Operating Instructions for
Evenheat's DTC 100 and DTC 100C

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The DTC 100C and DTC 100 are solid state microprocessor based temperature control devices. The heart of the controller is a computer chip not unlike those found in many home computers. Programming the DTC 100C and the DTC 100 are much like programming many of the microwave ovens on the market. It requires only a little study to master it.

CHECK THE ELECTRICAL INSTALLATION

1. Open lid completely.
2. -PF- will appear in the display.
3. Touch any key; IdLE should appear in the display.
4. Touch *, then touch * again; current kiln temperature should appear in the display (approximately room temperature).
5. Temperatures should start to rise as indicated on the display.
6. Top and bottom elements will glow bright red - middle elements will glow dull red after several minutes for most models, but never in less than 10 or 15 second.
7. After a rise of 100 °F and after you are satisfied that all the elements are operating, touch # to stop the kiln.

   *NOTE - the kiln will cycle during this heating period - that is normal.

SEATING THE ELEMENTS

Every precaution has been taken to buffer our product against vibration and jarring during shipment. But a kiln is fragile and the elements may become dislodged. Visual inspection may not reveal this.

Before the kiln is fired for the first time, run a kitchen knife completely around each groove, pressing the elements down into the groove.

If the elements should need reseating at any time after the first firing, they must first be heated.

After an element has been fired it becomes brittle in its cool state and is easily broken if handled.

With the kiln at IdLE, program the kiln to climb to 250 °F at 2400°F/hr. As soon as the elements have heated to a dull red glow, push the stop key, UNPLUG the kiln and reseat the elements with a knife. As soon as the elements begin to cool and become stiff, begin the heating procedure again.
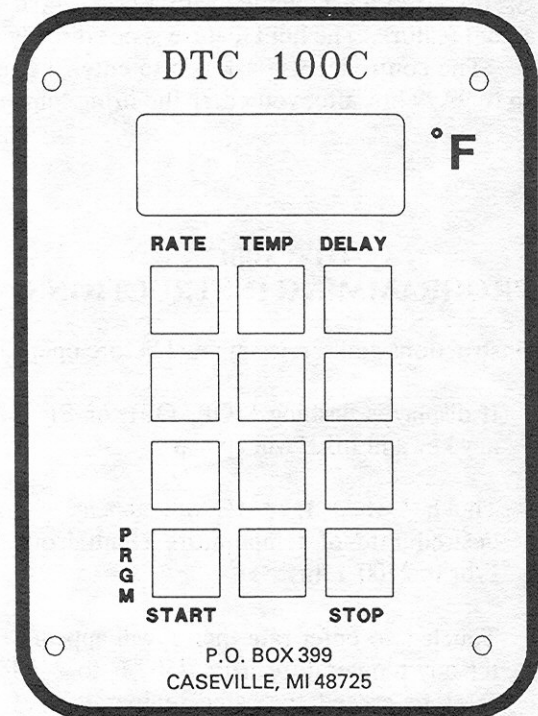
Plug in the kiln, it will read PF.
Touch any key to return to IdLE.
Touch * then 1, program 2400°.
Touch * until IdLE appears.
Touch * then *.

When elements turn red touch # (STOP), UNPLUG the kiln.

DTC 100C °F

RATE   TEMP   DELAY

P R G M

START   STOP

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THE KEY PAD - The key pad is like the one found on most touch tone phones. It was selected because of its high reliability. Special use keys are defined on the faceplate.

THE DISPLAY - The display is used to indicate the temperature of the kiln during firing and cool down. It also displays the program parameters as they are entered.

SPECIAL USE KEYS:

* - The star key is the programming key (when used in conjunction with other special use keys) and the start button.

- The pound key is the stop key. It is depressed any time during the firing cycle to stop the kiln.

Key 1 - RATE - This key if depressed after the * key in the programming cycle will display rate. It will allow you to enter the firing rate.

Key 2 - TEMP - This key if depressed after the * key in the programming cycle will display °F. It will allow you to enter the firing temperature (Note: The °F symbol will appear automatically after the rate has been entered. It is used when you want to change only the firing temperature and not the rate.

Key 3 - DELAY - This key if depressed after the * will display dELA. It will allow you to enter a delay time up to 99.99 hrs.

NOTE: If your kiln is equipped with a DTC 100 it will have a hold feature. The hold feature is not directly accessible. The controller will ask you to enter the hold time up to 99.99 hrs. after you enter the firing temperature.

