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# **Bloom Viscosity Tester**

## **ND-3**

**User's Manual**

Table of Contents	
Table of Contents	1
Introduction	2
Product registration	2
Technical service	2
Proper operation	2
Contact Us	2
Introduction	3
Brief introduction	3
Function description	4
Specification	6
Environment requirement	6
Power supply	7
Installation	7
Check	7
Instrument settle	7
Connect to the power supply	7
Bath liquid	7
Bath box	7
Refill bath liquid	7
Circulate bath liquid	7
Let bath liquid	8
Instead bath liquid	8
Offset adjustment	8
Temperature adjustment	8
Operation	8
Power on	8
Temperature preset	8
Temperature control	8
Test	9
Power off	9
Demonstration	9
Maintenance	10
Replacement capillary	10
Troubleshooting	10
Appendix I Temperature preset	11
Appendix II Temperature adjustment	11
Packing list	12
Product quality guarantee	13
Using instruction	12

## Introduction

Thanks for purchasing the product ND-3 Bloom Viscosity tester designed and manufactured by us.

Please read user's manual carefully before using the product. It will help you operate it properly and efficiently.

## Product Registration

Prior to use the product, please fill up the user's registration card and mail to us, in order to get our service in future.

## Technical Service

Pls. contact our marketing department for any service during warranty. Be sure that you have sent back the user's registration card.

If you have any problems, Pls. Try to find answers in user's manual first, or you can call our marketing department.

## Proper Operation

Make sure you have read this manual carefully before installing/operating the instrument. For any concerns pls. Contact us.

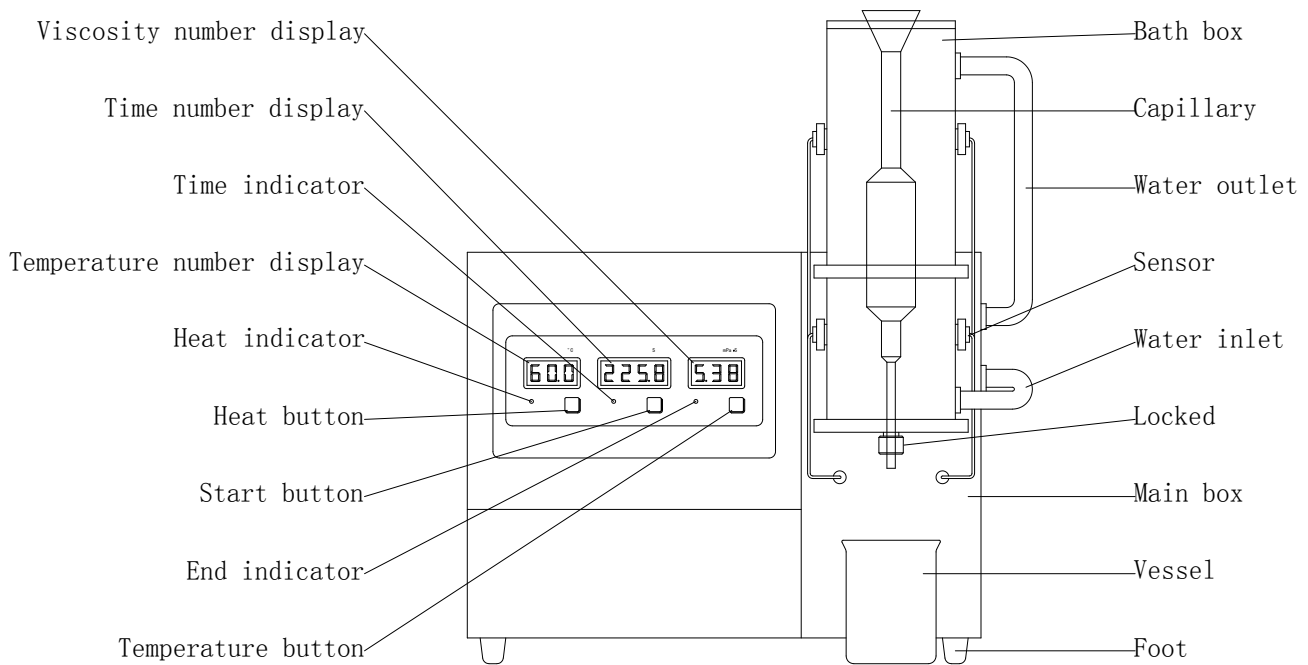
- Transport with care. Any incline, convert, and hit are prohibited.
- Check and protect all safety related labels.
- It is prohibited to use any damaged product and power cord.
- Turn off the power before maintenance, or moving.

## Contact Us

Brief introduction

ND-3 Bloom viscosity tester consists of main box, control system, test system, the capillary accessories etc and central controlled by MPU. The features: reasonable structure, auto-operation, high accuracy, high sensitivity, simple operation, and stable performance.

