

Diesel Engine Tachometer

GE-1200

Instruction Manual

Thank you for selecting Ono Sokki's diesel engine tachometer.

We recommend that you read and follow the instructions in this manual to get the most out of you instrument.

Precautions

Please read this document and the product instruction manual to ensure safe and proper use of your GE-1200 diesel engine tachometer.

Ono sokki, Ltd. bears no responsibility for any warranty regarding damages or injury resulting from failure to follow directions given within this document during operation.

WARNING and CAUTION

In this document precautions are classified into two categories: WARNING and CAUTION.

This depends on the degree of danger or damage possible if the precaution is ignored and the product is used incorrectly.

WARNING This symbol is used to indicate precautions where there is a risk of death or serious personal injury to the operator if the product is handled incorrectly.

CAUTION This symbol is used to indicate precautions where there is a risk of some personal injury to the operator or only material damage to the product if the product is handled incorrectly.

Depending on the situation, failure to follow some CAUTIONs may lead serious results. Be sure to observe all of them.



BEFORE USING

- Do not operate this product on locations where there is gas or steam. Using this product where there is steam or combustible or explosive gas may result in an explosion.
- Avoid using the product on locations with high temperature exceeding the specified temperature range. Using the product on locations with high temperature may cause fire.
- Never recharge dry cell batteries (including all primary batteries). Heat radiation and/or leaking from batteries may ruin the immediate area surrounding the batteries. Never recharge dry cell batteries.
- Do not remove the casing or take apart the product. Use of the product without its casing or while taken apart may result in damage to equipment or electrical hazards. When internal adjustment, inspection or repairs are required please contact the retail store where you bought the product or Ono Sokki sales office nearby.
- Do not splash or spill water on the product because doing so may cause fire or electrical hazards due to short or increased heat. If you get water inside the product, unplug the power cord immediately and call the retail store where you bought the product or Ono Sokki sales office nearby as soon as possible.
- Never touch rotating parts with your hands because doing so could result in serious injury if your hand becomes caught. Also note that there is serious danger of clothing or gloves becoming caught. Use extreme caution when dealing with rotating parts.



IF A PROBLEM OCCURS

- Unplug the product immediately if any metal, water, or foreign object should fall inside. Continued use after metal, water, or foreign object has fallen inside may cause fire or electrical hazards. After unplugging the product immediately, contact the retail store where you bought the product or Ono Sokki sales office nearby as soon as possible.
- Unplug the product if you perceive smoke, strange noise or strange smell coming from the product or if you accidentally drop it or damage it. Continued use may cause fire or electrical hazards. After immediately unplugging the product, contact the retail store where you bought the product or Ono Sokki sales office nearby as soon as possible.



ABOUT AC ADAPTOR (OPTION)

- Only use the power cord or AC adaptor included with the product or one specified by Ono Sokki. Use of a power cord or AC adaptor other than one specified may result in electrical hazards or fire.



ABOUT INSTALLATION AND CONNECTIONS

- Do not install the product on unstable locations. If the product should fall it may result in injury or damage to equipment.
- Do not place large or heavy objects on top of the product. If an object on top of the product should fall it may result in injury or damage to equipment.
- Do not install the product on locations where there is oily smoke or steam or where there is high humidity or lots of dust. Electricity could conduct through the oil, water vapor, or dust resulting in fire or electrical hazards.
- Do not install the product on locations subject to extremely high temperature or direct sunlight because doing so may cause fire.

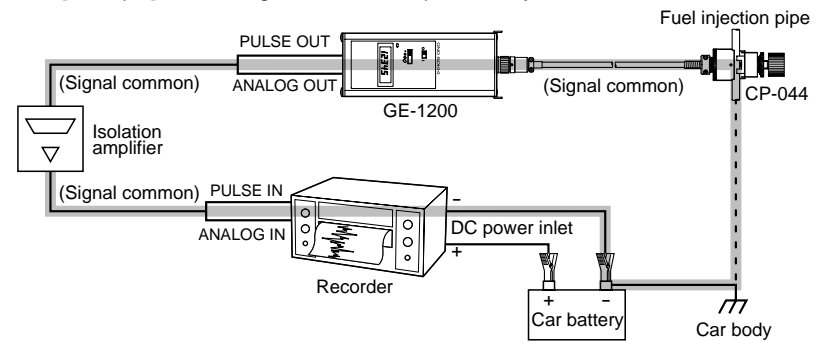
ABOUT BATTERIES

- Insert batteries with the proper polarity as failure to do so may result in generation of heat or leakage which could lead to fire, injury or ruin the surrounding product area.
- Never use batteries other than those specified and never use old and new batteries or batteries of different types together because doing so may result in fire, injury or ruin the surrounding product area.
- Never take apart batteries, subject them to heat, immerse them in water, or put them in a fire because doing so may cause them to burst or leak resulting in injury or ruining surroundings.
- Remove batteries when the product is not to be used for an extended period of time. If batteries are left in the product they may burst or leak resulting in injury or ruining the surrounding product area.
- Stop using batteries if you detect leakage. Using batteries which are leaking can lead to shorts resulting in fire or injury. If you detect battery leakage, return them to the retail store when you bought the product or Ono Sokki sales office nearby.

