EXTECH INSTRUMENTS
A FLIR COMPANY

USER GUIDE

Model RPM33

Laser Photo / Contact Tachometer

Introduction

Congratulations on your purchase of the Extech Laser Photo / Contact Tachometer, Model RPM33.

This digital tachometer offers fast and accurate RPM and surface speed measurements of rotating objects.

Measurement types:

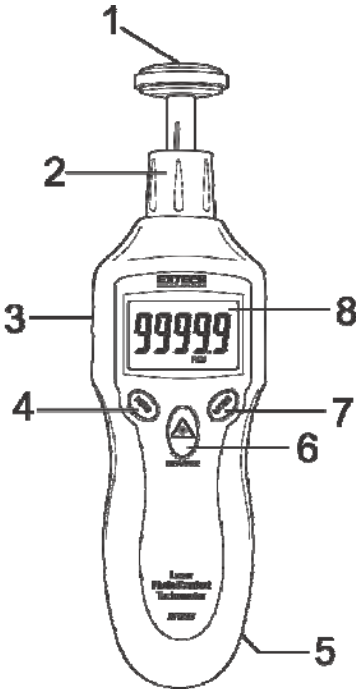
- Rotational speed (RPM)
- Total Revolutions (REV)
- Frequency (Hz)
- Surface Speed (meters per minute, inchers per minute, feet per minute, and yards per minute)
- Length (meters, inches, feet, and yards)

Features include wide measurement range, high resolution, easy-to-read backlit LCD, MAX-MIN-AVG-DATA memory capability, and Laser sighting.

This device is shipped fully tested and calibrated and, with proper use, will provide years of reliable service. Please visit our website (www.extech.com) to check for the latest version of this User Guide. The Extech Instruments brand, a wholly owned subsidiary of FLIR Systems, Inc., is ISO-9001 certified.

Meter Description

1. Surface (circumference) wheel adaptor shown connected to meter
2. Removable collar that protects the Photo Tachometer sensor and laser source
3. AC Power Adaptor
4. MEM (Memory) button
5. Battery compartment (rear)
6. MEASURE button
7. MODE button
8. LCD Display



LASER POINTER SAFETY

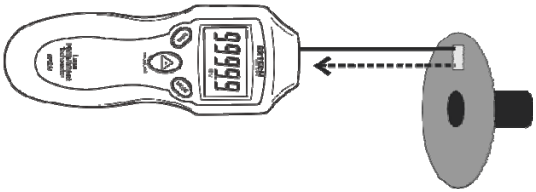
WARNING: Do not directly view or direct the laser pointer toward an eye. Low power visible lasers do not normally present a hazard, but may present some potential for hazard if viewed directly for extended periods of time.

The Laser in this unit complies with: FDA 21 CFR 1040.10 and 1040.11, IEC 60825-1 (2001-2008) Edition 1.2 EN 60825-1:1994/A11:1996/A2:2001/A1:2002

Meter Operation

PHOTO (NON-CONTACT) TACHOMETER MEASUREMENT PREPARATION

Apply a square piece of reflective tape to the surface of the object under test (nominal tape size: 0.5”/12mm). Be sure to affix the tape as close to the outer edge of the object under test as possible. See diagram below.



CONTACT TACHOMETER MEASUREMENT PREPARATION

Slide the supplied contact adaptor onto the tachometer’s shaft. Be sure to align the adaptor with the alignment pin on the shaft of the contact adaptor.

TAKING A MEASUREMENT AND SELECTING UNITS OF MEASURE

1. Select a preparation step above (Non-Contact or Contact).
2. Press and hold the Measure button (MEAS).
3. **For Photo-tachometer operation**, unscrew and remove the collar (item 2 in description diagram) and point the meter toward the device under test at a distance of 2" to 20" (50 to 500mm). Be sure to align the laser light beam with the reflective tape (see diagram above). Verify that the (( )) Monitor Indicator appears on the LCD when the reflective tape passes through the light beam.
4. **For Contact Tachometer operation** touch the probe to the object under test.
5. Read the measurement result from the LCD display.
6. When the Measure button is released the last reading will remain on the display for 5 to 10 seconds before the ‘Auto Power OFF’ feature switches the meter OFF.
7. To change the unit of measure, release the MEAS button and press the MODE button repeatedly until the desired unit of measure is observed. For a full list of measurement units refer to the specifications table. There are two measurement unit modes (Photo and Non-Contact), press and hold the MODE button to jump from one mode to the next. See the specification table for a breakdown of the two modes.

