

Thank you for your selection of the HT-6200 Handheld Digital Tachometer.

To ensure the performance of the HT-6200, please read this manual thoroughly.

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Omission of Issuance of Certificate

This product has been tested under strict inspections for correct operation before shipment. Please note that the issuance of certificate is omitted.

Warranty

1. This product is covered by a warranty for a period of one year from the date of delivery.
2. This warranty covers free-of-charge repair during the warranty period for defects occurred while the product is used under correct operating conditions according to descriptions in this manual and notices on the unit label.
3. For free-of-charge repair during the warranty period, contact your dealer or your nearest Ono Sokki sales office nearby.
4. Even during the warranty period, the following failures will be handled on a fee basis.

- (a) Failures or damages occurring through misuse, misoperation, repairing without ONO SOKKI'S approval.
- (b) Failures or damages occurring through mishandling (dropping) during transportation after purchase.
- (c) Failures or damages occurring by an Act of God (fires, earthquakes, flooding, and lightning), environmental disruption, or abnormal voltage.
- (d) Replenishment of expendable supplies, spare parts, and accessories.

This guarantee covers only the performance of the product itself only.

All inconvenience by the trouble of this product is not included.

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

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Functions and Operations

1. Power Switch

- ① When you slide the power switch upward, the power of the main unit turns ON.
- ② When you turn ON the power, the software version is displayed in the MAIN display and product code "HT6" of the main unit is displayed in the SUB display. Then, the measurement mode is entered.
- ③ For each parameter, the condition of previous measurement is backed up. However, the peak-hold mode becomes the

"NORMAL" condition.

- ④ Set each parameter at first whenever the measurement condition and function shall be changed.

2. Function of Each Switch

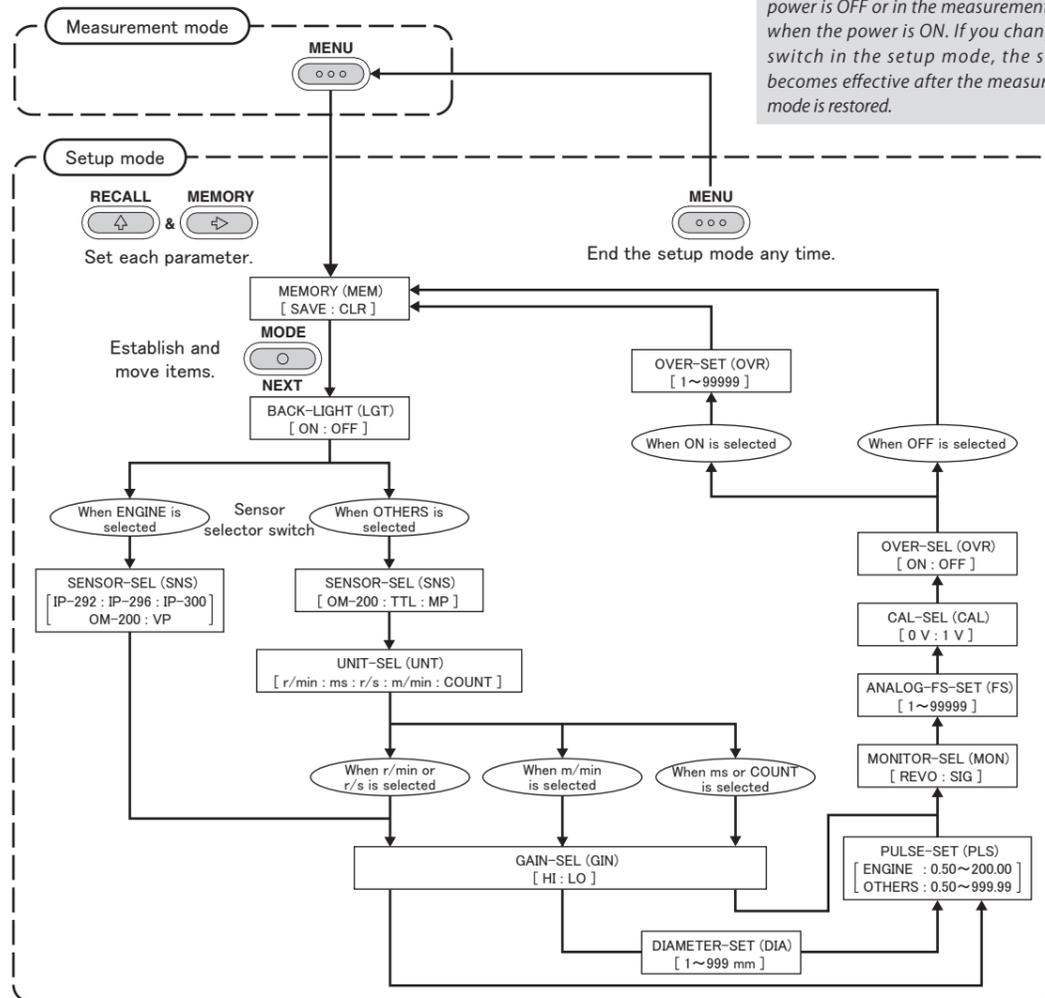
When you turn ON the power, each switch has a different function between the measurement mode and the setup mode. The function of each switch in each mode is shown below.

