

AGTRON MODEL E30TP
TOMATO PRODUCTS ANALYZER
OPERATION MANUAL
SOFTWARE VERSION TC-130CS
07/20/05

SOFTWARE VERSION TC-130CS
Special Applications
Abridged Spectrophotometer

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Made in the USA.

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I. INITIAL SET-UP

Carefully remove the analyzer from the shipping box.

Inspect the analyzer for any signs of shipping damage.

Contact Agtron immediately if any signs of damage are apparent. A claim for damage will need to be filed as soon as possible.

IMPORTANT: Keep the box and all packing material. Any equipment returned to Agtron for service must be shipped in the original packaging or Agtron will not accept the unit.

The carton contains:

- One E30TP analyzer
- One Power Cord with surge protector attached
- One Life Disk
- Four Clear Plastic Product Sample Dishes
- One Two-Sided Tomato Calibration Disk/Dish
- One Rectangular Metal Tray
- This Operation Manual

Place the Agtron analyzer on a clean level surface.

IMPORTANT: Make certain that the analyzer is level as the samples are liquid and need to be kept flat.

Keep the cooling fan vent on the back of the unit free of obstruction.

Avoid placing the unit where it will be in direct sunlight.

Remove the large disk from the box marked LIFE DISK.

Fully open the sample drawer by pulling it straight out until it contacts the bumper stop.

Place the LIFE DISK in place under the drawer with the handle facing down, flat side up, so that the disk handle fits into the mating hole in the bottom of the analyzer. The Life Disk may have marks or scratches on the surface. This will not affect performance.

Place the rectangular metal tray into the cutout on the sample drawer top so that it recesses into the cutout.

Fully close the sample drawer.

Connect the AC power cord to its mating socket on the back of the unit.
Make certain that the plug is firmly seated.

WARNING: *Check that the Agtron is correctly configured for your Mains Voltage. Contact Agtron immediately if a power incompatibility exists. Do not attempt to connect to an incorrect Voltage line. Use only a 3-prong earth grounded connection. Do not bypass the power cord grounding pin or serious electrical shock to the operator and damage to the unit may occur.*

Connect the unit to AC mains power.

NOTE: *The E30TP VEX III has no ON / OFF power switch and will **power-up** as soon as it is connected to mains power. Always leave the unit on (connected to power). The Analyzer uses very little power, about as much power as a 20-watt light bulb.*

The display should activate and begin timing a 45-minute warm-up period.

IMPORTANT: Wait about two minutes and momentarily depress the RESET button on the back panel to reset the computer.

The 45-minute warm-up period will restart.

The analyzer model type will appear on the display along with the unit serial number and other information.

The display will repeat / cycle the startup display information until the 45-minute warm-up period is over.

At the end of the warm-up period, the display will show:

<<< AGTRON MODE >>>

Contact Agtron immediately if the Display does not show <<< AGTRON MODE >>> following the initial warm-up period. Internal shipping damage may have occurred and a damage claim will need to be filed as soon as possible.

II. FRONT PANEL

The front of the analyzer has two panels, one vertical and the other tilted. The vertical panel is the sample drawer face. The lower center edge of the drawer has a relief cutout. This is where you place your fingers to open the drawer. Open the drawer by pulling the panel straight-out from the unit until the drawer hits the stop bumper. When using the E30TP, it is necessary to pull the drawer out fully until the stop is contacted to initialize calibration.

The tilted panel has the LCD display and two keypads, one for Numeric entry and the other for Function selection.

Active keys on the Numeric Keypad are: **0** thru **9**, **E** (Enter), and *****.

Active keys on the Function Keypad are:

CAL, SKIP, DATE, Quick Cal, F1, F2, F3

The back panel on the analyzer has the socket / fuse holder for mains power connection, the cooling fan and filter media frame, a serial port for communication inter-face (optional software required), and a push button for system reset.

WARNING: Do not connect any peripheral devices to the communications port or serious damage may occur to the analyzer. Optional software and internal interface modifications are required for each specific application. Contact Agtron for assistance.

