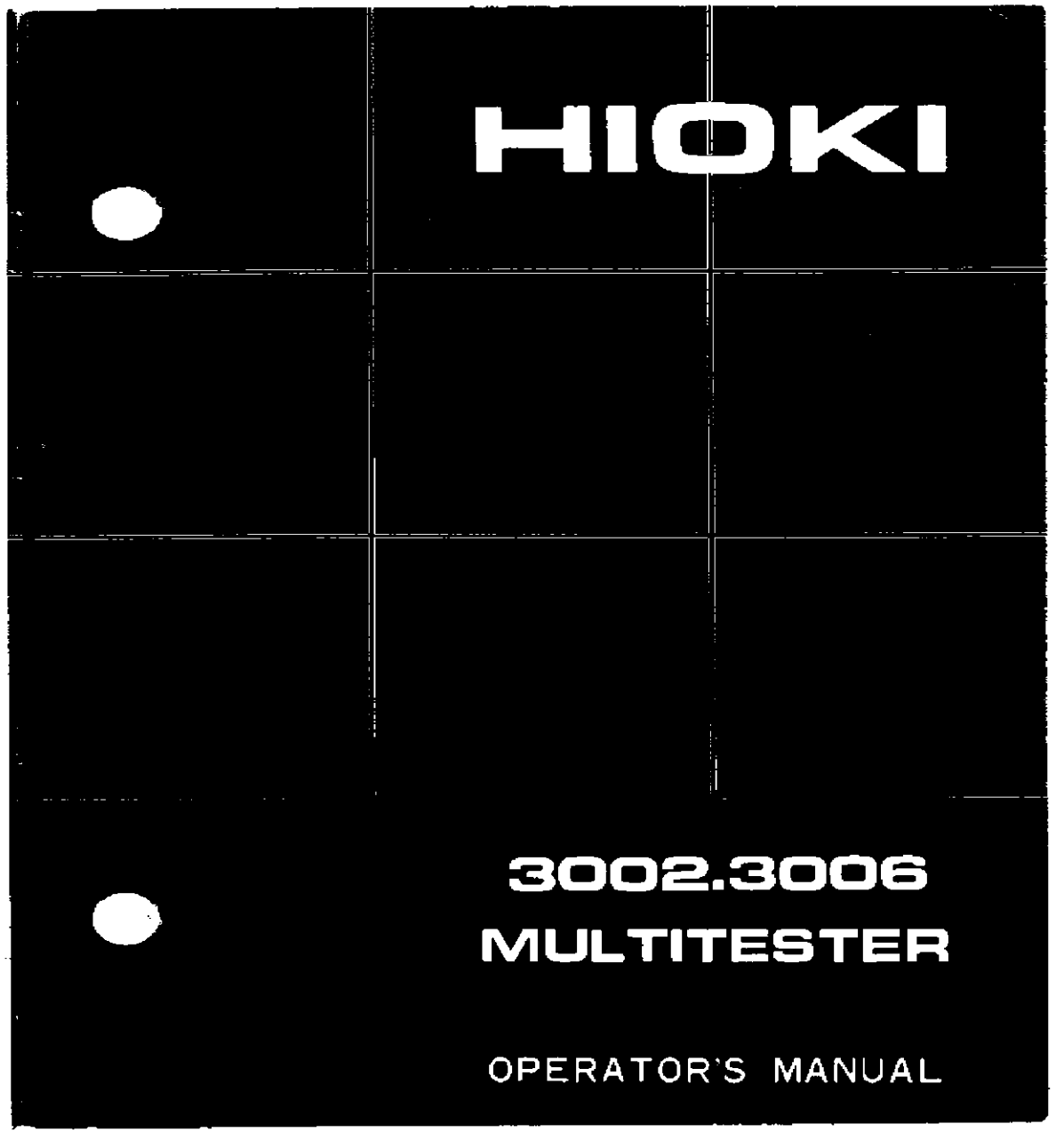


Printed in Japan 3002-3006-1E

WARNING

This Instrument is designed to prevent accidental shock to the operator when properly used. However, no engineering design can render safe an instrument which is used carelessly. Therefore, this manual must be read carefully and completely before making any measurement. Failure to follow directions can result in a serious or fatal accident.

