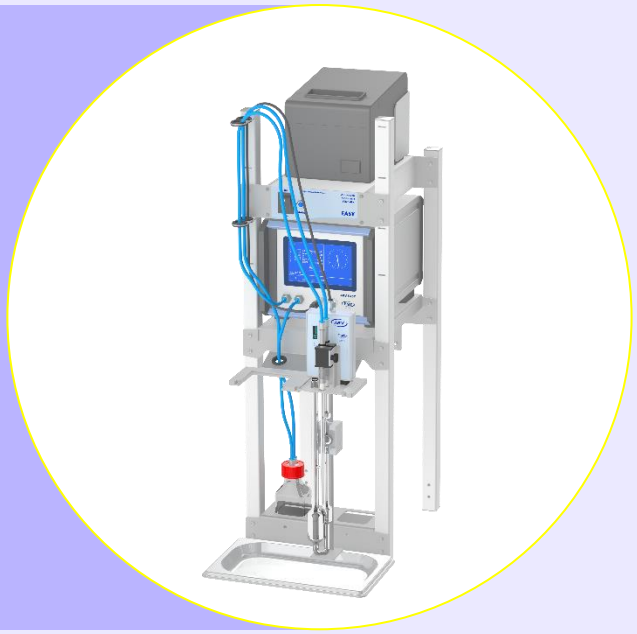
Tamson Instruments
Specification sheet

Specifications upgrade kit AKV EASY

Automated Kinematic Viscosity upgrade kit for TV4000MKII, TV4000DC and TV2000MKII



Item	Unit	AKV EASY
Temperature range		Up to +120°C (248°F)
Viscosity range		From 0.3 up to 10,000 mm²/s
Number of channels		Single, optional dual for TV4000MKII
Detection		Infra-Red (IR)
Timer	[sec]	0.10 - 9999.99
Resolution	[sec]	0.01
Accuracy	[ppm]	<10 (flowtime > 100 sec)
Pump		Suction pump (<-300 hPa)*
Viscometer		Ubbelohde
Data output		Printer, database up to 254 measurements
Dimensions tower (LxWxH)	[mm]	500 * 270 * 760
* Pressure pump available on request		

AKV EASY

- **Upgrade kit for manual baths**
- **Automated Kinematic Viscosity**
- **ASTM D445, IP71, ISO 3104**
- **User-friendly touch screen**
- **Database (up to 254 results)**
- **Customize test configuration**

General
The Tamson AKV EASY determines automated kinematic viscosity which complies with test methods ASTM D445, IP 71 and ISO 3104 using an Ubbelohde viscometer. The viscosity of Newtonian fluids can be most precisely determined using glass capillary viscometers. The upgrade kit can be used together with Tamson viscosity baths (TV4000MKII, TV4000DC, TV2000MKII and OEM baths) that are currently used in the field, or bought as a new bath, for manual viscosity determinations. With the upgrade kit, the user can upgrade from manual determinations to automated kinematic viscosity.

Construction
The modular AKV EASY is a measuring system that includes everything you need to make precise and reproducible measurements. For the upgrade, the measuring head, AKV EASY, a new cover, AKV E/A Ubbelohde viscometers and a tower (consisting of a frame, tubing, printer, fluid trap, power supply and spill tray) are needed. The AKV EASY is operated by a user-friendly touch screen.

Two different versions of the AKV EASY are available: single channel and dual channel. Dual channel allows the performance of simultaneous measurements.

A single channel version with a semi-automated cleaning module will become available by the end of 2020. With the rinsing module, the system will rinse the viscometer with the manually inserted cleaning solvent. Without the rinsing module, the filling and cleaning of the viscometers must be done manually.

Infrared light barriers in the measuring head determine the flow time for a sample to pass two marks on a calibrated glass capillary viscometer. The AKV EASY calculates the kinematic viscosity based on the constant of the viscometer and the measured flow time.

The AKV EASY is capable of measuring the kinematic viscosity of oils and other Newtonian liquids that are suitable for Ubbelohde viscometers with a range from 0.3 up to 10,000 mm²/s (cSt).

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Specifications upgrade kit AKV EASY

Accessories

Eight different viscometers can be programmed in the system. Changing the viscometer is a very easy task taking less than a minute. Up to 254 results are saved in the database and can be printed at any time. Each result consists of up to 99 runs. These runs can be done sequentially without interference from the user. The maximum time between two sequential runs is four hours. This allows the customer to test how the viscosity changes over time. The system determines the best repeatability from the measuring runs. The kinematic viscosity result is calculated in two decimals. Furthermore, the AKV EASY supports calculation of the dynamic, relative and intrinsic viscosity.

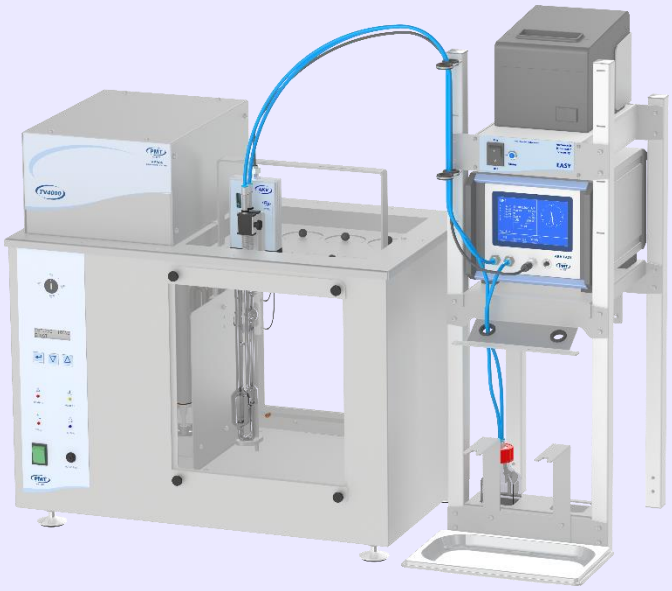
Application
The AKV EASY is ideal for users that don't run a lot of different samples in a day but also don't want to perform labor intensive manual determinations. The system also reduces operator to operator variability. The apparatus eliminates subjective measurement errors. The great advantage of the AKV EASY is that the system is flexible. Up to eight custom-made test configurations can be predefined. This allows users to adapt the system to their testing requirements. The number of runs, preheating time, maximum flow time and acceptable deviation of flow time are examples of variables that can be preset. For a complete overview, please see the user manual.

