

Intelligent Touch Screen Rotary Viscometer Series

Thank you for purchasing an Intelligent Touch Screen Rotary Viscometer from Ascott. Please read these instructions carefully and retain for future reference.

Important Information

This equipment should only be used as intended by suitably qualified and trained personnel.

These instructions should be always readily available to such personnel.

Normal common-sense safety precautions must be taken at all times to avoid the possibility of accidents.

We recommend that users produce their own risk assessment for the entire testing process for which this equipment will be used.

Contents:

Main Unit



LV Spindles



Lifting Rod & Base



AC adapter

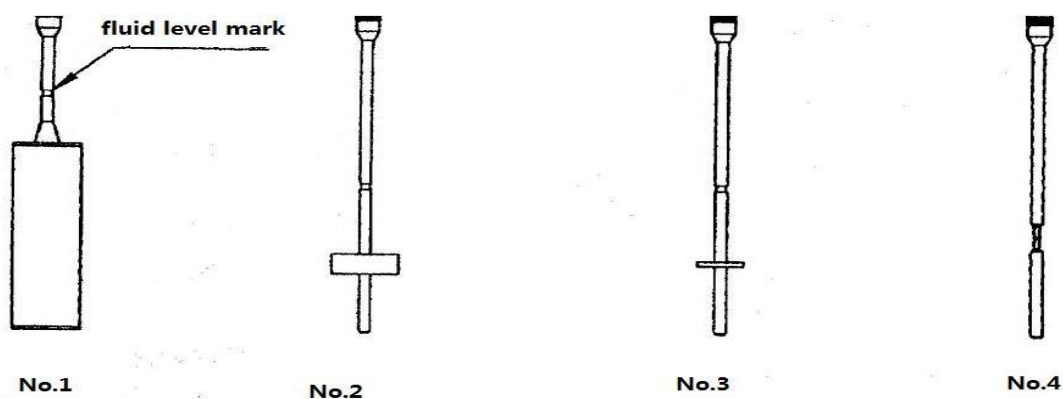


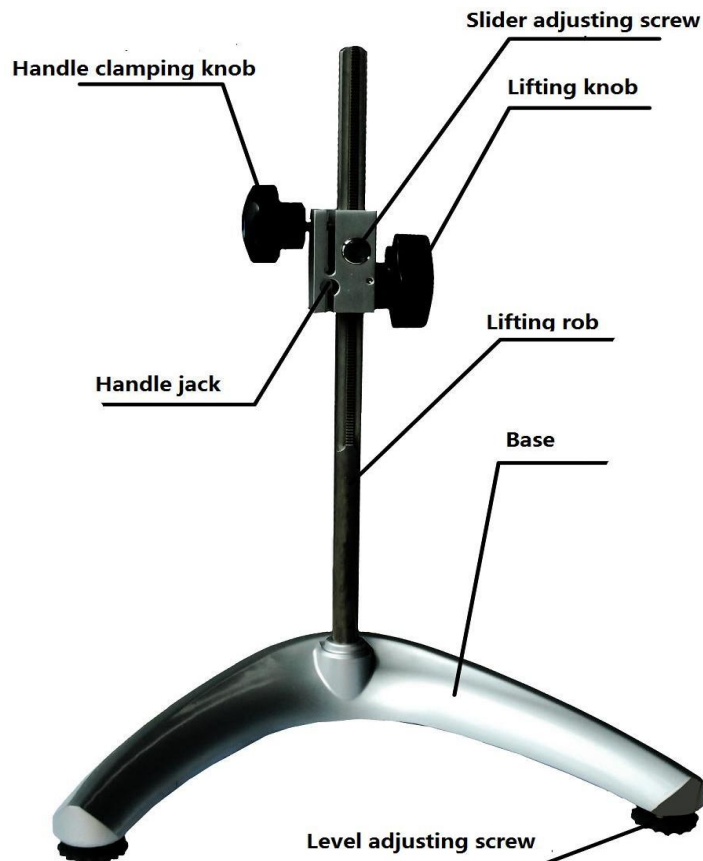
Protective Guard





LV Spindles

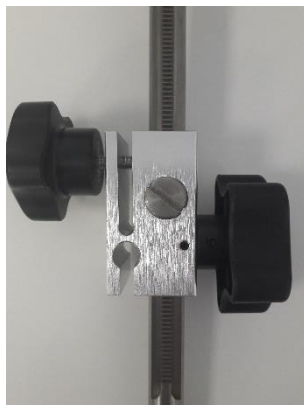




The metal lifting rod and the base assembly

1. Before use

1. Remove parts from the box, base, metal lifting rod, main unit, power adapter, RTD temp probe etc.
2. Remove the screw and spring washer from the lifting rod and insert the lifting rod into the middle hole of the base keeping the gap at the bottom of the lifting rod corresponding with the groove in the middle hole. Then fix the lifting rod on the reverse side of the base with the screw and spring washer. Tighten the screws with the Allen key provided. Screw the level adjustment feet respectively into the two ends of the base until level.
3. Turn the knob on the lifting rod to check flexibility and self-locking of the lifting clamp. If it is too loose or too tight, adjust the adjustment screw in front of the lifting rod with a screwdriver.



Ascott Analytical Equipment Limited

6-8 Gerard, Lichfield Road Industrial Estate, Tamworth, Staffordshire, B79 7UW, Great Britain

T +44 (0) 1827 318040 F +44 (0) 1827 318049 E info@ascottshop.com W www.ascottshop.com

