



# Viscometry

VISCOSYSTEM® | AVS® | VISCOCLOCK | VISCOMETERS

SI Analytics

a **xylem** brand

# 1.2 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

The viscometer stand:  
high-performance  
plastic PPA

Well arranged:  
The new display

## 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

In the analytics of plastics, for evaluation the relative viscosity is calculated, and depending on this also viscosity number (VN), intrinsic viscosity (IV) or the K value according to Fikentscher. 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.

## Ordering Information

Type No.	Order No.	Description	Page
ViscoClock <i>plus</i>	285417900	Timing unit for capillary viscometer. Including power supply 100-230V and hand pump	9
ViscoClock <i>plus</i> M1, 230V	285417910	ViscoClock <i>plus</i> and acrylic glass thermostatic bath CT72/P (230V) for temperatures +10 °C ... +60 °C	9, 39
ViscoClock <i>plus</i> M1, 115V	285417920	ViscoClock <i>plus</i> and acrylic glass thermostatic bath CT72/P (115V) for temperatures +10 °C ... +60 °C	9, 39
ViscoClock <i>plus</i> M2, 230V	285417930	ViscoClock <i>plus</i> and glass panelled thermostatic bath CT72/2 (230V) for temperatures -40 °C ... +150 °C	9, 39
ViscoClock <i>plus</i> M2, 115V	285417940	ViscoClock <i>plus</i> and glass panelled thermostatic bath CT72/2 (115V) for temperatures -40 °C ... +150 °C	9, 39
Thermostat vessel	285424400	Thermostat vessel ViscoClock <i>plus</i>	57

# Technical Data - ViscoClock *plus*

<b>Measuring range - Time</b>	up to 999.99 s; resolution 0.01 s
<b>Accuracy of time measurement</b>	±0.01 s/±1 digit; however no more precise than 0.1 %; indicated as measuring uncertainty with a confidence level of 95 %
<b>Measuring range - viscosity</b>	0.35 to 10,000 mm <sup>2</sup> /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.
<b>Display</b>	LCD graphic display (FSTN) 128 x 64 pixel, 51x31mm (w x h) seconds indication with 2 decimal digits after the decimal point, resolution 0.01 s
<b>Voltage supply</b>	DC + 9 V
<b>Power supply</b>	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
<b>Interfaces</b>	USB Host to connect USB flash drive or printer (TZ 3863) USB OTG to connect (PC), printer (TZ 3863) or USB flash drive
<b>Plug Connections</b>	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 Type A USB connector Type B mini USB connector
<b>Ambient Conditions</b>	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
<b>Housing</b>	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
<b>Country of origin</b>	Federal Republic of Germany
<b>CE symbol</b>	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
<b>Viscometer types</b>	Ubbelohde (DIN; ISO; ASTM; Micro), Micro-Ostwald, type SI Analytics®
<b>Transparent thermostatic baths</b>	The ViscoClock <i>plus</i> can be used in all SI Analytics® bath types