kaise KU-2602 Digital Multi Meter Instruction Manual

Contents

kaise

kaise KU-2602 Digital Multi Meter

Specifications

- **DISPLAY (LCD):** Numerical Display 3 3/4 digit, 4000 count, 12mm high
- **Units and Symbols:** mV, V, Hz, %, Ω, kΩ, MΩ, nF, F, µF, A, mA, µA, Ω, REL, %, H, OL, AUTO, AC, DC, and decimal point
- **OPERATING PRINCIPLE:** conversion
- **RANGE SELECTION:** Auto/Manual

Product Usage Instructions

Unpacking and Inspections

Confirm if the following items are contained in the package in good condition.

1. Digital Multimeter with Holster
2. Test Lead (100-50)
3. Temperature Sensor (818-02)
4. Spare Batteries (1.5V R6P, AA)
5. Spare Fuses (0.5A/250V, 10A/250V)
6. Instruction Manual

Safety Measures

- To prevent electrical shock hazards or damage to the instrument.
- Read the instruction manual carefully before use.
- Avoid measuring High Power Lines.
- Pay careful attention when measuring high voltage lines, even in Low Power Line measurements.

Maximum Performance

- To obtain the maximum performance of the KU-2602 Digital Multimeter.
- Read the Instruction Manual carefully.
- Take safe measurements.

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.
- ⚠**WARNING:** The symbols⚠ on the instrument and in this instruction manual are highly important.
- The symbol listed in IEC 61010-1 and ISO 3864 means “Caution (refer to instruction manual)”.

Important Symbols :

- ⚠**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 damage.
- ⚠**WARNING:** Do not measure High Power Line (High Energy Circuits). High Power lines are very dangerous and sometimes include High Surge Voltage that could cause explosive short in the instrument and could result in serious injury to the operator.
- This instrument is for Low Power Line measurement. Even in the Low Power Line, one must pay careful attention when measuring high voltage lines.

INTRODUCTION

Thank you for purchasing KAISE “KU-2602 DIGITAL MULTIMETER”. To obtain the maximum performance of this instrument, read this Instruction Manual carefully and take safe measurements.

UNPACKING AND INSPECTIONS

- Confirm if the following items are contained in the package in good condition.
- If there are any damaged or missing items, ask your local dealer for replacements.
    1. Digital Multimeter with Holster 1 pce.
    2. Test Lead (100-50) 1 set
    3. Temperature Sensor (818-02) 1 pce.
    4. Spare Batteries (1.5V R6P, AA) 2 pcs.
    5. Spare Fuses (0.5A/250V, 10A/250V) 1 pce. each
    6. Instruction Manual 1 pce.

SPECIFICATIONS

GENERAL SPECIFICATIONS

1. **DISPLAY (LCD)**
   - **a. Numerical Display** 3 3/4 digit, 4000 count, 12mm high
   - **b. Units and Symbols** mV, V, Hz, %, Ω, kΩ, MΩ, nF, μF, ℃, μA, mA, A, , , REL Δ, , , OL, AUTO, AC, DC, and decimal point
2. **OPERATING PRINCIPLE** Σ⊿ conversion
3. **RANGE SELECTION** Auto/Manual
4. **POLARITY** A uto polarity (“ ” sign when minus)
5. **OVERLOAD INDICATION** “O L” is displayed on LCD except for AC/DC600V
6. **BATTERY WARNING:** indication at approx. 2.4V or less
7. **SAMPLING RATE:** 2 times/second
8. **DISPLAY HOLD** Hold indicating values by HOLD Key
9. **DIFFERENCE MEASUREMENT:** Measurable by RELΔ Key
10. **DIELECTRIC STRENGTH:** 3.7kV for 1 minute (between input terminals and case)
11. **OPERATING TEMPERATURE & HUMIDITY** 0℃ to 40℃, less than 85 RH in non-condensing
12. **STORAGE TEMPERATURE & HUMIDITY** -20℃ to 60℃, less than 95 RH in non-condensing
13. **POWER SUPPLY** 1.5V R6P or LR6 (AA) batteries x 2
14. **POWER CONSUMPTION** approx. 9mW typ
15. **CONTINUOUS OPERATING TIME:** 70 hours or more
16. **AUTO POWER OFF** Power turns off automatically after approximately. 15 minutes (cancelable)
17. **FUSE** μA, mA function : Fast-acting 0.5A/250V, φ5×20mm A function : Fast-acting 10A/250V, φ6×30mm
18. **SAFETY LEVEL** CE marking approved (EN61010-1 CATⅡ600V, CATⅢ300V)
19. **DIMENSIONS** & **WEIGHT** 155(H)×75(W)×29(D)mm, Approx. 180g
20. **ACCESSORIES:** 100- 50 Test Leads, 818-02 Temperature Probe, 1.5V R6P (AA) Batteries × 2 (Installed & Spare), F14 Spare Fuse (0.5A/250V), F17 Spare Fuse (10A/250V), Holster, Instruction Manual
21. **OPTIONAL ACCESSORIES:** 660 AC/DC Clamp Adapter, 821 AC Clamp Adapter, 100-41 Test Lead Kit, 100-62 Test Lead Set, 940 Alligator Clip, 995 Carrying Case, 817-01 to 817-25 Temperature Probe, 732 Miniature Connector Conversion Plug

MEASUREMENT SPECIFICATION

(23℃±5℃ 75 RH in non-condensing)

