Z-one™ Relay
WIRING GUIDE

The ZSR101 is a versatile single relay control with two outputs for operating a 120 VAC pump with boiler enable, or two 120 VAC devices without boiler enable. Features include rear knock outs for 4x4 junction box mounting, convenient pre-installed jumper for pump operation, and 10 amp total load rating.

The ZSR Series of controls is for zoning using pumps. Up to 6 zone pumps (model dependent) along with a primary pump can be operated. Zone priority is selectable with 1-hour time-out feature. Other features include pump exercising, selectable post purge, and 3 pump ground terminals for simplified wiring.

The ZVR Series of controls is for zoning using zone valves. Up to 6 valves (model dependent), along with a system pump, secondary pump(s), and primary pump can be operated. Zone priority is selectable with 1-hour time-out feature. System pump status (on\off) during priority is also selectable. Replaceable snap-fit 40 VA transformer standard for 3 & 4 zone models – expandable to 80 VA with 2nd transformer. 6 zone model has two 40 VA (80 VA) transformers.

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Conforms to UL Standard 873

CALEFFI Hydronic Solutions

Form 031914 rev.1

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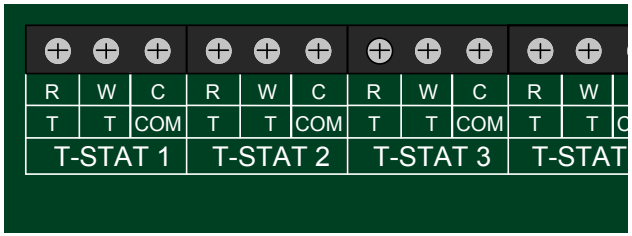
Caleffi shall not be liable for damages resulting from misapplication or misuse of it products.

Z-one Thermostat Connections

All Caleffi Z-one controls use the same interface to connect to thermostats. This interface is very flexible and allows many different types of thermostats to be connected to the control including 2, 3 and 4 wire versions. In addition, any type of switching device can be used to signal a heat demand by connecting the R & W (T & T) terminals together. The terminals are dual labeled to help simplify wiring.

Z-one T-stat interface



Description

R = 24 VAC Supply

W = Heat Call

C = 24 VAC Common

Function

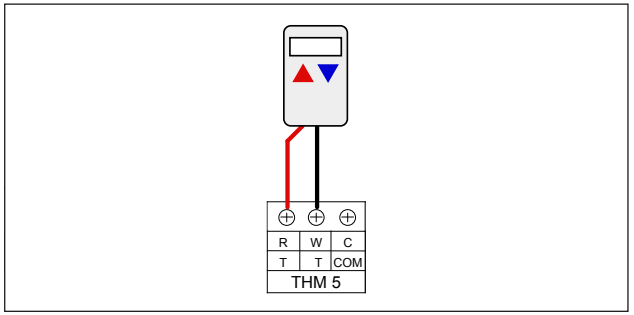
R&W: When connected, signals a heat demand.

R&C: Provides 24 VAC to powered thermostats.

WARNING: NEVER CONNECT R & C DIRECTLY, this will be a direct short on the 24 VAC supply

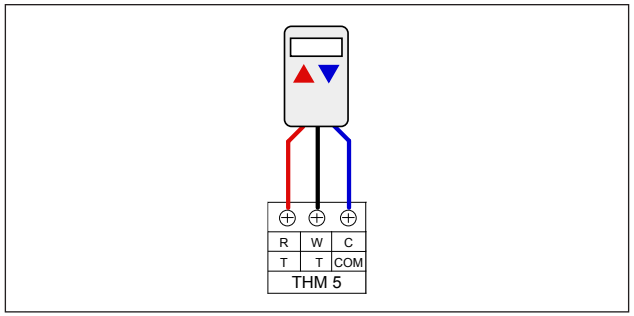
2-Wire Thermostats

There are a few different types of 2 wire thermostats including bi-metallic, power stealing and battery powered. All of these thermostats connect in the same manner to the Caleffi Z-one series of controls. Connect R to R and W to W. See below.



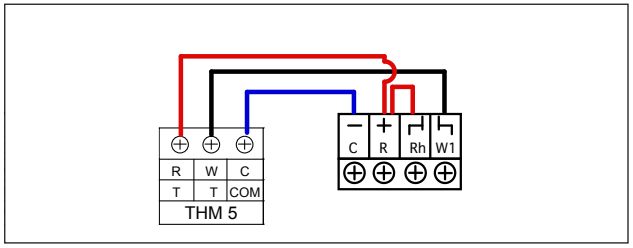
3-Wire Thermostats

Three wire thermostats get their power from the control they are connected to. R & C from the Z-one Control supply 24 VAC to the thermostat at all times while the W lead signals a heat demand.



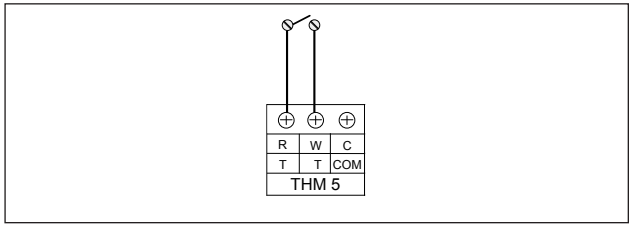
4-Wire Thermostats

To connect a 4-wire thermostat to the Z-one series controls, connect R to R, W to W and C to C. A jumper in the thermostat is also required between R & Rh as shown below. Similar to a 3-wire thermostat, R & C from the Z-one Control supply constant 24 VAC to the thermostat.



Dry Contacts

A heat demand can also be initiated by any type of device that has dry contacts (dry contacts are a set of contacts that open and close but do not have any voltage present until supplied from an outside source). The end switch on a Z-one series zone valve is an example of a dry contact. Using a dry contact to connect R to W will initiate a heat demand.



Always refer to the thermostat manufacturer's instructions.

SAFETY INSTRUCTION
This safety alert symbol will be used in this manual to draw attention to safety related instructions. When used, the safety alert symbol means ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED! FAILURE TO FOLLOW THESE INSTRUCTIONS MAY RESULT IN A SAFETY HAZARD.

CAUTION: All work must be performed by qualified personnel trained in the proper application, installation, and maintenance of systems in accordance with all applicable codes and ordinances.

CAUTION: Electrical shock hazard. Disconnect power before installation to prevent electrical shock or equipment damage. Make sure all connections are in accordance with the electrical wiring diagram and in accordance with national and local electrical codes.

CAUTION: Avoid electrical noise interference. Do not install near large conductors, electrical machinery, or welding equipment. Avoid locations where excessive moisture, corrosive fumes, vibration, or explosive vapors are present.

Caleffi shall not be liable for damages resulting from misapplication or misuse of it products.

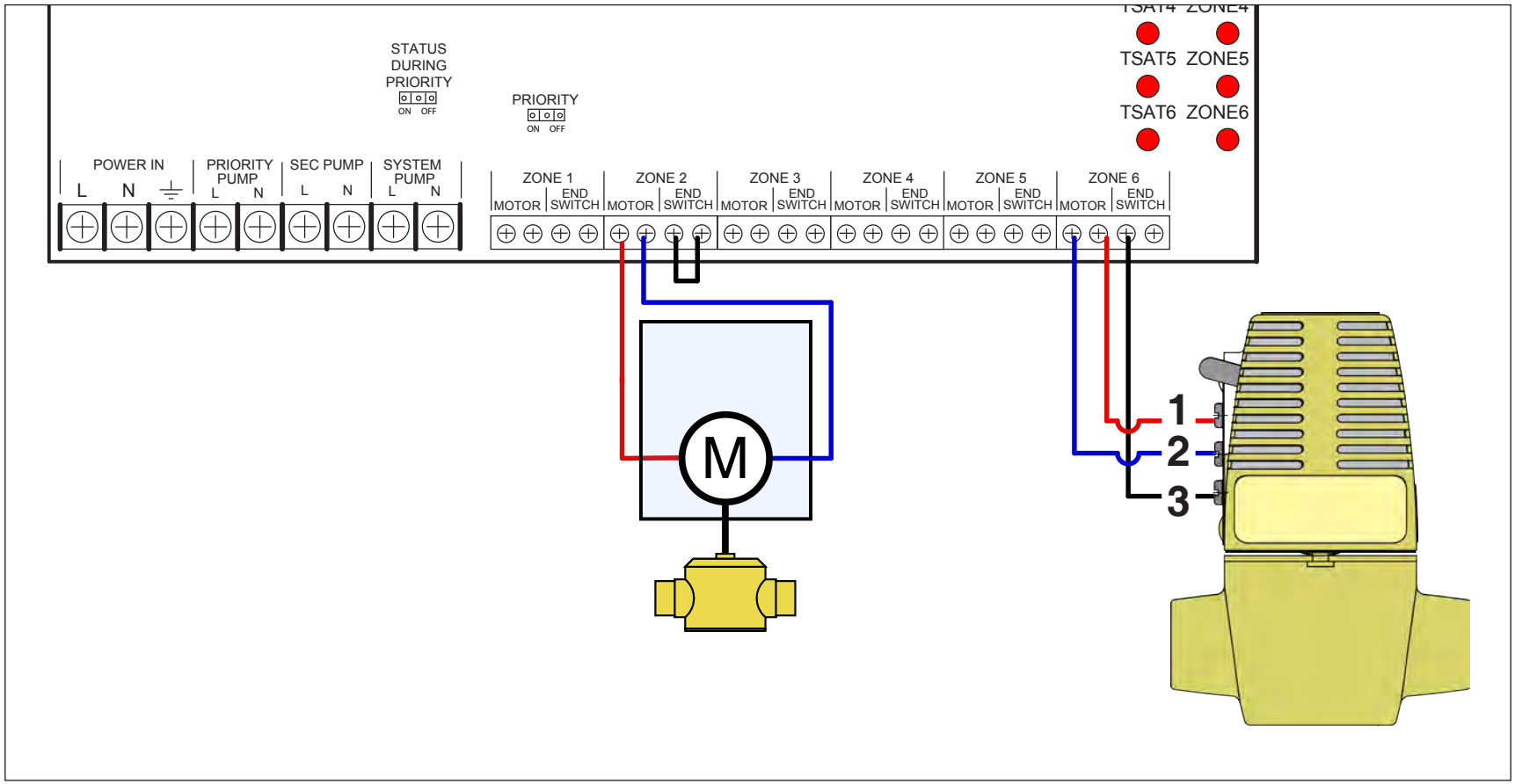
Wiring of 2 wire or 3 zone valve to Caleffi Z-one Relay

Wiring a 2 wire zone valve to Caleffi Z-one Relay

Since a two wire actuator does not have an end switch for feedback to the relay box, the end switch terminals must have a jumper to simulate the end swith. If the end switch jumper is not installed, no demand will be sent to the boiler and the pumps will not turn on.

Wiring a 3 wire zone valve to Caleffi Z-one Relay

The Taco 570 zone valve presents a unique wiring challenge. When connecting the Taco 570 zone valve to the Caleffi Z-one Relay, the wiring of this valve can only be done in one way. The left motor terminal on the ZVR series control must be connected to terminal 2 on the zone valve. The right motor terminal must be connected to terminal 1 on the zone valve. Lastly, the left end switch terminal must be connected to terminal 3 on the zone valve. Failure to follow schematic will lead to damage of product.



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Z-one™ Relay

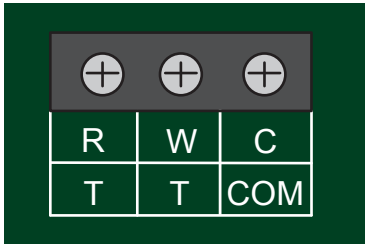
ZSR101 - Single Zone Switching Relay

Overview

- Compatible with 2, 3 and 4-wire thermostats or other low voltage controllers with switching action
- 120 VAC input
- Heavy duty, sealed, DPDT, fuse protected relay (with spare fuse)
- Two dry contact outputs (Relay 1 and Relay 2) for operating 120 VAC pump with boiler enable or two devices without boiler enable
- 5 A capacity each relay - 10 A total
- Rear knock-outs for mounting onto 4”x4” junction box
- High capacity 6VA transformer
- Simplified wiring with pre-installed jumper
- 100% factory tested with 3 year warranty
- ETL certified

See technical brochure 01284-14 NA for more product information.

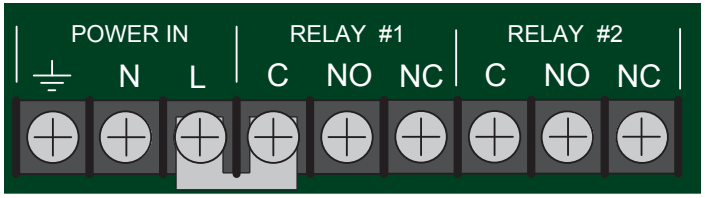
Operating Principles



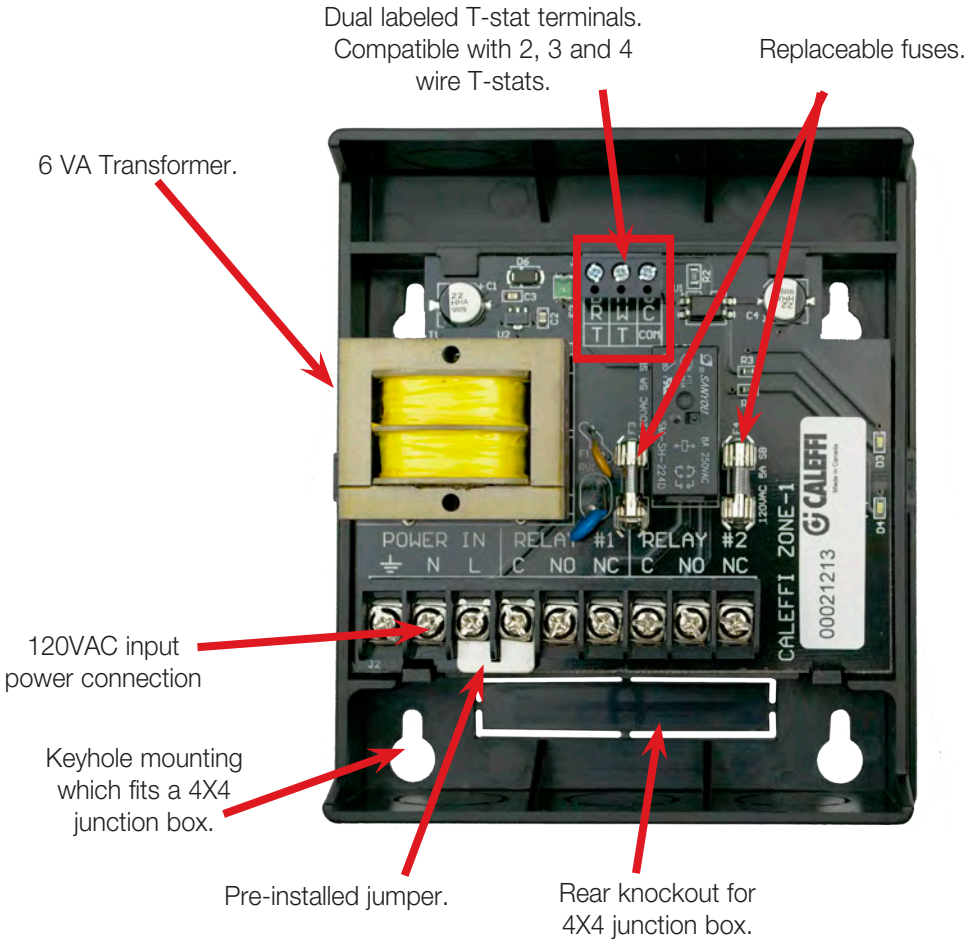
When a zone has a demand from a thermostat (TT or R W) the relay will close sending 120 VAC to Relay #1 NO terminal and switching the pump on, and the C to NO dry contact on relay #2 closes, signaling the boiler of a heating demand.