CONTENTS

OUTLINE

3002 and **3006** Multitesters satisfy the requirements of Japanese Industrial Standard (JIS) C1202 for A Class multitesters' and are therefore allowed bear the JIS mark.

Since the **3006** is **dropproof**, it will not break even if accidentally dropped while in use.

Mital has been entirely eliminated from the exterior of panel, to entirely eliminate the possiblity of electric shock.

Meter protection and fuse type circuit protection has been included to guard the circuit against the effects of misuse.

We have also got right away from the old accepted arrangement of the measuring range and have put the Ω and CURRENT ranges on the bottom and the high voltage range on top, thus increasing safety when the tester is in use.

The **3002 · 3006** Multitester is equipped with the CORE MAGNET TAUT BAND METER, Making it more shockproof than older types and unaffected by external magnetic fields.

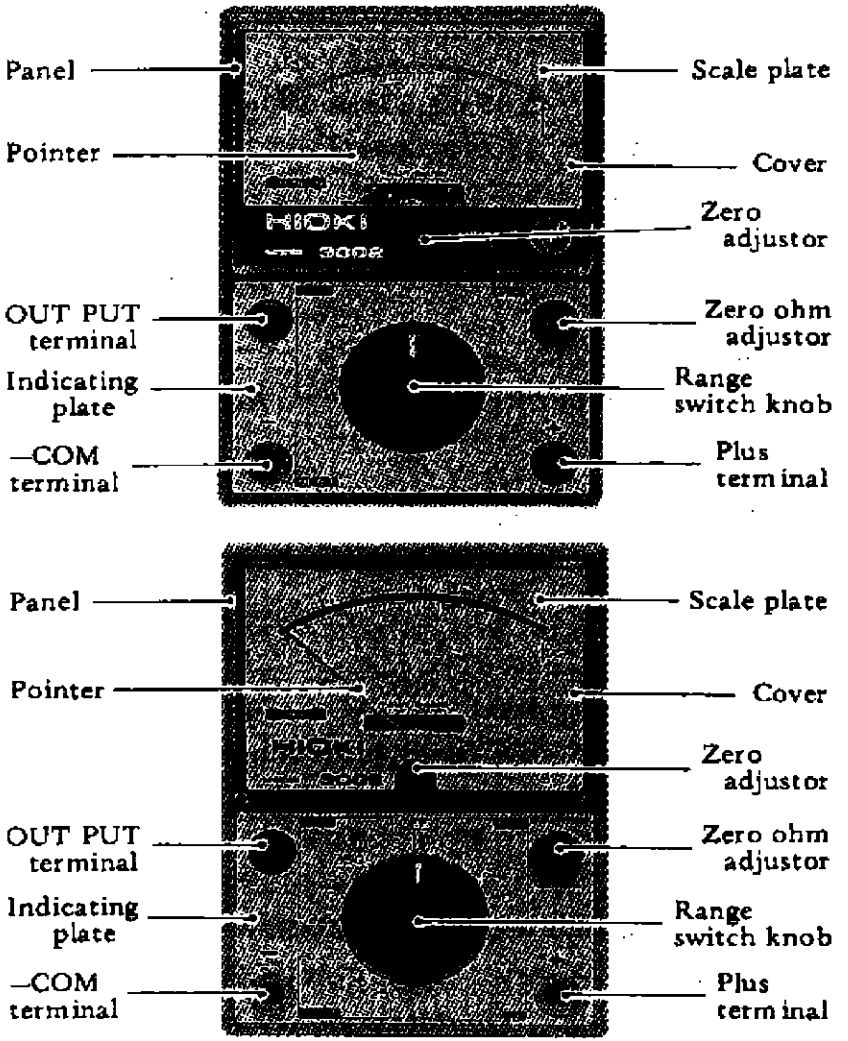
1. GENERAL FEATURES (3002·3006)

(1) A compact, high sensitivity 20 k Ω/V tester.
(2) The use of the self-shielding core magnet TAU BAND meter has greatly increased resistance to shock and eliminated the effects of external magnetic fields.
(3) The mirror scale is an aid to more accurate reading.
(4) Fuse type circuit protection has been included to guard the circuit against the effects of misuse.
(5) Since an output terminal is provided, it is possible to obtain readings for low frequency output.

