Capillary Suction Timer
Model 440

Instruction Manual

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Instrument No. 209703

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Fann Instrument Company

Capillary Suction Timer Instruction Manual

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1 Introduction

The Capillary Suction Timer, Model 440 measures the filtration rate of free water in a fluid. The instrument contains a control cabinet that houses a timer and connects to the test head with electrodes. Fluid will contact and penetrate a thick, special grade paper (test blotter paper) that sits between the acrylic plates of the test head. This fluid will travel outward from a circular spot and will reach the nearest electrical contact on the sensor plate. It will continue to spread until it reaches the next electrical contact. The Capillary Suction Timer measures the time it takes for the fluid to spread from the first electrical contact to the second contact. This time is measured in 1/10 seconds.

The Capillary Suction Timer consists of the following:

- Cabinet — controls, batteries, and connection for the test head (acrylic unit)
- Test Head — sensor plate (on top) with pins and cable connection into the instrument cabinet and the sensor tray (bottom)
- Test Blotter Paper
- Funnel
- 9VDC battery
- Battery Eliminator, 115 VAC

This instrument may be operated from its self-contained 9 volt battery for field use, or from 115V, 60 Hz power. The 115 volt adapter when plugged into the instrument will operate it. This adapter will not charge the batteries.

1.1 Document Conventions

The following icons are used as necessary in this instruction manual.

NOTE. Notes emphasize additional information that may be useful to the reader.

CAUTION. Describes a situation or practice that requires operator awareness or action in order to avoid undesirable consequences.

MANDATORY ACTION. Gives directions that, if not observed, could result in loss of data or in damage to equipment.

WARNING! Describes an unsafe condition or practice that if not corrected, could result in personal injury or threat to health.

ELECTRICITY WARNING! Alerts the operator that there is risk of electric shock.

HOT SURFACE! Alerts the operator that there is a hot surface and that there is risk of getting burned if the surface is touched.

EXPLOSION RISK! Alerts the operator that there is risk of explosion.

2 Safety

Safe laboratory practices and procedures should be observed while operating and maintaining the Capillary Suction Timer. This section lists some precautions to follow.

If the instrument will be used on 115 volt AC power, plug the transformer into and AC receptacle and the jack into the back of the instrument case marked EXTERNAL POWER.

Make sure the transformer and cable to the Capillary Suction Timer are in good condition. Plugging a defective device into 115 volts can cause electrical shock.

3 Features and Specifications

The Capillary Suction Timer, Model 440 consists of a control cabinet with a digital timer, test head, funnel (sample cell), test blotter paper, and 5-ml syringes. See Figure 3-1 and Table 6-1.

The control cabinet functions are as follows:

POWER	ON/OFF
START	Lamp lights, counter starts, and timing begins
FINISH	Lamp lights, counter stops, and timing ends
LOW BAT	Low battery indicator
RESET	Clears counter (zeros) and FINISH light is off.

