AGTRON MODEL E30FP-III TURBO POTATO PRODUCTS ANALYZER OPERATIONS MANUAL

Revision B

SOFTWARE TC140CS-III Version 6.0

2020

Special Applications
Abridged Spectrophotometer

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INTRODUCTION

The E30FP-III evaluates potato par-fry using two bands of energy reflected from the surface of the sample. With standard analyzer calibration, the ratio of these two energy bands correlates directly to a composite development of both process (degree of fry / par-fry) and appearance indexes. The resolution and linearity of the standard Agtron Scale provides a useful reference for controlling the consistency of pre and post-process development. Because product measurements are relative to the standards used during calibration, the analyzer is extremely flexible. The user can bias the measurement scale by changing the numbers used by the supplied calibration disks, use a product to establish a reference, or modify analytical resolution (the difference the E30FP-III sees between two products), and dynamic range, by selecting any of the optional modes. These calibration options add to the versatility of the analyzer to accommodate a wide variety of products.

BASIC THEORY of OPERATION

There are two fundamental considerations in establishing quality control references for the thermal processing of potato products; appearance and sensory character. Appearance covers the physical properties of the product: physical geometry, uniformity, and perceived complex color (chromaticity and saturation). Sensory character embodies mouth feel, olfactory, and organoleptic parameters. The Agtron E30FP-III uses a comprehensive approach for the classification of process progression by focusing on both perceived color and constituent development relative to olfactory and organoleptic character.

Using the standard Agtron Scale and associated calibration, both chromatic-specific and process-specific parameters are evaluated and equally weighted in calculating the Agtron Score. The process and chromatic characteristics have overlapping optical parameters allowing photometric normalization of sample surface area and geometry. As a result, sample preparation is non-critical and product can be evaluated in its natural geometry. Process assessment is based on a narrow band of the infrared / near-infrared spectrum selected for its relationship to the polymerization of sugars, significant to organoleptic character and linked directly to the development of many other sensory constituents. The polymerization of surface sugars also affects perceived color.

Chromatic assessment is based on a band in the visible spectrum selected for the linear correlation to Maillard reaction progression. When heated sufficiently, amino groups form condensation products with aldehydes which are principally responsible for the browning effect when amino acids and sugar coexist. In addition to affecting product appearance, primarily the perceived lightness/darkness of the product, Maillard reaction progression is also related to the thermal development of other constituents essential to organoleptic character. As potatoes vary in the concentrations of both aldehydes and sugars, consideration of a composite of these overlapping parameters provides an accurate and high-resolution indication of process development.

E30FP-III OWNERS MANUAL INDEX

I. INITIAL ANALYZER 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 E30FP-III Turbo analyzer
- One Power Cord
- One White Colored Life Disk
- One Yellow / Black Two-Sided Calibration Disk
- One Calibration Disk Locating Tray
- Two Aluminum Sample Dishes
- This Operation Manual
- Laminated Calibration Certification Sheet

Place the Agtron analyzer on a clean level surface

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

DO NOT CONNECT THE ANALYZER TO AC POWER BEFORE INSTALLING THE LIFE DISK

Fully open the sample drawer by pulling it straight out until it hits the bumper stop.
Place the LIFE DISK in place under the drawer so that the disk handle fits into the mating hole on the raised platform 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: ***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 power switch for the E30FP-III is on the back panel next to the power- cord connector. Always leave the unit on for best accuracy and stability; it uses very little power, about as much power as a 20-watt light bulb.

● Turn the power switch to the –ON- position

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

IMPORTANT: If the warm-up timer does not start after approximately one-minute, momentarily depress the red RESET button on the back panel. This will reset the internal computer.

A 45-minute warm-up period should restart. If it does not, contact Agtron for assistance

The unit model type, serial number and other information will appear on the display. The startup display information will repeat until the 45-minute warm-up period is over.

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

[**E30FP SCALE]**

(or if selected) **[E15FP SCALE]**

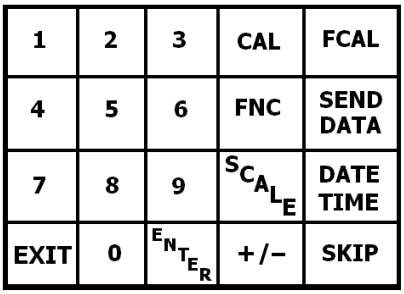
(or if selected) **[CUSTOM SCALE]**

Contact Agtron immediately if the Display does not show [**E30FP SCALE]** ***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. E30FP-III KEYPAD FUNCTIONS

The front of the analyzer has two panels:

• The lower vertical panel is the sample drawer face. The bottom 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 E30FP-III, it is necessary to pull the drawer out fully until the stop is contacted to initialize auto-calibration.
• The upper panel has the LCD display and a function keypad



KEYS	FUNCTION
[0] – [9]	**Enters numeric data**
[CAL]	**Activates calibration routine using stored reference values**
[F-CAL]	**Activates Fast-Calibration routine**
[SCALE]	**Toggles: E30FP Scale → E15FP Scale → Custom Scale** ↳ ← ← ← ← ← ← ↲
[DATE-TIME]	**Displays date and time and allows editing**
[FNC]	**Accesses Custom Scale variable editing**
[SEND DATA]	**Automatically sends display data with time/date stamp via serial port once per refreshed display**
[SKIP]	**Function varies and is display prompted**
[EXIT] or [●]	**Escapes most functions without saving edits/changes**
[6] + [SEND DATA]	**Toggles Auto Data-Transmit ON ←→ OFF**
[2] + [F-CAL]	**Enables editing/storing Cal Disk product reference value**
[1] + [CAL]	**Enables editing/storing all selected scale Cal Disk Values**

III. SETTING THE DATE & TIME

Depress the **[DATE-TIME]** key

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

XX:XX:XX XX/XX/XX

The time is displayed in the 2400-hour format. The bottom of the display will alternate between the following two statements:

[SKIP] KEY TO EXIT
PRESS [+/-] 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 [**X]** 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 [+/-] key. To keep the settings, and exit the Date & Time program, press the [**SKIP**] key.

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

IV. CALIBRATION CERTIFICATION SHEET

AGTRON E30FP-III CALIBRATION OPTIONS

E30FP & E15FP STANDARD SCALES

CERTIFIED CALIBRATION VALUES

TWO-SIDED YELLOW / BLACK CALIBRATION DISK

ANALYZER E30FP-III Ver. TC140CS-5.0

S/N 11111111-U

CERTIFICATION DATE: April XX, 20XX

CERTIFIED BY AGTRON INCORPORATED

IMPORTANT: The two-sided Yellow/Black calibration disk provided with analyzer **S/N 11111111-U** is only certified for use with analyzer **S/N 11111111-U**

OPTION 1: E30FP SCALE

YELLOW / BLACK CALIBRATION DISK

BLACK-SIDE: **GREEN LOW = 005.0 / NIR LOW = 005.0**

YELLOW-SIDE: **GREEN HIGH = 055.0 / NIR HIGH = 055.0**

YELLOW DISK CERTIFIED PRODUCT REFERENCE SCORE: **XXX.X**

OPTION 2: E15FP SCALE

(YELLOW / BLACK CALIBRATION DISK)

BLACK-SIDE: **GREEN LOW = 005.0 / NIR LOW = 005.0**

YELLOW-SIDE: **GREEN HIGH = 035.0 / NIR HIGH = 095.0**

YELLOW DISK CERTIFIED PRODUCT REFERENCE SCORE: **XXX.X**

E30FP-III analyzers are provided with a laminated calibration sheet specific to that analyzer. On the laminate sheet supplied with the analyzer, the underlined XXX.X product reference scores will be pre-programmed with numbers specific to calibrating the analyzer thats serial number appears on the sheet. There are two pre-set options for calibration. The first option produces product scores using the standard E30FP scale. The second option emulates the older E15FP analyzer scale. Select one of the calibration options and follow the full calibration procedure in (Section V).

V. FULL CALIBRATION PROCEDURE

a) ALL SCALES

REQUIRES THE TWO-SIDED YELLOW & BLACK CALIBRATION DISK and CALIBRATION DISK LOCATING TRAY

The E30FP-III requires full calibration at the beginning of each shift or every 4-hours, whichever occurs first. Periodic fast calibration (see Section VII), say every 2-hours, will improve analytical accuracy. When the sample drawer is fully opened, the unit automatically re-calibrates by reading the LIFE DISK under the drawer and fine adjusting to the reference established during either a full calibration or fast calibration procedure.

There are two steps to a full calibration:

1) The first step establishes the span and slope for each of the energy bands. Both sides of the two-sided Yellow / Black Calibration Disk are used for this step. The high and low-values referenced in the following procedure are pre-programmed factory defaults for the standard E30FP & E15FP scales.

2) The second step sets the Product Reference Score. Only the Yellow-Side of the two-sided calibration disk is used for this step. The product reference score specific to the analyzer is noted on the laminated Calibration Certification sheet provided with the analyzer and is also pre-programmed. Unlike the span and slope values, the product reference score can be user edited to fine adjust the analyzer to known product standards or various product categories. For more information on editing the Product Reference Score: Reference Section VI.

