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WARRANTY

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RVB-2
Rotational Viscometer

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RVB-2

Rotational Viscometer

Operation Manual

Content

The instrument is a precise instrument, please read the Operator's Manual before using.

I. Summary

The RVB-2 Rotation Viscometer uses advanced mechanical design technology, manufacturing techniques and compute controlling technology, enabling it to collect data accurately. The white background light and ultra-bright LCD make the RVB-2 display clear and easy to read. Equipped with a special print interface, the RVB-2 can print out measurement data through a local printer.

The RVB-2 is a highly sensitive, reliable, and convenient instrument. The RVB-2 is used to determine absolute viscosity of Newton liquids and apparent viscosity of Non-Newton liquids. It is widely used to determine the viscosity of liquids such as greases, oil paints, plastic, pharmaceutials, dopes, adhesive solvents and washing solvents.

II. Main technical specification

1. Measurement range: 10～2000000 cps
2. Rotor specification: No.1～4, total four types of rotors
3. Rotation speed of rotor: 0.3, 0.6, 1.5, 3, 6, 12, 30, 60 r/min; total 8 grades
4. Measurement error: ±3% (F·S)
5. Power supply: AC 120 V±10%, 50 Hz±10%, 230V ±10%, 60
6. Ambient temperature: Temperature 5°～35°C (41°～95°F)
7. Relative humidity: not more than 80%

III. Working principle

The RVB-2 is a rotation Viscometer. The motor is used to drive and regulate the constant speed of the rotor. When rotated the liquid will produce a viscidity moment. The higher the viscosity of liquids, the higher the viscidity moment and the lower the viscosity of liquids, the lower the viscidity moment. The viscidity moment is determined by a sensor, and the viscosity of measured liquids is calculated by the processor.

The RVB-2 can carry out data processing for the data determined by the sensor, and display the set rotor number, rotation speed, viscosity, and full scale percent of measured liquids.

The instrument has 4 rotors (1, 2, 3 and 4) and 8 grades of rotation speed (0.3, 0.6, 1.5, 3, 6, 12, 30 and 60 r/min), offering 32 different combinations for measuring the viscosity of liquids within the measurement range.

IV. Instrument structure and installation

(I) Structure

The structure of the instrument is shown as Figure 1.

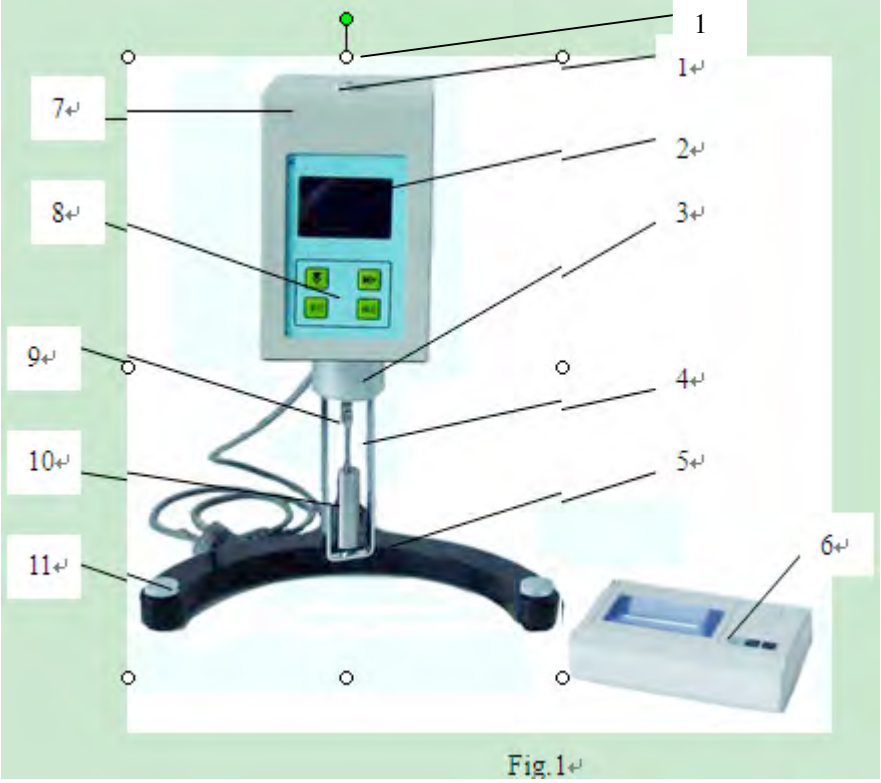

Fig.1

(1) Water level bubble on the head of the viscometer (2) LCD (3) Outer shield
(4) Protection holder of rotor (5) Pedestal of main unit (6) Micro-printer
(7) Head of viscometer (8) Operation keyboard (9) Joint of rotor (10) Rotor
(11) Level regulation knob on the pedestal of main unit

(II) Installation

1. Check power supply to ensure it meets local regulations.

2. The instrument should be installed on a workbench without corrosive gas,

electromagnet interference or vibration.