ND-3 Bloom viscosity tester main box consist of box, bath box, front panel, rear panel etc.

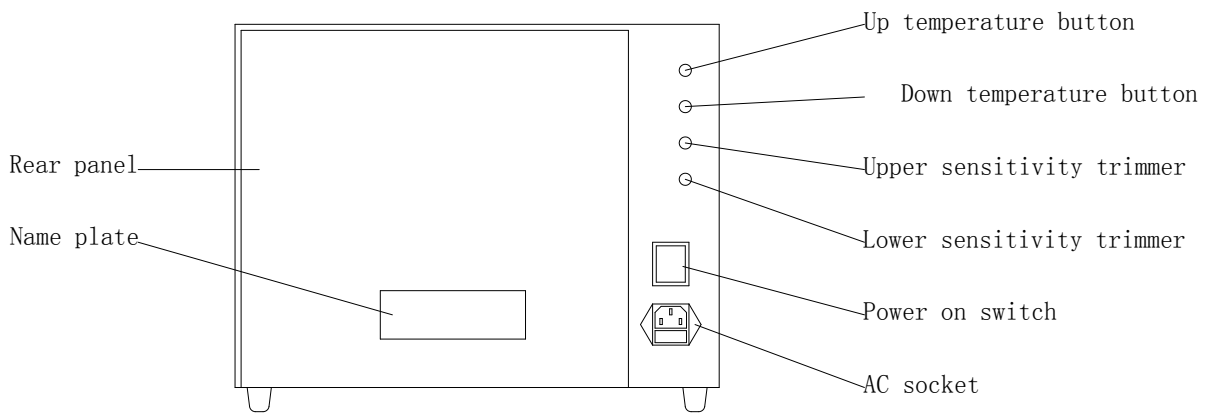


Front panel includes:

- Temperature number display
- Heat button
- Heat indicator
- Time number display
- Start button
- Time indicator
- Viscosity number display
- Temperature button
- End indicator
- Product model

Box include:

- Water outlet
- Water inlet



Rear panel includes:

- Up temperature button
- Down temperature button
- Upper sensitivity trimmer
- Lower sensitivity trimmer
- Power on switch
- AC socket (fuse jack included)
- Name plate

Function description

- Temperature number display

3 digital LED to indicate the preset temperature or the actual temperature of the water bath.

- **HEAT** button

HEAT button is used to control the working status of the temperature system. Press this button, can turn on/off automatic controlled temperature system with beep sound.

- **HEAT** indicator

HEAT indicator indicates the working status of the system. When it light, it means the system in automatic controlled status, otherwise, it means the system in uncontrolled status.

- Time number display

4 digital LED to indicate the time the gelatin solution takes to flow down from the upper scale bar to the low one.

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- Start button

Start button is to control account time system status. Press this button, can start/stop it with beep sound.

- Time indicator

Time indicator indicates working states. When it light, it means the system in automatic accounted time status, otherwise, it means the system in unaccounted status.

- Viscosity number display

3 digital LED to indicate viscosity numeric.

- Temperature button

Temperature button is the preset temperature function key. Press the temperature button once, and the temperature display window will display the preset temperature value (60.0° C by default). If you need to change the preset temperature value, press the temperature button again at this time, and the preset temperature value will change to 60.1 °C; Press the temperature button again, and the preset temperature value will change to 60.2 °C; Press the temperature button continuously, and the preset temperature value will change quickly and continuously; The temperature display window shows that the temperature value has been changed accordingly. This key is the cyclic selection function key.

The temperature preset range is 20.0~70.0° C After the preset is completed, the system will automatically return to the real-time state in about 2 seconds.

Every time you press the temperature button, **with beep sound** shortly.

- End indicator

End indicator the working status. When mode lamp light, it shows system is on the finished date processing, off means date processing.

- Power on switch

Power on switch is main power switch, in on position, tester is in stand by status, OFF position, tester stops working.

*Before connecting to AC power, please ensure it's in OFF position!*

- AC socket

Ac socket is connected to the power supply with power cord offered in this tester.

Fuse is under the AC socket, attached one 3A fuse and backup one is offered. This is to prevent damage to this tester in suddenness case happened.

Please make sure AC power supply is connected properly!

When change fuse, make sure same spec part is used for tester safety!

● Up temperature button

Up temperature button is a function key to increase the actual temperature value. Press the up button once, the actual temperature value is +0.1 °C, press the up button again, the actual temperature value becomes +0.2 °C, press this button continuously, the actual temperature value increases quickly and continuously; The temperature display window shows that the temperature value has been changed accordingly. This key is used to verify the value of the actual temperature.

Each time the key is pressed **with beep sound** shortly.

