

fb
fisher biotec
australia

MORE THAN
20
YEARS
IN BUSINESS
Established 1997

Australian distributors:
Fisher Biotec Australia
free call: 1800 066 077
email: info@fisherbiotec.com
web: www.fisherbiotec.com

Sine-wave Vibro Viscometer
SV-10/SV-100



Viscometry Revolution!



AND ...Clearly a Better Value
A&D Company, Limited

Sine-wave Vibro Viscometer

Viscometry Revolution!

Newly developed Tuning-fork Vibration method* promises you high accuracy and a wide measurement range without replacing the sensor plates!! (* Patent pending)

Sine-wave Vibro Viscometer SV series measures viscosity by detecting the driving electric current necessary to resonate the two sensor plates at a constant frequency of 30Hz and amplitude of less than 1mm.

Selectable Wide Measurement Range

Samples with very low viscosity to very high viscosity can be measured without changing the sensor plates, so a wide range of measurements can be made continuously.

(SV-10: 0.3mPa·s - 10,000mPa·s / SV-100: 1,000mPa·s - 100,000mPa·s)

High Measurement Accuracy

The sine-wave Vibro Viscometer SV series, incorporating the innovative Tuning-fork Vibration Method, provides an excellent repeatability of 1% of reading for viscosity measurement.

Temperature Measurement

It is very important to measure the temperature of the fluid correctly because the viscosity is very much dependent upon the temperature of the fluid. The SV series can detect accurate temperature immediately because the fluid sample and the detection unit (sensor plates) with small surface area/thermal capacity reach thermal equilibrium in only a few seconds.

Real-time Measurement

The SV series sensor plate is very thin and small, both in area and in mass, which means that the sample is not adversely affected by temperature change. As a result, a stable viscosity measurement can be monitored in real-time.

Non-Newtonian Sample Viscosity Measurement

Thin sensor plates allow little disturbance of sample texture and thus enable measurement of stable viscosity values.

Sol and Gel Measurement

Sol and Gel sample fluid like starch can be measured during the change of material characteristic.

Standard RS-232C Interface

The RS-232C comes as standard for your PC or Printer connectivity and the connection cable (25 pin – 9 pin) is also standard for your convenience.

Continuous Measurement

The SV series Tuning-fork Vibration Method does not disturb the sample fluid and allows measurement of cloud point of samples such as surface active agents and of surface/interface changes such as wettability due to its ability to measure a wide range without the need to replace the sensor plates.

Viscosity Calibration

Using a Viscosity Standard, viscosity calibration can be easily done. 1 point calibration or 2 point calibration is selectable in the calibration mode.

Data Collection and Graphing Software

WinCT-Viscosity (RsVisco) software transmits viscosity and temperature measurement data to a PC and displays it on a graph in real-time.

Small Sample Size

The standard sample cup requires just over 35ml of sample fluid so there is very little waste. (Optional 10ml/13ml sample cups are also available.)

Easy Cleaning

Due to their simple structure, the SUS 304 stainless steel sensor plates and temperature sensor (all gold-plated) and SUS 304 stainless steel protector can be quickly and easily cleaned.

Flowing Sample Measurement

Even the viscosity of flowing samples can be measured, including liquid in turbulent flow, enabling field data measurement, which is as reliable as measurements in a laboratory.

Vacuum Fluorescent Display

You can avoid unnecessary reading errors with an easy-to-read, large, clear display: 13mm height for viscosity measurement and 11mm height for temperature measurement.

JCSS (Japan Calibration Service System)

The SV series measurement method has been recognized in Japan by JCSS as an official viscosity measurement instrument, which meets JIS Q 17025 (2005) requirements (equivalent to ISO/IEC 17025: 2005). The SV series measurement method also complies with the Guide to the expression of uncertainty in measurement (GUM) and ISO/TR 3666 (1998) – Viscosity of water.

Foaming Sample Measurement

A low drive frequency of 30Hz allows measurement of foaming samples without breaking minute foams and with less influence scattering larger foams.

