

Paedia[®]LLC Model DS-36 Conductivity Meter

Instructions and Guide for Toner Maintenance



Use

The Paedia Model DS-36 conductivity meter is intended for use with Hilord brand liquid toners for electrographic printing. Simply press the power button on the side of the case, and immerse the probe's electrodes in the liquid to be measured. The meter reads the conductivity of the liquid in standard units, "picoSiemens/cm" also called "picomhos/cm".

Principle of Operation

Two electrodes of known size and spacing are immersed in the liquid to be measured. An alternating electric field is applied to the electrodes. Toner particles move back and forth between the electrodes in response to the applied field. Their motion is sensed as a current. This current is converted to a voltage. This voltage is multiplied by a scale factor and displayed on the DS-36 readout as conductivity.

The DS-36 conductivity meter is microprocessor-based. A signal processing algorithm results in improved signal-to-noise performance. Automatic zeroing is also provided.

Toner Maintenance

Optimum performance and maximum life are obtained from electrographic toners when their conductivity is properly controlled. During use, particles are removed from the toner—causing its conductivity to decrease. Concentrate is added and solvent evaporates—causing the conductivity to increase. The conductivity must be measured frequently, and adjusted when necessary.

Follow the simple steps in Appendices A (Xerox®) or B (Raster Graphics®) to get the most from your toner.

Probe Maintenance

Rinse the probe electrodes inside and outside with clear dispersant after each use. The probe tip can be stored by immersing the electrodes in clear dispersant.

Electrographic toner must not be allowed to dry in the probe. If this happens, soak the probe in clear dispersant overnight, then use an ultrasonic cleaner to dislodge remaining toner from the electrode surfaces. Check calibration after cleaning the electrodes.

Zero Adjustment

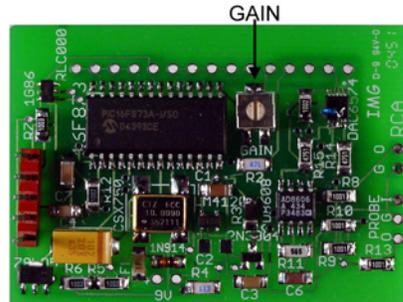
Zero adjustment is automatic. A zero reading of 0-3 picoSiemens is normal.

Gain Adjustment

The gain of the Model DS-36 meter is set at the factory. This adjustment is *not normally required*. If you feel your readings are not correct, obtain a sample of toner and measure its conductivity using another, calibrated conductivity meter. (Be sure the ink is fully agitated before making this measurement.)

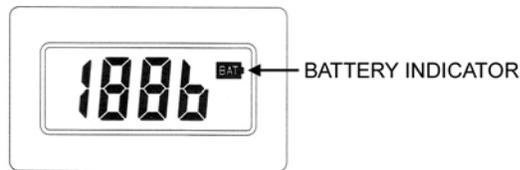
1. Carefully remove the back of the case.
2. Turn the DS-36 meter ON.
3. Fully immerse the probe end in the liquid ink sample.

4. Watch the meter as you turn the Gain adjustment potentiometer on the printed circuit board.
5. When the meter reads the correct conductivity, the Gain Adjustment is finished.
6. Turn the meter OFF and replace the back cover.
7. Rinse the electrodes.



Low Battery Indication

An alkaline battery will last about 6-1/2 hours.



A battery indicator will appear on the display. When the battery indicator flashes, an alkaline battery will last about an additional 30 minutes. When the battery is no longer usable, the display will go blank. For best results, replace the battery when the indicator flashes. Always keep a fresh battery in the DS-36 probe.

Turn the meter OFF when replacing the battery.

Meter Output

An RCA jack on the side of the DS-36 probe provides a voltage output which can be used to drive a remote meter. The output range is 0-0.1999 volts for 0-1999 pS. The source impedance is 1K ohm.

