

## PRELIMINARY TECHNICAL INFORMATION

### MODEL 400A VOLTMETER

The Model 400A is a new a-c voltmeter to cover the frequency range from 10 cps to 1 megacycle. This new meter is simple and reliable in operation and provides excellent accuracy for general laboratory work.

**USES:** The Model 400A is excellent for nearly every application in the audio frequency field. The wide frequency range is useful for measuring the response characteristics of amplifiers, transformers, networks, and other audio equipment. Measurements with this instrument are particularly accurate because the indication is proportional to the average value of the wave, and waveform errors are thereby reduced. Furthermore the high input impedance of this meter will not ordinarily affect the circuit being measured.

The extended frequency of the Model 400A makes it suitable for radio frequency measurements through the broadcast band to 1.5 megacycles. This covers a wide range of applications including the carrier current, super-sonic, television, and broadcast fields. The response is carried below 10 cycles on the low frequency end to make this meter suitable for geophysical, electromedical and other applications where the low frequencies are important.

The usefulness of this meter is increased because of its sensitivity. A full scale indication is obtained on 0.03 volts and since the scale is linear a reasonably accurate measurement of a 1 millivolt can be made over the entire frequency range.

**DESCRIPTION:** The Model 400A consists of a wide band feedback amplifier which operates a diode voltmeter of the average reading type. Feedback is used to stabilize not only the amplifier but also the diode current so that the overall operation is independent of line voltage and tube characteristics to a high degree. A special input amplifier circuit is used to keep the input impedance to a value as high as possible and also to permit the use of an accurate voltage divider to select the various ranges. The power supply is self contained and it is thoroughly filtered and electrostatically shielded from the primary voltage source.

The Model 400A Meter is mounted in a metal case with the indicating scale on a sloping panel to facilitate readings. The scale is calibrated in volts and decibels and the unit is adequately protected against reasonable overloads. The small size and light weight of the meter combine with its excellent characteristics to make it a real time saving instrument in the laboratory or in the field.

Model 400A

SPECIFICATIONS

- VOLTAGE RANGE:** A switch on the front panel selects nine voltage ranges having full scale sensitivities of .03 volts, .1 volt, .3volts, 1.0 volts, 3.0 volts, 10.0 volts, 30.0 volts, 100 volts, 300 volts.
- FREQUENCY RANGE:** The frequency response of the meter is within 3% from 10 cps to 1,000,000 cps. Readings can be made with reasonable accuracy to 1.5 megacycles.
- CALIBRATION:** The meter scales are linear and are calibrated to read the r.m.s. value of a sinusoidal wave. The indication is proportional to the average value of the wave, thus wave form errors are reduced to a minimum. A decibel scale is marked on the meter to facilitate decibel readings.
- ACCURACY:** The overall accuracy of the meter is 3%. Because of the feedback circuit the accuracy is to a high degree independent of line voltage variations, tube characteristics and temperature.
- INPUT IMPEDANCE:** The input impedance is equivalent to 1 megohm shunted by 11 uu.
- POWER SUPPLY:** The meter operates from 120 volts 60 cps, and the power supply circuit is thoroughly filtered and shielded to prevent stray pick-up from the power source.
- MOUNTING:** The meter is mounted in a steel cabinet finished in wrinkle grey. The front panel is heavy brass finished in satin chrome plate with photo-etched designations. The cabinet is 7-1/2 inches wide, 8 inches high, and 9 inches deep. The top portion of the panel on which the meter is mounted is sloping to facilitate reading the meter scale. A leather handle is provided at the top of the cabinet.

The Model 400A will be available for delivery approximately October 1, 1941. The foregoing specifications are preliminary, and orders may be placed subject to acceptance of any changes.

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