

Features of ELECTRONIC-TENSIOMETER R-3000



The Instrument for production- and quality control and R+D

Tension Measurements and recording

All controls, settings by finger touch on display

Large multi color display

Range : 0.05 – 200 000

Measuring frequency up to 300 cycles

Dampening to be set 0.1 – 4 seconds

Afterglow of galvanometer needle (tension fluctuations)

Tension-graphs displayed on the instruments display

Maximum/Minimum warning with control

outputs for max/min control points

Choice of Measuring-mode: T1 or T2 or T1 + T2

Digital or Analog Data-Readings or Graphs displays and Data output

Choice of language (English/German/French)

Main or battery operated (build in power pack – 8 hours autonomy)

Automatic recharging of battery when reconnected to the mains.

Mains-connection 110 V / 220V 50/60 cycles

incorporated "Help-menu" for concise instructions

Accuracy better than 2 %

Measurements possible in wet and acid surroundings

MEASURING HEADS are an integral part of the instrument

Over 100 different measuring heads for various applications

Each measuring head has a choice of 3 measuring ranges

Yarn is not deflected from its path while measuring

Measuring Heads can be adapted with different lengths and types of yarn guides and a choice of materials such as graphite

Measuring Heads can be adapted for applications with *–Glass-fibres, - Flat yarns, - Tow or - humid and acid surroundings*

Data evaluation with software ET R-2000W/BTA

Pre-set measuring time (1 second – 2 weeks)

Choice of measuring mode (T1 or T2 or T1 + T2)

Long term measurements up to 10 days

Zooming – any section of the measured cycle can be called up for zoom-projection down to 1 second from the full width of the measuring cycle

Automatic calculation of statistics (X / CV / MAX / MIN /Histogram etc)

Frequency of measured cycle

Setting of histogram for 5 / 10 / 25 / 50 / 100 %

All measured files are automatically stored and filed in alphabetical Order

The recorded data can be converted into ASCII code

Event-Marker- for correlation of machine position with tension graph

Options :

Multi-Position measurements (up to 100 positions)

with automatic restarting for each new position

Conversion to F-METER – (Friction Coefficient measurements)

Following standard measuring heads are available:

	Nominal		Measuring range cN:		yarn guides	
2.1)	1 cN	0 - 0,25	0 - 0,5	0 - 1	Ceramic	
2.2)	4 cN	0 - 1,	0 - 2,	0 - 4	Ceramic	
2.3)	10 cN	0 - 2,5	0 - 5,	0 - 10	Ceramic	
2.4)	40 cN	0 - 10,	0 - 20,	0 - 40	Ceramic	
2.5)	100 cN	0 - 25,	0 - 50,	0 - 100	Ceramic	
2.9)	100 cN	0 - 25,	0 - 50,	0 - 100	Outer =roller, inner sapphire	
2.7)	400 cN	0 - 100,	0 - 200,	0 - 400	Ceramic	
2.8)	1,000 cN	0 - 250,	0 - 500,	0 -1000	Ceramic	
2.10)	400 cN	0 - 100,	0 - 200,	0 - 400	Roller with r.-bearing	
2.11)	1,000 cN	0 - 250,	0 - 500,	0 -1000	Roller with r.-bearing	
2.12)	4,000 cN	0 - 1000,	0 - 2000,	0 -4000	Roller with r.-bearing	
2.13)	10,000 cN	0 - 2500,	0 - 5000,	0-10000	Roller with r.-bearing	
2.14)	20,000 cN	0 - 5000,	0-10,000,	0-20000	Roller with r.-bearing	
2.15)	200 000 cN				large Roll 200 mm	

special measuring heads - for glas fiber (graphit guides)

- for measuring in baths (also sulfuric baths)

- for carpets and tire-yarns (wide rollers)

