

FLUKE®

930/931

Tachometer

Users Manual

English

PN 4971074
January 2009, Rev. 2, 5/18

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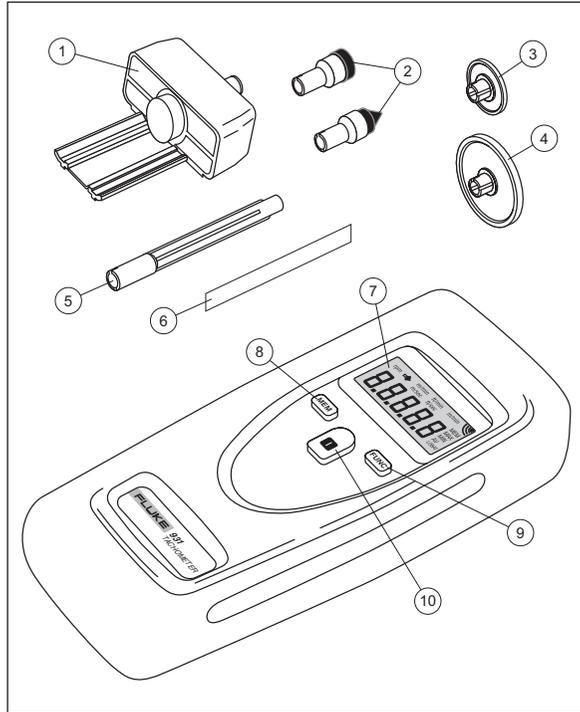
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930/931 Tachometer

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| Feature | 930 | 931 | Feature | 930 | 931 |
|------------------------|-----|-----|-------------------|-----|-----|
| ① Mechanical Adapter | | ● | ⑥ Reflector Strip | ● | ● |
| ② Shaft Contacts | | ● | ⑦ Display | ● | ● |
| ③ Contact wheel 0.1 m | | ● | ⑧ Memory key | ● | ● |
| ④ Contact wheel 6 inch | | ● | ⑨ Function key | ● | ● |
| ⑤ Shaft Extension | | ● | ⑩ ON key | ● | ● |

INTRODUCTION

The Fluke 930 Tachometer and the Fluke 931 Tachometer (the Tachometer) are hand-held instruments that accurately measure rotational Revolutions Per Minute (RPM). The Fluke 931 measures surface speed as well as length. Use the red beam function to make non-contact RPM measurements. The Fluke 931 uses the mechanical adapter and selectable tip to make contact RPM measurements. The Memory function allows storing the maximum (MAX), minimum (MIN), average (AV), and last reading.

SAFETY

A **Warning** identifies the conditions and procedures that are dangerous to the user.

Warning

To prevent possible electrical shock, fire, or personal injury:

- Carefully read all instructions.
- Read all safety information before you use the Product.
- Use the Product only as specified, or the protection supplied by the Product can be compromised.
- Do not use the Product around explosive gas, vapor, or in damp or wet environments.
- Do not use and disable the Product if it is damaged.
- Replace the batteries when the low battery indicator shows to prevent incorrect measurements.
- Remove the batteries if the Product is not used for an extended period of time, or if stored in temperatures above 50 °C. If the batteries are not removed, battery leakage can damage the Product.
- Do not use the Product if it operates incorrectly.
- Do not wear loose clothing when making measurement around moving machinery.

SYMBOLS

The following symbols are used on the Product and in this manual.

| Symbol | Description |
|---|--|
|  | WARNING.RISK OF DANGER. |
|  | Consult user documentation. |
|  | Battery or battery compartment. |
|  | Conforms to relevant South Korean EMC Standards. |
|  | Conforms to relevant Australian Safety and EMC standards. |
|  | Conforms to European Union directives. |
|  | This product complies with the WEEE Directive marking requirements. The affixed label indicates that you must not discard this electrical/electronic product in domestic household waste. Product Category: With reference to the equipment types in the WEEE Directive Annex I, this product is classed as category 9 "Monitoring and Control Instrumentation" product. Do not dispose of this product as unsorted municipal waste. |