Features of the 3006 Multitester

(1) Because dropproof, it will not break even if accidentally dropped. (**Max. of DROP PROOF:** 1 m on the concrete.)
(2) It is provided with a strong polycarbonate plastic case

2. NAMES OF PARTS 3002 3006



3. SPECIFICATIONS

(1) **Measurement Range**

DC Voltage 0.25V 2.5V 10V 50V 250V 1000V

AC Voltage 10V 50V 250V 500V 1000V

DC Current 0.05mA 25mA 250mA

Ohms (Ω) ×1 ×10 ×100

Center Ω: 100Ω

Measuring Range: 0 ~ 1MΩ

Low frequency level (dB): −20 ~ +22dB, +20 ~ +36dB

(2) **Input Resistance and Accuracy**

	Input Resistance & Battery	Accuracy
DC V	20kΩ/V	±3% of full scale value
AC V	9kΩ/V	"
DC mA	250mV (Voltage drop)	"
Ω	SUM-3×1 (1.5V) ("AA")	±3% of scale length
Low frequency level		±4% of scale length

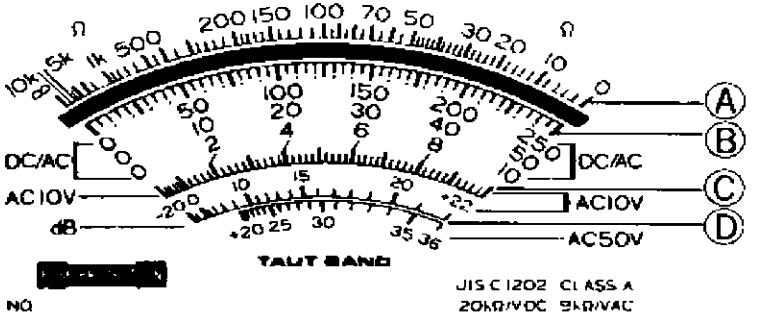
(3) **Accessory circuit:** Meter protecting circuit
Circuit protecting Fuse

(4) **Accessories:** Test leads 1 set
Spare glass fuse 0.5A 1 pce

(5) **Dimension and Weight:** 133H×93W×49D mm 280g

(6) **Optional accessory:** High Voltage Probe: 9011
Measurement range DC 0 ~ 25 kV

4. HOW TO READ THE SCALE



Scale section		Range to measure	Scale to use	Multiplying figure
B	DC Voltage (DC V)	DC 0.25 V	B (250)	×0.001
		2.5	B (250)	×0.01
		10	B (10)	×1
		50	B (50)	×1
		250	B (250)	×1
		1000	B (10)	×100
C	AC Voltage (AC V)	AC 10 V	C (10)	×1
B		50	B (50)	×1
		250	B (250)	×1
		500	B (50)	×10
		1000	B (10)	×100
B	DC Current (DC mA,)	DC 0.05 m A	B (50)	×0.001
		25	B (250)	×0.1
		250	B (250)	×1
A	Ohms (Ω)	×1	A	×1
		×10	A	×10
		×100	A	×100
	Low frequency level (dB)	AC 10 V	D (+22)	×1
		50	D (+36)	×1

5. GENERAL CAUTIONS CONCERNING USE

(1) Turn Zero Adjuster so that the pointer indicated 0 on the left scale.

(2) Test the fuse. This is done by pushing the range switch to either resistance range and then creating a short-circuit with the points of the two test leads. If the pointer moves to the 0Ω graduation on the right hand side the fuse is normal, but if the pointer fails to move at all this indicates that the fuse is blown and it should be replaced.

