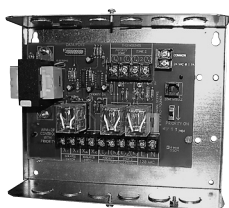




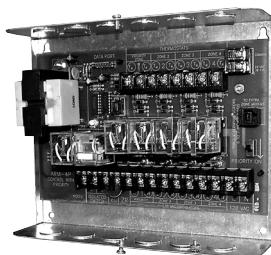
# ARM SERIES Switching Relays With Priority

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

## INSTALLATION, OPERATION & MAINTENANCE MANUAL



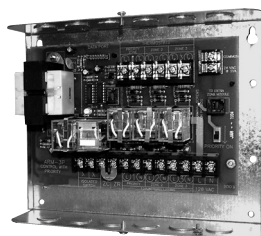
ARM-2P



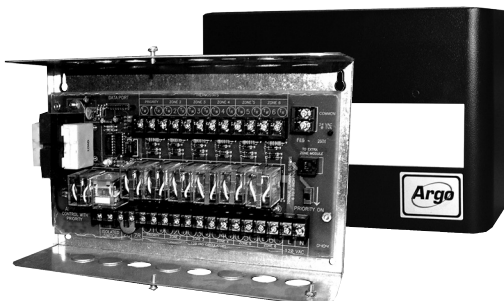
ARM-4P



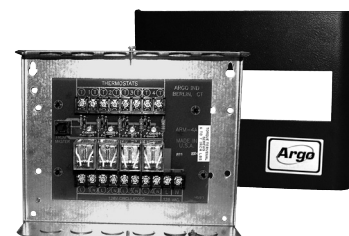
AD-1



ARM-3P



ARM-6P



AD-4



Information and specifications outlined in this manual in effect at the time of printing of this manual. ECR International, Inc. reserves the right to discontinue, change specifications or system design at any time without notice and without incurring any obligation, whatsoever.



**ECR international**  
EST. 1928  
A Family of Heating & Cooling Brands.

Manufactured by:

**ECR International, Inc.**  
2201 Dwyer Avenue, Utica NY 13501  
web site: [www.ecrinternational.com](http://www.ecrinternational.com)  
[www.argocontrols.com](http://www.argocontrols.com)

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

**Information and specifications outlined in this manual in effect at the time of printing of this manual. ECR International reserves the right to discontinue, change specifications or system design at any time without notice and without incurring any obligation, whatsoever.**

**Keep this manual near boiler  
Retain for future reference**

## **WARNING**

Fire, explosion, asphyxiation and electrical shock hazard. Improper installation could result in death or serious injury. Read this manual and understand all requirements before beginning installation.

***Become familiar with symbols identifying potential hazards.***



This is the safety alert symbol. Symbol alerts you to potential personal injury hazards. Obey all safety messages following this symbol to avoid possible injury or death.

## **DANGER**

Indicates a hazardous situation which, if not avoided, WILL result in death or serious injury

## **WARNING**

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

## **CAUTION**

Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

## **NOTICE**

Used to address practices not related to personal injury.