DTC 100C
PROGRAMMING INSTRUCTIONS

Read instructions and service manual before operating

1. If display is flashing StOP, OFF or PF touch any key and IdLE will appear.

2. Touch * then 1; rAtE will appear. Enter desired rate of temperature climb from 100 °F/hr to 2400°F/hr.

3. Touch * to enter rate then F will appear. Enter any temperature from 250 °F to 2400 °F. (Not to exceed the rated temperature of the kiln.

4. Touch * to enter temperature; IdLE will appear.

5. If delay start is desired touch * then 3; dELA will appear. Enter delay time in hours, tenths and hundreths of hours up to 99.99 hours. (e.g. 12 1/2 hours would be 1250.)

6. Touch * to enter delay; IdLE will appear.

7. To start program touch * then *. Kiln temperature will be displayed (flashing) or, if a delay was programmed, time remaining until start will appear (not flashing).
    When programmed firing cycle is completed OFF will appear alternately with the kiln temperature during cool down. To stop the program during the firing cycle, touch #.

DTC 100
PROGRAMMING INSTRUCTIONS

Read instructions and service manual before operating

1. If display is flashing StOP, OFF or PF touch any key and IdLE will appear.

2. Touch * then 1; rAtE will appear. Enter desired rate of temperature climb from 100 F/hr to 2400 F/hr.

3. Touch * to enter rate then F will appear. Enter any temperature from 250 °F to 2400 °F. (Not to exceed the rated temperature of the kiln.)

4. Touch * to enter temperature; HOLd will appear.

5. Enter desired hold time in hours, tenths & hundreths of hours up to 99.99 (e.g. 3 3/4 hrs. would be 0375).

6. Touch * to enter hold time; IdLE will appear.

7. If delay start is desired touch * then 3; dELA will appear. Enter delay time in hours, tenths and hundreths of hours up to 99.99 hours. (e.g. 12 1/2 hours would be 1250.)

8. Touch * to enter delay; IdLE will appear.

9. To start program touch * then *. Kiln temperature will be displayed (flashing) or, if a delay was programmed, time remaining until start will appear (not flashing).
    When programmed firing cycle is completed OFF will appear alternately with the kiln temperature during cool down. To stop the program during the firing cycle, touch #.

PROGRAM REVIEW

To review program stored in memory

1. With IdLE in the display.
2. Touch * then 1 rAtE will appear.
3. Touch * the rate stored in memory will appear for about 3 seconds then °F will appear.
4. Touch * the temperature stored in memory will appear for about 3 seconds then IdLE will appear on the DTC 100C (HOLd will appear on the DTC 100. Touch * to review hold time, it will appear for about 3 seconds then IdLE will appear).
5. If the program stored in memory is correct, touch * then * to begin firing.

DEFINITIONS

RATE - Rate is an increase in temperature over a period of one hour. Example; a rate of 300 means the kilns temperature will increase 300 degrees Fahrenheit every hour, or; a rate of 500 means the kilns temperature will increase 500 degrees farenheit every hour; and so on.

Suggested firing rates for the touchmatic are:	
-Low Fire	500 degrees per hour
-Ceramic Fire	500 degrees per hour
-Porcelain Fire	300 degrees per hour

These rates are only suggested rates. You may fire at a faster or slower rate, if desired. The **MINIMUM RATE** is 100 degrees per hour. The **MAXIMUM RATE** is 2400 degrees per hour.

F - This farenheit symbol is asking for the final temperature of the firing. To find the final temperature for a cone, look on the front of the control panel, or see the "Temperature Equivalents" chart in this booklet. Example; firing to cone 05 (ceramic fire), the final temperature is 1888 degrees Fahrenheit or firing to cone 6 (porcelain fire), the final temperature is 2194 degrees Fahrenheit and so on.

When the kiln temperature reaches the programmed temperature, the power to the elements is shut off. The kiln display will then flash, back and forth, between "off" and the kilns temperature.

> NOTE: When using the "Temperature Equivalents" chart, use the temperatures in the "108 degree F" column.

> NOTE: As you would adjust a kiln sitter to perfect your firings, you must also adjust the touchmatic. Test fire using witness cones, if the kiln is cool, increase your final temperature until it is correct. If the kiln is too hot, decrease your final temperature until it is correct. 10 to 15 degrees is a good starting point.

HOLD - (Optional Feature). The hold feature allows you to hold the final temperature for a period of time, up to 99.99 hours. Example; a hold of 2 hours and 30 minutes, will maintain the final temperature for 2 hours and 30 minutes and will then turn off power to the elements.

