ONO SOKKI

Digital Tachometer (For high speed)

HR-6800

Instruction Manual (Function Reference)

Thank you for your selection of the HR-6800 Digital Tachometer.
To ensure the performance of the HR-6800, please read this manual thoroughly.

■ 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 lightening), 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 HR-6800 unit turns ON.

② When you turn ON the power, the software version is displayed in the MAIN display and product code "HR6" of the main unit in the SUB display. Then, the measurement mode or setup lock mode is entered.

③ Each parameter condition used in previous measurement is backed up. However, the "NORMAL" peak-hold mode is entered.

④ When you perform measurement for the first time, set each parameter first.

2.Function of Each Switch

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

	Measurement Mode	Setup Lock Mode	Parameter 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	Calls 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 set to 9, returns to 0.
MENU switch	Selects the parameter setup mode. When pressed during memory value call, returns to the measurement mode. Pressing this switch for 3 seconds or longer selects the setup lock mode.	Pressing this switch for 3 seconds or longer selects the measurement mode.	Applies the current setting and then selects 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 this order.		Applies the current setting and then moves to the next setting.
Type A/B selector switch	Type A: Normal mode (Hi and Lo ranges selectable) Type B: Conventional model compatible mode (when used as a substitute for the HR-205)		When the parameter setup mode is selected, the selection is not enabled until control returns to the measurement mode.

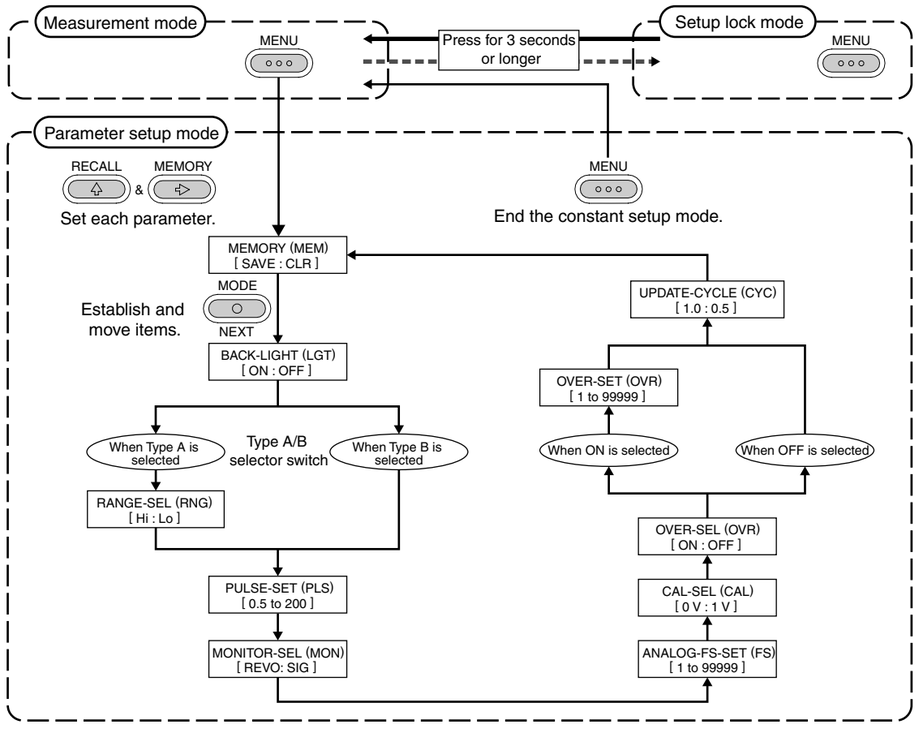
3.Setup Lock Mode

The setup lock mode is a function for preventing parameter setups from being carelessly changed. If you press the MENU switch for 3 seconds or longer in the measurement mode, "LoC" is displayed in the SUB display for one second and the setup lock mode is entered. In the setup lock mode, if you press the MENU switch, "LoC" is displayed in the SUB display for one second (the parameter setup mode cannot be entered).
To cancel the setup lock mode, press the MENU switch for 3 seconds or longer again. At this time, "UNL" is displayed in the SUB display for one second and the measurement mode is entered. Setup lock mode and measurement mode conditions are also saved when the power is turned OFF.

4.Parameter Setup Mode

When you press the MENU switch in the measurement mode, the parameter setup mode is selected.
Then, set parameters using the RECALL & ↑ and MEMORY & → switches. Apply parameters and select items using the MODE & NEXT switch.
The operation flow in the parameter setup mode is shown below.

