Gasoline & diesel engines, EV & HEV motors

Handheld Digital Tachometer

HT-6200

External Sensor Input Type

ONO SOKKI

Handheld Digital Tachometer

HT-6200

Advanced model of the HT-6100

Not just measuring gasoline/diesel engine rotation but motor rotation of EV/HEV !

All in one model for measuring gasoline/diesel engines and EV/HEV motors!

Three types of output (analog, pulse and monitor) for recording and for tracking analysis of rotation.

Features

1 Can be used with various sensors

Various types of rotation sensors can be connected.
Rotation measurement of gasoline engines, diesel engines and motors can be performed with one tachometer.

2 Three outputs provided as standard

Analog output : For recording rotation speed
Pulse output : For synchronous signal with rotation
Monitor output : For checking detected signals.

3 Built-in peak-hold function

Max. and min. values can be displayed during measurement.

4 Built-in memory function

Up to 20 data can be stored.

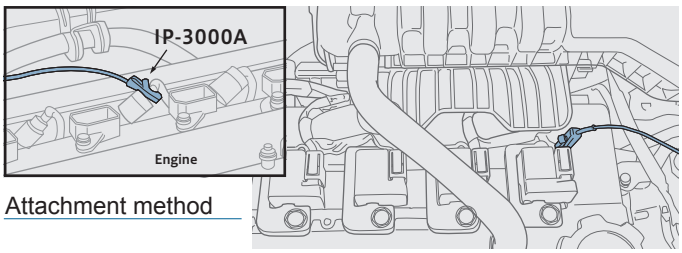
Specifications

Object to be measured			Engines, motors and rotating objects in general
Display			5-digit LCD with backlight (character height: 10.2 mm)
Calculation method			Periodic operation method
Measurement time			1 s±1 period
Measurement accuracy			Displayed value x (±0.02 %) ±1 count (Not including a quantization error) The measurement accuracy of the circumferential speed depends on the accuracy of rotation speed (r/min).
Setup range of number of pulses (P/R)			0.50 to 200.00(engine rotation measurement) 0.50 to 999.99(other than engine rotation measurement) (Can be set at intervals of 0.01)
Measurement function	**Peak-hold function**		Maximum value (MAX), Minimum value (MIN)
	Memory function		Up to 20 data
	Over-range function		The over-range warning (ERROR mark) is displayed when the measured value exceeds the display range.
	Rotation upper limit warning function		The upper limit warning (↑ mark) is displayed when the rotation speed exceeds the preset upper limit value.
	Circumferential speed calculation function		Calculates the circumferential speed from the preset diameter value (mm) and the measured rotation speed.
	Accumulation function		Counts acumulated pulses of input signal
	Period measurement function		Measures the input pulse period (When 1 second or less: average value of input pulse)
	Trigger level adjustment function		Trigger level can be adjusted using a rotary dial at the right-hand side of the main unit.
Output section	**Connector**		φ2.5 sub-mini jack
	Analog output	**Output content**	Output to the display value of rotation speed
		Output voltage	0 to 1 V/0 to F.S. (F.S. can be specified.)

Output section	**Analog output**	**Conversion method**	10-bit D/A conversion method
		Linearity	±1 %／F.S.
		Output update time	within 50ms + 1 period
		Temperature stability	± 0.05 % / F.S./ °C (ZERO & SPAN)
		Setting error	±0.5 %／F.S.
		Load resistance	100 kΩ or more
	Monitor output	**Output content**	Detected signal of a sensor (available by switching from analog output.)
		Load resistance	100 kΩ or more
	Pulse output	**Output voltage**	High level: +4.5 V or more Low level : +0.5 V or less
		Output logic	Positive logic pulse
		Load resistance	100 kΩ or more
General specifications	**Power supply**		Size AAA battery (x 4) or exclusive AC adapter (PB-7090 sold separately)
	Continuous operating time		16 hours or more (backlight OFF) 8 hours or more (backlight ON) *When alkaline batteries are used at 20 °C.
	Battery LOW display		Lights up at about 4.4 V("LOW" will be displayed.
	Operating temperature range		0 to +40 °C
	Storage temperature range		−10 to +50 °C
	Outer dimensions		47.5(W)×189.5(L)× 66(D) mm
	Weight		Approx. 280 g (including batteries)
	Accessories		Size AAA battery x 4, carrying case x 1, Instruction manual x 1