## **Introduction**

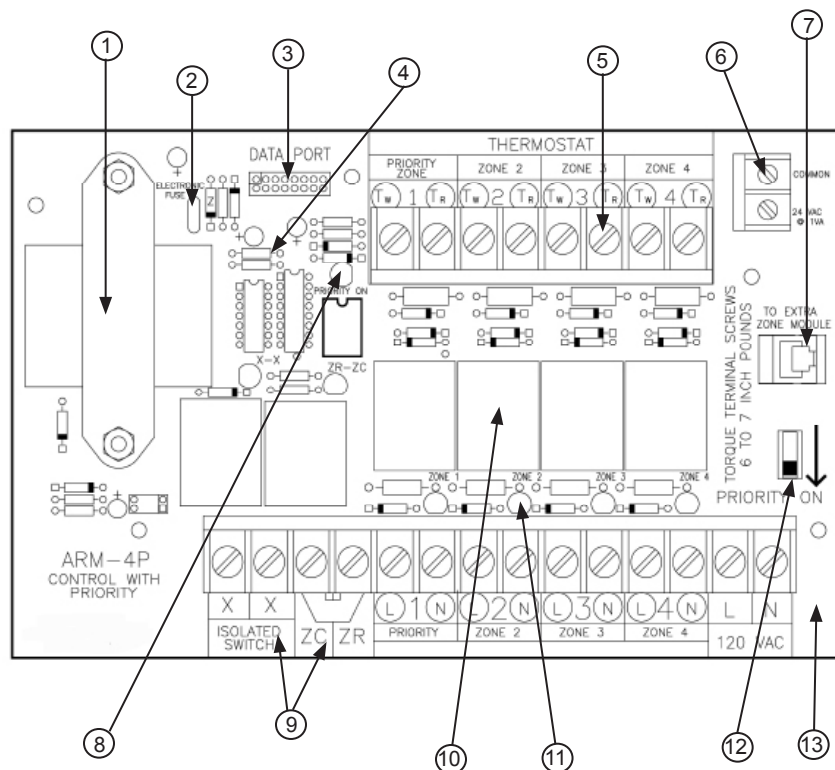
This manual is intended to familiarize the installer and user of the Argo ARM Series Switching Relays with their installation and operation to assure normal trouble-free operation.

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.

## INSTALLATION MANUAL AND OPERATING INSTRUCTIONS

### 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.
  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: 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. ARM Series Switching Relays have a 5-year warranty, AD Expansion Modules have 18-month warranty.



## MOUNTING INSTRUCTIONS

Mount Argo ARM Series Switching Relays vertically on a solid wall or partition.

Manufacturer recommends, for your convenience, 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 1/8" (3mm) from the surface. The AD-1 requires a screw 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. Failure to follow these instructions could result in death or serious injury.

## General Wiring Notice

Disconnect before installing or servicing.

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 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					
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)***

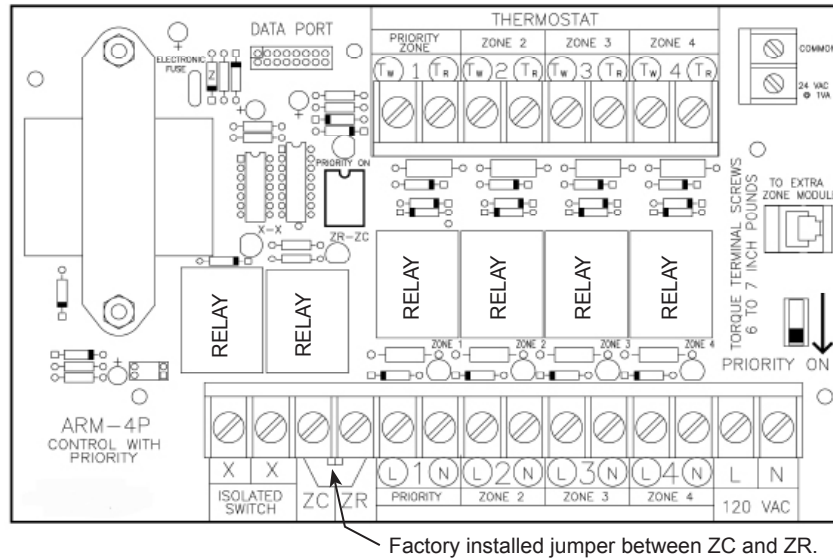
1. Isolated switch coil is energized and the contact closes.
2. X-X switch is closed. (X1-X1 and X2-X2 switches closed on ARM-2P) and X-X indicator light turns on.
3. Controller relay closed and ZC-ZR indicator light turns on. (ARM-2P does not include ZC-ZR light). A ZC to ZR connection is required, either 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 the Priority Switch is "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.



## 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

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).

