Technical data K11

### Measuring range
- **SFT / IFT**
  - 1 to 999 mN/m
- **Density**
  - 1 to 2200 kg/m³

### Resolution
- **SFT / IFT**
  - 0.01 mN/m
- **Density**
  - 1 kg/m³

### Measurement rate
- 12.5 measured values / second

### Movement range
- >110 mm

### Stroke speed
- 0.1 to 500 mm/min

### Max. balance load
- 120 g

### Temperature range
- -10°C to 130°C

### Power consumption
- 40 W

### Mains supply
- 100 to 240 V AC, 47 to 63 Hz

### Display panel
- Touchpanel, 800×600 px, 170×127 mm

### Dimensions
- 390×300×585 mm (B×D×H)

### Weight (instrument + panel)
- 21.3 kg

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### Measuring methods

- **Ring method** (Du Noüy; corrections as per Huh&Mason, Harkins&Jordan, Zuidema&Waters)
- **Plate method** (Wilhelmy)
- **Rod method** for very small sample volumes
- **Density measurement** of liquids

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### Optional accessories

- Various thermostat jackets with built-in magnetic stirrer
- Temperature sensor for direct measurement of sample temperature
- Various rings and plates
- Thermostats for different applications
- Density determination set, consisting of special holder and immersion body

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We reserve the right to make technical alterations.

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### Overview of standards (selection)

The measurements can be adapted to comply with the following standards:

- **ASTM D 0971** Standard test method for interfacial tension of oil against water by the ring method
- **ASTM D 1331** Standard test method for surface and interfacial tension of solutions of surface active agents
- **ASTM D 1417** Standard method of testing rubber latices (synthetic)
- **ASTM D 1590** Standard test method for surface tension of water
- **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
- **ISO 1409** Plastics/rubber - Polymer dispersions and rubber latices (natural and synthetic) - Determination of surface tension by the ring method
- **ISO 204** 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)
- **OECD 115** OECD Guideline for the testing of chemicals - surface tension of aqueous solutions

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Ensuring quality with quality – the K11 from KRÜSS is the fully automatic stand-alone instrument with touchscreen operation for quality control measurements of the surface and interfacial tension.

- **Fully automatic determination of the surface and interfacial tension**
- **High-resolution, robust measuring system**
- **Stand-alone instrument with large, high-resolution touchscreen**
- **Ergonomic, intuitive, menu-controlled user guidance**
- **Flexibly configurable measuring templates**
- **Presentation of results, raw data and measuring parameters with report function**
Overview of the K11

- Fully automatic determination of the surface and interfacial tension for routine laboratory and quality control measurements at the push of a button
- High-resolution and constant position force measurement with overload protection
- Stand-alone instrument with large, high-resolution, intuitive user interface
- Ergonomic, menu-controlled user guidance
- Flexibly configurable measuring templates for all methods
- Presentation of results, raw data and measuring parameters with report function
- Uniform sample table movement with large dynamic range
- Closed and illuminated sample chamber
- Thermostat connection for carrying out measurements as a function of the temperature
- User-friendly calibration for traceability to national reference standards
- USB-interface for data storage or a printer
- Orientation on national and international standards (e.g. DIN, ISO, ASTM) is possible
- Rod method for small liquid volumes and density measurements is possible

Quality assurance with quality

The Tensiometer K11 from KRÜSS is a stand-alone instrument for routine measurement of the surface and interfacial tension. Standardized automatic measuring sequences with a high sample throughput and gapless documentation in the measurement report – these services make the K11 the ideal partner for quality control. Predefinition and accurate control of the measuring sequences without user intervention mean that the instruments meet even high demands placed on the reproducibility of the results.

Intuitive and well-thought-out

With the large-format, high-resolution touch-panel automatic measurements with the ring, plate or rod method as well as lamella tear-off and density measurements are configured, started and saved.

Measuring parameter templates for each method allow a measurement to be programmed in only a few seconds. Speeds, paths and detection sensitivities can be custom-made for the particular measuring task or adapted to comply with international standards.

The instrument is equipped with a high-precision force sensor that, apart from installation or servicing, does not have to be recalibrated. The force measurement works at a constant position, so that height values such as the surface or lamella height can be determined or set exactly. The sample table with built-in stirrer moves in a speed range from 0.1 to 500 mm/min. Optional accessories allow measurements to be made at temperatures between -10°C and 130°C.

The touch-panel stores the results and measuring parameters as well as raw data such as the time-dependent or path-dependent force values or the lamella height – and therefore incorporates the functions of a software data logger. Clearly-laid-out reports can be transferred to a USB-stick or printed out on a directly connected printer.

Quick and easy – four steps to a measuring report

Step 1

Select measuring method. Measuring templates with standard parameters are included; these are suitable for most cases.

Step 2

Define the measurement. A name for the measurement is entered and – if the method requires it – the density value. For individual solutions the measuring parameters can be flexibly altered.

Step 3

Start the measurement. After the start of the measurement the user is guided through the measuring sequence. Detecting the surface, immersing the measuring body and the measurement itself are all carried out fully automatically. The averaged result, the raw data and all measuring parameters are clearly shown.

Step 4

Create the report. The measurement report is drawn up by fingertip; it can be printed out immediately or saved as a Microsoft XPS-file.
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http://www.kruss.de

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