

Measure what you see.

# byko-visc DS Rotational Viscometer



Manual



**byko-visc DS**  
**Rotational Viscometer**

**Manual**



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### 1. Safety Information

**Caution!**

Read Instruction Manual before using this instrument.

**Warning!**

This manual cannot address all of the safety considerations associated with its use. It is the responsibility of the user to consult this manual and establish appropriate safety practices for use with this equipment and the individual material being tested.

**Warning!**

The byko-visc DS Viscometer is designed and intended for the use described in this manual. Using the viscometer for other purposes for which it was not designed may reduce or eliminate the protection offered by the features of the device. Serious injury may result.

**Warning!**

This instrument is not intended for use in a potentially hazardous environment or with materials that may release toxic or flammable gases at the temperatures encountered during testing.

**Warning!**

Never defeat the ground conductor or operate the equipment in the absence of a suitably installed ground conductor. Contact the appropriate electrical inspection authority or an electrician if you are uncertain that suitable grounding is available.

**Warning!**

Ultimate disposal of this product should be handled according to all national laws and regulations.

**Please note the following points:**

- Familiarize yourself with the layout and operation of the controls.
- Ensure the operator has no loose clothing or jewelry which could become caught in the moving parts.

## 2. Preparations

Unpack the unit being careful to check all packaging for items. Some accessories required for specific tests may be found in a separate box within the main box.

Within the package are the following standard items:

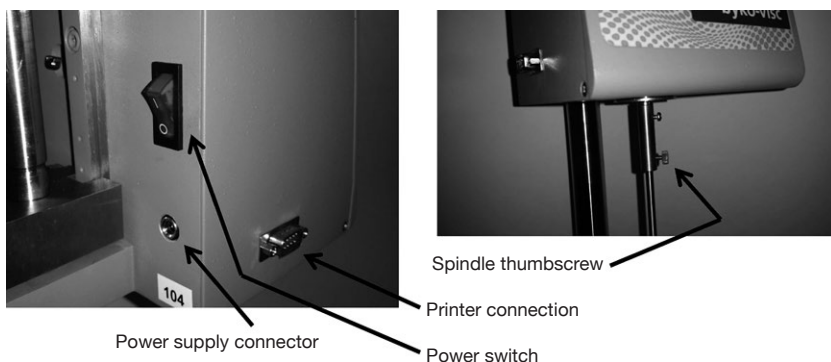
| Quantity | Description             |
|----------|-------------------------|
| 1        | byko-visc DS viscometer |
| 1        | Paddle spindle          |
| 1        | Power supply            |
| 1        | Power cord              |
| 1        | Can adapter             |

Find a suitable location free from obstructions and clutter. The instrument is designed for indoor use only. The viscometer should be at a convenient height for the operator.

Plug the power supply into the DC input jack on the rear, near the power switch. A power cord appropriate for your area's power connector is supplied to connect the power supply with AC power. The system will operate on power from 100-240 V~ at 50/60 Hz.

Raise the handle to its highest position to install the Paddle Spindle into the Spindle Clamp. Slide the spindle up to align the groove in the spindle so that the thumbscrew tightens on the groove. Hand tighten the thumbscrew to hold the spindle in place. Never use a tool to tighten the thumbscrew. Do not force the spindle to rotate by hand, as you may damage the sensitive measurement mechanism.

A RS-232 port is located on the left side of the instrument for an optional printer. The printer will print the viscometer readings when the handle is raised after a test.



### 3 System Description

The byko-visc DS (Digital Stormer) Viscometer measures fluid viscosity in Krebs units (KU). This type of viscometer is known as a Stormer or Krebs viscometer. It is designed around the ASTM D562 standard which can be used as an application reference.

The paddle type spindle is driven at constant 200 rpm by a computer controlled motor. The reaction torque of the spindle rotating at 200 rpm is converted to viscosity in Krebs Units. The digital display of the Viscometer shows viscosity in Krebs Units (KU), the associated grams value (gm), and viscosity in centipoise (cP). The value for centipoise is a conversion from the Krebs value as described in the ASTM standard. The Viscometer will measure viscosity from 40 KU to 141 KU, at weights of 32 to 1,099 grams (the equivalent centipoise range is 27 - 5,274 cP).

NOTE: As the centipoise value is a correlation developed as part of the ASTM method, it should not be assumed to be equivalent to measurements made by a rotational viscometer such as a BYK-Gardner byko-visc Premium. Use the centipoise value for reference only.

The base is designed to accommodate standard US paint cans, quart, pint and ½ pint. Quart cans may be placed directly on the base. Place the can adapter on the base for other sizes, the deep side is for pint cans, the shallow side is for ½ pint cans.



#### Optional Printer

A 9-pin RS-232 port is provided on the left side of the instrument for an optional printer. Connecting a printer will give a hard copy record of each reading. Each time the handle is raised to complete a test, the displayed results will be printed as in the example below.