4. Insert the handle of the viscometer into the small round hole on the slider, rotate the clamp handle to secure, ensuring that the instrument is level. Remove the black cap below the instrument and put it aside (it must be installed during maintenance and transportation). Do not discard as it must be replaced for transport or if the instrument is unused for a period of time.
5. Adjust two level adjustment feet until the spirit level at the top is centralised.
6. Install the RTD temp probe into the RTD temp probe interface. If necessary, install the printer into the RS232 interface and USB into USB interface. If the viscometer needs to be connected to a computer, install the connection into corresponding interface.
7. Make sure the viscometer power switch is on "OFF". Connect the power adapter to the viscometer DC power socket. Insert the other side into the 220V AC power supply socket. If you want to disconnect the AC power adapter, first remove the AC power plug from the socket, and then remove the DC power plug from the viscometer.

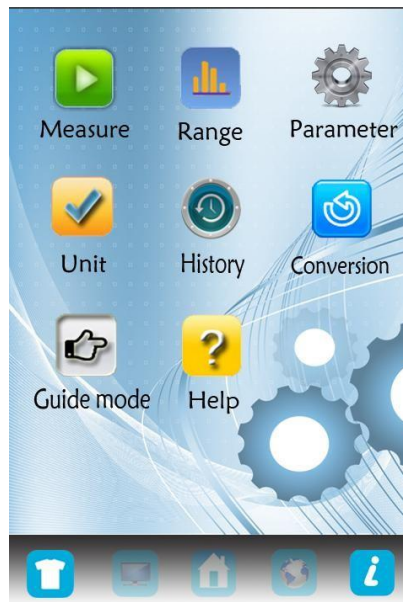
2. Parameters:

N.B: To test the viscosity value of 1mPa.s, ultra-low viscosity adapter (Spindle No.0) is needed.

3. Screen

First screen display type and version, as FIG. 1

Type	T01-700304	T01-700305	T01-700306
Range mPa.s	1-0.6M	1-6M	6-80M
Speed (R/Min)	1-60	0.1-100	0.1-100
Spindles	No.1, 2, 3, 4 (No.0 is optional)		
Accuracy	±1.0% of full range		
Repeatability	±0.2% of full range		
Power Supply	AC100-240V, 50Hz/60Hz. Output DC12V1.5A		



Main Menu

Set the detection parameters in the main menu.

1. Choose range (spindles and rotation speed), as FIG.2.

Speed Spindle	10.0 RPM	60.0 RPM
No.0	60	10
No.1	600	100
No.2	3000	500
No.3	12000	2000
No.4	60000	10000

Unit: mPa.s

Choose range

FIG.2

Speed Spindle	10.0 RPM	60.0 RPM
No.0	60	10
No.1	600	100

Unit: mPa.s

Choose range

FIG.3

The speed of the series is optional. (They are recognized that each spindle tests full range at 10 or 60 RPM.)

To change the speed, enter the desired speed on the numeric keyboard with the stylus (FIG.3), then enter 20 RPM in the data frame, and click to confirm. Then the full range of each spindle at 20 RPM will be displayed.

