

LASER TYPE DIGITAL TACHOMETER INSTRUCTION MANUAL
TM-7000 / TM-7010 / TM-7010E

Thank you for purchasing our digital tachometer.
 Please read this instruction manual carefully before using to ensure the correct usage of this device.
 Please keep this instruction manual for future reference.

Safety Precautions

For safe usage of this device, observe all statements regarding precautions and warnings in this instruction manual.

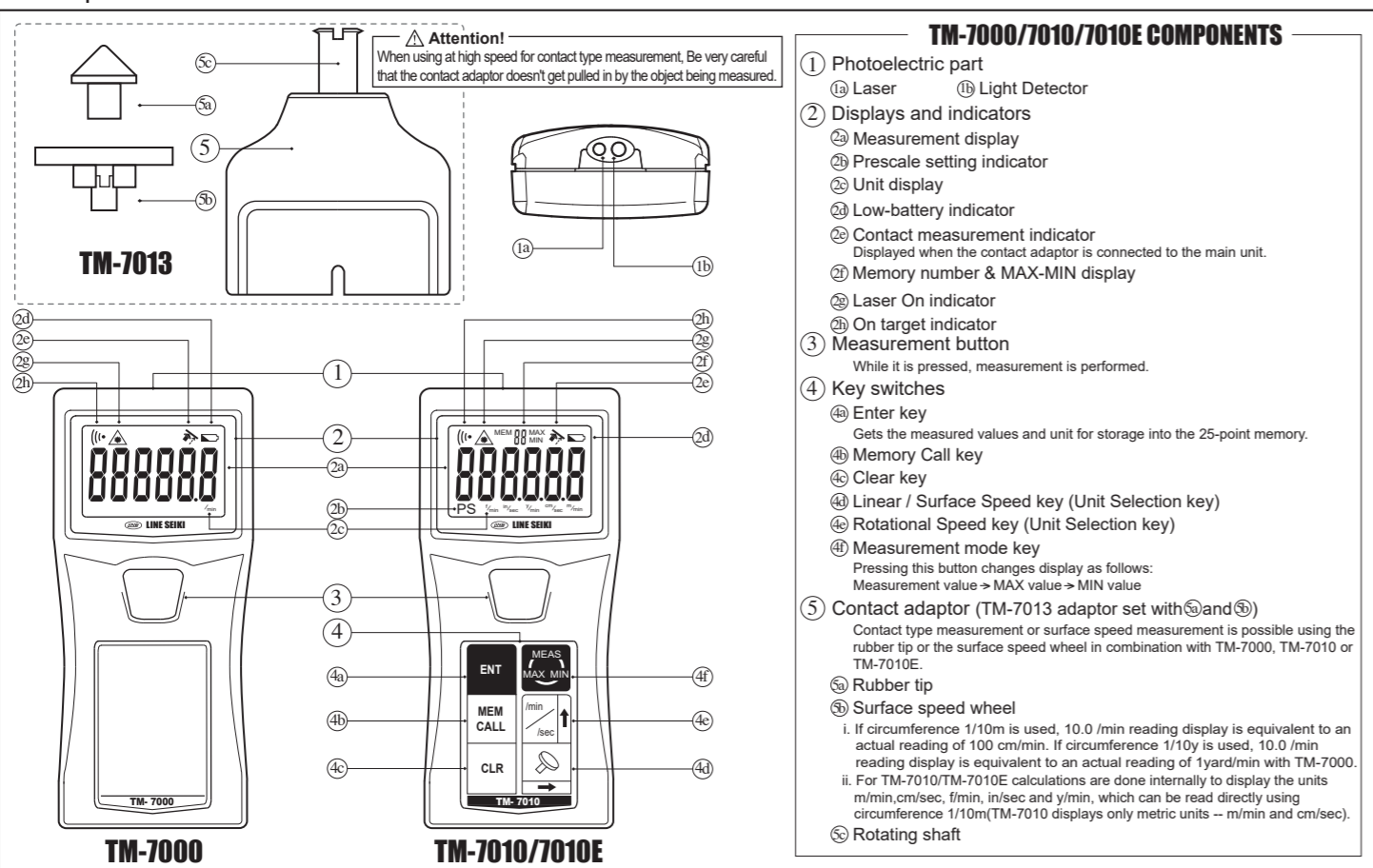
Warning

- Warning**
- ⚠ LASER RADIATION. CLASS 2 LASER PRODUCT.**
- This unit emits a laser light when used. Please do not point the laser light directly to human or animal eye.
 - Do not look directly at the laser light.
 - When measuring objects with mirrorized or reflective surfaces, avoid looking directly at the reflection of the laser light.
 - Do not aim or point the laser light at inflammable gases or objects.
- Caution**
- Do not use this device for any use other than as directed.
 - Do not use this device for measuring anything except rotational, linear or surface speed.
 - Do not use this device near machines that emit strong electromagnetic fields or objects that store static electricity.
 - Do not drop this device or submit it to strong impact.
 - Do not use or store the device where it can be exposed to direct sunlight, dust, high temperature and high humidity.
 - Inspect the device before conducting measurements.
 - See the battery case markings to ensure that the battery is properly installed.
 - Remove the battery when the device will not be used for a long period of time.
 - Do not attempt to disassemble or modify this device.
 - Be careful that contact adaptor doesn't get pulled in by the object being measured.

