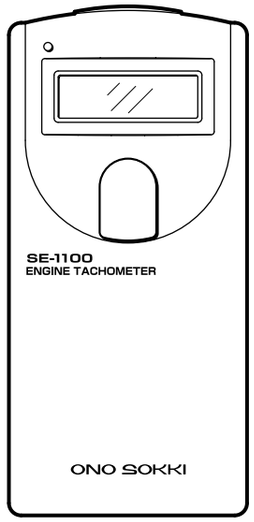
DIGITAL ENGINE TACHOMETER

SE-1100

INSTRUCTION MANUAL



ONO SOKKI

*Outer appearance and specifications are subject to change without prior notice.
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Thank you for your selection of the SE-1100 Digital Engine Tachometer. To ensure that you get the most out of the instrument, we strongly recommend you read and follow the instructions in this manual carefully.

GENERAL OPERATING PRECAUTIONS

⚠ WARNING

• Moving engine components.
Wear safety goggles.
Keep self and tools clear of moving parts.
Moving components can cause injury.

⚠ WARNING

• Care should be taken not to touch the rotating parts and heated parts of the engine when making measurements.

⚠ CAUTION

• Do not ever bring the SE-1100 in contact with high-tension wires. Particularly, in the vicinity of the ignition plugs, the high voltage may cause malfunctions or damages. If an irregular display occurs due to an accidental contact with the high-tension cords, turn off the power and then turn it on again.

⚠ CAUTION

• Do not bring the SE-1100 in contact with heated parts such as exhaust pipes.

• Do not use the SE-1100 at a location subjected to sudden temperature changes. Do not hastily move the SE-1100 from high temperature to low temperature environments or vice versa to prevent internal condensation which may cause an equipment failure.

• Be careful not to allow water or dust to intrude inside the cabinet. Do not use the SE-1100 at a location where it may be exposed to splashing water, excessive moisture or dust.

⚠ WARNING

• Do not drop or give strong shocks to the SE-1100. It contains precision electronic components which can be damaged by dropping or strong shocks.

• Be sure to remove batteries when not using the SE-1100 for an extended period of time. If the SE-1100 left with discharged batteries or unused for a long time with batteries inside, it may be damaged by battery leakage.

⚠ CAUTION

• If the outer case becomes soiled, wipe it with a dry soft cloth or with a cloth slightly dampened with a neutral detergent. Avoid volatile organic solvents such as thinners, benzine and alcohol.

1. GENERAL DESCRIPTION

1.1 OUTLINE

The SE-1100 hand-held engine tachometer displays rotational speed of gasoline engines in 1 r/min unit. It is a non-contacting type tachometer which easily measures the rotational speed just by bringing the detection head close to the high-tension wires of gasoline engines.
Its one unit construction containing the detector, the counter and the display as well as batteries are convenient for use at any places.

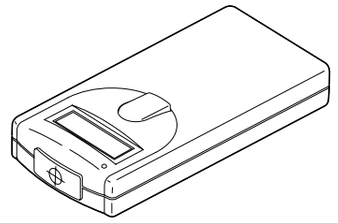
1.2 FEATURES

- Non-contacting detection enables an easy and safe measurement.
- It assures an accurate measurement because the signal indicator (red LED lamp) shows how the signal is captured.
- Accurate rotational speed can be obtained in 1 r/min unit.
- When the battery runs out or the voltage drops, the "B" mark at the upper right corner of the display panel lights up.
- The five-digit LCD is suitable for out-door measurement.
- Compact, light weight and easy-to-carry, enabling one-hand measurement.

1.3 STANDARD ACCESSORIES

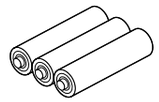
Your package should contain the following materials. Please make sure that you have received all these items upon unpacking.

① Digital Engine Tachometer SE-1100 1
② Size AAA Battery 3
③ Instruction manual 1
④ Exclusive screwdriver 1
(Stored in the Battery case)