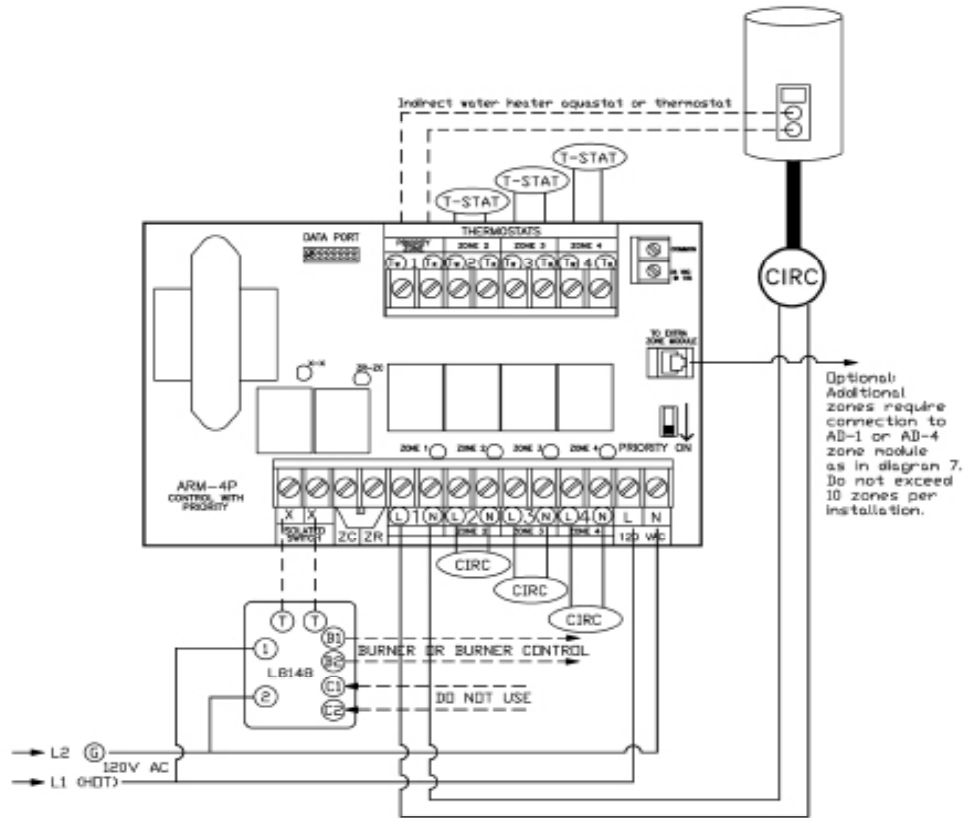
### NOTICE

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



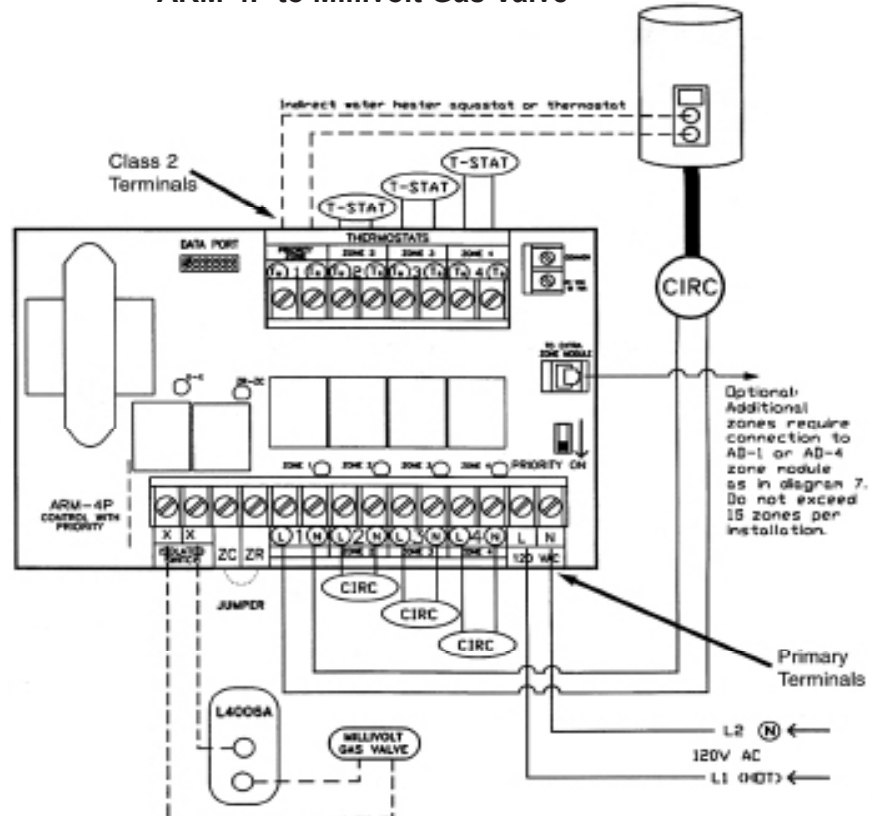
# ARM "COLD START" WIRING

ARM-4P to MH L8148



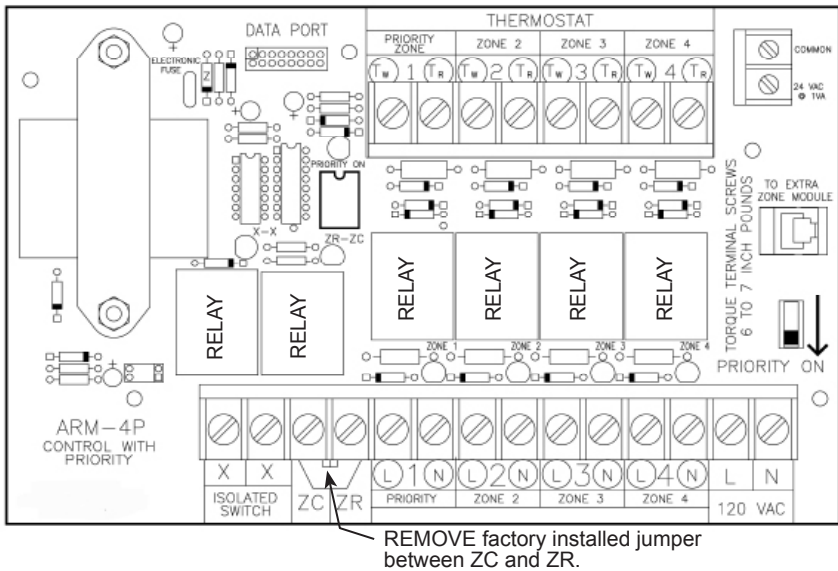
# ARM "COLD START" WIRING

ARM-4P to Millivolt Gas Valve





