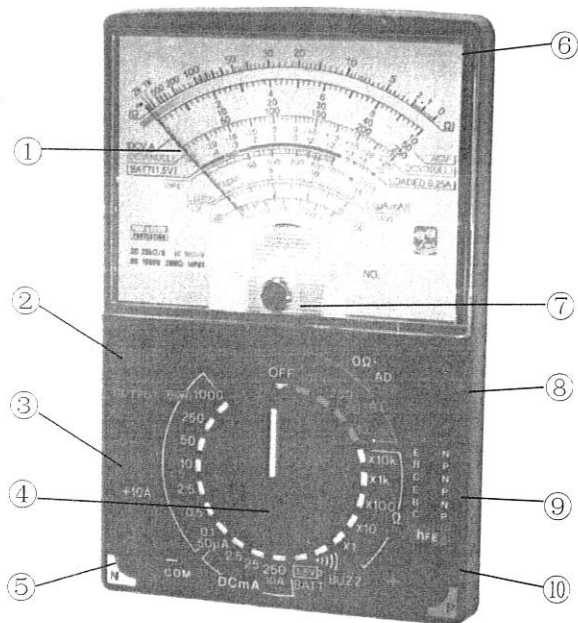


M-1250

MULTITESTER

OPERATOR MANUAL

Appearance and parts names



- 1 : Pointer
- 2 : Series capacitor terminal
(OUTPUT)
- 3 : D.C.10A Terminal
- 4 : Range selector switch knob
- 5 : Measuring terminal-COM

- 6 : Scale reading
- 7 : Zero Corrector
- 8 : $0\ \Omega$ adjusting knob/0-centering meter(NULL meter) adjusting knob
- 9 : hFE test terminal
- 10 : Measuring terminal +

Measurement	Measurement ranges	Accuracy	Remarks
DCV	0-0.1V-0.5V-2.5V-10V-50V-250V-1000V	With in $\pm 3\%$ F.S. 1000V for $\pm 5\%$ F.S.	Input impedance 20k Ω /V
DCV NULL meter	0- $\pm 5V$ 0- $\pm 25V$	With in $\pm 5\%$ F.S.	0-centering meter type input impedance 40k Ω /V
DCmA	0-50uA-2.5mA-25mA-250mA-10A (50uA at the DC 0.1V POSITION)	With in $\pm 3\%$ F.S. 10A for $\pm 5\%$ F.S.	Terminal Voltage drop 250mA (100mV for 50uA)
ACV	0-10V-50V-250V-1000V	With in $\pm 4\%$ F.S. 1000V for $\pm 5\%$ F.S.	Input Impedance 9k Ω /V
AF OUTPUT (dB)	-10dB-+22dB(AC10V)-+62dB 0dB/0.77V(1mW through 600 Ω) Impedance circuit)		Input Impedance 9k Ω V for output terminal
Resistance (Ω)	X 1:0-0.2 Ω 2k Ω Center 20 Ω X 10:0-2 Ω 20k Ω Center 200 Ω X 100:0-20 Ω 200k Ω Center 2000 Ω X 1k:0-200 Ω 2Mk Ω Center 20K Ω X 10k:0-2K Ω 20Mk Ω Center 200K Ω	With in $\pm 3\%$ of arc	Internal batteries UM-3 (1.5V)X2 006P (9V)X1
Buzzer	Conduct indicator (Buzzer is emitted at 120 Ω or less)		Same Ω range power supply optional
Battery test (BATT)	0-1.5V GOOD ? BAD color coded scale		Load current 250mA
Leakage Current (I _{ceo})(LI)	0-150uA at X1k range 0-15mA at X10k range 0-1.5mA at X100 range 0-15mA at X1 range		Current across terminals
Terminal to terminal Voltage(LV)	Common to each Ω range 3V-0V (Reverse of LI scale)		Voltage applied, across terminal while Ω is measured
DC current amplification factor(HFE)	Transistor hfe:0-1000 (in X 10 Ω range)		insert hfe terminal (on scale) directly