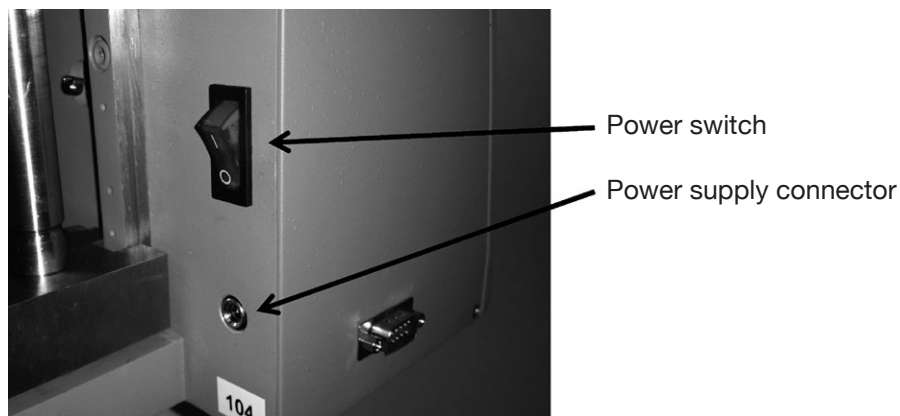
|     |      |
|-----|------|
| 1   |      |
| KU: | 0.0  |
| g:  | 0    |
| Cp: | 0    |
| 2   |      |
| KU: | 49.4 |
| g:  | 60   |
| Cp: | 164  |

A reading number is followed by all three results. Each time the handle is lowered and raised will print another result. The reading number will reset to 1 each time the instrument is powered on.

## 4 Start Up

Plug the external power supply into the connector on the rear of the instrument near the power switch. Plug the other end into an appropriate grounded electrical outlet as described in Section 2.

Turn on the power switch. The power switch is located on the rear of the instrument, near the power cord.



The front LCD display will illuminate, the instrument is now ready to operate.

All results are displayed on the LCD.

|                                           |
|-------------------------------------------|
| KU: 0.0                                   |
| gm: 0                                     |
| cP: 0                                     |
| Please lower handle<br>and start testing! |

The LCD screen on start up

The display shows the results of a test with three values, KU (Krebs Units), Grams, and Centipoise. All three readings are shown simultaneously.

### 5 Operation

Follow the procedures in Section 2 Preparations to ready the viscometer for use.

The byko-visc DS is designed for use with standard US paint can sizes. Other containers may be used with care. Quart cans should be placed directly on the recess in the base. Pint cans use the deep well in the can adapter and ½ pint cans use the can adapter with the shallow well up.

NOTE: When using ½ pint cans the opening in the can is smaller than the span of the spindle paddles! You must lift the can and tilt it around the spindle blades and then lower the spindle to start the test.

Lower the spindle into the liquid until the liquid level is up to the immersion mark on the spindle shaft. Always place the groove at the surface of the liquid to insure consistent measurements.

#### To begin a test

Lower the handle into the test liquid to start the test. The byko-visc will start rotating automatically when the instrument is with 13mm of the bottom of the travel. The instrument will take a few seconds to stabilize and display the results.

```
KU: 0.0
gm: 0
cP: 0
Data processing
Waiting . . . . 5s
```

A message of **Viscosity is less than the range!** and a display of all zeros indicates that the sample viscosity is too low to be measured by a Stormer-type viscometer.

A message of **Viscosity is out of the range!** and a display of all 9's indicates that the viscosity of the sample is too high to be measured with a Stormer-type of viscometer.

#### Test Complete

Once the readings stabilize the results are displayed. The display shows the KU and grams directly from the measurement. The centipoise value is calculated from the KU reading according to the ASTM D562 standard.

```
KU: 49.4
gm: 60
cP: 164
Please lower handle
and start testing!
```

Raise the handle to end the test and stop spindle rotation. The last reading made will remain on the display until the handle is lowered for the next test.

## 6 Maintenance and Repair

### Cleaning and Routine Maintenance

Remove the spindle after use to clean. Severe damage to the instrument can occur if the spindle is cleaned while mounted to the viscometer. The stainless steel paddle spindle may be cleaned with solvents required for the material being measured and a non-abrasive cloth. Remove spilled material from the instrument case and base. Avoid solvents on the faceplate and the LCD as they may be seriously damaged by strong solvents.

### Troubleshooting

If problems occur, verify that power is being applied, first to the power supply then from the power supply to the instrument. If the power is good, disconnect the power supply from the back of the instrument for at least 30 seconds, reconnect the power supply and turn on the power switch. If problems persist, please contact your nearest BYK-Gardner office.

### Service and Spare Parts

For all service and spare parts requirements, please contact your local BYK-Gardner office.

### Components

#### Ordering Information

| Part Number | Description             |
|-------------|-------------------------|
| 8324        | byko-visc DS Viscometer |

#### Recommended Accessories

| Part Number | Description                     |
|-------------|---------------------------------|
| 7510        | Replacement paddle-type spindle |
| 7511        | Paste spindle                   |

7 Technical Data

|                       |                                            |               |
|-----------------------|--------------------------------------------|---------------|
| Weight                | 20 pounds                                  | 9.1 kg        |
| Height                | 20 inches                                  | 508 mm        |
| Width                 | 11 inches                                  | 280 mm        |
| Depth                 | 15 inches                                  | 380 mm        |
| Altitude              | Up to 6,500 ft                             | Up to 2,000 m |
| Temperature Operating | 50° - 104° F                               | 10° - 40° C   |
| Humidity              | 20-80% RH non-condensing                   |               |
| Power                 | Power supply input:<br>100-240V ~ 50/60 Hz |               |
|                       | Power supply output:<br>24V --- 2.5 Amp    |               |

All technical data is subject to change.



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