KOSO® — Feel The Speed

INSTRUCTIONS

● Thank you for purchasing our product. Before installing/operating the product, please read the instructions carefully and retain them for future reference.

⚠ Attention!

● For installation, please follow the steps described. Any damage caused by wrong installation shall be imputed to the users.
● To avoid a short circuit from occuring do not pull or modify the wires during installation.
● Do not disassemble or change any parts. Opening and disassembling this unit will void any warranty.
● Maintenance and repairs should be executed by our professionals only.
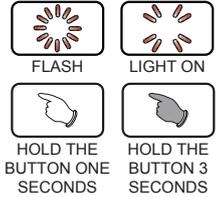
◎ Symbol description:

NOTE

⚠ Some procedures must be followed to avoid damages to the product.

⚠ **WARNING!** Certain procedures must be followed to avoid damages to yourself, to the vehicle or others.

FLASH | LIGHT ON

HOLD THE BUTTON ONE SECONDS | HOLD THE BUTTON 3 SECONDS

1 Accessories

1 Meter X1	**2** Main wiring harness X1	**3** RPM wire (TYPE A) X1	**4** RPM wire (TYPE B) X1

5 External button X1	**6** Gasket X1	**7** Washer X1	**8** Nut X1

9 Meter bracket X1	**10** M5 washer X2	**11** M5 Anti-slip nut X2	**12** Oxygen sensor X1 — Bosch LSU 4.9

13 Sensor bung X 1	**14** V type Meter bracket x 1 set	**15** Handle bar clamp and rubber x 1	**16** M6 x 18L mm screw x 1

17 M6 x P1.0 mm nut x 1	**18** M6 washer x 1	**19** Aluminum bushing x 1	**1-2 Optional accessory** — **1** Sensor adapter X1 (For 2 strokes engine only!)

2-0 Oxygen sensor installation

1. Drill a 22mm (7/8") hole in the exhaust system at 20cm away from the exhaust flange.
   20cm (+/- 8")

2. Weld the sensor adapter to the muffler.

3. Install the oxygen sensor adapter. (For 2-stroke engine only!)

4. Install the oxygen sensor into the adapter.

NOTE If the meter is used on a 4-stroke engine. Please skip step3.

2-1 Wiring installation instructions

Connect to Lambda Sensor LSU 4.9

Black - Ground wire connects directly to the negative pole of the battery.

Mid-way connector

Red - Positive pole (Connect to the battery **DC 12V**)

Brown/Red - RPM signal

External button (Accessories 5)

Ignition coil positive

RPM wire (TYPE A) (Accessories 3)

RPM wire (TYPE B) (Accessories 4)

Mid-way connector

A

B

RPM wire (TYPE B) (Accessories 4)

EMS CDI

Flywheel

Ignition pulse

Pick up

Tachometer

C

Coil

Spark plug wire

Spark plug

Spark plug cap

NOTE When connecting the power wire, please follow the instructions carefully.
If the red & brown wires are connected in parallel, the meter will not work properly.

⚠ The RPM wire installation
We recommend installing R type spark plugs or low-resistance spark plug caps at the same time.
A. Connect the RPM wire (Type A) on the spark plug wire by connecting the male and female connectors.
B. Connect the RPM wire (Type B) to the pick up sensor.
C. Connect in parallel the RPM wire (Type A) with the original tachometer signal wire.
The best signal source will be in order as C>B>A, we suggest that you try a different way if you have problems getting the RPM signal.

