



HOSHIZAKI AMERICA, INC.

SERVICE BULLETIN

SB98-0001R

February 5, 1998

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Subject: “E” SERIES CONTROL BOARD

Beginning in February, the KM Universal Alpine replacement control board part number 2U0139-01, will sub to a new Control Products control board part number 2A0836-02. This new board, referred to as the “E” control board is a universal replacement for any “C” or Alpine control board unit. This board **is not** designed for an “A” or “B” board application.

To install the new universal board, follow these simple steps.

1. Turn off the power at the unit disconnect and gain access to the control box.
2. Disconnect the K3 thermistor (white connector), K5 float switch (black connector), K2 control transformer (2 wire), and K1 (10 pin connector).
3. Remove the original board from the control box. You will find it easier to leave the mounting pins on the board as you remove it. Depress the pins from the outside of the control box and push them inward.
4. Transfer 4 mounting pins to the new board. Be sure to touch the metal frame of the unit to discharge any static electricity prior to handling the new board (by the edges only).
5. Adjust the dip switches per the adjustment chart published in the Tech Specs book or the same as the Alpine board you are removing. Switch 7 & 8 must remain in the OFF position.
6. Adjust the ALP / C switch located between relays X3 & X4 to the correct position. To determine which position is correct, look at the 10 pin connector in the control box. If the ten pin connector has a white wire, adjust this switch to the C position. If no white wire is present, adjust this switch to the ALP position. ALP would also be the correct position if you are replacing an original “E” production board part # 2A0863-01.
7. Adjust the test switch S3 to the OFF position and install the board into the control box using 4 of the 6 original board mounting holes.
8. Reconnect the connectors K1 10 pin, K2 transformer, K3 thermistor (white) and K5 float switch (black). Nothing should be connected to the K4 red connector!
9. Place the operation label provided with the “E” board in a visible location on the unit.

The installation is now complete. Prior to restarting the unit, inspect the original board for burnt spots on the back of the 10 pin connector. If a burnt spot is visible, check the corresponding components and wiring for a shorted condition. If no shorted conditions exist, turn on the unit disconnect and check the unit using the 10 minute checkout procedure.

An explanation of the “E” board sequence of operation and features is provided on the following pages along with a copy of the operation label.

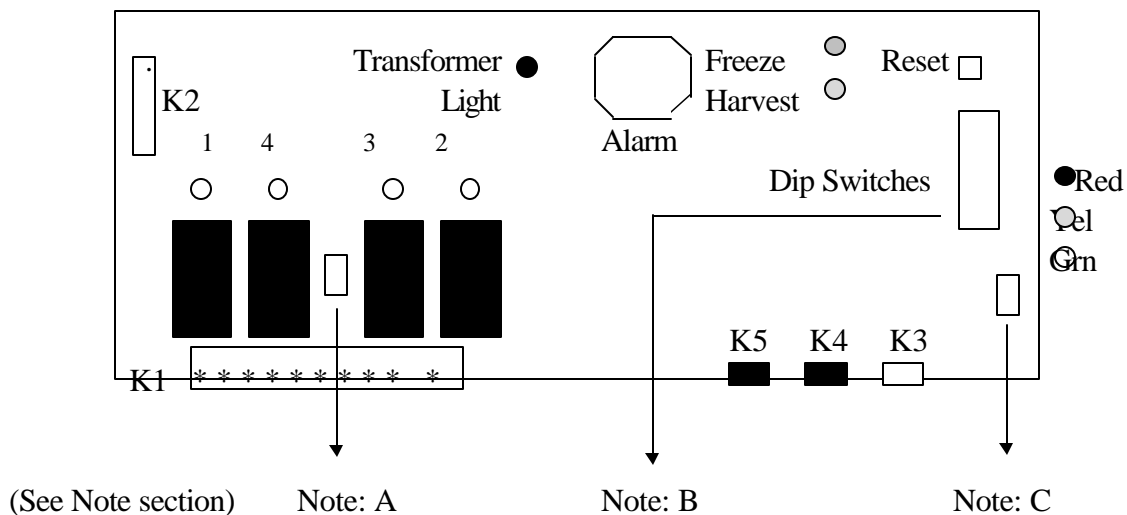
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The Sequence of Operation On The New Control Products “E” Control Board Part # 2A0836-02 With LED Lights.

On the new control board there are several lights to indicate **what controller relay or internal board** safety has been activated during operation. The alarm will sound a specific sequence if a safety activates. The following is a list of what lights are energized throughout its sequence of operation as well as information on the additional safeties.



The red transformer light is illuminated to indicate that correct control voltage power is being supplied to the board through the K2 connector. If the voltage **drops below 9.5 volts or** rises above 14.5 volts the transformer light will de-energize and an audible alarm will sound indicating a voltage supply problem. There is an acknowledgment beep that occurs when the initial power is supplied and when power is turned OFF.

Sequence:

5 Second Delay / Internal Board Check. (New on this board)

Fill Cycle = the green LED number four and its corresponding relay is energized.

