kaise

HANDY mΩ TESTER

Instruction Manual

SK-3800

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.

⚠	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 "**HANDY mΩ TESTER SK-3800**".
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. SK-3800 Main Unit (with Holster) ——— 1 pce.
2. 100-71 Test Leads ——— 1 pce.
3. 1035 Carrying Case ——— 1 pce.
4. Spare Fuse F22 (0.5A/600V, contained in rear case) ——— 1 pce.
5. 1.5V R6P (AA) Batteries ——— 8 pcs. (Installed)
6. Instruction Manual ——— 1 pce.

2. SPECIFICATIONS

2-1. GENERAL SPECIFICATIONS

1. **DISPLAY (LCD) :**
   a. Numerical Display : 4199 count, 12mm high
   b. Units and Symbols : DH, MEA, , COMP, HIGH, LOW GOOD, m, k, Ω, −, and decimal point
2. **OPERATING PRINCIPLE :** Σ⊿ conversion
3. **RANGE SELECTION :** Manual Range
4. **OVERLOAD WARNING :** "OL" indication when exceeding 4200 count (in comparator, "Hi" indication when exceeding 4000 count)
5. **BATTERY LEVEL INDICATIONS :** " " indication at 60% or more
   " " indication from 30% to 59%
   " " indication from 10% to 29%
   " " indication less than 10%
6. **OPERATING VOLTAGE :** Approx. from 8.5V to 12.8V
7. **SAMPLING RATE :** 2 times / second
8. **DISPLAY HOLD :** Hold indicating values by DH Key
9. **COMPARATOR :** Available with COMP Keys
10. **ZERO ADJUSTMENT :** Available with 0Ω ADJ Key
11. **OPERATING TEMPERATURE & HUMIDITY :**
    0℃ to 40℃, less than 80%RH in non-condensing
12. **STORAGE TEMPERATURE & HUMIDITY :**
    -20℃ to 60℃, less than 70%RH in non-condensing
13. **TEMPERATURE COEFFICIENT :** Accuracy at 23℃±5℃×0.1/℃
14. **POWER SUPPLY :** 1.5V R6P (AA) Batteries 8 pcs.
15. **POWER CONSUMPTION :** 300mA maximum (in mΩ measurement)
16. **AUTO POWER OFF :** Automatic turn off after approx. 10 minutes
17. **CONTINUOUS MEASUREMENT :** up to 3 minutes
18. **MEASURABLE NUMBER OF TIMES (3 min. continous) :**
    mΩ range : approx. 40 times (with manganese batteries)
    Ω/kΩ range : approx. 250 times (with manganese batteries)
19. **FUSE :** Fast-acting 0.5A / 600V (φ 6.3×32mm) 1pce.
20. **SAFETY LEVEL :** CE Marking approved (EN61326-1)
21. **TEST LEAD LENGTH :**
    Approx. 1250mm (excluding terminals and plugs)
22. **DIMENSIONS & WEIGHT :** 140mm(H)×130mm(W)×60mm(D), approx. 600g (excluding batteries)
23. **ACCESSORIES :** Holster, 100-71 Test Leads, 1035 Carrying Case, Spare Fuse F22 (0.5A/600V) 1 pce (contained in the rear case), 1.5V R6P (AA) Batteries 8 pcs, Instruction Manual

2-2. MEASUREMENT SPECIFICATION

(23℃±5℃、<80%RH in non-condensing)

1. RESISTANCE (Ω)

Range	Accuracy	Resolution	Test Current	Max. Applied Power
40.00mΩ	±0.3%rdg±3dgt	10μΩ	200mA	1.7mW
400.0mΩ		100μΩ		17mW
4.000Ω		1mΩ	2mA	17μW
40.00Ω		10mΩ		170μW
400.0Ω		100mΩ	1mA	420μW
4.000kΩ	±0.3%rdg±2dgt	1Ω	20μA	1.7μW
40.00kΩ		10Ω	10μA	4.2μW

※Open circuit voltage : 5V or less
※Effect of radiated radio-frequency electromagnetic field : 15% at 3V/m

3. SAFETY PRECAUTIONS

3-1. WARNINGS

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

⚠ WARNING

■**Checks of Body and Test Lead**
Before measurement, confirm there are no damage on the body of this instrument and handle insulators and cables of the Test Leads. Dust, grease and moisture must be removed.