2-2 Installation instructions
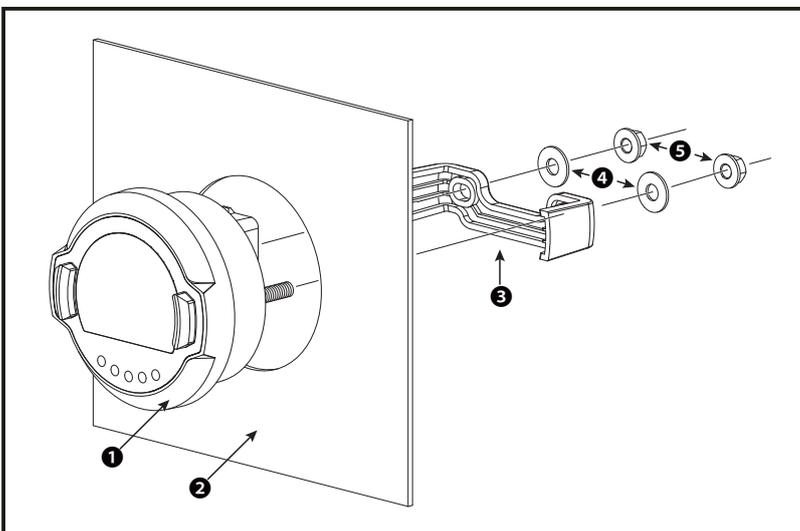
When installing, please follow the steps bellow.

1. Meter x1 (Accessory 1)
2. Vehicle

NOTE An opening must be made in the vehicle, with a size ≧ 64 mm.

3. Meter bracket x1 (Accessory 9)
4. M5 washer x2 (Accessory 10)
5. M5 Anti-slip nut x2 (Accessory 11)

2-3 Installation instructions
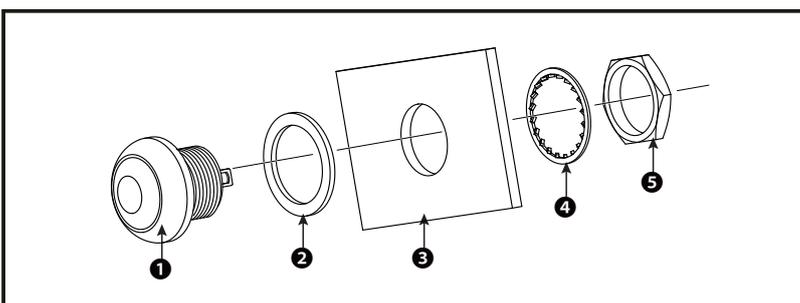
When installing, please follow the steps bellow.

1. External button x1 (Accessory 5)
2. Gasket x1 (Accessory 6)
3. Vehicle

NOTE An opening must be made in the vehicle, with a size ≧ 12 mm.

4. Washer x1 (Accessory 7)
5. Nut x1 (Accessory 8)

3-1 Basic function instruction
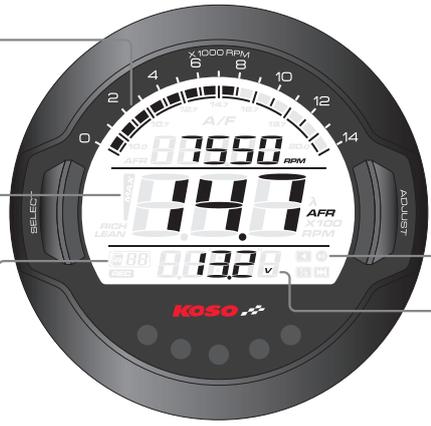
Tachometer
- Display Range : 0 ~ 14,000 RPM
- Display unit：100 RPM
  Tachometer (Displays in segments)
- Display Range :
  Displays in 14 segments (100 RPM each segment) Air-fuel ratio
- Display Range : 9.0 ~ 24.0
- Display unit：0.1
  Air-fuel ratio (Displays in segments)
- Display Range : Displays in 12 segments

Max. RPM
- Display Range : 0 ~ 14,000 RPM
  Max. Air-fuel ratio (value of ratio) record
- Display Range : 9.0 ~ 24.0
  Max. Air-fuel ratio (λ) record
- Display Range : 0.61 ~ 1.63

Play mode Speed
- 1x play/pause
- 1/3x play/pause
- 3x play/pause
- 1x rewind/pause

Type of RPM signal
- Setting range : Hi Act、Lo Act
  Warning for RPM
- Setting range : 1,000 ~ 14,000 RPM
- Setting unit : 100 RPM
  Warning for low voltage
- Setting range : 8.0 ~ 13.0 V
- Setting unit : 0.1 V
  Backlight brightness
- Setting range : 1 - 5 (darkest)~ 5 - 5 (brightest)

