



WARNING



Indicates a potentially hazardous situation which, if not avoided, **COULD** result in death or serious injury.



CAUTION



Indicates a potential hazardous situation which, if not avoided, **MAY** result in minor or moderate injury. It may also be used to alert against unsafe practices.

IMPORTANT: Read the following instructions **COMPLETELY** before installing!!



WARNING



All installations should be done only by a qualified expert and in accordance with the appropriate Argo manual. Installing an electric appliance with improper methods or materials may result in serious injury or death due to fire.

INTRODUCTION

This manual is intended to familiarize the installer and user of the Argo AZ-CP Zone Valve Controls with their installation and operation so as to assure normal trouble-free operation.

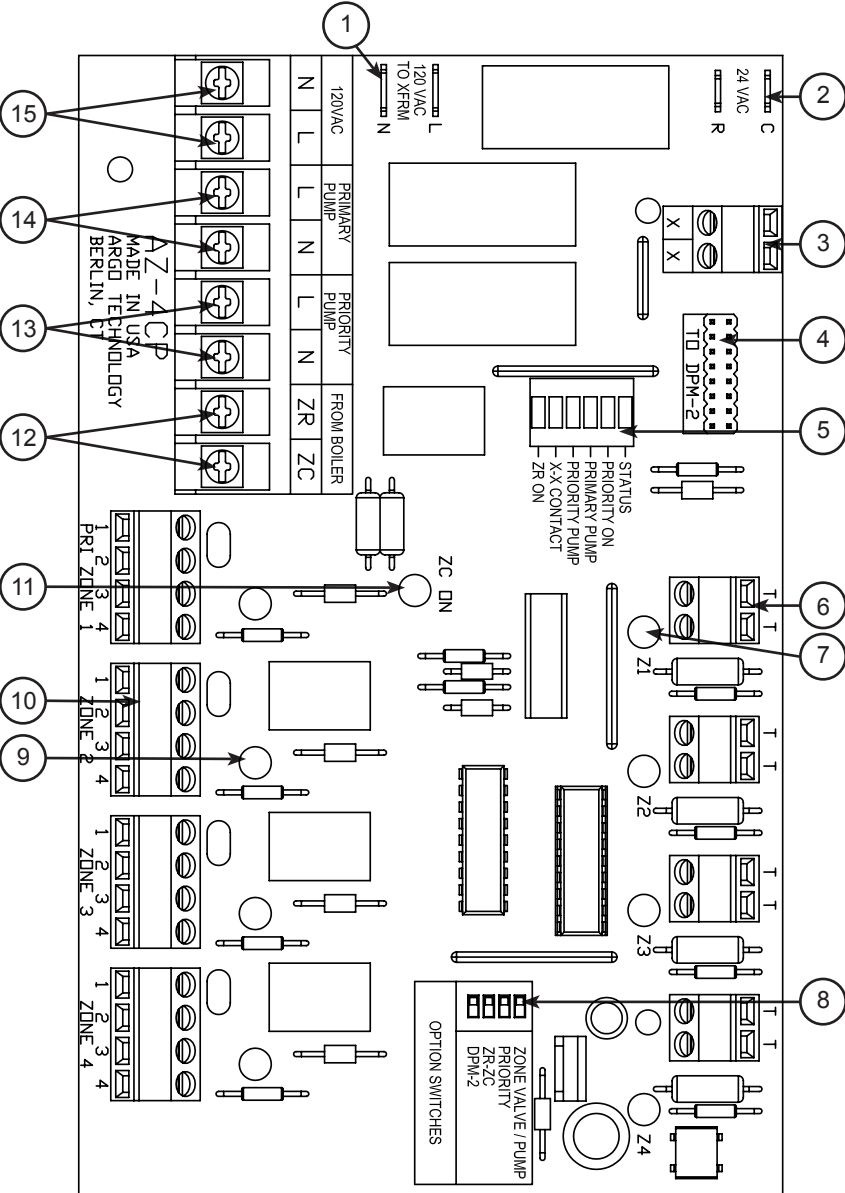
Argo controls are designed and manufactured with quality components for maximum life and durability and require minimum service. To insure a satisfactory installation, it is imperative that the instructions be followed carefully before operating the control. Failure to do so may result in breach of warranty.

PRODUCT DESCRIPTION

The Argo AZ-4CP and AZ-6CP Zone Valve Controls are multi-zone (4 and 6 zone) controls for operating both low voltage (24Vac) zone valves for hydronic heating. The heating zones will be controlled by thermostats (low voltage, digital, or power-robbing) or any other type of low voltage control with SPST switching action. Priority for an indirect fired domestic hot water tank is provided by a field selectable switch on Zone 1. An option for a circulator on Zone 1 (by field selectable switch) is also provided. The following capacities can be achieved:

- **AZ-4CP:** 4 zone valves with a primary circulator or 3 zone valves with priority (indirect hot water) circulator and primary circulator.
- **AZ-6CP:** 6 zone valves with a primary circulator or 5 zone valves with priority (indirect hot water) circulator and primary circulator.