## ARM "TANKLESS COIL" APPLICATION



## ARM "TANKLESS COIL" APPLICATION

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 ARM relays will not operate if 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

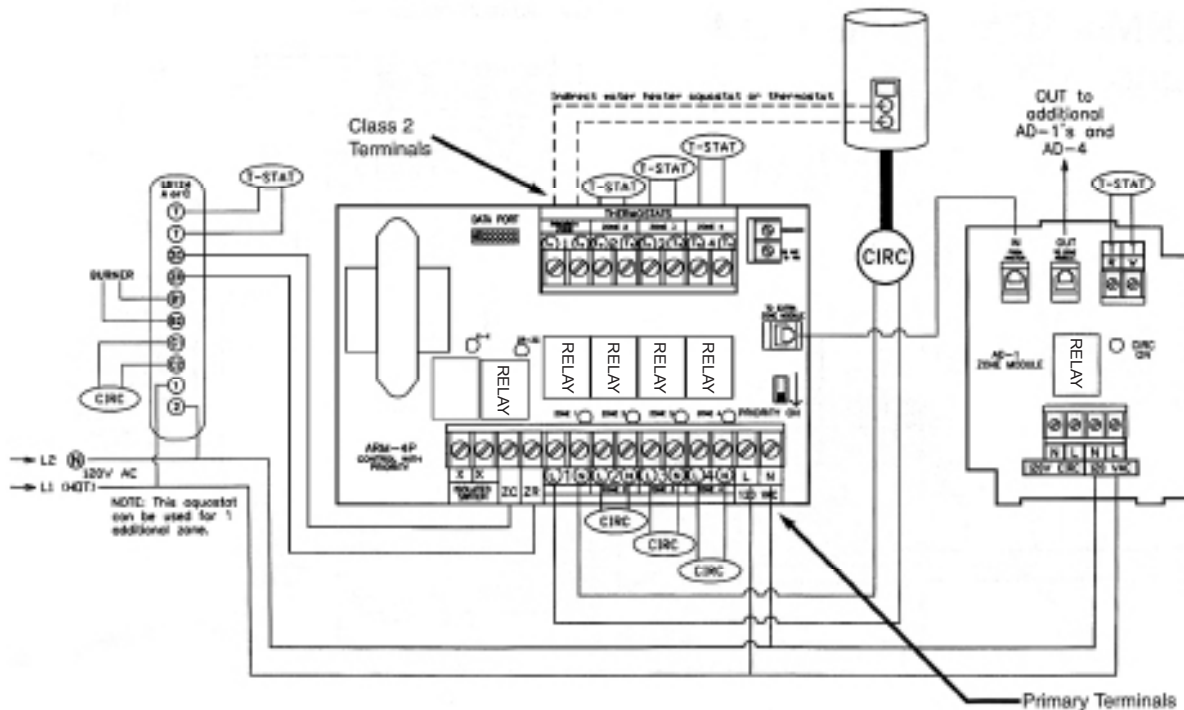
Any control connected to the ARM is isolated and protected from circulator current with built-in 120 volt control relay.

