

Zone Controls

Models: UPZC-3

US Installation and operating instructions



Overview:

The UPZC zone control family are non-networked devices for control of hydronic circulators and boilers. This relay control connects to industry standard thermostats using either two or three wires. The optional third wire provides 24VAC to thermostats that require external power. The UPZC operates in a cold start configuration with a call for heat from a thermostat. The module's relay is energized which, in turn, switches 120VAC to activate the circulator and also provides a call-for-heat signal to the boiler.

Features:

Front mounted high resolution LED's for system status, troubleshooting, and zone function.

Single universal service relay. Only one service relay required for all UPZC models. Lowering inventory requirements and ensuring ease of fieldservice.

Selectable Priority and Freeze Protection with a Simple Switch Selection. When Priority is not required, the switch is in the **OFF** position. If the switch is set to **TIMER**, the Priority Zone will be enabled, and the Freeze Protection Timer will restore heating zones if the Priority Zone is not satisfied within 1 hour. If the switch is placed in the **ON** position, Priority will be established but the Freeze Protection timer will be disabled. This can be a valuable feature if the Priority Zone is a heating zone such as high mass radiant heating. This would allow the radiant zone to compensate for a higher thermal mass during recovery from unoccupied periods or on start up. Also valuable when used with "staple up" or other lower mass radiant systems.

Multiple panels can be coupled in several configurations to provide simple expandability. In one configuration, the Master panel can be set up with Priority, and Slave panels will obey the Priority command from the Master. Selectable Freeze Protection is provided if needed. Multiple Priorities can be established in another configuration. This can be perfect for Radiant Heating applications where the Indirect Water heater can be configured for Priority with Freeze Protection on one priority zone, and the second priority zone can be used for a high demand radiant heating load. This allows system recovery for longer lead time radiant zones, especially on start up.

Protection for system safety. UPZC uses a **PTC fuse** on system 24VAC which means that any system side overload is protected. Since a PTC is automatically resets, it eliminates the need to replace fuses. With UPZC, you're protected.

Top Quality Transformers. UPZC relay panels are designed with the industry's most reliable transformers. The PRC-1 has a 15VA rated transformer, and the PRC 3 through 6 have a high capacity 25VA rated transformer.

2-Wire and one 3-wire thermostat capability C terminal for thermostats that require constant 24VAC Power. This means thermostats that require constant 24VAC power for operation are properly wired.

CP terminal for Easy Field Wiring and Use on Older Systems. Another UPZC exclusive is the CP terminal which serves as a universal COMMON terminal for all pumps connected to the UPZC relay panel. This facilitates field wiring since all commons can be tied together. Another valuable use of the CP terminal is when the factory installed jumper is removed; the terminal can be used to provide Line Voltage to the boiler. This is common in older systems when the Burner is wired through a line voltage aquastat. This means that these systems can be adapted **without** the use of additional relays.

Optional configuration for domestic hot water priority operation. In this configuration, when Zone-1 of the relay is activated, the remaining zone circulators will be deactivated while maintaining thermostat 24V power. When Zone-1 is deactivated, Zone-2 and higher will return to normal operation.

Warning: Electrical Shock and Potential Circuit Damage. Disconnect power supply before beginning installation. All wiring must comply with national and local electrical codes, ordinances and regulations. Failure to follow electrical codes could result in serious personal injury, death, and property damages. All wiring should be performed by qualified personnel. Failure to follow these instructions could result in serious personal injury or death and void warranty.

Caution: Electrical Shock and Potential Circuit Damage

- Class 2 wiring shall be segregated from the wiring of Class 1 circuits. When Class 2 wiring is routed with Class 1 wiring, the Class 2 wiring insulation shall be rated for the minimum voltage of the Class 1 wiring. Segregation is not required if all circuits are wired as Class 1, electric light or power circuits.

Caution: Electrical Shock and Potential Circuit Damage

- All electrical connections must be made using copper wire only
- 12-16 gauge wire is recommended for 120VAC connection
- 12-22 gauge wire for thermostat connections
- 12-22 gauge wire for 24VAC connections
- Use UL listed conduit fittings only

Input Power:

- 120VAC 60HZ connected to terminals 120VAC Neutral and 120VAC Line

Mounting:

- Mount the UPZC to a suitable flat surface using the key and standard mounting holes. Standard knockouts are provided for conduit fittings.

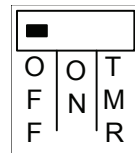
Installation:

Review the following pages (wiring schematics) for your specific wiring application

- 1) Power must be disconnected
- 2) The factory jumper is installed between L1 and ZC/CP so that power can be switched to terminals C1 through C3. Review wiring schematics for proper position of jumper wire for specific applications.
- 3) Attach low voltage thermostat leads to respective thermostat terminals. If using 3-wire thermostat, use 24AC terminal C
- 4) Attach circulator leads to respective terminals
- 5) Connect boiler aquastat leads
- 6) Select Priority Switch setting: (Switch positions: OFF, TIMER, ON)
- 7) Connect power supply voltage to terminals (N & L1)

Priority Switch Settings:

- OFF: No set priority, all zones operate independently
- TIMER: Zone 1 has priority for 1-hour. The remaining zones will stop operation until zone 1 is satisfied or until the 1-hour priority has expired
- ON: Zone 1 has priority until the demand is satisfied



External Diagnostics (LED's):

- The external lights show the functionality of the UPZC.
- Green: Light indicates presence of 24VAC at secondary side of transformer
- Yellow: Light indicates a thermostats call for heat
- Red: Light indicates zone 1 priority is active

