Digital Engine Tachometer

CT-6700

Compact and portable design

ONOSOKKI

Compact Tachometer for various engine measurement

The CT-6700 is a digital engine tachometer to measure rotation speed of gasoline/diesel engines, motors equipped on electric vehicles/hybrid electric vehicles, and general rotating bodies. Compact, space-saving design provides good operability and portability not only measurement on an engine test bench but also an actual vehicle.

1 High response measurement

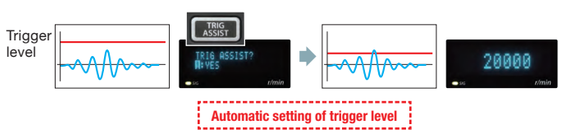
The CT-6700 captures transitional phenomenon of engine rotation speed with high response.
The analog output follows the acceleration/deceleration behavior within the conversion time of 1 cycle+8 µs of input signal. The signal is output as a wave-shaped pulse, which enables the engine rotation speed to be sent without delay. High speed digital output is also possible with CAN output function.

2 Wide variety of detectors can be used

By adding the ECU's crank angle signal output function, it becomes possible to measure not only 10 kinds of detectors but also the rotation speed of various engines that could not be detected so far.

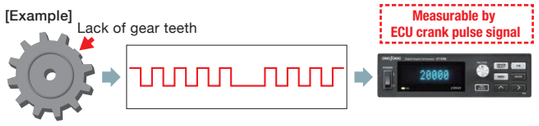
3 Automatic setting of trigger level with the Trigger assist function

The trigger assist function speeds up the trigger level setting. This function automatically make an adjustment of trigger level for stable engine or motor rotation measurement. Manual adjustment such as elimination of noise which might be included in an ignition pulse signals is not required anymore.



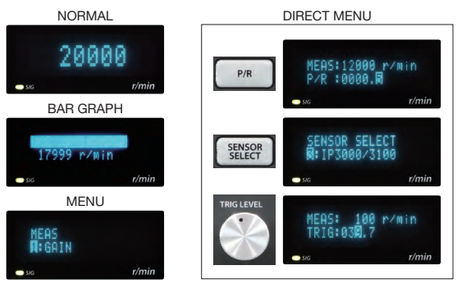
4 Measurement of unequal interval pulses by ECU crank pulse signal (option: CT-0672)

The CT-6700 uses the ECU crank pulse signal to measure engine rotation.
These signals have output with unequal intervals because the gear teeth are arranged at unequal intervals at a particular point for detection of the top dead center. With the ECU crank pulse signal input function (CT-0672:option), the CT-6700 ensures reliable engien rotation speed measurement through learning pulse patterns of irregular output.



5 Compact and easy to use

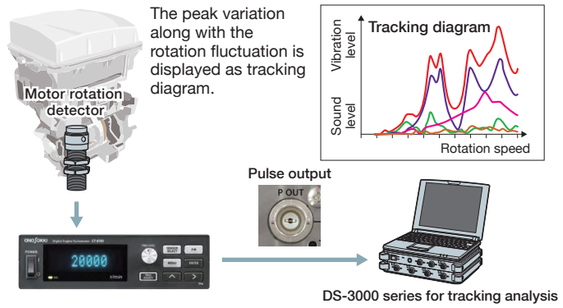
Compact, portable, and flexible design (170:W × 49:H × 120:D). Easy to see with large display, and easy to set functions by selecting menu. Also you can easily set frequently-used items, such as sensor type, pulse count and trigger level, with direct keys including a volume dial.



Various functions to help measurement

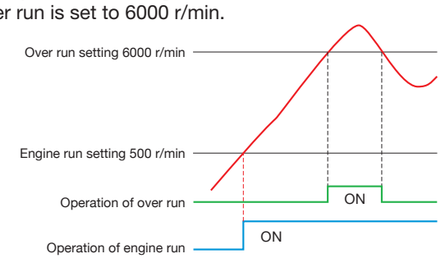
Pulse output function for tracking analysis

Tracking analysis can be performed by reading DIRECT pulse output of the CT-6700 (signal for rotation synchronization) with DS-3000 series of Ono Sokki.



