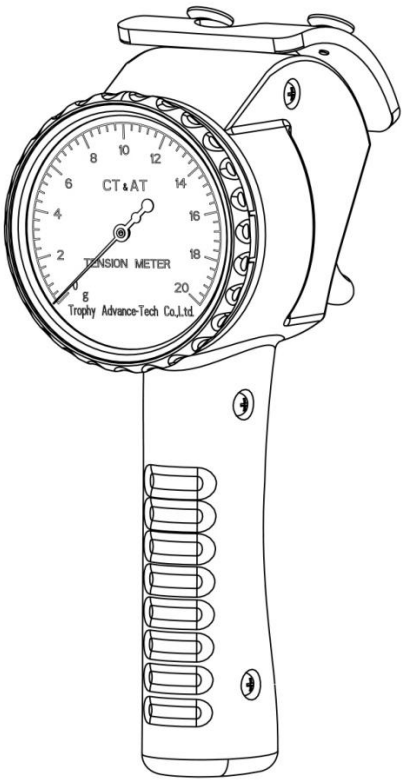
Operation Manual for Tension Meter

T1 Series



MADE BY Trophy

Trophy Advance–Tech Co., Ltd. Ver: 2010 .11

Please Read and understand this Instruction Manual before use.

Application

Mechanical Tension Meter T1 series has wide range of applications, it can be used to measure tension of:

Thread; Copper wire; plastic wire; fiber; optical fiber, silk, and others.

Depends on the requirement and application, it can measure tension of material in either running or stationery condition.

Use of Tension Meter, T1 Series

1) During the measurement of enameled wire, the wire might be bent, leaving on the enamel layer, or the wire itself.
2) When taking measurement, release the Trigger soft and gently. Fast impact will cause breakage or scar on the measuring material (wire etc).
3) Tension Meter is a complex precision instrument, do not disassemble. Do not apply impact, or drop it.
   Operating temperature: -2 ℃ ~ 40 ℃.
4) Dedicated lubricant is used in the mechanism. DO NOT use general lubricant.
5) Line (material) running speed during measurement to be controlled below 500 meter/min (8 meter/sec).
6) Technically, nature of the material (such as thickness and hardness) will cause the following effect on the output value during measurement:
   Softer and thinner material: smaller output value
   Thicker and stiffer material: Bigger output value
7) This Meter is calibrated using the following material and specifications, use of this Meter on other material may cause some deviation.
   For 20g & 50g meter, material: Polyethylene braided line, diameter 0.04mm.
   For 100g meter, material: Polyethylene braided line, diameter 0.10mm.
   For 200 & 300g meter, material: Polyethylene braided line, diameter 0.15mm
   For 500g meter, material: Polyethylene braided line, diameter 0.20mm

Model and specifications

Product Type	Trigger Spec	Max Measured Tension	Measurement Range, value per division
T1	01	020grams	Measurement Range : 0g～20g, value per division : 0.4g
T1	01	050grams	Measurement Range : 0g～50g, value per division : 1.0g
T1	01	100grams	Measurement Range: 0g～100g, value per division: 2.0g
T1	01	200grams	Measurement Range : 0g～200g, value per division : 4.0g
T1	01	300grams	Measurement Range: 0g～300g, value per division : 6.0g
T1	01	500grams	Measurement Range : 0g～500g, value per division: 10.0g
T1	01	0.2N	Measurement Range : 0g～0.2N, value per division: 0.004N
T1	01	0.5N	Measurement Range : 0g～0.5N, value per division: 0.01N
T1	01	1N	Measurement Range : 0g～1N, value per division: 0.02N
T1	01	2N	Measurement Range : 0g～2N, value per division: 0.04N
T1	01	3N	Measurement Range : 0g～3N, value per division: 0.06N
T1	01	5N	Measurement Range : 0g～5N, value per division: 0.1N
T1	02	1000 grams	Measurement Range : 0g～1000g, value per division: 20.0g
T1	02	2000 grams	Measurement Range : 0g～2000g, value per division: 40.0g
T1	02	3000 grams	Measurement Range : 0g～3000g, value per division: 60.0g
T1	02	20N	Measurement Range : 0g～20N, value per division: 0.4N

Product Type - **T1** represent Mechanical Type Tension Meter.