### **⚠ 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-1**

1. 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.

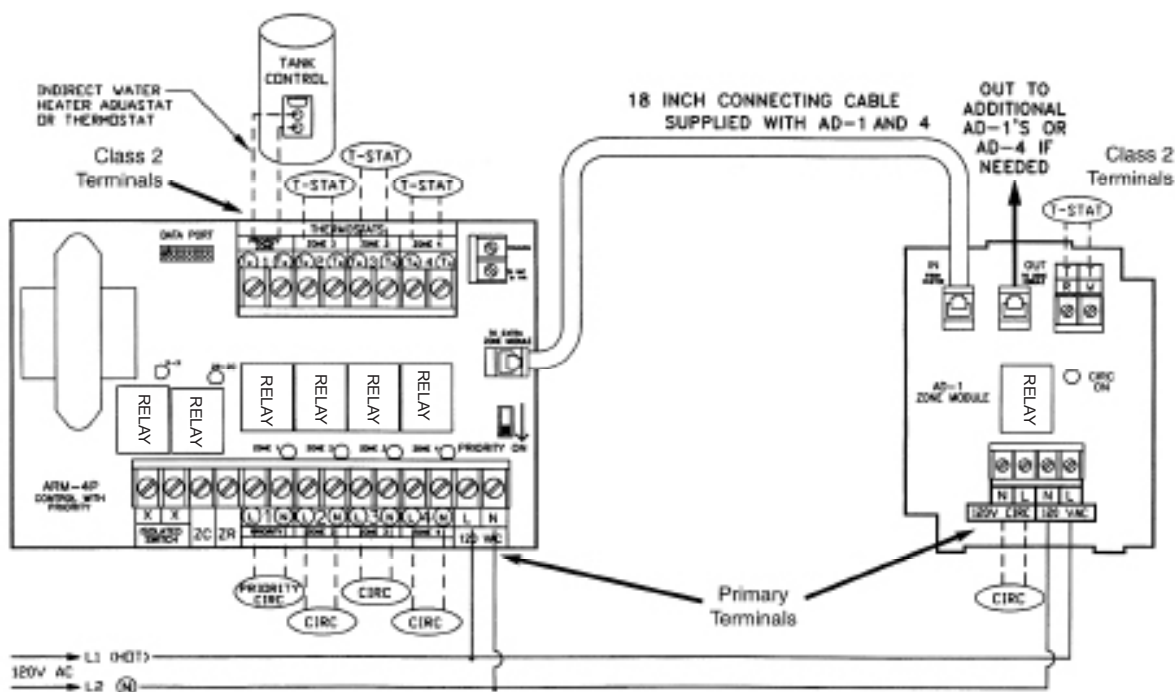
AD-4 expansion module does not have an out to zone module terminal. If additional zones are required a telephone jack tee adapter (Argo Item #J8) can be plugged into the "in" from master terminal. The incoming phone cord from the master control and output phone cord to additional AD modules can both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