① Digital Engine Tachometer SE-1100

③ Instruction manual



② Size AAA Battery

④ Exclusive screwdriver

2. HOW TO USE

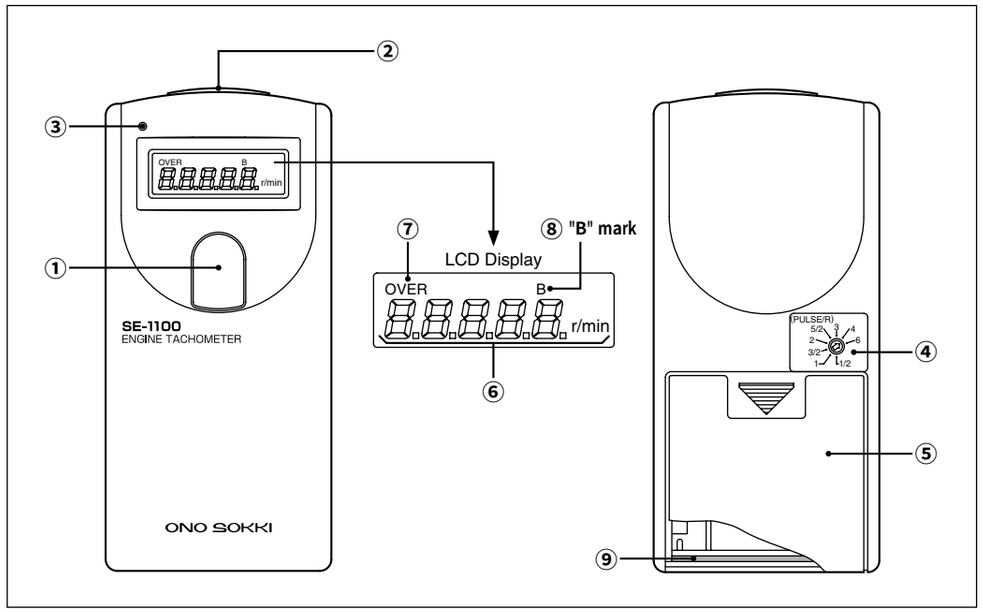
2.1 NAME AND FUNCTION OF EACH PART

① Power switch

By keeping this switch depressed with a finger the power is supplied for making measurement and the power is cut off when the finger is removed.

② Detection head

The part detects the rotational signal (ignition pulse) when placed close to the high-tension wire (ignition cord) of engines.



③ Indicator

This blinks when the sensor circuit detects the rotation signal (ignition pulses).

④ PULSE/R (SIGNAL SELECTOR)

This is a switch to select the number (PULSE/ R: the number of ignition pulses per rotation). The number of the "PULSE/R" varies depending upon the number of cylinders and cycles of the engine. Set the number appropriate for engine to be measured.

⑤ Battery cover

The cover is removed by pushing and sliding it in the direction indicated by an arrow when the batteries are replaced.

⑥ LCD Display

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

⑦ "OVER" indicator

"OVER" indicator appears on the display when the rotational speed exceeds the measuring range.

⑧ "B" mark

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

⑨ Exclusive screwdriver.

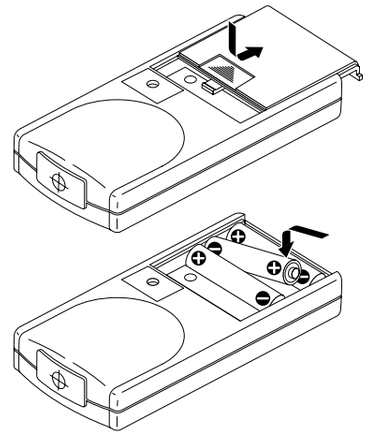
This is used for turning the signal selector ④.

2.2 ABOUT THE BATTERIES

This instrument operates on three Size AAA dry cell batteries. When the batteries have been discharged, the LCD display shows a "B" mark. Be sure to replace all three batteries with new batteries when this has happened.

How to replace the batteries

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



2.3 MEASURING METHOD

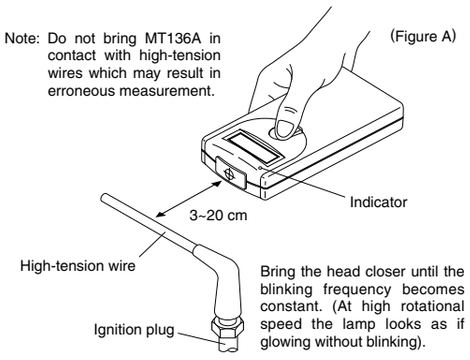
(1) Initial operation

- "SIGNAL SELECTOR" rotary switch inside the battery box has been set at 1/2 P/R position at the time of delivery. Reset the switch to an appropriate number for the engine to be measured carefully referring to Paragraph 2.4 for the number of the PULSE/R.

(2) 1-cylinder gasoline engine

Note: Do not bring MT136A in contact with high-tension wires which may result in erroneous measurement.