Operate the Type A/B selector switch when the power is OFF or in the measurement mode when the power is ON. If you change it in the parameter setup mode, the selection will be enabled when control returns to the measurement mode.



Before setting each parameter in the parameter setup mode, select the measurement mode to be used.
There are two different measurement modes (A and B) which can be selected with the Type A/B selector switch on the right-hand side face.

Type A B	A	Normal measurement mode There are two measurement ranges: Hi and Lo.
	B	Set this mode when used as a substitute for a conventional model, such as the HR-205, etc. Note: Not completely compatible with conventional models.

Type A is applicable to measurement of high-speed and low-speed rotations by setting rotational range Hi or Lo with RANGE-SEL in the parameter setup mode.
Measurable rotational speed range in each mode is as shown below.

Type selection	RANGE	Rotational speed range
A	Hi	10,000 to 999,990 r/min
	Lo	100 to 50,000 r/min
B	—	200,000 to 999,990 r/min

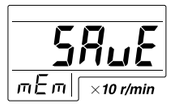
* When the number of pulses is set to "1"
* Generally, use Type A.

① Setting the 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 function, "SAuE" is initially selected.

SAuE	Retains the memory values.
CLr	Clears all the memory values.



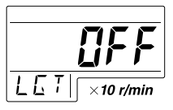
Also for the following settings, when you press the MODE & NEXT switch to move selection or press the MENU switch to return to the measurement mode, the setting is applied.

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

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

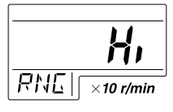


③ Setting Type A measurement range (Range-Sel → RNG)

Set the Type A measurement range.

Hi	Set the measurement range to the high rotation measurement range.
Lo	Set the measurement range to the low rotation measurement range.

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

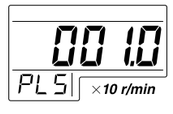


④ Setting the number of pulses (Pulse → PLS)

Set the number pulses (P/R) per rotation according to the body of revolution.

Setup range: 0.5 to 200

* Set to "001.0" at the time of shipment.

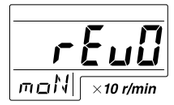


⑤ Selecting analog monitor output (Monitor → moN)

Select a signal to be output as analog output.

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

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



⑥ Setting analog output full-scale value (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.)

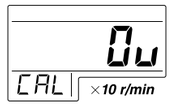
* Set to "99999" at the time of shipment.

⑦ Analog output calibration (Calibration → CAL).

Outputs the calibration signal (0V or 1V) for analog voltage output.

Note: The setting of this function is not retained. When you select this function, "0u" is selected initially.
The selected analog output is enabled only while the same item is selected.

0 V	0V output
1 V	1V output

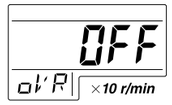


⑧ Setting the measurement value peak-limit function (Over → oVR)

Turns the measurement value peak-limit function ON or OFF.

OFF	Measurement value peak-limit function OFF
ON	Measurement value peak-limit function ON

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



⑨ Setting the measurement value peak-limit (Over → oVR)

(Can be set only when the measurement value peak-limit function is set to ON.)

Set the measurement value peak-limit.

If the measurement value exceeds the specified value, OVER mark "▲" lights up.

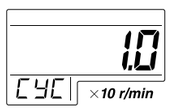
Setup range: 1 to 99999 (When 0 is set, 1 is set automatically.)

⑩ Setting the refresh time (Update Cycle → CyC)

Set the refresh time of the rotational speed.

1.0	Set the long refresh time. At about 1.0-second intervals
0.5	Set the short refresh time. At about 0.5-second intervals

* Set to "1.0" at the time of shipment.

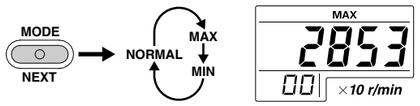


Measurement Operations

1.Measuring Peak-hold Value

① 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.

② 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.)

③ Each peak-hold value is updated only when the peak-hold measurement mode is selected.

④ To clear the peak-hold value, select "CLr" for setting "mEm" (Memory) in the setup mode and then return to the measurement mode.

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

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

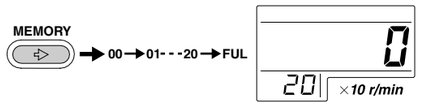
① To memorize the current measurement value, press the MEMORY & → switch during measurement.

② 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.