1. **AC Voltage (V)** Average Rectification

Range	**Accuracy (40 to 400Hz)**	**Resolution**	**Input Impedance**	**Maximum Input**	**Range Selection**	**Overload Protection**
400.0mV	±1.2%rdg±5dgt	0.1mV	≒11MΩ	600V rms	Auto/ Manual	600V rms
4.000V	±0.8%rdg±5dgt	1mV				
40.00V		10mV	≒10MΩ			
400.0V		100mV				
600V	±1.2%rdg±5dgt	1V				

- Measurement range of 400.0mV range 5.0mV to 400.0mV
- Accuracy does not apply to Hz or Duty measurements entered from AC Voltage range

2. **DC Voltage (⎓V)**

Range	Accuracy	Resolution	Input Impedance	Maximum Input	Range Selection	Overload Protection
400.0mV	±0.5%rdg±5dgt	0.1mV	>100MΩ	600V DC	Auto/ Manual	600V DC
4.000V		1mV	≒11MΩ			
40.00V		10mV	≒10MΩ			
400.0V		100mV				
600V	±0.8%rdg±5dgt	1V				

- Accuracy does not apply to Hz or Duty measurements entered from DC Voltage range

3. **RESISTANCE (Ω)**

Range	Accuracy	Resolution	Test Current	Open Circuit Voltage	Range Selection	Overload Protection
400.0Ω	±1.0%rdg±5dgt	0.1Ω	≦0.3mA	≒0.44V	Auto/ Manual	250V RMS in 10 seconds
4.000kΩ		1Ω	≦40μA			
40.00kΩ		10Ω	≦4μA			
400.0kΩ		100Ω	≦0.4μA			
4.000MΩ		1kΩ	≦40nA			
40.00MΩ	±2.0%rdg±5dgt	10kΩ				

4. **DIODE TEST ( )**

Range	Accuracy	Test Current	Open Circuit Voltage	Overload Protection
4.000V	±5%rdg±3dgt	≦0.5mA	≦1.5V	250V RMS in 10 seconds

5. **CONTINUITY TEST ( )**

Range	Buzzer Sound	ResponseTime	Open Circuit Voltage	Overload Protection
400.0Ω	less than 60Ω	1m sec.	≒0.44V	250V RMS in 10 seconds

6. CAPACITANCE ( )

Range	Accuracy	Resolution	Range Selection	Overload Protection
4.000nF	±5.0%rdg±10dgt	1pF	Auto	250V RMS in 10 seconds
40.00nF	±3.0%rdg±10dgt	10pF		
400.0nF	±2.0%rdg±5dgt	0.1nF		
4.000µF		1nF		
40.00µF		10nF		
200.0µF	±4.0%rdg±5dgt	0.1µF		

7. **TEMPERATURE (°C)**

Range	Accuracy	Resolution	Sensor
0°C to 40°C	±3°C	1°C	Built-in
-20°C to 200°C	±0.75%rdg±3°C		External
200°C to 500°C	±1.5%rdg±3°C		

- **K-type thermocouple / Sensor accuracy is not included**
- **Specification of supplied temperature sensor (818-02):** Measurement range -50°C to 100°C (Accuracy ±2.5°C)

8. **FREQUENCY (Hz)**

Range	Accuracy	Resolution	Input Sensitivity	Maximum Input	Range Selection
9.999Hz to 9.999MHz	±0.02%rdg±5dgt	0.01Hz to 1.0kHz	3V rms	250V rms	Auto

9. **DUTY CYCLE ( )**

Range	Accuracy (1Hz to 10kHz)	Resolution	Input Sensitivity	Maximum Input
0.1% to 99.9%	±2%rdg±5dgt	0.1%	3V rms	250V rms

10. **DC/AC CURRENT**

- **µA Range (µA / µA)** AC: Average Rectification

Range	Accuracy (AC:40 to 400Hz)	Resolution	Voltage Drop	Maximum Input	Range Selection	Overload Protection
400.0μA	DC ±1.5%rdg±5dgt AC ±2.0%rdg±5dgt	0.1μA	40mV	4000μA	Auto/ Manual	0.5A/250V fuse
4000μA		1μA	400mV			

- Accuracy does not apply to Hz or Duty measurements entered from μA range
- **mA Range (mA / mA)AC:** Average Rectification

Range	Accuracy (AC:40 to 400Hz)	Resolution	Voltage Drop	Maximum Input	Range Selection	Overload Protection
40.00mA	DC ±1.5%rdg±5dgt AC ±2.0%rdg±5dgt	10μA	70mV	400mA	Auto/ Manual	0.5A/250V fuse
400.0mA		100μA	700mV			

- **A Range (A / A)AC:** Average Rectification

Range	Accuracy (AC:40 to 400Hz)	Resolution	Voltage Drop	Maximum Input	Range Selection	Overload Protection
4.000A	DC ±2.0%rdg±5dgt AC ±2.5%rdg±5dgt	1mA	500mV	10A (less than 15 seconds)	Auto/ Manual	10A/250V fuse
10.00A		10mA	1.4V			

- Accuracy does not apply to Hz or Duty measurements entered from A range

SAFETY PRECAUTIONS

- ⚠**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.