DELAY - The delay feature allows you to start the kiln at a future time, up to 99.99 hours. Example; you want the kiln to start firing in 1 hour, you would then key-in a delay of 100.

***** Please note there is a difference between the cones with 0 in front of the number and the cones with no zero. Example: Cone 06 is a lower temperature than a Cone 6. Make sure you know the difference and use the correct cone temperature. Any questions, contact your dealer for the correct cone number to use.

SAMPLE PROGRAMS
FOR DTC 100 C

Programming the kiln for ;   **cone 018 (China, Lusters, Metalics)**
500 degrees per hour
no delay start

Press #	- until "idLE" appears
Press *	- "----" will appear
Press 1	- "rAtE" will appear
Press 5,0,0	- " 500" will be displayed
Press *	- this enters rate, " F" appears
Press 1,2,8,5	-"1285" will be displayed
Press *	- this enters final temp.,"idLE" appears
Press *,*	- kiln will start,kiln temp. displayed

Programming the kiln for ;   **cone 05 (Ceramic Fire)**
500 degrees per hour
1 hour delay start

Press #	- until "idLE" appears
Press *	- "----" will appear
Press 1	- "rAtE" will appear
Press 5,0,0	- " 500" will be displayed
Press *	- this enters rate, " F" appears
Press 1,8,8,8	- "1888" will be displayed
Press *	- this enters final temperature, "idLE" appears
Press *	- "----" will appear
Press 3	- "dELA" will appear
Press 1,0,0	- " 100" is displayed
Press *	- to enter delay , "idLE" appears
Press **	- " 100" will be displayed. This 100 will count down to 0 in 1 hour. When it reaches 0, kiln will start.

Programming the kiln for ;   **cone 6 (High Fire - Porcelain)**
300 degrees per hour
no delay start

Press #	- until "idLE" appears
Press *	- "----" will appear
Press 1	- "rAtE" will appear
Press 3,0,0	- " 300" will be displayed
Press *	- this enters rate, " F" appears
Press 2,1,9,4	- "2194" will be displayed
Press *	- this enters final temperature, "idLE" appears
Press *,*	- kiln will start, kiln temperature displayed

NOTE: If at any time during the programming you wish to stop, press # *until "iDLE" appears. This will allow you to start from scratch.*

THE DISPLAY

The temperature and all program messages are displayed via 7 segment L.E.D.s much like you would find on a microwave oven. Because of the arrangement of the light bars on the L.E.D.s, the messages sometimes must appear as a combination of capital and small letters. The following is a listing of display messages and a depiction of how they will appear on the display as well as their meaning.

DISPLAY MESSAGES:

OFF - Last program cycle completed.

STOP - Last Program cycle stopped before cycle completed.

ERR - Parameter entered that is outside of specifications (e.g. entering a rate below 100°F/hr.)

RATE - Program is asking for the desired rate of temperature rise in °F/hr.

°F - Program is asking for the desired end temperature.

HOLD - Program is asking for desired hold time in hours, tenths and hundreths of hours up to 99.99 hrs. (Available on DTC100 only)

DELA - Program is asking for delay time in hours, tenths and hundreths of hours up to 99.99 hrs.

FAIL/OPEN - (Flashing alternately) - Thermocouple circuit is open. Must be corrected before program will accept any instructions. (Power to kiln must be cut off to repair.)

PF - Power failure; Power to kiln has been interrupted. Reprogram to restart.

IDLE - Controller is in the idle state. Any program parameter may be called when the controller is in this state.

TEMPERATURE EQUIVALENTS ORTON PYROMETRIC CONES

Cone Number Heated at:	Large Cones 108°F. per hour*	270°F. per hour*	Small Cones 540°F. per hour*
022	1069	1086	1165
021	1116	1137	1189
020	1157	1175	1231
019	1234	1261	1333
018	1285	1323	1386
017	1341	1377	1443
016	1407	1458	1517
015	1454	1479	1549
014	1533	1540	1596
013	1596	1566	1615
012	1591	1623	1650
011	1627	1641	1680
010	1629	1641	1686
09	1679	1693	1751
08	1733	1751	1801
07	1783	1803	1846
06	1816	1830	1873
05	1888	1915	1944
04	1922	1940	2008
03	1987	2014	2068
02	2014	2048	2098
01	2043	2079	2152
1	2077	2109	2154
2	2088	2124	2154
3	2106	2134	2185
4	2134	2167	2208
5	2151	2185	2230
6	2194	2232	2291
7	2219	2264	2307
8	2257	2305	2372
9	2300	2336	2403
10	2345	2381	2426

*Rate of temperature increase during last several hundred degrees of firing.