Separated Type Model

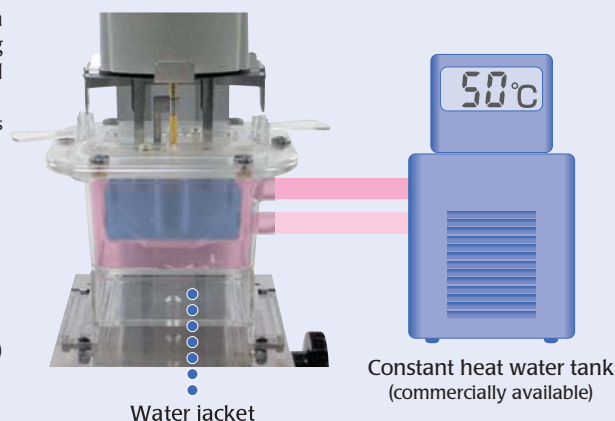
The SV-10 series is composed of a Display Unit and a Main Unit offering excellent placement flexibility.

Sample Temperature Control

Our water jacket (AX-SV-37) (optional) used in conjunction with a commercially available constant heat water tank to heat the circulating system, ensures that the sample remains at a constant temperature and that the temperature can be changed for viscosity measurement.

(A small sample cup AX-SV-34 and a glass sample cup AX-SV-35 are available, as optional accessories.)

- AX-SV-37 Application of temperature control of sample fluid
 - Water jacket (body: polycarbonate, packing: silicon gum)
 - Small sample cup & lid (4 of each provided)
 - Can be used with the small sample cup provided, or with a glass sample cup (AX-SV-35)
 - Specifications
 - Application temperature range : 0°C – 100°C
 - Outer dimension of nozzle for circulation : 10.5mm diameter
 - Recommended hose : silicon tube, inner measurement 8mm diameter
 - Additionally, a commercially available constant heat water tank is necessary
 - A stirrer can be set at the base of the water jacket, and can stir up to a viscosity of 1,000mPa·s. (SV-10 only)
- Stirrer: VARIOMAG MICRO made by H+P Labortechnik (Germany)
Please use a rotator with dimensions 6mm (length) x 4mm (diameter).



SV-10/SV-100

SV-10

0.3mPa·s–10Pa·s*
(0.3–10,000mPa·s)

SV-100

1–100Pa·s
(1,000–100,000mPa·s)

Sensor Unit



Corrosive-resistant gold-plated sensor plate

Only 35ml of sample needed

Corrosive-resistant gold-plated temperature sensor

Display Unit

Easy-to-read VFD for viscosity and temperature.
Only 6 keys for simple operation.



Wide range

SV-10 0.3mPa·s–10Pa·s
SV100 1–100Pa·s

Measurement begins approx.
15 secs after pressing the [START] key

Separated Display Unit

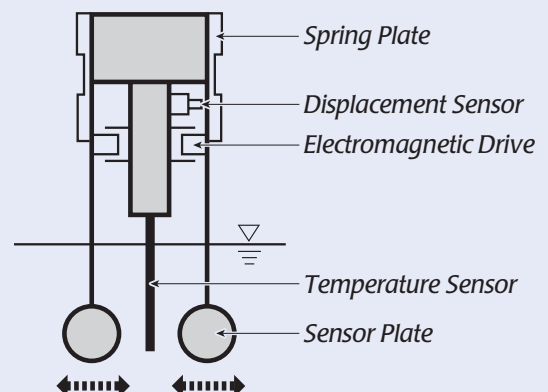
Main Unit and Display Unit for a variety of applications



Measurement Principle for SV Series

The SV series has 2 thin sensor plates that are driven with electromagnetic force at the same frequency by vibrating at constant sine-wave vibration in reverse phase like a tuning-fork.

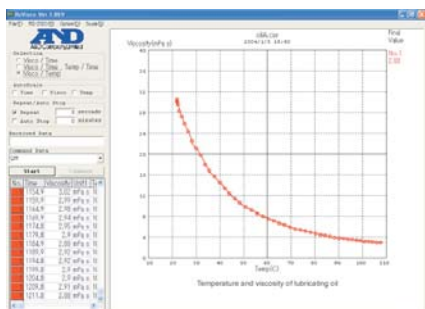
The electromagnetic drive controls the vibration of the sensor plates to maintain constant amplitude. The driving electric current, which is an exciting force, will be detected as the magnitude of viscosity produced between the sensor plates and the sample fluid. The coefficient of viscosity is obtained by the correlation between the driving electric current and the magnitude of viscosity.



