



Kinematic Viscosity Bath **LB-10KVB**

Operational Manual

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1. Safety Measures

- After powering on, the "Start" function for testing and the "On" function for heating will remain disabled if the water bath is empty, to prevent heater damage from dry burning.
- When placing the water bath cover, do so carefully to prevent damaging the tub.
- If performing high-temperature experiments, avoid touching the tub during operation to prevent burn injuries.
- Ensure proper grounding of the equipment to prevent electrical shock.
- Do not operate the bath dry, always check that the bath is filled to the required level before turning on the heater.
- Use appropriate bath fluid with a viscosity less than 10 centistokes.
- Avoid touching the bath during high-temperature operation to prevent burns.
- Make use of over-temperature protection features built into the device.
- Handle the viscometer tubes carefully and ensure they are clean and dry before use.
- Use correct inner diameter viscometers to maintain measurement accuracy.
- Regularly monitor the bath fluid level and replace or top up as needed.
- Keep the water bath cover clean and handle it gently to avoid damaging the unit.

Constant temperature time of viscometer in constant temperature bath

Test temp, °C	Constant temperature time, min
80,100	20
40,50	15
20	10

2. Introduction

Kinematic Viscosity Bath LB-10KVB offers a wide testing range of 0.5 mm²/s to 20000 mm²/s, ensuring accurate viscosity measurements. It provides a controlled temperature range from RT to 100 °C, accommodating both low and high-viscosity oils. It incorporates a ring-shaped daylight lamp for enhanced visual clarity during testing. Our viscosity bath features a large LCD color screen, offering a visualized and clear real-time display.

3. Features

- Temperature and time indicator
- Corrosion-resistant stainless steel
- Complies with ASTM D 445 standards
- Three-point capillarimeter clutch
- Automatic viscosity calculation
- High-speed thermal printing
- Auto-timing and auto-result printing

4. Specifications

Model No	LB-10KVB
Testing Range	0.5 mm ² /s to 20000 mm ² /s 0.3 mPa.s to 40000 mPa.s
Temperature Control Range	RT to 100 °C
Temperature Control Accuracy	± 0.1 °C
Sample Installing Capacity	4 pieces
Homoeothermic Bathtub	300 × 300 mm double layer
Time Range	0.1 s to 999.9 s
Time Accuracy	± 0.1 s
Stirring Speed	1520 rpm
Ambient Temperature Range	0 °C to 40 °C
Relative Humidity	< 80 %
Power Consumption	800 W
Power Supply	AC 220 V ± 10 %; 50 Hz
Dimensions	560 × 370 × 520 mm
Weight	20 kg

5. Applications

Kinematic Viscosity Bath LB-10KVB is used in industries such as petroleum, pharmaceuticals, and chemical sectors for accurate viscosity testing. It is ideal for laboratories that require precise temperature control and analysis of various oil viscosities.

6. Operations

6.1 Function Instruction

- 1) The instrument name will be displayed when the device is turned on, and it will automatically enter the test interface after 2 seconds.
- 2) **Experimental interface**

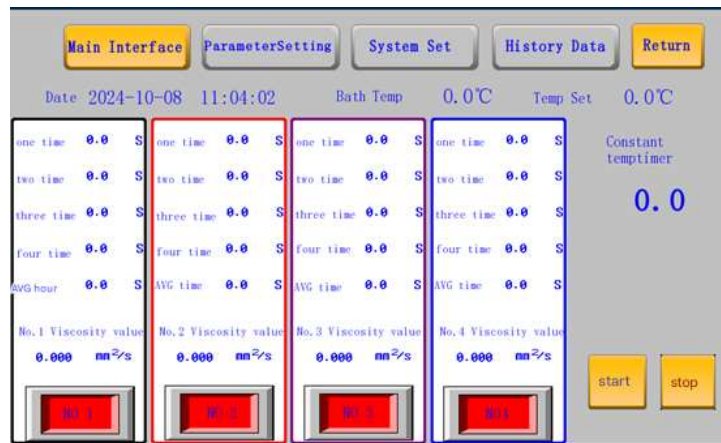


Figure-1

As shown in the figure, the interface includes four buttons: "Main Interface," "Parameter Settings," "System Settings," and "Historical Data." Once the bath temperature reaches the set value, click "**Start**" to begin timing the constant temperature period.

When the set time is completed, the timer will stop automatically, a buzzer will sound for 3 seconds, and the display will show: "Constant temperature time ends, start test." At this point, users can press buttons **1, 2, 3, or 4** to begin test timing. Pressing the "**Stop**" button will end the experiment without saving any test results.

- 3) **Parameter Settings**

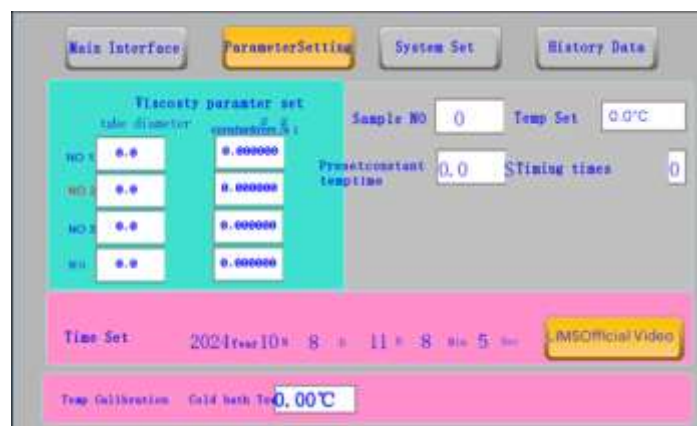


Figure-2

Click "**Parameter Settings**" to access four preset configuration screens for glass viscometers. These include options to input the viscometer diameter, constant, sample number, sample temperature, constant temperature duration, and the number of average timing cycles.