Record
- Maximum number of recorded runs: 50 runs
- Maximum recording time for a single record run: 99m 59s 90; the recording will stop upon reaching the maximum time.
- Total recording time: Approximately 3.15 hours

Maximum RPM and air-fuel ratio for a single run
- Scope of recording for RPM：0 ~ 14,000 RPM
- Air-fuel ratio (value of ratio) record：9.0 ~ 24.0
- Air-fuel ratio (λ)record：0.61 ~ 1.63

3-2 Features and settings description

●Tachometer	Display Range : 0 ~ 14,000 RPM Display unit：100 RPM	●Air-fuel ratio	Display Range : 9.0 ~ 24.0 Setting unit : 0.1
●Tachometer (Display in segments)	Display Range : Displays in 14 segments (100 RPM each segments)	●Warning for Rich air-fuel ratio	Setting range : 9.0 ~ 14.7 Setting unit : 0.1 Default value : 14.4
●RPM input pulse	Setting range : 0.5、1、1.5、2、2.5、3、4、5、6、7、8、9、10、11、12、13、14、15、16、17、18、19、20、21、22、23、24	●Warning for Lean air-fuel ratio	Setting range : 14.7 ~ 24.0 Setting unit : 0.1 Default value : 15.0
●Type of RPM signal	Setting range : Hi Act、Lo Act Default value : Hi Act	●Air-fuel ratio (display segments)	Display Range : Displays in 12 segments
●Warning for RPM	Setting range : 1,000 ~ 14,000 RPM Setting unit : 100 RPM Default value : 8,000	○Operating voltage	DC 12V
		●Temperature range	-10 ~ +60°C
●Warning for low voltage	Setting range : 8.0 ~ 13.0 V Setting unit : 0.1 V Default value : 11.5 V	○Specifications	JIS D 0203(S2)
		●Meter Size	72 X 32.3 mm
		○Meter Weight	About 100 g
●Backlight brightness	Setting range : 1 - 5 (darkest)~ 5 - 5 (brightest) Default value : 5		

NOTE Design and specifications may change without further notice.