(3) Start measuring after each time confirming the range to be used. Measuring voltage with resistance range or amperage range is apt to burn internal parts of the tester.

(4) When switching the range during measuring operation, do so only after removing the test lead from the circuit.

(5) Do not use this tester to take readings for high voltage circuits such as those in electronic cooking ranges and other high frequency devices, because the tester can then only withstand the voltage for a small fraction of the time that it can withstand ordina commercial supply frequencies and for this reason the user may exposed to electric shock.

(6) Since circuit protection is provided up to 200V only, on no account should the tester be used to take readings on more powerful circuits.

(7) Do not store the tester in a hot or damp place

HOW TO TAKE READINGS

6-1 Taking DC voltage readings

(1) Insert the black test lead into the [−COM] terminal and the red one into the ⊕ terminal.

(2) Set the range switch knob to the DC V range (0.25V~1000V) on the indicating plate. If the value is known beforehand, set to the range where it can be measured; if the value is unknown, set to the maximum range (1000V), and when the value is known, set to the range for the value.

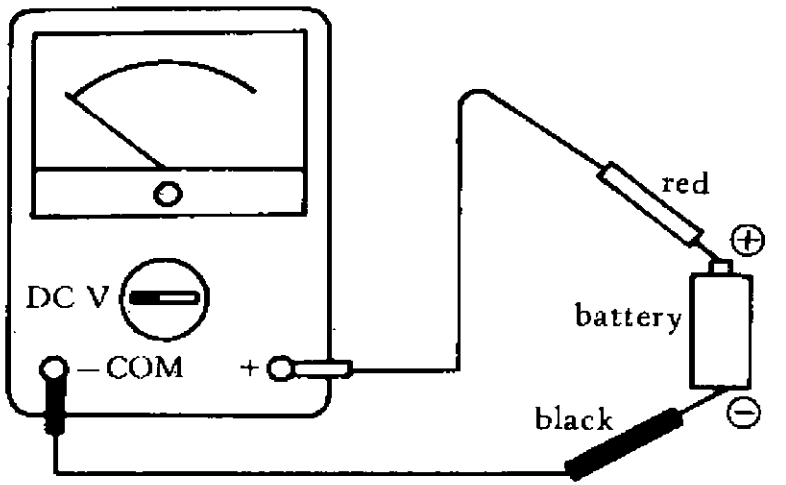


Fig 6—1

(3) To take readings connect (parallel to the part to be measured) the black test lead to the minus side of circuit and the red one to the plus side.

(4) For reading of the value, refer to page 5.

6-2 Taking DC current readings

(1) Insert the black test lead into the [–COM] terminal and the red one into the ⊕ terminal.

(2) Set the range switch knob to the range of DC mA.

(3) Connect the black test lead to the minus side and the red one to the plus side in series to the circuit. (Connect them after cutting off the power source for circuit). Power is turned on at the time of testing. When testing is finished, shut off the power before disconnecting.

(4) Fore reading, refer to page 5.

