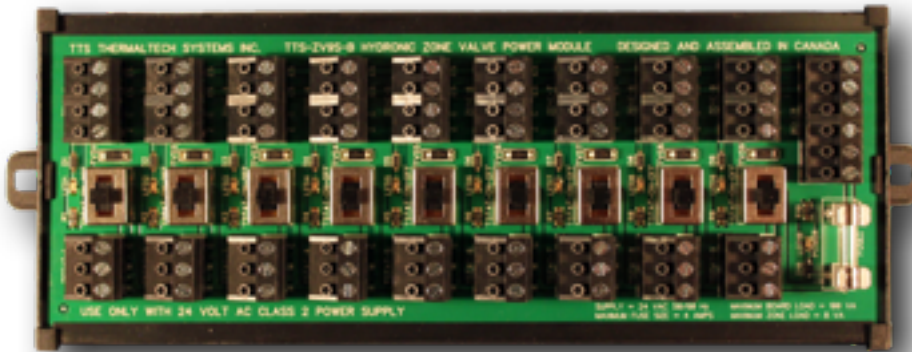


ZV9S Zone Board

Radiant Zoning Made Easy

Power Distribution and End Switch termination with visual indication and manual control.



The ZV9S zone board greatly simplifies valve wiring, diagnostics, and testing when used in 24VAC hydronic systems where 4 wire zone valves are utilized. 3 wire zone valves are also supported.

Visual indication using LED indicator lamps is provided for both supply power as well as individual zone operation. An easy to use OFF / ON / THERMOSTAT switch makes testing, maintenance and diagnostics extremely easy.

This product is designed for 24VAC Class II (2) power circuits only. Do not attempt to connect this zone board to any other power supply other than specified. Failure to comply with the power supply requirements as specified will void all warranties, and may cause series injury, death or fire hazard.

SPECIFICATIONS

- 24VAC 50/60 Hz. Supply¹
- CLASS II (2) Use Only
- Power Consumption³ : 100ma
- Dimensions : 9.15" x 3.45" x 1.10"
- Valve Connections : 9
- Thermostat Connections : 9
- Power Connections : 2
- TT / Output Connections : 1
- Max Power per zone : 8VA
- Max Power per board : 100VA
- Mounting² : Panel Mount
- IP Rating : None / Open Chassis
- ROHS Compliant : PENDING
- Frame Material : PVC / Nylon
- Terminals : #22 - #14 Gauge
- Fuse : 2 Amp Fast Acting

¹ 24VAC class II power supply not included.

² DIN rail mount adapter available as option.

³ Calculated at rated input voltage of 24VAC

ASSEMBLED IN CANADA
FROM PARTS SOURCED GLOBALLY

3 YEAR LIMITED PRODUCT WARRANTY FOR THE UNITED STATES OF AMERICA AND CANADA

TTS Thermaltech Systems Inc. (TTS) will repair or replace without charge (at the company's option) any ZV series zone board or board component that is proven defective under normal use within (3) years from date of manufacture.

In order to obtain service under this warranty, it is the responsibility of the purchaser to promptly notify TTS in writing and promptly deliver the subject part(s), delivery prepaid to TTS. Should the subject part(s) contain no defect(s) as covered by this warranty, the purchaser will be invoiced for parts and labour charges in effect at the time of factory examination and repair.

Any TTS part not installed or operated as per detailed in these instructions, or which has been subject to misuse, misapplication, abuse or modification, will not be covered by this warranty.

TTS reserves the right to provide replacement products and parts which are substantially similar in design and functionally equivalent to the defective product or part. TTS reserves the right to make changes in details of design, construction, or arrangement of materials of its products without notification.

TTS OFFERS THIS WARRANTY IN LIEU OF ALL OTHER EXPRESS WARRANTIES. ANY WARRANTY IMPLIED BY LAW INCLUDING WARRANTIES OF MERCHANTABILITY OR FITNESS IS IN EFFECT ONLY FOR THE DURATION OF THE EXPRESS WARRANTY SET FORTH IN THE FIRST PARAGRAPH ABOVE.

