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kaise

INSTRUCTION MANUAL

DROP-PROOF
MULTITESTER

MODEL	SK—350
	SK—352
	SK—355

V - Ω - mA - ℃

KAISE CORPORATION

FOR SAFETY MEASUREMENTS

Prior to use, to avoid an electrical shock hazard to the operator and/or damage to the instruments, read carefully the WARNINGS with the symbol ⚠ listed in 「4. SAFETY PRECAUTIONS」, 「5. MEASUREMENT PROCEDURES」 and 「6. MAINTENANCE」 of this instruction manual.

Important Symbol

⚠ : The symbol listed in IEC 1010 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.

⚠ WARNING

Do not measure High Power Line with this instrument. High Power Line sometimes includes High Surge Voltage that could possibly induce dangerous arcs of explosive short in the instrument and could result in serious injury to the operator. When measuring dangerous voltages of High Voltage Circuits, always place the instrument away from your body without holding it with your hands.

Do not touch Multitester, its Test Leads, or any part of the circuit while it is on.

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1. INTRODUCTION

1-1. GENERAL

The SK-350 Series is a very useful, versatile and tough instrument that was designed with users in mind for maintaining and reparing electrical appliances and equipments.

The strong Taut-Band Metermovement and rugged Cases enabled the instrument to be called Drop-Proof Multitester compared with the others. The three models are very sensitive, versatile instruments that provide the facilities and quality required by today's electric/electronic technicians and engineers.

1-2. FEATURES

1. **1m. DROP-PROOF :** Model SK-350 Series will not break and it will still read within the specified accuracy, even if it is dropped on a concrete floor from one meter height by careless mistake.
2. **TAUT-BAND METER :** The meter is free from friction and very strong for drop-shock. Also, easy to read provided with a large 3 colored Scale Plate.
3. **hFE MEASUREMENTS :** SK-350 can measure hFE easily by the Transistor Socket on the Front Case and can read hFE value on the Linear hFE Scale..
4. **TEMPERATURE MEASUREMENTS :** The models can measure temperature of −30℃ to +200℃ by using Temperature Probe purchased separately.
5. **12A AC/DC MEASUREMENTS :** SK-352 can measure current up to 12A DC and SK-355 up to 12A AC/DC.
6. **CONTINUITY BUZZER :** Continuity less than 3kΩ is checked by audible sound of buzzer.
7. **ADDITIONAL MEASUREMENTS :** capable of High Voltage (50kV DC) and Large Current (600A AC) Measurements by using optional adapters.
8. **PORTABILITY :** Compact and Lightweight instruments, the cases of which are made of shock-resistant ABS.

1-3. UNPACKING AND INSPECTION

Before unpacking, examine the shipping carton for any sign of damage.

Unpack and inspect the instrument and accessories for any damage from mechanical shock, water leakage, or other causes. If any damage or missing item is found, consult the local dealer for replacement.

Make certain that following items are included in the box.

1. Multitester
2. One pair of Test Leads (100-04)
3. One 1.5V R6P Battery, One 9V 6F22 Battery
4. One Spare Fuse : 0.75A 250V
5. Instruction Manual

2. SPECIFICATIONS (23℃±5℃)

1. MEASURING RANGES

	SK-350	SK-352	SK-355
⎓ V	0.3/3/12/30/120/300/1200V	0.3/3/12/30/120/300/1200V	0.3/3/12/30/120/300/1200V
~ V	12/60/300/1200V	12/30/120/300/1200V	12/60/300/1200V
⎓ mA, A	60μ/3m/30m/600mA	60μ/3m/30m/600m/12A (less than 60 sec.)	60μ/3m/30m/600m/12A (less than 60 sec.
~A	———	———	12A (less than 60 sec.)
Ω	2k/20k/2M/20MΩ	2k/200k/2M/20MΩ	2k/200k/2M/20MΩ
TEMP.	———	−30℃~+200℃ (by optional Temperature Probe)	
hFE	0~1200	———	———
dB	−10~+23/37/51/63dB	−10~+23/31/43/51/63dB	−10~+23/37/51/63dB

2. **ACCURACY :** ⎓ V, ⎓ mA, ⎓ A, hFE ; ±3% of FS.
   ~ V, ~ A ; ±4% of FS.
   Ω, TEMP. (℃) ; ±3% of FSL.
3. **OVERLOAD PROTECTION :** One pair of Diodes and one 0.75A 250V Fuse on mA and Ω ranges. ⎓/~ 12A ranges are not fused.
4. **DIELECTRIC STRENGTH :** 3.4kV AC one minute between Cases and Terminals.
5. **OPERATING TEMPERATURE & HUMIDITY :**
   0℃ to 40℃, less than 80% RH in non-condensing.
6. **STORAGE TEMPERATURE & HUMIDITY :**
   −20℃ to 60℃, less than 75% RH in non-condensing.

7. **POWER SUPPLY :** One 1.5V R6P (AA) battery and one 9V 6F22 battery.
8. **DIMENSIONS & WEIGHT :** 140×92×30mm, 280g,
9. **OPTIONAL ACCESSORIES :**
   - 660 Clamp Adapter (300A DC),
   - 810-03 Temperature Probe (−30℃ to +200℃),
   - 862-04 High Voltage Probe (50kV DC),
   - 876-02 Clamp Adapter (600A AC),
   - 940 Alligator Clips,
   - 976 Carrying Case.

