CANNON® miniAV™-X Automatic Viscometer

- Meets all ASTM D445 Precision Specifications
- Affordable Automated Testing
- Low Solvent/Sample Volume
- Faster Through-Put
- 100-Fold Tube Ranges for KinVis up to 5000 cSt
- Selectable Temperature from 20 to 100°C
- Smart Table Technology
- Attractive and Compact Benchtop Unit—Saves Space, Saves Time, Saves Money!

CANNON INSTRUMENT COMPANY®

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INNOVATIONS IN VISCOSITY MEASUREMENT

CANNON® miniAV™-X Automatic Viscometer with 10 place auto sampler

ASTM D445, ISO 3104, IP 71, ASTM D446, ISO 3105

Affordable D445 Automation

The miniAV™-X from CANNON Instrument Company offers every laboratory an exciting new tool for convenient and highly accurate kinematic viscosity measurement. Occupying roughly the same footprint as a tabletop rotational viscometer, the miniAV-X automates the time-consuming sample measurement and viscometer tube wash/dry procedures associated with the ASTM D445 method, freeing the laboratory technician for other duties. The miniAV-X has been designed as an affordable alternative to traditional labor-intensive manual KinVis measurement methods, and provides full laboratory automation.

The miniAV-X performs in tandem with the proven VISCPRO® II software for Windows® 98/NT®/XP®, providing convenient sample ID data entry, database maintenance, and powerful reporting and LIMS connectivity capabilities.

Operation

Operation of the miniAV-X is simple. The user fills the sample vials and then places them into a numbered carousel beneath the viscometer. Carousel locations are numbered 1 to 10. Sample ID information is entered via the computer. The user initiates the test with a single mouse click. Without further operator involvement, the sample is drawn into the viscometer tube, held for temperature equilibration, and then measured. Data is transferred to the computer database via the RS-232 serial connection. The sample is then ejected as waste, and the sample vial becomes a wash station as solvent is automatically metered into the viscometer tube and then evacuated to complete the cleaning cycle. Following tube drying, the vial is lowered and placed in its original position. The next sample is automatically advanced to a position directly under the viscometer tube. This sequence is repeated until all 10 tests are complete. Total cycle time for each test is 3 to 5 minutes depending on the viscosity. Connect two miniAV-X's to a single PC to easily determine Viscosity Index for a sample. Up to four miniAV-X's may be controlled by a single PC.

Accuracy

The miniAV-X provides automatic kinematic viscosity testing within parameters specified by ASTM D445/446 and ISO 3104/3105. The miniAV-X measures flow rates within ±0.001 second by electronically timing the liquid meniscus as it moves between thermistor timing sensors. Bath temperature is controlled with accuracy better than ±0.01°C between 20° and 100°, as required by ASTM D445/446. Thermistor sensors allow dark or opaque liquids to be measured with the same precision as transparent fluids – without the need to change tubes. Unlike non-traditional bench-top instruments which claim D445 correlation, the miniAV-X is truly a KinVis instrument. Using a capillary viscometer defined in D446, the miniAV-X performs equally well on Newtonian materials, fully formulated oils and additives.

Features

The miniAV-X bath unit housing is only 10"W x 17"D x less than 21"H. Modular side panels swivel out for convenient maintenance/ replacement. The modified Ubbelohde compound viscometer tube offers a 100-fold viscosity range (easily covering the range of 5 separate manual glass viscometers), and requires only 5 mL of sample (3 mL with Fast-Run tubes). The tube rests in a 1-liter temperature bath that also contains temperature and fluid level sensors, optional TE cooling device, heating elements, and an impeller that circulates bath fluid to ensure high temperature uniformity.

Like the fully-automatic high capacity CAV 2000 Series instruments, the miniAV-X offers selectable temperatures between 20° and 100°C. Data is transmitted to and from the controlling computer via a standard RS-232 serial interface.

The instrument is shipped with the VISCPRO II controlling software, external power supply, and waste receiver assembly. Convenient chromatography-type container lids are provided for connecting your in-house solvent containers to the miniAV-X.

Required accessories

The miniAV-X requires a computer with the Windows® 98/NT®/XP® operating system. The user must provide a suitable non-pressurized solvent container for each solvent. For test temperatures below 30°C or for operation in high-ambient environments, an optional chiller or TE bath chiller is required.

miniAV®-X Automatic Viscometer Specifications

miniAV-X Dimensions:	254 mm wide x 437 mm deep x 526 mm high (10 x 17.2 x 20.7")
Power Supply Dimensions:	330 mm wide x 396 mm deep x 172 mm high (13 x 15.6 x 6.8")
Weight:	Bath Unit: 18 kg (40 lbs); Power Supply: 11 kg (24 lbs); Waste Receiver: 6 kg (13 lbs)
Shipping Weight:	57 kg (125 lbs) with all units/accessories
Operating Conditions:	15°-30°C, 10%-90% RH non-condensing, Installation Category II, Pollution degree 2
Fuse Rating:	115V & 100V Units: M 250V 8A, 1.25 x 0.25"; 230V Unit: M 250V 4A, 1.25 x 0.25"
Compliance:	CE Mark: EMC directive (89/336/EEC); Low voltage directive (73/23/EEC); HI-POT (1900 VDC, 60 sec.)
Computer Requirements	Computer not included, please contact Cannon for specifications.

