

Suitable for measuring gas oils, distillate fuels and diesel fuels, as specified in ASTM D975, EN590 and ISO 8217 (marine fuels).

The RHEOTEK AKV-diesel is a fully automated viscometer system suitable for measuring kinematic viscosity in full compliance with ASTM D445, IP71 & ISO 3104.

## Automated kinematic Viscometer – key features

- Fully complies with ASTM D445
- Two measuring positions
- Remove cap and pour in sample
- Precise ASTM Ubbelohde viscometer tubes with independent ISO 17025 calibration
- In-situ solvent cleaning and drying
- User friendly PC control system



## AKV-diesel

The **RHEOTEK AKV-diesel** provides a reliable and precise method for measuring gas oils, distillate fuels and diesels at 40°C.

Automatic flow time measurements are determined in high precision ASTM Ubbelohde viscometer tubes.

Reported kinematic viscosity results are in full compliance with ASTM D445, IP 71 & ISO 3104.

The AKV-diesel system is truly compliant with ASTM D445 – using standard apparatus and automating the manual steps set out in the method.

Furthermore, independent calibration provides the lowest possible uncertainties of measurement.

The AKV system is suitable for other applications, including biodiesels.



## Features of operation:

### FULL COMPLIANCE WITH METHODOLOGY

Diesel fuels are required to be certified to international standards. These specifications require kinematic viscosity to be measured in accordance with ASTM D445, IP71, or ISO 3104. The RHEOTEK AKV-diesel strictly adheres to these methods, complying in every respect.

Compliance to ASTM D 445 is achieved by using a glass capillary viscometer tube (ASTM Ubbelohde design), in an automated assembly with each step of the method pre-programmed. This removes the possibility of deviating from the method, as well as ensuring the most precise results.

The powerful AKV-diesel software package records all flow time measurements and states the precision obtained for each result. Full traceability of measurements is provided.

### PRINCIPLE OF OPERATION

The RHEOTEK AKV-diesel uses ASTM Ubbelohde viscometer tubes to make precise flow time measurements. Each tube is *independently* calibrated with a certified constant, using calibration data produced by the PSL ISO 17025 accredited laboratory. Samples are loaded into the viscometer, via the unique RHEOTEK filling station. An internal pump pushes the sample up into the capillary tube to position it for measurement.

The sample is released and the flow time is automatically measured by the NiR optical detectors. On completion of the first run, the sample is once again pushed up into the capillary tube, and a second consecutive flow time is measured. The AKV-diesel software will then calculate the kinematic viscosity result.

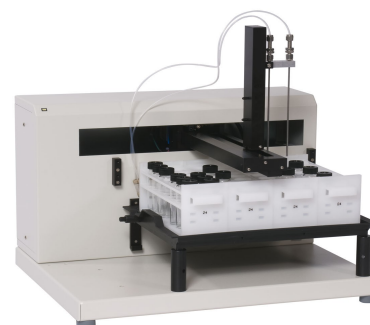


### SAFE VACUUM (IN-SITU) CLEANING AND DRYING

On completion of the measurement process, the AKV-diesel will automatically use a “safe vac” system to clean and dry the Ubbelohde viscometer tube using suitable solvents. The waste sample and solvent is taken to a waste container, and the system is air dried, leaving it ready for the next sample.

### OPTIONS

Several options are available for the AKV-diesel, including the RHEOTEK Smart Sampler. This comprises of a XYZ auto sampler with disposable vials. Up to 52 sample positions.



## SYSTEM CONFIGURATIONS

### AKV-diesel with two measuring positions (AKV5002S):

Modular system consisting of:

- Visibility bath
- 2 measuring positions
- AKV control/cleaning module
- ASTM Ubbelohde viscometers
- AKV software & PC control card.



### SYSTEM PART NUMBERS:

- AKV5001S RHEOTEK AKV-diesel with ONE measuring position
- AKV5002S RHEOTEK AKV-diesel with TWO measuring positions
- AKV5003S RHEOTEK AKV-diesel with TWO measuring positions and XYZ auto sampler

### REQUIRED OPTIONS:

- PC system
- Laboratory vacuum or vacuum pump
- Bath oil

<b>AKV - ASTM Ubbelohde Tube Sizes</b>		
Tube Ref	Tube Size	Recommended Viscosity Range*
AKV-0B	0.005	Viscosity range 0.5 to 3 mm <sup>2</sup> /s, cSt
AKV-1	0.010	Viscosity range 0.7 to 6 mm <sup>2</sup> /s, cSt
AKV-1C	0.030	Viscosity range 1.05 to 18 mm <sup>2</sup> /s, cSt

\* Permitting use of ASTM D 445 kinetic energy correction for automated flow times <200s

### PSL - a world leader in Viscosity Measurement

The RHEOTEK range of instruments are manufactured in the United Kingdom and the USA by Poulten, Selve and Lee Ltd.

Poulten, Selve & Lee Ltd. (PSL) was established in 1850. For more than 60 years the company has been specializing in viscosity measurement. PSL's high precision glass capillary viscometers are used worldwide for manual and automated viscosity measurement.

All glass capillary viscometers are hand made by PSL's highly skilled glass blowing department and calibrated by the in-house ISO 17025 accredited laboratory.

Over the past decade, the company has developed a complete range of high precision automated viscometers. These are used in a wide range of industries such as petrochemical, polymer, pulp and pharmaceutical.

The company's USA operations are based in Kentucky. RHEOTEK USA Inc. provides sales, service and applications support to customers throughout the USA, Canada and Mexico.

Worldwide, the RHEOTEK range of instruments are sold and serviced by a network of authorized sales agents.

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### AKV-diesel Specifications

Operating Temperature °C	40.00°C ( <i>other temperatures available on request</i> )
Kinematic viscosity test methods	IP 71, ASTM D 445, ASTM D 446, ISO 3104, ISO 3105
Viscometer tube	ASTM Ubbelohde. Options also for Cannon-Fenske Routine and DIN Ubbelohde. All Viscometers supplied with ISO 17025
Sample volume	12 ml
Sample induction	Sample is poured into a filling station above the viscometer - no syringe required
Test duration	Typically 12-15 minutes (test result within 5-7 minutes)
Cleaning	In-situ automatic cleaning. Cleaning solvent miscible with sample followed by drying solvent. Optimized cleaning parameters to minimize solvent usage whilst providing a
LIMS	Compatible
Electrical	110V or 220-240VAC, 50/60Hz
Manufacturer	Poulten, Selve & Lee Ltd - UK

### AKV-diesel Accessories

AKV5010	PC system – complete with WINDOWS operating system
AKV5014	Mineral bath oil
AKV5015	Silicone bath oil
AKV5020	Laboratory vacuum pump - single stage (single or dual position AKV systems)
AKV5022	Laboratory vacuum pump - dual stage (dual position AKV system with XYZ auto sampler)
AKV5025	PIAB vacuum pump (requires compressed air supply)
AKV5030	ASTM Ubbelohde size 1B (recommended viscosity range 1.05 to 18 mm <sup>2</sup> /s. Complete with ISO 17025 certificate of calibration.
AKV5050	Spares kit including essential tools & spare parts