# Instruction Manual

# Tensometric Combi 490

Electronic Tensionmeter

**with guide roller M156:**


**with guide roller M150:**


**Tensometric Combi 490** is a handy and reliable electronic tensionmeter for quick checking the tensile force on running materials in machines.

The guide rollers are well adapted to the material to be measured.

By push on a button the last measured value can be held.

The Combi 490 can be operated with one hand.

The instrument is protected by the little case which is included.

The **Tensometric Combi 490** is exclusively destined for measuring the tensile force.

Included in delivery:

| | |
|---|---|
| 1 | Combi 490 |
| 1 | Little case |
| 1 | Battery 9V |
| 1 | Instruction manual |
| 1 | Connector, output signal |

## I EC - Conformity

The measuring device of type series Combi 490 is complying with the standards EN 61000-6-2 EN 61000-6-3

CE

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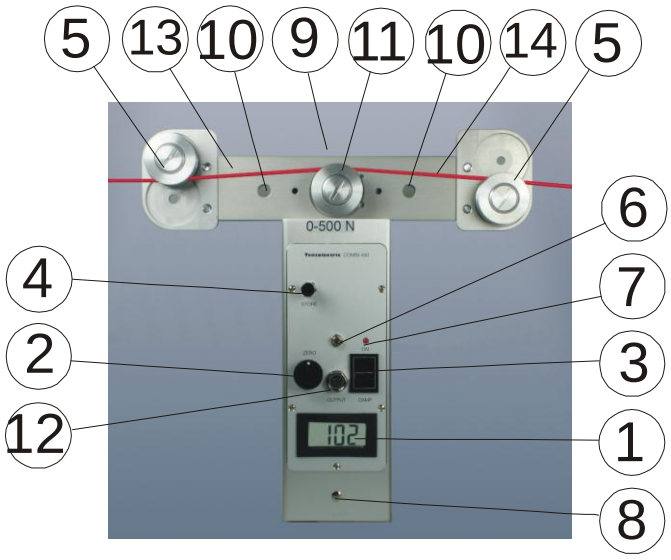
## II. Control elements:

Figure 1: Control elements:




( 1 ) Digital display
( 2 ) Zero set
( 3 ) Switch ON - OFF - DAMP
( 4 ) Hold measuring value (STORE)
( 5 ) Guiding roller
( 6 ) Potentiometer for calibration
( 7 ) Batterie control lamp
( 8 ) mountig screw for battery case
( 9 ) max. measured value label
(10) Fixing screw
(11) Measuring roller
(12) Socket Output 0-1V
(13) Mouting plate
(14) Gravure, material guide

( 1 ) Digital display Indication of the tensile force. Value is regenerated 3 times/sec

( 2 ) Zero set Before starting the measurements, the display must show -000- .
Deviation can be corrected by means of the turning knob ZERO (2).

( 3 ) Switch (DAMP)
Switching on by pressing the rocker switch (3)
Rocker-switch (3) has 3 positions :

Upper position: (ON)
The device is switched on, the measuring values appear on the display (1) with a frequency of typ. 3 / sec. unfiltrated.

Middle position:
Device is switched off.

Lower position: (DAMP)
Device is switched on, the measuring values appear with a frequency of typ. 3 /sec. on the digital display (1).
The measuring signals are filtrated. With fluctuating tensile forces the display thereby becomes more smoothly.
The measuring result appears only after approx. 3 - 4 seconds.

( 4 ) Hold measuring value (STORE)
The indication (1) of the measured value will be held as long as the push button STORE (4) is pressed.

( 5 ) Guiding rollers
During the measurements, these rollers guide the material in a defined angle around the middle measuring roller.

( 6 ) Potentiometer
for value calibration -> see calibration

( 7 ) Battery control lamp
When the digital display (1) indicates values and the lamp (7) is not on, the device is ready for use.
When the digital display (1) indicates values and the red lamp (7) is on, the battery must be replaced.
When the digital display (1) indicates no values and the lamp (7) is not on, the device is switched off or no battery is in.

( 8 ) mounting screw
Removing the mounting screw, the battery case can be pulled out.

( 9 ) Max. measured value
The identification label gives the maximum measuring value of the device (Nominal load).

(10) Fixing threads
M8

(11) Measuring roller

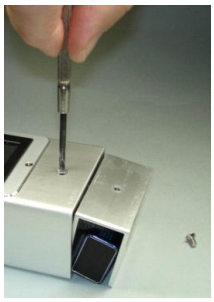
(12) Socket


Pin 1 = Output signal 0-10V, Pin 2 = Ground

# III Starting up and handling

## Inserting the battery

Figure 2
Open battery case



Unscrew flat head screw (8) with a screwdriver.
Now the battery case can be pulled out.
A cable with 2 push buttons appears.
Please connect the 9 V block battery 6 LR 61 to the push buttons.
Push the battery into the case and screw on the battery case

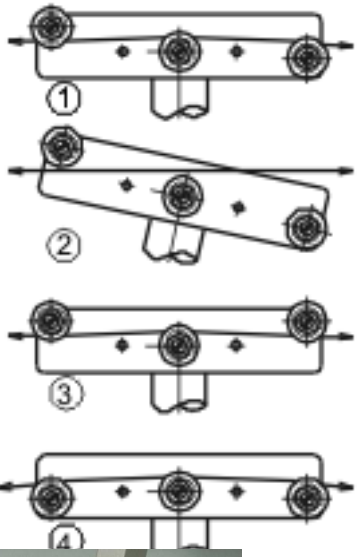
## Measuring

1. Switch device on. Rocker-switch (3) in upper position "ON", with fluctuating tensile forces into lower position "DAMP". The digital display (1) indicates values.
2. Adjust with potentiometer ZERO (2) the digital display (1) to ' 000 ' (zero) and hold the Combi 490 in such a way as it corresponds to the later measuring position. The material may not yet be threaded,
3. Feed in the material to be measured by guide roller (5).