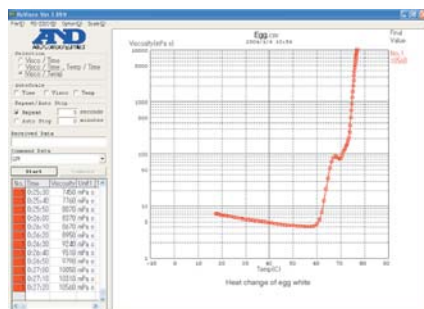
*1,000mPa·s - 10,000mPa·s can be written also as 1Pa·s - 10Pa·s

WinCT-Viscosity

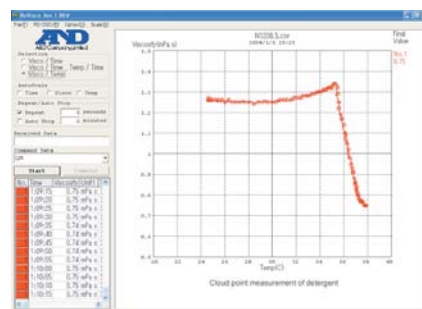
RsVisco software was developed for the transmission of real-time viscosity and temperature measurement results from the SV series to a PC. The results are displayed in a graph format with scaling conversion and logarithm display functions available. The user can save the measurement data as a "CSV" file and open it using RsVisco for future analysis of a sample.



Temperature and viscosity of lubricating oil



Heat change of egg white or Log display



Cloud point measurement of detergent

Specifications

	SV-10	SV-100
Measurement Method	Sine-wave Vibro Viscometer using Tuning Fork Vibration Method	
Vibration Frequency	30Hz	
Viscosity Measurement Unit	mPa·s, Pa·s, cP, P	Pa·s, P
Viscosity Measurement Range	0.3mPa·s – 10Pa·s (0.3 – 10,000mPa·s)	1 – 100Pa·s (1,000 – 100,000mPa·s)
Accuracy	1% of Repeatability (S.D., 20 – 30°C, No condensation)	
Operating Temperature	10 – 40°C (50 – 104°F)	
Minimum Sample Amount	Standard Sample Cup (35ml-45ml), Optional Small Sample Cup (10ml), Optional Glass Sample Cup (13ml)	
Temperature Measurement	0 – 160°C / 0.1°C (32 – 320°F/0.1°F)	
Display	Vacuum Fluorescent Display (VFD)	
Interface	RS-232C	
Power Supply	AC Adaptor	
Power Consumption	Approx. 14VA	
Physical Dimensions	Main Unit : 332 (W) x 314 (D) x 536 (H) mm / Approx. 5.0 kg Display Unit : 238 (W) x 132 (D) x 170 (H) mm / Approx. 1.3 kg	
Connection Cable Length	1.5m (Between the Main Unit and the Display Unit)	
Standard Accessories	Manual , AC Adaptor , CD-ROM (WinCT-Viscosity) Sample Cups , RS-232C Cable (25 pins – 9 pins)	

Accessories



Small sample cup (10ml)
Used when measuring small volume samples



Glass sample cup (approx. 13ml)
Used when measuring solvents, etc.



Water jacket
Used to keep the temperature of the sample constant, or to change the temperature. A constant temperature water tank is also necessary.



Positioning stopper
Used to set the sensor unit and sensor plates to a uniform height when making repeated measurements.

- AX-SV-33 Sample cup (PC [polycarbonate], volume 35ml – 45ml) Same as container that comes as standard with the SV unit. Set of 10 pcs
- AX-SV-34 Small sample cup (PC [polycarbonate], volume 10 ml) Set of 10 pcs Set of 10 lids included
- AX-SV-35 Glass sample cup (volume approx. 13ml)
- AX-SV-36 Positioning stopper
- AX-SV-37 Water jacket (body: polycarbonate, packing: silicon gum), with 4 sets of small sample cup and lids
- AX-SV-38 Glass sample cup (volume approx. 60ml) Set of 10 pcs
- AX-SV-42 Analogue voltage output (0 – 1V)
- AX-SV-43 Extension cable (5m) to connect measuring unit to display unit
- AD-8121B Compact printer

AND ...Clearly a Better Value



Australian distributors:
Fisher Biotec Australia
free call: 1800 066 077
email: info@fisherbiotec.com
web: www.fisherbiotec.com