NOTE: *The E30TP can be fully reset by depressing the back panel reset button for about 5 seconds. Resetting puts the analyzer into the 45minute warm-up mode. The **SKIP** key on the function keypad can be depressed at any time to exit the warm-up mode and go to the <<< **AGTRON MODE** >>>. Whenever the system is reset, the analyzer will prompt the operator to recalibrate.*

III. SETTING THE DATE & TIME

Momentarily depress the **DATE** key on the function keypad.

Current time and date settings will be displayed on the top of the display as follows:

XX:XX:XX XX/XX/XXX

The time is displayed in the 2400hour format.

The bottom of the display will alternate between the following two statements:

SKIP QUILTS ANY TIME

- and -

PRESS F1 TO CHANGE

If the date and time displayed are correct, depress the **SKIP** key on the function keypad to save the settings and exit the Date & Time function.

IF you wish to change the Date & Time displayed, depress the **F1** key.

The display will show: **YEAR (YY):**

Using the numeric keypad, enter the last two digits of the year (2002 would be 02).

The display will show: **MONTH (MM):**

Enter the month in two-digit format (April would be 04, October would be 10).

The display will show: **DAY (DD):**

Enter the day of the month in two-digit format.

The display will show: **24 HOUR (HH):**

Enter the current hour in 24hour format (7 am would be 07, 10 am would be 10, 2 pm would be 14, 12 pm / midnight would be 24).

The display will show: **MINUTE: (mm):**

Enter the current time minutes in two-digit format.

The display will now show the new Date & Time settings. To change the settings, press the **F1** key. To keep the settings, and exit the Date & Time program, press the **SKIP** key.

NOTE: *Whenever you exit the program Date / Time function, the analyzer will prompt the operator to RECALIBRATE.*

IV. USING THE AGTRON E30TP TO EVALUATE FRUIT MATURITY OR DEGREE OF PROCESS

In the Agtron Mode (Agtron Scale: Selected by depressing the **AGTRON** Key on the function keypad), E30TP looks at the ratio of two bands of energy reflected from the surface of the product sample. The wavelengths correlate directly to maturity (ripeness) and to process development (degree of cook). Both the resolution and linearity of the standard Agtron Scale provide a useful standard for controlling product consistency relative to maturity or degree of process. Because all measurements are relative to the standard used during calibration, the analyzer is extremely flexible. The user can adjust analytical resolution by changing the high and low reference scores during calibration. The scale can also be changed to suit various product applications by changing the Product Reference Score relative to any number of tomato products.

V. INITIAL REFERENCE CALIBRATION PROCEDURE

REQUIRES THE TWO-SIDED CALIBRATION DISK SET AND A PREPARED PRODUCT SAMPLE OF KNOWN SCORE

Before using the E30TP to grade product, a reference calibration must be performed to establish the relative product standard for the tomato-colored side of the Calibration disk. Once this reference is established, product is no longer required for calibration as the tomato colored side of the Calibration Disk will be used.

The E30TP automatically re-calibrates each time the sample drawer is opened. It reads the LIFE DISK under the drawer and adjusts to an established reference. This reference is stored during the CALIBRATION procedure. All product measurements are relative to the standards used for calibration.

NOTE: *CALIBRATION should be performed at the beginning of each day or shift to maintain maximum instrument accuracy. CALIBRATION can be performed more frequently if desired. The computer keeps track of CALIBRATION intervals and will prompt the user to recalibrate every 24-hour cycle at 00:00:01.*

NOTE: Once the initial reference calibration procedure is performed and a product standard is established, the E30TP is calibrated using the two-sided Calibration Disk.

Remove the Two-Sided Calibration Disk/Dish from its box.

IMPORTANT: Always place the Calibration Disk into the deep side of the calibration dish.

NOTE: *The Two-Sided Calibration Disk set supplied with the analyzer is your perpetual calibration reference. There are two sides; one side is tomato color, the other side is black. Disks are matched by serial number to a specific E30TP and should only be used with that unit.*

NOTE: *There are two labels affixed to the side of the Calibration Disk Dish. One label lists the unit serial number and in-service date, the other the standard calibration values for each side of the calibration disk..*

NOTE: *Avoid touching the top surface of the disk. Clean the disk surface occasionally with a soft cotton cloth. Use very light pressure and a 10% solution of Windex and distilled water. Keep the disk stored in the box provided and away from direct sunlight or heat. Never leave the Calibration disk in the analyzer.*

Depress the **CAL** key on the function keypad.

