

## SPECIFICATIONS

## AS AN AUTORANGING VOLTMETER

RANGE:  $\pm 10$  microvolts per digit (10mV full range) to  $\pm 100$  volts full range in five decade ranges. 100% overranging to 1999 on all ranges.

ACCURACY (20°C to 30°C):  $\pm(0.2\%$  of reading  $+0.1\%$  of range).

READING TIME: Less than 4 seconds to within 0.1% of final reading, except where limited by source characteristics.

ZERO DRIFT: Less than (50 microvolts  $+0.01\%$  of range) per °C, and less than 100 microvolts per 24-hour period after two hours warm-up (during which drift does not exceed 500 microvolts).

NOISE:  $\pm 10$  microvolts with input shorted.

INPUT IMPEDANCE: Greater than  $2 \times 10^{14}$  ohms shunted by 20 picofarads. Input resistance may also be selected in decade steps from 10 to  $10^{11}$  ohms.

## NORMAL MODE REJECTION RATIO:

RANGE	NMRR	MAX. AC
10mV	94dB	2V p-p
100mV	80dB	2V p-p
1 V	80dB	20V p-p
10 V	60dB	20V p-p
100 V	60dB	200V p-p

For voltage of line frequency and at least 10% of full range dc reading. Maximum total input 200 volts peak ac + dc.

COMMON MODE REJECTION RATIO: Greater than 140 dB at line frequency with 300 volts peak-to-peak from circuit Lo to chassis ground, up to  $10^{11}$  ohm source resistance, and at least 10% of full range dc reading.

## AS AN AMMETER

RANGE:  $\pm 10^{-16}$  ampere per digit ( $10^{-13}$  ampere full range) to  $\pm 0.1$  ampere full range in 13 decade ranges. 100% overranging to 1999 on all ranges.

ACCURACY (20°C to 30°C):

Range Switch Setting	Accuracy
$10^{-1}$ to $10^{-7}$ A	$\pm(0.5\%$ of reading $+0.1\%$ of range)
$10^{-8}$ A	$\pm(2\%$ of reading $+0.1\%$ of range)
$10^{-9}$ to $10^{-11}$ A	$\pm(5\%$ of reading $+0.1\%$ of range)

NOISE:  $2 \times 10^{-15}$  ampere peak-to-peak on the most sensitive range, exclusive of alpha particle disturbance.

OFFSET CURRENT: Less than  $5 \times 10^{-15}$  ampere.

COMMON MODE REJECTION: 300 volts peak-to-peak at line frequency from circuit Lo to chassis ground on any range and with at least 10% of full range dc reading will not degrade accuracy more than 0.3% of range. (Equivalent to 140 dB CMRR).

## AS AN OHMMETER

RANGE: 1 ohm per digit (1000 ohms full range) to  $10^{14}$  ohms full range in 12 decade ranges. 100% overranging to 1999 on all ranges.

ACCURACY (20°C to 30°C):

Range Switch Setting	Accuracy
$10^5$ to $10^7\Omega$	$\pm(0.5\%$ of reading $+0.1\%$ of range)
$10^8\Omega$	$\pm(2\%$ of reading $+0.1\%$ of range)
$10^9$ to $10^{12}\Omega$	$\pm(5\%$ of reading $+0.1\%$ of range)

METHOD: Two-terminal constant-current. Current equals reciprocal of OHMS range.

## AS A COULOMB METER

RANGE:  $\pm 10^{-15}$  coulomb per digit ( $10^{-12}$  coulomb full range) to  $\pm 10^{-5}$  coulomb full range in 8 decade ranges. 100% overranging to 1999 on all ranges.

ACCURACY (20°C to 30°C):  $\pm(5\%$  of reading  $+0.1\%$  of range) on all ranges.

## AS A CONSTANT CURRENT SOURCE

RANGE: 8 currents in decade steps from  $10^{-5}$  to  $10^{-12}$  ampere using OHMS ranges. Hi terminal is positive.

COMPLIANCE: Up to 200 volts.

ACCURACY (20°C to 30°C):  $\pm 0.5\%$  from  $10^{-5}$  to  $10^{-7}$  ampere.  $\pm 2\%$  at  $10^{-8}$  ampere.  $\pm 5\%$  from  $10^{-9}$  to  $10^{-12}$  ampere.

LOAD REGULATION: Better than 0.1% for loads up to  $10^{11}$  ohms.

## GENERAL

DISPLAY: 3 digits plus 1 overrange digit; decimal position, polarity, and overload indication; 5 readings per second. Depending on sensitivity setting, 3 least-significant digits blink or blank when overload condition exists.

POLARITY SELECTION: Automatic

SENSITIVITY SELECTION: Automatic: Voltage sensitivity selection is fully automatic. Sensitivity selection is automatic two decades above and below range switch setting for resistance, charge, and most current measurements. Manual: Front panel switch. Remote: Programmable with the Model 6162 Output/Control (optional).

ISOLATION: Circuit Lo to chassis ground; greater than  $10^9$  ohms shunted by 500 picofarads (decreasing to  $10^8$  ohms at 30°C and 70% relative humidity). Circuit Lo may be floated up to  $\pm 1000$  volts with respect to chassis ground.

ANALOG OUTPUTS: Unity Gain: For dc inputs, output is equal to input within 20 ppm for output currents of 1mA or less. In the fast mode output polarity is opposite input polarity. 1 volt:  $\pm 1$  volt at up to 1mA with respect to circuit Lo for full range input; 100% overrange capability. In the normal mode the output polarity is opposite input polarity.

OPERATING ENVIRONMENT: 20°C to 30°C, 0% to 70% relative humidity. 10°C to 50°C with derated specifications. Storage: 0°C to 70°C.

CONNECTORS: Input: Teflon-insulated triaxial.

Analog Outputs: Unity gain, 1 volt chassis, Lo, and guard; binding posts. BCD Output: Internal connectors for interfacing the Model 6162 Isolated Output/Control.

DIMENSIONS; WEIGHT: Style M 3-1/2 in. half-rack, overall bench size 4 in. high x 8-3/4 in. wide x 15-3/4 in. deep (100 x 220 x 400 mm); net weight, 11 pounds (4,8 kg).

POWER: Line Operation: 90-125 or 180-250 volts (switch selected), 50-60 Hz, 9 watts.

ACCESSORIES SUPPLIED: Model 6011 Input Cable: 3 ft. (1m) triaxial cable with triaxial connector and 3 alligator clips.

NOTE: All accuracy and gain specifications are exclusive of noise and zero offsets. Accuracies include temperature coefficient. On the 5% accuracy ranges as an Ammeter, Ohmmeter, and Constant Current Source the coefficient is less than 0.2% per °C.