AZ-4CP CONTROL BOARD

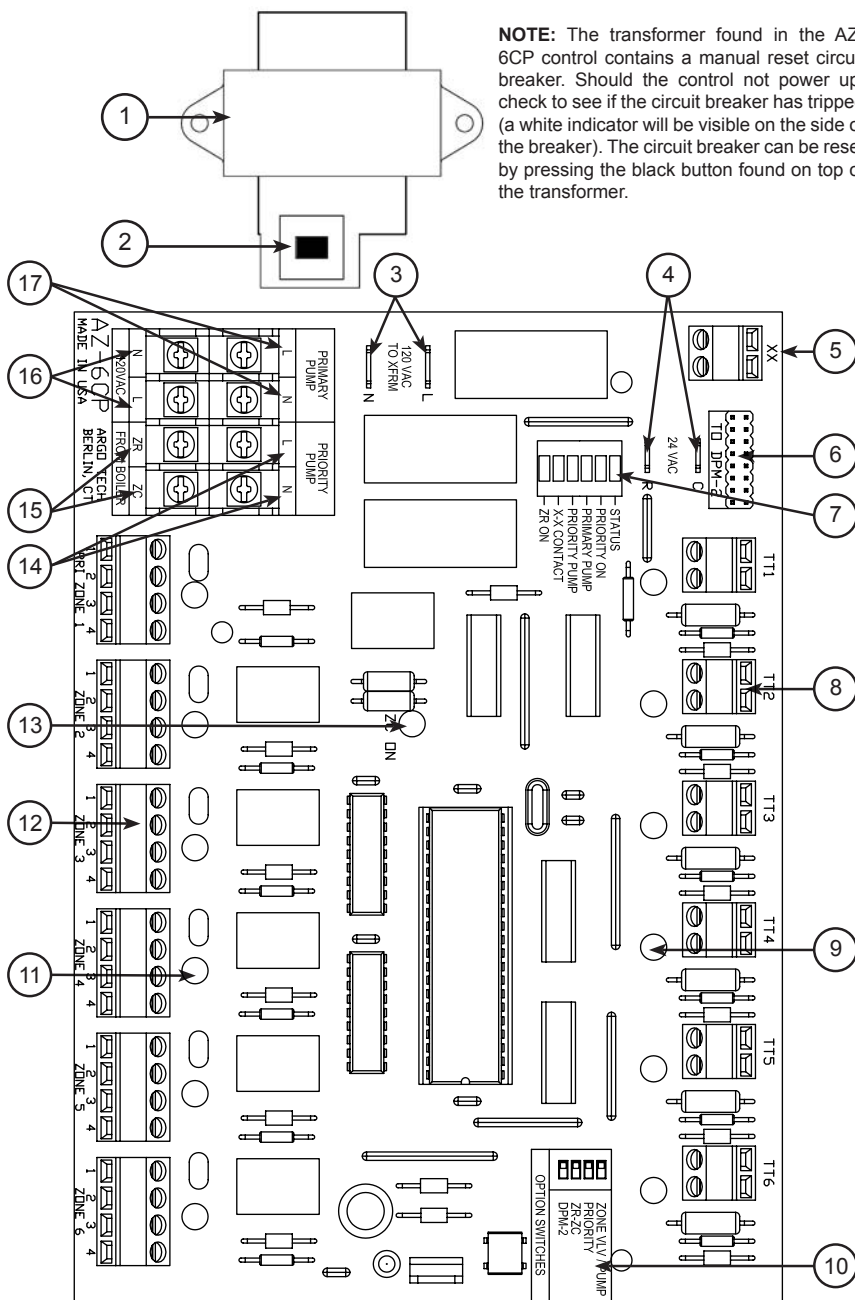


AZ-4CP CONTROL BOARD

1. Transformer Spade Terminals (120 Vac) (*Primary*)
2. Transformer Spade Terminals (24 Vac) (*Class 2*)
3. Isolated End Switch X-X
4. Data Port Terminal - used for communication with the Argo DPM-2 Outdoor Temperature Setback Control
5. LED Array
 - Status LED - **flashes during normal operation**
 - Priority On - indicates priority mode is selected
 - Primary Pump - indicates primary pump is energized
 - Priority Pump - indicates the priority zone pump is energized
 - X-X Contact - indicates X-X contact is closed and calling for heat from the boiler
 - ZR On - indicates ZR-ZC dip switch is in the ON position, priority zone is calling, and ZR-ZC terminals are energized.
6. Thermostat Terminals (*Class 2*)
7. Green Indicator LED - indicates zone is calling for heat
8. Field Selectable Option Dip Switches (*see “Field Selectable Option Switches” in this manual for explanation*)
9. Red Indicator LED - indicates zone valve is fully open
10. Zone Valve Terminals (*Class 2*)
11. ZC on Green Indicator LED
12. ZR-ZC Terminals (used for tankless coil applications) (*Primary*)
13. Priority Pump Terminals (*Primary*)
14. Primary Pump Terminals (*Primary*)
15. Source Power Terminals (*Primary*)

AZ-6CP CONTROL BOARD

NOTE: The transformer found in the AZ-6CP control contains a manual reset circuit breaker. Should the control not power up, check to see if the circuit breaker has tripped (a white indicator will be visible on the side of the breaker). The circuit breaker can be reset by pressing the black button found on top of the transformer.



AZ-6CP CONTROL BOARD

1. Transformer - 75VA, 120V/24V 50 HZ
2. Circuit Breaker Reset Switch
3. Transformer Spade Terminals (120 Vac) (*Primary*)
4. Transformer Spade Terminals (24 Vac) (*Class 2*)
5. Isolated End Switch X-X
6. Data Port Terminal - used for communication with the Argo DPM-2 Outdoor Temperature Setback Control
7. LED Array (*see “AZ-4CP Control Board” in this manual for specifications*)
8. Thermostat Terminals (*Class 2*)
9. Green Indicator LED - indicates zone is calling for heat
10. Field Selectable Option Dip Switches (*see “Field Selectable Option Switches” in this manual for explanation*)
11. Red Indicator LED - indicates zone valve is fully open
12. Zone Valve Terminals (*Class 2*)
13. ZC on Green Indicator LED
14. Priority Pump Terminals (*Primary*)
15. ZR-ZC Terminals (used for tankless coil applications) (*Primary*)
16. Source Power Terminals (*Primary*)
17. Primary Pump Terminals (*Primary*)

MOUNTING INSTRUCTIONS

Mount the AZ-CP Zone Valve Control vertically on a solid wall or partition. For your convenience it is recommended that the control be mounted as close as possible to the device to be controlled. The switching relay should never be mounted more than 75 feet away. Select a location that is easily accessible for installation and service.

