SCHMIDT
control instruments

SCHMIDT control instruments – over 60 years all over the world.
Our Product Lines

Stroboscope

Tachometer

Hardness Tester

Test Stand

Force Gauge

Torque Meter

Thickness Gauge

Sample Cutter / Weight Balance

Textile Moisture Meter

Please visit us in the World Wide Web!

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We solve measuring problems. Take advantage of our experience!
SCHMIDT control instruments are indispensable in production monitoring, quality control, automation and process engineering in a wide variety of industrial applications.

We are Partner of many Industries

- Aircraft & Aeronautic

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- Engine Construction

- Electronic Production

- Food Industry

- Medical Engineering

- Pharma Industry

- Packing Industry

- Plastic Industry

- Research

- Textile Industry

- Wire and Cable Industry

SCHMIDT – more than 60 years
all over the world wherever precision
and superior quality are essential
in production and processing

SCHMIDT
control instruments

This brochure informs of our extensive range of measuring instruments.

MORE THAN

60

YEARS

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Product Directory

		Section
A	**Force Gauges and Test Stands**	A 1 – A 17

- Force gauges with analog and digital display
- Attachments, cables, grips
- Horizontal and vertical test stands
- Universal testing machine (force displacement)
- Wire terminal tester

B **Torque Meters** — B 1 – B 3
- Cap torque meters
- Torque meters with seperate sensor for mobile use

C **Speed- and Length Meters** — C 1 – C 2
- Universal yarn speed tachometer
- Yarn consumption meters for circular knitting machines

D **Tachometers** — D 1 – D 3
- Electronic hand-held tachometers for contact or / and non-contact use

E **Stroboscopes** — E 1 – E 7
- For measuring revolutions and for inspection of moving objects

F **Thickness Gauges** — F 1 – F 8
- Analog or digital for static measurements
- Analog or digital for moving objects (e.g. wires)
- Digital gauges according standards

G **Shore Durometers** — G 1 – G 2
- To measure the hardness of rubbers, elastomers, plastic, thermoplastic etc.

H **Yarn Package Hardness Testers** — H
- To measure winding hardness of textile bobbins

I **Sample Cutter** — I
- For fabric, paper etc. cut outs

J **Area Weight Balance** — J
- To determine the area weight g / m² of fabric

K **Textile Moisture Meter** — K 1 – K 2
- To determine the moisture of yarn, fabric etc.

L **Bending Stiffness Tester** — L
- To determine stiffness of different materials

M **Elongation Tester** — M
- To determine the elongation of fabric

N **Maintenance Instruments** — N
- Leak-detect for checking leakages

Index:

Subject to change without notice.

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Force Gauges

Force Gauges, Test Stands and Attachments to measure compression, tension (push and pull) and peeling forces

Applications:

- Pull-off force values of electrical leads, crimped terminals, connectors etc.
- Switch, keyboard contact pressure
- Test Wire-Wrap on clip connection
- Test of strength of various circuit components as transistors etc.
- Testing shear load of components mounted on circuits
- Compression and tensile strength testing of springs, plastic, foils and films
- Glas, ceramic, pills crush strength
- Brake, clutch pedal operating pressure
- Adhesive bond of glues, stickers etc.
- Needle penetration force
- Plastic, cardboard box breaking strength
- Paste materials, fruit firmness
- Measures torque of srews, torque-wrenches etc.
- Measures torque of bottles caps
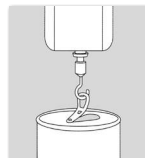
Pop test: Measurement of can opening force.

Adhesion test: Adhesion test of PCB and adhesive tapes.

Break-down test: Tension break-down test of wire.
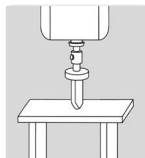
Bending test: Ceramic, glass, plastic and raw materials.
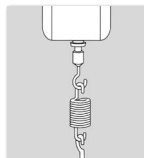
Compression / Tension: Simple testing of springs.

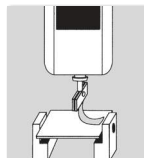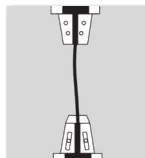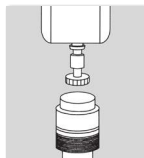**Contact point test:** Measurement of contact point operating force.
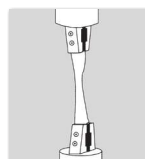
Extension test: Tension test of rubber and raw materials.
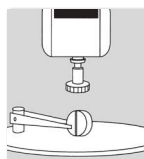
Hardness test: Drugs, pills, fruits, lip-sticks, paste materials.
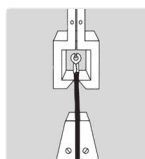
Pull test of terminal
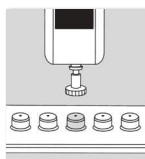
Test of key switch operating force: Telephone, car stereo key board, remote control.
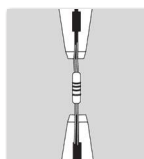
Test of electronic components strength: Resistor, condenser, capacitor & etc.
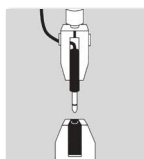
Insertion / Withdrawal test: Measurement of connector insertion and withdrawal force.

Application Industries:

- Aircraft
- Automotive
- Electronics
- Precision
- Plastics & Chemicals
- Machinery & Manufacturing
- Business equipment
- Medical and Health
- Textile
- Sport goods
- Foods
- Toys

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PS Series

High precision model for accurate measurements

Standard features for all <u>mechanical</u> Imada Force Gauges:

- Easy to use
- Ergonomic rugged die-cast aluminium housing
- Easy to read dial
- Real Time and Peak Force display
- Peak Hold function captures transient values and peaks
- Zero Tare Ring to zero the gauge in each position
- Facilities for mounting on test stands

Application examples:

Attachments see page A 10 and A 11

Pull

Model PS-100 N

with standard attachments in carrying case

Standard model

Model PS

Push

Dimensions Series PS and FB
Mounting thread 4 x M 4 – Depth max. 6 mm
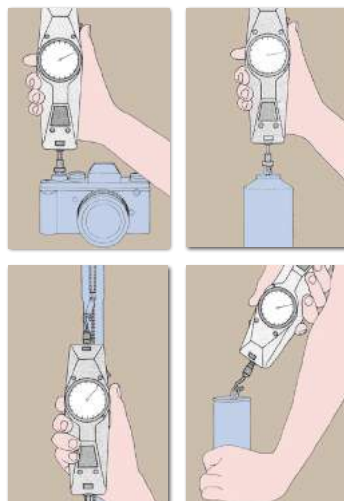
Available Models	Capacity	Resolution
PS-10 N	0 - 10 N	0.1 N
PS-20 N	0 - 20 N	0.2 N
PS-30 N	0 - 30 N	0.25 N
PS-50 N	0 - 50 N	0.5 N
PS-100 N	0 - 100 N	1 N
PS-200 N	0 - 200 N	2 N
PS-300 N	0 - 300 N	2.5 N
PS-500 N	0 - 500 N	5 N

Other units as Kgf and lbf are available on request.

Specifications	Series PS
Displacement:	10 mm
Accuracy:	± 0.1 % FS*
Temperature range:	5 - 45 °C
Air humidity:	85 % RH, max.
Housing dimensions:	235 x 65 x 50 mm (L x W x H)
Weight, net (gross):	approx. 530 g (1000 g)

Delivery includes: *Force gauge, standard attachments, carrying case, manufacturer's calibration report*

* FS = Full Scale

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FB Series

Economic model for a wide variety of applications

The most popular force gauge

Pull

Model FB

Push

Model FB
with standard attachments in carrying case

Dimensions
see Model PS
(page A 3)

PSH Series

Pull

For high forces

Model PSH

Model PSH
with standard attachments in carrying case

Dimensions Serie PSH
Mounting thread 4 x M 10 – Depth max. 5 mm

Push
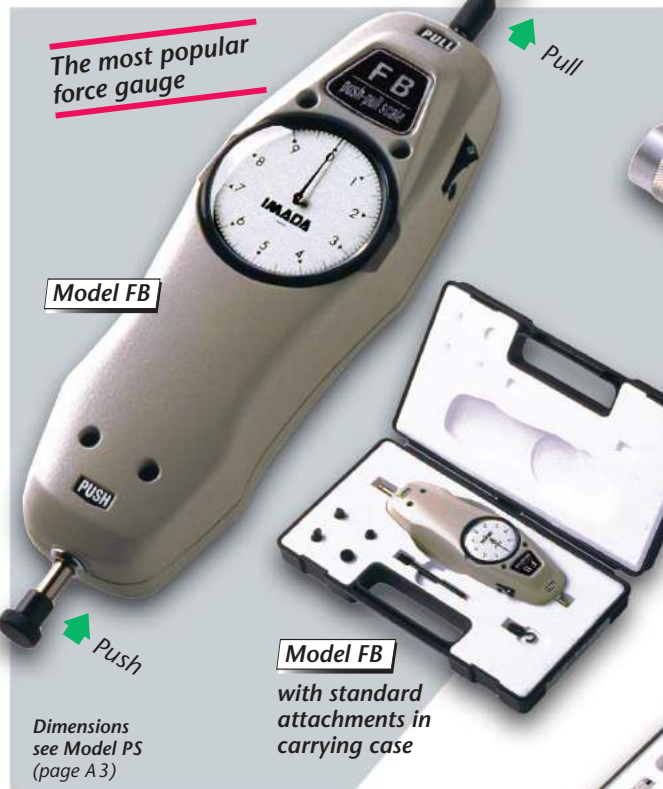
Available Models	Capacity	Resolution
FB-10 N	0 - 10 N	0.1 N
FB-20 N	0 - 20 N	0.2 N
FB-30 N	0 - 30 N	0.25 N
FB-50 N	0 - 50 N	0.5 N
FB-100 N	0 - 100 N	1 N
FB-200 N	0 - 200 N	2 N
FB-300 N	0 - 300 N	2.5 N
FB-500 N	0 - 500 N	5 N

Attachments see page A 10 and A 11

Other units as Kgf and lbf are available on request.

Available Models	Capacity	Resolution
PSH-1000 N	0 - 1000 N	10 N
PSH-2000 N	0 - 2000 N	20 N
PSH-3000 N	0 - 3000 N	25 N

Other units as Kgf and lbf are available on request.

Specifications	Series FB
Displacement:	10 mm
Accuracy:	± 0.3 % FS*
Temperature range:	5 - 45 ℃
Air humidity:	85 % RH, max.
Housing dimensions:	235 x 65 x 50 mm (L x W x H)
Weight, net (gross):	approx. 530 g (1000 g)

Delivery includes: *Force gauge, standard attachments, carrying case, manufacturer's calibration report*

* FS = Full Scale

Specifications	Series PSH
Displacement:	10 mm
Accuracy:	± 0.1 % FS*
Temperature range:	5 - 45 ℃
Air humidity:	85 % RH, max.
Housing dimensions:	285 x 95 x 63 mm (L x W x H)
Weight, net (gross):	approx. 3100 g (4000 g)

Delivery includes: *Force gauge, standard high-capacity attachments, carrying case, manufacturer's calibration report*

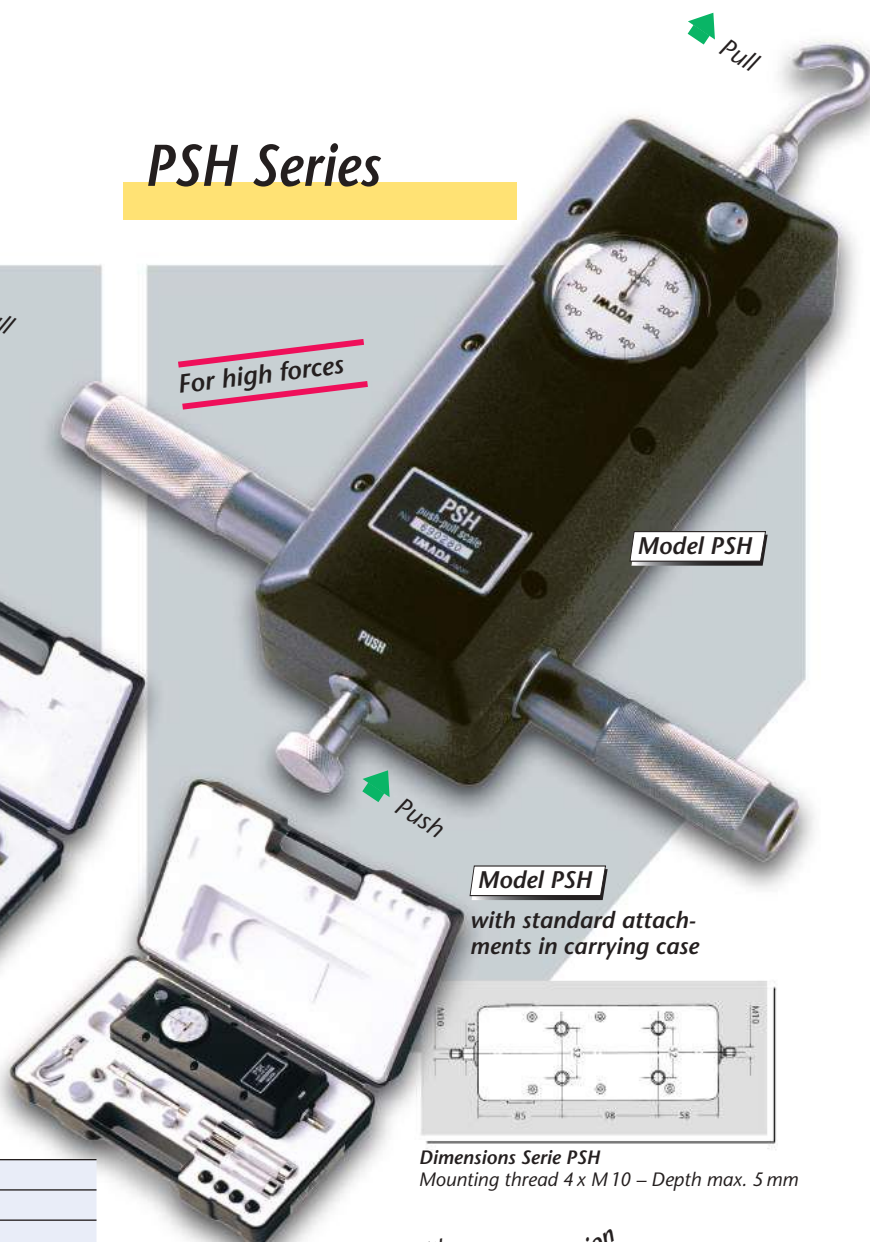** FS = Full Scale*

Gauges for a wide variety of applications

Pull
Push

**Standard features
for all _digital_ FG series
Force Gauges:**

▮ User switchable units:
  FGJN: N and Kgf (gf)
  FGP: N, Kgf (gf) and lbf (ozf)
▮ Selectable Real Time or Peak Modes
▮ Display can be
  reversed for in-
  verted use
▮ High measuring frequency
  1000 Hz
▮ 200 % overload protection
▮ Small, compact, rugged
  die-cast aluminium housing
▮ Facilities for mounting on
  test stands

Model FGJN
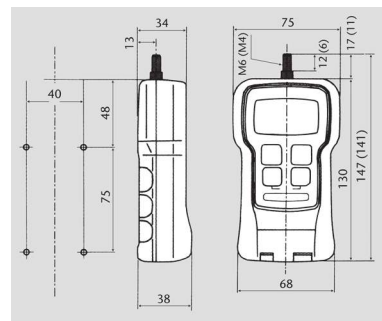
Dimensions Series FGJN and FGP:
Mounting thread 4 x M 4 – Depth max. 6 mm
Dimensions in bracket: Model FGP-0.2
and Model FGP-0.5

FGJN Series

Basic Unit without interface

Model FGP

**with standard
attachments in
carrying case**

FGP Series

**The universal unit which
meets all requirements**

ToriemonUSB

Additional features:

✚ Output (USB, RS 232 C,
  analog)
✚ Overload output signal
✚ Storage of 1000 readings
  for continuous measuring;
  100 readings for single
  measurement

**Software for data-
transfer and storage
in an Excel file
100 readings/s**

Small Hook	Flat Tip Ø 12 mm	Conical Tip 70°	Chisel Tip 70°	Notched Tip 70°	Extension Shaft 80 mm
C-1	C-2	C-3	C-4	C-5	C-6

»C« Series (steel)

Specifications | **Series FGJN / FGP**

Available Models	Capacity	Resolution
FGJN-2	0 - 20.00 N	0.01 N
FGJN-5	0 - 50.00 N	0.01 N
FGJN-20	0 - 200.0 N	0.1 N
FGJN-50	0 - 500.0 N	0.1 N
FGP-0.2	0 - 2.000 N	0.001 N
FGP-0.5	0 - 5.000 N	0.001 N
FGP-1	0 - 10.00 N	0.01 N
FGP-2	0 - 20.00 N	0.01 N
FGP-5	0 - 50.00 N	0.01 N
FGP-10	0 - 100.0 N	0.1 N
FGP-20	0 - 200.0 N	0.1 N
FGP-50	0 - 500.0 N	0.1 N
FGP-100	0 - 1000 N	1 N

attachments
see page A 11

Other units as Kgf and lbf are available on request.

Specifications	Series FGJN / FGP
Displacement:	0.5 mm
Accuracy:	FGJN: ± 0.3 % FS* ± 1 digit
	FGP: ± 0.2 % FS* ± 1 digit
Display:	4 digit LCD, 12 mm high
Overload capacity:	200 % FS*, display flashes beyond 120 % FS*
Zero adjustment:	10 % FS*
Sampling rate:	internal max. 1000 Hz
Temperature range:	5 - 45 °C
Air humidity:	85 % RH, max.
Power supply:	Rechargeable NiMh battery pack and / or
	100 ... 240 V AC adapter
Housing dimensions:	147 x 75 x 38 mm (L x W x H)
Weight, net (gross):	approx. 450 g (1000 g)

For FGP Series

Output signal:	USB, RS 232 C, analog ± 1 V DC,
	overload signal: open collector
	(DC 30 V, 5 mA)

Delivery includes: *Force gauge, standard attachments,
AC adapter, USB connecting cable (series FGP only),
carrying case, certificate of compliance with the order*

* FS = Full Scale

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The economic standard model

DS2 Series

Economic model for all branches of industry

Standard features for all <u>digital</u> Imada Force Gauges:

- User selectable units: N, kgf (gf) and lbf (ozf)
- High display update rate
- Selectable Real Time or Peak Modes
- Easy to read digital display
- »Zero Set« to zero the gauge in all operating positions
- 200 % overload protection
- Ergonomically-designed, rugged die-cast aluminium housing
- Facilities for mounting on test stands
- Operates on rechargeable battery and / or AC adapter
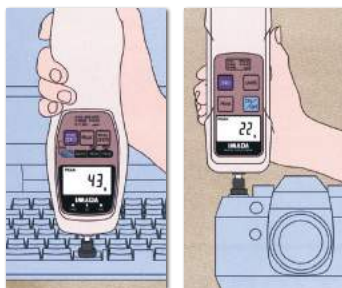
Special features:

- **+** Easy to use
- **+** Internal sampling rate up to 1000 times/sec
- **+** Output (RS 232 C, analog and Mitutoyo Digimatic)