	Measurement Mode	Setup Mode
Power switch	Ends the measurement mode and then turns OFF the power.	Cancels the current setting and then turns OFF the power.
RECALL & ↑ switch	Recalls the memory value in sequence.	Changes the selection of the current setting. During numerical parameter setting, increments the numerical value of the relevant digit. When 9, returns to 0.
MENU switch	Selects the setup mode. When pressed during memory value call, returns to the measurement mode.	Establishes the current setting condition and then change to the measurement mode.
MEMORY & → switch	Memorizes up to 20 measurement values present when pressed.	During numerical parameter setting, moves the setting cursor to the right. When it is at the least significant digit, returns to the most significant digit.
MODE & NEXT switch	Changes the peak-hold mode (MAX, MIN and normal) in order.	Establishes the current setting condition and then moves to the next setting.

3. Setup Mode

When you press the MENU switch in the measurement mode, the setup mode is selected.

Then, set parameters using the RECALL & ↑ and MEMORY & → switches. Establish parameters and select items using the MODE & NEXT switch. The operation flow in the setup mode is shown below.

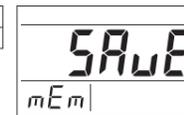


Operate the sensor selector switch when the power is OFF or in the measurement mode when the power is ON. If you change this switch in the setup mode, the setting becomes effective after the measurement mode is restored.

- ① Setting clearance of all memory values (Memory → mEm)
When you press the MODE & NEXT switch when "CLR" is displayed in the MAIN display or press the MENU switch to return to the measurement mode, the memory values are all cleared.

Note: The setting of this function is not retained. When you select this item, "SAuE" is initially selected.

SAuE	Saves the memory values.
CLR	Clears all the memory values.



Also for the following settings, when you press the MODE & NEXT switch to move items or press the MENU switch to return to the measurement mode, the setting condition is established.

- ② Setting the lighting condition of the LCD back light (Light → LGT)
Turn the LCD back light ON or OFF.

OFF	Back light OFF
ON	Back light ON



- ③ Selecting a connected sensor (Sensor → SNS)
Select a sensor to be used.

Use the sensor selector switch to select engine rotation measurement or rotation measurement other than engine.

OTHERS	OTHERS	Measurement other than engine rotation
ENGINE	ENGINE	Engine rotation measurement

ENGINE	IP292	Select when the IP-292 is used.
	IP296	Select when the IP-296 is used.
	IP300	Select when the IP-300A, IP-3100 is used.
	on200	Select when the OM-1200, OM-200 is used.
	UP	Select when the VP-1220, VP-202 is used.



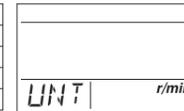
OTHERS	on200	Select when the OM-1200, OM-200 is used.
	TTL	Select when a sensor with TTL signal output is used.
	PIP	Select when the MP-9000 series is used.



Note: Inputting a TTL signal or other voltage signal with the IP-292 selected may cause damage to the external sensor. Therefore, be sure to select "TTL" before connecting the sensor.