NOTE: To reduce the possible transformer hum and relay noise that is sometimes amplified by mounting surfaces such as sheet metal, plasterboard, and similar materials, place rubber or felt washers between the case and the mounting surface.

1. Position the control and mark the mounting holes.
2. Start screws (not provided) for the keyhole type mounting holes in the upper corner(s). Tighten the screws down to about $\frac{1}{8}$ " (3mm) from the surface.
3. Hang the control on the screw(s), position the case, and start the bottom screws.
4. Tighten all screws.

ELECTRICAL SPECIFICATIONS AND WIRING



ELECTRICAL SHOCK HAZARD! Disconnect power before installing or servicing. Can cause severe personal injury, death, or substantial property damage if ignored.

– GENERAL WIRING NOTICE –

All primary wiring must be 14 AWG minimum. Torque terminal screws 6 to 7 inch pounds.

U.S.A. - National Electric Code and any other national, state, or local code requirements. Wiring must be N.E.C. Class 1.

CANADA - C.S.A. C22.1 Canadian Electrical Code Part 1 and any other national, provincial, or local code requirements. Wiring must be C.S.A. C22.1 C.E.C. Part 1.

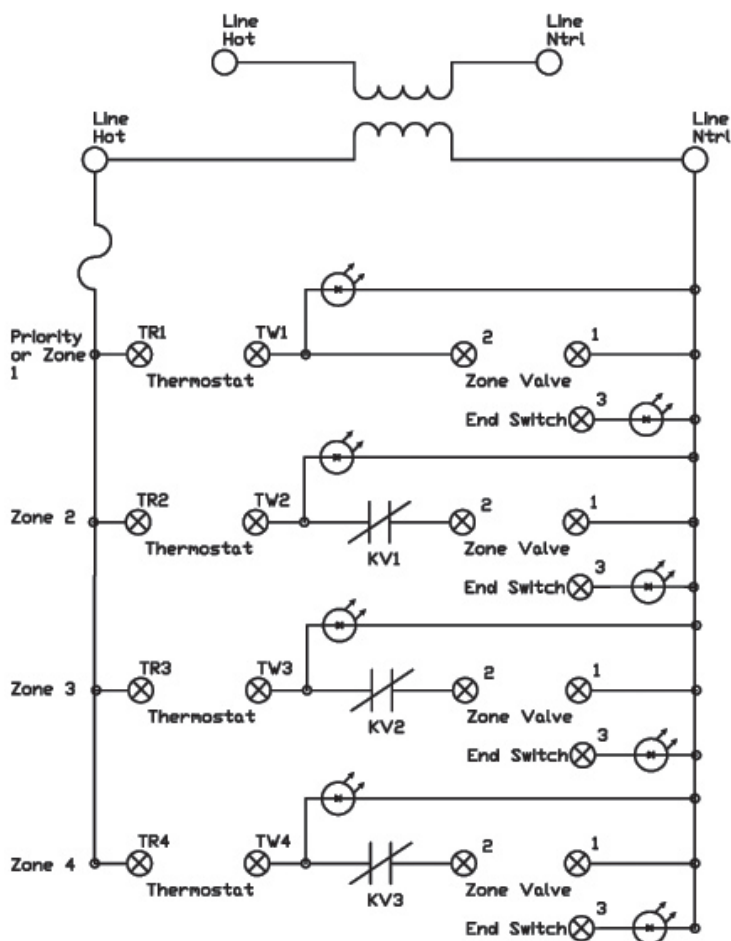
ELECTRICAL SPECIFICATIONS AND WIRING

– ELECTRICAL SPECIFICATIONS –

Model Number	Zones	Transformer Voltage	Relay Switching Action	Total Amp Draw (120VAC)
AZ-4CP	4	120V/60Hz/40Va	SPST	7.2A
AZ-6CP	6	120V/60Hz/75Va	SPST	7.2A