R, W, C and T T Comm dual labeling at thermostat terminals. Compatible with low voltage 2, 3, or 4 wire thermostats or any other low voltage devices having a switching action.

Supply 120 VAC hot to terminal L and 120 VAC neutral to N. A factory installed jumper from L terminal to the C terminal of Relay 1 is supplied for simplified pump connection.



If dry contacts are desired from relay #1, remove the factory installed jumper between L and C.



Cover removal

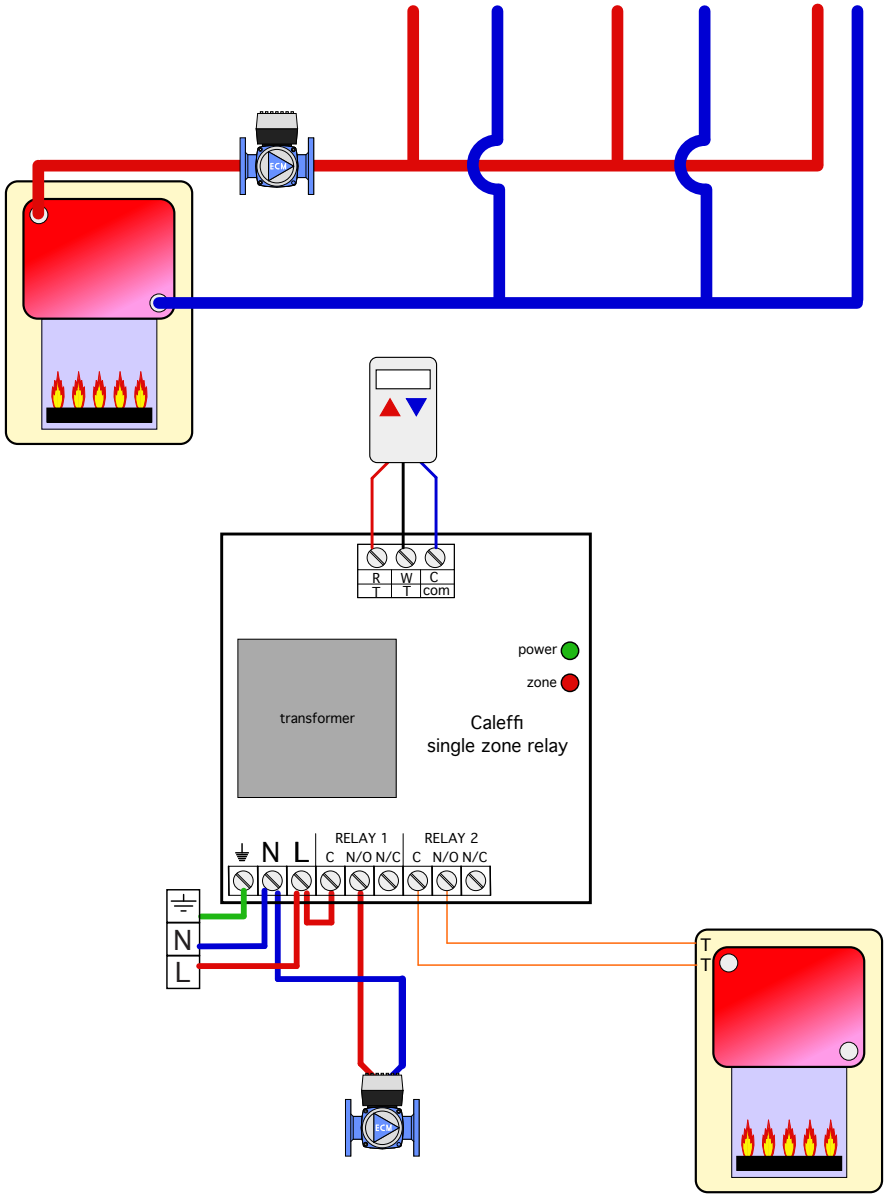
Hold either the left or the right end of the box up and at an angle. Use body for stabilizing relay box. Insert screwdriver and push tab inward.

Turn box and repeat inserting screwdriver and pushin tab inward on opposite side, cover should release from base.

Slide cover off base.

Mounting: Do not mount to a surface that exceeds 115°F (45°C). The unit must be only located in dry interior locations. Use only copper conductor supply wire suitable for at least 105° C. All circuits must have a common disconnect and be connected to the same pole of the disconnect. It is not suitable for installation in hazardous locations.

A1 - Single thermostat



Hydronic diagram is for illustration purposes only, some components have been removed for simplicity.

Description of terminals

⏚ = Ground

N = Neutral (Common leg of 120 VAC)

L = Line (live leg of 120 VAC)

C = Common terminal

NO = Normally Open terminal

NC = Normally Closed terminal

Note: There is a factory installed jumper between the 120 VAC line (L) and the common terminal of relay #1 (C).

Thermostat terminals

R = 24 VAC

W = Heat call

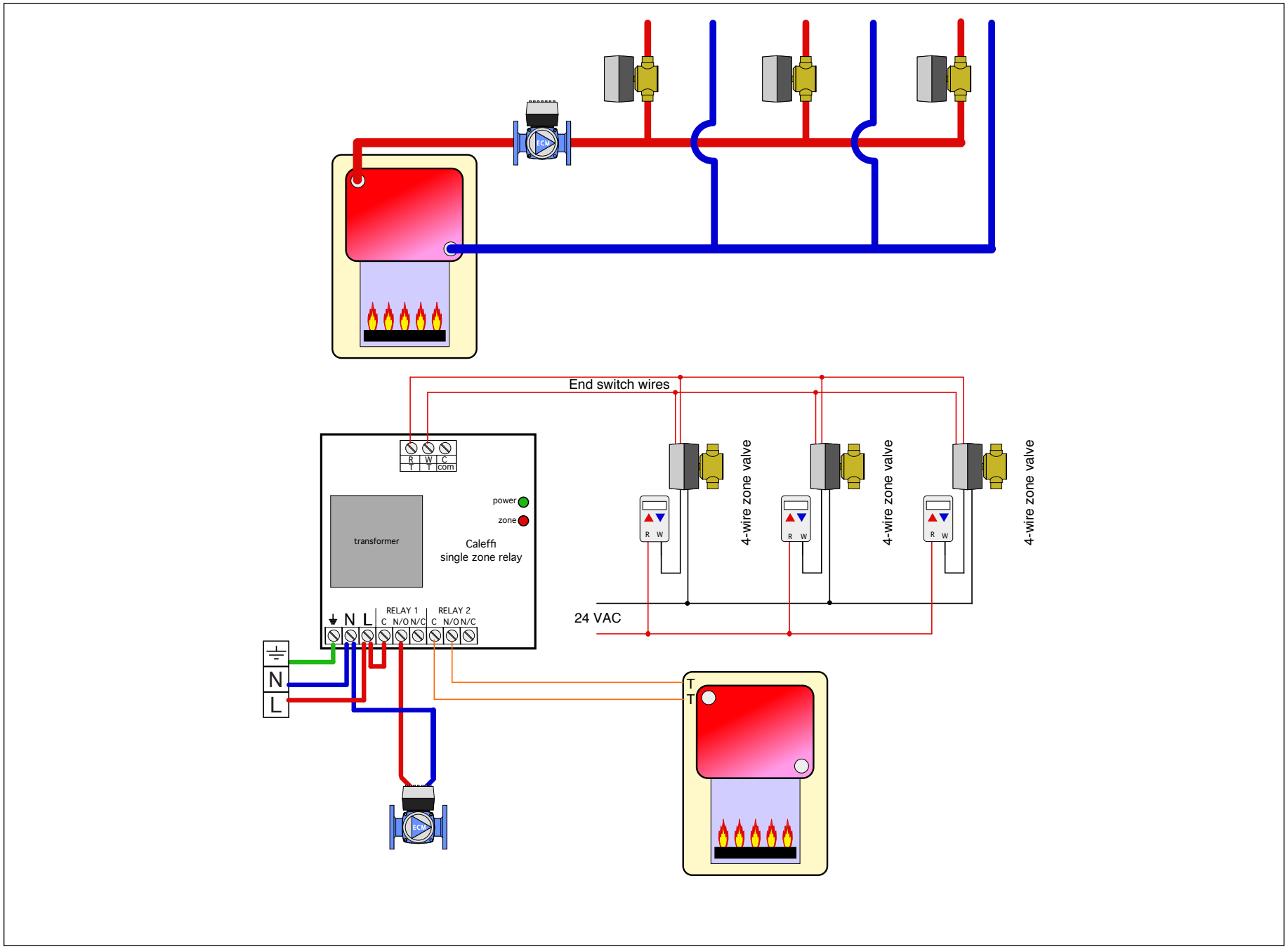
C = Common of 24 VAC

WARNING: NEVER CONNECT R & C DIRECTLY, this will be a direct short on the 24 VAC supply

Sequence of Operation / Settings

- A demand occurs and closes RW (TT)
- Relay #1 and relay #2 both fire connecting the common terminal to the NO terminal.
- If the factory installed jumper has not been removed, the NO terminal of relay #1 will deliver the hot leg of 120 VAC. Relay #2 has dry contacts.
- The zone LED illuminates.
- The demand is satisfied and opens RW (TT).
- The relay contacts return to their normal position (common to normally closed).
- The zone LED turns off.

A2 - Multiple thermostats



Hydronic diagram is for illustration purposes only and could be missing system components.

Description of terminals

⏚ = Ground

N = Neutral (Common leg of 120 VAC)

L = Line (live leg of 120 VAC)

C = Common terminal

NO = Normally Open terminal

NC = Normally Closed terminal

Note: There is a factory installed jumper between the 120 VAC line (L) and the common terminal of relay #1 (C).

Thermostat terminals

R = 24 VAC

W = Heat call

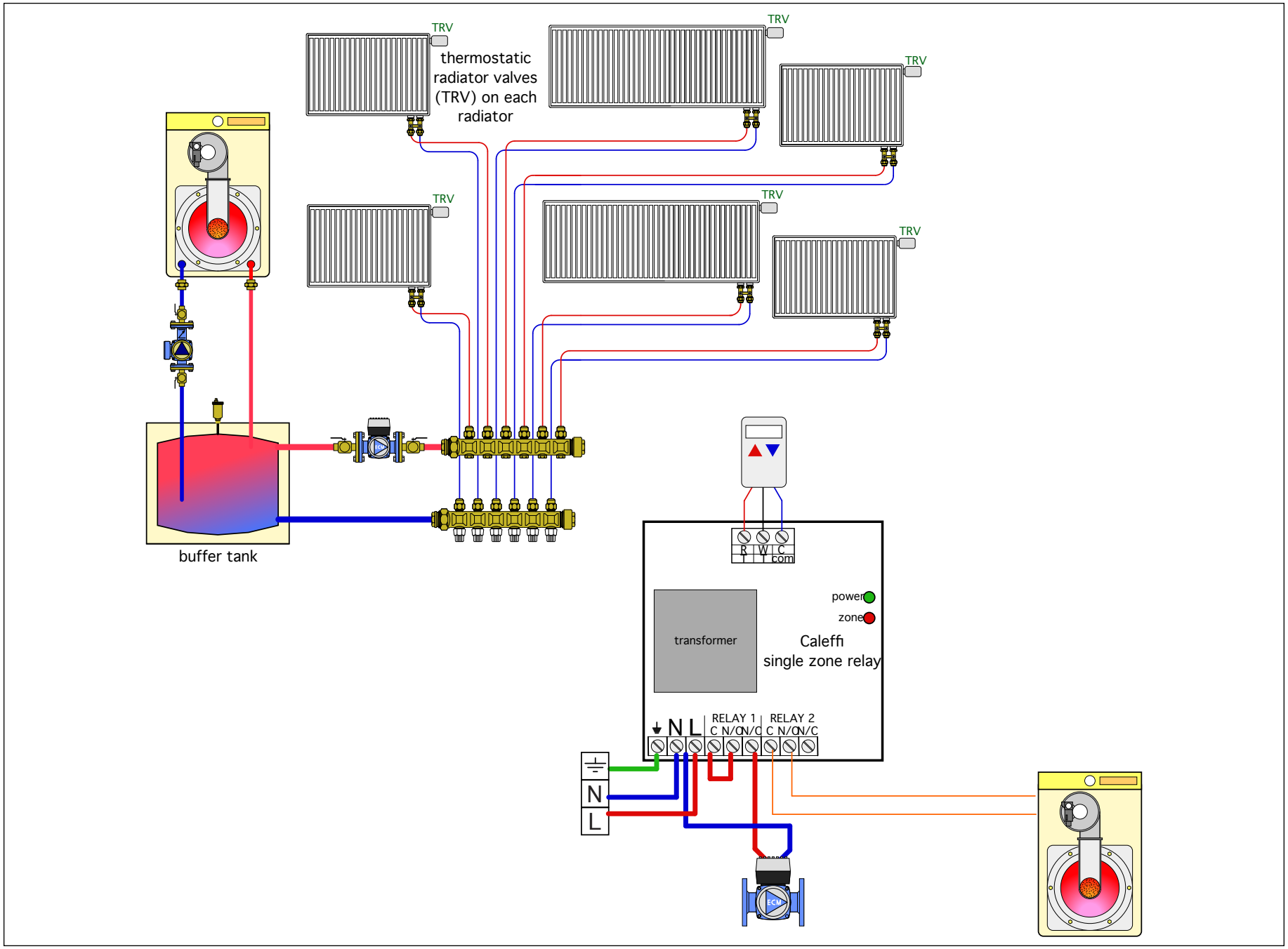
C = Common of 24 VAC

WARNING: NEVER CONNECT R & C DIRECTLY, this will be a direct short on the 24 VAC supply

Sequence of Operation / Settings

- There is a demand by one of the t-stats which sends power to the corresponding zone valve.
- When the zone valve opens, its end switch contacts close and signal a demand to the RW (TT) contacts on the single zone relay control.
- Relay #1 and relay #2 fire
- If the factory installed jumper has not been removed, the NO terminal of relay #1 will deliver the hot leg of 120 VAC thus firing the pump.
- Relay #2 closes the TT contacts on the boiler signally a demand.
- The Zone LED illuminates.
- When the last of the T-stats is satisfied, the corresponding zone valves closes which opens the end switch contacts.
- The relay contacts return to their normal position turning off power to the system pump and opening the RW (TT) contacts.
- The Zone LED turns off.

A3 - Single master thermostat, panel radiators with TRVs, variable speed pump



Hydronic diagram is for illustration purposes only, some components have been removed for simplicity.

Description of terminals

⏚ = Ground

N = Neutral (Common leg of 120 VAC)

L = Line (live leg of 120 VAC)

C = Common terminal

NO = Normally Open terminal

NC = Normally Closed terminal

Note: There is a factory installed jumper between the 120 VAC line (L) and the common terminal of relay #1 (C).