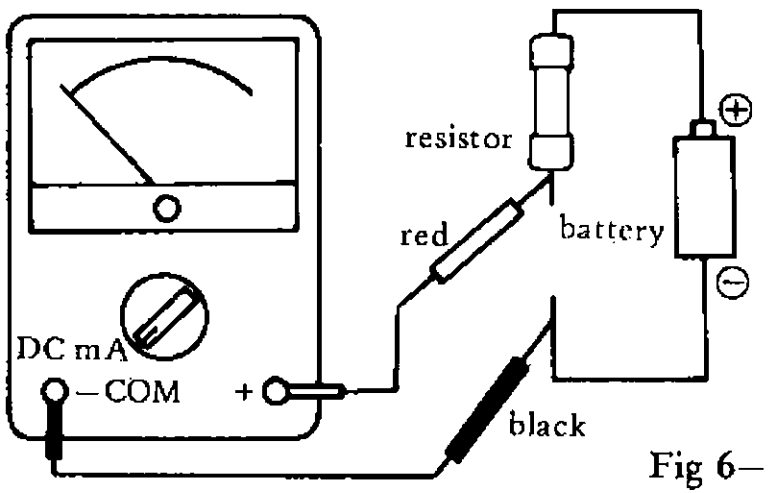


Fig 6–2

6-3 Taking AC voltage readings

(1) Insert the black test lead into the [–COM] terminal and the red one into the ⊕ terminal.
Set the range switch knob to the AC V range (red color 10V~1000V) on the indicating plate.

(3) Take readings by connecting the black and red test leads, regardless of polarity, in parallel to the part to be measured.

(4) For reading of the value, refer to page 5.

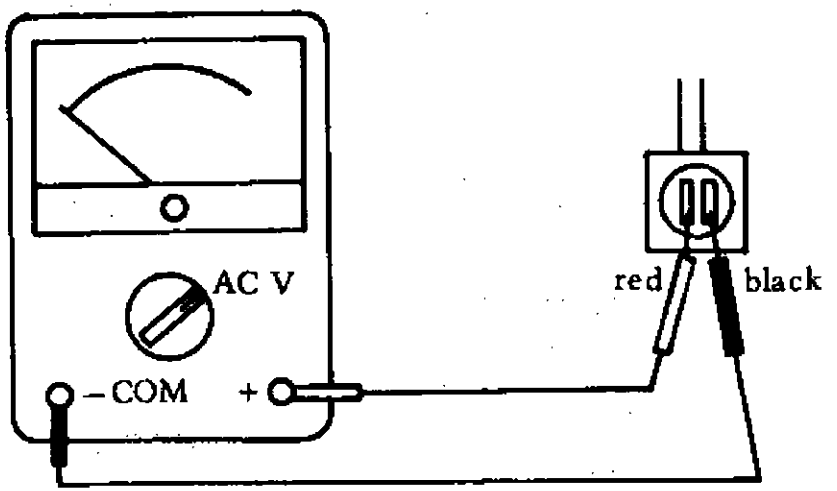


Fig 6–3

6-4 Taking Resistance readings

(1) Insert the black test lead into the [–COM] terminal and the red one into the ⊕ terminal.

(2) Set the range switch knob to the OHMS range (X1, X10, X100,).

(3) Short the tips of he test lead.

(4) The pointer points to 0 of the [Ω] scale. If it does not, set to 0 by adjusting the 0Ω ADJUST knob. If 0 is not indicated even after the adjustment, the battery voltage is insulfficient and the batteries mi

(5) When adjustment is over, connect the test leads to both ends of the objects of to be measured, and read the resistance value.

(6) Fore reading of the value refer to page 5.

Note 1) Measure the resistance of the circuit only after cutting off the power.

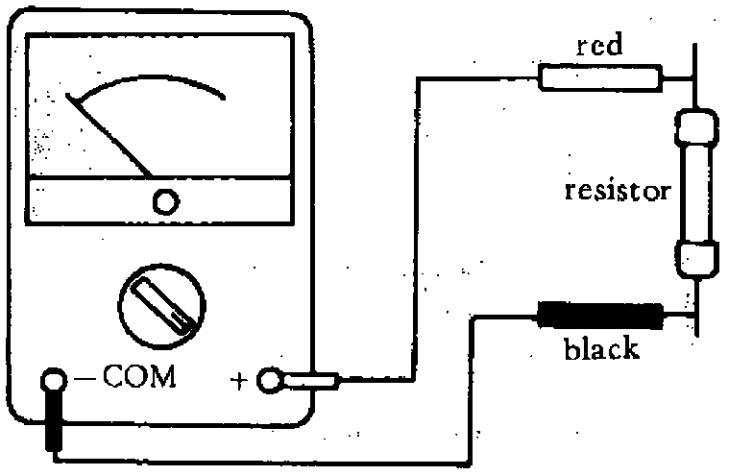


Fig 6—4

6-5 Taking Out Put voltage readings

This concerns measurement of low frequency output voltage of amplifiers etc. Generally speaking, the low

frequency output voltage of circuits of vacuum tubes and transistors often comes in the form of overlapping with DC voltage, and readings must be taken with the needless DC portion eliminated. In order, therefore, to eliminate the DC portion, condensers are inserted into the OUTPUT terminals in series to the AC V circuit.