THE ABOVE WARRANTIES ARE IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR STATUTORY, OR ANY OTHER WARRANTY OBLIGATION ON THE PART OF TTS.

TTS WILL NOT BE LIABLE FOR ANY SPECIAL, INCIDENTAL, INDIRECT OR CONSEQUENTIAL DAMAGES RESULTING FROM THE USE OF ITS PRODUCTS OR ANY INCIDENTAL COSTS OF REMOVING OR REPLACING DEFECTIVE PRODUCTS.

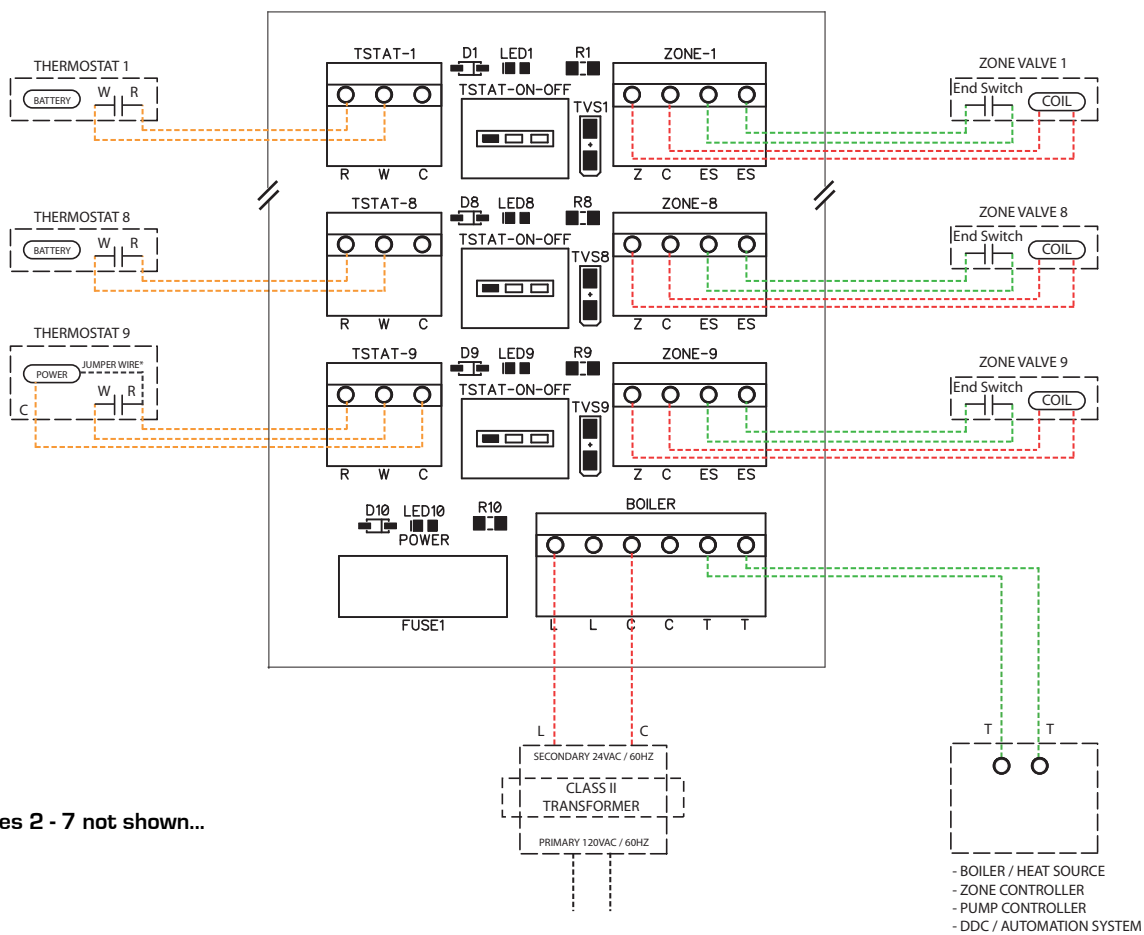
This warranty gives the purchaser specific rights, and the purchaser may have other rights which vary within their jurisdiction. Some jurisdictions do not allow limitations on how long an implied warranty lasts or on the exclusion of incidental or consequential damages, so these limitations or exclusions may not apply to you.

