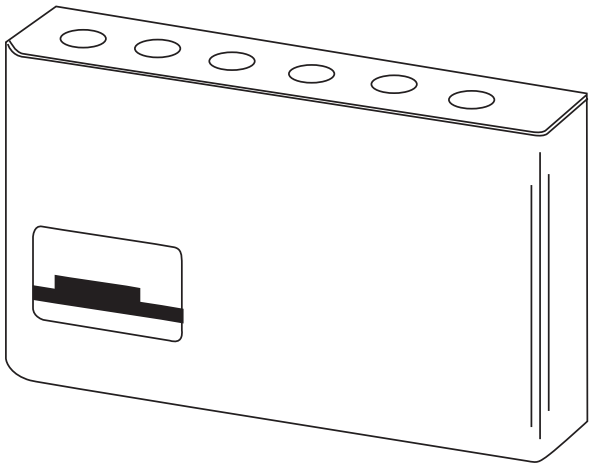
# TAC Erie™ VL500

***Zone Valve Control Center***
***General Instructions***

## Application

The VL500 zone control system provides control of up to five zone valves, a circulator and boiler control in a multi-zone hydronic heating system. Field selectable priority for zone 1 eliminates the need for additional relays to provide domestic hot water priority. Additional zones can be added.



**VL500**

## Features

- Field selectable priority or Priority Plus zone
- Unlimited zone expansion. Maximum load on any serially linked VL500 slave module should not exceed 50 VA
- Field replaceable relay
- LED status window
- Common 24 Vac transformer terminal
- Field replaceable fuse

# SPECIFICATIONS

## Inputs

**Power (N-L1):** 120 Vac, 50/60 Hz, 100 VA.
**Main Fuse (F2):** 10A, 250 Vac slow blow (Bussman MDA-10 or equal)
**Thermostat/Heat Demand Dry Contacts (T1-T1 through T5-T5):** 24 Vac, Class 2
Switched load is 0.05A plus load current at corresponding "1-2" terminals.
(Power supplied by this unit - do not connect external power source).
Set thermostat anticipator per thermostat instructions to measured current.
**Zone in Terminals:** External dry contacts rated for 24 Vac, 2.2 A (58VA), Class 2

## Outputs

**Line Voltage Circulator Output (C1-N):**
**Motor:** 1/3 hp @ 120 Vac
**Boiler Output (Dry Contact X1-X2):**
**General Purpose:** 3A @ 24 Vac, Class 2
**Transformer:** 24 Vac, 75 VA Class 2 (total external loads limited as specified below)
**Secondary Fuse (F1):** 3.2A, 250 Vac slow blow (Bussman MDQ-3 2/10 or equal)
**Zone Valve Outputs (5 pair of terminals 1-2):** 24 Vac, Class 2
**Any Single Zone : 0.9A (22VA),**
**Maximum Total for Master Zone Valves and Thermostats:** 2.7A (65VA)**,**
**Maximum Total for Slave Zone Valves and Thermostats:** 2.1A (50VA)**,**
**Zone Out Terminals:** Switching capacity: 24 Vac, 2.2A (58VA), Class 2

## Environment

**Operating Temperature Limits:** 32 to 104°F (0 to 40°C).
**Humidity:** Up to 85% RH non-condensing.
**Shipping Weight:** 6 lbs (2718 g).
**Location:** NEMA Type 1 (IP20).

## TYPICAL APPLICATIONS (wiring diagram)

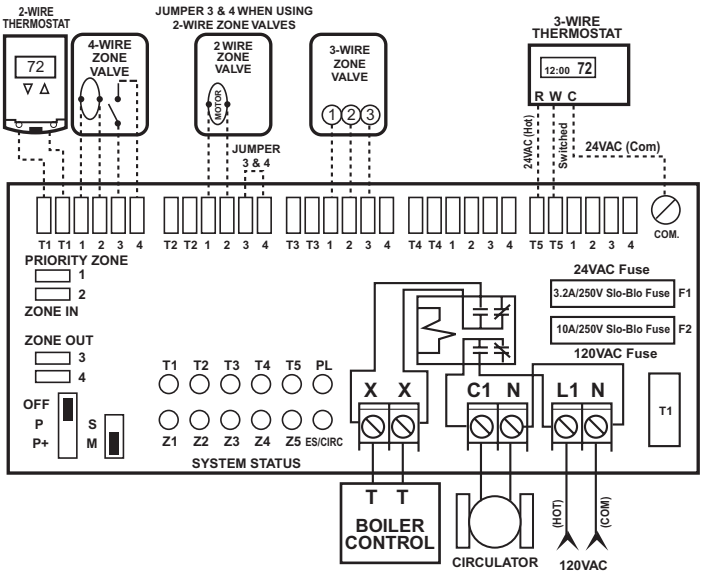



Figure-1 Typical Wiring VL500 Series.

