

## R8888A,B Hydronic Circulator Zone Panels with Priority Control

### PRODUCT DATA



### APPLICATION

The R8888A,B Hydronic Circulator Zone Panels with Priority Control provide relay switching for multizone hot water control systems.

### FEATURES

- Provide burner control and circulator pump motor control for up to three (R8888A) or four (R8888B) zones in hot water systems.
- Zone 1 may be selected to give priority to the indirect hot water tank.
- Zone 2 burner control can be disabled. The circulator can run without the burner to prevent short cycling of small capacity zones.
- Panels may be wired together for expansion while maintaining priority zoning.
- Up to four panels (12 to 16 zones total) may be used in a system.
- The R8888 may be used in combination with the R8889 Hydronic Zone Valve Panels with Priority Control.
- For use in residential and light commercial applications.
- Operate 120V motors up to 1/6 hp.
- Include replaceable 24V NEMA rated transformer to provide power for low voltage control circuit.
- Include diagnostic light-emitting diodes (LEDs) for troubleshooting.
- Relays are socket-mounted and field-replaceable.
- Clearly marked terminal designations provide easy wiring.
- Compatible with electronic and electromechanical thermostats and Honeywell Aquastat® Controls.
- Mount horizontally only.

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## SPECIFICATIONS

### IMPORTANT

*The specifications given in this publication do not include normal manufacturing tolerances. This unit may not exactly match the listed specifications. Also, this product is tested and calibrated under closely controlled conditions, and some minor differences in performance can be expected if those conditions are changed.*

### TRADELINE® Models

TRADELINE models are selected and packaged to provide ease of stocking, ease of handling, and maximum replacement value.

#### TRADELINE® Models Available:

R8888A Hydronic Circulator Zone Panel with Priority Control—Provides switching for hot water control systems (up to *three* zones) with the ability to field-configure Zone 1 as priority over the others; includes separate 24V NEMA rated transformer that provides power to low voltage circuit.

R8888B Hydronic Circulator Zone Panel with Priority Control—Provides switching for hot water control systems (up to *four* zones) with the ability to field-configure Zone 1 as priority over the others; includes separate 24V NEMA rated transformer that provides power to low voltage circuit.

#### Electrical Ratings:

Motor Load Ratings for Each Zone at 120 Vac:  
Full Load: 4.4A.  
Locked Rotor : 26.4A.  
Horsepower: 1/6 hp.  
Secondary Circuit: 20 VA max.

**Thermostat Heat Anticipator Setting:**  
0.12A.

**Maximum Ambient Temperature Rating:**  
40° F to 105° F (4° C to 41° C).

**Humidity:**  
0 To 90% rh, non-condensing.

**Terminals:**  
Captivated wire-clamp screw terminals.

**Finish:**  
Painted gray enamel.

**Knockouts:**  
Knockouts for 1/2 in. conduits in sides of case.

**Dimensions:**  
See Fig. 1.

**Replaces:**  
Up to four R845 Relays.

**Approvals:**  
Underwriters Laboratories Inc. listed: File no. E4436.  
Canadian Underwriters Laboratories.

**Replacement Parts:**  
AT20A1123 Transformer—24 Vac.  
208621 Replacement Relay.

## ORDERING INFORMATION

For ordering information when purchasing replacement and modernization products from your TRADELINE® wholesaler or your distributor, refer to the TRADELINE catalog or price sheets for complete ordering number or specify—

1. Order number.
2. Number of zones.

If you have additional questions, need further information, or would like to comment on our products or services, please write or phone:

1. Your local Home and Building Control Sales Office (check white pages of your phone directory).
2. Home and Building Control Customer Relations  
Honeywell, 1885 Douglas Drive North  
Minneapolis, Minnesota 55422-4386

In Canada—Honeywell Limited/Honeywell Limitée, 35 Dynamic Drive, Scarborough, Ontario M1V 4Z9.

International Sales and Service Offices in all principal cities of the world. Manufacturing in Australia, Canada, Finland, France, Germany, Japan, Mexico, Netherlands, Spain, Taiwan, United Kingdom, U.S.A.

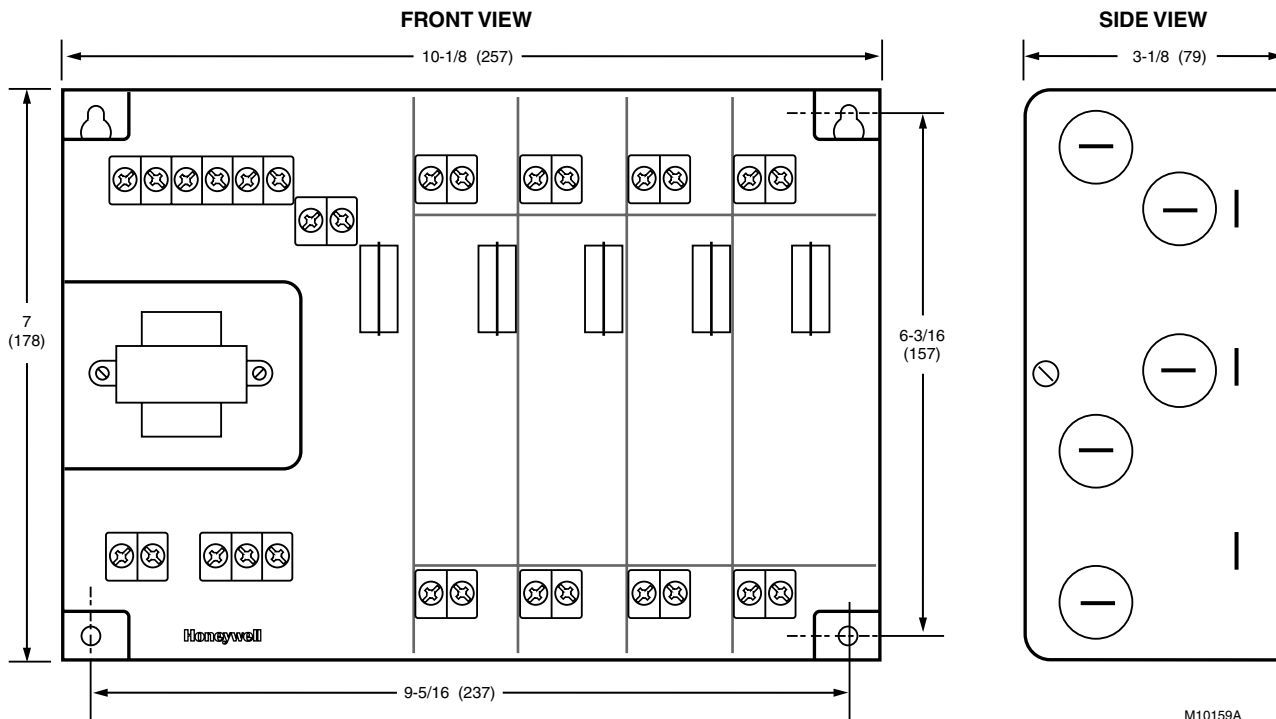


Fig. 1. R8888 mounting dimensions in in. (mm).