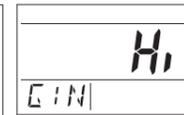
- ④ Setting the measurement unit (Unit → UNT)
Select the measurement unit for each measurement. The unit setting is effective only when "OTHER" is selected. The unit setting is fixed to "r/min" when "ENGINE" is selected.

r/min	Rotation speed
ms (*1)	Average period time (Decimal point position 0.0)
r/s	Rotation speed (Decimal point position 0.00)
m/min	Circumferential speed (Decimal point position 0.0)
COUNT	Integration value (No decimal point)



- ⑤ Setting the gain of the sensor amplifier (GAIN GIN) Set the gain of the sensor amplifier.

Hi	Set the gain of the sensor amplifier to the Hi level. Measurement is normally performed with the Hi level setting. However, if the rotation speed is not stable (or becomes higher than the normal value) when, for example, disturbance noise or a signal from other cylinders is detected, set the gain to the Lo level.
Lo	Set the gain of the sensor amplifier to the Lo level. If the rotation speed is not stable (or becomes lower than the normal value) when the Lo level is selected, the amplitude of the sensor signal may possibly be small and therefore set the gain to the Hi level.



- ⑥ Setting the diameter of the body of revolution (Diameter → dIA)
(Enabled only when m/min is selected as the unit setting.)
Set the diameter of the body of revolution when obtaining the circumferential speed from the rotation speed.

Setup range: 1 to 999 mm (When 0 is set, 1 is set automatically.)

* Set to "100" at the time of shipment.



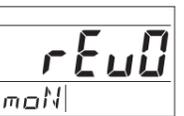
- ⑦ Setting the number of pulses (Pulse → PLS)
Set the number of pulses per rotation (P/R) according to the object under measurement. When "ENGINE" is selected in sensor selector switch. Setup range: 0.50 to 200.00 (Can be set in increments of 0.01)
When "OTHER" is selected in sensor selector switch. Setup range: 0.50 to 999.99 (Can be set in increments of 0.01)
Note: Please set appropriate range depending on.

* Set to "000.5" at the time of shipment.



- ⑧ Selecting the analog monitor output (Monitor moN)
Select a signal to be output as an analog output.

rEuO	Voltage output proportional to the rotation speed
Sig	Output for monitoring the sensor signal after waveform shaping (before pulse conversion)



* Set to "rEuO" at the time of shipment.

- ⑨ Setting the analog output full-scale (Full Scale FS)
Set the count value corresponding to the full-scale (F.S. value: 1V) of the analog voltage output. Setup range: 1 to 99999 (When 0 is set, 1 is set automatically.)
Note: When units other than "r/min" are chosen, a value ignoring the decimal point is set. For example, when 100.0 corresponds to 1V, set 1000.

* Set to "99999" at the time of shipment.



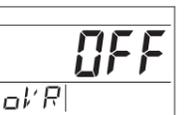
- ⑩ Setting analog output calibration (Calibration CAL)
Output the calibration signal (0V or 1V) for analog voltage output.
Note: The setting of this function is not retained. When you select this item, "0u" is selected initially. The selected analog output is enabled only while the same item is selected.

0V	0V output
1V	1V output



- ⑪ Setting the upper limit value against measurement value (Over oVR)
Turns the measurement value upper-limit function ON or OFF.

OFF	Measurement value upper-limit function OFF
ON	Measurement value upper-limit function ON

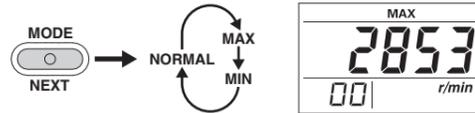


- ⑫ Setting the upper measurement value (Over oVR)
(Can be set only when the measurement value upper-limit function is set to ON.)
Set the upper measurement value. If the measurement value exceeds the specified value, OVER mark "oVR" lights up.
Setup range: 1 to 99999 (When 0 is set, 1 is set automatically.)
Note: Set a value ignoring the decimal point.

Measurement Operations

1. Measuring Peak-hold Value

- To measure the peak-hold value, select the desired peak-hold measurement mode (MAX or MIN) by pressing the MODE & NEXT switch in the measurement mode.
- When measurement of the peak-hold value starts, "MAX" or "MIN" lights up in the CONDITION display section of the LCD.



If "MAX" or "MIN" is not lit, the peak-hold mode is suspended.

(The current measurement value for the body of revolution is displayed.)

