АВТОМАТИЧЕСКИЕ ВИСКОЗИМЕТРЫ CANNON

Техническое описание

CMRV-4500 Mini-Rotary Viscometer

The CMRV-4500 is a semi-automated mini-rotary viscometer for measuring low-temperature pumping viscosity from –5 °C to –40 °C. It has 9 test cells and is thermoelectrically-cooled via an external air/water heat exchanger.

Common Applications

- Drive line lubricants
- New engine oils
- Used automotive oils

Dimensions (W × D × H)	**Unit:** 31.7 cm × 26.0 cm × 48.9 cm (12.5 in × 10.25 in × 19.25 in) **Air/water heat exchanger:** 47.0 cm × 34.8 cm × 34.0 cm (18.5 in × 13.7 in × 13.4 in)
Weight	**Unit:** 18.6 kg (41 lb) **Air/water heat exchanger:** 31.8 kg (70 lb)
Shipping dimensions (W × D × H)	**Box 1:** 88.9 cm × 88.9 cm × 88.9 cm (35 in × 35 in × 35 in) **Box 2 (recirculating cooler):** 81.3 cm × 61.0 cm × 106.7 cm (32 in × 24 in × 42 in)
Shipping weight	**Box 1:** 68.0 kg (150 lb) **Box 2:** 31.8 kg (70 lb)
Maximum thoughput	9 samples per test cycle
Automated sample capacity	9
Temperature range and accuracy	−5 °C to −40 °C, ± 0.1 °C
Minimum sample volume	10 mL per test
Operating conditions	15 °C to 30 °C, 10% to 75% relative humidity (non-condensing), Installation Category II; Pollution Degree 2
Electrical specifications	100 VAC, 50/60 Hz; 115 VAC, 50/60 Hz; 230 VAC, 50/60 Hz; 400 watts power consumption (unit); 1100 watts power consumption (AWHE)
Compliance	CE Mark; EMC directive (2004/108/EC); Low voltage directive (2006/95/EC); HI-POT (1900 VDC, 60 sec.); ROHS

CMRV-5000 Self-Contained Mini-Rotary Viscometer

The semi-automated CMRV-5000 is a compact and completely self-contained mini-rotary viscometer for measuring low temperature pumping viscosity from –5 °C to –40 °C. It comes with five removable test cells and offers integrated thermoelectric air-cooling.

Common Applications

- Drive line lubricants
- New engine oils
- Used automotive oils

Dimensions (W × D × H)	28.4 cm × 39.6 cm × 61.7 cm (11.2 in × 15.6 in × 24.3 in)
Weight	23 kg (50 lb)
Shipping dimensions (W × D × H)	58.4 cm × 48.3 cm × 68.6 cm (23 in × 19 in × 27 in)
Shipping weight	29.5 kg (65 lb)
Maximum thoughput	5 samples per test cycle
Automated sample capacity	5
Temperature range and accuracy	−5 °C to −40 °C, ± 0.1 °C
Minimum sample volume	10 mL per test
Operating conditions	15 °C to 30 °C, 10% to 75% relative humidity (non-condensing), Installation Category II; Pollution Degree 2
Electrical specifications	100/115 VAC, 50/60 Hz; 230 VAC, 50/60 Hz; 600 watts power consumption
Compliance	CE Mark; EMC directive (2004/108/EC); Low voltage directive (2006/95/EC); HI-POT (1900 VDC, 60 sec.); ROHS

DPV® Digital Paddle Viscometer

For Dynamic Viscosity of Non-Homogenous Materials Including Emulsified Asphalts ASTM (D7226, D2397, D977) and AASHTO TP-121

The DPV is an automated, rotational digital paddle viscometer for measuring the dynamic viscosity of non-homogenous materials such as emulsified asphalts, marine fuels, residual oils, slurries and foods at 40 °C, 50 °C, 80 °C, and 100 °C. For tests at 25 °C, see the TE-DPV product page. The DPV provides an automated alternative to older, labor-intensive and less precise methods.

