Cone & Plate Viscometer - Low temp. / High torque

BGD 182-1H

Product Description

Paints and inks experience a range of shear rates throughout their journey from manufacturing to application. As typical non-Newtonian fluids, paints and inks display varying viscosity characteristics at different shear rates.

Generally, paints are exposed to low shear rates during storage, transport, leveling, and sagging. During operations such as pumping, dipping, and low-speed mixing, they encounter medium shear rates. At high-speed processes—including dispersion, rolling, spraying, and brush coating—they are subjected to high shear rates, typically ranging from 9,000 s^{-1} to 12,000 s^{-1}.

Understanding the rheological behavior of paints or inks at these high shear rates requires the use of a cone-and-plate viscometer. The BGD 182 Cone-and-Plate Viscometer employs a special-angle conical spindle, delivering very high shear rates to the sample via a high-speed stepper motor. The instrument is compliant with ISO 2884-1: Paints and varnishes — Determination of viscosity using rotary viscometers — Part 1: Cone-and-plate viscometer operated at a high rate of shear.

Technical Specification

- 7-inch touch screen with menu-based operation and rich display features (measurement values, spindle number, speed, shear rate, etc.) for simple and convenient use.
- Durable metal housing. The device is easily positioned with a handle, allowing for precise and fast adjustments with high reliability.
- Carefully engineered electrical components for improved reliability, precision, stability, and ease of use.
- Integrated ARM chip processor for faster data handling.
- High-precision linear calibration performed before shipment; supports multipoint interpolation for enhanced measurement accuracy.
- Stepless speed adjustment enables viscosity measurements at a wide range of shear rates, allowing operators to select suitable conditions for each sample.
- Continuously variable viscosity readings, with the option to freely switch between multiple viscosity units.
- Automatic alerts when measurement limits are exceeded.

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- High-speed data transmission interface, ensuring fast and stable communication with a computer.
- Data storage with external USB export functionality.
- Built-in high-precision PT100 temperature sensor, offering excellent temperature control accuracy and stability.
- Calibration to temperature for precise and reliable temperature regulation.
- Powerful yet simple calibration: users need only a single bottle of standard oil and can quickly perform calibration using the built-in menu.
- Optional data collection and analysis software for comprehensive rheological evaluation.

Main Technical Parameters

- **Adjustable Speed Range:** 5 rpm to 1,000 rpm (continuously variable, adjustable in 1 rpm increments)
- **Measurement Error:** Less than 2% of full scale
- **Sample Volume:** Less than 2 ml (see the table below for details)
- **Temperature Control:**
  - Two built-in options:
    - L type (Low temperature): 5 °C to 75 °C
    - H type (High temperature): 50 °C to 235 °C
- **Temperature Resolution:** 0.1 °C
- **Temperature Control Accuracy:**
  - ±0.5 °C (L type)
  - ±1 °C (H type, when the set temperature is below 150 °C)
  - ±2 °C (H type, when the set temperature is above 150 °C)
- **Rotors:** 10 types available (corresponding shear rates and measurement ranges are provided in the table below)
- **Power Supply:** AC 220 V, 50/60 Hz, maximum current approx. 1.5 A
- **Overall Dimensions:** 275 mm × 210 mm × 460 mm (L × W × H)
- **Net Weight:** 12 kg

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Main Technical Parameters

Ordering Information:

- **BGD 182/1L** – Cone & Plate Viscometer (Low Temperature and Low Torque)
- **BGD 182/1H** – Cone & Plate Viscometer (High Temperature and Low Torque)
- **BGD 182/2L** – Cone & Plate Viscometer (Low Temperature and High Torque)
- **BGD 182/2H** – Cone & Plate Viscometer (High Temperature and High Torque)

Important: Please indicate the spindle(s) as accessories when placing your order. One spindle is supplied free of charge with each BGD 182 Cone & Plate Viscometer.

Spindle	CAP-01	CAP-02	CAP-03	CAP-04	CAP-05	CAP-06	CAP-07	CAP-08	CAP-09	CAP-10
Sample Volume	67µL	38µL	24µL	134µL	67µL	30µL	1700µL	400µL	100µL	170µL
Shear Rate Range (S^{-1})	66.5~ 13,300	66.5~ 13,300	66.5~ 13,300	16.5~ 3,300	16.5~ 3,300	16.5~ 3,300	13~ 2,000	13~ 2,000	13~ 2,000	25~ 5,000
BGD 182-1 Measurement Range (mPa.s)	20~ 1,600	20~ 3,200	20~ 6,600	20~ 13,000	20~ 26,000	20~ 66,000	20~ 2,600	20~ 10,800	20~ 44,000	20~ 4,400
BGD 182-2 Measurement Range (mPa.s)	20~ 37,500	40~ 75,000	80~ 150,000	100~ 300,000	300~ 600,000	800~ 1,500,000	78~ 62,500	313~ 250,000	125~ 1,000,000	100~ 100,000

Note: Calculation of Shear Rate

- for CAP-01 to CAP-03: Shear rate = 13.33 × current speed (rpm)
- for CAP-04 to CAP-06: Shear rate = 3.33 × current speed (rpm)
- for CAP-07 to CAP-09: Shear rate = 2 × current speed (rpm)
- for CAP-10: Shear rate = 5 × current speed (rpm)

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