To select the range of 300, enter "300", then enter parameters:

Spindle No.1, 20RPM, Full range of 300. The shutdown saves the last parameter.

Parameter Setting

The screenshot shows a 'Parameter Setting' interface with three main sections, each enclosed in a red rounded rectangle. The top section, 'Common coefficient settings', includes 'File Management settings' with an 'Enter' button, and input fields for 'Measuring time' (with a colon separator), 'Number of measure', and 'Print interval' (also with a colon separator). The middle section, 'Correction factor setting', prompts the user to 'Please enter the verification code' with a text box containing '0' and an 'Enter' button. The bottom section, 'Network Communication settings', shows 'IP Address' as '192.168.1.252' and 'Data ports' as '1031'. At the very bottom, there is a navigation bar with five icons: a trash can, a printer, a home icon, a globe, and a person icon.

FIG.5

- 1) Measuring Time, the default time is 00:00.

Click into the first measuring time field to enter the number of minutes and enter the required number from the digital keyboard and press OK, the input of "seconds" is the same. Then press home to return to the main menu.

- 2) Number of measure is the average number of viscosity value.


E.g., if set to 3, the "average viscosity" in the lower right corner of the detection main screen will show the average viscosity value of 3 times. It can be generally used in the average viscosity detection of "Newtonian fluid", and "non-Newtonian fluid" within the same periods.

To test 3 average values, first press the "measure" button, measure the viscosity of samples and press "stop" button to get a single final numerical value as viscosity. Repeat 2 more times to get 3 average viscosity value.

- 3) Print Interval - If using a micro printer, install the connection line and printing paper as required (thermal printing paper, pay attention to the front and the back), then set print interval, e.g., 15seconds. When the viscometer starts measurement, click "print" The printer will print the value every 15 seconds.

- 4) Correction Factor Setting : the default verification code is 0. If a user is qualified with all conditions of standard viscosity measurement, connect with manufactures for the true verification code and do the correction for each spindle.

- 5) Network Communication Setting: the default IP address is 192.168.1.252. if user equipment collides with it, then the network cannot be connected. The IP address should be changed for normal communication. Generally, parameter "252" can be changed.

- 6) File Management Setting: click the button  to enter (FIG.6).

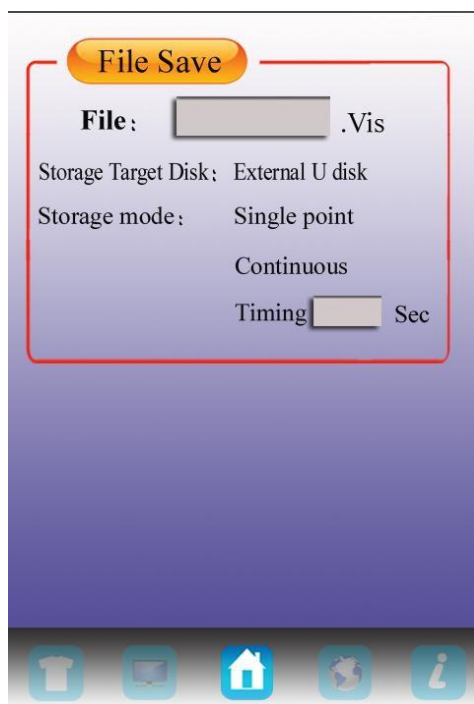


FIG.6

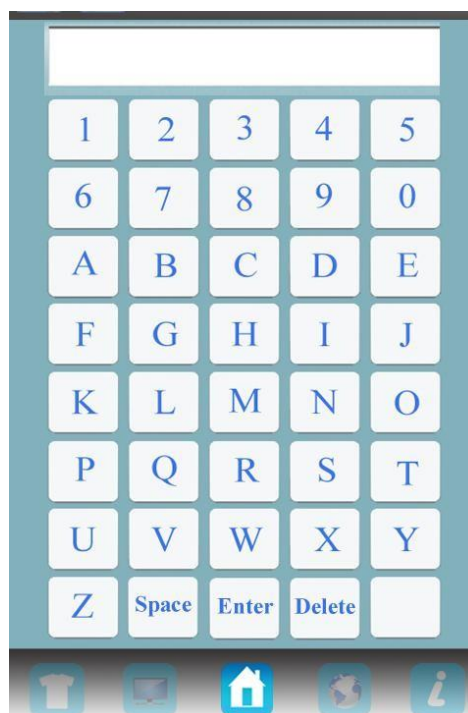


FIG.7

Enter the file name, as FIG.7. Input the name (max 6 characters) and click to confirm. There are 3 kinds of storage mode, which are single point, continuous and timing.