To maintain analytical accuracy, the Full Calibration procedure should be performed at the beginning of each shift or every 4-hours, whichever occurs first.

NOTE: The computer keeps track of calibration intervals and will also prompt the user to recalibrate every 24-hour cycle based on the internal clock setting.

The [**SCALE**] key toggles between three scale options:

E30FP SCALE → E15FP SCALE → CUSTOM SCALE
└ ← ← ← ← ← ← ┘

Depress the **[SCALE]** key momentarily to until:

E30FP SCALE, E15FP SCALE, or CUSTOM SCALE appears on the display

Depress the **[ENTER]** key on the keypad to select the desired scale

Depress the **[CAL]** key on the 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: **BLACK-SIDE CAL DISK**
-- > CLOSE DRAWER < --

Insert the disk locating tray into the cutout on the sample drawer. Place the two-sided calibration disk between the locating pins on the tray with the Black-Side facing up. Make certain that the tray lays flat on the drawer surface.

Fully close the sample drawer

The display will show: **LOW GREEN REFERENCE**
SETTING TO -- > 005.0

Factory default values for both the E30FP & E15FP SCALE low green reference is **005.0**

The display will show: **MEASURING LOW GREEN**
-- > PLEASE WAIT < --

Followed by: **LOW NIR REFERENCE**
SETTING TO --> 005.0

Followed by: **MEASURING LOW NIR**
-- > PLEASE WAIT < --

Factory default values for both the E30FP & E15FP SCALE low NIR reference is **005.0**

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

Fully open the sample drawer

The display will show: **YELLOW-SIDE CAL DISK**
- - > CLOSE DRAWER < - -

Turn the two-sided calibration disk over and place it onto the tray between the locating pins with the Yellow-Side facing up and fully close the drawer.

The display will show: **HIGH GREEN REFERENCE**
SETTING TO -- > 055.0 (035.0 for E15FP Scale)

The factory default value for the E30FP SCALE high green reference is **055.0**

The factory default value for the E15FP SCALE high green reference is **035.0**

Followed by: **MEASURING HIGH GREEN**
-- > PLEASE WAIT < --

Followed by: **HIGH NIR REFERENCE**
SETTING TO -- > 055.0 (095.0 for E15FP Scale)

The factory default value for the E30FP SCALE high NIR reference is **055.0**

The factory default value for the E15FP SCALE high NIR reference is **095.0**

The display will show: **MEASURING HIGH NIR**
-- > PLEASE WAIT < --

Followed by: **POTATO REFERENCE**
SETTING TO --> XXX.X

Followed by: **MEASURING GREEN**
-- > PLEASE WAIT < --

Followed by: **MEASURING NIR**
-- > PLEASE WAIT < --

Followed by: ** **CALCULATING SCALE** **

Followed by: [**E30FP SCALE]**
(or if selected) **[E15FP SCALE]**
(or if selected) **[CUSTOM SCALE]**

Whenever changing from one scale to another, depending on the previous selected scale, the analyzer will either show PLEASE RECALIBRATE or READY FOR SAMPLE

In example the display will either show:

[E30FP SCALE]
READY FOR SAMPLE

-or-

[E30FP SCALE]
PLEASE RECALIBRATE

Depress the [**CAL**] key and follow the display prompted instructions for a full calibration

When the full calibration procedure is completed, the display will show:

[E30FP SCALE]
READY FOR SAMPLE

Remove the calibration disk locating tray from the sample drawer cutout

The E30FP-III is now ready to read product samples

Keep the sample drawer in the fully closed position when the analyzer is not being use

See Section VII for information about the CUSTOM SCALE options

VI. FAST CALIBRATION PROCEDURE / ALL SCALES

Periodic fast calibrations, say every 2-hours, will improve analytical accuracy. Selecting Fast Calibration also allows the user to edit the product reference score to fine adjust the analyzer to known product standards or various product categories. The fast calibration feature will work for whichever of the three scales is selected.

Momentarily depress the [**F-CAL**] key

NOTE: If you changed scales before selecting Fast calibration, the analyzer will prompt a full calibration procedure.

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

Fully open the sample drawer

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

Followed by: **POTATO REFERENCE**
-- > **CLOSE DRAWER** < --

Followed by: **POTATO REFERENCE**
SETTING TO --> **XXX.X**

Followed by: **MEASURING GREEN**
-- > **PLEASE WAIT** < --

Followed by: **MEASURING NIR**
--> **PLEASE WAIT** <--

Followed by: ** **CALCULATING SCALE** **

Followed by: [**E30FP SCALE]**

(or if selected) **[E15FP SCALE]**

(or if selected) **[CUSTOM SCALE]**

The E30FP-III is now ready to read product samples

VII. SAMPLE PREPARATION

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

Sample Temperature: Samples should always be analyzed at room temperature. Evaluating a hot or cold product will affect the score accuracy.

