

The right temperature worldwide

LAUDA



- Fully automatic and compact
- Integratable PTT stirring Peltier thermostating unit
- Vibration damping with solid base plate

NEW

LAUDA
Tensiometer TD 3

LAUDA TD 3

Ring/Plate Tensiometer TD 3

The ring/plate method of measuring the surface and interfacial tension of liquids is an established method with future potential: the increasing demand for surface active additives and proof of these in quality control requires fully automated and user-friendly equipment. As a stand-alone device, the compact, fully automated TD 3 ring/plate tensiometer with LAUDA Command remote control offers everything that is needed, both in the laboratory environment and for use on-site.

At the touch of a button, surface and interfacial tension can be measured easily, calculated precisely and reproducibly, printed, saved and optionally transferred to a computer.

LAUDA TD 3, the successor to TD 2, comes with a new design and new technical features, some of which are unique. As such, e.g. the world's smallest thermostat, the LAUDA PTT Peltier thermostating unit, is easy to insert into the device. The temperature of the measuring samples can be set from 5 to 80 °C extremely quickly, conveniently and with the smallest space requirement. The TD 3 determines the interfacial/surface properties of organic and inorganic liquids (liquid/liquid or liquid/gaseous), dispersions, emulsions including for the development of surface active substances such as surfactants and emulsifiers and as evidence of these in sewage and bodies of water.



Tensiometer TD 3 with Command remote control

Application example: Control of cleaning water



Task: Even the smallest residues of detergents in beverage bottles, beer-barrels etc. have a negative effect on frothing and must be avoided. A surfactant analysis would take too long and would be too expensive. Summary information about surfactant pollution is needed here by means of a measuring method that is quick and easy to execute, yet also precise.

Solution: By measuring the surface tension with the TD 3, e.g. using the ring method, and by comparison with clean water, it is possible to quickly check whether the rinse water contains residues of surfactants (down to the range of ppm). Here, clean bottles are filled with distilled water and the surface tension is then measured with the tensiometer. Even the smallest impurities will reduce the surface tension of water. The integrated PTT Peltier thermostating unit ensures adherence to a temperature stability of ± 0.1 °C, in accordance with the standards.

Application example: Aging of insulating oils



Task: The insulating properties of oils in transformers deteriorate during operation as a result of the oxidation of the oil, e.g. as a result of the penetration of water or the absorption of products from the decomposition of the cellulose in the winding papers. This silt severely impairs the winding cooling and therefore impedes heat dissipation. In turn, this build-up of heat results in severe aging of the winding paper. It must always be ensured that the oil is changed or recycled routinely.

Solution: The interfacial tension, which is easy to measure with the TD 3 even when used on the move, is an indicator of the quality of the transformer oil. This test is a measure of the concentration of the polar molecules in the oil, which develop during the aging process. The greater this concentration, the lower the interfacial tension and therefore the greater the silting tendency of the insulating oil. Interfacial tensions of fewer than 15 mN/m are indicative of possible silting. The integrated PTT Peltier thermostating unit keeps the temperature absolutely constant during the measurement and is therefore compliant with the ± 0.5 °C required by ASTM D971.

We have considered the operator ...

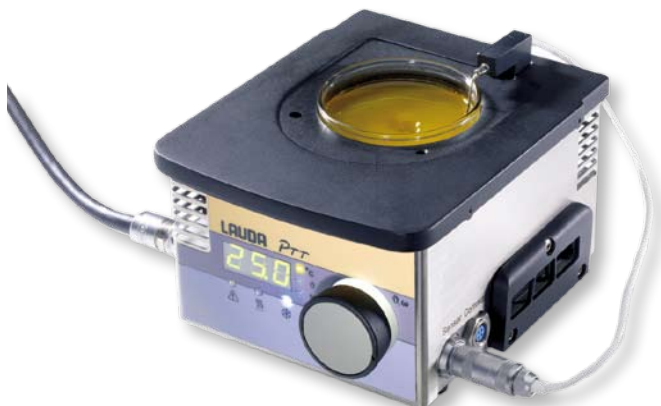
The practical LAUDA Command remote control has a large display and is easy to operate with no need for a time-consuming training session. It allows uninterrupted remote operation of the TD 3, e.g. outside a fume hood.

