The GE-2500 diesel engine tachometer uses rotation speed of an alternator to measure engine rotation speed. With FFT calculation, this new tachometer achieves reliable and stable measurement for both diesel and gasoline engines.

Because the vehicles with multiple injection by common rail system have increased, measuring engine rotation is becoming more difficult in recent years. With the conventional method, which uses engine vibration or pulsation of injection pipes, some engines cannot be measured depending on engine type or number of cylinders. By making use of an alternator, the GE-2500 can detect rotation speed of engines regardless of engine types and cylinder numbers.

**Feature**

1. Rotation of both gasoline and diesel engines can be measured.
2. Auto calibration function is provided. The rotation speed ratio of the alternator and engine is calibrated automatically.
3. Easy setup. The sensor can be set on any place of an alternator.

**Application**

- Measurement of diesel engine rotation speed in construction machine
- Measurement of engine rotation speed at safety inspection
- Measurement of engine rotation speed at pass-by noise testing (noise outside vehicle)

**Specification**

- **Measurement section**
  - Measurement object: Diesel engine, gasoline engine with an alternator
  - Calculation method: FFT calculation
  - Input frequency range: 1, 2, 5 kHz (Measurement mode MAIN) / 500 Hz (Calibration mode REF)
  - Measurement accuracy: ±2 × rotation speed resolution (r/min) ± 1 count
  - Rotation speed resolution: Frequency range (Hz) + 12800 × 60 + rotation ratio

- **Display section**
  - Display: Fluorescent display tube
  - Display update cycle: Selectable from 0.2, 0.5, 1 or 2 (second)
  - Display resolution: 1 r/min, 1 Hz
  - Measurement display range: 20,000 r/min

- **Input section**
  - Input: 2-ch MAIN for measurement / REF for calibration
  - Input voltage range: ±5 V, ±0.5 V, ±0.05 V
  - Input connector: BNC
  - Input coupling: AC coupling
  - Constant drive power supply: 2.2 to 3.2 mA (REF only)

- **Analog output section**
  - Output information: Outputs for rotation speed display values.
  - Voltage range: 0 to F.S. / 0 to 10 V (Value of F.S can be specified.)
  - Conversion method: 12 bit D/A conversion method
  - Linearity: ±0.3 % F.S.
  - Output update cycle: 200 ms or less
  - Load resistance: 100 kΩ or more
  - Output connector: BNC

- **Analog output section**
  - Output information: Output of sensor signal connected to MAIN (can be used switching from analog output)
  - Load resistance: 100 kΩ or more
  - Output connector: BNC

- **Pulse output section**
  - Output information: Outputs frequency of displaying rotation speed. [100 Hz Duty: 1: 1 at 6,000 r/min]
  - Output voltage: Lo: 0.5 V or less, Hi: 4.5 V or more (at no load)
  - Output update cycle: 200 ms or less
  - Load resistance: 100 kΩ or more
  - Output connector: BNC

- **General specification**
  - Power supply: DC 12 to 24 V
  - Power consumption: 8 VA or less
  - Operating temperature range: 0 to +40 °C
  - Operating humidity range: +20 to +80 %RH (with no condensation)
  - Storage temperature range: -10 to +55 °C
  - Storage humidity range: +20 to +80 %RH (with no condensation)
  - Outer dimensions: Approx. 144 (D) x 72 (H) x 180 (D) mm (not including protruded section)
  - Weight: 2 kg or less
  - Standard: CE marking, RoHs
  - Accessories: Instruction manual x 3 kinds, rubber support pad x 4, GE-0102 power cable for cigarette lighter plug (1.5 m) x 1

- Notes:
  - It may not measure depending on the engine and motor type. For more details, please contact your nearest distributor or send us an e-mail: overseas@onosokki.co.jp
  - To use the GE-2500, the alternator and engine must be running in synchron with each other. The measurement error may become large when the special kind of alternator is used or the belt between an alternator and engine is loose.
Measurement procedure

1. Attach the sensor to the alternator.
2. Execute the calibration to find the rotation speed ratio between the alternator and engine.
3. Start measurement.

**STEP 1**
Attach the sensor (OM-1500 or OM-1200) to the alternator.

1. Attach the OM-1500 or OM-1200 perpendicular to the alternator’s rotating shaft.
2. Connect the sensor to 「MAIN」 in the rear panel of the GE-2500.

**STEP 2**
Execute the calibration to find the rotation speed ratio between the alternator and engine.
Set the rotation speed ratio at the GE-2500.

- Setting up using the sensor for calibration
- Setting up manually (three selections)

When using the sensor for calibration
Measure rotation speed of the alternator and engine at the same time, and calculate the rotation speed ratio between them automatically.

When setting up manually (select one from 3 methods)
- Input the pulley ratio, number of alternator’s poles.

<table>
<thead>
<tr>
<th>CAL</th>
<th>PULLEY</th>
<th>2.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>POLE</td>
<td>6.0</td>
<td></td>
</tr>
</tbody>
</table>

- Input the rotation ratio (rotation ratio of the alternator engine).

<table>
<thead>
<tr>
<th>CAL</th>
<th>ALT</th>
<th>160 Hz</th>
</tr>
</thead>
<tbody>
<tr>
<td>RATIO</td>
<td>012.00000</td>
<td></td>
</tr>
</tbody>
</table>

- Input the engine rotation speed at idling.