NOTES ON USE

- Before touching parts of the product where voltage/current is output or circuits connected to parts where voltage/current is output, make sure that the power is off.
- Be careful not to get water, oil, or other liquids on the product, especially on the sensor.
- Do not rotate or move the sensor installed on the fuel injection pipe with excessive force because doing so may cause clack on the shield foil protecting the sensor.
- When the common side of the pulse (analog) out of the GE-1200 is connected to the chassis ground through the recorder or other instruments, a looped common line (ground) is formed which may cause malfunction due to noise. In this case, be sure to isolate the pulse (analog) signal.

[Example] Connecting with a recorder powered by car batteries



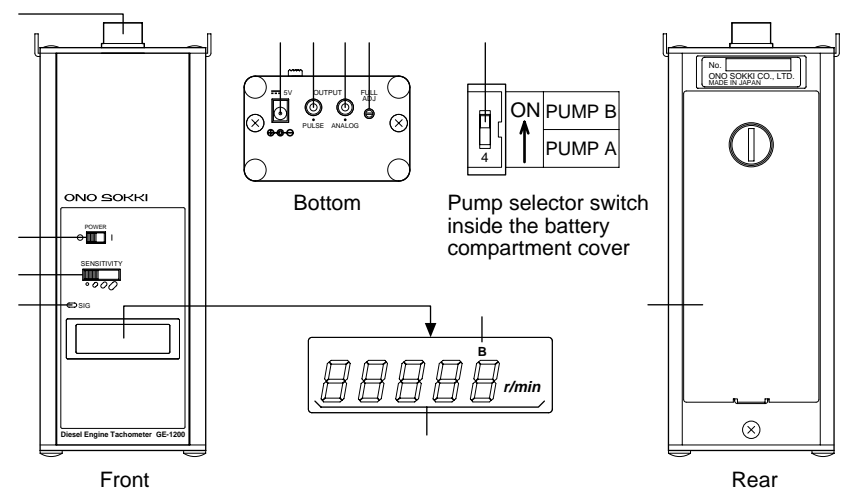
- Because the product handles very small signals, there may be some fluctuation of the output signal when a connected AC equipment is turned on or off. However, this is not a failure.

Outline

This tachometer is designed exclusively for use with four-cycle diesel engines. A sensor mounted to the fuel injection pipe enables it to carry out high precision measurement of engine r/min with simple operation.

Applicable injection pipe diameter : $\phi 4.0$ to $\phi 8$ mm

Name of each part



Input connector

This connector is used to input signals from the sensor.

Power switch

This switch is used to turn on or off the power of the instrument.

Sensitivity adjustment switch

This switch is used to set the input sensitivity appropriate to the signal level from the sensor.

Signal indicator [SIG]

It keeps flashing while signals from the sensor are being input.

Display

Indicates measured rotations in r/min unit.

Low battery indicator

When the batteries become worn, a "B" mark appears in the upper right of the display.

Power input connector [DC 5V IN]

This connector is used when power is supplied from the optional AC adapter (PB-703).

Pulse output connector

When the detecting signals are input from the sensor. It outputs one pulse every two rotations of the engine.

Analog voltage output connector

It outputs 0-1V voltage signals corresponding to 0-10,000 r/min.

Analog output voltage adjusting trimmer

This trimmer is used to adjust the analog output voltage. Turning it clockwise increases the voltage.

Pump selector switches

These switches should be set to suit the type of fuel injection pump being measured.

Battery compartment cover

To remove the cover, insert a coin into the slot of the knob and turn it counter-clockwise.

How to insert batteries

Insert a coin into the slot of knob on the battery compartment cover and turn it counter-clockwise to remove the cover.

Insert three type AA (UM-3) dry batteries, taking care to observe the polarities as indicated.

