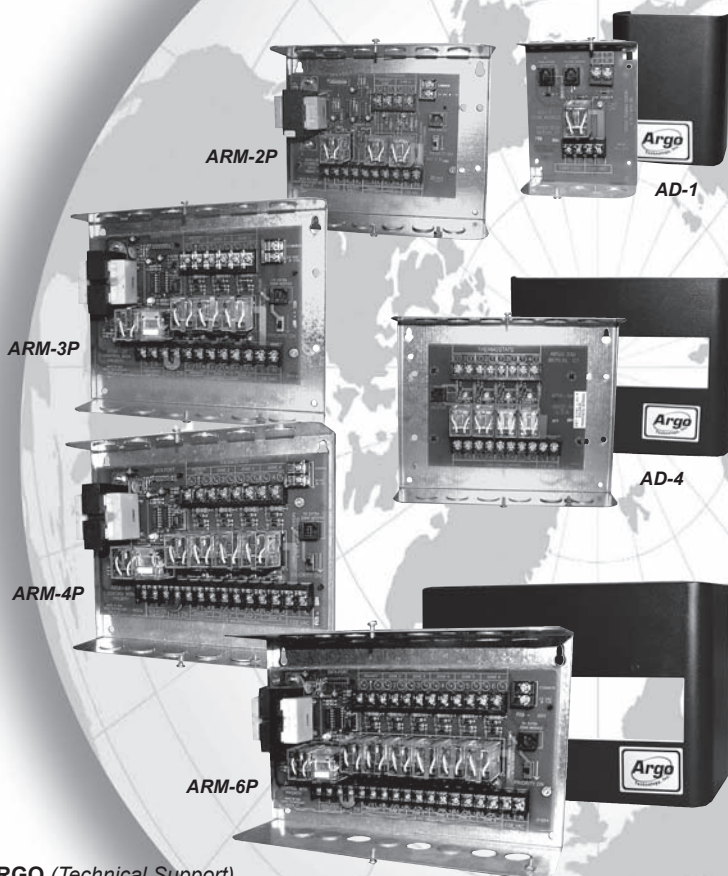


ARGO ARM SERIES SWITCHING RELAYS WITH PRIORITY

ARM-2P, ARM-3P, ARM-4P, ARM-6P, AD-1, AD-4

Argo



ARGO (Technical Support)
2201 Dwyer Avenue
Utica, NY 13501

(Corporate Sales)
85 Middle Road
Dunkirk, NY 14048
www.argoindustries.com

An **ECR** International Brand
An ISO 9001-2000 Certified Company



P/N 240005129, Rev. 1.3 [10/06]

INSTALLATION MANUAL AND OPERATING INSTRUCTIONS

P/N#240005129, 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



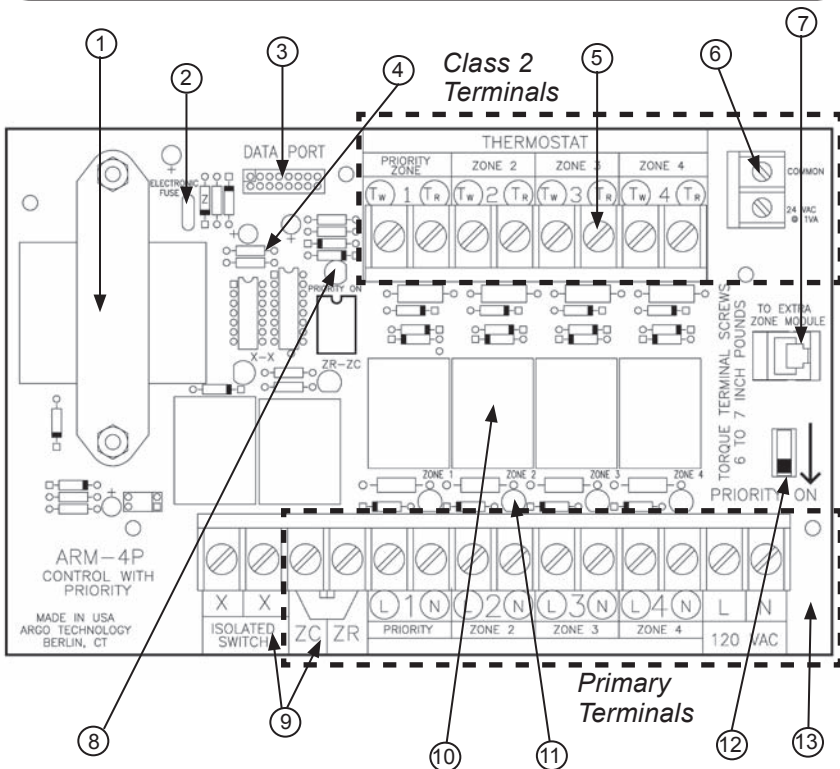
All installations should be done only by a qualified expert and in accordance with the appropriate Argo manual. Installing an electric appliance with improper methods or materials may result in serious injury or death due to fire.

INTRODUCTION

This manual is intended to familiarize the installer and user of the Argo ARM Series Switching Relays with their installation and operation to assure normal trouble-free operation.