Specifications

Operating temperature range 65-75 deg. F (18-24 deg. C)

Conductivity range 0-1999 picoSiemens/cm (picomhos/cm)

Display Rate 2/second

Measurement Frequency 27 Hz nominal

Power 9V alkaline battery, 20 mA operating current

Meter output (RCA jack) 0-0.1999 volts, 0-1999 pS, 1K ohm impedance

Dimensions 3.0" W x 1.625" D x 13.0" H (6.35 x 4.13 x 36.2 cm)

Net weight 7.0 oz (199 g)

Service

The Model DS-36 conductivity probe is designed to last for many years. Gain adjustment can be performed by the user. In the event it needs more than this, contact Paedia by phone at 1-415-861-8097 (U.S. 800-889-9398), fax 1-415-861-6683, or e-mail: service@paedia.com.

Serial Number

The serial number is located inside the battery compartment. Remove the battery to expose the serial number.

Warranty

This product is warranted for one year from the ex-factory date of sale to operate as described in this manual, with the following limitations described in the “Disclaimer of Warranties and Limitation of Liability” below. The warranty is void if the product is abused or misused.

Disclaimer of Warranties and Limitation of Liability

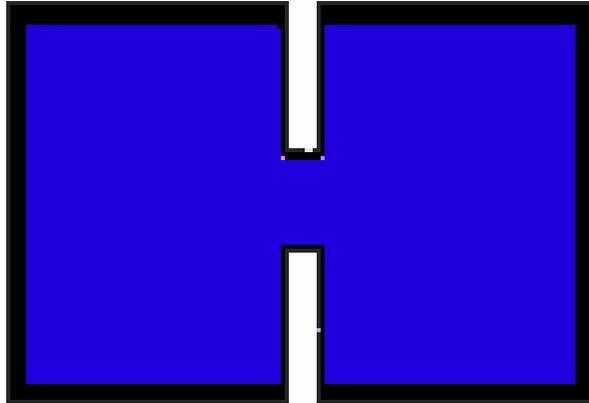
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Appendix A.



CONTROLLING THE DENSITY BY MONITORING THE DIP-CELL (FOR 8954-III DYE SUB.)

MANUAL CONCENTRATE-ADD SYSTEM

Follow procedure “A” to obtain the initial target values, then, follow procedure “B” during production. Procedure “C” should be followed every morning.

PROCEDURE “A”

Follow this procedure every time you use a new (fresh) toner set.

Steps:

- 1) Install a new (unused) set of toner into the plotter.
- 2) Run the flush cycle and then plot to confirm that the toners print satisfactory.
- 3) Insert the probe into the bottle until it rests to the bottom.
- 4) Run the "Flush" cycle. Let it flush for one or two minutes and take several readings until the value is stable (while it is flushing).
- 5) Record the readings for all four colors. These will be the set points “SP”.
- 6) Set the contrast to 50 (menu 55) for all colors and run a color test (menu 94).
- 7) Transfer and record all the densities. These will be the target reflective densities for each color “TRD”

PROCEDURE “B”

Follow this procedure during normal production.

Steps:

- 1) After a certain amount of application plots (depending on the coverage) check the conductivity reading for each color. Make sure that you take the reading during printing (while the pump is running – or during flushing) record as DC (dip-cell conductivity)
- 2) If the reading “DC” is 2 points lower from the set point “SP”, add concentrate slowly until the set point is achieved. If the reading is more than 10 % higher than the set point, then, dilute (with clear) slowly to the set point.
- 3) After adding concentrate or clear continue printing and monitoring the “DC” (continue with PROCEDURE “B” Step #1).



PROCEDURE “C”

Follow this procedure every morning.

Steps:

- 1) Run the "Flush" cycle. Let it flush for one or two minutes and take several readings until the value is stable (while it is flushing).
- 2) Record the readings “DC” for all four colors.
- 3) Set the contrast to 50 (menu 55) for all colors and run a color test (menu 94).
- 4) Transfer and record all the densities “RD”.
- 5) For adjustments follow the guidelines listed below.

The only variables used are Reflective Density and Dip-Cell conductivity.