The AKV EASY is ideal for testing the viscosity of Newtonian fluids, such as formulated oils, lubricants, diesel, hydraulic oils, additives, base oils, light fuels, waxes, light crude oils and glycols.

Primary benefits of Tamson AKV EASY

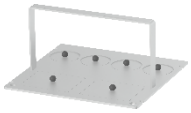
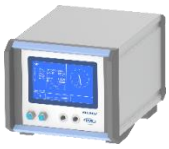
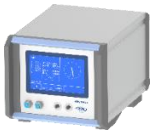
- Meets ASTM, IP, ISO and DIN standards related to kinematic viscosity
- Suitable for Newtonian fluids like lubricants, fuels and polymer solutions
- Easy viscometer exchange
- Chemically resistant to an extended range of fluids and solvents
- Extremely accurate temperature control using well-known Tamson viscosity baths
- Very precise flow-time measurement independent of fluid type
- Up to 12 mL sample volume (Ubbelohde)
- Budget sensitive way of determining viscosity automated
- User-configurable reports are saved and can be viewed and printed at any time
- Modular bath for easy maintenance access
- Use of suspended level viscometer allows single temperature calibration point, saving time and money on multiple calibration points
- Subjective measurement errors by operators are eliminated
- Up to 99 runs can be done sequentially without interference from the user, allowing to test viscosity changes over time
- Up to eight test configurations can be predefined and saved

AKV EASY



Specifications upgrade kit AKV EASY

Upgrade TV4000MKII and TV4000DC

Table 1: Recommended set-up for upgrading Tamson TV4000MKII and TV4000DC					
P/N	**Picture**	**Suggested quantity for 1 channel**	**Suggested quantity for 2 channel**	**Suggested quantity for 1 channel with rinsing**	**Description**
23T2414		1	1	1	Cover for TV4000MKII, two openings for measuring head AKV E/A. Additionally four ø51mm openings with lids are included
00T0870		1	2	0	Measuring head AKV E/A Ubbelohde
00T0872		0	0	1	Measuring head AKV E/A Ubbelohde with rinsing
16T0001		1	0	0	AKV EASY with single channel, pump with suction mode
16T0002		0	1	0	AKV EASY with dual channel, pump with suction mode
16T0003		0	0	1	AKV EASY with single channel with rinsing module, pump with pressure and suction mode. Will become available at the end of 2020
01T5000		1	1	1	Tower for AKV EASY. The tower is delivered with tubing, power supply, spill tray, fluid trap and printer

Specifications upgrade kit AKV EASY

Upgrade TV2000MKII

Table 2: Recommended set-up for upgrading Tamson TV2000MKII				
P/N	**Picture**	**Suggested quantity for 1 channel**	**Suggested quantity for 1 channel with rinsing**	**Description**
23T2415		1	1	Cover for TV2000MKII, one opening for measuring head AKV E/A.
00T0870		1	0	Measuring head AKV E/A Ubbelohde
00T0872		0	1	Measuring head AKV E/A Ubbelohde with rinsing
16T0001		1	0	AKV EASY with single channel, pump with suction mode
16T0003		0	1	AKV EASY with single channel with rinsing module, pump with pressure and suction mode. Will become available at the end of 2020
01T5000		1	1	Tower for AKV EASY. The tower is delivered with tubing, power supply, spill tray, fluid trap and printer

AKV EASY

Specifications upgrade kit AKV EASY

Accessories

Table 3: Necessary accessories				
AKV E/A Ubbelohde viscometer for transparent liquids				
25T0600	Size 0	Nom. Constant 0.001	Range from 0.3 to 1 mm²/s	
25T0601	Size 0C	Nom. Constant 0.003	Range from 0.6 to 3 mm²/s	
25T0602	Size 0B	Nom. Constant 0.005	Range from 1 to 5 mm²/s	
25T0603	Size 1	Nom. Constant 0.01	Range from 2 to 10 mm²/s	
25T0604	Size 1C	Nom. Constant 0.03	Range from 6 to 30 mm²/s	
25T0605	Size 1B	Nom. Constant 0.05	Range from 10 to 50 mm²/s	
25T0606	Size 2	Nom. Constant 0.1	Range from 20 to 100 mm²/s	
25T0607	Size 2C	Nom. Constant 0.3	Range from 60 to 300 mm²/s	
25T0608	Size 2B	Nom. Constant 0.5	Range from 100 to 500 mm²/s	
25T0609	Size 3	Nom. Constant 1.0	Range from 200 to 1000 mm²/s	
25T0610	Size 3C	Nom. Constant 3.0	Range from 600 to 3000 mm²/s	
25T0611	Size 3B	Nom. Constant 5.0	Range from 1000 to 5000 mm²/s	
25T0612	Size 4	Nom. Constant 10	Range from 2000 to 10000 mm²/s	

AKV EASY