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

PRODUCT FEATURES



1. Powerful 30 VA transformer – will operate up to 15 zones. (ARM-2) uses 20 VA transformer.
2. Electronic fuse on transformer secondary protects transformer from excessive loading. Automatically resets itself.

PRODUCT FEATURES *Continued*

3. Data Port terminal allows for an easy connection of the DPM-2 outdoor reset control.
4. Three second time delay for boiler shutoff.
5. 24 VAC transformer terminals – for easy connection of 3-wire thermostats and field replacement of transformer.
6. Clearly marked terminals with clamping plates and plenty of room for wiring.
7. Expansion module plug-in – makes adding zone(s) easy and economical through the use of the Argo AD-1 & AD-4 expansion modules.
8. Priority zone safety timer – Priority feature will turn off (light off) temporarily if priority zone calls for heat longer than 30 minutes, allowing all zones to operate independently of each other. Repeats every 30 minutes.
9. Separate X-X (isolated switch) and ZC-ZR relays protect boiler aquastat – can be used with either “cold start” or “tankless coil” boiler application. ARM-2 controls do not have ZC-ZR terminals.

NOTE: *that terminals ZC-ZR are 120VAC Connections.*

10. Plug-in replaceable relays for long life. High relay load rating – 1/3 HP. U.L./CSA listed.
11. LED lights turn on when relay contacts are closed. Makes for easy troubleshooting by indicating relay operating status.
12. Switchable priority improves versatility.
13. Double sided printed circuit board construction 100% factory tested. Advanced printed circuitry compatible with most programmable thermostats.

NOTE: *The 4-zone ARM-4P is featured in this manual. The ARM2-P, ARM-3P, and ARM-6P circulator relays have identical electrical specifications. Differences in operating features are noted in this manual.*

14. The ARM Series Switching Relays have a 5-year warranty, while AD Expansion Modules have an 18-month warranty.

MOUNTING INSTRUCTIONS

Mount the Argo ARM Series Switching Relays 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. The AD-1 will require a screw to be installed in the lower left hand corner after the control is hung and leveled.
3. Hang the control on the screw(s), position the case, and start the bottom screws.
4. Tighten all screws.

ELECTRICAL SPECIFICATIONS & WIRING



WARNING



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

GENERAL WIRING NOTICE

Electrical shock hazard – Disconnect before installing or servicing. Can cause severe personal injury, death or substantial property damage if ignored. All primary wiring must be 14 AWG minimum. Torque terminal screws 6 to 7 inch pounds. All wiring must be installed in accordance with:

U.S.A. – National Electrical 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

ARGO Model Number	Zones	Transformer Voltage	Relay Switching Action	Thermostat Current (amps)	Single Phase Motor Rating (Each Circuit) 120 VAC
ARM-2P	2	120V, 60 HZ, 20VA	SPST	0.085	1/3 HP
ARM-3P	3				
ARM-4P	4				
ARM-6P	6				
AD-1	1	24 VAC Supplied by ARM	SPST	0.085	1/3 HP
AD-4	4				

SEQUENCE OF OPERATION

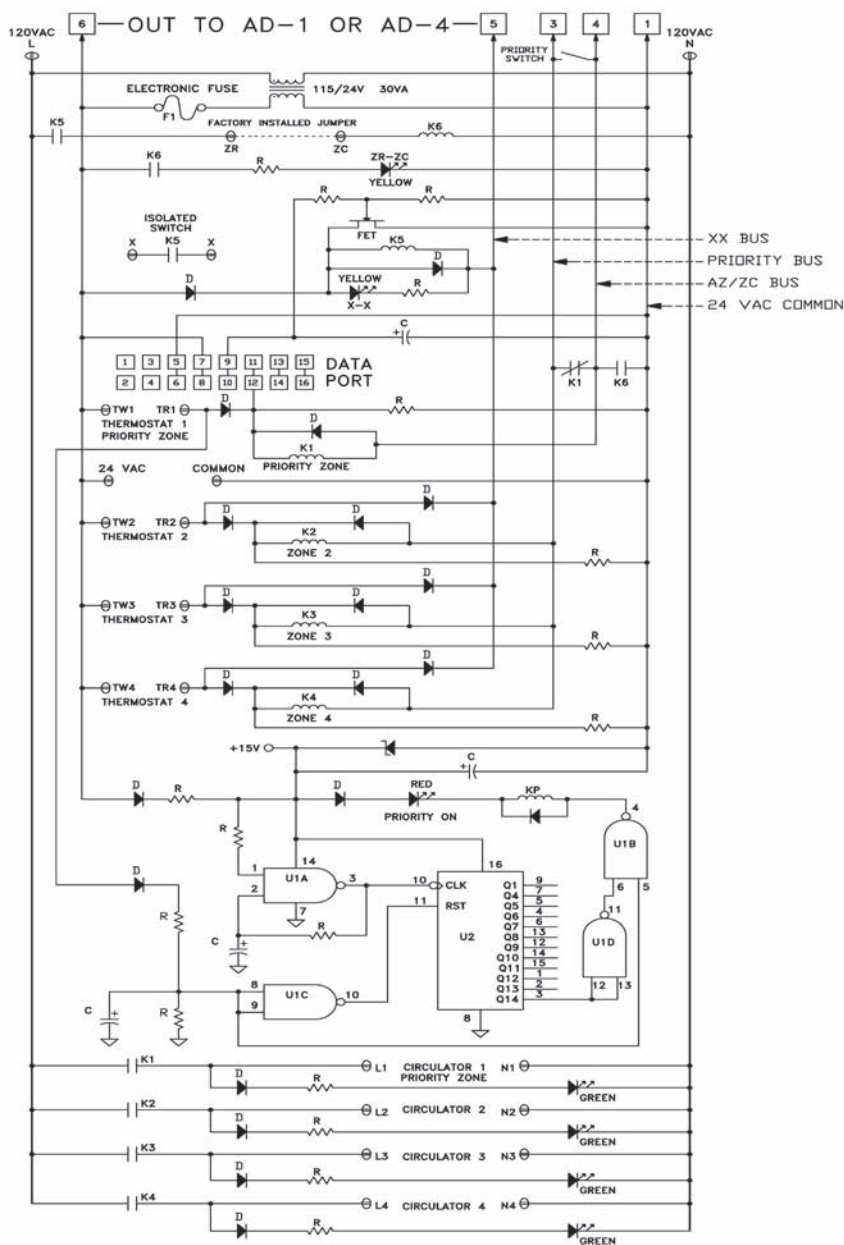
When A Zone Calls For Heat (Circuit Is Closed)

