

# 263 Calibrator/Source

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

Assumes <100μV compliance (voltage burden).

COULOMBS V/R (Passive)		ACCURACY ±(% setting + offset) 18°-28°C		TEMPERATURE COEFFICIENT ±(% setting + offset)/°C 0°-18°C & 28°-50°C		OUTPUT RESISTANCE
RANGE	STEP SIZE	1 Year	1 Year	0°-18°C & 28°-50°C	0°-18°C & 28°-50°C	
20 pC	0.5 fC	1.0 + 50 fC	1.0 + 50 fC	0.05 + 10 fC	0.05 + 10 fC	100 GΩ
200 pC	5 fC	0.5 + 75 fC	0.5 + 75 fC	0.01 + 10 fC	0.01 + 10 fC	10 GΩ
2 nC	50 fC	0.1 + 300 fC	0.1 + 300 fC	0.01 + 10 fC	0.01 + 10 fC	1 GΩ
20 nC	500 fC	0.1 + 3 pC	0.1 + 3 pC	0.01 + 100 fC	0.01 + 100 fC	100 MΩ
200 nC	5 pC	0.5 + 30 pC	0.5 + 30 pC	0.01 + 1 pC	0.01 + 1 pC	10 MΩ
2 μC	50 pC	0.5 + 300 pC	0.5 + 300 pC	0.01 + 10 pC	0.01 + 10 pC	1 MΩ
20 μC	500 pC	0.5 + 3 nC	0.5 + 3 nC	0.01 + 100 pC	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		ACCURACY <sup>1</sup> ±(% setting + offset) 18°-28°C		TEMPERATURE COEFFICIENT ±(% setting + offset)/°C 0°-18°C & 28°-50°C	
RANGE	STEP SIZE	90 Days	1 Year	0°-18°C & 28°-50°C	0°-18°C & 28°-50°C
200 mV	5 μV	0.0125 + 15 μV	0.0175 + 15 μV	0.002 + 0.5 μV	0.002 + 0.5 μV
2 V	50 μV	0.0125 + 50 μV	0.0175 + 50 μV	0.002 + 2 μV	0.002 + 2 μV
20 V	500 μV	0.0125 + 500 μV	0.0175 + 500 μV	0.002 + 20 μV	0.002 + 20 μV

<sup>1</sup>Load 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, SDC, UNL, UNT, GTL.

**UNILINE COMMANDS:** REN, ATN, EOI, IFC, SRQ.

**INTERFACE FUNCTIONS:** SH1, AH1, T6, TE0, L4, LE0, SRI, RL0, PPO, DC1, DT0, 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:** >10<sup>14</sup>Ω.

**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		ACCURACY ±(% setting) 18°-28°C		TEMPERATURE COEFFICIENT ±(% setting)/°C 0°-18°C & 28°-50°C	
NOMINAL VALUE	90 Days	1 Year	0°-18°C & 28°-50°C	0°-18°C & 28°-50°C	0°-18°C & 28°-50°C
1 kΩ	0.04 <sup>1</sup>	0.04 <sup>1</sup>	0.0005	0.0005	0.0005
10 kΩ	0.02 <sup>1</sup>	0.02 <sup>1</sup>	0.0005	0.0005	0.0005
100 kΩ	0.02	0.02	0.0005	0.0005	0.0005
1 MΩ	0.025	0.025	0.0005	0.0005	0.0005
10 MΩ	0.035	0.0375	0.0015	0.0015	0.0015
100 MΩ	0.065	0.07	0.0015	0.0015	0.0015
1 GΩ	0.08	0.10	0.008 <sup>2</sup>	0.008 <sup>2</sup>	0.008 <sup>2</sup>
10 GΩ	0.20	0.225	0.008 <sup>2</sup>	0.008 <sup>2</sup>	0.008 <sup>2</sup>
100 GΩ	0.375	0.40	0.04 <sup>2</sup>	0.04 <sup>2</sup>	0.04 <sup>2</sup>

<sup>1</sup> After subtracting ZERO offset.

<sup>2</sup> 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):** >10<sup>10</sup>Ω 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 × 14¼ in). Net weight 3.6kg (8.1 lbs).

**ACCESSORY SUPPLIED:** Model 7024-3 Triax Cable.