BROOKFIELD DV-II+ Pro

PROGRAMMABLE VISCOMETER

Operating Instructions

Manual No. **M/03-165-C0508**

BROOKFIELD

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MEASUREMENT AND
CONTROL OF VISCOSITY

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I. INTRODUCTION

The Brookfield DV-II+Pro Viscometer measures fluid viscosity at given shear rates. Viscosity is a measure of a fluid's resistance to flow. You will find a detailed description of the science of viscosity in the Brookfield publication *"More Solutions to Sticky Problems"* a copy of which was included with your DV-II+Pro.

The DV-II+Pro offers exceptional versatility in modes of control allowing for traditional standalone operation, automatic operation through programs downloaded from the PC or with complete control by PC using Brookfield Rheocalc32 Software.

- The DV-II+Pro can be used as a traditional Brookfield viscometer for collection of single speed viscosity data through the easy to use keypad; just select the spindle and speed and read the value from the display. **[see Section II, Getting Started]**
- The Brookfield DVLoader Software can be used to program the DV-II+Pro to control all aspects of the test and data collection without the need for the operator to monitor the instrument; just start the program and return to the printed test data (printer is optional). **[see Section IV, DVLoader Software]**
- The Brookfield Rheocalc32 Software will perform all control and data collection functions of the DV-II+Pro from the PC while also providing a platform for advanced data collection and analysis. **[see Section II.9, External Control]**

In any of these modes of control, the DV-II+Pro will provide the best in viscosity measurement and control.

The principal of operation of the DV-II+Pro is to drive a spindle (which is immersed in the test fluid) through a calibrated spring. The viscous drag of the fluid against the spindle is measured by the spring deflection. Spring deflection is measured with a rotary transducer. The measurement range of a DV-II+Pro (in centipoise or milliPascal seconds) is determined by the rotational speed of the spindle, the size and shape of the spindle, the container the spindle is rotating in, and the full scale torque of the calibrated spring.

There are four basic spring torque series offered by Brookfield:

	Spring Torque	
Model	dyne/cm	milli Newton/m
LVDV-II+Pro	673.7	0.0673
RVDV-II+Pro	7,187.0	0.7187
HADV-II+Pro	14,374.0	1.4374
HBDV-II+Pro	57,496.0	5.7496

The higher the torque calibration, the higher the measurement range. The measurement range for each torque calibration may be found in Appendix B.

All units of measurement are displayed according to either the CGS system or the SI system.

1. Viscosity appears in units of centipoise (shown as "cP") or milliPascal-seconds (shown as "mPa•s") on the DV-II+Pro Viscometer display.
2. Shear Stress appears in units of dynes/square centimeter ("D/cm²") or Newtons/square meter ("N/m²").
3. Shear Rate appears in units of reciprocal seconds ("1/SEC").
4. Torque appears in units of dyne-centimeters or Newton-meters (shown as percent "%" in both cases) on the DV-II+Pro Viscometer display.

   Note: To change CGS to SI units on the display - see Section III.2.2.

The equivalent units of measurement in the SI system are calculated using the following conversions:

	SI		**CGS**
Viscosity:	1 mPa•s	=	1 cP
Shear Stress:	1 Newton/m²	=	10 dyne/cm²
Torque:	1 Newton/m	=	10^7 dyne/cm

References to viscosity throughout this manual are done in CGS units. The DV-II+Pro Viscometer provides equivalent information in SI units.

I.1   Components

Please check to be sure that you have received all components, and that there is no damage. If you are missing any parts, please notify Brookfield Engineering or your local Brookfield agent immediately. Any shipping damage must be reported to the carrier.

Component	Part Number	Quantity
DV-II+Pro Viscometer	varies	1
Model S Laboratory Stand	MODEL S	1
Spindle Set with Case	varies	1
LVDV-II+Pro set of four spindles	SSL	*or*
RVDV-II+Pro set of six spindles (#2 - #7)	SSR	*or*
HA/HBDV-II+Pro set of six spindles (#2 - #7)	SSH	
For Cone/Plate versions: a spindle wrench, one cone spindle and sample cup, Part No. CPE-44Y replace the spindle set.		
Power Cord		1
DVP-65 for 115 or	DVP-65	
DVP-66 for 230	DVP-66	
RTD Temperature Probe	DVP-94Y	1
Guard Leg:		1
LVDV-II+Pro	B-20Y	
RVDV-II+Pro	B-21Y	
Carrying Case	DVE-7Y	1
DVLOADER CD ROM	DVLOADER	1
Cable (DV-II+Pro to computer)	DVP-80	1
Operating Manual	M/03-165	1

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