1. The isolated switch coil is energized and the contact closes.
2. X-X switch is closed. (X1-X1 and X2-X2 switches closed on ARM-2P) and the X-X indicator light turns on.
3. Controller relay closed and the ZC-ZR indicator light turns on. (ARM-2P does not include ZC-ZR light). A ZC to ZR connection is required, either by factory-installed jumper or through boiler aquastat. (ARM-2P does not include ZC-ZR relay or terminals.) Terminals ZC-ZR are 120 VAC connections.
4. Zone circulator relay closes turning on circulator. "Circulator On" light turns on.

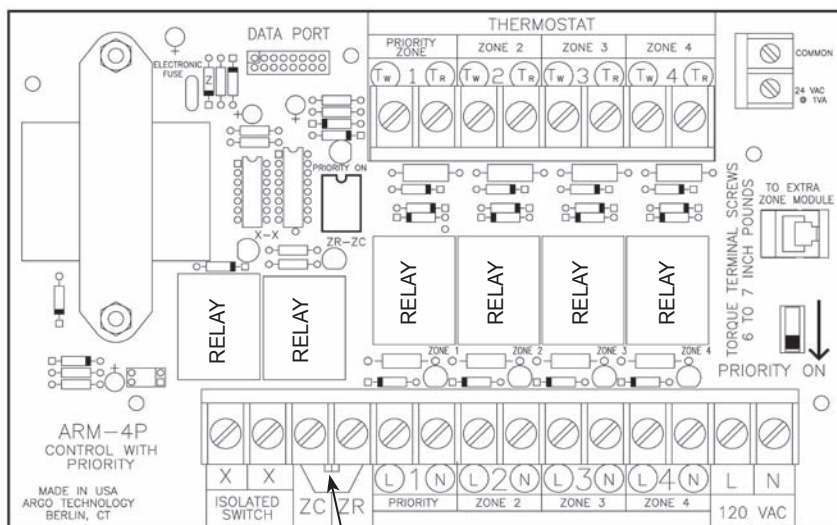
If Priority Switch Is In "ON" Position

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

WIRING SCHEMATICS



ARM "COLD START" APPLICATION



Each zone thermostat will signal the ARM control to operate its zone circulator and start the boiler through the XX isolated end switch.

