This manual is intended to familiarize the installer and user of the Argo ARH Series of Controls 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 control. Failure to do so may result in breach of warranty.

Argo Hydro-Air Zoning Controls provide the easiest way to interface between the thermostat and air handler. These dependable control relays will control from 1 to 20 zones of heating/cooling and provide priority switching for domestic hot water. Boiler and A/C condenser wiring is virtually fool proof.
Choice of Three Models
– Single Zone/Expansion module (ARH-1)
– Two-Zone With Priority (ARH-2)
– Three-Zone with Priority (ARH-3)

All ARH Models have plug-in connections for easy expansion up to 20 zones.

Multiple Terminals for 2-speed air handlers

Built-In Air Handler “Freeze Protection”

Switch-able Priority for domestic hot water applications.

LED Diagnostic Lights for easy troubleshooting.

Includes Strap-On Bi-Metal Aquastat to prevent “cold air” circulation in heating mode.

100% Quality Controlled

All Controls Supported by Argo Technical/Support
ARH CONTROL BOARD DIAGRAMS

ARH-2

24VDC RELAY

24VDC RELAY

24VDC RELAY

TO ADD-ON MODULE ARH-1 ONLY

ON

OFF

PRIORITY

ARH-3
Mount the Argo ARH Series 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 being controlled, however it should never be mounted more than 75 feet away. Select a location that is easily accessible for installation and service.

**NOTICE**

**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 ⅛” (3mm) from the surface. The ARH-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 screws, 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. Could cause severe personal injury, death 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

<table>
<thead>
<tr>
<th>Argo Model Number</th>
<th>Argo Part Number</th>
<th>Power Input</th>
<th>Thermostat Current</th>
<th>Supplied Aquastat</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARH-1 Z181</td>
<td>24VAC/60Hz</td>
<td></td>
<td>.085A</td>
<td>3/8” to 3/4” Strap on Bi-Metal (ON at 118°F ± 5%) (OFF at 95°F ± 5%)</td>
</tr>
<tr>
<td>ARH-2 Z179</td>
<td>24VAC/60Hz</td>
<td>120VAC/60Hz for Circulator Power</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ARH-3 Z180</td>
<td>24VAC/60Hz</td>
<td>120VAC/60Hz for Circulator Power</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**SEQUENCE OF OPERATION**

When the thermostat calls for heat, the boiler end switch closes, starting the burner and energizing the heating circulator. The fan will operate at low speed (G1) when the water temperature is above (118°F) the aquastat setting at the Hydro-Coil.

If priority zone is actuated, the priority circulator and boiler end switch is energized. The heating circulator is shut off and the fan will operate at low speed (G1) until the water temperature drops below the aquastat setting.

When the thermostat calls for cooling, the Argo Control energizes the outdoor condenser and starts the fan on high speed (G2).

**Optional Freeze Protection** for Hydro-Coil: When the Freeze Terminals (TT) are shorted together as with SPST actuator, the heating zone circulator will operate to circulate water through the Hydro-Coil.

For additional zones, use telephone connector to ARH-1 module. Up to 20 Air Handler Zones can be “Daisy Chained” together.

**TERMINAL DESCRIPTIONS**

**Thermostat**

- **W** - Heat Switched Leg
- **G** - Fan Switching Leg
- **Y** - Cool Switching Leg
- **R** - 24VAC Hot
- **C** - 24VAC Common (Optional for use on thermostats requiring common leg)

**Aquastat**

**TT** - Connect to factory supplied strap-on aquastat (118°F) at Hydro-Coil. These terminals must be closed for fan to operate in Heating Mode. Install a jumper if no aquastat is used.

**Freeze**

**TT** - Optional freeze protection (Argo A11F) when (TT) is connected to aquastat at Hydro-Coil. When closed, these terminals start the heating circulator, but not the fan. Using an SPST aquastat that closes when temperature falls to 40°F with a 5°F differential (Honeywell L4080B), is recommended.

**Boiler End Switch**

- **X1X1** - Connect to TT terminal on boiler
- **X2X2** - Extra End Switch

**NOTICE**

Note: A single Speed Fan requires Jumper to be installed between G1 and G2.

- **R** - 24VAC Hot used to switch all functions.
- **C** - 24VAC Common used to power fan control.

