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Tensiometer K11



- **Fully automatic SFT and IFT measurement**
- **Servo motor drive sample positioning**
- **Precise and highly dynamic force measuring system keeping the measuring probe in a constant position**
- **Closed and illuminated sample compartment**
- **Storage of measuring parameters**
- **Digital output for computer and printer**

The K11 in brief

- Fully automatic determination of surface and interfacial tension for routine measurements in laboratory and quality control applications
- High throughput sample performance and high efficiency of measurements
- Sample positioning by vibration free running servo motor drive with large dynamic range
- Precise and highly dynamic force measuring system with overload protection which keeps the measuring probe in a constant position
- Closed and illuminated sample compartment
- Performing of temperature controlled measurements
- External control panel with optimally readable LC-display.
- Ergonomical design and menu controlled user guidance
- Tabular presentation of measuring results for quick survey
- Storage of all measuring parameters, if required by password protection
- User friendly calibration to revert to national reference standards
- Digital output for computer and printer allows extensive and GLP-compliant documentation
- Alignment with valid national standards (e.g. DIN, ISO, ASTM).



Norms and Standards

ASTM D 0971-91	Standard test method for interfacial tension of oil against water by the ring method
ASTM D 1331-56	Standard test method for surface and interfacial tension of solutions of surface active agents
ASTM D 1417-83	Standard method of testing rubber latices (synthetic)
ASTM D 1590-60	Standard test method for surface tension of water
DIN 53593	Prüfung von Latex: Bestimmung der Oberflächenspannung
DIN 53914	Prüfung von Tensiden: Bestimmung der Oberflächenspannung
DIN EN 14210	Grenzflächenaktive Stoffe - Bestimmung der Grenzflächenspannung von grenzflächenaktiven Lösungen mittels Bügel- oder Ringverfahren
DIN EN 14370	Grenzflächenaktive Stoffe Bestimmung der Oberflächenspannung
DIN 14272	Schaummittel: Wasserfilmbildende Schaummittel zur Erzeugung von Schwertschaum für Löschzwecke
ISO 1409-1995	Plastics/rubber - Polymer dispersions and rubber latices (natural and synthetic) - Determination of surface tension by the ring method
ISO 304-1985	Surface active agents - Determination of surface tension by drawing up liquid films
ISO 6889	Surface active agents - Determination of interfacial tension by drawing up liquid films
Amtsblatt der EU	Oberflächenspannung L251/37 (1984)

Easiest Handling!

The tensiometer K11 combines highly precise and fully automatic measurements with plain handling and robustness. Swing doors give easy access to the illuminated sample compartment - samples and measuring probes are very quickly changed. The electronic force compensated measuring system and a precise and highly dynamic sample positioning go hand in hand: a closed-loop cycle ensures fully automatic measurements in a very short time. By means of statistic methods, raw data is evaluated and stability criteria is deter-

mined that can refer to different valid standards.

The K11 works as a fully automatic "stand-alone" instrument provided by the internal micro processor and the clearly structured user menus. The measuring results are shown on the large and easy to read graphical display. The K11 is optionally supplied with a printer and windows-based LabDesk software receiving data from the instrument. Moreover, LabDesk allows data evaluation with all current Windows-Office products.

For those applications requiring the highest precision, a special balance with a higher resolution, larger dynamic range and improved temperature behaviour is available. For adjustable and constant sample temperature, a thermostatable jacket is available, which in addition is equipped with an electro-magnetic stirrer.

Everything synchronized!

The measuring and drive technology of the K11 are exactly synchronised. The force sensor is a regulated force compensated balance, keeping the balance beam permanently in a constant position, thereby different from conventional tensiometers.

Measuring results are not influenced by the proper movement of the measuring probe. The sample positioning drive system is exactly tailored to the force sensor, applying an electronically controlled sensor motor with position control that guaranties an opti-

mal synchronous run at infinitely variable speed and height so that measuring results are not affected by vibrations or mistakes in positioning.

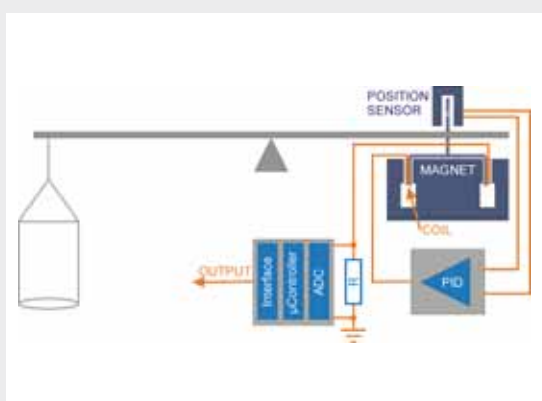


Fig. 1: Balance

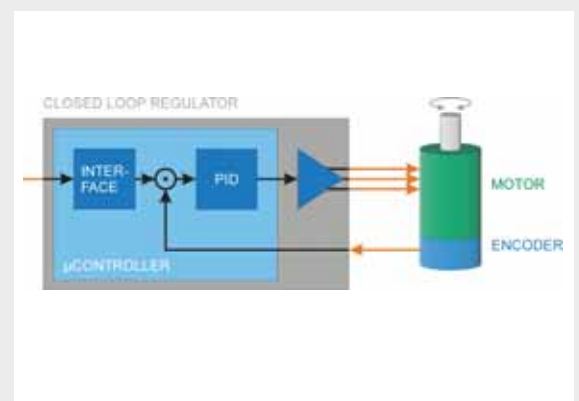


Fig. 2: Drive

Technical Specification

Measuring range:

- SFT/IFT: 1 - 999 mN/m
- Density: 1 - 2200 kg/m³

Resolution:

- SFT/IFT: 0.1 mN/m
(optional: 0.01 mN/m)
- Density: 1 kg/m³

Measuring rate:

10 readings / second
(optional: 20 readings / second)

Max. lifting range:

> 95 mm

Lifting speed:

0.1 - 500 mm/min

Max. sample weight:

50 g (optional: 100 g)

Sample resolution:

500 µg (optional: 100 µg)

Max. Sample width:

150 mm

Power consumption:

40 VA

Input voltage:

85 - 264 VAC

Input voltage:

40 - 60 Hz

Temp. measurement:

-20 bis +150°C, +/- 0.1 K

Data output:

serial, RS232C, (USB optional)

Display:

graphic, 8 lines, 40 characters each

Dimensions:

300 x 540 x 370 mm (W x H x D))

Measuring methods

- Ring method (Du Noüy; correction acc. to Huh&Mason, Harkins&Jordan; Zuidema&Waters)
- Plate method (Wilhelmy)
- Density determination of liquids

Basic instrument / accessories

- K11** **Tensiometer** for measuring surface and interfacial tension with data transfer to PC or printer
- K11HRX** **Tensiometer** for measuring surface and interfacial tension with high resolution of 0.01 mN/m
- TJ0524** **Thermostatable jacket** with integrated electro-magnetic stirrer (-10 to +130°C) for sample vessels of 70 mm
- PR0510** **Protocol printer** for measurement documentation (40 characters per line)
- DE01** **Density measuring kit** consisting of special Ptlr-suspension and precision density bar made of Si
- SW0501** **Windows Data-Logger-Software**

Technical specifications are subject to change without notice.



<http://www.kruss.de>

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