

Zone Controller – Add-On Zones

EB-ZEA-2

Reference Master Zone Controller Board, EB-ZTA-1 or EB-ZEA-1

This add-on zone controller is for larger systems and represents a second board which acts as a “slave” to the main zone controller EB-ZTA-1 installed within the TS boiler or EB-ZEA-1 mounted externally. This combination provides connections for up to 8 active zones. All functions of the “master” remain the same, this is simply an add-on 4 zones which function similarly to zones 2, 3, and 4.

Except for Priority Dual Temperature features, configuration is the same as EB-ZTA-1 or EB-ZEA-1 (install manual BI008) and it is assumed the installer is familiar with the TS boiler zone controller system.

Note: Capacity dial switches must be set during installation.

Drawings: **BH021**



ELECTRO INDUSTRIES, INC.
2150 West River Street, PO Box 538, Monticello, MN 55362
763.295.4138 • 800.922.4138 • fax 763.295.4434
sales@electromn.com • www.electromn.com

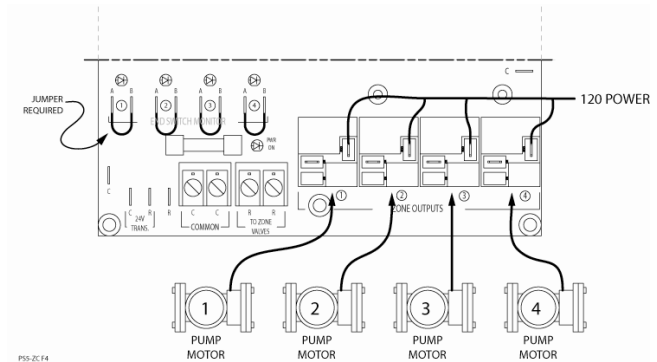
Installation/Hookup

1. Mount enclosure in a convenient location between the boiler and zone devices. Slab stats (temperature controlling thermostat) are wired at the top and zone devices are wired at the bottom.
2. **Transformer power** – internal transformer has primary taps for 120, 208, 240 volts, 60 hertz, single phase. Route appropriate source to left compartment and connect to transformer wires. Cap off the unused transformer wires.
 - a. 120 – black and white.
 - b. 208 – black and red.
 - c. 240 – black and orange.
3. Connect slab stat or temperature sensing **thermostat** to the top terminal block “R and W” as shown on drawing BH021. If using Electro-Stat, a common is required at each Electro-Stat. Common is available at the top right terminal block. Drawing shows typical hookups for various thermostats. Connect per your selected thermostat.
4. Zone devices sizing/priority – actually there is no such thing as a priority associated with the 2 through 8 zones, but the system will function better if the smaller zones are connected to this “slave” controller. If you have a choice, the largest zone would be number 1 on the master board and then simply work your way down.
5. Connect a wire from “C” to “C” between all boards.

Installation/Hookup – Zoning Devices

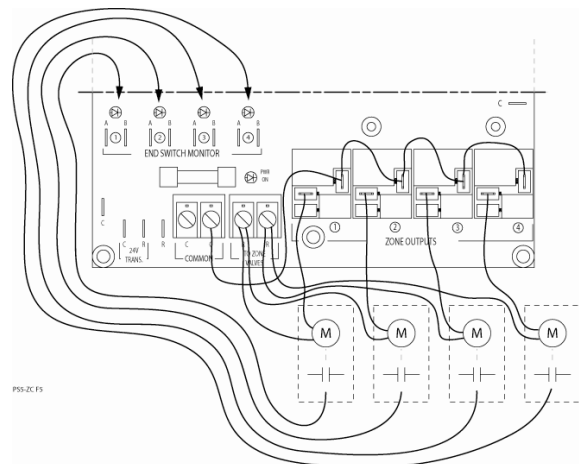
Zone Pumps – Drawing BH019, page 1

1. The 120-volt source for the zone pumps is tied to one tab of each of the zone output relays.
2. The other tab on the relay goes to each zone pump.
3. The common of each zone pump is tied together back to neutral.
4. Since zone pumps do not have an end switch, there must be a jumper across each end switch monitor tab. Simply make up four short wires with a ¼ female tab connector on each end and install A to B as shown.



Zone Valve, 4-Wire – Drawing BH019, page 4

1. Connect a circuit board terminal C wire to a tab terminal on each zone output relay.
2. Connect the other relay tab terminal to one wire of the zone valve motor.
3. Take the second wire from the zone valve motor to the “R” terminal block.
4. Each zone valve end switch wires are extended and connected to the END SWITCH MONITOR tabs.



Zone Actuators or 2-Wire Zone Valves – Drawing
BH019, page 3

1. Zone valve solenoid or motors are wired identical to above.
2. Since 2-wire device does not have end switch, the END SWITCH MONITOR tabs must be jumpered as stated above under Zone Pumps.

3-Wire Zone Valves – Drawing BH019, page 5

1. With these devices internal to the zone valve the 24-volt input wire is common to one side of the end switch.
2. Connect a circuit board terminal C wire to a tab terminal on each zone output relay.
3. Connect the other relay tab terminal to one wire of the zone valve motor.
4. The other point of the end switch (typically terminal 3) is connected to the “B” tab of the end switch monitor.

Taco Self-Contained Pumps – Drawing BH019, page 2

1. Each of the pump circuit boards requires a 120 source.
2. The priority switch on the pump board must be in “non-priority”.
3. The stat terminals for the zone pump board are connected to a relay contact on the zone board.
4. The end switch terminals on the pump circuit board are connected to an appropriate end switch monitor A and B point.

