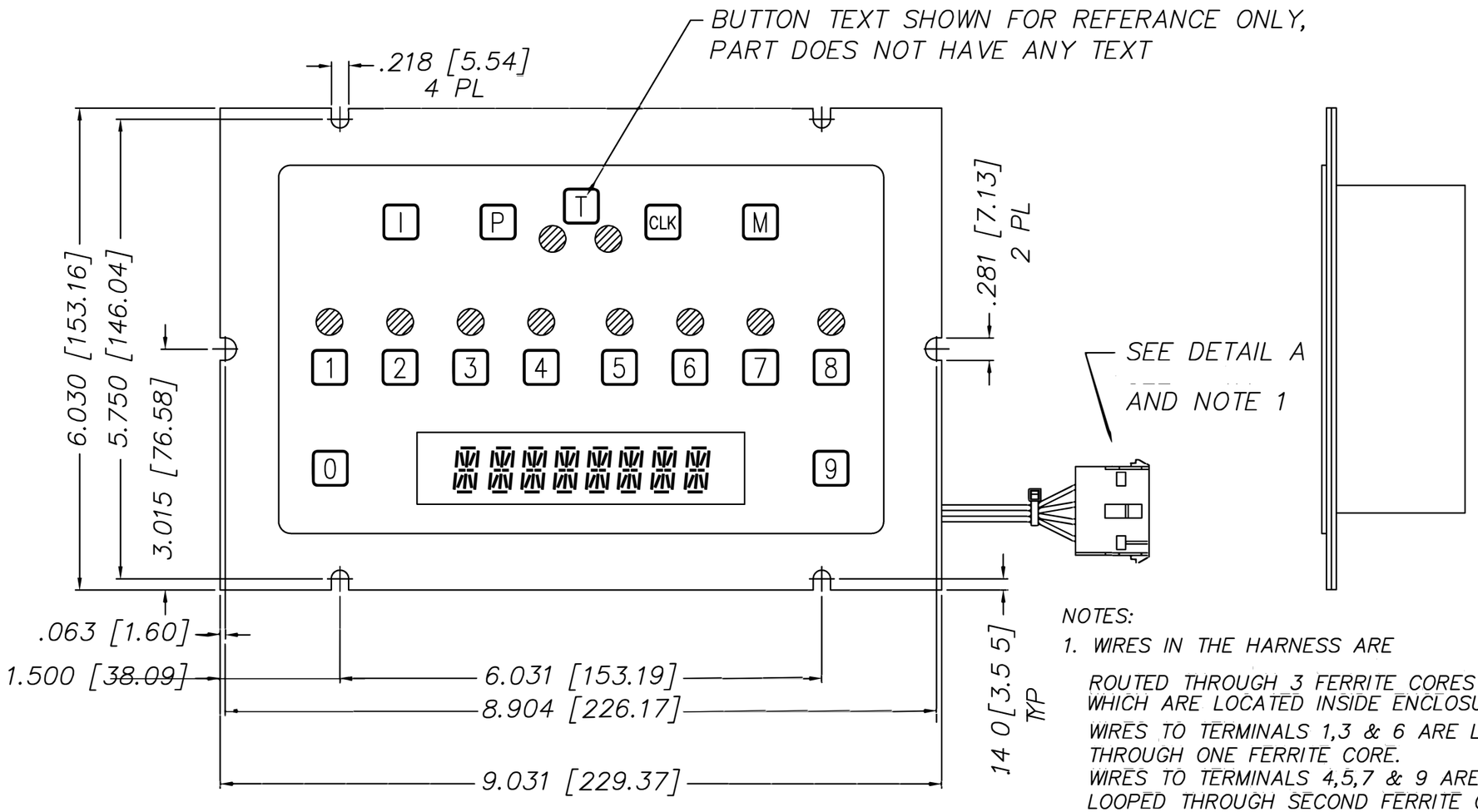
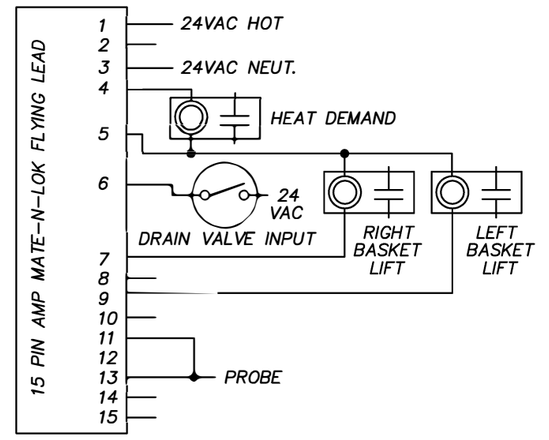
DIMENSIONS SHOWN IN INCHES [METRIC]



