

F-METER R-3088 1
FM3088 Photos f. Expose 220813

F-METER R-3088 new !



Measured Solutions, Inc.

Trusted Resource. Precise Results.

103 Pilgrim Road
Greenville, SC 29607

(864) 331-1810 Fax (864) 281-7744

F-METER R-3088 1b

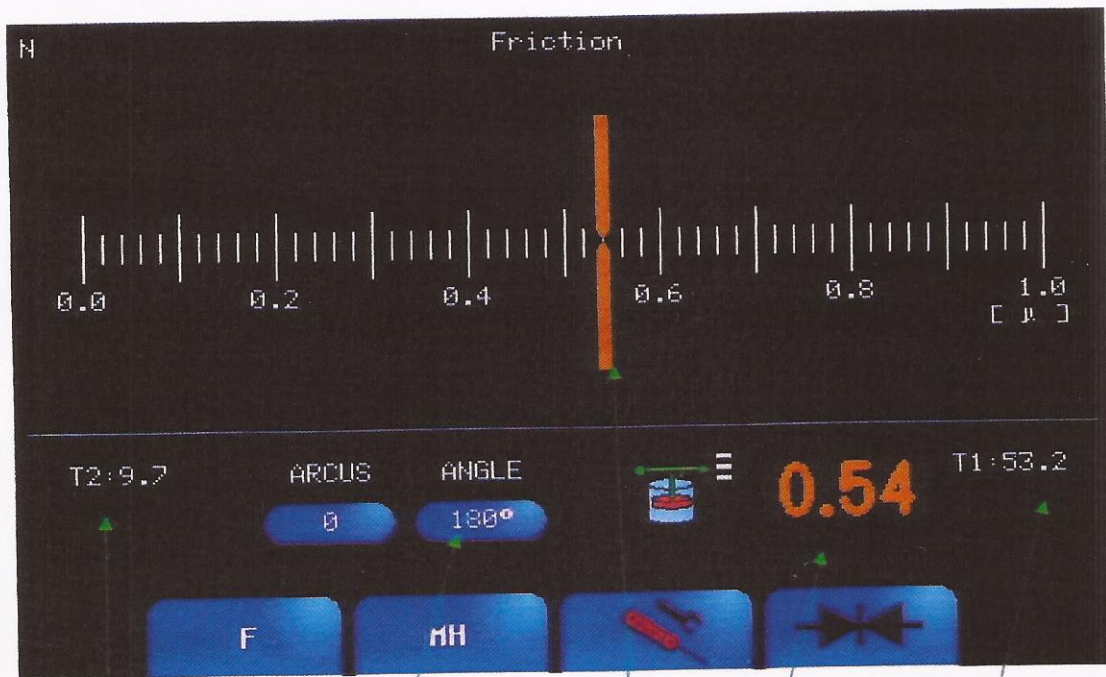


F-METER R-3088

Winder R-1084

Up-Winder R-1073

F-METER R-3088 scale



T2

friction angle

μ (friction coefficient)
(analog and digital)

T1

Measuring process

The friction coefficient is calculated by measuring the two yarn tensions before and after the friction point. The values of the measured yarn tensions are calculated into logarithms and subtracted from each other. The information thus obtained is divided by the arc value of the friction angle. The friction coefficient μ thus calculated is indicated on the F-METER.

$$\mu = \frac{\log T1 - \log T2}{\alpha}$$

The friction coefficient μ , as well as the two yarn tensions T1 (after) and T2 (before) are continuously recorded.

The F-METER R-3088 can also be used as a double ELECTRONIC-TENSIOMETER

Measuring methods

The following measurements are possible :

- yarn/ceramic friction
- yarn/steel friction
- yarn/yarn friction
- stick/slip measurements (static friction)

Applications.:

- friction coefficients of yarns, ribbon, tows
- friction coefficients of yarn guides
- finish efficiencies
- evenness of fiber surfaces
- measurements of yarn tensions (1 or 2 simultaneously)

Technical Data

- automatic zeroing and calibration of measuring heads
- button for setting wrap angles (90 – 6 x 360 °)
- measuring range : friction μ 0 – 1 0 – 0.33 0 – 0.166
tensions 0.02 – 20 000 cN
- Data evaluation :
WINDOWS XP / W-7 and higher
Line recorder

F – METER R-3088 3

Measuring range.

Each measuring head can be set for 3 measuring ranges in the ratio 10 : 5 : 2.5 (e.g. Measuring head 100 cN for 0 – 100 / 0 – 50 / 0 – 25 cN)

If the measuring ranges are exceeded or not attained an optical signal is automatically activated.