3. NAME ILLUSTRATION

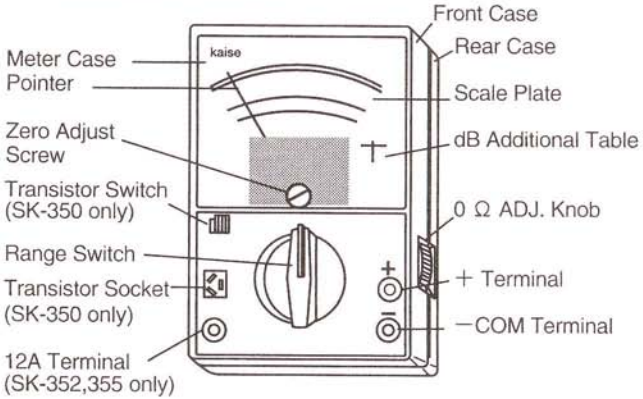


fig. 1

4. SAFETY PRECAUTIONS

Correct knowledge about electric measurements is necessary because electric measurement is sometimes a very dangerous work. To eliminate possibility of injury to the operator and damage to the instrument, the following precautions and measurement procedures must be taken. Misuse, abuse and carelessness cannot be prevented by any written word and is fully the operator's responsibility. Observing the following precautions, take safe measurements.

4-1. WARNINGS

⚠ WARNING 1. Checks of Body and Test Leads

Before every measurement, do not fail to confirm that the body of this instrument and handle insulators of the attached Test Leads have no cracks nor any other damage on them. Make sure that the body and the handle insulators are free of dust, grease and moisture.

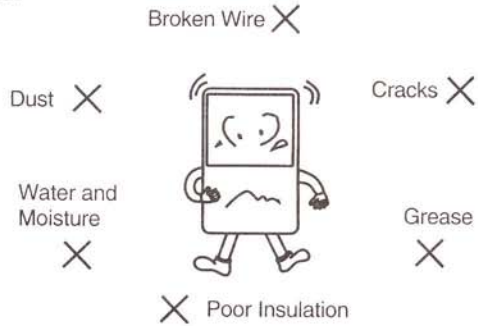


fig.2

⚠ WARNING 2. Measurements of High Power Line Prohibited

Do not measure with this instrument High Power Line (High Energy Circuits) such as Distribution Transformers, Bus Bars, Power Line for Big Motors, etc. High Power Line is very dangerous as it sometimes includes High Surge Voltage that will induce short in the instrument and results in shock hazard. Use the special instrument designed to measure High Power Line.

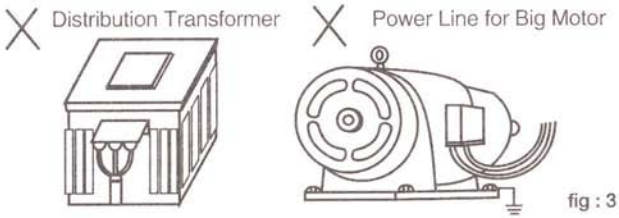


fig : 3

⚠ WARNING 3. Warning for High Voltage Measurements

Even if to measure Low Energy Circuits of electric/electronic appliances, heating elements, small motors, line cords and plugs, etc., High Voltage Measurements are very dangerous. Do not touch the Multitester, its Test Leads or any part of the Circuit while it is on. Generally, shock hazard shall be considered to exist at any part involving a potential in excess of 30V rms or 42.4V DC or peak and where a leakage current from that part to ground exceeds 0.5mA.

⚠ WARNING 4. Dangerous Voltage Measurement Procedure

Always observe strictly the following measurement procedure when measuring dangerous voltage.

1. Before measurement, turn off power to the circuit to be measured.
2. Insert Black Test Plug of Test Leads into −COM Terminal and Red Test Plug of Test Leads into + Terminal.
3. Attach Black and Red Alligator Clips (optional) to both Test Prods of Test Leads.
4. Set RANGE Switch to a desired V position.
5. Confirm that the power of the circuit to be measured is OFF. Then, connect Black Alligator Clip to − (earth) side and Red Alligator Clip to + (positive) side of the circuit to be measured.
6. Place the instrument away from your body , and do not touch it with your hands. Also, take safety distance from the power source or the circuit to prevent any part of your body from touching dangerous voltage.
7. Turn on power to the circuit to be measured and read the voltage on the Meter. Refer to the figure 4.

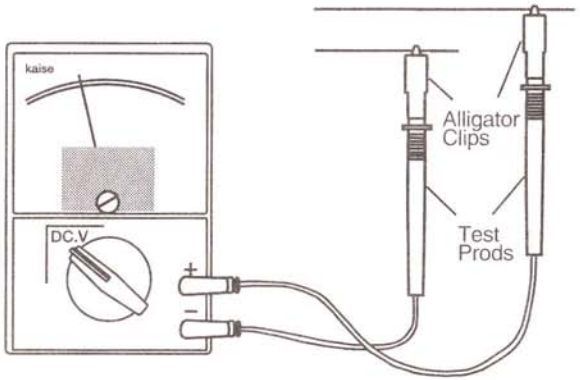


fig. 4

8. Turn off power to the circuit to be measured and discharge all capacitors in the circuit.
9. Disconnect Alligator Clips of Test Prods from the circuit.

In case you want to measure live line, observe the following procedure.

1. Insert Black Test Plug into −COM Terminal and Red Test Plug into +Terminal.
2. Set RANGE Switch to a desired V position.
3. Take safety distance from the power or the circuit to be measured to prevent any part of your body from touching dangerous voltage.
4. Attach Black Alligator Clip to Black Test Prod. Then, connect Black Alligator Clip to − (earth) side of the circuit to be measured.
5. Hold Red Test Prod with one hand and connect it to + (positive) side of the circuit to be measured.
6. Read the voltage on the Meter. Refer to the figure 5.