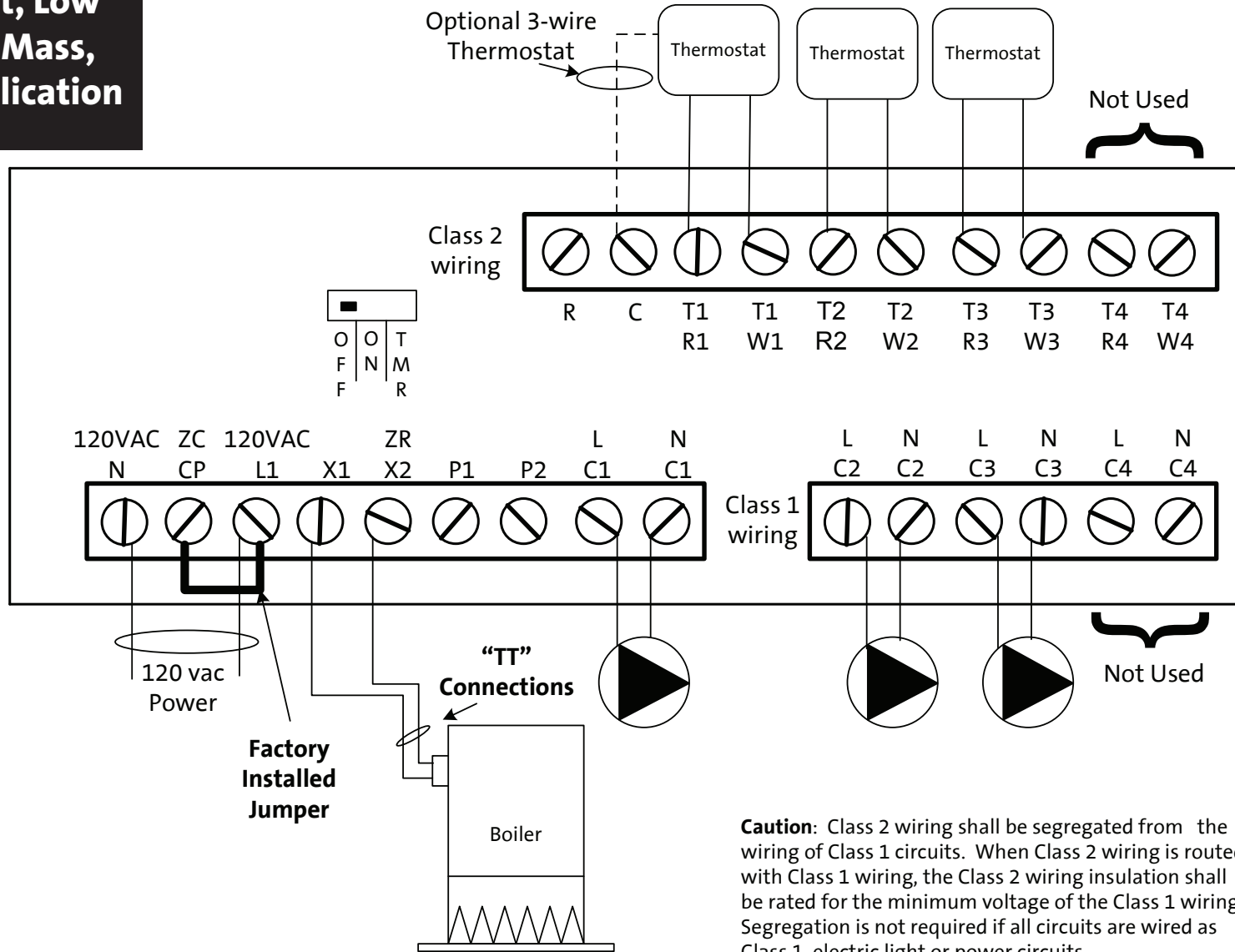
Operation:

- Connect a conventional thermostat to the “T#, R#” & “T#, W#” terminals on the UPZC, Class 2 terminal block. When the thermostat calls for heat, the relay is energized, and 120VAC is switched to the corresponding circulator.

Terminal Tag Descriptions:

- T#, R# & T#, W#:** • Thermostat connections for zones 1 thru 3
- C:** • Optional; Common for 3-wire thermostats
- R:** • 24VAC
- 120VAC/Neutral:** • Neutral class 1 terminal for circulators
- 120VAC Line:** • Line class 1 terminal for 120VAC input power
- ZC/CP:** • Class 1 terminal for circulators or when jumper is removed, ZC connection to Boiler
- ZC-To Aquastat
- CP-Common power to Circulator
- ZC-To Tankless Coil
- X1:** • Dry contact to boiler “T” connection
- ZR/X2:** • Usage depends on Cold Start or Tankless application refer to drawings for details
- ZR-To Aquastat
- X2-“T” on Boiler, Dry contact
- ZR-To Tankless Coil
- P1:** • Not Used
- P2:** • Not Used
- L, C# & N, C#:** • Normally Open Class 1 terminal for circulator