Power supply : 110 / 200 volts - 50 / 60 cycles - 100 watts

Accessories :

Measuring heads –

The **F-METER R-3088** requires 2 measuring heads to effect the measurements. These heads are normally of the same nominal value but they may also differ. The instrument takes measuring heads of different nominal values automatically in account.

Measuring heads for the following nominal values are obtainable :

1 / 4 / 10 / 20 / 40 / 100 / 200 / 400 / 1000 / 4000 / 10000 / 20000 cN

Yarn transport

A reproducible yarn transport trough the measuring head at different speeds is mandatory . The winder R-1084 with a controlled speed range (0.001 – 300 m/min.) and settings for different wrap angles with supports for the measuring heads is recommended (see separate description) A take-up system R – 1073 takes the yarn over from the winder R-1084.

PC-Interface

The **F-METER R-3088** is connected to the PC with the interface and software ST/SL R-2088. The software supplied enables the PC to process all statistical relevant values and to display friction graphs (see separate description)

Software F-METER R-3088 ED/STSL

It is recommended to evaluate the data measured on the F-METER R-2088 with the interface R-3088 and the special software R-3088 ED/STSL.

All data are evaluated statistically and graphs in different forms are presented.

The structure of the graph can be followed on the monitor and printed out at the end.

Beside of the evaluation of the friction data the software also evaluates yarn tensions taken on machine positions from the built in ELECTRONIC-TENSIOMETER .

The enclosed sheets are showing some typical graphs.
All measurements were made with the same yarn.

Parameters: yarn speed 100 m/min (STICK/SLIP page FMG 5 0.001 m/min)

Friction angle 180°

Measuring time 1 minute

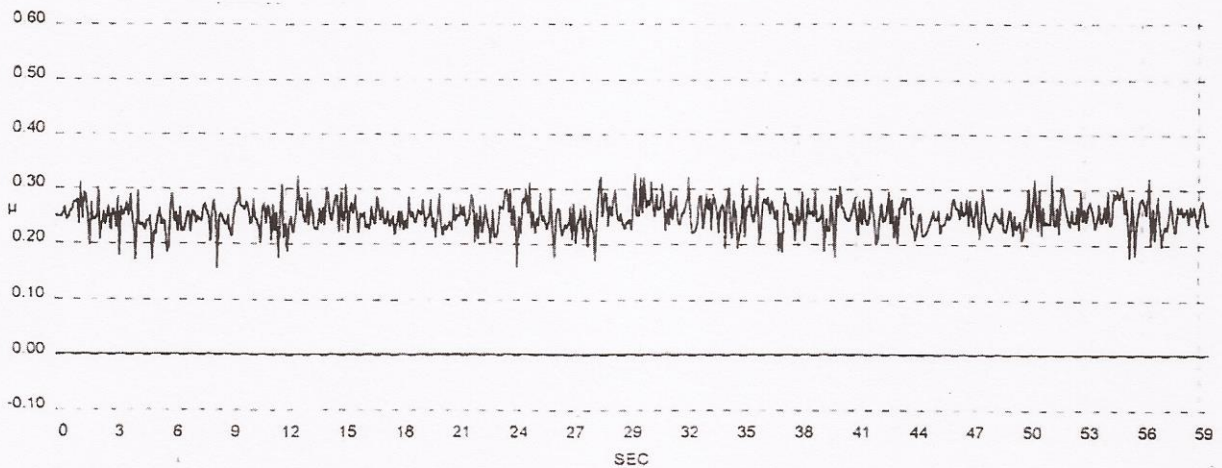
| | | |
|------------|--------------|-------------------------------|
| Page FMG 2 | yarn/ceramic | graph / statistic / histogram |
| Page FMG 3 | yarn/steel | graph / statistic / histogram |
| Page FMG 4 | yarn/yarn | graph / statistic / histogram |
| Page FMG 5 | stick/slip | graph / statistic / histogram |