Common Applications

- Emulsified asphalts
- Marine fuels
- Suspensions
- Slurries
- Foods
- Paints
- Residual oils

PolyVISC® AIRBATH® Dilute Solution Polymer Viscometer

PolyVISC® is a fully automated, benchtop capillary viscometer with an 11 position sample handler for unattended processing and testing of of dilute solution viscosity of polymers in organic solvents and aqueous solutions. The ultra-stable thermostatic air chamber provides temperature control from 20 °C to 135 °C (with available options).

- Elastomers
- Plastics
- Thermoplastic elastomers
- Copolymers
- Biopolymers
- Polymer blends
- Oligomers
- Pre-polymers
- Resins
- Viscosity modifiers

Designed to meet specific polymer industry needs

- Standard unit is compatible with organic solvents and aqueous solutions. Upgrade to PVDF/PTFE components permits testing with highly aggressive solvents.
- On-board software with specialized polymer calculations determines relative, inherent, reduced and intrinsic viscosity
- Ultra-stable thermostatic air chamber with AIRBATH® technology provides excellent temperature control (±0.01 °C) from 20 °C to 100 °C (high temperature bath option provides range to 135 °C)
- Kinematic viscosity range: 0.3 mm^2/s (cSt) to 20,000 mm^2/s (cSt) in 100-fold increments. Special ranges available.

Fully automated bench-top testing

- User-friendly software controls the instrument and facilitates tasks such as sampling, measurement and viscometer tube washing.
- 11 position sample handler allows for unattended operation

- Automated processing reduces operator to operator variability

Compact, robust design

- Bench-top design conserves valuable lab space
- Built-in thermoelectric cooling requires no external chiller

Simplified maintenance & test versatility

- Accurately measures viscosity of opague and transparent samples. Standard infrared sensors available for transparent samples and some opague samples.
- AIRBATH® chamber allows for rapid temperature and viscometer changes
- Uses either a modified Atlantic compound viscometer tube (applicable for most samples) or a modified Ubbelohde tube (for volatile samples)
- Volatile sample testing option provides protection from solvent evaporation to enhance test precision and reduce the presence of toxic or corrosive vapors in the AIRBATH® chamber

PulpVIS® Portable Kinematic Viscometer

PulpVIS® is a single sample, portable viscometer with built-in TE cooling for testing pulp at 20 °C or 25 °C. It is easy to use, rugged and fast. Available tubes cover the TAPPI viscosity range of 0.8 mPa·s (cP) to 190 mPa·s (cP) at 20 °C and 25 °C.

Common Applications

- Pulp & paper mills
- Cellulose production
- Private and commercial test labs
- Academic research

Dimensions (W × D × H)	13.0 cm × 37.0 cm × 31.0 cm (5.0 in × 14.0 in × 12.0 in)
Weight	5.6 kg (12.3 lb)
Shipping dimensions (W × D × H)	48.3 cm × 48.3 cm × 20.3 cm (19.0 in × 19.0 in × 8.0 in)
Shipping weight (with all items)	9.5 kg (21 lb)
Maximum thoughput	20 tests per hour
Sample capacity	1
Viscosity range	0.8 mPa·s (cP) to 190 mPa·s (cP) at 20 °C and 25 °C* * Values are presented in mPa·s (cP) when the TAPPI T230 specified density value is entered
Test accuracy	< 3% of measured value, calibrated
Test repeatability	< 2% of measured value, typical
Temperature range and accuracy	20 °C or 25 °C, ± 0.05 °C
Minimum sample volume Minimum solvent volume	Sample volume: 0.5 mL per test Solvent volume: 10 mL to 15 mL per test

Solvent compatibility	Internal wetted components compatible with acetone & CED (cupri-ethylenediamine solution) * Upgrade available for use with toluene/n-heptane
Operating conditions	15 °C to 30 °C, 10% to 75% relative humidity (non-condensing), Installation Category II; Pollution Degree 2
Electrical specifications	Input power: 11 VDC to 13 VDC at 8 A peak AC/DC adapter: 100 VAC to 230 VAC, 50/60 Hz; 120 watts power consumption
Compliance	CE Mark; EMC directive (2004/108/EC); Low voltage directive (2006/95/EC); HI-POT (1900 VDC, 60 sec.); ROHS
Data output	RS-232 via DB9 connector