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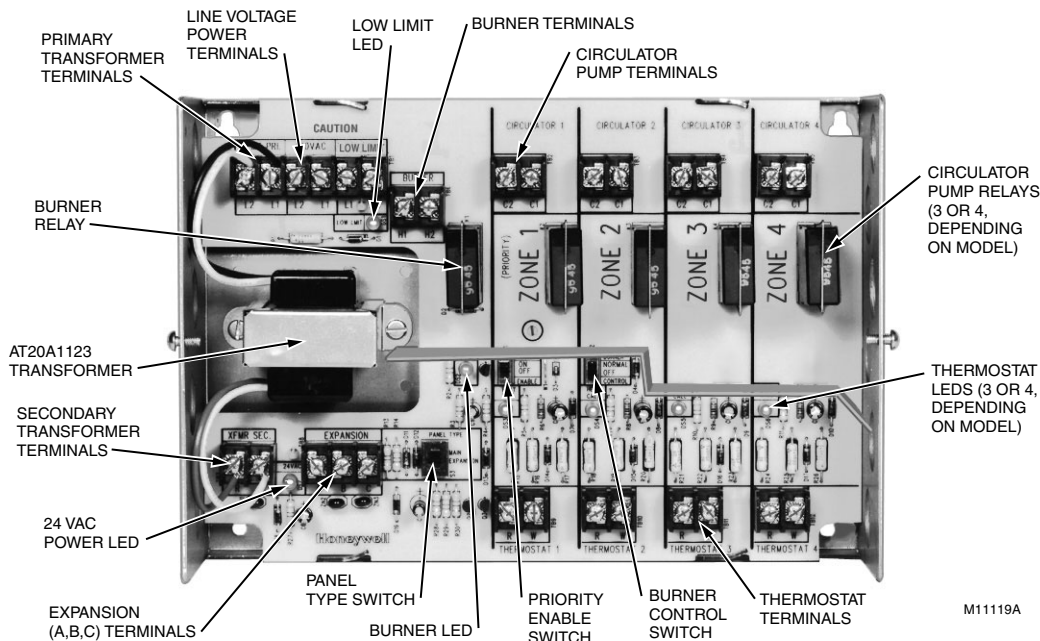


Fig. 2. Internal view of R8888 (R8888B model shown).

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## INSTALLATION

### When Installing this Product...

1. Read these instructions carefully. Failure to follow them could damage the product or cause a hazardous condition.
2. Check the ratings given in the instructions and on the product to make sure the product is suitable for your application.
3. Installer must be a trained, experienced service technician.
4. After installation is complete, check out product operation as provided in these instructions.

## ⚠ CAUTION

Disconnect power supply before beginning installation to prevent electrical shock or equipment damage.

## Choose Location

If this is a replacement application, mount the R8888 in the same location as the old control or choose a suitable location as follows:

- Mount R8888 directly on a panel or wall near the equipment to be controlled.
- Make sure location is accessible for installation and service.
- Make sure operating ambient temperature at the selected location does not exceed 105°F (41°C).

## Mounting

### Mounting R8888

Remove the R8888 Cover by loosening and removing the screws. Carefully lift off the cover from the panel. Set aside the cover.

#### IMPORTANT

*The R8888 Relays can become loose during shipping. Make sure the relays are securely fastened in the sockets on the R8888 panel for proper operation.*

Position the R8888 panel on the wall at the selected location. Mount the R8888 horizontally only. Using the panel as a guide, mark the location of the mounting holes. Loosely fasten the panel to the wall or outlet box using four No. 8-3/4 in. screws (included) as shown in Fig. 3. Fasten the screws securely.

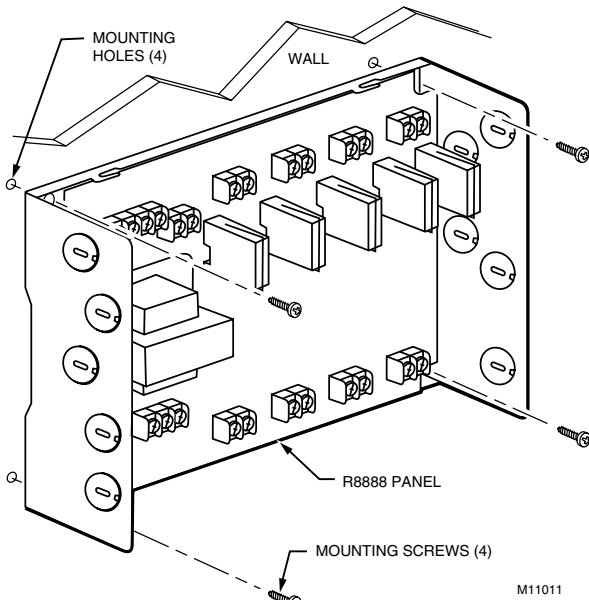


Fig. 3. Mounting R8888 on the wall.

## Wiring

## ⚠ CAUTION

1. Disconnect power supply before beginning installation to prevent electrical shock or equipment damage.
2. Use copper conductors only.
3. Use only NEC Class 1 wire for all line voltage wiring connections. Class 1 wires must be rated for at least 167°F (75°C).

All wiring must comply with applicable electrical codes and ordinances.

Run wiring from the system components to the R8888 location. Make wiring connections as shown in Table 1 and Fig. 5 through 14. Make sure all line voltage connections are in the R8888 enclosure. Keep line voltage wires away from R8888 low voltage area as shown in Fig. 4. Use the plastic bushing (included) in the knockout for the thermostat wiring to avoid damaging the thermostat wires. See Fig. 4.

#### IMPORTANT

*The R8888 has knockouts on both sides of the case. Only specific wiring must be run through each knockout. See Fig. 4.*

Table 1. Wiring Connections.

Terminal Designation	Connect to System Component
H1, H2	Burner control.
C1, C2	Circulator pump for each zone.
L1	Line voltage (hot) power.
L2	Line voltage (neutral) power.
Zc	Line voltage (hot) power input to all circulator relays.
R, W	Low voltage thermostat for each zone.
C, R (24 Vac) (XFMR SEC.)	Low voltage power from transformer.
A,B,C	Expansion to additional R8888 or R8889 Zone Panels.
L1, L2 (XFMR PRI.)	Line voltage power to transformer.

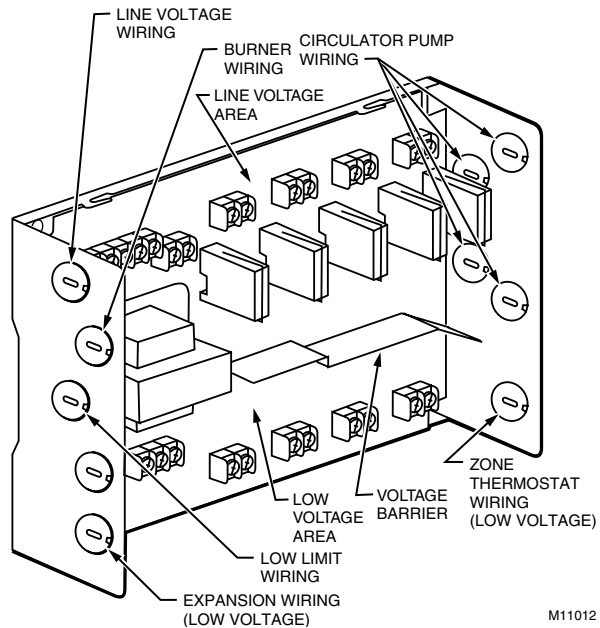


Fig. 4. R8888 knockout wiring designations.