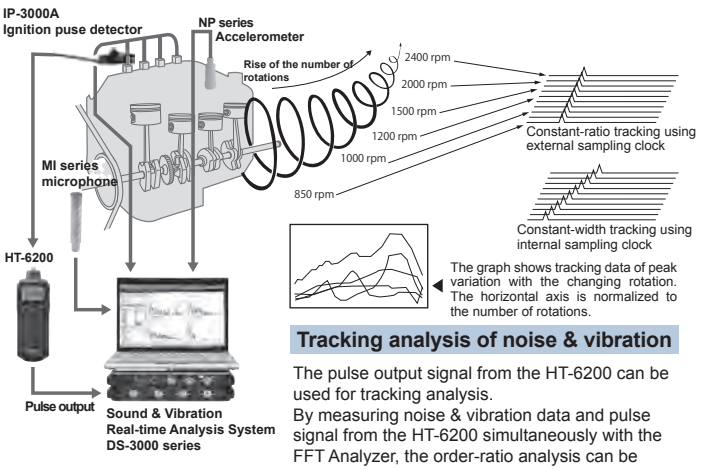
Applications

Measuring rotation of gasoline engines



Attachment method

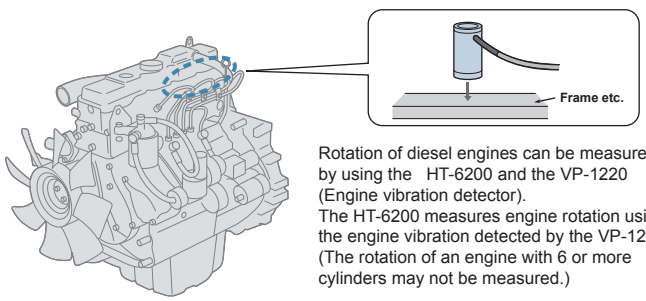
The rotation of gasoline engines can be measured using the IP-3000A (Ignition pulse detector) and the HT-6200 (Handheld digital tachometer).
The IP-3000A is attached on an ignition cable.



Tracking analysis of noise & vibration

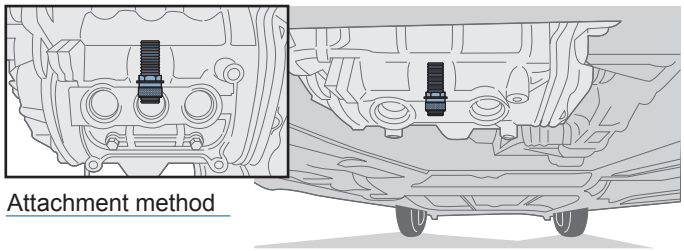
The pulse output signal from the HT-6200 can be used for tracking analysis.
By measuring noise & vibration data and pulse signal from the HT-6200 simultaneously with the FFT Analyzer, the order-ratio analysis can be performed.

Measuring rotation of diesel engines



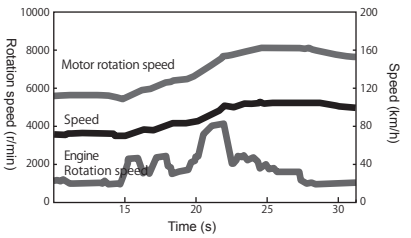
Rotation of diesel engines can be measured by using the HT-6200 and the VP-1220 (Engine vibration detector).
The HT-6200 measures engine rotation using the engine vibration detected by the VP-1220.
(The rotation of an engine with 6 or more cylinders may not be measured.)

Measuring motor rotation of EV/HEV



Attachment method

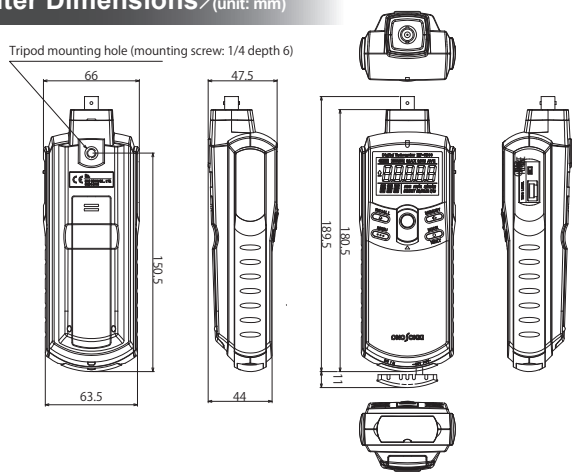
The OM-1200 (Motor/gasoline engine RPM detector) detects the magnetic flux leakage from a motor and enables rotation measurement of EV/HEV.
Just attach the sensor to the outside of the motor to measure rotation. No processing such as hole drilling is required.
The OM-1200 is installed perpendicularly to the rotating shaft of the motor. It needs to set the number of poles (number of pulses P/R) for the HT-6200.



Actual running test of HEV

The above graph shows the rotation speed of a motor and an engine in HEV (measured by two HT-6200's), and the speed of HEV (measured by the LC-8100 GPS speedometer).