Sample Preparation: It is important that the height of the product be fairly level with the top edge of the sample dish. It will improve repeatability if the product is arranged in a random manner so that the area of the sample at the surface is consistent.

VIII. NORMAL ANALYZER OPERATION

In the normal operating mode, the display shows the last product score read or the active scale (i.e.):

[E30FP SCALE]

or

E30FP SCORE 068.2

Prepare the sample following recommended procedures

Fully open the sample drawer

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

Followed by: **READY FOR SAMPLE**

NOTE: The drawer must be closed within 30-seconds to read the sample or the calibration will time-out and the analyzer will not take a reading.

When a time-out occurs, the display will show the active scale:

[E30FP SCALE]

To read a sample following a time-out, you must fully close and then fully open the sample drawer to recalibrate

IX. EDITING THE CUSTOM SCALE VARIABLES

Based on which scale is active (E30FP or E15FP), when the CUSTOM SCALE is selected, editing the intercept values allows the user to modify the root score of that scale.

Custom Scale Score is the E30FP or E15FP root score modified by the equation:

(Custom Scale Score) CS = (A x S^2) + (B x S) +/- C

Custom Scale Score is the E30FP or E15FP root score modified by the equation, where:

S represents the E30PF or E15FP scale root score

A represents a multiplier for the squared E30PF or E15FP scale root score

B represents a multiplier for the E30PF or E15FP scale root score

C represents an add or subtract E30PF or E15FP root scale score offset constant

VARIABLE DEFAULTS & LIMITS

Variable A: Default (0.00000) / Limits (0.00000 to 0.59998)

Variable B: Default (1.000) / Limits (0.000 to 9.876)

Variable C: Default (00.00) / Limits (+/- 00.00 to 98.76)

Depress the [**SCALE**] key and select either the E30FP or E15FP scale

Depress the [**FNC**] key to access intercept function editing

The display will show:
CS = A(S x S) + (B x S) + C
<< **CUSTOM – SCALE** >>

Followed by:
CS = A(SxS) + (BxS) + C
SQ MULTPLR = .00000

Followed by:
PRESS NUMBER TO CHANGE
SQ MULTPLR = .00000

Followed by:
PRESS [ENTER] TO ACCEPT
SQ MULTPLR = .00000

Followed by:
PRESS [FNC] NEXT
SQ MULTPLR = .00000

Followed by:
<< **CUSTOM – SCALE** >>
SQ MULTPLR = .00000

Followed by:
PRESS [•] = EXIT = QUIT
SQ MULTPLR = .00000

The upper line of the display will continue to cycle as noted above until either the [•] key is depressed to exit the equation editing function, or one of the other key options above is selected. If no editing was performed, the default or previously edited variable will be retained and applied to the Custom Scale calculation

When the [**FNC**] key is depressed to access the intercept function equation, each time the [**FNC**] or [**SKIP**] is depressed the bottom line of the display will move in a loop to the next editable variable:

SQ MULTPLR A = .00000 → SLOPE B = 1.000 → CONSTANT C = ±00.00
└ ← ← ← ← ← ← ← ← ← ┘

In example, if the bottom line of the display shows:

PRESS [ENTER] TO ACCEPT
SQ MULTPLR A = .00000

Depressing either the [FNC] or [SKIP] key will move to the next variable:

SLOPE MULTIPLIER B = 1.000

Depressing either the [FNC] or [SKIP] key will move to the next variable:

CONSTANT C = +00.00

The order in which the variables are presented, and in which the options are displayed will, vary depending on where the previous [**FNC**] edit sub-routine was exited

To edit variable values:

Depress the [**0**] key when the variable you want to edit is displayed

An underscore will be displayed under the first position of the variable

In example if the Display shows:

PRESS NUMBER TO CHANGE
SQ MULTPLR A = .00000

Depress [**0**] key and the display shows:

PRESS NUMBER TO CHANGE
SQ MULTPLR A = .0̲0000

Key-in the desired value for the (**A)** variable and depress the [**ENTER**] key to accept

Each variable (A, B, C) can be edited in the same manner. When all of the variables are edited to the desired values, depress the [•] key to exit the variable editing sub-routine.

