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# 230



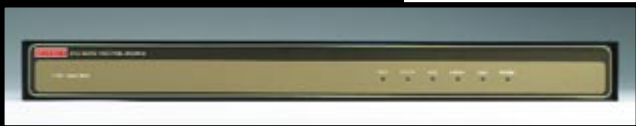
- $\pm 2\text{mA}$ ,  $\pm 20\text{mA}$ ,  $\pm 100\text{mA}$  programmable I-LIMIT
- Remote sensing
- 100-point source memory
- Programmable Digital I/O

## Ordering Information

230 Programmable Voltage Source

Extended warranty, service, and calibration contracts are available.

# 213



- GPIB controlled
- Autoranging or programmable  $\pm 1\text{V}$ ,  $\pm 5\text{V}$ , or  $\pm 10\text{V}$  ranges
- 10mA output current per channel
- Fast waveform buffers

## Ordering Information

213 Quad Voltage Source

Extended warranty, service, and calibration contracts are available.

# Programmable Voltage Source

The Model 230 Voltage Source is a programmable solution for precision sourcing of low-level DC voltage.

RANGE	MAXIMUM OUTPUT	ACCURACY (1 Year) 18°-28°C	STEP SIZE	TEMPERATURE COEFFICIENT/°C 0°-18°C & 28°-50°C
100 V	$\pm 101.00$ V	0.05 % + 50mV	50 mV	0.005% + 0.5 mV
10 V	$\pm 19.995$ V	0.05 % + 10mV	5 mV	0.005% + 100 $\mu\text{V}$
1 V	$\pm 1.9995$ V	0.05 % + 1mV	500 $\mu\text{V}$	0.005% + 25 $\mu\text{V}$
100 mV	$\pm 199.9$ mV	0.075% + 300 $\mu\text{V}$	50 $\mu\text{V}$	0.01 % + 25 $\mu\text{V}$

**SELECTABLE CURRENT LIMIT:**  $\pm 100\text{mA}$ ,  $\pm 20\text{mA}$ ,  $\pm 2\text{mA}$  (-0, +20%).  
**NOISE:** (150 $\mu\text{V}$  + 50ppm range) p-p, 0.1Hz to 300Hz; 5mV p-p, 0.1Hz to 300kHz. Specification applies for local sensing only, typical.  
**RESPONSE TIME, TRANSIENT RECOVERY TIME:** <3ms.  
**OUTPUT IMPEDANCE:** 1m $\Omega$ .  
**EXTERNAL TRIGGER:** TTL-compatible.  
**OUTPUT CONNECTIONS:** Five-way binding posts for OUTPUT, OUTPUT SENSE, COMMON, COMMON SENSE, and CHASSIS GROUND; BNC for EXTERNAL TRIGGER INPUT and OUTPUT.

## ACCESSORIES AVAILABLE

- 7008-\* IEEE-488 Digital Cable
- 1019A-\* Single or Dual Fixed Rack Kit
- 4288-4 Rack Mount Kit

## GENERAL

**SYSTEMS COMPATIBILITY:** IEEE-488-1978.  
**MAXIMUM COMMON MODE VOLTAGE:** 250V rms, DC to 60Hz.  
**EMC:** Conforms to European Union Directive 89/336/EEC.  
**SAFETY:** Conforms to European Union Directive 73/23/EEC (meets EN61010-1/IEC 1010).  
**POWER:** 105-125 or 210-250VAC, 50 or 60Hz (80VA). 90-105 or 180-210V AC operation available.  
**DIMENSIONS, WEIGHT:** 127mm high  $\times$  216mm wide  $\times$  359mm deep (5 in  $\times$  8 1/2 in  $\times$  14 1/4 in). Net weight 4.4kg (9 lb 11 oz).

# Quad Voltage Source

The Model 213 Quad Voltage Source (QVS) is a convenient and cost-effective instrument for sourcing voltage. Each of four fully independent and stackable channels provides up to  $\pm 10\text{V}$  of bias at 10mA.

## Digital I/O with 100mA Drive Current

The Model 213 QVS also provides 8 bits each of TTL compatible digital input and output on a DB25 female connector for driving relays and similar applications.

VOLTAGE RANGE	MAXIMUM OUTPUT	STEP SIZE	ACCURACY 18°-28°C I <sub>OUT</sub> = 1mA	NOISE (p-p, typical) 0.1-10Hz
1 V	$\pm 1.02375$ V	250 $\mu\text{V}$	$\pm(0.05\% + 1\text{mV})$	<5ppm of range
5 V	$\pm 5.11875$ V	1.25 mV	$\pm(0.05\% + 3\text{mV})$	<3ppm of range
10 V	$\pm 10.2375$ V	2.5 mV	$\pm(0.05\% + 10\text{mV})$	<3ppm of range

**TEMPERATURE COEFFICIENT OF ACCURACY (0°-18°C & 28°-50°C):**  $\pm(0.002\%$  of setting + 100 $\mu\text{V})/^\circ\text{C}$ .

**INTERNAL BUFFER:** An 8192-location internal buffer is used to store values for waveform generation as fast as 1ms per point.

**DIGITAL I/O:** 8 TTL compatible level sensitive inputs. 8 outputs, internally selectable TTL compatible or open collector with 100mA drive and capable of withstanding 50V (for driving relays or other devices from an external voltage supply).

## ACCESSORIES AVAILABLE

- 213-CON Analog Output Connector
- C126-1 DB25 Male to DB25 Female with 1.5m (5 ft) Cable
- CS-400 DB25 Male Solder Cup

**RANGING:** Autorange or select one of three fixed ranges.  
**OUTPUT RESISTANCE:** <500m $\Omega$ , typical.  
**WIDEBAND NOISE (p-p, typical):** 0.1 to 20MHz, 8mV

## GENERAL

**CHANNEL-TO-CHANNEL, CHANNEL TO DIGITAL LOW ISOLATION:** 500V or 105V-Hz, whichever is less.  
**POWER:** 90-125 or 180-250V AC (internally switch selectable); 50-60Hz, 70VA max.  
**DIMENSIONS, WEIGHT:** 425mm wide  $\times$  45mm high  $\times$  309mm deep (16 1/4 in  $\times$  1 3/4 in  $\times$  12 in). Net weight 3.52kg (7.75 lb).

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