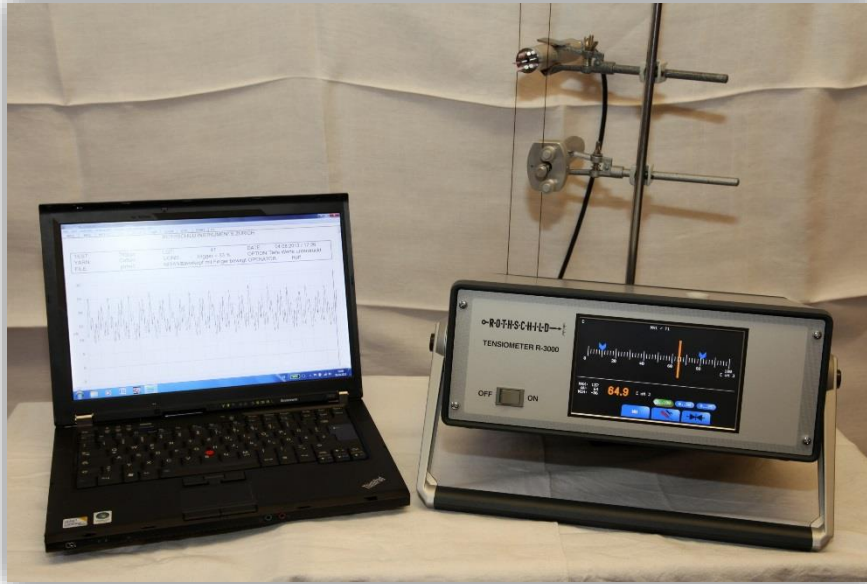
- for tows

The new ELECTRONIC-TENSIOMETER R- 3000 ALL FUNCTIONS AS „ touch screen“ functions

Following functions can be selected or altered just by “touch” on the ET 3000 display :

- Selection of measuring-head(s) MH 1 / MH 2 / MH1 + MH2
- Pre-Selection of measuring head nominal-value
1 cN / 4cN / 10 cN / 40 cN / 100 cN / 400 cN /
10 N / 40 N / 100 N / 200 N
- dampening of tension readings 0.1 – 4 seconds
- Maxima / minima alarm 2 – 100% (with output signal)
- data transfer from measuring head “wireless” or “cable”
- choice of measuring instrument Electronic -Tensiometer / F-Meter (option)
- Range of measuring head 100% / 50 % / 25 %
- automatic zero setting
- automatic calibration
- graphic on display for mh 1 / mh 2 / mh1 + mh 2
- selecting scale for graphic recording :
15 / 30 / 75 / 150 seconds 15 / 30/ 75 minutes / continuous for last 150 seconds
- information and readings on display : english/francais/deutsch
- intensity of background lighting

ELECTRONIC TENSIOMETER R – 3000



GENERAL REMARKS

Traditional: Among the many mechanical stresses exerted on yarns and fibres during production and processing, tensile stress is of great importance. It is crucial to know whether the occurring stresses are below or above a certain optimum value. After the end of the process there will be, depending on the properties of the material, - no ill effects in the first case, but in the latter case - permanent distortions and expansions will result. The ill effects of exceeding the elasticity limit are well known. To a greater or lesser degree the finished products will show glazing, shiners, warp straks and bands, uneven contraction or elongation, etc.

In many cases there is complete ignorance as to what yarn tension counts are expedient or safe. At best one falls back on judging by the touch.

Systematic approach: Before any systematic work can be carried out on the finding and, if possible, avoidance and diminution of critical stresses, these first have to be registered objectively by reproducible measurements which must be continuously recorded and quantitatively compared and evaluated. On this basis, the technologic conditions of the sequence of operations on the machines can be followed closely, neuralgic points can be found and stresses continuously supervised.

Conventional: Conventional yarn tensiometers used to contain mechanical elements for converting transient yarn tensions into pointer deflections which can be read in grams from a calibrated scale. Such tensiometers will provide quite useful approximate values of the average yarn tension, but peak tensions and short period variations are lost because of the inertia of the system. Apart from the rotating rollers and other moving parts which prejudice the measuring result, such an instrument is seldom sensitive or accurate enough. A further disadvantage is the fact that during the measurement the yarn is considerably deviated out of the normal path and exposed to inadmissible additional stress.