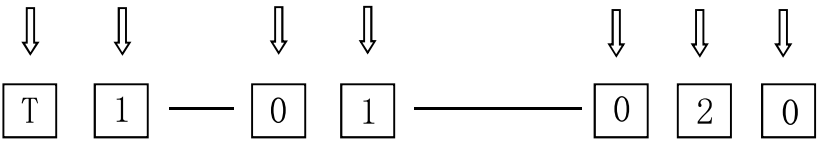
Trigger Spec – **01:** Narrow Trigger plate

02: Wide Trigger Plate

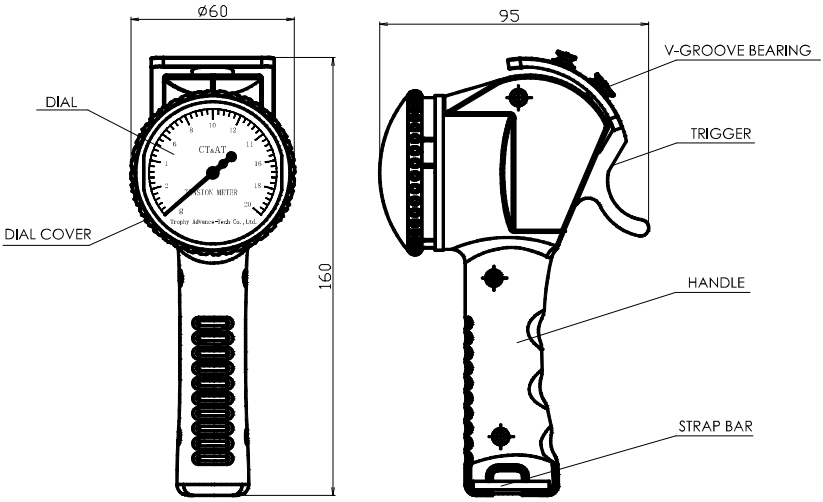
Max Measured Tension – the figure represent the maximum measured tension.

Example of Model Combination:

Product Type (Ex.: Mechanical type) Trigger Spec (ex.: Narrow Trigger Plate) Max measured range (ex.: 20 grams)



Dimensions



Product Data

(1) TYPE: Mechanical

(2) Body Material: ABS Plastic

(3) Range: 0～20g, 0～50g, 0～100g,0～200g, 0～300g, 0～500g, 0～1000g,0～2000g,0～3000g; 0～0.2N, 0～0.5N, 0～1N, 0～2N, 0～3N, 0～5N, 0～10N, 0～20N,0～30N（Ref to table 1.1)

(4) Min value per division: 0.4g, 1.0g, 2.0g, 4.0g, 6.0g, 10.0g,20.0g,40.0g,60.0g; 0.004N,0.01N,0.02N,0.04N,0.06N,0.1N,0.2N,0.4N,0.6N

(5) Accuracy: within ±1 division

(6) Dimensions: ~¢ 60mm (W) X 160mm (H) X 95mm (D)

(7) Weight: ~0.38kg

Taking Measurement

This portable Tension Meter weighs only 0.38Kg. It is light and easy to operate.