## To thread the material

With the **Combi 490 – M156** unit both guide rollers can be moved in such a way that 3 different material guide methods are possible.
With the **Combi 490 – M150** unit only one material guide (4) is possible.

Figure 3 -Material guiding and feed in:



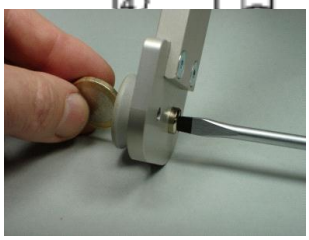

1 left guide roller above, right roller below the material to be measured:
- optimal for measurements by hand.
- easy threading

2 Threading of the material to be measured by swaying the device

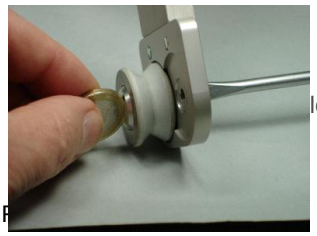
3 left and right guide roller above the material to be measured:
- no displacement of the material to be measured from his run direction.

4 right and left guide roller below the material to be measured:
- the device is pushed against the material to be measured.
- the material must lie close in both guide rollers.

**- 156:**



ng screw of the Guide roller is at the back of the board.
It is to be unscrewed with a screwdriver



The rotate of the guide roller is to be prevend with a coin held in the ler slit.

Put the guiding roller in the new position, and fastens them with the fixing screw.

## Measured value display

When the material is threaded, the digital display indicates the measuring result.
If the digital display cannot be read, then the measurement result can be held on the display (1) with a constant finger pressure on key STORE (4),
With still pressed STORE key (4) the measuring result on the digital display (1) can be read.

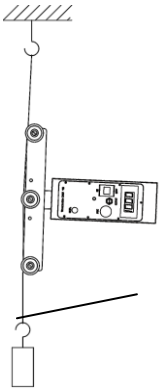
# IV Calibration

The Combi 490 is calibrated work-provided. To achieve the measuring accuracy the device must be calibrated with the material which shall be measured.

1. Switch (3) in position ON
2. With zero setting ZERO (2) set digital display (1) to ' 000 ' (point zero)
3. Hang up approx. 1,5 m of the material, which should be afterwards, with a standard weight.
   The standard weight should generate the tensile force,
   which is in the middle of the range wanted to reach the highest precision.
4. Now the material guide roller of the Combi 490 is positioned in the material to be measured..
5. Move the Combi 490 evenly upwards.

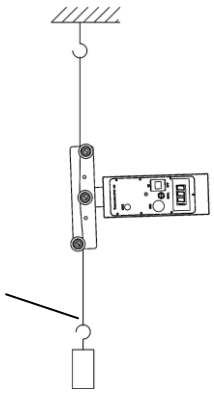
Figure 6
Calibration

Combi 490-M150



Calibration weight

Combi 490- M156



5. Set with potentiometer CAL (6) the tensile force of the standard weight on digital display (1).

6. Remove material with standard weight from the guiding rollers.

7. The calibration should be repeated twice from point 2.

**Preface:**
The combi 490 is to be kept after use in the case.
If the device is not used longer time, the battery from the device is to be removed.

**Application:**
Short time – tensile force measurement on flexible materials by hand.

**Attention:**
The rollers must be treated carefully. So, e.g. already an uncontrollably strong thumb pressure on the measuring roller (11) will influence precision of the device or even destroy it.

**Malfunctions:**

| | |
|---|---|
| No display | The lamp (7) is not on. The device is switched off or no or an empty battery is inserted.<br>-> use full battery and switch on Combi 490. |
| Zero setting | Zero setting impossible -> Battery empty? -> if not:<br>-> The device must be sent to Tensometric, for calibration. |
| Calibration | calibration impossible -> The material is too thick or too rigid -> no corrective possible.<br>calibration impossible -> The device must sent back to Tensometric for calibration. |

## Technical Data Combi 490; M156; Combi 490 - M150:

Measuring range: see label ( II-9 )

| | |
|---|---|
| max. material speed | 1200 m/min |
| Indication | Digital, LCD, 3 ½ digits, height 10mm , 3 measurement / s |
| Housing | aluminium - metal, alloy anodized ; dimensions 200mm x 60mm x 40mm |
| Service voltage | 9 V |
| Current | < 10 mA |
| Battery | 9 V battery Type 6LR61 |
| Operating time | approx. 75 h -- by using an alcaline battery |
| Error in meas. system | < ± 1 % ± 2 digits from 0 - 150% of the calibrated tensile force |
| Overload protection | 5 times the nominal load |
| Output signal | 0 -> 1V corresponding to 0 - 100% of the nominal load |

Pin- connection :
view on the socket - output


PIN 1 = output signal 0 - 1V
PIN 2 = GND

| | |
|---|---|
| Weight | appr. 0,7 kg |