The integrated micro-controller takes over the table positioning, maximum detection and correction of measured data from the user. The program continues to repeat measurements until the measurement stability defined by the user is reached and calculates the statistical surface or interfacial tension. The measurements can be taken entirely independently of the user and are more precise than those required by the principal standards. As such, the device is also compliant with the requirements of the strict GLP guidelines. Furthermore, both liquid density and light weights can be determined in a simple manner.

Globally unique: the PTT Peltier thermostating unit can be used in the sample compartment of the TD 3. Without using an ordinary, laboratory thermostat and a double jacketed vessel, the sample can be quickly and easily brought to the exact sample temperature required. This remains absolutely constant during measuring. The controllable, integrated stirrer helps with rapid thermostating and aids in creating a homogeneous sample.



Command remote control



PTT Peltier thermostating unit



Distinguishing features

- Very high resolution (± 0.01 mN/m, ± 0.1 mg) and measurement stability
- Automatic maximum detection and maximum scanning
- Tabular representation of the individual measurements
- Automatic measurement corrections (based on Zuidema and Waters)
- Statistical checking of measurement stability
- Three filter levels for measurements in agitated surroundings
- Uninterrupted remote operation via a detached operating console
- Menu-driven input, e.g. sample geometry, standard deviation, measurement duration, lift speed
- Storage of up to 500 measuring results with parameters
- Numerical, user-defined sample designation
- Measurement output to optional printer or data transfer to PC via RS 232



New with TD 3

- Granite base plate for vibration damping and to increased stability
- Housing with improved chemical resistance
- Integratable LAUDA PTT Peltier thermostating unit with stirrer
- Simple lift limiting and sample positioning
- Measuring chamber backlighting
- Programmable waiting time before the start of measuring (ASTM D971)

PTT Peltier thermostating unit

LAUDA TD 3



Standards

LAUDA TD 3 for standard-compliant measurements

EN 14210 · EN 14370 · ASTM D971 · ISO 304 ·
ISO 4311 · ASTM D1331 · ISO 6295 · ISO 1409

Standard accessories:

Du Noüy (2-legged) measuring ring · 500 mg calibration weight · plunger body (glass) · tweezers · set of sample beakers (10) · plastic case

Recommended accessories:

PTT (Peltier thermostating unit with stirring function) · Du Noüy measuring ring (4-legged) · Wilhelmy measuring plate · 500 mg calibration weight with DKD certificate · set of sample beakers (10) · dot matrix printer · data transfer software for PC

Tensiometer TD 3 with PTT and Command remote control



Technical features		TD 3
Measuring range surface and interfacial tension	mN/m	0...300 (ring method); 0...999 (plate method); resolution: 0.01
Density measurement	kg/m ³	0...2000; resolution: 1
Weight measurement	mg	0...5000; resolution: 0.1
Measuring mode selection/parameter input		Ring/plate/density/weight/menu-driven
Measuring point interval	Minute	0...120, selectable
Measurement memory	Results	max. 500, with date and time
Ring correction		Automatic based on Zuidema and Waters
Stability criterion		Standard deviation over option of 3...9 measurements
Temperature range (PTT)	°C	5...80 (±0.1)
Magnetic stirrer		Integrated into the PTT, adjustable (10 levels)
Stage movement	mm/s	0.1...1 (10 levels)
Interface		RS 232, Command remote control
Control and evaluation		Command remote control (control, display, documented data storage)
Ambient temperature range	°C	10...40
Power consumption	W	10
Dimensions (WxDxH)	mm	245x205x335
Weight	kg	9.5
Cat. No.	90...240 V; 50/60 Hz	LMT 850 incl. power supply unit

Thermostats · Circulation chillers · Water baths
Process cooling systems · Heat transfer systems · Secondary circuit systems
Viscometers · Tensiometers

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