(1) Insert the black test lead into the [—COM] terminal and the red one into the [OUTPUT] terminal.

(2) Set the range switch knob to the AC V range to be measured.

(3) Obtain readings by connecting the black test lead to the earth side of the object to be measured and the red one to the plus side.

(4) Values are to be read in the same way as for the AC V range.

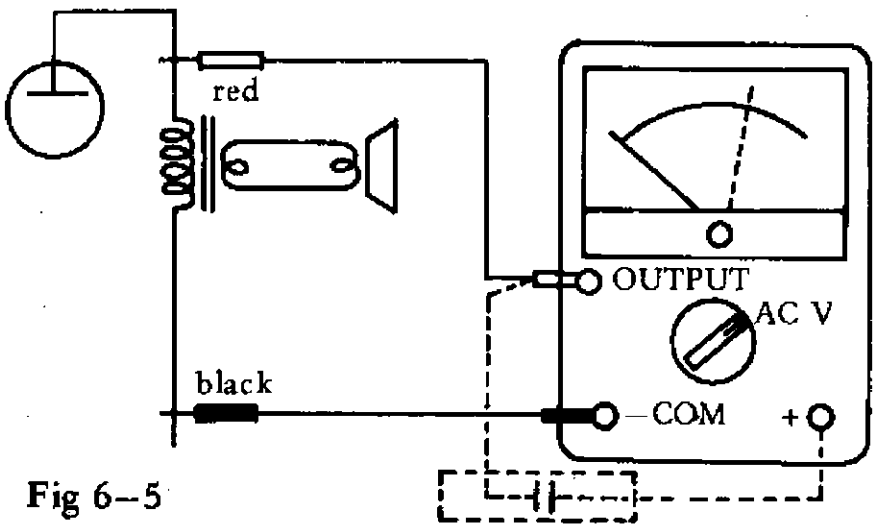


Fig 6—5

6-6 Taking dB readings

dB is a unit that shows the relative ratio (voltage ratio, amperage ratio, power ratio) of the input and output sides of transmitting circuit of amplifiers etc.

The dB markings are −20~+22 (10V) +20~+36 (50V UP) at the lower and of the scale, dB is to be measured in the AC V range from the dB markings. In the case of AC 10V, the −20~+22 (10V) markings are to be read, and in the case of AC 50V, +20~+36 (50V UP) marking.

In the case of over AC 50V, add the dB value shown on the back of the case to the 50V UP.

In the case of readings at AC 250V →+14dB

In the case of readings at AC 500V →+20dB

In the case of readings at AC 1000V→+26dB

With our tester, the dB markings are such that 0 dB = 1 mW = 600Ω.

In the case of other impedance that 600Ω: Circuits that have a 600Ω circuit impedance are transmitting circuits in the main, but the impedances around us are almost invariably those of speakers. For making measurement where the impedance is so low, you may have prepared an impedance matching transformer.

The primary side has 4, 8 or 16Ω which is the same as the speaker impedance. Make 600Ω on the secndary side to mattch it. The primary side is connected with the

output transformer and measurement is made on the secondary side. If you bear it in mind that a value lower by the transformer loss is indicated, you will obtain a enerally correct value.

7. FUSE PROTECTION CIRCUIT

All circuit are protected by a 0.5A glass fuse. The fuse is installed as a protection in case an operation mistake is made. The burn out of the fuse doesn't always protect the circuit completely.

Use the 3002·3006 tester correctly insure long life.

The fuse is standard.

