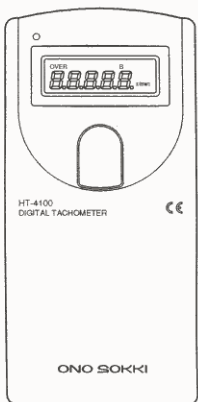


DIGITAL HAND TACHOMETER

HT-4100

INSTRUCTION MANUAL



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OVERVIEW

Comprising a revolution sensor, a measuring section and a display in a compact body, the HT-4100 is a non-contact-type handheld tachometer operated with built-in batteries. Measurements can be easily made by aiming a visible light beam emitted from the probe head at a piece of reflective marker tape adhered on a rotating object.

FEATURES

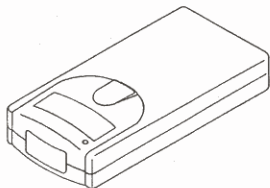
- Compact and lightweight.
- Auto-range measurements between 30 r/min and 50000 r/min at a resolution of 1 r/min.
- 20 mm to 300 mm long measuring distance.
- Last measured data is displayed on screen for about one minute after measurement by data hold function.

STANDARD ACCESSORIES

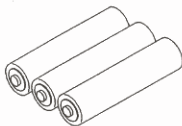
Your package should contain the following materials.

Please make sure that you have received all these items upon unpacking.

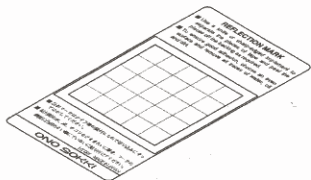
- | | | | |
|---|----------------------------------|--|---|
| ① Digital Hand Tachometer HT-4100 | 1 | ③ Size AAA dry cell battery R-03 | 3 |
| ② Reflective marker tape | 1 sheet
(12 mm sq. × 25 pcs.) | ④ Instruction manual | 1 |



① Digital Hand Tachometer HT-4100



③ Size AAA dry cell battery

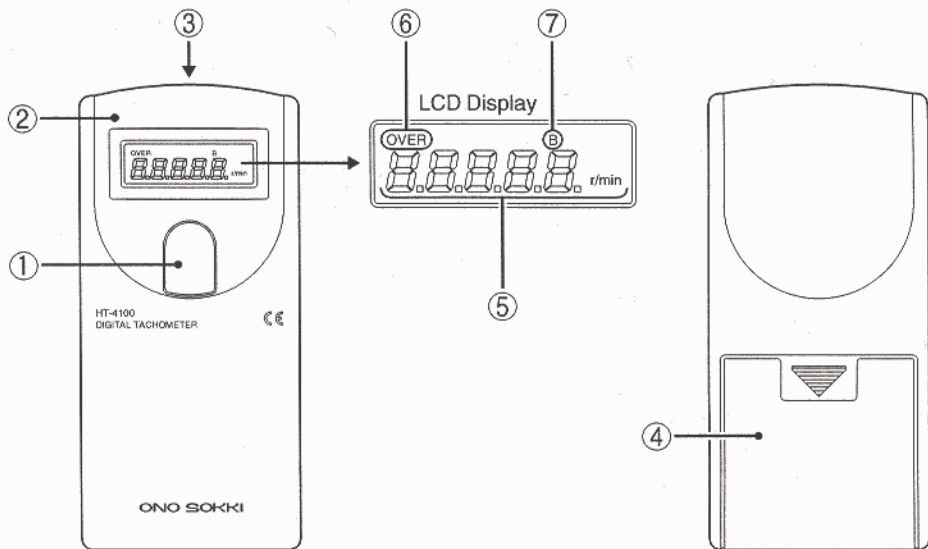


② Reflective marker tape



④ Instruction manual

NOMENCLATURE AND FUNCTION OF INDIVIDUAL PARTS



① Measure switch

The instrument is turned on and becomes ready to start measurement when this switch is depressed.

② On-target indicator (Input signal confirmation lamp)

Lights when the sensor circuit detects reflected light.

③ Probe head

Combines a light projector and receiver consisting of a visible light red LED and an optical sensor to detect the rotational speed.

