

SAKURA TEST INSTRUMENTS

MODEL VT-19

VACUUM TUBE VOLTMETER



SAKURA ELECTRIC CO., LTD.  
TOKYO JAPAN

# SAKURA VACUUM TUBE VOLTMETER

## MODEL VT-19

### FEATURES

1. Factory assembled, wired and tested. NOT A KID.
2. Large, clear and legible meter scales
3. Strong steel case, with durable grey finish
4. Shingle test probe for DC, AC and OHM measurements
5. Stabilized DC amplifier circuit
6. High input impedance for negligible circuit loading
7. RMS and Peak-to-Peak voltage scales
8. Zero center for detector checks
9. Polarity reversing on volts

### DESCRIPTION

The Model VT-19 is an outstanding vacuum tube voltmeter designed for the electronic industry. It is an instrument of versatility for use in radio shops, Plants, laboratories and industrial establishments. It has a wide range of both DC and AC voltages and resistance which make it the most useful instrument for the busy technician. Due to its high impedance, it will not disturb the circuit conditions during voltage measurements. It is an absolute necessity for adjusting and balancing DC and audio circuits of Hi-Fi equipment which of late have come into prominence.

## SPECIFICATIONS

DC Voltages, 7 ranges	0—1.5—5—15—50—150—500—1,500 V (up to 30,000V with HV probe)
Input Resistance	11 megohms
AC Voltages, 7 ranges	0—1.5—5—15—50—150—1,500 V RMS 0—4.2—14—42—140—420—1,400—4,200 P-P
Decibels	-20 to +66db (0db, 1mW into 600 $\Omega$ )
Ohmmeter	0.1 $\Omega$ to 1,000M $\Omega$ 10-100-1K-10K-100K-1M-10M at scale center
Tube Complement	6AL5, 12AU7
Power Supply	AC, 230 Volts, 50/60 cps; 10W
Dimensions H x W x D	20 x 13 x 11 cm. (8 x 5 $\frac{1}{8}$ x 4 $\frac{3}{8}$ in.)
Weight	2.2KG (5 lbs. approx)

## OPERATING INSTRUCTIONS

Measurements of DC and AC voltages and resistance are made by the use of the test probe. This probe is inserted in the jack at the lower center of the front panel. The AC plug is inserted into the local main supply, making certain that the voltage is that for which the instrument was designed.

Set the Selector switch, lower right to -DC, and allow a warm up period of about three minutes for stabilization. The pointer of the meter must be set "0" by means of the ZERO Adjustment control.

- 1) DC Voltage Measurements. It will be noticed that the tip end of the test probe may be rotated. Turn this so that the white dot will be alongside the marking "DC". For ordinary voltage checks, turn the Selector to + DC, and the probe tip will be the positive (+). The

negative lead (—) will be the black test lead, which can be clipped on the chassis of the apparatus under test. The Voltage range is selected by the range switch at the lower left. If the voltage is unknown, start with the higher range and shift towards the lower ranges. When the polarity is reversed, it is necessary to turn the Selector switch to —DC; the ranges are unchanged.

- 2) AC Voltage Measurements. The tip end, AC $\Omega$ , is set to the white dot. Set the Selector switch to AC, and the range switch to 1.5 V. Short the test probe tip to ground, and set the pointer to "0" by the AC ADJ control. Set the Selector to + DC and —DC; the "0" setting of the pointer should not change. Repeat the AC ADJ if this condition is not obtained. The scales indicate the RMS values of sine waves, and peak-to-peak voltages of the complex waveforms are read off the P-P scales.
- 3) Resistance Measurements. (outermost scale). Set the probe tip to AC  $\Omega$ . Turn Selector to OHMS, short the the tip with the ground clip, and set the pointer to "0" with the ZERO ADJ control. The clip is taken from the probe tip and the pointer should indicate  $\infty$  (infinity). If it does not, then turn the OHMS ADJ control for the setting. Short the probe tip again for the "0" ohm setting. This adjustment compensates for the variations in the internal battery voltage. This resistance measurements are made by connecting the probe tip and the clip across the resistor under test, and setting the range to obtain suitable readings.
- 4) Decibel Measurements. The meter scales are calibrated in decibels for a 0 db reference of 1 milliwatt into a 600 $\Omega$  line or load. The AC voltage. ranges are used for taking measurements. For impedances other than 600 $\Omega$ , the scales may be used to obtain relative values of the power levels
- 5) High Voltage Measurements. A special high voltage probe is

available for use with the instrument for DC voltages up to 30,000 volts. Its resistance is 1,090M $\Omega$ , having a multiplying factor of 100 times the scale values. It is recommended for use in measurement of the high anode voltages in TV receivers.

## MAINTENANCE

The Model VT-19 is sturdily constructed for years of service. However, to obtain the most satisfaction from the instrument, it should be handled carefully.

### Replacements:

- A. The battery should be replaced once every six months, or when the shorting test fails to bring the pointer to "O"
- B. The vacuum tubes are operated very conservatively, and should give long service. In case replacements are required, the tubes should be "aged" for at least 24 hours, either in the instrument, or externally by applying similar operating voltages, before the final calibrations are made.

# CIRCUIT DIAGRAM