SimpleVIS® Portable Automated Kinematic Viscometer

For Direct Kinematic Viscosity of Transparent & Opague Liquids with Near ASTM D445 Precision
ASTM D7279

SimpleVIS® is a single sample, portable viscometer for on-site testing. With near D445 precision, it is easy to use, rugged and fast. Available viscometer tubes cover a viscosity range of 2 mm²/s (cSt) to 700 mm²/s (cSt) at two selected temperatures between 40 °C and 100 °C.

Common Applications

- Product chain of custody monitoring
- Contamination checks
- Point of use testing
- Industrial lube blending
- Packaging & distribution of petroleum products
- Petroleum terminals
- Remote used oil predictive maintenance
- Power plant applications
- Remote mining applications

Dimensions (W × D × H)	12.8 cm × 35.6 cm × 30.4 cm (5.0 in × 14.0 in × 12.0 in)
Weight	4.6 kg (10.2 lb)
Shipping dimensions (W × D × H)	48.3 cm × 48.3 cm × 20.3 cm (19.0 in × 19.0 in × 8.0 in)
Shipping weight (with all items)	9.5 kg (21 lb)
Maximum thoughput	20 tests per hour
Sample capacity	1
Viscosity range	2 mm²/s (cSt) to 700 mm²/s (cSt)* * Depending on tube selection and temperature
Test accuracy	< 3% of measured value, calibrated
Test repeatability	< 2% of measured value, typical
Temperature range and accuracy	40 °C or 100 °C, ± 0.05 °C* *Custom calibration at any two temperatures between 40 °C and 100 °C is available on request

Minimum sample volume Minimum solvent volume	Sample volume: 0.5 mL per test Solvent volume: 10 mL to 15 mL per test
Solvent compatibility	Internal wetted components compatible with n-heptane only* * Upgrade available for use with acetone
Operating conditions	15 °C to 30 °C, 10% to 75% relative humidity (non-condensing), Installation Category II; Pollution Degree 2
Electrical specifications	Input power: 11 VDC to 13 VDC at 5 A peak AC/DC adapter: 100 VAC to 230 VAC, 50/60 Hz; 100 watts power consumption
Compliance	CE Mark; EMC directive (2004/108/EC); Low voltage directive (2006/95/EC); HI-POT (1900 VDC, 60 sec.); ROHS
Data output	RS-232 via DB9 connector

SimpleVIS® II Portable Viscometer for Subambient Testing

For Direct Kinematic Viscosity of Transparent & Opague Liquids with Near ASTM D445 Precision
ASTM D7279

SimpleVIS® II is a single sample, portable viscometer with built-in TE cooling for testing down to 15 °C. With near D445 precision it is easy to use, rugged and fast. Available tubes cover a viscosity range of 2 mm²/s (cSt) to 700 mm²/s (cSt) at two selected temperatures between 15 °C and 30 °C

Dimensions (W × D × H)	13.0 cm × 37.0 cm × 31.0 cm (5.0 in × 14.0 in × 12.0 in)
Weight	5.6 kg (12.3 lb)
Shipping dimensions (W × D × H)	48.3 cm × 48.3 cm × 20.3 cm (19.0 in × 19.0 in × 8.0 in)
Shipping weight (with all items)	9.5 kg (21 lb)
Maximum thoughput	20 tests per hour
Sample capacity	1
Viscosity range	2 mm²/s (cSt) to 700 mm²/s (cSt)* * Depending on tube selection and temperature
Test accuracy	< 3% of measured value, calibrated
Test repeatability	< 2% of measured value, typical
Temperature range and accuracy	15 °C or 30 °C, ± 0.05 °C* *Custom calibration at any two temperatures between 15 °C and 30 °C is available on request
Minimum sample volume Minimum solvent volume	Sample volume: 0.5 mL per test Solvent volume: 10 mL to 15 mL per test
Solvent compatibility	Internal wetted components compatible with acetone only* * Upgrade available for use with toluene/n-heptane

