

ViscoClock *plus*

AUTOMATIC VISCOSITY MEASUREMENT
EASY AND PRECISE

SI Analytics

a xylem brand

ViscoClock *plus* - Measurement *plus* data storage

The ViscoClock *plus* is an electronic timing unit for glass capillary viscometers used to determine kinematic and relative viscosity. Succeeding the well-proven ViscoClock, the new instrument features data storage and simpler handling. The ViscoClock *plus* is especially designed for Ubbelohde type viscometers which are well-known for highest precision.

The ViscoClock *plus*

The ViscoClock *plus* automatically measures the flow time of temperature-stabilized liquids in capillary viscometers by means of infrared light barriers: the manual measurement with a stopwatch becomes obsolete.

The viscometer including a sample is inserted into the ViscoClock *plus* and immersed into a thermostatic bath for temperature stabilization. After thermostating, the sample is pumped into the measuring bulb, and the flow time is detected automatically. The large display enables easy read-off of flow times and additional information: date, time, sample ID and viscometer ID.



ViscoClock *plus* - head

Automatic measurement of flow times

The ViscoClock *plus* is designed for SI Analytics® Ubbelohde, Micro Ubbelohde and Micro Ostwald viscometers. The flow time is measured automatically by two infrared light barriers which detect the passing liquid meniscus. The repeatability of the automatic time measurement is considerably higher in comparison to the measurement using a stop watch. Therefore some viscometry standards allow a flow time reduction in case of automatic flow time measurement.

Properties and materials

The ViscoClock *plus* can be used for measuring temperatures ranging from -40 °C to 150 °C. The stand of the ViscoClock *plus* is made of high quality polymer PPA. For temperature stabilization in a thermostatic bath, the following liquids are suitable: Water, alcohol, glycol, paraffin oil, and silicon oil.

The electronic measuring unit is built-in to a PP casing.

Easy handling

The ventilation of Ubbelohde viscometers is managed by an electromechanic valve which makes handling easier in comparison to the mechanical mechanism of the previous ViscoClock.

Data storage

The measuring results of the ViscoClock *plus* can be stored on a USB flash drive including date, time and sample/viscometer ID. The data are stored as pdf (non-editable) and csv (editable). Alternatively, for data transfer the ViscoClock *plus* can be connected to a printer (TZ 3863) or a PC.



- ▶ Automatic and precise flow time measurement for a low price
- ▶ Suitable for SI Analytics® Ubbelohde, Micro Ubbelohde and Micro Ostwald viscometers
- ▶ Data storage incl. time, date, viscometer and sample ID
- ▶ Stand is made of high performance engineering plastic PPA and enables measuring temperatures up to 150°C
- ▶ Electromagnetic venting valve for convenient handling of Ubbelohde viscometer
- ▶ Compatible with all SI Analytics® thermostatic bath types

Benefits
ViscoClock *plus*

ViscoClock *plus* - The **plus** for your measurements

Sample and viscometer identification

To allocate the stored measuring results, the user can enter 2-digit numbers to the ViscoClock *plus* before measurement. These IDs - together with date and time - ensure an unambiguous assignment of the flow times.

Absolute viscosity

To determine absolute kinematic viscosities, calibrated viscometers have to be used. To guarantee best accuracy viscometers which were calibrated by automatic measurement should be used. The constant of automatic calibration can be slightly different in comparison to manual calibration, as the level of the light barriers may not be identical to the position of timing marks.

Relative viscosity

For determination of relative viscosities, calibrated as well as non-calibrated viscometers can be used. For evaluation, the calibration constant is not required in this case.



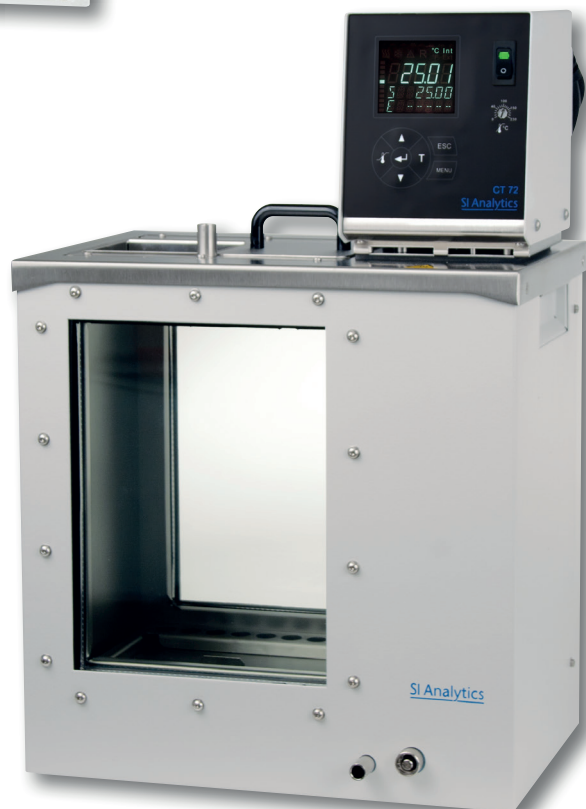
ViscoClock *plus* - Perfectly harmonized

...with our thermostates

Our ViscoClock *plus* is perfectly harmonized with our thermostat baths. If needed we provide you with perfectly matching ViscoClock modules..