FRICITION MEASUREMENTS Reibungs-Messungen

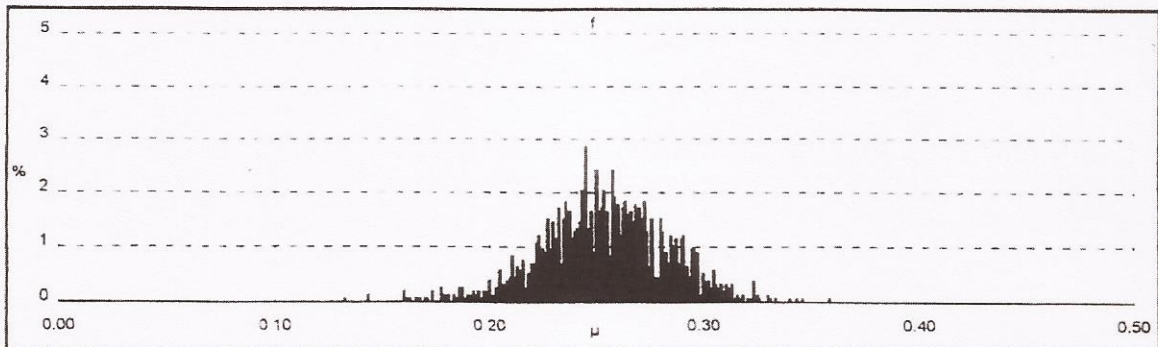
Yarn / Ceramic - Faden/AL 02

ROTHSCHILD INSTRUMENTS ZÜRICH

| | | | | | |
|-------|------------------|----------|-----------|-----------|------------|
| TEST: | yc1min | LOT: | 54RT | DATE: | 02:26:1998 |
| YARN: | POLYESTER 70 / 8 | COND.: | 100 M/MIN | OPTION: | |
| FILE: | YC1MIN | MISANC.: | 180° | OPERATOR: | MOSBACHER |



| | | | | |
|------------------------|-----------------------------|----------|---------------|---------|
| MEASURING FMETER 1:1 | *** FMETER MEASUREMENTS *** | | | |
| MEAS.RANGE 100 cN 100% | NUMBER OF MEASURINGS | 1574 | MINIMUM | 0.131 µ |
| DEGREES 180 | DURATION | 00:00:59 | MAXIMUM | 0.357 µ |
| FMETER RANGE 1.00 | STANDARD-DEVIATION | 0.030 µ | AVERAGE VALUE | 0.252 µ |
| INERT OFF | VARIATION COEFF. | 11.77 % | | |