INCLUDED ACCESSORIES

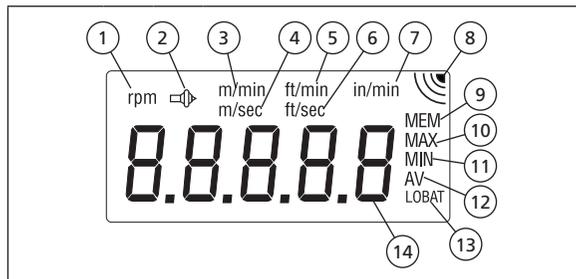
The following accessories are included with the Tachometer:

| Accessories | 930 | 931 |
|-----------------------------|-----|-----|
| 0.1 m Contact Wheel | | ● |
| 6 in Contact Wheel | | ● |
| Cone Shaft Contact | | ● |
| Internal Cone Shaft Contact | | ● |
| Shaft Extension | | ● |
| 10 Reflective Strips | ● | ● |

THE KEYPAD

| Key | Description |
|---|---|
|  | Selects MAX, MIN, AV, and last reading |
|  | Turns ON the Tachometer and makes selections. The Tachometer turns OFF after 30 seconds of inactivity. |
|  | Selects the Measurement function |

THE DISPLAY



| Item | 930 | 931 | Description |
|------|-----|-----|-----------------------------|
| ① | ● | ● | Optical RPM measurement |
| ② | | ● | Contact RPM measurement |
| ③ | | ● | Meters per minute |
| ④ | | ● | Meters per second |
| ⑤ | | ● | Feet per minute |
| ⑥ | | ● | Feet per second |
| ⑦ | | ● | Inches per minute |
| ⑧ | ● | ● | Trigger display |
| ⑨ | ● | ● | Memory, last stored reading |
| ⑩ | ● | ● | Memory, maximum reading |
| ⑪ | ● | ● | Memory, minimum reading |
| ⑫ | ● | ● | Memory, average reading |
| ⑬ | ● | ● | Low battery indicator |
| ⑭ | ● | ● | Numerical reading |

OPERATION

Press  to power up the Tachometer. The display test illuminates all LCD segments for 1 second and then shows the configured surface speed selection.

- The last selected mode appears at when the Tachometer is turned ON.
- The Tachometer automatically turns OFF after 30 seconds of inactivity.

CONFIGURATION (FLUKE 931)

To configure the Tachometer for the correct contact wheel used for surface speed measurements:

1. Turn ON the Tachometer.
2. Press  and  release.
3. Use  to select 0.1 (0.1 m circumference small wheel) or 6" (6 inch circumference large wheel). A 12" wheel is not available.

OPTICAL (NON-CONTACT)

To measure RPM using the non-contact red beam, remove the mechanical adapter from the top of Tachometer. Pull the adapter straight out to remove. See Figure 2.

1. Stop the rotating device to measure.
2. Clean a spot for the reflective strip.
3. Place reflective strip on rotating device.
4. Turn ON the Tachometer.
5. On the Fluke 931 use  to select RPM.
6. Aim Tachometer at rotating reflective strip keeping within 500 mm (20 inches).
7. Press  to enable the red beam.
8. When the Tachometer is triggered by the reflective strip, the trigger symbol on the display flashes and RPM will be displayed.

CONTACT (FLUKE 931)

To use the Tachometer for contact measurement, insert the mechanical adapter into top of the Tachometer, see Figure 1:

1. To measure, connect the cone or internal cone shaft contact to the end of the shaft.
2. Turn ON the Tachometer and use  to select RPM .
3. Press  to take measurements.
4. When the Tachometer is triggered, the trigger symbol flashes and the RPM is displayed.