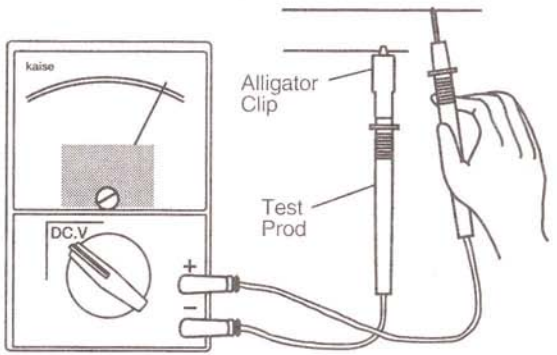


fig. 5

7. Disconnect Red Test Prod from the circuit and then disconnect Black Alligator Clip from the circuit.

⚠ WARNING 5. Warning for 12A DC/AC Measurements (SK-352/355)

When measuring 12A, pay attention to the following points as they often cause troubles.

1. Confirm that Black and Red Test Plugs are inserted into −COM and +12A Terminals, and RANGE Switch is set to ⎓12A or ∼ 12A range.
2. This 12A range is not fused. Do not measure current that might exceed 12A. 12A measurements must be made within one minute to avoid electrical shock hazard and/or damage to the instrument.
3. Do not measure Car Battery directly or 100V to 110V power in the home on this 12A range.

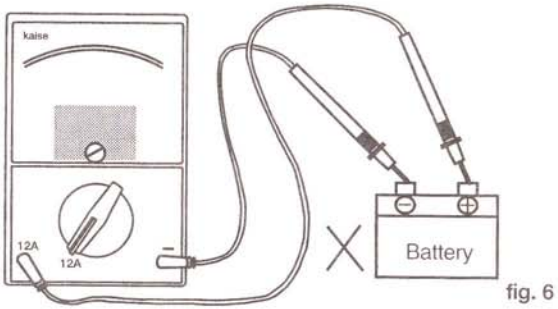


fig. 6

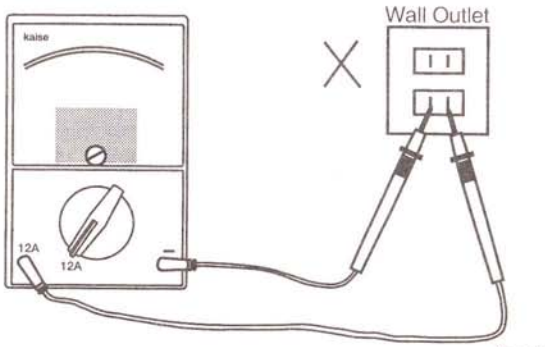


fig. 7

⚠ WARNING 6. Maximum Input Observance

Do not attempt to measure voltage or current that might exceed the specified maximum input of the range to be used.

⚠ WARNING 7. Correct Selection of RANGE Switch

When taking measurements, always confirm that RANGE Switch is set to correct position. Do not measure voltage on Ω, mA, hFE, ♫ and ⎓ /∼12A ranges.

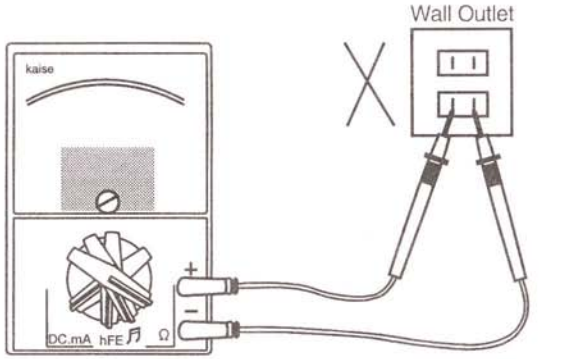


fig. 8

⚠ **WARNING 8. Test Leads Removing**
Prior to changing RANGE Switch to another position when measuring, or opening Rear Case for replacement of battery or fuse, always remove Test Leads from the circuit being measured.

4-2. CAUTIONS IN HANDLING

⚠ **CAUTION 1.** Do not polish the Meter, Front and Rear Cases, or attempt to clean them with any cleaning fluid, gasoline, benzine, etc. If necessary, use silicon oil or antistatic fluid.

⚠ **CAUTION 2.** Avoid severe mechanical shock or vibration, extreme temperature or very strong magnetic fields.

⚠ **CAUTION 3.** Remove the batteries when not in use for an extended time since the exhausted batteries might leak electrolyte and corrode the internal components.

⚠ **CAUTION 4.** The points of Test Prods are sharp and dangerous. Do not get hurt with them.

⚠ **WARNING 5.** Do not let the children use the instrument or those people who have no knowledge and experience of electric measurements.

5. MEASUREMENT PROCEDURES

5-1. PREPARATION FOR USE

1. INSTRUCTION MANUAL ⚠

Prior to use, read INSTRUCTION MANUAL carefully and acquaint yourself with the specifications and functions of the instrument. Especially, read and ovserve strictly 「4. SAFETY PRECAUTIONS」.

2. BATTERY

One 1.5V R6P and one 9V 6F22 batteries are furnished with this instrument. Remove Rear Case by unscrewing the mounting screw and place the batteries in the Battery Case. Make sure that the batteries are firmly set in the correct polarity. For replacement, refer to 「6-2. BATTERY REPLACEMENT」 on page 26.

3. FUSE

One 0.75A 250V 5×20mm fuse is installed to protect Ω and mA ranges. ⎓/~12A range is not fused. When placing the batteries, make sure that the fuse is set tightly in the Fuse Holders. For replacement, refer to 「6-3. FUSE REPLACEMENT」 on page 27.

4. METER ZERO ADJUSTMENT

Before each use, for best accuracy, make certain that the Meter Pointer is set exactly on the Zero position, at the left extremity of the scales. If not on zero, turn right or left the Zero Adjust Screw so that the Meter Pointer should exactly indicate the Zero position. Refer to the figure 9 on page 12.