Thermostat terminals

R = 24 VAC

W = Heat call

C = Common of 24 VAC

WARNING: NEVER CONNECT R & C DIRECTLY, this will be a direct short on the 24 VAC supply

Sequence of Operation / Settings

- A single “master” thermostat is wired to the ZSR101 control. The master thermostat is set to a slightly higher set point than the desired room temperatures on the thermostatic radiator valves.
- When the temperature drops below the thermostat’s set point, a heat demand is initiated by closing the R & W terminals.
- Relay #1 and relay #2 both fire.
- If the factory installed jumper has not been removed, the NO terminal of relay #1 will deliver 120 VAC line to the variable speed circulator.
- Relay #2 closes the TT contacts on the boiler signaling a demand.
- The Zone LED illuminates.
- Using an outside air sensor and system temperature sensor located in the buffer tank, the boiler determines if the water in the boiler meets the target temperature based off the outside air reset curve.
- As long as the master thermostat is calling, the boiler will maintain the buffer tank to the target temperature.
- The thermostatic radiator valves modulate the flow through the panel radiators because the variable speed circulator is enabled.
- When the master thermostat reaches set point, the master thermostat will open the contact between R & W.
- The relay contacts return to their normal position turning off power to the variable speed circulator and opening the RW (TT) contacts. Both the boiler and pump are no longer enabled.
- The Zone LED turns off.

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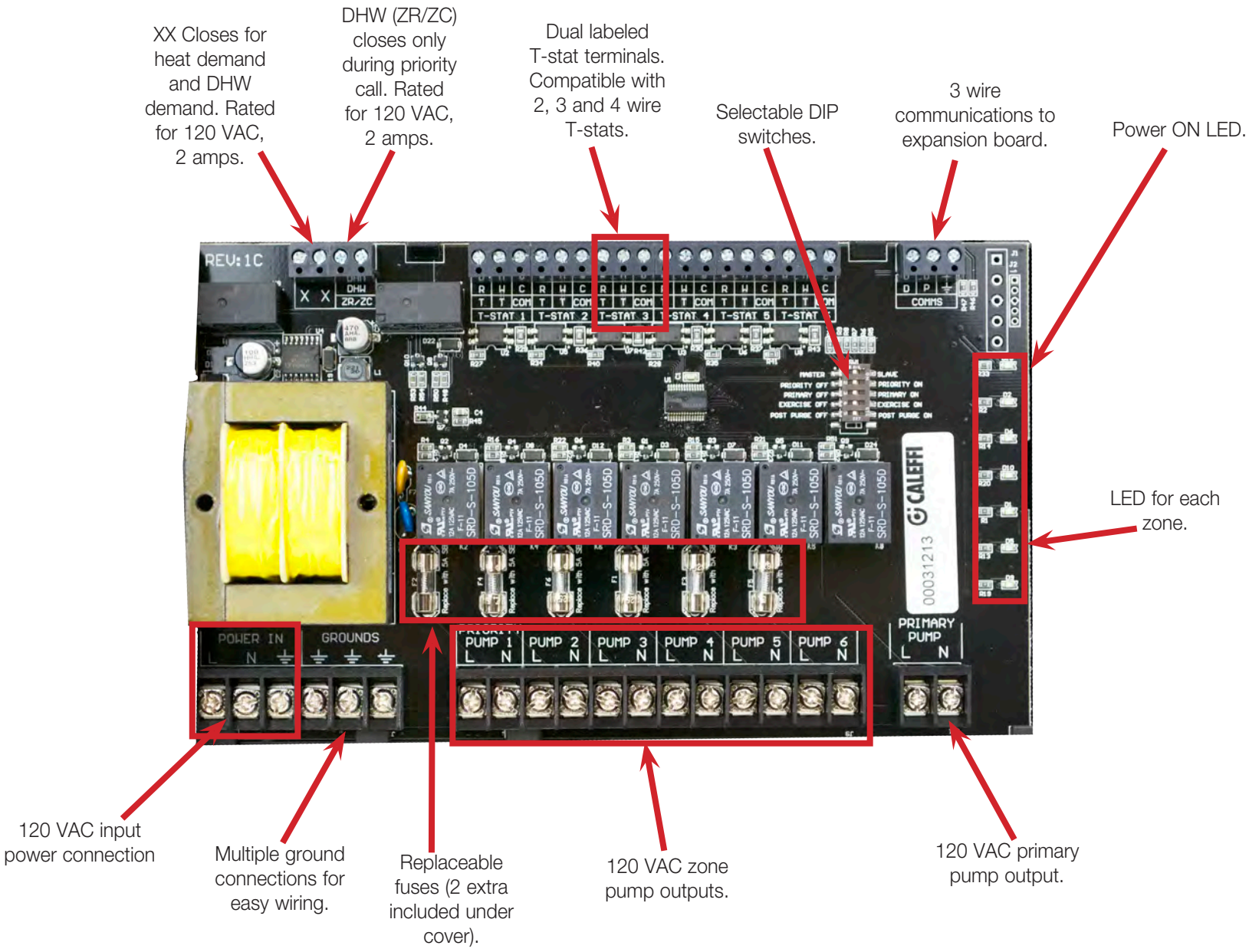
Z-one™ Relay

ZSR10X - Multi-Zone Pump Control

Overview

- Compatible with low voltage 2, 3, or 4 wire thermostats
- R, W, C and TT Comm dual labeling at thermostat terminals
- Z-oneLink unlimited zone expansion
- 120 VAC pump outputs
- Selectable priority with 1 hour time-out feature
- Selectable post purge and exercise
- Dry contacts for DHW (ZR/ZC), capable of switching line voltage
- High capacity transformer
- Large terminal connections
- Simplified wiring with extra ground terminals
- Heavy duty sealed relays
- Fuse protected (with spare fuse)
- Front LED lights
- 100% Factory tested with 3 year warranty
- ETL approved

See technical brochure 01286-14 NA for more product information.


XX Closes for heat demand and DHW demand. Rated for 120 VAC, 2 amps.
DHW (ZR/ZC) closes only during priority call. Rated for 120 VAC, 2 amps.
Dual labeled T-stat terminals. Compatible with 2, 3 and 4 wire T-stats.
Selectable DIP switches.
3 wire communications to expansion board.
Power ON LED.
LED for each zone.
120 VAC input power connection
Multiple ground connections for easy wiring.
Replaceable fuses (2 extra included under cover).
120 VAC zone pump outputs.
120 VAC primary pump output.
REV:1C
POWER IN
GROUNDS
PUMP 1
PUMP 2
PUMP 3
PUMP 4
PUMP 5
PUMP 6
PRIMARY PUMP
T-STAT 1
T-STAT 2
T-STAT 3
T-STAT 4
T-STAT 5
T-STAT 6
COMMS
CALEFFI

Cover removal

Hold either the left or the right end of the box up and at an angle. Use body for stabilizing relay box.

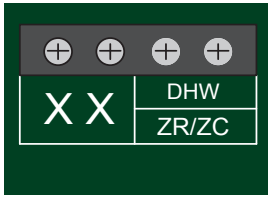
Insert screwdriver and push tab inward, cover should release from base.

Roll cover off base.

Mounting: Do not mount to a surface that exceeds 115°F (45°C). The unit must be only located in dry interior locations. Use only copper conductor supply wire suitable for at least 105° C. All circuits must have a common disconnect and be connected to the same pole of the disconnect. It is not suitable for installation in hazardous locations.

Maintenance and Repair: The Caleffi Z-one™ multi-zone pump control comes with two spare fuses. If control fails or is damaged, replace control with functional one.

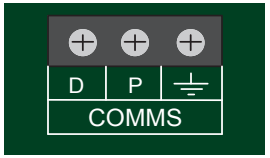
Boiler connections:



XX = Dry contacts rated up to 120 VAC, 2 Amps. Closes when any zone calls including priority. Typically connected to TT on boiler control.

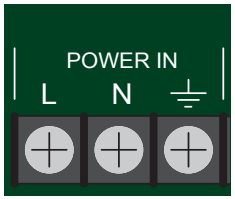
DHW (ZR/ZC) = Dry contacts rated up to 120 VAC, 2 Amps. Closes only when priority is enabled and calling. Typically used to close ZR\ZC (120 VAC) or DHW contacts (24 VAC) on boiler controls equipped with these features.

Communication connections:



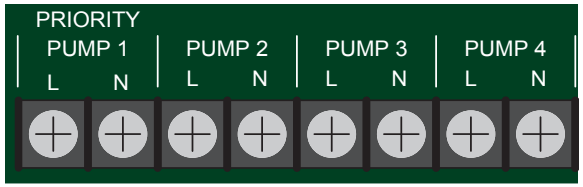
Connect terminals to matching terminal of slave boards
D to D, P to P, Ground to Ground

Input Power:

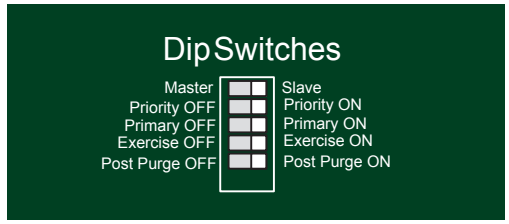


L = Line (hot leg) of 120 VAC supply
N = Neutral of 120 VAC
⏚ = Ground
Note: when connecting 2 or more Z-one controls, all controls must be powered by the same 120 VAC circuit.

Zone pump outputs:

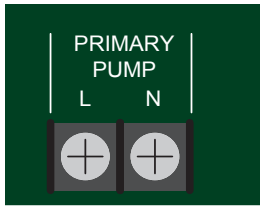


Zone pumps run when corresponding thermostat initiates a demand.
GROUND = Connect the ground from the pump to the ground terminal.
PRIORITY PUMP = Runs when zone #1 calls. Can be programmed to be the priority zone.
L = Line (hot leg) of 120 VAC to power the pump
N = Neutral leg of 120 VAC to power the pump



The DIP Switches on the ZSR series can be positioned for the following operations.
Master / Slave: allows for unlimited expansion to additional ZSR relays.
Priority OFF / Priority ON: When priority mode is ON, upon demand, zone 1 will operate as priority and all other zones are temporarily switched off (with 1 hour time-out). When priority mode is OFF, all zones remain active.
Primary OFF / Primary ON: When primary mode is ON, the primary pump will continue to operate during priority.
Exercise OFF / Exercise ON: When exercise mode is ON, each circulator is switched on for 30 seconds following 72 hours of inactivity.
Post Purge OFF / Post Purge ON: When post purge is ON, the priority pump continues operating for 2 minutes after the priority zone is switched off.

Primary pump output:



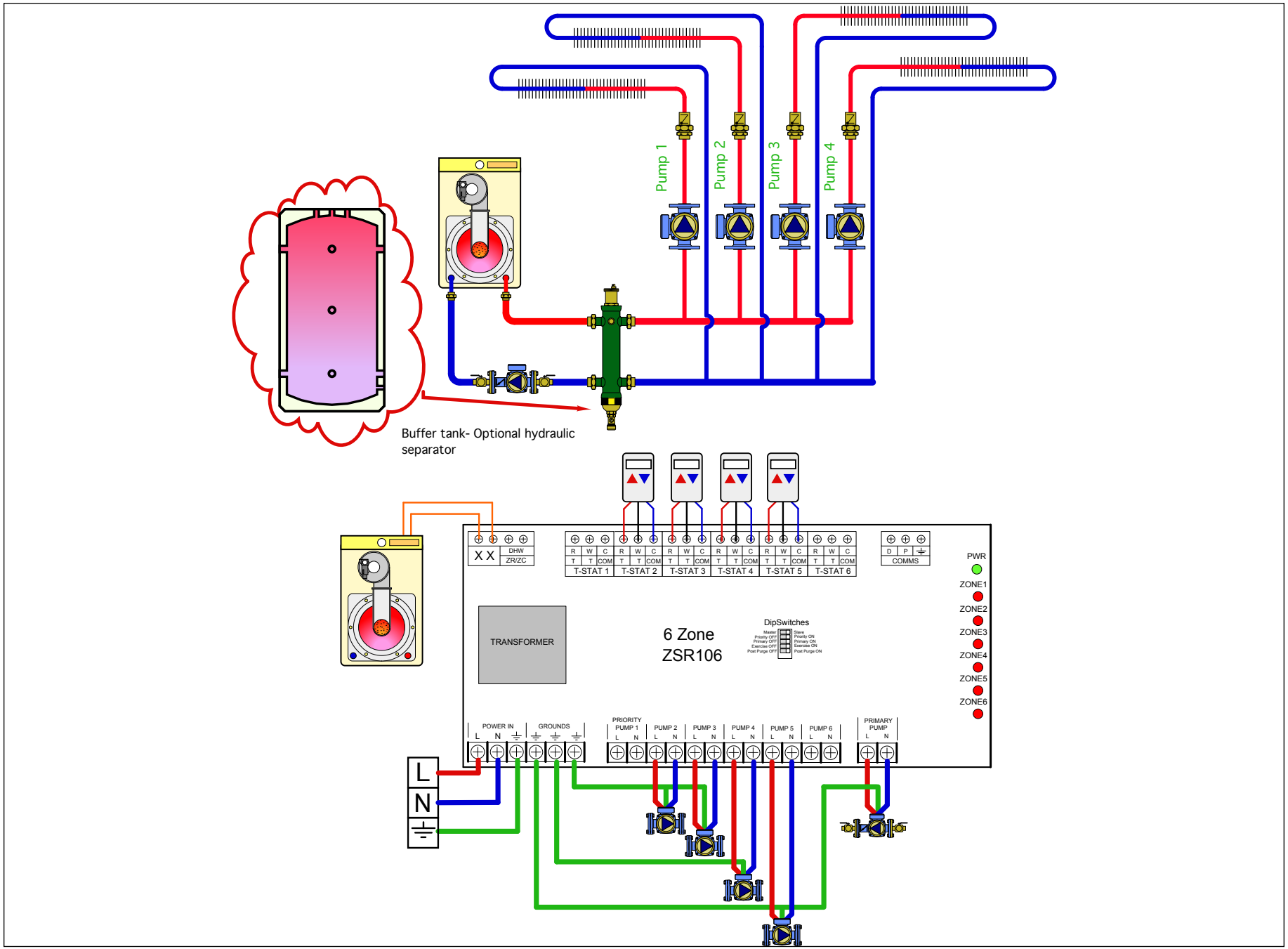
Primary pump runs when any zone pump runs. Its status during priority (on\off) can be programmed using the DIP switches.
L = Line (hot leg) of 120 VAC to power the pump
N = Neutral leg of 120 VAC to power the pump

WARNING: NEVER CONNECT R & C DIRECTLY, this will be a direct short on the 24 VAC supply.

WARNING: When connecting 2 or more Z-one controls, all controls must be powered by the same 120 VAC circuit.

WARNING: When replacing fuses, make sure power is disconnected to control box.

B1 - Mod/con boiler, hydro separator or buffer tank, zone pumps



Hydronic diagram is for illustration purposes only, some components have been removed for simplicity.

Description of terminals

⏚ = Ground

N = Neutral (Common leg of 120 VAC)

L = Line (Hot leg of 120 VAC)

Thermostat terminals

R = 24 VAC

W = Heat call

C = Common of 24 VAC

Boiler terminals

XX = Dry contacts rated up to 120 VAC, 2 Amps. Closes when any zone calls including priority. Typically connected to TT on boiler control.

DHW (ZR/ZC) = Dry contacts rated up to 120 VAC, 2 Amps. Closes only when priority is enabled and calling. Typically used to close ZR\ZC (120 VAC) or DHW contacts (24 VAC) on boiler controls equipped with these features.