1. ⚠**WARNING 1. Checks of Body and Test Lead**
   - Before measurement, confirm the body of this instrument and handle insulators of the Test Lead have no cracks or any other damages. Dust, grease and moisture must be removed.
2. ⚠**WARNING 2. High Power Line Measurements is Prohibited**
   - Do not measure High Power Line (High Energy Circuits) such as Distribution Transformers, Bus Bars and Large Motors.
   - High Power Line sometimes includes High Surge Voltage that could cause explosive short in the instrument and could result in a shock hazard.
   - Generally, a shock hazard could occur when the current between the circuit involves more than 33V rms or 46.7V DC or peak, and the ground goes up to 0.5mA or more.

3. ⚠**WARNING 3. Warning for High Voltage Measurements**
    - Even for Low Energy Circuits of electric/electronic appliances, such as heating elements, small motors, line cords, and plugs, High Voltage Measurements are very dangerous. Do not touch any part of the circuit.
4. ⚠**WARNING 4. Dangerous Voltage Measurement Procedure**
    - For dangerous voltage measurement, strictly observe the warnings below.
    - Do not hold the instrument in your hands.
    - Keep a safe distance from the power source or circuit to be measured so as not to touch the dangerous voltage.
    - Attach black and red alligator clips to test lead pins.
    - Turn off the circuit to be measured when connecting the test leads.
    - After finishing the measurement, turn off the circuit to be measured again and discharge all the capacitors. Then, detach alligator clips (test leads) from the circuit.

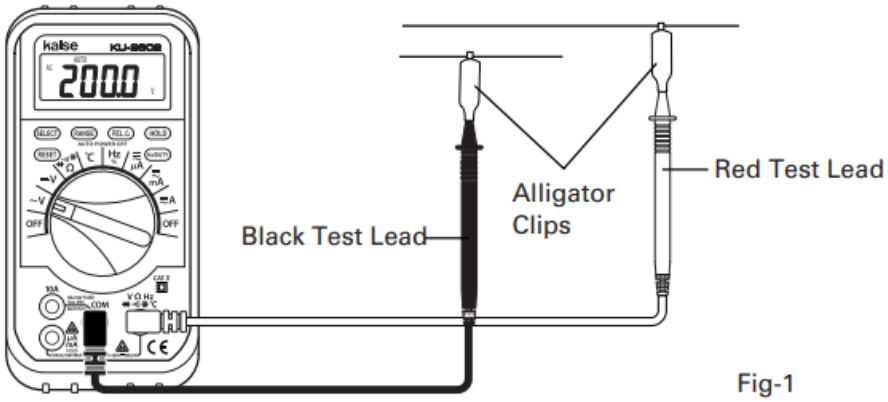

Fig-1

In case of live-line measurement, strictly observe the warnings below:

- Do not hold the instrument in your hands.
- Keep a safe distance from the power source or circuit to be measured so as not to touch the dangerous voltage.
- **Black test lead:** Attach black alligator clip and connect to (earth) side of the circuit.
- **Red test lead:** Connect to the (positive) side of the circuit.

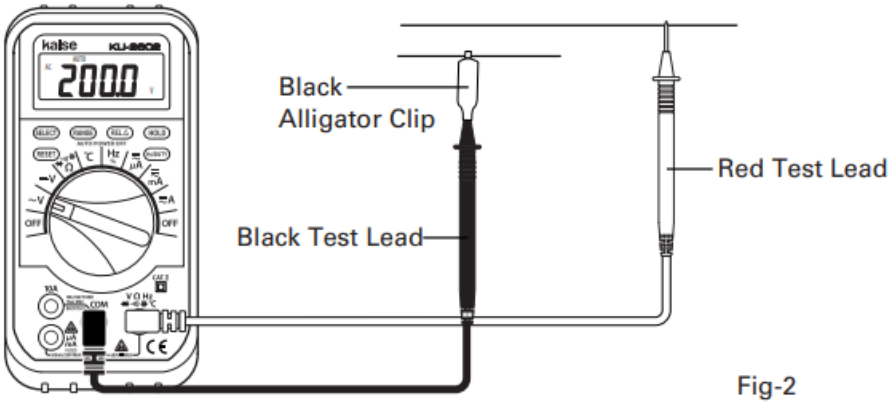

Fig-2

PREVENTION OF FAILURE

1. ⚠**WARNING 1. Correct Selection of Function Switch**
    - Always confirm that the FUNCTION Switch is set to the correct position. Do not measure voltage except

at the Voltage measurement function.

2. ⚠**WARNING 2. Maximum Input Observance**
   - Do not measure anything that might exceed the specified maximum input values.
3. ⚠**WARNING 3. Test Lead Detachment**
   - Detach test leads from the measuring circuit when changing measurement functions or removing the rear case for battery or fuse replacement.

GENERAL WARNINGS AND CAUTIONS

- ⚠**WARNING 1.** Children and people who do not have enough knowledge about electric measurements must not use this instrument.
- ⚠**WARNING 2.** Do not measure the electricity in naked or barefooted to protect yourself from electrical shock hazard.
- ⚠**WARNING 3.** Be careful not to get hurt by the sharp test lead pins.
- ⚠**CAUTION 1.** Keep away the instrument from hot and humid conditions like in the car. Do not apply hard mechanical shock or vibration.
- ⚠**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 battery might leak electrolytes and corrode the inside.