Sine-wave Vibro Viscometer

SV-1A

Series



Australian distributors:
Fisher Biotec Australia
free call: 1800 066 077
email: info@fisherbiotec.com
web: www.fisherbiotec.com

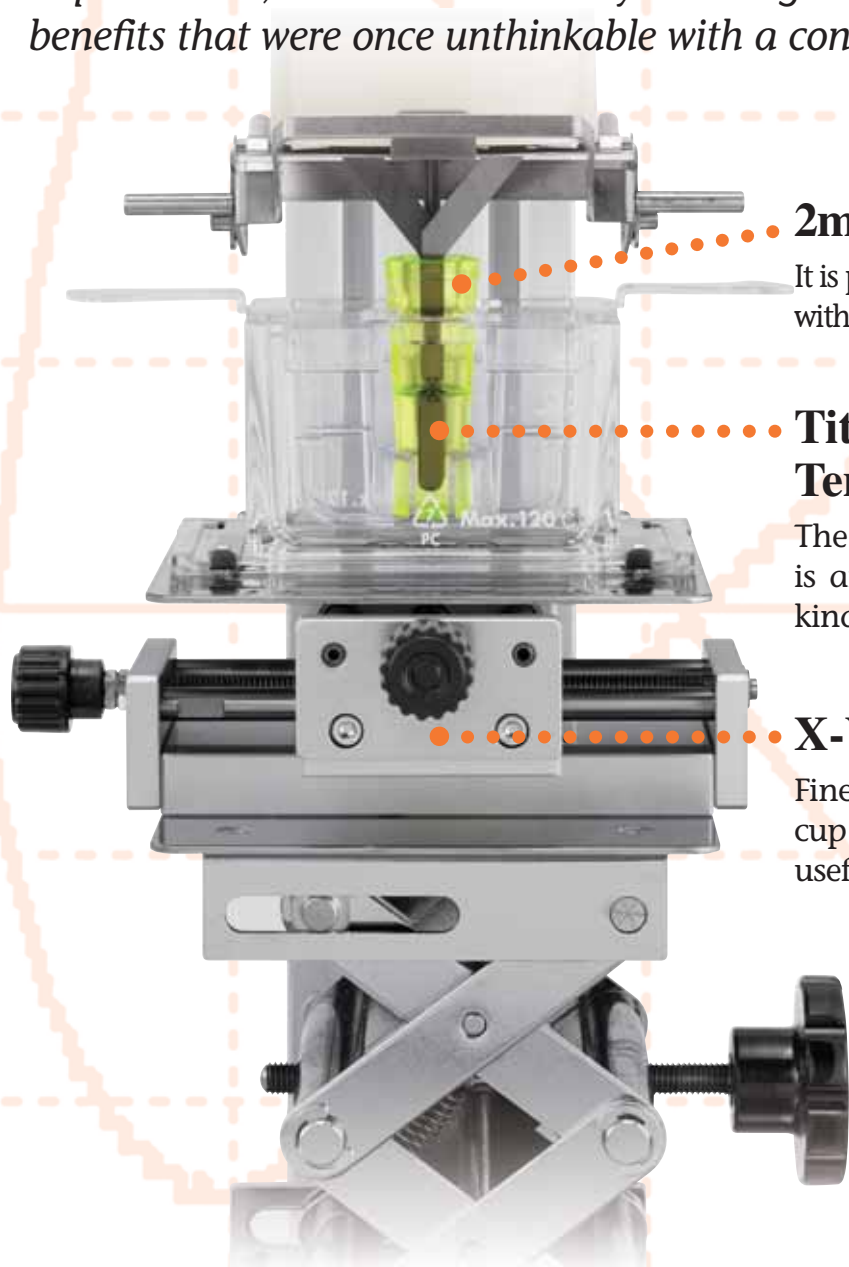


2ml Sample Measurement
Now Possible!



A&D's own technology is setting a new standard for viscosity measurement!

Speed? Accuracy? User-friendly? A&D's highly sensitive, tuning-fork vibration viscometer, the SV-A series, not only completely satisfies these basic requirements, but does more by offering users a number of additional benefits that were once unthinkable with a conventional viscometer. *Patent Approved*



2ml Sample Measurement

It is possible to perform viscosity measurements with sample liquid as small as 2ml (SV-1A).

Titanium Sensor Plates and Temperature Sensor

The sensors are made of titanium, which is anti-corrosive and resistant to various kinds of chemical substances.