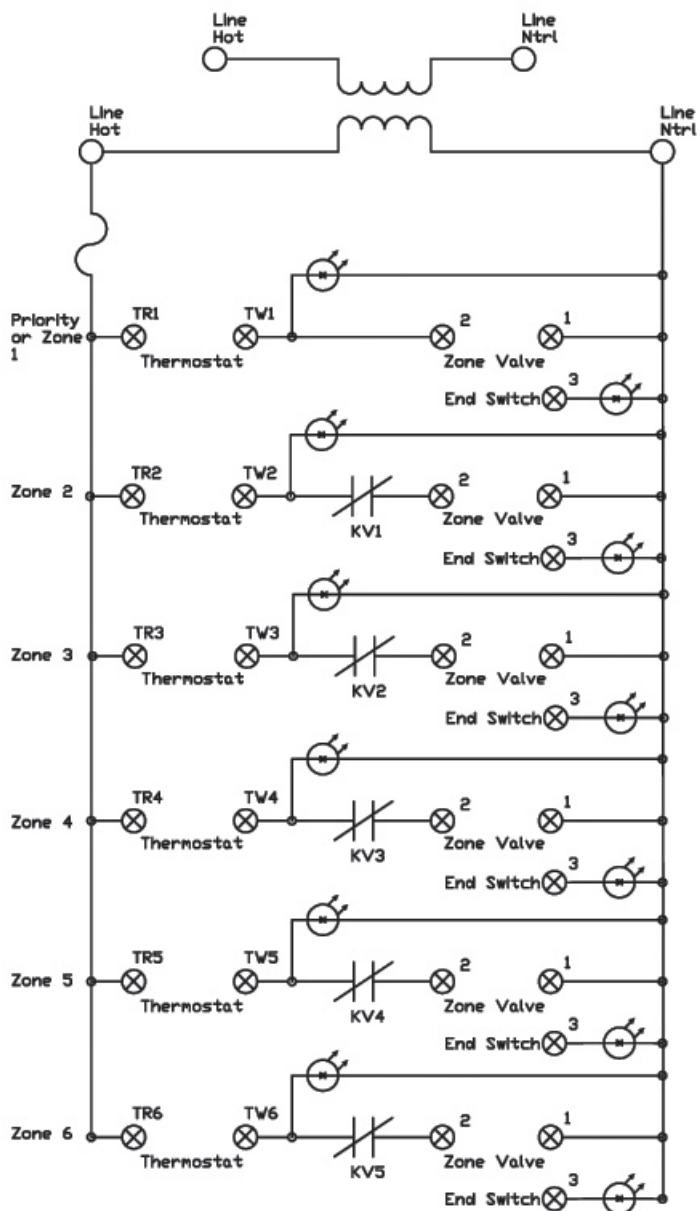
AZ-CP WIRING SCHEMATIC

– AZ-4CP –



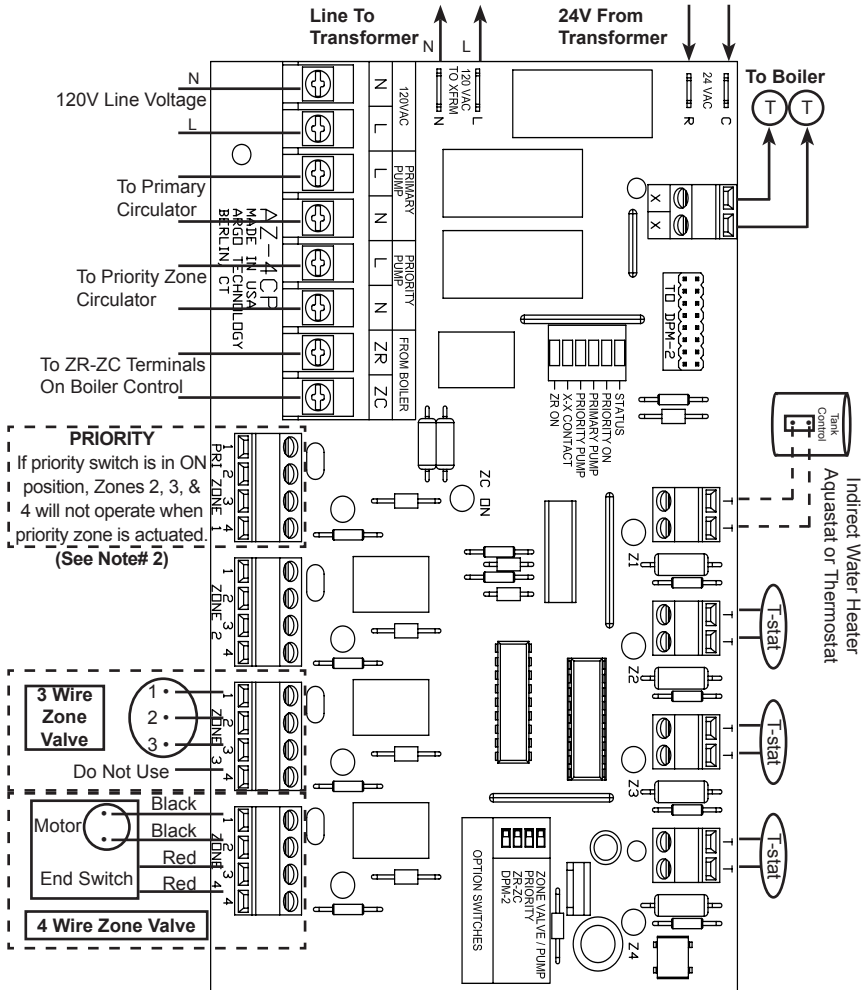
AZ-CP WIRING SCHEMATICS

- AZ-6CP -



AZ-CP WIRING SCHEMATICS

The diagrams in this manual represent the Argo AZ-4CP Zone Valve Control. The AZ-6CP has similar electrical connections. Differences in operating features are noted in this manual.



NOTES:

1. The switching relay terminals are approved for use with copper wires only. Torque terminal block screws 6 to 7 inch pounds.

2. When using a priority zone circulator, a jumper is required between terminals 3 and 4 of Priority Zone 1. This jumper is not required when using a zone valve.