TYPICAL ZV9S WIRING DIAGRAM

4-Wire Zone Valve Connections with Dry Contact End Switch Output

Typical 4-wire zone valve connections to the ZV9S board should be made as per the wiring diagram below. In this configuration, the ZV9S board provides an isolated dry contact output as supplied by the end switches in the zone valves. This configuration is typical when used with pump zone controllers which tend to supply their own control power voltage in the range of 5V AC/DC and 24V AC/DC.

Terminal Blocks may be removed from the circuit board to assist in wiring. To remove, firmly grab terminal block and pull in a motion perpendicular to the board. Terminals should disconnect easily. **DO NOT USE EXCESSIVE FORCE!** Terminals may be installed with wiring oriented towards the top, or bottom of the circuit board. Terminals may also be installed vertically to allow for increased wiring space. When connecting terminal blocks, ensure that wiring connections are correct as certain terminal block orientations will reverse wiring and may cause incorrect operation.



Abbreviations Used In Wiring Diagram:

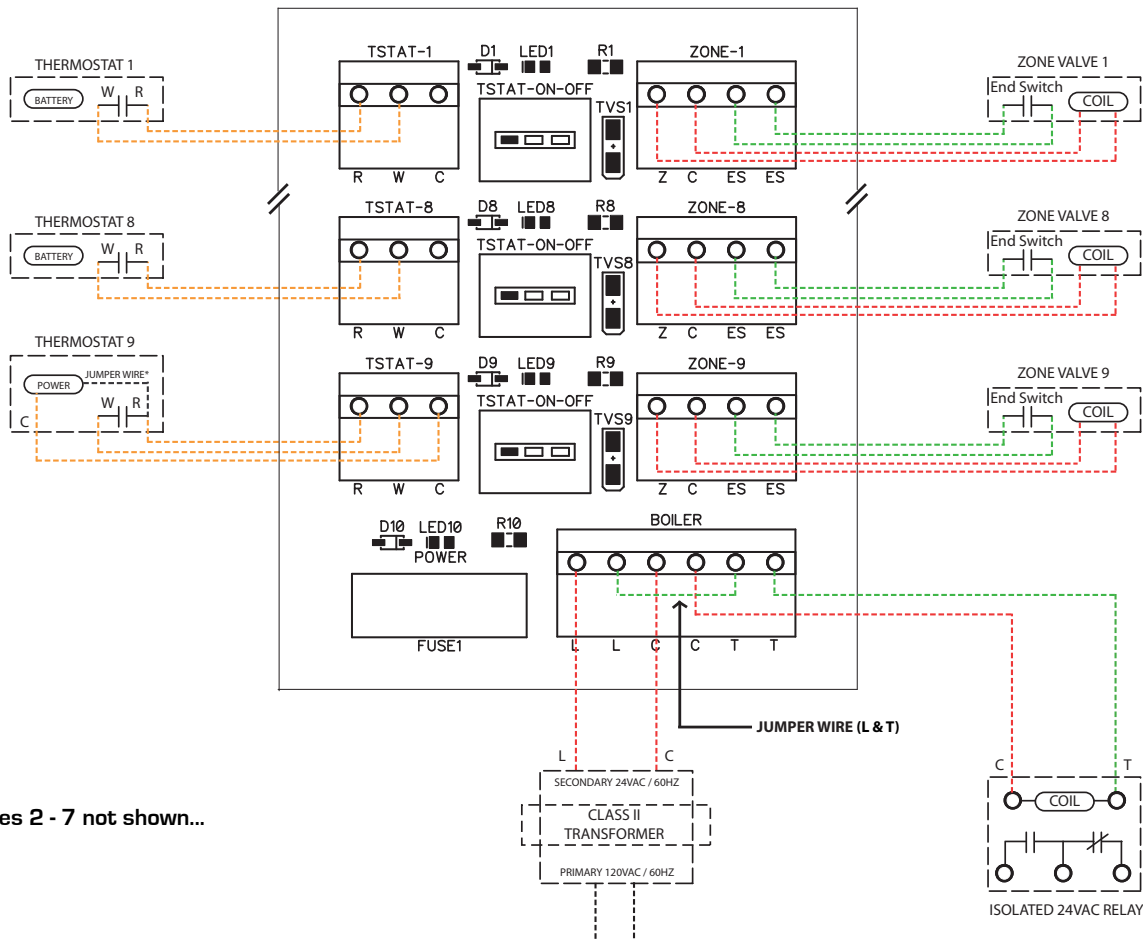
TSTAT = Thermostat L = 24VAC Line C = 24VAC Common Z = Zone Valve ES = End Switch W = Thermostat Heat Relay R = Thermostat Line/Hot
 BATTERY = Thermostat Battery POWER = Thermostat Power Supply LED = Light Emitting Diode COIL = Zone Valve Motor, Actuator or Solenoid