3-3 Meter size

Ø72 mm

32.3 mm

45 mm

Ø72 mm

M5xP0.8

18.4 mm
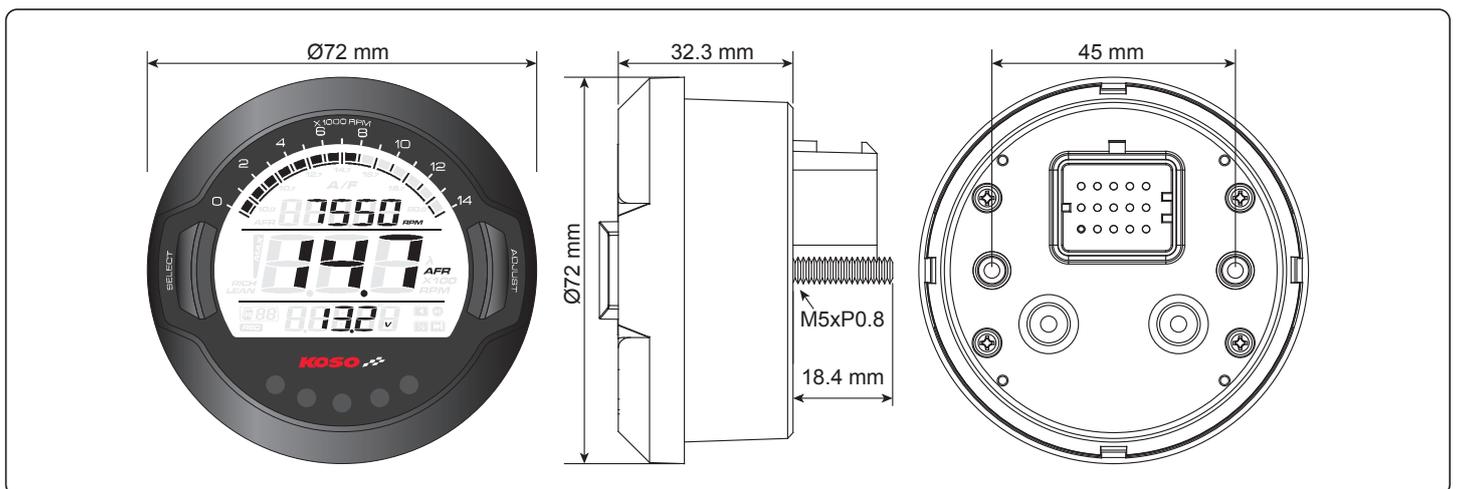
4-1 Description of Warnings

● Warning for rich air-fuel ratio

≤ Warning value
Default value : 14.4

≤ Minimum display value 9.0

● Warning for lean air-fuel ratio

≥ Warning value
Default value : 15.0

≥ Maximum display value 24.0

● Warning for RPM

≥ Warning value
Default value : 8,000 RPM

≥ Maximum display value 14,000 RPM

● Warning for low voltage

≤ Warning value 10 seconds
Default value : 11.5 V

4-2 Description of Select Button Function

● | RPM |
| Air-fuel ratio | screen, **press the select button once**
| Voltage |

to switch to | Air-fuel ratio |
| RPM |
| Voltage |

●**Hold the select button for 3 seconds**, and the display of air-fuel ration shifts from the value of ratio to **λ** value.

● | Air-fuel ratio |
| RPM | screen, **press the select button once**
| Voltage |

to switch to MAX | RPM |
| Air-fuel ratio |
| X |

● MAX | RPM |
| Air-fuel ratio | screen, **press the select button once** to return to | RPM |
| X | | Air-fuel ratio |
| Voltage |

●**Hold the adjust button for 3 seconds,** to clear the MAX recording screen.

● | RPM |
| Air-fuel ratio | screen.
| Voltage |

●
RPM
Air-fuel ratio
Voltage
screen, **press the adjust button once** to switch to the recording screen.

●**Hold the adjust button for 3 seconds,** and the Bar display shifts from RPM to air-fuel ratio.

●At the recording screen, **press the adjust button once** to switch to the play screen.

●**Press the external button once,** to enter the setting for the recording screen.

NOTE Please refer to 3-6 Setting.

●The playing screen, **press the adjust button once** to return to
RPM
Air-fuel ratio
Voltage
.

●**Press the select button once** to enter the play screen.

NOTE Please refer to 3-7 Setting.

●
RPM
Air-fuel ratio
Voltage
screen.

●Main screen, **press the adjust button once to enter** the recording screen.

●The recording screen, **press the external button once** to start recording.

NOTE **Hold the External button for 3 seconds,** to enter the operating screen for clearing records.

●At the screen during recording, **press the External button once** to stop recording.
●The first run has been recorded.

●To stop the recording screen, **press the External button once** to enter the recording screen for the second entry.

●Prepare to enter the recording screen for the second entry.

●Currently it is in the recording screen for the second entry.

●Currently it is in the recording screen for the third entry.

●Currently it is in the recording screen for the fourth entry.

●At the recording screen for the fifth entry, press the External button twice to return to the main screen.

●Main screen.

●Main screen, **press the adjust button twice to enter** the play screen.

●The playing screen, **press the select button once** to enter the screen of the highest RPM for the period of the recorded run.

●At the screen of the highest RPM, **press the adjust button once** to choose the run to be played.

NOTE **Hold the select button for 3 seconds,** to immediately slow down the play screen.

●To select the fourth run for playing, **press the adjust button once** to enter the play / stop screen.

NOTE At any point, **hold the adjust button for 3 seconds,** to return to the main screen.

●At the recording screen of the fourth run, **press the select button once** to start playing at normal speed.

●At the end of playing the entry at normal speed, **press the adjust button once** to enter the screen of playing at 1/3 speed.

●At the end of playing at 1/3 speed, **press the adjust button once** to enter the screen of playing at 3x speed.

●At the end of playing at 3x speed, **press the adjust button once** to enter the reverse screen.

●At the end of playing the reverse screen, **press the adjust button once** to return to the screen for maximum RPM.