Dip switch description

Master / Slave: Used when joining 2 or more controls together. Only one Master per group

Priority OFF / Priority ON: Used to set Zone #1 as the priority zone. All other zones will hold off during priority. Priority has a one hour time out feature to prevent freeze up.

Primary OFF / Primary ON: Sets the status of the primary pump when there is a priority call. This allows the DHW pump to be on either side of a hydro separator.

Exercise OFF / Exercise ON: When enabled the pumps will rub for 30 seconds after 72 hours without a demand.

Post Purge OFF / Post Purge ON: Allows the DHW pump to run for 2 minutes after the DHW demand has been satisfied.

WARNING: NEVER CONNECT R & C DIRECTLY, this will be a direct short on the 24 VAC supply

Sequence of Operation / Settings

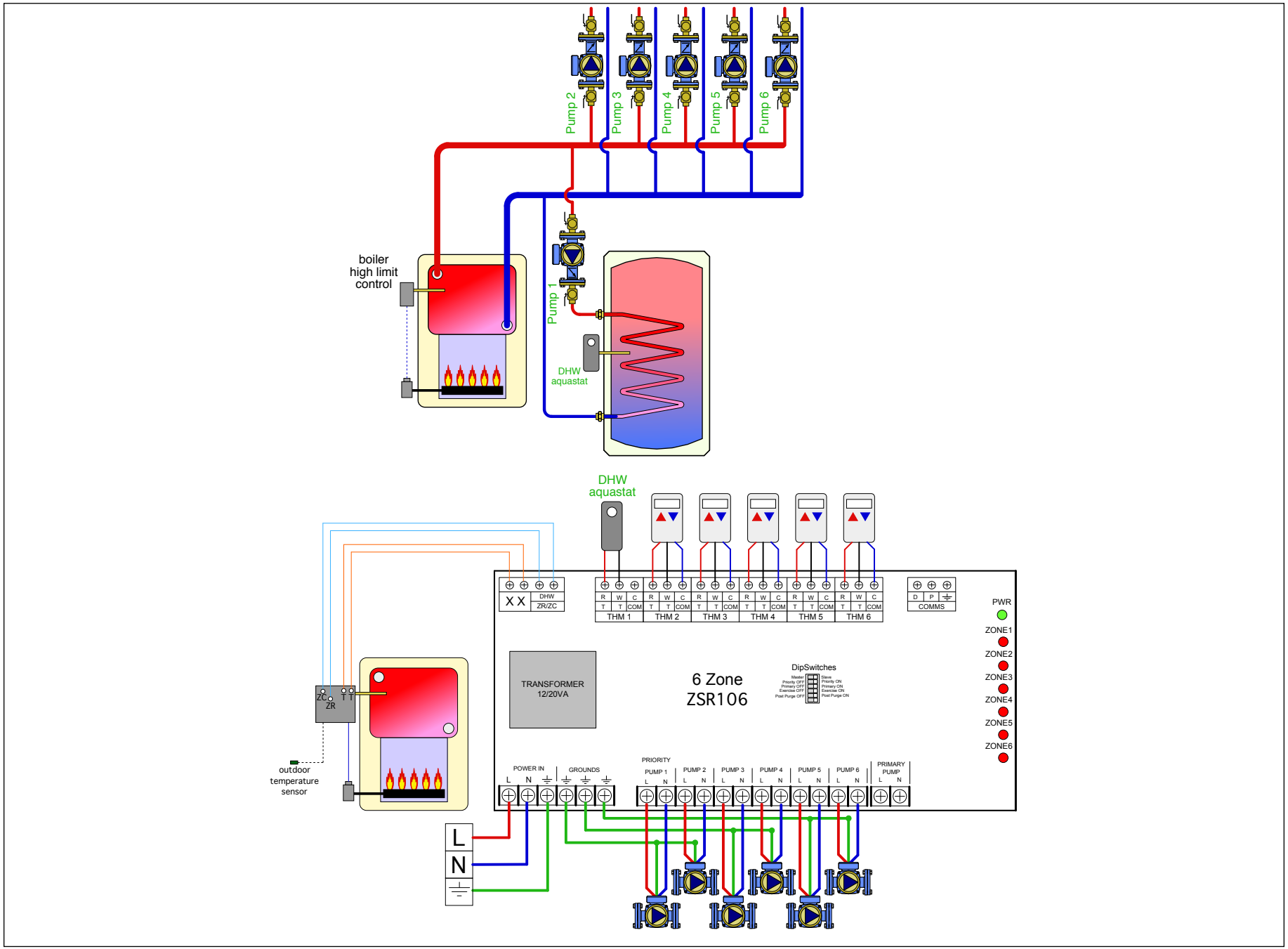
Priority switch: OFF

Master / Slave switch: Master

Status During Priority switch: OFF

- A demand occurs from any T-stat (T-stat closes TT terminals). The “PUMP ON” LED illuminates for that zone.
- ZSR control sends 120 VAC to the corresponding zone pump and the primary pump outputs, XX contacts close to signal boiler of a demand.
- When the demand from the last T-stat calling is satisfied (T-stat opens TT terminals), the XX contacts are opened, the “PUMP ON” LED turns off and the 120 VAC to the zone pump and primary pump outputs are dropped.

B2 - Traditional boiler, indirect DHW w/ priority, zone pumps



Hydronic diagram is for illustration purposes only, some components have been removed for simplicity.

Description of terminals

⏚ = Ground

N = Neutral (Common leg of 120 VAC)

L = Line (Hot leg of 120 VAC)

Thermostat terminals

R = 24 VAC

W = Heat call

C = Common of 24 VAC

Boiler terminals

XX = Dry contacts rated up to 120 VAC, 2 Amps. Closes when any zone calls including priority. Typically connected to TT on boiler control.

DHW (ZR/ZC) = Dry contacts rated up to 120 VAC, 2 Amps. Closes only when priority is enabled and calling. Typically used to close ZR\ZC (120 VAC) or DHW contacts (24 VAC) on boiler controls equipped with these features.

Dip switch description

Master / Slave: Used when joining 2 or more controls together. Only one Master per group

Priority OFF / Priority ON: Used to set Zone #1 as the priority zone. All other zones will hold off during priority. Priority has a one hour time out feature to prevent freeze up.

Primary OFF / Primary ON: Sets the status of the primary pump when there is a priority call. This allows the DHW pump to be on either side of a hydro separator.

Exercise OFF / Exercise ON: When enabled the pumps will rub for 30 seconds after 72 hours without a demand.

Post Purge OFF / Post Purge ON: Allows the DHW pump to run for 2 minutes after the DHW demand has been satisfied.

WARNING: NEVER CONNECT R & C DIRECTLY, this will be a direct short on the 24 VAC supply

Sequence of Operation / Settings

Priority switch: ON (Zone #1 becomes priority)

Master/Slave switch: Master

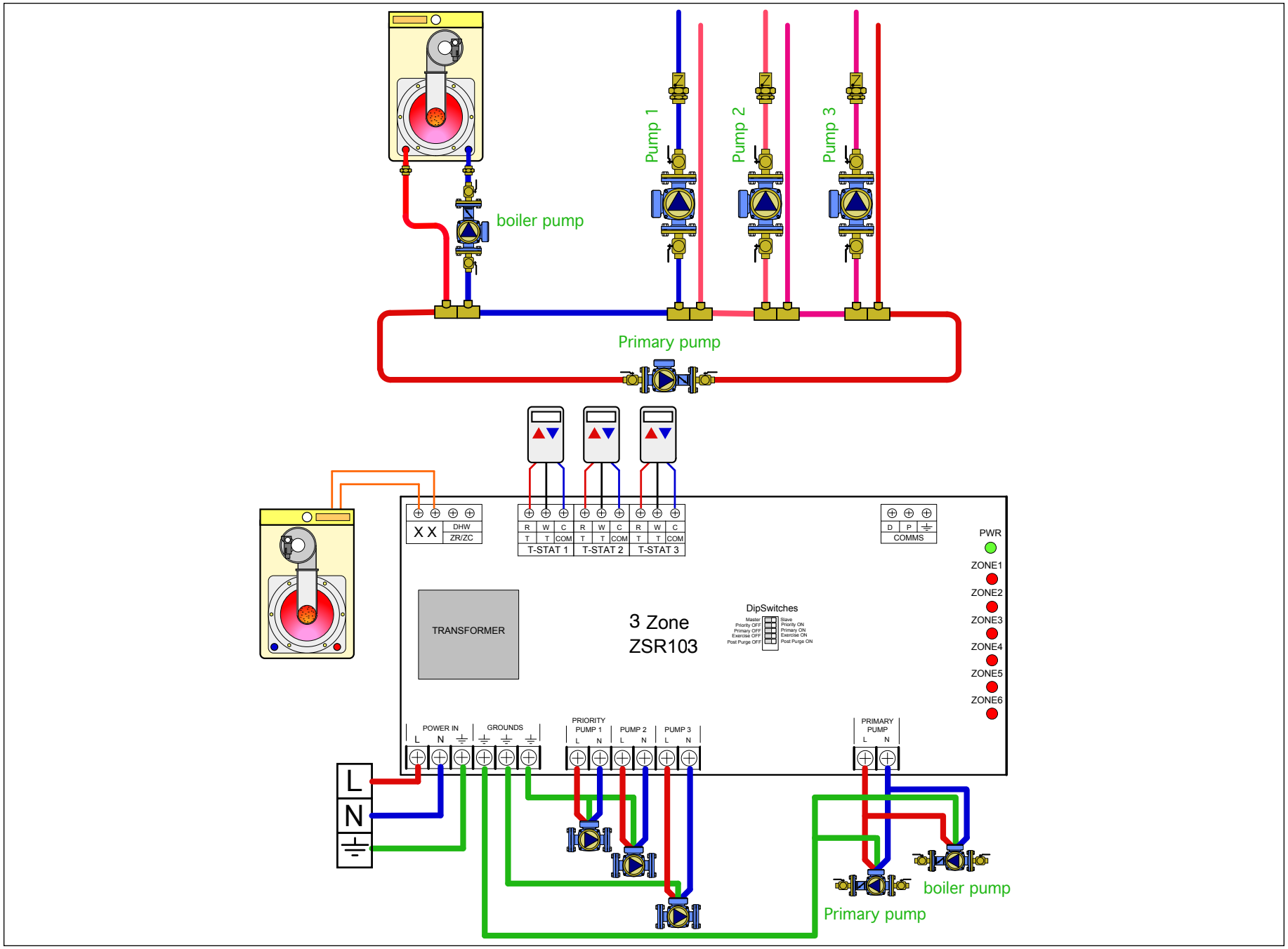
Primary Status During Priority switch: OFF

- A demand occurs from a T-stat (T-stat closes TT terminals) in zones 2 thru 6.
- The “PUMP ON” LED illuminates for that zone.
- ZSR control sends 120 VAC to the corresponding zone pump terminals to fire the zone pump and closes the XX contacts to signal a heat demand to the boiler. The PRIMARY PUMP output will also deliver 120 VAC even if no pump is connected.
- When the demand from the T-stat is satisfied (T-stat opens TT terminals), the “PUMP ON” LED turns off.
- 120 VAC is dropped from the corresponding zone pump terminals.
- If no other zones are calling, power is dropped to the SEC PUMP and SYSTEM PUMP and the XX contacts are opened.
- If a demand occurs from the DHW aquastat (zone #1), The “PUMP ON” LED illuminates for Zone #1.
- If any other zone was calling (Zones 2 thru 6) when Zone #1 called, power (120 VAC) is dropped to those zone pumps.
- The XX and DHW contacts close.
- The PRIORITY PUMP contacts deliver 120 VAC
- Once the Zone #1 DHW demand is satisfied, power to the PRIORITY PUMP is dropped, the DHW contacts open.
- If a demand from zones 2 thru 6 is present, 120 VAC is delivered to the corresponding zone pump(s) and the “PUMP ON” LED for those zones will illuminate.
- The XX contacts close to signal a heat demand to the boiler.
- When all zones are satisfied, the XX contacts open and power (120 VAC) is turned off to all of the zone pumps.

DHW Time Out \ Freeze Prevention Feature

- After one hour of a priority demand, the control will open the DHW contacts and turn off power to the DHW pump.
- If a heating demand is present from Zones #2- 6, the control will satisfy those demands before going back to the DHW call.
- After the heating demands are met, the control will go back to DHW and re-set the one hour timer.

B3 - Mod/Con boiler, primary loop, closely spaced tees, zone pumps



Hydronic diagram is for illustration purposes only, some components have been removed for simplicity.

Description of terminals

⏚ = Ground

N = Neutral (Common leg of 120 VAC)

L = Line (Hot leg of 120 VAC)

Thermostat terminals

R = 24 VAC

W = Heat call

C = Common of 24 VAC

Boiler terminals

XX = Dry contacts rated up to 120 VAC, 2 Amps. Closes when any zone calls including priority. Typically connected to TT on boiler control.

DHW (ZR/ZC) = Dry contacts rated up to 120 VAC, 2 Amps. Closes only when priority is enabled and calling. Typically used to close ZR\ZC (120 VAC) or DHW contacts (24 VAC) on boiler controls equipped with these features.

Dip switch description

Master / Slave: Used when joining 2 or more controls together. Only one Master per group

Priority OFF / Priority ON: Used to set Zone #1 as the priority zone. All other zones will hold off during priority. Priority has a one hour time out feature to prevent freeze up.

Primary OFF / Primary ON: Sets the status of the primary pump when there is a priority call. This allows the DHW pump to be on either side of a hydro separator.

Exercise OFF / Exercise ON: When enabled the pumps will rub for 30 seconds after 72 hours without a demand.

Post Purge OFF / Post Purge ON: Allows the DHW pump to run for 2 minutes after the DHW demand has been satisfied.

WARNING: NEVER CONNECT R & C DIRECTLY, this will be a direct short on the 24 VAC supply

Sequence of Operation / Settings

Priority switch OFF

Master / Slave switch: Master

Status During Priority switch: OFF

- A demand occurs from any T-stat (T-stat closes TT terminals). The “PUMP ON” LED illuminates for that zone.
- ZSR control sends 120 VAC to the corresponding zone pump and the primary pump outputs, XX contacts close to signal boiler of a demand.
- When the demand from the T-stat is satisfied (T-stat opens TT terminals), the XX contacts are opened, the “PUMP ON” LED turns off and the 120 VAC to the zone pump and primary pump outputs are turned off.
- ALTERNATE WIRING: The boiler pump can be controlled by the Mod/Con boiler if equiped to do so.