**Air Handler**

- **Y** - Cooling Relay (Condenser)
- **G1** - Heat Fan Center Relay (Low Speed)
- **G2** - Cool Fan Center Relay (High Speed)
**ARH-1 SINGLE ZONE HYDRO-AIR CONTROL INSTRUCTIONS**

* TO FACTORY SUPPLIED STRAP-ON AQUASTAT ON RETURN LINE OF HYDRO-COIL (REMOVE JUMPER) *IF USED. IF NOT USED, JUMPER MUST BE INSTALLED.

**Note:**  Connection for 2 Speed Fan (Remove Jumper) (G1/G2)

**Note:**  Zone 1 R & C terminals must be connected and energized for board to function.
ARH-2 TWO ZONE HYDRO-AIR CONTROL INSTRUCTION (1 AIR HANDLER AND 1 PRIORITY ZONE)

NOTE:
- TO FACTORY SUPPLIED STRAP-ON AQUASTAT ON RETURN LINE OF HYDRO-COIL (REMOVE JUMPER)
- IF USED. IF NOT, JUMPER MUST BE INSTALLED

(TANK CONTROL)

24VDC RELAY

24VDC RELAY

24VDC RELAY

240 VAC II

120 VAC

INPUT (FOR CIRCUIT POWER)

HEAT CIRC

BLANK

PRIORITY

CIRCULATOR

ZONE 1

PRIORITY CIRCULATOR

NP

HP

L1 L2 N1 H1

X1 X1 X2 X2

END SWITCH 1

END SWITCH 2

R C Y G1 G2

AIR HANDLER ZONE 1

NOT: ZONE 1 R & C TERMINALS MUST BE CONNECTED AND ENERGIZED FOR BOARD TO FUNCTION.

NOTE: CONNECTION FOR 2 SPEED FAN (REMOVE JUMPER)

OUTDOOR CONDENSER

24VAC

FAN CENTER RELAY

AIR HANDLED

TO ADD-ON MODULE ARH-1 ONLY

2 SPEED FAN

HEAT AQUASTAT

FREEZE

COOL

FAN

24VAC HOT

OPTIONAL

CONNECTOR FOR ADDING ADDITIONAL ZONES USING ARH-1

TO ADD-ON MODULE ARH-1 ONLY

ON

OFF PRIORITY
ARH-3 THREE ZONE HYDRO-AIR CONTROL INSTRUCTION (2 AIR HANDLER AND 1 PRIORITY ZONE)

**WIRING DIAGRAM APPLICATIONS**

* TO FACTORY SUPPLIED STRAP-ON AQUASTAT ON RETURN LINE OF HYDRO-COIL (REMOVE JUMPER)
* - IF USED, IF NOT USED JUMPER MUST BE INSTALLED.

TANK CONTROL

INDIRECT

**NOTE:** ZONE 1 R & C TERMINALS MUST BE CONNECTED AND ENERGIZED FOR BOARD TO FUNCTION.

OUTDOOR CONDENSER

24VAC

FAN CENTER RELAY

AIR HANDLED

**NOTE:** CONNECTION FOR 2 SPEED FAN (REMOVE JUMPER)

OUTDOOR CONDENSER

FAN CENTER RELAY

AIR HANDLED

THERMOSTAT

CONNECTOR FOR ADDING ADDITIONAL ZONES USING ARH-1

(OPTIONAL) SUPPLIED BY OTHERS (ARGO A11F)

(2) VAC HOT

OPTIONAL

HEAT

COOL

24VAC

24VDC RELAY
Wiring Diagram for Adding ARH-1 TO ARH-2 OR ARH-3
### Replacement Parts

<table>
<thead>
<tr>
<th>Part Description</th>
<th>Argo Part Number</th>
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<tbody>
<tr>
<td>Relay 24VDC Coil</td>
<td>R35DC</td>
</tr>
<tr>
<td>Snap on Aquastat (118° F)</td>
<td>A10</td>
</tr>
<tr>
<td>18” Expansion Cable</td>
<td>C1</td>
</tr>
<tr>
<td>Freeze Stat Aquastat (40°F)</td>
<td>A11F</td>
</tr>
</tbody>
</table>

### 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.

<table>
<thead>
<tr>
<th>Information Needed When Calling</th>
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<tbody>
<tr>
<td>Model Number</td>
</tr>
<tr>
<td>Installation Date</td>
</tr>
<tr>
<td>Installer</td>
</tr>
</tbody>
</table>