④ Battery cover

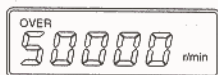
When replacing the batteries, pull this cover while pressing it down with your finger until it comes off.

⑤ Display

Shows a 5-digit measurement value associated with the unit of measure "r/min".

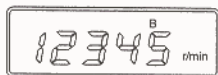
⑥ "OVER" alarm

An "OVER" alarm appears when the measured speed exceeds 50000 r/min, showing "50000 r/min" on screen.



⑧ "B" alarm

The letter "B" appears on the LCD display when the batteries have been discharged. Replace the batteries as soon as possible.

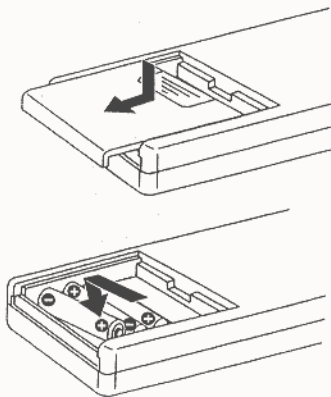


ABOUT THE BATTERIES

This instrument operates on three Size AAA dry cell batteries. The attached batteries are samples. The life may be shorter than normally expected. When the batteries have been discharged, the LCD display shown a "B" alarm. Be sure to replace all three batteries with brand-new batteries when this has happened.

How to replace the batteries

- (1) Remove the battery cover by sliding it while pressing it down.
- (2) After removing the existing batteries, insert new batteries with care not to reverse their polarity.
- (3) Close the battery cover.



MEASUREMENT PROCEDURE

- (1) Attach a piece of reflective marker tape on the rotating object to be measured. Wipe out the surface of the object to ensure that it is free from water, oil and dust. If the object itself is reflective having a plated surface, for example, aim the light beam at a slight angle, coat the surface with black paint, or take other appropriate measures to prevent reflection from the object before attaching the reflective marker.
- (2) While holding the Measure switch down, aim the red light beam emitted from the probe head at the reflective marker as shown in Fig.1 and confirm the on-target indicator flashes. The distance between the probe head aperture and reflective marker must be 20 to 300 mm to take measurements.

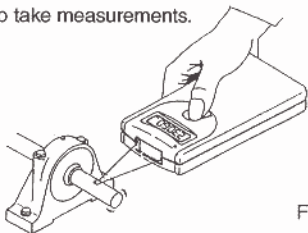


Fig. 1

- (3) The tachometer gives a digital rpm reading that is continuously updated every second.
- (4) After releasing the Measure switch, the built-in memory retains the last reading until it is automatically erased about one minute later. However, beware that the reading will be cleared if you re-press the Measure switch within the one-minute period.

ADDITIONAL ACCESSORIES

- Reflective Marker (HT-011, 12 mm sq. x 25 pcs x 10 sheets, optional)
- Carrying Case (HT-0002A, Hard case, optional)
- Soft Case (HT-0003, optional)

STORAGE INSTRUCTIONS

The HT-4100 is designed for a storage temperature range of -10°C to $+55^{\circ}\text{C}$. Store it in a well ventilated place not exposed to extremely high or low temperature, high humidity or direct sunlight. Be sure to remove batteries when not using the instrument for a long period to prevent damages caused by the leak of chemicals, etc.

SPECIFICATIONS OF HT-4100

1. Measuring Section

Measuring range : 30 - 50000 r/min

Over range indication : When measurement taken exceeds 50000 r/min, the reading shows "50000 r/min" with the legend "OVER" displayed at the upper-left corner of the LCD readout.

Display : LCD

No. of digits : 5 digits

Measurement display time :

1s (2s between 30 - 60 r/min)

Measuring resolution : 1 r/min

Measuring accuracy : 30 - 12499 r/min \pm 1 r/min

12500 - 24999 r/min \pm 2 r/min

25000 - 50000 r/min \pm 4 r/min

2. Sensor Section

Detecting method : Light reflection system

Reflection detecting range :

20-300 mm

Light source : Red LED

Light sensor : Photo transistor

No. of marker : 1 reflective marker / revolution
(12 \times 12 mm reflective marker)

3. Data Hold Function

The last measured data is kept alive in memory and displayed on screen for one minute after measurement. The reading is automatically erased one minute later.

