

263 Calibrator/Source

AMPS V/R (Passive)

| RANGE | STEP SIZE | ACCURACY ±(% setting + offset) 18°–28°C | | TEMPERATURE COEFFICIENT ±(% setting + offset)/°C 0°–18°C & 28°–50°C | | OUTPUT RESISTANCE |
|--------|-----------|---|----------------|--|--|----------------------|
| | | 90 Days | 1 Year | | | |
| 2 pA | 50 aA | 0.375 + 10 fA | 0.425 + 10 fA | 0.04 + 2 fA | | 100 GΩ |
| 20 pA | 500 aA | 0.325 + 10 fA | 0.375 + 10 fA | 0.04 + 2 fA | | 100 GΩ |
| 200 pA | 5 fA | 0.20 + 30 fA | 0.25 + 30 fA | 0.01 + 2 fA | | 10 GΩ |
| 2 nA | 50 fA | 0.0625 + 100 fA | 0.065 + 100 fA | 0.01 + 30 fA | | 1 GΩ |
| 20 nA | 500 fA | 0.0625 + 1 pA | 0.065 + 1 pA | 0.0035 + 100 fA | | 100 MΩ |
| 200 nA | 5 pA | 0.035 + 10 pA | 0.035 + 10 pA | 0.0025 + 1 pA | | 10 MΩ |
| 2 μA | 50 pA | 0.025 + 100 pA | 0.025 + 100 pA | 0.0025 + 10 pA | | 1 MΩ |
| 20 μA | 500 pA | 0.025 + 1 nA | 0.025 + 1 nA | 0.0025 + 100 pA | | 100 kΩ |
| 200 μA | 5 nA | 0.025 + 10 nA | 0.025 + 10 nA | 0.0025 + 1 nA | | 10 kΩ |
| 2 mA | 50 nA | 0.025 + 100 nA | 0.025 + 100 nA | 0.0025 + 10 nA | | 10 kΩ |
| 20 mA | 500 nA | 0.15 + 1 μA | 0.15 + 1 μA | 0.0025 + 100 nA | | 1 kΩ |

Assumes <100μV compliance (voltage burden).

COULOMBS V/R (Passive)

| RANGE | STEP SIZE | ACCURACY ±(% setting + offset) 18°–28°C | | TEMPERATURE COEFFICIENT ±(% setting + offset)/°C 0°–18°C & 28°–50°C | | OUTPUT RESISTANCE |
|--------|-----------|---|--|--|--|----------------------|
| | | 1 Year | | | | |
| 20 pC | 0.5 fC | 1.0 + 50 fC | | 0.05 + 10 fC | | 100 GΩ |
| 200 pC | 5 fC | 0.5 + 75 fC | | 0.01 + 10 fC | | 10 GΩ |
| 2 nC | 50 fC | 0.1 + 300 fC | | 0.01 + 10 fC | | 1 GΩ |
| 20 nC | 500 fC | 0.1 + 3 pC | | 0.01 + 100 fC | | 100 MΩ |
| 200 nC | 5 pC | 0.5 + 30 pC | | 0.01 + 1 pC | | 10 MΩ |
| 2 μC | 50 pC | 0.5 + 300 pC | | 0.01 + 10 pC | | 1 MΩ |
| 20 μC | 500 pC | 0.5 + 3 nC | | 0.01 + 100 pC | | 100 kΩ |

Measurement interval is 2.5 seconds.

Assumes <100μV of compliance (voltage burden).

COULOMBS (Active)

Accuracy is the same as COULOMBS V/R, except change the offset to 300fC on the 20pC and 200pC ranges.

VOLTS

| RANGE | STEP SIZE | ACCURACY ¹ ±(% setting + offset) 18°–28°C | | TEMPERATURE COEFFICIENT ±(% setting + offset)/°C 0°–18°C & 28°–50°C | |
|--------|-----------|--|-----------------|--|--|
| | | 90 Days | 1 Year | | |
| 200 mV | 5 μV | 0.0125 + 15 μV | 0.0175 + 15 μV | 0.002 + 0.5 μV | |
| 2 V | 50 μV | 0.0125 + 50 μV | 0.0175 + 50 μV | 0.002 + 2 μV | |
| 20 V | 500 μV | 0.0125 + 500 μV | 0.0175 + 500 μV | 0.002 + 20 μV | |

¹Load resistance >100kΩ.

RESPONSE TIME: <0.5 second to rated accuracy.

OUTPUT RESISTANCE: <1Ω.

SHORT CIRCUIT CURRENT LIMIT: <75mA.

