# 6640A Series Single-Output, 200 W DC Power Supplies, GPIB

Data Sheet

Speed and accuracy for test optimization

- Fast, low-noise outputs
- Analog control of output voltage and current
- Fan-speed control to minimize acoustic noise
- Parallel and series connections of multiple units
- Built-in measurements and advanced programmable features
- Protection features to ensure DUT safety

This series of 200 W linear-regulated DC power supplies is designed to maximize the throughput of DUTs through the manufacturing test process with fast up and down programming time.

Valuable assemblies can be destroyed by a minor component failure that can allow a surge of voltage or current to flow to the DUT. Fast protection features, including fast crowbar, mode crossover protection, and the ability to connect the protection circuitry of multiple power supplies can increase production yield.

Programming of the DC output and the protection features can be done either from the front panel or using industry standard SCPI commands, via the GPIB. Using the serial link, up to 16 power supplies can be connected through one GPIB address. Test system integration can be further simplified be using the VXI*plug&play* drivers. The output voltage and current can also be controlled with analog signals. This is helpful for certain types of noisy environments, and also immediate reactions to process changes.

Lab bench use is enhanced by the fan speed control, which helps to minimize acoustic noise.

Agilent Technologies

# Specifications

| **Specifications** *(at 0 ° to 55 °C unless otherwise specified)* | **6641A** | **6642A** | **6643A** | **6644A** | **6645A** |
|---|---|---|---|---|---|
| **Number of outputs** | 1 | 1 | 1 | 1 | 1 |
| **GPIB** | Yes | Yes | Yes | Yes | Yes |
| **Output ratings** | | | | | |
| Output voltage | 0 to 8 V | 0 to 20 V | 0 to 35 V | 0 to 60 V | 0 to 120 V |
| Output current (40°C) | 0 to 20 A | 0 to 10 A | 0 to 6 A | 0 to 3.5 A | 0 to 1.5 A |
| Maximum current (50 °C/55 °C) | 18 A/17 A | 9 A/8.5 A | 5.4 A/5.1 A | 3.2 A/3 A | 1.4 A/1.3 A |
| **Programming accuracy** (at 25 °C ± 5 °C) | | | | | |
| Voltage 0.06% + | 5 mV | 10 mV | 15 mV | 26 mV | 51 mV |
| Current 0.15% + | 26 mA | 13 mA | 6.7 mA | 4.1 mA | 1.7 mA |
| **Ripple and noise** from 20 Hz to 20 MHz | | | | | |
| Voltage rms | 300 µV | 300 µV | 400 µV | 500 µV | 700 µV |
| peak-to-peak | 3 mV | 3 mV | 4 mV | 5 mV | 7 mV |
| Current rms | 10 mA | 5 mA | 3 mA | 1.5 mA | 1 mA |
| **Readback accuracy** at 25 °C ± 5 °C (percent of reading plus fixed) | | | | | |
| Voltage 0.07% + | 6 mV | 15 mV | 25 mV | 40 mV | 80 mV |
| +Current 0.15% + | 18 mA | 9.1 mA | 5 mA | 3 mA | 1.3 mA |
| –Current 0.35% + | 40 mA | 20 mA | 12 mA | 6.8 mA | 2.9 mA |
| **Load regulation** | | | | | |
| Voltage | 1 mV | 2 mV | 3 mV | 4 mV | 5 mV |
| Current | 1 mA | 0.5 mA | 0.25 mA | 0.25 mA | 0.25 mA |
| **Line regulation** | | | | | |
| Voltage | 0.5 mV | 0.5 mV | 1 mV | 1 mV | 2 mV |
| Current | 1 mA | 0.5 mA | 0.25 mA | 0.25 mA | 0.25 mA |

**Transient response time**

Less than 100 µs for the output voltage to recover to its previous level (within 0.1% of the voltage rating of the supply or 20 mV, whichever is greater) following any step change in load current of up to 50% of the output current rating of the supply

| **Supplemental characteristics** *(Non-warranted characteristics determined by design and useful in applying the product)* | **6641A** | **6642A** | **6643A** | **6644A** | **6645A** |
|---|---|---|---|---|---|
| **Average programming resolution** | | | | | |
| Voltage | 2 mV | 5 mV | 10 mV | 15 mV | 30 mV |
| Current | 6 mA | 3 mA | 2 mA | 1.2 mA | 0.5 mA |
| OVP | 13 mV | 30 mV | 54 mV | 93 mV | 190 mV |
| **OVP accuracy** | 160 mV | 400 mV | 700 mV | 1.2 V | 2.4 V |

