

kaise

DIGITAL TACHOMETER INSTRUCTION MANUAL

SK-8401

KAISE CORPORATION

FOR SAFETY MEASUREMENTS!!

To prevent an electrical shock hazard to the operator and/or damage to the instruments, read this instruction manual carefully before using the instrument. WARNINGS with the symbol ⚠ on the instrument and this instruction manual are highly important.

Important Symbols

- ⚠ The symbol listed in IEC 61010-1 and ISO 3864 means "Caution (refer to instruction manual)".
- ⚠ **WARNING** : The symbol in this manual advises the user of an electrical shock hazard that could result in serious injury or even death.
- ⚠ **CAUTION** : The symbol in this manual advises the user of an electrical shock hazard that could cause injury or material damages.

INTRODUCTION

Thank you for purchasing KAISE "SK-8401 DIGITAL TACHOMETER". To obtain the maximum performance of this instrument, read this Instruction Manual carefully, and take safe measurement.

1. UNPACKING AND INSPECTIONS

Confirm if the following items are contained in the package in good condition. If there is any damage or missing items, ask your local dealer for replacement.

- | | |
|-------------------------|--------|
| 1. Digital Tachometer | 1 pce. |
| 2. RPM Sensor (652) | 1 pce. |
| 3. Carrying Case (1020) | 1 pce. |
| 4. Batteries (1.5V R6P) | 2 pcs. |
| 5. Instruction Manual | 1 pce. |

2. SPECIFICATIONS

2-1. GENERAL SPECIFICATIONS

- DISPLAY (LCD)**
 - Numerical Display** : Maximum reading 9999, 15mm high
 - Units and Symbols** : rpm, , , , , , AUTO,
- OVERLOAD INDICATION** : "OL" indication at 10000rpm or more
- BATTERY WARNING** : indication at approx. 2.3V or less
- DISPLAY HOLD** : Hold indicating values by DH Key
- MEASUREMENT FUNCTION** : two-stroke cycle or four-stroke cycle selected by SHIFT Key
- MEASUREMENT SENSITIVITY** : Low or High selected by SHIFT Key
- AUTO POWER OFF** : Power turns off automatically after approx. 30 minutes. (cancelable)
- DIELECTRIC STRENGTH** : 1.2kV 50Hz sine wave, for 1 minute (between circuit and case)
- OPERATING POWER SUPPLY VOLTAGE** : 2.3 to 3.6V
- OPERATABLE TEMPERATURE & HUMIDITY** : 0 to 40°C, 80%RH or less in non-condensing
- STORAGE TEMPERATURE & HUMIDITY** : -20 to 60°C, 70%RH or less in non-condensing
- TEMPERATURE COEFFICIENT** : 0 to 18°C, 28°C to 40°C ; add ±1rpm/°C
- SAFETY LEVEL** : CE marking approved (IEC-61010-1, CAT I 1000V and EMC Test passed.)
- POWER SUPPLY** : 1.5V R6P or LR6 (AA) batteries x 2
- POWER CONSUMPTION** : 15mVA max. (Approx. 1.4 μVA in power-off)
- CONTINUOUS OPERATING TIME** : Approx. 300 hours (Manganese cell), Approx. 600 hours (Alkaline cell)
- DIMENSIONS & WEIGHT** : 148(H) × 83(W) × 33(D)mm, 180g
- ACCESSORIES** : 652 RPM Sensor, 995 Carrying Case, 1.5V R6P (AA) batteries x 2, Instruction Manual
- OPTIONAL ACCESSORIES** : 650 RPM Sensor (for High Tension Cord)

2-2. MEASUREMENT SPECIFICATION

(23°C±5°C, <80%RH in non-condensing)

Revolutions Per Minute (rpm)	Accuracy	Resolution	Maximum Input
Range			
100 to 9999 rpm	±0.2%rdg±10rpm	1 rpm	10000 rpm

3. SAFETY PRECAUTIONS

Correct knowledge of electric measurements is essential to avoid unexpected danger such as operator's injury or damage to the instrument. Read the following precautions carefully for safety measurements.

3-1. WARNINGS

⚠ WARNING 1. Checks of Instrument

Before measurement, check if there is no damage to the instrument. Dust, grease and moisture must be removed.

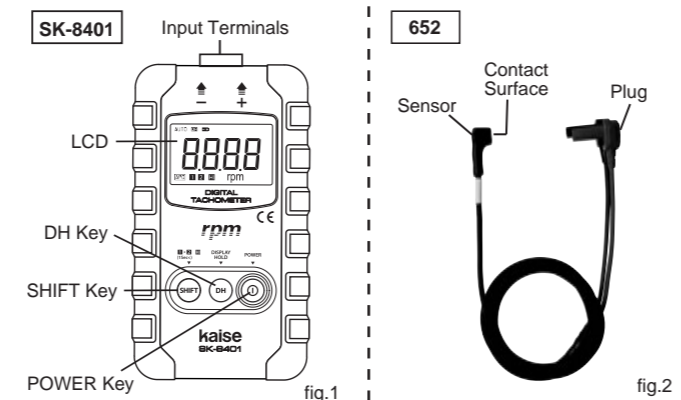
⚠ WARNING 2. Maximum Input Observance

Do not measure any RPM that might exceed the specified maximum input value.

