

Fig. 1 Schematic of Portable/Disposable Viscometer

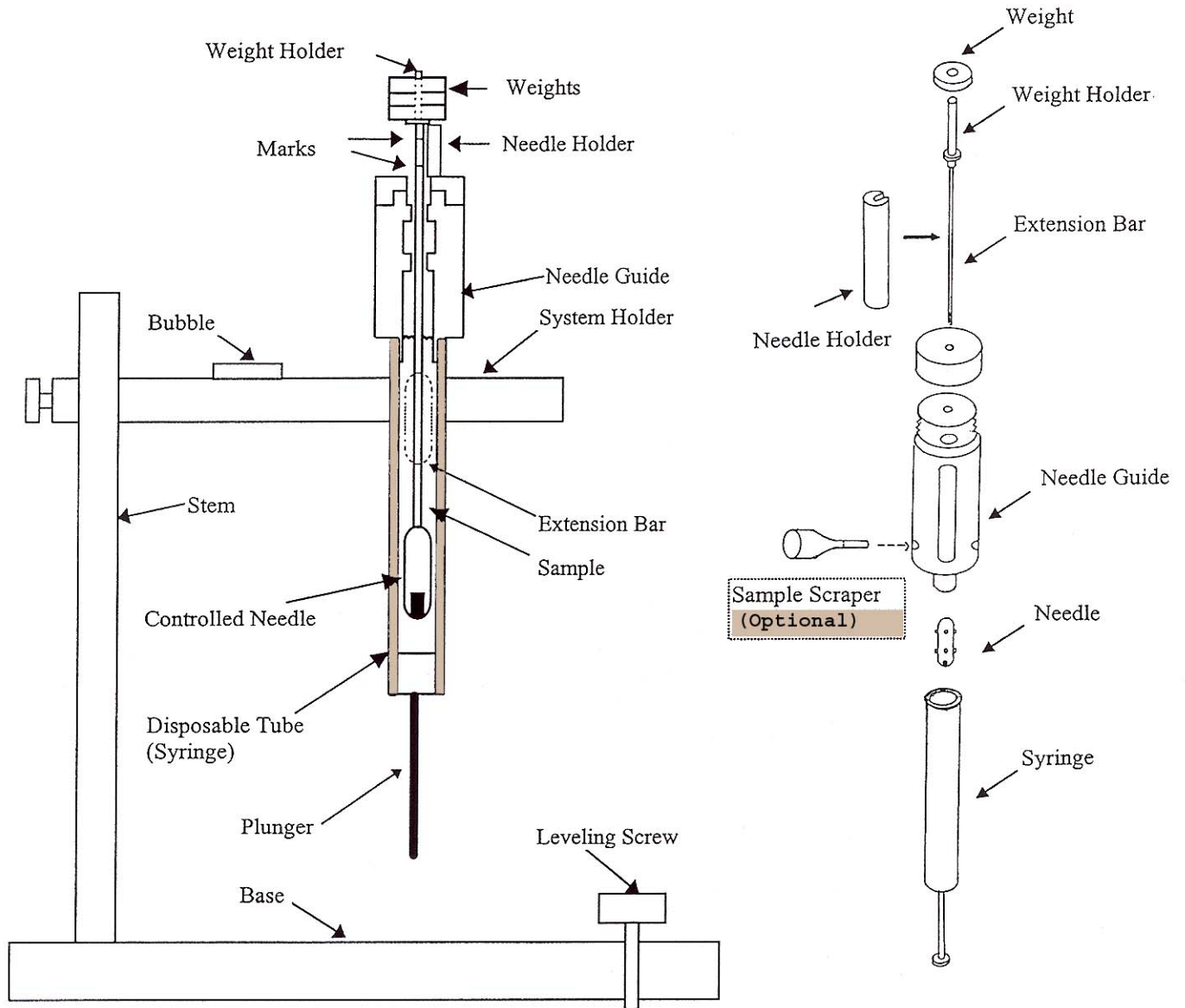
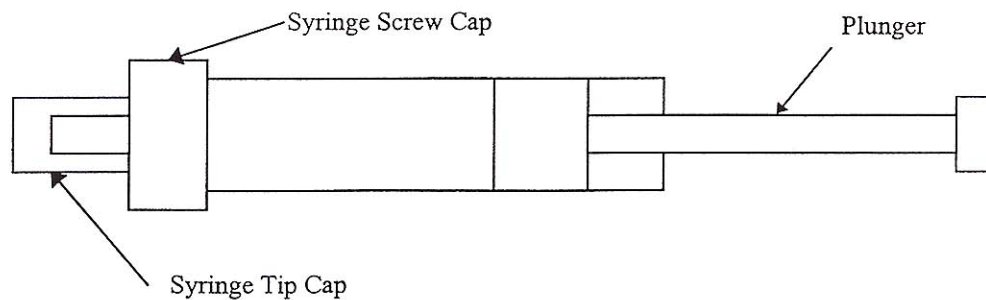