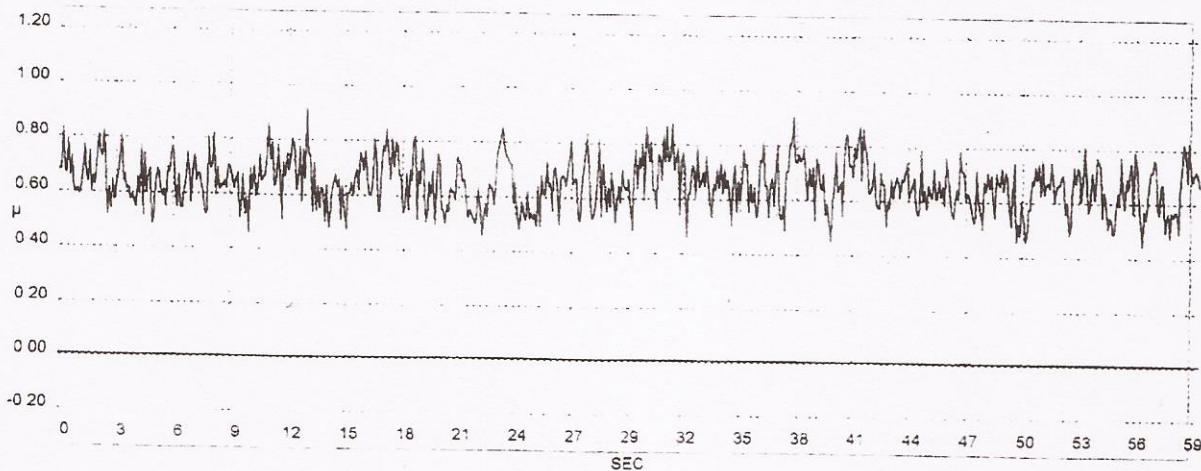


FRICITION MEASUREMENTS Reibungs-Messungen

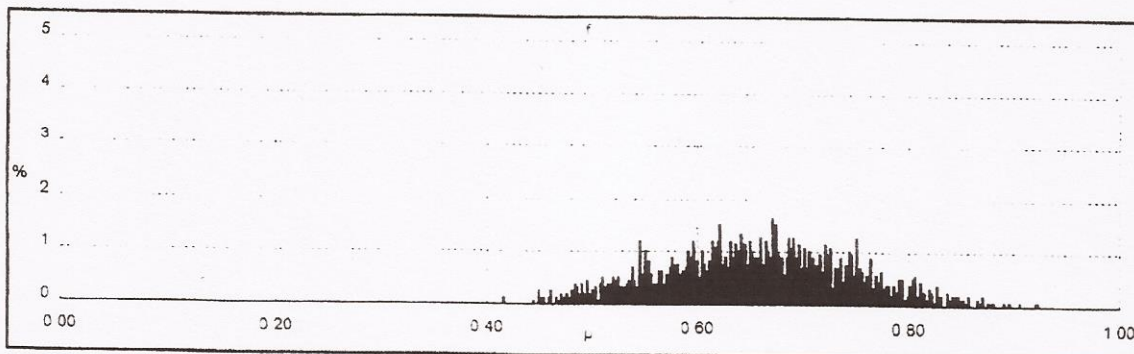
Yarn / Steel - Faden/Stahlstift

ROTHSCHILD INSTRUMENTS ZÜRICH

| | | | | | |
|-------|------------------|----------|-----------|-----------|-----------|
| TEST: | yST1min | LOT: | 54RT | DATE: | |
| YARN: | POLYESTER 70 / 8 | COND.: | 100 M/MIN | OPTION: | |
| FILE: | YST1MIN | MISANC.: | 180° | OPERATOR: | MOSBACHER |



| | | | |
|------------------------|-----------------------------------|----------|-----------------------|
| MEASURING FMETER 1:1 | *** STCIK / SLIP MEASUREMENTS *** | | |
| MEAS.RANGE 100 cN 100% | NUMBER OF MEASURINGS | 114 | X/MINIMUM 0.553 μ |
| DEGREES 180 | DURATION | 00:00:59 | X/MAXIMUM 0.753 μ |
| FMETER RANGE 1.00 | MINIMUM | 0.414 μ | X/AMPLITUDE 0.201 μ |
| INERT OFF | MAXIMUM | 0.919 μ | AVERAGE VALUE 0.654 μ |