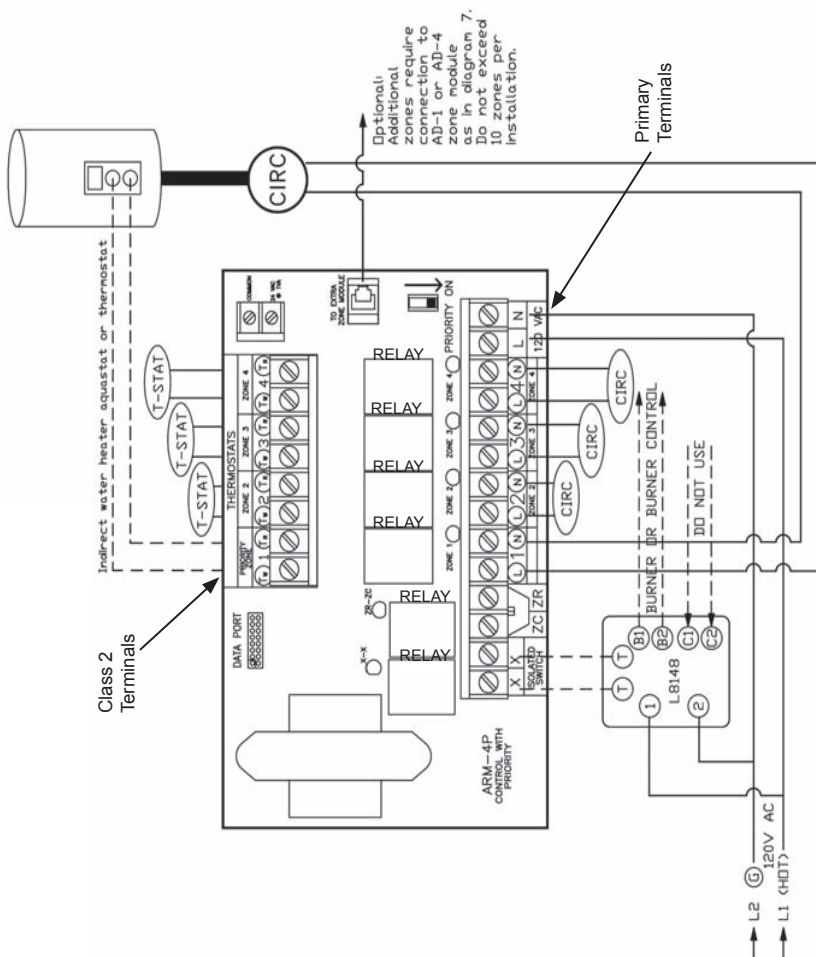
JUMPER

To be placed between terminals ZC and ZR. (Jumper is factory-installed in this position.) Terminals ZC-ZR are 120 VAC connections.

Connect isolated switch terminals X-X to boiler thermostat connection (see boiler manual).

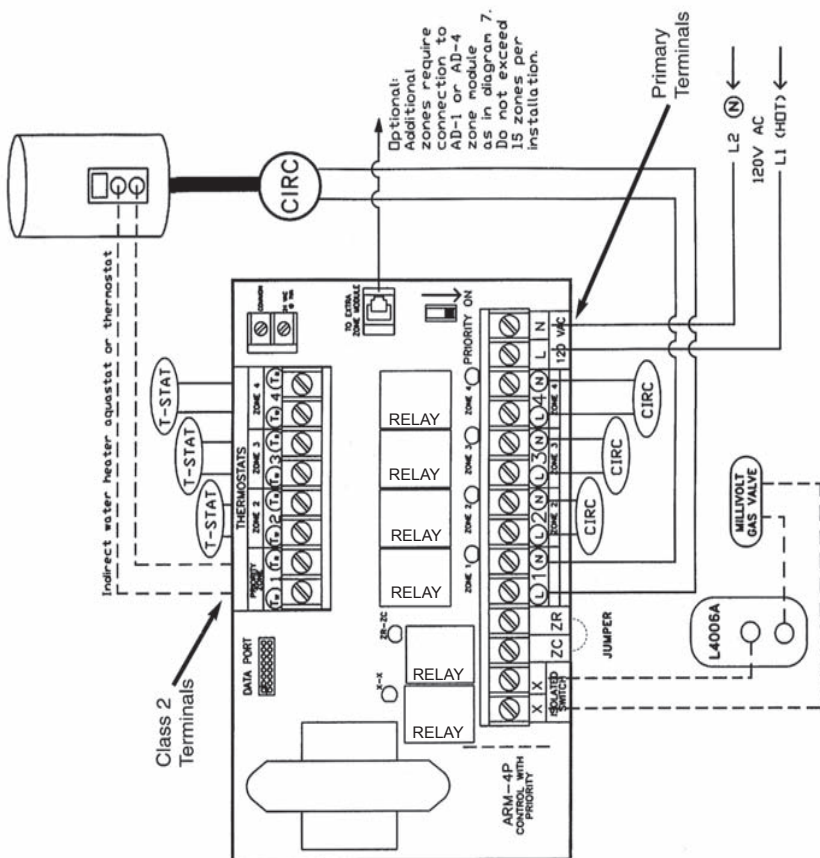
NOTE: ARM-2 does not have ZC-ZR Terminals but has 2 isolated switches marked X1X1 and X2X2.