■**DO NOT Measure Voltage-Applied Circuit**
Be sure to turn off the object to be measured before connecting the Test Probes to the circuit. Measuring voltage applied circuit could cause electrical shock hazard or damage to this instrument.

⚠ WARNING

■**Test Probes Detachment**
Detach Test Probes from circuit or object to be measured when changing the measurement ranges, or opening Battery Cover for batteries or fuse replacements.

3-2. GENERAL WARNINGS AND CAUTIONS

⚠ WARNING

■Children and the persons who do not have enough knowledge about electric measurements must not use this instrument.
■Do not measure the electricity naked or barefooted to avoid electrical shock hazard.
■Do not attempt to disassemble or modify the instrument.
■Do not use this instrument with wet hands to avoid electrical shock hazard.

⚠ CAUTION

■Do not use the instrument continuously for 30 minutes or more.
■This instrument is not waterproof. Do not get wet, Keep dry.
■Keep away the instrument from hot and humid conditions like in the car. Do not apply hard mechanical shock or vibration.
■Do not polish the case or attempt to clean it with any cleaning fluid like gasoline or benzine. If necessary, use silicon oil or antistatic fluid.
■Remove the batteries when the instrument is out of use for a long time. The exhausted batteries might leak electrolyte and corrode the inside.
■Do not use this instrument in high-magnetic field.

4. NAME ILLUSTRATION

■MAIN UNIT

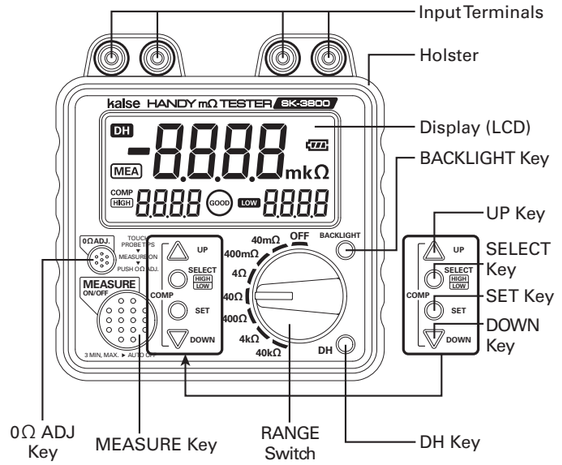

Fig-1

■Test Leads

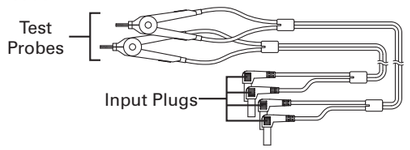

Fig-2

4-1. Display (LCD)

Fig-3

DH	:Display hold	LOW	:Lower limit of comparator
MEA	:Measurement activating	GOOD	:Measurement passed in the comparator range
	:Remaining battery level	mkΩ	:Measurement units
COMP	:Comparator activating	−	:Minus
HIGH	:Upper limit of comparator		

4-2. RANGE Switch

The switch to turn on the instrument and to select the measurement ranges.
※After measurement, set the switch to "OFF" position.

4-3. MEASURE Key

The switch to start measurement. (MEA lights up)
Press this key again to stop the measurement. (MEA turns off)
Continuous measurement is limited up to 3 minutes. After a lapse of 3 minutes, measurement stops automatically.

After stopping the measurement, − − − − flashes on LCD for 15 seconds. Do not start the next measurement until the flashing stops.

4-4. 0Ω ADJ Key

The switch to make Zero Adjustment.
Press MEASURE Key with the test probe tips short-circuit, then press this key. Zero adjustment is needed on each measurement.

4-4. BACKLIGHT Key (Backlight Function)

The key to turn on / off the LCD backlight.
The light is automatically turned off after 30 seconds.

4-6. DH Key (Display Hold Function)

The key to activate display hold. (DH lights up)
Press this key again to release the display. (DH turns off)

4-7. SET Key

The key to activate Comparator Setting Mode (press 1 second or more). Also works to change the decimal point in Comparator Setting process.

4-8. SELECT Key

The Key to change HIGH (Upper limit) and LOW (Lower Limit) in Comparator Setting Mode.

4-9. Up Key / DOWN Key

The keys to change the setting values in Comparator Setting Mode.