- Each peak-hold value is updated only when the peak-hold measurement mode is selected.
- To clear the peak-hold value, push "MODE & NEXT" switch to return to the state "MAX" or "MIN" is not on. And select "CLr" for setting "mEm"(Memory) in the setup mode and then return to the measurement mode.

The measurement value when cleared is set to "MAX" and "MIN."

The proper value is not set when the "CLr" is selected during "MAX" or "MIN" is on.

Note: If the peak-hold measurement mode is entered when the body of revolution stops, the "MIN" value becomes zero. Therefore, the value is not updated even if the body of revolution rotates, disabling measurement of the "MIN" value. Therefore, if the peak-hold measurement mode is entered or if the "MIN" value becomes zero when the body of revolution is rotating, once clear the peak-hold value before starting measurement.

Note: When the peak-hold value is cleared, the memorized measurement values are also cleared. The peak-hold value is also cleared when you turn OFF the power.

2. Memorizing Measurement Values

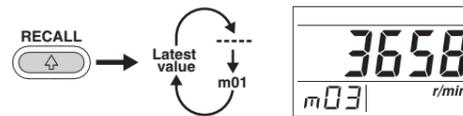
- To memorize the current measurement value, press the MEMORY & → switch during measurement.
- When the measurement value has been memorized, the numerical value in the SUB display is incremented. Therefore, the number "00" in the SUB display indicates that there is no measurement value memorized.
- Up to 20 measurement values can be memorized. When the number of the memory values reaches 20, no more values can be memorized. When you press the MEMORY & → switch at this time, "FUL" is displayed.



- Since memory values are stored in non-volatile memory, they are retained even after the power is turned OFF.

3. Recalling Memory Values

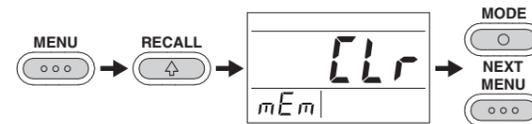
- Memory values can be called by pressing the RECALL & ↑ switch in the measurement mode. The memory No. is displayed as "mXX" (for example, m05) in the SUB display.
- Memory values are called from the latest memory No. and then in order of the memory No. m01, m02, m03, and so on.
- If there are three memory values, the value of memory No. m03 is displayed first. Then, the SUB display displays m04 and the MAIN display displays "-----" indicating that there is no measurement value memorized. Therefore, if there is no memory value, "-----" is displayed for m01.



- To return to the measurement mode, press the MENU switch. The numerical value in the SUB display changes to "XX" which indicates the number of values memorized (without leading "m").

4. Clearing All Memory Values

- To clear all memory values, select "CLr" for setting "mEm" (Memory) in the setup mode and then press the MODE & NEXT switch or press the MENU switch to return to the measurement mode.



- When the memory values are cleared, the numerical value in the SUB display becomes "00."

Note: When you perform the memory clear operation (all clear), the memory values are all cleared. When there is the peak-hold value, it is also cleared at the same time.

5. Clearing COUNT Value

- To clear the COUNT value when an integrated value counting is performed selecting "COUNT" in measurement unit setting, push "MENU" switch after a signal input is OFF in the state of measurement mode.

Note: The integrated value is not cleared even if the signal input is OFF in setup mode.

Description of CONDITION Display Section

1. ERROR Display

If the "ERROR" mark lights up, one of the following error has occurred.

- If the measurement value exceeds "99999", a display digit over error occurs.
 - The display value is averaged. Therefore, even if the display value is smaller than "99999" (except for the decimal point), this mark lights up when the result of one measurement is larger than "99999".
- If the input frequency exceeds the upper-limit frequency corresponding to the revolution of the measurement range, a frequency over error occurs.
 - Although the display value is averaged, this mark lights up if the result of one measurement exceeds the upper-limit frequency. Frequency range: 0.1 to 1666.66 Hz

2. LOW Display

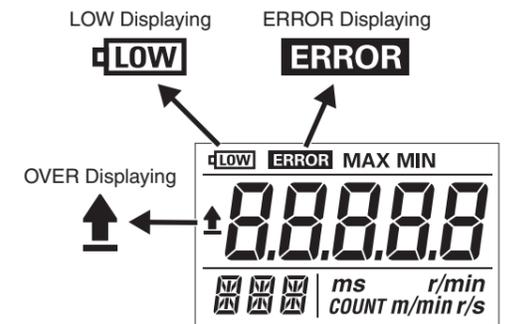
If the "LOW" mark lights up, the battery has been consumed and the low battery condition occurred.

