

Diesel Engine Tachometer

GE-2500



DIESEL ENGINE
TACHOMETER

ONOSOKKI

Diesel Engine Tachometer GE-2500

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		Analog output section [SIG]	
Measurement object	Diesel engine, gasoline engine with an alternator	Output information	Output of sensor signal connected to MAIN (can be used switching from analog output)
Calculation method	FFT calculation	Load resistance	100 kΩ or more
Input frequency range	1, 2, 5 kHz(Measurement mode MAIN) / 500 Hz(Calibration mode REF)	Output connector	BNC
Measurement accuracy	±2 × rotation speed resolution(r/min) ± 1 count	Pulse output section	
Rotation speed resolution	Frequency range(Hz)÷ 12800 × 60 ÷ rotation ratio	Output information	Outputs frequency of displaying rotation speed. [100 Hz Duty1 : 1 at 6,000 r/min]
Display section		Output voltage	Lo:0.5 V or less, Hi:4.5 V or more(at no load)
Display	Fluorescent display tube	Output update cycle	200 ms or less
Display update cycle	Selectable from 0.2, 0.5, 1 or 2(second)	Load resistance	100 kΩ or more
Display resolution	1 r/min, 1 Hz	Output connector	BNC
Measurement display range	20,000 r/min	General specification	
Input section		Power supply	DC 12 to 24 V
Input	2-ch MAIN(for measurement) REF(for calibration)	Power consumption	8 VA or less
Input voltage range	±5 V, ±0.5 V, ±0.05 V	Operating temperature range	0 to +40 °C
Input connector	BNC	Operating humidity range	+20 to +80 %RH(with no condensation)
Input coupling	AC coupling	Storage temperature range	-10 to +55 °C
Constant drive power supply	2.2 to 3.2 mA(REF only)	Storage humidity range	+20 to +80 %RH(with no condensation)
Analog output section [REVO]		Outer dimensions	Approx.144(D)×72(H)×180(D)mm(not including protruded section)
Output information	Outputs for rotation speed display values.	Weight	2 kg or less
Voltage range	0 to F.S. / 0 to 10 V(Value of F.S can be specified.)	Standard	CE marking, RoHs
Conversion method	12 bit D/A conversion method	Accessories	Instruction manual x 3 kinds, rubber support pad x 4, GE-0102 power cable for cigarette lighter plug(1.5 m) x 1
Linearity	±0.3 %/ F.S.		
Output update cycle	200 ms or less		
Load resistance	100 kΩ or more		
Output connector	BNC		

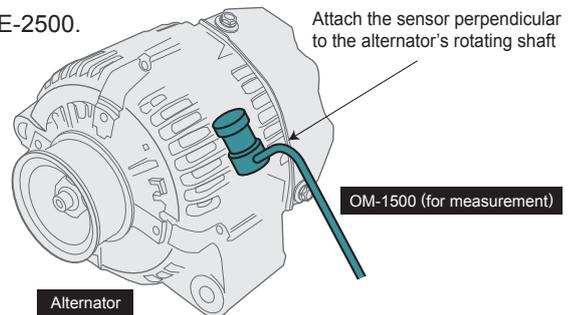
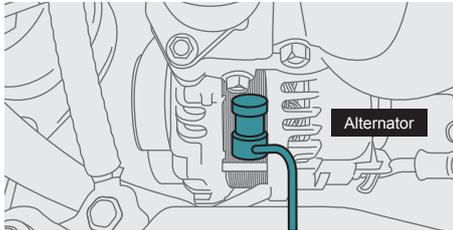
■ It may not measure depending on the engine and motor type. For more details, please contact your nearest distributor or send us an e-mail: overseas@onosokki.co.jp
 ■ To use the GE-2500, the alternator and engine must be running in synch with each other. The measurement error may become large when the 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.

750 r/min

Calibration example

When setting up manually (select one from 3 methods)

- Input the pulley ratio, number of alternator's poles.

CAL	PULLEY	2.5
	POLE	6.0

- Input the rotation ratio (rotation speed ratio of the alternator and engine)

CAL	ALT	160 Hz
	RATIO	0 12.00000

- Input the engine rotation speed at idling

CAL	ALT	160 Hz
	ENG	750 r/min

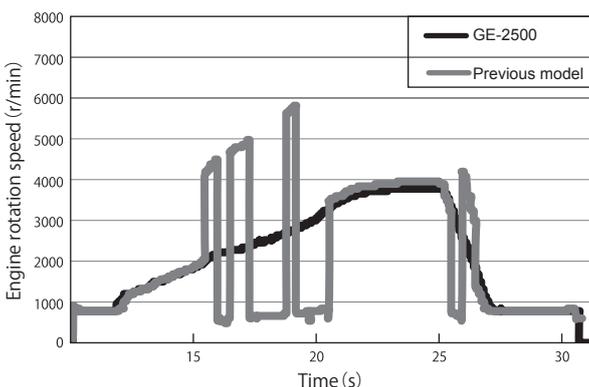
STEP 3 Remove the sensor for calibration and start measurement by the sensor for measurement (OM-1500 or OM-1200).