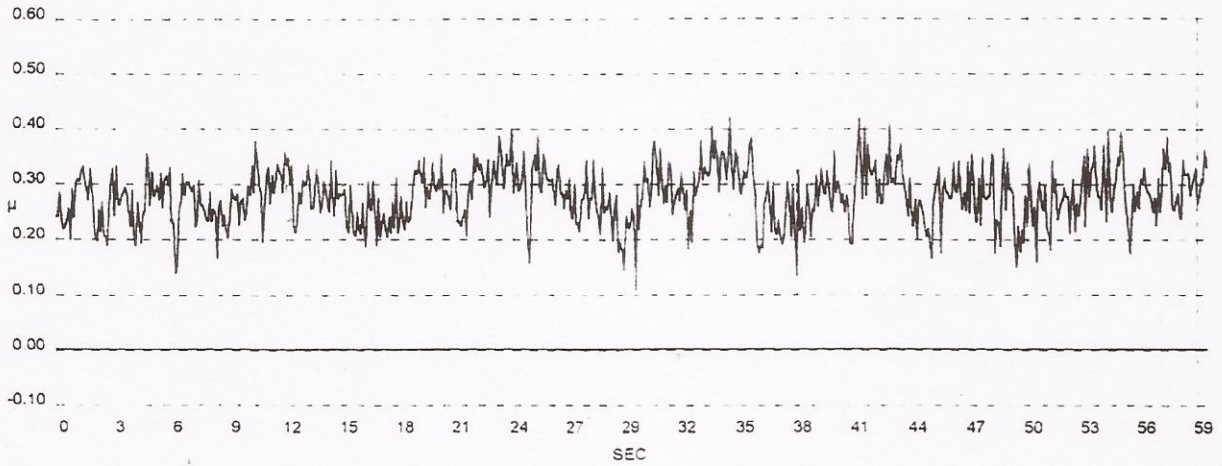


FRICITION MEASUREMENTS
Reibungs-Messungen

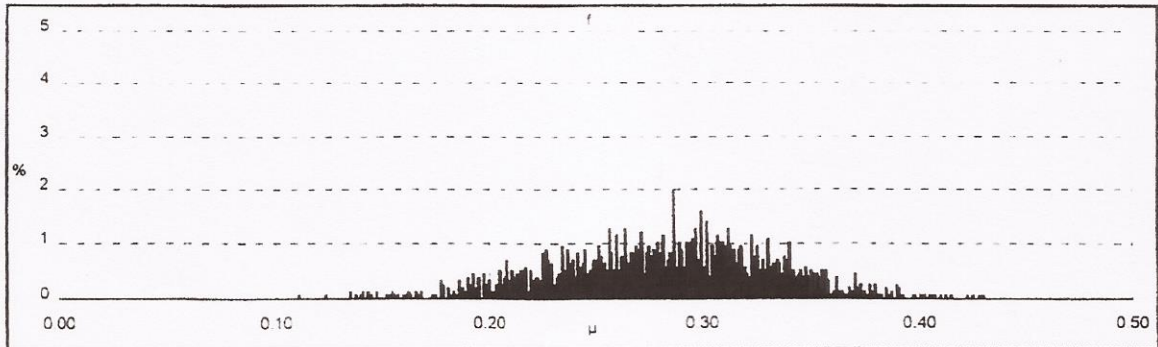
Yarn / Yarn - Faden / Faden

ROTHSCHILD INSTRUMENTS ZÜRICH

| | | | | | |
|-------|------------------|----------|-----------|-----------|-----------|
| TEST: | yY1min | LOT: | 54RT | DATE: | |
| YARN: | POLYESTER 70 / 8 | COND.: | 100 M/MIN | OPTION: | |
| FILE: | YY1MIN | MISANC.: | 180° | OPERATOR: | MOSBACHER |



| | | | |
|------------------------|-----------------------------|----------|-----------------------|
| MEASURING FMETER 1.1 | *** FMETER MEASUREMENTS *** | | |
| MEAS.RANGE 100 cN 100% | NUMBER OF MEASURINGS | 1574 | MINIMUM 0.109 µ |
| DEGREES 180 | DURATION | 00:00:59 | MAXIMUM 0.429 µ |
| FMETER RANGE 1.00 | STANDARD-DEVIATION | 0.051 µ | AVERAGE VALUE 0.280 µ |
| INERT OFF | VARIATION COEFF. | 18.25 % | |