X-Y-Z Stage

Fine position adjustment of the sample cup in three directions. This is especially useful when the sample cup is very small.

Wide-range, Continuous Measurements without Replacing the Sensor Plates

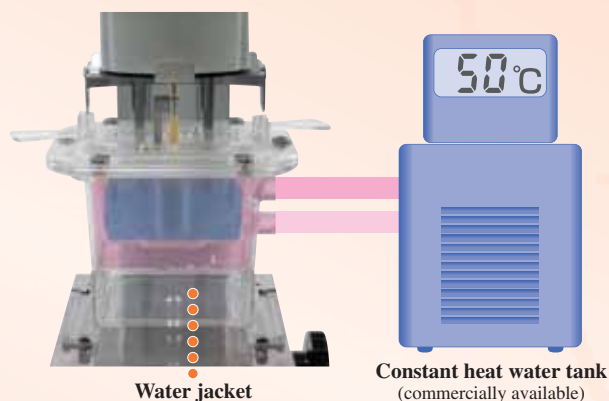
Unlike the rotational viscometer, which requires several different rotors to cover a wide range of measurements, the SV-A series is capable of using the same, fixed sensor plates to perform **continuous measurements** from **very low** to high viscosity [SV-1A: 0.3 ~ 1000mPa·s (cP), SV-10A: 0.3 ~ 10000mPa·s (cP), SV-100A: 1000 ~ 100000mPa·s (cP)].

Simultaneous Measurements of Temperature and Viscosity

It is widely known that viscosity is very temperature dependent ($-2 \sim -10\%/^{\circ}\text{C}$). The SV-A series has a temperature sensor ($0 \sim 160^{\circ}\text{C}$) right next to the viscosity sensor plates, enabling users to easily monitor the relationship between viscosity and temperature.

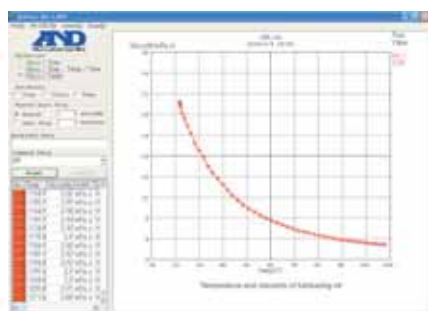
Sample Temperature Control

A water jacket is provided as standard to be used in conjunction with a commercially available constant heat water tank to heat the circulating system. This ensures that the sample remains at a constant temperature and that the temperature can be changed for viscosity measurement ($0 \sim 100^{\circ}\text{C}$).

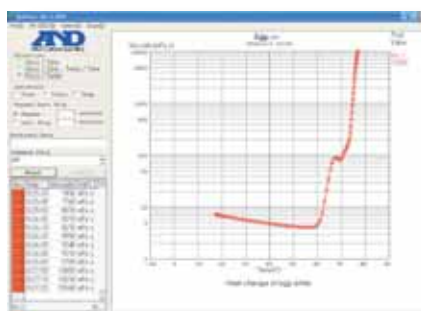


Standard Windows Communication Tools WinCT-Viscosity and a Serial-USB Converter

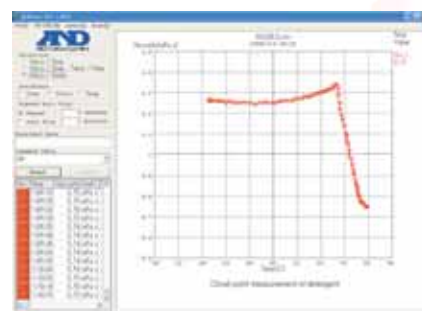
The graphing program RsVisco receives the viscosity and temperature data from the SV-A series and creates a graph on a personal computer **in real time**. As such, changes in viscosity and temperature over time as well as the correlation between viscosity and temperature can be observed visually.