③ 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.



④ Since memory values are stored in non-volatile memory, they are retained even after the power is turned OFF.

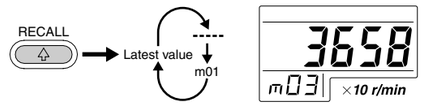
3.Recalling Memory Values

① 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.

② Memory values are called from the latest memory No. and then in order of the memory No. m01, m02, m03, and so on.

③ 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.

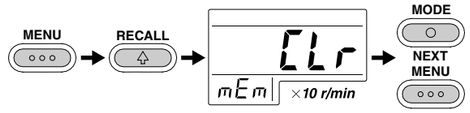


④ To return to the measurement mode, press the MENU switch.

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

① 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.



② 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.

Description of CONDITION Display Section

1.ERROR Display

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

① **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", this mark lights up when the result of one measurement is larger than "99999."**

② With Type A (Hi) and Type B, if the input frequency exceeds 16.666 kHz, a frequency over error occurs. With Type A (Lo), if it exceeds 1.666 kHz, the same error occurs.

* Although the display value is averaged, this mark lights up if the result of one measurement exceeds the upper-limit frequency.

2.LOW Display

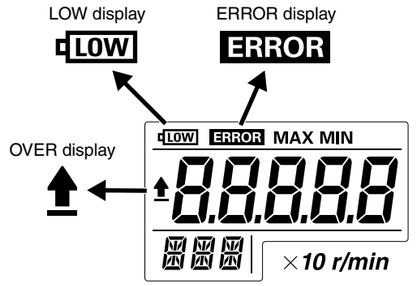
If the "LOW" mark lights up, the battery has been consumed and the low battery condition occurred.

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

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



Outputs

1.Analog output

[When REVO is selected]

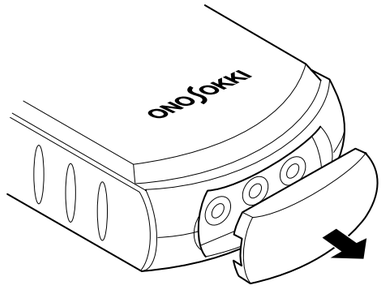
- Analog voltage with the setting of the analog output "F.S." (full scale) in the setup mode is output from the analog output jack.
- The analog output becomes 1V when the value of the MAIN display agrees with the full-scale setting. The minimum load resistance of the analog output is 100 kΩ.

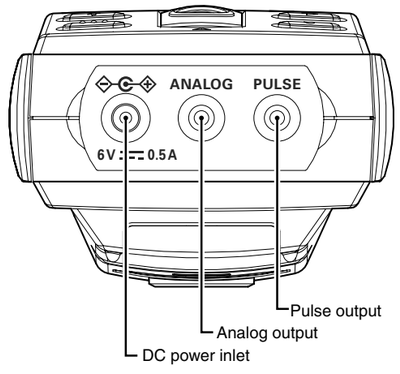
[When SIG is selected]

- A sensor signal after waveform shaping (signal before pulse waveform conversion) is output.
- If you can observe the waveform with an oscilloscope, make sure that this signal is equivalent to a sine wave with an amplitude of about 2V. If the waveform is not a sine wave or if the amplitude is small, stable measurement is not possible.

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 normally after check, contact your dealer (Ono Sokki agency) or Ono Sokki sales office nearby.

Symptom	Check Point	Solution
No display	① Are batteries set ? ② Is the battery polarity correct ? ③ Are batteries consumed ? ④ When using the AC adapter, is the dedicated AC adapter connected to an outlet and the DC input terminal of the main unit ? ⑤ Is the measurement type correct ? ⑥ Is the measurement range of Type A correct ?	① Set batteries. ② Change the battery polarity correctly. ③ Replace all batteries with new ones. ④ Plug the dedicated AC adapter to an outlet and then connect the DC plug to the DC input terminal of the main unit. ⑤ Set the slide switch on the side face. ⑥ Set the measurement range (RNG) of the setup parameter.
Unstable display	① Is the trigger level appropriate ? ② Is the cable connector loose ? ③ Is the connection cable damaged ?	① Adjust the trigger level adjustment volume so that the indicator blinks stably. ② Connect the connector properly. ③ Replace the connection cable with a new one.
Abnormally high or low rotation speed	① Is the setting of the number of pulses appropriate ?	① Set correctly the number of pulses per rotation (P/R) according to the body of revolution under measurement.