Click "Single point", the viscometer will collect data at a single point when conditions are met click "Save" repeatedly, to save data at different single points.

Click "Continuous", the viscometer will collect data at many points based on time.

During the process, clicking "Save" will show "Save..." button to save data dynamically.

When the collection ends, click "Save" and "Stop".

Click "Timing data collection" to input time, which is the time interval of data collection and storage.

During the process, click  to save data dynamically. When the collection ends, click

 and 

2. Unit: click the unit icon, as FIG. 8.

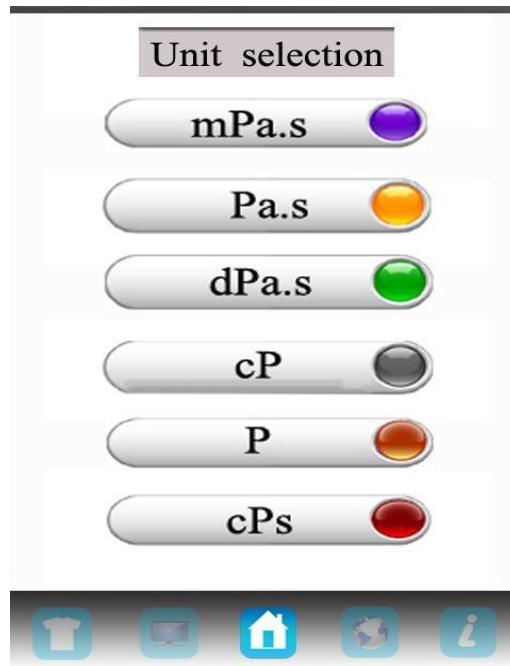


FIG.8

Click the required box units with the stylus and return to the main menu.



Note: Only mPa.s, cPs, cP can be used in the full range less than 100.

3. Kinematic viscosity conversion:

Enter the sample density first to learn the kinematic viscosity of the sample. Click the conversion icon, as FIG.9.

Click the number box and enter the correct sample density.

Kinematic viscosity calculation can be a part of the detection process. Return to the main menu.