- This mark lights up if the battery voltage drops to 4.5V or lower.
- If this mark lights up, immediately replace the four batteries with new ones. Using the consumed batteries may disable measurement.
- If the batteries are further consumed under this condition, measurement is disabled and the MAIN display displays "-----".
- If the battery voltage drops to about 4.5V or lower, the back light becomes dark (with no problem).

3. OVER Display (Blink)

With the measurement value upper-limit function set to ON in setup mode, if the display value exceeds the upper-limit setting, the "↑" mark appears.

- The display value is averaged. Therefore, even if the display value is smaller than the upper-limit setting, this mark appears. when result of one measurement exceeds the upper-limit value.
- When the measurement value exceeds the upper-limit value, this mark blinks in setup mode.

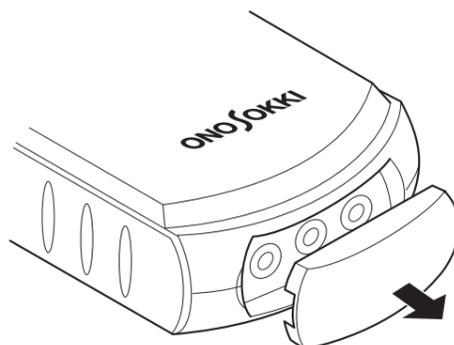


Outputs

1. Analog Output

[When REVO is selected]

- Analog voltage with the setting of the analog output "F.S." (full scale) in the setup mode is output from the analog output jack.
- The analog output becomes 1V when the value of the MAIN display agrees with the full-scale setting. The minimum load resistance of the analog output is 100 kΩ.

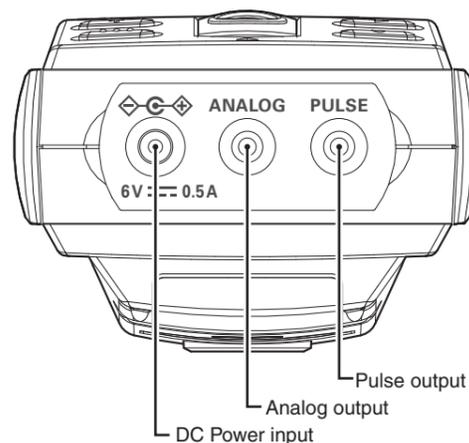


[When SIG is selected]

- A sensor signal after waveform shaping (signal before pulse waveform conversion) is output.

2. Pulse Output

- A pulse waveform shaped according to the detected rotation signal is output from this jack.
- As for the output level, the Hi level is 4.5 to 5V and the Lo level 0 to 0.5 V. The minimum load resistance is 100 kΩ.



Troubleshooting

If you perceive any abnormal condition, first check the following points. If the instrument does not operate correctly after check, contact your dealer (Ono Sokki agency) or Ono Sokki sales office nearby.

Symptom	Check Point	Countermeasure
No display	<ol style="list-style-type: none"> Are batteries set ? Are the batteries set at correct polarity ? Are batteries consumed ? When using the AC adapter, is the dedicated AC adapter connected to an outlet and the DC input connector of the main unit ? 	<ol style="list-style-type: none"> Set batteries. Put the batteries at the correct polarity. Replace all batteries with new ones. Plug the dedicated AC adapter to an outlet and then connect the DC plug to the DC input connector of the main unit.
Unstable display	<ol style="list-style-type: none"> Is sensor selection appropriate ? Is the trigger level appropriate ? Is the amplifier gain appropriate ? 	<ol style="list-style-type: none"> Select the sensor used with the setup menu or sensor selector switch. Adjust the trigger level adjustment volume so that the indicator blinks stably. If the rotation display is higher than the normal value, set the amplifier gain to "Lo"; otherwise, set it to "Hi." Then, adjust the trigger level again.
Abnormally high or low rotation speed	<ol style="list-style-type: none"> Is the setting of the number of pulses appropriate ? 	<ol style="list-style-type: none"> Set correctly the number of pulses per rotation (P/R) according to the body of revolution under measurement.