●At the screen of maximum RPM, **hold the adjust button for 3 seconds** to return to the main screen.

●Main screen.

●At the main screen, **press the Adjust button** once to enter the recording screen.

●At the recording screen, **hold the External button** for three seconds to enter the operating screen for clearing records.

●The recording screen may also be cleared.

●Clearing the record; wait for a few seconds to complete clearing.

NOTE Where there is no record to be cleared, press either "Adjust," "Select," or "External" button to return to the recording screen.

●Clearing complete; wait for a few seconds to return to the recording screen.

●The recording screen.

5 **The Settings Screen Description**
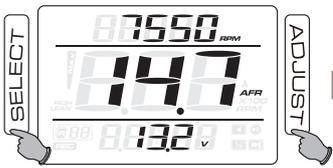
●Main screen

●Setting screen

●Warning for RPM
+1
+2
+3
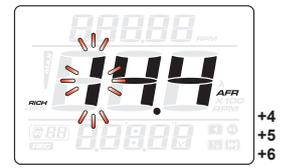
●Warning for rich air-fuel ratio
+4
+5
+6

●Warning for lean air-fuel ratio
+7
+8
+9

●In the main screen, **hold the Adjust button and the select button for 3 seconds** to enter the setting screen.
●**Press the Select button** to select the desired setting screen.
In order; Warning for RPM 、Warning for rich air-fuel ratio 、
Warning for lean air-fuel ratio 、Warning for low voltage 、Backlight brightness 、
RPM input pulse 、Type of RPM signal.

NOTE If you enter the settings screen and dont press any buttons for 30 seconds, it will automatically retun to the main screen.
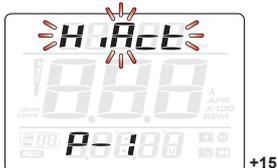
●Type of RPM signal
+15
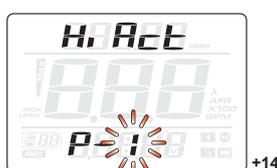
●RPM input pulse
+14
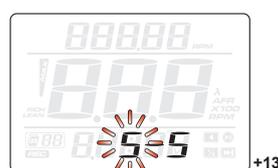
●Backlight brightness
+13
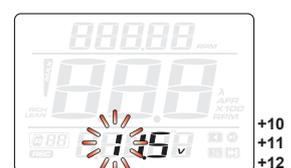
●Warning for low voltage
+10
+11
+12

5-1 **Over RPM Warning Setting**

●In the main screen, **hold the adjust button and the select button for 3 seconds** to enter the over RPM warning setting.

●**EX**：**To set the over RPM warning value to 9,000 RPM.**
●**Press the select button once** to choose the setting number.
⚠ Now the setting value will blink.

NOTE Setting range：1,000 ~ 14,000 RPM
Setting unit：100 RPM
Default value : 8,000 RPM.

●**Press the select button** to choose the setting number.

●Example：Set the over RPM warning setting value from 8,000 RPM to 9,000 RPM.
●**Press the select button twice** to enter the Warning for rich air-fuel ratio.

●Warning for rich air-fuel ratio screen.

5-2 Warning For Rich Air-Fuel Ratio Setting
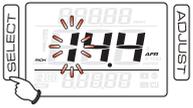
●**EX：To set the warning for rich air-fuel ratio value to 12.5.**
●**Press the select button once** to choose the setting number.
⚠ Now the setting value will blink.

NOTE Setting range：9.0 ~ 14.7
Setting unit：0.1
Default value : 14.4
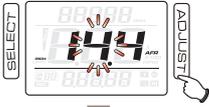
●**Press the adjust button** to choose the setting number.
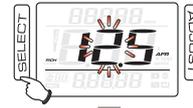
●Example：Set the warning for rich air-fuel ratio value from 14.4 to 12.5.
●**Press the select button twice** enter the warning for lean air-fuel ratio.

●Warning for lean air-fuel ratio screen.

5-3 Warning for lean air-fuel ratio Setting

●**EX：To set the warning for lean air-fuel ratio value to 19.5**
●**Press the select button once** to choose the setting number.
⚠ Now the setting value will blink.