8. THE TAUT BAND METER

By su porting the moving part of the TAUT BAND with a special type of wire, the effect of friction is muc less than in older type meters in which the pivot system is employed, and as a result stable function is assured at all times.

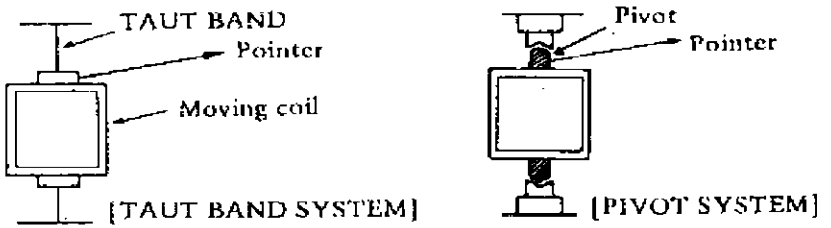


Fig 8–1

The HIOKI TATU BAND is, to give its complete title or description, a self-shielding CORE MAGNET TAUT BAND suspension system. Since is of the core magnet type, not only does it remain unaffected by external magnetic fields but it is at the same time very compact and, as to be expected with the TAUT BAND structure, it is very resistant to shock and because friction does not occur it is amazingly durable.

Other features that give the high performance HIOi TAUT BAND an edge over competitors are the high sensitivity (up to 8.9μA) and superior scale linearity, etc. (PAT. PAT. P)

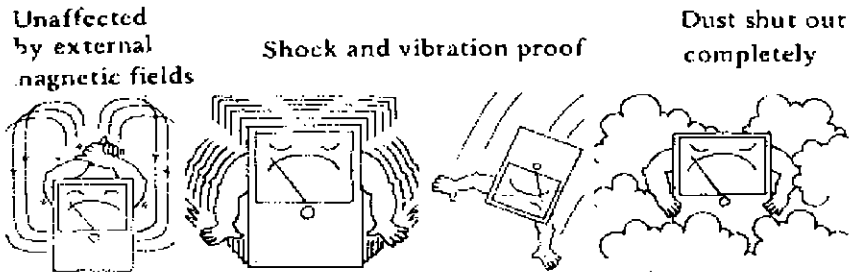


Fig 8–2

9. CONCERNING THE EXPRESSION 'DROPPROOF' (3006)

Sometimes when testers are dropped while in use or being carried, the meter is broken and the tester rendered unusable, but in the case of these Multitesters a special shock-absorbing mechanism and shockproof polycarbonate cover are used and because of this the instrument is referred to as ' dropproof '.

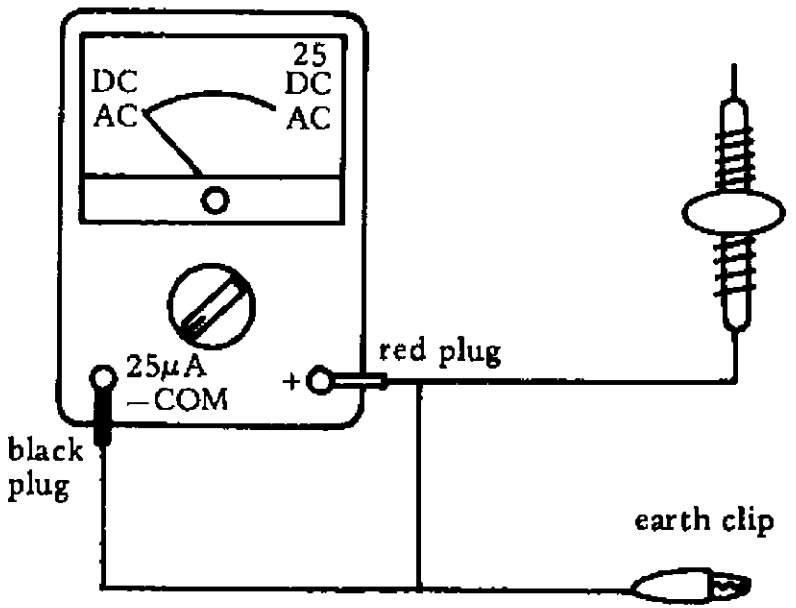
10. OPTIONAL ACCESSORY

9013 High Voltage Probe

This is a 25kV DC capacity high voltage probe

designed for great dielectric strength and outstanding insulating properties to make safety certain and to facilitate the testing of high voltage DC equipment such as TV Braun tubes, etc.