## **Specifications,** continued

| **Specifications** *(at 0 ° to 55 °C unless otherwise specified)* | **6641A-J04** Special order option | **6643A-J11** Special order option | **6644A-J09** Special order option | **6645A-J05** Special order option | **6645A-J06** Special order option |
|---|---|---|---|---|---|
| **Number of outputs** | 1 | 1 | 1 | 1 | 1 |
| **GPIB** | Yes | Yes | Yes | Yes | Yes |
| **Output ratings** | | | | | |
| Output voltage | 13 V | 40 V | 70 V | 150 V | 170 V |
| Output current (40 °C) | 15.3 A | 5 A | 3 A | 1.2 A | 1 A |
| Maximum current (50 °C/55 °C) | 13.77 A/13 A | 4.5 A/4.25 A | 2.7 A/2.55 A | 1.08 A/1.02 A | 0.9 A/0.85 A |
| **Programming accuracy** (at 25 °C ± 5 °C) | | | | | |
| Voltage 0.06% + | 8.5 mV | 17.5 mV | 31 mV | 65 mV | 74 mV |
| Current 0.15% + | 21 mA | 6.7 mA | 4.1 mA | 1.7 mA | 1.7 mA |
| **Ripple and noise** from 20 Hz to 20 MHz | | | | | |
| Voltage rms | 300 µV | 450 µV | 600 µV | 900 µV | 1 mV |
| peak-to-peak | 3 mV | 3.5 mV | 6 mV | 9 mV | 10 mV |
| Current rms | 8 mA | 53 mA | 1.5 mA | 1 mA | 1 mA |
| **Readback accuracy** at 25 °C ± 5 °C (percent of reading plus fixed) | | | | | |
| Voltage 0.07% + | 10 mV | 30 mV | 47 mV | 100 mV | 140 mV |
| +Current 0.15% + | 15 mA | 5 mA | 3 mA | 1.3 mA | 1.3 mA |
| –Current 0.35% + | 40 mA | 12 mA | 6.8 mA | 2.9 mA | 2.9 mA |
| **Load regulation** | | | | | |
| Voltage | 1 mV | 3 mV | 4.5 mV | 7 mV | 8 mV |
| Current | 1 mA | 0.25 mA | 0.25 mA | 0.25 mA | 0.25 mA |
| **Line regulation** | | | | | |
| Voltage | 0.5 mV | 1 mV | 1.5 mV | 2.5 mV | 3 mV |
| Current | 1 mA | 0.25 mA | 0.25 mA | 0.25 mA | 0.25 mA |

**Transient response time**

Less than 100 µs for the output voltage to recover to its previous level (within 0.1% of the voltage rating of the supply or 20 mV, whichever is greater) following any step change in load current of up to 50% of the output current rating of the supply

| **Supplemental characteristics** *(Non-warranted characteristics determined by design and useful in applying the product)* | **6641A-J04** Special order option | **6643A-J11** Special order option | **6644A-J09** Special order option | **6645A-J05** Special order option | **6645A-J06** Special order option |
|---|---|---|---|---|---|
| **Average programming resolution** | | | | | |
| Voltage | 3.5 mV | 12 mV | 1.4 mV | 37.5 mV | 42.5 mV |
| Current | 5 mA | 2 mA | 1.2 mA | 0.5 mA | 0.5 mA |
| OVP | 23 mV | 62 mV | 110 mV | 250 mV | 285 mV |
| **OVP accuracy** | 260 mV | 800 mV | 1.5 mV | 3 V | 3.4 V |

## Supplemental characteristics for all model numbers

**DC floating voltage:** Output terminals can be floated up to ± 240 VDC from chassis ground

**Remote sensing:** Up to half the rated output voltage can be dropped in each load lead. The drop in the load leads subtracts from the voltage available for the load.

**Command processing time:** Average time required for the output voltage to begin to change following receipt of digital data is 20 ms for the power supplies connected directly to the GPIB

**Output programming response time:** The rise and fall time (10/90% and 90/10%) of the output voltage is less than 15 ms. The output voltage change settles within 1 LSB (0.025% x rated voltage) of final value in less than 60 ms.