DC: Dip-Cell

RD: Reflective Density.

SP: Set Point for DC

TRD: Target Reflective Density.

- 1) $DC > SP$, $RD > TRD$: No action. *
 - 2) $DC > SP$, $RD < TRD$: Add clear until $DC = SP$ **
 - 3) $DC > SP$, $RD = TRD$: Increase SP to DC
 - 4) $DC < SP$, $RD > TRD$: Decrease SP to DC. *
 - 5) $DC < SP$, $RD < TRD$: Update (add concentrate) until $DC = SP$
 - 6) $DC < SP$, $RD = TRD$: Decrease SP to DC
 - 7) $DC = SP$, $RD > TRD$: No action. *
 - 8) $DC = SP$, $RD < TRD$: Increase SP slowly (no more than 20% of original value) ***
 - 9) $DC = SP$, $RD = TRD$: No action.
- * Regarding "1", "4" and "7", if $RD \gg TRD$: add clear until $RD = TRD$ set SP to new DC
- ** If $DC > SP$, $RD \ll TRD$: Add enough clear so that $DC < SP$, then go to "5"
- ***If "8" does not work, remove one quart of premix from the bottle and replace it with clear, go to statement "5)". Repeat until $RD = TRD$. (Similar to #2)

CONTROLLING THE DENSITY BY MONITORING THE DIP-CELL (FOR DYE SUB.)

MANUAL CONCENTRATE-ADD SYSTEM

PROCEDURE “A”

Follow this procedure every time you use a new (fresh) toner set.

Steps:

- 1) Install a new (unused) set of toner into the plotter.
- 2) Flush all colors and then plot to confirm that the toners print satisfactory.
- 3) Insert the probe into the bottle until it rests to the bottom.
- 4) Run the "Flush" cycle. Let it flush for one or two minutes and take several readings until the value is stable (while it is flushing).
- 5) Record the readings for all four colors. These will be the set points “SP”.
- 6) Set the contrast to 0 for all colors and run a color test (color-bars).
- 7) Transfer and record all the densities. These will be the target reflective densities for each color “TRD”

PROCEDURE “B”

Follow this procedure during normal production.

Steps:

- 1) After a certain amount of application plots (depending on the coverage) check the conductivity reading for each color. Make sure that you take the reading during printing (while the pump is running – or during flushing) record as DC (dip-cell conductivity)
- 2) If the reading “DC” is 2 points lower from the set point “SP”, add concentrate slowly until the set point is achieved. If the reading is more than 10 % higher than the set point, then, dilute (with clear) slowly to the set point.
- 3) After adding concentrate or clear continue printing and monitoring the “DC” (continue with PROCEDURE “B” Step #1).

PROCEDURE “C”

Follow this procedure every morning.

Steps:

- 1) Run the "Flush" cycle. Let it flush for one or two minutes and take several readings until the value is stable (while it is flushing).
- 2) Record the readings “DC” for all four colors.
- 3) Set the contrast to 0 for all colors and run a color test (color-bars).

- 4) Transfer and record all the densities "RD".
- 5) For adjustments follow the guidelines listed below.

The only variables used are Reflective Density and Dip-Cell conductivity.

DC: Dip-Cell

RD: Reflective Density.

SP: Set Point for DC

TRD: Target Reflective Density.

- 1) $DC > SP$, $RD > TRD$: No action. *
- 2) $DC > SP$, $RD < TRD$: Add clear until $DC = SP$ **
- 3) $DC > SP$, $RD = TRD$: Increase SP to DC
- 4) $DC < SP$, $RD > TRD$: Decrease SP to DC. *
- 5) $DC < SP$, $RD < TRD$: Update (add concentrate) until $DC = SP$
- 6) $DC < SP$, $RD = TRD$: Decrease SP to DC
- 7) $DC = SP$, $RD > TRD$: No action. *
- 8) $DC = SP$, $RD < TRD$: Increase SP slowly (no more than 20% of original value) ***
- 9) $DC = SP$, $RD = TRD$: No action.

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