(Figure A)



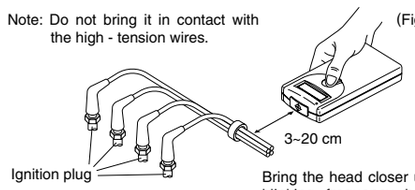
Bring the head closer until the blinking frequency becomes constant. (At high rotational speed the lamp looks as if glowing without blinking).

- When the detection head is placed close to the high-tension wire (ignition cord) of the engine while keeping the power switch button depressed, the indicator starts blinking.
- When you bring the detection head closer to the high-tension wire, the indicator lamp blinks at a constant frequency corresponding to the rotational frequency. (At high rotational speed the lamp looks as if glowing without blinking). This is the measuring position.
- The distance between the high-tension wire and the measuring position varies depending on engines but it normally is 3~20cm.

(3) Distributor type multi-cylinder gasoline engine

Note: Do not bring it in contact with the high - tension wires.

(Figure B)

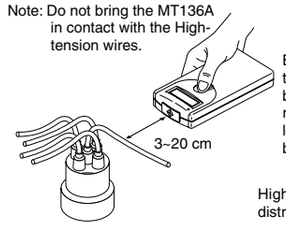


Where all the high-tension wires of cylinders are bundled together.

Bring the head closer until the blinking frequency becomes constant. (At high rotational speed the lamp looks as if glowing without blinking).

Note: Do not bring the MT136A in contact with the High-tension wires.

(Figure C)



Bring the head closer until the blinking frequency becomes constant. (At high rotational speed the lamp looks as if glowing without blinking).

High-tension wire connecting distributor and ignition coil.

- As shown in the figure B.C, bring the detection head close to the high-tension wire that connect the distributor and the ignition coil, or to the place where all the high-tension wires of the cylinders are bundled together.
- Just as in the case of 1-cylinder engines, make the measurement at the position where the indicator blinks at a constant frequency corresponding to the rotational speed. The blinking frequency decreases when the detection head is placed too far from the tension wire connecting the distributor and the ignition coil, or close to the singled (not bundled) tension wire. In this case, the ignition pulse of each cylinder cannot be detected uniformly.

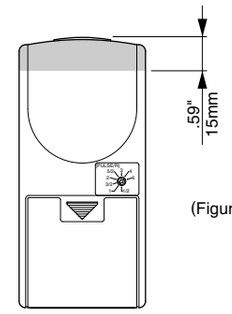
(4) Multi-cylinder gasoline engine without distributor

- Bring the detection head close to the place where the high-tension wire of each cylinder is bundled together.
- The measurement is impossible if all the high-tension wires are not bundled together since the distance between the detection head and each high-tension wire differs.

(5) Measurement precaution .

- Do not put any obstacle between the SE-1100 and high-tension wires. The accurate measurement is impossible if there is any abstract between them since the rotation signal (ignition pulse) is cut off.
- Do not put a finger on the oblique line of the figure D and the head of the SE-1100.

  The accurate measurement may be impossible since the finger lowers the sensitivity of the SE-1100.
- The accurate measurement is impossible if the gasoline engine has any defect of the ignition system such as the distributors, high-tension wires and the ignition plugs.
- The maximum rotational speed that can be measured by the SE-1100 is 20,000 r/min. Never use it for an object rotating at a speed over 20,000 r/min.



(Figure D)

(6) Warnings

- Do not ever bring the main body or the detection head in contact with high-tension wires. Particularly, in the vicinity of the ignition plugs, the high voltage may cause malfunctions or damages.

  If an irregular display occurs due to an accidental contact with the high-tension wires, turn off the power and then turn it on again. .
- Do not bring the main body or the detection head in contact with heated parts such as exhaust pipes. Care should be taken not to touch the rotating parts and heated parts of the engine when making measurements.

2.4 Setting of "PULSE/R"(SIGNAL SELECTOR) number

- Set the "PULSE/R" rotary switch using the exclusive screwdriver for engines to be measured as shown in the list below.

4-cycle engine	2-cycle engine	SIGNAL SELECTOR rotary switch	Number of "Pulse/R"	Measurering Range
1 Cylinder		SIGNAL SELECTOR 	1/2 P/R	100~20,000r/min
2 Cylinder	1 Cylinder	SIGNAL SELECTOR 	1 P/R	100~20,000r/min
3 Cylinder		SIGNAL SELECTOR 	3/2 P/R	100~20,000r/min
4 Cylinder	2 Cylinder	SIGNAL SELECTOR 	2 P/R	100~20,000r/min
5 Cylinder		SIGNAL SELECTOR 	5/2 P/R	100~20,000r/min
6 Cylinder	3 Cylinder	SIGNAL SELECTOR 	3 P/R	100~20,000r/min
8 Cylinder		SIGNAL SELECTOR 	4 P/R	100~15,000r/min
12 Cylinder		SIGNAL SELECTOR 	6 P/R	100~10,000r/min
Note) 2 place which have no PULSE/R indications			–	Fixed to "0 r/min" can't measure

(NOTE) For engines of extra ignition type (twice as much ignitions), double the number of the "SIGNAL SELECTOR" already set.

