220 Programmable Current Source

MODEL 220 CURRENT SOURCE

RANGE	MAXIMUM OUTPUT	ACCURACY (1 Year) 18°–28°C	STEP SIZE	TEMPERATURE COEFFICIENT/°C 0°–18°C & 28°–50°C	NOISE (pk-pk of range)	3dB BANDWIDTH
100 mA	±101.00 mA	0.1 % + 50 µA	50 µA	0.01 % + 2 µA	100 ppm	0.1 Hz to 30 kHz
10 mA	±19.995 mA	0.05% + 10 µA	5 µA	0.005% + 200 nA	100 ppm	0.1 Hz to 100 Hz
1 mA	±1.9995 mA	0.05% + 1 µA	500 nA	0.005% + 20 nA	100 ppm	0.1 Hz to 100 Hz
100 µA	±199.95 µA	0.05% + 100 nA	50 nA	0.005% + 2 nA	100 ppm	0.1 Hz to 100 Hz
10 µA	±19.995 µA	0.05% + 1 nA	5 nA	0.005% + 200 pA	100 ppm	0.1 Hz to 100 Hz
1 µA	±1.9995 µA	0.1 % + 1 nA	500 pA	0.01 % + 20 pA	100 ppm	0.1 Hz to 100 Hz
100 nA	±199.95 nA	0.3 % + 100 pA	50 pA	0.02 % + 2 pA	100 ppm	0.1 Hz to 100 Hz
10 nA	±19.995 nA	0.3 % + 10 pA	5 pA	0.02 % + 200 fA	200 ppm	0.1 Hz to 10 Hz
1 nA	±1.9995 nA	0.4 % + 2 pA	500 fA	0.02 % + 200 fA	400 ppm	0.1 Hz to 10 Hz

OUTPUT RESISTANCE: $>10^{14}\Omega$ (on 1nA range).
OUTPUT CAPACITANCE: <20pF.
LINE REGULATION: <0.01% for AC power line changes within specified limits.
VOLTAGE LIMIT: Bipolar, 1V to 105V in 1V programmable steps.
RESPONSE TIME: <3ms to within 0.1% of programmed change.
TRANSIENT RECOVERY TIME: <3ms to rated accuracy following any change in compliance voltage.
GUARD OUTPUT:
Maximum Load Capacitance: 10nF.
Maximum Load Current: Absolute total (Output + Guard) not to exceed 105mA.
Accuracy: ±1mV (excluding output lead voltage drop).
PROGRAM MEMORY:
Number of Locations: 100.
Range of Dwell Times: 3ms to 999.9s.
Accuracy of Dwell Time: ±(0.05%+200µs).
OUTPUT LOAD: Output load must be non-inductive.
EXTERNAL TRIGGER: TTL-compatible EXTERNAL TRIGGER INPUT and OUTPUT.
OUTPUT CONNECTIONS: Teflon® insulated 2-lug triax connector (Specialty Connector #30JR121-1) for output; five-way binding posts for GUARD, OUTPUT COMMON, and CHASSIS; BNC (chassis isolated) connectors for EXTERNAL TRIGGER INPUT and OUTPUT, Amphenol or Cinch Series 87 IEEE and printed circuit digital I/O port. All connections on rear panel.

IEEE-488 BUS IMPLEMENTATION

MULTILINE COMMANDS: DCL, LLO, SDC, GET, GTL, UNT, UNL, SPE, SPD.
UNILINE COMMANDS: IFC, REN, EOI, SRQ, ATN.
INTERFACE FUNCTIONS: SH1, AH1, T6, TE0, L4, LE0, SR1, RL1, PP0, DC1, DT1, C0, E1.
INTERNAL PROGRAMMABLE PARAMETERS: Display Mode, Output, Prefix Data Format, EOI, SRQ (including mask for over Limit), Program Mode, Range, Trigger Mode, Terminator Character, Inputs (Source, Limit, Dwell Time, 100-Point Memory Locations), Output Status, Digital Self Test.
DIGITAL I/O PORT: A separate I/O port consisting of four input and four output lines as well as common (IEEE-488) and +5V DC. Outputs will drive one TTL load. Inputs represent one TTL load. The 220 or 230 can be programmed to generate an "SRQ" upon any change in the four bit input data. Mating connector supplied.

GENERAL

DISPLAY: 0.5 in LED digits, 4½-digit signed mantissa, 1-digit signed exponent.
SYSTEMS COMPATIBILITY: IEEE-488-1978.
LIMIT INDICATIONS (Voltage Limit): "V-LIMIT" LED will blink.
MAXIMUM ALLOWABLE COMMON MODE VOLTAGE (OUTPUT or OUTPUT COMMON to CHASSIS): 250V rms, DC to 60Hz.
SELF TEST: Digital RAM, ROM, front panel LEDs upon power ON.
EMC: Conforms to European Union Directive 89/336/EEC.
SAFETY: Conforms to European Union Directive 73/23/EEC (meets EN61010-1/IEC 1010).
WARM-UP: 1 hour to rated accuracy.
POWER: 105–125 or 210–250V AC (internal switch selected), 50 or 60Hz, 60W maximum (80VA maximum). 90–105 or 180–210V AC operation available.
COOLING: Internal fan for forced air cooling.
ENVIRONMENTAL LIMITS: Operating: 0°–50°C; up to 35°C at 70% non-condensing relative humidity. **Storage:** –25° to 70°C.
DIMENSIONS, WEIGHT: 127mm high × 216mm wide × 359mm deep (5 in × 8½ in × 14⅛ in). Net weight 4.4kg (9 lb 11 oz).
ACCESSORIES SUPPLIED: Model 6011 Triaxial Test Lead (3 ft).