

Zone Controller — Add-On Zones

EB-ZEA-2

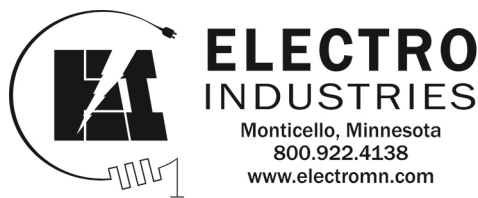
Reference Master Zone Controller Board, EB-ZTA-1 or EB-ZEA-1

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**
 XX017



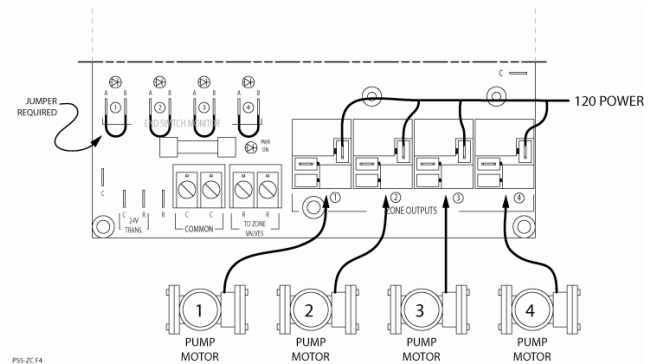
Installation/Hookup

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

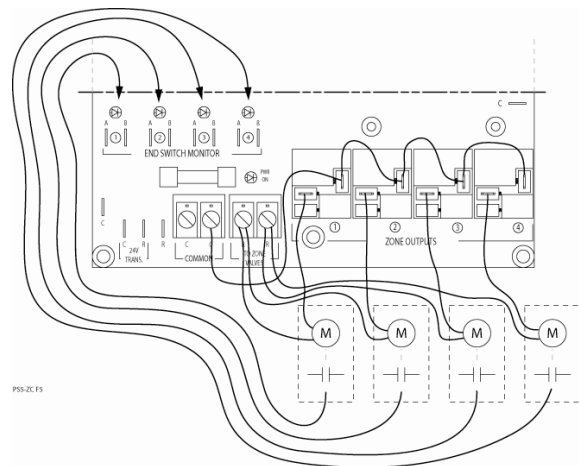
Zone Pumps – Drawing BH019, page 1

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 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.

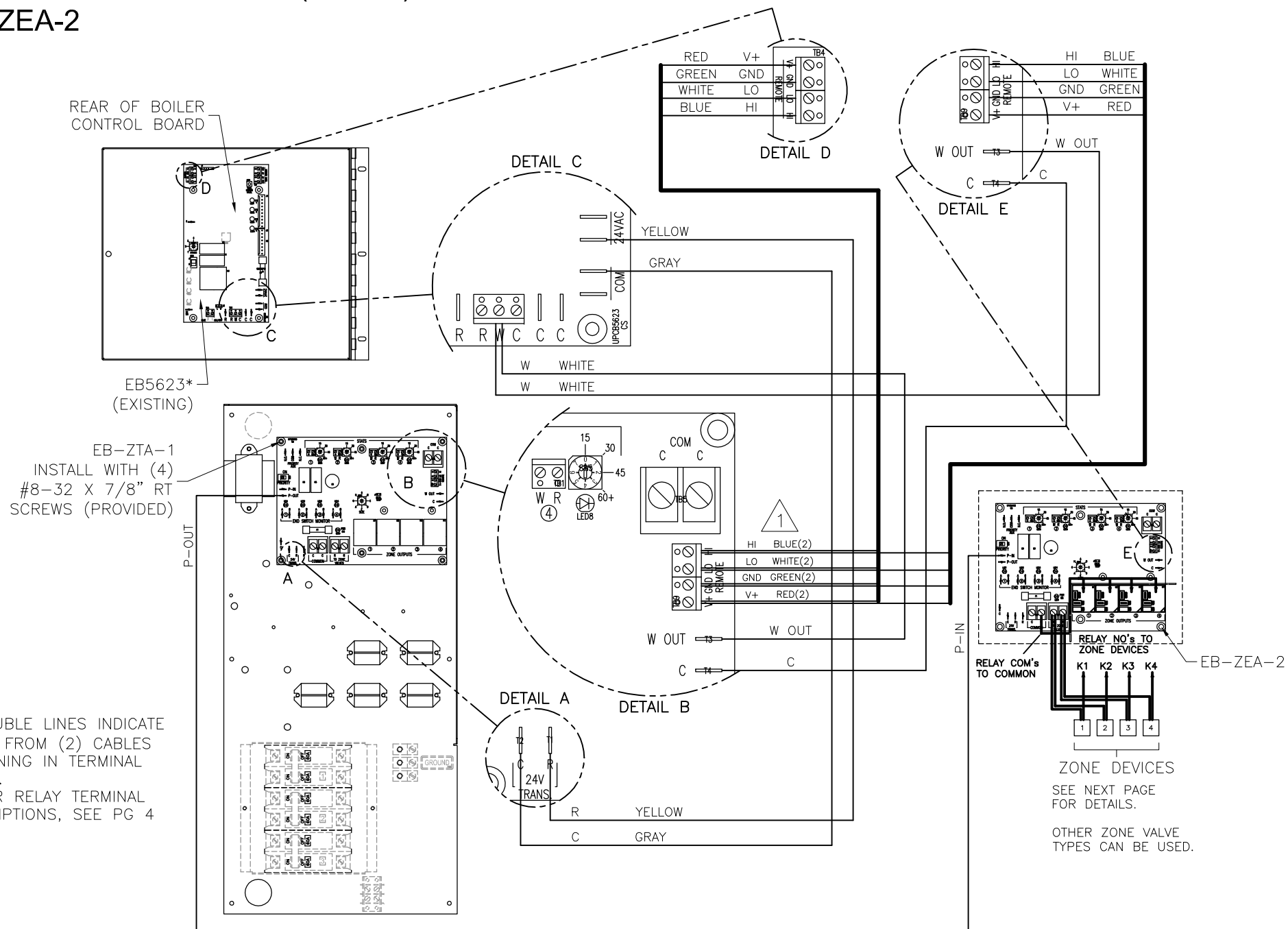
Note – The above sequence applies when you have both the main board with its first 4 zones (master) **and** the added second board with the additional 4 zones (slave). The LED test action is different if it is a single board, see single board manual BI008 for appropriate blinking response.