NOTE Setting range：14.7 ~ 24.0
Setting unit：0.1
Default value : 15.0
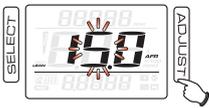
●**Press the adjust button** to choose the setting number.

●Example：Set the warning for lean air-fuel ratio value from 15.0 to 19.5.
●**Press the select button once** enter the warning for warning for low voltage.

●Warning for low voltage screen.

5-4 Warning For Low Voltage Setting

●**EX：To set the warning for low voltage value to 10.5.**
●**Press the select button once** to choose the setting number.
⚠ Now the setting value will blink.

NOTE Setting range：8.0 ~ 13.0 V
Setting unit：0.1 V
Default value : 11.5 V
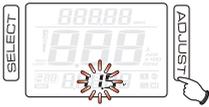
●**Press the adjust button** to choose the setting number.
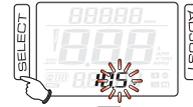
●Example：Set the warning for low voltage value from 11.5 V to 10.5 V.
●**Press the select button once** to enter the warning for backlight brightness.

●Backlight brightness screen.

5-5 Backlight Brightness Setting

●**EX：To set backlight brightness value to 3/5.**
●**Press the adjust button once** to choose the setting number.
⚠ Now the setting value will blink.

NOTE Setting range：1/5 ~ 5/5
Setting unit：1/5
Default value : 5/5

●Example：Set the backlight brightness value from 5/5 to 3/5.
●**Press the select button once** to enter the warning for RPM input pulse

●RPM input pulse screen.

5-6 RPM Input Pulse Setting
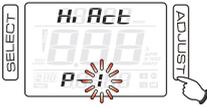
●EX. You want to connect the RPM signal wire to the pick up signal and there are 12 flywheel signals per turn.
●**Press the adjust button once** to choose the setting number.
⚠ Now the setting value will blink.

NOTE Setting range：P-0.5、P-1、P-1.5、P-2、P-2.5、P-3、P-4、P-5、P-6、P-7、P-8、P-9、P-10、P-11、P-12、P-13、P-14、P-15、P-16、P-17、P-18、P-19、P-20、P-21、P-22、P-23、P-24
Default value : P-1
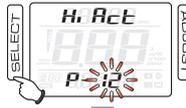
●Example：Set the RPM input pulse value from P-1 to P-12.
●**Press the select button once** enter the type of rotation speed signal.

●Type of RPM signal screen.

5-7 Type Of RPM Signal Setting
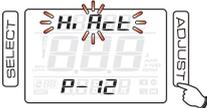
●**EX：To set type of RPM signal value to Lo Act.**
●**Press the adjust button once** to choose the setting number.
⚠ Now the setting value will blink.

NOTE Setting range : Hi Act、Lo Act
Default value : Hi Act

●Example：Set the type of RPM signal from Hi Act to Lo Act.
●**Press the select button once** to return to the main screen.

●Main screen.

6 Trouble shooting

The following situations do not necessarily indicate malfunction of the product. Please check the following points, before contacting us.

Trouble	Check item	Trouble	Check item
The meter doesn't work when the power is on. The meter shows wrong information. Tachometer doesn't appear or appears incorrectly.	●**The power isn't supplied to the meter.** →**Please make sure the wiring is connected. The wiring and fuse are not broken.** →**The battery is too old to supply needed power (DC 12 V).** ●Check the voltage of your battery, and make sure the voltage is over DC 12 V. ●May be due to poor connection of wires. →Please check whether the wiring is disconnected or has fallen off. ●May be due to the failure to change to the type R spark plug. ●May be wrong settings. →Please check the settings menu to confirm whether the setting for RPM is correct.	**Voltage doesn't appear or appears incorrectly.** A / F does not display or displays error.	●**Wiring for the connector may be poorly installed.** →**Please confirm whether the wires for the connector are properly installed.** ●May be due to poor connection of wires. →Please check whether the wiring is disconnected or has fallen off. ●May be due to the wrong setting of AFR. →Please check the settings menu to confirm whether the setting is correct.

※If the problems still can't be solved, please contact our technical department for assistance.