Operating conditions	15 °C to 30 °C, 10% to 75% relative humidity (non-condensing), Installation Category II; Pollution Degree 2
Electrical specifications	Input power: 11 VDC to 13 VDC at 5 A peak AC/DC adapter: 100 VAC to 230 VAC, 50/60 Hz; 120 watts power consumption
Compliance	CE Mark; EMC directive (2004/108/EC); Low voltage directive (2006/95/EC); HI-POT (1900 VDC, 60 sec.); ROHS
Data output	RS-232 via DB9 connector

SimpleVIS®+ Portable Viscometer with Active Cooling

For Direct Kinematic Viscosity of Transparent & Opaque Liquids with Near ASTM D445 Precision
ASTM D7279

SimpleVIS®+ is a single sample, portable viscometer with built-in active cooling for rapid temperature adjustment. With near D445 precision, it is easy to use, rugged and fast. Available viscometer tubes cover a viscosity range of 2 mm²/s (cSt) to 700 mm²/s (cSt) at two selected temperatures between 40 °C and 100 °C

Dimensions (W × D × H)	12.8 cm × 35.6 cm × 30.4 cm (5.0 in × 14.0 in × 12.0 in)
Weight	4.6 kg (10.2 lb)
Shipping dimensions (W × D × H)	48.3 cm × 48.3 cm × 20.3 cm (19.0 in × 19.0 in × 8.0 in)
Shipping weight (with all items)	9.5 kg (21 lb)
Maximum thoughput	20 tests per hour
Sample capacity	1
Viscosity range	2 mm²/s (cSt) to 700 mm²/s (cSt)* * Depending on tube selection and temperature
Test accuracy	< 3% of measured value, calibrated
Test repeatability	< 2% of measured value, typical
Temperature range and accuracy	40 °C or 100 °C, ± 0.05 °C* *Custom calibration at any two temperatures between 40 °C and 100 °C is available on request
Minimum sample volume	Sample volume: 0.5 mL per test
Minimum solvent volume	Solvent volume: 10 mL to 15 mL per test
Solvent compatibility	Internal wetted components compatible with n-heptane only* * Upgrade available for use with acetone
Operating conditions	15 °C to 30 °C, 10% to 75% relative humidity (non-condensing), Installation Category II; Pollution Degree 2
Electrical specifications	Input power: 11 VDC to 13 VDC at 5 A peak AC/DC adapter: 100 VAC to 230 VAC, 50/60 Hz; 100 watts power consumption
Compliance	CE Mark; EMC directive (2004/108/EC); Low voltage directive (2006/95/EC); HI-POT (1900 VDC, 60 sec.); ROHS
Data output	RS-232 via DB9 connector

TE-DPV® Thermoelectric Rotational Paddle Viscometer

For Dynamic Viscosity of Non-Homogenous Materials Including Emulsified Asphalts ASTM D7226, ASTM D2397, ASTM D977 and AASHTO TP121

TE-DPV® is an automated, thermoelectrically cooled rotational digital paddle viscometer for measuring the dynamic viscosity of emulsified asphalts, marine fuels and other non-homogeneous materials at 25 °C, 40 °C, 50 °C, 80 °C, and 100 °C. The TE-DPV provides a convenient, automated alternative to older, labor-intensive and less precise methods.

- Emulsified asphalts
- Marine fuels
- Suspensions
- Slurries
- Foods
- Paints
- Residual oils

Dimensions (W × D × H)	23.5 cm × 27.3 cm × 45.1 cm (9.3 in × 10.8 in × 17.8 in)* * 15 cm rear clearance required
Weight	10.0 kg (22.0 lb)
Shipping dimensions (W × D × H)	38.1 cm × 40.6 cm × 53.3 cm (15.0 in × 16.0 in × 21.0 in)
Shipping weight (with all items)	16.3 kg (36.0 lb)
Maximum throughput	2 to 4 samples per hour
Automated sample capacity	1
Viscosity range & accuracy	30 mPa·s (cP) to 3000 mPa·s (CP)* ± 5%
Test temperatures & accuracy	25 °C, 40 °C, 50 °C, 80 °C, 100 °C ± 0.1 °C
Minimum sample volume	135 mL per test
Operating conditions	15 °C to 30 °C, 10% to 75% relative humidity (non-condensing), Installation Category II, Pollution Degree 2
Electrical specifications	100 VAC to 240 VAC, 47 to 63 Hz, 120 watts power consumption
Compliance	CE Mark; EMC directive (2004/108/EC); Low voltage directive (2006/95/EC); HI-POT (1900 VAC, 60 sec.); ROHS
Data output	RS-232