ALTERNATE WIRING DIAGRAM # 1

4-Wire Zone Valve Connections with 24VAC Relay / Signal Output

An alternate connection configuration to the ZV9S is shown in the wiring diagram below. In this configuration, the ZV9S board provides a 24VAC output as supplied by the end switches in the zone valves. This configuration is typical when used with site built, 24VAC relay based pump controls.

Terminal Blocks may be removed from the circuit board to assist in wiring. To remove, firmly grab terminal block and pull in a motion perpendicular to the board. Terminals should disconnect easily. **DO NOT USE EXCESSIVE FORCE!** Terminals may be installed with wiring oriented towards the top, or bottom of the circuit board. Terminals may also be installed vertically to allow for increased wiring space. When connecting terminal blocks, ensure that wiring connections are correct as certain terminal block orientations will reverse wiring and may cause incorrect operation.



* zones 2 - 7 not shown...

Abbreviations Used In Wiring Diagram:

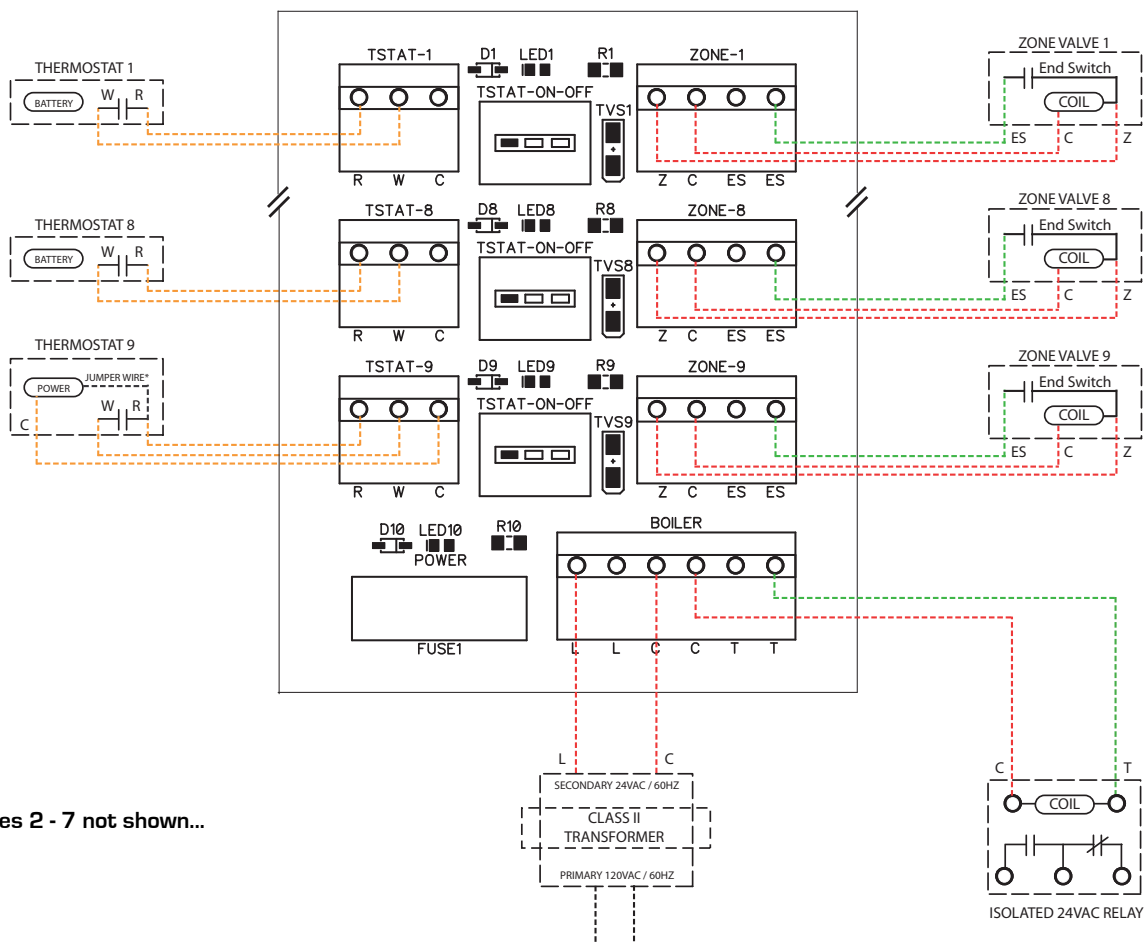
TSTAT = Thermostat L = 24VAC Line C = 24VAC Common Z = Zone Valve ES = End Switch W = Thermostat Heat Relay R = Thermostat Line/Hot
 BATTERY = Thermostat Battery POWER = Thermostat Power Supply LED = Light Emitting Diode COIL = Zone Valve Motor, Actuator or Solenoid

ALTERNATE WIRING DIAGRAM #2

3-Wire Zone Valve Connections with 24VAC Relay / Signal Output