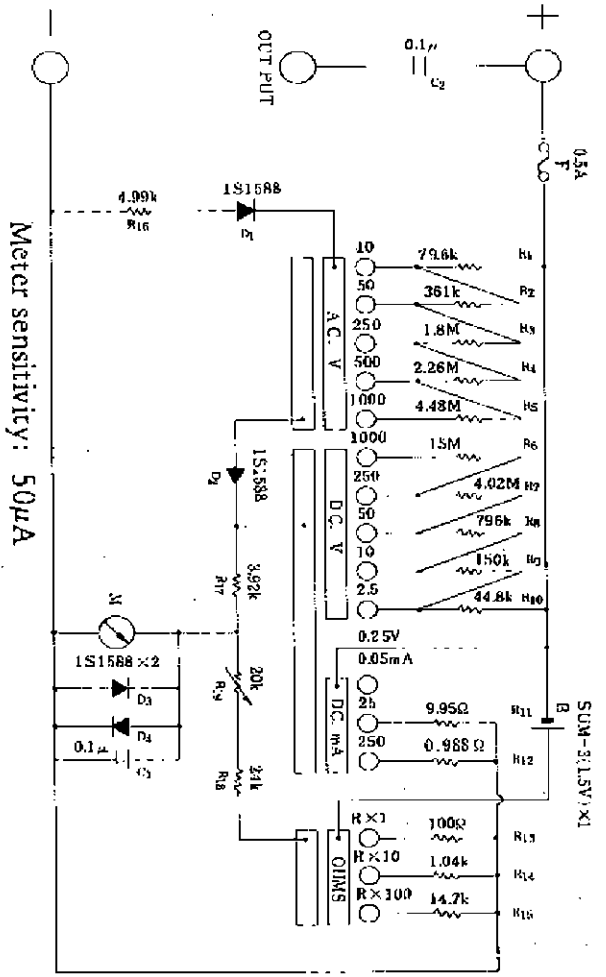
- Test Voltage: 0~25kV DC (Internal resistance: 1000MΩ)
- Accuracy: ±5% of rated valve. (when used with the 3002·3006 Multitester)
- How used: With tester on 50μA DC range.



3002·3006 Tester major parts list

Mark	Items	
R1	Metal film resistor	SN14k2E79.6kΩ
R2	"	SN14k2E361kΩF
R3	"	SN14k2E1.8MΩF
R4	"	Rk½P2.26MΩF
R5	Metal glaze resistor	½ 4.48MΩF
R6	"	½ 15MΩF
R7	"	½ 4.02MΩF
R8	Metal film resistor	SN14k2E79.6kΩF
R9	"	SN14k2E150kΩF
R10	"	SN14k2E44.8kΩF
R11	"	SN14k2H9.95ΩF
R12	Wiring resistor	½L 0.98Ω F
R13	Metal film resistor	SN14k2H100ΩF
R14	"	SN14k2E1.04kΩF
R15	"	SN14k2E14.7kΩF
R16	"	SN14k2E4.99kΩF
R17	"	SN14k2E3.92kΩF
R18	"	SN14k2E24kΩF
R19	Variable resistor (Volume) 20kΩ/B	
C1	Oil condencer 0.1μF 400WV	
C2	Film condencer 0.1μF 50WV Meter protection	
C1~4	Silicon diodes 1S—1588	
F	Glass fuse 0.5A	Circuit Protection
B	Batterys SUM—3 1.5V "AA"	

3002·3006 CIRCUIT DIAGRAM



Meter sensitivity: 50μA
Meter internal resistance: 1.05kΩ

* The value of circuit element is subject to change without notice.