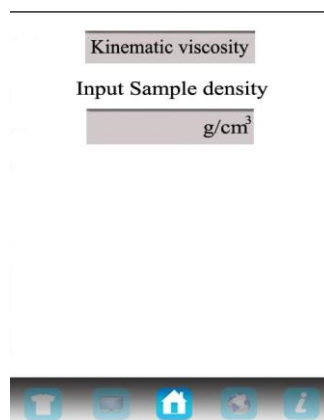


FIG.9

4. Click the "viscosity" icon after parameter setting, as FIG. 10.

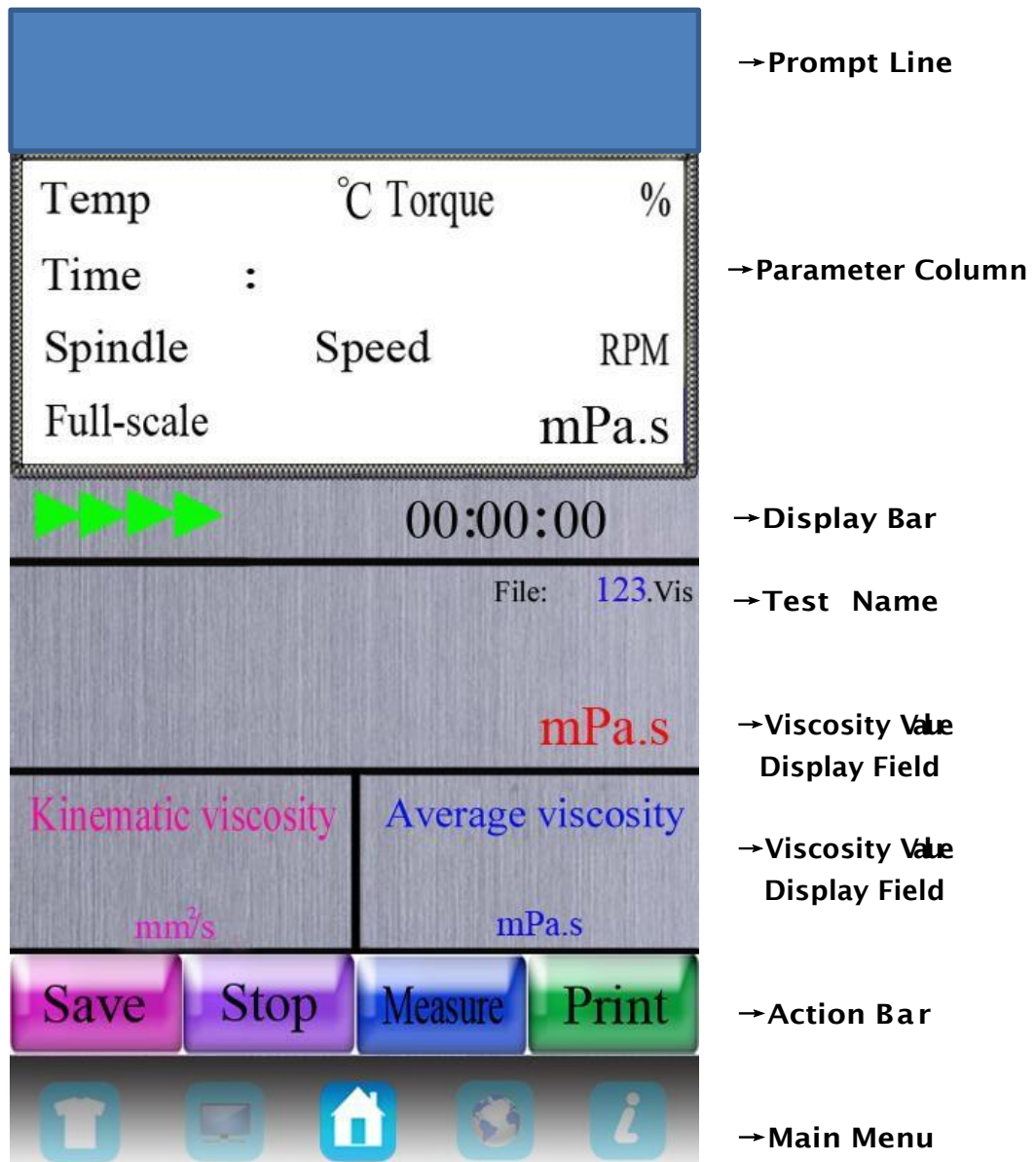


FIG.10

Check whether the parameters in the parameter column are correct. Prepare the sample for the test.

In the parameter column:

Temp is real-time temperature detected by the RTD probe. It displays 0.0°C without the RTD probe.

Torque is the deflection of torque sensor with the range of 0-100%. If the torque reading is between 20 and 100%, BGD 155/S series can obtain the result in needed accuracy. If the torque is below 20%, an alarm will sound. Adjust the detection parameters according to the percentage of data.

Viscosity is calculated based on the detected torque with the specific spindle and rotation speed. Timing is the countdown from the beginning of the measurement. The test will stop when the countdown stops.

Full range is the maximum measuring range able to be calculated by the combination of spindle type and speed. If it exceeds the current measuring range of the spindle and the speed, the screen will display 100% and an alarm will sound.

Connect to PC

Install SNB Software.

Click the control panel and find “Networking”. Choose “Local Area Connection” on a right mouse-click and click “Properties”. Choose TCP/IP and confirm it. Then set the computer parameters as below.

Check the parameters of the viscometer. Click “Parameter Setting” and the screen shows as below.

Check the IP address and keep the same address as below

Connect the viscometer to a computer, and open the SNB Software, the button “start to collect data” will be available.