Intertek
4009064

Certified to CSA C22-2 No.24
Conforms to UL Standard 873

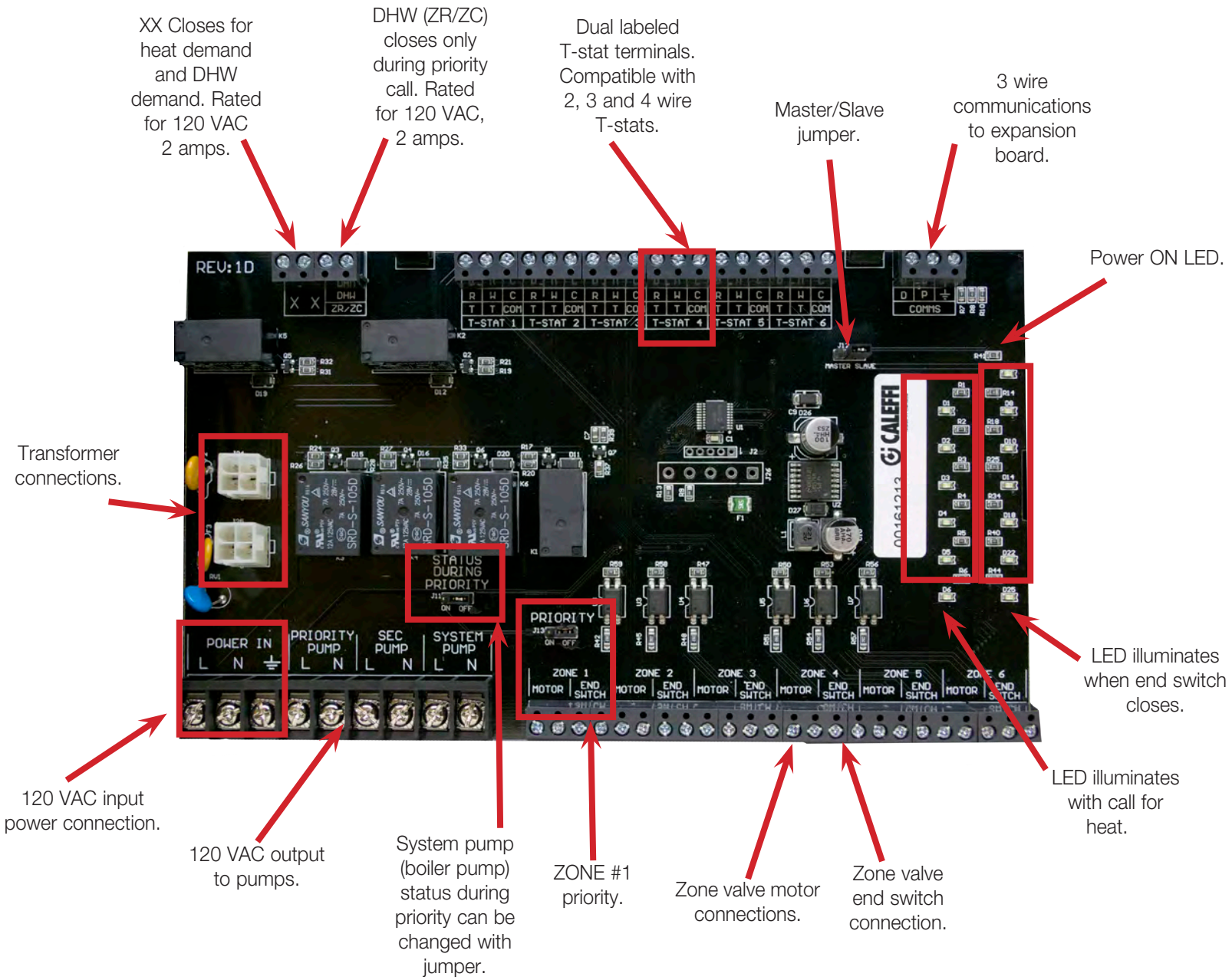
Z-one™ Relay

ZVR10X - Multi-Zone Valve Control

Overview

- Compatible with low voltage 2, 3, or 4 wire thermostats
- R, W, C and TT Comm dual labeling at thermostat terminals
- Z-oneLink unlimited zone expansion
- Selectable priority with 1 hour time-out feature
- System pump status selectable during priority
- Pump will start only after the zone valve end switch is closed
- Dry contacts for DHW (ZR/ZC), capable of switching line voltage
- Large terminal connections
- High capacity 40 VA transformer standard for 3 and 4 zone models-expandable to 80 VA, and 80 VA for the 6 zone model
- Automatic resettable fuse
- Controls system pump, secondary pump, and priority pump
- Front LED Lights
- 100% Factory tested with 3 year warranty
- ETL approved

See technical brochure 01285-14 NA for more product information.


XX Closes for heat demand and DHW demand. Rated for 120 VAC 2 amps.
DHW (ZR/ZC) closes only during priority call. Rated for 120 VAC, 2 amps.
Dual labeled T-stat terminals. Compatible with 2, 3 and 4 wire T-stats.
Master/Slave jumper.
3 wire communications to expansion board.
Power ON LED.
Transformer connections.
LED illuminates when end switch closes.
LED illuminates with call for heat.
120 VAC input power connection.
120 VAC output to pumps.
System pump (boiler pump) status during priority can be changed with jumper.
ZONE #1 priority.
Zone valve motor connections.
Zone valve end switch connection.
REV: 1D
POWER IN
PRIORITY PUMP
SEC PUMP
SYSTEM PUMP
STATUS DURING PRIORITY
PRIORITY
ZONE 1
ZONE 2
ZONE 3
ZONE 4
ZONE 5
MOTOR
END SWITCH
T-STAT 1
T-STAT 2
T-STAT 4
T-STAT 5
T-STAT 6
COMMS
MASTER SLAVE

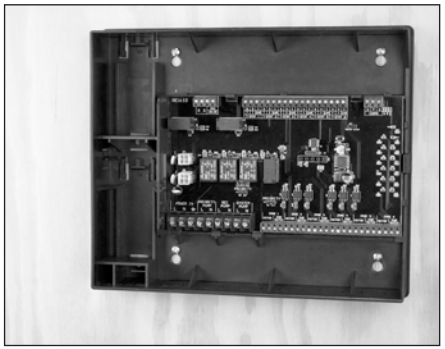
Cover removal

Hold either the left or the right end of the box up and at an angle. Use body for stabilizing relay box.

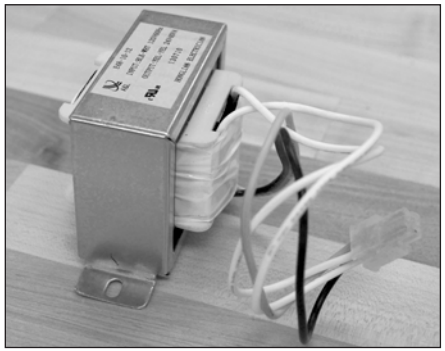
Insert screwdriver and push tab inward, cover should release from base.

Roll cover off base.

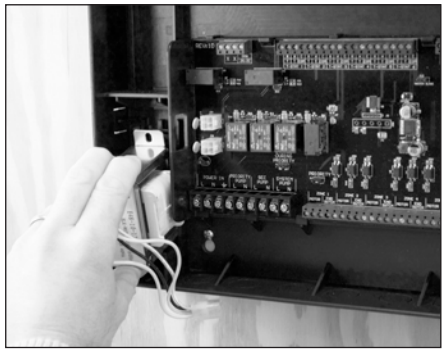
Transformer Installation



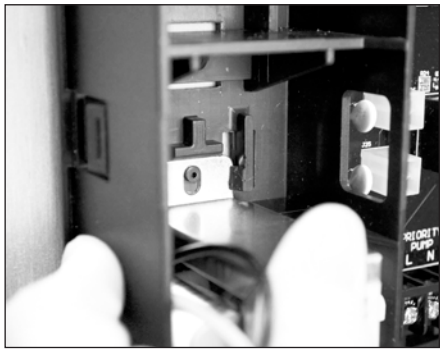
Mount box on stable surface using level.



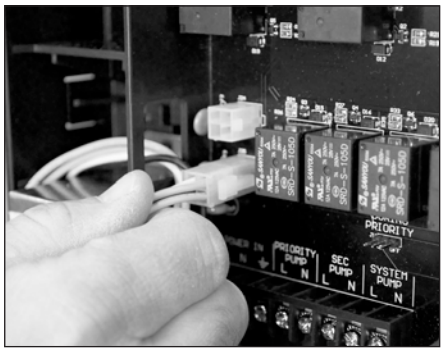
Remove transformer(s) from packaging.



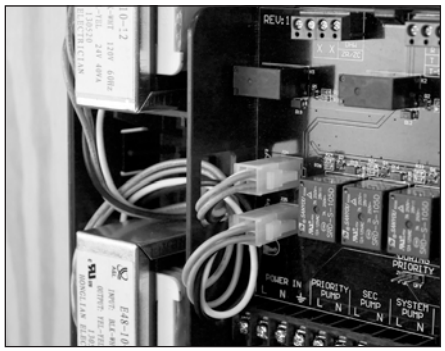
Slide bottom end of transformer into bottom latch.



Snap top of transformer into latch arms.



Feed wiring through hole near the top of the transformer and insert transformer plug into the socket.



Repeat process for 2nd transformer if using six valve relay box.

Mounting: Do not mount to a surface that exceeds 115°F (45°C). The unit must be only located in dry interior locations. Use only copper conductor supply wire suitable for at least 105° C. All circuits must have a common disconnect and be connected to the same pole of the disconnect. It is not suitable for installation in hazardous locations.

Maintenance and Repair: The Caleffi Z-one™ multi-zone valve relay comes with a resettable fuse and requires no maintenance. If control fails or is damaged, replace control with functional one.

The ZVR series of controls is programmed by positioning a series of jumpers. Example photo to right shows jumper in off position (left photo) and on position (right photo). Jumpers are used for the following operations.

Priority ON / Priority OFF: When priority jumper is ON, upon demand, zone 1 will operate as priority and all other zones are temporarily switched off (with 1 hour time-out). When priority mode is OFF, any zones that were active when zone 1 was switched on will remain on.

Status During Priority ON / Status During Priority OFF: When status jumper is ON, the system pump will continue to operate during priority.

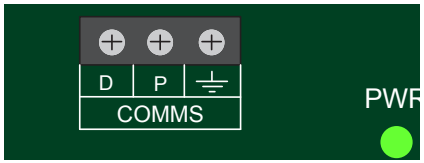
Master / Slave: allows for unlimited expansion to additional ZVR relays.

Boiler Connections

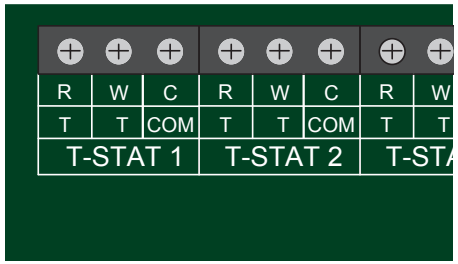
XX = Dry contacts rated up to 120 VAC, 2 Amps. Closes when any zone calls including priority. Typically connected to TT on boiler control.
DHW (ZR/ZC) = Dry contacts rated up to 120 VAC, 2 Amps. Closes only when priority is enabled and calling. Typically used to close ZR\ZC (120 VAC) or DHW contacts (24 VAC) on boiler controls equipped with these features.

Communication connections

Connect terminals to matching terminal of slave boards
D to D, P to P, Ground to Ground
Use 18 gauge thermostat wire. Wire should be shielded if located in close proximity to high voltage wiring.

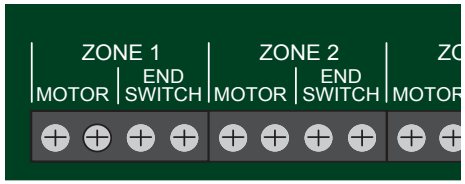


Thermostat connections



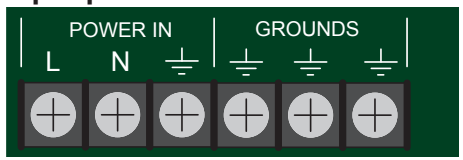
R = 24 VAC.
W = Heat call
C = Common of 24 VAC
Heat demand is initiated by closing R to W.
24 VAC is always present between R & C.

Zone valve connections



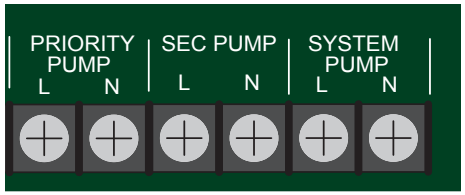
Motor = 24 VAC to power the zone valve motor
End Switch = Connects to end switch on zone valve. Must be jumpered if using a 2 –wire zone valve.

Input power



L = Line (hot leg) of 120 VAC supply
N = Neutral of 120 VAC
⏚ = Ground

Pump outputs

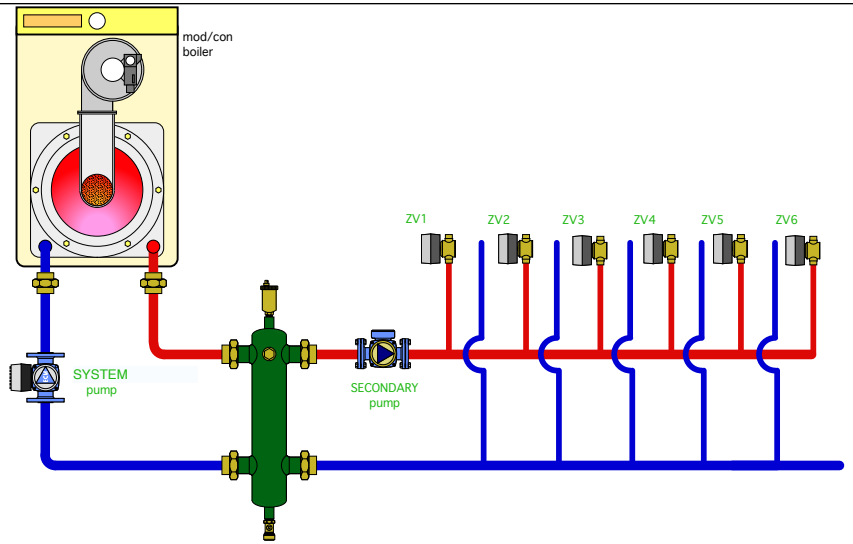


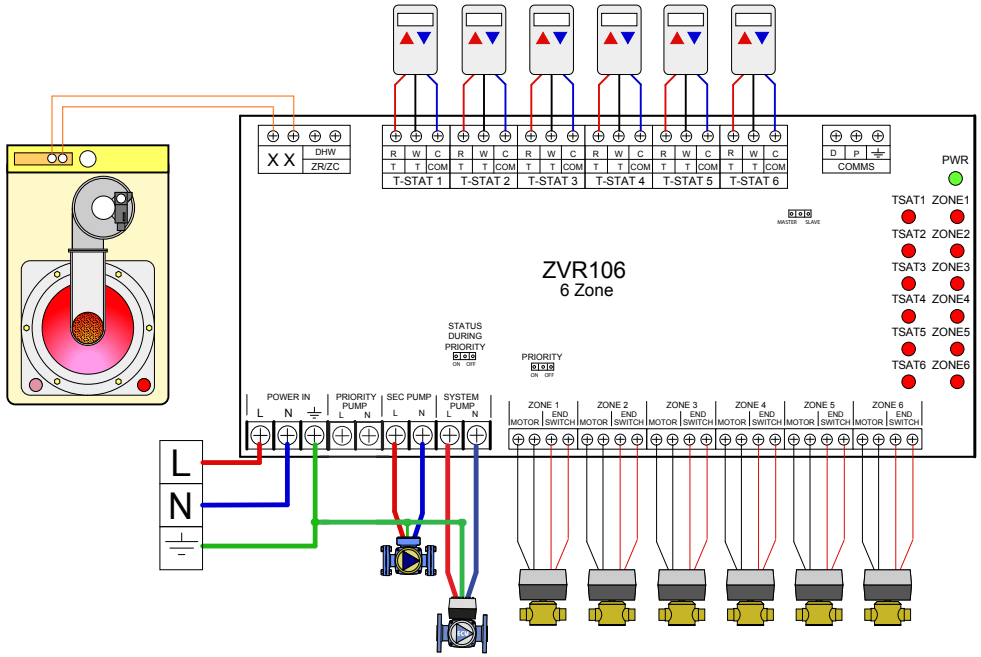
SYSTEM PUMP = Runs when any zone calls for heat. When priority is enabled, the status of the pump (on\ off) during a priority call is selected via a jumper
SEC PUMP = Runs when any zone calls for heat except the priority zone when it is enabled.
PRIORITY PUMP = Runs when the priority zone calls. A jumper is required between the END SWITCH terminals when using a pump for DHW.