5. TEST LEADS

Insert Black Test Plug of Test Leads into −COM Terminal and Red Test Plug of Test Leads into + or +12A Terminal. Test Prods of Test Leads are connected to the circuit to be measured.
It is good practice to use Black Test Lead for −COM Terminal (− polarity) and Red Test Lead for + or +12A Terminal (+ polarity).

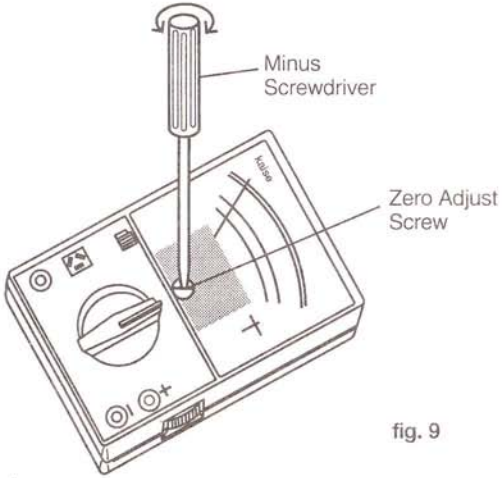


fig. 9

6. RANGE Switch

1. Range Selection : Set RANGE Switch to a desired position. But, if the value of the voltage or current to be measured is unknown, always start with the highest range of the function and read the approximate value. Then, remove Test Leads from the circuit being measured and set RANGE Switch to a suitable range to meet the approximate value.
2. Confirmation of RANGE Switch : Prior to each measurement, always confirm that RANGE Switch is set to a suitable range of the function. Do not measure voltage on Ω, mA, hFE, ♫ or 12A range.

> **⚠ WARNING**
>
> Prior to changing RANGE Switch to another position while making measurement, always remove Test Leads from the circuit being measured. If RANGE Switch is rotated when the instrument is under load, this could result in shock hazard and/or damage to the instrument.

7. HOW TO READ SCALE PLATE

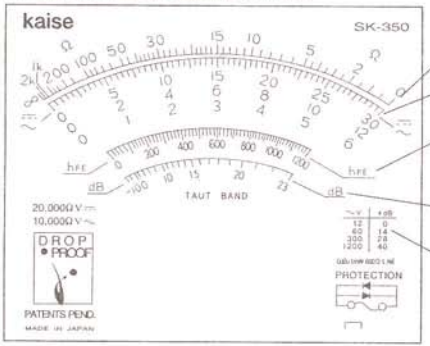


fig. 10

Scale common use for ⎓V, ~V, ⎓mA and ⎓12A. Read a measuring value on 0~6, 0~12 or 0~30 numerals depending on the selected range and multiply it by a suitable ten time multiplier.

Examples : ⎓30V Range ; Read on 0~30 and multiply by 1.
⎓120V Range ; Read on 0~12 and multiply by 10.
⎓0.06mA Range ; Read on 0~6 and multiply by $\frac{1}{100}$.
⎓3V Range ; Read on 0~30 and multiply by $\frac{1}{10}$.

Ω Scale used for resistance measurements. Read a measuring value on 0~2kΩ scale and multiply it by the multiplier of selected range, ×1, ×10 (SK-350), ×100 (SK-352/355), ×1k or ×10k.

Examples : on ×1 Range ; Multiply the reading value by 1.
on ×1k Range ; Multiply the reading value by 1000.

TEMP. ℃ Scale (Temperature) Read the value directly.

hFE (Transistor) Read the value directly.

dB Scale (Decibels) When measured on ~12V Range, read directly. On the other ~V Ranges, read the dB by adding XdB of dB Table on the scale plate.

8. SYMBOLS

Following is the international electrical symbols listed in IEC-1010-1 and ISO 3864, and marked on meters and in the instruction manual.

Symbols	Meaning
⚠	: Warning or Caution, see instruction manual.
⎓	: Direct Current (DC).
~	: Alternating Current (AC).
⎓~	: DC and AC
⏚	: Diode.
⏚	: Earth (ground) Terminal.
⎓	: Fuse.
⧈	: Double Insulation.

9. MEASUREMENT ACCURACY

The measurement accuracy will be affected with the following matters.

1. Meter Zero Adjustment is made exactly?
2. Meter Pointer is read with the eye placed in the right upper position?
3. Multitester is not placed in the environment of strong magnetic fields or noise?
4. Periodical Check and Calibration are made at least once each year and or after it is repaired?

10. OVERLOAD PROTECTION

The multitester is protected against overloads by diodes and fuse. However, the overload protection cannot be goofproof nor perfect. Do not apply voltage on ⎓mA, Ω, hFE and 12A ranges.

5-2. DC VOLTAGE (⎓V) MEASUREMENTS

⚠ WARNING

Do not measure High Power Line (High Energy Circuit) with this instrument. To avoid electrical shock hazard and/or damage to the instrument, do not measure voltage that might exceed Maximum Value of each range.
Prior to each use of the instrument, read carefully 「4. SAFETY PRECAUTIONS」 of this instruction manual and take safe measurements.

1. Insert Black Test Plug into −COM Terminal and Red Test Plug into + Terminal.
2. Set RANGE Switch to a desired range of 0.3V to 1200V DC ranges.
   NOTE : If the approximate value is not known, start with the highest range of 1200V DC and work down to a lower range.

⚠**WARNING :** Prior to setting RANGE Switch to a lower range, always remove Test Leads from the circuit being measured for safety.