**Down programming:** An active down programmer sinks approximately 20% of the rated output current

**Modulation:** (Analog programming of output voltage and current)
Input Signal: 0 to –5 V
Input Impedance: 10 kΩ nominal

**AC input:**
(AC input frequency 47 to 63 Hz)

| **Voltage** | 100 VAC | 120 VAC | 220 VAC | 240 VAC |
|---|---|---|---|---|
| **Current** | 4.4 A | 3.8 A | 2.2 A | 2.0 A |

**InpInput power:** 480 VA, 400 W at full load; 60 W at no load

**GPIB interface capabilities:**
SH1, AH1, T6, L4, SR1, RL1, PP0, DC1, DT1, E1, and C0. IEEE-488.2 and SCPI-compatible command set

**Software driver:**
• IVI-COM
• VXI*plug&play*

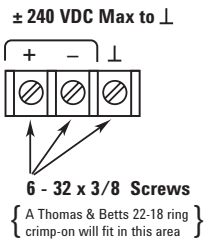
**Regulatory compliance:** Conforms to UL 1244 and IEC61010-1.

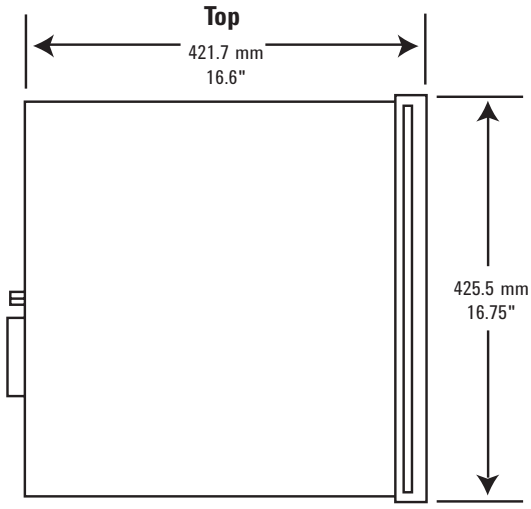
**Size:**
425.5 mm W x 88.1 mm H x 439 mm D
(16.75 in x 3.5 in x 17.3 in)

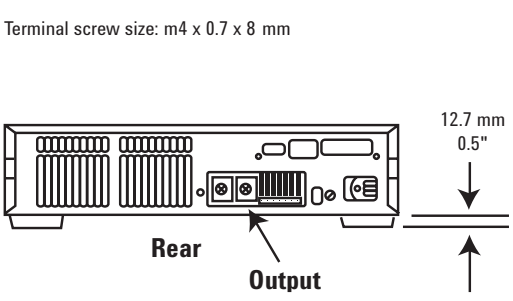
**Weight:** Net, 14.2 kg (31.4 lb); shipping, 16.3 kg (36 lb)

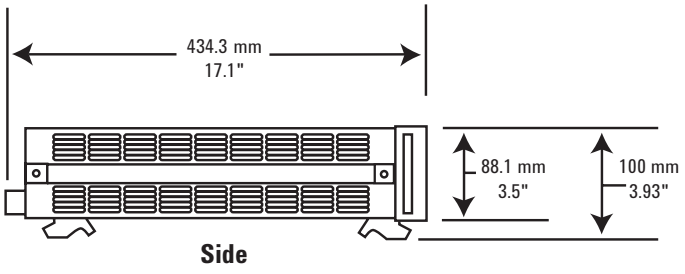
**Warranty:** One year

**Agilent models:** 6641A, 6642A, 6643A, 6644A, 6645A



## Ordering information

**Opt 100** 87 to 106 VAC, 47 to 63 Hz
**Opt 120** 104 to 127 VAC, 47 to 63 Hz
**Opt 220** 191 to 233 VAC, 47 to 63 Hz
**Opt 240** 209 to 250 VAC, 47 to 63 Hz

**Opt 0L1** Full documentation on CD-ROM and printed user's and programming guides. CD-ROM includes user's guide, programming guide, service manual, and quick start guide

### Accessories

**1CM002A*** Rack mount flange kit 88.1 mm H (2U), 1.75 inch hole spacing, two flange brackets
**1CP001A*** Rack mount flange and handle kit 88.1 mm H (2U) – two brackets and front handles
**E3663AC** Support rails for Agilent rack cabinets
**p/n 1494-0060** Accessory slide kit
**p/n 1252-3698** 7-pin analog plug
**p/n 1252-1488** 4-pin digital plug
**p/n 5080-2148** Serial link cable 2 m (6.6 ft)

## Application notes

*10 Practical Tips You Need to Know About Your Power Products*, 5965-8239E

*10 Hints for Using Your Power Supply to Decrease Test Time*, 5968-6359E

*Understanding Linear Power Supply Operation (AN1554)*, 5989-2291EN

*Modern Connectivity–Using USB and LAN I/O Converters (AN 1475-1)* 5989-0123EN

* Support rails required

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