**AD-4**

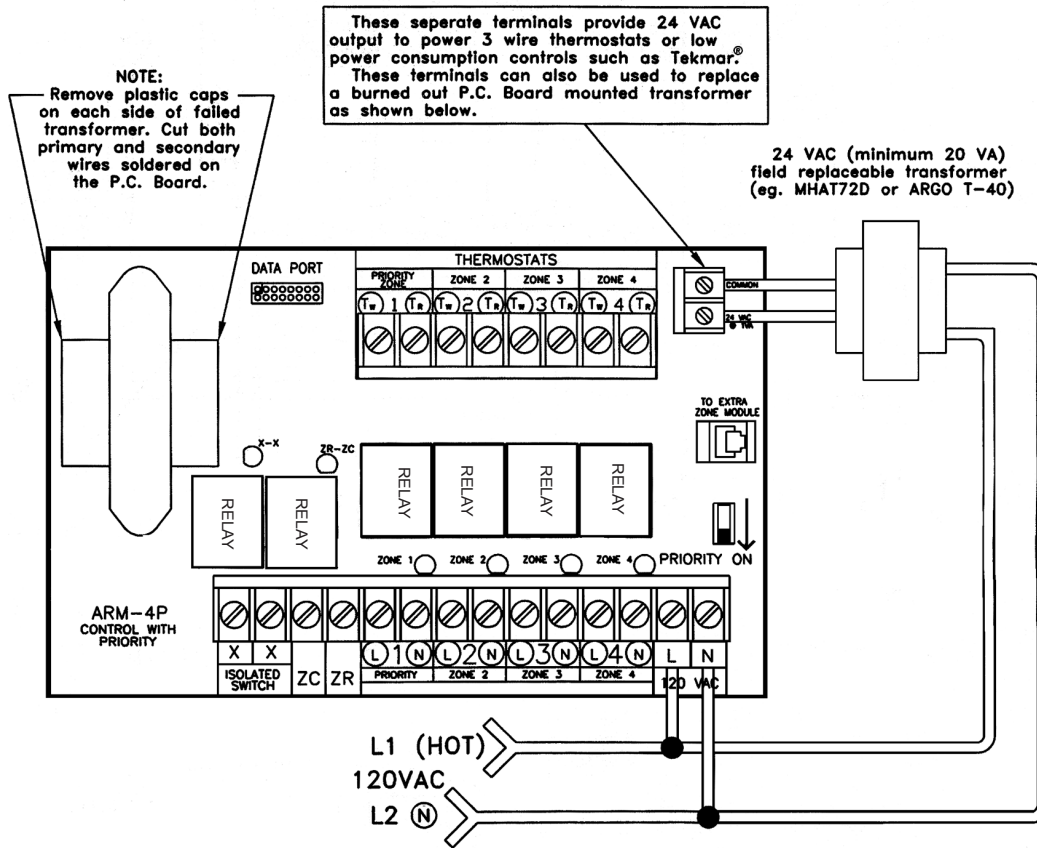
1. AD-4 Expansion Module plugs into the ARM-2P, ARM-3P, ARM-4P, ARM-6P, or AD-1 to provide four additional heating zones.
2. Combinations of AD-1 (single zone) with an AD-4 (4-zone) Expansion Module can be used to provide up to 15 zones maximum. The 18" connecting cable, which plugs into the ARM Circulator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