PROBE TEMP. (IN F)	RESISTANCE (IN OHMS)
75	95,552
100	53,020
150	18,587
200	7,527
250	3,441
300	1,729
350	942
400	540
430	401

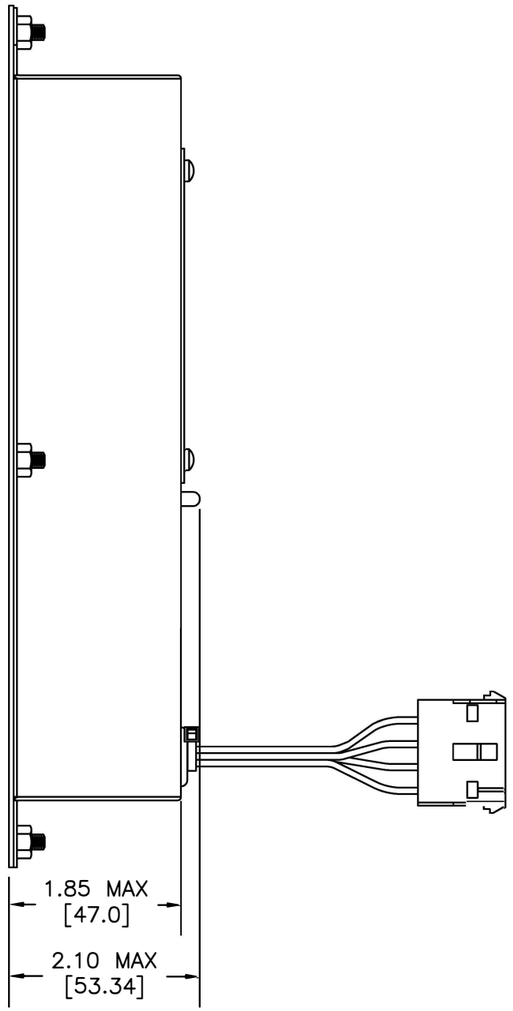
NOTES:

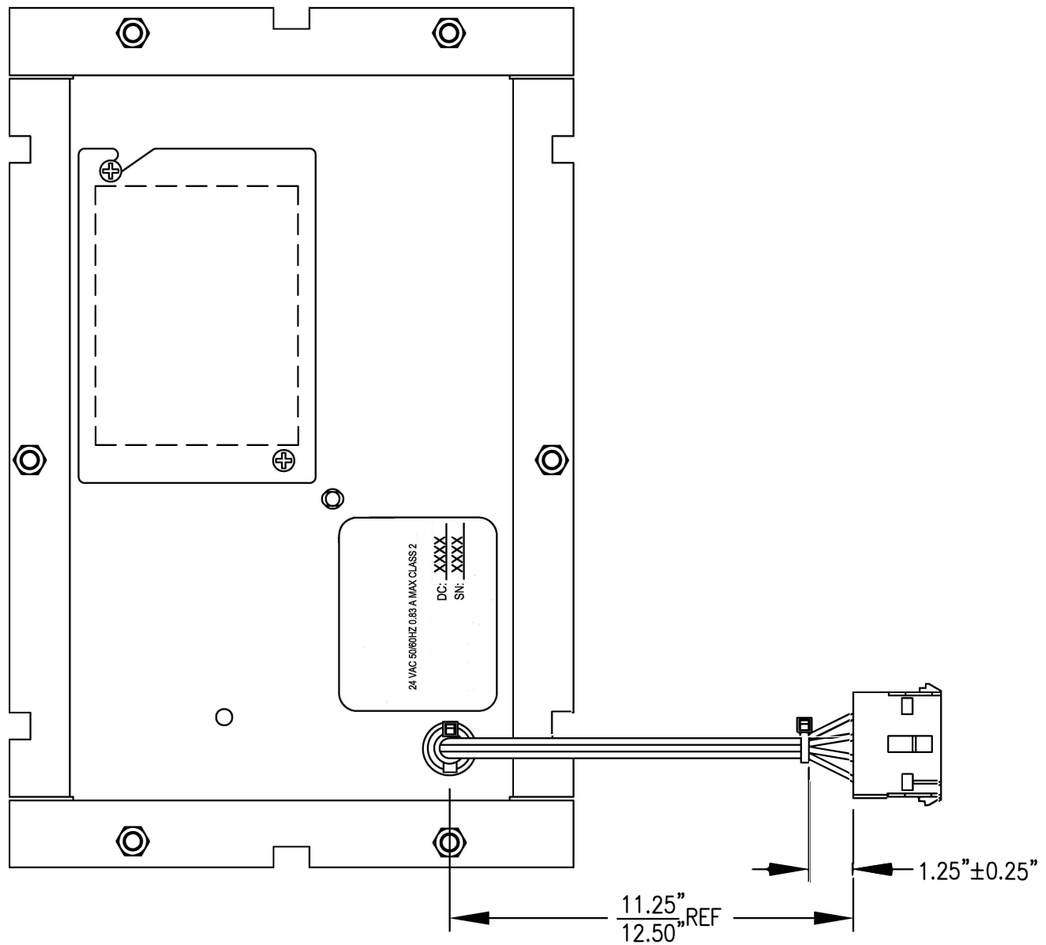
1. WIRES IN THE HARNESS ARE ROUTED THROUGH 3 FERRITE CORES WHICH ARE LOCATED INSIDE ENCLOSURE.
   WIRES TO TERMINALS 1,3 & 6 ARE LOOPED THROUGH ONE FERRITE CORE.
   WIRES TO TERMINALS 4,5,7 & 9 ARE LOOPED THROUGH SECOND FERRITE CORE.
   WIRES TO TERMINAL 11 & 13 ARE LOOPED THROUGH THE THIRD FERRITE CORE.