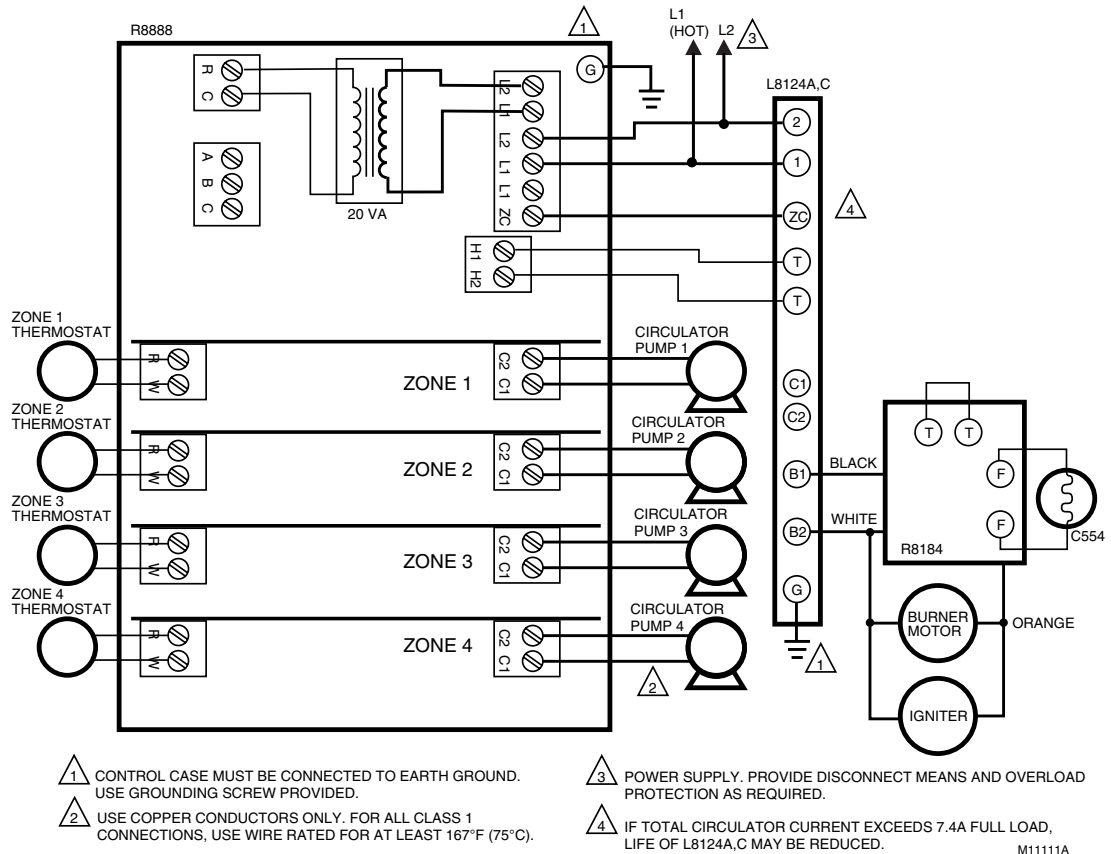


Fig. 5. Typical hookup for R8888 in oil-fired, tankless zoned systems with L8124A,C Aquastat® Controller.

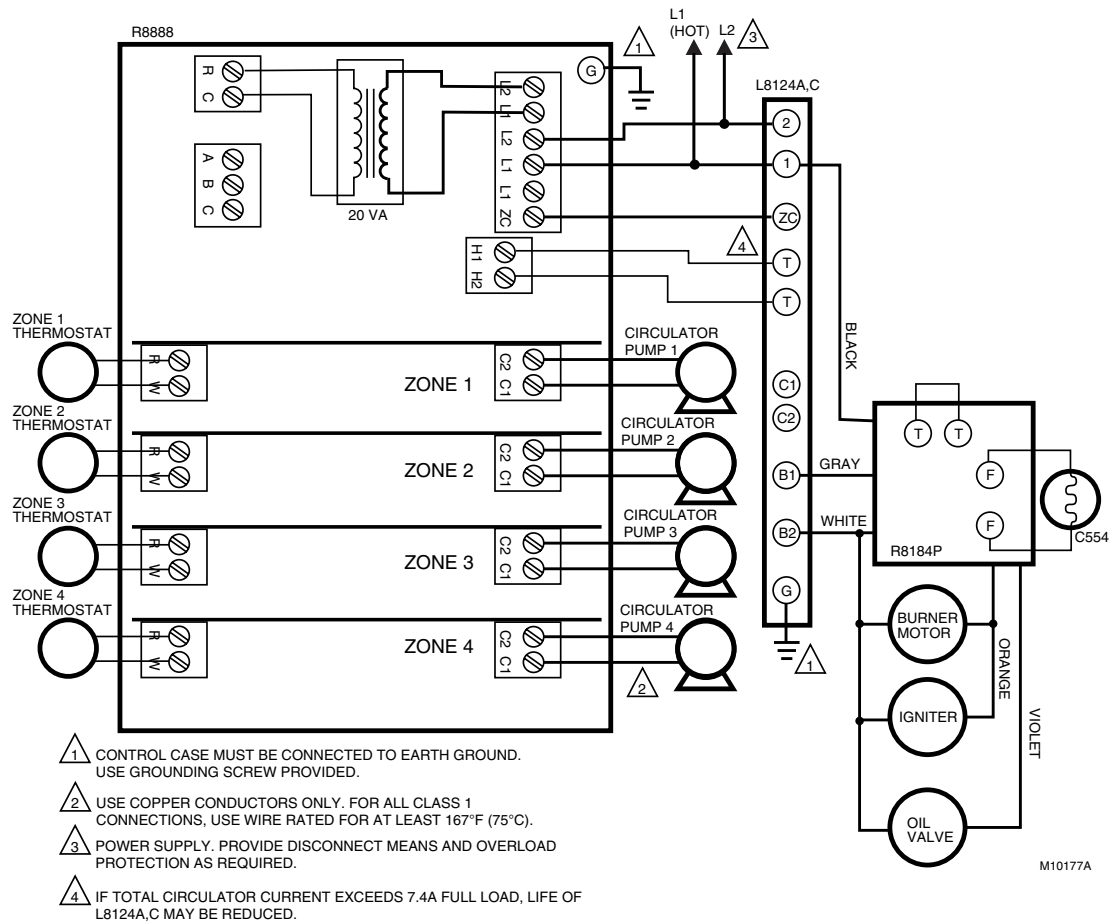
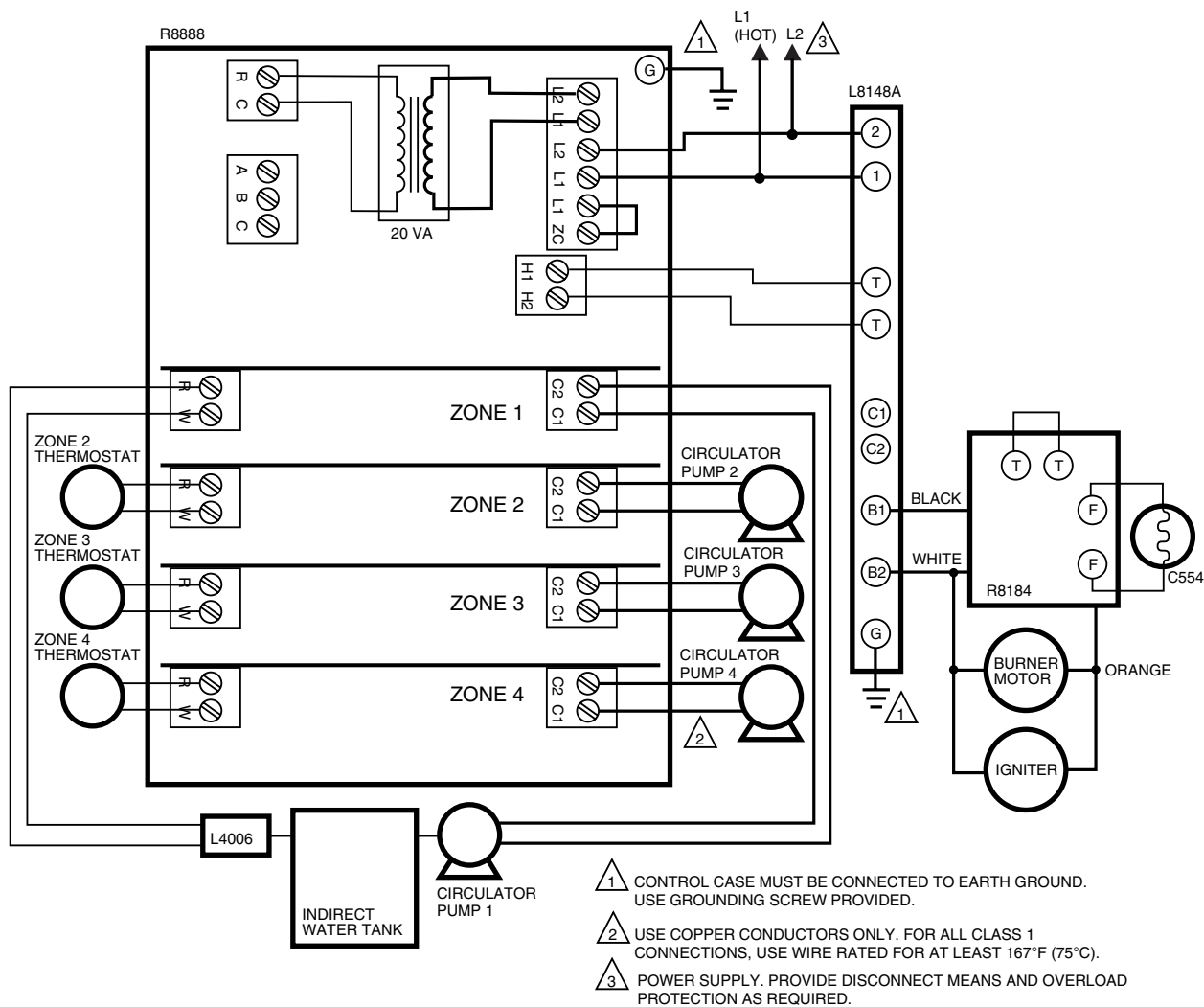


Fig. 6. Typical hookup for R8888 in oil-fired, tankless zoned systems with L8124A,C Aquastat® Controller and R8184P Oil Primary Control.