By to-day's standards, conventional yarn tensiometers are therefore in many cases inadequate for accurate measurements.

New technology: The continually increasing refinement of the textile measuring technique calls for yarn tension measuring instruments with a reproducible accuracy of at least 0,1 cN. Moreover, tension variations should be recorded continuously and practically without any inertia and without any substantial deviation of, and additional stress to, the yarn.

These requirements are met to a high degree by the electronic-tensiometer which has proven itself very much in practical applications.

The ROTHSCCHILD ELECTRONIC - TENSIO METER R-2000 in the past has become worldwide the most "recognised" and "used" electronic tensiometer since many years.

But times and techniques have not stand still. Over the years we further developed our instruments.

Our new **ELECTRONIC-TENSIO METER R-3000** includes all these new improvements With his "touch screen" method the handling has become easier than ever thought.

Measuring Head(s) The measuring head is the tensiometer proper, which is in direct contact with the yarn to be measured. It consists on the outside of a metal cylinder, from one end of which protrudes the center measuring rod and the two yarn guides. At the other end there is the plug for the cable connection to the ELECTRONIC TENSIO METER control unit

The measuring head is designed as a differential capacitor. A capacitor electrode, - here referred to as measuring rod - is placed in such a way as to be moved very slightly by the yarn passing between the yarn guides and the rod. This movement causes the capacity variations.

The measuring rod is anchored to a torsion spring by which it is adjusted in its initial position. Measuring rod movements caused by the passage of the yarn amount to only 100 *micron* at full load, showing full deflection by the control unit. As the capacitive measuring principle has the advantage to have the measuring system designed in extremely small dimensions. The high resonance frequencies which result from this system allow the faultless recording of high speed yarn tension variations. The measuring system is damped subcritically so that about 70% of its resonance frequency can be exploited - or - e.g. a measuring head of 100 cN can follow up to 300 load variations per second with full amplitude accuracy.

Different measuring heads are available covering a total measuring range of 0,01 - 200'000 cN. They may be used for loads exceeding their nominal value by about 30%. Acidproof and watertight measuring heads are manufactured for special requirements, For glasfiber and glasfiber spinning special heads with graphite guides are available.

Each measuring head is connected by a 3-pole plug to a cable with a standard length of 1,5 which connects to the control unit. Cable connections may have a maximum length of 12 m

Also wireless data transfer between measuring heads and the ET 3000 instrument is available for distances up to 100 meters.

Yarn passage and yarn guides on the Measuring Head:In order to ensure reproducible measuring results the yarn guidance is clearly defined with regard to the measuring rod by two fixed outside sapphire pins (yarn guides). Owing to the complete absence of all inertia forces any falsification of the measuring results - which necessarily occurs because of variations, particularly of high speed ones - is avoided. At the same time a smooth yarn passage is secured.

The angle of wrap at the measuring rod is 30° only. This causes the stress - effect of the yarn passage to be so small that it is negligible for all practical purposes.

INTERFACE / SOFTWARE ET R-3000W/BTA- WIN-7 (2.08.3000)

DATA TRANSFER from the ELECTRONIC-TENSIOMETER R- 3000

GENERAL

The importance, to have exact yarn-tension-data available during yarn production and yarn processing, has already been recognized many years ago. In line with the search for higher productivity, the trend to increase the production rate of the textile machines goes on and on. ROTHSCCHILD, in anticipation of this demand, has redesigned from the base the ELECTRONIC TENSIOMETER, which has the potential to respond to the requests for a multitude of tension measurements and is the most efficient yarn tension measuring Instrument today, built for the future.