WARNING: NEVER CONNECT R & C DIRECTLY, this will be a direct short on the 24 VAC supply.

WARNING: When connecting 2 or more Z-one controls, all controls must be powered by the same 120 VAC circuit.

C1 - Mod/Con boiler, hydro separator, zone valves





Hydronic diagram is for illustration purposes only, some components have been removed for simplicity.

Description of terminals

⏚ = Ground

N = Neutral (common leg of 120 VAC)

L = Line (live leg of 120 VAC)

Thermostat terminals

R = 24 VAC

W = Heat call

C = Common of 24 VAC

Boiler terminals

XX = Dry contacts rated up to 120 VAC, 2 Amps. Closes when any zone calls including priority. Typically connected to TT on boiler control.

DHW (ZR/ZC) = Dry contacts rated up to 120 VAC, 2 Amps. Closes only when priority is enabled and calling. Typically used to close ZR\ZC (120 VAC) or DHW contacts (24 VAC) on boiler controls equipped with these features.

Pump terminals

SYSTEM PUMP = Runs when any zone calls for heat. When priority is enabled, the status of the pump (on\off) during a priority call is selected via a jumper

SEC PUMP = Runs when any zone calls for heat except the priority zone when it is enabled.

PRIORITY PUMP = Runs when the priority zone calls. A jumper is required between the END SWITCH terminals when using a pump.

Valve terminals

Motor = 24 VAC to power the zone valve motor

End Switch = Connects to end switch on zone valve. Must be jumpered if using a 2 –wire zone valve.

WARNING: NEVER CONNECT R & C DIRECTLY, this will be a direct short on the 24 VAC supply

Sequence of Operation / Settings

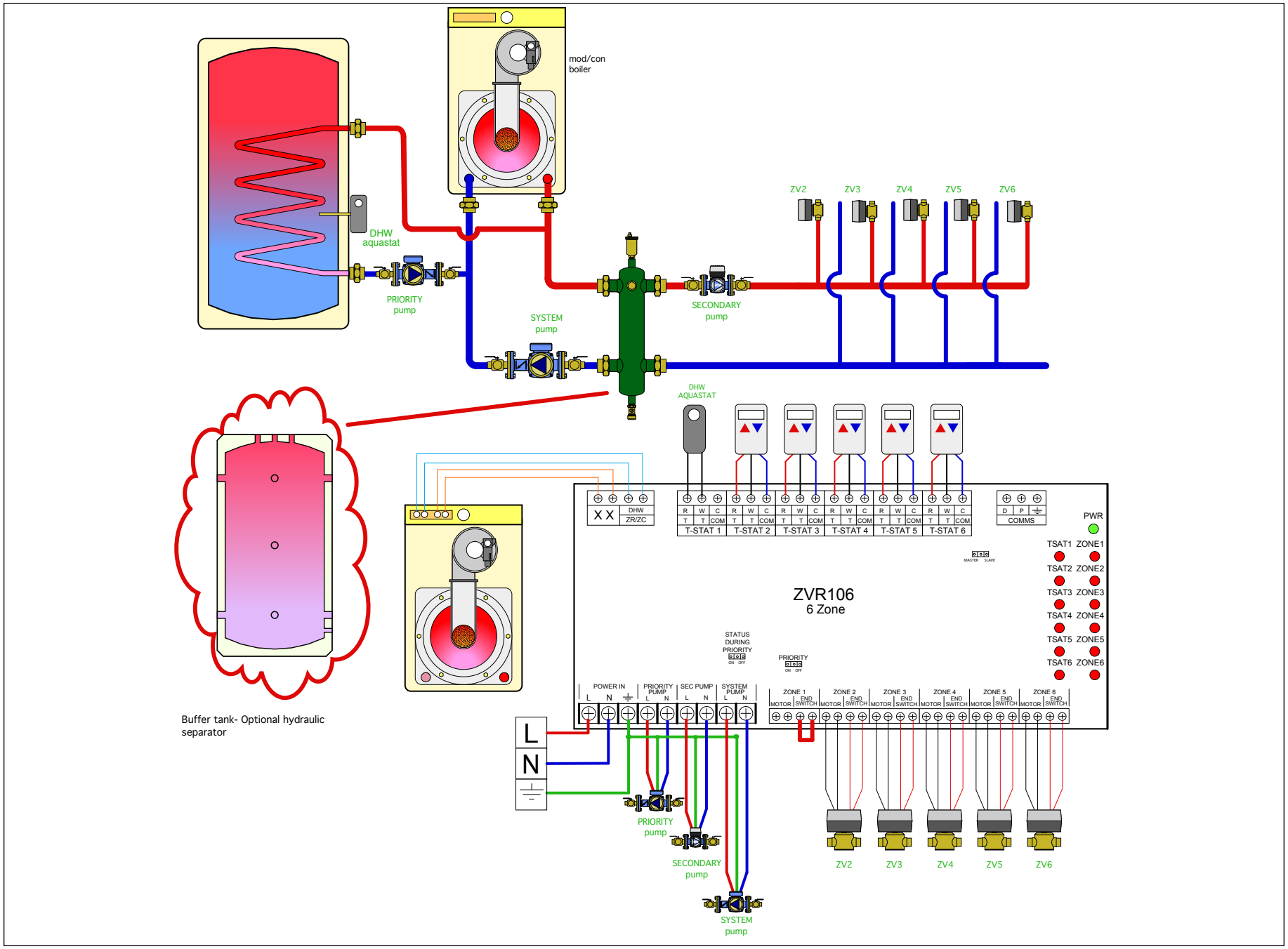
Priority Jumper: OFF

Master / Slave Jumper: Master

Status During Priority: OFF

- A demand occurs from any T-stat (T-stat closes TT terminals). The “T-STAT CALL” LED illuminates for that zone.
- ZVR control sends 24 VAC to the corresponding zone MOTOR terminals to open the zone valve.
- When the end switch on the zone valve closes, the control sends 120 VAC to SEC PUMP and SYSTEM PUMP. The “VALVE OPEN” LED illuminates for that zone and the XX contacts close to signal a heat demand to the boiler.
- When the demand from the T-stat is satisfied (T-stat opens TT terminals), both the “T-STAT CALL” and “VALVE OPEN” LED’s turn off.
- 24 VAC is dropped from the corresponding zone MOTOR terminals.
- If no other zones are calling, power is turned off to the SEC PUMP and SYSTEM PUMP and the XX contacts are opened.

C2 - Mod/Con boiler, priority indirect DHW on primary side of hydro sep, zone valves



Hydronic diagram is for illustration purposes only, some components have been removed for simplicity.

Description of terminals

⏚ = Ground

N = Neutral (common leg of 120 VAC)

L = Line (live leg of 120 VAC)

Thermostat terminals

R = 24 VAC

W = Heat call

C = Common of 24 VAC

Boiler terminals

XX = Dry contacts rated up to 120 VAC, 2 Amps. Closes when any zone calls including priority. Typically connected to TT on boiler control.

DHW (ZR/ZC) = Dry contacts rated up to 120 VAC, 2 Amps. Closes only when priority is enabled and calling. Typically used to close ZR\ZC (120 VAC) or DHW contacts (24 VAC) on boiler controls equipped with these features.

Pump terminals

SYSTEM PUMP = Runs when any zone calls for heat. When priority is enabled, the status of the pump (on\off) during a priority call is selected via a jumper

SEC PUMP = Runs when any zone calls for heat except the priority zone when it is enabled.

PRIORITY PUMP = Runs when the priority zone calls. A jumper is required between the END SWITCH terminals when using a pump.

Valve terminals

Motor = 24 VAC to power the zone valve motor

End Switch = Connects to end switch on zone valve. Must be jumpered if using a 2 –wire zone valve.

WARNING: NEVER CONNECT R & C DIRECTLY, this will be a direct short on the 24 VAC supply

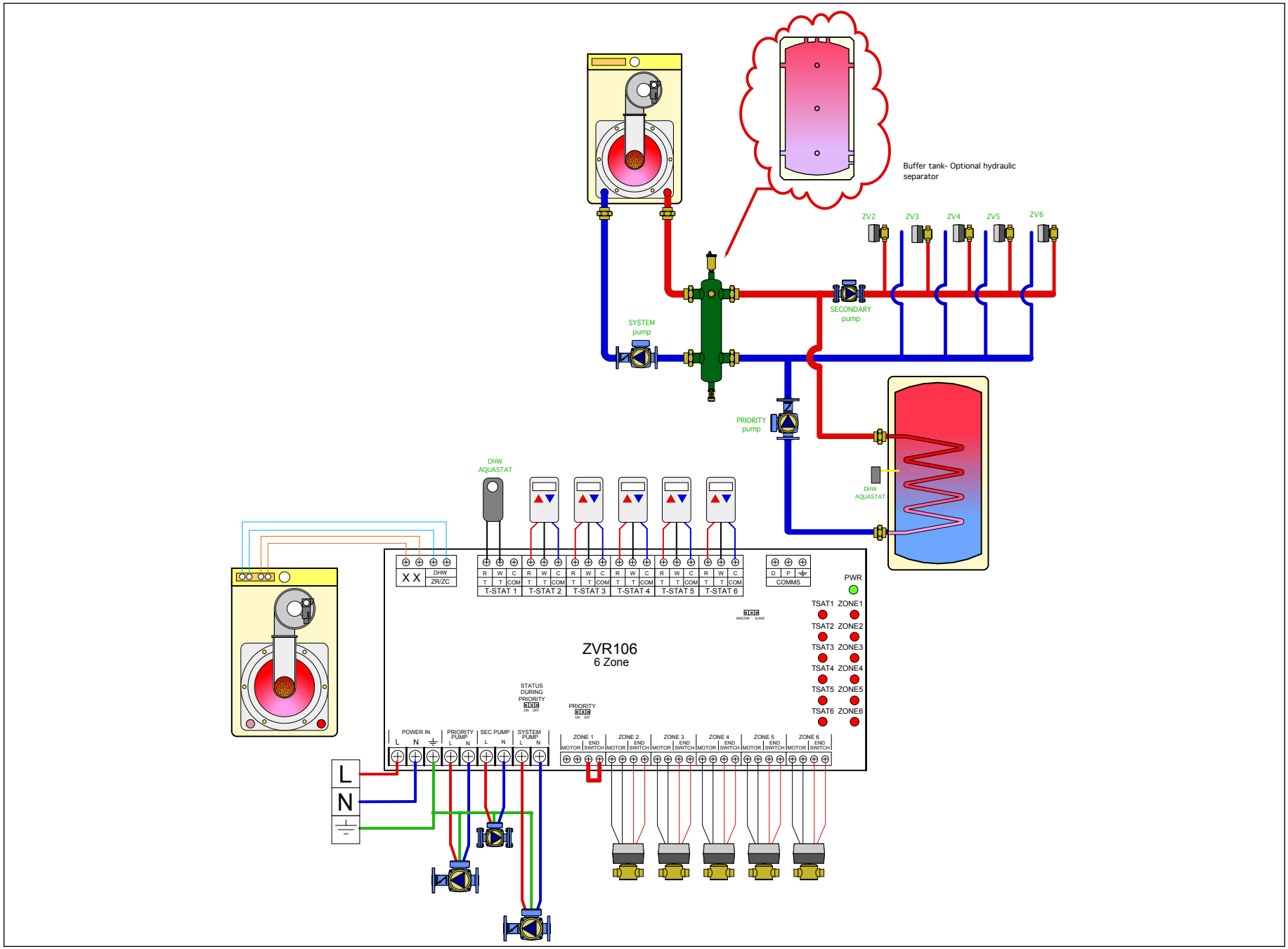
Sequence of Operation / Settings

- Priority Jumper: ON (Zone #1 becomes priority)
- Master/Slave Jumper: Master
- Status During Priority: OFF
- A demand occurs from a T-stat (T-stat closes TT terminals) in zones 2 thru 6. The “T-STAT CALL” LED illuminates for that zone.
- ZVR control sends 24 VAC to the corresponding zone MOTOR terminals to open the zone valve.
- When the end switch on the zone valve closes, the control sends 120 VAC to SEC PUMP and SYSTEM PUMP. The “VALVE OPEN” LED illuminates for that zone and the XX contacts close to signal a heat demand to the boiler.
- When the demand from the T-stat is satisfied (T-stat opens TT terminals), both the “T-STAT CALL” and “VALVE OPEN” LED’s turn off.
- 24 VAC is dropped from the corresponding zone MOTOR terminals.
- If no other zones are calling, power is dropped to the SEC PUMP and SYSTEM PUMP and the XX contacts are opened.
- If a demand occurs from the DHW aquastat (zone #1), The “T-STAT CALL” LED illuminates for Zone #1 and the “VALVE OPEN” LED will illuminate. (When using a DHW pump, a jumper must be installed on Zone #1 end switch terminals.)
- If any other zone was calling (Zones 2 thru 6) when Zone #1 called, power (24 VAC) is dropped to those zones.
- The XX and DHW contacts close.
- The PRIORITY PUMP contacts deliver 120 VAC
- The SEC PUMP and SYSTEM PUMP are off.
- Once the Zone #1 DHW demand is satisfied, power to the PRIORITY PUMP is dropped, the DHW contacts open.
- If a demand from zones 2 thru 6 is present, 24 VAC is delivered to the corresponding zone valve(s) and the “T-STAT CALL” LED’s illuminate.
- When the zone valve end switch closes, the “VALVE OPEN” LED illuminates, the XX contacts close, the SEC PUMP and SYSTEM PUMP terminals deliver 120 VAC.

DHW Time Out \ Freeze Prevention Feature

- After one hour of a priority demand, the control will open the DHW contacts and turn off power to the DHW pump and Zone Valve #1.
- If a heating demand is present from Zones #2- 6, the control will satisfy those demands before going back to the DHW call.
- After the heating demands are met, the control will go back to DHW and re-set the one hour timer.

C3 - Mod/Con boiler, priority indirect DHW on load side of hydro sep, zone valves



Hydronic diagram is for illustration purposes only, some components have been removed for simplicity.

Description of terminals

⏚ = Ground

N = Neutral (common leg of 120 VAC)

L = Line (live leg of 120 VAC)

Thermostat terminals

R = 24 VAC

W = Heat call

C = Common of 24 VAC

Boiler terminals

XX = Dry contacts rated up to 120 VAC, 2 Amps. Closes when any zone calls including priority. Typically connected to TT on boiler control.

DHW (ZR/ZC) = Dry contacts rated up to 120 VAC, 2 Amps. Closes only when priority is enabled and calling. Typically used to close ZR\ZC (120 VAC) or DHW contacts (24 VAC) on boiler controls equipped with these features.

Pump terminals

SYSTEM PUMP = Runs when any zone calls for heat. When priority is enabled, the status of the pump (on\off) during a priority call is selected via a jumper

SEC PUMP = Runs when any zone calls for heat except the priority zone when it is enabled.