Messinstrumente

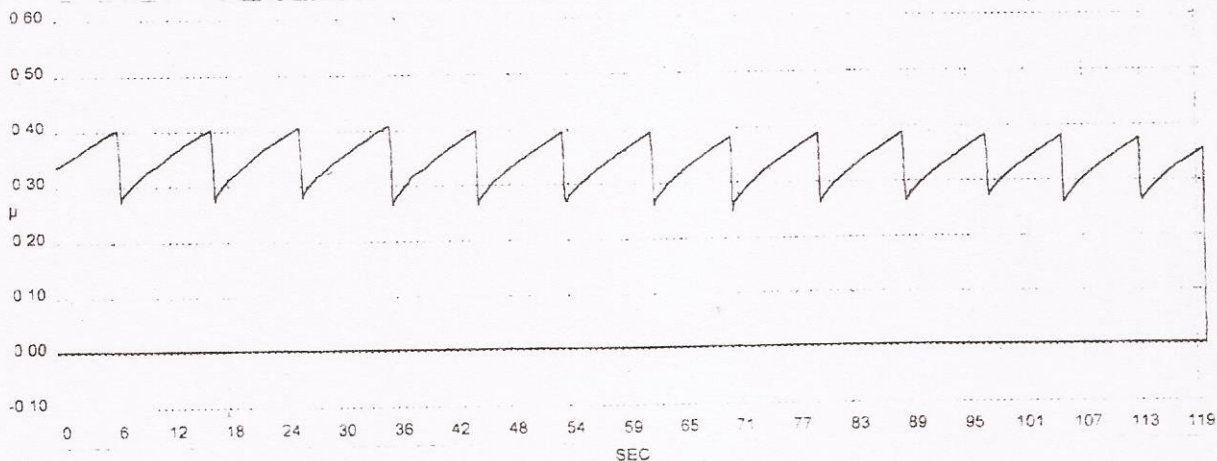
8002 Zürich Traubenstr. 3 / Schweiz

FRICITION MEASUREMENTS
Reibungs-Messungen

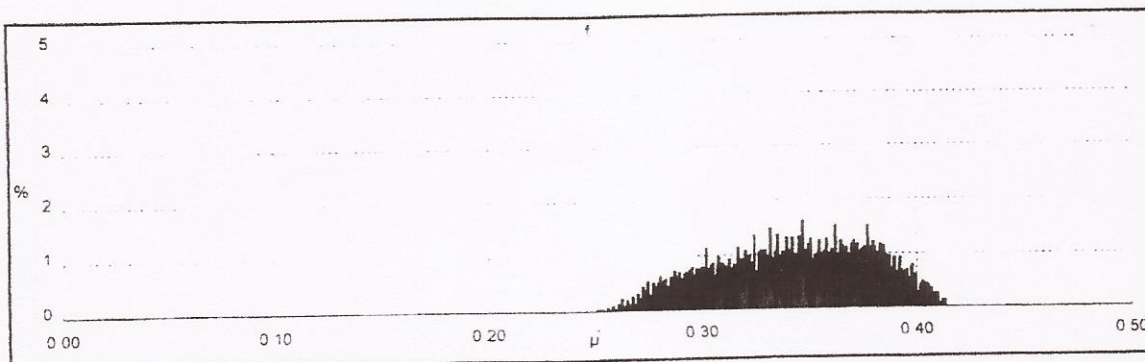
STICK/SLIP

ROTHSCCHILD INSTRUMENTS ZÜRICH

| | | | | | |
|-------|-----------|----------|-------------|-----------|------------|
| TEST: | Garn | LOT: | 1234 | DATE: | 26.2.98. |
| YARN: | Baumwolle | COND.: | Schnell | OPTION: | Jedes Feld |
| FILE: | ysstsl | MISANC.: | Kommentar ? | OPERATOR: | Rolf |



| | | | |
|-------------------------|-----------------------------------|----------|-----------------------|
| MEASURING FMETER 1.1 | *** STICK / SLIP MEASUREMENTS *** | | |
| MEAS. RANGE 100 cN 100% | NUMBER OF MEASURINGS | 13 | X/MINIMUM 0.263 µ |
| DEGREES 180 | DURATION | 00:01:59 | X/MAXIMUM 0.395 µ |
| FMETER RANGE 1.00 | MINIMUM | 0.249 µ | X/AMPLITUDE 0.132 µ |
| INERT OFF | MAXIMUM | 0.412 µ | AVERAGE VALUE 0.340 µ |