ZR-ZC WIRING

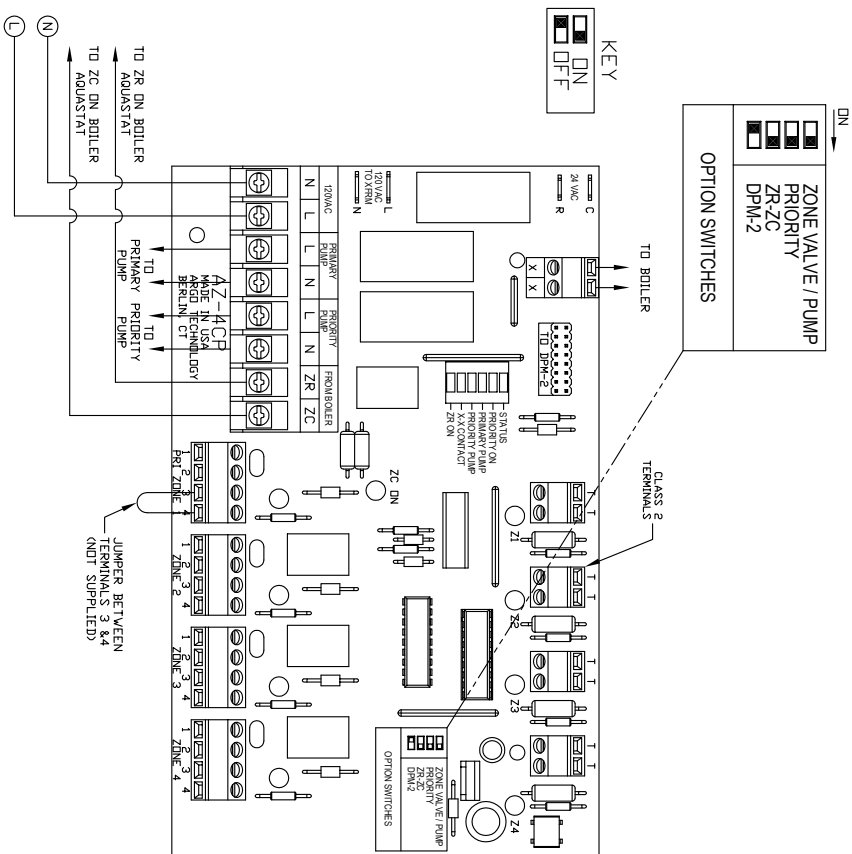


⚠ WARNING ⚠

When using ZC-ZR careful attention must be paid to keeping the polarity of the wiring consistent between the Argo control and the boiler aquastat. Failure to do so could result in a secondary source of power activating the boiler under certain circumstances which could result in serious injury or death. Always disconnect power to both the Argo control and the boiler when installing or servicing this product.

- TANKLESS COIL BOILER TO AZ-CP CONTROL -

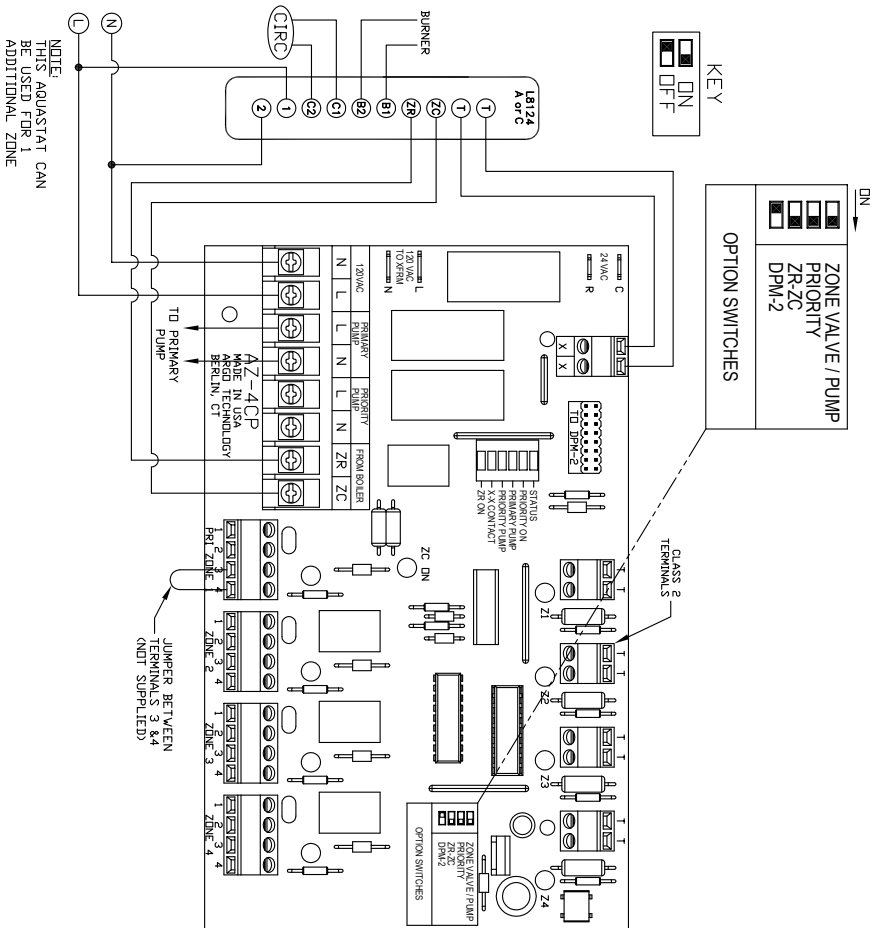
(PRIORITY PUMP, PRIORITY, AND ZR-ZC OPTIONS SELECTED)