REFERENCE TABLE FOR READING

Test	Range Position	Scale to read	Multiplied
Resistance	$\times 1$ $\times 10$ $\times 100$ $\times 1 K$ $\times 10 K$	A A A A A	$\times 1$ $\times 10$ $\times 100$ $\times 1000$ $\times 10000$
DC Volt	DC 0.1V 0.5V 2.5V 10V 50V 250V 1000V	B 10 B 50 B 250 B 10 B 50 B 250 B 10	$\times 0.01$ $\times 0.01$ $\times 0.01$ $\times 1$ $\times 1$ $\times 1$ $\times 100$
DC Current	DC 50 μA 2.5mA 25mA 250mA 10A	B 50 B 250 B 250 B 250 B 10	$\times 1$ $\times 0.01$ $\times 0.1$ $\times 1$ $\times 1$
AC Volt	AC 10V 50V 250V 1000V	B 10 B 50 B 250 B 10	$\times 1$ $\times 1$ $\times 1$ $\times 100$
DCV (NULL)	$\pm 5V$ $\pm 25V$	C ± 5 C ± 25	$\times 1$ $\times 1$
hFE	$\times 10$	D	$\times 1$
ICEO	$\times 1$ $\times 10$	E E	$\times 1$ (for big TR) $\times 1$ (for small TR)
Diode	$\times 1 K$ $\times 100$ $\times 10$ $\times 1$	E F E F E F E F	$\mu A \times 10$ VX1 $\mu A \times 100$ VX1 mA $\times 10$ VX1 mA $\times 100$ VX1
Decibel	AC 10V 50V 250V 1000V	G G G G	$\times 1$ $\times 1 + 14dB$ $\times 1 + 28dB$ $\times 1 + 40dB$

Operation a Circuittester

1 Zero correction of indicator.

Zero corrector ⑦ is adjusted to place the pointer ① on 0 of the scale left. It need not be repeated at each measurement, but the position of the pointer on zero must be confirmed before starting measurement.

2 Test lead connections.

The test leads attached are inserted well down; the red lead going to the + jack and the black lead to the -COM jack.

3 Selection of range.

When selecting a range, the white mark on the knob is correctly positioned at the prescribed range.

(1) DC voltage (DCV) TEST

DC voltages of batteries, amplifier circuits, power source of communication equipment, tube and transistor circuit biases, etc. are measured. Each of the 7 range notations (0.1~1000) indicates the maximum voltage reading for that range.

(2) DCV (NULL) TEST

- ① Please set pointer on zero center position before starting measurement. (Use ADJ knob to place the pointer on 0 of scale)
- ② Set the range selector switch knob to either $\pm 5V$ or $\pm 25V$ in DCV ranges. The two ranges are of automatic polarity circuit. So, if the knob is set to one of the ranges, the indicator pointer will automatically move to around the center and becomes a 0-centering meter (NULL meter)
- ③ When the indicator pointer moves to around the center 0 line, align the pointer exactly to the zero line with 0-centering meter (NULL meter) adjusting knob.
- ④ Set the range selector switch knob to other range positions after finishing measurement.

(3) DC current (DCA) TEST

Current consumption of DC power operated equipment, bias current of tube and transistor circuits, etc. are measured. Each of the 5 range notations (50 μA ~10A) Indicates the maximum current reading for that range. ($\mu A=10^{-3}$ mA and $A=10^3$ mA)

(4) AC voltage (ACV) TEST

Voltage of commercial AC supply, AC powered circuits, AF signal level, etc. are measured. Each of the 4 range notations (10~1000) indicates the maximum voltage reading for that range.

(5) dB TEST

For measurement on the 10V range, the dB scale (-10dB ~ +22dB) is read directly, but, when measured on the 50V range, 14dB is added. On the 250V range, 28dB is added to the reading on the scale, and on the 1000V range 40dB is added.

Thus, the maximum dB readable is $22+40=62$ (dB) measured on the 1000V range.