DETAIL A

REV. A


1.85 MAX
[47.0]
2.10 MAX
[53.34]


24 VAC 50/60HZ 0.83 A MAX CLASS 2
DC: XXXX
SN: XXXX
1.25"±0.25"
11.25"
12.50" REF

Operating Logic

I. Overview of operation

1. Controller operational when appliance is on and "I" key (soft on/off) pressed.
2. Programmable timer for (8) products. Each product may be up to (10) stage profile with (3) programmable alarms
3. Allowable set point temperatures: 200 F to 390 F
4. Default operating mode on startup is Melt until set point temperature unless "M" (Melt Exit) key pressed when temperature is above melt release temperature.
5. Optional temperature setback based on programmable length of time with no user interaction or user presses key sequence to initiate.
6. Optional filtration and shortening disposal prompts based on number of hits cooked.
7. Boil mode has automatic 30 minute (fixed) countdown timer
8. Filter mode has automatic 10 minute (fixed) countdown timer

II. User controls and displays summary

1. Display
   a) 8-digit 14-segment LED display
   b) 10 LED lights
      (1) "Heat demand"-illuminated when heater is energized
      (2) "PK 1-8"-solid when activated, blinking when cook time completec
2. Operator keypad
   a) "I" key to start or stop controller
   b) "P" key to enter and exit programming mode
   c) "TEMP" key for selection of display of actual or set point temperature, initiates manual Setback mode, and initiates Boil mode.
   d) "TIME" key for starting Filter Timer, activates/aborts recipe display, and for displaying time remaining of active cook.
   e) "M" key aborts melt cycle, aborts Filter Timer, activates/aborts Setback mode, and serves as ACCEPT key during programming.
   f) "0-9" numerical keys for programming (0 also used as toggle in programming). Keys "1-8" having associated LEDs for product keys (PK's) programming, cook start, and displays. "0" key also used to display filter hit counts/time prompt.
3. Annunciator (nominally 3500 Hz) sounds
   a) To annunciate keypad button push
   b) Fast rate beep at the end of cook cycle
   c) Sustained for probe fault and high temperature alarms

III. Input/ Output

1. Inputs
   a) 24 VAC Drain Valve Interlock (pin 6)
   b) 91 Kohm RT#16 NTC thermistor (pin 11 + 13)
2. Outputs
   a) Heat demand relay driver output (pin 4)
   b) Buzzer relay driver output (pin10) echo's on board piezio alert.
   c) Two (2) basket lift outputs
      (1) Cooks on keys 1-4 activate left basket lift (pin 9)
      (2) Cooks on keys 5-8 activate right basket lift (pin 7)
   d) Pin 5 is the relay drive common for all outputs