Comparator function for monitoring engine measurement status

The CT-6700 recognizes that the engine has started when exceeding the engine run set value. When exceeding the over run set value, it is regarded as an engine failure and the contact point is output. The following graph shows an example when the engine run is set to 500 r/min and the over run is set to 6000 r/min.



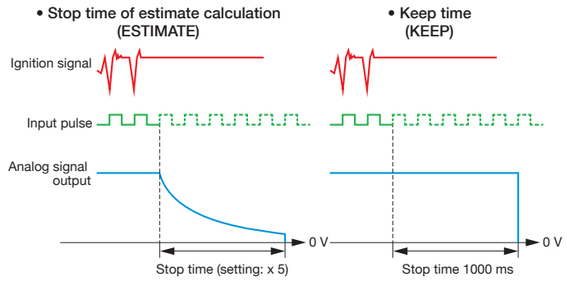
High speed digital data CAN output function (option: CT-0671)

Outputs rotation speed data by CAN communication. The output update cycle is 1 kHz at maximum.
Any CAN-communicated devices, such as a CAN logger, can be used to record rotation speed data.

Baud rate (kbps)	125, 250, 500, 1000
Update frequency (Hz)	OFF, 1, 2, 5, 10, 20, 100, 1000

Deceleration calculation function supports the measurement in engine stop

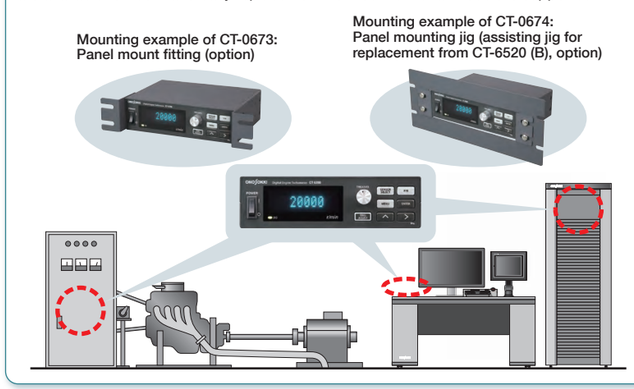
When an engine stops suddenly, no pulse signal is generated, making it difficult to determine whether the engine tachometer stopped or not. This issue is solved by performing precalculation using deceleration calculation function. The signal predicted from the last detected signal period is output, or rotation speed analog signal at 0 r/min is output after the set time is elapsed.



Application 1

Measurement on an Engine Bench

Compact design allows easy installation at anywhere, including on an operation desk or into a control panel.
For installing into an engine bench control panel, not only being able to use standard size panel mount fitting, also exclusive mounting jigs according to the size of the previous model are available. Smooth and easy replacement from conventional models is supported.



Application 2

Measurement on an Actual Vehicle

Compact design makes it useful for measurement on an actual vehicle.

Mounting example of CT-0675
Protection handle (option)

Mounting example of CT-0676:
Light shielding hood (option)

Wide variety of engine rotation measurement

For Gasoline Engine

■ IP-3000A Ignition pulse detector

Applicable engine
: 2/4 cycle gasoline engine
Detection point: Conductor of ignition coil primary side, current cable of electronic distributor
Code diameter : max. ϕ5 mm
Output code length
: 4.9 m (direct-attached with BNC)
Operating temperature range
: -40 to 120 °C
Outer dimensions
: 8 (W) × 14.3 (H) × 30 (D) mm
Weight : approx. 80 g (cable included)

■ IP-3100 Ignition pulse detector

Applicable engine
: 2/4 cycle gasoline engine
Detection point
: Conductor of ignition coil primary side / secondary side, current cable of electronic distributor
Code diameter
: max. ϕ10 mm
Output code length
: 4.9 m (direct-attached with BNC)
Operating temperature range
: -40 to 120 °C
Outer dimensions
: 13 (W) × 33 (H) × 60 (D) mm
Weight : approx. 130 g (cable included)

■ IP-292/296 Ignition pulse detector

Applicable engine
: 2/4 cycle gasoline engine
Detection point
: Conductor of ignition coil primary side (IP-292), Conductor of ignition coil secondary side (IP-296)
Code diameter
: max. ϕ10 mm
Output code length
: 4.9 m (direct-attached with BNC)
Operating temperature range
: -40 to 120 °C
Outer dimensions
: 102 (W) × 48 (H) × 30 (D) mm
Weight : approx. 280 g