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-ANZ*) can be used to verify the step up in temperature if dual temp feature is used.

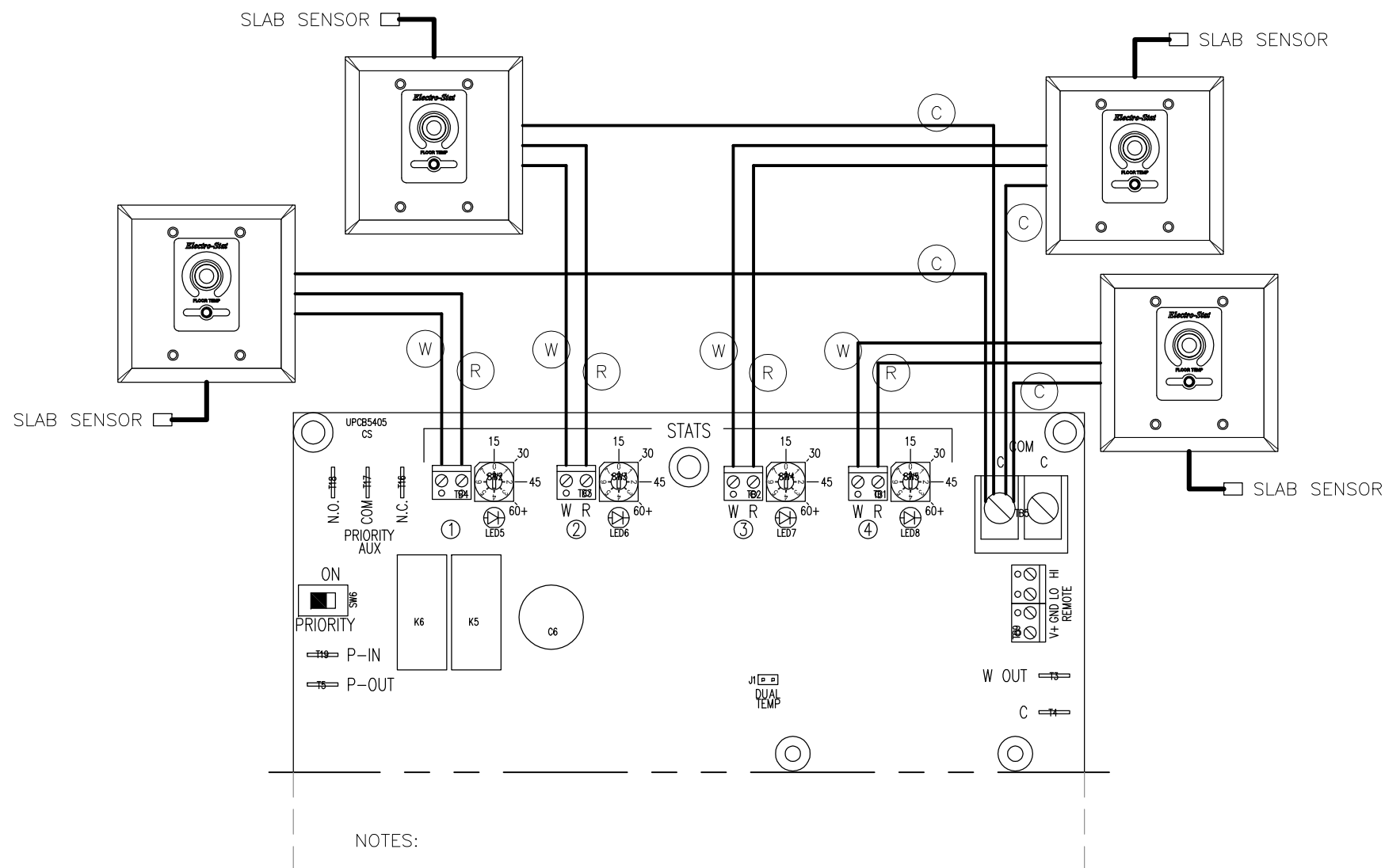
ADD 2ND CONTROLLER (SLAVE) - 5-8 ZONES



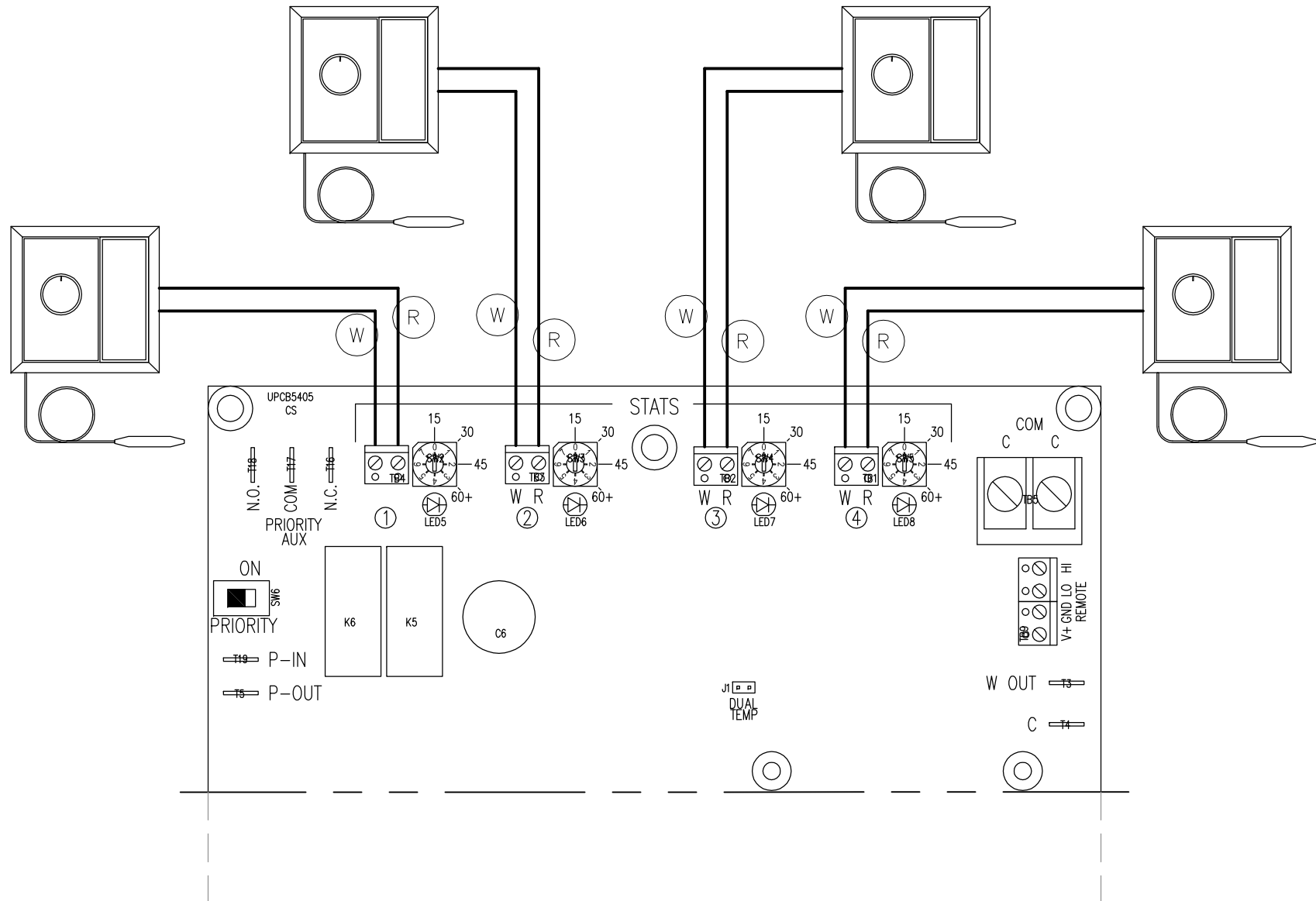
NOTES:

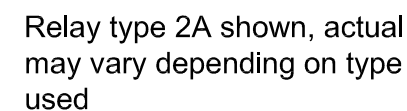
1. DOUBLE LINES INDICATE WIRES FROM (2) CABLES COMBINING IN TERMINAL BLOCK.
2. FOR RELAY TERMINAL DESCRIPTIONS, SEE PG 4

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



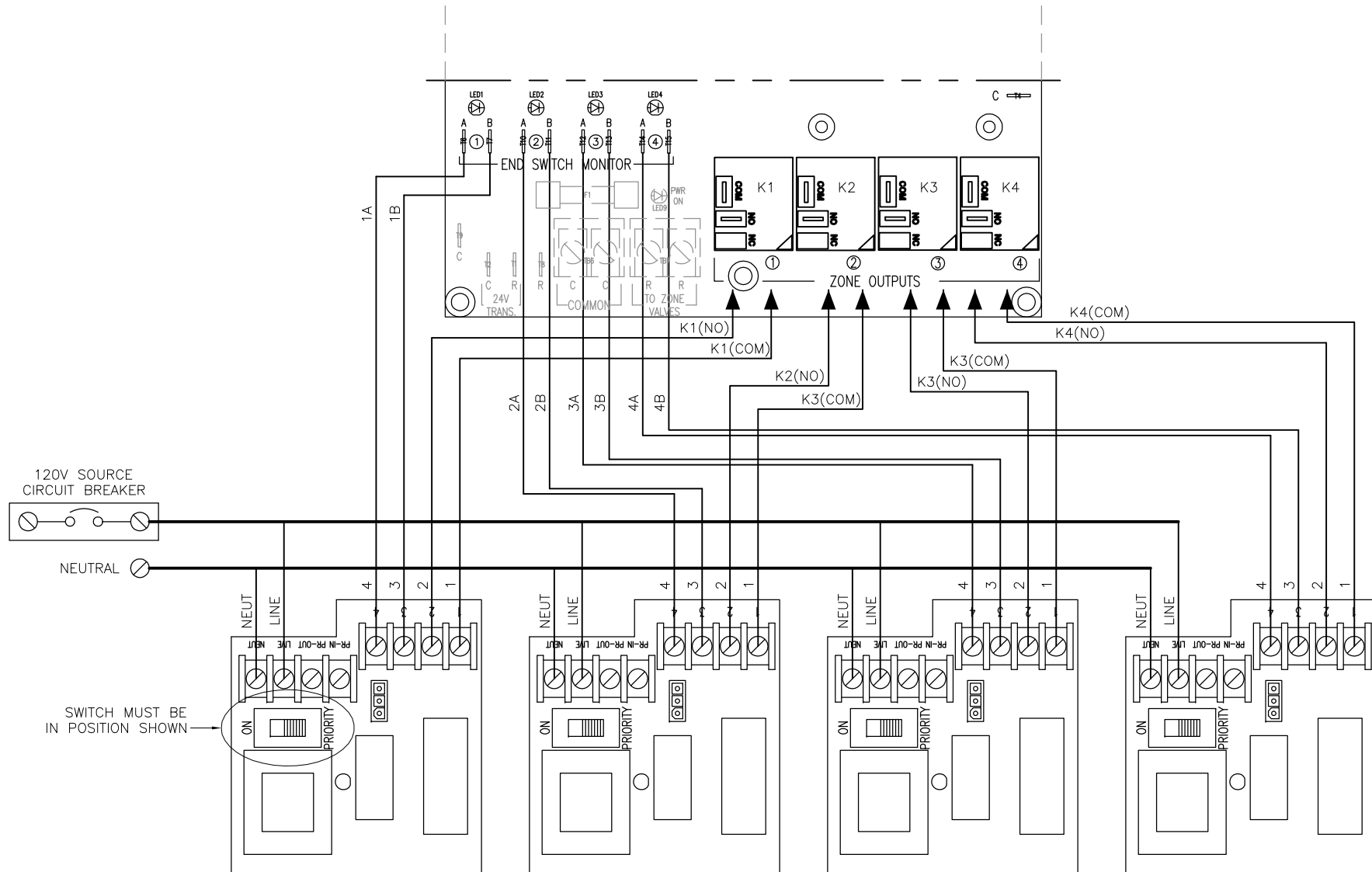
AIR STAT OR CAPILLARY





EB-ZEA-2

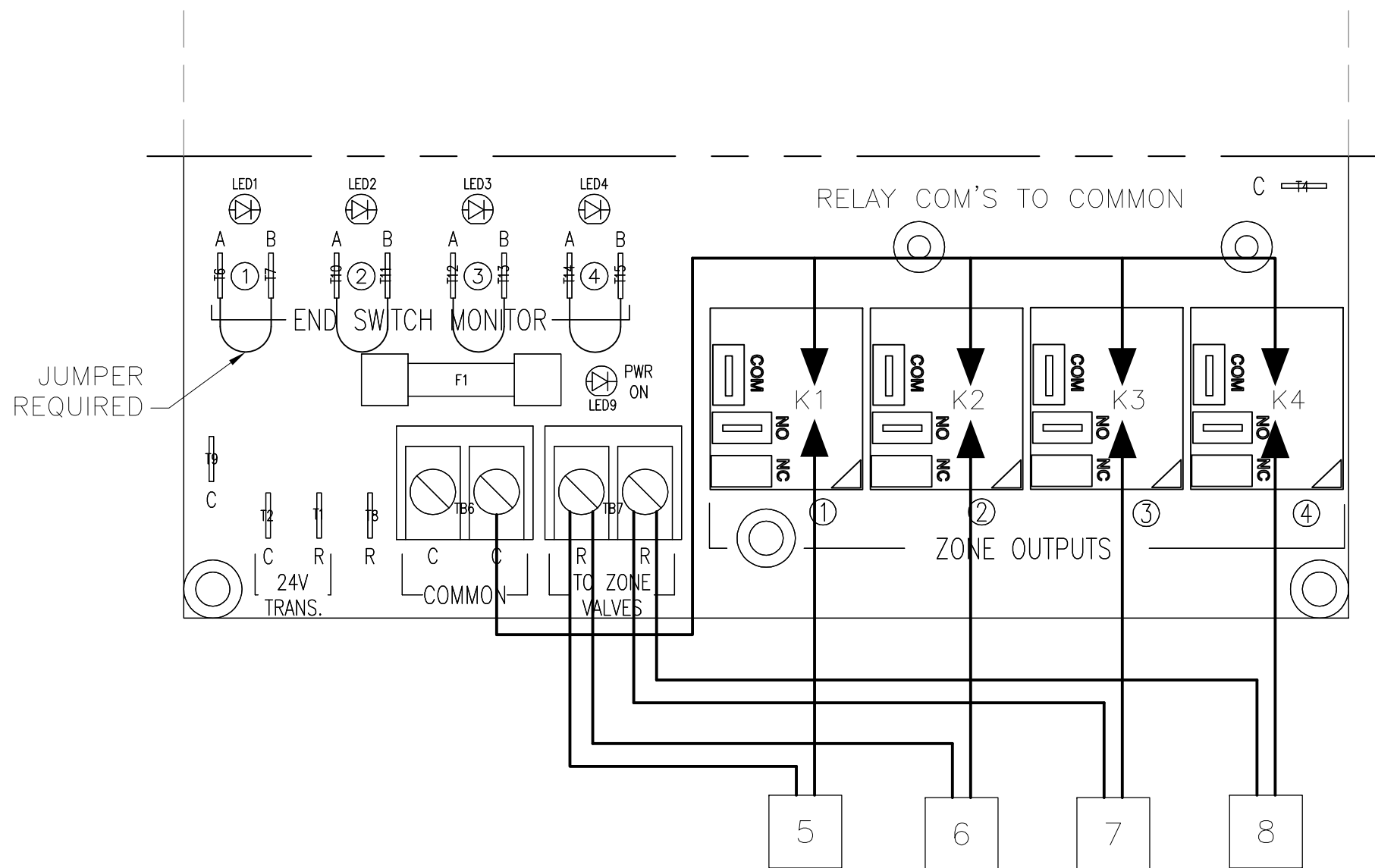
5 - 8 TACO SELF-CONTAINED (003Z - 0014Z)