Temperature and viscosity of lubricating oil



Heat change of egg white or Log display



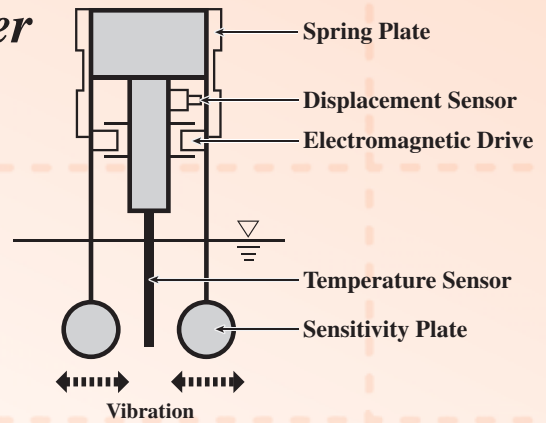
Cloud point measurement of detergent

Example Applications

- Measure the viscosity necessary for the correction of particle size distribution
- Control the viscosity of resist liquids, inks, coating materials, adhesives, etc.
- Control the viscosity of abrasives for semiconductors, ceramic materials, etc.
- Measure the cure processes of polymers, soldering flux, proteins, and gelation point, etc.
- Detect the cloud points of nonionic surface-active agents
- Measure viscosity variation due to changes in temperature of a lubricant, engine oil, food, etc.
- Quantify the "swallowability" of beverages
- Quantify the physical properties of biological substances, such as blood, etc.

Tuning-fork Vibration Viscometer

The tuning-fork vibration viscometer has a pair of thin sensor plates of the same natural frequency, which are driven with electromagnetic force to vibrate at the same amplitude. The viscosity produced between the sensor plates and the sample liquid is detected based on the amount of electronic current required to drive the sensor plates and maintain them at a constant amplitude.



- The vibration viscometer is accredited as a Japan Calibration Service System (JCSS) standard device by the National Institute of Technology and Evaluation (NITE), along with the capillary viscometer and the rotational viscometer.
- The sensor plates have very small thermal capacity and cause only minute displacement in the sample liquid, which prevents changes to the temperature and the physical properties of the sample.
- Since the two sensor plates vibrate in reverse phase, it is possible to measure the viscosity of a sample while flowing or being stirred.

Very Quick Measurement

The initial viscosity coefficient will be indicated **just 15 seconds** after starting the measurement. The measured values will then be displayed in real time in response to the changes in viscosity.

High Accuracy

The SV-A series achieves an excellent repeatability of 1% of reading over its full measurement range.

Low Viscosity Measurement

No other viscometer is capable of measuring viscosity from as low as 0.3mPa·s. (SV-1A/10A)

Easy Calibration

Both one-point and two-point calibrations are possible using either viscosity standard liquids (optional) or samples of known viscosities. **Simplified Calibration function**, a one-key operation that utilizes purified water is also available for the SV-1A/10A.

Clearly Visible Display

Easy-to-read VFD for viscosity and temperature. Only 6 keys for simple operation.



Portable Sensor Unit

The sensor unit can be detached to perform measurements on location at a manufacturing factory, field research, etc. A portable carrying case is also provided as standard.



Standard Cup Set for SV-1A (AX-SV-55)

Sample cup:

45 ml, Polycarbonate × 5 pcs

2 ml, with lid, Polycarbonate × 10 pcs

2 ml, Glass × 10 pcs

2ml sample cup holder, Polycarbonate:

Transparent × 3 pcs

Black × 2 pcs

2ml sample cup stand × 1 pc

Water jacket × 1 pc



Standard Cup Set for SV-10A/100A (AX-SV-54)

Sample cup:

45 ml, Polycarbonate × 5 pcs

10 ml, with cover, Polycarbonate × 5 pcs

13 ml, Glass × 2 pcs

Glass sample cup holder, Stainless steel × 1 pc

Water jacket × 1 pc



Anti-Vibration Table AD-1685 (optional)

Depending on the measurement location, the highly sensitive tuning-fork vibration sensor can be influenced by low-frequency vibrations that cannot be detected by humans. AD-1685 effectively isolates such adverse vibrations from the viscometer to guarantee stable and accurate measurements.



