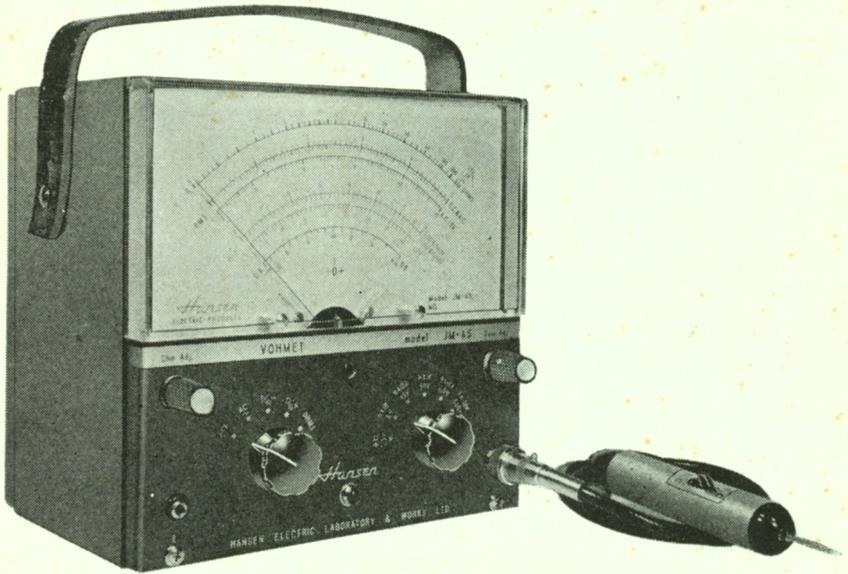


*original*

# Hansen

model JM-45 VTVM. VOM

**' VOHMET '**



**HANSEN ELECTRIC LABORATORY  
& WORKS, LTD.**

**SPECIFICATIONS AND OPERATING  
INSTRUCTIONS FOR "HANSEN"  
'VOHMET' MODEL JM-45**

**SPECIFICATIONS.**

**Ranges :**

DC VOLTS.

**Ranges :** 0—1.5/5/15/50/150/500/1500 volts.

**Input resistance :** 11 megohms., (all ranges).

(Sensitivity on 1.5 V range : 7.3 megohms., per volt)

AC VOLTS.

**Ranges :** 0—1.5/15/50/150/500/1500 volts  
(RMS).

0—4/14/42/140/420/1400/4200 volts  
(P—P).

**Frequency response :** from 30 c/s to 3 mc/s,  $\pm 10\%$   
(1.5—150 V ranges for F. S. D.  
source impedance 100 ohms.,  
approx.)

**Separate crystal probe :** within 15% from 80 kc/s to 250  
mc/s.

OHMS.

**Seven ranges :** 0—1000 megohms.,  
(10/100/1 K/10 K/100 K/1 M/10 M  
ohms., on centre scale).

**Meter movement :**

Moving coil type, 100  $\mu$ A., F. S. D.

**Tube complement :**

6 AL 5 $\times$ 1, 12 AU 7 $\times$ 1, 6 X 4 $\times$ 1.

**Accessories :**

AC—DC Measuring Probe.

Test Lead.

Crystal Diode Probe.

High Voltage Probe Available as optional extra.

**Power Supply :**

230 to 250 V, 50 c/s—60 c/s, AC.

Internal 1.5 V Dry Battery.

**Maximum input voltages :**

DC (no AC present).....1500 V.

AC (no DC present)

**Sine wave :** 1500 V (RMS) or 4200 V. (P—P).

**Complex waveforms :** 2000 V (P—P)

**Combined AC & DC :** 1600 V (Peak).

## FRONT PANEL CONTROLS.

### Power and Function Switch.

Power is applied to the instrument when this control is turned clockwise from the 'OFF' position, and also selects the instrument function. In the 'OFF' position, the meter terminals are shorted in order to damp the meter movement and so reduce the possibility of damage during transit.

### NOTE.

When using the JM-45 V. T. V. M., wait approximately 30 secs., to 1 minute after turning the instrument on, to allow it to warm up.

**Range Switch.**

Selects the AC, DC or resistance range required.

**NOTE.**

If an AC or DC voltage is unknown, select the highest range first and work down to a lower range, as a precautionary measure.

**Electrical Zero Adjustor.**

This is used to set the instrument pointer to the zero mark on the instrument scale.

**Ohms Adjustor.**

This is used to set the instrument pointer to the f. s. d. ( $\infty$  ohm) mark on the resistance scale (when the instrument is used on the ohms ranges).

**Meter Mechanical Zero Corrector.**

This control is a screwdriver adjustment, and is centrally located between the 'zero adjustor' and 'ohms adjustor' controls on the front panel. It should be set so that the instrument pointer rests in the zero position of the scale when the instrument is not in use.

## OPERATION

**Preliminary adjustments :**

- (1) Connect the AC—DC Probe and the Test Lead to the connectors on the front panel.
- (2) If necessary, set the meter to Mechanical Zero by the 'Meter Mechanical Zero Corrector'.
- (3) Connect the power cord to the AC Mains.
- (4) Set the 'Power and Function Switch' to "DC—" or "DC

- +' ranges, and allow a short warm-up period (1 minute).
- (5) Adjust the 'Zero Adjustor Control' to position the meter pointer to zero.
  - (6) When measuring voltages, connect the alligator clip of the test lead to ground (chassis) of the unit under test.
  - (7) Set the 'Power and Function Switch' to 'OFF' position when JM-45 is not in use.

#### **SCALES.**

AC and DC voltages are read on the black DC and AC scale, but when the 1.5 volt AC range is in use, the AC 1.5 V scale should be used.

The black ohms., scale is used for resistance readings. P-P and db., scales are used for p-p and decibel measurements of AC voltages.

#### **AC VOLTAGE.**

- (1) Set the switch on the AC-DC Probe to the AC  $\Omega$  position.
- (2) Set the 'Power and Function Switch' to AC.
- (3) Set the range switch to a position in excess of the estimated voltage to be measured.
- (4) Adjust the 'Electrical Zero Control' to bring the meter pointer to the zero position.

#### **RESISTANCE.**

- (1) Set the switch on the AC-DC Probe to AC- $\Omega$  position.
- (2) Set the 'Power and Function Switch' to ohms.,
- (3) Set the range switch to the resistance range required.
- (4) Short the probe head and alligator clip and adjust the

- 'Electrical Zero Control' to position the pointer to zero.
- (5) Remove the short, and set the 'Ohms Adjust Control' for full scale meter deflection.
  - (6) Connect the probe head and alligator clip to the resistance to be measured.
  - (7) Multiply the reading obtained on the OHMS scale by the factor indicated on the range switch.

**DC VOLTAGE.** (Normal condition).

- (1) Set the switch on the probe to the 'DC' position
- (2) Set the 'Power and Function Switch' to "DC+" or "DC-", as required.
- (3) Connect the clip on the Negative test lead to ground (chassis) on the unit under test.
- (4) Set the 'Range Switch' to a position in excess of the anticipated voltage to be measured.
- (5) Adjust the 'Electrical Zero Adjustor Control' to set the meter pointer to zero.

(Centre zero measurement)

**NOTE.** The maximum input must never exceed **HALF** that indicated on the range scale.

There are seven ranges each equal to + or - half the voltage indicated on the Range Switch scale, e. g. 50 V scale: centre zero reading + or - 25 V.

- (6) Rotate the 'Electrical Zero Control' to set the pointer to the centre zero mark, located near the bottom of the scale.
- (7) Set the Range Switch to a position equal to at least **TWICE** the voltage anticipated.