TESC Thermoelectric Sample Conditioner System

The compact, economical TESC (thermoelectric sample conditioner) system integrates and automates the entire ASTM D2983 conditioning and testing process for low temperature viscosity of gear oils and ATF. Provides an automated alternative to ASTM D2983 sample conditioning and testing. Eliminates sample disruption during preheating, room temperature stabilization, cooling and final viscosity testing. Reduces result variability due to temperature fluctuation. Provides superior precision. Allows for unattended operation.

Dimensions (W × D × H)	16.5 cm × 51.0 cm × 76.0 cm (6.5 in × 20.0 in × 30.0 in)
Weight	19.5 kg (43 lb) including DV2T viscometer
Shipping dimensions (W × D × H)	73.7 cm × 71.1 cm × 58.4 cm (29.0 in × 28.0 in × 23.0 in)
Shipping weight (with all items)	34 kg (75 lb)
Sample capacity	1
Temperature range & accuracy	−40 °C to 90 °C (± 0.1 °C)
Sample volume	20 mL
Operating conditions	15 °C to 30 °C, 10% to 75% relative humidity (non-condensing), Installation Category II, Pollution Degree 2
Electrical specifications	100 VAC to 240 VAC 50/60 Hz, 300 watts power
Compliance	CE Mark; EMC directive (2004/108/EC); Low voltage directive (2006/95/EC); ROHS
Data output	USB and RS-485

V-2020 Rotational Viscometer

For Measuring Viscous Drag of a Liquid Against a Rotating Spindle

The CANNON® V-2020 viscometers are easy-to-use, affordable rotational viscometers for the determination of dynamic viscosity. they measure the viscous drag of a liquid against a rotating spindle. With available spindles, the low viscosity LV-2020 measures from 1 mPa·s (cP) to 2,000,000 mPa·s (cP) while the moderate viscosity MV-2020 measures from 100 mPa·s (cP) to 13,000,000 mPa·s (cP). Both instruments offer 18 selectable speeds ranging from 0.3 rpm to 100 rpm.

Dimensions (W × D × H)	27.6 cm × 29.8 cm × 41.5 cm (10.9 in × 11.7 in × 16.4 in)
Weight	7.7 kg (17.0 lb)
Shipping dimensions (W × D × H)	48.0 cm × 25.0 cm × 38.0 cm (19.0 in × 10.0 in × 15.0 in)
Shipping weight (with all items)	9.0 kg (20.0 lb)
Available spindle speeds	0.3 rpm, 0.5 rpm, 0.6 rpm, 1.0 rpm, 1.5 rpm, 2.0 rpm, 2.5 rpm, 3.0 rpm, 4.0 rpm, 5.0 rpm, 6.0 rpm, 10 rpm, 12 rpm, 20 rpm, 30 rpm, 50 rpm, 60 rpm, 100 rpm
Viscosity range	LV-2020: 1 mPa·s (cP) to 2,000,000 mPa·s (cP) MV-2020: 100 mPa·s (cP) to 13,000,000 mPa·s (cP) * Options required to achieve lower viscosity ranges (see "Features & Benefits" for additional details
Torque measurement accuracy	± 1.0% of range in use
Repeatability	± 0.2% of range in use

Operating conditions	0 °C to 40 °C, 20% to 80% relative humidity (non-condensing)
Electrical specifications	115 VAC, 50/60 Hz; 230 VAC, 50/60 Hz; <20 watts power consumption
Compliance	CE Mark; EMC directive (2004/108/EC)