IV. Operating Modes

1. Default display:
   a) Software rev. level on start-up
   b) "MELT G", "MELT E", or "MELT P" until "M" key is pressed or until set point temperature achieved.
   c) ""HEATING"" when actual temperature is below (setpoint – ready level). (Default is setpoint – 20 F).
   d) "READY" if actual temperature is > (setpoint – ready level) and < (setpoint + 40 F).
   e) "HIGH" when actual temperature is above (setpoint + 40 F).
   f) "HIGH TMP" if actual temperature is > 420 F. Alarm will also sound.
2. Checking current and stored values:
   a) To check actual temperature press "TEMP" key. Actual temperature will display for about 3 seconds.
   b) Additional press of "TEMP" key (within the 3 seconds) will display current setpoint temperature for about 3 seconds.
   c) Additional press of "TEMP" key (within the 3 seconds) will return to previous display.
   d) To check programmed recipes when not cooking, press "TIME" key followed by PK# 1 through 8. Values will be displayed in sequence pausing momentarily on each value. LED for selected PK# will be illuminated. Pressing the "TIME" key, while displaying, will abort the recipe display.
   e) To check the status of filter prompts, press "0". Current Hit Count will be displayed for about 3 seconds. Press "0" again (within the 3 seconds) to display the current Time Prompt value (in hours and minutes) if enabled, else will display "TIME DIS", for about 3 seconds.
3. Default setpoint temperature: last established set point.
4. Actual Temperature Display: If actual temperature is < 100 F or > 420 F display will be "ACT ---F" when checking temperature.
5. Default Melt Cycle: Operational as 8 on/ 32 off (gas timings) until set point. Bypassed by pressing "M" key if temperature is above melt release temperature.
6. Boil Mode
   a) If actual temperature is <220 F press of "TEMP" key followed by "212" will enter boil mode
   b) Heat will be full on until above 192 F.
   c) Temperature will be maintained at about 192 F.
   d) Display will be "BOILXX:XX"
   e) Countdown timer will be initiated. (Default = 30 minutes).
   f) Alarm will sound for approx.5 sec. at end of cycle
   g) Display will be "TURN OFF"
   h) Power must be cycled to exit boil mode
   i) Setpoint will return to last established set point
7. Idle:
   a) Fryer will idle at programmed set point using adaptive Lifeguard control algorithm.
   b) If factory download variable (stored_idle_pulse) is set to value >0 seconds, will bypass adaptive Lifeguard algorithm and use Lifeguard with a fixed, non-adaptive idle pulse. Value of "0" will default to adaptive Lifeguard algorithm.

8) Setback Temperature:
   a) After a period of time (front panel programmable) with no user action, the setpoint will move to a programmable number of degrees below current setpoint.
   b) Also can be initiated by press of "TEMP" key followed by "M" key if not in MELT and temperature > 220 deg. F.
   c) Display will show "SETBACK".
   d) Adaptive idle values will not be modified when in setback.
   e) Press "M" key again or product keys 1 thru 9 to exit "SETBACK" and return to the last stored setpoint.

9) Key press limitations:
   a) No programming can be initiated after initiation of a cook cycle. Recipes cannot be displayed while cooking. Key press will beep to acknowledge press, but no action will be taken.