3. Connect Black Test Prod to − side of the circuit to be measured and Red Test Prod to + side of the circuit.

⚠**WARNING :** When measuring dangerous voltage more than 100V, turn off power to the circuit to be measured and connect Test Prods to the circuit using Alligator Clips. Do not touch the multitester, its Test Leads or any part of the circuit while it is on. When Test Prod connections are finished, turn on power to the circuit to be measured. Refer to 「⚠WARNING 4. Dangerous Voltage Measurement Procedure」 on page 6.

NOTE : When taking voltage measurements, always connect the instrument **IN PARALELL** with the circuit to be measured.

NOTE : If Test Prods are connected in reverse, Meter Pointer indicates to the left of Zero position.

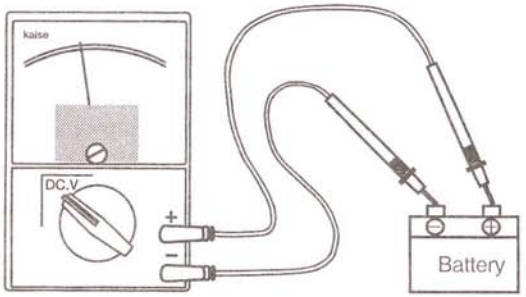
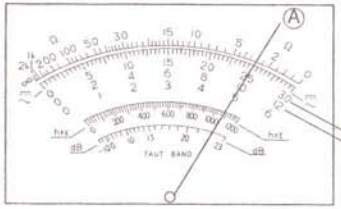


fig. 11

4. Read the voltage on the second black arc down, marked ⎓.



0.3, 3, 30, 300V ranges.

12, 120, 1200V ranges.

Range	How to Read	Example : When Pointer indicates A position.
0.3 V	Read 0 to 30 numerals and multiply by $\frac{1}{100}$.	$25\times\frac{1}{100}=0.25$ (V)
3 V	Read 0 to 30 numerals and multiply by $\frac{1}{10}$.	$25\times\frac{1}{10}=2.5$ (V)
12V	Read 0 to 12 numerals directly.	$10\times1=10$ (V)
30V	Read 0 to 30 numerals directly.	$25\times1=25$ (V)
120V	Read 0 to 12 numerals and multiply by 10.	$10\times10=100$ (V)
300V	Read 0 to 30 numerals and multiply by 10.	$25\times10=250$ (V)
1200V	Read 0 to 12 numerals and multiply by 100.	$10\times100=1000$ (V)

5. When measurements are finished, remove Test Prods from the circuit.

⚠**WARNING :** When dangerous voltage is measured with using Alligator Clips, turn off power to the circuit being measured and remove Alligator Clips from the circuit.

5-3. AC VOLTAGE (~V) MEASUREMENTS

> ⚠ **WARNING**
> Do not measure High Power Line (High Energy Circuit) with this instrument. To avoid electrical shock hazard and/or damage to the instrument, do not measure voltage that might exceed Maximum Voltage of each range.
> Prior to each use of the instrument, read carefully 「4. SAFETY PRECAUTIONS」 of this instruction manual and take safe measurements.

1. Insert Black Test Plug into −COM Terminal and Red Test Plug into + Terminal.
2. Set RANGE Switch to a desired range of 12V to 1200V AC ranges.
   NOTE : If the approximate value is not known, start with the highest range of 1200V AC and work down to a lower range.

⚠**WARNING :** Prior to setting RANGE Switch to a lower position, always remove Test Leads from the circuit being measured for safety.

3. Connect Black Test Prod to the earth (negative) side of the circuit to be measured and Red Test Prod to the high potential (positive) side of the circuit.

⚠**WARNING :** When measuring dangerous voltage more than 100V, turn off power to the circuit to be measured and connect Test Prods to the circuit using Alligator Clips. Do not touch the multitester, its Test Leads or any part of the circuit while it is on. When Test Prod connections are finished, turn on power to the circuit to be measured.

NOTE : When taking voltage measurements, always connect the instrument **IN PARALELL** with the circuit to be measured.

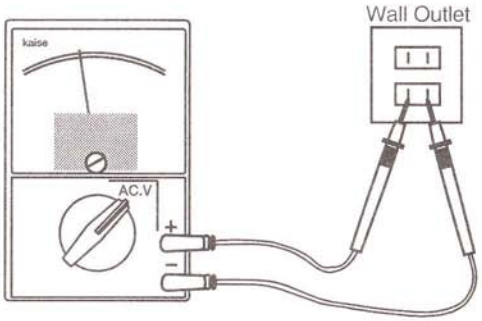
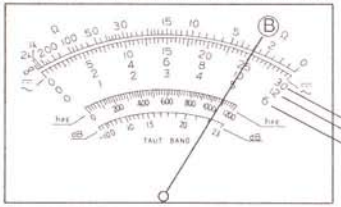


fig. 12

4. Read the voltage on the second black arc down, marked ≂.



Range	How to Read	Example : When Pointer indicates B position.
12V	Read 0 to 12 numerals directly.	10×1=10 (V)
30V	Read 0 to 30 numerals directly.	25×1=25 (V)
60V	Read 0 to 6 numerals and multiply by 10.	5×10=50 (V)
120V	Read 0 to 12 numerals and multiply by 10.	10×10=100 (V)
300V	Read 0 to 30 numerals and multiply by 10.	25×10=250 (V)
1200V	Read 0 to 12 numerals and multiply by 100.	12×100=1200 (V)

5. When measurements are finished, remove Test Prods from the circuit.

⚠**WARNING** : When dangerous voltage is measured with using Alligator Clips, turn off power to the circuit being measured and disconnect Alligator Clips from the circuit.