Cold Start, Low Thermal Mass, Boiler Application

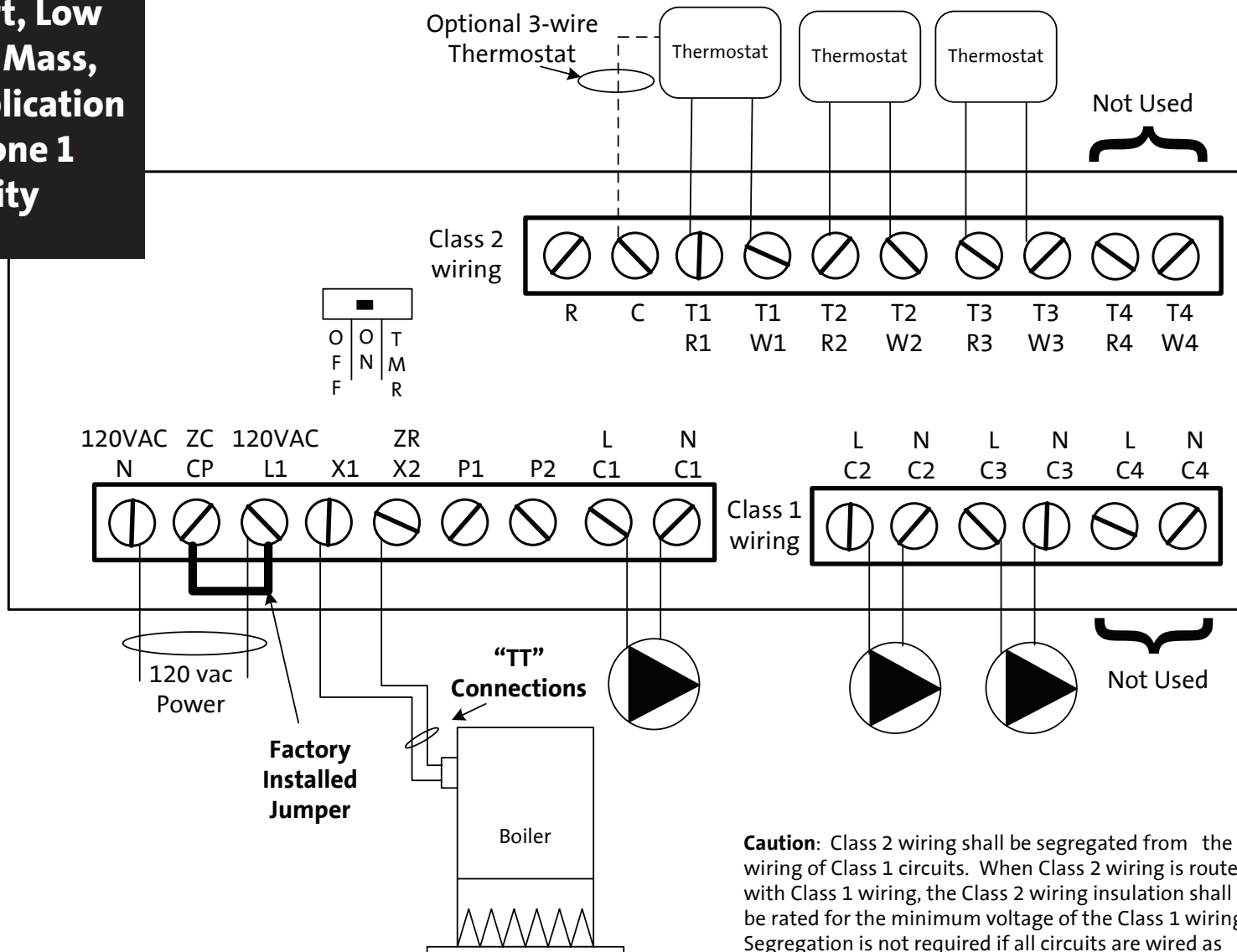


Note: Place the Priority Timer switch in the OFF position.

Caution: Class 2 wiring shall be segregated from the wiring of Class 1 circuits. When Class 2 wiring is routed with Class 1 wiring, the Class 2 wiring insulation shall be rated for the minimum voltage of the Class 1 wiring. Segregation is not required if all circuits are wired as Class 1, electric light or power circuits.

Use UL Listed conduit fittings only.