NO PUMP CONNECTION AT BOILER PUMP TB



EB-ZEA-2

ZONE ACTUATORS OR 2-WIRE ZONE VALVES

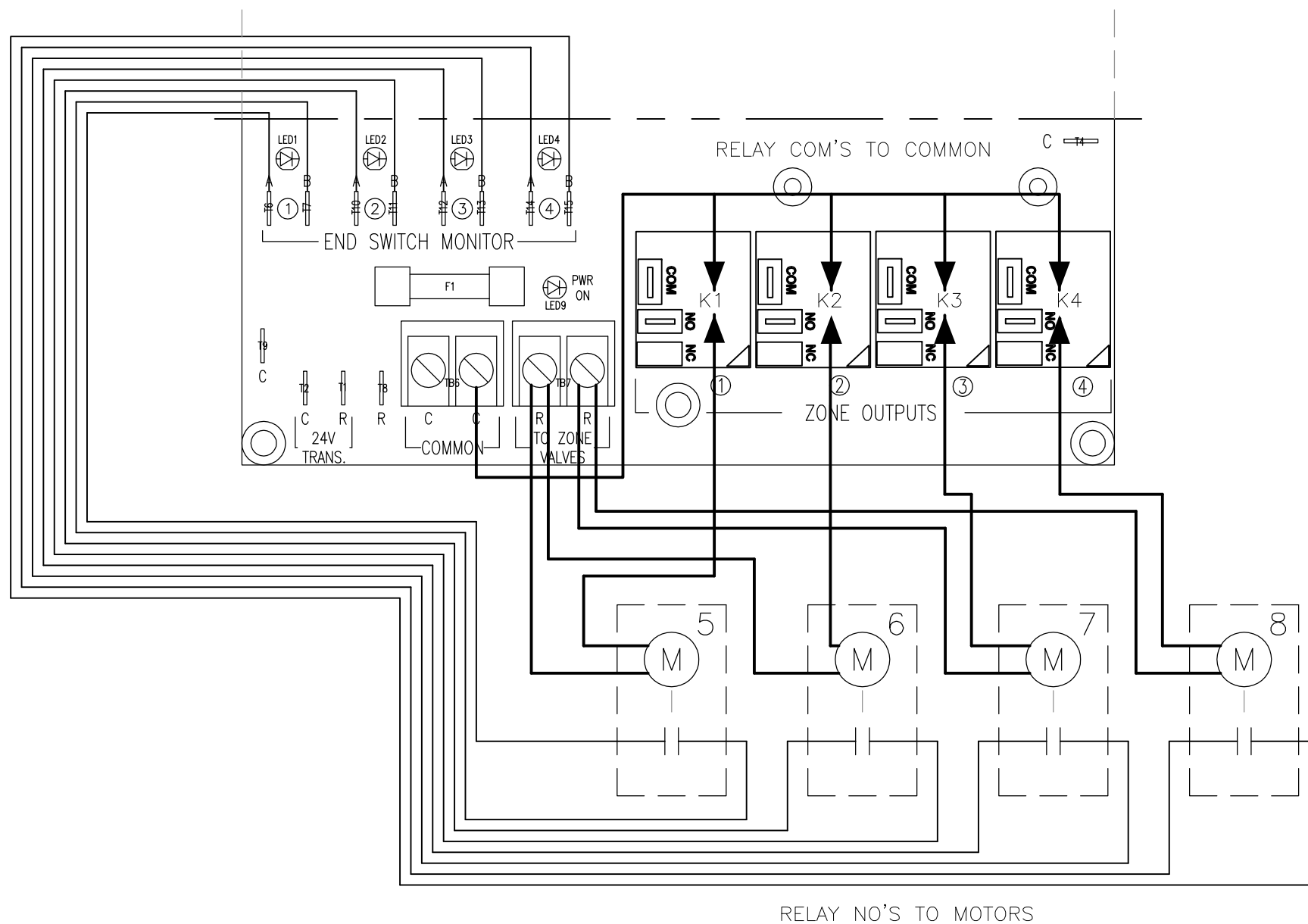
ASSUME SINGLE PRIMARY PUMP (CONNECT TO BOILER TB CONTACT)