SURFACE SPEED AND LENGTH (FLUKE 931)

Surface speed and length can be measured using the mechanical adapter and contact wheel.

| | Range | |
|--------|------------------------------------|-------------------------------------|
| | 0.1 m circumference small wheel | 6 inch circumference large wheel |
| m/min | 0.10 to 1999 | 0.10 to 1524 |
| ft/min | 0.40 to 6550 | 0.40 to 5000 |
| in/min | 4.0 to 78700 | 4.00 to 60000 |
| m/sec | 0.10 to 33.30 | 0.10 to 25.40 |
| ft/sec | 0.10 to 109 | 0.10 to 83.33 |
| m | 0 to 99999 | 0 to 99999 |
| ft | 0 to 99999 | 0 to 99999 |
| in | 0 to 99999 | 0 to 99999 |

CONTACT WHEEL USE (FLUKE 931)

1. Insert mechanical adapter into the top of the Tachometer. See Figure 1.
2. Select either the 0.1 m or 6 in contact wheel to use.
3. Set the Tachometer to 0.1 m or 6 in setting for the contact wheel in use.
4. Use **[FUNC]** to select units of measure.
5. Contact wheel to surface to measure and press **[M]** to take measurements.
6. When the Tachometer is triggered, the trigger symbol flashes and the measurement is displayed.

MAX, MIN, AND AV READINGS

Press **[MEM]** to enable MAX, MIN, and AV readings stored in memory. Each time a new measurement is taken, the maximum, minimum, average, and last value are stored. The last value is shown under MEM. The units of measure for the stored readings will also be displayed. Press **[M]** to exit the memory display mode.

MAINTENANCE

Beyond replacing the batteries, do not attempt to repair or service the Product unless you are qualified to do so and have relevant calibration, performance test, and service instructions. The recommended calibration cycle is 12 months.

Warning

To prevent possible electrical shock, fire, or personal injury:

- Repair the Product before use if the battery leaks.
- Use only specified replacement parts.
- Have an approved technician repair the Product.
- Be sure that the battery polarity is correct to prevent battery leakage.

REPLACING THE BATTERIES

Replace the batteries when the low battery symbol appears on the display.

1. Remove the battery cover on back of the Tachometer. See Figure 3.
2. Replace with 2 AA 1.5V IEC LR6 (Alkaline) batteries.
3. Replace the battery cover.

CLEANING

Periodically wipe the case with a damp cloth and mild detergent. Do not use abrasives or solvents. Dirt or moisture in the terminals can affect readings.

SPECIFICATIONS

RPM

| | Range |
|-----------------------|--------------------|
| Optical (non-contact) | 1 RPM to 99999 RPM |
| Contact (Fluke 931) | 1 RPM to 19999 RPM |

| | |
|----------------------------|--|
| Accuracy | ±0.02 % of reading ±1 digit |
| Sensing Distance (optical) | 500 mm (20 inches) |
| Battery Type | 2x AA 1.5 V IEC LR6 (Alkaline) |
| Battery Life | Fluke 930 approximately 35 hours Fluke 931 approximately 40 hours |
| Operating Temperature | 0 °C to +50 °C (32 °F to 122 °F) |
| Storage Temperature | -20 °C to +70 °C (0 °F to 160 °F) |
| Operating Humidity | 10 %-90 % RH (non-condensing) |
| Operating Altitude | 2000 m |

Weight 250 g (0.55 lbs)
Size 175 x 60 x 28 mm (7 x 2.5 x 1 inch)

Electromagnetic compatibility (EMC)

International IEC 61326-1:Portable; CISPR 11:Group 1, Class A.

Group 1: Equipment has intentionally generated and/or uses conductively-coupled radio frequency energy that is necessary for the internal function of the equipment itself.

Class A: Equipment is suitable for use in all establishments other than domestic and those directly connected to a low voltage power supply network which supplies buildings used for domestic purposes.

Korea (KCC) Class A Equipment (Industrial Broadcasting & Communication Equipment)

Class A: Equipment meets requirements for industrial electromagnetic wave equipment and the seller or user should take notice of it. This equipment is intended for use in business environments and not to be used in homes.

Note: Serial number of the Tachometer is located in battery compartment.