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**Fig. 7. Typical hookup for R8888 in oil-fired, zoned systems using L8148A Aquastat Controller and priority zoned indirect water tank.**

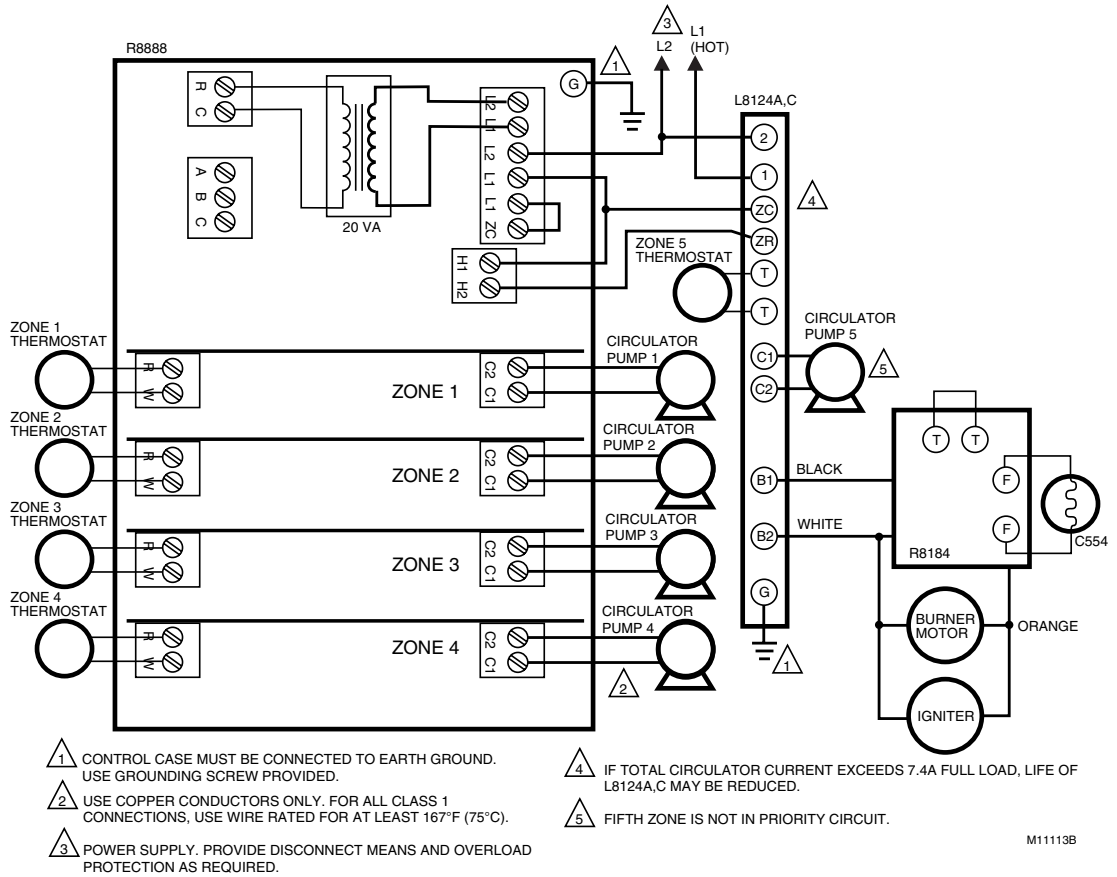


Fig. 8. Typical hookup for R8888 in oil-fired, zoned systems using L8124A,C Aquastat Controller as a fifth zone.

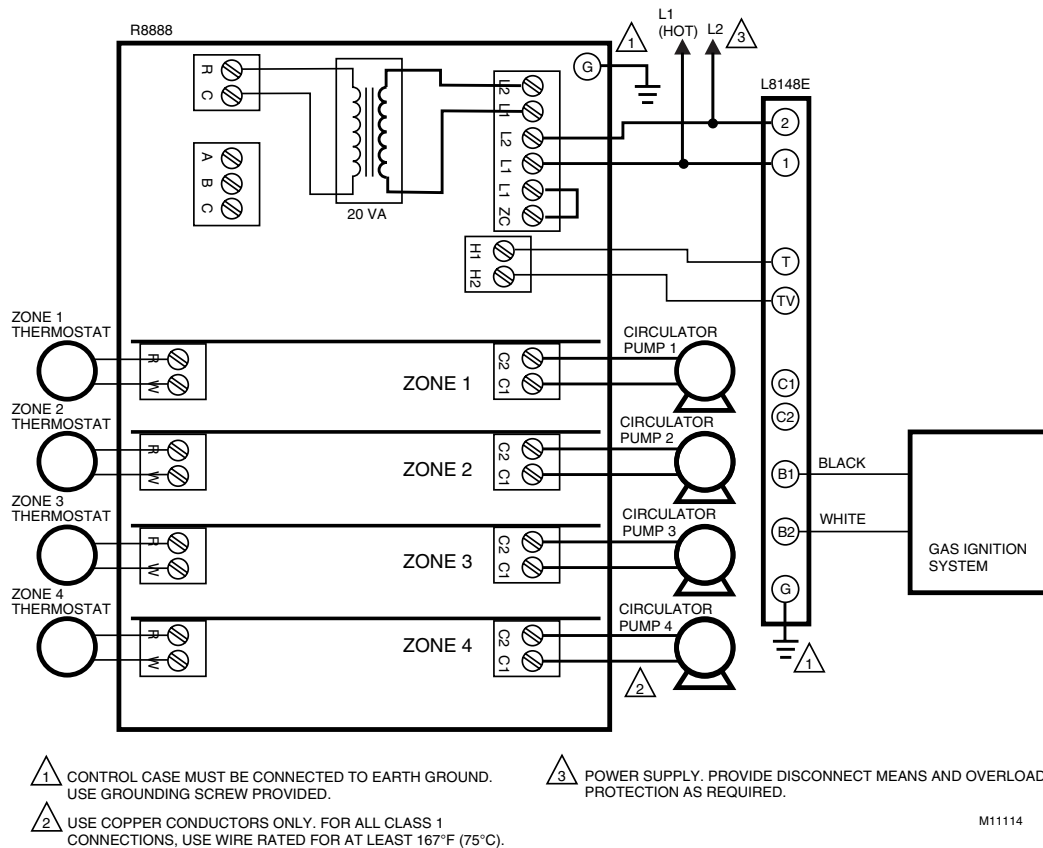
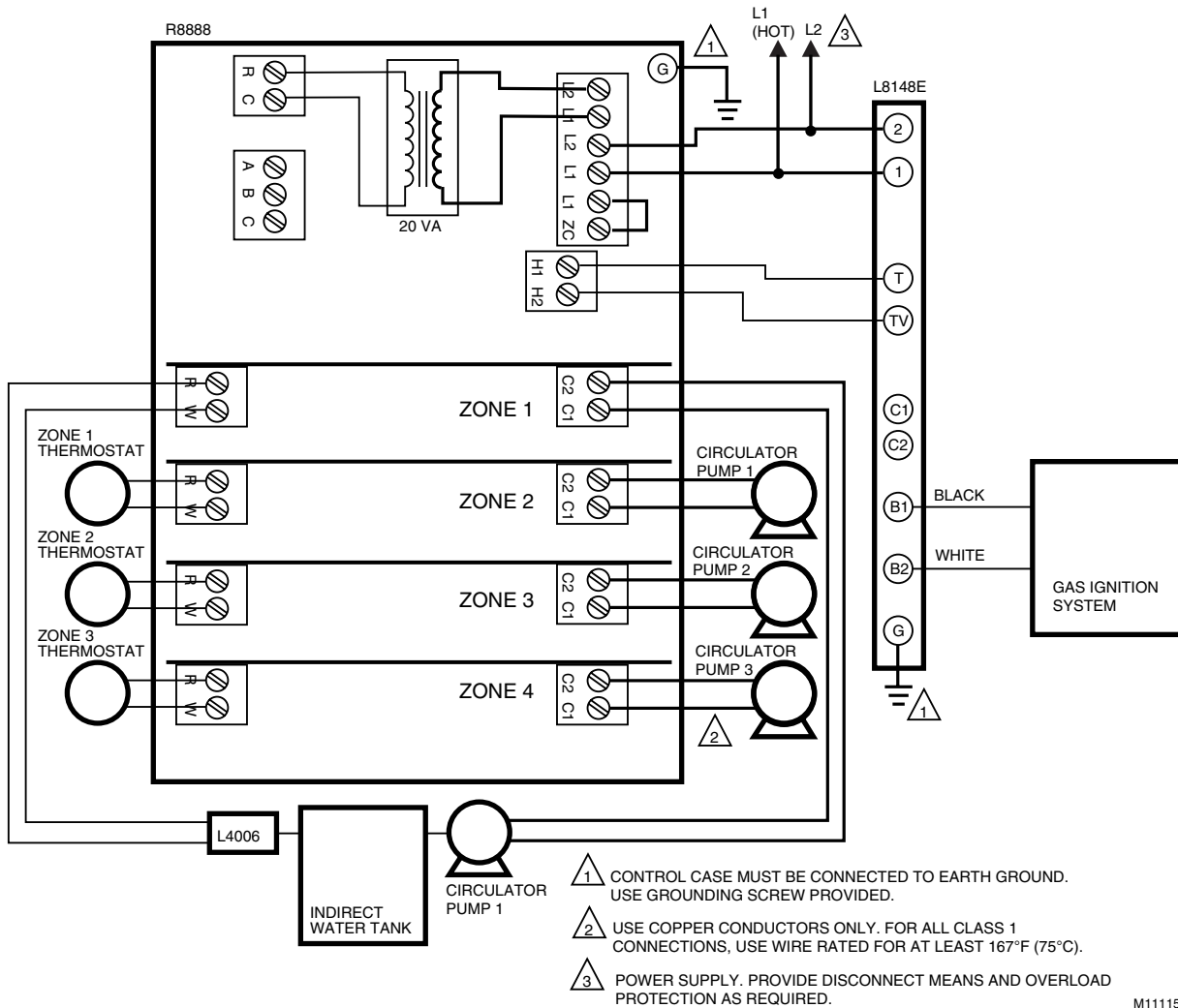