Fig. 2 Disposable Tube (Syringe)



INSTRUCTION MANUAL FOR PORTABLE/DISPOSABLE VISCOMETER

A. Instrument Set Up (Refer to Fig. 1)

1. Screw the 12" long **Stem** into the **Base**.
2. Insert the **System Holder** on the **Stem** approximately 10 inches from the **Base**.
3. Plumb the instrument using the **Leveling Screws** at the **Base**.

B. Sample Loading (Refer to Fig. 2)

1. Pull off the **Syringe Tip Cap**.
2. Draw the **Sample** into the **Syringe**.
3. Hold the **Syringe** up and remove the **Syringe Screw Cap**.
4. Make sure that the amount of **Sample** present allows for the **Controlled Needle** to be inserted without causing the **Sample** to overflow (approximately 2.1, 1.8, and 1.3 cm below from the top of the **Syringe** for the 0.90, 0.78, and 0.68 cm O.D. **Controlled Needles**, respectively).
5. Slide the **Syringe** (with the plunger pointing down) into the hole of the **System Holder**.
6. Measure the **Sample** temperature with the supplied **Digital Thermometer**.

C. Sample Testing (Refer to Fig. 1)

1. Insert the **Extension Bar** into the **Needle Guide**.
2. Screw the **Controlled Needle** into the end of the **Extension Bar**.
3. Remove the **Syringe** from the **System Holder**. Slide the **Needle Guide** with the **Controlled Needle** into the **Syringe**.
Note: With the **Controlled Needle** top approximately 0.5cm apart from the **Needle Guide**, smoothly insert the **Controlled Needle** into the **Syringe** until the opening of the **Syringe** touches the **Needle Guide**.
4. Slide the **Syringe** with the launching mechanism into the hole of the **System Holder** until just firmly held.
5. Raise the **Controlled Needle** again until it touches the bottom of the **Needle Guide**, and then position the **Needle Holder** between the bottom of the **Weight Holder** and the top of the **Needle Guide**.
6. Add the proper **Weight(s)** needed to control the **Controlled Needle** density.
7. Remove the **Needle Holder** while holding onto the top of the **Extension Bar**. Make sure that the **Controlled Needle** is touching the bottom of the **Needle Guide** before releasing it.
8. Measure the falling time of the **Controlled Needle** using the **Marks** etched on the upper portion of the **Extension Bar**. Start the stopwatch when the bottom line reaches the top of the **Needle Guide**. Stop the stopwatch when the top line reaches the top of the **Needle Guide**.
9. Obtain the viscosity data using the furnished graph, an equation, or a preprogrammed calculator (optional).
10. For repeated measurements using a high viscosity sample: Insert the **Sample Scraper** into the bottom hole of the **Needle Launcher** in order to remove any sample adhering to the surface of the **Extension Bar**. Do so by slowly raising the **Controlled Needle** until it touches the bottom of the **Needle Guide**. Remove the **Sample Scraper**.
11. To perform additional measurements, repeat steps 6-10.
12. Remove the **Controlled Needle** and **Needle Guide** from the **Syringe**.
13. Dispense the **Sample** from the **Syringe** before disposing of the **Syringe**.
14. Rinse the **Controlled Needle** with a suitable solvent and dry with cotton or a paper towel.