An alternate connection configuration to the ZV9S is shown in the wiring diagram below. In this configuration, the ZV9S board provides a 24VAC output as supplied by the end switches in the 3-wire zone valves. Three wire zone valves are not capable of providing an isolated / dry contact and therefore must use an isolation relay if a dry contact is required. This configuration is typical when used with site built, 24VAC relay based pump controls.

Terminal Blocks may be removed from the circuit board to assist in wiring. To remove, firmly grab terminal block and pull in a motion perpendicular to the board. Terminals should disconnect easily. **DO NOT USE EXCESSIVE FORCE!** Terminals may be installed with wiring oriented towards the top, or bottom of the circuit board. Terminals may also be installed vertically to allow for increased wiring space. When connecting terminal blocks, ensure that wiring connections are correct as certain terminal block orientations will reverse wiring and may cause incorrect operation.



* zones 2 - 7 not shown...

Abbreviations Used In Wiring Diagram:

TSTAT = Thermostat L = 24VAC Line C = 24VAC Common Z = Zone Valve ES =End Switch W = Thermostat Heat Relay R = Thermostat Line/Hot
 BATTERY = Thermostat Battery POWER = Thermostat Power Supply LED = Light Emitting Diode COIL = Zone Valve Motor, Actuator or Solenoid

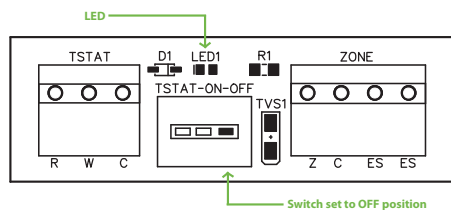
CONFIGURATION AND USE

POWER INDICATOR

The ZV9S Zone Board has a clearly marked red LED power indicator that remains ON whenever power is applied to the board. Although the LED indicator is highly reliable, and is designed to operate without issue for the life of the product, it is highly recommended to verify that no power is present with a suitable electrical tester / test apparatus BEFORE servicing.