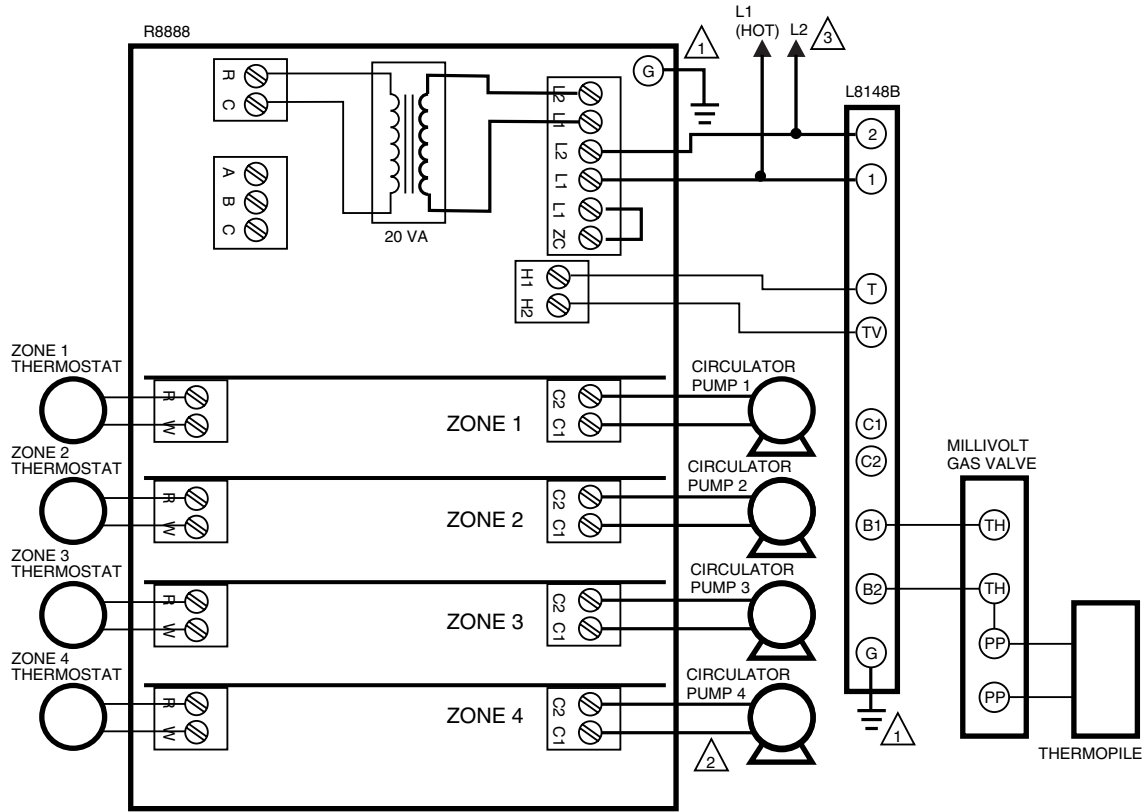
Fig. 9. Typical hookup for R8888 in 24V, gas-fired, zoned systems using L8148E Aquastat Controller.



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**Fig. 10. Typical hookup for R8888 in 24V, gas-fired, zoned systems with L8148E Aquastat Controller and priority zoned indirect water tank.**





1 CONTROL CASE MUST BE CONNECTED TO EARTH GROUND. USE GROUNDING SCREW PROVIDED.

3 POWER SUPPLY. PROVIDE DISCONNECT MEANS AND OVERLOAD PROTECTION AS REQUIRED.

2 USE COPPER CONDUCTORS ONLY. FOR ALL CLASS 1 CONNECTIONS, USE WIRE RATED FOR AT LEAST 167°F (75°C).

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Fig. 11. Typical hookup for R8888 in millivolt, gas-fired, tankless zoned system.