10) Recipe (Profile Cook Time/ Temperature) Programming:
   a) There are two types of cooking cycles profile and non-profile. Non-Profile cooking cycles only have one cooking stage with only a preset cook time and temperature. Profile cooking cycles can have up to 10 stages that will have different cooking temperatures for a preset time. Stage one is the total time of the cooking cycle and the initial vat temperature, stage 2 starts when the cycle time counts down to the time set for stage 2, the fryer will then control the vat to the temperature preset for stage 2. This will continue through all cooking stages. Both of these cooking cycles can have up to three stir alarms which are independent of the number of stages or their times.
   b) Press "P" to enter program mode. Display will show PROGRAM.
   c) Enter COOK PASSWORD to enter product key programming. (Fixed at "3660").
   d) Display will show "RECIPE" and all "PK" LEDs will be lit.
   e) Press "PK" (Product Key number) to be programmed.
   f) Respond to prompt "nn STEPS" with number of cooking steps to be programmed for this "PK". Maximum number accepted is 10 and will display "TOO HIGH" if >. If too high, a legal value must be re-entered. If 0 steps are entered, programming for this product key is ended. Press "M" to accept displayed value.
   g) Respond to "Snn MM:SS" with time for nth step. All times are referenced to the end of cook. Each time entered must be a minimum of 5 seconds less than previous entry, else "TOO HIGH" will be displayed. If too high, a legal value must be re-entered. If 00:00 time is entered for the 1st stage, programming for this product key is ended. If 00:00 time is entered for any subsequent stages, programming will continue with number of alarms and ignore the remaining stages time programming. Press "M" to accept displayed value.
   h) Respond to "STRAIGHT" for nth step by toggling "STRAIGHT" or "FLEX" using "0" key. Press "M" to accept displayed value.
   i) Respond to "Snn XXX F" with temperature for nth step. Temp must be between 200 and 390 deg.F. and will display "TOO HIGH" if > or "TOO LOW" if <. If too high or low, a legal value must be re-entered. Press "M" to accept displayed value.
   j) Repeated presses of "M" will scroll through time, straight or flex, and temperature for each of the n steps until the last step is completed.
   k) Respond to prompt "ALARMS m" with number of stir alarms to be programmed for this "PK". Maximum number accepted is 3 and will display "TOO HIGH" if >. If too high, a legal value must be re-entered. If 0 alarms are entered, programming will continue with hit weight. Press "M" to accept displayed value. Message will be STIR and alarm will auto cancel after 5 seconds.
   l) Respond to "Am MM:SS" with time for mth alarm until all stir alarm times have been entered. All times are referenced to the end of cook. Each time entered must be a minimum of 10 seconds less than previous entry else "TOO HIGH" will be displayed. The entry must also be > 5 seconds else "TOO LOW" will be displayed. If too high or low, a legal value must be re-entered. If 00:00 time is entered for any alarms, programming will continue with hit weight and ignore the remaining alarm times programming. Press "M" to accept displayed value.
   m) Respond to "HITS ##" with hit count value to be incremented following execution of cooking operation on this "PK". Maximum number accepted is 99. This is used for the filter and disposal prompts. Press "M" to accept displayed value.
   n) Press of "P" at any point will show RECIPE and all "PK" LEDs will be lit to program another "PK".
   o) Press "P" again to exit to PROGRAM mode or select another "PK" to program and repeat steps above.
   p) Press "P" again, to exit programming, or a password to enter RECIPE or FEATURE level programming again.
   q) A programming timeout will occur if no keys are pressed for 2 minutes and control returned to normal operation.

11. Feature Programming:
   a) Press "P" key. Display will show PROGRAM.
   b) Enter Feature Password (Note: This is a different password than the Cook Password, fixed at "3661").
   c) Display will show "FEATURE" and "PK" LEDs 2 through 8 will be lit to show the 7 choices.
   d) When viewing/programming any of the features, pressing "P' will save the current setting and revert back to the "FEATURE" level. Pressing "M" will also save the current setting and advance to the next level (for features with more than one parameter), or will revert back to the "FEATURE" level if at the last parameter.
   e) TOO HIGH" or "TOO LOW" displayed, legal value re-entry required.
   f) Press "P" again to exit to PROGRAM mode or select another "PK" number to program another feature and repeat steps above.
   g) Press "P" again, to exit programming, or a password to enter RECIPE or FEATURE level programming again.
   h) A programming timeout will occur if no keys are pressed for 2 minutes and control returned to normal operation.
   i) Toggle between Celsius and Fahrenheit: Press "2" then press "0" to toggle between temperature units.
   j) Beeper volume: Press "3" then "0" to toggle between beeper volumes.
   k) Setback Time/ Temperature: Press "4" to display/program Setback Time ("SETBXX:XX) in Hours: Minutes.
      (1) Maximum value 12 hours, else "TOO HIGH" displayed.
      (2) Programming "0" will disable this feature.
      (3) Press "M" to display/edit setback temperature "SETBXXXF" (number of degrees below current setpoint).
      (4) Maximum value 150 deg F, else "TOO HIGH" displayed