1. Preparations

- 1. Installing the batteries**
- Press and slide down the battery cover at the back side of the main unit.
 - Install the four batteries (AAA 1.5V). Note the polarity indicated inside.
 - After installing the batteries, replace and slide back the cover.

2. Components



Attention

Please note that misuse of this device may lead to injury to the user or damage to the device.

Customer Service

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3. Measurement

- Taking a measurement**
 - To start measuring, press the measurement button (**Only while the measurement button is pressed, measurement is performed.**), confirm that "▲" is displayed on screen. The "Ⓛ" mark will appear confirming that the sensor is working.
 - If the measurement is out of range, "-----" will appear.
- Non-contact type measurement**
 - Cut off a length of 10 to 30 mm of the reflective tape. Remove the backing paper and stick the reflective tape on the object whose rotational speed is to be measured.
 - Wipe off oils or stains from the surface where the reflective tape will be attached.
 - Stick the reflective tape as near as possible to the outer edge of the object whose rotational speed is to be measured.
 - The distance between reflective tape and tachometer main unit is 50 to 1000 mm and the angle of incidence of the light is within +/- 40°.

Note

- Make sure that lights coming from a stroboscope and/or fluorescent lights do not reach the photoelectric part and reflective tape attached to the rotating object to prevent measurement errors.
- Before starting rotation of object under test, please confirm that the measurement on the reflective tape is 0.0. If the measurement is affected by external light, change the position of the unit.

3. Contact type measurement

- Loosen the lock screw at the back of the unit, insert the contact adaptor to the upper side of the main unit and tighten the lock screw using a screw driver. Use a coin if a screw driver is not available. The lock screw must be tightened securely to ensure that the contact adaptor will not detach while in use. "▶" is displayed on screen.
 - Adaptor set TM-5013 / 5014 can not be used with TM-7000 / 7010 / 7010E for contact type measurement instead of TM-7013 adaptor set.

- Use the rubber tip correctly by touching it perpendicular to the center of the axle of the rotating object under test. To measure the peripheral speed of the items such as belts, replace the rubber tip with the surface speed wheel.
- To attach the surface speed wheel, pull out the rubber tip with your hand and press the surface speed wheel axle so that the boss of the wheel axle is inserted into the slit of the adaptor axle. Pull the surface speed wheel gently to confirm that it does not come off.
- When measuring the circumferential velocity, the surface speed wheel should touch the measured object so that the surface speed wheel turns in parallel with it.

4. Auto-power off

After the measurement button is released, the display is held for about 3 minutes then the unit automatically turns OFF if no further measurements are made during that time.

4. Functions (For TM-7010/7010E only)

- Changing of Measurement Units**
 - The default unit display is /min. Pressing the rotational speed key changes the /min unit to /sec and vice versa at each successive key press.
 - The linear/surface speed key displays the units m/min, cm/sec, y/min, in/sec and f/min in succession at each key press. (Note: Only m/min & cm/sec units are displayed by TM-7010)
- Maximum / Minimum Values**
 - The measurement mode key allows the viewing of MAX and MIN values. These are the maximum and minimum readings taken from the start of measurement (at the measure button key press) until its release.
 - When a new measurement is taken, the previous maximum and minimum measurement values are cleared.
- Memory**
 - To enter a reading into memory, press the Enter key. Up to 25 measurement readings can be stored except "0" reading. (It can be done one time only after measurement key is released)
 - To recall a stored reading, press the Memory Call key. MEM icon and the memory number will be seen flashing on screen.
 - To clear the entire memory, enter into memory recall following 4.3b, then press the Clear key. When ALLCLr display is seen flashing on screen, press the Enter key to clear all the values stored in memory.
 - If the Memory Call key is pressed or if Enter key is not pressed 10 sec. after ALLCLr display, Normal Mode resumes and the next measurement can be taken. The values stored in memory are not removed in this case.

- Prescale Setting**
 - In Prescale Mode, a prescale value is specified as a multiplier to the actual measured value.
 - To enter into prescale, press both Rotational and Linear/Surface Speed keys (simultaneous, or one after another with at most 1second interval from the first key press) and hold for about 2 secs. The default display 000.000 appears, with the selected digit and PS icon flashing.
 - Press the Linear/Surface Speed key to increment the selected digit. Press the Rotational Speed key to move the cursor to the next digit.
 - After setting the prescale value, press the Enter key to save the value and exit from Prescale Mode. The PS icon is displayed when in Prescale Mode.
 - If the Clear key is pressed instead of the Enter key or if no key is pressed after 10 seconds, the display returns to Normal Mode.
 - To return to Normal Mode once in the Prescale Mode, enter into prescale by following the procedure in 4.4b. then press the Clear key or enter the default value 000.000.