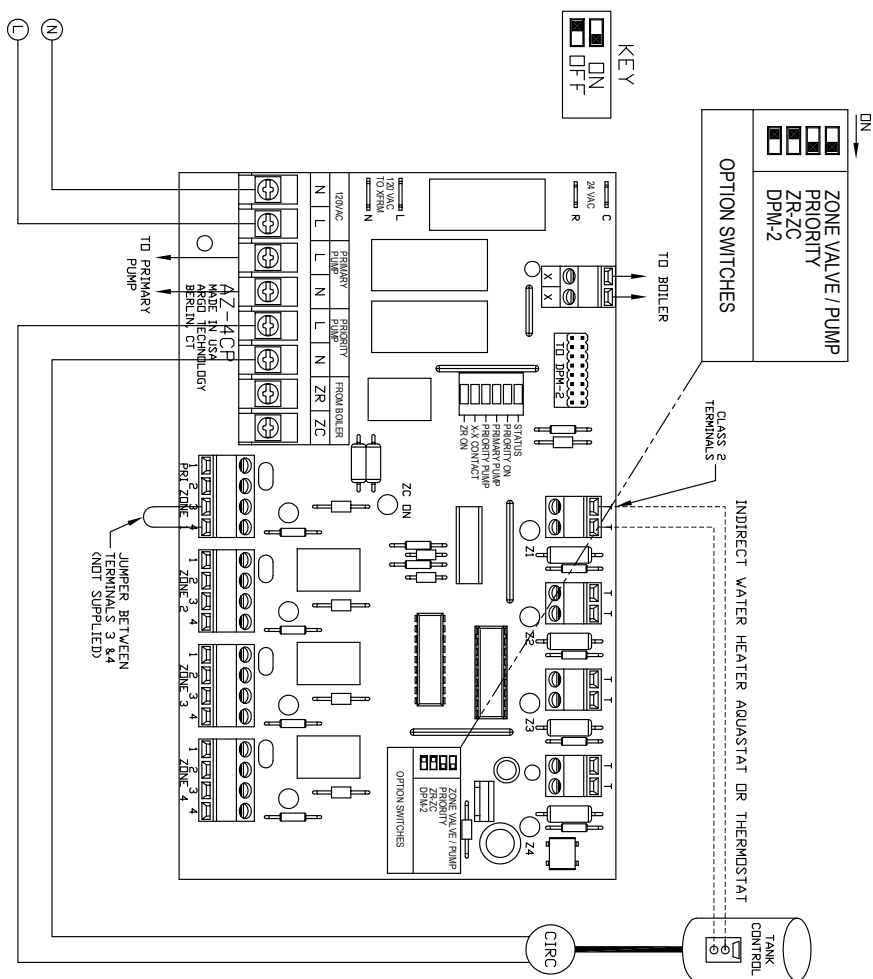
ZR-ZC WIRING

- TANKLESS COIL BOILER WITH MH L8124 A OR C
TO AZ-CP CONTROL -

(PRIORITY PUMP, PRIORITY, AND ZR-ZC OPTIONS SELECTED)



– INDIRECT WATER TANK TO AZ-CP CONTROL –
(INDIRECT WIRING WITH PUMP AND PRIORITY OPTIONS SELECTED)



FIELD SELECTABLE OPTION SWITCHES

NOTE: Priority selection switches may be covered with protective film. Remove before using selection switches.

– ZONE VALVE/PUMP SELECTION SWITCH –

Control must be in priority mode (priority switch ON) to access this feature. With the zone valve/pump switch in the OFF position, only the priority **ZONE VALVE** terminals are energized when Zone 1 calls for heat. With the zone valve/pump switch in the ON position, the priority **PUMP** terminals will be energized with 120Vac when Zone 1 calls for heat.

IMPORTANT: A jumper wire (not included) must be installed between terminals 3 and 4 of Zone 1 when using the Priority Pump Feature. A jumper is not required when using a zone valve.

– PRIORITY SELECTION SWITCH –

If priority switch is in the ON position:

1. Zone 1 becomes priority zone.
2. When Zone 1 calls for heat, the priority zone is activated and all other zones are deactivated. (Zone valves for Zones 2 and higher will not operate.) Priority ON light turns on.
3. Built-in timer automatically shuts off priority feature (light off) temporarily if priority zone calls for heat longer than 30 minutes, allowing all zones to operate. Repeats every 30 minutes until priority zone is satisfied. Prevents house freeze-up in event of indirect heater malfunction.

– ZR-ZC SELECTION SWITCH –

The ZR-ZC switch is used in tankless coil boiler applications. The ZR-ZC terminals on the AZ-CP control are connected to the ZR-ZC terminals on the boiler aquastat or low limit control. If the ZR-ZC switch is in the ON position the ZR-ZC terminals are energized when there is a call for heat on the priority zone and the priority zone end switch is closed.

FIELD SELECTABLE OPTION SWITCHES

- DPM-2 SELECTION SWITCH -

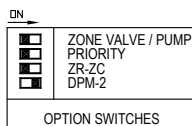
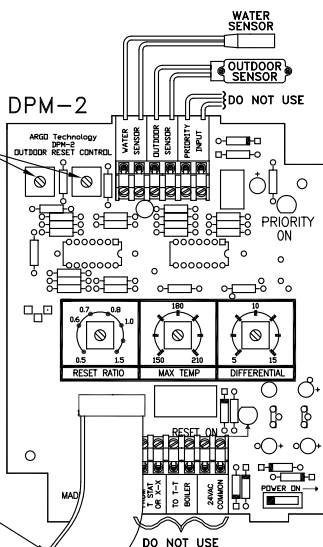
The DPM-2 Outdoor Reset Control is designed to raise or lower the temperature of the boiler supply water based upon a proportionate drop or rise in temperature at the outside sensor. The DPM-2 plugs into a data port on the AZ-CP control with a ribbon cable. If the DPM-2 selection switch is in the ON position, the AZ-CP will be able to communicate with the DPM-2. (See the separate DPM-2 Installation Manual for more information.)