Special – Zone Pumps with Zone 4 going to a sub-branch of 4 additional valves - Drawing
BH022

1. A second controller, EB-ZEA-2, is also required for the second subset of 4.
2. The pump associated with the second zone board (having zone valves) must be operated from #4 relay on the first board (primary).
3. The pumps for zones 1, 2, and 3 are connected and wired same as the above first section.
4. On the slave zone board must pull peg jumper “Dual Temp” (do not worry about text words).

Boiler Circulator/Pump Information

The pump connection and operation to the main boiler depends upon the zone arrangement detailed in the previous section.

1. If it is zone pumps you do not use or wire to the zone pump terminal block in the boiler itself.
2. If it is zone valves the single pump will receive its contact closure from the terminal block within the boiler itself.

Thermostat Heat Anticipator Setting

The two thermostat screw terminal contacts match to fixed 650-ohm load. Set the anticipator to 0.2 or less.

Setup – Zone Sizes

On the zone valve controller board there are four dial switches. From building design information and/or zone capacity calculations, installer must know the approximate BTUH capacity of each zone. Dial in this capacity for each zone:

- 0 = 15,000 BTUH

- 1 = 30,000 BTUH
- 2 = 45,000 BTUH
- 3 = 60,000 BTUH

Monitor LED's

- Power on – green LED represents good fuse and 24-volt transformer source.
- Slab stat or temperature sensing thermostat inputs – illuminates with voltage at “W”.
- Zone valve – illuminates with appropriate stat heat call **and** an end switch contact between 3 and 4.

Fuse

Protects this board and all external field connections/wiring. Replace with 2-amp, fast blow, AGC2.

Staging

This “slave” board sends capacity information to the master board. The master board uses the zone sizing (Btu capacity) information to determine which stages should be active within the zone and the main boiler. In other words, this is simply an extension of the four zones on the master board and the staging calculations are summed from all zones (1-8) that may be active at any one time.

Operational Test

1. Thermostat and zone reaction – as each thermostat is turned up there should be an appropriate reaction from the zone pump/valve/actuator connected to the correct zone number and zone thermostat. LED's for stat input and amber LED's for “end switch monitor” should follow their appropriate inputs.
 - If you do not observe end switch monitor LED's, there is a problem with the end switch monitor wires associated with the A and B tabs. Recheck the hookups on drawing BH019 or the end switch itself within your particular zone device.
2. Boiler, call for heat LED – with a single zone turn-on, the boiler should be activated and show a heat call.
 - If not, check the “C” or common between this zone board and the boiler or the “W-OUT” wire going to the boiler W.
3. Digital communication to the main boiler board – there are two suggested checkout methods. The A method can only apply if the program control chip within the main boiler is 5.33 (or higher) or 6.22 (or higher).

A – After each power-up the internal system verifies proper data communication between the zone controller and the boiler main board. This can be verified by observing the power (green) and EL ON (yellow) front panel LED.

1. Turn off the boiler CB1 (basically removing power from the internal 24-volt transformer).
2. Watching the front panel power (green) and EL ON (yellow) LED, turn on the circuit breaker.
3. Approximately 5 to 8 seconds later the green and yellow LED alternate for approximately 15 seconds.
4. This is a verification of proper hookup and functioning of both main board and zone controller board.
5. If the blink function was not correct as detailed above, recheck the wiring between the two REMOTE terminal blocks, 24-volt power at the Zone Controller board, proper 24-volt wiring polarity with C going to C, etc. Also proper identification between a master and slave board is the priority switch. This must be on the master or first board.

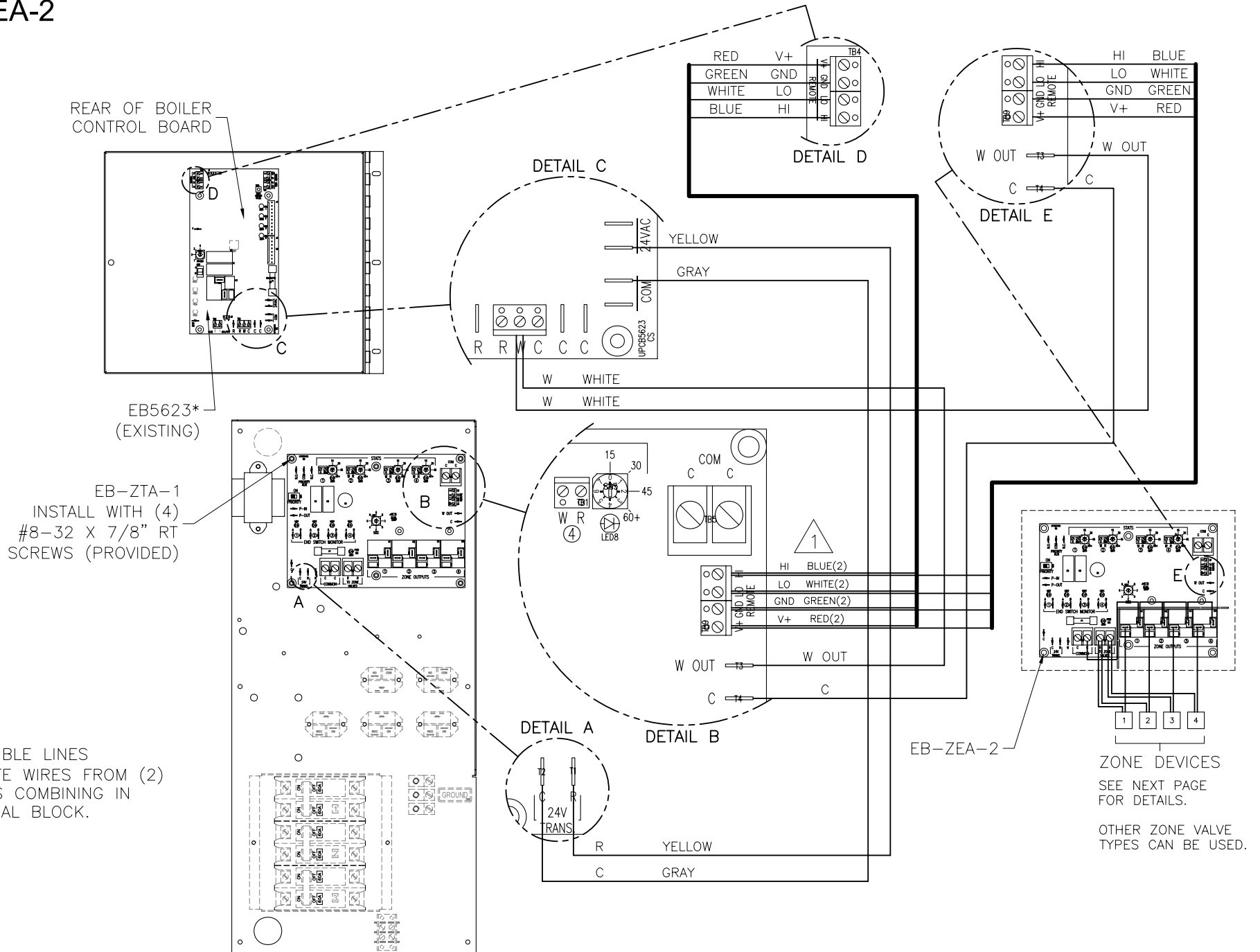
Note – The above sequence applies when you have both the main board with its first 4 zones (master) **and** the added second board with the additional 4 zones (slave). The LED test action is different if it is a single board, see single board manual BI008 for appropriate blinking response.