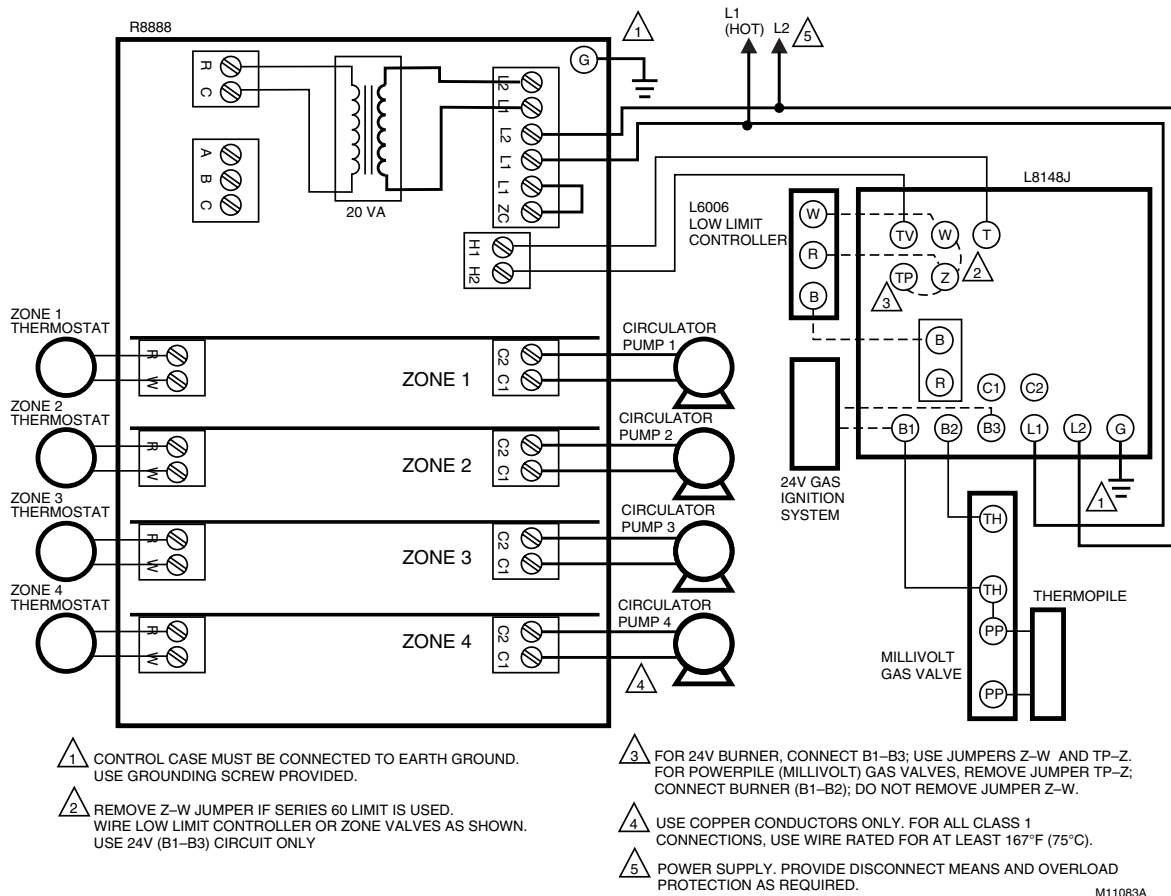


Fig. 12. Typical hookup for R8888 in millivolt or low volt, gas-fired system with L8148J Aquastat Controller.

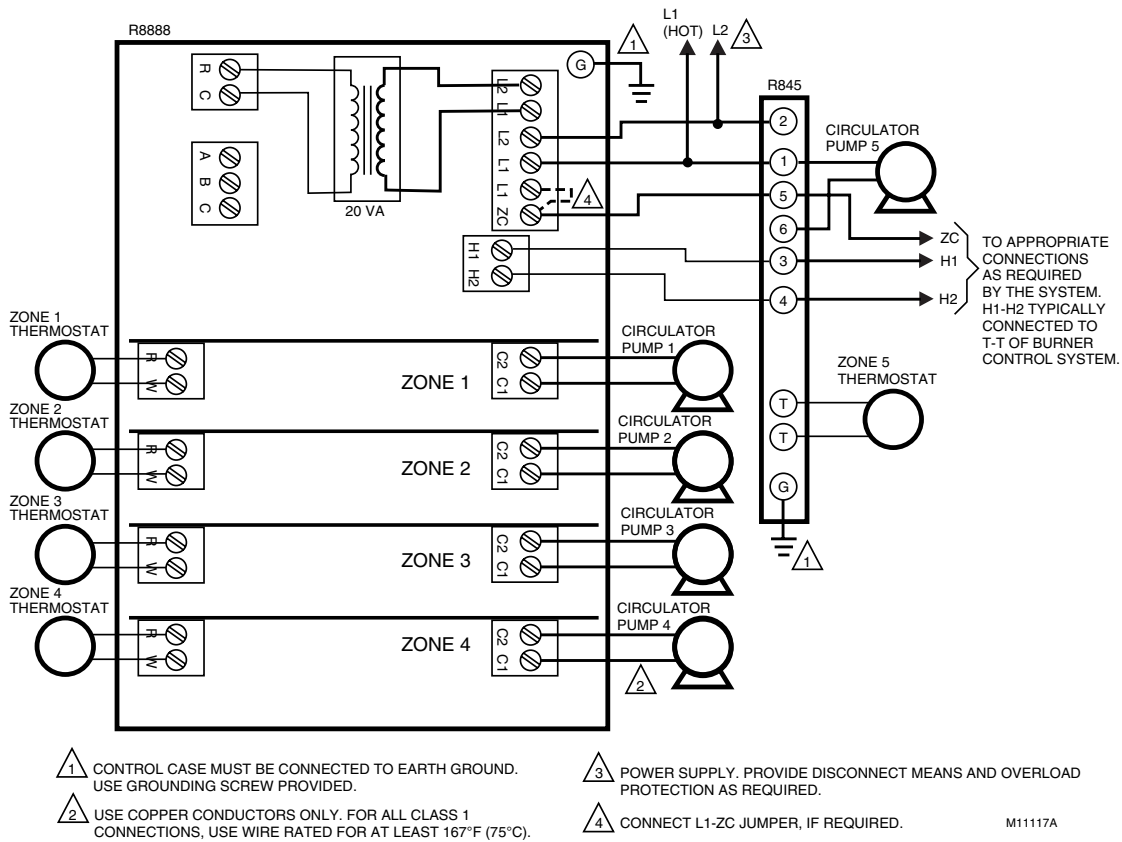


Fig. 13. Zone expansion using additional R845 Hydronic Switching Relays.