Step 1) Pull Trigger gently to separate three pulleys

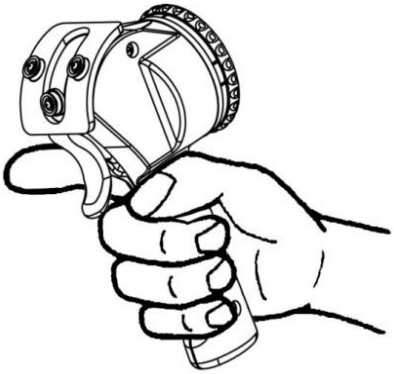


Fig 4.1 Pull down Trigger gently

Step 2) Guide the material (wires, fiber & etc) into the pulleys

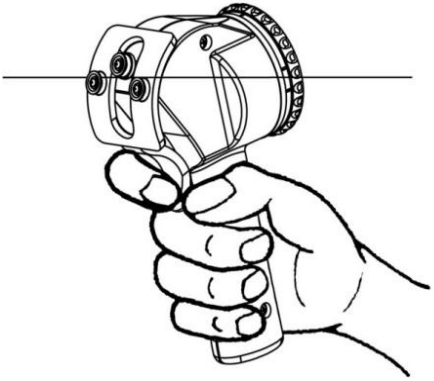


Fig 4.2 Guide the Material into pulleys

Step 3) Gently release the Trigger, material should sit into V-grooves of all pulleys

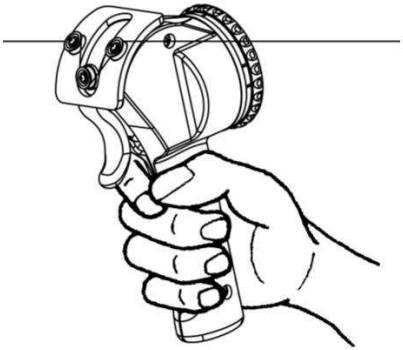


Fig 4.3 Release the Trigger Gently

Step 4) Read Measurement from dial

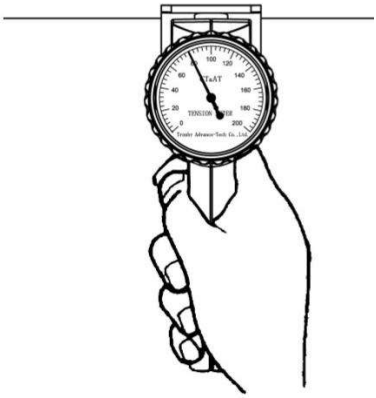


Fig 4.4 Read measurement

Important Note:

Material Should sit properly and in contact with the v-grooves of all the three pulleys.

The Middle Pulley is connected to the Tension measuring mechanism.

Tension Unit: in gram

Line (material) running speed during measurement to be controlled below 500 meter/min

(8 meter/sec).

Calibration and maintenance

All Tension Meters are calibrated and inspected before shipment out to user.

Mechanical Tension meter is durable instrument; with proper cares, it can last a few years in normal use. However, **we recommend user to do calibration once a year to confirm the accuracy.**

Trophy provides calibration, maintenance and repair services.

For tension meters which return for yearly calibration, our technical dept will conduct a 100% check of the mechanism; adjust the indication needle setting back to the default factory setting; and do a standard factory Calibration.

Upon completion, a factory Calibration Certificate will be issued.

Others: Recommended Tension Value for enameled wire (coil Winding)

Tension Meter is commonly used in coil winding industry. Below is the recommended tension for some wire size. This table is only for reference; user should select the wire tension base on the type of wire/coil and application.

Wire Size-Tension Reference Table(during winding process)

Wire size(mm)	Tension(g)	Wire size(mm)	Tension(g)	Wire size(mm)	Tension(g)
0.02	3.5	0.11	93.0	0.21	298.0
0.025	5.5	0.12	108.0	0.22	323.0
0.03	9.0	0.13	125.0	0.23	350.0
0.04	13.5	0.14	143.0	0.24	380.0
0.05	20.3	0.15	161.0	0.25	410.0
0.06	29.0	0.16	181.0	0.26	438.0
0.07	40.6	0.17	203.0	0.27	470.0
0.08	50.0	0.18	225.0	0.28	505.0
0.09	62.6	0.19	248.0	0.29	535.0
0.10	78.0	0.20	272.0	0.30	565.0