Pull
Push
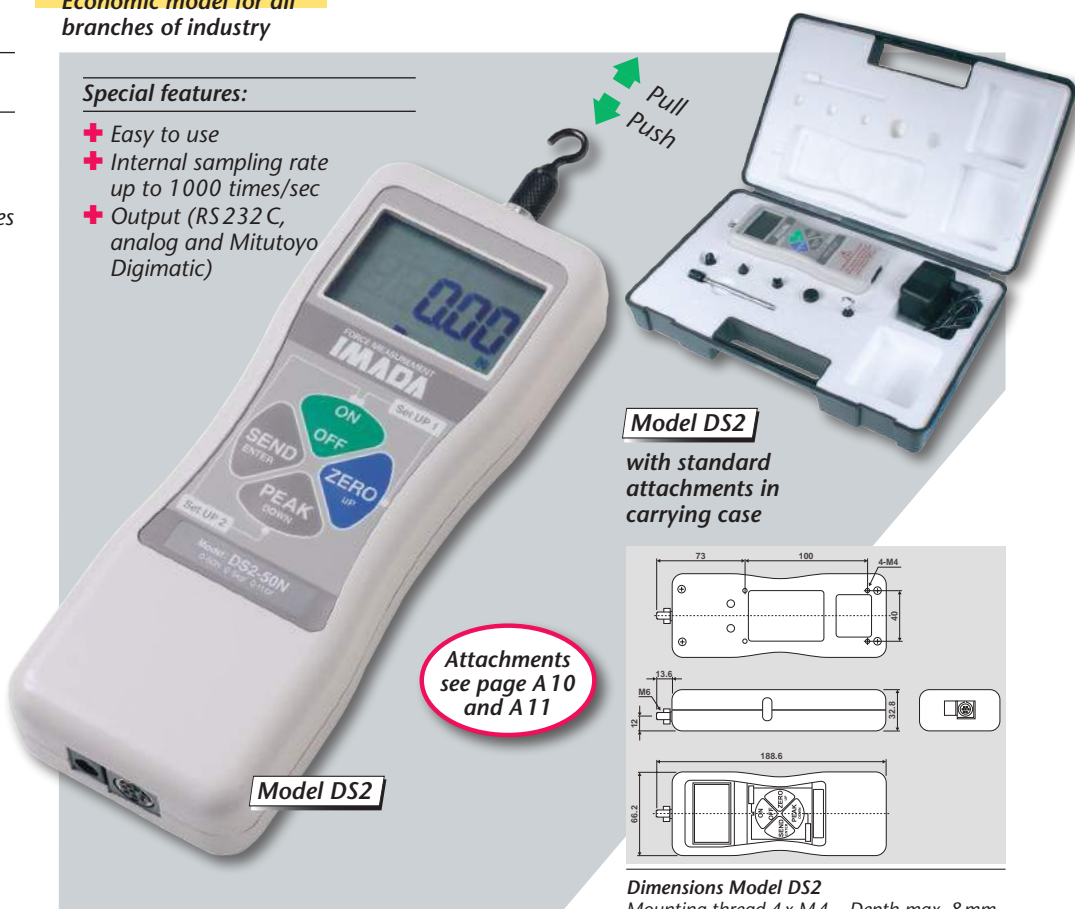
Model DS2

with standard attachments in carrying case

Model DS2

Attachments see page A 10 and A 11
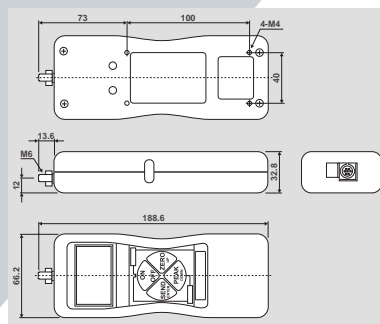
Dimensions Model DS2
Mounting thread 4 x M 4 – Depth max. 8 mm

Application examples:

Display can be reversed for inverted use; e.g. on test stands

Specifications	Model DS2
Displacement:	0.2 mm**
Accuracy:	± 0.2 % FS* ±1 digit
Display:	4 digit, 14 mm high
Overload capacity:	200 % FS*, > 5 N 150 % FS* display flashes beyond 110 % FS*
Zero adjustment:	10 % FS*
A/D Converter:	16 bit
Output signal:	RS 232 C (8, 1, N, 19200), analog ± 1 V DC, Mitutoyo Digimatic
Temperature range:	5 - 45 ºC
Air humidity:	85 % RH, max.
Power supply:	Rechargeable NiMH battery pack and/or 230 V AC Adapter
Housing dimensions:	188 x 66 x 33 mm (L x W x H)
Weight, net (gross):	approx. 430 g (1300 g)

Available Models	Capacity	Resolution
DS2-2N	0 - 2.000 N	0.001 N
DS2-5N	0 - 5.000 N	0.001 N
DS2-20N	0 - 20.00 N	0.01 N
DS2-50N	0 - 50.00 N	0.01 N
DS2-200N	0 - 200.0 N	0.1 N
DS2-500N	0 - 500.0 N	0.1 N
DS2-1000N	0 - 1000 N	1 N

Delivery includes: *Force gauge, standard attachments, AC adapter, carrying case, manufacturer's calibration report*

* FS = Full Scale
** = 0.5 mm for Model DS2-2N and DS2-5N

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ZT Series

Model ZTS with USB, RS232, analog and digimatic output up to 5000N
Model ZTA with additional features up to 5000N

Special features:

✚ Extremly high internal sampling rate (2000 times/sec) for fast measurements and best Peak capture

✚ OLED display is highly visible in dark locations

✚ Storage of 1000 readings which can be recalled on the display or transfered to a PC for simple data analysis (reading, time, date, limits) using the Software »ZT-Logger« free of charge

✚ The header- and footline of the display can be set up by the operator (time, date, force transiton etc.)

✚ Programmable high/low set-points for go/no-go testing with color-coded indicators in the LED display and relais outputs

✚ <u>Real Time:</u> to display current values
<u>Peak Modes:</u> to capture the peak force achieved during a test

✚ Damping rate, display functions, auto power off, etc. are adjustable by the operator

✚ Selectable languages for the display (english, german and 6 other languages)

✚ Overload alarm and output signal

Special features model ZTA in comparision to model ZTS

✚ In combination with a test stand with length measurement Code FA - force and displacement values can be displayed or shown as graph including data analyse on a PC using software »Force Recorder Professional«

✚ Displayed readings and stored readings can be transferred to a USB flash drive (100 readings/sec)

✚ 1st and 2nd Peak values can be captured before load value drops

Pull
Push

Model ZTS-500

Model ZTS

with standard attachments in carrying case

Specifications	Model ZTS and ZTA
Accuracy:	± 0.2% FS* ±1 digit
Selectable units:	N, Kgf (gf), lbf (ozf)
Display:	OLED, 4 digit; update 10 times/sec
Overload capacity:	200% FS* (display flashing beyond 110% FS*)
Memory:	Internal memory for max. 1000 values recallable peak, tension and compression
Setpoints:	Min, Max (programmable), with output signal ZTA: 4 setpoints
Output signal:	USB, RS232C (8, 1, N, 19200) Mitutoyo Digimatic, analog ± 2V DC, Open collector Comperator 3x (+NG, Ok, -NG), overload signal
Temperature range:	0-40°C
Air humidity:	80% RH, max.
Power supply:	Rechargeable NiMH battery pack (approx. 8 hours continous use) and/or 100...240 VAC adapter with two adapters (EU/USA)
Dimensions:	up to 1000 N: 191 x 75 x 34 mm (L x W x H) from 2500 N: 221 x 83 x 44.5 mm (L x W x H)

Available Models		Capacity	Resolution
ZTS-2	ZTA-2	0 - 2.000 N	0.001 N
ZTS-5	ZTA-5	0 - 5.000 N	0.001 N
ZTS-20	ZTA-20	0 - 20.00 N	0.01 N
ZTS-50	ZTA-50	0 - 50.00 N	0.01 N
ZTS-100	ZTA-100	0 - 100.0 N	0.1 N
ZTS-200	ZTA-200	0 - 200.0 N	0.1 N
ZTS-500	ZTA-500	0 - 500.0 N	0.1 N
ZTS-1000	ZTA-1000	0 - 1000 N	1 N
ZTS-2500	ZTA-2500	0 - 2500 N	1 N
ZTS-5000	ZTA-5000	0 - 5000 N	1 N

Delivery includes: Force gauge, standard attachments, AC adapter, carrying case, manufacturer's calibration report, USB cable 1.5 m, CD-ROM with driver and simple software for communication and data logging »ZT-Logger« – **Model ZTA additional: USB adapter**

* FS = Full Scale

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S C H M I D T
c o n t r o l   i n s t r u m e n t s

Model ZTS / ZTA

For measuring high forces
from 2500 N up to 5000 N

Attachments
see page A 10
and A 11

Pull
Push

IMADA

Model ZTA-5000

with handles

123.4 N

123.4 N

Display can be reversed
for inverted use; e. g.
on test stands

Model ZTS-DPU/ZTA-DPU

With separate remote load sensor

Function, specifications and
delivered equipment same
as for model ZTS / ZTA.

Dimensions of the remo-
te sensor e.g. Model
ZTS-50-DPU:
73 x 73 x 21 mm
(L x W x H)

0.00 mN
Hi +1.00 Lo −1.00

IMADA

DPU
50N
IMADA

Pull
Push

Model ZTS-DPU

Model ZTA-DPU

with standard
attachments in
carrying case

Dimensions model ZTS, ZTA
measuring range up to 1000 N
Mounting thread 4x M 4
Depth max. 5 mm

Dimensions model ZTS, ZTA
measuring range 2500 N / 5000 N
Mounting thread 4x M 4
Depth max. 5 mm

Available Models		Capacity	Resolution
ZTS-2-DPU	**ZTA-2-DPU**	0 - 2.000 N	0.001 N
ZTS-5-DPU	**ZTA-5-DPU**	0 - 5.000 N	0.001 N
ZTS-20-DPU	**ZTA-20-DPU**	0 - 20.00 N	0.01 N
ZTS-50-DPU	**ZTA-50-DPU**	0 - 50.00 N	0.01 N
ZTS-100-DPU	**ZTA-100-DPU**	0 - 100.0 N	0.1 N
ZTS-200-DPU	**ZTA-200-DPU**	0 - 200.0 N	0.1 N
ZTS-500-DPU	**ZTA-500-DPU**	0 - 500.0 N	0.1 N
ZTS-1000-DPU	**ZTA-1000-DPU**	0 - 1000 N	1 N
ZTS-2000-DPU	**ZTA-2000-DPU**	0 - 2000 N	1 N
ZTS-5000-DPU	**ZTA-5000-DPU**	0 - 5000 N	1 N
ZTS-10 K-DPU *	**ZTA-10 K-DPU** *	0 - 10 kN	10 N
ZTS-20 K-DPU *	**ZTA-20 K-DPU** *	0 - 20 kN	10 N

* No standard attachments are included with model ZTS / ZTA-10 K-DPU and
higher. These models do not have measuring shaft, but there is a female
thread in place of a measuring shaft.

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Physical Therapy & Strength Testing Kits

Model RZTA-1000 with USB, RS 232, Digimatic and analog output
Model RDS-1000 with RS 232, Digimatic and analog output
Model RFB-750 mechanical, analog force gauge

Force gauges for determination of muscle strength, useable for numerous applications in rehabilitation and physical therapy

Special features Model RZTA-1000 -
Laboratory Instrument to meet the highest demands:

(specifications same as model ZTA-1000, ➔ see page A 7 ➔)
✚ *Max. range 1000 N*
✚ *2 selectable display modes: Real Time and Peak Mode*
✚ *Highest sampling rate 2000 Hz*
✚ *Storage of 1000 readings*
✚ *Programmable high / low set points with color-coded LED display*
✚ *USB output, connecting cable and Software Force Recorder*

Special features Model RDS-1000 -
most used economic model with basic functions:

(specifications same as model DS2-1000, ➔ see page A 6 ➔)
✚ *Max. range 1000 N*
✚ *2 selectable display modes: Real Time and Peak Mode*
✚ *Internal sampling rate up to 1000 Hz*
✚ *Programmable high / low set points with ↑↓ indication in the display*

Special features Model RFB-750 -
for quick and easy use:

(specifications same as model FB-500, ➔ see page A 4 ➔)
✚ *Max. range 750 N*
✚ *2 selectable display modes: Real Time and Peak Mode*

Available Models	Capacity	Output signal
RZTA-1000	0 - 1000 N	USB, RS 232, Digimatic, analog
RDS-1000	0 - 1000 N	RS 232, Digimatic, analog
RFB-750	0 - 750 N	none

Model RZTA-1000
with handle and curved pad

Model RFB-750
analog force gauge with standard accessories

Model RDS-1000

Measuring the arm muscle strength with the curved pad

Measuring the leg muscle strength with the curved pad

A   B   C   D   E   F
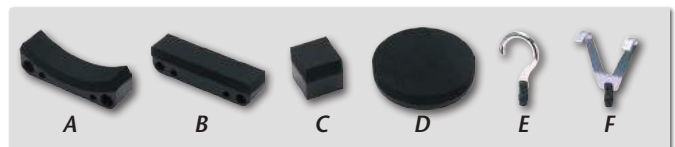
Delivery includes following attachments:
A: Curved pad, e. g. for arms and legs (MED-R80)
B: Rectangular pad, e. g. for arms and legs (MED-100-25)
C: Square pad,. g. for face or tongue (MED-25-25)
D: Round pad, e. g. for back (MED-D80)
E: Large hook, e. g. doors, wagons, cartons (S-7)
F: Y-hook, e. g. doors, wagons, cartons (S-8)

Delivery includes: *Force gauge, 6 inserts (A - F), handle, AC-adapter, manufacturer`s calibration report and operating manual in English*

Standard Attachments

Small Hook	Flat Tip	Conical Tip 85°	Chisel Tip 85°	Notched Tip 90°	Extension Shaft	Large Hook * *not included in delivery with series FB and DS2	Y-Hook *
A-1	A-2 Ø 13 mm	A-3	A-4	A-5	A-6 80 mm	A-7 *	A-8 *
S-1	S-2 Ø 16 mm	S-3	S-4	S-5	S-6 100 mm	S-7 *	S-8 *

Small Hook	Flat Tip	Conical Tip 85°	Chisel Tip 85°	Notched Tip 85°	Extension Shaft	Handles
B-1	B-2 Ø 23 mm	B-3	B-4	B-5	B-6 100 mm	B-7

▪ **»A« Series** *(aluminium M 6) attachments are supplied for models with capacities up to 100 N*

▪ **»S« Series** *(steel M 6) attachments are supplied for models with capacity from 100 N to 1000 N*

▪ **»B« Series** *(steel M 10) attachments are supplied for models PSH, ZTS, ZTA with capacity > 1000 N*

4x Mounting bolts M 10 to M 6
B-8

Accessories

Connecting cables

Available for all digital force gauges with output:

for RS-232 C for connection to PC
Model CB-203: *Sub D 9 female for model DS2*
Model CB-208: *Sub D 9 female for models ZTS, ZTA, HTGS, HTGA, DTXS and DTXA*

for connection to a line recorder
Model CB-101: *For models DS2*
Model CB-108: *for models ZTS, ZTA, HTGS, HTGA DTXS and DTXA*

for connection to Mitutoyo evaluation units
Model CB-301: *For model DS2*
Model CB-308: *For models ZTS, ZTA, HTGA, DTXS and DTXA*

for connection of extern units
Model CB-808 *For model ZTS, ZTA, HTGS, HTGA, DTXS und DTXA*
Model CB-908: *With open ends for model ZTS, ZTA HTGS, HTGA, DTXS and DTXA*

for stands series MX
Model CB-508: *Force control for models ZTS, ZTA*

for stands series MX2 and EMX
Model CB-518: *Force control for models ZTS and ZTA*
Model CB-706: *With open ends, customized in/output signal for EMX and MX2-CN*

Optional handles

Imada's mechanical and digital force gauges can easily be fitted with a handle. This ensures safe and consistent measuring conditions.

Please contact us !

Software

Requirements:
Windows XP/Vista/7 (32 Bit/64 Bit)
CPU: Pentium 4 (1 GHz or more), 2GB RAM

Only for model DS2:
Z Link 3
Data acquisation using RS-232 C output
▪ *Data transfer 50 data/sec*
▪ *Displays the actual reading*
▪ *Data storage as CSV file*

Only for model IPT200:
ZP Recorder
Data acquisation using USB connection
▪ *Data transfer 1000 data/sec*
▪ *Data storage as graph (force-time) and CSV file*
▪ *Comparison of 5 graphs*

Only for model ZTS, ZTA, HTGS, HTGA, DTXS and DTXA
Force Recorder *(Light/Standard/Professional)*
▪ *3 versions with different features*

Version:	Light	Standard	Professional
Graph type:	Force-time	Force-time	Force-time Force-displacement with FSA test stand
Data transfer:	2000 Data/s	2000 Data/s	2000 Data/s
Graph overlaying function:	no	yes	yes
Trigger function:	no	yes	yes
Point marking:	no	yes	yes
Border line function:	no	yes	yes
Graph editing:	yes	yes	yes
Statistics output:	yes	yes	yes
Comment function:	yes	yes	yes
Description:	no	yes	yes
Print:	yes	yes	yes

Printer

Model DP-1 VR:
To print stored values using Mitutoyo Digimatic output

SCHMIDT
control instruments
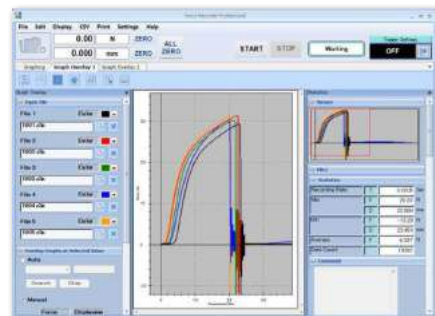
Special Attachments

We offer a wide selection of various attachments for any application required:

Penetrating Pin Gauges Series PG

Length: 20 mm

To check the hardness of clay-like materials, the burst strength of plastic coverings, skins etc.
Model PG-2: outer Ø 2 mm
Model PG-3: outer Ø 3 mm
Model PG-4: outer Ø 4 mm
Model PG-5: outer Ø 5 mm
Max. capacity:
PG-2/PG-3: 100 N
PG-4/PG-5: 200 N

Jacob's Chucks Series GC

For fixing shafts, rigid rods and small wires.
Model GC-5:
for Ø 0.5 to 5 mm
Max. capacity: 500 N
Model GC-15:
for Ø 2 to 13 mm
Max. capacity: 1000 N

Coefficient of friction tester Model COF-10N

For analysis surface conditions of paper and printed matter and coefficient of friction measurement of various materials.

Model COF-10N:
Max. capacity: 10 N
Including software with graphics

Pin Grip Model CP-150N

For gripping small diameter wires, pins, filaments etc.
Model CP-150N:
for Ø 0 to 3.2 mm
Max. capacity: 150 N

Wedge Grip Model KC

Self-tightening by spring force for tensile tests of thick materials up to 10 mm; serrated jaws, width 15 mm;
Model KC-100:
for materials up to 10 mm thickness
Max. capacity: 500 N

Fine Point Grips Series FP

For fine wires up to max. Ø 0.5 mm.
Model FP-50:
Width of jaw: 1 mm
Weight: 19 g
Max. capacity: 100 N
Model FP-51:
Width of jaw: 1 mm
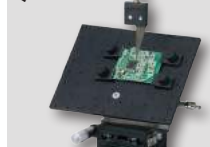Weight: 8 g
Max. capacity: 50 N

Tape Grip Series GC

Self-tightening »buckle-type« mechanism ensures slip-free operation. For testing rubber, paper, films etc. up to 2 mm thickness; serrated jaw.
Max. capacity: 500 N
Model GC-60: for materials with 20 mm width
Model GC-100: for materials with 50 mm width

Attachment for pull test QFP45-100N

Table and Grip Series LF
For pull down and shear tests of electronic components
Model QFP45-100N:
45° table, hook and x-y stage
Model TIP-90-100N:
90° table, shear hook and x-y stage

Fine Point Grips Series SC

For testing small to medium diameter wires, small components, ribbon tapes (max. opening width 1 mm).
Model SC-3:
Width of jaw: 3 mm
Max. capacity: 100 N
Model SC-8:
Width of jaw: 8 mm
Max. capacity: 150 N

Wire Wrapping Grip Model GC

For measuring the strength of wires, filaments, fibres etc. Wrapping a sample avoids breaking at the gripping point.
Model GC-30:
Max. capacity: 500 N

Bend Test Stand Model GA

Test the bend strength of rods, strips etc. of max. 40 mm width.
Model GA-10:
Max. capacity: 500 N
Model GA-5000:
Max. capacity: 5000 N
Mounting screw: M 10

Film Grips Series FC

Use these spring loaded film grips to check tensile strength of thin film samples up to 2 mm thickness; serrated jaws.
Max. capacity: 500 N
Model FC-20:
Width of jaw: 20 mm
Model FC-40:
Width of jaw: 40 mm

Peeling Attachments Series GT

GT-10

GT-20

To measure the peeling force of laminated materials or electronic components on circuit boards etc.
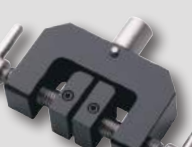**Model GT-10:**
Pull test peeling
Model GT-20:
Push test peeling

Compression jig

For measurement of many kinds of compression force and breaking strength a variety of shapes and sizes are designed for jigs.