NOTE: Wiring application at right shows the DPM-2 Outdoor Reset with an AZ-4CP Control.

TRIMPOTS FOR FACTORY CALIBRATION (DO NOT USE)

RED WIRE

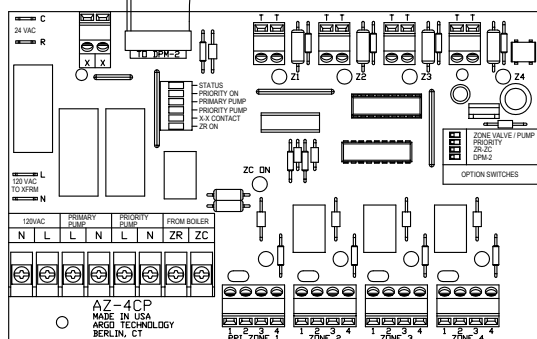
RIBBON CABLE



KEY



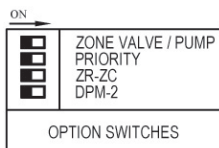
NOTE:
REFER TO DPM-2 MANUAL
FOR DPM-2 OPERATION



SEQUENCE OF OPERATION

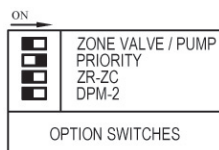
– NORMAL OPERATION–

(ALL DIP SWITCHES IN THE OFF POSITION)



- The control will scan all TT terminals looking for a call for heat from any thermostat.
- When a call for heat is detected the green TT LED for that zone will illuminate.
- The corresponding zone terminals 1 & 2 will be energized with 24 volts.
- The control will then wait for the zone valve end switch to close, a red LED will illuminate, indicating an open valve.
- Once the zone valve opens the primary pump is energized with 120 volts and the X-X contact will close.

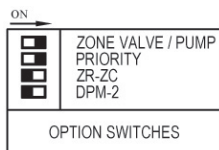
– PRIORITY CHOSEN –



- The control will scan all TT terminals looking for a call for heat from any thermostat.
- When a call for heat is detected on the priority zone the green TT LED for the priority zone will illuminate.
- The priority zone (zone 1) terminals 1 & 2 will be energized with 24 volts.
- The control will then wait for the priority zone valve end switch to close, a red LED will illuminate indicating the valve has opened.
- Once the zone valve opens the primary pump is energized with 120 volts and the X-X contact will close.
- While the priority zone is calling for heat any call for heat on zones 2 and above will be ignored until the priority zone is satisfied or the priority timer has elapsed. (*See "Priority Timer" in this manual for a more detailed explanation.*)
- If call for heat is detected on terminals 2 or above when the priority zone is not calling the control will operate as outlined above.

SEQUENCE OF OPERATION

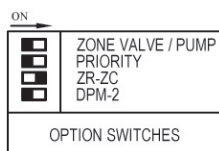
– PRIORITY PUMP CHOSEN –



In order to use the priority pump feature both the zone valve/pump and priority dip switch must be in the on position.

- The control will scan all TT terminals looking for a call for heat from any thermostat.
- When a call for heat is detected on the priority zone the green TT LED for the priority zone will illuminate.
- The jumper on terminals 3 & 4 of the priority zone will result in the end switch being automatically closed.
- The priority pump is energized with 120 volts and the X-X contact will close.
- While the priority zone is calling for heat any call for heat on zones 2 and above will be ignored until the priority zone is satisfied or the priority timer has elapsed. (*See “Priority Timer” in this manual for a more detailed explanation.*)
- If call for heat is detected on terminals 2 or above when the priority zone is not calling the control will operate as outlined above.

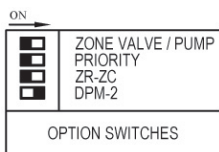
– ZR-ZC –



- The control will scan all TT terminals looking for a call for heat from any thermostat.
- When a call for heat is detected the green TT LED for that zone will illuminate.
- The corresponding zone terminals 1 & 2 will be energized with 24 volts.
- The control will then wait for the zone valve end switch to close; a red LED will illuminate indicating an open valve.
- The X-X terminal will be closed.
- The control will wait for a signal back from the ZR-ZC terminals on the boiler aquastat. Once the signal is received the “ZC On” light will illuminate.

SEQUENCE OF OPERATION

- The primary pump will be energized with 120 volts.



– DPM-2 CHOSEN –

- The control will scan all TT terminals looking for a call for heat from any thermostat.
- When a call for heat is detected the green TT LED for that zone will illuminate.
- The corresponding zone terminals 1 & 2 will be energized with 24 volts.
- The control will then wait for the zone valve end switch to close; a red LED will illuminate indicating an open valve.
- After the end switch has closed the AZ-CP control will wait to receive a signal from the DPM-2. Please see the separate DPM-2 manual for the DPM-2 sequence of operation.
- Once the DPM-2 sends a signal back to the AZ-CP control the primary pump is energized with 120 volts and the X-X contact will close.

– PRIORITY TIMER –

When the priority zone has called for heat for 30 minutes, the priority and non-priority zones are allowed to call for heat together for an additional 30 minutes. After the second 30 minute period ends, the control will switch back to priority only mode. This pattern is repeated until the priority zone is satisfied.