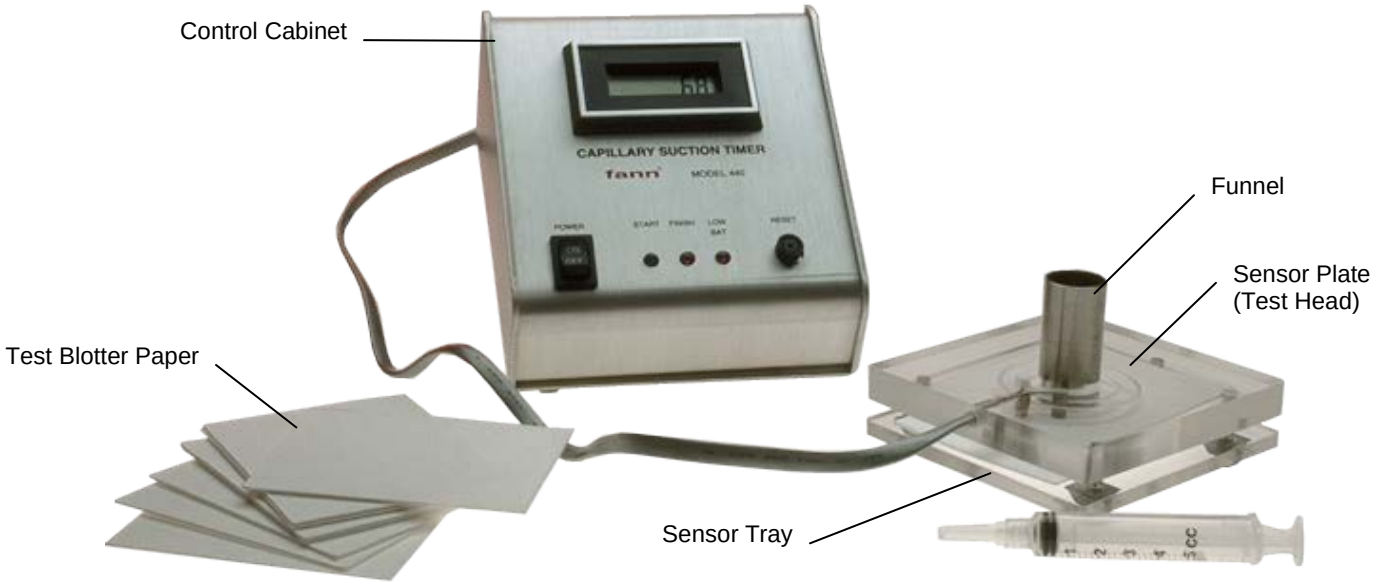

Figure 3-1 Capillary Suction Timer

4 Test Procedure

If the instrument will be used on 115 volt AC power, plug the transformer into an AC receptacle, and plug the jack into socket marked EXTERNAL POWER (back of the instrument cabinet).

Make sure the transformer and cable to the Capillary Suction Timer are in good condition. Plugging a defective device into 115 volts can cause electrical shock.

1. Clean and dry the sensor tray and sensor plate.
2. Plug the sensor plate assembly into the socket marked TEST HEAD (on the back of the instrument).
3. Place test blotter paper on top of the sensor tray and under all three pins as shown in Figure 4-1. Place the sensor plate, probe side down on top of the test blotter paper, engaging the two alignment pins.

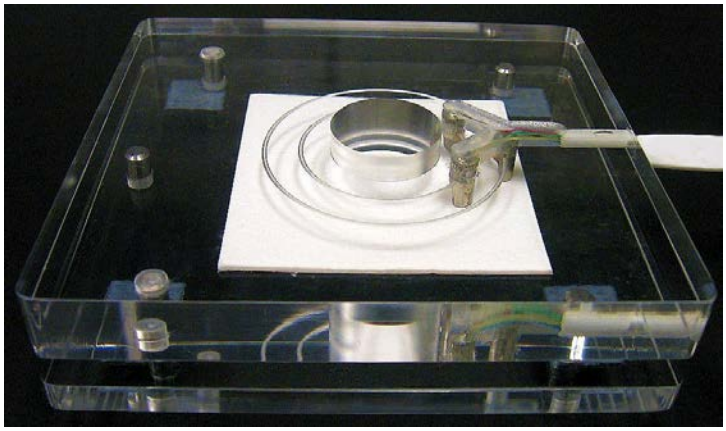

Figure 4-1 Test Head and Sensor Tray

The test blotter paper is large enough to extend beyond the sensor pins and the scribed sensor area on the sensor head. Refer to Figure 4-1.