The display will show: *** OPEN SAMPLE DRAWER ***
 < <<< ----->>> >

Fully open the sample drawer.

The display will first show: **=CAL MODE ENGAGED=**
 STAND-BY

The display will change to: **TOMATO REFERENCE**

->>CLOSE DRAWER<<-

Place the tomato colored side “facing up” in the deep side of the dish. Place the Reference Calibration Disk and Dish into the rectangular sample tray.

Fully close the sample drawer.

The display will show: **GREEN HIGH REFERENCE**
 ENTER SCORE : 35.0

The unit will display the previous Green High Reference Score entered.

If the number displayed does not match the High Green value on the Disk label; key-in the correct score using the numeric keypad.

Depress the **E** key on the bottom right corner of the numeric keypad to enter the displayed value.

The display will show: **MEASURING HIGH GREEN**

Followed by: **RED HIGH REFERENCE**
 ENTER SCORE : 65.0

If the number displayed does not match the value on the Disk label; key-in the correct score using the numeric keypad.

Depress the **E** key on the bottom right corner of the numeric keypad to enter the displayed value.

The display will show: **MEASURING HIGH RED**

Followed by: **OPEN SAMPLE DRAWER**
 <<<<----->>>>

Fully open the sample drawer.

The display will show: **INSERT BLACK DISK**
 ->>CLOSE DRAWER<<-

Turn the tomato colored disk over so that the black side faces up.
Place the disk & dish into the sample tray and fully close the drawer.

The display will show: **LOW GREEN REFERENCE**
 ENTER SCORE: 05.0

If the number displayed does not match the Low Green reference on the Disk label; key-in the correct score using the numeric keypad.

Depress the **E** key on the bottom right corner of the numeric keypad to enter the displayed value.

The display will show: **MEASURING LOW GREEN**

Followed by: **LOW RED REFERENCE**
 ENTER SCORE: 05.0

If the number displayed does not match the Low Red reference on the Disk label; key-in the correct score using the numeric keypad.

Depress the **E** key on the bottom right corner of the numeric keypad to enter the displayed value.

The display will show: **MEASURING LOW RED**

Followed by: **OPEN SAMPLE DRAWER**
 < <<< ----->>> >

Fully open the sample drawer.

The display will show: **TOMATO REFERENCE**
 ->>**CLOSE DRAWER**<<-

Place a prepared reference tomato sample into the sample location.
Carefully close the sample drawer to avoid disturbing the sample.

The display will show: **PRODUCT CALIBRATION**
 ENTER SCORE: XX.X

Enter the sample Reference Score using the numeric keypad.

Depress the **E** key on the bottom right corner of the numeric keypad to enter the displayed value.

Display shows: **MEASURING GREEN**
Followed by: **MEASURING RED**
Followed by: **CALCULATING**

Followed by: <<<<**AGTRON MODE**>>>>

Fully open the sample drawer and allow the analyzer to calibrate. Place the dish containing the tomato colored disk into the sample location with the red side facing up. Close the drawer. Read and record the Agtron score.

The tomato colored side of the calibration disk and the recorded value are used for future calibration until a product recalibration is performed.

The E30TP is now ready to read Agtron Product Scores.

VI. QUICK CALIBRATION FEATURE

REQUIRES THE TOMATO COLORED CALIBRATION DISK / DISH OR A PREPARED REFERENCE PRODUCT SAMPLE

The Quick Calibration Feature provides a fast method to set the product score or reference. This allows the operator to move from one product classification to another. It can also be used more frequently than a Full Calibration to maintain better analytical

accuracy. While a Full Calibration is recommended every 12 hours, or at the beginning of each shift, the Quick Calibration procedure should be performed every 50 readings or every four hours. Quick Cal deletes STEP I and only requires STEP II of the Full Calibration Procedure detailed in Section V.

Depress the **Quick Cal** key. Fully open the sample drawer and follow the screen-prompted ratio calibration procedure as detailed in Section V, STEP II using either the tomato colored disk / dish or a reference product sample of known score.