3-2. GENERAL WARNINGS AND CAUTIONS

- ⚠ **WARNING 1.** Children and the persons who do not have enough knowledge about electric measurements must not use this instrument.
- ⚠ **WARNING 2.** Do not measure the electricity in naked of barefooted to protect yourself from electrical shock hazard. Away the instrument from hot and humid conditions. Do not apply hard mechanical shock or vibration (like in the car).
- ⚠ **CAUTION 1.** Do not polish the case or attempt to clean it with any cleaning fluid like gasoline or benzene. If necessary, use silicon oil or antistatic fluid.
- ⚠ **CAUTION 2.** Do not polish the case or attempt to clean it with any cleaning fluid like gasoline or benzene. If necessary, use silicon oil or antistatic fluid.
- ⚠ **CAUTION 3.** Remove the batteries when the instrument is out of use for a long time. The exhausted batteries might leak electrolyte and corrode the inside.

4. NAME ILLUSTRATION



4-1. LCD

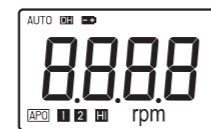


fig.3

- AUTO : Auto-ranging measurement
- : Lights up in display hold function
- : Low battery warning
- : Lights up when auto power off is activated
- : Lights up in two-stroke cycle measurement
- : Lights up in four-stroke cycle measurement
- : Lights up in high sensitivity measurement
- rpm : Lights up in RPM measurement

4-2. POWER Key

Press this key for 0.5 seconds or less to turn on. To turn off, press it for 1 second or more.

4-3. DH Key : Display Hold

Holds displayed value on LCD by pressing this key for 0.5 seconds or less. ("") lights up)

To release it : Press DH Key again for 0.5 seconds or less.

4-4. SHIFT Key

Pressing for 0.5 seconds or more : Selects measurement sensitivity. ("") lights up in high sensitivity mode.

Pressing for 1 second or more : Selects measurement function either two-stroke cycle or four-stroke cycle.

4-5. AUTO POWER OFF

Power turns off automatically after approx. 30 minutes.

NOTE : Approx.1.4 μVA is consumed even in the power-off condition.

To cancel it : Turn the power on holding down DH Key. Auto power off is disabled and "" disappears from LCD.

4-6. SYMBOL MARK

The following symbol marks shown on the instrument and instruction manual are listed in IEC 61010-1 and ISO 3864.

	Caution (refer to instruction manual.)
	CE Marking Conformity

5. MEASUREMENT PROCEDURES

5-1. Measurement of Direct Ignition Engine

※ Use 652 RPM Sensor

⚠ WARNINGS

- Pay careful attention not to drop off the instrument and RPM sensor into the engine room.
- Ignition system generates high voltage that could cause an electrical shock hazard. Stop the engine when touching or removing the RPM Sensor.

- Stop the engine.
- Insert black plug of RPM sensor in "-" terminal, and red plug in "+" terminal.
- Press POWER Key for 0.5 seconds or less and turn the power on.
- Select measurement function by pressing SHIFT Key for 1 second or more. Default setting is four-stroke cycle.
Two-stroke cycle measurement : "" lights up.
Four-stroke cycle measurement : "" lights up.
- Touch the contact surface of the sensor on the top or side of direct ignition coil.
NOTE : Contact surface is marked in red.
NOTE : Use tapes to fix the sensor.
- Start the engine and read the measurement value on LCD.
- If measurement cannot be done, change the measurement sensitivity into HIGH by pressing SHIFT Key for 0.5 seconds or less. ("" lights up)
NOTE : Measurement may not be done depending on the sensor position. In that case, move the sensor to the measurable position.
NOTE : After measurement, remove the tapes that fixed the sensor.
- After finishing the measurement, turn the power off by pressing POWER Key for 1 second or more.

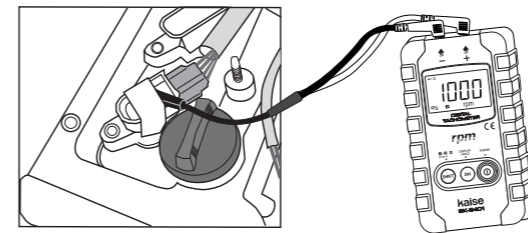


fig.4

5-2. Measurement of High Tension Code Type Engine

※ Use 650 RPM Sensor (option)

⚠ WARNINGS

- Pay careful attention not to drop off the instrument and RPM sensor into the engine room.
- Ignition system generates high voltage that could cause an electrical shock hazard. Stop the engine when clamping or removing the RPM Sensor.