4-10. Auto Power Off

Automatic turn off function after a lapse of 10 minutes of the last key operation. This function cannot be deactivated.

4-11. Holster

Slip-proof rubber holster to protect the instrument.

5. MEASUREMENT PROCEDURES

5-1. PREPARATION FOR USE

■INSTRUCTION MANUAL ⚠

Read Instruction Manual carefully to understand the specification and functions correctly. "3. SAFETY PRECAUTIONS" is very important for safety measurement.

■BATTERY

Before starting measurement, put 8 pcs of 1.5V R6P (AA) batteries in the instrument as per "6-1. BATTERY AND FUSE REPLACEMENT". Replace them in the same procedures when weakened.

■FUSE

Measurement ranges are protected with a 0.5A/600V fuse. When blowout, replace it as per "6-1. BATTERY AND FUSE REPLACEMENT".

5-2. RESISTANCE MEASUREMENT (Ω)

⚠ WARNING

■DO NOT Measure Voltage-Applied Circuit

Be sure to turn off the object to be measured before connecting the Test Probes to the circuit. Measuring voltage applied circuit could cause electrical shock hazard or damage to this instrument.

⚠ CAUTION

■Do not use the instrument continuously for 30 minutes or more.

■Do not use this instrument in high-magnetic field.

1. Insert the Input Plugs of Test Leads to the Input Terminals.

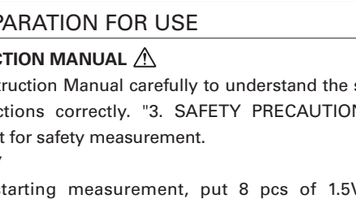

Fig-4

2. Turn on the instrument with RANGE Switch, and set it to the proper measurement range.

3. Make Zero Adjustment. Press MEASURE Key with the Test Probe Tips short-circuit (MEA lights up). Keeping this, and press 0Ω ADJ Key. LCD readings are adjusted into 0Ω.

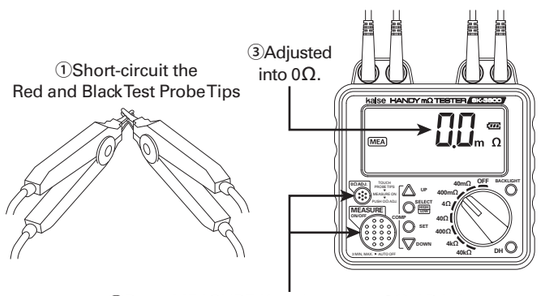

Fig-5

4. Connect the Test Probes to the object to be measured.

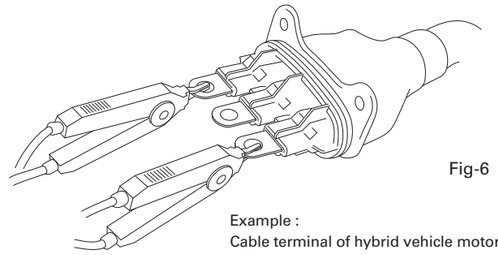

Fig-6

Example :
Cable terminal of hybrid vehicle motor

5. Read the resistance on LCD.

> Continuous measurement is limited up to 3 minutes.
> After a lapse of 3 minutes, measurement stops automatically.

※LCD displays "OL" when the measured value exceeds 4200 count. If "OL" keeps displayed for 10 seconds, the measurement stops automatically. (MEA turns off)

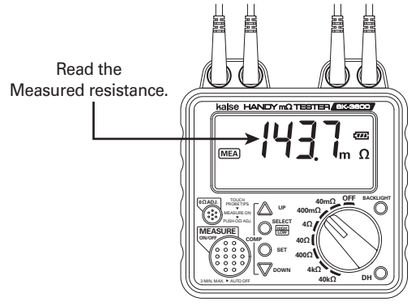

Fig-7

6. Press MEASURE Key to stop the measurement. (MEA turns off)
To turn off the instrument, set the RANGE Switch to OFF.

> After stopping the measurement, – – – – flashes on LCD for 15 seconds. Do not start the next measurement until the flashing stops.

5-3. COMPARATOR FUNCTION

■What is Comparator Function?

The function useful to judge GOOD/FAIL test result under the certain threshold. You can check the result by buzzer in accordance with the preset upper and lower limits. This function is effective for quick and easy GOOD/FAIL judgment of the object to be measured without reading the LCD.