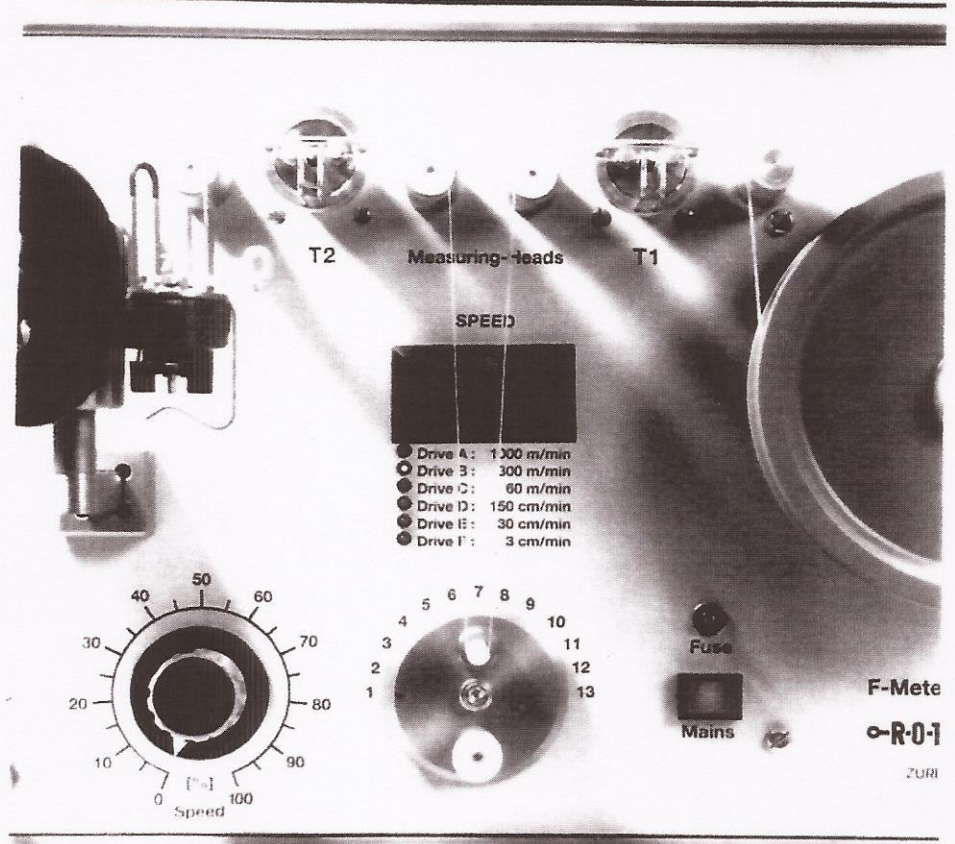
F - METER R-3088

Yarn/Ceramic
Yarn/Steel
Yarn/Glass

Friction-Measurement

Faden/Keramik
Faden/Stahl
Faden/Glas

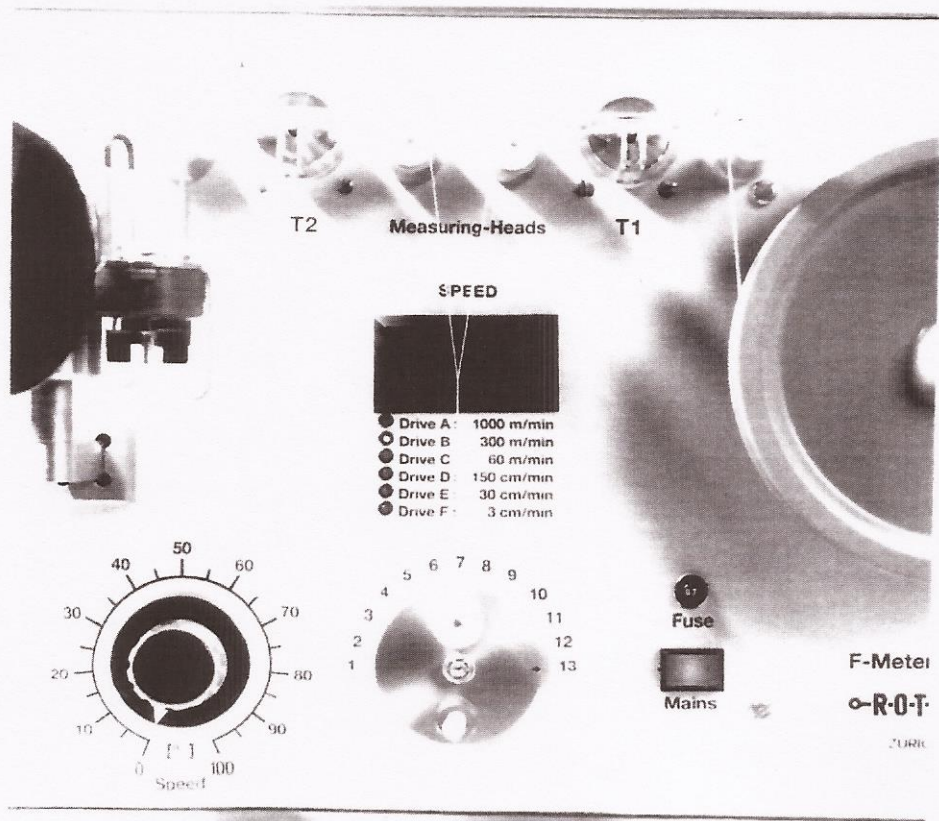
Reibungsmessung



- SPEED**
- Drive A: 1300 m/min
 - Drive B: 300 m/min
 - Drive C: 60 m/min
 - Drive D: 150 cm/min
 - Drive E: 30 cm/min
 - Drive F: 3 cm/min

Yarn/Yarn
Friction Measurement

Garn/Garn -
Reibungsmessung



- SPEED**
- Drive A: 1000 m/min
 - Drive B: 300 m/min
 - Drive C: 60 m/min
 - Drive D: 150 cm/min
 - Drive E: 30 cm/min
 - Drive F: 3 cm/min

