

**Model 461895**  
**COMBINATION CONTACT/PHOTO TACHOMETER****1. INTRODUCTION**

Congratulations on your purchase of Extech's Combination Contact/Photo Tachometer, Model 461895. The combination tachometer is a patented design providing contact and non-contact RPM measurements. In addition, linear surface speeds can be measured in ft/min. or m/min.

**Features**

- Use of an exclusive micro-computer LSI-circuit and crystal time base offers high 0.05% accuracy and fast measuring time
- RPM measurements span wide ranges: 5 to 99,999 RPM for photo tachometer and 0.5 to 20,000 RPM for contact tachometer
- Suppression of insignificant zeroes in large, 5 digit LCD display provides exact RPM while saving battery power
- Last value and last max/min readings can be automatically stored and recalled

## 2. SPECIFICATIONS

### 2-1 General Specifications

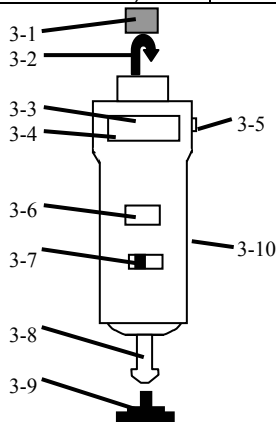
|                                       |  |
|---------------------------------------|--|
| Circuit                               | Custom one-chip LSI microprocessor circuit.  |
| Time base                             | Quartz crystal   |
| Display                               | 5 digit, 10 mm (0.4") LCD display with function annunciation   |
| Measurement                           | Photo Tachometer - 5 to 99,999 rpm<br>Contact Tachometer - 0.5 to 19,999 rpm<br>Surface Speed - 0.2 to 6,560 ft/min<br>Surface Speed - 0.05 to 1,999 m/min |
| Memory                                | Last value, last max. reading, last min. reading   |
| Sampling Time                         | Photo Tachometer - 1 sec. (over 60 rpm)<br>Contact Tachometer - 1 sec. (over 6 rpm)  |
| Detecting Distance - Photo Tachometer | 50 to 150 mm (2 to 6 inches) depending on ambient light  |
| Operating Temperature                 | 32 °F to 122 °F (0 °C to 50 °C)  |
| Power Supply                          | 4x 1.5 V AA (UM 3) batteries   |
| Weight                                | 0.66 lbs. / 300g (including battery)   |
| Size                                  | 8.5 x 2.6 x 1.5" (215 x 65 x 38mm)   |
| Accessories                           | Reflective tape (23"), cone and funnel rpm adaptor, surface speed test wheel, and carrying case  |

### 2-2 Electrical Specifications

| Measurement        | Range                | Resolution  | Accuracy (% rdg)   |
|--------------------|----------------------|---|--------------------|
| Photo Tachometer   | 5 to 99,999 rpm      | 0.1 rpm (0.5 to 999.9 rpm)<br>1 rpm (over 1000 rpm)             | ±(0.05% + 1 digit) |
| Contact Tachometer | 0.05 to 19,999 rpm   | 0.1 rpm (0.5 to 999.9 rpm)<br>1 rpm (over 1000 rpm)             |                    |
| Surface Speed      | 0.2 to 6560 ft/min   | 0.1 ft/min (0.1 to 999.9 ft/min)<br>1 ft/min (over 1000 ft/min) | ± (1% rdg + 1d)    |
| Surface Speed      | 0.05 to 1999.9 m/min | 0.01 m/min (0.05 to 99.99 m/min)<br>0.1 m/min (over 100 m/min)  |                    |

### 3. FRONT PANEL DESCRIPTION

- 3-1 Reflective tape
- 3-2 Signal light beam
- 3-3 Monitor indicator
- 3-4 Display
- 3-5 Measure button
- 3-6 Memory button
- 3-7 Function switch
- 3-8 Rotating ring
- 3-9 Circumferential speed ring
- 3-10 Battery compartment



## 4. OPERATION

### 4.1 Photo Tachometer

- a) Slide the Function Switch to the "rpm PHOTO" position.
- b) Apply a 0.5" (12mm) square piece of reflective tape to the object being measured.
- c) Press the Measure button and align the visible light beam with the object being measured. Check that the Monitor Indicator lights when the reflective tape passes through the light beam. Release the Measure button once the display stabilizes (approx. 2 seconds). For best results, hold the meter's light source 6 - 12" from the object being measured (low ambient light recommended).
- d) If the RPM measurement is less than 50, apply additional squares of reflective tape (equidistant). Divide the reading shown on the display by the number of reflective squares to get the actual RPM.

NOTE: Bright ambient light may interfere with the reflected light beam. Shading the target area may be necessary in some cases.

CAUTION: Rotating objects can be dangerous. Use extreme care when holding the meter near any such object.

### 4.2 Contact Tachometer

- a) Slide the Function Switch to the "rpm CONTACT" position.
- b) Press the Measure button while lightly pressing the rotating ring against the center opening of a rotating shaft. Release the Measure button once the display has stabilized (approx. 2 seconds).

### 4.3 Surface Speed Measurement

- a) Slide the Function Switch to "SURFACE SPEED ft/min" or "m/min".
- b) Affix the Surface Speed Wheel on the meter shaft.
- c) Press the Measure button and hold the surface speed wheel against the device being measured. Release the Measure button once the display has stabilized (approx. 2 seconds).

### 4.4 Memory Recall

When measuring, the last reading and last max and min values are automatically stored before the Measure button is released. Recall the values by pressing the Memory button the appropriate number of times (see below).

- a) Press once and hold - the last value is displayed followed by "LA"
- b) Press again and hold - the maximum value is displayed followed by "UP"
- c) Press again and hold - the minimum value is displayed followed by "dn"

## 5. BATTERY REPLACEMENT

5.1 The low battery indication appears as a "LO" on the display.

5.2 To replace the battery:

- a) Loosen the screw on the battery cover (3-10, Fig. 1) and remove.
- b) Replace with 4 x 1.5V AA batteries and replace cover.

## 6. CALIBRATION / REPAIR SERVICES

**Extech offers complete repair and calibration services** for all of the products we sell. For periodic calibration, NIST certification or repair of any Extech product, call customer service for details on services available. Extech recommends that calibration be performed on an annual basis to insure calibration integrity.

## 7. WARRANTY

EXTECH INSTRUMENTS CORPORATION warrants this instrument to be free of defects in parts and workmanship for one year from date of shipment (a six month limited warranty applies on sensors and cables). If it should become necessary to return the instrument for service during or beyond the warranty period, contact the Customer Service Department at (781) 890-7440 ext. 210 for authorization. A Return Authorization (RA) number must be issued before any product is returned to Extech. The sender is responsible for shipping charges, freight, insurance and proper packaging to prevent damage in transit. This warranty does not apply to defects resulting from action of the user such as misuse, improper wiring, operation outside of specification, improper maintenance or repair, or unauthorized modification. Extech specifically disclaims any implied warranties or merchantability or fitness for a specific purpose and will not be liable for any direct, indirect, incidental or consequential damages. Extech's total liability is limited to repair or replacement of the product. The warranty set forth above is inclusive and no other warranty, whether written or oral, is expressed or implied.

**Copyright © 2001 Extech Instruments Corporation. All rights reserved  
including the right of reproduction in whole or in part in any form.**



### **Tech Support Hotlines**

781-890-7440 ext. 200

[extech@extech.com](mailto:extech@extech.com)

[www.extech.com](http://www.extech.com)