Flat Chucks Series GC

Squared serrated face, heavy-duty flat grip for many applications.
Model GC-1100:
Grip dimensions:
20 x 20 mm (W x H)
max. opening width: 10 mm
max. capacity: 1000 N
Model GC-1200:
Grip dimensions:
20 x 20 mm (W x H)
max. opening width: 20 mm
max. capacity: 1000 N
Model GC-5000:
Grip dimensions:
29 x 37.5 mm (W x H)
max. opening width: 30 mm
max. capacity: 5000 N
Mounting thread: M 10

Cam Grip Model GR

Eccentrically mounted, serrated roller grips allow for self-tightening of thin material.
Model GR-30:
width of chuck: 50 mm
max. opening width: 2 mm
max. capacity: 500 N
Model GR-2000:
width of chuck: 50 mm
max. opening width: 4 mm
max. capacity: 2000 N
Mounting thread: M 10

Wedge Grips Model KC

Spring loaded jaws automatically close on the specimen and tighten as tension is applied. For testing wires, stripes, tapes and films.
Model KC-1001:
Width of chuck: 10 mm
max. opening width: 3.5 mm
Grip dimensions:
10 x 15 mm (W x H)
max. capacity: 1000 N
Model KC-5000:
Width of chuck: 23.8 mm
max. opening width: 6 mm
Grip dimensions:
23,8 x 26 mm (W x H)
max. capacity: 5000 N
Mounting screw: M 10

For more grips visit www.hans-schmidt.com

Some grips require an adapter coupling from M 6 shaft to M 10. In case of order please mention force gauge model and range. For the grips we can supply detailed drawings and additional specifications. Please ask us.

Subject to change without notice.

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Horizontal Test Stands

The test stands assure consistent, identical measuring conditions for a wide range of applications.
All Imada force gauges can easily be mounted to these stands.

Motorized Test Stand IPT200 Series

to determine peeling force of emboss tapes, stickers, films etc.

180° Peeling Tester

Special features model IPT200:

▌ With integrated load cell DPU
▌ Sample width: 8 - 88 mm
▌ including software with graphics

Model IPT200-5N

For grips see page A 11

Model SH-1000 N

Model MH-1000 N

Model MH2-500 N

Special features MX series:

▌ Table for sample height adjustable:
▌ Max. sample length
   SH-1000 N: 250 mm
   SH-3000 N: 355 mm

For compression and tension test

Special features model MH2-500 N and MH-1000 N:

▌ Speed controlled: to enable force controlled testing and conditional overload prevention (only with ZT series)
▌ Manual operation: The carriage is moving as long as switch is pressed. It stops when travel limits are reached
▌ Single cycle mode: Carriage travels up and down once within the limits (only MH-1000N)
▌ Cycle mode: Carriage travels up and down within the limits, numers of cycle can be set.
   Jog mode: Moves the cross head exactly 0.01 mm (only MH2-500N)
▌ Endurance tests: Setting number of cycle and time period to keep force.
▌ LCD display with many functions (only MH2-500N): digital setting of travel speed and traveling distance

Specifications	SH-1000N	SH-3000N	Typ MH2-500N	MH-1000N	IPT200
Max. capacity:	1000 N	3000 N	500 N	1000 N	5, 20 oder 50 N
Stroke:*	300 mm	370 mm	275 mm	300 mm	200 mm
Travel speed in mm/min:	1.2 mm**	0.6 mm**	10 - 300	6 - 180	120, 300, 500 1000, 1500
Power supply:	–	–			
Weight net:	15 kg	22 kg	14 kg	14 kg	11 kg
Dimensions in mm:	560 x 265 x 220	696 x 285 x 225	554 x 220 x 219	700 x 195 x 210	710 x 300 x 126
Attachment					
Length meter:***	yes	yes	yes	yes	–
Linear encoder:****	–	–	yes	–	–

*according to the used force gauge
***Code S (with distance meter; see page A13)

**one complete turn of the hand wheel
****Code FA (for force displacement-graphing)

Delivery includes: Test stand without force gauge, operating manual in English

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S C H M I D T
control instruments

Vertical Test Stands

The test stands assure consistent, identical measuring conditions for a wide range of applications. All Imada force gauges can easily be mounted to these stands.
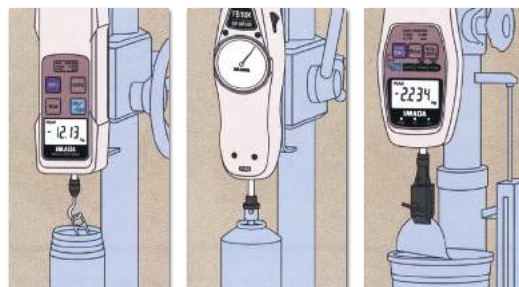
Model MSF-50N

Model KV-50N

Application examples:

For grips see page A11

Manual Test Stands with small knob
Model MSF-50N
– Max. capacity: 50N
– Stroke: 80mm
– One complete turn of knob = 1.8mm
– Weight, net: approx. 1.2 kg
– Dimensions (L x W x H): 110 x 81 x 204 mm
– Code FA optional (= model MSL)

Model KV-50N
– Max. capacity: 50N
– Stroke: 70mm
– One complete turn of knob = 1 mm
– Weight, net: approx. 2 kg
– Dimensions (L x W x H): 140 x 180 x 220 mm

For compression and tension test

Distance Meter Code S

To measure the exact travel distance all vertical test stands are also available with a length measurement system:
– Adjustable display in mm or inch
– Resolution of length measurement 0.01 mm
– Zero setting
– Digimatic output

Available for Models:

KV-50N .... 100 mm*
SVL-1000N ..... 100 mm*
SVH-1000N .... 100 mm*
HV-500N .... 300 mm*
HV-1000N ..... 300 mm*
HV-3000N ..... 300 mm*
MX2-500N .... 300 mm*
MX2-1000N .. 300 mm*
MX2-2500N... 300 mm*
MX-500N ...... 300 mm*
MX-1000N .... 300 mm*
SH-1000N ..... 300 mm*
SH-3000N ..... 300 mm*
MH2-500N .... 300 mm*
MH-1000N .... 300 mm*
* Measuring range

Model SVL-1000N

Model SVH-1000N

Model HV-500N

For compression and tension test

Model HV-1000N

For compression and tension test

Manual Test Stand with Lever Model SVL-1000N Hand Wheel Model SVH-1000N
– Max. capacity: 1000N
– Stroke: 60mm
– Stroke control by mechanical stops
– Fixed position (clearance): adjustable from 0 to 265mm
– Weight, net: approx. 7 kg
– Dimensions (L x W x H): 200 x 280 x 410 mm

Manual Test Stand with Hand Wheel Model HV-500N
– max. capacity: 500 N
– Stroke: 288 mm
– One complete turn of the hand wheel = 2 mm
– Weight, net: approx. 10 kg
– Dimensions (L x W x H): 327 x 309 x 597 mm

For compression and tension test

Manual Test Stands with Hand Wheel Model HV-1000N and Model HV-3000N
– max. capacity: 1000 N (HV-1000 N) 3000 N (HV-3000 N)
– Stroke: 430 mm
– One complete turn of the hand wheel 1.2 mm (HV-1000 N) 0.6 mm (HV-3000 N)
– Weight, net: approx. 18 kg (HV-1000 N) approx. 24 kg (HV-3000 N)
– Dimensions (L x W x H): 305 x 275 x 730 mm (HV-1000 N) 355 x 310 x 744 mm (HV-3000 N)

Delivery includes: *Test stand without force gauge, operating manual in English*

For grips see page A 11

The economic basic stand

With high repeatability

The universal stand with best features

Model MX-500N

Model MX2-500N

Model EMX-1000N

Special features MX series:

▌ Enables force controlled testing and conditional overload prevention

▌ Manual operation: the carriage is moving as long as switch is pressed. It stops when travel limits are reached

▌ Single cycle mode: Carriage travels up and down once within the limits

▌ Continuous cycle mode: Carriage travels up and down continuously within the limits

▌ 2 manual adjustable limits to adjust range of movement

Special features EMX series:

▌ Force controlled: To enable force controlled testing and conditional overload prevention (only with ZT series)

▌ Manual operation: The carriage is moving as long as switch is pressed. It stops, when travel limits are reached

▌ Cycle mode: Carriage travels up and down within the limits, numbers of cycles can be set.

▌ Jog mode: Moves the cross head exactly 0.01 mm

▌ Endurance tests: Setting number of cycles and time period to keep force.

▌ LCD display with many functions:
MX2: digital setting of travel speed
EMX: digital setting of travel speed and travel distance

▌ 3 different speeds adjustable (start, measuring, back)

▌ Stronger main shaft improves measurement accuracy

Specifications	Model MX-500	MX-1000N	MX-5000N	MX2-500N	MX2-1000N	MX2-2500N	EMX-1000N
Max. capacity:	500N	1000N	5000N	500N	1000N	2500N	1000N
Stroke:*	275mm	420mm	340mm	230mm	290mm	290mm	290mm
Travel speed in mm/min:	10-300	8-240	10-300	10-300	10-300	10-300	0.5-600
Power supply:	100...240VAC, 50/60Hz						
Weight net:	13kg	24kg	30kg	18kg	19kg	26kg	23.5kg
Dimensions in mm:	214x428x573	263x368x903	250x420x816	220x380x562	280x421x660	280x421x644	280x421x643

Attachment							
Long stroke:	L (250N)	L (500N)	–	L	L	L	L
Length meter:**	yes	yes	yes	yes	yes	yes	yes
Linear encoder:***	–	–	–	yes	yes	yes	yes

*according to the used force gauge   **Code S (see page A13)   ***Code FA (for force displacement-graphing)

Delivery includes: Test stand without force gauge, operating manual in English

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Force-Displacement Measuring Unit

FSA Series

Ranges from 2N up to 2500N

**For Force-displacement measurements. Using the software »Force Recorder Professional«
force-displacement and force-time graphs can be easily created and analyzed**

For compression and tension measurements, strength tests, shearing and peeling tests, longterm tests etc.

Special features:

✛ *Force gauge with high sampling rate of 2000 measurements/sec.*
✛ *Force gauges with different ranges can be mounted on the test stand*
✛ *Test stands with high precision linear scale Code FA (resolution using software 0.001 mm)*
✛ *The displacement readings can be shown on the force gauge display (resolution 0.01 mm)*

Software »Force Recorder Professional«:

▪ *High sampling rate (2000 readings/sec)*
▪ *Automatic statistic calculation (min-, max-, average values)*
▪ *5 graphs can be displayed and easily compared at the same time*
▪ *It is possible to start/stop the recording automatically when the measured value reaches set points*

Model FSA-1KE-500N

Delivery includes no computer

## The FSA system exists out of following components

Motorized vertical test stand
Model MX2-500N, MX2-1000N, EMX-1000N and MX2-2500N each with Code FA (linear scale)

Manual vertical test stand
Series MSF-50 is used as a portable, mini material tester. (model MSL = model MSF with linear scale)

Force gauge ZTA series
Force gauge ZTA sereies for compression and tension forces with measuring range 2N up to 2500N
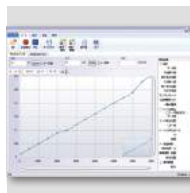
Software »Force Recorder Professional«
is used for data acquisiton using USB output. Force-displacement or force-time graphs can easily be created and stored

Available Models	MSF-50N	MX2-500N	MX2-1000N	EMX-1000N	MX-2500N
Nominal load:	50N	500N	1000N	1000N	2500N
Model FSA:	MSL	0.5K2	1K2	1KE	2.5K2
Travel distance:	80mm	235mm	300mm	320mm	320mm

Test stand   *Range of force gauge*   *Complete order no.*

To place an order
please indicate the complete model number, e.g.:

FSA + **0.5K2** + **200N** = **FSA-0.5K2-200N**

Delivery includes: Force gauge, standard attachments, AC adapter, carrying case, manufacturer's calibration report, USB cable 1.5m, USB adapter, CD-ROM with driver and simple software for communication and data logging »ZT-Logger, software »Force Recorder Professional«, operating manual in English

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control instruments

Universal Test Stand

ZPM Series

Tester for tensile and compression forces including displacement measurement.
To determine tensile strength, crushing strength, peeling-, friction- or shear forces etc.

Special features:

✚ *Interchangeable load cell to cover capacities up to max. 5000 N*
✚ *USB port to control the machine and for communication to PC*
✚ *High precision drive using ball screw, ball bearings and timing belt*
✚ *Length measurement with encoder, resolution 0.01 mm (display)*
✚ *The supplied software offers several tests:*
  Tensile strength, peeling- and friction tests and constant load holding
✚ *A machine with excellent value and many features*

Standard features:

▮ *Working area of 500 mm (exclude grips), optional 1200 mm.*
▮ *Load cell and grips can easily be changed*
▮ *Strong, rugged, bending resistant housing design*
▮ *A wide range of grips and fixtures are optionally available; please send us your demand profile*
▮ *Calibration report of load cell is included free of charge*

A wide range of grips are available

Available Models	Capacity	Stroke
ZPM-50-500	*50 N*	*500 mm*
ZPM-100-500	*100 N*	*500 mm*
ZPM-200-500	*200 N*	*500 mm*
ZPM-500-500	*500 N*	*500 mm*
ZPM-1000-500	*1000 N*	*500 mm*
ZPM-2000-500	*2000 N*	*500 mm*
ZPM-3000-500	*3000 N*	*500 mm*
ZPM-5000-500	*5000 N*	*500 mm*

TH56-K
Vice grip for clamping paper, foil, fabric etc. max. load 1 kN

TH76-5
*Rope grip with deflecting cylinder and wedge clamp max. load 5 kN*

Model ZPM

Specifications — **Model ZPM**

Accuracy:	*Load cell: Linearity - better than ±0.03 %, Hysterese ±0.02 nominal load* *Distance measuring by encoder 0.0001 mm (internal)*
Overload capacity:	*Approx. 120 % nominal load*
Display:	*LCD with double-spaced display: force, distance, speed*
Resolution:	*Force 0.01 N (50 N load cell), 0.1 N (load cells up to 5000 N)* *Distance 0.01 mm (LCD), 0.001 mm (PC)*
Measuring frequency:	*USB output with fast data transfer*
Feed:	*Under load: 1 - 500 mm/min continously adjustable* *Without load: 1 - 700 mm/min continously infinitely adjustable*
Max. travel distance:	*500 mm excluding grips (optional 1200 mm)*
Software:	*Win XP and higher*
Power supply:	*230 V (switchable to 110 V)*
Housing material:	*Rugged construction; aluminium and stainless steel*
Weight net, (gross):	*Approx. 48 kg (60 kg)*
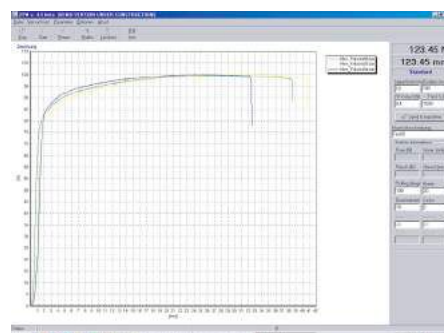
Easy to use software for machine control, to create hysteresis graphs and force-distance diagrams
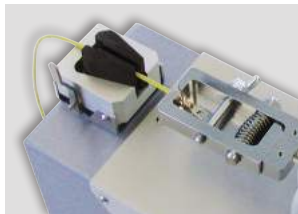
Delivery includes: *1 test stand, load cell, software, calibration certificate*

Wire Pull Testers

For testing the pull-off force of wire/terminal connections

Model LH-500 N

– Max. capacity: 500 N
– Stroke: 85 mm
– Weight: approx. 11 kg
– Dimensions (L x W x H): 450 x 155 x 182 mm
– **Delivery includes:** test stand, wedge grip CW-500N
 and wire terminal clamp CH-500N, without force gauge

Model ACT-1000 N

Measures accurately the pull-off force on most soldered or solderless wire terminals, crimped connectors and similar wire terminations.

Model LH-500 N

Special features:

✚ For testing accordance UL 486A-486B and JIS C2805 standards
✚ For wires with diameter between 1 mm up to 8 mm
✚ Terminal grip with 12 slots from 1 to 8 mm
✚ 2 selectable modes: <u>Break Mode:</u> to capture peak force
  <u>Keep Mode:</u> to apply the adjusted force for a
    specified time
✚ To store test conditions for 26 samples (name, mode, speed, force)
✚ Internal memory for recall readings at the display or transfer to a PC with software free of charge
✚ Programmable high / low setpoints for go / no-go testing with color-coded indicators (orange, green, red) in the LED display and relais outputs

Available Models	Capacity	Resolution	speed mm/min
ACT-1000	1000 N	1 N	10/25/50/100
ACT-1000-V300	1000 N	1 N	25/50/100/300

Model ACT-1000

Specifications	Model ACT-1000 N
Terminal grip slot:	1, 1.5, 2, 2.5, 3, 3.5, 4, 4.5, 5, 6, 7 and 8 mm
Wire diameter:	1 - 8 mm
Accuracy:	±0.5 % FS*; ±1 digit
Sampling rate:	2000 times/sec
Selectable units:	N, kgf, lbf
Stroke:	50 mm
Sample length:	100 mm or more
Overload:	150 % FS* (Symbol flashes at 110 %)
Output:	USB, RS 232
Power supply:	100 ... 240 V AC
Temperature range:	0 - 40 °C
Air humidity:	80 % RH, max.
Housing dimensions:	400 x 240 x 150 mm
Weight, net (gross):	11 kg

Delivery includes: Test stand with force gauge and clamps, operating manual in english

* FS = Full Scale

Operation:
The user insert the sample into the wire terminal slot and the wire end into the combined clamp-pull device. Press start key to zero the gauge and to start the pull motor. The wire will be fixed and constantly pulled off from the clamp. When the wire breaks, the display will show the peak force and the wire grip will return to home position.

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S C H M I D T
c o n t r o l   i n s t r u m e n t s

Nm

Torque Meter

HTG Series

Hand-held torque meter with seperate sensor, output signal and memory

HT-DC-6.5   HT-9.5SQ   HT-DBH   HT-ST

For measuring the torque of screws, screw and plug connectors, components or screwdrivers etc.

Special features:

✦ *Display of opening or closing torque (left and right torque)*
✦ *Real Time: to display the current values*
  Peak Modes: to capture the peak force achieved during a test
✦ *Selectable units: Nm, Ncm, kgfm, kgfcm, lbf.in, ozf.in*
✦ *Programmable high / low setpoints for*
  go / no-go testing with color-coded indicators
  (orange, green, red) in the LED display
  and relais outputs
✦ *Storage of 1000 values, which can be recalled or downloaded to a PC*
✦ *Output signals (USB, RS 232, analog) and Mitutoyo Digimatic*
✦ *OLED display is highly visible in dark locations*

Special features of model HTGA in comparison with model HTGS

✦ *Readings can be transferred from the internal memory to an USB flash drive or directly saved on it*
✦ *2 output values can be set, from which the actual reading will be sent to external devices*
✦ *Indication of two peak values per measurement*

Sensor Attachment:
Various torque pin chucks, a socket holder, hexagon socket, an adapter with male thread and a table with different table pins are available as sensor attachment.
For more information vistit us at
www.hans-schmidt.com

Model HTGS-5N

For portable use

Sensor attachment must be ordered additional

Accessories see page A 10

Torque sensor with additional supporting handels for 10 Nm models

Available Models	Capacity	Resolution
HTGS-2N	0 - 2.000 Nm (200 Ncm)	0.001 Nm (0.1 Ncm)
HTGS-5N	0 - 5.000 Nm (500 Ncm)	0.001 Nm (0.1 Ncm)
HTGS-10N	0 - 10.00 Nm (1000 Ncm)	0.01 Nm (1 Ncm)
HTGA-2N	0 - 2.000 Nm (200 Ncm)	0.001 Nm (0.1 Ncm)
HTGA-5N	0 - 5.000 Nm (500 Ncm)	0.001 Nm (0.1 Ncm)
HTGA-10N	0 - 10.00 Nm (1000 Ncm)	0.01 Nm (1 Ncm)

Specifications	Series HTG		Setpoints:	Min, Max (adjustable), with output signal
Accuracy:	± 0.5 % FS* ±1 digit			
Sampling rate:	2000 times / s		Temperature range:	0 - 40 °C
Selectable units:	Nm, Ncm, kgfm, kgfcm, lbf.in, ozf.in		Air humidity:	80 % RH, max.
Display:	OLED, 4 digit; update 10 times/sec			
Overload capacity:	200 % FS* (display flashing beyond 110 % FS*)		Power supply:	Rechargeable NiMH battery pack
Memory:	Internal memory for max. 1000 values (clockwise or counter clockwise torque and peak values)			(approx. 8 hours continuous use) and / or 100...240 V AC adapter with two adapters (EU/USA)
Output signal:	USB, RS 232 C (8, 1, N, 19200) Mitutoyo Digimatic, analog ± 2 V DC, Open collector 3x Comperator (+NG, Ok, -NG), overload signal		Housing dimensions: (approx.)	Display unit: 187 x 75 x 34 mm (L x W x H) Sensor: 183 x 38 mm (L x Ø)
			Weight: (approx.)	Display unit: 440 g / Sensor: 530 g complete set: 2000 g

Delivery includes: *Torque meter with 1 sensor **without** pin chuck, handle (only HTGS-10N and HTGA-10N), USB cable, AC adapter, carrying case, manufacturer's calibration report, CD-ROM with driver and simple software for communication and data logging »ZT-Logger«*

* FS = Full Scale

IMADA
ISO 9001 CERTIFIED

S C H M I D T
c o n t r o l   i n s t r u m e n t s

Nm

Cap Torque Meters

DTX Series

Torque meter – table design –
with output signal and memory

For checking the cap torque of bottles, glass jars, cans etc.
in the food, pharmaceutical and beverage industry.