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

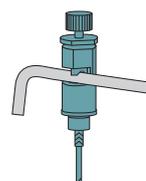
Comparison of the GE-2500 and the previous model (6-cylinder engine)

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



Difficulties with previous models

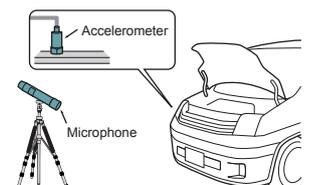
Detected by pulsation of fuel injection pipe



Weakness

- The measurement value is varied affected by multiple injections.
- Not easy mounting

Detected by sound or vibration



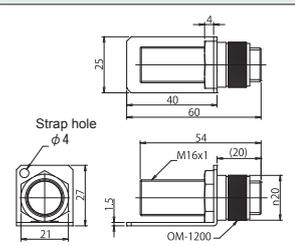
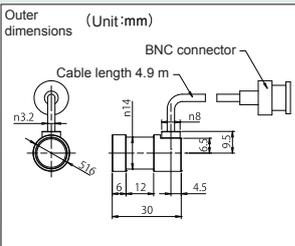
Weakness

- Difficult to measure while driving.
- Difficult to measure low vibration associated with increasing rotation speed

The GE-2500 can perform all these tasks

Options

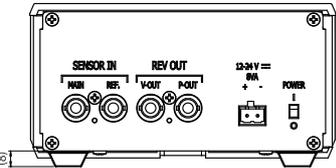
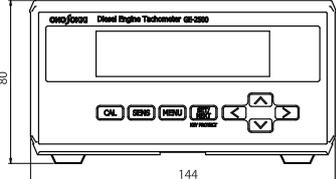
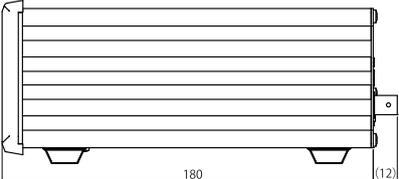
■ Sensor for measurement: Sensor for detecting alternator rotation

 <p>OM-1200 (sensor) OM-0102 (mounting fixture)</p> <p>↑ OM-1200 with OM-0102 →</p>		 <p>OM-1500</p>	 <p>Outer dimensions (Unit:mm)</p> <p>Cable length 4.9 m</p> <p>BNC connector</p>																
				<table border="1"> <thead> <tr> <th></th> <th>OM-1200</th> <th>OM-1500</th> </tr> </thead> <tbody> <tr> <td>Detection method</td> <td colspan="2">Electromagnetic induction</td> </tr> <tr> <td>Cable length</td> <td>sold separately</td> <td>4.9 m</td> </tr> <tr> <td>Operating temperature range</td> <td>0 °C to +80 °C</td> <td>-10 °C to +100 °C</td> </tr> <tr> <td>Weight</td> <td>approx. 65 g</td> <td>approx. 130 g (including cable)</td> </tr> <tr> <td>Outer dimensions</td> <td>φ 16 × 5.4 (sensor only) φ 16 × 8.0 (when connecting cable)</td> <td>φ 16 × 30</td> </tr> </tbody> </table>		OM-1200	OM-1500	Detection method	Electromagnetic induction		Cable length	sold separately	4.9 m	Operating temperature range	0 °C to +80 °C	-10 °C to +100 °C	Weight	approx. 65 g	approx. 130 g (including cable)
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■ Sensor for calibration: Sensor for detecting engine rotation (rotation ratio between the alternator and engine)

 <p>Engine vibration detector VP-1220</p>	 <p>Accelerometer NP series</p>	 <p>Microphone & preamplifier MI series</p>	 <p>Cigarette lighter socket sensor FT-0801</p>	 <p>Ignition pulse sensor (Primary side) IP-292</p>	 <p>Ignition pulse sensor (Secondary side) IP-296</p>	 <p>Ignition pulse sensor IP-3000A</p>	 <p>Ignition pulse sensor IP-3100</p>
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Outer Dimensions

<p>GE-2500 Diesel engine tachometer (with rubber support pads)</p>	 <p>(Unit : mm)</p>	
		

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 Accerelometer
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
GE-0102 Power cable for cigarette lighter socket 1.5 m
(standard accessory of GE-2500)

ONOSOKKI

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