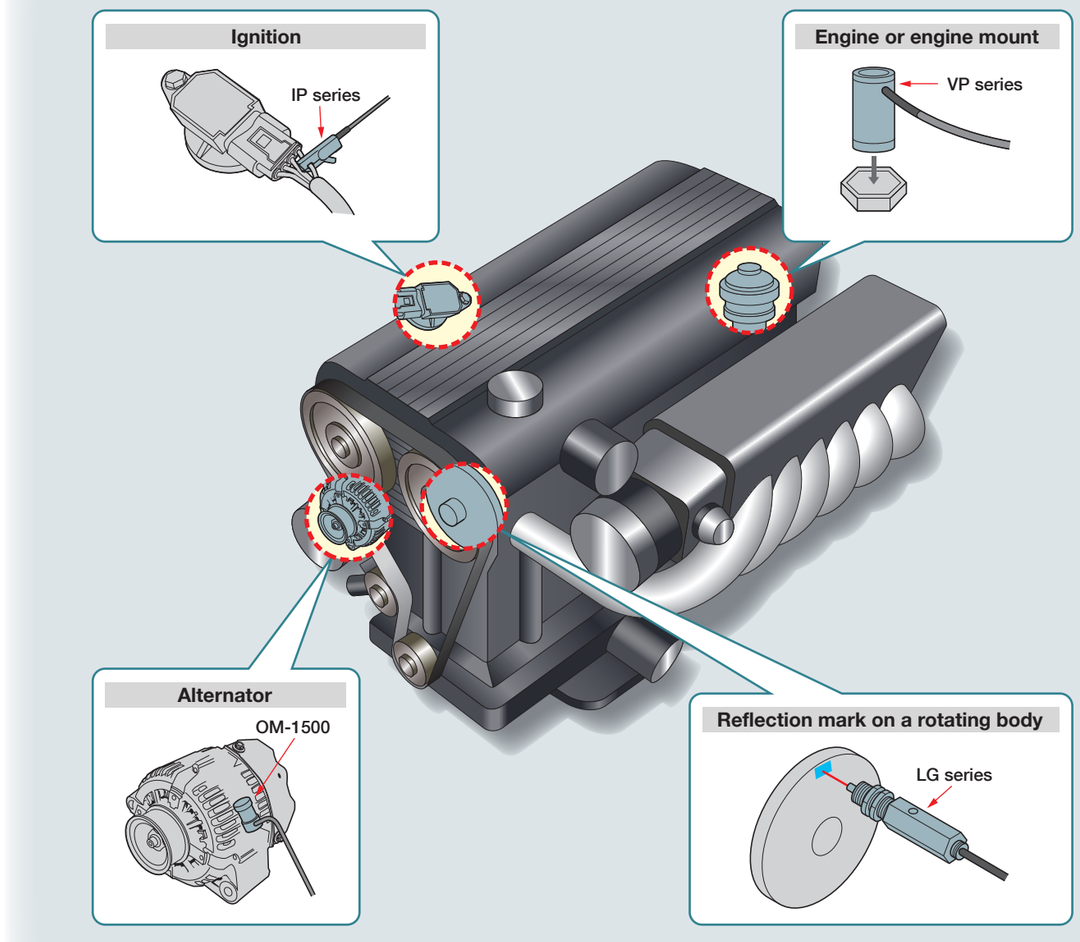
For Motor and Gasoline Engine

■ OM-1200 Motor / gasoline engine RPM detector

Applicable engine
: 2/4 cycle gasoline engine, EV/HEV, motor
Detection method
: Electromagnetic induction type
Signal cable : MX-005/010/015/020 (sold separately)
Operating temperature range
: 0 to 80 °C
Outer dimensions
: ϕ16 × 54 mm (sensor)
ϕ16 × 80 mm (sensor with connection cable)
Weight : approx. 65 g

■ OM-1500 Motor / gasoline engine RPM detector

Applicable engine
: 2/4 cycle gasoline engine, EV/HEV, motor
Detection method
: Electromagnetic induction type
Output code length
: 4.9 m (direct-attached)
Operating temperature range
: -10 to100 °C
Outer dimensions
: ϕ16 × 30 mm
Weight : approx. 130 g (cable included)



* The above is an example of measurement. The setting location may be different depending on a vehicle type.
* Measurement may not be performed or measurement range may be changed depending on an engine type.