Thermostat CT72/P



Thermostat CT72

Technical Data - ViscoClock *plus*

Measuring range-time	up to 999.99 s; resolution 0.01 s
Accuracy of time measurement	± 0.01 s/ ± 1 digit; however no more precise than 0.1 %; indicated as measuring uncertainty with a confidence level of 95 %
Measuring range - viscosity	0.35 to 10,000 mm ² /s (cSt) the absolute, kinematic viscosity is additionally dependent on the uncertainty of the numerical value of the viscometer constant and on the measuring conditions, in particular the measuring temperature.
Display	LCD graphic display (FSTN) 128x64 pixel, 51x31mm (w x h) seconds indication with 2 decimal digits after the decimal point, resolution 0.01 s
Voltage supply	DC + 9 V
Power supply	socket for low voltage connection: coaxial power connector, inner diameter 2.1 mm, plus pole at inner contact for connection of Universal power supply TZ 1858
Power supply	in accordance to class of protection III degree of protection for dust and humidity IP 50 in accordance with DIN 40 050 Universal power supply TZ 1858: 100-240 V, 50-60 Hz (9 V, 550 mA) not suitable for use in areas subject to explosion hazards
Plug Connections	USB Host to connect USB flash drive or printer (TZ 3863) USB OTG to connect (PC), printer (TZ 3863) or USB flash drive Type A USB connector Type B mini USB connector
Ambient Conditions	Ambient temperature + 10 to + 40 °C for storage and transport Operating temperature stand: - 40 to + 150 °C electronic measuring unit: +10 to +40 °C Humidity in accordance with EN 61 010, Part 1; max. relative humidity 80% for temperatures up to 31 °C, decreasing linearly to 50% of relative humidity at a temperature of 40 °C
Housing	Materials stand: polyphthalamide (PPA) casing*: polypropylene (PP) gaskets: silicone Dimensions ~515 x 90 x 30 mm (H x W x D) Weight ~450 g (without viscometer) power supply unit: ~220 g
Country of origin	Federal Republic of Germany
CE symbol	In accordance with low voltage guideline 2014/35/EU Test regulation EN 61 010-1:2011-07 for laboratory instruments in accordance with EMC regulation 2014/30/EU Test regulation EN 61 326 Part1:2012 In accordance with RoHS regulation 2011/65/EU; Test regulation EN 50 581:2013-02 FCC Symbol
Viscometer types	Ubbelohde (DIN; ISO; ASTM; Micro), Micro-Ostwald, manufactured by SI Analytics®
Transparent thermostatic baths	The ViscoClock <i>plus</i> can be used in all SI Analytics bath types

* Use in heat carrier liquids can result in discoloration of the synthetic material. The discoloration does not, however, have any effect on the function and quality of the ViscoClock. Subject to technical changes.

Ordering Information

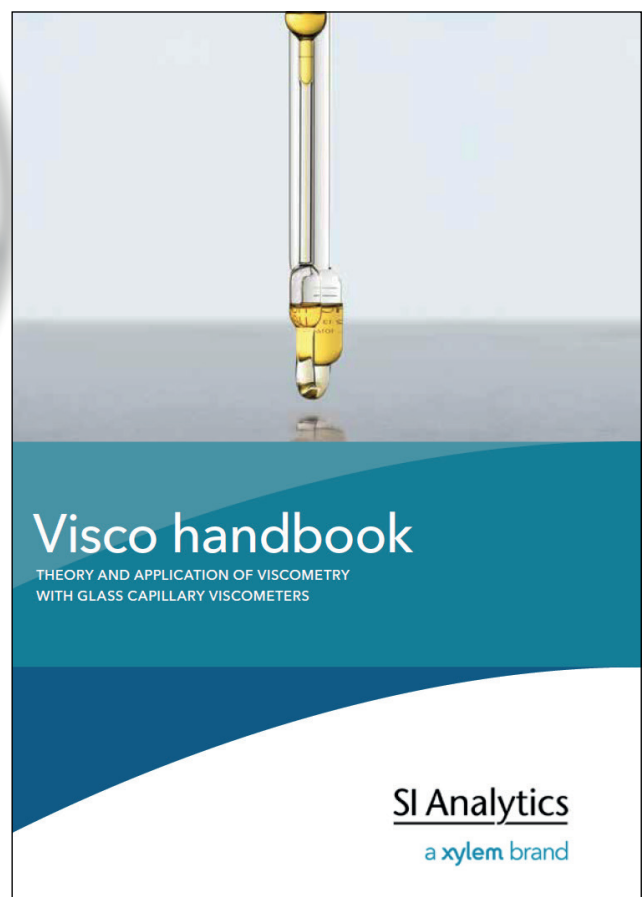
Type No.	Order No.	Description
ViscoClock plus	285417900	Timing unit for capillary viscometer. Including power supply 100-230V and hand pump
ViscoClock plus M1, 230V	285417910	ViscoClock plus and acrylic glass thermostatic bath CT72/P (230V) for temperatures +10 °C ... +60 °C
ViscoClock plus M1, 115V	285417920	ViscoClock plus and acrylic glass thermostatic bath CT72/P (115V) for temperatures +10 °C ... +60 °C
ViscoClock plus M2, 230V	285417930	ViscoClock plus and glass panelled thermostatic bath CT72/2 (230V) for temperatures -40 °C ... +150 °C
ViscoClock plus M2, 115V	285417940	ViscoClock plus and glass panelled thermostatic bath CT72/2 (115V) for temperatures -40 °C ... +150 °C

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- 1) The tissue in plants that brings water upward from the roots;
- 2) a leading global water technology company.

We're a global team unified in a common purpose: creating innovative solutions to meet our world's water needs. Developing new technologies that will improve the way water is used, conserved, and re-used in the future is central to our work. We move, treat, analyze, and return water to the environment, and we help people use water efficiently, in their homes, buildings, factories and farms. In more than 150 countries, we have strong, long-standing relationships with customers who know us for our powerful combination of leading product brands and applications expertise, backed by a legacy of innovation.

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