Cold Start, Low Thermal Mass, Boiler Application with Zone 1 Priority

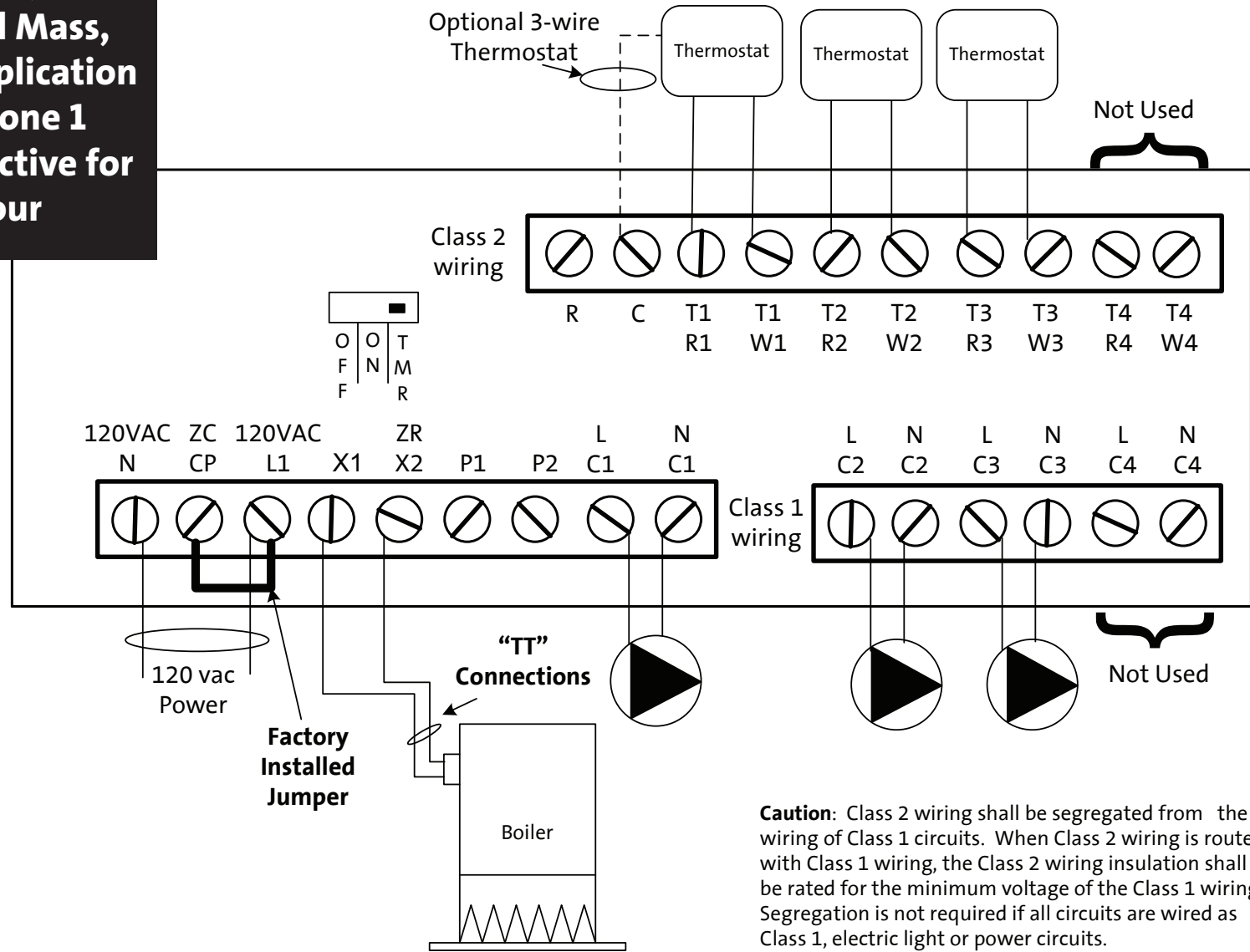


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Note: Place the Priority Timer switch in the ON position.

Use UL Listed conduit fittings only.

Cold Start, Low Thermal Mass, Boiler Application with Zone 1 Priority active for 1 hour

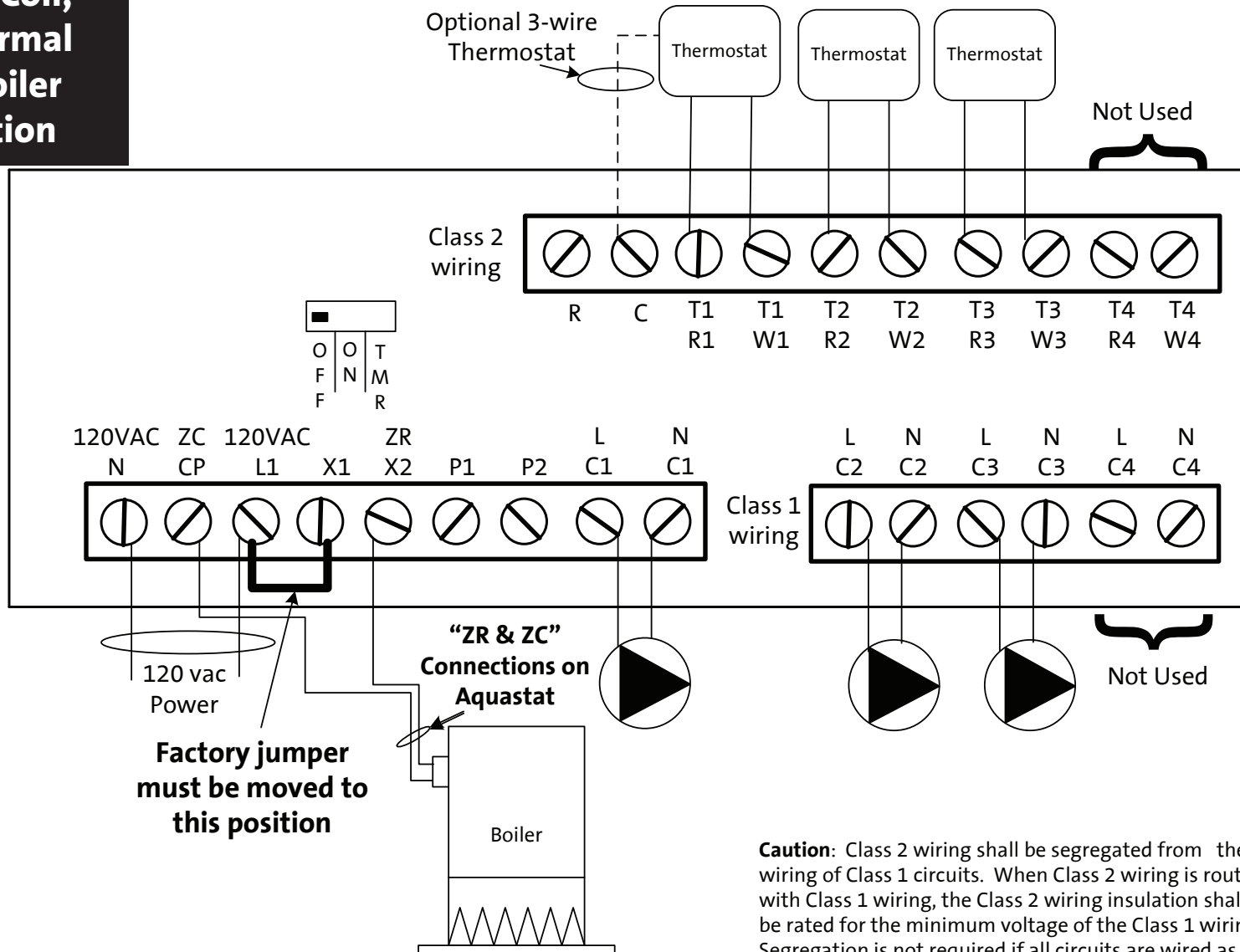


Note: Place the Priority Timer switch in the TIMER position.