3. Screw the toothed vertical shaft in the screw hole on the pedestal of the main unit. The toothed surface should face to the front of the pedestal. Secure nut onto vertical shaft using a wrench, to avoid any rotation of the vertical shaft. (Figure 2)

4. Install the positioning knob for the viscometer head on the vertical shaft (Figure 2). Rotate the knob to move the viscometer head up and down. If the knob is too tight or too loose, adjust the bolt on the lower surface of the clamps. When moving the head of viscometer to a proper position, screw the dead bolt on the back of knobs to fasten the head of viscometer.

5. Remove the locknut from the yellow protection cap and remove the protection cap.

6. Level the viscometer head on the pedestal using the knobs.

7. Connect the power supply and printer shown as Figure 3.

Note: the “PC interface” in the figure 3 is not used at present.

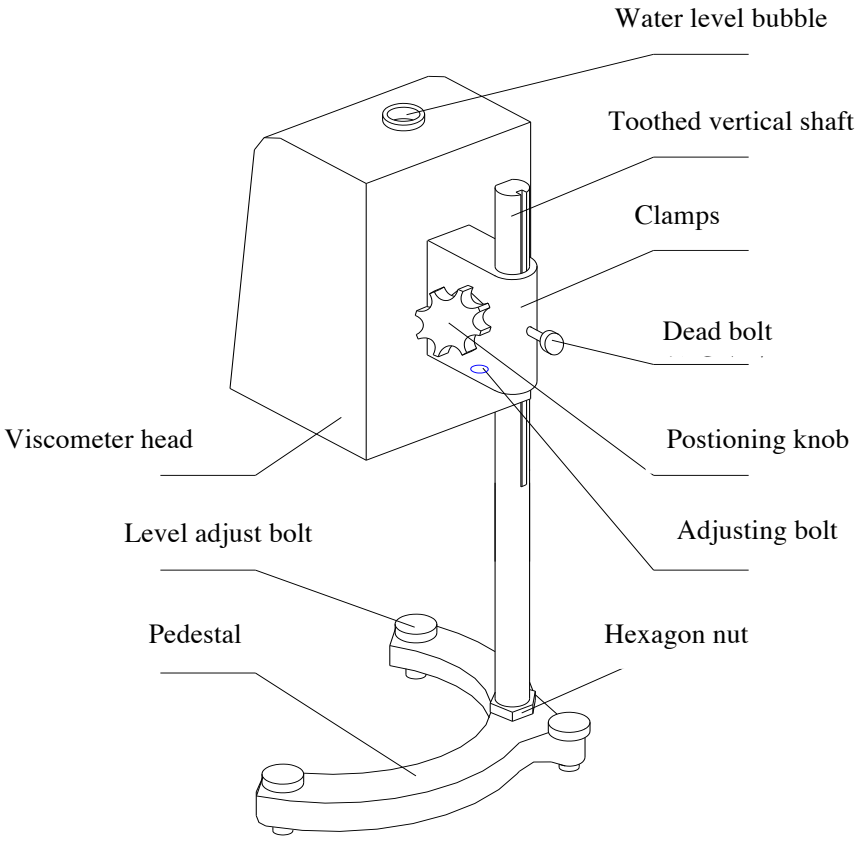

Figure 2

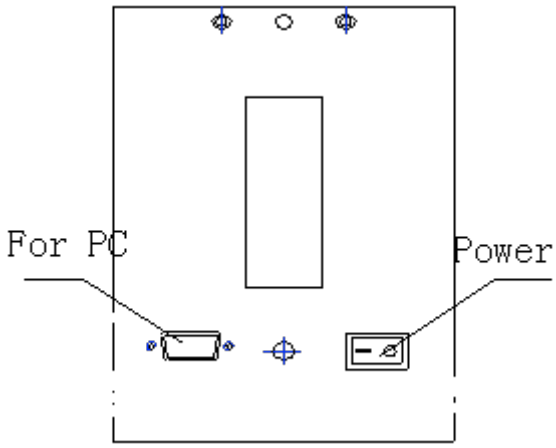

Figure 3

V. Operation procedure

1. Prepare the measured sample. Place the liquid in a beaker or container, whose diameter is not less than 70 mm (2.76 in), and height is not less than 125 mm (5 in).