NOISE: <25ppm of range peak to peak in a 0.1Hz to 10Hz bandwidth.

IEEE-488 BUS IMPLEMENTATION

MULTILINE COMMANDS: DCL, LLO, SDG, UNL, UNT, GTL.
UNILINE COMMANDS: REN, ATN, EOI, IFC, SRQ.
INTERFACE FUNCTIONS: SH1, AH1, T6, TE0, L4, LE0, SR1, RL0, PPO, DC1, DTO, C0, E1.
PROGRAMMABLE PARAMETERS: Function, Range, Value, Zero, Operate, Guard, Digital Calibration, Temperature Compensation, Terminator, Status, Data Format, SRQ.

Specifications are subject to change without notice.

AMPS (Active)

Accuracy is the same as Amps V/R, except change the % setting on the 20mA range to 0.035% and change the offsets per the following table:

| RANGE | ACCURACY ± offset | TEMPERATURE COEFFICIENT ± offset/°C |
|--------|----------------------|---|
| 2 pA | 100 fA | 30 fA |
| 20 pA | 100 fA | 30 fA |
| 200 pA | 120 fA | 30 fA |
| 2 nA | 200 fA | No change |

OUTPUT RESISTANCE: >10¹⁴Ω.

OUTPUT CAPACITANCE: <50pF.

OUTPUT LOAD: Output load must be non-inductive.

COMPLIANCE VOLTAGE: >12V. Front panel OPERATE light flashes when compliance is reached.

MAXIMUM OPEN CIRCUIT VOLTAGE: <45V for the 2mA and 20mA ranges; <25V for the 2pA–200μA ranges.

RESPONSE TIME: <0.5 second to rated accuracy for the 2nA–20mA ranges; <5 seconds for the 2pA–200pA ranges.

PREAMP OUTPUT: Maximum Load Current: 5mA.

Maximum Load Capacitance: 10nF.

OHMS

| NOMINAL VALUE | ACCURACY ±(% setting) 18°–28°C | TEMPERATURE COEFFICIENT ±(% setting/°C) 0°–18°C & 28°–50°C |
|------------------|--------------------------------------|---|
| 1 kΩ | 0.04 ¹ | 0.04 ¹ |
| 10 kΩ | 0.02 ¹ | 0.02 ¹ |
| 100 kΩ | 0.02 | 0.02 |
| 1 MΩ | 0.025 | 0.025 |
| 10 MΩ | 0.035 | 0.0375 |
| 100 MΩ | 0.065 | 0.07 |
| 1 GΩ | 0.08 | 0.10 |
| 10 GΩ | 0.20 | 0.225 |
| 100 GΩ | 0.375 | 0.40 |

¹ After subtracting ZERO offset.

² Displayed value corrected for resistor temperature coefficient.

ZERO OFFSET: <1Ω.

TOLERANCE OF NOMINAL VALUE: 1kΩ–1MΩ, 0.1%; 10MΩ, 0.2%; 100MΩ–100GΩ, 3%.

MAXIMUM VOLTAGE ACROSS RESISTANCE FOR RATED ACCURACY: 1kΩ–10GΩ, 20V; 100GΩ, 100V.

GENERAL

DISPLAY: 5½-digit numeric LEDs with appropriate decimal point and polarity indication; signed two-digit alphanumeric exponent.

OUTPUT CONNECTIONS: Two-lug triaxial connector for output; five-way binding posts for PREAMP OUT, COMMON, and EXT INPUT. All connections on rear panel.

PROGRAMS: Menu provides front panel access to IEEE-488 address, Alpha or Numeric Exponent, Digital Calibration, and Temperature Compensation selection.

MAX. COMMON MODE VOLTAGE (DC to 60Hz sinewave): 350V peak.

ISOLATION (Common to Chassis): >10¹⁰Ω paralleled by <500pF.

EXT INPUT: Max. Input: 200V peak, 100mA peak.

Series Resistance: <1Ω.

WARM-UP: 1 hour to rated accuracy.

ENVIRONMENT: Operating: 0°–50°C; <70% RH non-condensing, up to 35°C. **Storage:** –25° to +65°C.

POWER: 105–125V or 210–250V (rear panel switch selected), 90–110V available, 50–60Hz, 25VA maximum.

DIMENSIONS, WEIGHT: 127mm high × 216mm wide × 359mm deep (5 in × 8½ in × 14½ in). Net weight 3.6kg (8.1 lbs).

ACCESSORY SUPPLIED: Model 7024-3 Triax Cable.