For Gasoline/Diesel Engine

■ VP-202/1220 Engine vibration detector

Applicable engine
: 4-cylinder diesel engine, 4-cylinder gasoline engine
Detection point : Bolt on an engine/cylinder head part, engine fixing bolt
Detection method
: Electromagnetic vibration detection type
Output signal : Pulse signal
Output code length
: 2.9 m (direct-attached)
Operating temperature range
: 0 to 100 °C
Outer dimensions
: ϕ25 × 50 mm
Weight : approx. 110 g (VP-202)
approx. 130 g (VP-1220)

For Gasoline/Diesel Engine

■ MP-9100/911 Electromagnetic rotation detector

Output voltage
: 2.0 Vp-p or more (1 kHz, load 10 kΩ) M=1, gap=0.5 mm
Rotation speed
: 200 to 35,000 r/min (60 P/R)
Detection gear optimum module
: 1 to 3
Operating temperature range
: -10 to 90 °C
Detection distance
: 0.5 to 1 mm
Power requirement
: not needed
Outer dimensions
: MP-9100 ϕ20 × 58.5 (L) mm
MP-911 ϕ20 × 64 (L) mm
Weight : MP-9100 approx. 90 g
MP-911 approx. 300 g (cable included)
Others : MP-930 Oil proof type
MP-935 Oil proof & heat resistant type
MP-9120 Low impedance type

■ MP-981/9820 Magneto-electric rotation detector

Output waveform
: Square Hi ; 5±0.5 V
Lo ; 0.5 V or less
Measurement range
: MP-981 1 Hz to 20 kHz
MP-9820 1 Hz to 100 kHz
Detection gear
: Ferromagnet, gear width 3 mm or more, module 0.5 to 3
Output type : Floating ground
Output impedance
: approx. 330 Ω
Operating temperature range
: -10 to 70 °C
Power requirement
: 12±2 VDC, approx. 40 mA (at 12V)
Outer dimensions
: ϕ22 × 75 mm (length)
Weight : approx. 80 g
(including 2 pcs. of mounting nut)

For Gasoline/Diesel Engine

■ LG-9200 Optical rotation detector

Detection method
: Photoelectric reflection using visible light
Detection distance
: 20 to 40 mm (when using 12 mm square reflection mark)
Light source : Light emitting diode (red visible light)
Max. response speed
: 40 m/s (Circumpherential speed conversion of rotating shaft)
Output waveform
: Rectangular Hi ; 5 ±.05 V
Lo ; 0.5 V or less
Output impedance
: 1 kΩ or less
Operating temperature range
: -10 to 60 °C
Power requirement
: 12±2 VDC, approx. 60 mA (at 12 V)
Outer dimensions
: 21 (W) × 24 (H) × 117 (D) mm
Weight : approx. 150 g
(including 2 pcs. of mounting nut)