2. Correctly control the temperature of measured liquids.

3. Adjust the level of the instrument and check the bubble of the water level meter to ensure the viscometer is level.

4. Choose a suitable rotor and rotation speed according to the estimated viscosity of the liquids.

5. Adjust the up and down knobs slowly to adjust the height of rotor in the measured liquid until the liquid surface sign on the rotor is equal with the liquid surface.

6. Keyboard operation and indication interface

(1) The keyboard of the instrument is shown as figure 4.

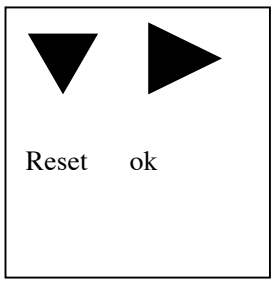

Figure 4

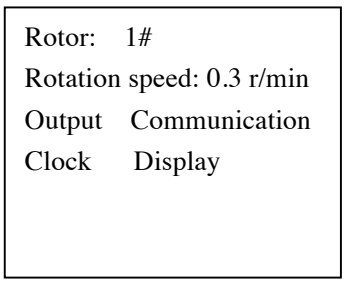

Figure 5

(2) Turn on the power supply switch on the back of the instrument and enter into the user choice mode as shown in figure 5. The cursor is at the "1#". Press "right move" button to choose the required rotor.

(3) Press "down" button to switch to rotation speed item. The cursor is at the item 0.3 r/min shown as in the figure5.

Press "right move" button to choose required speed. There are 8 grades of rotation speeds, 0.3, 0.6, 1.5, 3, 6, 12, 30 and 60 r/min.

(4) Press "ok" button after choosing the suitable rotor and rotation speed. The

rotor will begin to rotate and the instrument will begin to measure. The display is shown as figure 6.

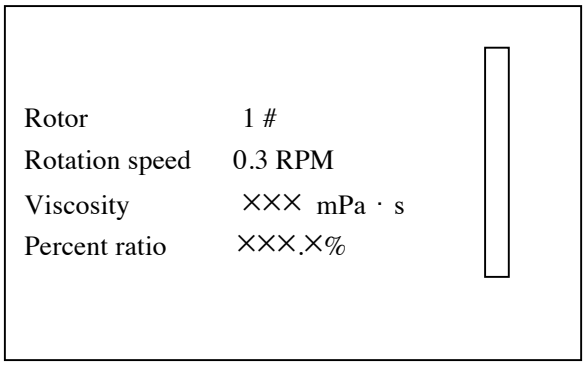

Figure 6

In figure 6, the unit of rotation speed is RPM. The unit of viscosity is mPa·s (cps). The vertical bar on the right side indicates the course of sampling. The percent ratio is the ratio between the measured viscosity and the full scale.

(5) In figure 5, when adjusting the cursor to the "output" position, press the "right move" button to choose "communication" and "print". Press "ok" button at the "print" position, and it will print the test data through a printer. The function of "communication" is not used.

(6) In figure 5, when moving the cursor to the "clock" position, press "right move" button, and choose "indicate" and "modify". If the "ok" button is pressed at "display" position, it will indicate the hour: minute: second –year-month-day at present. If the "ok" button is pressed at "modify" position, the time and data can be modified.

(7) Press "reset" button and the instrument will stop measuring. Press the "ok" button, to resume measuring the viscosity of sample using the previous rotor number and rotation speed.

7. Operation instruction

(1) Estimate the viscosity range of measured liquids and choose a suitable rotor and rotation speed as per the full scale sheet shown in table 1.

(2) If the viscosity of the measured liquid can not be estimated, take the viscosity

of measured liquids as a high viscosity. Then choose a rotor from small to large (the number is from high to low) and a rotation speed from slow to fast. In principle, choose a small rotor (high rotor number) and slow rotation speed to determine high viscosity liquids, and choose a large rotor (low rotor number) and rapid rotation speed to determine low viscosity liquids.

(3) In order to ensure the measurement precision, the full scale percent should be at 10%～100% during measurement. If the displayed value flitters, the reading is too large or too small, and the scale of the rotor should be adjusted.

(4) Press "reset" button at any time, the program will revert to the initial state, and the operation interface will revert to user choosing state.