Contact Agtron for additional assistance with optional calibration methods.

VII. SAMPLE PREPARATION

As with any piece of analytical equipment, good sample preparation is important if meaningful and repeatable results are to be achieved.

Sample Temperature

Samples should always be analyzed at room temperature. Never evaluate a hot or cold product, as this may affect the score.

Sample Preparation

Follow either the USDA procedure for preparing the sample, or an internal method (SOP) that includes solids screening and the removal of air bubbles with a vacuum fixture.

Samples should be measured at a constant Brix value for the most valid and repeatable results. Mix samples with distilled water to achieve the desired Brix number as measured with a refractometer.

Pour the prepared sample into the deep side of the sample dish so that the surface touches the scribed line on the inside edge of the sample dish. Agtron will provide a copy of the USDA procedure on request.

Sample Preparation to Analysis Time

Once the product has been prepared, it may be advantageous to allow the samples to settle for several minutes before evaluating. Make certain that the surface does not contain air bubbles. Experiment with samples to determine how long it takes scores to settle down (good repeatability). Do not allow the samples to sit too long or product oxidation may affect analytical results.

VII. NORMAL OPERATION

TOMATO SAMPLES CONTAIN ACID.

IF THE SAMPLES SPLASH INSIDE OF THE ANALYZER THE ACID MAY DAMAGE INTERNAL COMPONENTS.

USE CARE TO INSURE THAT THE SAMPLE DISH SITS FLAT IN THE SAMPLE TRAY.

OPEN AND CLOSE THE SAMPLE DRAWER SLOWLY TO AVOID SPLASHING SAMPLE INTO THE ANALYZER.

In the normal operating mode, the display shows the last product score read or the statement:

<<< AGTRON MODE >>>

Fully open the sample drawer.

The display will show: **CALIBRATING ANALYZER**
 <- KEEP DRAWER OPEN ->

DO NOT MOVE THE DRAWER DURING AUTO CALIBRATION

Followed by: **READY FOR SAMPLE**

NOTE: *The drawer must be closed to read the sample within 30 seconds or the calibration will time-out and the analyzer will not take a reading. When a time-out occurs, the display will show: <<< AGTRON MODE >>> To read the sample following a time-out, you must fully close and then fully open the sample drawer to recalibrate.*

Place the sample into position and fully close the sample drawer.
Make certain that the sample dish sits flat into the tray.

The display will show: *** ANALYZING SAMPLE ***
 >KEEP DRAWER CLOSED<

Followed by: **AGTRON SCORE : XX.X**

VIII. SCALE MULTIPLIERS

There are three scale multipliers that can be programmed for various product categories. The F1 / F2 / F3 keys access the multiplier functions. Activating this feature will multiply the analyzer root score by the factor entered and display the result of that multiplication.

Example

To activate the **F1** multiplier to multiply the product score displayed in the Agtron Mode by 1.128:

Depress the **F1** key.

Enter the desired multiplier of 1.128. (Any value from 0.005 to 9.876)

Cleaning the Analyzer Interior

Unplug the analyzer. Remove the LIFE DISK from under the sample drawer. Remove the rectangular sample tray. Use a soft cloth and alcohol or Windex to clean spilled product that may have accumulated on the inside of the unit.

Cleaning the LCD Display / Keypad / And Analyzer Exterior Surfaces

Use a soft cloth moistened with a 40% solution of water and Windex to clean the LCD display window.

CAUTION: Use very light pressure on the LCD or you might crack the window glass or damage the LCD.

Use a soft dry cloth to clean the keypads.

Use denatured alcohol or Windex at full strength to clean all other analyzer exterior surfaces.

X. IMPORTANT OPERATION INFORMATION

- ✦ Avoid exposing the analyzer to direct sunlight
- ✦ More frequent **Full Calibrations** will be required if the environment temperature changes significantly.
- ✦ Do not connect the analyzer to a computer UPS, connect only directly to an AC line of correct voltage using the supplied surge suppressor.
- ✦ Keep the fan media clean.
- ✦ Keep the interior of the analyzer clean and free of product.