NAME ILLUSTRATION

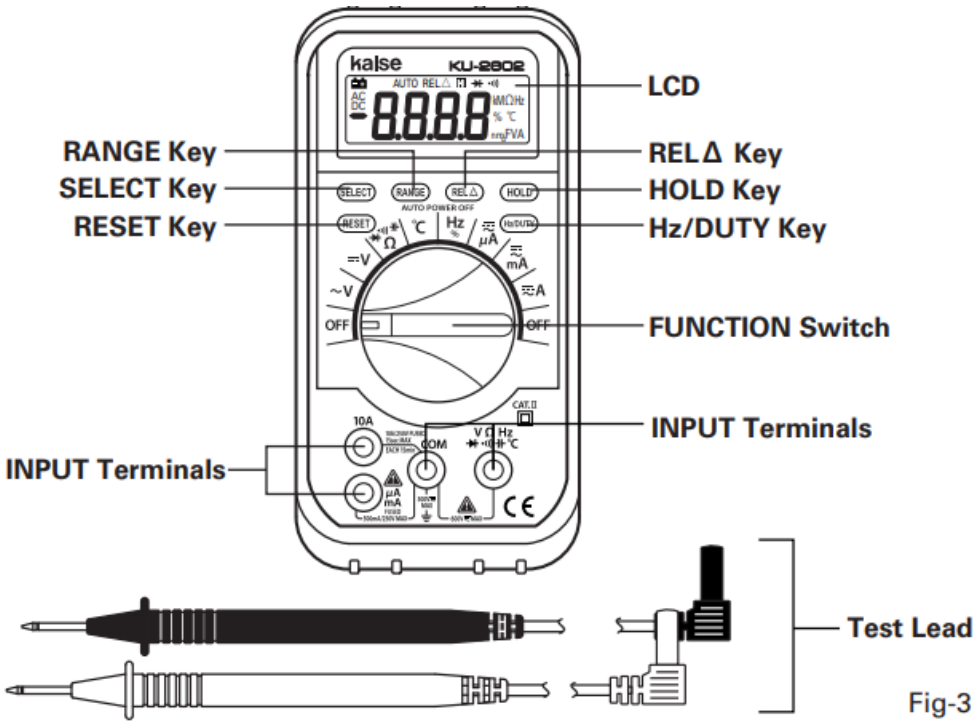

Fig-3

LCD

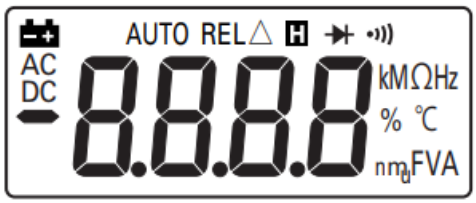

Fig-4

: Low battery warning		•)))	: Continuity test
AC	: Alternative Current	Ω, kΩ, MΩ	: Resistance measurement
DC	: Direct Current	Hz	: Frequency measurement
–	: Minus	%	: Duty cycle measurement
AUTO	: Auto-ranging	℃	: Temperature measurement
REL△	: Difference measurement	nF, μF	: Capacitance measurement
H	: Lights up in Display Hold function	mV, V	: Voltage measurement
	: Diode test	μA, mA, A	: Current measurement

FUNCTION SWITCH

- The switch to turn on the instrument and to select measurement functions. After finishing the measurement, turn it to “OFF”.
- ⚠**WARNING:** Always confirm that the FUNCTION Switch is set to the correct position. Do not measure voltage except at the Voltage measurement function.
- To prevent electric shock or damage of this unit, detach test leads from the measuring circuit before changing measurement functions.

SELECT Key

- Use this Key to select sub-measurement functions in resistance or current measurements.
- Functions are changed as follows each time the SELECT Key is pressed.
- **Resistance measurement:** Ω → → •))) → → Ω
- **Current measurement (μA / mA / A)** DC A → AC A → DC A

RANGE Key

- Manual-range measurement is possible by pressing this key during the auto-range measurement (“AUTO” disappears from LCD).
- To change the measurement range to manual range, press the RANGE Key.
- Check the decimal point and select the suitable ranges.
- **To return to Auto-range:** Press Rthe ANGE Key for 1 second or more. (“AUTO” lights up).
- **NOTE:** RANGE Key is available for DC/AC Voltage, resistance and DC/AC measurements.

RELΔ Key

- Press the RELΔ Key to start the difference measurement (” REL △ ” lights up).
- Measurement value displayed on LCD is converted into 0±1 digit, and the relative value is displayed.
- **To release it,** press the RELΔ Key again. The difference measurement is finished and returns to the normal measurement mode (” REL △ ” disappears).

- **NOTE:** RELΔ Key is not available in Frequency and Duty Cycle measurements.

HOLD Key: Display Hold

- Press this key to hold the displayed value on LCD. (**H** lights up).
- **To release it:** Press the HOLD Key again.
- **NOTE:** HOLD Key is not available in Frequency measurement.

Hz/DUTY Key: select Frequency or Duty

- Hz/DUTY Key is available in Frequency or Duty measurement ranges.
- Press this key to select Hz or Duty cycle measurement function.
- **NOTE:** Accuracy is not applicable to Hz or Duty measurements that are entered from AC/DC voltage or AC/DC functions.

RESET Key

- Press the RESET Key to reset the setting of each measurement function to the initial setting when powered on.

Input terminals Test lead

Insert the black test lead to the COM terminal and the red test lead to the other terminals.