ARM-4P to MH L8148



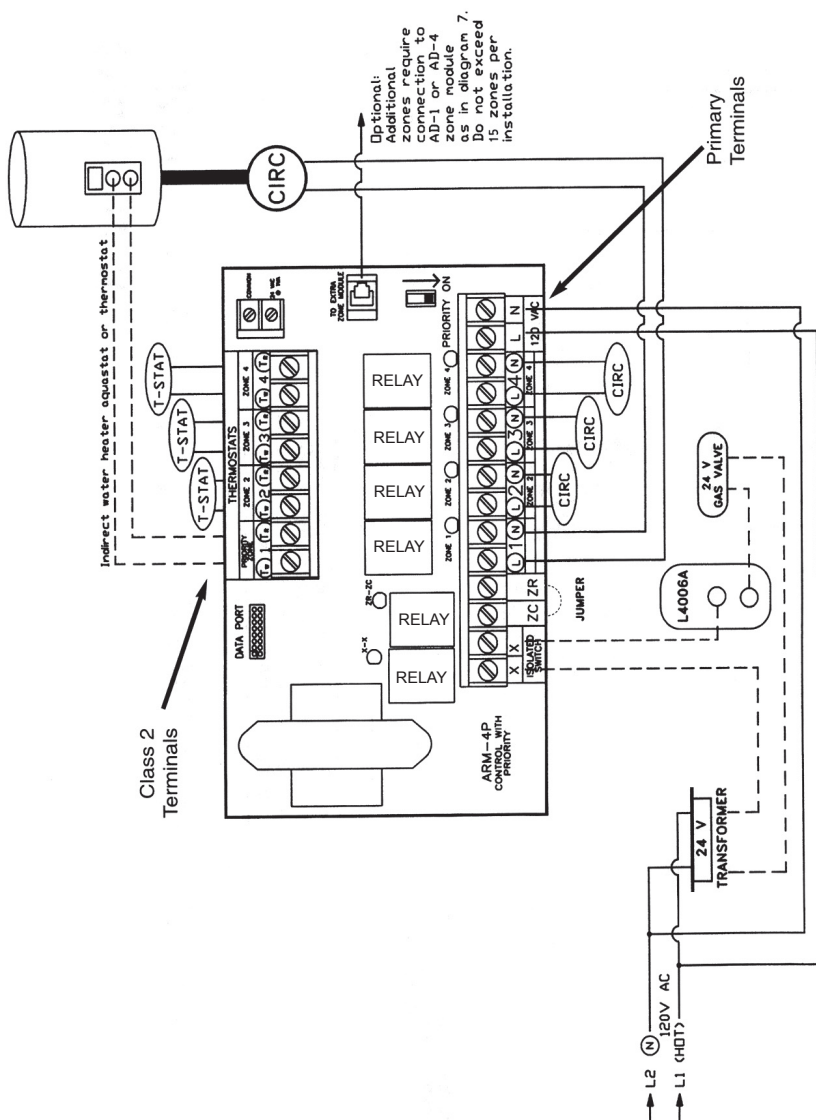
ARM "COLD START" WIRING

ARM-4P to Millivolt Gas Valve

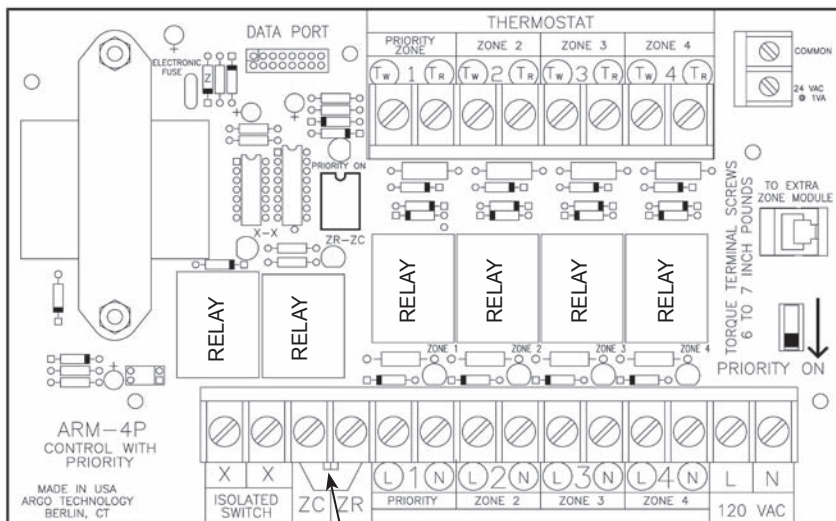


ARM "COLD START" WIRING

ARM-4P to 24 Volt Gas Valve



ARM "TANKLESS COIL" APPLICATION



REMOVE factory installed jumper between ZC and ZR.

A tankless coil requires a boiler aquastat. Each zone thermostat will signal the ARM to start its zone circulator and send a call for heat to the boiler aquastat. If boiler temperature drops below the low limit setting, all circulating will cease until temperature of boiler water is increased.

JUMPER

Remove factory-installed jumper between terminals ZC and ZR.

Connect terminals ZC and ZR to corresponding ZC and ZR terminals on boiler aquastat. Circulators for zones connected to the ARM relays will not operate if the boiler tankless coil aquastat low limit is not satisfied. Terminals ZC-ZR are 120 VAC connections.

PRIORITY

Circulators for additional zones will not operate when zone 1 (priority) circulator is actuated. (Priority switch is **ON**.) When priority switch is **not ON**, all zones operate independently of each other.

ARM “TANKLESS COIL” WIRING

Any control connected to the ARM is isolated and protected from circulator current with built-in 120 Volt control relay.