Special features:

✚ Display of opening or closing torque
✚ <u>Real Time</u>: to display current values
  <u>Peak Mode</u>: to capture the peak force achieved during a test
✚ Selectable units: Nm, kgfm, lbf.in or Ncm, kgfcm, lbf.oz
✚ Clambs containers from Ø 20 to 180 mm
  (small table with Ø 7 to 50 mm on request)
✚ Programmable high/low setpoints for go/no-go testing with
  indicators in the LED display and relais output
✚ Storage of 1000 values which can be recalled on the display
  or downloaded to a PC
✚ Output signals (USB, RS 232, analog) and Mitutoyo Digimatic
✚ OLED display is highly visible in dark locations

Special features of model DTXA in comparision with model DTXS

✚ Readings can be transferred from the internal memory to an
  USB flash drive or directly saved on it
✚ 2 output values can be set, from which the actual reading
  will be sent to external devices
✚ Indication of two peak values per measurement

Clamping Table:
A large and small table with
different table pins and various
torque pin chucks are available.
For more information vistit us at
www.hans-schmidt.com

Accessories see
page A 10

Model DTX2A

Available Models	Capacity	Resolution
DTXS-2	0 - 2.000 Nm (200 Ncm)	0.001 Nm (0.1 Ncm)
DTXS-5	0 - 5.000 Nm (500 Ncm)	0.001 Nm (0.1 Ncm)
DTXS-10	0 - 10.00 Nm (1000 Ncm)	0.01 Nm (1 Ncm)
DTXA-2	0 - 2.000 Nm (200 Ncm)	0.001 Nm (0.1 Ncm)
DTXA-5	0 - 5.000 Nm (500 Ncm)	0.001 Nm (0.1 Ncm)
DTXA-10	0 - 10.00 Nm (1000 Ncm)	0.01 Nm (1 Ncm)

Torque meter
DTXA with small
table and
50 mm table
pins

Specifications	**Series DTX**
Accuracy:	± 0.5 % FS* ±1 digit
Sampling rate:	2000 times / sec
Selectable units:	Nm, Ncm, kgfm, kgfcm, lbf.in, ozf.in
Display:	OLED, 4 digit, 14 mm high
Overload capacity:	200 % FS* *(flashing LED beyond 110 % FS*)*
Output signal:	USB, RS 232 C (8, 1, N, 19200), Mitutoyo Digimatic, analog ± 2 V DC, Open collector 3x, (+NG, Ok, -NG) overload signal
Setpoints:	Min, Max (programmable), with output signal

Memory:	Internal memory for max. 1000 values (clockwise or counter clockwise torque and peak values)
Temperature range:	5 - 40 °C
Air humidity:	85 % RH, max.
Power supply:	Rechargeable NiMH battery pack (approx. 8 hours continuous use) and/or 100...240 V AC adapter with two adapters (EU/USA)
Dimensions:	305 x 233 x 127 mm (L x W x H)
Weight, net (gross):	Approx. 4900 g (5900 g)

Delivery includes: Torque meter, 1 table, 1 set of chuck pins 25 mm long, AC adapter, manufacturer´s calibration report, USB cable 1.5 m,
CD-ROM with driver, simple software for communication and data logging »ZT-Logger« operating instruction

* FS = Full Scale

Subject to change without notice.

ISO 9001 CERTIFIED

MTS Series

**Motorized torque stand
for constant measuring conditions**

*For checking the cap torque of bottles, glass jars, cans etc.
in the beverage, cosmetic and pharmaceutical industry.*

*Accessories see
page A 10*

Special features:

✚ *The motorized torque test stand can be configured according the customer`s
demand. The torque stand exists out of a test stand depending on the sample
height, a torque meter with different ranges and features as well as an upper
chuck and lower table.*

✚ *The torque will be measured without influence of the operator. The results are
more accurate and significant as measured with a manual device.*

✚ *3 selectable modes:* <u>Normal</u>: *Revolution in one direction until manual stop*
<u>NG Stop:</u> *Revolution in one direction until the adjusted value is reached*
<u>Endurance Test:</u> *Repeats the operation in two directions within the adjusted
limits (MTS series). The number of repeats are shown in the display. The opening
and closing angel as well as the number of repeats can be adjusted with
MTS-RA series*

✚ *Max. size of samples:*
- upper clamping chuck Ø 20 - 90 mm or Ø 7 - 50 mm
- lower clamping table Ø 20 - 160 mm or Ø 7 - 50 mm
- Max. available sample height 140, 240 or 340 mm

✚ *The rotation speed can continuously be adjusted between 3 - 90 degree/sec.
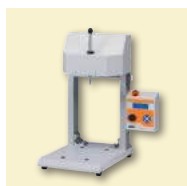The value will be displayed*

▮ *You can find information about the torque meter at
page B 2 and online at* **www.hans-schmidt.com**

Model MTS-10N

Required Moduls
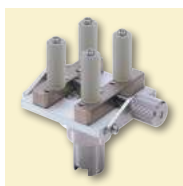
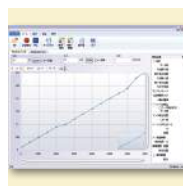|				
Torque stand (Model MTS)	Torque meter (Series DTX)	Lower clamping table	Upper clamping chuck	Software

Clamping Chucks:
*A large and small table with
different table pins, various torque
pin chucks and an adapter with
M 10 male thread are available.
For more information vistit us at*
www.hans-schmidt.com

Specifications

Torque Stand

Specifications	
Sample Height:	max. 140, 240 or 340 mm
Speed:	3 - 90°/sec adjustable
Temperature range:	0 - 40° C
Air humidity:	80 % RH, max.
Power supply:	100 - 240 V AC, 50/60 Hz, max. 3 A
Weight:	14 kg net without accessories

*Delivery includes: Torque stand, power cable, cable for torque
meter, centering stick and operation instruction in english*

Available Models	Capacity	Resolution
MTS-10N	140 mm	
MTS-10N-L	240 mm	
MTS-10N-2L	340 mm	
MTS-10N-RA	140 mm	with rotary encoder
MTS-10N-L-RA	240 mm	with rotary encoder
MTS-10N-2L-RA	340 mm	with rotary encoder

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Multi-function

Speed- and Length Meter as well as Tachometer

Model YS-20

Tachometer to measure yarn or wire speed and length as well as revolutions and surface speed.

Measures the speed or length of yarns, wires and other filaments (material diameter up to 0.5 mm) – for example on circular knitting and hosiery machines – using a yarn measuring adapter with an easy-run, rubber coated measuring wheel and unique »wrapper« roller.
This technique eliminates filament slip and breakage. The YS-20 can also be used either as a contact or a non-contact tachometer to measure revolutions of shafts, motors, pulleys etc. or line speed of moving surfaces as conveyor belts, webs of paper or fabric etc.

3IN1

Special adapter (optional) for speed measuring of welding-wire on roboters model YS-W

Pic. above: **Non-contact with reflective tape and contact measurement with adapter**

Pic. left: **With yarn measuring adapter as speed and length meter**

Speed measurement

0.10 ... 1999 m / min
0.30 ... 6500 feet / min
4.00 ... 78000 inch / min

Length measurement

0.02 ... 99999 m
0.01 ... 99999 feet
1.00 ... 99999 inch

Revolution measurement

Non-contact measurement:
1.00 ... 99999 min^{-1}
Contact measurement:
1.00 ... 19999 min^{-1}

Specifications — Model YS-20

Accuracy:	± 0.2 % of displayed value ± 1 digit
Measuring time:	0.5 s
Resolution:	0.01 m (length measurement)
Display:	5 digit LCD, 10 mm high – floating decimal point
Memory:	Min, Max, last reading
Auto Power Off:	after 30 s of non-use
Temperature range:	5 - 45 °C
Air humidity:	85 % RH, max.
Batteries:	2x 1.5 V Type AA (approx. 20 h continuous use)
Housing material:	ABS plastic
Dimensions:	145 x 60 x 30 mm (L x W x H)
Weight, net (gross):	approx. 150 g (700 g)

Delivery includes: Tachometer in carrying case with standard accessories:
2 Batteries, 1 Adapter for yarn speed measurement, 1 Adapter for contact measurement, 1 Rubber Tip, 1 Measuring wheel (10 cm circumference), 1 Set of reflective tapes

Subject to change without notice.

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S C H M I D T
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Yarn Consumption Meter

For Knitting Industries

LM Series

Electronic Yarn Consumption Meter (Inch-Meter)

The LM Series accurately measures the accumulated total yarn consumption of a single yarn feeding system for one or more machine cycles of a circular knitting machine.

Special features:

✚ **2 Different Models:**
— Sensor controlled unit with an external sensor (Code V) for automatic start/stop signal
— Basic unit without sensor for manual use
✚ Both models are available in cm (LMC) or inch (LMI)
✚ Precision, ball-bearing mounted wheel is recessed into an adjustable slot on the rear side
✚ Magnet base for convenient mounting. It is stationary mounted on the cylinder ring between filament break monitors and the filament guides.

Advantage of use:

▌ Yarn consumption measurements of all knitting feeds ensure uniform stitch lengths and homogeneous fabric structure.
▌ Fabric specifications can be reliably maintained and repeated.
▌ The quantities of yarn which are required for producing particular fabrics can be simply and accurately calculated.
▌ The use of LM ensures the same fabric quality, respectively structures can be produced on different machines in the same quality.
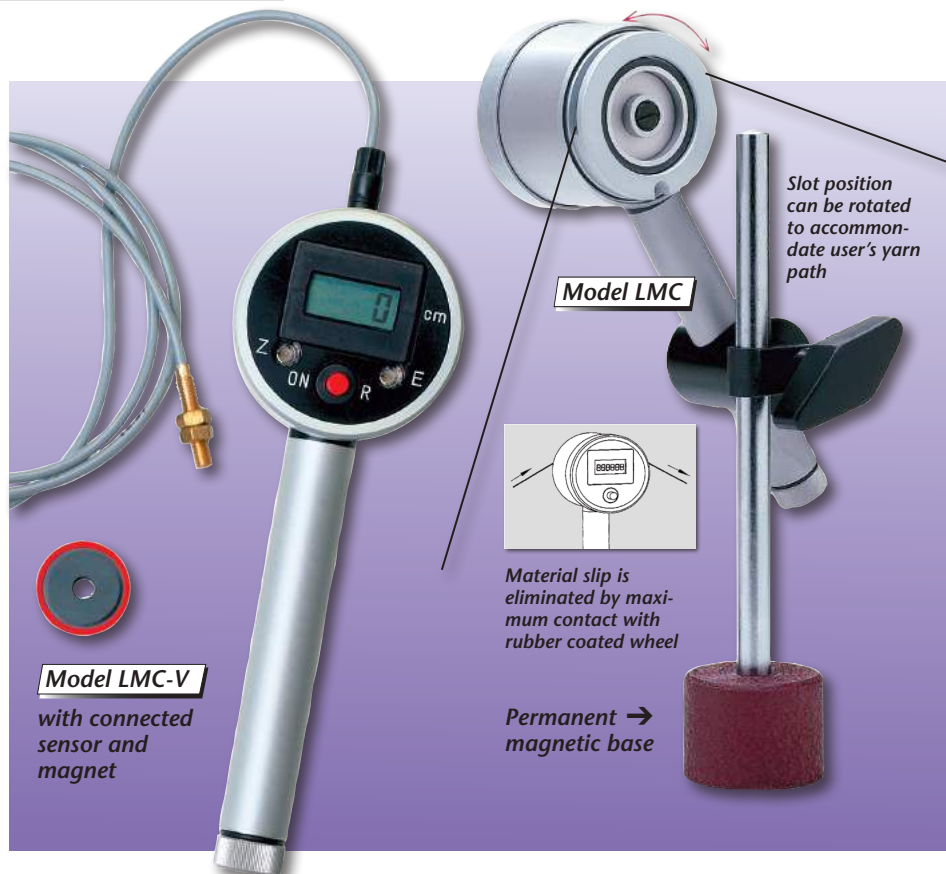
Operation of model LMC-V and model LMI-V:
— In »**Auto**« **mode** the sensor/magnet supplies the start/stop signal for measurement during user-selected number of machine revolutions (from 1- 99 rev. set on front-panal rotary switches).
— In »**Manual**« **mode** the unit works without external sensor as long as the operator desires – this function is equivalent to the operating principle of basic unit model LMC and model LMI.

Model LMC

Slot position can be rotated to accommondate user's yarn path

Material slip is eliminated by maximum contact with rubber coated wheel

Permanent ➜ magnetic base

Model LMC-V

with connected sensor and magnet

| Specifications	Model LMC/LMC-V	▌ Model LMI/LMI-V
Measuring range:	1 - 999999 cm	▌ 1 - 999999 inch
Resolution:	1 cm	▌ 1 inch
Accuracy:	± 1 % of displayed value ± 1 digit	
Measuring principle:	Pulse counting	
Preselect switch:	1- 99 Machine revolutions (Option Code V)	
Display:	LCD, 5 mm high	
Auto Power Off:	after 2 min of non-use	
Temperature range:	10 - 45 ºC	
Air humidity:	85 % RH, max.	
Batteries:	2x 1.5 V Type AAA (about 30 h of continuous use)	
Housing material:	Aluminium	
Dimensions:	Instrument: 160 x 55 x 51 mm (L x W x H) Magnetic base: height 190 mm, diameter 40 mm	
Weight:	Instrument: approx. 210 g; Magnetic base: approx. 430 g Complete with carrying case (gross): approx. 1400 g	

Delivery includes:	**Model LMC/LMI:** Length meter with transport packaging incl. 2 Batteries and 1 Magnetic base **Model LMC-V/LMI-V:** Length meter with transport packaging incl. 2 Batteries, 1 Magnetic base, 1 Sensor with cable 1m, 1 Magnet
Special accessories:	EK0630: Extension cable 0.8 m EK0631: Additional sensor and magnet

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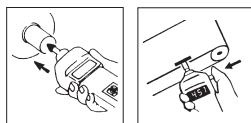
Contact measurement
of revolutions,
surface speed and
length

Model DT-105 A

**Electronic hand-held tachometers
Contact type**

Standard features:

- ▮ *Measures revolutions,
  surface speed and length*
- ▮ *Easy to read LCD display*
- ▮ *Easy to use*
- ▮ *Built-in memory for Last, Max,
  Min and 10 seperate readings
  for recall in display*
- ▮ *Rugged aluminium housing*
- ▮ *16 user selectable engineering units*

Model DT-107 A

Standard features:

- ▮ *Same as DT-105 A, but with
  LED display*

Model DT-107 A

Bright, easy to read
LED display

Model DT-105 A

LCD display for
longer battery life

Accessories

A | B | F | G
10006 S | 10007 S | 10002 S | 10005 S
| | E |
| | 10008 E |

Model DT-107 A-12C

Model DT-105A and DT-107A is also
available with 12 inch grooved wheel
(groove 24 mm) to determine wire speed
and length of ropes, tapes etc.
Code 12C e.g. DT-107A-12C

| Specifications	Model DT-105 A	▮ Model DT-107 A
Measuring ranges: (floating decimal point)	**Revolutions:** 0.1 - 25000 min^{-1} **Speed:** e.g. 0.02 - 3810 m / min **Length:** e.g. 0.5 - 99999 cm	
Accuracy:	0 - 999.9 min^{-1} (± 0.1 min^{-1}) ± 1 digit 1000 - 9999.9 min^{-1} (± 1 min^{-1}) ± 1 digit 10000 - 25000 min^{-1} (± 0.01 % of reading) ± 1 digit **Speed and Length:** ± 0.4 % of reading ± 1 digit	
Measuring units:	**Revolutions:** min^{-1} (rpm); rph; **total rotations** (counter): rev **Speed:** m / min; m / h; feet / min; feet / h; yards / min; yards / h; inch / min; inch / h; miles / h **Length:** cm; m; inch; feet; yard	
Display:	5 digit **LCD** 12 mm high	▮ 5 digit **LED** 10 mm high
Auto power off:	after 5 min of non-use	▮ 10 s
Batteries:	2x 1.5 V Type AA approx. 65 h continuous use	▮ approx. 40 h continuous use
Memory system:	13 readings (incl. Last + Max + Min) are stored and retained for 5 min	
Temperature range:	5 - 45 °C	
Air humidity:	85 % RH, max.	
Housing material:	Die-cast aluminium	
Dimensions:	180 x 60 x 47 mm (L x W x H)	
Weight, net (gross):	approx. 350 g (800 g)	

**Model DT-105 A and
DT-107 A:**
Built in selector switch
permits the user
to display readings in
a wide variety
of measuring units.

**Delivery includes:** Tachometer in carrying case with standard accessories:
2 Batteries, 2 Rubber Tips (A), 1 Funnel (B), 1 Rubber measuring wheel (F) 6 inch
circumference, 1 Extension shaft (E) 75 mm, Certificate of compliance with the order,
Instruction manual in German and English
Special accessories: Grooved measuring wheel (G) with 6 inch circumference
for measuring yarn and wire speeds, Calibration certificate

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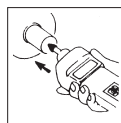
Contact measurement of revolutions, surface speed and length
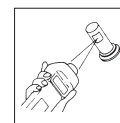
Non-contact measurement of revolutions, using a laser beam and reflective tape

Model DT-205 L

**Electronic hand-held tachometers
Contact and non-contact type**

1. **Without Adapter** (with laser beam):
   Non-contact measuremet of
   revolutions
2. **With additional Adapter:**
   Contact measurement of
   revolutions,
   surface _speed_ and _length_

The screw-in adapter makes it quick
and easy to convert from contact
to non-contact operation.

Combined unit

Standard features:

▊ Easy to read LCD display
▊ Measuring distance up to 2 m
▊ Built-in memory for Last, Max,
  Min and 10 seperate readings
  for recall in display
▊ Rugged aluminium housing

Reflective tapes

Model DT-205 L

with Adapter H and
rubber tip A

Model DT-205 L

LCD display for
longer battery life

_Series DT
is also
available with
measuring wheel
12 inch circumference
(Code-S)
e.g. DT-205LS_

Model DT-207 L

Standard features:

▊ Same as DT-205 L,
  but with LED display

Model DT-207 L

Bright, easy to
read LED display

Specifications	Model DT-205 L	▊ Model DT-207 L
Measuring ranges: (floating decimal point)	**Revolutions** (non contact): 6 - 99999 min^{-1} **Revolutions** (contact): 1 - 25000 min^{-1} **Speed** (contact): e.g. 0.11 - 3810 m/min **Length** (contact): e.g. 0.02 - 99999 m	
Accuracy:	6 - 8300 (± 1 min^{-1}) ± 1 digit 8301 - 25000 (± 2 min^{-1}) ± 1 digit 25001 - 99999 (± 0.01 % of reading) ± 1 digit **Speed and Length:** ± 0.4 % of reading ± 1 digit	
Measuring units:	**Revolutions:** min^{-1} (rpm) **Speed:** m/min; feet/min; yards/min; inch/min **Length:** m; inch; feet; yard	
Laser, class 2:	Output < 1 mW, wavelength 670 nm, max. measuring distance 2 m	
Display:	5 digit **LCD** 12 mm high	▊ 5 digit **LED** 10 mm high
Auto power off:	after 5 min of non-use	▊ 10 s
Batteries:	2x 1.5 V Type AA approx. 40 h ...	▊ approx. 25 h continuous use
Memory system:	13 readings (incl. Last + Max + Min) are stored and retained for 5 min	
Temperature range:	5 - 45 ºC	
Air humidity:	85 % RH, max.	
Housing material:	Die-cast aluminium	
Dimensions:	167 x 60 x 47 mm (L x W x H)	
Weight, net (gross):	approx. 365 g (950 g)	

**Model DT-205 L and
DT-207 L:**
Built in selector switch
permits the user
to display readings in
a wide variety
of measuring units.