MEASUREMENT PROCEDURES

PREPARATION FOR USE

1. ⚠**INSTRUCTION MANUAL**
   - Read the INSTRUCTION MANUAL carefully to understand the specification and functions correctly. “3. SAFETY PRECAUTIONS” is very important for safety measurement.
2. **BATTERY**
   - Two 1.5V R6P (AA) batteries are installed in this instrument. When “ −+ ” lights up on the LCD, replace them with the new ones about “6-1. BATTERY AND FUSE REPLACEMENT”.
3. **FUSE**
   - 0.5A/250V and 10A/250V fuses are installed to protect the current measurement function. Replace them about “6-1. BATTERY AND FUSE REPLACEMENT” when blown out.
4. **OVERLOAD INDICATION**
   - LCDs “OL” when measurement value exceeds the maximum value of each measurement range.
5. **AUTO POWER OFF**
   - The power turns off automatically after approximately. 15 minutes of last operation.
   - **NOTE** Be sure to set the FUNCTION Switch to “OFF” after finishing the measurement.
   - **To cancel it:** Turn on the instrument holding down the SELECT Key.

VOLTAGE MEASUREMENT (V/⎓V)

- ⚠**WARNING:** Do not measure high-power lines or high-power circuits.
- Do not measure any voltage that might exceed the maximum input value (600V AC/DC).
- Confirm the FUNCTION Switch is set to the correct position.
- Read “3. SAFETY PRECAUTIONS” carefully to avoid electric shock hazards and serious damage to the instrument.

1. Insert black test lead to COM terminal, and insert red test lead to V terminal.
2. Set FUNCTION Switch to ” V ” or “ ⎓ V “.
    - **NOTE:** LCD might be drifting at this time due to the high input impedance of this instrument, but it does not affect the measurement.
    - Connect the black test lead to the measured circuit’s (earth) side, and connect the red test lead to the (positive) side.
    - **NOTE:** Connect the instrument IN PARALLEL to the circuit.
    - **NOTE:** Use alligator clips (optional) for dangerous voltage measurement.
3. Read the measurement value on LCD.
4. After finishing the measurement, set the FUNCTION Switch to “OFF”.
    - **NOTE:** Accuracy is not applicable to Hz or Duty measurements that are entered from ⎓V / V measurement functions.

Available functions: Range hold, Display hold, Difference measurement and Reset function

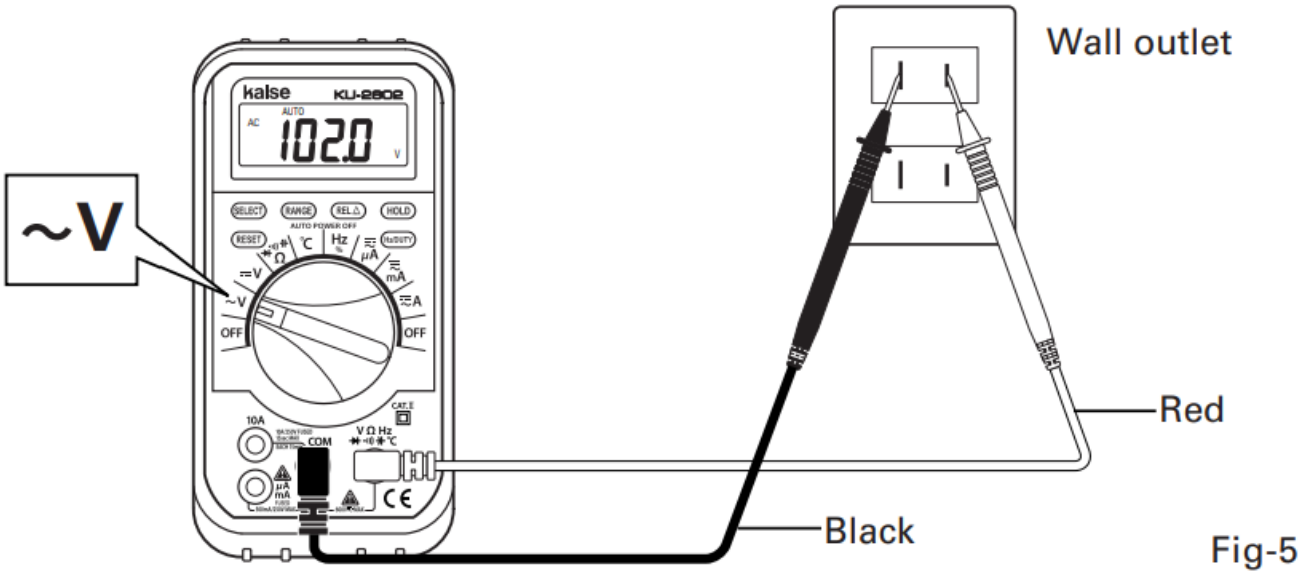

Fig-5

RESISTANCE MEASUREMENT (Ω)

- ⚠**WARNING:** Confirm the FUNCTION Switch is set to the correct position.
- Do not measure voltage in Ω position. This will cause an electrical shock hazard to the operator and/or serious damage to the instrument.
- In case in-circuit resistance is measured, turn off the power to the circuit being measured and discharge all capacitors.
- Read “3. SAFETY PRECAUTIONS” carefully before measurement.
    1. Insert black test lead to COM terminal and insert red test lead to Ω terminal.
    2. Set FUNCTION Switch to ” Ω “.

3. If the resistor to be measured is connected in a circuit, turn off the power to the circuit and discharge all the capacitors.
4. Then, disconnect one side of the resistor. Connect test leads to the resistor (or circuit) to be measured.
5. Read the measurement value on LCD.
6. After finishing the measurement, set the FUNCTION Switch to “OFF”.