The display will show the scale initially selected: [**E30FP**] or [**E15FP**]

To activate the intercept function equation:

Depress the [**SCALE**] key and select the CUSTOM SCALE

The display will show: [**CUSTOM SCALE**]

Product readings will now be adjusted by the intercept equation

NOTE: The product readings of the scale used for the root score variable edits will still function normally and product readings in that scale will not be modified by the intercept equation. In example, if the E30FP scale was used as the root scale for the CUSTOM Scale intercept calculations, selecting the E30FP scale would still read the E30FP-III root scores without any change.

X. EDITING CALIBRATION DISK VALUES

The E30FP-III analyzer is certified at the factory with standardized values specific to the analyzer and the calibration disk supplied with the analyzer.

Factory calibration disk default values for the span, slope, and product reference score of the E30FP scale are as follows:

Low Green = 005.0 / Low NIR = 005.0
High Green = 055.0 / High NIR = 055.0
Product Reference Score = XXX. X (Specific to the scale and to each analyzer and as noted on the calibration certification sheet provided with the analyzer)

Factory calibration disk default values for the span and slope of the E15FP scale are as follows:

Low Green = 005.0 / Low NIR = 005.0
High Green = 035.0 / High NIR = 095.0
Product Reference Score = XXX.X (Specific to the scale and to each analyzer and as noted on the calibration certification sheet provided with the analyzer)

The calibration disk values for the E30FP scale and E15FP scale can be edited by the user and will be stored and used for that scale during the calibration procedure until they are again edited.

Note: The CUSTOM SCALE uses the calibration disk values from the E15FP scale calibration disk values. If the E15FP scale values are edited, the CUSTOM SCALE will also use the edited values for calibration whenever the analyzer is calibrated when operating in the CUSTOM SCALE

To edit the E30FP or E15FP calibration disk values:

The [**SCALE**] key toggles between three scale options:

E30FP SCALE → E15FP SCALE → CUSTOM SCALE
└ ← ← ← ← ← ← ┘

1) Depress the **[SCALE]** key momentarily to until either the E30FP or E15FP scale is displayed

2) When the desired scale is displayed (E30FP or E15FP) depress the [**ENTER**] key to select.

Note: Disk values edited in the Custom Scale will not be stored. To change and store the calibration values used during Custom Scale calibration, edit the values in the E15FP scale.

3) Depress the [**1**] + [**CAL**] keys on the keypad

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

4) Fully open the sample drawer

The display will first show: **CAL MODE ENGAGED**
***** STAND-BY *****
The display will change to: **LOW REFERENCE DISK**
-- > CLOSE DRAWER < --

5) Insert the disk locating tray into the cutout on the sample drawer. Place the two-sided calibration disk between the locating pins on the tray with the Black-Side facing up. Make certain that the tray lays flat on the drawer surface.

6) Fully close the sample drawer

The display will show: **LOW GREEN REFERENCE**
ENTER SCORE: 005.0

Factory default value for both the E30FP & E15FP SCALE low green reference is **005.0**

7) Key-In the desired score and depress the [**ENTER**] key to accept the new value

The display will show: **MEASURING LOW GREEN**
-- > PLEASE WAIT < --

Followed by: **LOW NIR REFERENCE**
ENTER SCORE: 005.0

Factory default value for both the E30FP & E15FP SCALE low NIR reference is **005.0**

8) Key-In the desired score and depress the [**ENTER**] key to accept the new value

The display will show: **MEASURING LOW NIR**
-- > PLEASE WAIT < --

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

9) Fully open the sample drawer

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

10) Turn the two-sided calibration disk over and place it onto the tray between the locating pins with the Yellow-Side facing up and fully close the drawer.

The display will show: **HIGH GREEN REFERENCE**
ENTER SCORE: 055.0

The factory default value for the E30FP SCALE high green reference is **055.0**

The factory default value for the E15FP SCALE high green reference is **035.0**

11) Key-In the desired score and depress the [**ENTER**] key to accept the new value

The display will show: **MEASURING HIGH GREEN**
-- > PLEASE WAIT < --

Followed by: **HIGH NIR REFERENCE**
ENTER SCORE: 055.0

The factory default value for the E30FP SCALE high NIR reference is **055.0**

The factory default value for the E15FP SCALE high NIR reference is **095.0**

12) Key-In the desired score and depress the [**ENTER**] key to accept the new value

The display will show: **MEASURING HIGH NIR**
-- > PLEASE WAIT < --

Followed by: **POTATO REFERENCE**
ENTER SCORE: XXX.X

13) Key-In the desired score and depress the [**ENTER**] key

The display will show: **MEASURING GREEN**
-- > PLEASE WAIT < --

Followed by: **MEASURING NIR**
-- > PLEASE WAIT < --

Followed by: ** **CALCULATING SCALE** **

Followed by: **[E30FP SCALE]**
(or if selected) **[E15FP SCALE]**

Whenever changing from one scale to another, depending on the previous selected scale, the analyzer will either show PLEASE RECALIBRATE or READY FOR SAMPLE

XI. ADJUSTING PRODUCT SCORES TO READ HIGHER OR LOWER

It is possible to adjust product samples to read scores higher or lower than results achieved for either the E30FP or E15FP scale when using the two-sided Yellow/Black calibration disk certified reference values by adjusting the number used for the product reference score supplied with the yellow disk.