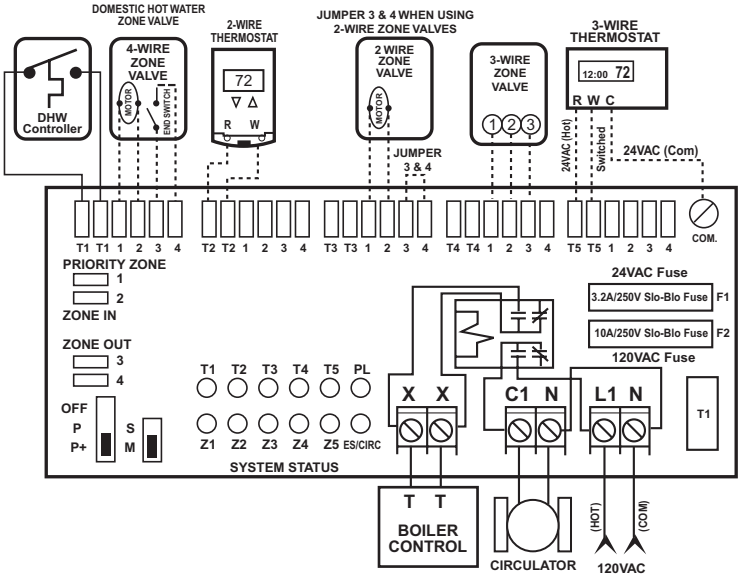



Figure-2 Typical Wiring VL500 Series with Domestic Hot Water Priority Zone, Boiler Controller and Circulator.