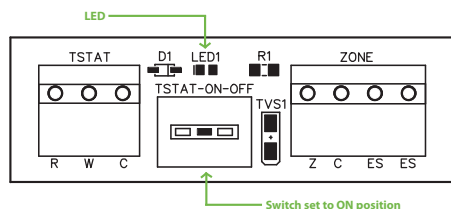
ZONE SWITCH - OFF Position

When a zone switch is set to the OFF position, the zone valve will be turned OFF and will not respond to thermostat commands. The green zone LED indicator will remain OFF indicating that no power is being applied to the zone valve.



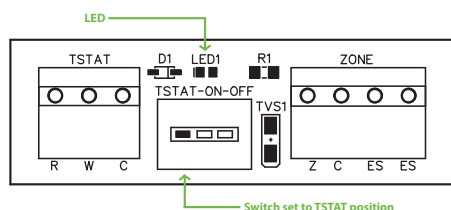
ZONE SWITCH - ON Position

When a zone switch is set to the ON position, the zone valve will be turned ON and will not respond to thermostat commands. The green LED indicator will turn ON indicating that power is being applied to the zone valve.



ZONE SWITCH - TSTAT Position

When a zone switch is set to the TSTAT position, the zone valve will be controlled by the thermostat connected to the TSTAT terminal block. The green LED indicator will turn ON when the thermostat calls for heat.



WARNINGS

24VAC CLASS 2 USE ONLY

Wiring connections must be made in accordance with all applicable laws and electrical codes by a qualified installer.

Use only the recommended fuses as detailed in Service and Repair section of this manual.

Failure to comply with the specified power supply, fuse, circuit board and zone power (VA) ratings may cause overheating, board failure and or present a fire hazard.

CAUTION: To prevent risk of electrical shock, be sure to disconnect all electric power to the system at the main fuse, circuit breaker or local disconnect until installation is complete.

When a service switch is installed, more than one disconnect switch may be required to fully de-energize all power prior to servicing.