● Down temperature button

Down temperature button is the function key for downward the actual temperature value. Press the downward adjustment button once, the actual temperature value is -0.1 °C, press the downward adjustment button again, the actual temperature value becomes -0.2 °C, press this button continuously, the actual temperature value decreases quickly and continuously; The temperature display window shows that the temperature value has been changed accordingly. This key is used to verify the value of the actual temperature.

Each time the key is pressed **with beep sound** shortly.

## Specification

Test range:	( 0 ~ 9 . 9 9 ) m P a • s
Test accuracy:	0 . 0 2 m P a • s
Temperature control:	2 0 . 0 ~ 7 0 . 0 ° C
Temperature control accuracy:	± 0 . 1 ° C
Volume:	1 0 0 m L
Volume accuracy:	± 1 m L
Scale mark distance:	( 1 5 2 ± 2 ) m m
Power:	2 2 0 V / 5 0 H z / 6 0 0 W
Dimension:	( 4 0 0 × 3 0 0 × 5 1 0 ) m m <sup>3</sup>
Weight:	1 1 k g

## Environment requirement

Usage temperature	+ 1 8 ° C ~ + 2 8 ° C
Store temperature	- 1 0 ° C ~ + 5 0 ° C
Humidity	2 0 % ~ 8 0 %

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## Power supply

Range of input power supply	220 V $\pm$ 10 % V A C	50 H z
Max input power		600 W

## Installation

### Checking

Open package, take out manual, tester, and accessories, and check items per packing list, any mismatch/damage happened, please contact marketing department immediately.

### Tester settle

Tester must be placed in stable work station/table and put damping pad attached in between table and tester.

Minimum space required around test is 0.5m, to ensure heat escaping, clean tester periodically to prevent dusty affect normal operation.

### Connect to the power supply

Link the socket & AC power supply source with attached power cord.

### Bath liquid

Distill water is recommended.

### Bath box

Water bath case, pump and electric heater compose a closed water bath circulation system.

*Running the water bath case without the bath liquid is prohibited!*

### Refill bath liquid

Clean up the inside of the water bath case, fill the water bath liquid into the case till the liquid the surface touches the cover of the case.

### Circulate bath liquid

Discharge any air inside the circulation system before every use so that the water bath liquid circulates efficiently.

Turn the power switch to I position, the power indicator lights, the instrument



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runs and circulation pump rotates. Suck up the air out of the circulation system quickly with an air bulb so that the liquid runs out the pump smoothly at the same time watch the liquid surface and add the liquid continually.

*The pump runs without loaded is prohibited!*

#### Drain bath liquid

Disconnect the tube from the inlet of the bath case and then turn the power switch to position I. The power indicator will light, the pump begins to rotate and the bath liquid comes out of the tube. Clean up the inside of the bath case after the liquid is totally drained.

#### Instead bath liquid

It can be done by repeat above procedures: Drain liquid, Refill the liquid and liquid circulation.

#### Offset adjustment

#### Temperature adjustment

Turn on the tester and press HEAT button, the HEAT indicator light, means the system beginning automatic temperature control. After about 30 minutes, the temperature stabilize at  $60 \pm 0.1^\circ\text{C}$  . Insert the thermometer into the bath box and compare the number between the thermometer and the tester after stabilization. If there is an error, the adjustment is shown in Appendix II

#### Operation

#### Power on

Turn the power switch to ON position, the indicator light, initialize the tester for 10 minutes, then it's readiness.

#### Temperature preset

When the tester is turned on, the temperature display window shows the actual temperature of the liquid in the water bath. Press the temperature preset button, and the display window displays the system temperature preset value, which automatically defaults to  $60.0^\circ\text{C}$ . If you need to change the preset temperature value, refer to Appendix I

#### Temperature control

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When power on, it is in initial status, system auto-set to 60 degree, the LED shows the actual temperature of liquid in bath box.

Press HEAT Button and the indicator light. The system begins heating and automatically controlling the temperature. Otherwise indicator off, it means uncontrolled.

The system is at the automatic controlled condition as this feature is on. If the real temperature of the bath liquid is lower than preset temperature, the electric heater will on. If the real temperature of the bath liquid is higher than the preset temperature, the electric heater will be off. The system controls the temperature of the bath liquid in this way.

### Test

Press TEMP key when the power is on. The instrument is ready for use when the temperature of the bath liquid is at 60°C and stable.

Prepare 120ml 6.67%/61°C gelatin solution . Press the end of the capillary of the viscosity tester by a finger and fill the gelatin solution into the funnel of the capillary quickly till the surface of the gelatin solution is over the upper scale bar by 2-3cm. Avoid the air or foam from going into it in this procedure. When the temperature is at  $60 \pm 0.1^\circ\text{C}$ , press START key and move the finger away from the capillary. The gelatin solution surface goes down and the instrument accounts the time the gelatin solution takes to flow down from the upper scale bar to the low one. The instrument processes the data automatically and display when counting is done.