Delivery includes: Tachometer in carrying case with standard accessories:
2 Batteries, 35 self-adhesive reflective tapes, 1 Adapter (H), 2 Rubber Tips (A), 1 Funnel (B),
1 Rubber measuring wheel (F) 6 inch circumference, 1 Extension shaft (E) 75 mm,
Certificate of compliance with the order, Instruction manual in German and English
Special accessories: Set with 140 self-adhesive reflective tapes, Grooved measuring wheel (G)
with 6 inch circumference for measuring yarn and wire speeds, Calibration certificate

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min
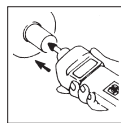
Tachometers

Contact measurement of revolutions, surface speed and length

Non-contact measurement of revolutions, using a laser beam and reflective tape

PH Series

Electronic hand-held tachometers
Contact and non-contact type

Adapter LC

Standard features:

- Easy to read LCD display
- Built-in memory for Max, Min, Average, Last and 10 seperate readings for recall in display
- Compact, rugged plastic housing
- 10 user selectable measuring units

High value at low cost

2in1

Reflective tapes

Model PH-100 A

Contact Type:
Measures revolutions, surface speed and length

Model PH-200 LC

Combined Instrument:
1. **Non-Contact mode** uses laser beam and reflective tape for measuring rpm
2. **Contact type mode** uses screwed-in adapter for measuring rpm, surface speed and length

Model PH-200 L

Non-Contact Type:
Measures revolutions with laser beam

LASER RADIATION
CLASS 2 LASER PRODUCT

Specifications	Model PH-100 A	∎ Model PH-200 LC	∎ Model PH-200 L
Measuring ranges: (floating decimal point)	**Revolutions** (non contact): **Revolutions** (contact): 1.0 - 25000 **Speed:** e.g. 0.1 - 3810 m/min **Length:** e.g. 0.01 - 99999 m	∎ 6 - 99999 min⁻¹ ∎ 6 - 25000 min⁻¹ ∎ e.g. 1.0 - 3810 m/min ∎ e.g. 0.2 - 99999 m	∎ 6 - 99999 min⁻¹ − − − − − − − − −
Accuracy:	1 - 599 min⁻¹ (± 1 min⁻¹) ± 1 digit 600 - 25000 min⁻¹ (± 0.01 % of reading) ± 1 digit **Speed and Length:** ± 0.4 % of reading ± 1 digit	∎ 6 - 599 (± 1 min⁻¹) ± 1 digit ∎ 600 - 25000 (± 2 min⁻¹) ± 1 digit ∎ 25001 - 99999 (± 0.01 % of reading) ± 1 digit	∎ 6 - 599 (± 1 min⁻¹) ± 1 digit ∎ 600 - 99999 min⁻¹ (± 0.01 % of reading) ± 1 digit − − −
Measuring units:	**Revolutions:** min⁻¹ (rpm); **total rotations** (counter): rev **Speed:** m/min; feet/min; yards/min; inch/min **Length:** m; inch; feet (only Model PH-100 A); yard	∎ min⁻¹ (rpm) − − − − − −	
Memory system:	14 readings (incl. Last + Middle + MAX + MIN) are stored and retained for 5 min		
Laser, class 2:		∎ Output < 1 mW, wavelength 670 nm, max. measuring distance 2 m	
Batteries:	3x 1.5 V Type AA approx. 50 h ...	∎ approx. 35 h continuous use	∎ approx. 35 h continuous use
Display:	5 digit LCD 12 mm high		
Auto power off:	after 5 min of non-use		
Temperature range:	5 - 45 °C		
Air humidity:	85 % RH, max.		
Housing material:	Plastic (ABS)		
Dimensions:	123 x 64 x 32 mm (L x W x H)	∎ 150 x 64 x 32 mm (L x W x H)	∎ 116 x 64 x 32 mm (L x W x H)
Weight, net (gross):	approx. 180 g (400 g)	∎ approx. 230 g (450 g)	∎ approx. 170 g (390 g)

Accessories

A   B   F   G

10006 S   10007 S   10002 S   10005 S

Delivery includes: Tachometer in carrying case with 3 Batteries, Certificate of compliance with order, Instruction manual in German and English:

1 Rubber Tip (A), 1 Funnel (B), 1 Rubber measuring wheel (F) with 6 inch circumference	∎ 1 Adapter (LC), 35 reflective tapes, 1 Rubber Tip (A), 1 Funnel (B), 1 Rubber measuring wheel (F)	∎ 35 self-adhesive reflective tapes

Special accessories:

Grooved measuring wheel (G) with 6 inch circumference for measuring yarn and wire speeds, Calibration certificate	∎ Grooved measuring wheel (G) with 6 inch circumference for measuring yarn and wire speeds, Calibration certificate	∎ Set with 140 self-adhesive reflective tapes, Calibration certificate

Subject to change without notice.

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Stroboscopes

The true RPM (min⁻¹):
All stroboscopes give the illusion
of stopped motion when flashing in
submultiples of the true speed.

To obtain the correct RPM:
Turn frequency always from the
highest RPM downwards.
When the first single image appears,
read the true RPM.
To verify this, double the flash rate,
you then might see 2 images.
If the flash rate, however,
is below the actual RPM value by
1/even numbers, a freezed motion
with only one image will appear.

**Measuring higher RPM
than the stroboscope range
using harmonics:**
All instruments can be used also to
measure higher RPM by using the
images effect.

For example:
– Range up to 20000 min⁻¹
– Rotating object 40000 min⁻¹
– Images 2 times seen

Stroboscopes are highly stable
industrial quality instruments for
non-contact RPM measurement
as well as for inspection and
observation of moving parts.

General applications:
▮ RPM measurement
▮ Measuring the number of
  oscillations
▮ Detecting slippage
▮ Motion analysis by »freezing« or
  »slowing down« actions

Principle:
If a periodic flash is aimed at a
rapidly rotating or oscillating object
at always the same position,
the object appears to stand still or
to move in slow motion.

Phase shifter:
Phase shift adjustment permits
movement of objects to desired
position for convenient
observation.

Applications:
▮ Electrical industry
▮ Mechanical engineering
▮ Automotive industry
▮ Textile industry
▮ Optical industry
▮ Printing and paper
  industry
▮ Ship-building and
  aircraft
▮ Chemical industry
▮ Medical industry
▮ Mining industry

Revolutions of shaft rpm	Stroboscope display = Number of flashes (rpm)	Flashes / rpm shaft	Number of visible images
	6000	4	4
	4500	3	3
	3000	2	2
at 1500 rpm	1500	1	1
	750	1/2	1
	500	1/3	1

rpm = (min⁻¹)

Number of visible images:

Rotating   Motor   4 x   3 x   2 x
disk   1 x   1/2 x   1/3 x
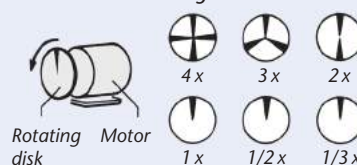
Model MS-1

Pocket-Mini-Stroboscope

Standard features:

- Small, handy unit for one hand operation
- Easy to read LCD display
- For measuring 30 to 12500 rpm and higher using „harmonics" (see page E1)
- Brightest flash in his class
- Trigger input for external triggering the strobe
- Battery operated with high quality batteries and short charging time
- Last displayed value is stored and strobe runs at that speed when switched on again
- Tripod mounting facility

The „mini" flash pocket

Model MS-1

with standard attachments in carrying case

Model MS-1

1200 Lux

*distance to measure 20 cm

Specifications	Model MS-1
Flash range:	0.5 - 208.3 Hz = 30 - 12500 min^{-1} (rpm, FPM)
Accuracy:	± 0.01 % of displayed value ± 1 digit
Resolution:	± 1 min^{-1}
Light intensity:	approx. 1200 Lux 20 cm distance
Flash duration:	< 9 µs
Display:	5 digit LCD, 9 mm high
Flash tube:	Xenon-Longlife (Lifetime approx. 200 million flashes) at 6000 min^{-1}
External trigger input:	0 - 5 V DTL/TTL compatible, U_{out} = 7.2 V unregulated, R_i = 100 KΩ
Tripod mount:	1/4" 20
Power supply:	Li-ion rechargeable battery (2h continuous use, 5 h recharging time) and / or AC Adapter 100 ... 240 V DC, 50 / 60 Hz
Temperature range:	0 - 40 °C
Air humidity:	85 % RH, max.
Housing material:	ABS
Dimensions:	240 x 65 x 40 mm (L x W x H)
Weight, net (gross):	approx. 420 g (approx. 1300 g)

Special accessories:

Belt-clip holster

Belt-clip holster:	Model 20003 R

Delivery includes: Stroboscope with carrying case and manufacturer´s inspection report, battery recharger with 4 adapters for world wide use, jack 3.5 mm plug for trigger signal, operating manual in several languages
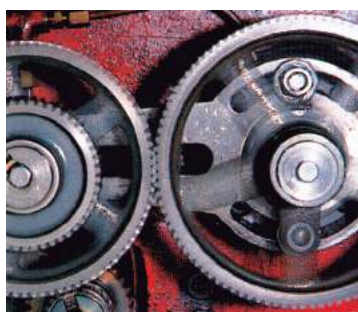
SCHMIDT
control instruments

Series 3000
Compact stroboscopes

Standard features:

- 4 different models
- Light weight and handy size
- Analog or digital display
- Mains use or battery-operated
- Display in Hz (flashes/sec) and min^{-1} (rpm)

Accumulator / Charger Model 2020.03

Accumulator: with Euro/US adapters In leather case with fastening clip, about 2 h of continuous use (depending on flash rate), weight approx. 700 g

Charger: Required power 100 ... 240 V AC, output 12 V DC

Leather case
Model 3000.10

Model 3000-BA

Model 3000-BD

Specifications	Model 3000-NA	Model 3000-BA	Model 3000-ND	Model 3000-BD
Flash range:	2.5 - 300 Hz = 150 - 18000 min^{-1}		4 - 335 Hz = 240 - 20100 min^{-1}	
Power supply*:	220 ... 250 V AC 50/60 Hz	▮ 12 V DC	220 ... 250 V AC 50/60 Hz	▮ 12 V DC
Light intensity:	max. 450 Lux in 50 cm distance (depending on flash rate)			
Flash duration:	7 µs, max.			
Accuracy:	< ± 2 % of set value		▮ ± 0.01 % of set value, ± 1 digit	
Display:	analog		▮ LCD 2 x 8 characters	
Flash tube:	Xenon-longlife (Lifetime approx. 100 million flashes)			
Temperature range:	5 - 45 °C			
Air humidity:	85 % RH, max.			
Housing material:	Plastic shatterproof			
Dimensions:	155 x 95 x 80 mm (L x W x H)			
Weight, net (gross):	approx. 600 g (800 g)			

Special accessories:

Accumulator / Charger*:	Model 2020.03		Model 2020.03	
Leather case:	Model 3000.10	Model 3000.10	Model 3000.10	Model 3000.10

* Standard 220 - 250 V
(Should you require 115 V, please indicate in your order)

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Model DT-311N
Mains operated, portable

Standard features:

- For revolutions up to 35000 min⁻¹
- Easy to operate controls
- Easy to read LED display
- Detachable pistol-grip handle and mounting possibility on tripod
- Double-flash (x 2) and half-rate (÷2) flash selection for easy determination of true flash rate
- Provides synchronizing pulse output for other stroboscopes
- Accepts external trigger input: Phase shift adjustment 0° to 359° permits movement of objects to desired position for best view and flash photography
- Flash delay switch to move a freezed object slowly within 6 s
- Rugged aluminium housing

Model DT-311N

Model DT-315N

Model DT-315N
With internal battery, portable

Additional features:

Same functions as Model DT-311N, but additionally with:

✚ Integrated rechargeable battery, 12 V power required
✚ AC adapter for recharging and/or mains operating

Model DT-315N-H

Model 20009S rubber caps for shock absorbing

Specifications	Model DT-311N	▌ Model DT-315N
Flash range:	0.7 - 585 Hz = 40 - 35000 min⁻¹ (rpm, FPM) automatic range control	
Accuracy:	± 0.1 % of reading, ± 1 digit	
Resolution:	40 - 4999 min⁻¹: 0.1 min⁻¹; 5000 - 7999 min⁻¹: 0.2 min⁻¹ 8000 - 9999 min⁻¹: 0.5 min⁻¹; 10000 - 35000 min⁻¹: 1 min⁻¹	
Light intensity:	approx. 300 Lux (depending on flash rate)	
Flash duration:	10 - 40 µs	
Display update time:	approx. 0.2 s	
Display:	LED 5 digit, 10 mm high	
Flash tube:	Xenon, 10 W (Lifetime approx. 100 million flashes)	
Phase shift:	0°- 359° with 1° resolution	
Triggering input signal:	**H-level:** 2.5 - 12 V – **L-level:** 0 - 0.8 V, pulse width minimum 50 µs, positive edge trigger; input resistance approx. 4.7 KΩ	
Output signal for sensor:	12 V ± 0.6 V DC, 40 mA	
Power supply*:	230 V AC ± 10 %, 50/60 Hz	▌ 10.5 - 15 V DC (2.3 A) ▌ NiCd battery (1 h continuous use) ▌ and/or AC adapter 230 V DC
Temperature range:	5 - 45 °C	
Air humidity:	85 % RH, max.	
Housing material:	Aluminium profil, ABS	
Dimensions:	185 x 120 x 120 mm (L x W x H)	▌ 250 x 120 x 120 mm (L x W x H)
Weight, net (gross):	approx. 1200 g (1800 g)	▌ approx. 2000 g (3200 g)

Standard 230 V
(Should you require 115 V, please indicate in your order – extra charge)

Model QLED
Hand-held LED Stroboscope

Standard features:

- For revolutions up to 300000 min^{-1} (rpm, FPM)
- Latest LED technique with 40 or 118 LEDs depending on model
- Recommended distance to object: 1 m or 3 m depending on model
- Rugged aluminium housing for industrial use
- 5 flash frequencies can be saved for fast adjustment
- IP 30 protected
- Power supply: Li-Ion battery
- AC adapter for charging

Special features:

- Powerful light output: 1750 or 8000 Lux at 1° / 300 mm depending on model
- 2 operation modes:
  <u>Standard:</u> Frequency, brightness, phase shifting
  <u>Pro:</u> additional e. g. slow motion, frame rate, pulse devider, memory
- Can be triggered internal and external: for phase shifting and additional functions
- Illuminants with adjustable light intensity and sharpness
- Adjustable units: FPM, Hz, min^{-1}
- LCD Display
- Resolution depending on flash frequency 0.1, 1 or 10 FPM
- Thread insert for handle or stationary use

Model QLED-40

Easy to use with a large number of functions

Model DT-400

with standard attachment in carrying case

Specifications	Model QLED-40	Model QLED-118
Number of LED´s:	40	▮ 118
Frequency range:	30 - 300000 min^{-1} (rpm, FPM)	
Display:	LCD, multiline	
Accuracy:	±0.02 % ±1 digit / ±0.025 µ	
Resolution:	±0.1 (30 - 999.9 min^{-1})	
	±1 (1000 - 9999 min^{-1})	
	±10 (10000 - 300000 min^{-1})	
External trigger input:	3-30 V / max. 5 mA, DIN 41524 5-Pin standard plug	
Light duration:	Adjustable	
Light intensity:	Approx. 1750 Lux at 1° / 300 mm	▮ Approx. 8000 Lux at 1° / 300 mm
Flash color:	Approx. 5000 - 8000 K	
Power supply:	Integrated Li-Ion Akku	
Operating time:	Approx. 7 h at 0.5° (~ 875 Lux)	▮ Approx. 2.3 h at 0.5° (~ 4000 Lux)
	Approx. 4 h at 1.14° (~ 2000 Lux)	▮ Approx. 5 h at 0.25° (~ 2000 Lux)
Temperature range:	0 - 40 °C	
Housing material:	Aluminium	
Dimensions:	150 x 130 x 112 mm (L x W x H)	
Weight:	1050 g	▮ 1150 g

Delivery includes: Stroboscope with carrying case, AC adapter with 4 adapters (EU, GB, USA, AUS), trigger plug, handle, calibration certificate and operating manual

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Series DSL

LED Stroboscopes, hand-held, portable

Standard features:

▌ *Latest LED technique*
▌ *Lifetime of LED`s do not need wear-out or replacement*
▌ *Easy to use just in one hand*
▌ *Recommended distance to object: 20 - 50 cm*
▌ *Double-flash-function (x2) and half-rate-flash-function (:2) for easy and fast determination of the true flash rate*
▌ *Rigid Aluminium housing*

Special features

✚ *For revolutions up to 300000 min^{-1} (rpm, FPM)*
✚ *Exceptionally light-intense: 1500 Lux at 6000 min^{-1}, distance 20 cm*
✚ *User programmable settings: flash duration, phase shift, delay and much more*
✚ *IP65 protected (dust and splash water)*
✚ *Model DSL-T with combined trigger input/output*
✚ *3 standard AA-batteries provide 6 hours continuous use*

Model DSL-300

Available Models	Measuring Range	Trigger Signal
DSL-300	30 - 300000 min^{-1} (0.5-5000Hz)	no
DSL-300-T	30 - 300000 min^{-1} (0.5-5000Hz)	yes

Specifications	Model DSL-300
Flash range:	0.5 - 5000 Hz = 30 - 300000 min^{-1} (rpm, FPM)
Accuracy:	0.02 % (± 1 digit)
Resolution:	0.1 min^{-1} (30 - 999 min^{-1}), 1 min^{-1} (1000+)
Light intensity:	1500 Lux at 6000 min^{-1} at 20 cm distance
Display:	LCD, multiple lines
Flash color:	approx. 6500K
Phase shift internal:	360° (increment 1°)
Power supply:	3 x AA batteries, operation: approx. 6 h
Temperature range:	Operation: 0 - 40 °C
Housing material:	Aluminium/ABS
Dimensions:	191 x 82 x 60 mm (L x W x H)
Weight, net (gross):	approx. 420 g (approx. 850 g)
	Model DSL-300-T only
Trigger output:	Optocoupler non-isolated
Level:	NPN, max. 32 V, 50 mA
Pulse length:	adjustable
Trigger input:	Optocoupler, isolated
Level:	3 ... 32 V NPN + PNP
Minimal puls length:	50 usec
Phase shift external:	360° (increment 1°)
Delay time:	0 ... 999 ms
Reverse voltage protection:	yes

Light output (Lux)
DSL-300 at 20 cm distance and 6000 min^{-1}

■	2.000-2.250
■	1.750-2.000
■	1.500-1.750
■	1.250-1.500
■	1.000-1.250
□	750-1.000
□	500-750
■	250-500
■	0-250
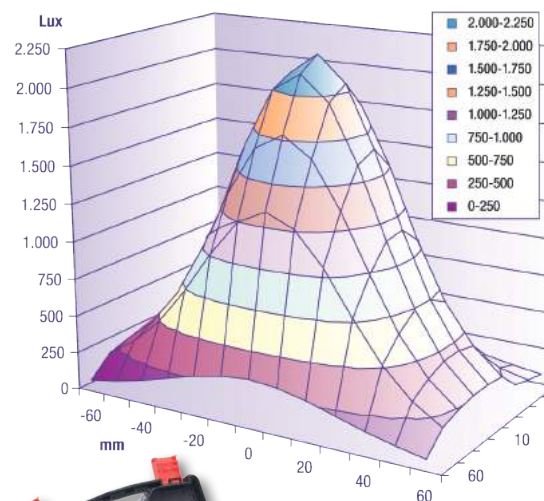
Delivery includes: *Stroboscope with carrying case, 6 batteries, manufacturer`s inspection report and manual in different languages, DSL-300-T: 3 m trigger cable*

DSL Series

LED Stroboscopes, hand-held

Standard features:

▌ *Easy to read LED display*
▌ *Highly efficient LED illuminants assure a good illumination of the observing object*
▌ *For revolutions up to*
 DSL-200: max. 150000 min⁻¹
 DSL-600: max. 120000 min⁻¹
▌ *For one hand operation*
▌ *Double-flash-function (x 2) and half-rate-flash-function (: 2) for easy and fast determination of the true flash rate*
▌ *9 flash rates can be stored*
▌ *Adjustable flash duration time for best illumination*
 - shorter flash period - tighter image
 - longer flash period - more brightening
▌ *Handy, rugged aluminium housing*
▌ *Battery operated*

Additional features DSL-200:

✚ *359° digital phase shift adjustment in 1° increments to permit movement of objects*
✚ *External trigger input and output*
✚ *Tripod mountable*

Model DSL-200

Model DSL-600

Model DSL-200
with standard attachment in carrying case

Model DSL-600
with standard attachment in carrying case

Specifications	Model DSL-200	Model DSL-600
Flash range:	0.2 - 2500 Hz 12 - 150000 min⁻¹ (rpm, FPM)	0.2 - 2000 Hz 12 - 120000 min⁻¹ (rpm, FPM)
Accuracy:	0.01 % (± 1 Digit)	0.01 % (± 1 Digit)
Resolution:	0.1 (12 - 9999.9 min⁻¹) 1 (10000 - 150000 min⁻¹)	0.1 (12 - 9999.9 min⁻¹) 1 (10000 - 120000 min⁻¹)
Light intensity:	4300 Lux at 6000 rpm at 20 cm distance	1200 Lux at 6000 rpm at 20 cm distance
Flash duration:	adjustable	adjustable
Display:	LCD, 5 digit, 12 mm high	LCD, 5 digit, 12 mm high
Power supply:	Ni MH rechargeable	2 x AA Battery
Operation time:	6 h bei 6000 rpm (continuous use)	8 h bei 6000 rpm (continuous use)
Temperature range:	0 - 45 °C	0 - 45 °C
Housing material:	Aluminium	Aluminium
Dimensions:	190 x 33 x 30 mm (L x W x H)	168 x 39 x 33 mm (L x W x H)
Weight, net (gross):	Approx. 350 g (1200 g)	Approx. 225 g (610 g)

Delivery includes: *Stroboscope with carrying case, 2 batteries, charger (only DSL-200) and operating manual in english*

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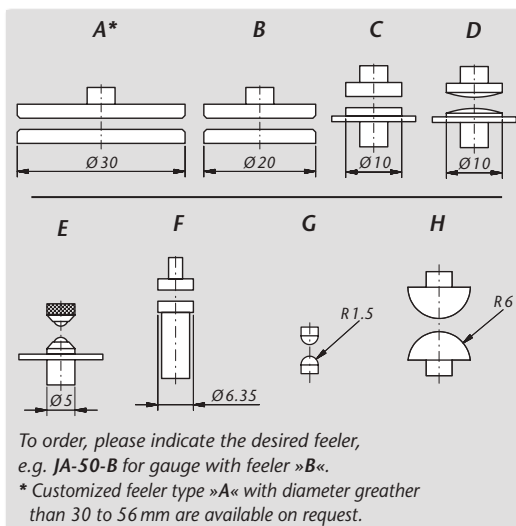control instruments

Thickness Gauges

Thickness gauges are used for measuring the thickness of leather, textiles, cardboard, felt, rubber, sheet metal, foils, plywood, plastic parts of all kinds etc. Depending on the application, the following points are important for selecting the best model:

- Max. resolution required
- Measuring range
- Depth of jaw
- Shape of feelers
- Measurement principle

The aluminium housing is lightweight and rugged.