– PUMP INACTIVE TIMER –

(EXERCISES PUMPS IF OFF FOR MORE THAN 24 HOURS)

If either the primary or priority pump is off for more than 24 hours, both pumps are turned on for 5 seconds and then turned off.

If either pump is turned on, the timer is reset.

IMPORTANT: The ZR-ZC and DPM-2 selection switches should not both be in the “On” position at the same time.

ZONE STAGING

Zone Staging is a feature that is unique to the AZ-6CP control. When the AZ-6CP senses a power demand that exceeds the capabilities of the 75VA transformers, the control will energize one zone at a time until all calling zone valves are opened. Please note that Priority/Zone 1 is not affected by Zone Staging and is permitted to open at any time.

AZ-CP CONTROL EXPANSION

Following the instructions below, up to two (2) AZ-CP controls can be wired together. Using two AZ-6CP controls, this allows a maximum of ten zones plus a priority zone to be installed in a system.



WARNING



Do not attempt to chain more than 2 controls together.

– INSTALLATION OF MULTIPLE CONTROLS –

1. Mount controls following directions in this instruction manual.
2. Wire controls together as shown on next page. Note that only the priority zone is shown wired. Other zones are installed as shown previously in this manual.
3. Move the priority selection switch to the ON position on both controls.



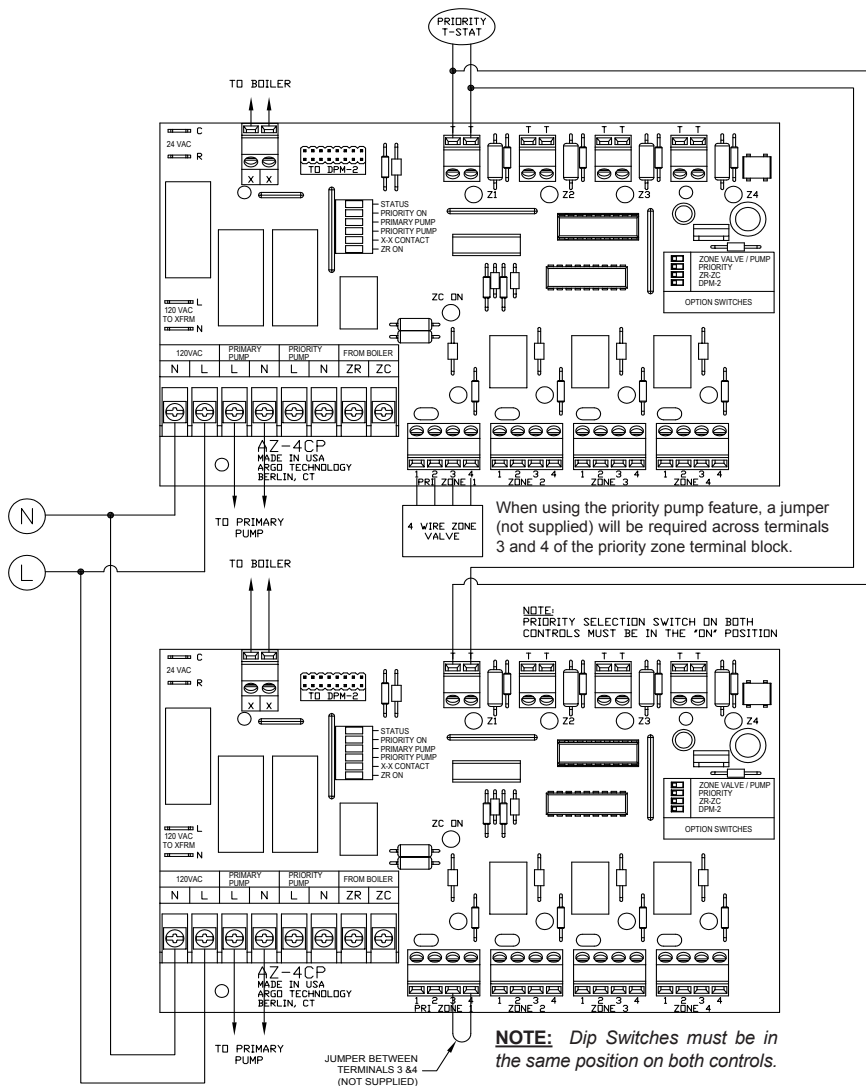
WARNING



When wiring the thermostat to both controls verify that there is no call for heat when the thermostat is not calling. If there is a continuous call on the priority zone regardless of the state of the thermostat, the transformers may be out of phase. If this occurs, reverse the T-T leads on the secondary control.

DO NOT RUN CONTROL FOR AN EXTENDED PERIOD OF TIME WITH TRANSFORMERS OUT OF PHASE.

AZ-CP CONTROL EXPANSION



REPLACEMENT PARTS AND CONTROLS

– REPLACEMENT CONTROLS –

Part Description	Part Number
AZ-4CP Control with Priority	Z297
AZ-6CP Control with Priority	Z298
DPM-2 Outdoor Reset Control	Z172

– REPLACEMENT PARTS –

Part Description	Part Number
Circuit Board AZ-4CP	B215
Circuit Board AZ-6CP	B216
Transformer - 40VA, 120V/24V 50 HZ (AZ-4CP)	T79
Transformer - 75VA, 120V/24V 50 HZ (AZ-6CP)	240005137

TECHNICAL SUPPORT

For technical support on this and all Argo products, please contact ECR International Technical Service at 1-800-325-5479. Please have the following information available when calling.

Information Needed When Calling

Model Number

Installation Date

Installer