8. Full scale sheet

rotor / Full scale mPa · s / r/min Rotation speed	1	2	3	4
60	100	500	2000	10000
30	200	1000	4000	20000
12	500	2500	10000	50000
6	1000	5000	20000	100000
3	2000	10000	40000	200000
1.5	4000	20000	80000	400000
0.6	10000	50000	200000	1000000
0.3	20000	100000	400000	2000000

VI. Notes

1. The power supply should be within the error limit of the voltage and frequency, or it will affect the test precision.

2. Please assemble and disassemble the rotor carefully. Remember to raise the connection bolt at the lower section of the instrument prior to assembly and disassembly. To avoid bending the rotor, do not handle it with excessive force or push the rotor transversely. Keep the connection surface and screw thread of connection bolt, and rotor clean, or they will affect installation, and stability of rotor when

rotating.

4. Do not let the rotor rotate without any liquids to avoid destroying the axle point and bearing.

5. Please clean the rotor immediately after using. Disassemble the rotor to clean it. Do not clean the rotor when still installed in the instrument. The rotor should be stored in the storage case after cleaning.

6. Please cover the yellow protection cap and raise the connection bolt, and screw on the dead bolt on the protection cap tightly during carrying or transporting the instrument.

Note: The protection cap should be disassembled before connecting to power supply to avoid destroying the instrument.

7. Do not disassemble the instrument or replace the accessory of the instrument. Do not add lubricating oil.

8. Most suspending liquids, emulsion, high polymer and other high viscosity liquids are “Non-Newton liquid”. The apparent viscosity of these mediums always changes following the change of shear speed and time. When determining the viscosity of sample using a different rotor, rotation speed and at different times, it is normal that the viscosity will be different.

9. Do not lay the instrument in its side or transversely.

10. Perform the tests using the following guidelines:

A. Control the temperature of measured liquids.

Note: you can purchase the circulation constant temperature water bath and a special two layer sample cup if necessary.

B. Submerge the rotor in the measured liquids for a long time and keep the temperature of the liquid constant to let the temperature of the rotor and measured liquid equal.

C. Ensure the uniformity of measured liquids.

D. Place the rotor in the center of the container during measurement.

E. Carry out measurement using the protection holder.

F. Keep the rotor clean.

G. Prevent any bubbles from adhering to the rotor when immersed in the measured liquids.

VII. Full set and technical documents

1. Full set

No	Name	Unit	Quantity
1	Main unit of NDJ-1B Digital Rotation Viscometer	Set	1
2	No.1～4 rotor	Piece	1 for each
3	Protection sleeve	Piece	1
4	Standing pole	Piece	1
5	Pedestal (including three pieces of level adjust bolts)	Pair	1
6	Rotor protection holder	Piece	1
7	Power supply wire (120 V 6 A)	Piece	1
8	Printer (including connection cable, power supply wire)	Set	1
9	Aluminum case (it contains main unit, rotor and rotor protection holder, etc)	Piece	1

2. Optional parts

(1) HWY-10 Circulation constant temperature water bath

(2) Special double layers sample cup

NOTES:

WARRANTY/DISCLAIMER

OMEGA ENGINEERING, INC. warrants this unit to be free of defects in materials and workmanship for a period of **13 months** from date of purchase. OMEGA's WARRANTY adds an additional one (1) month grace period to the normal **one (1) year product warranty** to cover handling and shipping time. This ensures that OMEGA's customers receive maximum coverage on each product.

If the unit malfunctions, it must be returned to the factory for evaluation. OMEGA's Customer Service Department will issue an Authorized Return (AR) number immediately upon phone or written request. Upon examination by OMEGA, if the unit is found to be defective, it will be repaired or replaced at no charge. OMEGA's WARRANTY does not apply to defects resulting from any action of the purchaser, including but not limited to mishandling, improper interfacing, operation outside of design limits, improper repair, or unauthorized modification. This WARRANTY is VOID if the unit shows evidence of having been tampered with or shows evidence of having been damaged as a result of excessive corrosion; or current, heat, moisture or vibration; improper specification; misapplication; misuse or other operating conditions outside of OMEGA's control. Components in which wear is not warranted, include but are not limited to contact points, fuses, and triacs.

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The purchaser is responsible for shipping charges, freight, insurance and proper packaging to prevent breakage in transit.

FOR **WARRANTY** RETURNS, please have the following information available BEFORE contacting OMEGA:

1. Purchase Order number under which the product was PURCHASED,
2. Model and serial number of the product under warranty, and
3. Repair instructions and/or specific problems relative to the product.

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1. Purchase Order number to cover the COST of the repair,
2. Model and serial number of the product, and
3. Repair instructions and/or specific problems relative to the product.

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