Tension Meter

MKM Series

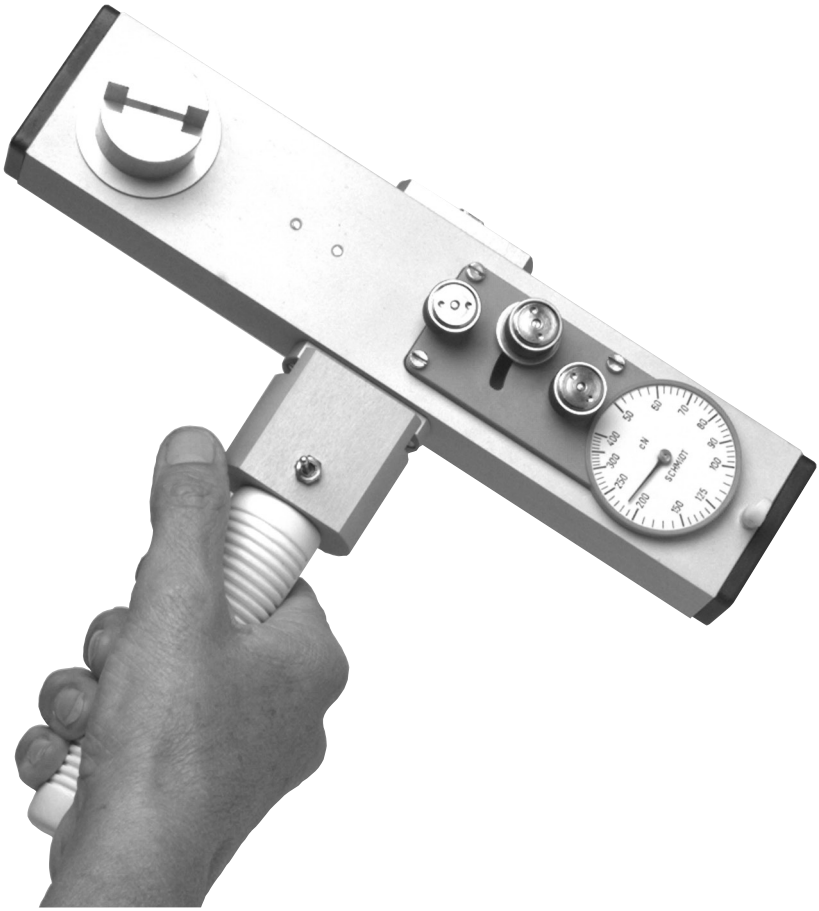
Model *MKM-50*
MKM-100
MKM-400

SCHMIDT
control instruments

Edition *MKM 04.E*

Instruction Manual

Valid as of: 01.10.2019 • Please keep the manual for future reference!



CE

SCHMIDT · 1ST IN TENSIONMETERS WORLDWIDE

Contents

1 Warranty and Liability

In principle, the supply of the device is subject to our “General Conditions of Sale and Delivery.” These have been provided to the operating company on conclusion of the contract, at the latest.

Warranty:

- SCHMIDT tension meters are warranted for 12 months.

Parts subject to wear, electronic components and measuring springs are not covered by the warranty. No warranty or liability will be accepted for bodily injury or property damage resulting from one or several of the following causes:

- Misuse or abuse of the device.
- Improper mounting, commissioning, operation and maintenance of the device (e.g. verification interval).
- Operation of the device if any safeguards are defective or if any safety and protection precautions are not properly installed or not operative.
- Failure to comply with the notices in the Operating Instructions regarding transport, storage, mounting, commissioning, operation, maintenance and setup of the device.
- Any unauthorized structural alteration of the device.
- Insufficient inspection of device components that are subject to wear.
- Opening the device or improper repair work.
- Disasters caused by the effects of foreign objects or by force majeure.

1.1 Notices within the Operating Instructions

The fundamental prerequisite for the safe handling of this device and its troublefree operation is the knowledge of the basic safety notices and safety instructions.

These Operating Instructions contain the most important notices for the safe operation of the device.

These Operating Instructions, in particular the safety notices, must be observed by any person who works with the device. In addition, the local valid rules and regulations for the prevention of accidents must be complied with.

The representations within the Operating Instructions are not true to scale.

The dimensions given are not binding.