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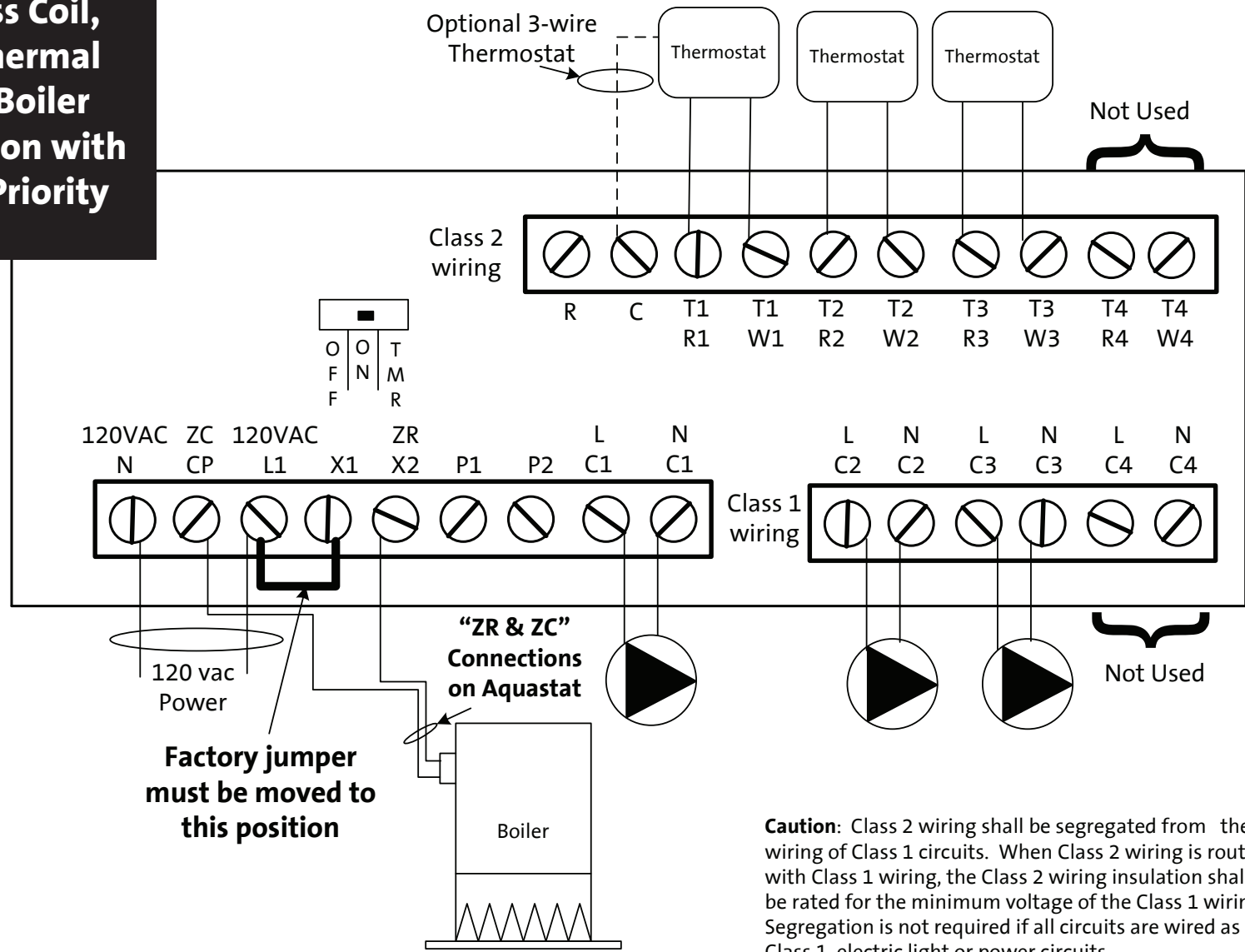
**Tankless Coil,
High Thermal
Mass, Boiler
Application**



Note: Place the Priority Timer switch in the OFF position.

Use UL Listed conduit fittings only.