It can be easily zeroed by turning the outer knurled ring of the scale.

Specified Test Report with calibration report can be made only for the dial gauge for an extra charge.

A*	B	C	D
Ø 30	Ø 20	Ø 10	Ø 10

E	F	G	H
Ø 5	Ø 6.35	R 1.5	R 6

To order, please indicate the desired feeler, e.g. **JA-50-B** for gauge with feeler »B«.
* Customized feeler type »A« with diameter greather than 30 to 56 mm are available on request.

Feeler shapes and applications:
A + B: for rubber, felt*, soft materials*, non wovens*, etc.
C + F: for soft leather, cardboard, paper, foils, etc.
D + H: for hard leather, plywood, fiberboard, etc.
E + G: for sheet metal, etc.

* meets no DIN EN ISO standards

Model J-50

You can choose following measuring principles:

Measurement by spring force:

Opening by lifting wheel – self closing

Opening by lifting device (lever) – self closing

Model J-15   Model J-45

Measurement by manual pressure by plunger:

Opening by spring force – self opening

Specifications	J-15	J-45	J-50	JA-50	J-100
Resolution:	0.01 mm	0.01 mm	0.01 mm	0.01 mm	0.01 mm
Measuring range:	10 mm	10 mm	10 mm	10 mm	10 mm
Depth of jaws:	18 mm	45 mm	50 mm	50 mm	100 mm
Scale diameter:	36 mm	36 mm	54 mm	54 mm	54 mm
Measuring pressure:	0.8 N	0.8 N		0.8 N	0.8 N
On request:				0.6 N / 2 N	0.6 N / 2 N
Feeler shape*:	F	F	A/B/C/D/E	A/B/C/D/E	A/B/C/D/E
Lifting wheel:	■	■			
Spring force:			●		
Lifting device:				○	○
Weight, net:	90 g	110 g	300 g	300 g	450 g

*To order, please indicate the desired feeler, e.g. **JA-50-B** for gauge with feeler »b«.*
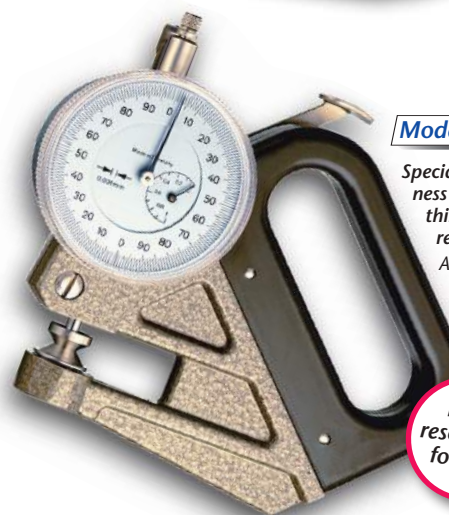
Model JA-50

Model J-200-30

Model J-100

Model F-1000-30

Special-purpose thickness gauge for foils and thin materials with a resolution of 1 µm.

An insulated handle prevents transfer of heat from the hand to the movement.

High resolution for foils

Specifications	J-200	J-200-30	J-300	J-300-30	J-400	J-400-30	F-1000-30
Resolution:	0.01 mm	0.01 mm	0.01 mm	0.01 mm	0.01 mm	0.01 mm	0.001 mm
Measuring range:	10 mm	30 mm	10 mm	30 mm	10 mm	30 mm	1 mm
Depth of jaws:	200 mm	200 mm	300 mm	300 mm	400 mm	400 mm	30 mm
Scale diameter:	54 mm	54 mm	54 mm	54 mm	54 mm	54 mm	54 mm
Measuring pressure:	1.5N	1.5N	1.5N	1.5N	1.5N	1.5N	2N
On request:	1.2N/3N	1.2N/3N	1.2N/3N	1.2N/3N	1.2N/3N	1.2N/3N	0.4N/4N
Feeler shape*:	A/B/C/D/E	A/B/C/D/E	A/B/C/D/E	A/B/C/D/E	A/B/C/D/E	A/B/C/D/E	F
Lifting wheel:							
Spring force:							
Lifting device:	O	O	O	O	O	O	O
Weight, net:	1100 g	1100 g	1350 g	1350 g	1500 g	1500 g	340 g

** To order, please indicate the desired feeler, e.g. **JA-50-B** for gauge with feeler »b«.*

Model K-15

Model K-50-3

Model K-50-5

Model K-100

Model K-200

The Model K-200, K-300 and K-400 thickness gauges are provided with a swing-out foot for on-table operation.

Specifications	K-15	K-50	KA-50	K-50-2	K-50-3	K-50-5	K-100	K-200	K-300	K-400
Resolution:	0.1 mm	0.1 mm	0.1 mm	0.1 mm	0.1 mm	0.1 mm	0.1 mm	0.1 mm	0.1 mm	0.1 mm
Measuring range:	10 mm	10 mm	10 mm	20 mm	30 mm	50 mm	30 mm	30 mm	30 mm	30 mm
Depth of jaws:	15 mm	50 mm	50 mm	50 mm	50 mm	50 mm	100 mm	200 mm	300 mm	400 mm
Scale diameter:	36 mm	54 mm	54 mm	54 mm	54 mm	54 mm	54 mm	54 mm	54 mm	54 mm
Measuring pressure: On request:			0.5 N					1.8 N 0.9 / 2.5 N	1.8 N 0.9 / 2.5 N	1.8 N
Feeler shape*:	F	A/B/C/D/E	A/B/C/D/E	A/B/C/D/E	A/B/C/D/E	A/B/C/D/E	A/B/C/D/E	A/B/C/D/E	A/B/C/D/E	A/B/C/D/E
Spring force:	●	●		●	●	●	●			
Lifting device:			○					○	○	○
Weight, net:	60 g	300 g	300 g	300 g	330 g	350 g	450 g	700 g	1000 g	1400 g

** To order, please indicate the desired feeler, e.g. **K-50-B** for gauge with feeler »b«.*

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Digital Thickness Gauges

JD and FD Series

- Easy to read LCD display
- Highest accuracy
- User selectable units mm and inch
- Dial gauge: Sylvac S 229
- USB or RS 232 output for data-collection
- Includes swing-out foot for on-table operation (Model JD-200-25 only)

Accessory:

USB or RS 232 connecting cable to connect the gauge with a computer; it is delivered with a Windows program (Win XP and higher) to transfer the data to the PC and to store them as an Excel file.

Model JD-50

Model JD-200-25

Model FD-1000-30-3

Special-purpose thickness gauge for foils and thin materials with a resolution of 1 µm. An insulated handle prevents transfer of heat from the hand to the movement.

Specifications	JD-50	JD-100	JD-200	JD-200-25	FD-50	FD-200-25	FD-1000-30-3
Resolution:	0.01 mm	0.01 mm	0.01 mm	0.01 mm	0.001 mm	0.001 mm	0.001. mm
	0.001 inch	0.001 inch	0.001 inch	0.001 inch	0.0001 inch	0.0001 inch	0.00005 inch
Measuring range:	10 mm / 0.4 inch	as JD-50	as JD-50	25 mm / 1 inch	10 mm / 0.4 inch	25 mm / 1 inch	3 mm / 0.12 inch
Depth of jaws:	50 mm	100 mm	200 mm	200 mm	50 mm	200 mm	30 mm
Shape of jaws:	as J-50	as J-100	as J-200	as K-200	as J-50	as J-200	as F-1000-30
Measuring pressure:	< 1.4 N						2 N
Feeler shape*:	A / B / C / D / E						f
Display:	LCD 6 digit, 8.5 mm high						
Measuring principle:	Capacitive (Sylvac)						
Temperature range:	10 - 45 °C						
Battery:	3 V Lithium, CR 2032						
Data output:	USB or RS 232, galvanic isolation						
Lifting device:	O	O	O	O	O	O	O
Weight, net:	300g	450g	1100g	700g	300g	1100g	300g

* To order, please indicate the desired feeler, e.g. **JD-200-25-D** for gauge with feeler »**d**«.

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Thickness Gauges with big jaws and enlarged measuring range

Max. 650 mm depth of jaw, max. 100 mm measuring range

Standard Features:

▮ Measuring principle:
Measurement by spring force (pressure) –
opening by lifting device (self closing),
not model RMU
Measurement by manual pressure by plunger
(self opening) – opening by spring force
(only series RMU)

▮ Big foot for on table use is optional available.
Code F (not RMU)

▮ Depending to the application a big variety of feeler
shapes are available ➔ see page F1 ➔

▮ Output signal: RS 232 (only for series DMD
and MDM)

▮ Optional for series DMD and MDM: USB converter
with cable and software to download and store readings
➔ see page F7 ➔

Model DMD-830-1

Model RMU-75

Model MDM-840-F

Model DMH-820-1
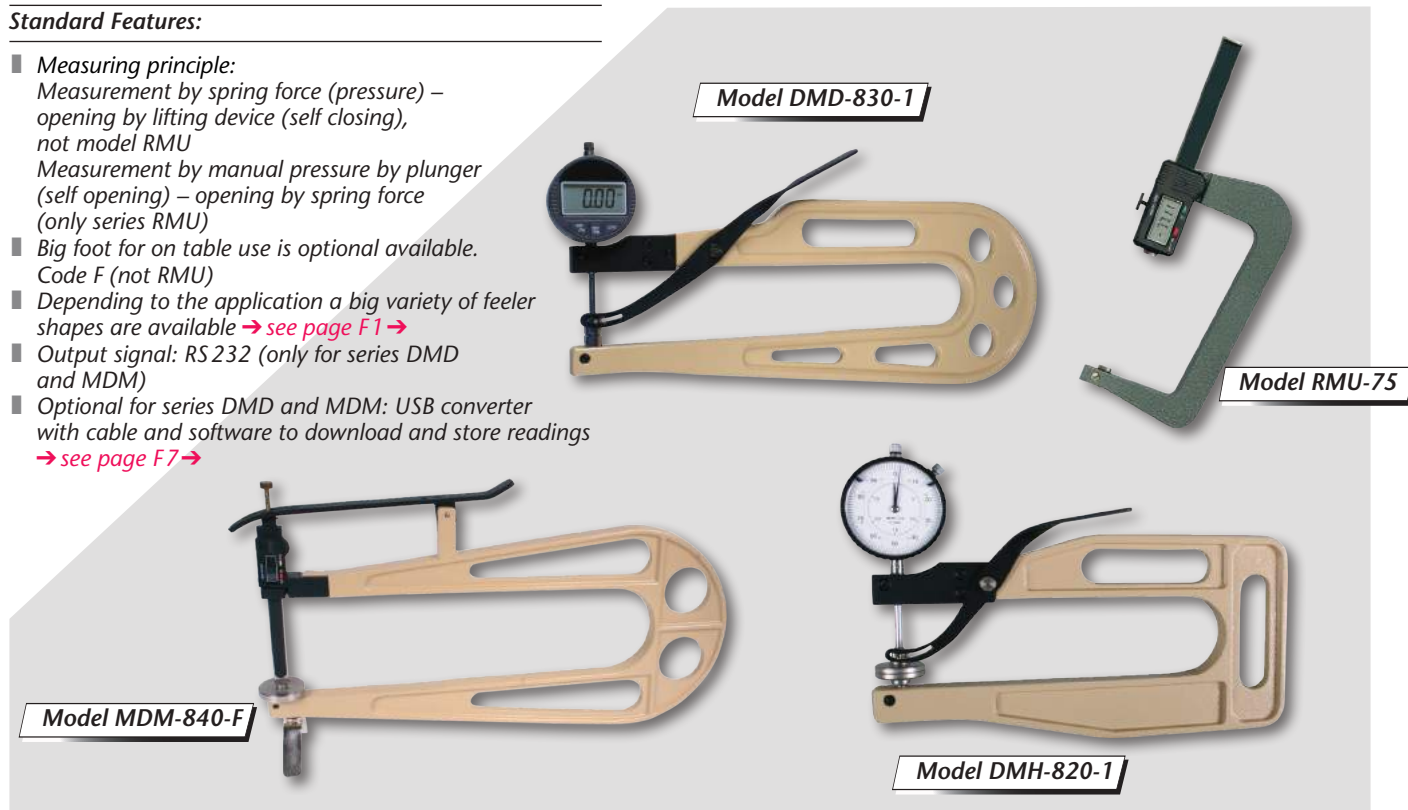
Available Models	Measuring Range	Depth of jaw	Resolution	Measuring Pressure
Analog display				
DM-820	0 - 25 mm	200 mm	0.1 mm	2 N
DM-820-1	0 - 50 mm	200 mm	0.1 mm	2 N
DM-830	0 - 25 mm	300 mm	0.1 mm	2 N
DM-830-1	0 - 50 mm	300 mm	0.1 mm	2 N
DM-835	0 - 75 mm	350 mm	0.1 mm	2 N
DM-840	0 - 100 mm	400 mm	0.1 mm	2 N
DM-850	0 - 25 mm	500 mm	0.1 mm	2 N
DM-850-1	0 - 50 mm	500 mm	0.1 mm	2 N
DM-865	0 - 25 mm	650 mm	0.1 mm	2 N
DM-865-1	0 - 50 mm	650 mm	0.1 mm	2 N
DMH-3-1	0 - 25 mm	50 mm	0.01 mm	1 N
DMH-820-1	0 - 25 mm	200 mm	0.01 mm	1 N
DMH-830-F	0 - 10 mm	300 mm	0.01 mm	1 N
DMH-830-1-F	0 - 25 mm	300 mm	0.01 mm	1 N
DMH-850-F	0 - 10 mm	500 mm	0.01 mm	1 N
DMH-850-1-F	0 - 25 mm	500 mm	0.01 mm	1 N

Available Models	Measuring Range mm	Depth of jaw mm	Resolution	Measuring Pressure
Digital display				
DMD-3	0 - 10 mm	50 mm	0.01 mm	2 N
DMD-3-1	0 - 25 mm	50 mm	0.01 mm	2 N
DMD-820	0 - 10 mm	200 mm	0.01 mm	2 N
DMD-820-1	0 - 25 mm	200 mm	0.01 mm	2 N
DMD-830-F	0 - 10 mm	300 mm	0.01 mm	2 N
DMD-830-1-F	0 - 25 mm	300 mm	0.01 mm	2 N
DMD-850-F	0 - 10 mm	500 mm	0.01 mm	2 N
DMD-850-1-F	0 - 25 mm	500 mm	0.01 mm	2 N
MDM-815-1	0 - 50 mm	150 mm	0.01 mm	2 N
MDM-820-1	0 - 50 mm	200 mm	0.01 mm	2 N
MDM-830-1-F	0 - 50 mm	300 mm	0.01 mm	2 N
MDM-835-F	0 - 75 mm	350 mm	0.01 mm	2 N
MDM-840-F	0 - 100 mm	400 mm	0.01 mm	2 N
RMU-30	0 - 30 mm	50 mm	0.01 mm	
RMU-50	0 - 50 mm	50 mm	0.01 mm	
RMU-75	0 - 75 mm	50 mm	0.01 mm	

To order, please indicate the desired feeler. (a, b, c, g, h), e.g DMD-820-A for gauge with feeler »a«

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control instruments

Measuring moving objects

With analog or digital display

8.7 mm rollers permit measurement on moving materials such as wires, tapes, foils etc. up to a speed of 150 m / min. The rollers are grounded.

The lower roller is standard equipped with flanges.
If wider material has to be measured the lower roller is available without flanges. To order use:
Code-O e.g. FD-50-RO.

Model JD-50-R

Accessory:

USB or RS 232 connecting cable to connect the gauge with a computer; it comes with a Windows program (Win XP or higher) to transfer the data to the PC and to store them as an Excel file.

Model FD-50-R

Model J-50-R

Specifications	Model J-50-R *	Model J-50-RS *	Model JD-50-R *	Model FD-50-R *
Resolution:	0.01 mm	0.005 mm	0.01 mm / 0.001 inch	0.001 mm / 0.0001 inch
Measuring range:	0 - 5 mm	0 - 5 mm	10 mm / 0.4 inch	10 mm / 0.4 inch
Depth of jaws:	50 mm	50 mm	50 mm	50 mm
Measuring pressure:	1.0 N	1.0 N	< 1.4 N	< 1.4 N
Scale diameter:	54 mm	54 mm		
Display:			LCD 6 digit, 8.5 mm high	
Measuring principle:			Capacitive (Sylvac)	
Temperature range:			10 - 45 °C	
Battery:			3 V Lithium, CR 2032	
Data output:			USB or RS 232, galvanic isolation	
Lifting device:	O	O	O	O
Weight, net:	300 g	300 g	300 g	300 g

*The lower roller is standard equipped with flanges; if required without flanges use Code O: e.g. **FD-50-RO***

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Series DD

To determine the thickness of textiles, *fleece, leather etc. corresponding to the standard. This thickness gauge is used for quick comparative measurements.*

Special features:

▪ *Depending on the application the measuring feeler size and measuring pressure is corresponding to the standard*

▪ *Measuring range 0 - 10 mm (optional Code E: 0 - 25 mm)*

▪ *Big foot for on table operation*

▪ *Optional: USB converter for data transfer to PC*

Standard features:

▪ *Easy to use; opening by lifting device (self closing)*

▪ *LCD display 4 digits, with selectable units (mm or inch)*

▪ *Zero setting by pushing a button*

▪ *Manufacturer`s calibration report is included*

Model DD-300-T
for textiles and non-woven textiles

Model DD-50-V
for standard fleece
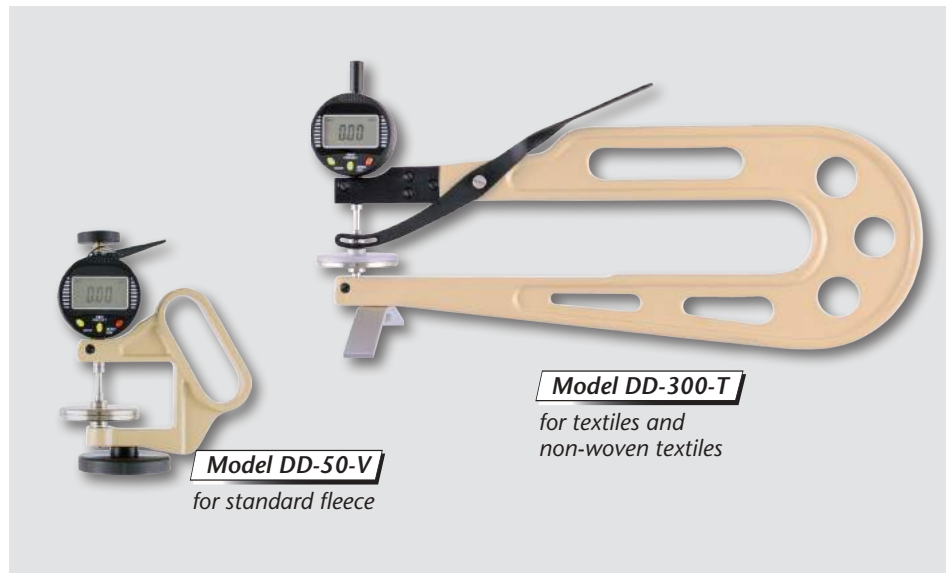
Model DD-50-T
Opening by lifting device
Self closing by spring force

USB Konverter with cables
for data transfer to a PC with software SW-50 by USB or RS 232 interface.
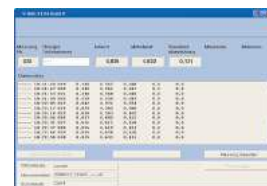
Software SW-50
for data transfer, displaying and analysis of measured data on PC

Available Models	Measuring Range	Dept of jaw	Resolution	Application	Standard	Feeler Ø	Face of Feeler	Pressure
DD-50-T	*0 - 10 mm*	*50 mm*	*0.01 mm*	*Textiles and non-woven textiles*	*corresponding DIN EN ISO 5084*	*50.42 mm*	*20 cm²*	*1 kPa*
DD-200-T	*0 - 10 mm*	*200 mm*	*0.01 mm*					
DD-300-T	*0 - 10 mm*	*300 mm*	*0.01 mm*					
DD-500-T	*0 - 10 mm*	*500 mm*	*0.01 mm*					
DD-50-V	*0 - 10 mm*	*50 mm*	*0.01 mm*	*Standard fleece*	*corresponding DIN EN ISO 9073-2*	*56.42 mm*	*25 cm²*	*0.5 kPa*
DD-200-V	*0 - 10 mm*	*200 mm*	*0.01 mm*					
DD-300-V	*0 - 10 mm*	*300 mm*	*0.01 mm*					
DD-500-V	*0 - 10 mm*	*500 mm*	*0.01 mm*					
DD-50-L	*0 - 10 mm*	*50 mm*	*0.01 mm*	*Leather*	*corresponding DIN EN ISO 2589*	*10 mm*	*0.785 cm²*	*49.1 kPa*
DD-200-L	*0 - 10 mm*	*200 mm*	*0.01 mm*					
DD-300-L	*0 - 10 mm*	*300 mm*	*0.01 mm*					
DD-500-L	*0 - 10 mm*	*500 mm*	*0.01 mm*					

Optional measuring range 0 - 25 mm (e. g. DD-50-T Code E) as required. Please mention when ordering.

