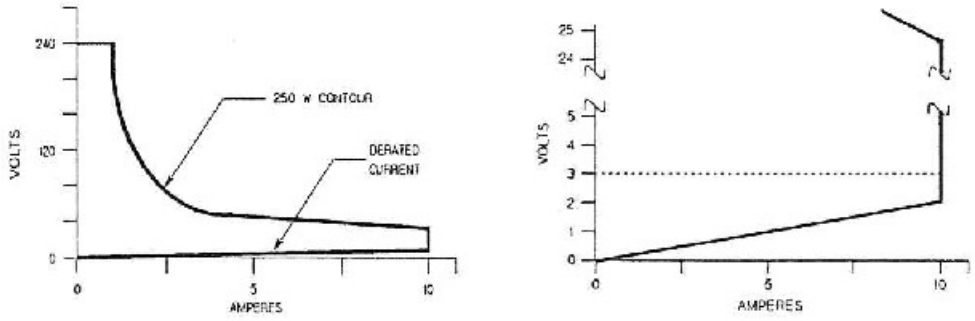
Table 60503-1. Specifications

(Specifications apply for 25°C ±5°C, except as noted)

DC Input Rating:

Current: 0 to 10 A
Voltage: 3 V to 240 V (minimum dc operation from 0 to 2 V for 0 to 10 A)
Power: 250 W at 40°C (derated to 187 W at 55°C)

HP 60503A



A. OPERATING CHARACTERISTICS

B. DERATED CURRENT DETAIL

Constant Current Mode:

Ranges: 0 to 1 A; and 0 to 10 A
Accuracy: (after 30 second wait): ±0.15% ±10 mA (both ranges)
Resolution: 0.26 mA (1 A range); 2.6 mA (10 A range)
Regulation: 8 mA (both ranges)
Temperature Coefficient: 150 ppm/°C ±1 mA/°C (both ranges)

Constant Resistance Mode:

Ranges: 0.20 to 24 Ω; 24 Ω to 10kΩ; and 240 Ω to 50 kΩ
Accuracy: ±0.8% ±200 mΩ with ≥1 A at input (24 Ω range);
±0.3% ±0.3 mS with ≥24 V at input (10 k and 50 kΩ ranges)
Resolution: 6 mΩ (24 Ω range); 0.011 mS (10 kΩ range); 0.001 mS (50 kΩ range)
Regulation: 10 mV with remote sensing (24 Ω range); 8 mA (10 k and 50 kΩ ranges)
Temperature Coefficient: 800 ppm/°C ±10 mΩ/°C (24 Ω range);
300 ppm/°C ±0.03 mS/°C (10 k and 50 kΩ ranges)

Constant Voltage Mode:

Range: 0 to 240 V
Accuracy: ±0.12% ±120 mV
Resolution: 64 mV
Regulation: 10 mV (remote sense); 40 mV (local sense)
Temperature Coefficient: 120 ppm/°C ±10mV/°C

Transient Operation:

Continuous Mode
Frequency Range: 0.25 Hz to 10 kHz
Frequency Resolution: 4%

Table 60503-1. Specifications (continued)

Continuous Mode (continued)

Frequency Accuracy: 3%
Duty Cycle Range: 3% to 97% (0.25 Hz to 1 kHz); 6% to 94% (1 kHz to 10 kHz)
Duty Cycle Resolution: 4%
Duty Cycle Accuracy: 6% of setting ±2%

Pulsed Mode

Pulse Width: 50 µs ±3% minimum; 4 s ±3% maximum

Transient Current Level (0 to 1 A and 0 to 10 A ranges):

Resolution: 4 mA (1 A range); 43 mA (10 A range)
Accuracy: ±0.18% ±13 mA (1 A range); ±0.18% ±50 mA (10 A range)
Temperature Coefficient: 180 ppm/°C ±1.2 mA/°C

Transient Resistance Level (0.20 to 24 Ω, 24 Ω to 10 kΩ, and 240 Ω to 50 kΩ ranges):

Resolution: 100 mΩ (24 Ω range); 0.18 mS (10 kΩ range); 0.018 mS (50 kΩ range)
Accuracy: ±0.8%+200 mΩ with ≥1 A at input (24 Ω range)
±0.3%+0.5 mS with ≥24 V at input (10 kΩ range)
±0.3%+0.4 mS with ≥24 V at input (50 kΩ range)

Transient Voltage Level (0 to 240 V):

