

ELECTRONIC INKOMETER CONVERSION MODEL E2000, Version 2

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1.0 INTRODUCTION

Kershaw Instrumentation has been an innovator in instrument systems and laboratory test equipment for many years. Their vast design resources along with extensive “hands on” experience enables Kershaw Instrumentation to provide a complete line of products and services for the graphic arts industry.

One of our innovations is the electronic Inkometer conversion Model E2000. This machine is designed for highly accurate testing and will provide for many years of durable trouble-free service both in the laboratory and in the workplace.

1.1 Description of Version 2

The E2000 utilizes a microprocessor based Tack display which includes all of the calibration and clock functions required for the tack measurement and printer option. The version 2 digital Tack display has 3 buttons; P, ▲, ▼ as shown in the picture in section 4.2.

2.0 DESIGN FEATURES

The Model E2000 has been carefully engineered to provide durability and high accuracy. Many of the components are standard commercial parts thus proven to provide low maintenance and ease of service. The following is a brief description of some of the design features.

2.1 Temperature Control System

The optional temperature control provided with the model E2000 Electronic Inkometer Conversion is a six liter heater circulator. This “stand alone” device is connected to the unit as well. A centralized water system can be utilized simply by disconnecting these hoses and reconnecting them to the alternate temperature control source.

The water is connected to the rotating brass roller via a mechanical water seal. The unique, rugged design of this seal will provide years of trouble free operation.

2.2 Variable Speed Drive

A full size ½ horsepower variable speed motor powers the Model E2000. The speed of the brass roller can be adjusted from 0-2000 R.P.M. A digital readout displays the speed at all times. The brass roller is driven

directly from the motor via a timing belt, thus no gears or transmission components are utilized. The operation of the speed controls is discussed in Section 3.3.

3.0 OPERATION OF CONTROLS

3.1 Tack Indicator

While running a test, the tack measurement is displayed on the digital indicator continuously. A zero button is located beneath the digital indicator to zero the instrument prior to running a test.

3.2 Speed Indicator

A digital readout is provided to indicate the speed of the brass roller in R.P.M.'s. This speed reading is measured directly from the brass roller via a digital speed sensor thus no calibration is required.

3.3 Speed Controls

Two adjustable speed controls are provided on the Model E2000. The low speed control is used for distributing the ink, cleaning the rollers, and idle running of the machine. The high speed control is used for running a test. The high speed control should be set to the specified test speed.

3.3.1 Manual Speed Control

With the auto/manual switch in the "manual" position, the operator may select either low speed or high speed operation simply by using the high/low switch.

3.3.2 Automatic Speed Control

Upon switching the auto/manual switch to the "auto" position, the machine will begin to distribute the ink at low speed and the distribution timer will begin its' time cycle. Once the distribution timer elapses, the machine will ramp up to high speed. The machine will now run at this specified test speed until the operator moves the auto/manual switch to the OFF position to conclude the test.

Note: This distribution timer should be adjusted for a long enough time period to properly distribute the ink. The operator may want to record this

distribution time as part of the test specification.

3.4 Interval Timer

The interval timer provides the operator with an audible tone at preset levels. The Interval Timer works as a “Stop Watch” to cue the operator to observe the tack readings during a test. The Interval Timer contains two adjustable dials. The inner dial (GREEN) sets the “tone on” time and the outer dial (RED) sets the “tone-off” or interval time. A switch is provided to shut off the Interval Timer circuit if it is not required. The Interval Timer only works in the automatic mode.

Note: An extra circuit is provided with the interval timer for use with the computer interface option and/or the data printer. By utilizing this circuit the interval timer will trigger the computer or data printer to begin its data collection thus providing a completely automatic data collection system.

3.5 Operation

3.5.1 Setting up for a Test

Move the auto/manual switch to the manual mode and the High/Low switch to the high position. Adjust the high speed control to the specified operating speed.

With the speed and temperature stable and the rubber rollers in contact with the brass roller, adjust the tack indicator to zero. Next, move the auto/manual switch to the “OFF” position.

Now adjust the distribution timer for the required distribution time, and the interval timer for the desired data interval. The instrument is now ready to test.

3.5.2 Running a Test

Fill the pipette with the test ink. Carefully remove all the air bubbles to insure that the proper volume of ink is obtained. Apply the test ink sample to the distributor roller evenly.

Now, move the auto/manual switch to the auto position. The machine will now run at the low distribution speed for the elapsed time as preset on the distribution timer. When the distribution timer elapses, the machine will ramp up to the specified operating speed. The interval timer will sound the audible sonalert to indicate the operator should read the data. Upon completion of the

test the operator simply moves the auto/manual switch to the OFF position to end the test.

Now the operator can use the manual speed position to clean the machine and stabilize it for the next test.

4.0 Calibration

4.1 Speed Calibration

_____The speed reading is measured directly from the brass roller via a digital speed sensor thus no calibration is required.