WARNING

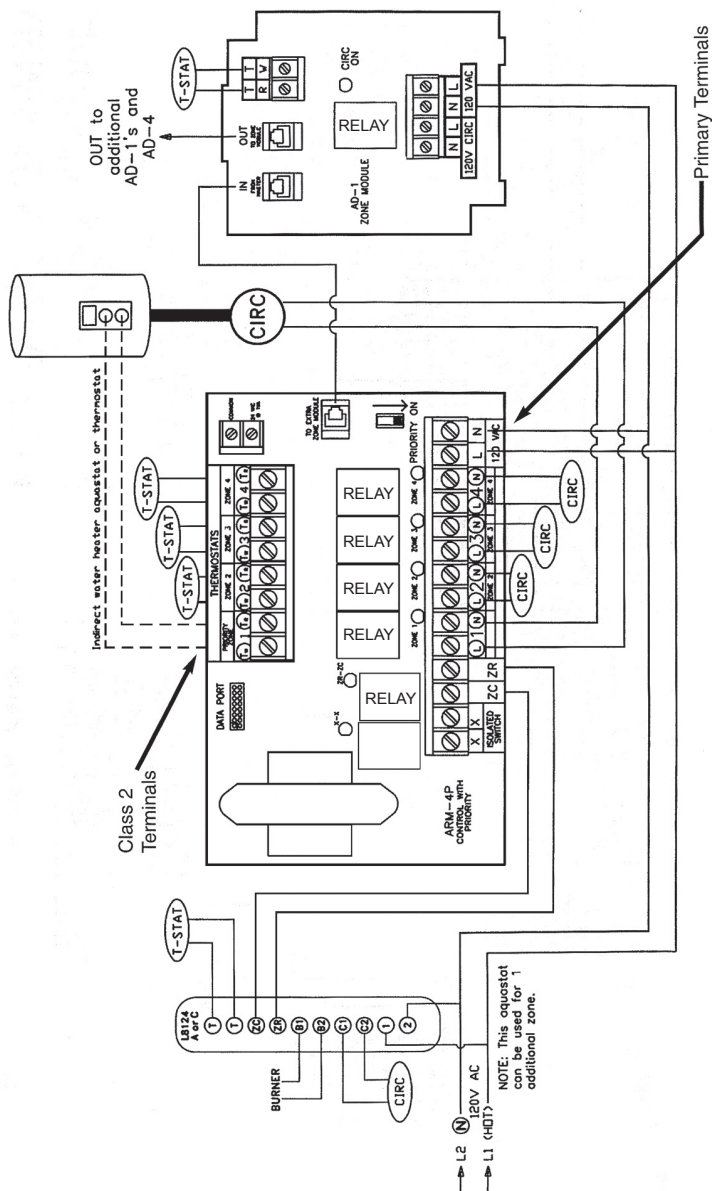


When using ZC-ZR careful attention must be paid to keeping the polarity of the wiring consistent between the Argo control and the boiler aquastat. Failure to do so could result in a secondary source of power activating the boiler under certain circumstances which could result in serious injury or death.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

NOTE: *This does not apply to model ARM-2P.*

ARM "TANKLESS COIL" WIRING

ARM-4P to MH L8124 A or C



AD EXPANSION MODULE

AD-1

1. The AD-1 Expansion Module plugs into the ARM-2P, ARM-3P, ARM-4P, and ARM-6P to provide one additional heating zone.
2. Multiples of AD-1 (single zone) Expansion Modules can be used to provide up to 15 zones maximum. The 18" connecting cable, which plugs into the ARM Circulator Zone Relay, is supplied with the unit. Separate line voltage is required.

AD-4

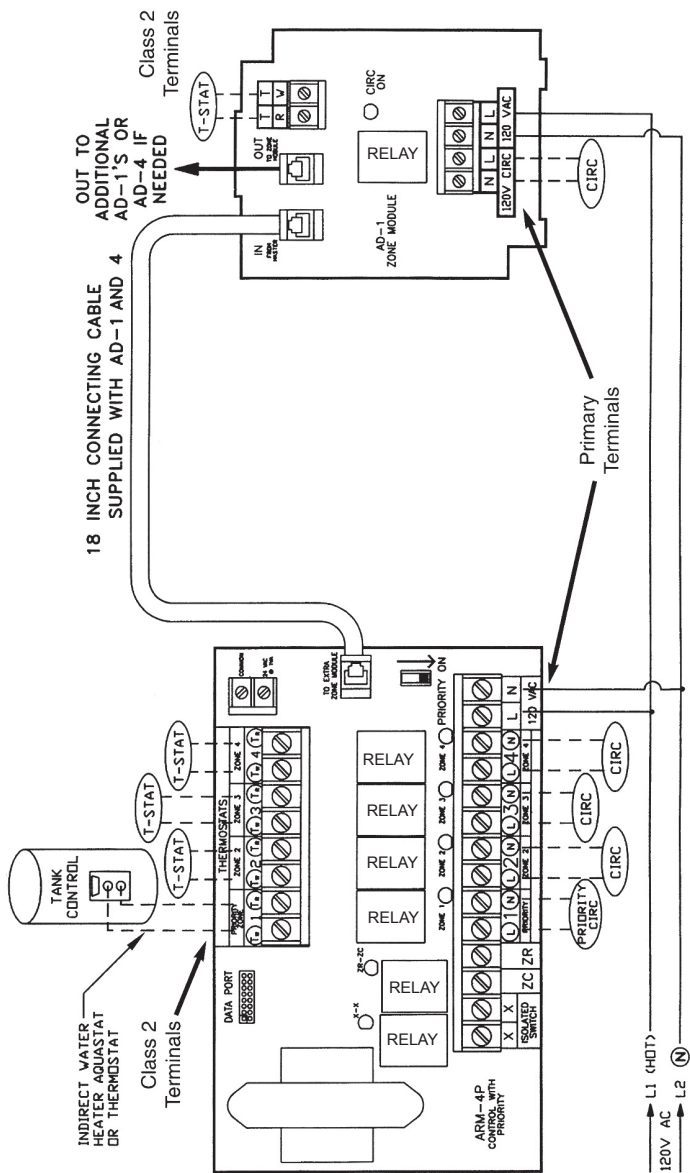
1. The AD-4 Expansion Module plugs into the ARM-2P, ARM-3P, ARM-4P, ARM-6P, or AD-1 to provide four additional heating zones.
2. Combinations of AD-1 (single zone) with an AD-4 (4-zone) Expansion Module can be used to provide up to 15 zones maximum. The 18" connecting cable, which plugs into the ARM Circulator Zone Relay, is supplied with the unit. Separate line voltage is required.