**Tankless Coil,
High Thermal
Mass, Boiler
Application with
Zone 1 Priority**

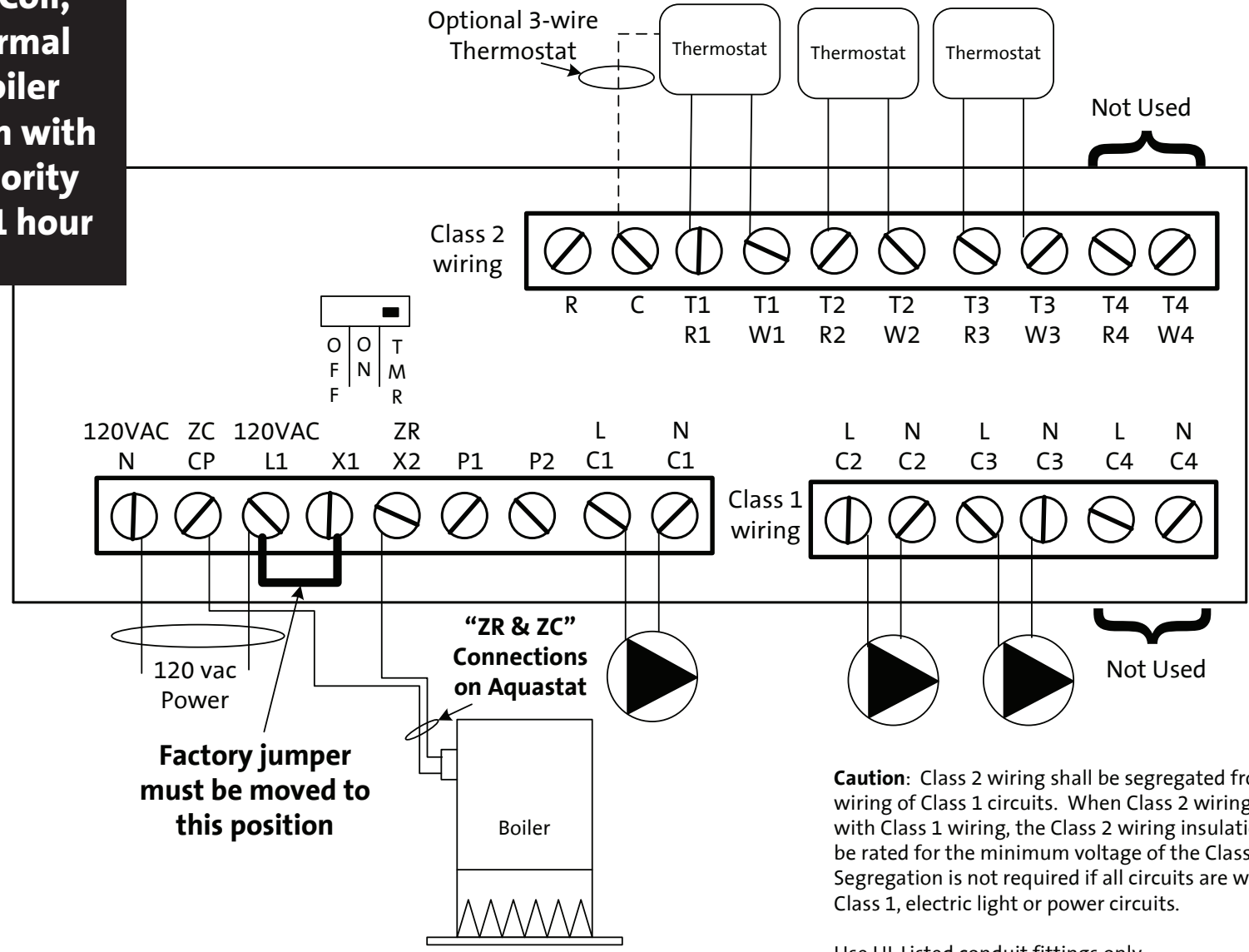


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Note: Place the Priority Timer switch in the ON position.

Use UL Listed conduit fittings only.