Harvest Cycle = the green LED number one, four, and two and their corresponding relays are energized.

Freeze Cycle = the green LED number one and its corresponding relay is energized.

Reverse Pump Out = the green LED number one, three, and two and their corresponding relays are energized.

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Safeties:

High Temperature Safety = if the evaporator outlet line temperature reaches 127° F the unit will shut down and give a single beep every three seconds. (No lights other than the red transformer power supply light will be energized.) Manually reset the alarm by depressing the white reset button while the unit is still energized.

Defrost Back Up Timer = after two consecutive twenty minute harvests the unit will shut down and energize the yellow harvest D13 light (identified by a “20min” marking). An audible alarm of two beeps every three seconds will sound. Manually reset the alarm by depressing the white reset button while the unit is still energized.

Freeze Back Up Timer = after two consecutive sixty minute freeze cycles, the unit will shut down and will energize the yellow freeze D14 light (identified by a “60min” marking). An audible alarm of three beeps every three seconds will sound. Manually reset the alarm by depressing the white reset button while the unit is still energized.

High Voltage Alarm = if the control voltage increases above 147Vac \pm 5 % , the red indicator de-energizes, the unit will automatically shut down, and an audible alarm of seven beeps every three seconds will sound. When the voltage returns to normal, the unit will automatically restart and the alarm will reset.

NOTE: POWER MUST BE APPLIED TO THE BOARD IN ORDER TO RESET ANY OF THE MANUAL RESET SAFETY FEATURES. THE MANUAL RESET ALARMS WILL REMAIN IN MEMORY UNTIL THE RESET IS DEPRESSED.

- NOTE: A. This switch allows the new “E” control board to fit any C or Alpine board application. If this switch is not in the proper position either the compressor runs with the toggle switch in the “OFF” position or the inlet water valve does not energize.
- B. Adjust the dip switches the same as the Alpine control board. Check the adjustment chart published in the Tech Specs for proper settings.
- C. The output test switch performs a 5 second interval sequence check of relays X1 - X4 and their corresponding lights. This switch must remain in the “OFF” position for normal operation.

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**Control Box
Label:**

ATTENTION !

THIS UNIT HAS A CONTROL PRODUCTS "E" CONTROL BOARD
INSTALLED. HOSHIZAKI PART NUMBER 2A0836-02.

The "E" board includes LED lights and audible alarm safeties. The red
LED indicates proper control voltage and will remain on unless a
control voltage problem occurs. At startup a 5 second delay occurs
while the board conducts an internal timer check. A short beep occurs
when the power switch is turned ON or OFF.

The green LED's 1~4 represent the corresponding relays and energize
and sequence 5 seconds from initial startup as follows:

Sequence step.	LED.s on.	Length: Min	Max	Avg.
1 Minute Fill Cycle	LED4			60 sec.
Harvest Cycle	LED1, 2, & 4	2 min.	20 min.	3~5 min.
Freeze Cycle	LED1	5 min.	60 min.	30~35 min.
Reverse Pump Out	LED1, 2, & 3	10 sec.	20 sec.	Factory set.
{ LED 1 - Comp, LED 2 - HGV/CFM, LED 3 - PM, LED 4 - WV }				

The built in safeties shut down the unit and have alarms as follows

1 beep every 3 sec. = **High Evaporator Temperature** >127 ° F.

Check for defrost problem (stuck HGV or relay), hot water entering
unit, stuck headmaster, or shorted thermistor.

2 beeps every 3 sec. = **Defrost Back Up Timer**. Defrost >20 minutes.
Orange LED marked 20 MIN energizes.

Check for open thermistor, HGV not opening, TXV leaking by, low
charge, or inefficient compressor.

3 beeps every 3 sec. = **Freeze Back Up Timer**. Freeze > 60 minutes.
Yellow LED marked 60 MIN energizes.

Check for F/S stuck closed (up), WV leaking by, HGV leaking by,
TXV not feeding properly, low charge, or inefficient compressor.

**To manually reset the above safeties, depress white alarm reset
button with the power supply ON.**

7 beeps every 3 sec. = **High Voltage**. Control voltage > 142Vac \pm 5%.
The red LED will de-energize if either voltage protection operates.
The voltage safeties automatically reset when voltage is corrected

The **Output Test** switch "S3" provides a relay sequence test. With
power OFF, place S3 on and switch power to ICE. The correct lighting

sequence should be none, 2, 3, 4, 1, & 4, in 5 second intervals then to normal sequence. S3 should remain "OFF" for normal operation.

The application switch located between relay X3 & X4 must be set to match the original board application. Place this switch in the ALP position if there is no white wire supplied to the K1 connector. If there is a white wire, place the switch in the C position. If this switch is placed in the wrong position either the compressor contactor will remain energized with the control switch OFF or the unit will not start.

The dip switches should be adjusted per the adjustment chart published in the Tech Specs book. 7 & 8 must remain in the OFF position.