CONFIGURATION AND USE

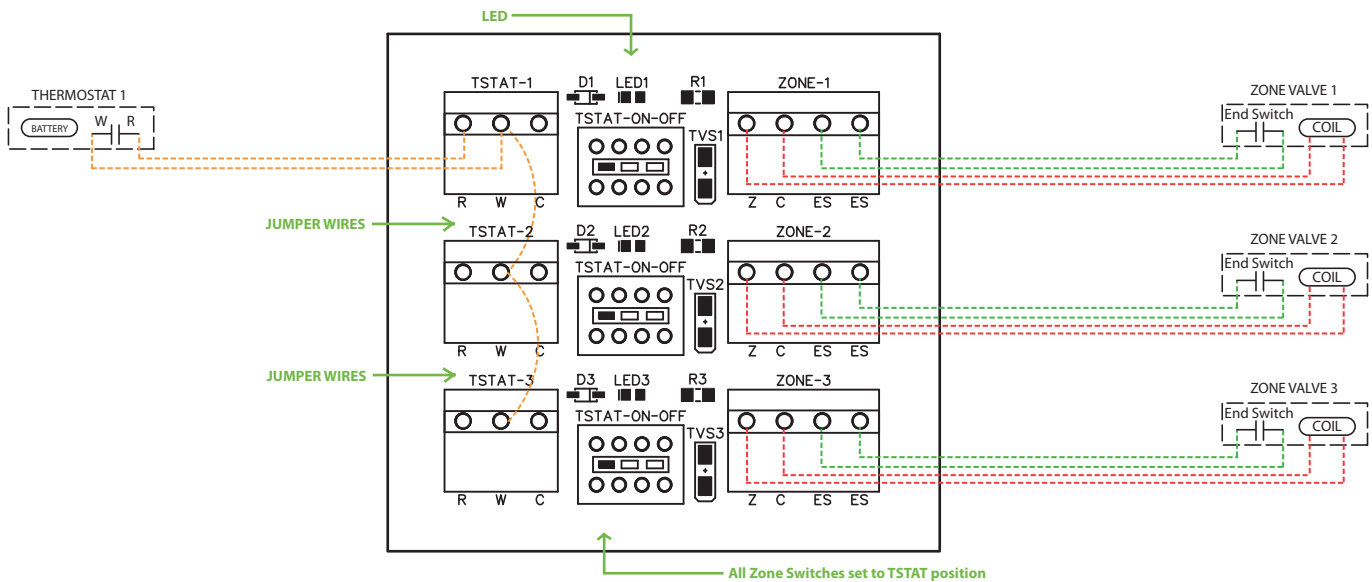
MULTIPLE ZONE VALVES CONTROLLED BY A SINGLE THERMOSTAT

The ZV9S Zone Board can be easily wired to operate multiple zone valves using a single thermostat.

Method A: Bridged Thermostat Terminals

Jumper wires can be installed to “bridge” the connections between thermostat terminals for operation of multiple zone valves from one thermostat input. Individual zone valves retain the ability to be operated using the corresponding zone switch.

IMPORTANT NOTE: Ensure that the thermostat relay contacts are capable of switching the combined load of all connected zone valves.



Notes:

1. For proper operation using a single thermostat, All zone valves connected to bridge circuit must have their zone control switches placed in the TSTAT position.
2. To force all zone valves within the bridged circuit OFF, place all zone switches to the OFF position.
3. To force individual zone valves within the bridge circuit ON on or OFF, use the respective zone switch for manual operation.
4. Return all zone switches to the TSTAT position to resume normal thermostat control / operation.