NOTE: *The AD-4 expansion module does not have an out to zone module terminal. If additional zones are required a telephone jack tee adapter (Argo Item #J8) can be plugged into the "IN" from master terminal. The incoming phone cord from the master control and the output phone cord to additional AD modules can both be plugged into the telephone jack tee.*

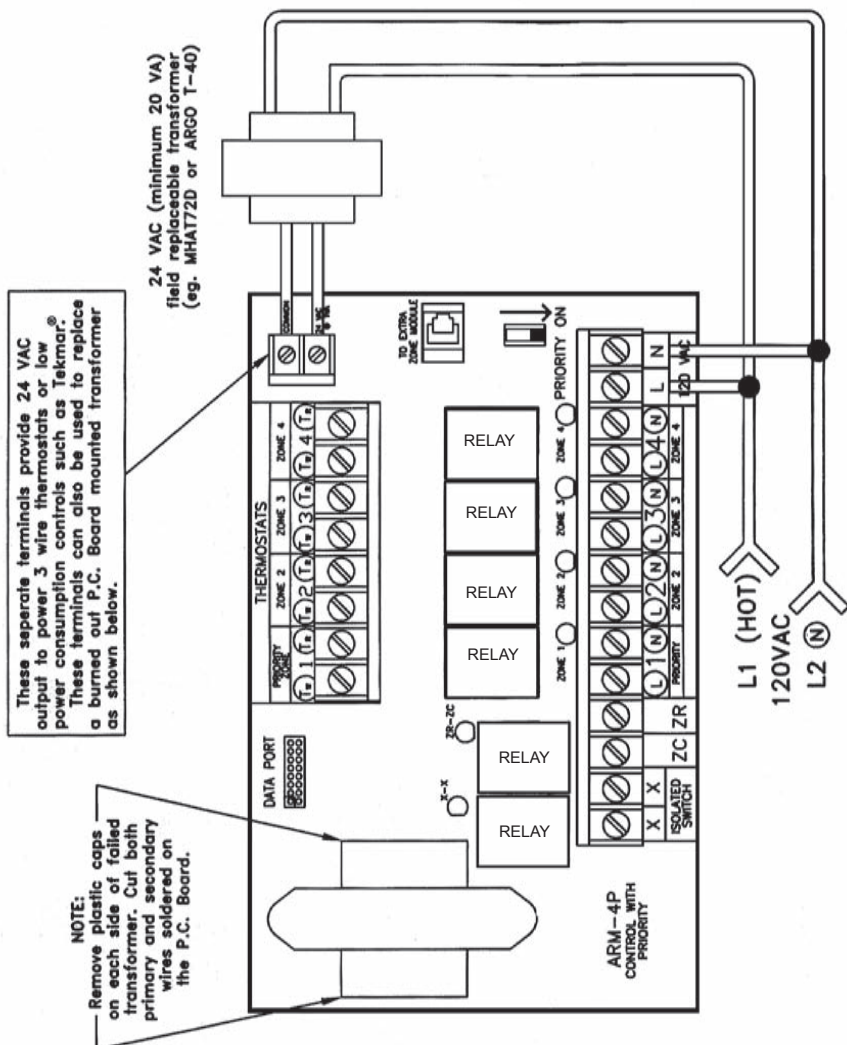
SPECIFICATIONS

ARGO Model Number	Zones	Transformer voltage (24 VAC)	Thermostat current (amps)	Relay contact rating (10 amps @ 120)
AD-1	1	Supplied by master ARM	0.085	1/3 HP @ 120 VAC
AD-4	4			