PRIORITY PUMP = Runs when the priority zone calls. A jumper is required between the END SWITCH terminals when using a pump.

Valve terminals

Motor = 24 VAC to power the zone valve motor

End Switch = Connects to end switch on zone valve. Must be jumpered if using a 2 –wire zone valve.

WARNING: NEVER CONNECT R & C DIRECTLY, this will be a direct short on the 24 VAC supply

Sequence of Operation / Settings

Priority Jumper: ON (Zone #1 becomes priority)

Master/Slave Jumper: Master

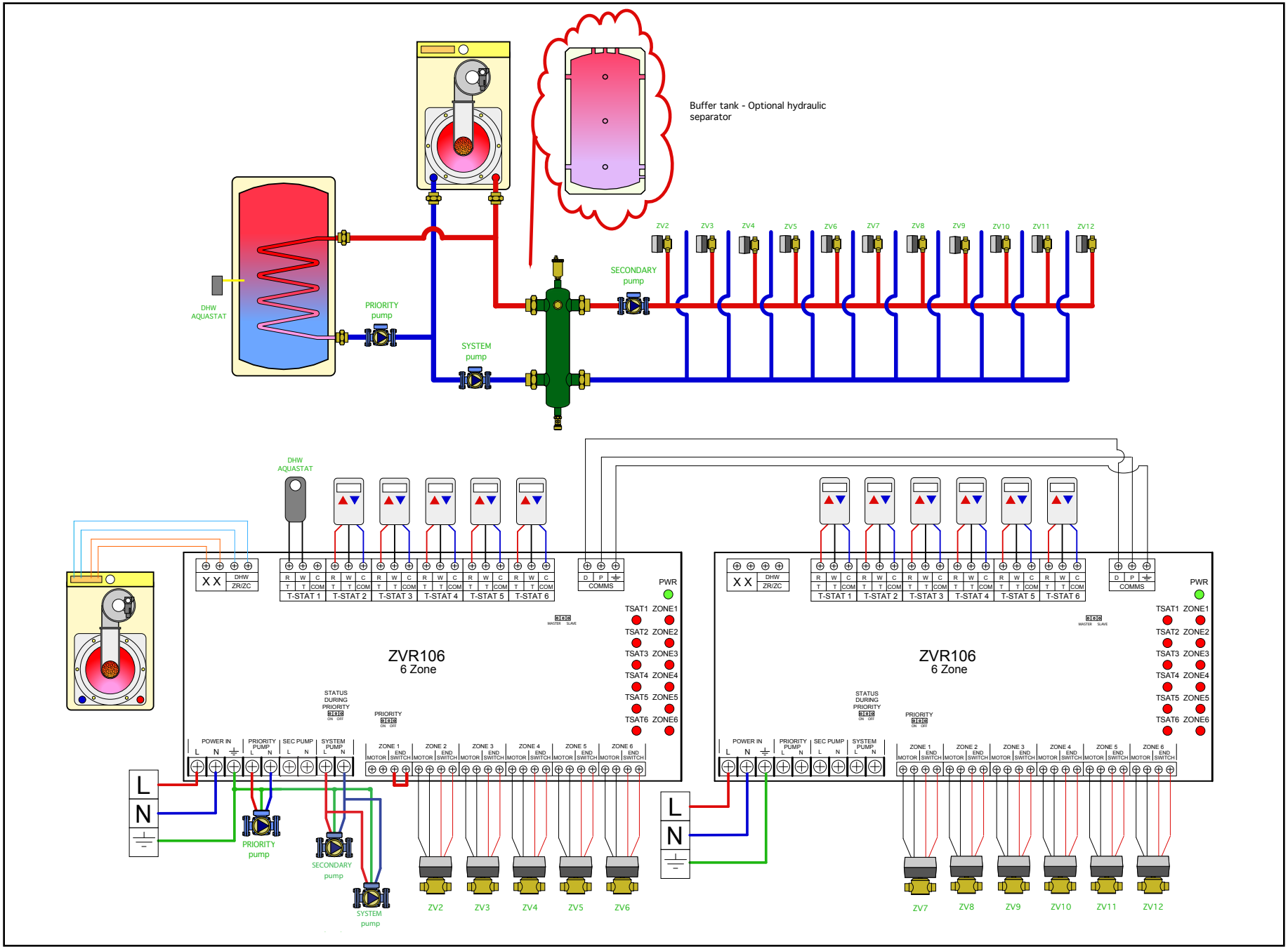
Status During Priority: ON

- A demand occurs from a T-stat (T-stat closes TT terminals) in zones 2 thru 6. The “T-STAT CALL” LED illuminates for that zone.
- ZVR control sends 24 VAC to the corresponding zone MOTOR terminals to open the zone valve.
- When the end switch on the zone valve closes, the control sends 120 VAC to SEC PUMP and SYSTEM PUMP. The “VALVE OPEN” LED illuminates for that zone and the XX contacts close to signal a heat demand to the boiler.
- When the demand from the T-stat is satisfied (T-stat opens TT terminals), both the “T-STAT CALL” and “VALVE OPEN” LED’s turn off.
- 24 VAC is dropped from the corresponding zone MOTOR terminals.
- If no other zones are calling, power is dropped to the SEC PUMP and SYSTEM PUMP and the XX contacts are opened.
- If a demand occurs from the DHW aquastat (zone #1), The “T-STAT CALL” LED illuminates for Zone #1 and the “VALVE OPEN” LED will illuminate. (When using a DHW pump, a jumper must be installed on Zone #1 end switch terminals.)
- If any other zone was calling (Zones 2 thru 6) when Zone #1 called, power (24 VAC) is dropped to those zones.
- The XX and DHW contacts close.
- The PRIORITY PUMP and SYSTEM PUMP contacts deliver 120 VAC
- The SEC PUMP is off.
- Once the Zone #1 DHW demand is satisfied, power to the PRIORITY PUMP and SYSTEM PUMP is dropped, the DHW contacts open.
- If a demand from zones 2 thru 6 is present, 24 VAC is delivered to the corresponding zone valve(s) and the “T-STAT CALL” LED’s illuminate.
- When the zone valve end switch closes, the “VALVE OPEN” LED illuminates, the XX contacts close, the SEC PUMP and SYSTEM PUMP terminals deliver 120 VAC.

DHW Time Out \ Freeze Prevention Feature

- After one hour of a priority demand, the control will open the DHW contacts and turn off power to the DHW pump and Zone Valve #1.
- If a heating demand is present from Zones #2- 6, the control will satisfy those demands before going back to the DHW call.
- After the heating demands are met, the control will go back to DHW for and re-set the one hour timer.

C4- Mod/Con boiler, priority indirect DHW on primary side of hydro sep, expansion control



Hydronic diagram is for illustration purposes only, some components have been removed for simplicity.

Description of terminals

⏚ = Ground

N = Neutral (common leg of 120 VAC)

L = Line (live leg of 120 VAC)

Thermostat terminals

R = 24 VAC

W = Heat call

C = Common of 24 VAC

Boiler terminals

XX = Dry contacts rated up to 120 VAC, 2 Amps. Closes when any zone calls including priority. Typically connected to TT on boiler control.

DHW (ZR/ZC) = Dry contacts rated up to 120 VAC, 2 Amps. Closes only when priority is enabled and calling. Typically used to close ZR\ZC (120 VAC) or DHW contacts (24 VAC) on boiler controls equipped with these features.

Pump terminals

SYSTEM PUMP = Runs when any zone calls for heat. When priority is enabled, the status of the pump (on\off) during a priority call is selected via a jumper

SEC PUMP = Runs when any zone calls for heat except the priority zone when it is enabled.

PRIORITY PUMP = Runs when the priority zone calls. A jumper is required between the END SWITCH terminals when using a pump.

Valve terminals

Motor = 24 VAC to power the zone valve motor

End Switch = Connects to end switch on zone valve. Must be jumpered if using a 2 –wire zone valve.

WARNING: NEVER CONNECT R & C DIRECTLY, this will be a direct short on the 24 VAC supply

Sequence of Operation / Settings

Control #1 (Master)

Priority Jumper: ON (Zone #1 becomes priority)

Master/Slave Jumper: Master

Status During Priority: OFF

Control #2 (Slave)

Priority Jumper: OFF

Master/Slave Jumper: Slave

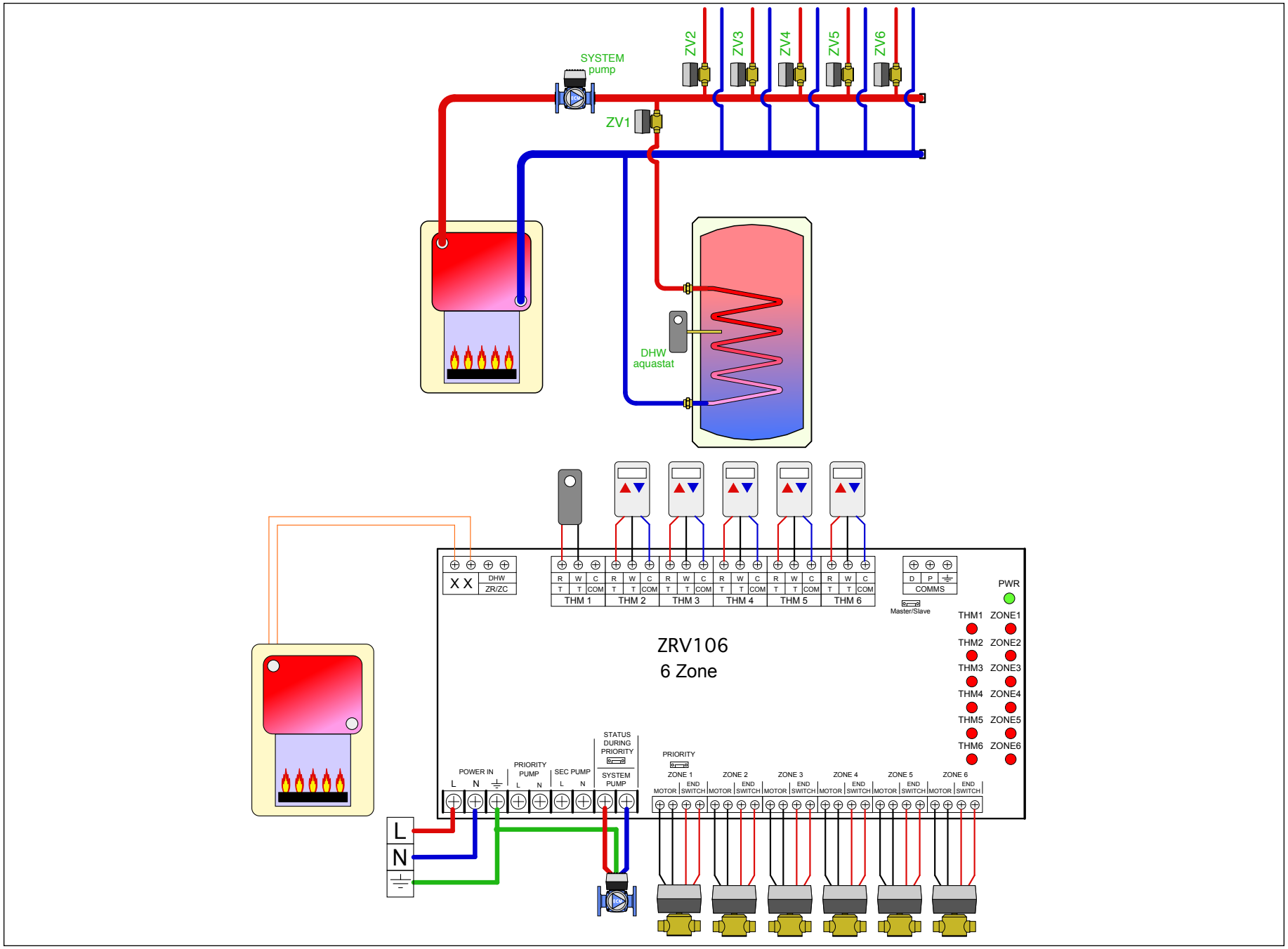
Status During Priority: OFF

- A demand occurs from a T-stat (T-stat closes TT terminals) in zones 2 thru 12. The “T-STAT CALL” LED illuminates for that zone.
- ZVR control sends 24 VAC to the corresponding zone MOTOR terminals to open the zone valve.
- When the end switch on the zone valve closes, the control sends 120 VAC to SEC PUMP and SYSTEM PUMP. The “VALVE OPEN” LED illuminates for that zone and the XX contacts close to signal a heat demand to the boiler.

NOTE: The SEC PUMP output is only fired on the control that receives the t-stat call. For instance, if a zone from control #1 calls, the SEC PUMP on control #1 fires but SEC PUMP on control #2 does not. When using a single secondary pump with 2 controls, the secondary pump must be connected to the “SYSTEM PUMP” terminals. (An alternative wiring option for secondary pump is to wire the secondary pump to the “SEC PUMP” terminals of both controls).

- When the demand from the T-stat is satisfied (T-stat opens TT terminals), both the “T-STAT CALL” and “VALVE OPEN” LED’s turn off.
- 24 VAC is dropped from the corresponding zone MOTOR terminals.
- If no other zones are calling, power is dropped to the SEC PUMP and SYSTEM PUMP and the XX contacts are opened.
- If a demand occurs from the DHW aquastat (zone #1), The “T-STAT CALL” LED illuminates for Zone #1 and the “VALVE OPEN” LED will illuminate. (When using a DHW pump, a jumper must be installed on Zone #1 end switch terminals.)
- If any other zone was calling (Zones 2 thru 12) when Zone #1 called, power (24 VAC) is dropped to those zones.
- The XX and DHW contacts close.
- The PRIORITY PUMP contacts deliver 120 VAC
- The SEC PUMP and SYSTEM PUMP are off.
- Once the Zone #1 DHW demand is satisfied, power to the PRIORITY PUMP is dropped, the DHW contacts open.
- If a demand from zones 2 thru 12 is present, 24 VAC is delivered to the corresponding zone valve(s) and the “T-STAT CALL” LED’s illuminate.
- When the zone valve end switch closes, the “VALVE OPEN” LED illuminates, the XX contacts close, the SEC PUMP and SYSTEM PUMP terminals deliver 120 VAC.
- DHW Time Out \ Freeze Prevention Feature
- After one hour of a priority demand, the control will open the DHW contacts and turn off power to the DHW pump and Zone Valve #1.
- If a heating demand is present from Zones #2- 12, the control will satisfy those demands before going back to the DHW call.
- After the heating demands are met, the control will go back to DHW for and re-set the one hour timer.

C5 - Traditional boiler, indirect DHW (no priority) with valve, zone valves



Hydronic diagram is for illustration purposes only, some components have been removed for simplicity.

Description of terminals

⏚ = Ground

N = Neutral (common leg of 120 VAC)

L = Line (live leg of 120 VAC)

Thermostat terminals

R = 24 VAC

W = Heat call

C = Common of 24 VAC

Boiler terminals

XX = Dry contacts rated up to 120 VAC, 2 Amps. Closes when any zone calls including priority. Typically connected to TT on boiler control.

DHW (ZR/ZC) = Dry contacts rated up to 120 VAC, 2 Amps. Closes only when priority is enabled and calling. Typically used to close ZR\ZC (120 VAC) or DHW contacts (24 VAC) on boiler controls equipped with these features.