Comment – This test is about an 85% guarantee of correct wiring hookup. Suggest also running the “B” sequence using the upper 4 zones for the test.

B – Activate several zone thermostats and wait for all four stage lights (main circuit board, inside) to come on within the main boiler. Turn off or decrease setting of all zone thermostats **except** the one smallest zone. Within 15 seconds, the stage lights on the main boiler board shall drop out, showing only the number of stages relating to the value dial switch setup for the smallest zone (example – dial switch set on 0 or 15,000 Btu equals stage 1 only).

4. Priority (if using and on) – do not activate stage 1, activate one or two other stages and observe proper action within the zone device (not LED, the zone device itself). Now activate zone 1 verify the other zone devices drop out. The main boiler will also stage up for full output.
 - PC software or updated Analyzer (WF-ANZ5) can be used to verify the step up in temperature if dual temp feature is used.

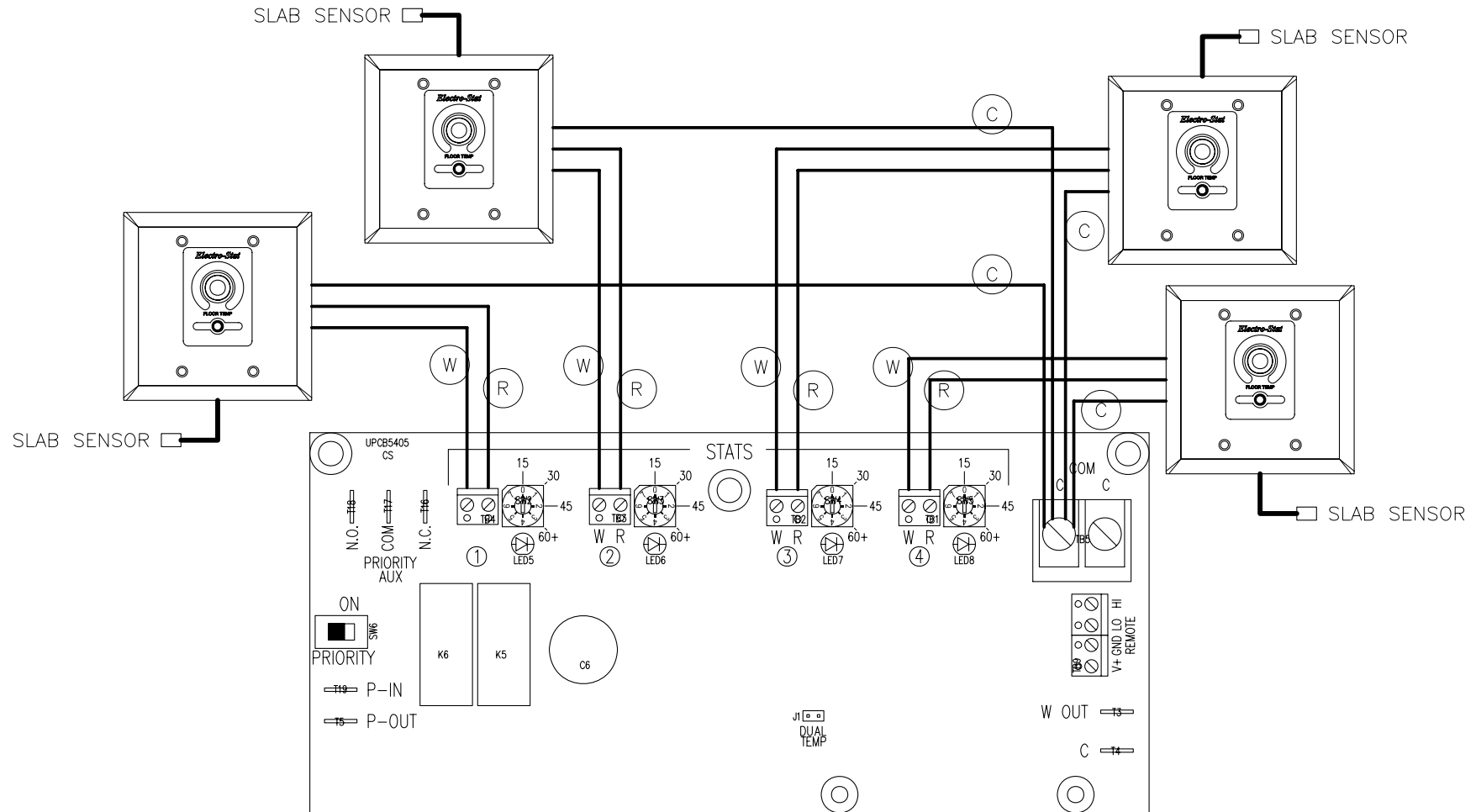
ADD 2ND CONTROLLER (SLAVE) - 5-8 ZONES EB-ZEA-2