miniAV® Order Information

Catalog #	Item Description
9725-A85	miniAV-X 115v 50/60 hz
9725-A86	miniAV-X 230v 50/60 hz
9725-A87	miniAV-X 100v 50/60 hz
P81.1085	44C thermometer (20° C)
P81.1086	120C thermometer (40° C)
P81.1087	121C thermometer (100° C)
P81.1088	46C thermometer (50° C)
P81.2450	DigiSense Thermometer, Digital Kit 115V
P81.2451	DigiSense Thermometer, Digital Kit 230V

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CANNON miniQV™-X Quick Automatic Viscometer

A New Approach to in-service Oil Viscosity Measurement

Less Sample
+ Less Solvent
+ Less Waste
+ Less Time
= More $ Value

- Rapid Analysis – 3 min or less
- Reduced Lab Operating Costs
- Small Sample Volume 4 to 5mL
- Uses Low Cost 17x100 mm Standard HDPE Sample Vial
- Low Solvent Usage - 8mL per sample
- Quick Tube Replacement
- High Reliability/Easy Serviceability
- Small Footprint

Only $0.035 in Consumables per Test

CANNON INSTRUMENT COMPANY®

Instruments for Quick Automated Viscosity Determination

CANNON **miniQV-X** Quick Automatic Viscometer with 25 place auto sampler

High Performance Automation for in-service Oil Analysis

The miniQV-X from CANNON Instrument Company offers the laboratory an exciting new tool for convenient and rapid kinematic viscosity (KV) measurement. Occupying roughly the same footprint as a tabletop rotational viscometer, the miniQV-X automates the time-consuming sample measurement and viscometer tube wash/dry procedures associated with the ASTM D445 method, freeing the laboratory technician for other duties. The miniQV-X is designed as a rapid fully-automated viscosity analysis tool - an alternative to slower D445 compliant manual measurements. Operation of the miniQV-X is simple and quick with typical sample-to-sample cycle times of less than three minutes.

Required accessories

The miniQV-X requires a computer with the Windows® 98/NT®/XP® operating system. The user must provide a suitable non-pressurized solvent container for each solvent and a waste container.

miniQV-X Features

Viscosity Range:

- 40°C: 25 to 125 mm^2/s
- 100°C: 5 to 50 mm^2/s

Tube Type: Fast Run D446 Ubbelohde style

Auto-Sampler: Removable 25 position rotary

Methodology:

- Follows most ASTM D445 principles
- Shorter flow times than available by D445 with kinetic energy correction
- ±0.01°C temperature accuracy
- Quick tube wash and dry

Optional Accessories:

- Solvent Reservoir with low level alarm
- PC Computer control for up to 4 units
- Central Waste Repository w/ high level alarm

Bath Safety features suspend testing for:

- Bath over temperature
- Low bath liquid
- Empty solvent
- Missing sample vial

- VISCPRO® II software for Windows® 98/NT®/XP®
- Powerful reporting and LIMS connectivity
- The miniQV-X measures flow rates within ±0.001 seconds
- Thermal meniscus detection – eliminates issues caused by opaque samples
- Bath temperature is controlled with accuracy better than ±0.01°C between 40° and 100°
- Low sample volume Ubbelhode style tube 4 to 5mL
- Low solvent consumption- 8mL typical per sample

miniQV-X Automatic Viscometer Specifications

Dimensions

miniQV-X:	254 mm wide x 437 mm deep x 598 mm high (10 x 17.2 x 23.5")
Power Supply:	330 mm wide x 396 mm deep x 172 mm high (13 x 15.6 x 6.8")
Weight:	miniQV-X bath unit: 27 kg (45 lbs); Power Supply: 11 kg (24 lbs); Waste Receiver: 6 kg (13 lbs)
Shipping Weight:	68 kg (130 lbs) with all units/accessories
Operating Conditions:	15°-30°c, 10%-90% RH non-condensing, Installation Category II, Pollution degree 2
Fuse Rating:	115V & 100V Units: M250V 8A, 1.25 X 0.25"; 230V Unit: M 250V 4A, 1.25 X 0.25"
Compliance:	CE Mark: EMC directive (89/336/EEC); Low voltage directive (73/23/EEC); HI-POT (1900 VDC, 60 sec.)
Computer Requirements:	Computer not included, Please contact CANNON for specifications.

miniQV-X Order Information

Catalog#	Item Description
9725-A88	miniQV-X 100v 50/60 Hz 500 Watts
9725-A89	miniQV-X 115v 50/60 Hz 500 Watts
9725-A90	miniQV-X 230v 50/60 Hz 500 Watts
P81.1086	120C thermometer (40°C)
P81.1087	121C thermometer (100°C)
P81.2450	DigiSense Thermometer, Digital Kit 115V
P81.2451	DigiSense Thermometer, Digital Kit 230V

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CANNON® miniAV® Automatic Viscometer

- **Meets all ASTM D 445 Precision Specifications**
- **Convenient and Affordable Automated Testing**
- **100-Fold Range Tubes for Kinematic ViscositiesBetween 0.5 and 6,000* mm²/s**
- **Selectable Temperature Range Between 20° and 100°C**
- **Attractive and Compact Tabletop Unit—Save Space, Save Time, Save Money!**

*Additional application-specific extended range tube designs available; some upper viscosity measurements may be limited by test temperature.