〈Outer Dimensions〉(unit: mm)



	Gasoline engine	Diesel engine	Motor (EV, HEV)	Rotating object in general
Applicable detector	・Ignition pulse detector: IP-296/292/3100/3000A ・Motor/gasoline engine RPM detector: OM-1200/1500 ・Engine vibration detector:VP-202/1220	・Engine vibration detector:VP-202/1220	・Motor/gasoline engine RPM detector: OM-1200/1500	・Electromagnetic rotation detector MP-900/9000 series
Object to be measured	・Ignition coil, primary/secondary ignition cables ・ECU rotation pulse (5V) ・Cylinder-head of an engine (When using the VP-202/1220)	・Cylinder-head of an engine (when using the VP-202/1220)	・Motor	・Rotation detection gear

	Rotation measurement of gasoline/diesel engines	Rotation measurement other than engines
Measurement unit	r/min（rotation speed）	r/min, r/s (rotation speed), m/min (circumferential speed), ms (period), COUNT (accumulated count)
Input frequency range	1 to 1666.67 Hz	3.33 to 1666.67 Hz
Maximum measurement value	20,000 r/min The maximum rotation speed is 20,000 r/min regardless of the number of pulses per one rotation (P/R).	99999 r/min (P/R=1), 999.99 r/s (P/R=1) 9999.9 m/min (diameter =100 mm), 300 (ms), 99999 (COUNT) The maximum value varies depending on the number of pulses per one rotation.

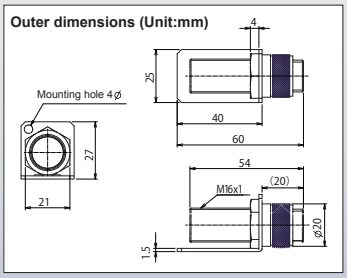
※ The measurement range may be changed depending on measurement objects.
※ The measurement range may be changed depending on the sensor installation position or type of motor when the motor rotation is measured using the OM-1200.
※ The measurement may not be performed normally depending on type of a motor, type of an engine or other reason. Please contact your nearest distributor for more details.

Options

For measuring EV/HEV motor rotation

OM-1200 (detector)
OM-0102 (mounting fixture)

Detector with a mounting fixture



Motor/gasoline engine RPM detector
OM-1200/1500

Electromagnetic rotation detector
MP series

Ignition pulse detector (Primary side)
IP-292

Ignition pulse detector (Secondary side)
IP-296

Ignition pulse detector
IP-3000A

Ignition pulse detector
IP-3100

Engine vibration detector
VP-202/1220

AC adapter
PB-7090

Main unit

HT-6200 Handheld Digital Tachometer

Sensors (sold separately)

VP-202/1220	Engine vibration detector
IP-292/296	Ignition pulse detector
IP-3100/3000A	Ignition pulse detector
OM-1200/1500	Motor/gasoline engine RPM detector
MP series	Electromagnetic rotation detector

Accessories (sold separately)

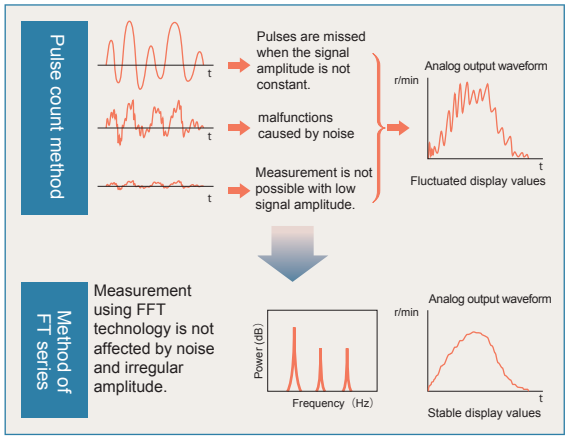
AX-501	Signal output cable (for analog and pulse output) 2.5φ sub-mini plug to CO2 (BNC), 2m
MX series	Cable for electromagnetic rotation detector (for OM-1200, MP series) MX-005 5m MX-010 10m
OM-0102	Mounting fixture for OM-1200 (with 3 of adhesive sheet)
PB-7090	AC adapter Input: 100 to 240V AC Output: 5.9V DC/3.5A (with AC power cable:AC100 to 120 V)

For stable measurement — High precision type the FT-7200 Advanced Handheld Tachometer

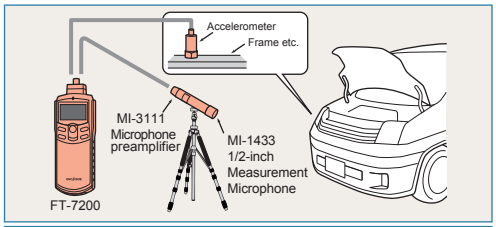
FT-7200

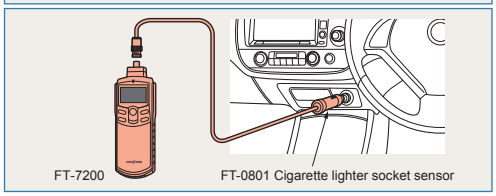
Cigarette lighter socket sensor
FT-0801

The FT-7200 is a handheld type tachometer which measures the rotation speed by performing frequency analysis using FFT calculation. This tachometer is useful for measurement of sensor signal with noise or small amplitude.



Measurement examples





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CAT.NO.198-03E Printed in Japan 197 (LI)