



TJERNLUND PRODUCTS, INC.

1601 Ninth Street • White Bear Lake, MN 55110-6794
PHONE (800) 255-4208 • (651) 426-2993 • FAX (651) 426-9547
Visit our web site • www.tjernlund.com

REV. B 11/05

**MAC1E
BOARD
VERSION F**

MAC1E OPERATION

The MAC1E is used in conjunction with the UC1 Universal Control to interlock one additional 24 VAC, 115 VAC or millivolt (Dry Contact) controlled appliance. 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 appliance to operate. Any pre/post-purge settings on the UC1 will be defaulted to the MAC1E. Three LEDs are provided on the MAC1E. LED #1 (Amber) shows an appliance call for heat. LED #2 (Blue) shows that the burner is approved to fire after the Venter Fan Prover safety circuit through the UC1 is completed. LED #6 (RED) means power is supplied to the MAC1E through the UC1.

MILLIVOLT INSTALLATIONS

Each millivolt appliance interlocked with the MAC1E 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 MAC1E 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 MAC1E 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.

MAC1E MOUNTING

Do not mount the MAC1E 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 MAC1E is intended for indoor installation only.

The MAC1E has a 2 foot whip that contains 1 ground, 2 power and 3 communication leads. Mount MAC1E adjacent to UC1 control.

Use the key hole slots on the back of the MAC1E junction box as a template. Mark 4 holes on the mounting surface, drill pilot holes if necessary, and secure junction box using provided screws.

MAC1E SAFETY INTERLOCK TEST

PERFORM THE FOLLOWING INTERLOCK TEST AFTER CONNECTING MAC1E TO UC1 AND INTERLOCKING ALL BURNERS

1. Confirm power is supplied to MAC1E control from the UC1. MAC1E Power LED #6 (RED) should be on.
2. Initiate an appliance call for heat. MAC1E LED #1 (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. MAC1E LED #2 (BLUE) shows 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 MAC1E 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 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 MAC1E 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, MAC1E 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.

MAC1E WIRING CONNECTIONS WITH UC1 UNIVERSAL CONTROL

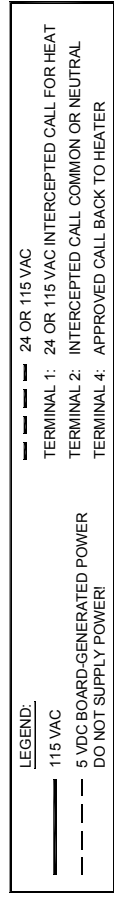
WARNING

Remove power to UC1 and heating equipment when making connections from the MAC1E 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 any LED's on UC1 or MAC1E 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 MAC1E and UC1 Universal Control appliance interlock steps and diagrams are identical.

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

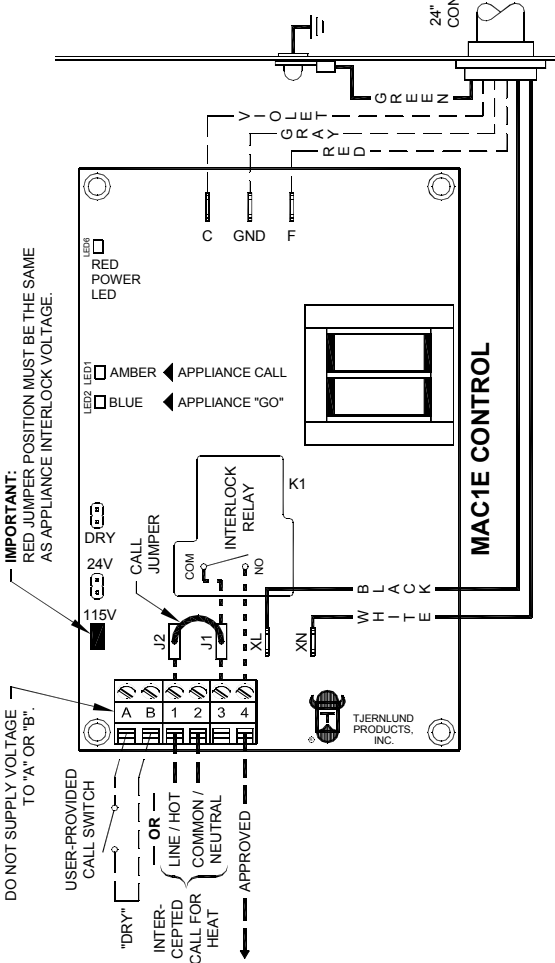
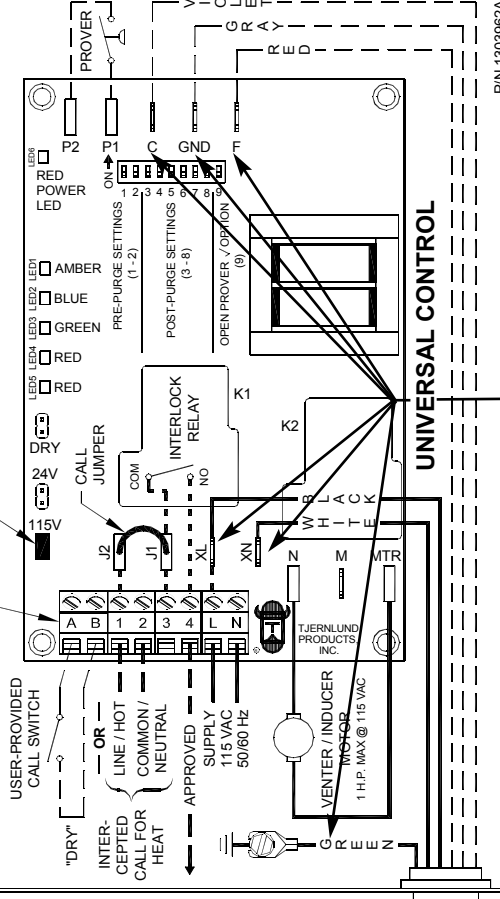
WARNING: Remove power to Universal Control and all connected appliances when installing or servicing the MAC1E. Failure to do so may result in personal injury and/or equipment damage.



LED STATUS INDICATOR LIGHTS

- LED #1 (Amber) Appliance call for heat.
- LED #2 (Blue) Safety circuit through Universal Control P1 & P2 Fan Prover is verified "Open" upon start up. Burner circuit is energized with contact closure from terminal 3 to terminal 4.

IMPORTANT: RED JUMPER POSITION MUST BE THE SAME AS APPLIANCE INTERLOCK VOLTAGE.



IMPORTANT: Venter Fan Prover must be wired to P1 and P2 safety circuit in UC1.

RED appliance interlock voltage jumper in MAC1E and UC1 must be positioned based on the control voltage of the appliance interlocked with each control 115V, 24V or DRY.

- Connect Black from MAC1E whip to XL on UC1.
- Connect White from MAC1E whip to XN on UC1.
- Connect Violet from MAC1E whip to C on UC1.
- Connect Gray from MAC1E whip to GND on UC1.
- Connect Red from MAC1E whip to F on UC1.
- Connect Green from MAC1E whip to ground in UC1.