5-4. DC CURRENT (⎓ mA and ⎓12A) MEASUREMENTS

> ⚠ **WARNING**
>
> Do not measure High Power Line (High Energy Circuit) with this instrument. To avoid electrical shock hazard and/or damage to the instrument, do not measure dc current that might exceed the Maximum Current of each range.
> Prior to each use, always make sure that correct Range and Terminals are selected. Do not measure voltage on ⎓ mA and 12A ranges. Also, before every measurement, read carefully 「4. SAFETY PRECAUTIONS」 of this instruction manual and take safe measurements.

1. Insert Black Test Plug into −COM Terminal and Red Test Plug into + Terminal. When to measure ⎓12A on SK-352 and SK-355, insert Red Test Plug into + ⎓12A Terminal.
2. Set RANGE Switch to a desired range of 0.06mA to 600mA (12A) ranges.

> ⚠ **WARNING**
>
> ⎓mA ranges are protected by one 0.75A 250V fuse. But, 12A range is not fused. Do not measure Wall Outlet voltage or Car Battery directly (do not measure + −Terminals directly) on ⎓mA and 12A ranges.

3. Turn off power to the circuit to be measured and discharge all capacitors in the circuit. Then, open the circuit in which current is to be measured.
4. Connect Black Test Prod to the − side of the circuit to be measured and Red Test Prod to the + side.

NOTE : It is recommended to use Alligator Clips (optional) to connect Test Prods to the circuit to be measured.

NOTE : When measuring current, always connect the instrument **IN SERIES** with the circuit to be measured.

NOTE : If Test Prods are connected in reverse, Meter pointer indicates to the left of Zero position.

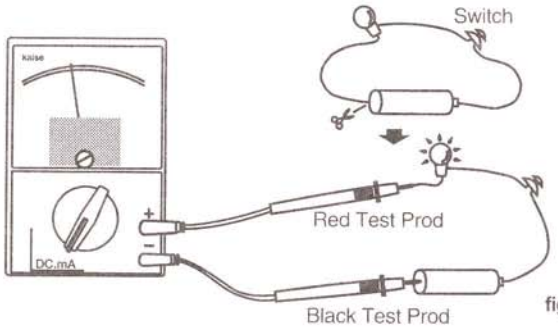
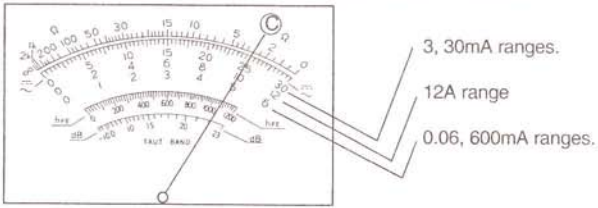


fig. 13

5. Turn on power to the circuit to be measured.
6. Read the current on the second black arc down, marked ⎓.



Range	How to Read	Example : When Pointer indicates C position.
0.06mA	Read 0 to 6 numerals and multiply by $\frac{1}{100}$.	$5\times\frac{1}{100}=0.05$ (mA)
3mA	Read 0 to 30 numerals and multiply by $\frac{1}{10}$.	$25\times\frac{1}{10}=2.5$ (mA)
30mA	Read 0 to 30 numerals directly.	$25\times1=25$ (mA)
600mA	Read 0 to 6 numerals and multiply by 100.	$5\times100=500$ (mA)
12A	Read 0 to 12 numerals directly.	$10\times1=10$ (mA)

7. When measurements are finished, turn off power to the circuit being measured and discharge all capacitors in the circuit.
8. Remove Test Prods from the circuit and reconnect the circuit that was being measured.

5-5. AC CURRENT (~12A) MEASUREMENTS (SK-355)

⚠ WARNING

Do not measure High Power Line (High Energy Circuit) with this instrument. 12A Range is not fused. Do not measure current that might exceed 12A to avoid electrical shock hazard and/or damage to the instrument. 12A must be measured within one minute. Prior to each use, always make sure that correct Range and Terminals are selected. Also, before every measurement, read carefully 「4. SAFETY PRECAUTIONS」 of this instruction manual and make safe measurements.

1. Insert Black Test Plug into −COM Terminal and Red Test Plug into +~12A Terminal.
2. Set RANGE Switch to AC12A range.
3. Turn off power to the circuit to be measured and discharge all capacitors in the circuit. Then, open the circuit in which current is to be measured.
4. Connect Black Test Prod to the earth (negative) side of the circuit to be measured and Red Test Prod to the high potential (positive) side of the circuit.
   NOTE : It is recommended to use Alligator Clips (optional) to connect Test Prod to the circuit to be measured.
   NOTE : When measuring current, always connect the instrument **IN SERIES** with the circuit to be measured.
5. Turn on power to the circuit to be measured.
6. Read the current on the 0 to 12 numerals of the second black arc down, marked ⎓.
7. When measurements are finished, turn off power to the circuit being measured and discharge all capacitors in the circuit.
8. Remove Test Prods from the circuit and reconnect the circuit that was being measured.

5-6. RESISTANCE (Ω) MEASUREMENTS

⚠ WARNING

Do not measure Voltage on Ω Ranges. This will cause shock hazard to the operator and/or damage to the instrument. In case in-circuit resistance is measured, turn off power to the circuit to be measured and discharge all capacitors in the circuit.

Prior to measurements, read carefully 「4. SAFETY PRECAUTIONS」 of this instruction manual.

1. Insert Black Test Plug into −COM Terminal and Red Test Plug into + Terminal.
2. Set RANGE Switch to a desired Ω Range of ×1 to ×10k.
3. If the resistor to be measured is connected in a circuit, turn off power to the circuit and discharge all capacitors in the circuit.
4. Short both Test Prods together and adjust 0Ω ADJ. Knob until the pointer stays exactly on the Zero Line of the first blue arc down marked Ω. This procedure is called Zero Ohm Adjustment. This adjustment must be made whenever RANGE Switch is changed.