CAUTION: Rotating and linear moving objects can be dangerous. Use extreme care.

MEASUREMENT CONSIDERATIONS

1. Bright ambient light may interfere with the reflected light beam. Shading the target area may be necessary in some cases.
2. The non-reflective area must always be larger than the reflective area.
3. If the shaft or rotating object is normally reflective, it must be covered with black tape or paint before the reflective tape is applied.
4. To improve repeatability of low RPM measurements, apply additional squares of reflective tape. Divide the reading shown on the display by the number of pieces of reflective tape squares to calculate the actual RPM.

MEASUREMENT DATA RECORD AND RECALL

1. Take a measurement as described earlier in this guide.
2. With a reading displayed on the meter, press the MEM button to record the displayed reading.
3. The MAX (maximum), MIN (minimum), and AVG (average) readings will be recorded in a data 'set'.
4. Use the MEM button to scroll through the stored data sets. The DATA SET number will appear on the lower right area of the LCD. Each data set has a MIN, MAX, and AVG reading value that can be scrolled using the MEM button.
5. When recalling data, Press and hold the MEM button to quickly jump from one Data Set to another. Watch the Data Set number scroll on the lower right portion of the LCD while holding down the MEM button. Release the button when the desired data set is shown.
6. The meter can store up to 40 Data Sets.

Battery Replacement

The low battery indication appears as **BAT** on the display. To replace the battery, loosen the Philips head screw securing the rear battery cover and lift the cover off. Replace the 9V battery and replace cover.

The end user is legally bound (**Battery ordinance**) to return all used batteries and accumulators; **disposal in the household garbage is prohibited!**

Dispose of used batteries / accumulators at community collection points or wherever batteries / accumulators are sold!

Disposal: Follow the valid legal regulations with respect to the disposal of the device at the end of its lifecycle

Specifications

General Specifications

Time base	Quartz crystal
Display	5-digit LCD Display
Laser light source	Class 2 laser < 1mW power; Wavelength is 630 to 670nm
Detecting Distance	50 to 500 mm (2 to 20")
Sampling Time	0.5 seconds (> 120 rpm)
Tachometer accuracy	± (0.05% reading + 1digit)
Memory	MIN/MAX/AVG readings in up to 40 data sets
Operating Conditions	0 °C to 50 °C (32 °F to 122 °F); RH 80% Max
Power Supply	9V battery
Power Consumption	45mA DC approximately
Weight	151 g (5.3 oz.)
Size	160 x 60 x 42 mm (6.2 x 2.3 x 1.6")

Measurement Range Specifications

	Range	**Resolution**	**Accuracy**
Photo-Tachometer			
Revolutions per minute	2 to 99,999 RPM	0.1 rpm (2.0 to 9999.9 RPM) 1 rpm (> 9999 rpm)	0.05% of reading + 1 digit
Frequency	0 to 1666 Hz	1 Hz	
Contact-Tachometer			
Revolutions per minute	2 to 19,999 rpm	0.1 rpm (2.0 to 9999.9 RPM) 1 rpm (> 9999 rpm)	0.05% of reading + 1 digit
Surface Speed	0 to 78, 720 inches per minute	1 in/min	
	0 to 6560 feet per minute	1 ft/min	
	0 to 2186 yards per minute	1 yd/min	
	0 to 2000 meters per minute	1 m/min	
Length (using circumference wheel attachment)	3.9 to 39370 inches	0.1 inch up to 9999.9 1 inch > 9999	
	0.3 to 3280 feet	0.1 inch	
	0.1 to 1093 yards	0.1 yard	
	0.1 to 1000 meters	0.1 meter	
Frequency	0 to 1666 Hz	1 Hz	