SYM	REVISION

DR. LT 7/12/10

l) Melt Options: Press "5" then
(1) Press "0" to toggle G for gas, E for electric, and P for purge. Gas cycle is 8 on/ 32 off. Electric cycle is 4 on/ 36 off. Purge cycle is 12 on/28 off.
(2) Press M to accept and display Melt Release setting as "M REL HI" or "M REL LO".
(3) Press "0" to toggle high (135 F) or low (75 F) melt release temperature (temperature above which melt exit key is operational)

m) View Recovery Test: Press "6" then "0" to scroll between viewing LAST, PREVIOUS, and FACTORY recovery times. While viewing factory, a new value can be entered by pressing "M" 1st, then entering 3 digits in seconds.

n) Filter Prompt: Press "7" to display/program the Filter Hit Count Limit ("FHCL ###") for the filter prompt.
(1) Press M to accept and display current Filter Hit Counts ("FHCS ###"), modify if desired.
(2) The Filter Hit Count and Limit have a maximum value of 999. Programming the Limit to "0" will disable this feature.
(3) Press M to accept and display the Time Prompt Limit setting ("TIME ##"), modify if desired.
(4) Note that the Time Prompt Limit is in hours, with a maximum value of 99. Programming it to "0" will disable the Time Prompt. The controller will count actual hours (whenever it is soft on) for use with the Time Prompt Limit.

o) Shortening Disposal Prompt: Press "8" to display/program Disposal Hit Count Limit ("DHL#####") for disposal prompt.
(1) Maximum value 65,535 and will default to this if exceeded.
(2) Programming "0" will disable this feature.
(3) Press M to accept and display current Disposal Hit Count ("DHC#####"), modify if desired.

12. Operation
a) Press "I" to turn control on/off.
b) On startup fryer will be in MELT mode until set point temperature is reached the display will show "MELT X" where X = "G" for the gas melt cycle or "E" for the electric melt cycle. When the vat temperature exceeds the melt release temperature the audio alert will pulse On and Off for 5 seconds and the display will alternate the messages "EXIT" "MELT". During the alert or when the display shows "EXIT" "MELT" press of "M" (melt exit) key will end melt cycle. Cooks will be locked out during MELT mode.
c) If "M" key is pressed before temperature reaches 220 then time to heat from 230 to 280 will be measured and stored as Last Recovery Time.
d) After Melt Exit, display will show "HEATING", the corresponding PK# LEDs will be lit and cooks will be locked out until the Ready temperature is reached (at startup the set point and PK# selection used last before Off mode will be used).
e) After "READY" is displayed, press "PK#" to select product to cook.
(1) If the PK# LED is illuminated, a cook will start.
(2) If the PK# LED is not illuminated, the Set point will change to the starting set point of the selected PK# and PK# LED lamps will be illuminated for all PK#'s with the same starting set point.
(3) Press a PK# again, with LED illuminated, to start a cook.
(4) A PK# LED cooking will blink fast.
f) Multiple cooks can be initiated as described below.
(1) If none of the cooks are profile cooks and the set point of another product is within ± 5° F of current set point, a cook start will occur (PK# LEDs illuminated for cook start enable indication).
(a) Display will show the PK# and time of next to complete.
(b) Press "TIME" then associated PK# to display the remaining time of an active timer.
(c) The PK# LED of the first to finish will blink fast, other active PK# LED's will blink slowly.
(2) When a profile cook cycle is in process another profile cycle can not be started.
(3) While a profile cook cycle is in process any non-profile cycle may be started (PK# LEDs will be illuminated for cook start enable indication other profile cook PK# will not be illuminated).
(a) The 2nd product will be cooked with the temperature profile of the 1st product.
(b) If the 2nd product started is set for straight time the time counts down in real time, if it is set for flex time the time count down is based on the current vat temperature.

g) During profile cooks, the new setpoint temperature is displayed for a couple second when the stage changes.

h) When a timer completes, alarm will sound and "DONE #" or "STIR #" will be displayed, where "#" is the PK# alarming.

i) Press associated PK# to silence alarm.