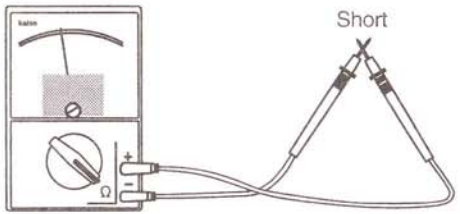


fig. 14

NOTE : If Zero Ohm Adjustment cannot be made, replace 1.5V R6P battery or 9V 6F22 battery.
Refer to 「6. 6-2. BATTERY REPLACEMENT」.

5. Open one side of the resistor to be measured and connect Black and Red Test Prods to both sides of the resistor.

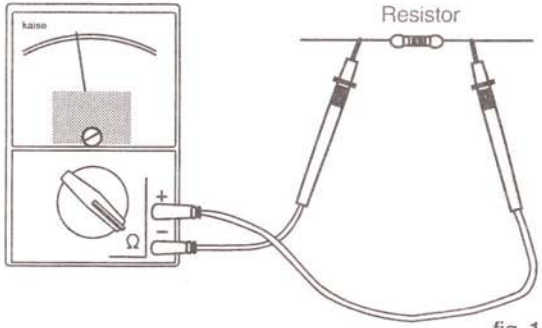
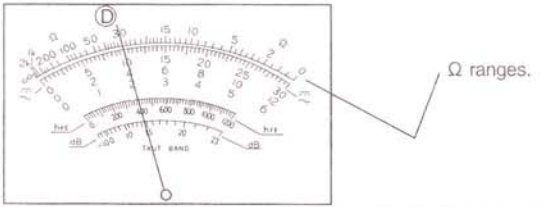


fig. 15

6. Read the resistance on the first blue arc down marked Ω and multiply by the selected Ω range multiplier, ×1, ×10(SK-350), ×100(SK-352 and SK-355), ×1k or ×10k.



Range	How to Read	Example : When Pointer indicates D position.
× 1	Read numerals and multiply by 1.	30×1=30 (Ω)
× 10	Read numerals and multiply by 10.	30×10=300 (Ω)
× 100	Read numerals and multiply by 100.	30×100=3000 (Ω)
× 1k	Read numerals and multiply by 1k(1000).	30×1k=30k (Ω)
× 10k	Read numerals and multiply by 10k(10000).	30×10k=300k (Ω)

7. When measurements are finished, remove the Test Prods from the resistor being measured.

5-7. TEMPERATURE (℃) MEASUREMENTS

> **⚠ WARNING**
> Do not measure Voltage on TEMP(×100) Range to avoid electrical shock hazard and/or damage to the instrument.

Temperature measurements (−30℃ to +200℃) of gas, liquid and solid materials are available with this instrument using the optional Temperature Probe (810-03).

1. Insert Black Test Plug into −COM Terminal and Red Test Plug into + Terminal.
2. Set RANGE Switch to TEMP (×100) Range.
3. Short Black and Red Test Prods together and adjust 0Ω ADJ. Knob so that the Meter Pointer may stay exactly on CAL Line of TEMP ℃ scale (Zero Ohm Adjustment).
4. Remove Test Leads from Terminals and insert Test Plugs of Temperature Probe into the same −COM and + Terminals.
5. Contact the Tip of Temperature Probe to the object to be measured.
6. Read the temperature on the third red arc down, marked TEMP. ℃.
7. When measurements are finished, remove the Tip of Temperature Probe from the object being measured.
8. Remove Test Plugs of Temperature Probe from Terminals.

5-8. TRANSISTOR (hFE) MEASUREMENTS (SK-350)

SK-350 is provided with Transistor Socket to make hFE measurements (0~1200) quite easily and yet more accurately on the linear hFE scale.

1. Set RANGE Switch to hFE Range.
2. Set TRANSISTOR Switch to PNP or NPN position, depending on the type of the transistor to be measured.
3. Insert EBC Pins of the transistor into EBC of Transistor Socket.
4. Read hFE on the third red arc down, marked hFE.
5. When measurement is finished, remove the transistor from TRANSISTOR Socket.

5-9. CONTINUITY (♬) TESTS

> **⚠ WARNING**
> Do not test continuity of High Power Line. This will cause shock hazard to the operator and/or damage to the instrument. Prior to testing continuity, always turn off power to the circuit to be tested and discharge all capacitors in the circuit.

Continuity Tests less than 3kΩ are available audibly by buzzer.

1. Insert Black Test Plug into −COM Termial and Red Test Plug into + Terminal.
2. Set RANGE Switch to ♬ range.
3. Turn off power to the circuit to be tested and discharge all capacitors in the circuit.
4. Connect Black and Red Test Prods to the circuit to be tested.
5. Buzzer sounds if the circuit resistance is less than 3kΩ.
6. When continuity tests are finished, remove the Test Prods from the circuit to be tested.

5-10. DECIBEL (dB) MEASUREMENTS

> **⚠ WARNING**
> Do not measure High Power Line (High Energy Circuit). To avoid electrical shock hazard and/or damage to the instrument, do not measure voltage that might exceed the Maximum Value of the range. Before each use, make sure that correct Range and Terminals are selected. Also, read carefully 「4. SAFETY PRECAUTIONS」 of this instruction manual.

Decibel measurements are made in the same procedure as AC Voltage Measurements.

1. Insert Black Test Plug into −COM Terminal and Red Test Plug into + Terminal.
2. Set RANGE Switch to a desired ~V range of 12V to 1200V.
3. Connect Black Test Prod to the earth (negative) side of the circuit to be measured and Red Test Prod to the high potential (positive)

side of the circuit.