- **Available functions:** Range hold, Display hold, Difference measurement and Reset function

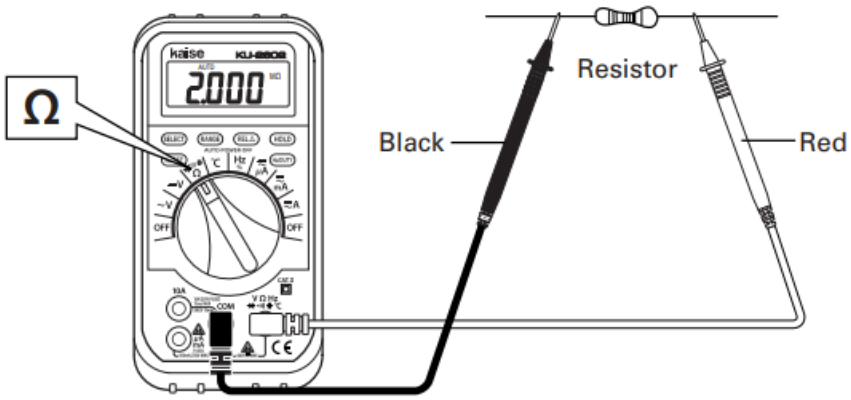

Fig-6

DIODE TEST ( )

- ⚠**WARNING:** Confirm the FUNCTION Switch is set to the correct position.
- Do not measure voltage in position. This will cause an electrical shock hazard to the operator and/or damage to the instrument.
- If the diode is connected in a circuit, turn off the power to the circuit and discharge all the capacitors.
- Read “3. SAFETY PRECAUTIONS” carefully before measurement.
    1. Insert black test lead to COM terminal and insert red test lead to terminal.
    2. Set FUNCTION Switch to ” Ω “.
    3. Press the SELECT Key once to display “ ” on LCD.
    4. If the diode is connected in a circuit, turn off the power to the circuit and discharge all the capacitors. Disconnect one side of the diode.
    5. Connect the black test lead to the Anode side and the red test lead to the Cathode side of the diode (Reverse connection). Confirm “OL” is displayed on LCD.
    6. Connect test leads to the opposite side of “5” (Forward Connection). Test results are good if the following voltage values are displayed on the LCD.
        - **Silicon diodes 0.4V** to 0.7V
        - **Germanium diodes 0.1V** to 0.4V
    7. After finishing the measurement, set the FUNCTION Switch to “OFF”.

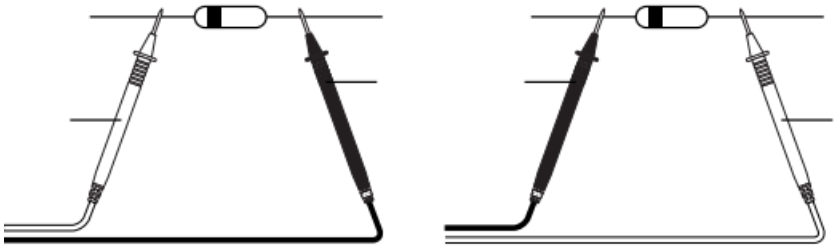

Fig-7

CONTINUITY TEST ( )

- ⚠**WARNING**
- Confirm the FUNCTION Switch is set to the correct position.
- Do not measure voltage in Ω position. This will cause an electrical shock hazard to the operator and/or damage to the instrument.
- When measuring in-circuit continuity, turn off the power to the circuit to be measured and discharge all capacitors.
- Read “3. SAFETY PRECAUTIONS” carefully before measurement.

1. Insert black test lead to COM Terminal and insert red test lead to terminal.
2. Set FUNCTION Switch to ” Ω “.
3. Press the SELECT Key twice to display ” ” on LCD.
4. If testing continuity in a circuit, turn off the power to the circuit and discharge all the capacitors.
5. Connect the test lead to both sides of the circuit to be measured. The buzzer sounds when the circuit resistance is approximately. 60Ω or lower.
6. After finishing the measurement, set the FUNCTION Switch to “OFF”.

CAPACITANCE MEASUREMENT ( )

- ⚠**WARNING:** Confirm the FUNCTION Switch is set to the correct position.
- Do not measure voltage in Ω position. This will cause an electrical shock hazard to the operator and/or damage to the instrument.
- If the capacitor is connected in a circuit, turn off the power to the circuit and discharge all the capacitors.
- Read “3. SAFETY PRECAUTIONS” carefully before measurement.
    1. Insert black test lead to COM terminal and insert red test lead to terminal.
    2. Set FUNCTION Switch to ” Ω “.
    3. Press the SELECT Key three times to display the unit of ” nF ” on LCD.
    4. Press the RELΔ Key to reset the display to 0.000nF±3dgt.
    5. If the capacitor is connected in a circuit, turn off the power to the circuit and discharge all the capacitors. Then, disconnect one side of the capacitor.
    6. Connect the test lead to both sides of the capacitor to be measured. Read the measurement value on LCD.
        - **NOTE:** A capacitance capacitor should be taken longer to get a measurement value.
    7. After finishing the measurement, set the FUNCTION Switch to “OFF”.
- **Available functions:** Display hold and Reset function

TEMPERATURE MEASUREMENT (°C)

- ⚠**WARNING:** Confirm the FUNCTION Switch is set to the correct position.
- Do not measure voltage **°C** in position. This will cause an electrical shock hazard to the operator and/or damage to the instrument.
- Read “3. SAFETY PRECAUTIONS” carefully before measurement.
    1. Set FUNCTION Switch to ” “. The ambient temperature can be measured by the built-in temperature

sensor.