- On one hand the specialists involved in machinery development, production control and research laboratories require the measuring results and processed data to be available in a much shorter time and in the form most suitable for the particular purpose, further processing and specific analysis of the yarn quality and corresponding machine settings.
- On the other hand by making use of the technology available from electronic data processing in general, ROTHSCCHILD has developed a SOFTWARE program based on "WINDOWS 98 "

THE ET R-3000 W/BTA INTERFACE / SOFTWARE

Interface / Software for the registering, extended evaluation and to analyse "Short-Term" "Long-Term" measurements of the yarn-tension — in connection with a PC (Windows XP / W-7 / Vista) and data transfer from the ET R-3000 To activate this software-program the special BTA processors have to be mounted in the ET R-3000 (when ordered with the ET-3000 these alterations are already included in the ET R-3000)

The ET R-3000/BTA provides the following evaluations:

- Choice of measuring - mode: channel 1, channel 2 or Dual-mode channel 1 + 2
- Long-term measurement up to 10 days
- Evaluation of all specific measured statistical values (X / CV / Max / Min etc.)
- Any section out of the total measured period can be called up for Zoom-projection down to 1 second over the full width of the measuring cycle.
- Projection of the Histogram with a choice of 5 / 10 / 25 / 50 / 100 %

- Projection of the statistics of the complete measuring-period or the chosen Zoom-sections. or
- Measuring response timeset at 1 msec. / 10msec. / 0.1 sec / 1 sec.
- Max- and Min.- values in the graphs can be shown by dots, connected dots or crosses
- All measunng - files are automatically stored and filed in alphabetical order
- This software is made as a WINDOWS program, so all WINDOWS Programs - facilities can be used.
- The recorded data can be converted into ASC II Code

INDIVIDUAL PROGRAMMING:

Where particular programming and transfer of measuring data and subsequent data processing is required, the ELECTRONIC TENSIO METER is equipped with an RS 232 output of the following specifications:

- 38400 Baud
- 1 Stopbit
- No Parity
- Continuous data-transfer.

THE COMPONENTS OF THE INTERFACE/SOFTWARE package:

- 1 Plug-in print ET 2010 to be inserted at the back of the ET R-2000. To this print is attached an output for the Event Marker Switch.
- 1 Event Marker Switch with connecting cable.
- 1 Diskette containing the SOFTWARE ET R-2000W/BTA-"W1N95"
- 1 Connecting cable ET PC, Operating Manual

Installation of the INTERFACE Print ET 2010, Loading of SOFTWARE program:

(The Interface is installed when supplied with a new ELECTRONIC TENSIO METER)

- Unscrew one of the blind covers at the back of the instrument,
- Slide in the print and tighten screws
- Connect cable from instrument (Print ET 2010) ↔ to the P 0 (COM 1 Input)
- Stide-in Software Diskette "R - 2000 W/BTA-W1N95 (Vers 1,5)" into PC
- Select SETTINGS → CONTROL PANEL → ADD/REMOVE PROGRAMS → INSTALL File
→ RUN

STATISTIC - FILTER

This Filter becomes important when it is necessary to avoid recording machine stoppages in evaluating the statistics of the measured data.

The setting is in % of the scale-range and will be shown on the monitor and print-out in a "dash - dot" line.

The count for the statistics is stopped as long as the tension values are below the set filter-line position.

EVENT MARKER

- There is a socket for the connection of an " EVENT MARKER "-switch on the plugin print installed at the back of the ELECTRONIC TENSIO METER R - 3000.

- The " EVENT MARKER "-switch can either be operated by hand or be mounted on the machine.

- The Operation of the " EVENT MARKER "-switch induces a mark in the form of a small vertical bar on the spot of the measuring cycle which will be shown in the graph on the monitor and/or print-out.

- With the event marker a specific movement on the machine can be correlated with the tension graph.

CHANGE OF FUNCTIONS FROME MOUSE TO F - KEYS

- List of key - Operations can be called up on the PC under "INFO" → "SHORT CUT"

- Mouse - Functions remain active.

 [Homepage of the R-3000](#)