**Tankless Coil,
High Thermal
Mass, Boiler
Application with
Zone 1 Priority
active for 1 hour**



**Factory jumper
must be moved to
this position**

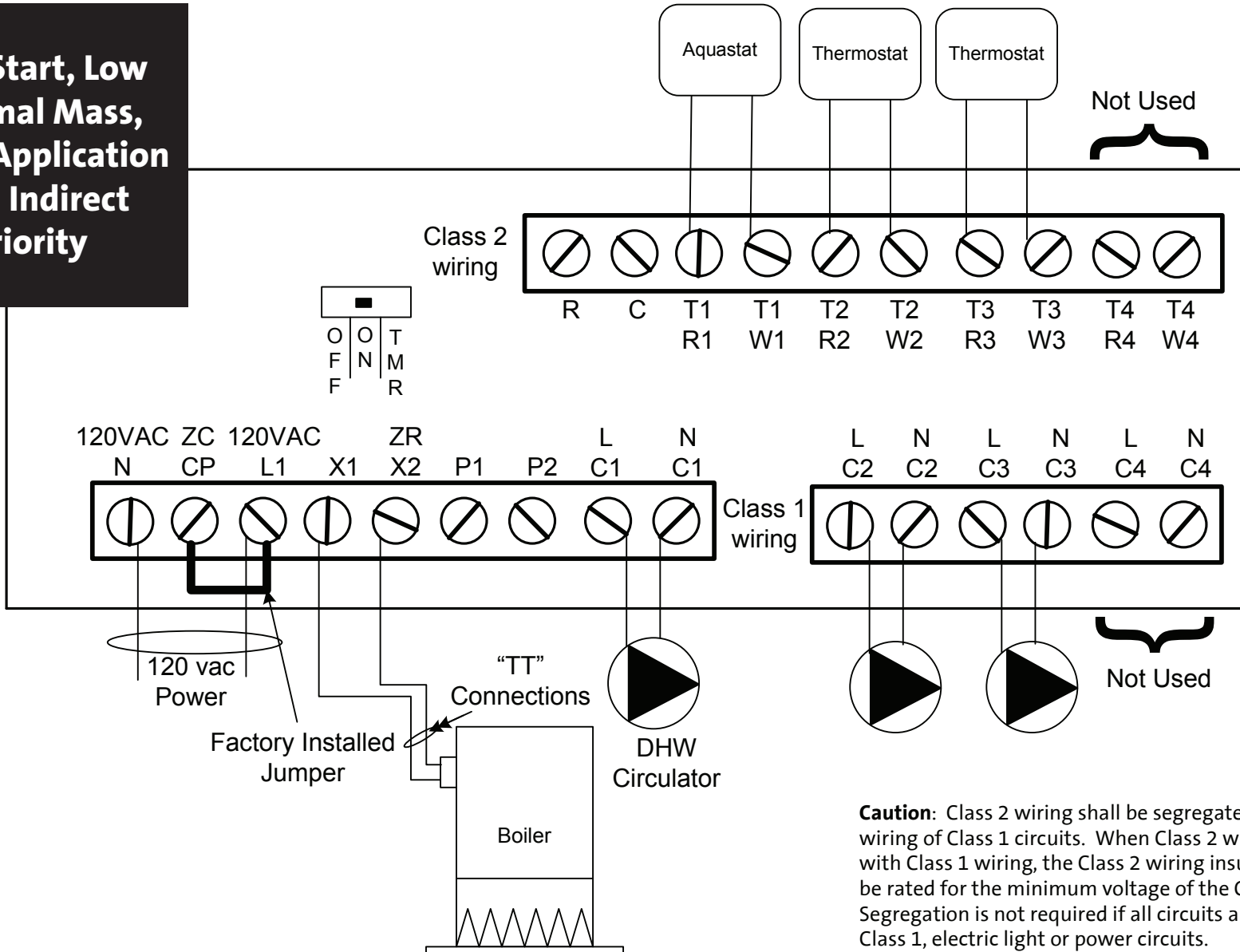
**"ZR & ZC"
Connections
on Aquastat**

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Use UL Listed conduit fittings only.

Note: Place the Priority Timer switch in the **TIMER** position.

Cold Start, Low Thermal Mass, Boiler Application with Indirect Priority

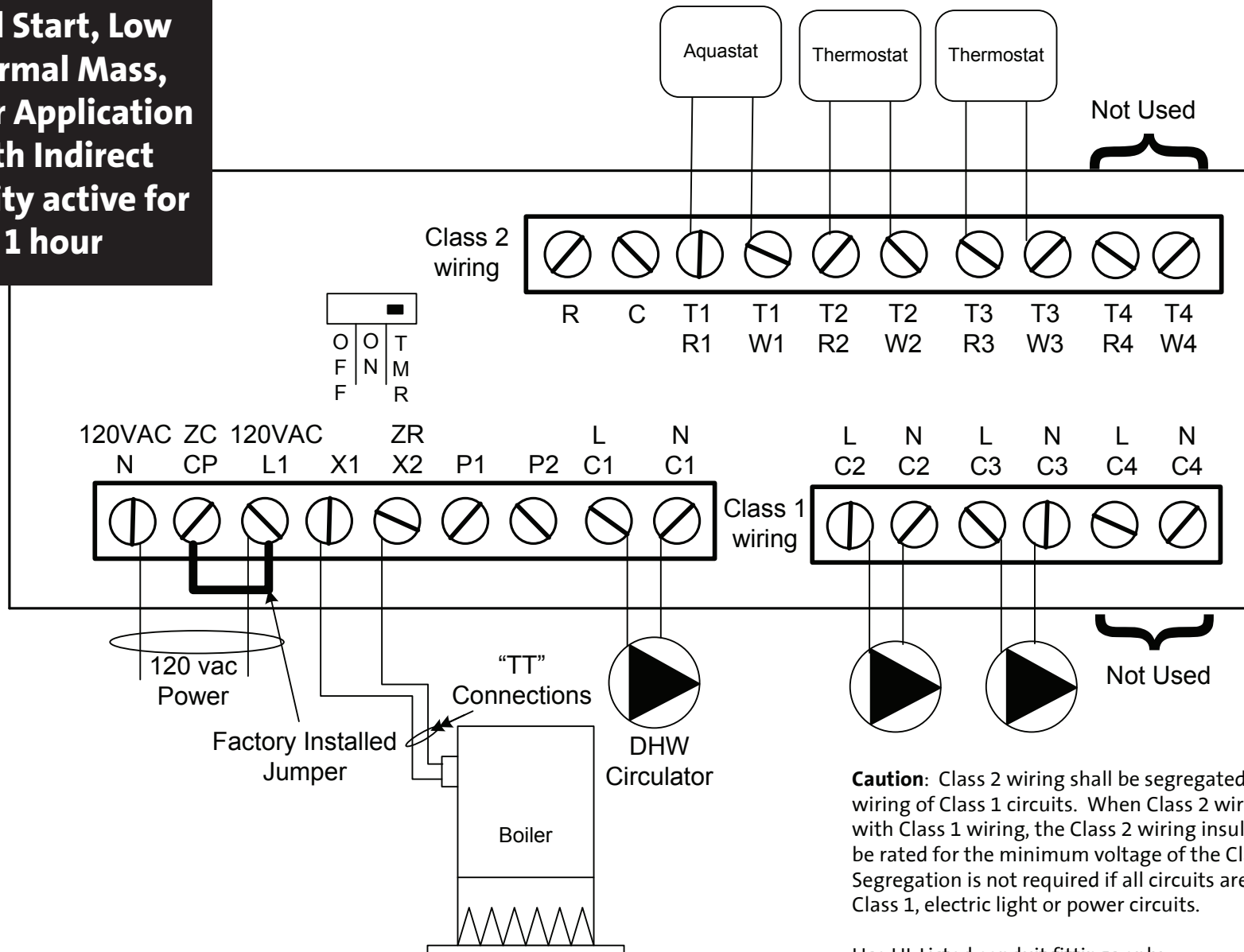


Caution: Class 2 wiring shall be segregated from the wiring of Class 1 circuits. When Class 2 wiring is routed with Class 1 wiring, the Class 2 wiring insulation shall be rated for the minimum voltage of the Class 1 wiring. Segregation is not required if all circuits are wired as Class 1, electric light or power circuits.