Option A: Using a Product Sample of Known Value
If you have a product sample with a known score, i.e. **66.8**, and the analyzer is reading that product Higher or Lower than the known score, i.e. **62.5**, you can use the product sample to determine a new product value for the Yellow-Side of the calibration disk.

1) Select the desired scale (E30FP or E15FP) and perform a full calibration

2) Open the sample drawer, place the product sample into the analyzer and fully close the sample drawer. Wait until the analyzer reads the sample

3) Edit the analyzer product reference score using the product sample to the desire score, in this example the desired score is 62.5 as follows:

a) Depress the [**2**] Key + [**F-CAL**] keys at the same time

The Display shows: **OPEN SAMPLE DRAWER**
<--- --->

b) Fully open the sample drawer

The display shows: ***** CAL MODE ENGAGED *****
STAND BY

Followed by: **POTATO REFERENCE**
--> **CLOSE DRAWER** <--

Followed by: **PRODUCT CALIBRATION**
ENTER SCORE: XXX.X

c) Key-in the desired product score (i.e. 62.5) and depress the [**ENTER**] key to accept the new value. **Do not open the sample drawer**. The analyzer is reading the product and calculating a new scaling value.

Wait until the display shows: [**E30FP SCALE**] or (E15FP SCALE if active)

d) Fully open the sample drawer and place the two-sided calibration disk and disk tray into the drawer with the yellow-side facing up, fully close the drawer and wait until the analyzer reads the disk.
e) Make a note of the new disk value
f) Repeat steps (a) through (c) above and in step (c) enter the new value for the yellow-side of the disk as noted above
g) Re-read the product sample to verify that the analyzer is now reading the desired product score

4) If the desired product score is not achieved, adjust the reference value for the yellow-side of the calibration disk up or down as required in small increments (±0.2) until the desired product score is achieved.

Option B: Calculating a New Product Reference Value

Note: Place a product sample prepared in an Agtron sample dish, either synthetic or real, into place in the sample drawer.

In example, if the E30FP SCALE is active and the product reads **062.8** following a full calibration, the yellow disk product reference score used was **122.6**, and you want the product to read **064.5**, start by increasing the yellow disk product reference score by the same percentage that the reading is low.

• Calculate the new value for the yellow disk product score as follows:

1) Divide the desired score (64.5) by the actual measured score (62.8) = 1.02707

2) Multiply the yellow disk supplied product reference score (122.6) by the percentage correction factor calculated in step (1): 122.6 x 1.02707 = 125.9

3) Edit the analyzer product reference score using the new reference value for the Yellow-side of the calibration disk to 125.9 as follows:

a) Depress the [**2**] Key + [**F-CAL**] key at the same time

The Display shows: **OPEN SAMPLE DRAWER**
<--- --->

b) Fully open the sample drawer

The display shows: *** **CAL MODE ENGAGED** ***
STAND BY

Followed by: **POTATO REFERENCE**
--> **CLOSE DRAWER** <--

Followed by: **PRODUCT CALIBRATION**
ENTER SCORE: XXX.X

c) Key-in the desired score from the above calculation (i.e. 125.9) and depress the [**ENTER**] key to accept the new value

Do not open the sample drawer. The analyzer is reading the yellow disk and calculating new scaling values.

d) Wait until the display shows: [**E30FP**] or [**E15FP**] if that was the active

e) Re-read the product to verify that the desired score is achieved

4) If the desired product score is not achieved, adjust the reference value for the yellow-side of the calibration disk up or down as required in small increments (±0.2) until the desired product score is achieved.

XII. DATA-TRANSMIT / CONNECTING TO A COMPUTER

The Data-Transmit function sends sample analysis results from the Serial or USB data connectors on the analyzer back panel to a PC or data acquisition system

Both Serial & USB transmit the following data:

Product Score, Selected Analyzer Scale, Time, Month/Day/Year

1) Windows based PC RS232 Connection for E30FP-III Data Output

- Open the *HYPER TERMINAL* and select an available serial port (COM1, COM2, etc.)
- Set *HYPER TERMINAL:* 9600 baud, 7 or 8 bits, 1 stop bit, No-Parity, No-Handshaking

a) Connecting the Analyzer to a PC or Data Terminal

WARNING: The E30FP-III does not have serial port isolation. Connecting the analyzer to a non-isolated serial port can permanently damage the internal micro-processor.