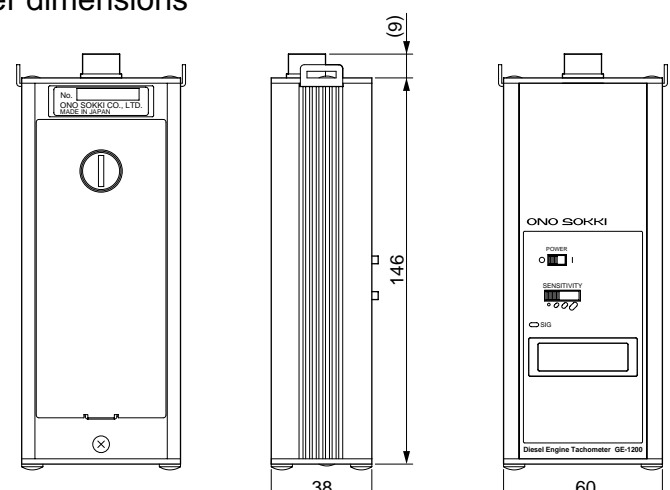
Mount the cover as it was.

Battery replacement

When the "B" mark appears in the display, the batteries are almost exhausted and it is time to replace them.

Always replace all three batteries at the same time.

Outer dimensions



Measurement procedure

Mounting the sensor to the fuel injection pipe

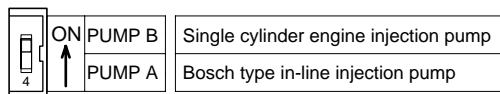
Mount the sensor to the fuel injection pipe of the engine, referring to the instruction manual sensor.

Connecting the sensor to the GE-1200

Connect the output connector of the sensor to the input connector of the GE-1200. Be sure to tighten the screw of the output connector when doing so.

Setting of the pump selector switches

Set the switch No.4 as shown below to suit the type of the fuel injection pump being measured.



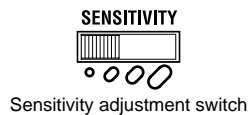
Pump selector switch

Turn the power switch on

Start the engine

Adjust the sensitivity

Slide the sensitivity adjustment switch from the left (lower sensitivity) to the right until the signal indicator starts flashing and the number of rotations appears in the display.



Sensitivity adjustment switch

<Note>

Do not rise the sensitivity up to the excessive level, otherwise measurement errors may occur depending on the type of engine.

Start measurement

When correct measurement cannot be made

Correct measurement cannot be expected in the following cases:

- When the injection pressure is excessively low or unstable. This is because the engine rpm is being measurement by sensing the variations of the pope diameter caused by fuel injection.
- When being subjected to vibration from other injection pipes via the clamping fixtures.
- When being subjected to vibration from the engine.

The pulse and analog output connectors

As accessory output cable (AX-501) can be used to make connection with external equipment such as a pen-recorder for various applications.

Specifications

Display section

- Display : Liquid crystal, 7-segment, 5-digit indication
- Measurement and display time : 1-s automatic repetition
- Measurement accuracy : ± 1 r/min
- Low battery warning function : When the battery voltage drop below approximately 3.5V, a "B" mark appears in the upper right of the liquid crystal display.
- Signal indicator : The LED flashed when signals are being input.

Analog output section

- Output voltage : 0 to 1 V / 0 to 10,000 r/min (F/V conversion method)
- Linearity : ± 0.5 % / full-scale or better
- Response : 0.5 s / 10 to 90 % or better
- Ripple : 5 mVp-p / 400 r/min max.
- Connectable load resistance : 2 k Ω min.
- Offset voltage at zero point : ± 0.5 % / full-scale max.
- Offset drift : ± 0.05 % / full-scale / °C max.
- Span drift : ± 0.05 % / full-scale / °C max.

Pulse output section

- Logic : Positive logic
- Pulse width : Rectangular pulses with 3.9 ± 0.1 ms
- The number of output pulse : 1 pulse every two rotations of the engine.
- Output level : Lo : 0.5 V max.
Hi : 4.5 V min.
- Connectable load resistance : 1 k Ω min.

General specifications

- Applicable sensors : CP-044
- Applicable engine : Four-cycle diesel engines
- Measuring range : 400 to 10,000 r/min.
- Operating temperature range : 0 to 40 °C
- Storage temperature range : -10 to 55 °C
- Mass : Approximately 400 g (including batteries)
- Power source : Three type AA (UM-3) batteries
- Continuous measuring time : About 10 hours (using manganese dry batteries, at 20 °C)

Standard accessories

- AX-501 Output cable 1
- Type AA (UM-3) dry batteries 3
- Carrying case 1

Option

- Sensor CP-044
- AC Adapter PB-703

Omission of Test Qualification Issuance

Since this product has been tested through a series of strict inspections and a complete program of quality control, issuance of the test qualification has been omitted.

Warranty

This product is covered by a warranty for a period of one year from the date of purchase. This covers free-of-charge repair for defects judged to be the responsibility of the manufacturer. While this product has been subjected to a series of severe inspection and a complete program of quality control, should a failure occur, please control your nearest Ono Sokki representative for assistance. Failure occurring through misuse or mis-operation will be handled on a fee basis, even during the warranty period.

ONO SOKKI

WORLDWIDE

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