2. Insert the “ ” side of the provided temperature probe into the COM terminal and insert the “ ” side into the terminal.
3. Put the tip of the temperature probe on the object to be measured, and read the measurement value on LCD.
4. After finishing the measurement, set the FUNCTION Switch to “OFF”.

- **Available functions** Display hold, Difference measurement and Reset function

FREQUENCY / DUTY CYCLE MEASUREMENT (Hz / %)

- ⚠**WARNING:** Confirm the FUNCTION Switch is set to the correct position.
- Do not measure voltage in position. This will cause an electrical shock hazard to the operator and/or damage to the instrument.
- Read “3. SAFETY PRECAUTIONS” carefully before measurement.
- The frequency and duty cycle for AC voltage or DC voltage of pulse waveform can be measured.

1. Insert black test lead to COM terminal and insert red test lead to Hz terminal.
2. Set FUNCTION Switch to ” Hz “.
3. Connect the test lead to the circuit to be measured. Read the measurement value on LCD.
    - **NOTE:** Connect the instrument IN PARALLEL to the circuit.
4. After finishing the measurement, set the FUNCTION Switch to “OFF”.
    - **Duty Cycle Measurement (%):** Duty cycle can be measured by pressing the Hz/DUTY Key during frequency measurement.
    - To return to the frequency measurement mode, press the Hz/DUTY Key again.
    - **Available functions:** Display hold (only for Duty Cycle) and Reset function

CURRENT MEASUREMENT (A / mA / µA)

- ⚠**WARNING:** Do not measure high-power lines or high-power circuits.
- Do not measure the current that exceeds the maximum input value.
- Confirm the FUNCTION Switch is set to the correct position.
- Do not measure voltage in µA / mA / A positions. This will cause an electrical shock hazard to the operator and/or damage to the instrument.
- Read “3. SAFETY PRECAUTIONS” carefully before measurement.
- Be sure to connect the RED test lead to the 10A terminal in A measurement.
- Continuous loading time of 10A (maximum input value) in A measurement is within 15 seconds.
    1. Insert black test lead to COM terminal and insert red test lead µA, mA or 10A terminal.
    2. **NOTE:** RED test lead must be connected to 10A terminal in A measurement function. Set FUNCTION Switch to “µA”, “mA” or “10A”. Select the suitable position depending on the amount of the measurement current.
    3. Press the SELECT Key once to measure AC.
    4. Turn off the power of the circuit to be measured. Open the circuit after discharging the capacitors.
    5. Connect the black test lead to the (earth) side, and connect the red test lead to the (positive) side of the circuit to be measured.

6. **NOTE:** Connect the instrument IN SERIES to the circuit.
7. **NOTE:** Use alligator clips (optional) for dangerous current measurement.
8. Turn on the power of the circuit to be measured. Read the measurement value on LCD.
9. Turn off the power of the circuit to be measured and discharge all the capacitors. Set
10. FUNCTION Switch to “OFF”.
11. **NOTE:** Accuracy is not applicable to Hz or Duty measurements that are entered from μA / mA / A measurement functions.

- **Available functions:** Range hold, Display hold, Difference measurement and Reset function

MAINTENANCE

BATTERY AND FUSE REPLACEMENT

- ⚠**WARNING:** To avoid electrical shock, replace batteries and fuses after finishing measurement. Detach test leads from the circuit and input terminals and set the FUNCTION Switch to “OFF”.
- Always use the specified fuse. Do not use this instrument shorting fuse holder without using the fuse.
- **FUSE SPECIFICATION** 0.5A/250V (φ5×20mm) and 10A/250V (φ6×30mm)

BATTERY REPLACEMENT

1. Detach test leads from input terminals and set FUNCTION Switch to “OFF”.
2. Loosen a screw of battery cover and open it.
3. Remove the exhausted batteries and insert 2 pcs of new 1.5V R6P (AA) batteries in the correct polarity.
4. Fix battery cover and tighten the screw.