- Connect the analyzer serial data port to the PC with an RS232 cable. The serial connector legend is as follows:

Pin 1 (NC) **/ Pin 2** (transmit) / **Pin 3** (receive) / **Pin 5** (ground) / **Pin 4** (NC)

b) Sending Data / Downloading Data to a Spreadsheet

- Use the *HYPER TERMINAL* capture feature to downloaded data as a TEXT file
- Open a Windows Spread Sheet to accept a TEXT DELIMITED file
- Open SCORE DATA
- Depending on the analyzer mode selected, data will be formatted as 4 to 7 columns on the spreadsheet

2) USB Connection for E30FP-III Data Output

IMPORTANT: Software compatible with a FT232R USB component must be downloaded **before** connecting to the E30FP-III USB port to avoid complications

Before connecting the analyzer to a PC/Mac computer:

- Open the computer's browser and navigate to www.ftdichip.com
- Download the D2XX software compatible with the computer's operating system. There are detailed installation guides on the D2XX page which can be found under the side bar of the Driver Menu.
- Once the software has been downloaded and activated, connect the E30FP-III USB to the computer

3) Using the Data Transmit Feature / RS232 & USB

There are two options to transmit data from the E30FP-III when a RS232 or USB cable is connected from the analyzer to a host computer:

1) **Manual-Transmit**
   After a product reading is taken, depress the [**SEND DATA**] key and the product score with the time and date will be transmitted. Only one data transmission will occur for each reading even if the [**SEND DATA**] key is pressed again.

2) **Auto-Transmit**
   a) Depress the [**6**] + [**SEND DATA**] keys at the same time to activate the auto data transmit feature. A time and date will be transmitted with the notation that the auto data transmit feature is ON. With auto-transmit ON, each time a reading is taken the product score with time and date will be transmitted.
   b) Depress the [**6**] + [**SEND DATA**] keys at the same time again to deactivate the auto data transmit feature. A time and date will be transmitted with the notation that the auto data transmit feature is OFF. No data will be transmitted unless the [**SEND DATA**] key is depressed.

XIII. PERIODIC MAINTENANCE

CLEANING THE TWO-SIDED CALIBRATION DISK

The two-sided calibration disk should be kept clean and free of contaminants. Clean the disk surfaces using a soft lint-free cloth and a dilute solution of denatured alcohol. Be careful not to scratch the disk surfaces.

CLEANING THE LIFE DISK

The life disk should be cleaned periodically. Remove the disk from the analyzer and wipe it with a soft lint-free cloth and a dilute solution of denatured alcohol and distilled water.

CLEANING THE ANALYZER INTERIOR

Unplug the analyzer. Remove the LIFE DISK from under the sample drawer. Remove the rectangular sample tray. Use a vacuum to remove any product that may have accumulated on the inside of the unit. Wipe drawer top surface with a soft cloth and denatured alcohol or Windex at full strength.

CLEANING THE LCD DISPLAY/ANALYZER EXTERIOR SURFACE/KEYPAD

CAUTION: ***Use very light pressure when cleaning the display to avoid cracking the window glass or damage the LCD.*** Use a soft cloth moistened with a dilute solution of water and Windex or denatured alcohol to clean the LCD display window.

CLEANING THE ANALYZER EXTERIOR

Use denatured alcohol or Windex to clean the analyzer exterior surfaces.
Use a soft dry cloth and dilute alcohol solution to clean the keypads.

XIV. IMPORTANT OPERATION NOTES FOR BEST RESULTS

- ✧ Analyze samples only when they are cooled to room temperature
- ✧ Avoid exposing the analyzer to direct sunlight, extreme heat, or frying oil
- ✧ Using the [**F-CAL]** Fast Calibrate feature frequently will improve accuracy
- ✧ More frequent **Calibrations** will be required if the environment temperature fluctuates significantly
- ✧ Power backup: only connect to a pure sine wave UPS or directly to an AC line using the supplied power cord. Do not bypass the power cord grounding pin.
- ✧ Keep the interior of the analyzer clean and free of stray product and frying oil

XV. LIMITED WARRANTY

Agtron Inc. warrants this product to be free of defects in material and workmanship for a period of one year from date of purchase. This warranty is valid only to the original purchaser.