For Touchmatic kilns with DTC 100C controller, use 108° F./hr. temperatures.

Tables by courtesy of The Edward Orton, Jr. Ceramic Foundation

THE FIRST FIRING

Load your kiln with posts and kiln washed shelves only (no ware), for foreign materials interfere with the formation of the oxide layer. This first firing will soften the elements, seat them properly, and form a good oxide coating on the elements. This will increase the elements life expectancy.

*Program the kiln to climb at 500°F/hr. to a temperature of 1950°F. (Note: if your kilns maximum rated temperature is 2000°F or less program a temperature that is 300°F less than its maximum; i.e. a kiln rated at 1700°F would be programmed for 1400°F.)

*Start the kiln and note your starting time, it is important to monitor the progress of your kiln and always check to make sure the kiln has shut off before leaving it unattended. You will be able to monitor the kilns progress via the temperature display. Check your kiln periodically to insure that it is progressing satisfactorily. (Note: most kilns will be able to maintain even the maximum rate of temperature rise initially. There will be however, a point at which the programmed rate of temperature rise will exceed the capability of the kiln. Do not be concerned, the cone reference chart printed on the kiln compensates for this rate change.) As the kiln approaches its programmed end temperature stay with it so that you can observe it when it goes off. Note the time. The elapsed time will give you an idea of the length of time it should take to fire your kiln to this temperature. Of course, variables such as load size, voltage and programmed rate will effect the firing time.

*Make sure that the kiln is off before leaving it unattended. Allow the kiln to cool to room temperature before opening.

DTC 100C (DTC 100) BOARD REPLACEMENT

1. Unplug kiln.
2. Remove 4 corner screws holding DTC 100C (DTC 100) faceplate to switch box.
3. Loosen screws along the terminal strip.
4. Remove all connecting wires. (Make a note of wire color order if wiring diagram is not available.)
5. Remove 4 screws holding processor board to the faceplate.
6. Install new board in same manner as the one removed.
7. Hook up all wires following color coding provided on your wiring diagram.
8. Reinstall board and faceplate assembly on switch box.

CIRCUIT BOARD FUSE REPLACEMENT

1. Unplug kiln.
2. Unscrew fuse holder cap (press in and turn approx. 1/2 turn counter clockwise.)
3. Replace fuse (DO NOT replace with fuse of higher amperage, this will void your warranty.)
4. Reinstall fuse holder cap.

THERMOCOUPLE REPLACEMENT

1. Unplug kiln.
2. Remove switch box.
3. Remove thermocouple connector block.
4. Remove old thermocouple.
5. Install new thermocouple (observe polarity of thermocouple - yellow wire is positive, red is negative).
6. When installing thermocouple, be sure that the thermocouple extends to the end of the thermocouple protection tube. This can be tested by attempting to push the thermocouple protection tube out from inside the kiln, it should not slide back more than 1/8".
7. Reinstall switch box.

THERMOCOUPLE PROTECTION TUBE REPLACEMENT

1. Remove switch box.
2. Remove thermocouple and thermocouple connector block assembly.
3. Slide out old thermocouple protection tube.
4. Slide in new thermocouple protection tube until the retaining collar is snug against the brick.
5. Reinstall thermocouple. (See step 6 of Thermocouple Replacement instructions.)
6. Reinstall switch box.

TRANSFORMER REPLACEMENT

1. Unplug kiln.
2. Remove switch box from kiln.
3. Detach transformer leads from transformer output. (Note wire color order if wiring diagram is not available.)
4. Disconnect transformer input leads from power supply cords by removing wire nuts.
5. Unbolt transformer from switch box.
6. Install new transformer by reversing above steps. (Note: insure that the transformer primary is properly wired for your kilns voltage. See picture below.)
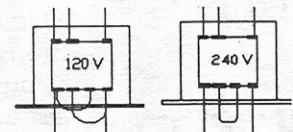
7. Reinstall switch box.

RELAY REPLACEMENT

1. Unplug kiln.
2. Remove switch box.
3. Remove leads from old relay one at a time and install on new relay as they are removed from the old relay.
4. Unbolt old relay from switch box
5. Install new relay in the same manner as relay being replaced.
6. Reinstall switch box.