



# TJERNLUND PRODUCTS, INC.

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REV. B 08/05

**MAC4E  
BOARD  
VERSION F**

## MAC4E OPERATION

The MAC4E is used in conjunction with the UC1 Universal Control to interlock up to four additional 24 VAC, 115 VAC or millivolt (Dry Contact) controlled appliances. It activates the Venter through its connections to the UC1 and in turn relies on the UC1 Fan Prover safety circuit (P1 & P2) to allow its interlocked appliances to operate. Any pre/post-purge settings on the UC1 will be defaulted to the MAC4E. Two LEDs for each appliance interlock block are provided on the MAC4E. LEDs #1, 3, 5, 7 (AMBER) show an appliance call for heat. LEDs #2, 4, 6, 8 (BLUE) show that the burner is approved to fire after the Venter Fan Prover safety circuit (P1 & P2) through the UC1 is completed. The MAC4E also has an LED #9 (RED) which means power is supplied to the MAC4E through the UC1.

### MILLIVOLT INSTALLATIONS

Each millivolt appliance interlocked with the MAC4E must have its own WHKE kit installed. The WHKE Gas Pressure Switch actuates the Venter through the A - B Dry contacts. The Linear Limit switch disables the heater in the event of a venting malfunction. **IMPORTANT:** Each millivolt appliance interlocked with the MAC4E must have its own Linear Limit spill switch.

### WARNING

Multiple heaters firing at the same time will result in varying volumes of flue gas and varying vent system draft pressures. Make sure all heaters interlocked with the MAC4E operate within the normal draft range specified by the heater manufacturer. All heaters utilizing a fixed speed Venter/Inducer must be equipped with a draft hood, draft diverter, or barometric draft control. Tjernlund ABD-Series Balancing Baffles may be utilized for balancing draft on each heater.

## MAC4E MOUNTING

Do not mount the MAC4E junction box on a heat source that exceeds 104°F (40°C). Examples of improper mounting surfaces include vent pipe, top of appliance casing or any place where radiant or convective heat would cause the junction box temperature to exceed 104°F.

The MAC4E is intended for indoor installation only.

The MAC4E has a 2 foot whip that contains 1 ground, 2 power and 3 communication leads. Mount MAC4E adjacent to UC1 control.

Using the key hole slots on the back of the MAC4E junction box as a template, mark 4 holes on the mounting surface, drill pilot holes if necessary, and secure junction box using provided screws.

## MAC4E SAFETY INTERLOCK TEST

### PERFORM THE FOLLOWING INTERLOCK TEST AFTER CONNECTING MAC4E(S) TO UC1 AND INTERLOCKING ALL BURNERS

1. Confirm power is supplied to MAC4E control(s) from the UC1. MAC4E Power LED #9 (RED) should be on.
2. Initiate an appliance call for heat. MAC4E LED #1, 3, 5, or 7 (AMBER) should be on indicating an appliance call for heat.
3. If the UC1, P1 & P2 Prover safety circuit is closed, indicating an approved condition, the appliance interlock relay will close making terminal #3 closed to terminal #4. MAC4E LED #2, 4, 6, or 8 (BLUE) show that the burner is approved to fire. Fire all appliances to make sure each burner fires properly.
4. Remove power to the UC1 and any interlocked appliances. The Power LED (RED) on UC1 or any LED's on UC1 or MAC4E should not be on. Test the safety circuit by removing either lead from Fan Prover switch connected to UC1 P1 and P2 Fan Prover safety circuit. Do not let the opened Lead touch a ground or damage may occur to the control when power is reestablished. Reestablish power to the UC1 and interlocked appliances and initiate a call for heat. After 60 seconds a Prover Start Up fault should arise with UC1 LED #4 (RED) flashing 3 times.
5. Remove appliance call for heat and power to the UC1 and any interlocked appliances. The Power LED (RED) on UC1 or any LED's on UC1 or MAC4E should not be on. Reconnect Fan Prover switch lead removed in step 4.
6. Reestablish power to UC1 and interlocked appliances and initiate a call for heat from each appliance to confirm proper operation of UC1, MAC4E and appliances.
7. Perform Draft Adjustment and Combustion air safety check as outlined in Venter/Inducer installation manual.

### WARNING

**IMPORTANT: DO NOT OPERATE AN APPLIANCE THAT OPERATES WITH THE PROVER SAFETY CIRCUIT DISCONNECTED!**

### RESETTING FAULT CODE CREATED BY STEP 4 OF SAFETY INTERLOCK TEST

**IMPORTANT:** Prior to accessing the fault code memory, note the settings of the UC1 dip switches so that they can be returned to their original Pre / Post-Purge positions. When power is supplied to the UC1 use caution when moving dip switches.

The last fault code can be retrieved at any time by setting all dip switches 1-8 to the up, or "on" position. The last fault code, or lack thereof, will be indicated by counting the number of times LED 4 flashes. By moving any of the dip switches back to their original position, the fault code will be cleared. **NOTE:** The UC1 board must have its 115 VAC power supply present when any of the (1-8) dip switches are moved back to their original position for the fault code to clear.