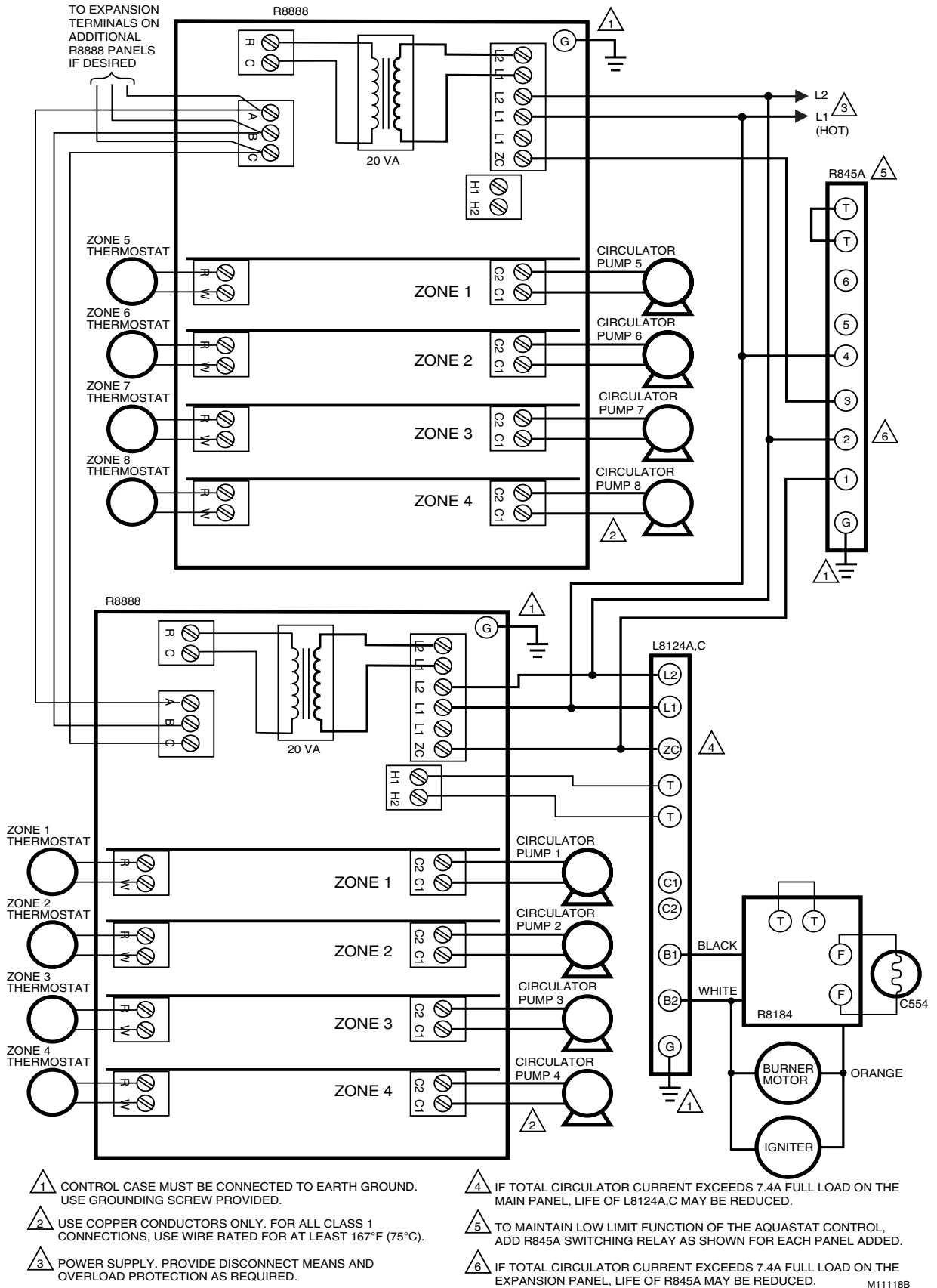


Fig.14. Zone expansion using additional R8888 Zone Panels.

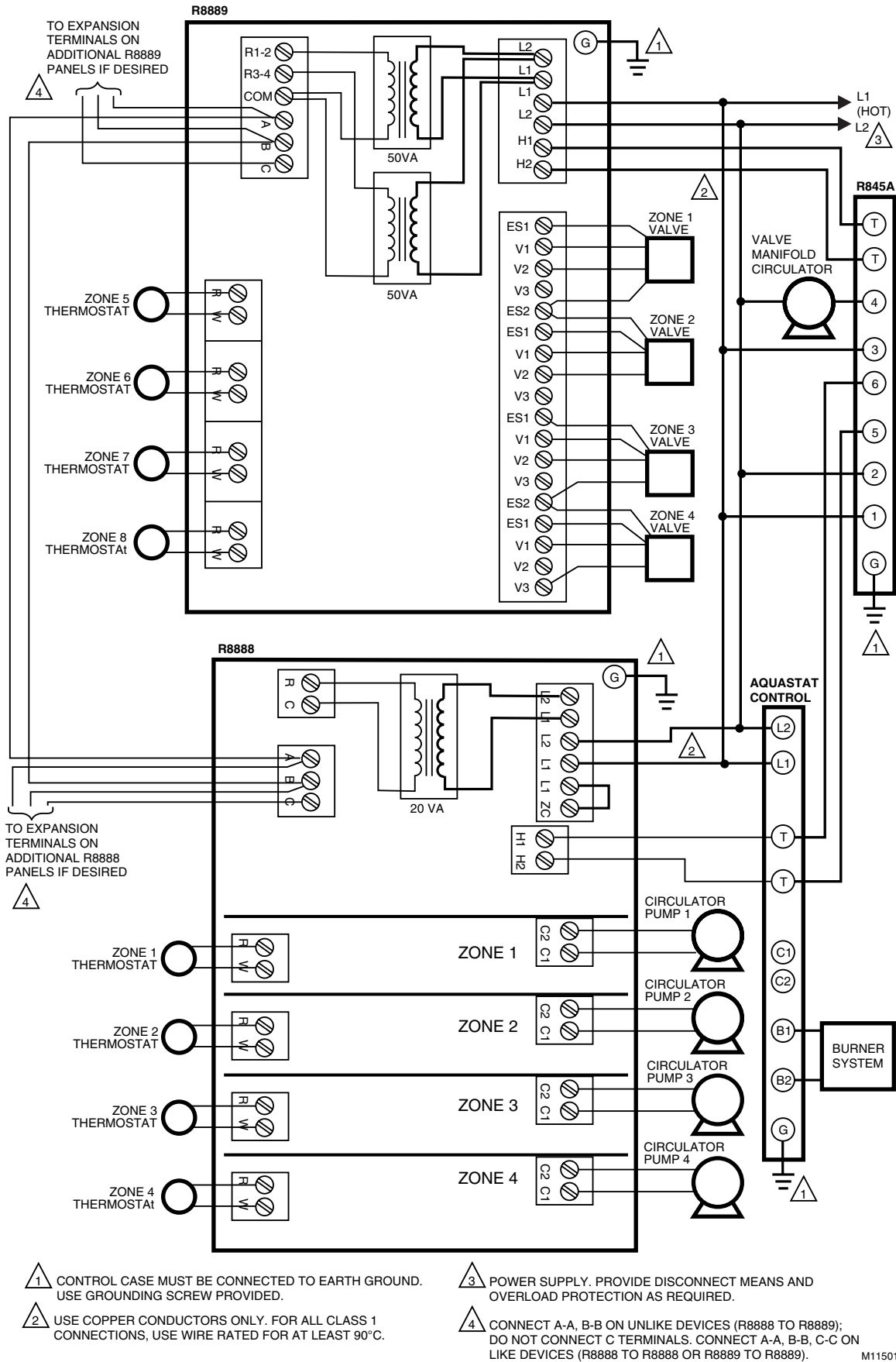


Fig. 15. Mixed mode zone expansion using R8888, R8889, and R845 Switching Relay.

## OPERATION

### Overview

The R8888 Hydronic Circulator Zone Panel with Priority Control can control up to three or four (depending on model) zone circulator pumps. Additional zones may be added one at a time using an R845 Hydronic Switching Relay for each additional zone or three or four zones at a time using additional R8888A or B Zone Panels, respectively.

Line voltage power connected to L1 and L2 on the R8888 Panel provides power to the 24V transformer. This transformer provides 24 Vac power to the R8888 Panel. A green light-emitting diode (LED) on the panel indicates that there is 24 Vac power applied to the R8888 Panel.

When a zone thermostat calls for heat during standard operation, the R and W terminals make for that zone thermostat. The relay for that zone is energized and the LED for that zone comes on. The burner relay is also energized and the H1 and H2 terminals make. The circulator relay for that zone is energized, providing line voltage between the C1 and C2 terminals, (energizing that zone circulator pump).

Each zone operates in the same sequence described above. As long as any zone is calling for heat, the burner relay is energized.

### Priority Zoning Operation

The R8888 allows Zone 1 to be field-configured as a priority or non-priority zone. Zone 1 is factory-set as a priority zone. (Refer to Fig. 2 for location and settings of the priority enable and burner control switches.) This feature is typically used in installations where indirect hot water tanks are installed. When configured in this manner, a call for heat from the priority zone disables the circulators on the other three zones, assuring maximum heat transfer to the hot water tank. Normal control of the non-prioritized zones returns when the priority zone call for heat ends. Since this feature is field-configurable, it can be disabled, giving equal priority to all four zones. Refer to Fig. 7 (oil-fired) and Fig. 10 (gas-fired) for typical wiring connections. Note that the LED for each zone remains on as long as a call for heat remains for that zone, even though the priority zone can cause its circulator relay to be de-energized.

**NOTE** When a power stealing thermostat is used in a non-priority zone, the heat call LED for that zone illuminates slightly under the following conditions:

- The power stealing thermostat is in the OFF state.
- PRIORITY ENABLE is ON.
- The priority zone is calling for heat.

### Burner Control Operation

The R8888 allows Zone 2 burner control to be disabled. Zone 2 is factory-set for normal burner control. (Refer to Fig. 2 for location and settings of the priority enable and burner control switches.) This feature may be used to prevent short cycling the boiler in installations where both small and large zones exist in close proximity. In these applications, if all zones have normal burner control, a call for heat from the small zone is satisfied quickly and the boiler short cycles. By switching the burner control from NORMAL to OFF, a call for heat results in only its circulator pump running. Often the latent heat in the boiler and pipes alone satisfies the small zone. If necessary, the larger zone brings on the boiler before too long due to the proximity of the zones.