General indications of direction, such as FRONT, REAR, RIGHT, LEFT apply when viewing the front of the device.

1.2 Responsibilities of the Operating Company

In compliance with the EC Directive 89/655/EEC, the operating company agrees to only permit persons to work with the device who:

- are familiar with the basic regulations on industrial safety and accident prevention and who have been trained in handling the device.
- have read and understood the chapter on safety and the warning notices in these Operating Instructions and have confirmed this with their signatures.
- are examined regularly on their safe and conscientious working method.

1.3 Responsibilities of the Personnel

All persons who work with the device agree to perform the following duties before starting work:

- to observe the basic regulations on industrial safety and accident prevention.
- to read the chapter on safety and the warning notices in these Operating Instructions and to confirm with their signatures that they have understood them.

1.4 Informal Safety Measures

The Operating Instructions must always be kept on hand where the device is operated. Apart from the Operating Instructions, the general and local valid regulations on accident prevention and environmental protection must be provided and complied with.

1.5 Training of the Personnel

Only trained and instructed personnel is permitted to work with the device. The responsibilities of the personnel must be clearly defined for mounting, commissioning, operation, setup, maintenance, and repair. Trainees may only work with the device under the supervision of experienced personnel.

1.6 Intended Use

The device is intended exclusively to be used as a tension meter.
Any other use or any use exceeding this intention will be regarded as misuse.
Under no circumstances shall HANS SCHMIDT & Co GmbH be held liable for damage resulting from misuse.
The intended use also includes:

- Complying with all notices included in the Operating Instructions and observing all inspection and maintenance works.

1.7 Dangers in Handling the Device

The device was designed according to the state of the art and the approved safety standards. Nevertheless, its use may cause serious or fatal injury to the user or third persons, and/or an impairment of the device or of other material assets.

The device may only be applied:

- For its intended use in a faultless condition with regard to the safety requirements.
- Malfunctions that could impair safety must be remedied immediately.
- Personal protective equipment must be used according to the EC Directive 89/686/EEC.

The device must not be operated in potential explosive areas and must not come into contact with aggressive substances.

1.8 Copyright

1.9 Declaration of Conformity

Our mechanical tension meters do not belong to the EC machinery directive 2006/42/EG and do not have a CE mark.

2 Available Models

The standard series is also available with the following modifications (customized versions):
- Special calibration using customer supplied material.
The Operating Instructions are also applicable to these customized versions as their handling is the same.

Model	Tension Ranges cN	Take-up Speed m/min	**SCHMIDT Calibration Material
MKM-50	5 - 50	15	PA: 0.12 mm Ø
MKM-100	10 - 100	15	PA: 0.12 mm Ø
MKM-400	50 - 400	8	PA: 0.20 mm Ø

* Suitable for 95% of all applications. PA = Polyamide Monofilament
If the material to be measured differs significant from the SCHMIDT calibration material in diameter, rigidity, shape, etc., we recommend calibration using customer supplied material. Please supply a material sample of 5 m for this purpose.
International unit of tensile force: 1 cN = 1.02 g = 0.01 N

2.1 Specifications

Calibration: According to SCHMIDT factory procedure
Accuracy: ± 1% full scale (FS) or ±1 graduation on scale
Take-Up Speed: ~ 15 m/min (MKM-50, MKM-100) ~ 8 m/min (MKM-400)
Scale Diameter: 41 mm
Temperature Range: 10 - 45 °C
Air Humidity: 85% RH, max.
Housing Material: Plastic (Makrolon)
Housing Dimensions: 210 mm x 225 mm x 54 mm (L x W x H)
Weight: Approx. 650 g (fully assembled and ready to operate)