NOTES:

1. DOUBLE LINES INDICATE WIRES FROM (2) CABLES COMBINING IN TERMINAL BLOCK.

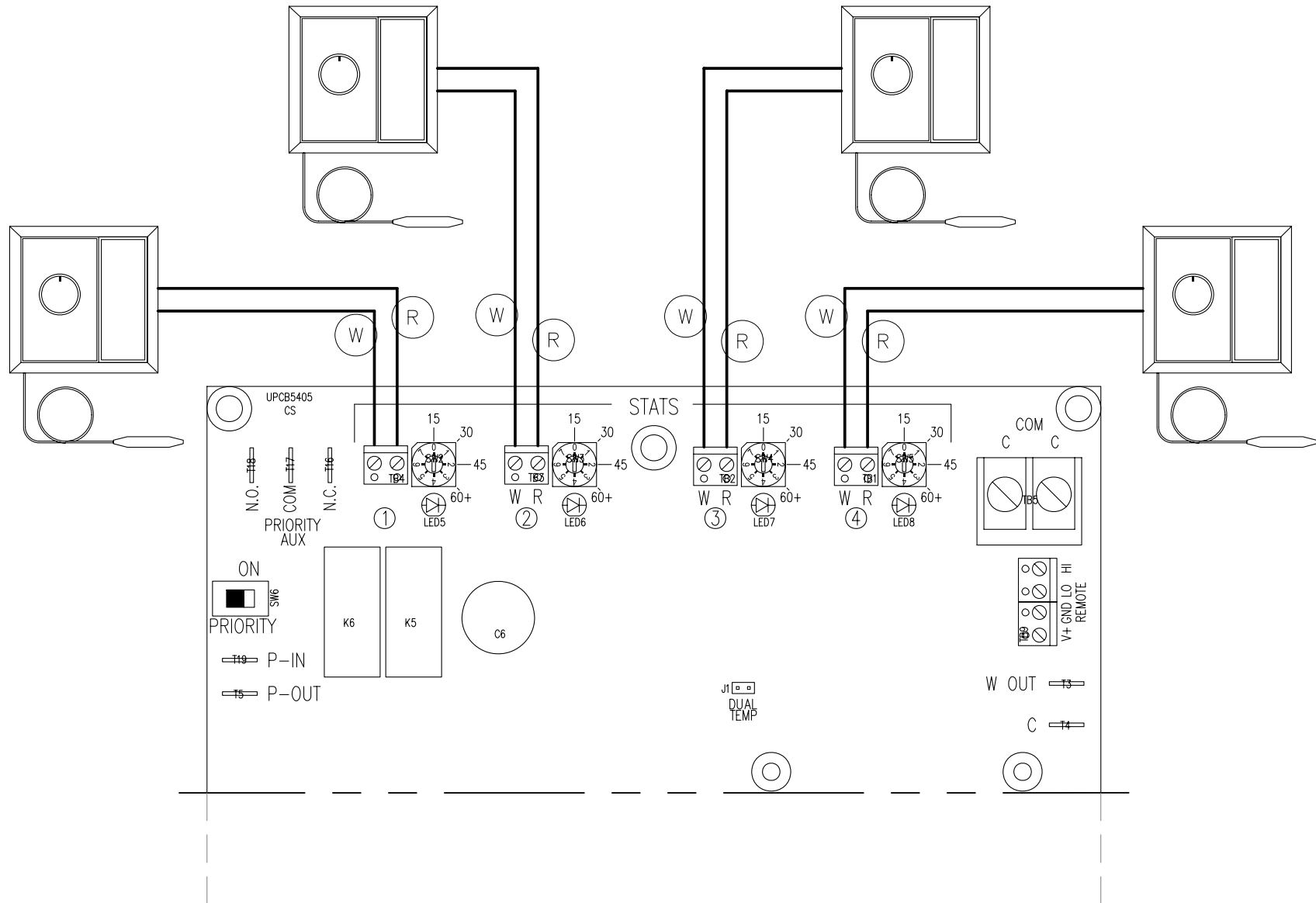
ELECTRO-STAT DIGITAL - ES-24-SRO, ES-24-SR KNOB SET - ES-24-C-RS



NOTES:

1. DIAL SWITCHES MUST BE SET FOR EACH ZONE BTUH LOAD CAPACITY.

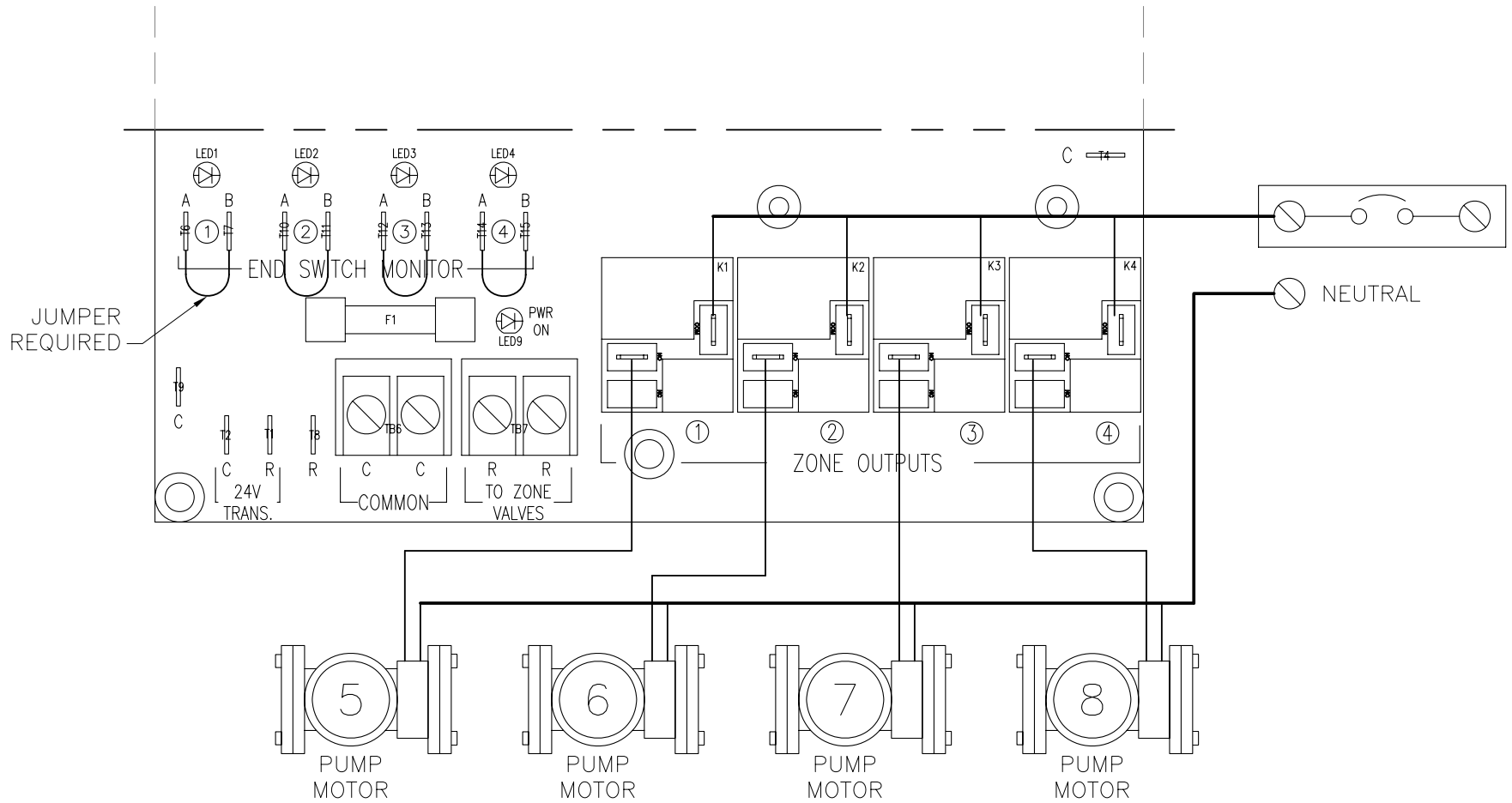
AIR STAT OR CAPILLARY



EB-ZEA-2

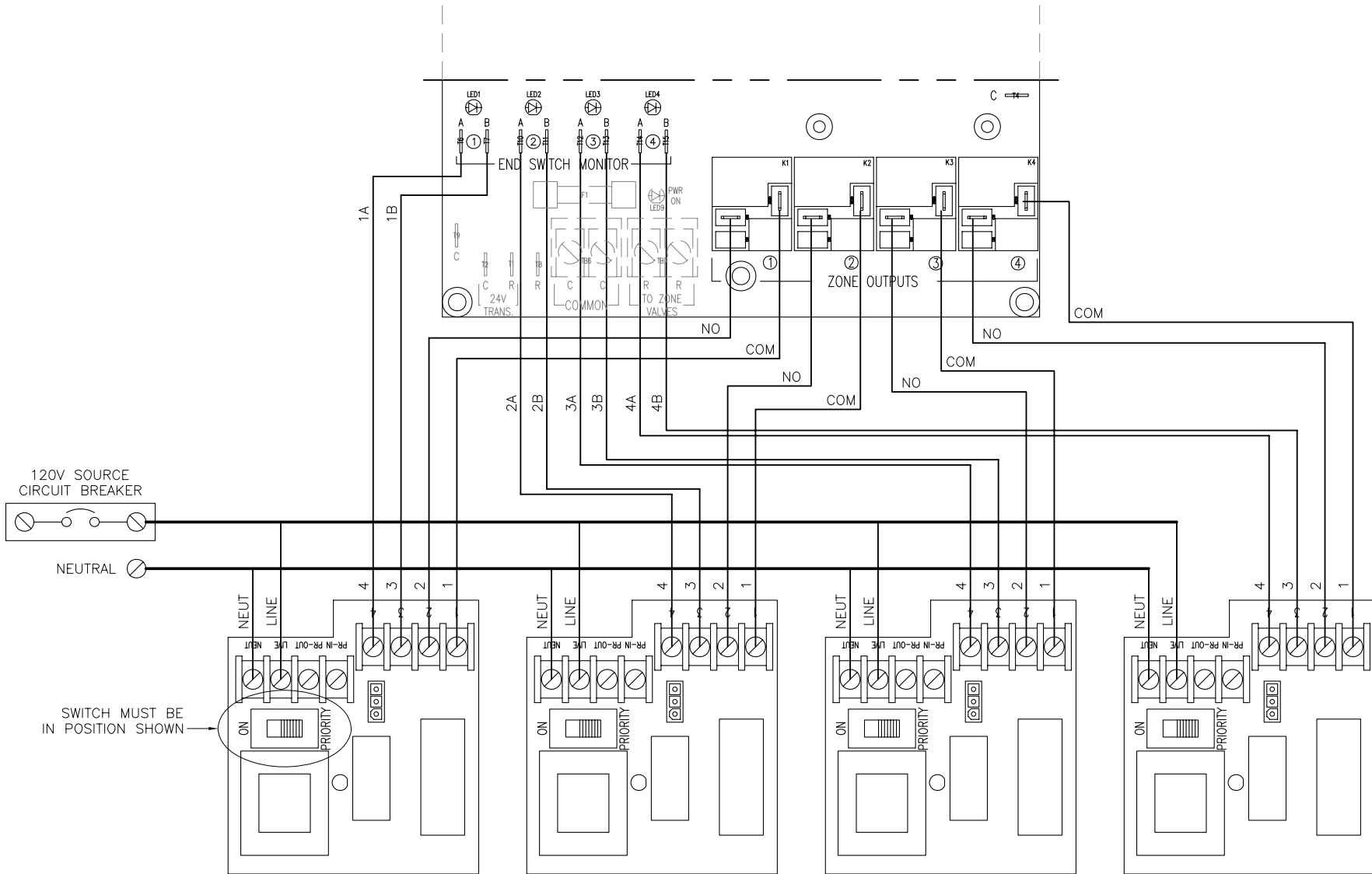