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S C H M I D T
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Thickness gauges according to International Standards

Series D-2000

Ask for additional information!

Thickness gauge with digital display to meet highest accuracy for textiles, fleece, carpet, geomaterials, leather, paper, foils, rubber, etc.

Special features:

+ Isolated dial gauge to protect the instrument against outside external impacts; this ensures highest accuracy and repeatability
+ Rigid housing frame
+ Feeler movement manual by plunger
+ Digital display with USB output (optional RS 232)
+ Measuring range 0 - 10 mm, optional 0 - 25 mm or 0 - 50 mm
+ Resolution 0.01 mm, optional 0.001 mm

Standard features:

▌ Easy to use
▌ LCD display with switchable units mm or inch
▌ Inspection sheet of manufacturer - free of charge
▌ DKD calibration certificate (German calibration institute) optional

Peripheral Equipment:

● Additional weights and measuring feeler depending on the required standard
● Motorized to lift and lower the measuring feeler
● Adjustable measuring time (2...32 sec)

| Model D-2000-NW |

Available Models	Standard	Application	Feeler Ø mm	Feeler cm²	Test Pressure
D-2000-T	DIN EN ISO 5084	Textiles	50.42	20	0.1 kPa and 1 kPa
D-2000-V1	DIN EN ISO 9073-2	Fleece	56.42	25	0.5 kPa
D-2000-V2	DIN EN ISO 9073-2	Fleece	56.42	25	0.1 kPa and 0.5 kPa
D-2000-G1	DIN EN ISO 9863-1	Geomaterials	56.42	25	2 kPa
D-2000-G2	DIN EN ISO 9863-1	Geomaterials	56.42	25	2 kPa, 20 kPa and 200 kPa
D-2000-NW	DIN 53855	Non-woven	56.42	25	0.5 kPa and 1 kPa
		textiles	35.68	10	5 kPa
D-2000-P*	DIN EN ISO 534	Paper	16	2	50 kPa and 100 kPa
D-2000-HY	DIN EN ISO 54540	Hygienic paper	56.42	25	2 kPa
D-2000-L	DIN EN ISO 2589	Leather	10	0.785	49.1 kPa
D-2000-Gi		Rubber	35.68	10	5 kPa
D-2000-F*	DIN 53370	Foils	R 30 mm Feeler Calotte		0.5 N

* Resolution 0.001 mm standard

All designs are available for series D-2010 and D-2020 with standard resolution 0.001 mm

Series D-2010

Thickness gauge with graphic display

Special features:

+ Motorized feeler movement Graphic display - touch-screen
+ 2 modes: Single or a series of measurements
+ Adjustable measuring time
+ Statistics (no. of readings, average, standard deviation)
+ USB output

| SW-50 |

Software for data transfer, displaying and analysis of measured data on PC optional available

Series D-2020

Thickness gauge with feed roller system

Special features:

+ Motorized feeler movement Graphic display - touch-screen
+ 2 modes: Single or a series of measurements
+ Feed roll for material transport during a series of measurements
+ Adjustable measuring time
+ Statistics (no. of readings, average, standard deviation)
+ USB output

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Shore Durometers

HPS Series
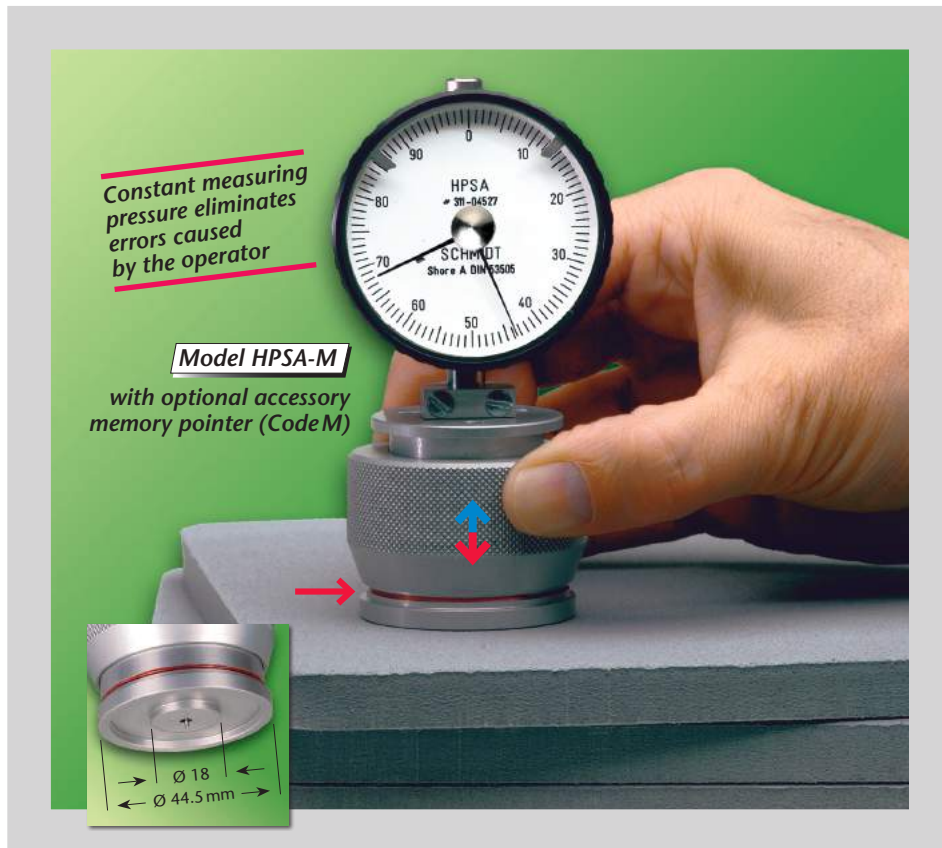
According DIN 53505, ISO 7619, ISO 868, ASTM D 2240
With constant measuring pressure

For determing the surface hardness of soft rubbers, elastomers, natural rubber products etc.
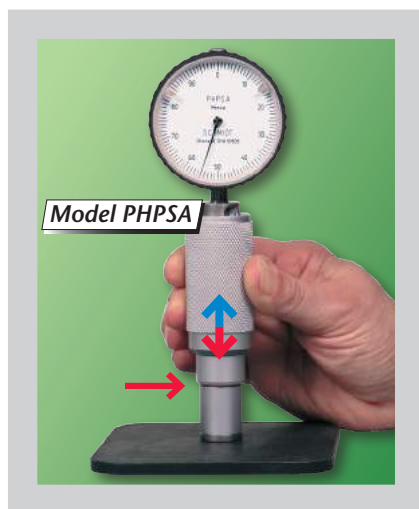
Special features:

✚ Easy to use
✚ Constant pressure indicating system assures uniform test pressure eliminating false reading due to differences between operators
✚ High repeatability
✚ Flat big working base (44.5 mm) prevent tilting and improve the measuring accuracy
✚ Adjustable Min. Max. indicator marks

For measuring the hardness, the spring-loaded outer ring of the housing is pressed downwards until the edge of the ring meets the red marking on the housing.
This ensures a constant pressure and prevents measuring errors.

Constant measuring pressure eliminates errors caused by the operator

Model HPSA-M

with optional accessory memory pointer (Code M)

Ø 18
Ø 44.5 mm

Series PHPS

For hard to reach areas

Model PHPSA

Special features:

✚ Working base = measuring face
Ø 18 mm

Series SHT

Compact durometer for fast measurements

When measuring, place the durometer vertical and shock-free on the material to be measured and press the housing down, till the measuring face rests on the sample.

Model SHTA
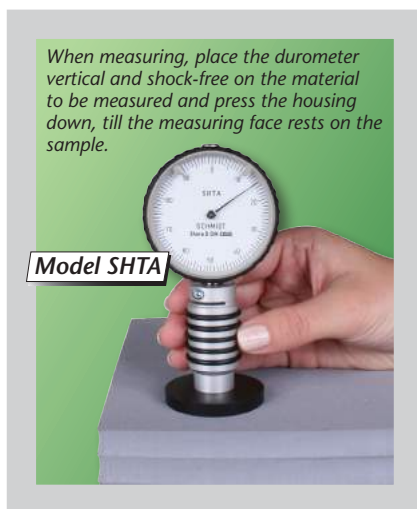
Special features:

✚ Working base = measuring face
Ø 18 mm

Series HPSA-R

For cots, pressure rollers and many other rubber coated rollers, etc.

Model HPSA-35R-M

Special features:

✚ Working face lightly curved to fit on rollers and to improve accuracy

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Shore Durometers

According DIN 53505, ISO 7619-1, ISO 868, ASTM D 2240

Specifications	Model HPSA	Model HPSAO	Model HPSO	Model HPSB	Model HPSC	Model HPSD
Shore:	Shore A	Shore AO	Shore 0	Shore B	Shore C	Shore D
Indentor:	Cone 35° Ø 1.25 mm	Ball Ø 5 mm	U-grooved 3/32"	Tapered pin 30° Ø 1.25 mm	Cone 35° Ø 1.25 mm	Tapered pin 30° Ø 1.25 mm
Typical applications:	Soft rubber, elastomers, natural rubber soft PVC, eather, etc.	Foams, steering wheels and inner linings of motor vehicles	Soft elastomers, oft elastic materials, medium fast textiles	For harder material than Shore A	Medium hard rubber, elastomers and plastic	Hard rubber, rigid thermoplaste, resopal, hard plastic materials
Application range:	10 - 90 Shore A	< 20 Shore A	20 - 80 Shore 0	10 - 90 Shore B	10 - 90 Shore C	10 - 90 Shore D
Standard:	DIN 53505 ISO 7619, ISO 868 ASTM D 2240	ISO 7619-1	ASTM D 2240	ASTM D 2240	ASTM D 2240	DIN 53505 ISO 7619, ISO 868 ASTM D 2240
Measuring spring force:	0.55 - 8.065 N	0.55 - 8.065 N	0.55 - 8.065 N	0.55 - 8.065 N	... 4,45 - 44.5 N	.. 4,45 - 44.5 N
Test pressure *:	approx. 12.5 N	approx. 12.5 N	approx. 12.5 N	approx. 12.5 N	approx. 50 N	approx. 50 N
Display range:	0 - 100 Shore units					
Scale diameter:	51 mm					
Measuring face:	18 mm Ø					
Weight, net (gross):	approx. 300 g (500 g)					
Dimensions:	50 x 58 x 110 mm (L x W x H)					

The principle used to measure hardness is based on measuring the resistance force of the penetration of a pin into the test material under a known spring load. The amount of penetration (max. 2.5 mm) is converted to hardness reading on a scale with 100 Shore units.

* *Spring load of outer ring to create constant pressure when outer ring is pulled down to red marking*

Specifications	Model PHPSA	Model PHPSO	Model PHPSB	Model SHTA	Model SHTD
Shore:	Shore A	Shore O	Shore B	Shore A	Shore D
Indentor:	Cone 35° Ø 1.25 mm	U-grooved 3/32"	Tapered pin 30° Ø 1.25 mm	Cone 30° Ø 1.25 mm	Tapered pin 30° Ø 1.25 mm
Measuring face:	18 mm Ø			18 mm Ø	
Weight, net (gross):	approx. 300 g (500 g)			approx. 200 g (300 g)	
Dimensions:	50 x 58 x 170 mm (L x W x H)			28 x 58 x 110 (L x W x H)	

Specifications	Model HPSA-R20-M	Model HPSA-R35-M	Model HPSA-R55-M
Shore:	Shore A	Shore A	Shore A
Recommended roller Ø:	< 40 mm	40 - 70 mm	70 - 110 mm
Radius of working face:	20 mm	35 mm	55 mm
Measuring base:	44.5 mm Ø		
Weight, net (gross):	Approx. 300 g (500 g)		
Dimensions:	50 x 58 x 110 mm (L x W x H)		

For more specifications see Shore durometers HPS series

Model HP-P20-100

Control rings:
Control of the measuring distance (available as optional accessory) 1 pcs. (20 Shore) or 1 set with 4 pcs. (20, 40, 60, 80 Shore) and one base disk (not for HPSA-R)

Model PSHP

For testing series:
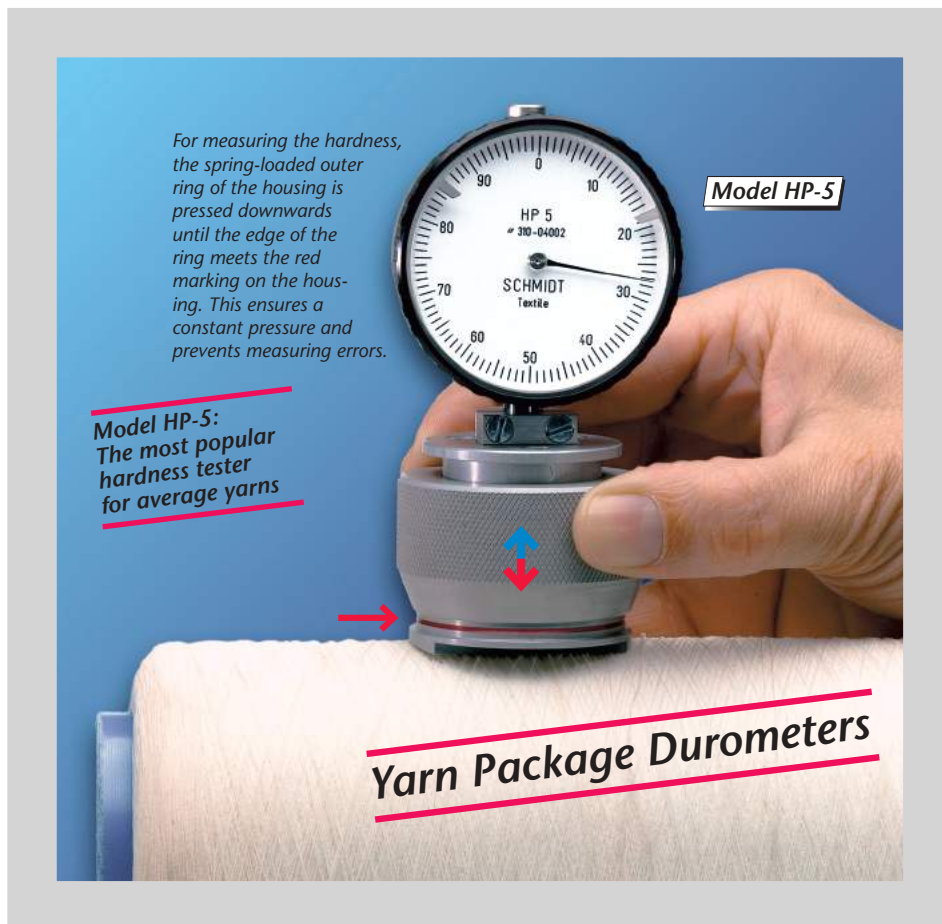Spring loaded lever for fast, precise positioning (only for HPS series)

Textile Hardness Tester

HP Series

With constant measuring pressure

To measure the winding density (hardness) of textile bobbins, beams, spools, cones, dye packages etc.

Special features:

✚ 6 different models with different ball sizes and working faces are available

✚ Constant pressure system eliminates false reading due to difference between operators

✚ Ball shaped indentor prevents damage to bobbins

✚ Working face slightly curved to fit on small bobbins

✚ Special flat bottom versions for bobbins with diameters over 400 mm, such as warp beams

✚ Also available with optional accessory memory pointer (Code M)

The principle used to measure textile hardness is based on measuring the resistance force of the penetration of a ball against the spool under a known spring load. The measuring principle is the same as for the Shore A hardness test.

For measuring the hardness, the spring-loaded outer ring of the housing is pressed downwards until the edge of the ring meets the red marking on the housing. This ensures a constant pressure and prevents measuring errors.

Model HP-5

Model HP-5:
The most popular hardness tester for average yarns

Yarn Package Durometers

Specifications	Model HP-2.5	Model HP-5	Model HP-10	Model HP-2.5-F	Model HP-5-F	Model HP-10-F
Indentor:	Ball 2.5 mm Ø	Ball 5 mm Ø	Ball 10 mm Ø	Ball 2.5 mm Ø	Ball 5 mm Ø	Ball 10 mm Ø
Area applications:	for closely wound bobbins of synthetic, finished fibers and filaments	for loosely wound bobbins of synthetic fibers and closely wound natural fibers, yarns and threads	for very loosely wound bobbins of thick yarns, such as carpet yarns	with flat working face for measuring warp beams Same as Model HP 2.5, but for bobbin diameters over 400 mm	Same as Model HP 5, but for bobbin diameters over 400 mm	Same as Model HP 10, but for bobbin diameters over 400 mm
Depth of indentation*:	0 - 2.5 mm	0 - 2.5 mm	0 - 2.5 mm	0 - 2.5 mm	0 - 2.5 mm	0 - 2.5 mm
Test pressure**:	approx. 12.5 N	approx. 12.5 N	approx. 12.5 N	approx. 12.5 N	approx. 12.5 N	approx. 12.5 N
Measuring spring force*:	0.55 - 8.065 N	0.55 - 8.065 N	0.55 - 8.065 N	0.55 - 8.065 N	0.55 - 8.065 N	0.55 - 8.065 N
Display range:	0 - 100 hardness graduation marks			0 - 100 hardness graduation marks		
Scale diameter:	51 mm	51 mm	51 mm	51 mm	51 mm	51 mm
Working face radius:	55 mm	55 mm	55 mm			
Working face flat:				45 mm Ø	45 mm Ø	45 mm Ø
Weight, net (gross):	approx. 300 g (500 g)			approx. 300 g (500 g)		
Dimensions:	50 x 58 x 110 mm (L x W x H)			50 x 58 x 110 mm (L x W x H)		

* Meets requirements of Shore A **** Spring load of outer ring to create constant pressure when outer ring is pulled down to red marking**

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These cutters are recommended for determination of weight per unit area

Sample Cutters

Model 240 and Model 230

The cutters are designed to precisely cut samples out of various materials, such as woven, non-woven and knitted fabric, carpet, film or paper.

Standard features:

▌ *Easy to use*
▌ *Rugged design*
▌ *4 High quality blades for precision cut*
Delivery includes:
Cutter with one cutting board and 4 spare blades

Procedure:
The material to be cut is placed under the cutter between the cutting board and the cutter. While holding the cutter with one hand, apply pressure to the handle and rotate it by at least 90°.