Pump terminals

SYSTEM PUMP = Runs when any zone calls for heat. When priority is enabled, the status of the pump (on\off) during a priority call is selected via a jumper

SEC PUMP = Runs when any zone calls for heat except the priority zone when it is enabled.

PRIORITY PUMP = Runs when the priority zone calls. A jumper is required between the END SWITCH terminals when using a pump.

Valve terminals

Motor = 24 VAC to power the zone valve motor

End Switch = Connects to end switch on zone valve. Must be jumpered if using a 2 –wire zone valve.

WARNING: NEVER CONNECT R & C DIRECTLY, this will be a direct short on the 24 VAC supply

Sequence of Operation / Settings

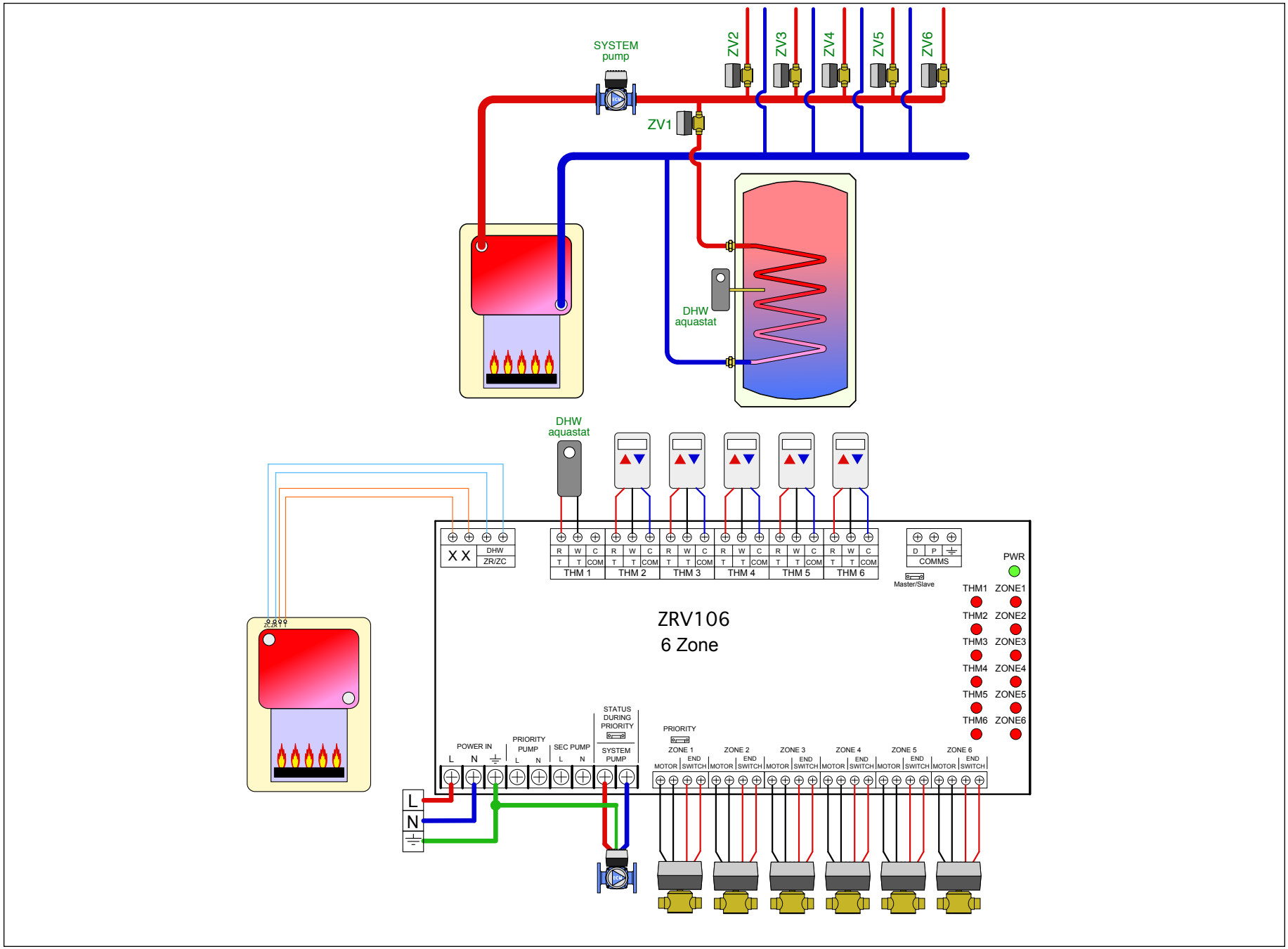
Priority Jumper: OFF

Master/Slave Jumper: Master

Status During Priority: OFF

- A demand occurs from a T-stat (T-stat closes TT terminals) in zones 2 thru 6 otr the aquastat on zone #1. The “T-STAT CALL” LED illuminates for that zone.
- ZVR control sends 24 VAC to the corresponding zone MOTOR terminals to open the zone valve.
- When the end switch on the zone valve closes, the control sends 120 VAC to SEC PUMP and SYSTEM PUMP. The “VALVE OPEN” LED illuminates for that zone and the XX contacts close to signal a heat demand to the boiler.
- When the demand from the T-stat is satisfied (T-stat opens TT terminals), both the “T-STAT CALL” and “VALVE OPEN” LED’s turn off.
- 24 VAC is dropped from the corresponding zone MOTOR terminals.
- If no other zones are calling, power is turned off to the SEC PUMP and SYSTEM PUMP and the XX contacts are opened.

C6- Traditional boiler with reset control, priority indirect DHW with valve, zone valves



Hydronic diagram is for illustration purposes only, some components have been removed for simplicity.

Description of terminals

⏚ = Ground

N = Neutral (common leg of 120 VAC)

L = Line (live leg of 120 VAC)

Thermostat terminals

R = 24 VAC

W = Heat call

C = Common of 24 VAC

Boiler terminals

XX = Dry contacts rated up to 120 VAC, 2 Amps. Closes when any zone calls including priority. Typically connected to TT on boiler control.

DHW (ZR/ZC) = Dry contacts rated up to 120 VAC, 2 Amps. Closes only when priority is enabled and calling. Typically used to close ZR\ZC (120 VAC) or DHW contacts (24 VAC) on boiler controls equipped with these features.

Pump terminals

SYSTEM PUMP = Runs when any zone calls for heat. When priority is enabled, the status of the pump (on\off) during a priority call is selected via a jumper

SEC PUMP = Runs when any zone calls for heat except the priority zone when it is enabled.

PRIORITY PUMP = Runs when the priority zone calls. A jumper is required between the END SWITCH terminals when using a pump.

Valve terminals

Motor = 24 VAC to power the zone valve motor

End Switch = Connects to end switch on zone valve. Must be jumpered if using a 2 –wire zone valve.

WARNING: NEVER CONNECT R & C DIRECTLY, this will be a direct short on the 24 VAC supply

Sequence of Operation

Priority Jumper: ON (Zone #1 becomes priority)

Master/Slave Jumper: Master

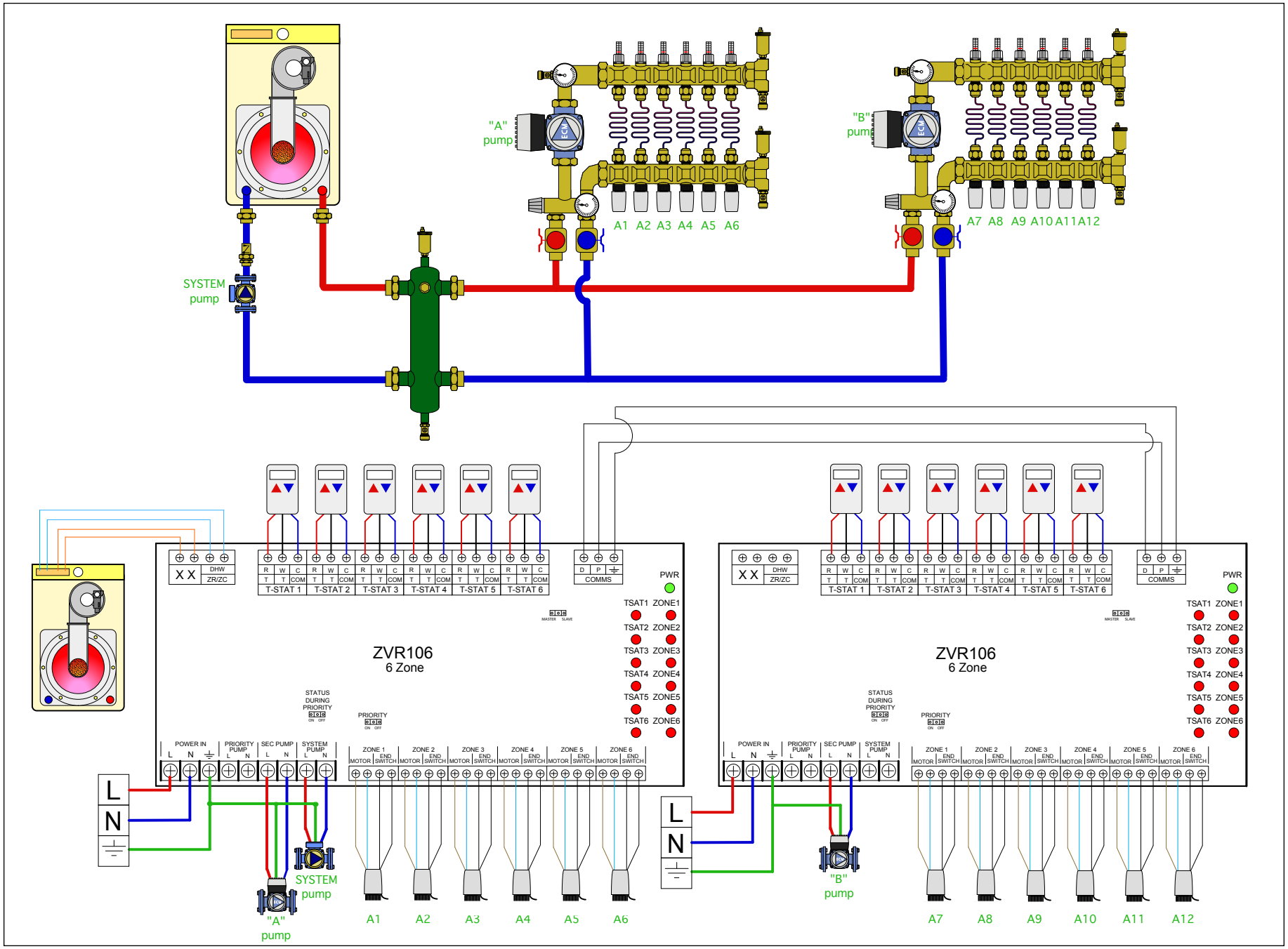
Status During Priority: ON

- A demand occurs from a T-stat (T-stat closes TT terminals) in zones 2 thru 6. The “T-STAT CALL” LED illuminates for that zone.
- ZVR control sends 24 VAC to the corresponding zone MOTOR terminals to open the zone valve.
- When the end switch on the zone valve closes, the control sends 120 VAC to SEC PUMP and SYSTEM PUMP. The “VALVE OPEN” LED illuminates for that zone and the XX contacts close to signal a heat demand to the boiler.
- When the demand from the T-stat is satisfied (T-stat opens TT terminals), both the “T-STAT CALL” and “VALVE OPEN” LED’s turn off.
- 24 VAC is dropped from the corresponding zone MOTOR terminals.
- If no other zones are calling, power is dropped to the SEC PUMP and SYSTEM PUMP and the XX contacts are opened.
- If a demand occurs from the DHW aquastat (zone #1), The “T-STAT CALL” LED illuminates for Zone #1 and the “VALVE OPEN” LED will illuminate. (When using a DHW pump, a jumper must be installed on Zone #1 end switch terminals.)
- If any other zone was calling (Zones 2 thru 6) when Zone #1 called, power (24 VAC) is dropped to those zones.
- The XX and DHW contacts close.
- The PRIORITY PUMP and SYSTEM PUMP contacts deliver 120 VAC
- The SEC PUMP is off.
- Once the Zone #1 DHW demand is satisfied, power to the PRIORITY PUMP and SYSTEM PUMP is dropped, the DHW contacts open.
- If a demand from zones 2 thru 6 is present, 24 VAC is delivered to the corresponding zone valve(s) and the “T-STAT CALL” LED’s illuminate.
- When the zone valve end switch closes, the “VALVE OPEN” LED illuminates, the XX contacts close, the SEC PUMP and SYSTEM PUMP terminals deliver 120 VAC.

DHW Time Out \ Freeze Prevention Feature

- After one hour of a priority demand, the control will open the DHW contacts and turn off power to the DHW pump and Zone Valve #1.
- If a heating demand is present from Zones #2- 6, the control will satisfy those demands before going back to the DHW call.
- After the heating demands are met, the control will go back to DHW and re-set the one hour timer.

C7 - Mod/Con boiler, hydro separator, zone valves (more than 6), multiple secondary pumps



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Description of terminals

⏚ = Ground

N = Neutral (common leg of 120 VAC)

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Thermostat terminals

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Boiler terminals

XX = Dry contacts rated up to 120 VAC, 2 Amps. Closes when any zone calls including priority. Typically connected to TT on boiler control.

DHW (ZR/ZC) = Dry contacts rated up to 120 VAC, 2 Amps. Closes only when priority is enabled and calling. Typically used to close ZR\ZC (120 VAC) or DHW contacts (24 VAC) on boiler controls equipped with these features.

Pump terminals

SYSTEM PUMP = Runs when any zone calls for heat. When priority is enabled, the status of the pump (on\off) during a priority call is selected via a jumper

SEC PUMP = Runs when any zone calls for heat except the priority zone when it is enabled.

PRIORITY PUMP = Runs when the priority zone calls. A jumper is required between the END SWITCH terminals when using a pump.

Valve terminals

Motor = 24 VAC to power the zone valve motor

End Switch = Connects to end switch on zone valve. Must be jumpered if using a 2 –wire zone valve.

WARNING: NEVER CONNECT R & C DIRECTLY, this will be a direct short on the 24 VAC supply

Sequence of Operation / Settings

Control #1 (Master)

Priority Jumper: OFF

Master/Slave Jumper: Master

Status During Priority: OFF

Control #2 (Slave)

Priority Jumper: OFF

Master/Slave Jumper: Slave

Status During Priority: OFF

- A demand occurs from a T-stat (T-stat closes TT terminals) in zones 1 thru 12. The “T-STAT CALL” LED illuminates for that zone.
- ZVR control sends 24 VAC to the corresponding zone MOTOR terminals to open the zone valve.
- When the end switch on the zone valve closes, the control sends 120 VAC to SYSTEM PUMP and to the SEC PUMP located on the ZVR control that is seeing the demand. The “VALVE OPEN” LED illuminates for that zone and the XX contacts close to signal a heat demand to the boiler.

NOTE: The SEC PUMP output is only fired on the control that receives the t-stat call. For instance, if a zone from control #1 calls, the SEC PUMP on control #1 fires but SEC PUMP on control #2 does not.

- When the demand from the T-stat is satisfied (T-stat opens TT terminals), both the “T-STAT CALL” and “VALVE OPEN” LED’s turn off.
- 24 VAC is dropped from the corresponding zone MOTOR terminals.
- If no other zones are calling, power is turned off to the SEC PUMP and SYSTEM PUMP and the XX contacts are opened.

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