<table>
<thead>
<tr>
<th>CAL</th>
<th>ALT</th>
<th>160 Hz</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENG</td>
<td>750</td>
<td>r/min</td>
</tr>
</tbody>
</table>

**STEP 3**
Remove the sensor for calibration and start measurement by the sensor for measurement (OM-1500 or OM-1200).

The rotation speed ratio calibrated is stored to the GE-2500 automatically. Up to 5 conditions can be saved to the main unit.

The GE-2500 can find solutions for engine rotation measurement

Comparison of the GE-2500 and the previous model (6-cylinder engine)

The GE-2500 enables stable measurement in entire range even when the engine rotation speed is increased.

Difficulties with previous models

Detected by pulsation of fuel injection pipe
- The measurement value is varied affected by multiple injections.
- Not easy mounting

Detected by sound or vibration
- Difficult to measure while driving.
- Difficult to measure low vibration associated with increasing rotation speed

The GE-2500 can perform all these tasks
Options

- Sensor for measurement: Sensor for detecting alternator rotation
  - OM-1200 (sensor)
  - OM-0102 (mounting fixture)
  - GE-2500 Diesel engine tachometer (with rubber support pads)

- Sensor for calibration: Sensor for detecting engine rotation (rotation ratio between the alternator and engine)
  - Engine vibration detector: VP-1220
  - Accelerometer: NP series
  - Microphone & preamplifier: MI series
  - Cigarette lighter socket sensor: FT-0801
  - Ignition pulse sensor (Primary side): IP-292
  - Ignition pulse sensor (Secondary side): IP-296
  - Ignition pulse sensor: IP-3000A
  - Ignition pulse sensor: IP-3100
  - Signal cable (connects OM-1200 and GE-2500): HS12P2--BNC
  - Signal cable (analog and pulse output of GE-2500): BNC--BNC
  - Others: OM-0102 Mounting fixture for OM-1200 (with 3 adhesive sheets)

GE-2500 Diesel engine tachometer

<table>
<thead>
<tr>
<th>Outer Dimensions</th>
<th>OM-1200</th>
<th>OM-1500</th>
</tr>
</thead>
<tbody>
<tr>
<td>Detection method</td>
<td>Electromagnetic induction</td>
<td></td>
</tr>
<tr>
<td>Cable length</td>
<td>sold separately, 4.9 m</td>
<td></td>
</tr>
<tr>
<td>Operating range</td>
<td>0 °C to +80 °C, -10 °C to +100 °C</td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td>approx. 65 g, approx. 130 g (including cable)</td>
<td></td>
</tr>
<tr>
<td>Outer dimensions</td>
<td>φ15 x 55 (sensor only), 15 x 80 (including cable)</td>
<td></td>
</tr>
</tbody>
</table>

Outer Dimensions

Product List

Main unit

GE-2500 Diesel engine tachometer

Sensors

- [For measurement (alternator)]
  - OM-1200 Motor/engine rotation detector
  - OM-1500 Motor/engine rotation detector (cable attached, 4.9 m)

- [For calibration (engine)]
  - VP-1220 Engine vibration detector
  - NP series Accelrometer
  - MI series Microphone & preamplifier
  - FT-0801 Cigarette lighter socket sensor
  - IP-292 Ignition pulse sensor
  - IP-296 Ignition pulse sensor
  - IP-3000A Ignition pulse sensor
  - IP-3100 Ignition pulse sensor

Accessory (sold separately)

- Signal cable (connects OM-1200 and GE-2500): HS12P2--BNC
  - MX-005 signal cable (5 m)
  - MX-010 signal cable (10 m)

- Signal cable (analog and pulse output of GE-2500): BNC--BNC
  - MX-101 signal cable (1.5 m)
  - MX-105 signal cable (5 m)

- Others
  - OM-0102 Mounting fixture for OM-1200 (with 3 adhesive sheets)
  - GE-0102 Power cable for cigarette lighter socket 1.5 m (standard accessory of GE-2500)

*Outer appearance and specifications are subject to change without prior notice.

URL: http://www.onosokki.co.jp/English/english.htm

WORLDSIDE ONO SOKKI CO., LTD.
1-16-1 Hakusan, Midori-ku, Yokohama, 226-8507, Japan
Phone: +81-45-935-3918 Fax: +81-45-930-1808
E-mail: overseas@onosokki.co.jp

U.S.A.
Ono Sokki Technology Inc.
2171 Executive Drive, Suite 400
Addison, IL 60101, U.S.A.
Phone: +1-630-627-9700 Fax: +1-630-627-0004
E-mail: info@onosokki.net
http://www.onosokki.net

THAILAND
Ono Sokki (Thailand) Co., Ltd.
29/67 Moo 5 Tivanon Road, Pakkred, Northburi 11120, Thailand
Phone: +66-2-964-3884 Fax: +66-2-964-3887
E-mail: osth_sales@onosokki.co.jp

INDIA
Ono Sokki India Private Ltd.
Unit No.4B, Ground Floor, Tower-A, Spazedge, Sector 47, Gurgaon-Sohna Expressway,
Gurgaon, Haryana-122002, INDIA
Phone: +91-124-421-1807 Fax: +91-124-421-1809
E-mail: osid@onosokki.co.in

P.R.CHINA
Ono Sokki Shanghai Technology Co., Ltd.
Room 506, No.47 Zengyi Road, Yangpu District, Shanghai, 200433, P.R.C.
Phone: +86-21-6503-2656 Fax: +86-21-6506-0327
E-mail: admin@shonosokki.com

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