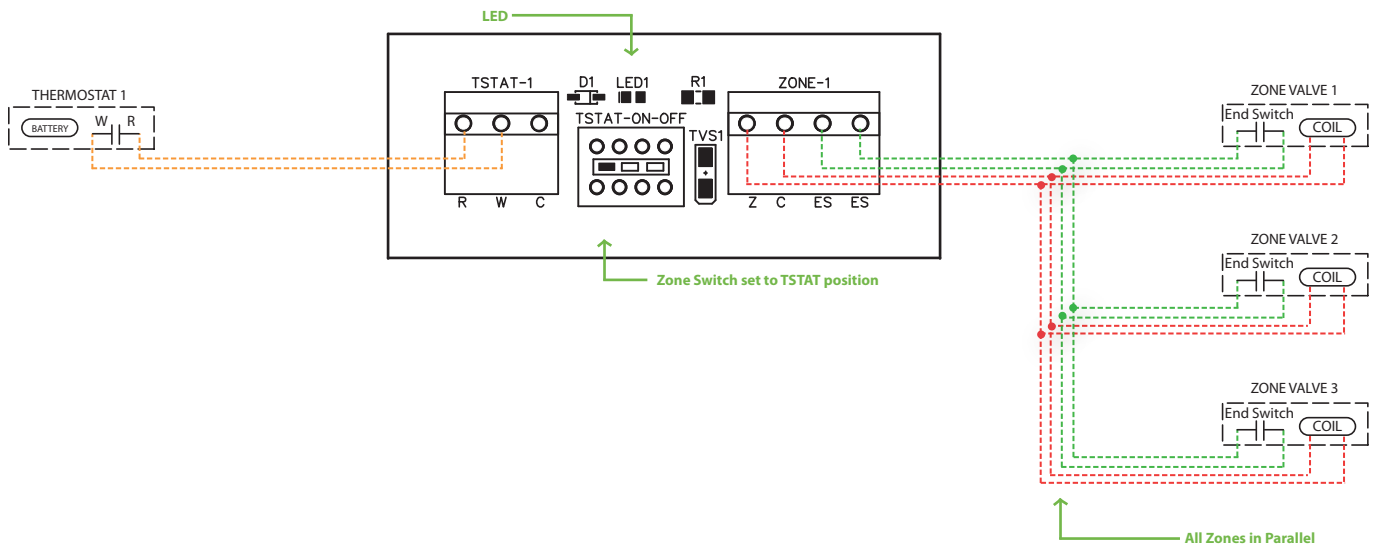
CONFIGURATION AND USE

MULTIPLE ZONE VALVES CONTROLLED BY A SINGLE THERMOSTAT (cont.)

Method B: Parallel Valves

Valves may be wired in parallel, using one thermostat zone for control. The zone valves may be operated using the Zone Switch for ON-OFF-TSTAT control as a group. Individual zone valves are not able to be individually operated as in the bridged method (A) above.

IMPORTANT NOTE: Ensure that the combined load of the connected zone valves are within the load capabilities of the zone control board (100VA), AND the load capabilities of the individual zone circuit (8VA).



Notes:

1. For proper operation using a single thermostat, All zone valves connected to parallel circuit must have their zone control switches placed in the TSTAT position.
2. To force the zone valve group OFF, place the zone switch in the OFF position.
3. To force the zone valve group ON, place the zone switch in the ON position.
4. Return the zone switch to the TSTAT position to resume normal thermostat control / operation.

SERVICE AND REPAIR

Fuse / Fuse Replacement

The ZV9S Zone Board is protected by a standard, user replaceable Cooper Bussman (or equivalent) type GMA, 2 amp fast blow fuse. This factory included 2 amp fuse is intended for standard 40VA transformer applications. For applications where a larger control transformers is used, a maximum fuse size of 4 amps is permitted. A 5 amp fuse is permitted for highly inductive valve loads that may cause the 4 amp fuse to blow during valve actuation. Continuous board load should not exceed 4 amps / 100VA

Replacement / Substitute fuses are available from your local dealer, direct from TTS Thermaltech Systems Inc., or most electrical / electronic wholesalers. Sold in packages of 5.

2 Amp GMA 5mm x 20mm Cooper Bussman Fuse - **Part # TTS-ZV-FU2**

3 Amp GMA 5mm x 20mm Cooper Bussman Fuse - **Part # TTS-ZV-FU3**

4 Amp GMA 5mm x 20mm Copper Bussman Fuse - **Part # TTS-ZV-FU4**

5 Amp GMA 5mm x 20mm Copper Bussman Fuse - **Part # TTS-ZV-FU5**

IMPORTANT NOTE: Failure to comply with rated fuse sizes, or fuse type may present risks associated with product failure.

User Replaceable Parts

The ZV9S Zone Board contains no user replaceable / serviceable parts other than the fuse and connectors. For service and or repair, please contact your local dealer, or TTS Thermaltech Systems Inc.

Optional Parts

The ZV9S Zone Board is designed for panel mounting applications using the tabs provided on the enclosure. For applications where mounting to a DIN rail is required, an optional mounting kit is available.

Din Rail Mounting Kit - **Part # TTS-DR-73**

Panel Mount End Piece Kit - **Part # TTS-PM-73**

Contact Information & Warranty Claim Service

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835-6540 East Hastings Street

Burnaby, BC V5B4Z5 CANADA

Toll Free 1.800.878.7860

Phone 1.604.628.6963

Fax 1.604.628.6967

<http://www.thermaltechsystems.com>

info@thermaltechsystems.com

* All warranty claims must include the serial number. The serial number is located on the original packaging label, and is also located on the bottom side of the circuit board, within the frame assembly. Serial number labels that show visible signs of tamper, will invalidate all warranties.