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Affordable D 445 Automation

The miniAV® from CANNON Instrument Company offers every laboratory an exciting new tool for convenient and highly accurate kinematic viscosity (Kin Vis) measurement. Occupying roughly the same footprint as a tabletop rotational viscometer, the miniAV automates the time-consuming sample measurement and viscometer tube wash/dry procedures associated with the ASTM D 445 method, freeing the laboratory technician for other duties. The miniAV has been designed as an affordable alternative to traditional labor-intensive manual Kin Vis measurement methods.

The miniAV performs in tandem with the proven VISCPRO® II software for Windows® 98/NT®/XP®, providing convenient sample ID data entry, database maintenance, and powerful reporting and LIMS connectivity capabilities. Up to four miniAV® instruments can be connected to a single PC.

Operation

Operation of the miniAV is simple. The user fills the sample vial, places it in the vial holder beneath the viscometer, and raises it into position. Sample ID information is entered via the computer. The user initiates the test with a single mouse click. Without further operator intervention, the sample is drawn up into the viscometer tube, held for temperature equilibration, and then measured. Data is automatically transferred to the computer database via the RS-232 serial connection. The sample is then ejected as waste, and the sample vial becomes a wash station as solvent is automatically metered into the viscometer tube and then evacuated to complete the cleaning cycle. Following tube drying, the vial holder is lowered to its original position, ready to receive the next sample. Total cycle time for a test is about five to eight minutes depending on the viscosity.

Accuracy

The miniAV provides automatic Kin Vis testing within parameters specified by ASTM D 445/446 and ISO 3104/3105. The miniAV-X measures flow rates within ±0.001 second by electronically timing the liquid meniscus as it moves between thermistor timing sensors. Bath temperature is controlled with accuracy better than ±0.01°C between 20° and 100°, as required by ASTM D 445/446. Dark or opaque liquids may be measured with the same precision as transparent fluids – without the need to change tubes.

Unlike non-traditional bench-top instruments which claim D445 correlation, the miniAV is truly a KinVis instrument. Using a capillary viscometer defined in D446, the miniAV performs equally well on Newtonian materials and fully formulated end products.

Features

The miniAV bath unit housing is only 10 inches wide, and the unit is less than 21 inches in height. Modular side panels swivel out for convenient maintenance/service. The modified Ubbelohde compound viscometer tube offers a 100-fold viscosity range (easily covering the range of 5 separate manual glass viscometers), and requires only 5-10 mL of sample (as little as three mL with Fast-Run tubes). The tube rests in a 1-liter temperature bath that also contains temperature and fluid level sensors, cooling coil, heating element, and impellers that circulate bath fluid to ensure high temperature uniformity. Like its fully-automatic cousins in the CAV 2000 Series, the miniAV offers selectable temperatures between 20° and 100°C.

The instrument is shipped with an external power supply and waste receiver assembly. Convenient chromatography-type container lids may be used for connecting cap thread #38 reagent bottles to the miniAV.

Required Accessories

The miniAV requires a computer with the Windows® 98/NT®/XP® operating system. The user must provide a suitable non-pressurized solvent container for each solvent. For test temperatures below 40°C or for operation in high-ambient environments, a chiller is required;

miniAV® Automatic Viscometer Specifications

miniAV Dimensions:	254 mm wide x 264 mm deep x 518 mm high (10 x 10.5 x 20.5")
Power Supply Dimensions:	330 mm wide x 356 mm deep x 159 mm high (13 x 14 x 6.25")
Weight:	12.5 kg (27.5 lbs) without bath fluid, Power Supply and Waste Receiver
Shipping Weight:	51 kg (113 lbs) with all units/accessories
Operating Conditions:	15°-30°C, 10%-90% RH non-condensing, Installation Category II, Pollution degree 2
Fuse Rating:	115V & 100V Units: M 250V 8A, 1-1/4 x 1/4""; 230V Unit: M 250V 4A, 1-1/4 x 1/4"
Compliance:	CE Mark pending: EMC directive (89/336/EEC); Low voltage directive (73/23/EEC); HI-POT (1900 VDC, 60 sec.)

miniAV® Order Information

Catalog #	Item Description
9725-A80	miniAV 115v 50/60 hz
9725-A81	miniAV 230v 50/60 hz
9725-A82	miniAV 100v 50/60 hz
P81.1085	44C thermometer (20° C)
P81.1086	120C thermometer (40° C)
P81.1087	121C thermometer (100° C)
P81.1088	46C thermometer (50° C)

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