ARM TO AD EXPANSION MODULE WIRING

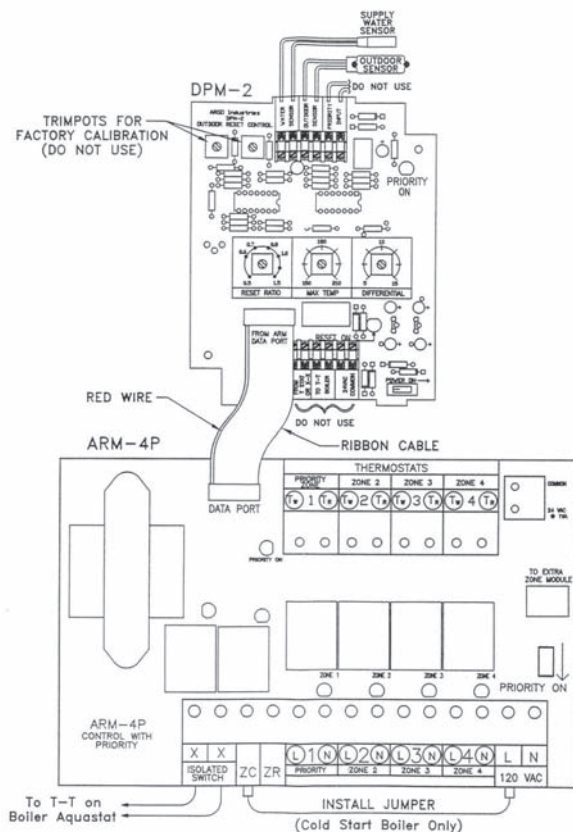


ARM TO FIELD REPLACEMENT TRANSFORMER WIRING



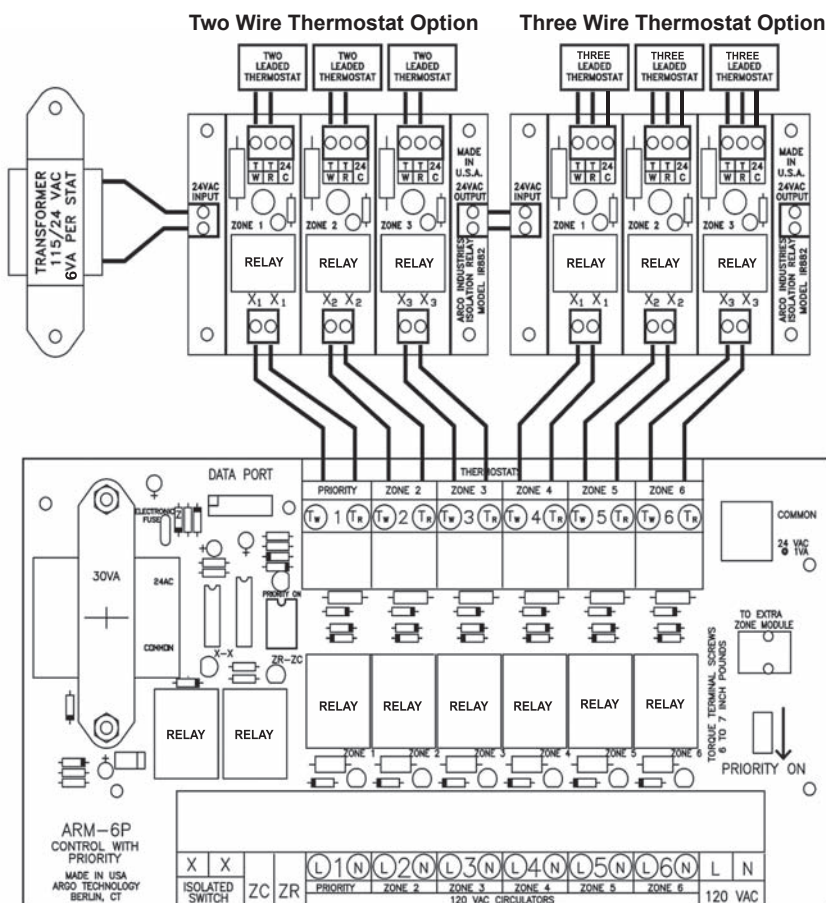
ARM WITH DPM-2 OUTDOOR RESET CONTROL

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. This control plugs into Argo control equipment with a data port or as a stand alone device that can be easily wired into almost any system. See the separate DPM-2 Installation Manual for more information.



ARM WITH /POWER ROBBING THERMOSTAT

Your new Argo ARM control should work well with all standard and most programmable setback thermostats. In the event the programmable thermostat you are using causes the control board relays to chatter, you will require an external 24V power supply (transformer) and an Argo IR882 Isolation Relay. Please refer to the literature with the IR882 for proper wiring and transformer sizing.



REPLACEMENT PARTS

Part Description	Part Number
Circulator plug-in relay (24 VAC coil)	R35
Control plug-in relay (120 VAC coil) (ARM-3, 4, and 6 only)	R49
18" Telephone cable connector (connects to AD-1, AD-4)	C1
Field-mounted 40 VA transformer (not used on AD-1, or AD-4)	T40
Telephone Jack Tee Adapter	J8

TECHNICAL SUPPORT

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

Information Needed When Calling

Model Number

Installation Date

Installer