Wash the capillary with 80°C hot water repeatedly after every test till no gelatin solution is left in the capillary and then blow the capillary to dry.

### Power off

Turn switch to OFF position, the indicator is off, tester stop.

### Demonstration

- ① Power on.
- ② Press TEMP key to control the temperature.
- ③ Prepare gelatin solution.
- ④ Fill gelatin solution
- ⑤ Press START key and begins to test.
- ⑥ Read the viscosity data.
- ⑦ Clean the capillary and dry it.
- ⑧ Repeat the same procedure in portion 4-7 steps.
- ⑨ Clear test, please turn off and on.

## Maintenance

Must clean box and parts periodically, do not use steel brush, it result in damage to the tester.

After testing every time, pls. Clean the capillary parts and ensure dry to avoid damage to the tester.

## Replacement capillary

Please contact the market department of our company in case the capillary is broken. Every capillary is used with a IC chip which forms a complete set with the capillary.

## Troubleshooting

- Can not power on

Check whether the voltage is OK and fuse is OK, please refer to the rating marked in nameplate while installation.

- LED displays error and alarm

Temperature number display shows 888 and alarm-- if the bath temperature is lower than 0°C or higher than 72°C, please refer to Adjusting Temperature.

Time number display shows 0000 and alarm-- if there is any dirty matter or air bobble at the inner side of the bath case and/or the capillary please clean them up. If the gelatin solution looks too dark, please turn off heat and test it again.

Viscosity number display shows 999 and alarm--- viscosity number exceed 99.9 mP.s or the sensor failed, test repeatedly.

Viscosity number display shows 000 and alarm -- the viscosity of the sample is too small to test. Replace the sample.

If the tester does not work after checking above items, please don't repair it by yourself, contact our market department please.

## Appendix I Temperature preset

1. When powered on, the temperature display shows the actual temperature value.
2. Press the temperature button, and the display window will be switched from the actual temperature value to the preset temperature value (60.0 °C).
3. When the temperature button is pressed again, the preset temperature value increases by 0.1 °C; The temperature button can be pressed continuously until the desired temperature is reached.
4. After the preset temperature reaches 70.0° C, when you press the temperature button again, the preset temperature will display 20.0° C. This preset value is not saved after shutdown. When the system is turned on again, the system preset temperature will return to the default temperature of 60.0 °C

## Appendix II Temperature adjustment

***The instrument has been calibrated before leaving the factory. No tuning is required for new machines!!***

If you must make adjustments, follow these steps:

1. Turn on the machine, press the HEAT button, the HEAT indicator light will be on, and the tester will start to automatically control the temperature, and the temperature window will display the actual temperature value at this time.
2. When the temperature stabilizes at  $60 \pm 0.1$  °C, the temperature can be adjusted.
3. Insert the attached mercury thermometer into the water bath, and after the mercury thermometer reading is stable, compare the mercury thermometer reading with the reading displayed by the instrument.
4. In the real-time state, adjust the temperature correction up and down buttons until the reading displayed by the instrument is consistent with the reading of the mercury thermometer.
5. After the tester is stable, repeat the above steps to make the readings of them consistent.

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## Packing list

The ND-3 Bloom viscosity tester include following items typically:

- Tester----- 1
- 220V AC power cord----- 1
- Capillary ----- 1
- Burning cups----- 1
- Mercury thermometer ----- 1
- User's manual ----- 1
- Product quality guarantee ----- 1

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## Product quality guarantee

- This quality guarantee covers the scope of ND-3 Bloom viscosity tester.
- Start from purchasing date; warranty period is one year.
- This quality guarantee is effective from receiving registration card filled by users.
- During warranty, we offer free charge service for troubleshooting in normal cases, but for any cases caused by flood, fire, earthquake, or other calamity, is excepted.
- During warranty, in one of the following cases, we will charge for material/service:
  - No product quality guarantee, mismatch with this guaranty or wrong record/remark.
  - Damages caused by unusual working environment.
  - Damages caused by disassembly, install, extend, move or modify without our permission.
  - Damages caused by repairing without our permission.
- Keep this guarantee in proper place and any other issue is provided.

## Using Instruction

- Proper operation & maintenance will prolong the working time of the instrument. Please follow the manual's instruction carefully.
- When the power supply is unstable, pls. Use AV regulator. Pay special attentions to the information related to power supply, temperature, humidity in the manual.
- Always keep the instrument cleaning. Disassembly/move any parts of the tester is prohibited.
- In case of trouble present, pls. Stop using, call us or dealer for help.