■ Specification

Input Section	Applicable detectors	IP-292/296/3000A/3100, OM-1200/1500, VP-202/1220, LG-9200, MP-900/9000 series/981, EXT(PULSE), ECU crank pulse signal (option)	
	Measurement range	IP-292/296/3000A/3100 OM-1200/1500 VP-202/1220 CRANK PULSE	120 to 20000 r/min
		MP-900/9000 series	30 to 99999 r/min
		MP-981, LG-9200, EXT (PULSE)	0 to 99999 r/min
	Input frequency range	0.1 Hz to 120 kHz*1	
Display	Type (size)	Fluorescent display tube (52.5 × 11.5 mm)	
	Display range	0 to 99999 r/min*1	
	Accuracy	±0.01 %F.S. (±1 count) or less	
Analog Output	Output range	0 to 10 V	
	Range setting	1 to 99999 r/min (set in steps of 1 r/min)	
	Load resistance	100 kΩ or higher	
	Response	Updates in less than 8 µs after cycle becomes stable	
	Resolution	16 bit	
Pulse Output	Output item (selectable)	DIRECT : Wave-shaped output 0.5 [P/R]: Output r/min value to obtain 0.5 P/R 1 [P/R] : Output r/min value to obtain 1 P/R 60 [P/R] : Output r/min value to obtain 60 P/R	
	Signal level	0 to 5 V logic signal (Lo: 0.4 V or lower, Hi: 4.5 V or higher)	
	Load resistance	100 kΩ or higher	
Contact Output	Item	Engine run, Over run	
	Setting range	1 to 99999 r/min	
	Contact capacity	30 VDC/0.1 A	
	Connector (cable side)	Phoenix Contact MVSTBR2, 5/4-ST-5, 08	
Digital Interface		RS-232C/CAN (option)	
Other Function	Moving average	2 to 720 times	
	Deceleration calculation	Selection of time or cycle Time : 1 to 1200 ms Cycle: ×1.5 / ×3 / ×5 / ×8 / ×16	
	Trigger assist	Automatic setting of trigger level employed until pulse detection	
	Resume	Preserving condition values even while power is off.	
	Condition memory	Maximum of five types of condition memory can be saved.	

General Specification	Power requirement	9 to 28 VDC, 12 VA or less AC adapter (100 to 240 VAC, 36 VA or less) Input cable with fuse clips on both ends (option)
	Outer dimensions (weight)	170 (W) × 49 (H) × 120 (D) mm (approx. 700 g)
	Operating temperature range	0 to +50 °C*2
	Operating humidity range	5 to 85 % (with no condensation)
	CE marking	Low Voltage Directive : 2014/35/EUEN61010-1 class 1 (When AC adapter is used) EMC Directive : 2014/30/EUEN61326-1 class 1 Industrial Environment RoHS Directive : 2011/65/EUEN50581
	FCC	47 CFR Part 15 Subpart B Class A
	Accessory	Rubber foot × 4 AC adapter × 1 (100 to 240 VAC, exclusive for 16 VDC) Instruction Manual × 1

*1 When EXT (PULSE) is used.
*2 AC adapter operating temperature range: 0 to +40 °C.

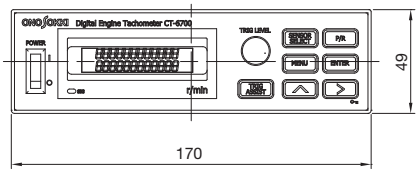
■ Product List

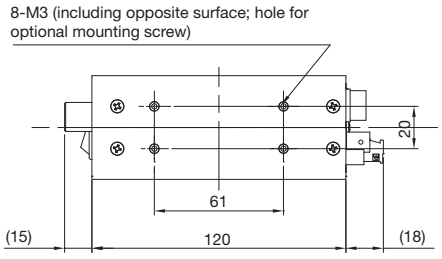
Model name	Product name
CT-6700	Digital Engine Tachometer (main unit)
CT-0671	CAN output function
CT-0672	ECU crank pulse signal input function*3
CT-0673	Panel mount fitting
CT-0674	Panel mounting jig (assisting jig for replacement from CT-6520 (B), option)*4
CT-0675	Protection handles
CT-0676	Light shielding hood

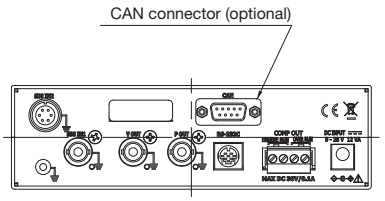
*3 The function enables to measure the engine rotation speed from the ECU crank pulse signal.
*4 For using the CT-0674, the CT-0673 is necessary.

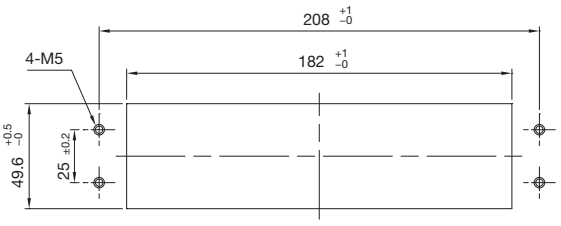
■ Outer Dimensions

(unit: mm)









Recommended panel dimension with panel mount fitting (option)

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