### Cold Start Boiler Operation (Fig. 7-10)

The R8888 may be applied to boilers using either the L8124 (high and low limit) or the L8148 (high limit only) Aquastat Controllers. When using the L8148, the boiler runs only when there is a call for heat from an external thermostat. Fig. 7 through 10 illustrate typical wiring connections for this application. Do not remove the factory-installed jumper between the L1 and Zc terminals. Fig. 8 illustrates a method of obtaining a fifth zone by using the Aquastat controller. Note that this hookup removes power from the thermostat whenever the limit opens.

#### **IMPORTANT**

*Do not use power stealing electronic thermostats in this application. Use battery powered thermostats or the T87 Round® Thermostat.*

### Tankless Coil Boiler Operation (Fig. 5)

When using the L8124, the R8888 may be connected so all zone circulators are disabled when the low limit opens. This allows the boiler water to reach minimum temperature before transferring heat to any zones. This is accomplished as power to all of the circulator relay contacts goes to terminal Zc. Remove the R8888 factory-installed jumper between the L1 and Zc terminals. Connect the Zc terminal from the R8888 to the Zc terminal on the L8124. When the L8124 senses that the boiler is below the low limit, it removes power from the Zc terminal.

To aid in troubleshooting, a green LED (LOW LIMIT) is provided. This LED illuminates whenever the power to the circulator relay contacts is available from the Zc terminal.

## Expansion

### Expansion Using an Aquastat Control (Fig. 8)

Control of a fifth zone can be obtained by using an Aquastat control. This hookup causes additional wear on the Aquastat low limit because the switch must remove power from all the circulators in the system when it switches off to allow the boiler temperature to recover. Zone expansion using additional R8888s or R845 Switching Relays is recommended.

**NOTE:** This hookup removes power from the thermostat whenever the limit opens. Do not use power stealing electronic thermostats. Use battery powered thermostats or the T87 Round® Thermostat.

### Expansion Using R845 Switching Relays (Fig.13)

The R8888 can be expanded one zone at a time by using R845 Switching Relays. The priority zone is not maintained in this hookup.

### Expansion Using Additional R8888s or R8889s (Fig.14-15)

The R8888 can be expanded three or four zones at a time using additional R8888 or R8889 Zone Panels. Up to four zone panels (12 to 16 zones total) may be added to a system. Connect the system burner to the burner terminals on the Aquastat Control. When using the additional zone panels, the priority zone is maintained. The burner control function on Zone 2 of the R8888 is not affected during expansion.

When wiring additional R8888s, connect the wires from the three expansion terminals (A,B,C) on one zone panel to the expansion terminals on the next zone panel. For each panel added, connect an R845A as shown in Fig. 14 to maintain the low limit function. Run wires through the knockouts on the sides of the zone panels (see Fig. 4).

When running a mixed mode system (R8888-R8889 combination), connect an R845A as shown in Fig. 15. Connect the wires from the expansion terminals (A,B,C) on one zone panel to the expansion terminals (A,B,C) on the next zone panel. Connect A to A, B to B, and C to C on like panels (R8888 connected to R8888, R8889 connected to R8889). Do not connect the C terminals when connecting an R8888 to an R8889.

When using multiple panels, set the PANEL TYPE switch on one panel to the MAIN position. Zone 1 on this panel is the priority zone for the system. Set the other panels to the EXPANSION position. Set the PRIORITY ENABLE switch to the same position on all panels.

## Thermostat Compatibility

The R8888 is compatible with both electromechanical and electronic thermostats. In the thermostat Off state, the R8888 allows up to 0.12A to be drawn, satisfying the *trickle charge* requirement of power-stealing electronic thermostats. In the thermostat On state, the R8888 provides 0.12A to satisfy the anticipator current requirement of all electromechanical and many electronic thermostats.

## SERVICE AND CHECKOUT



### CAUTION

Disconnect power supply before removing cover for servicing to prevent electrical shock or equipment damage.

1. Remove the R8888 cover.
2. With the cover removed, reconnect power to R8888 Zone Panel.
3. Check for power across L1 and L2 terminals using a voltmeter.
4. Check that green 24 Vac power LED lights, indicating 24 Vac power to low voltage circuit.



### CAUTION

If transformer fails and LED does not light, line voltage can continue to be present at L1 and L2 terminals. Check for power using a voltmeter.

5. If the transformer is determined defective, replace it with Honeywell part no. AT20A1123.
6. During checkout, jumper thermostat R-W terminals on R8888 separately for each zone. The green LED for that zone lights, simulating a call for heat from the zone thermostat.

## TROUBLESHOOTING

Check all wiring connections.

Check out system components according to equipment manufacturer instructions.

To perform troubleshooting, remove the R8888 cover from the panel.



## CAUTION

Although the green LED (24 Vac power) is not lit with the power connected, line voltage may be present at L1 and L2 terminals if the LED is defective. Check for power across L1 and L2 terminals using a voltmeter only.

<b>A zone thermostat is calling for heat, but there is no heat.</b>		
1. Check power indicator LED.	<b>Power LED is on.</b> 1. Go to step 3.	<b>Power LED is not on.</b> 1. Go to step 2.
2. Check for power (120 volts) at XFMR PRI. L1-L2 terminals.	<b>120 volts are present at XFMR PRI. L1-L2.</b> 2. Check for 24 volts at R-C terminals. If 24 volts are not present at terminals, tighten the wiring connections and recheck. If 24 volts continue to be absent, transformer is defective. Replace the transformer with part no. AT20A1123.	<b>120 volts are not present at XFMR PRI. L1-L2.</b> 2a. Check for 120 Volts at 120 Vac L1-L2. If 120 volts are present, replace R8888.  2b. If 120 volts are not present at 120 Vac L1-L2, check main power and wiring connections.
3. Check zone thermostat (green) indicator LED.	<b>Zone LED is on.</b> 3. Go to Step 4.	<b>Zone LED is not on.</b> 3. Jumper R,W terminals (for one zone) on the R8888 to simulate a call for heat. If the zone LED does not turn on, replace R8888. If the zone LED turns on, check the current draw between the R and W terminals. If 90 to 150 mA ac is measured with L1-L2 at 120 Vac, there is a problem with the thermostat or the wiring to the thermostat. Check the thermostat and thermostat wiring. If 90 to 150 mA ac is not measured with L1-L2 at 120 Vac, replace R8888.
4. Check burner operation.	<b>Burner LED is on. System Burner is off.</b> 4a. Jumper H1, H2 terminals. 4b. If burner starts, burner relay is defective. Replace part no. 208621 Burner Relay. Recheck. If burner does not start, replace R8888. 4c. If the system burner does not start, there is a problem with the external burner circuit. Check Aquastat Controller according to the manufacturer instructions.	<b>Burner LED is on. System Burner is on.</b> 4a. Check for 120 volts at C1, C2 terminals for the zone that is calling for heat. If 120 volts are present, the problem is with the circulator pump. Check the pump for that zone. 4b. If 120 volts are not present, check the LOW LIMIT LED. If the LED is on, make sure that the wiring between the expansion terminals is correct. 4c. If the wiring is correct, the circulator pump relay is defective. Replace part no. 208621 Circulator Pump Relay. Recheck. If 120 volts continue to be absent, replace R8888. 4d. If the LOW LIMIT LED is off, jumper the low limit (L1-ZC) terminals. If the LED turns on, there is a problem with the external low limit circuit. If the LED does not turn on, replace R8888.
	<b>Burner LED is not on. System Burner is off.</b> 4a. Set the BURNER CONTROL switch on zone 2 only to NORMAL. Make sure the wiring between the expansion terminals is correct. If the system burner does not start, replace R8888.	

<b>A zone thermostat is not calling for heat, but there is heat.</b>		
1. Check burner operation.	<b>Burner LED is not on. System Burner is on.</b> 4a. Remove burner relay. If the system turns off, burner relay is defective. Replace part no. 208621 Burner Relay. 4b. If the system burner is on, remove the field wire from H1 terminal. If the system burner is still on, the problem is with the external system burner circuit. If system burner turns off, replace R8888.	

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