This warranty does not cover:

- Equipment used for any purpose other than its intended application
- Cosmetic damage
- Problems resulting from improper installation
- Mains voltage related damage
- Equipment that has been altered, misused, or neglected
- Damage caused by exposure to harsh environments

Agtron equipment requiring warranty repair must have a "return for repair" authorization number (RFR) provided by Agtron. Obtain an RFR number prior to shipping and reference the number on all relative documents.

For insurance purposes, analyzers must be returned in the original Agtron box and packaging inserts. Customers will be responsible for analyzers damaged during shipping that are not in the original packaging. If you do not have the original packaging materials, please contact Agtron and we will send them to you for a nominal shipping fee of $35.00.

Warranty repairs should be accompanied by a copy of the original sales invoice or a reference to the original invoice number as proof of date of purchase.

The customer will be responsible for freight charges to Agtron and for full value shipping insurance. Agtron will not assume the responsibility for any shipping damage.
Agtron will pay for the return freight and insurance to the customer.

IMPORTANT / UNITS RETURNED FOR SERVICE:

1) **Include a brief description of the analyzer problem**
2) **Include the life disk, two-sided calibration disk, and calibration tray**
3) **originally supplied with the analyzer**
4) **Do not include the instruction manual or sample dishes**

XVI. E30FP-III POTATO ANALYZER FEATURES & SPECIFICATIONS

- **Fast Par-Fry and Fry analysis: Sample prep and measurement in less than 20-seconds**
- **LCD Display Prompted Operation**
- **Editable Measurement Scaling: Agtron or user defined Custom Scales**
- **Calibration Data Entered by Keypad: No internal or external adjustments required**
- **Durable Synthetic two-sided Calibration reference establishes both the analytical span, slope, and product references for maintaining long-term accuracy**
- **Automatically self-calibrates before each product reading to maintain analyzer accuracy and repeatability**
- **Internal Auto-Calibration Standard easily removed for cleaning**
- **Alpha Numeric Backlit LCD Display**
- **Product Score Format: 4-Digit(NNN.N)**
- **USB & RS-232 Interface capability for data transfer**
- **Product Score Limits: 000.5 – 199.0 (Dependent on Scale Calibration)**
- **Self-Contained Dual Microprocessor design does not require an additional external computer or software to function**
- **Analytical Method: Selected wavelengths of reflected near-infrared and VIS energy that correlate to the developed chemistry/appearance of the product**
- **Detector / Photo-Amplifier: Silicon / Ultra-Linear Trans-Conductance**
- **High Resolution 12-Bit Analog to Digital Conversion**
- **Optics: Specially Coated Quartz**
- **Measurement Geometry: Incident to Measurement Field**
- **Measurement Field: 28 sq.in., Circular**
- **Illuminant: Specific Wavelength Solid-State SMT Emitters**
- **Illuminant Geometry: Multiply Emitters in Coaxial Configuration**
- **Long-Life Illuminant: MTBF 12-Years**
- **Digital Power Supply: Regulated and Isolated HF Switching**
- **Analog Power Supply: Regulated and Isolated Linear**
- **Detector / Photo-Amplifier: Silicon / Ultra-Linear Trans-Conductance**
- **CWL Accuracy / Each Frequency Band: Better than +/- 2.5nm**
- **FWHM / Both Frequency Bands: +/- 5.0nm**
- **Analytical Resolution: 0.10%**
- **Analytical Linearity: +/- 0.20%**
- **Inter-Instrument Agreement: +/- 2.5%**
- **Dynamic Measurement Range: 0.0% to 100.0%**
- **Power Requirements: Universal Voltage Compatible 100-240vac,50/60Hz, 25Watts**
- **Dimensions: 9" H, 20 1/4" L, 14 1/2" W, 40 Pound Shipping Weight**

XVII. CE CERTIFICATE & DECLARATION OF CONFORMITY

CERTIFICATE & DECLARATION OF CONFORMITY FOR CE MARKING

Company contact details:
AGTRON INCORPORATED
9395 Double R Boulevard, Reno, Nevada, 89521, USA
Tel: (775)-850-4600 Fax: (775)-850-4611 Email: Agtron@aol.com

AGTRON INCORPORATED declares that their:
Tabletop Abridged Spectrophotometers
listed as the following models
E20CP-II, E30FP-II, M-SERIES II, S-SERIES II and M-BASIC II

comply with the Essential Requirements of the following EU Directives:
Low Voltage Directive 2006/95/EC
Electromagnetic Compatibility Directive 2004/108/EC

and further conform with the following EU Harmonized Standards:
EN 61326-1:2006
EN 61010-1:2010

Dated: 27 November 2012
Position of signatory: President / CEO
Name of Signatory: Carl A. Staub
Signed below:
on behalf of AGTRON INCORPORATED