4.2 Tack Calibration - Using the Calibration Weights

Using the manual mode, set the roller speed to 800 R.P.M. Carefully check and adjust the tack indicator to zero by depressing the zero button as shown below. Once the zero reading is stable, proceed to step 4.2.1



Zero Button

4.2.1 Zero Value Set

Press and hold the “Prog” button on the front of the tack meter for five seconds as shown in the illustration below.



Zero Value Set

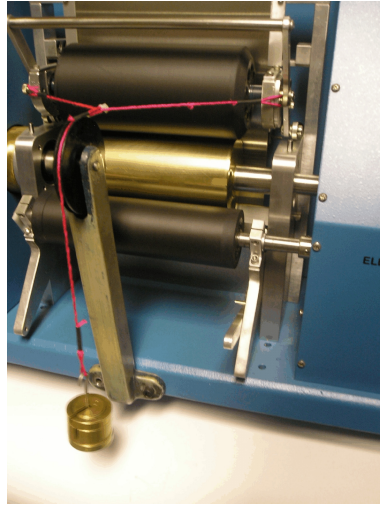
Once the word “Zero” appears on the display, you can remove your finger from the “Prog” button. You will notice the tack display is toggling between “Zero” and the zero value. The zero value must read “0.0”. Use the ▲ and ▼ arrows if necessary to make this value equal 0.0.

Once the “Zero” value is equal to “0.0”, allow the machine to run at 800 R.P.M. for at least thirty seconds to allow the tack circuit to stabilize. Now press and release the “Prog” button to enter this “Zero” value.

4.2.2 Span Value Set using the calibration weights

Upon completion of the zero value set the word “SPAN” will appear on the digital tack display.

Turn off the motor by moving the auto/manual switch to the “OFF” position. Disengage the distribution roller and install the calibration arm, string and pan to the top roller assembly. Add the 10 gm-mtr weight and the 5 gm-mtr weight to the pan to achieve a total bending moment of 20 gm-mtr. This set up is shown in the picture below.



Calibration Set Up

Turn on the motor by moving the auto/manual switch to the "ON" position. You will notice that the tack display is toggling between "SPAN" and the span value. Adjust the span value to "20.0" using the ▼ and ▲ arrows on the front of the tack display if required.

Once the "SPAN" value is equal to "20.0", allow the machine to run at 800 R.P.M. for at least thirty seconds to allow the tack circuit to stabilize. Now press the "Prog" button to enter this "SPAN" setting as shown below. The tack display will now return to the normal running mode.



Span Value Set

Turn off the motor and remove the weights and the calibration arm. Turn

the motor back on and allow the system to stabilize. Press the “Zero” button under the meter as shown in section 4.2 to tare the tack circuit. The machine is now ready to operate.

4.3 Tack Calibration - Using a Tack Standard Ink

Using the manual mode, leaving the rollers dry (no ink) set the roller speed to the specified speed for the tack standard ink. Allow the rollers to run at this speed for about 30 seconds to insure the readings are stable. Carefully check and adjust the tack indicator to zero by depressing the zero button as shown below. Once the zero reading is stable, proceed to step 4.3.1



Zero Button

4.3.1 Zero Value Set

Press and hold the “Prog” button on the front of the tack meter for five seconds as shown in the illustration below.



Zero Value Set

Once the word “Zero” appears on the display, you can remove your finger from the “Prog” button. You will notice the tack display is toggling between “Zero” and the zero value. The zero value must read “0.0”. Use the ▲ and ▼ arrows if necessary to make this value equal 0.0.

Once the “Zero” value is equal to “0.0”, allow the machine to run at the calibration speed for at least thirty seconds to allow the tack circuit to stabilize. Now press and release the “Prog” button to enter this “Zero” value.

4.3.2 Span Value Set using a Tack Standard Ink

Upon completion of the zero value set the word “SPAN” will appear on the digital tack display. You will notice that the tack display is toggling between “SPAN” and the span value. Adjust the span value to “XX.X” using the ▼ and ▲ arrows on the front of the tack display. XX.X is the specified ink tack value at 1 minute for your tack standard ink.

4.3.3 Running the tack standard ink

Turn off the motor by moving the auto/manual switch to the “OFF” position. Apply the ink to the rollers, adjust the distribution timer to the specified distribution time, adjust the interval timer to 1 minute, move the auto/run toggle switch to the “AUTO” position and then move the interval timer toggle switch to the “ON” position. The machine will now distribute the ink and then automatically proceed to the 1 minute tack test. Stand by the machine in preparation to enter the span value entered in step 4.3.2.

After 1 minute when the interval timer “beeps”, press the “Prog” button to enter the ink tack standard span value as shown below.



Enter Span Value

The span value is now set. After you clean the rollers it may be necessary to press the zero button once again to trim the zero reading. This is normal after completing the calibration process.