5 - 8 ZONE PUMPS

NO PUMP CONNECTION AT BOILER PUMP TB



EB-ZEA-2

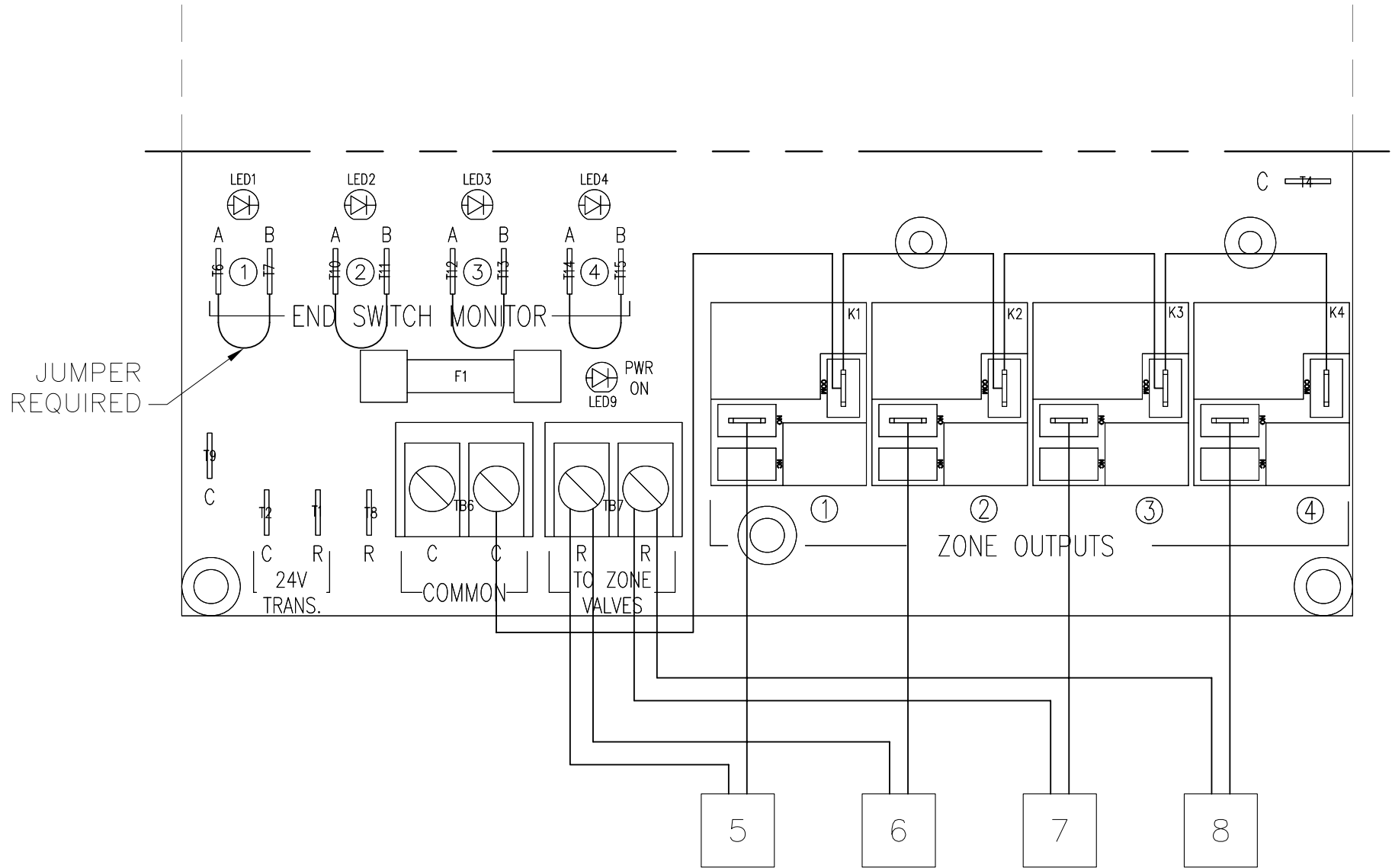
5 - 8 TACO SELF-CONTAINED (003Z - 0014Z) NO PUMP CONNECTION AT BOILER PUMP TB