Use UL Listed conduit fittings only.

Note: Place the Priority Timer switch in the ON position.

Cold Start, Low Thermal Mass, Boiler Application with Indirect Priority active for 1 hour



Caution: Class 2 wiring shall be segregated from the wiring of Class 1 circuits. When Class 2 wiring is routed with Class 1 wiring, the Class 2 wiring insulation shall be rated for the minimum voltage of the Class 1 wiring. Segregation is not required if all circuits are wired as Class 1, electric light or power circuits.

Use UL Listed conduit fittings only.

Note: Place the Priority Timer switch in the TIMER position.

Troubleshooting tips for the UPZC-3

Symptom: The zone is calling for heat but the circulator is not turning ON.

Possible Cause(s)/Solution(s):

- 1) Is the UPZC power light illuminated green? If not, verify line voltage is properly connected to the 120VAC terminals and using a Digital Multi Meter (DMM), verify 120VAC is present across all terminals
- 2) Have the Red and White thermostat wires been connected to the proper terminals on the UPZC? Note: If the Red wire is connected to R2 then the white wire must be connected to W2
- 3) Is the zone LED illuminated Yellow? If Yes, verify the circulator has been wired to the corresponding output. Also, using a DMM verify that 120VAC is present across the C2 terminals. Example: If the thermostat is connected to R2 & W2 the output must be wired to the C2 & C2 terminals.
- 4) Is there a jumper between 'Line' and ZC/CP or X1? If not, reference the drawings and determine the desired position.
- 5) Is the priority LED illuminated? If the priority LED is illuminated then the other zones will not be enabled until the priority is Off.
- 6) Is the priority timer switch in either the On or Timer position? If the priority timer switch is in the ON position the other circulators will not be enabled until the priority on zone 1 has expired. If the switch is in the Timer position, then the other zones will be enabled when the timer has expired, maximum 1 hour, or if zone 1 is satisfied prior to the expiring.
- 7) Is the relay firmly seated in the socket with the holder installed? If not push on the top of the relay so that its firmly seated in the socket. The wire bracket (holder) should fit snugly over the relay.
- 8) Switch the relay with another. Since the relays are Socketed they can be easily switched with another which will prove if the relay is defective.
- 9) If the problem still exists, it could be air in the system. Try bleeding the baseboard, radiators, etc.

Technical Information

Model	UPZC-1	UPZC-3	UPZC-4/6
Part Number	96741787	96741788	96741789
Number of Zones	1	3	4 to 6
Priority Feature	No	Yes	Yes
Priority Timer (min.)	N/A	60	60
Input Power 60HZ	120VAC +/- 10%		
Transformer Voltage	120VAC, 24V, 15VA, Class 2		
Thermostat output (Amps)	0.13A		
Max Single Phase Motor Rating (per Zone)	1/3Hp, 10A, GP		
Max Combined Load Rating: Output @ 120VAC (Amps)	10A	30A	
Min/Max Ambient Temperature Range	32DF (0DC) / 104DF (40DC)		
Max Operating Humidity Range: % RH	95%		
Number of Knockouts	4	14	
Size of Knockouts (in.)	7/8-inch		
UPZC Dimensions: W x H x D (in.)	5-3/16 x 4-5/15 x 2-15/16	15 x 11-3/8 x 4-7/8	
Relay Type	DPDT Socketed		
Approvals	UL-873, CAN/CSA C22.2 No. 24		
Warranty	36-months from date of manufacture		

Universal Service Relay	
Part Number: 10ea.	96741790

UPZC Zone Control Cross-reference

Grundfos	B&G	Taco	Erie Controls	Argo	Honeywell	White-Rodgers
UPZC-1	ZT-1X	SR501	SR 100	AR821 AR822	RA89A (2) RA832A (1) RA845A (1)	889-189 (2) 829-845 (1)
UPZC-3	ZT-2, ZT-3	SR502 SR503	SR20 SR301	AR302 AR303 AR861-3	R8886A1007	
UPZC-4/6	ZT-4, ZT-6	SR504 SR506	SR601	AR304 AR306 AR-842 AR866	R8886A1005	

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To obtain service under this warranty, the defective product must be returned to the distributor or dealer of GRUNDFOS products from which it was purchased together with proof of purchase and installation date, failure date, and supporting installation data. Unless otherwise provided, the distributor or dealer will contact GRUNDFOS or an authorized service station for instructions. Any defective product to be returned to GRUNDFOS or a service station must be sent freight prepaid; documentation supporting the warranty claim and/or a Return Material Authorization must be included if so instructed.

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U.S.A.
Grundfos Pumps Corporation
17100 W. 118th Terrace
Olathe, KS 66061
Telephone (913) 227-3400
Fax: (913) 227-3500

Canada
Grundfos Canada, Inc.
2941 Brighton Road
Oakville, Ontario L6H 6C9, Canada
Telephone: (905) 829-9533
Fax: (905) 829-9512

Mexico
Bombas Grundfos de Mexico, S.A. de C.V.
Boulevard TLC No. 15
Parque Industrial Stiva Aeropuerto
Apodaca, N.L. Mexico
C.P. 66600 Apodaca, N.L. Mexico
Telephone: 011-52-81-8144-4000
Fax: 011-52-81-8144-4010

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