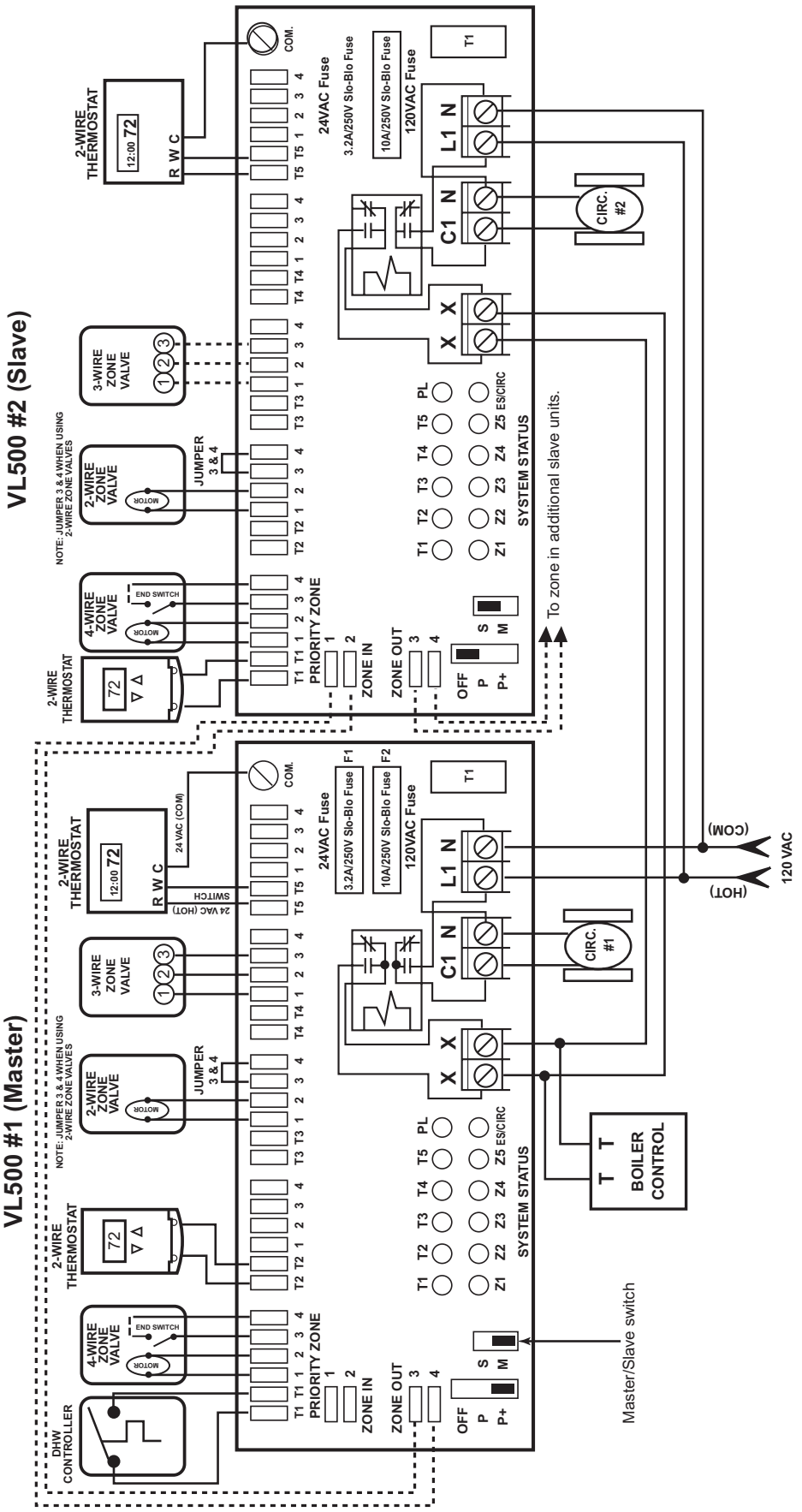



Figure-3 Two VL500 series with Domestic Hot Water Priority, Nine Heating Zones, Boiler and Circulator Control.

# INSTALLATION

## Inspection

Inspect the package for damage. If damaged, notify the appropriate carrier immediately. If undamaged, open the package and inspect the device for obvious damage. Return damaged products.

### Requirements

- Tools (not provided)
  - — Digital multimeter
  - — Screw driver
  - — Wire stripper
- Training: Installer must be a qualified, experienced technician

## Precautions

### General

***WARNING***

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

***CAUTION***

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

## Mounting

Mount the VL500 to a solid vertical surface. Slotted keyholes and standard holes are provided for mounting purposes. Do not mount on a surface that exceeds 104°F (40°C). Avoid high humidity and overhead dripping liquids.

## Status Indicators

### T1-T1—T5-T5 Red LEDs Lit

Indicates zone 1 through zone 5 heat demand is present.

### Z1-Z1—Z5-Z5 Green LEDs Lit

Indicates zone 1 through zone 5 valves are powered.

### ES/CIRC Green LED Lit

Indicates end switch has closed and circulator has been powered.

### PL Yellow LED Lit

Priority plus lock out has occurred. Domestic Hot Water zone (DHW) has called for more than 1 hour. Move the priority selection switch momentarily to the off position and reposition the DHW switch to the Priority Plus position to reset the DHW circuit.

## Wiring Requirements

**Terminal Descriptions** (Figures 1, 2 and 3)

Line Voltage Terminals:

L1, 120 Vac hot.

N, 120 Vac neutral input.

C1, 120 Vac circulator power.

N, 120 Vac Circulator neutral.

Dry Contact Terminals:

X, Dry contact heat demand.

X, Dry contact heat demand.

Low Voltage Terminals:

COM, 24 Vac transformer common (for electronic thermostats).

R, 24 Vac hot.

T1, (left), Zone 1 thermostat, (24V hot or R).

T1, (right), Zone 1 thermostat, (W).

1, Zone valve 24 Vac (common).

2, Zone valve switched 24 Vac (hot).

3, Zone valve end switch (heat demand).

4, Zone valve end switch (24 Vac hot).

## ZoneLink Expansion

The VL500 series is shipped from the factory with the master/slave switch in the M (master) position. To link one or more additional VL500 series:

1. Connect the ZONE OUT terminals of the master unit to the ZONE IN terminals of the slave unit.
2. Place the M/S switch of the master VL500 to the M position.
3. Place the M/S switch of the slave VL500 to the S position.
4. Additional VL500 series can be linked in a similar manner (refer to Figure-3).

## Domestic Hot Water (DHW) Priority

Move the OFF/PR/P+ switch to one of the following positions.

— Off — no DHW priority.

— PR (Priority) — Unlimited DHW priority.

— P+ (Priority Plus) — 1 hour time limit DHW priority.