Resolution: 1.0 V
Accuracy: ±0.15% ±1.1 V
Temperature Coefficient: 120 ppm/°C ±10 mV/°C

Programmable Slew Rate (For any given input transition, the time required will be either the total slew time or a minimum transition time, whichever is longer. The minimum transition time increases when operating with input currents under 0.2 A, and decreases with input currents over 2 A. The following are typical values; ±25% tolerance):

Current Slew Rate:*

Rate #	10 A Range Step	1 A Range Step	Transition Time
1	0.17 A/ms	17 A/s	8.0 ms
2	0.42 A/ms	42 A/s	3.2 ms
3	0.83 A/ms	83 A/s	1.6 ms
4	1.7 A/ms	0.17 A/ms	800 µs
5	4.2 A/ms	0.42 A/ms	320 µs
6	8.3 A/ms	0.83 A/ms	160 µs
7	17 A/ms	1.7 A/ms	80 µs
8	42 A/ms	4.2 A/ms	32 µs
9	83 A/ms	8.3 A/ms	20 µs
10	0.17 A/µs	17 A/ms	20 µs
11	0.42 A/µs	42 A/ms	16 µs
12	0.83 A/µs	83 A/ms	16 µs

*AC performance specified from 3 to 240 V.

Table 60503-1. Specifications (continued)

Voltage Slew Rate:

Rate #	Voltage Range Step	Transition Time*
1	4 V/ms	8.0 ms
2	10 V/ms	3.2 ms
3	20 V/ms	1.6 ms
4	40 V/ms	800 μs
5	100 V/ms	320 μs
6	200 V/ms	160 μs
7	0.4 V/μs	100 μs
8	1 V/μs	100 μs
9	2 V/μs	100 μs

*Transition time based on low capacitance current source.

Resistance Slew Rate (24 Ω range): Uses the value programmed for voltage slew rate.

Resistance Slew Rate (10 k and 50 kΩ ranges): Uses the value programmed for current slew rate.

Current Readback:

Resolution: 2.7 mA (via HP-IB); 10 mA (front panel)
Accuracy (after 30 second wait): ±0.12% ±10 mA
Temperature Coefficient: 100 ppm/°C ±1 mA/°C

Voltage Readback:

Resolution: 67 mV (via HP-IB); 100 mV (front panel)
Accuracy: ±0.1% ±150 mV
Temperature Coefficient: 100 ppm/°C ±8 mV/°C
Maximum Readback Capability: 260 V (typical)

Power Readback:

Accuracy: ±0.2% ±3 W

External Analog Programming 0 to 10 V (dc or ac):

Bandwidth: 10 kHz (3 db frequency)
Accuracy: ±3% ±10 mA (0 to 1 A range)
±3% ±20 mA (0 to 10 A range)
±0.5% ±150 mV (0 to 240 V range)
Temperature Coefficient: 150 ppm/°C ±1 mA/°C (current ranges)
120 ppm/°C ± 10 mV/°C (voltage range)

External Current Monitor (0 to 10 V):

Accuracy: ±3% ±10 mA (referenced to analog common)
Temperature Coefficient: 100 ppm/°C ±1 mA/°C

Table 60503-1. Specifications (continued)

External Voltage Monitor (0 to 10 V):

Accuracy: ±0.4% ±240 mV (referenced to analog common)
Temperature Coefficient: 70 ppm/°C ±1.2 mV/°C

Remote Sensing: 5 Vdc maximum between sense and input binding posts

Maximum Input Levels:

Current: 10.2 A (programmable to lower limits)
Voltage: 250 V

Minimum Operating Voltage: 2 V (derated to 0 V at 0 A)

Programmable Short Circuit: 0.20 Ω (0.10 Ω typical)

Programmable Open Circuit: 80 kΩ (typical)

Drift Stability (over an 8 hour interval):

Current: ±0.03% ±1.5 mA
Voltage: ±0.01% ±20 mV

PARD (20 Hz to 10 MHz noise):

Current: 1 mA rms/10 mA p-p
Voltage: 6 mV rms

DC Isolation Voltage: ±240 Vdc between + or − input binding post and chassis ground

Digital Inputs:

Vlo: 0.9 V maximum at Ilo = −1 mA
Vhi: 3.15 V minimum (pull-up resistor on input)

Digital Outputs:

Vlo: 0.72 V maximum at Ilo = 1 mA
Vhi: 4.4 V minimum at Ilo = −20 μA

Reverse Current Capacity: 20 A when unit is on; 10 A when unit is off

Weight: 3.2 kg (7 lbs.)