# MAC4E WIRING CONNECTIONS WITH UC1 UNIVERSAL CONTROL

## WARNING

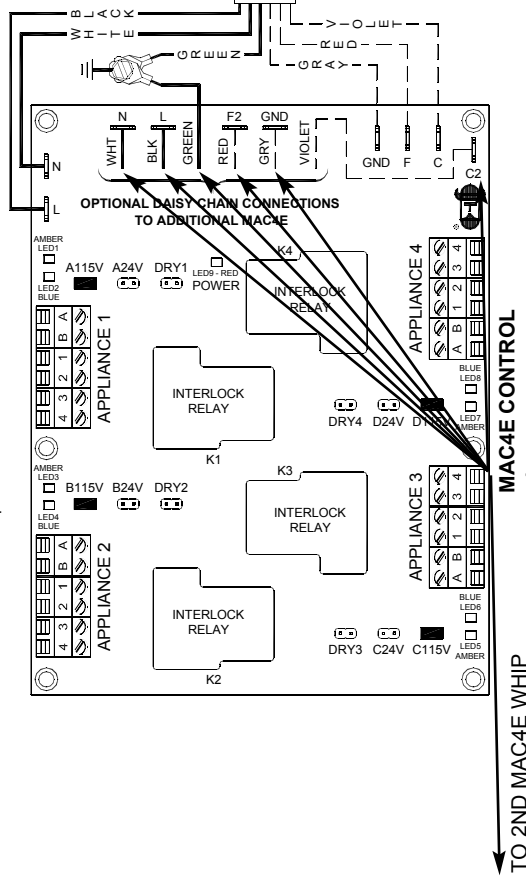
Remove power to UC1 and heating equipment when making connections from the MAC4E to the UC1 or installing, servicing or changing dip switch settings in the UC1. Failure to do so may result in personal injury and/or equipment damage. The Power LED (RED) on UC1 or MAC4E should not be on.

See UC1 Universal Control wiring section of Venter or UC1 instructions for 24 VAC, 115 VAC or Millivolt (Dry Contact) appliance interlock diagrams. The MAC4E and UC1 Universal Control appliance interlock steps and diagrams are identical.

**IMPORTANT:** Venter Fan Prover must be wired to P1 & P2 safety circuit in UC1. Do not supply power to P1 & P2 or damage will result. The MAC4E contains four appliance interlock blocks which are identical. Each appliance interlocked with the MAC4E and UC1 must have the Red voltage jumper on the proper 115V, 24V or DRY position based on appliance interlock voltage.

**NOTE:** This device must be connected to a Tjernlund Universal Control. All pre & post-purge settings + safety circuit connections are in the Universal Control.

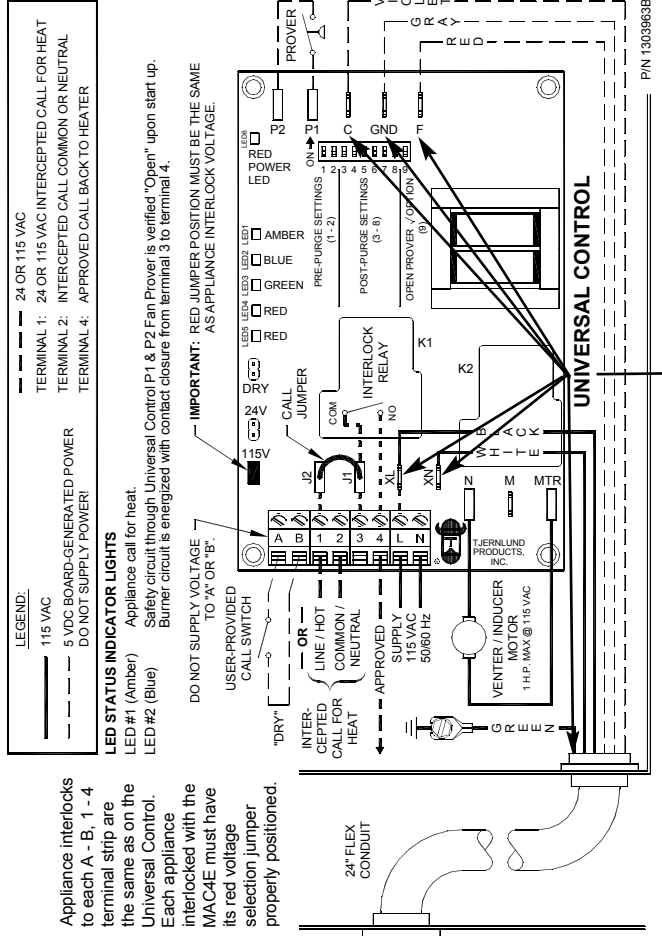
**WARNING:** Remove power to Universal Control and all connected appliances when installing or servicing the MAC4E. Failure to do so may result in personal injury and/or equipment damage. LED #9 (RED) on the MAC4E should not be on if power has been removed.



## DAISY CHAIN CONNECTIONS FOR MULTIPLE MAC4E'S CONNECTED TOGETHER

**IMPORTANT:** VENTING MULTIPLE HEATERS WITH A SINGLE FIXED SPEED VENTER / INDUCER MAY REQUIRE TIERNLUND ABD-SERIES BALANCING BAFFLES. FOR INSTALLATIONS REQUIRING MORE THAN ONE MAC4E INTERLOCK, WE RECOMMEND THAT OUR TECH SERVICE DEPT. BE CONTACTED AT 1-800-255-4208.

1. Connect White from second MAC4E whip to N on MAC4E connected to UC1.
2. Connect Black from second MAC4E whip to L on MAC4E connected to UC1.
3. Connect Green from second MAC4E whip to ground screw in MAC4E connected to UC1.
4. Connect Red from second MAC4E whip to F2 on MAC4E connected to UC1.
5. Connect Gray from second MAC4E whip to GND on MAC4E connected to UC1.
6. Connect Violet from second MAC4E whip to C2 on MAC4E connected to UC1.



## CONNECTIONS FROM MAC4E TO UC1 UNIVERSAL CONTROL

1. Connect Black from MAC4E whip to XL on UC1.
2. Connect White from MAC4E whip to XN on UC1.
3. Connect Green from MAC4E whip to ground screw in UC1.
4. Connect Gray from MAC4E whip to GND on UC1.
5. Connect Red from MAC4E whip to F on UC1.
6. Connect Violet from MAC4E whip to C on UC1.