4. Select appropriate funnel diameter and insert it into the test head. Choose either of these sizes:

   a. 1 cm (0.394 in.) diameter funnel opening for fast filtering systems

   b. 1.8 cm (0.708 in.) diameter funnel opening for slow filtering systems

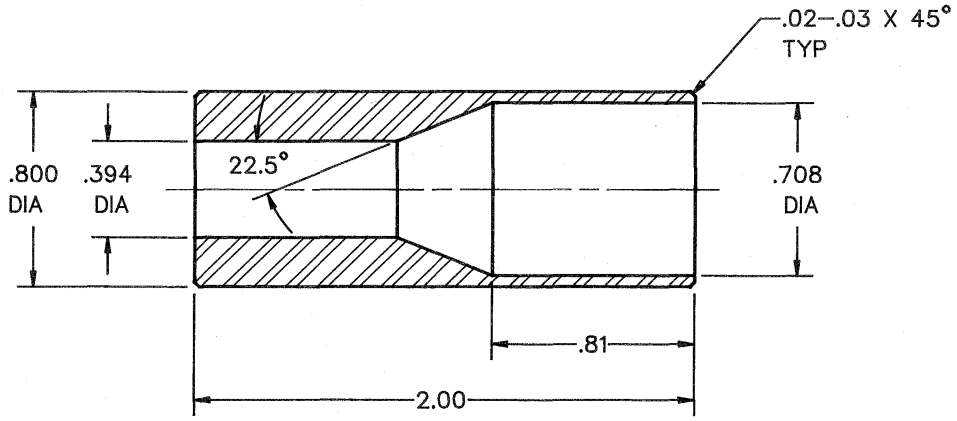

Figure 4-2 Capillary Suction Timer Funnel

5. Rotate the funnel, applying light downward pressure when in position to ensure even contact with the test blotter paper.

6. Turn the power switch to ON.

7. Press the RESET switch. The counter reads all zeros and the FINISH lamp is not lighted. The instrument is now ready for use.

8. Use a syringe to place approximately 5 ml of sample into the funnel. Liquid from the sample is absorbed by the test blotter paper in a circular pattern of increasing diameter.

9. When the liquid front reaches the first pair of contacts, the counter starts, the START lamp lights, and timing begins.

10. When the liquid front reaches the third contact, timing ceases, the counter stops, the FINISH lamp lights, and a brief audible signal sounds.

The counter reading which is the capillary suction time in second and tenth of seconds, and the funnel opening used 1.0 cm or 1.8 cm.

11. Remove the funnel and test blotter paper.

12. Clean and dry sensor plate, sensor bottom, and funnel. For additional measurements, repeat the procedure.

13. Turn the power switch to the OFF position after use.

5 Troubleshooting and Maintenance

Troubleshooting and regular maintenance procedures are described in this section. If more extensive maintenance or service of the instrument is required, please contact Fann Instrument Company.

Keep the test head clean and dry.

Occasionally clean the probes by drawing the block carefully with a slight downward pressure over the test blotter paper laid on a flat surface.

5.1 Battery Replacement

Proper installation is important. Place the battery in the drawer with the terminals as shown in the bottom of the drawer.

The battery should be removed if the instrument will be stored for a long time or if the instrument will be used with the battery eliminator.

Replace the battery with new 9-volt alkaline batteries (P/N 205643) or equal whenever the LOW BAT light flashes.

- The battery is accessed from the back of the Capillary Suction Timer.
- Lift and remove the battery drawer.
- Remove the bad battery.
- Place a new battery in the drawer with terminals to the open end, plus (+) battery terminal to the left as shown in the bottom of the drawer.
- Replace the drawer in the instrument.

6 Parts List

Table 6-1 Capillary Suction Timer, Model 440, P/N 209703

Part No.	Quantity	Description
209705	1	CONTROL CABINET
209707	1	TEST HEAD ASSEMBLY
209709	1	SENSOR TRAY ASSEMBLY
204217	1	INSTRUCTION MANUAL
205235	2	SYRINGE, 5 ML DISPOSABLE W/O NEEDLE
206059	1	TEST BLOTTER PAPER, 100/BOX
209710	1	FUNNEL
209998	1	BATTERY ELIMINATOR, 115V

7 Warranty and Returns

7.1 Warranty

Fann Instrument Company warrants its products to be free from defects in material and workmanship for a period of 12 months from the time of shipment. If repair or adjustment is necessary, and has not been the result of abuse or misuse within the twelve-month period, please return, freight prepaid, and correction of the defect will be made without charge.

Out of warranty products will be repaired for a nominal charge.

Please refer to the accompanying warranty statement enclosed with the product.

7.2 Returns

For your protection, items being returned must be carefully packed to prevent damage in shipment and insured against possible damage or loss. Fann will not be responsible for damage resulting from careless or insufficient packing.

Before returning items for any reason, authorization must be obtained from Fann Instrument Company. When applying for authorization, please include information regarding the reason the items are to be returned.

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