As an example, for a 2-cycle 2-cylinder extra ignition type engine which is normally of 2 P/R, reset at 4 P/R.

2.5 TROUBLESHOOTING

Symptom	Check item	Counter measure
• No indication	① Batteries are inserted? ② Battery polarity reversed? ③ Batteries are discharged?	**① Insert batteries.** **② Insert batteries in correct polarity.** **③ Replace batteries with new ones.**
• Unstable indication	① Is the measuring distance correct? ② Isn't the high-tension wire contacting to the SE-1100? ③ Is there any obstacle between the SE-1100 and high-tension wires? ④ Aren't you putting your finger on the oblique lines area or on the top of the SE-1100?	**① The distance at which measurement can be executed is 30-200mm from high- tension wires. Use the SE-1100 within this extent.** **② Do not let the high-tension wire contact to the SE-1100.** **③ Do not put an obstacle between the SE-1100 and high-tension wires.** **④ Do not put your finger on the oblique lines area or on the top of the SE-1100.**
• Different indication from the actual rotation speed. Even though indication is OK, but can't measure (Indication remains as 0 r/min)	① Is the set value of the PULSE/R (signal selector) correct? ② Is the measuring distance correct?	**① Set the correct value in reference to "Table 1".** **② Measurable distance is 30-200mm from hi9h-tension wires. Use the SE-1100 in this range.**

3. Specifications

3.1 Detector section

Applicable engine type : Gasoline engine
2-cycle (1, 2, 3, 4-cylinder)
4-cycle
(1, 2, 3, 4, 5, 6, 8, 12-cylinder)
Detection method : ignition spark noise detection
Detecting object : High-tension wire
(ignition cord)
Detection distance : 30 ~ 200mm

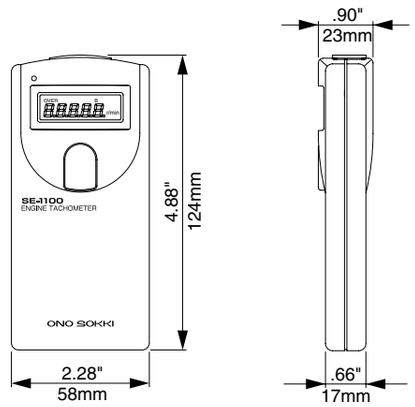
3.2 Measurement section

The number of "pulse/R", types of engines and the range of measurement are as follows :

Signal selector	4-cycle	2-cycle	Measurering Range
1/2 (P/R)	1 Cylinder		100~20,000r/min
1 (P/R)	2 Cylinder	1 Cylinder	100~20,000r/min
3/2 (P/R)	3 Cylinder		100~20,000r/min
2 (P/R)	4 Cylinder	2 Cylinder	100~20,000r/min
5/2 (P/R)	5 Cylinder		100~20,000r/min
3 (P/R)	6 Cylinder	3 Cylinder	100~20,000r/min
4 (P/R)	8 Cylinder	4 Cylinder	100~15,000r/min
6 (P/R)	12 Cylinder		100~10,000r/min

Display : 5-digit LCD
Measurement display time : 1second, automatic repeating
Accuracy : 100 ~ 12,499r/min : ± 1r/min
12,50~20,000r/min : ± 2r/min

3.3 General specifications



Power source : 3 size AAA batteries
Batteries life : Approx. 50 hours
(continuous use)
Low battery indication : When the battery voltage falls below about 3.3V, "B" mark appears on the display to indicate that the battery should be replaced to new ones.
Operating temperature : 0°C ~ +40°C
Storage temperature : -10°C ~ +60°C
Outer dimensions : 124.5 × 23 × 58 mm
Weight : Approx. 100 g (incl. Batteries)

4. Accessory

Size AAA battery 3
Exclusive screwdriver 1

5. Storage

- The storage temperature range is -10°C ~ +60°C. Avoid storing the unit in a damp place and under direct sunlight, and provide a good ventilation. When not in use for long period, remove batteries to prevent possible damage from battery leakage.

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 this 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.