***NOTE***

Zone 1 must be used for Domestic Hot Water priority or Priority Plus.

## Thermostat Anticipator Setting

Refer to thermostat manufacturer's anticipator setting instructions and to the Specifications in this document.

## CHECKOUT

1. Verify presence of 120 Vac power across L1 and N.
2. Verify presence of 24 Vac power across left side T1 terminal and common C terminal.
3. Verify priority selection and master/slave switch positions.
4. Jumper T1-T1 terminal.
5. Verify presence of 24 Vac power across zone valve terminals 1 and 2.
6. Jumper end switch terminal pair 3 and 4.
7. Verify contact closure across normally open dry contacts X and X.
8. Verify presence of 120 Vac power across circulator output terminals C1 and N.
9. Repeat steps 4 thru 9 for each zone if necessary.

## THEORY OF OPERATION

The VL500 is a zone valve control relay capable of handling up to five heating zones or one priority Domestic Hot Water (DHW) zone, and four heating zones. See the Specifications in this document for load limitations.

The VL500 zone input terminals T1-T1 thru T5-T5 each receive a pair of thermostat wires. When a call for heat occurs on the zone thermostat, the VL500 supplies 24 V to the zone valves, routing this power on terminals 1 and 2.

When the normally closed valve strokes open, the normally open end switch on the valve closes. Closure of the end switch completes a circuit through terminals 3 and 4 of the VL500 zone input terminals. During a call for heat, and once contact closure has occurred across terminals 3 and 4 of the zone, the normally open dry contacts for terminals X-X will go to the closed state. The X-X terminals are wired to the heat source, such as a boiler. Also occurring with any or all zone heat demands, power is routed to a circulator on VL500 terminals C1-N, which provide 120 Vac power to the main loop circulator.

## MAINTENANCE

Regular maintenance of the total system is recommended to assure sustained, optimum performance.

## FIELD REPAIR

The EXP-10 relay cube is replaceable.

Replace any damaged or failed units with functional replacements.

## DIMENSIONAL DATA

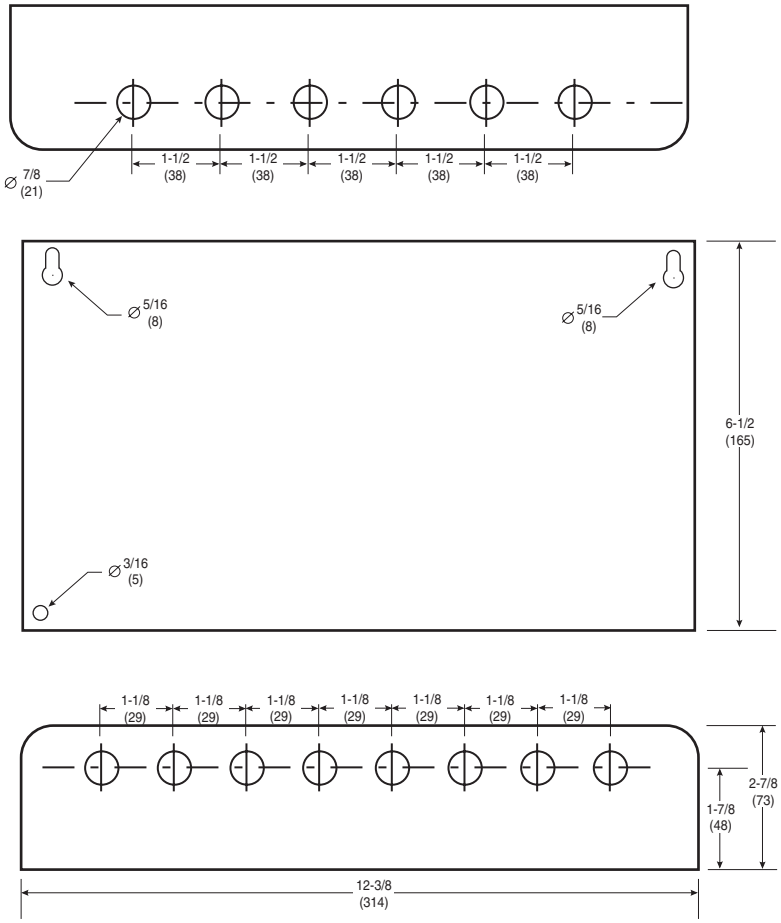



Figure-4 VL500 Series.



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