(6) Resistance (Ω) TEST

Resistance is measured, and line and circuit continuity (∞ or 0Ω) tested. Each of the 5 range notations indicates the multiplication of the reading for that range, where k stands for 1000.

(7) BUZZER TEST

Conduct indicator, buzzer is emitted at 120Ω or less.

(8) BATTERY TEST

Good battery : The pointer stays within the BLUE range.
(GOOD)

Good or bad? : The pointer stays within the ? range the battery
(?) may be used for a small transistor radio, but not
for equipment that needs power.

Bad..... : The pointer stays within the RED range.
(BAD)

(9) I_{ceo} (leakage current) TEST

- ① Plug the test leads into + and - COM sockets.
- ② Set the range selector to $\times 10$ (15mA) for small size transistor, or to $\times 1$ (150mA) for big size transistor.
- ③ Adjust 0Ω ADJ to set the pointer to zero position of the Ω scale.
- ④ Connect the transistor with tester.
For NPN transistor, the "N" terminal of the tester is connected with the COLLECTOR (C) of the transistor and the "P" terminal with the EMITTER (E) of the transistor. For "PNP" transistor,, reverse the NPN transistor connection.
- ⑤ If the reading falls within the red LEAK zone of the I_{ceo} scale, the TR tested is passable, but if it goes beyond the zone coming near to the full scale, the TR is definitely defective.

(10) hfe (DC amplification) TEST

- ① Set the range selector to $\times 10$
- ② Adjust 0Ω ADJ to adjust the pointer to zero position.
- ③ Insert hfe terminal (on scale) directly.
- ④ Read the hFE scale. The value of the reading is $\frac{I_c}{I_b}$, which is the DC amplification degree of the transistor connection.

(11) Diode TEST

- ① Set the range selector at a selected range position $\times 1K$ for 0-151 μA , $\times 100$ for 0-1.5mA, $\times 10$ for 0-15mA, $\times 1$ for 0-150mA test.
- ② Connect the diode to the tester:
For IF (forward current) test, connect the "N" terminal of the tester to the positive polarity of the diode and the "P" terminal to the negative polarity of the diode. For IR (reverse current) test, reverse the connection.
- ③ Read IF or IR on the LI scale provided.
- ④ Read the linear (forward) voltage of the diode on the LV scale while testing IF or IR.

Schematic diagram

DCV
(NULL)

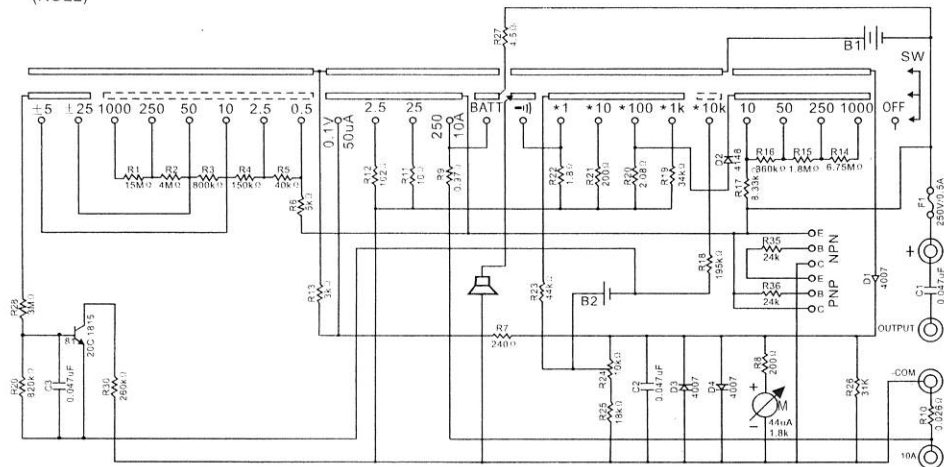
DCV (20k Ω/V)

DCmA

BATT \rightarrow

Ω

DCV (9k Ω/V)



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