EB-ZEA-2

ZONE ACTUATORS OR 2-WIRE ZONE VALVES

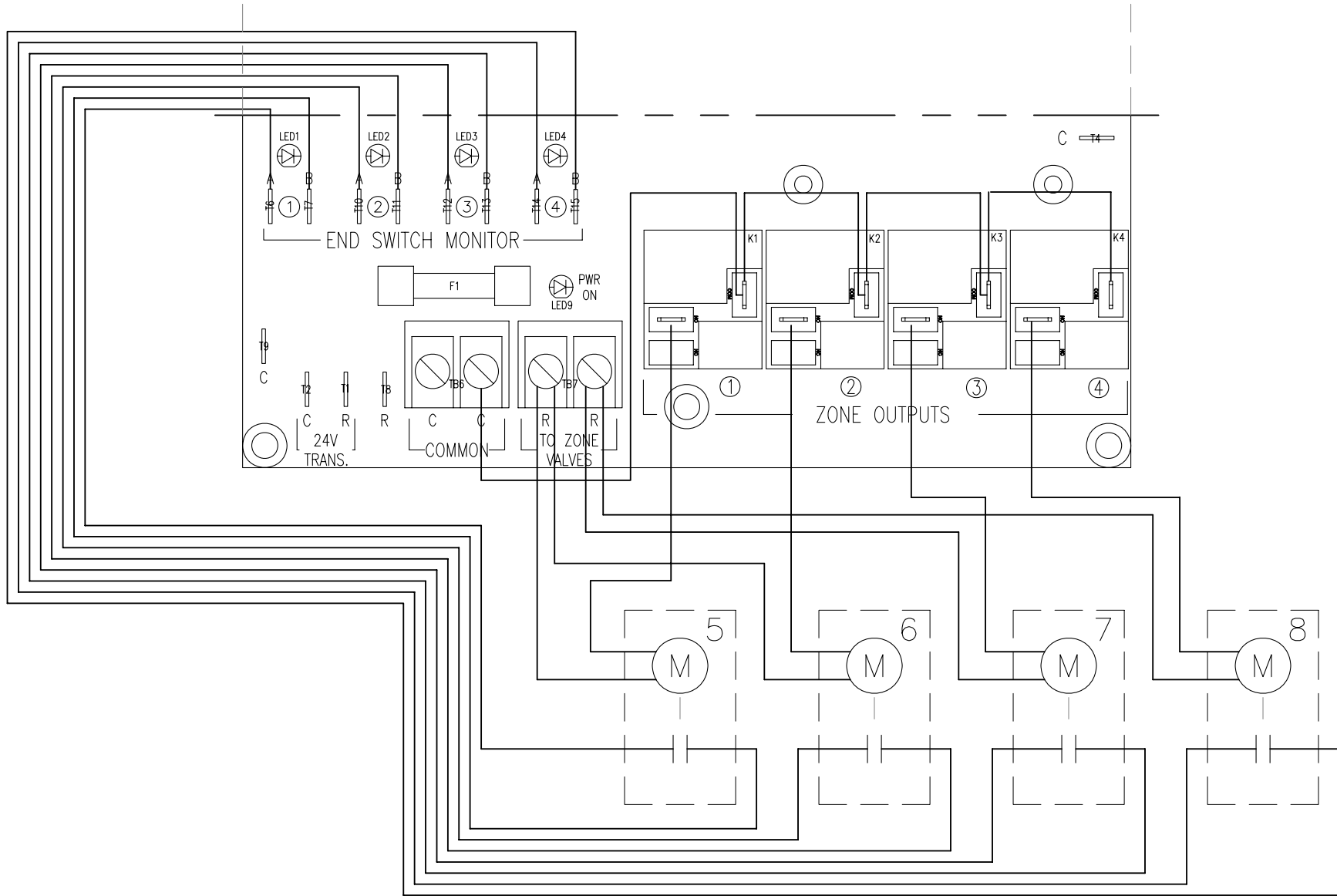
ASSUME SINGLE PRIMARY PUMP (CONNECT TO BOILER TB CONTACT)