Specifications

	SV-1A	SV-10A	SV-100A
Measurement Method	Tuning Fork Vibration Method (Natural Frequency at 30Hz)		
Viscosity Measurement Unit	mPa·s, Pa·s, cP, P		Pa·s, P
Viscosity Measurement Range	0.3~1000mPa·s	0.3~10000mPa·s	1~100Pa·s
Repeatability	1% of Reading (S.D., 20~30°C, No condensation)		
Minimum Sample Amount	2ml~	10ml~	
Temperature Measurement	0~160°C / 0.1°C (32~320°F/0.1°F)		
Display	Vacuum Fluorescent Display (VFD)		
Power Supply	AC Adaptor (Approx. 14VA)		
External Dimensions / Mass	Main Unit: 112 (W)×132 (D)×291(H) mm / Approx. 0.8kg Display Unit: 238 (W)×132 (D)×170(H) mm / Approx. 1.3kg		
Standard Accessories	Stand for Securing the Sensor Unit, X-Y-Z Stage, Cup Set Software Set (including a Serial-USB Converter) AC Adaptor, Connection Cable (1.5m), Carrying Case		

Options

Item	Description	SV-1A	SV-10A	SV-100A
AX-SV-33	Sample Cup, 45ml, Polycarbonate × 10pcs	○	○	○
AX-SV-34	Small Sample Cup, 10 ml, with Cover, Polycarbonate × 10pcs	○	○	○
AX-SV-35	Sample Cup, 13ml, Glass × 1pc	○	○	○
AX-SV-36	Positioning Stopper × 1pc	○	○	○
AX-SV-37	Water Jacket × 1pc, Small Sample Cup with Cover × 4pcs	○	○	○
AX-SV-38	Storage Container, 60ml, Glass × 10pcs	○	○	○
AX-SV-39	Storage Container, 120ml, Plastic × 20pcs	○	○	○
AX-SV-42	Analog Voltage Output (0 ~ 1V)	○	○	○
AX-SV-43	Extension Cable (5m) to connect the main unit and the display unit	○	○	○
AX-SV-51	Stand Set with X-Y-Z Stage	○	○	○
AX-SV-52	X-Y-Z Stage × 1pc	○	○	○
AX-SV-53-EX	Software Set (WinCT-Viscosity × 1pc, 25P-9P RS-232C Cable × 1pc, Serial-USB Converter × 1pc)	○	○	○
AX-SV-54	Cup Set for SV-10A/100A	○	○	○
AX-SV-55	Cup Set for SV-1A	○		
AX-SV-56-1	2ml Sample Cup Holder, Polycarbonate, Transparent × 5pcs	○		
AX-SV-56-2	2ml Sample Cup Holder, Polycarbonate, Black × 5pcs	○		
AX-SV-57	2ml Sample Cup Stand × 2pcs	○		
AX-SV-58	Sample Cup, 2ml with Lid, Polycarbonate × 100pcs	○		
AX-SV-59	Sample Cup, 2ml, Glass × 5pcs, 2ml Sample Cup Stand × 1pc	○		
AX-USB-25P-EX	Serial-USB Converter	○	○	○
AD-8121B	Compact Printer	○	○	○
AD-1682	Rechargeable Battery	○	○	○
AD-1685	Anti-Vibration Table	○	○	○
AX-SV-31-2.5	Standard Liquid for Calibration JS2.5 (500ml)	○	○	
AX-SV-31-5	Standard Liquid for Calibration JS5 (500ml)	○	○	
AX-SV-31-10	Standard Liquid for Calibration JS10 (500ml)	○	○	
AX-SV-31-20	Standard Liquid for Calibration JS20 (500ml)	○	○	
AX-SV-31-50	Standard Liquid for Calibration JS50 (500ml)	○	○	
AX-SV-31-100	Standard Liquid for Calibration JS100 (500ml)	○	○	
AX-SV-31-200	Standard Liquid for Calibration JS200 (500ml)		○	
AX-SV-31-500	Standard Liquid for Calibration JS500 (500ml)		○	
AX-SV-31-1000	Standard Liquid for Calibration JS1000 (500ml)		○	
AX-SV-31-2000	Standard Liquid for Calibration JS2000 (500ml)			
AX-SV-31-14000	Standard Liquid for Calibration JS14000 (500ml)			○
AX-SV-31-160000	Standard Liquid for Calibration JS160000 (500ml)			○

Temperature should be kept at or below 25°C when performing calibrations with the SV-100A.



X-Y-Z Stage



2ml Sample Cup Holder (Transparent)



2ml Sample Cup Holder (Black)

AND ...Clearly a Better Value
A&D Company Limited

fb
fisher biotec
australia

MORE THAN
20
YEARS
IN BUSINESS
Established 1997

Australian distributors:
Fisher Biotec Australia
free call: 1800 066 077
email: info@fisherbiotec.com
web: www.fisherbiotec.com