5. Battery Replacement

When "☹" appears and starts to flash at the right portion of the screen, replace the batteries. Refer to 'Installing the Batteries' for the battery replacement procedure.

- **Warning 1** When changing batteries, all previous data will be erased and settings will return to the default state.
- Replace all batteries with new ones.
- Be careful not to mix different types of batteries - i.e. manganese batteries and alkaline batteries together.

* The instrument cannot measure accurately after low battery indicator is displayed. Please replace the battery immediately.

6. Storage

When storing this device, please avoid areas which are very humid, exposed to direct sunlight, high temperature, subject to vibration, dusty, dirty, saline, subject to organic gases.

This device conforms to the following Safety and EMC regulations:
 Laser Safety : IEC 60825-1
 EMI : EN61000-6-3 EMS : EN61000-6-1 **CE RoHS**

● SPECIFICATIONS (MAIN UNIT)			
Model	TM - 7000	TM - 7010/7010E	
Measuring Range (Non contact)	6.0 - 99999.9 r/min	6.0 - 99999.9 r/min 0.10 - 1666.66 r/sec	- Prescale Mode -
Measuring Range (with contact adaptor)	6.0 - 15000.0 r/min	6.0 - 15000.0 r/min 0.10 - 250.00 r/sec 0.60 - 1500.00 m/min 1.00 - 2500.00 cm/sec 0.65 - 1640.41 y/min ★1 0.39 - 984.25 in/sec ★1 1.9 - 4921.25 f/min ★1	0.1 - 99999.9 /min 0.01 - 9999.99 /sec
Resolution	0.1 r/min	0.1 r/min•f/min, others 0.01	
Accuracy	±0.01% ±1 digit	±0.01% ±1 digit (r/min•m/min) ±0.05% ±1 digit (Other units including conversion accuracy)	
Sampling Time	1.0 - 10.0 seconds (1.0 - 2.0 seconds, with contact adaptor)		
Display	Measurement Display : 6 digits, 7 segment LCD Low-battery : ☹ mark Laser on : ▲ mark On target : Ⓛ mark Contact measurement : ▶ mark		
Display unit : /min	Display unit : /min, /sec, m/min cm/sec, y/min ★1, in/sec ★1, f/min ★1 Memory display : MEM1 - 25, MAX, MIN Prescale Mode Indicator :PS		
Prescale Range	—	0.001 - 999.999	
Auto Power-off	After 3 minutes from last measurement or key operation		
Data Hold Time	Measurement data : until the next data is defined Memory data : same as battery life		
Measuring Method	Non-contact measurement : using main unit (with reflective tape) Contact type measurement : using contact adaptor (with rubber tip or surface speed wheel)		
Optical System	Light Source : Laser, Class 2 Operating Range : 50 - 1000 mm ±40 degrees Wavelength : 650 nm, CW Power Output : Max. 1 mW		
Power Supply	4 pcs. of AAA alkaline battery		
Battery Life with continuous measurement ★2	approx. 30 hours	approx. 15 hours	
Storage Temperature	-10 - +60 °C (Non-Freezing)		
Backlight	None	Blue (Auto-Backlight Off after 10 seconds of inactivity)	
Operating Temperature	5 - 40 °C (Non-Freezing)		
Operating Humidity	35 - 85% (Non-Condensing)		
Dimension/Weight	125(H) x 58(W) x 27.4(D)mm / 140g (Battery Included)		

★1 These measuring units are only available in TM-7010E
 ★2 The battery life varies depending on battery type, storage conditions and operating environment. It is only for reference.

● MODELS			
TM - 7000	TM-7000 main unit		Reflective tape, 10 pcs. AAA alkaline battery, 4 pcs. Instruction manual
TM - 7010	TM-7010 main unit		
TM - 7010E	TM-7010E main unit		
TM - 7000K	TM-7000 main unit + Contact adaptor		Reflective tape, 10 pcs. Rubber tip, 3 pcs. Surface speed wheel (1/10 m), 1pc. AAA alkaline battery, 4 pcs. Instruction manual + Carrying Case
TM - 7010K	TM-7010 main unit + Contact adaptor		
TM - 7010EK	TM-7010E main unit + Contact adaptor		
TM - 7013	Contact adaptor		Rubber tip, 3 pcs. Surface speed wheel (1/10 m), 1pc.

● OPTIONS			
ZTM051	Reflective Tape, 10 pcs.	ZTM004 - SET	Rubber Tip, 3 pcs.
ZM4052	Surface Speed Wheel (1/10 m), 1pc.	ZM4053	Surface Speed Wheel (1/10 y), 1pc.
C - 7000	Carrying Case		