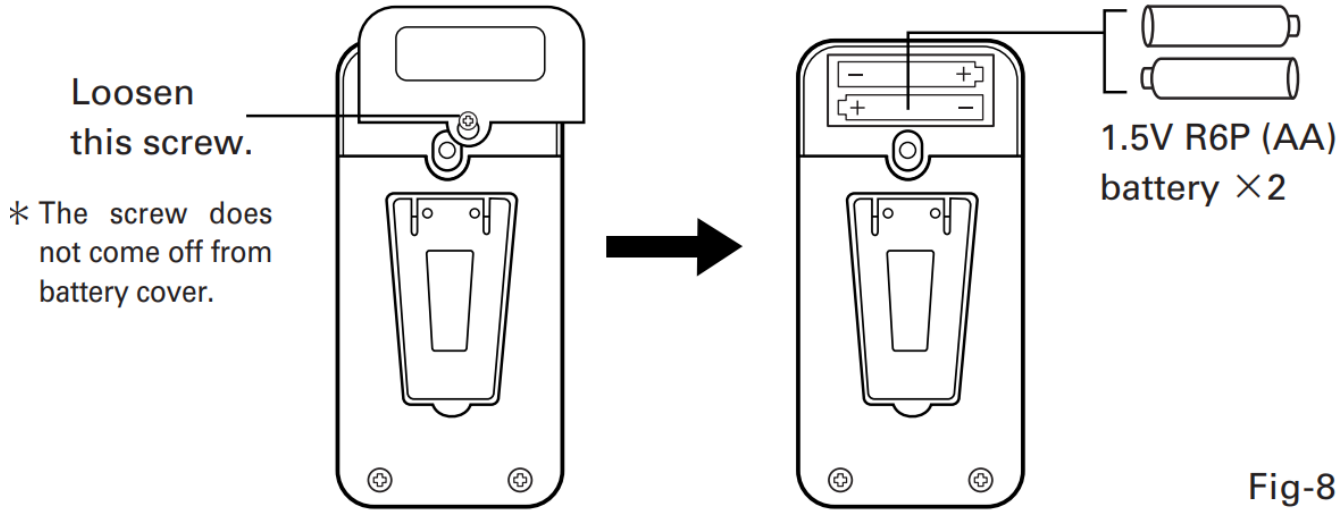

Fig-8

- Remove the battery when the instrument is out of use for a long time. The exhausted battery might leak electrolytes and corrode the inside.

FUSE REPLACEMENT

1. Detach test leads from input terminals and set FUNCTION Switch to “OFF”.
2. Loosen 2-screws on the lower side of the rear case and remove the rear case.
3. Remove the blown fuse from the fuse holder and insert a new one.
4. Fix rear case onto the front case and tighten the screws.

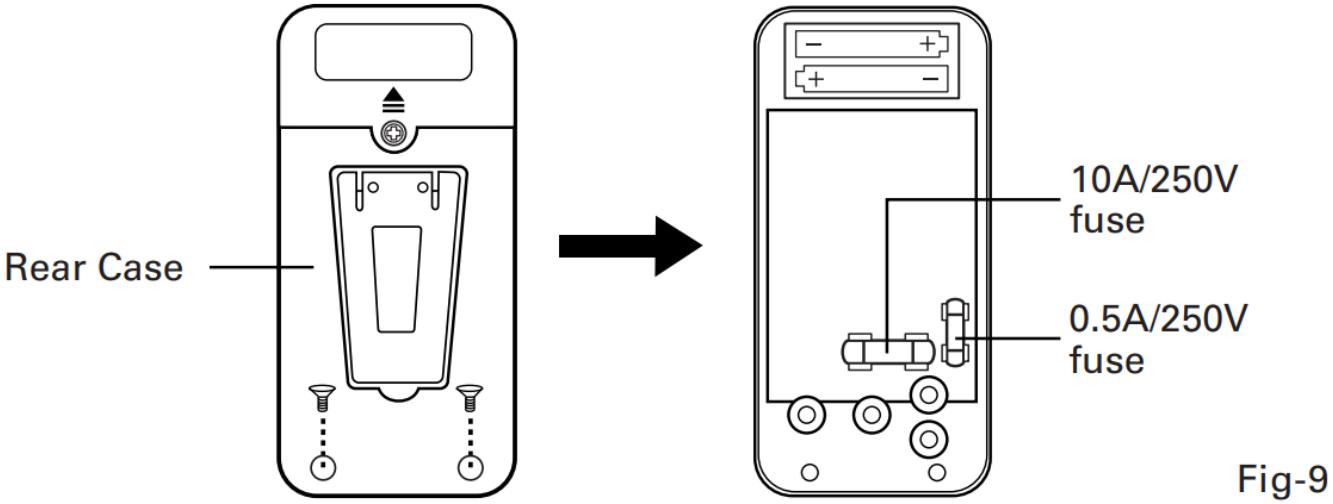

Fig-9

PERIODICAL CHECK AND CALIBRATION

- Periodical checks and calibration are 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.

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 for a repair service.
    1. Check the battery connection, polarity, and capacity.
    2. Check if the fuse does not blow out or not drop off from the fuse holder.
    3. Confirm that the FUNCTION Switch is set correctly.
    4. Confirm if the over input, exceeding the specified range value, is not applied.
    5. Confirm that measured accuracy is adopted in the operating environment.
    6. Confirm that the body of this instrument and the test leads have no cracks or any other damage.
    7. Check that the instrument is not affected by the strong noise generated from the equipment to be measured or the measuring surroundings.

WARRANTY

KU-2602 is warranted in its entirety against any defects of material or workmanship under normal use and service within 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 KU-2602 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 instead 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 that has been repaired or altered outside of KAISE AUTHORIZED SERVICE AGENCY, nor which has 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**
- **422 Hayashinogo, Ueda City, Nagano Pref., 386-0156 Japan**
- **TEL : +81268351601**
- **FAX: +81268351603**
  E-mail: sales@kaise.com
- **http://www.kaise.com**
- **Product specifications and appearance are subject to change without notice due to continual improvements.**

FAQ

- **Q: What should I do if I encounter a damaged or missing item in the package?**
  - **A:** If there are any damaged or missing items, ask your local dealer for replacements.
- **Q: Can the Digital Multimeter measure High Power Lines?**
  - **A:** No, the Digital Multimeter is designed for Power Line measurements. Do not measure High Power Lines as it can be dangerous.

Documents / Resources

	kaise KU-2602 Digital Multi Meter [pdf] Instruction Manual KU-2602 Digital Multi Meter, KU-2602, Digital Multi Meter, Multi Meter

References

- k
- User Manual