2.2 Delivery Incudes

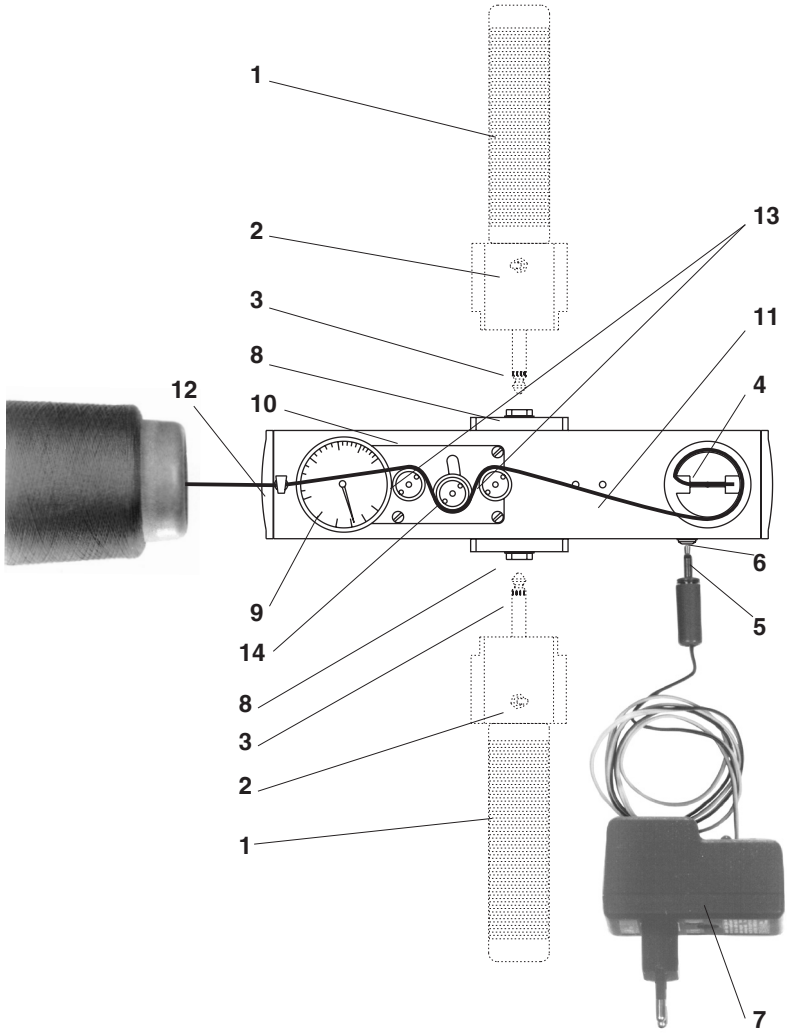
Tension meter
1 Battery charger
1 Operating Instructions

2.3 Unpacking

Unpack the instrument and inspect it for any shipping damage. Notices of defect must be announced immediately, in writing, at the latest within 7 days on receipt of the goods.

3 Initial Setup and Operating Procedure

3.1 Operating Elements



1 Handle
2 Motor switch
3 Jack plug 6.35 mm ø
4 Take-up wheel
5 Plug connector
6 DC connector
7 AC adapter
8 Jack socket 6.35 mm ø for handle
9 Scale
10 Tension meter
11 Process material
12 Guide eye
13 Outer rollers
14 Measuring rollers

3.2 Charging the Battery

The built-in battery needs to be charged before first use of your tension meter and after max. 6 hours of use.

The provided battery is a 9 V Li-Ion rechargeable battery with charging electronics. If a battery without charging electronics is used, it is not possible to plug in the AC adapter into the DC connector and therefor the battery can not be charged.
Before connecting the battery charger, check the supply voltage (100 - 240 V).
Hans Schmidt & Co GmbH disclaims any warranty or liability and assumes no responsibility whatsoever for battery chargers from other suppliers.

To connect the AC adapter:
- Connect the plug connector of the AC adapter with the DC connector of the tension meter.

Charging time is approx. 2 ½ hours.

3.3 Notes Before Starting Measurement

Have you read and understood the Operating Instructions, in particular Chapter 1 "Basic Safety Notices" ?
You are not permitted to operate the tension meter before doing so.

Before working with the instrument you must put on your personal protective clothing, if necessary. For example, eye protectors, gloves, etc.
To avoid damage, do not move the center roller by hand.

Tensions that exceed the tension range of the instrument by more than 100% may cause permanent damage to the measuring spring and must be avoided under any circumstances.

The ID plate with the serial number as well as the calibration label (optional) are provided on the bottom of the instrument, the SCHMIDT Quality Seal are provided on the surface.

3.4 Operating Procedure

- Depending on the orientation of use, plug in the jack plug of the handle at either of the two jack socket provided on the sides of the tension meter.
- Thread the process material through the guide eye, the outer rollers and the measuring roller. Then wind the process material **2** or **3** times around the take-up wheel.
- Press the motor switch to start measuring.

The scale now shows the measured tension values.