Spare parts

Models 240/100, 230/50 and 230/10 with sample cut-outs and cutting board

Specifications	Model 240/100	230/100	230/140	230/103	230/50	230/38	230/10
Cutting thickness:	max. 3 mm	max. 10 mm	max. 5 mm	max. 5 mm	max. 5 mm	max. 5 mm	max. 5 mm
Sample cutout:	100 cm²	100 cm²	154 cm²	1/100 yd²	50 cm²	12 cm²	10 cm²
Sample diameter:	113 mm	113 mm	140 mm	103 mm	80 mm	38 mm	36 mm
Weight net:	2200 g	1500 g	2000 g	1400 g	1100 g	750 g	750 g
Weight gross:	2800 g	2100 g	2600 g	2100 g	1700 g	1400 g	1400 g
Dimensions Ø:	165 mm	151 mm	175 mm	138 mm	118 mm	85 mm	80 mm
Dimensions H:	115 mm	103 mm	110 mm	110 mm	110 mm	113 mm	113 mm
For ordering spare parts:							
Blades (100 pcs.):	60001M	60002M (20 pcs.)	60001M	60001M	60001M	60007M	60007M
Rubber cutting boards:	1 or 10 pcs.	1 or 10 pcs.	1 or 10 pcs.	1 or 10 pcs.	1 or 10 pcs.	1 or 10 pcs.	1 or 10 pcs.

Area Weight Balance

Model ARR-300

Required to determine the weight per unit area of textile material to maintain production specifications or to determine material costs etc.

Standard features:

▌ *2 Measuring modes:*
  - g/m² for fabric, paper or similar materials
  - g to determine weight
▌ *Supplied with calibration weight for recalibration*
▌ *Integrated, rechargeable battery*
▌ *AC Adapter for recharching and/or mains operation*

Specifications	Model ARR-300
Capacity:	30000 g/m² Area weight mode 300 g Weight mode
Resolution:	1 g Area weight mode (g/m²) 0.01 g Weight mode
Sample size:	100 cm²
Power supply:	Accumulator (12 h continuous use, recharching time 12 h) and/or AC adapter* (DC 9 V – 500 mA)
Platform size Ø:	120 mm
Temperature range:	10 - 45 °C
Weight, net (gross):	approx. 1700 g (2700 g)
Dimensions:	200 x 220 x 60 mm (L x W x H)
Delivery includes:	Balance, AC adapter and Calibration weight

* *Standard 230 V (Should you require 115 V, please indicate in your order)*

Model ARR-300 with sample cutout and calibration weight

Rechargeable battery operated

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%
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Textile Moisture Meter
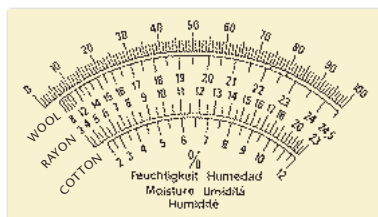
Model TEM-I

For determination the residual moisture content of yarn bobbins, fabric rolls, filaments, fiber flocks etc.
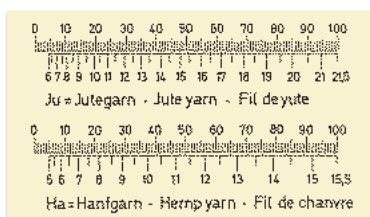
Special features:

✚ *Easy to use for many applications*

✚ *Multiple scale for direct readings for wool, rayon and cotton and 0 - 100 scale for comparison tables used for other materials*

✚ *Portable, battery-operated*

✚ *Compact housing supplied in leather carrying case*

Measuring principle:
The moisture content is determined by measuring the electrical conductivity of the material which always is proportional to the content of moisture.

Textile special

Model TEM-I

Direct readings for wool, rayon and cotton, and 0 - 100 scale for comparison tables

Comparison tables for 36 fiber types

Various interchangeable electrodes are available for use in a wide variety of applications:

50205M: Needle electrode for yarns in cops, cross-wound bobbins and hanks (needle length 25 mm)

50207M: same as 205 but with needle length 100 mm

50209aM: Stab electrode for textiles in sacks and rolls (needle length 325 mm)

50210M: Knife electrode for fabric rolls (knife length 110 mm)

50211M: Roller electrode for running webs of fabric (roller 27 mm Ø)

50212M: Continuous run electrode for yarn hanks and single filaments (roller 16 mm Ø)

50213M: Surface electrode for fabrics (surface 23 mm Ø)

50299M: Electrode for calibration

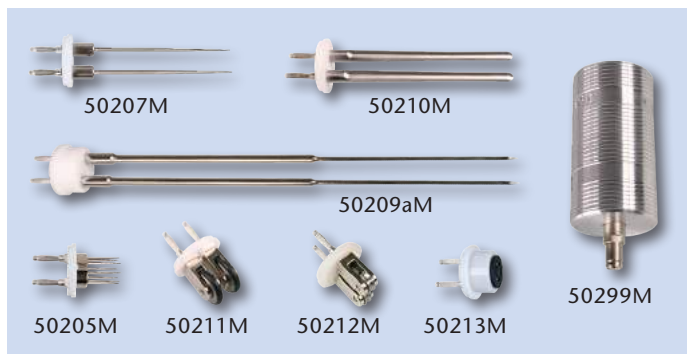| Specifications	Model TEM-I
Measuring ranges:	Wool: 8 to 24.5 % moisture content
	Rayon: 3 to 23 % moisture content
	Cotton: 2 to 12 % moisture content
	Comparison measurement: 0 - 100 scale
Battery:	9 V E-block
Weight instrument:	approx. 400 g, net
Weight total set:	approx. 1200 g, net
Dimensions:	200 x 250 x 70 mm (L x W x H)

Delivery includes:
– Instrument with leather carrying case
– 1 Connecting cable
– 1 Electrode holder with electrodes 50205M and 50207M
– 1 Operating manual with comparison tables

50207M
50210M
50209aM
50205M   50211M   50212M   50213M
50299M

Textile special

Model DHT-2

Multi functional instrument to determine the residual moisture of yarn bobbins, fabric rolls, filaments, cotton bales, fiber flocks as well as to measure room temperature and humidity RH %
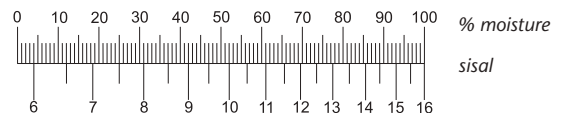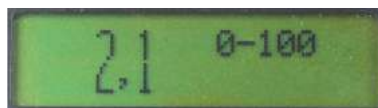
Model DHT-2

Special features:

+ *Digital display for direct moisture percentage reading of 10 materials and 10 often used material mixtures (50 PES/50 Zw, 50 PES/50 PAC, 50 PES/50 Bw, 67 PES/33 Bw, 70 PES/30 Zw, 70 PES/30 Wo, 67 PAC/33 BW, 70 PAC/30 Wo, 60 Bw/40 PES, 50 Wo/50Zw)*

0,4 COTTON

+ *Scale with 0 - 100 for non stored materials; with the help of supplied comparison tables the moisture of additonal 20 materials can be determined*
+ *Portable, battery operated*

Digital display with 0 - 100 scale for comparision tables for 20 often used materials mixtures

2,1   0-100

0	10	20	30	40	50	60	70	80	90	100	% moisture

sisal

6   7   8   9   10   11   12   13   14   15   16

Specifications	**Model DHT-2**
Applications Residual moisture:	Direct reading: wool, rayon, cotton, linen, nylon, acrylic, polyester, hemp, jute, paper and 10 material mixtures
	0-100 scale: 20 conversion sheets for different materials
Room temperature:	-30° to 70° Celsius (optional) with 50428M
RH %:	5 % to 95 % RH % (optional) with 50428M
Display:	LCD, resolution 0.1
Measuring accuracy:	1 % full scale
Power supply:	Battery 9 V E Block, low battery signal
Weight net (gross):	600 g (1300 g)
Dimensions:	170 x 250 x 65 mm (L x W x H)

Delivery includes:	– Instrument with leather carrying case – 1 Connecting cable – 1 Electrode holder with 2 electrodes: – 50414M and 50418M – 1 Operating manual with comparison tables

Various interchangeable electrodes are available for use in a wide variety of applications:
50414M: *2 Needles, 100 mm long*
50418M: *8 Needles, 80 mm long*
50412M: *Stab electrode for sacks and rolls, 300 mm long*
50416M: *Roller electrode for running fabrics and webs*
50428M: *Thermo-hygrometric probe to measure temperature and RH %*
50422M: *2 Calibration electrodes with constant values*
50426M: *Surface electrode for fabrics (surface 30 mm Ø)*

50412M

50418M   50416M   50426M   50422M

50414M   50428M

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# Stiffness Tester - Softometer

Series KWS

To determine the suppleness and stiffness of fabric, fleece, plastic, leather, paper and other limp materials

Special features:

✚ *High repeatability of test results through*
 - *Elimination of subjective influence by the operator*
 - *Precisely defined test conditions*
 - *Electronic timing of the test procedure*

✚ *2 operating modes*
 - *Display of measurement result after 10 sec.*
 - *Instant display of actual values, which change over time with testing materials with relaxation ability*

✚ *Rotable test table, 30° bending radius*

✚ *Recommended sample size: Max. width 60 mm, Max. length 75 mm Max. thickness 5 mm*

Operation:

A test sample of defined size and thickness is clamped onto the test table. The test table is tilted by 30° into the testposition, thereby bending the sample. The sample presses against the force sensor and the measured force is displayed in newtons and millinewton.

Model KWS-500

Sensor

Sample

Working principle
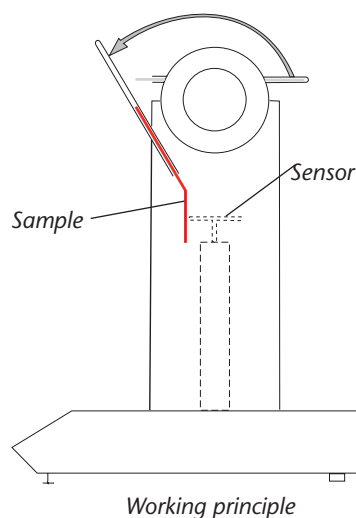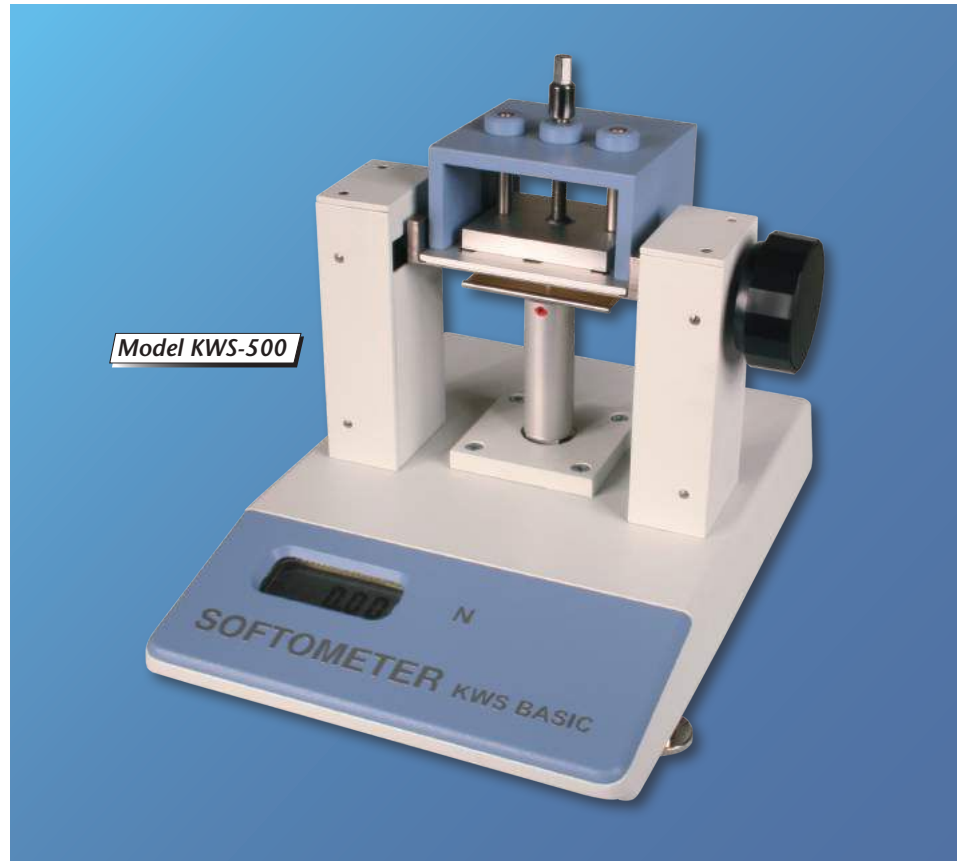
Available Models	Range	Resolution
KWS-500	0 - 500 mN	0.5 mN
KWS-2000	0 - 2000 mN	1 mN
KWS-20K	0 - 20 N	10 mN

Specifications	Series KWS
Unit of Measure:	mN (0.001N)
Sample bending angle:	max. 30°
Sample dimensions:	max. width 60 mm, max. length 75 mm, max. thickness 5 mm
Display:	digital, LCD, 13 mm
Operating modes:	actual value display or display after 10 sec, user-selectable
Interface:	RS 232C (8, 1, N, 9600)
Temperature range:	5 - 45°C
Air humidity:	85 % RH, max.
Power supply:	AC adapter 230 V AC, 50 Hz
Weight net (gross):	approx. 2.4 kg (approx. 4 kg)
Dimensions:	280 mm x 180 mm x 225 mm (L x W x H)

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control instruments

# Elongation Tester

Series EFT

*for measuring static and permanent
elongation of fabrics*

Special features:

✚ *3 different designs with 1, 3 or 6 test stations*
✚ *Rugged warp resistant aluminium frame*
✚ *Recommended size of the test specimen: 5 x 60 mm (non metal fabrics)*
✚ *Capacity 25, 50, 75, 100 or 125 N*
✚ *Max. test periode 99 minutes*
✚ *Elongation force tester with 0.01 mm resolution*
✚ *Accuracy at max. elongation is 0.4 mm*
✚ *According VW standard PV3909*

Test procedure:
Adjust the measuring force. Fix the test specimen, e. g. 50 x 160 mm, between the two clamps. Determine the length exactly by using the length measuring system and mark this initial value. Activate the timer. Read the static elongation at the end of the test period. Determine the permanent elongation after the adjusted balancing time.

Model EFT-3
with 3 stations
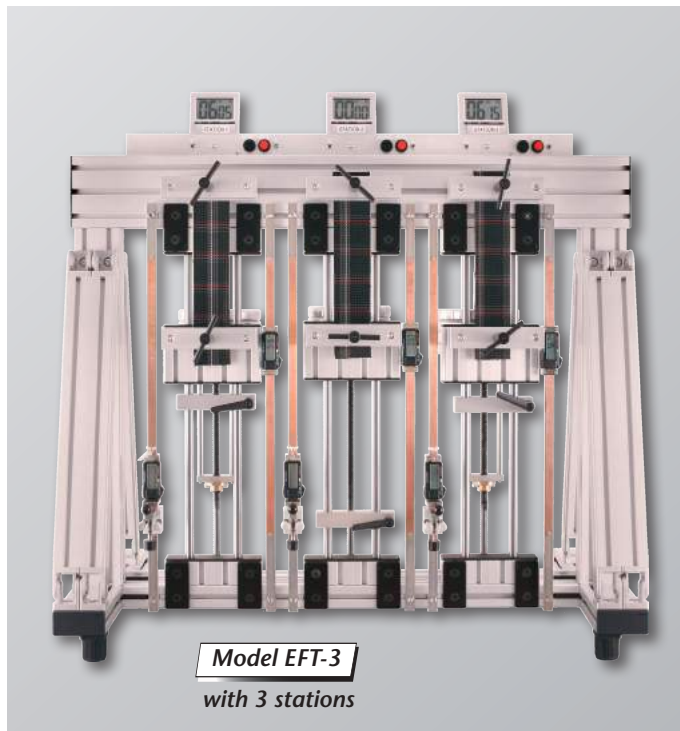
Leak Detector

Model LDT-1

Reduces the operating costs
of compressed air-systems

Convenient for locating leakages in compressed air-systems, pneumatic systems, valves, fittings, steam pipe lines, oxygen sockets in hospitals as well as checking internal sealing of e. g. cockpits, pressure chambers etc.

Special features:

✚ *For leakages with diameter more than 0.1 mm and 1 bar*
✚ *Signal indication over headset and LED indicator*
✚ *Longer probes and a ultrasonic parabolic reflector optional available*
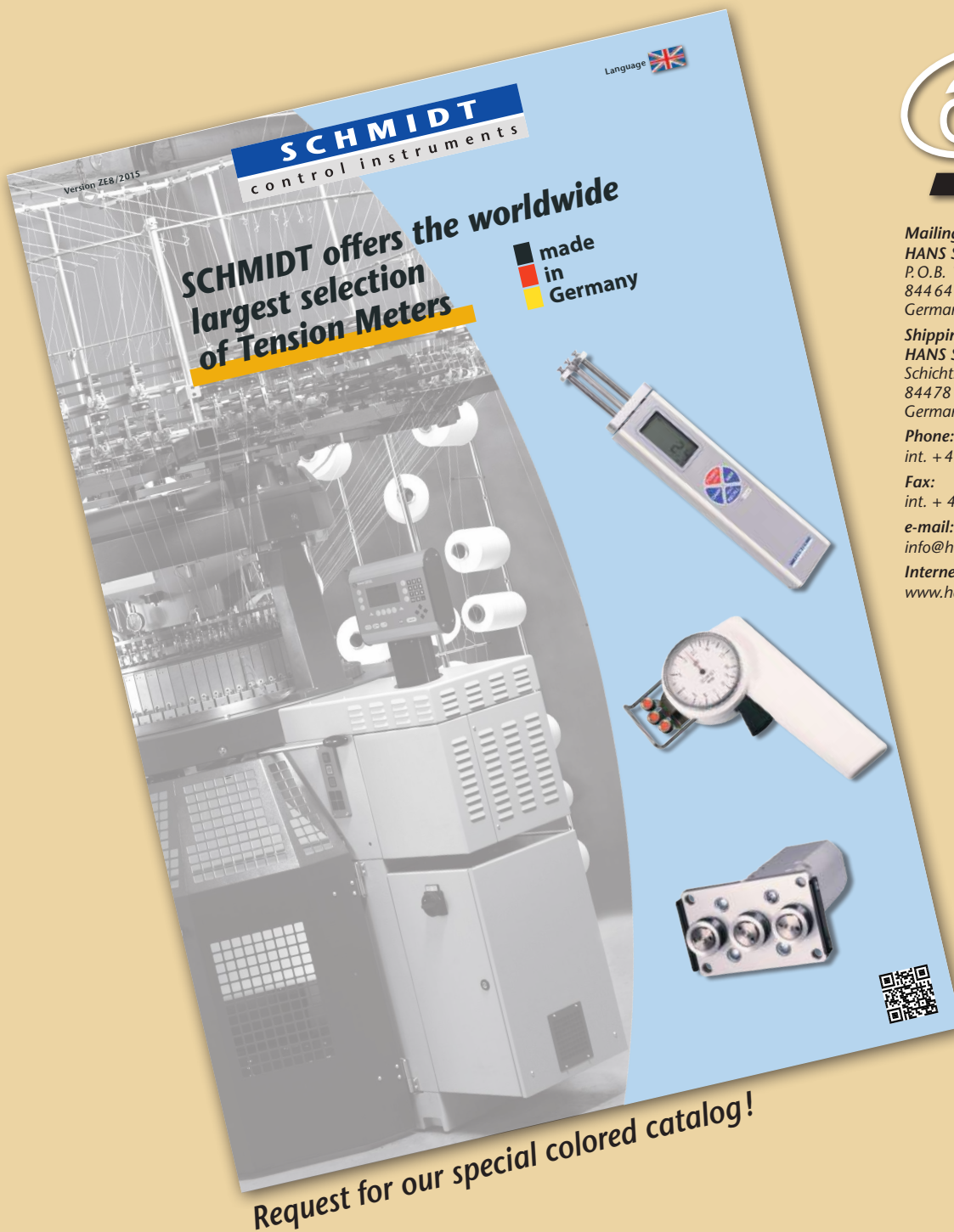✚ *For checking cabins ultrasonic transmitter optional available*

Model LDT-1

Specifications	Model LDT-1
Display:	LED and acustical
Power supply:	9 V battery, E-block
Housing material:	Plastic (ABS)
Dimensions:	180 x 90 x 70 mm (L x W x H)
Weight, net (gross):	Instrument with probe 250 g
	head phone 220 g (1800 g)

Functions:

Flowing gas from a leakage is a typical source of non-audible ultrasonic sound with defined frequency. LDT-1 converts this source into a audible signal and displays the signal level on a LED optically.