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



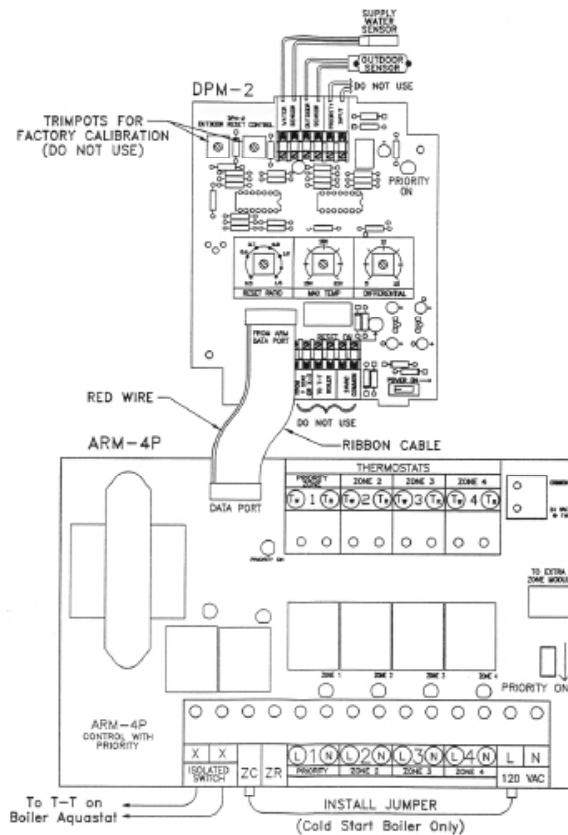
## ARM WITH DPM-2 OUTDOOR RESET CONTROL

DPM-2 Outdoor Reset Control is designed to raise or lower the temperature of boiler supply water based upon proportionate drop or rise in temperature at the outside sensor.

Control plugs into Argo control equipment with a data port or as a stand alone device easily wired into almost any system.

See the separate DPM-2 Installation Manual for more information.

## ARM WITH DPM-2 OUTDOOR RESET CONTROL

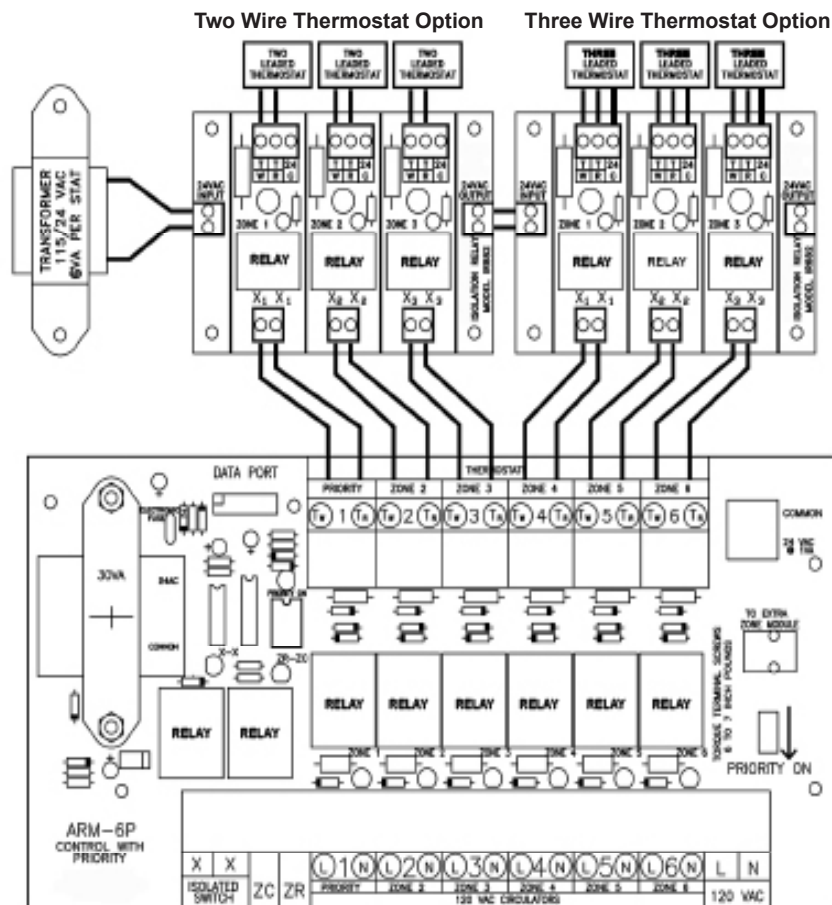


## ARM WITH /POWER ROBBING THERMOSTAT

Argo ARM control works well with all standard and most programmable setback thermostats.

If the programmable thermostat you are using causes the control board relays to chatter, you will need an external 24V power supply (transformer) and Argo IR882 Isolation Relay. Refer to the IR882 literature for proper wiring and transformer sizing.

### ARM WITH /POWER ROBBING THERMOSTAT





**REPLACEMENT PARTS**

<b>Part Description</b>	<b>Part Number</b>
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.

<b>Information Needed When Calling</b>
Model Number
Installation Date
Installer

[illegible]

[illegible]



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