4. General Specifications

Power supply/Battery life :

Size AAA dry cell batteries (3 pcs.), 20-hour continuous operation

Low voltage alarm : When battery voltage drops below about 3.3 V, the legend "B" appears on LCD to warn of low battery voltage.

Operating temperature : 0°C to +40°C
(Non-condensing)

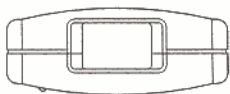
Storage temperature : -10°C to +55°C
(Non-condensing)

Dimensions and mass : 123 × 23 × 58 mm,
Approx. 110 g
(Including batteries)

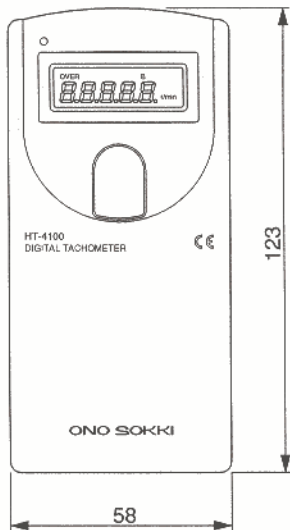
TROUBLESHOOTING

Symptom	Check procedure	Corrective action
No indication	<ol style="list-style-type: none">1. Batteries are inserted ?2. Battery polarity is reversed ?3. Batteries are discharged ?4. It is still no indication even through the batteries are replaced ?	<ol style="list-style-type: none">1. Insert batteries.2. Insert batteries is correct polarity.3. Replace batteries with new ones.4. Reset operation is conducted.<ol style="list-style-type: none">1) Remove the batteries.2) Press the measure switch for several seconds.3) Insert the batteries.
Incorrect speed indication	<ol style="list-style-type: none">1. More than one reflective marker is attached ?2. Irregular reflection is caused by scratched or unevenness of rotating object ?3. The measure switch is being pressed ?	<ol style="list-style-type: none">1. Remove reflective marker(s) leaving one marker only.2. Clean reflective surface, aim light beam at a slight angle, coat the surface of object with black paint, or take other measures to prevent irregular reflection.3. Press the measure switch.
Some indication is given but unable to measure	<ol style="list-style-type: none">1. Reflective marker is attached on rotating object ? Not peeled off ?2. Light beam hits reflective marker ?3. Distance is appropriate ?4. The measure switch is being pressed ?	<ol style="list-style-type: none">1. Attach one only reflective marker on rotating object.2. Direct light beam exactly on reflective marker.3. Measure at appropriate distance (20-300 mm) from target.4. Press the measure switch.

OUTER DIMENSIONS



(mm)



WARRANTY

1. This product is covered by a warranty for a period of one year from the date of purchase.
2. This warranty covers free-of charge repair for defects judged to be the responsibility of the manufacturer, i.e., defects occurred while the product is used under normal operating conditions according to descriptions in the manual and notices on the unit label.
3. For free-of-charge repair, contact either your sales representative or our sales office nearby.
4. The following failures will be handled on a fee basis even during the warranty period.
 - (a) Failures occurring through misuse, mis-operation, or modification
 - (b) Failures occurring through mishandling (dropping) or transportation
 - (c) Failures occurring through natural calamities (fires, earthquakes, flooding, and lightening), environmental disruption, or abnormal voltage.

*For repairs after the warranty period expired, contact your sales representative or our sales office nearby.

DECLARATION OF CONFORMITY

We

Ono Sokki Co., Ltd.

1-16-1 Hakusan, Midori-ku, Yokohama 226, Japan

declare under our sole responsibility that the product

Category Name: DIGITAL HAND TACHOMETER

Model Name: HT-4100

to which this declaration relates is in conformity with
the following standard(s) or other normative document(s):

EN55011(1991) Group1 ClassB

EN50082-2(1995)

following the provisions of 89/336/EEC directive

Yokohama, 8 December, 1995



Toshishige Maeda
General Manager
Design Engineering Div. 1
Ono Sokki Co., Ltd.