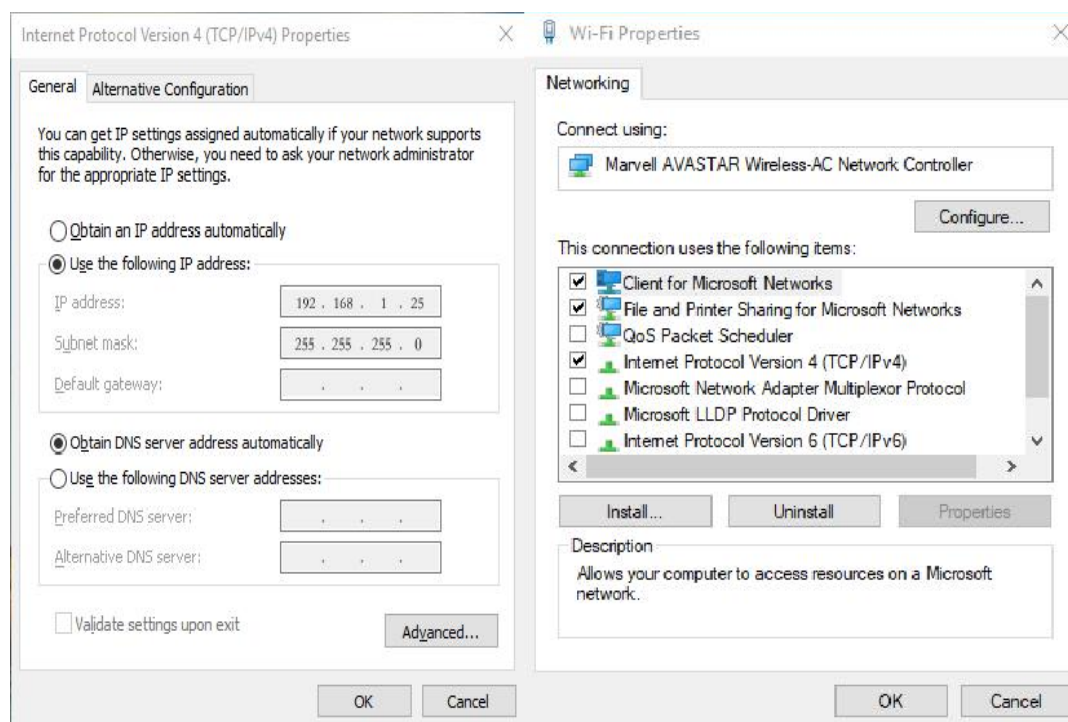


FIG.11

FIG.12

5. View historical data: click “historical data” icon(FIG.11).



FIG.13

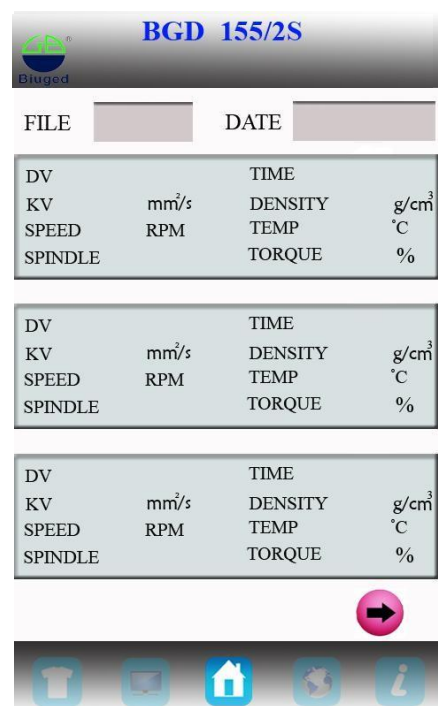


FIG.14

NB Deleting Historical data cannot be undone – all data will be lost

4. Test operation

- (1) Install the viscometer in place (See below for Preparation Steps)
- (2) Install the protective frame to the shield juncture. (Spin it right to install, left to uninstall)
- (3) Spin the selected spindle into the connecting screw. (Spin left to install, right to uninstall)
- (4) Start up. Set the test parameters.
- (5) Rotate lifting frame knob to lower the viscometer and gradually immerse the spindle in the liquid until the mark on the spindle is as high as liquid level. Ensure that the viscometer is still level.
- (6) Click the “measurement” button and measure the viscosity value and percent scale at current spindle and speed simultaneously.
- (7) During measurement, if you need to replace the spindle, press the stop button
- (8) Repeat the above steps (5) and (6) to continue when the spindle replacement is completed.