F-Meter
ROTH
ZURICH

ROTHSCHILD →

Messinstrumente

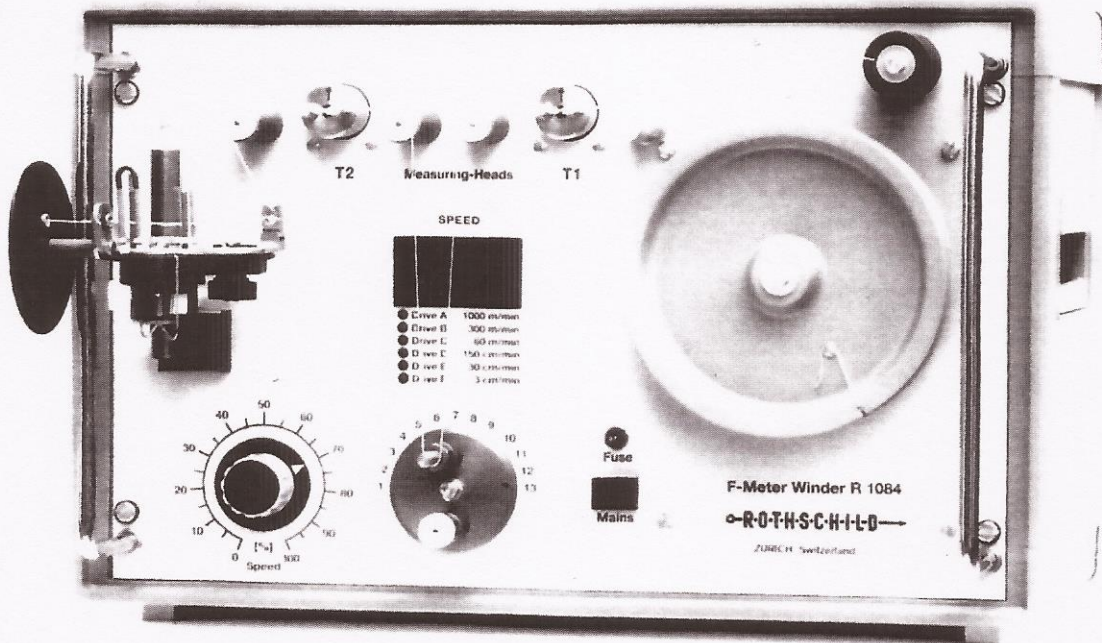
R - 1084

8002 Zürich Traubenstr. 3 / Schweiz

AUFWICKELGERÄT

ENROULEUR

WINDER



| | | |
|--|---|---|
| Fadendurchlaufgeschwindigkeit einstellbar Vitesse de fil réglable Yarn speed adjustable (Option - Option - Option) | : | 1 mm/min - 300 m/min 100 - 1000 m/min) |
| Reibungswinkel einstellbar Angle de frottement ajustable Friction angle adjustable | : | 90° - 6 x 360° |
| Eingangsspannung einstellbar Tension d'entrée ajustable Input tension adjustable (Option - Option - Option) | : | 4 - 15 cN 15 - 65 cN) |
| Max. Wickelspannung Puissance d'enroulement max. Maximum torque | : | 1500 cN |
| Dimensionen - Dimensions - Dimensions | : | 530 x 360 x 380 mm |
| Gewicht - poids - Weight | : | 20 kg |

WINDER for F - METER

GENERAL

The winder R - 1084 simplifies and standardizes the yarn transport during the measurement of the friction coefficient.

Quite apart from the high demands made on the accuracy of the measuring apparatus, the reproduction of exact friction values depends considerably on the even yarn guidance through the measuring heads and around the friction pin.

The yarn speed should be adjustable over a considerable range, thus permitting the measuring of static friction at very low speeds, as well as the measuring of dynamic friction at high speeds. The friction angle around the friction pin should be adjustable within very large limits. Furthermore it must be possible to carry out "yarn to yarn" friction measurements.

The WINDER R - 1084 meets all these requirements.

YARN SPEED

The speed can be continuously varied by an electronic drive in the ratio of 1 : 15. Once the speed has been set, it is electronically controlled and kept constant irrespective of the load. The yarn speed is set by a control knob and is monitored and checked on a LED display.

Four basic speeds can be set by interchangeable gears. All speeds can be subdivided again by a smaller winding wheel at the ratio of 1 : 10.

FRICITION ANGLE

The friction pin is exchangeable. All required angles can be set by a guide roll and a turntable.

For "yarn to yarn" friction measurements, the yarn to be tested is led around a ballbearing guide roll and wound around its own axis.

INPUT TENSION

A built-in compensation brake permits the setting of the input tension from 4 to 15 cN (without compensation up to 65 cN).

MEASURING RANGE

The yarn tension measuring heads can be easily exchanged. Yarn tensions are measurable from 1 to 1'000 cN. The maximum torque is 1'500 cN.

STATIC FRICTION MEASUREMENT ("STICK/SLIP")

A continuously engaged winding wheel makes it possible to measure static friction at yarn speeds of 0,002 to 0,03 m/min.

ELECTRICAL COMPONENT

An electronic control with built-in stabilizer feeds the DC drive motor. An overload of the gear-system automatically triggers a protective device. A special output connected to the RECORDER drive ensures that the RECORDER is only working when the WINDER R-1084 is in operation.