EB-ZEA-2

4-WIRE ZONE VALVES

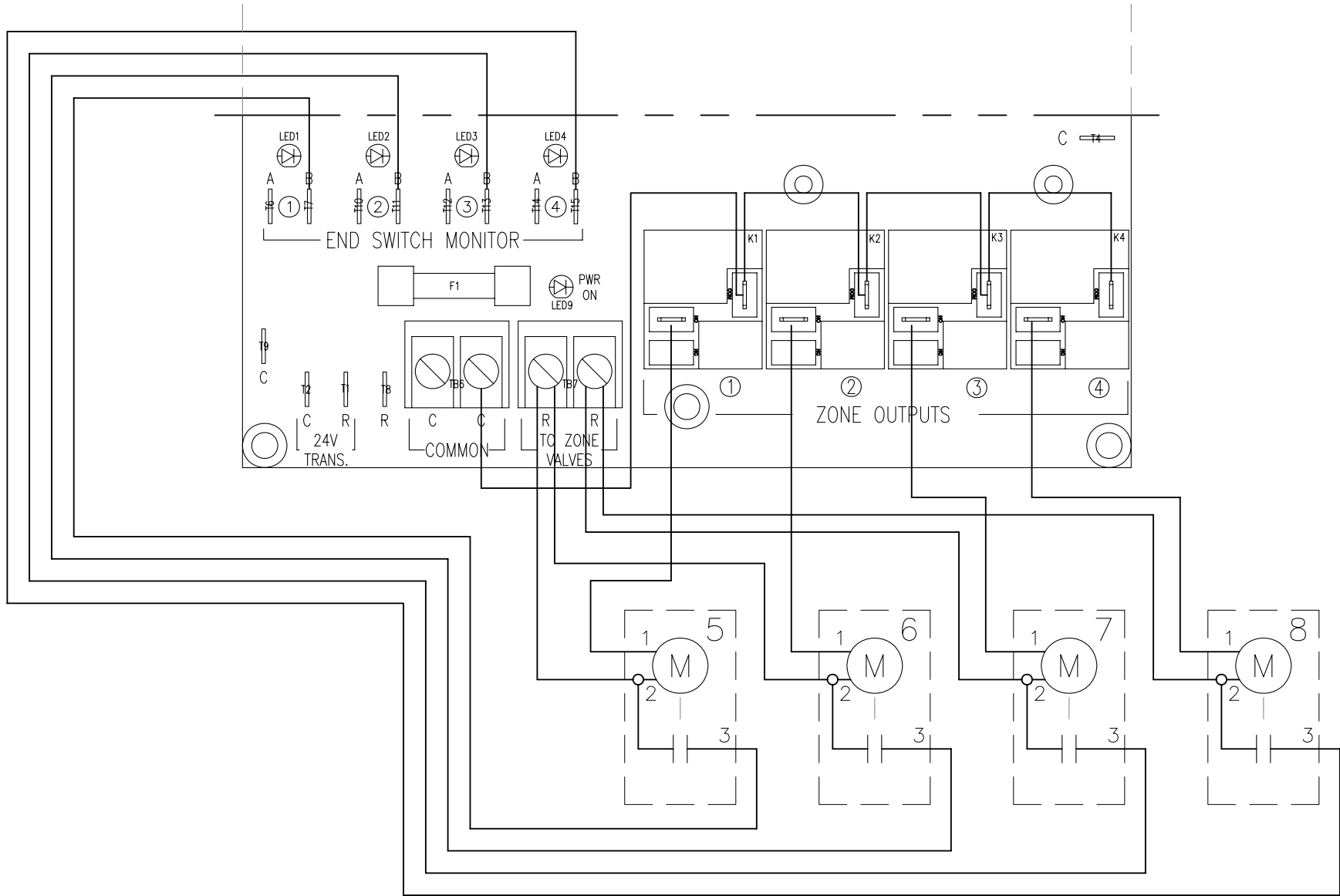
ASSUME SINGLE PRIMARY PUMP (CONNECT TO BOILER TB CONTACT)



EB-ZEA-2

3-WIRE ZONE VALVES

ASSUME SINGLE PRIMARY PUMP (CONNECT TO BOILER TB CONTACT)



LIMITED WARRANTY STATEMENT

Electro Industries, Inc., expressly warrants its products to the original purchaser of this product, except as noted and listed below, to be free of defects in material and/or workmanship for a period of three (3) years from manufacturing date code or two (2) years from date of installation, whichever occurs first. Except for this express warranty, the purchaser accepts product(s) AS IS. Remedies under this warranty are limited to repairing or replacing, at Electro Industries option, any malfunctioning part or component which shall, within the above stated warranty, be returned to Electro Industries at the address listed below, freight prepaid.

This limited warranty **does not** cover – normal maintenance; replacement of fuses, filters, refrigerant, etc.; transportation and installation charges for the replacement part or component; or any other service calls or labor repairs.

This warranty does not apply:

- If this unit has been installed in violation of any codes or statutes.
- If unit has been repaired improperly.
- If unit has been subject to alteration, neglect, or misuse.
- If installed in an area where atmosphere contained chemical erosion.
- If components are damaged due to freezing or water chemistry erosion.
- Damages resulting in shipment or handling by the freight carrier. It is the receiver's responsibility to claim and process freight damage.
- Damage resulting from improper voltages or power supply source.
- If unit is not installed according to manufacturer's specifications and installation instruction manual.
- If incorrect model or size was installed for the application.
- If unit contains modifications to internal wiring, removal or bypass of parts, bypass of safety circuits, modification of parts or circuit boards, or mechanical airflow changes not authorized in writing by the factory.
- If the serial identification decal (label) is defaced.
- If the invoice is marked "AS IS".

The returned part or component must contain a warranty tag or information clearly stating serial number, installation date, and nature of failure.

Replacement of a part or component under this limited warranty does not extend the warranty term or period.

There are no other express warranties. Specification sheets and descriptions of this product are only to identify it, and are not a warranty claim that the unit fits the description. We do not warranty this product suitable for the specific installation or application. It is the owner's (or installer's) responsibility for proper application.

Electro Industries is not bound by representatives, installers, warranties, or promises made by others beyond the terms of this express warranty. In no event shall Electro Industries be responsible for any installation incidental or consequential damages.

Any action for breach of this limited warranty must be commenced within one year from the date of the breach.

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state. For example, some states do not allow the exclusion or limitation of incidental or consequential damages. So the above limitation may not apply to you.



ELECTRO INDUSTRIES, INC.

2150 West River Street, PO Box 538, Monticello, MN 55362
763.295.4138 • 800.922.4138 • fax 763.295.4434
sales@electromn.com • www.electromn.com