3.5 Verification of Calibration

All tension meters are calibrated with standard materials - such as polyamide monofilament (PA) - according to the SCHMIDT factory procedure. The diameters are given in Chapter 2. Any difference in process material size and rigidity from the standard material may cause a deviation of the accuracy. In 95% of all industrial applications, the SCHMIDT calibration has been proven to provide the best results and is used for comparative purposes.

Should the process material differ significantly from the SCHMIDT calibration material in size, rigidity or shape, we recommend special calibration using customer supplied material. Please supply a material sample of 5 m for this purpose.

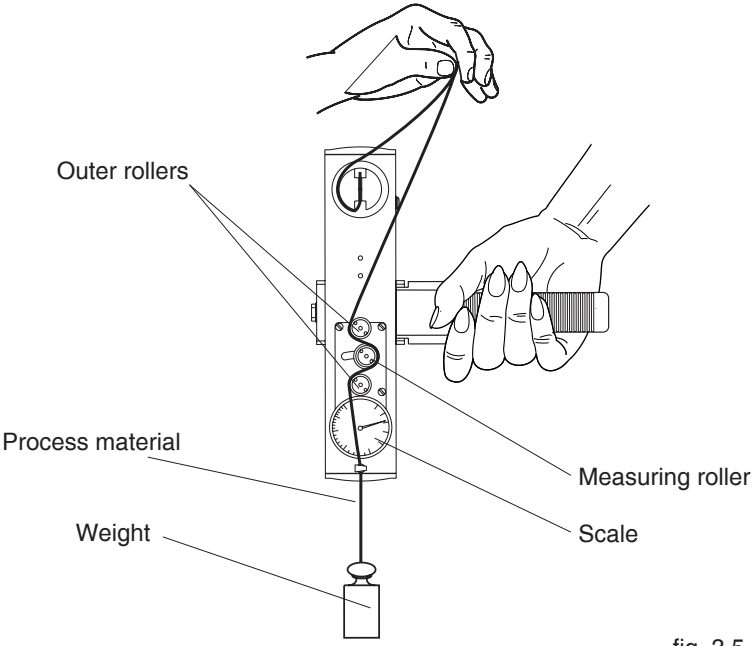


fig. 3.5

Verification Procedure:

- Hang a weight which corresponds to the tension to be measured (pay attention to the correct unit of measure) from the process material, vertically, as shown in fig. 3.5. (Always use a fresh portion of the material to be measured.)
- Before verifying the calibration, move the process material slowly up and down to compensate for possible mechanical friction losses and thus ensure repeatability of the measurements.
- The tension value shown on the scale should be equal to the value of the suspended weight.

If the verification of the calibration shows a deviation beyond the allowable tolerance and a reliable operation is no longer allowed, the instrument has to be returned to the factory for recalibration or servicing.

4 Service and Maintenance

The tension meter is easy to maintain. Depending on operating time and load, the instrument should be checked according to the locally valid regulations and conditions (as described in Chapter 3.5). The use of other test methods than the procedure described in Chapter 3.5 may cause deviating measuring results.

5 Cleaning

For cleaning the unit, do not use any

AGGRESSIVE SOLVENTS

such as trichloroethylene or similar chemicals.

NO WARRANTY OR LIABILITY

shall be accepted for damage resulting from improper cleaning.

6 Verification Interval

The question of finding the right frequency of calibration accuracy verification depends on several different factors:

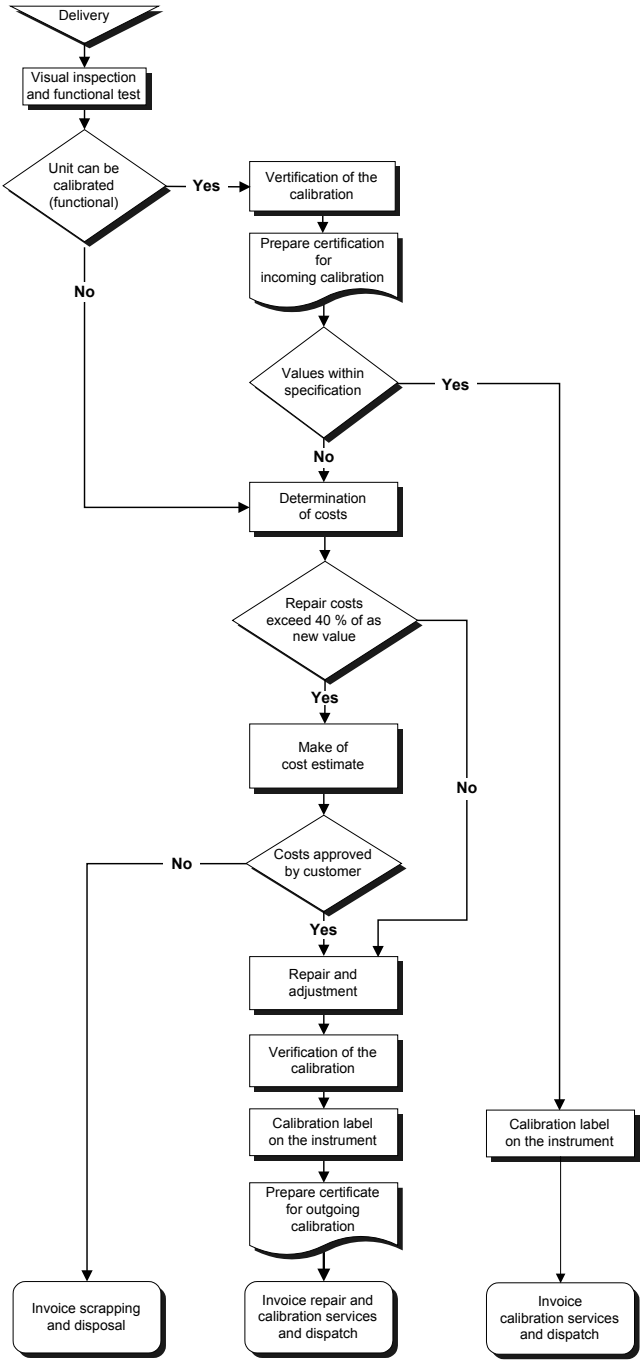
- ➔ Operating time and load of the SCHMIDT tension meter
- ➔ Tolerance band defined by the customer
- ➔ Changes to the tolerance band compared to previous calibrations

Therefore, the interval between verifications of calibration must be determined by the user‘s Quality Assurance Department, based on the user‘s experience.

Assuming normal operating time and load as well as careful handling of the tension meter, we recommend a verification interval of one year.

6.1 Verification of Calibration and Determination of Repair Costs

Flow chart for verifying the calibration of used tension meters, incoming and outgoing verification with Inspection Certificate 3.1 according to DIN EN 10204



7 Correspondence

Should you have any questions regarding the instrument or Operating Instructions, or their use, please indicate above all the following details which are given on the ID plate:

1) Model
2) Serial number

8 Repairs

Shipping instructions:

We kindly ask for return free of charge for us, if possible by airmail parcel. All occurring charges, if any (such as freight, customs clearance, duty etc.), will be billed to customer. For return from foreign countries, we ask you to include a proforma invoice with a low value for customs clearance only, e.g. 50 Euro, each and to advise the shipment in advance by fax or eMail.

To avoid unnecessary follow-up questions, and the resulting loss of time or possible misunderstandings, please return the instrument with a detailed fault description to our service department. Please indicate in your order whether you require an Inspection Certificate 3.1 according to DIN EN 10204.

Service address:

HANS SCHMIDT & Co GmbH
Schichtstr. 16
84478 Waldkraiburg
Germany

Notes:

SCHMIDT
control instruments

SCHMIDT-Test-Instruments indispensable in production monitoring, quality control and automation We solve your measuring problems:


Tension Meter


Force Gauge

Torque Meter

Tachometer


Speed- and Lengthmeter


Electronic Lengthmeter


Stroboscope


Screen Printing Tension Meter


Thickness Gauge


Yarn Package Durometer and Shore-A Durometer


Sample Cutter


Balance

Moisture Meter


Leak Tester


Softometer

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Mailing address:
P. O. B. 1154
84464 Waldkraiburg Germany
Shipping address:
Schichtstr. 16
84478 Waldkraiburg Germany

Phone:
int. + 49 / (0)8638 / 9410-0
Fax:
int. + 49 / (0)8638 / 4825
int. + 49 / (0)8638 / 67898

e-mail:
info@hans-schmidt.com

Internet:
http://www.hans-schmidt.com