5. Preparation

A) Viscometer: Install the viscometer according to the installation steps; use two adjusting screws of the base to adjust the level and confirm level by the spirit level in front of the viscometer. Detect the horizontal position before each test or in the test process.

B) Sample: the measured fluid (sample) must be placed in a container. LV is suitable for 400ml type spindle in high beaker (diameter greater than or equal to 70mm). We recommend you choose the appropriate spindle with specific container. Replacement containers can be used for convenience but may have an impact on the measurement precision.

The LV spindle is used with protective frame installed. If not, the results can be repeatable but may not be the true viscosity value.

When you compare data with others, check whether the protective frame is used, whether the sample container, the spindle, the spindle speed, and the sample temperature are consistent. In viscosity testing, many samples need specific temperature, when users adjust the temperature of samples, the temperature of spindles and containers should be the same.

C) The spindle and rotation speed: this series can test fluid in the range of 1- 80M (M means million cP). For an unknown fluid, repeated experiments are usually needed to select the spindle and spindle speed. The suitable selection can make viscometer torque in the range of 20%-100%. There are two general rules in the trial process: 1) viscosity range is inversely proportional to spindle size. 2) viscosity range is inversely proportional to spindle speed. In other words, for the test of high viscosity, choose a small volume and low speed spindle. If the spindle and spindle speed make the torque greater than 100%, reduce speed or choose a smaller spindle. When the test proves that several spindle and speed combinations can reach the test results, any of these combinations can be used.

Non-Newtonian fluid viscosity value tested may change with the spindle and speed.

To compare the viscosity data, make sure to use the same test, i.e. using the same device, spindle, speed, container, temperature and test time.

6. Attention

- (1) Slightly and carefully raise the connecting screw when installing and uninstalling the spindle. Avoid excessive force and lateral force to avoid spindle bending.
- (2) Don't put the viscometer equipped with spindle sideways or upside down.
- (3) Keep the connecting end face of connecting screw and the spindle and the thread clean, or it will affect the spindle vibration.
- (4) Support viscometer with hand when it is lifting to prevent falling due to weight.
- (5) Enter a new range after replacing the spindle. The used spindle should be cleaned and put back in the spindle rack. Do not clean the spindle whilst on the instrument.
- (6) When the liquid is changed, clean the spindle and spindle protection framework to avoid measurement errors
- (7) Match the instrument and the special spindle one to one. Do not use spindles from other instruments.
- (8) Do not attempt to open sealed parts of the instrument.
- (9) During moving and transportation, place the black cap on to the connecting screw, tighten the screws and place them into the box.
- (10) Do not rotate the spindle in the absence of liquid for a long time so as not to damage the shaft tip.
- (11) There are many non-Newtonian liquids amongst suspension, emulsion, polymer and other high viscosity liquid, the viscosity value of which varies with changes of the shear rate, time and other conditions. It is normal that the results in different cases of spindle, rotating speed and time are not consistent. It is not an error of the instrument. Generally, the spindle, rotation speed and time should be specified in measurement of non-Newtonian liquid.

(12) To get highly accurate results, the following steps should be done:

- Control the temperature of the liquid to be measured accurately.
- Immerse the spindle long enough in the liquid to be measured so that the two temperatures are consistent.
- Keep the uniformity of the liquid.
- Place the spindle in the center of container and install the protective frame before the test.
- Ensure the spindle is clean and secure
- When high-speed measurement turns into low speed immediately, the test should be stopped; or the measurement time at low rotation speed should be a little longer to overcome the error due to the rotation inertia caused by the liquid rotation.
- Determination of low viscosity match with spindle No.1; high viscosity with spindle No.4.
- The measurement time at low rotation speed should be a little longer.
- Check and adjust the horizontal position of the viscometer after changing the position of viscometer
- Keep the AC power supply well grounded, eliminating the damage in the internal circuit caused by static electricity.
- Note: in the process of operation, the spindle will be gradually immersed in the sample, especially for high viscosity samples, to avoid damage to the internal structure of the instrument, caused by measurement error

If you have any queries regarding your new equipment, or require any additional accessories or consumables, please contact info@ascottshop.com or telephone +44 (0)1827 318040. If you wish to contact us by post, our full mailing address is 6-8 Gerard, Tamworth, Staffordshire, B79 7UW