j) If Filter Hit Count >= "FILTR###" or the filter Time Prompt times out (if enabled), display "FILTER" alternating with normal display. Operation continues without a cook lockout until the filter is initiated.
(1) To initiate filter operation, open the drain valve. "DRAINING" alternating with "FILTER" will be displayed.
(2) Press the "TIME" key to initiate the filter timer. The 10-minute filter timer will start counting down. Display shows "FILTXX:XX".
(3) After filter timer times-out, the display will be "FILTER" alternating with "DONE" and an alarm will sound for approx. 5 seconds.
(4) The filter timer can be terminated early, or timeout/alarm acknowledged, by pressing the "M" key. The display will then be "DRAIN" alternating with "CLOSE".
(5) Close the drain valve. The Filter Hit Count and Time Prompt will reset and display will show "TURN OFF".
(6) Closing the drain valve will also terminate the filter done display or the filter timer, then display "TURN OFF".
(7) Switch Soft Off and back on again to resume normal operation (starting in Melt Mode again, press "M" key to exit melt mode).
(8) The "FILTER" prompt can only be reset by initiating a filter operation or disabling the function in programming. Cycling the power will not reset this prompt.

k) If Dispose Hit Count >= "DHL#####", display "DISPOSE" alternating with normal display. Operation continues without a cook lockout until the drain valve is opened, the display then showing "DISPOSE" alternating with "DRAINING". Switch the unit OFF to drain the shortening. After filling with new shortening, turn controller on again, enter programming mode and set current Disposal Hit Count to 0 to clear the "DISPOSE" prompt.
The "DISPOSE" prompt can only be rest by clearing the Disposal Hit Count or disabling the function in programming, cycling the power will not reset this prompt.

l) Drain Valve Interlock: If the drain valve is opened, the heat demand (and basket lift outputs) is de-activated. If any cook timers are active, they will be cancelled. The display alternates "DRAINING"/"TURN OFF", or "DRAINING"/"FILTER" if the filter prompt is active, or "DRAINING"/"DISPOSE" if dispose prompt is active. After the drain valve is closed, the display shows "TURN OFF". Switch Soft Off and back on again to resume normal operation (starting in Melt Mode again, press "M" key to exit melt mode if appropriate).

13. Probe Fault:
a) If a temperature probe fault occurs, a fault message will be displayed (open will display "PROBE OP", shorted will display "PROBE SH") and a continuous alarm sounded.
b) Open probe failure threshold equivalent to temperature < 32 F.
c) Shorted probe failure threshold equivalent to temperature > 460 F.
d) Any cook mode will be canceled, heat will be turned off, and normal keypresses inhibited.

14. Tripro Communications and Configuration Download:
a) To initiate communications, first connect the Tripro cable to J9 on the controller and the PC serial port.
b) Open Tripro on the PC.
c) Hold the "6" on the controller while turning power on.
d) After the revision message display, the controller display should be blank with only the "6" LED lit.
e) See the latest EP3660-7SU Release Note for configuration and address map files to use. Select 16 bit Address Mode (Data Bits).
f) See the Tripro Manual for further details.
g) While logging, the display will flicker once per second.
h) Turn power off to exit communications mode.

15. LED and Keypad Test:
a) This test is initiated by holding the "5" key while turning power on.
b) Release the "5" key while the revision message is being displayed.
c) All LEDs and display segments should be lit.
d) Press a valid key to begin the keypad test.
e) For each valid keypress, the display should show the key's value in each of the display segments and the beeper will chirp as long as the key is held (i.e., the "5" key shows "55555555").
f) The following values are shown for the function keys:

PROGRAM key:	"P"
TEMPERATURE key:	"T"
TIME (Clock) key:	"C"
M key:	"M"

(On/Off key exits test)
g) Invalid keys are ignored. (Note: that the key in the upper right corner is invalid).
h) To exit the keypad test, press the On/Off (I) key or turn power off.

SPECIFICATIONS

Input Power:	24 VAC +/- 25%, 50/60 Hz,, max 20VA
Sensor inputs:	One 91 Kohm RT #16 NTC thermistor
Outputs:	Three (3) relay driver outputs @24 VDC up to 100 mA on each output
Digital Inputs:	One (1) 24 VAC drain valve interlock digital input
User interface:	Fifteen (15) non-tactile membrane keys Ten (10) red LED lamps Eight (8) 14 segment red LED digits 0.5" high
Audible alarm:	Piezoelectric buzzer
Control Features:	Set point Accuracy: +- 1% of full scale I. Fault Protection: Integral probe fault detection and shutdown circuitry
Operating Environment:	0 to 70 deg C, 5-95% RH, PC Boards conformally coat

SYM	REVISION	DATE	BY	CH.

REV.