NOTE : When taking dB measurements, always connect the instrument **IN PARALELL** with the circuit to be measured.

NOTE : When measuring a dangerous circuit, turn off power to the circuit and connect Test Prods to the circuit using Alligator Clips. Then, turn on power to the circuit.

4. Read the dB on the fourth black arc down, marked dB. Read dB by using dB Table on the scale plate.

   Example : On AC 12V Range, read the dB value directly.
   If the meter indicates 20dB, 20dB+0dB=20dB
   On AC 300V Range, add 28dB to the reading value.
   If the meter indicates 15dB, 15dB+28dB=43dB

   NOTE : The dB scale of this instrument is referenced under condition that 0 dB is scaled to 1mW power consumption (0.7746V for AC Voltage) on a device with the circuit impedance of 600Ω load. Therefore, if decibels are measured on a device with the circuit impedance of other than 600Ω, the reading value shows only voltage level comparison. To obtain the actual decibels on the devices with other than 600Ω load, use the following formula.

$$X = Y + 10 \log \frac{600}{Z}$$

   X=Actual decibels.
   Y=Reading value on the dB Scale.
   Z=Ohms, the input impedance of the device to be measured.

6. MAINTENANCE

6-1. WARRANTY STATEMENT

The warranty statement for the Multitester is printed on the last page of the manual. Read it carefully before requesting a warranty repair.

6-2. BATTERY REPLACEMENT

> **⚠ WARNING**
> Remove both Test Leads from external circuit connections and from the Input Terminals before removing Rear Case to replace the battery.

1. If the batteries are consumed and Zero Ohm Adjustment cannot be made, replace the batteries. 1.5V R6P Battery covers ×1 to × 1k ranges and 9V 6F22 battery covers ×10k range.
2. Remove both Test Leads from the circuit and from the Terminals.
3. Unscrew the screw and remove Rear Case.
4. Replace the consumed battery with fresh one, 1.5V R6P or 9V 6F22. Place the battery in the correct polarity.
5. Replace Rear Case and screw.

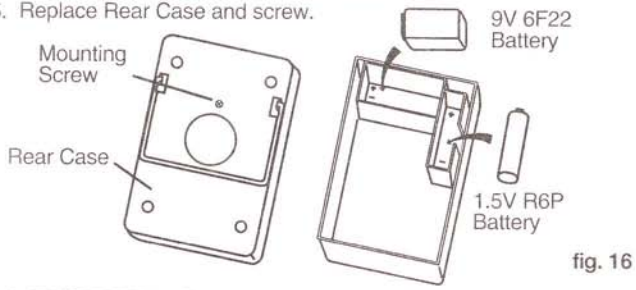


fig. 16

6-3. FUSE REPLACEMENT

> **⚠ WARNING**
> Remove both Test Leads from external circuit connections and from the Input Terminals before removing Rear Case to replace the fuse.

1. If the fuse is blown, mA and Ω ranges become null.
2. Unscrew the screw and remove Rear Case.
3. Replace the blown fuse with any fast acting glass tube fuse, 0.75A 250V 5φ×20mm.

⚠ **WARNING :** Always use the fuse that has the same specificatios as above. Do not bypass the fuse.

4. Replace Rear Case and screw.

6-4. PERIODICAL CHECK AND CALIBRATION

Periodical check and calibration are necessary to make safety measurements as well as to maintain the specifications described on page 3 to 4. It is recommended that the instrument may be checked and calibrated once each year and/or after it is repaired. Periodical Check and Calibration services are available at KAISE AUTHORIZED SERVICE AGENCY through your local dealer at a cost basis charge.

Pack the instrument securely in its original carton together with descriptions of your name, address, telephone number and the service required, and ship prepaid to your local dealer.

6-5. REPAIR

Repair service, warranty or non-warranty, is available at KAISE AUTHORIZED SERVICE AGENCY through your local dealer. Warranty repair is executed free of charge, but, non-warranty repair is charged on the cost basis.

Pack the instrument securely in its original carton together with descriptions of your name, address, telephone number, problem encountered and the service required, and ship prepaid to your local dealer.

When the instrument does not operate properly, the following steps should be taken before returning the instrument for repair, warranty or non-warranty.

1. Check the battery connection.
2. Check the batteries if they are installed in the correct polarity.
3. Check the batteries if they are alive and usable.
4. Check the fuse if it is not blown.
5. Make sure that RANGE Switch is set to correct position.
6. Make sure that the body of this instrument and the handle insulators of the Test Leads have no cracks nor any other damage on them.
7. Be careful of noise from the equipment under test or the ambient environment in which the instrument is being used. The instrument is fully shielded against noise, but may read error due to very strong noise.

WARRANTY

The Multitester, SK-350 Series, is warranted in its entirety against any defects of material or workmanship under normal use and service within a period of six months after the date of purchase of the instrument by the original purchaser. This warranty is extended by **KAISE AUTHORIZED DEALER** only to original purchaser or original user of the instrument on condition that the Warranty Registration Card is completed and returned to the authorized dealer within two weeks after the purchase of the instrument new from the dealer. The obligation under this warranty to be executed by **KAISE AUTHORIZED DEALER** is limited to repairing or replacing the Multitester, SK-350 Series returned intact to it, with transportation charge prepaid, and which to its satisfaction is judged by it to have been thus defective. **KAISE AUTHORIZED DEALER** and **KAISE CORPORATION**, the manufacturer shall not otherwise be liable for any damages or loss, consequential 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 **KAISE AUTHORIZED SERVICE AGENCY**, nor which has been subject to misuse, negligence or accident, incorrect wiring by users, or installation or use not in accord with instructions furnished by the manufacturer.

KAISE AUTHORIZED DEALER