- Stop the engine.
- Insert plugs of RPM sensor in input terminals putting projection side in "-" terminal.
- Press POWER Key for 0.5 seconds or less and turn the power on.
- Select Measurement Function by pressing SHIFT Key for 1 second or more. Default setting is four-stroke cycle.
Two-stroke cycle measurement : "" lights up.
Four-stroke cycle measurement : "" lights up.
- Clamp the sensor on No. 1 High Tension Cord facing the "SPARK PLUG" marked side to the spark plug.
- Start the engine and read the measurement value on LCD.
- If measurement cannot be done, change the measurement sensitivity into HIGH by pressing SHIFT Key for 0.5 seconds or less. ("" lights up)
- After finishing the measurement, turn the power off by pressing POWER Key for 1 second or more.

NOTE FOR MEASUREMENT

- For simultaneous ignition engine, doubled RPM value could be displayed. In that case, change measurement function into two-stroke cycle measurement.
- Measurement may not be done depending on the type of engine.
- Measurement cannot be made for rotary engine, diesel engine and vehicle equipped with MSD or MDI systems.

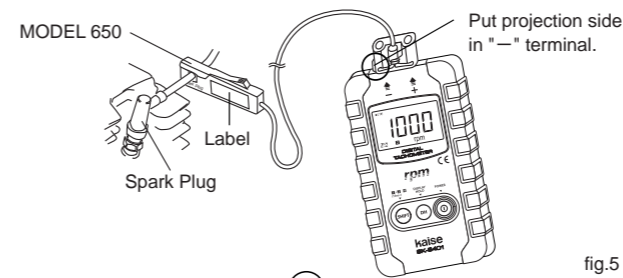


fig.5

6. MAINTENANCE

6-1. BATTERY REPLACEMENT

⚠ WARNING

To avoid electrical shock, detach RPM sensor from engine when to replace battery, and turn the power off.

Replace the batteries when "" lights up on LCD.

- Detach RPM sensor from engine, and turn the power off.
- Loosen a screw of battery cover and open. Then, remove exhausted batteries.
NOTE : Pull the screw when the battery cover is hard to be opened.
- Insert 2 pcs of new 1.5V R6P or LR6 batteries in correct polarity.
- Fix battery cover and tighten the screw.

NOTE : Remove the batteries when the instrument is out of use for a long time. The exhausted batteries might leak electrolyte and corrode the inside.

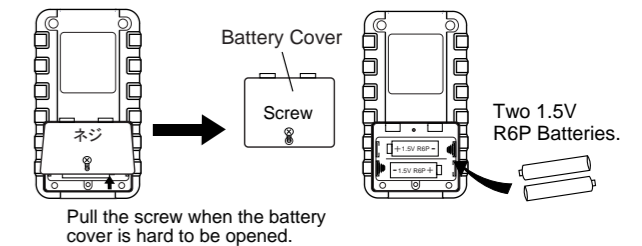


fig.6

6-2. PERIODICAL CHECK AND CALIBRATION

Periodical check and calibration is necessary to make safety measurements and to maintain the specified accuracy. The recommended check and calibration term is once a year and after the repair service. This service is available at KAISE AUTHORIZED SERVICE AGENCY through your local dealer.

6-3. REPAIR

Repair service is available at KAISE AUTHORIZED SERVICE AGENCY through your local dealer. Pack the instrument securely with your name, address, telephone number and problem details, and ship prepaid to your local dealer.

Check the following items before asking repair service.

- Check the battery connection, polarity, and capacity ("" lights up or not).
- Confirm that the keys are set correctly.
- Confirm that measured accuracy is adopted in the operating environment.
- Confirm that the body of this instrument has no cracks or any other damages.

WARRANTY

SK-8401 is warranted in its entirety against any defects of material or workmanship under normal use and service within a period of one year from the date of purchase of the original purchaser. Warranty service is available at **KAISE AUTHORIZED SERVICE AGENCY** through your local dealer. Their obligation under this warranty is limited to repairing or replacing SK-8401 returned intact or in warrantable defect with proof of purchase and transport charges prepaid. **KAISE AUTHORIZED DEALER** and the manufacturer, **KAISE CORPORATION**, shall not be liable for any consequential damages, loss or otherwise. The foregoing warranty is exclusive and in lieu of all other warranties including any warranty of merchantability, whether expressed or implied. This warranty shall not apply to any instrument or other article of equipment which shall have been repaired or altered outside of **KAISE AUTHORIZED SERVICE AGENCY**, nor which have been subject to misuse, negligence, accident, incorrect repair by users, or any installation or use not in accordance with instructions provided by the manufacturer.

KAISE AUTHORIZED DEALER

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Product specifications and appearance are subject to change without notice due to continual improvements.