EB-ZEA-2

4-WIRE ZONE VALVES

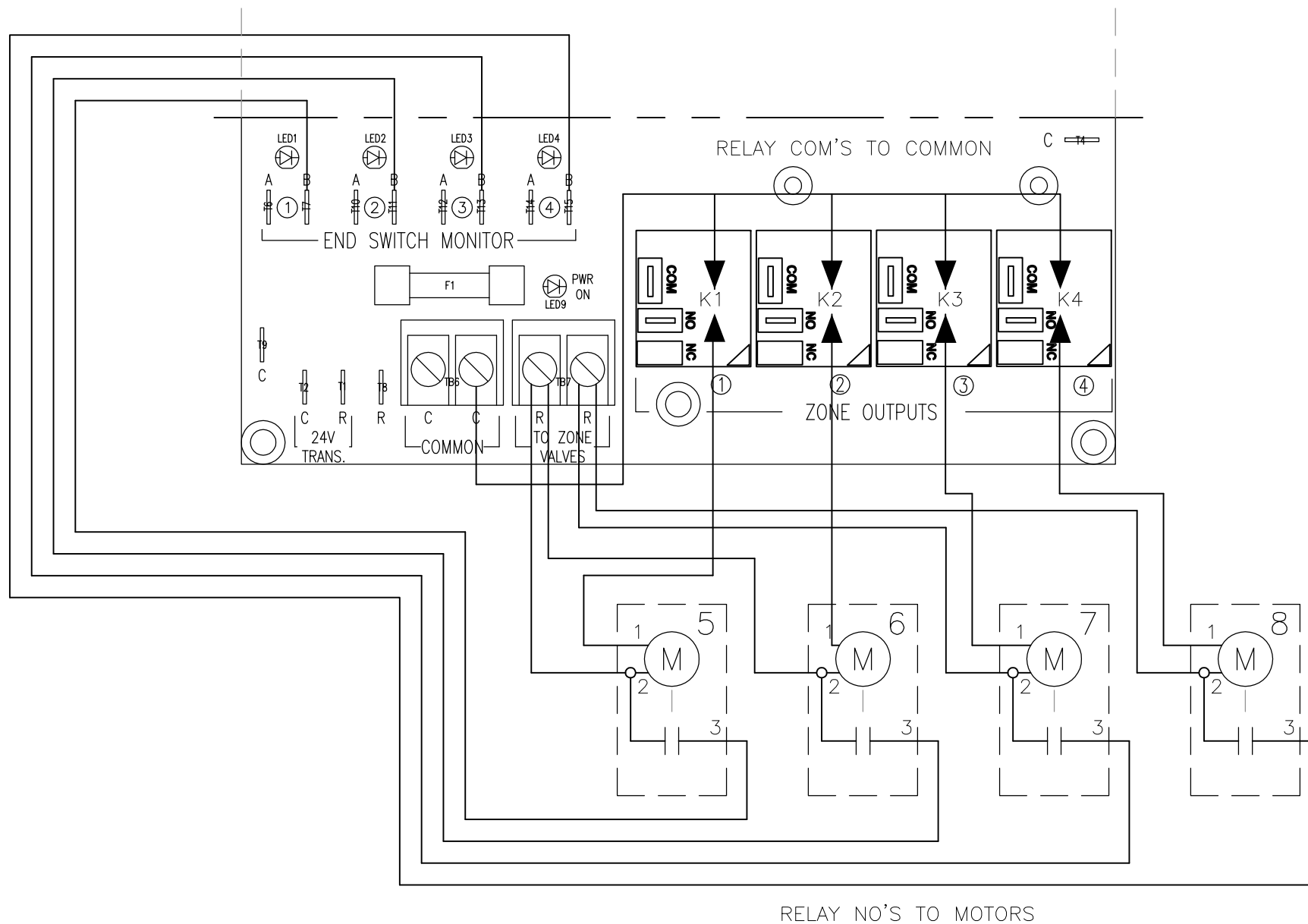
ASSUME SINGLE PRIMARY PUMP (CONNECT TO BOILER TB CONTACT)