4) System Settings



Figure-3

Heating Self-Tuning: If the temperature in the constant temperature bath is unstable, enable the self-tuning function. The system will automatically adjust and optimize temperature control for better accuracy.

Heating Device: Before beginning the experiment, press the **"ON"** button to heat the bath to the desired temperature. Once the temperature is reached, press **"OFF"** to stop heating.

⚠ Important: Do not press the **"Start"** buttons if there is no heat transfer fluid in the bath, as this can cause the heating element to burn out.

Printer: If the printer setting is ON, test results will print automatically after each test. If it is OFF, no printout will be generated.

Sample Selection: You can individually enable or disable each viscometer hole depending on which samples you want to test.

5) Historical data

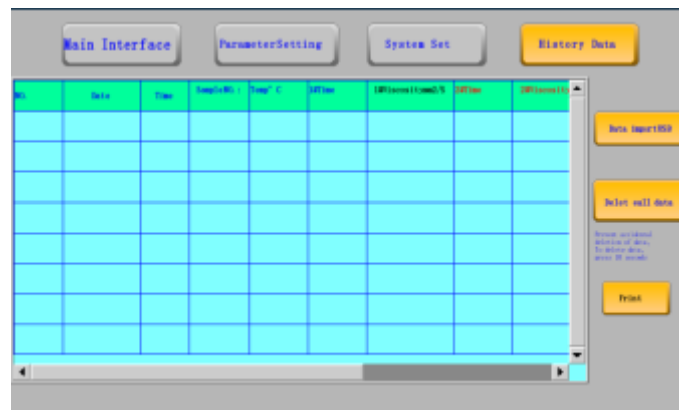


Figure-4

To view the saved results of the experiment, data can be imported into a USB drive and all data can be deleted.

6.2 Usage method

6.2.1 Preparation Work

If detecting light oil or lubricating oil, use a Pinker viscosity tube

- 1) **Reagent Preparation** (Self prepared for cleaning)
 - **Petroleum ether:** 60-90 °C, analytical grade.
 - **95% ethanol:** chemically pure.
- 2) **Sample pretreatment**
If the sample contains excessive water or mechanical impurities, it must be dehydrated and filtered through filter paper before testing to ensure accurate results.
- 3) **Selecting a Glass Capillary Viscometer:** Choose a suitable viscometer based on the test temperature, ensuring the sample's flow time is at least 200 seconds. For viscometers with a 0.4 mm inner diameter, the flow time should be no less than 350 seconds.
- 4) **Pre-Test Preparation of Glass Capillary Viscometer**
Before measuring sample viscosity, clean the viscometer with solvent oil or petroleum ether. If heavily soiled, clean it in sequence with chromic acid solution, tap water, distilled water, and 95% ethanol. After cleaning, dry the viscometer in an oven or with hot air filtered through cotton.
- 5) **Preparing the Constant Temperature Water Bath**
Add a suitable amount of temperature control liquid to the bath based on the required temperature setting. Refer to **Table 1** for the appropriate type of liquid to use at each temperature range.

Constant temperature bath liquids used at different temperatures

Set temp, °C	Constant temperature bath liquid
50~100	Transparent mineral oil, glycerol or 25% ammonium nitrate aqueous solution
20~50	Water

- 6) **Sampling:** When measuring the kinematic viscosity, the sample is loaded into a clean and dry capillary viscometer with an inner diameter that meets the requirements. Before installing the sample, block the mouth of tube body 6 with your fingers, invert the viscometer, and then insert tube body 1 into the container containing the sample. At this time, use an ear ball to suck the liquid onto the marked line b, while being careful not to cause bubbles and cracks in the liquid in the tube body 1, expansion parts 2 and 3. When the liquid level reaches the marked line b, lift the viscometer from the container and quickly restore it to normal.

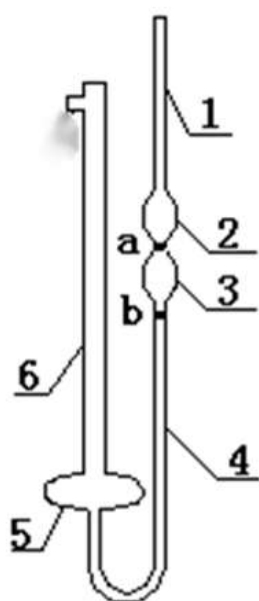


Figure-5

At the same time, carefully wipe away any excess sample clinging to the outer surface of the lower end of Tube Body 1 (see **Figure 5**).

- 7) Viscometer Installation: Place the viscometer filled with the sample into the preheated constant temperature water bath, making sure it is positioned vertically.

6.2.2 Sample testing

Turn on the power switch, then set the constant temperature, date, time, and number of timer readings on the instrument. Enter the diameter and constant value of the glass viscometer placed in the water bath and configure the printer settings (enable or disable printing). Next, access the system settings and switch on the heating device-the instrument will automatically begin heating and stabilize at the set temperature. To save time, you can pre-set the temperature before loading the sample. After maintaining the sample at constant temperature for the required duration use an ear bulb to draw the sample into the expansion chamber of viscometer body 1, ensuring the liquid level is slightly above mark line "a" and no bubbles or cracks are present. Observe the sample flow; when the liquid level reaches mark line "a", tap the button on the touchscreen to start timing, and tap again at mark line "b" to stop. The instrument will automatically calculate the viscosity. Multiple viscometers (up to four) can be tested independently starting the timing on one does not affect the others, and each can follow the same procedure.



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