■Comparator Settings

Example : Comparator passed between 80.0mΩ and 135.0mΩ with buzzer sound.

Turn on the instrument, and press SET Key for 1 second or more. The instrument enters Comparator Setting Mode with flashing HIGH and the maximum Upper-Limit digit on LCD.

[Initial display of Comparator Setting Mode]

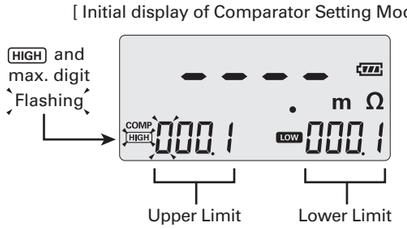

Fig-8

Setting of Upper Limit (HIGH)

1. Press UP / DOWN Keys and set the maximum digit (flashing).
2. Press SET Key. The maximum digit is fixed, and the flashing moves to the next digit. Set the digit with UP / DOWN Keys.
3. Repeat the above process until the minimum digit, then press SET Key.
4. Upper Limit setting is completed. The all digits are fixed with flashing HIGH .

Setting of Lower Limit (LOW)

1. Press SELECT Key after completing Upper Limit setting. The instrument enters Lower Limit Setting Mode with flashing LOW and the maximum Lower-Limit digit.
2. Set the Lower Limit until the minimum digit. Follow the same process as the Upper Limit, then press SET Key.
3. Lower limit setting is completed. The all digits are fixed with flashing LOW .
4. Press SET Key for 1 second or more. LOW stops flashing and COMP symbol on LCD turns off.
5. Comparator settings are completed.

[Comparator setting completed]

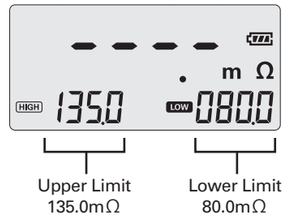

Fig-9

■Comparator Measurement

In case of the above setting,

- Measurement between 80.0mΩ and 135.0mΩ : Buzzer sound and GOOD symbol on LCD
- Measurement exceeding 135.0mΩ : Hi indication on LCD
- Measurement less than 80.0mΩ : LOW and Lower Limit Flash

6. MAINTENANCE

6-1. BATTERY AND FUSE REPLACEMENT

⚠ WARNING

■To avoid electrical shock hazard, be sure to finish the measurement before replacing the batteries and the fuse.

■Detach Test Probes from circuit or object to be measured.

■Set the RANGE Switch to OFF position.

■Be sure to use the specified fuse. Do not use the instrument shorting the fuse holder or without a fuse.
Fuse specification : Fast-acting 0.5A/600V (φ6.3×32mm)

Replace the batteries when "▭" symbol appears on LCD.

1. Remove the Rubber Holster from the instrument.
2. Remove the Battery Cover loosing 3 screws on the rear case.
3. Remove the weak batteries and replace with the new 8 pcs of 1.5V R6P (AA) batteries in the correct polarity.
4. Fuse Replacement : Replace the blowout fuse with the new specified one. (One spare fuse is contained in the rear case.)
5. Fix the Battery Cover and tighten the screws.
6. Put the Rubber Holster on the instrument.

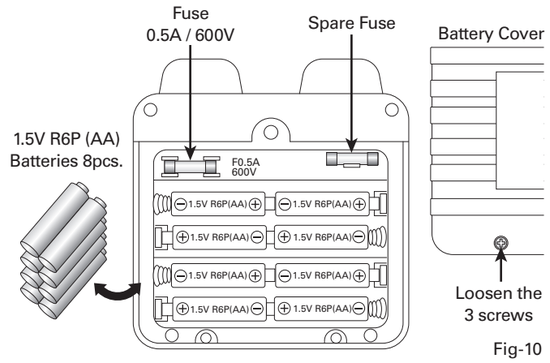

Fig-10

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.

1. Check the battery connection, polarity, and capacity.
2. Check if the fuse does not blow out.
3. Check if the RANGE Switch is set to the proper position.
4. Confirm that measured accuracy is adopted in the operating environment.
5. Confirm that there are no damage on the body of this instrument and handle insulators and cables of the Test Leads.
6. Check if there are no strong noise or magnetic field in the measurement environment.

WARRANTY

SK-3800 are 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-3800 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.

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