EB-ZEA-2

3-WIRE ZONE VALVES

ASSUME SINGLE PRIMARY PUMP (CONNECT TO BOILER TB CONTACT)



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Effective November 1, 2009

Electro Industries, Inc. warrants to the original owner, at the original installation site, for a period of two (2) years from date of original purchase, that the product and product parts manufactured by Electro Industries, Inc. are free from manufacturing defects in materials and workmanship, when used under normal conditions and when such product has not been modified or changed in any manner after leaving the plant of Electro Industries, Inc. If any product or product parts manufactured by Electro Industries, Inc. are found to have manufacturing defects in materials or workmanship, such will be repaired or replaced by Electro Industries, Inc. Electro Industries, Inc., shall have the opportunity to directly, or through its authorized representative, examine and inspect the alleged defective product or product parts. Electro Industries, Inc. may request that the materials be returned to Electro Industries, Inc. at owner's expense for factory inspection. The determination as to whether product or product parts shall be repaired, or in the alternative, replaced, shall be made by Electro Industries, Inc. or its authorized representative.

Electro Industries, Inc. will cover labor costs according to the Repair / Replacement Labor Allowance Schedule for a period of ninety (90) days from the date of original purchase, to the original owner, at the original installation site. The Repair / Replacement Labor Allowance is designed to reduce the cost of repairs. This Repair / Replacement Labor Allowance may not cover the entire labor fee charged by your dealer / contractor.

TWENTY YEAR (20) LIMITED WARRANTY ON BOILER ELEMENTS AND VESSELS

Electro Industries, Inc. warrants that the boiler elements and vessels of its products are free from defects in materials and workmanship through the twentieth year following date of original purchase. If any boiler elements or vessels are found to have a manufacturing defect in materials or workmanship, Electro Industries, Inc. will replace them.

TWENTY YEAR (20) LIMITED WARRANTY ON SPIN FIN ELEMENTS

Electro Industries, Inc. warrants that the spin fin elements of its products are free from defects in materials and workmanship through the twentieth year following date of original purchase. If any spin fin elements are found to have a manufacturing defect in materials or workmanship, Electro Industries, Inc. will replace them.

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2. Any product that has been damaged as a result of being improperly serviced or operated, including, but not limited to, the following: operated with insufficient water or airflow, allowed to freeze, subjected to flood conditions, subjected to improper voltages or power supplies, operated with airflow or water conditions and/or fuels or additives which cause unusual deposits or corrosion in or on the product, chemical or galvanic erosion, improper maintenance or subject to any other abuse or negligence.
3. Any product that has been damaged as a result of natural disasters, including, but not limited to, the following: lightning, fire, earthquake, hurricanes, tornadoes or floods.
4. Any product that has been damaged as a result of shipment or handling by the freight carrier. It is the receiver's responsibility to claim and process freight damage with the carrier.
5. Any product that has been defaced, abused, or suffered unusual wear and tear as determined by Electro Industries or its authorized representative.
6. Workmanship of any installer of the product. This warranty does not assume any liability of any nature for unsatisfactory performance caused by improper installation.
7. Transportation charges for any replacement part or component, service calls, normal maintenance; replacement of fuses, filters, refrigerant, etc.

CONDITIONS AND LIMITATIONS:

1. If at the time of a request for service the original owner cannot provide an original sales receipt or a warranty card registration then the warranty period for the product will have deemed to begin thirty (30) days after the date of manufacture and **NOT** the date of installation.
2. The product must have been sold and installed by a licensed electrical contractor, a licensed plumbing contractor, or a licensed heating contractor.
3. The application and installation of the product must be in compliance with Electro Industries' specifications as stated in the installation and instruction manual, and all state and federal codes and statutes. If not, the warranty will be null and void.
4. The purchaser shall have maintained the product in accordance with the manual that accompanies the unit. Annually, a qualified and licensed contractor must inspect the product to assure it is in proper working condition.
5. All related heating components must be maintained in good operating condition.
6. All lines must be checked to confirm that all condensation drains properly from the unit.
7. Replacement of a product or product part under this limited warranty does not extend the warranty term or period.
8. Replacement product parts are warranted to be free from defects in material and workmanship for ninety (90) days from the date of installation. All exclusions, conditions, and limitations expressed in this warranty apply.
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