

Test Equipment Solutions Datasheet

Test Equipment Solutions Ltd specialise in the second user sale, rental and distribution of quality test & measurement (T&M) equipment. We stock all major equipment types such as spectrum analyzers, signal generators, oscilloscopes, power meters, logic analysers etc from all the major suppliers such as Agilent, Tektronix, Anritsu and Rohde & Schwarz.

We are focused at the professional end of the marketplace, primarily working with customers for whom high performance, quality and service are key, whilst realising the cost savings that second user equipment offers. As such, we fully test & refurbish equipment in our in-house, traceable Lab. Items are supplied with manuals, accessories and typically a full no-quibble 2 year warranty. Our staff have extensive backgrounds in T&M, totalling over 150 years of combined experience, which enables us to deliver industry-leading service and support. We endeavour to be customer focused in every way right down to the detail, such as offering free delivery on sales, covering the cost of warranty returns BOTH ways (plus supplying a loan unit, if available) and supplying a free business tool with every order.

As well as the headline benefit of cost saving, second user offers shorter lead times, higher reliability and multivendor solutions. Rental, of course, is ideal for shorter term needs and offers fast delivery, flexibility, try-before-you-buy, zero capital expenditure, lower risk and off balance sheet accounting. Both second user and rental improve the key business measure of Return On Capital Employed.

We are based near Heathrow Airport in the UK from where we supply test equipment worldwide. Our facility incorporates Sales, Support, Admin, Logistics and our own in-house Lab.

All products supplied by Test Equipment Solutions include:

- No-quibble parts & labour warranty (we provide transport for UK mainland addresses).
- Free loan equipment during warranty repair, if available.
- Full electrical, mechanical and safety refurbishment in our in-house Lab.
- Certificate of Conformance (calibration available on request).
- Manuals and accessories required for normal operation.
- Free insured delivery to your UK mainland address (sales).
- Support from our team of seasoned Test & Measurement engineers.
- ISO9001 quality assurance.

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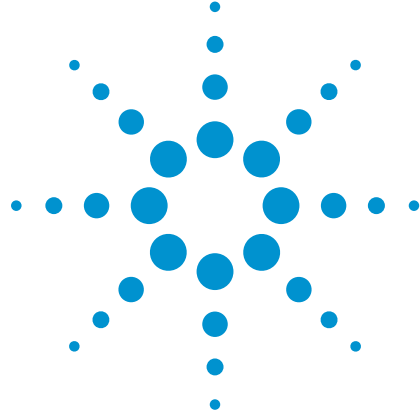
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Agilent
E36XXA Series
Non-Programmable DC Power Supplies
Data Sheet



Agilent Technologies

Reliable Power, Repeatable Results

- **Linear power supply**
- **Single, dual or triple output**
- **10-turn voltage and current control**
- **Low noise and excellent regulation**



Affordable, full-featured benchtop power supplies provide excellent performance and flexibility

A whole family of low-cost power supplies to meet your needs

The E3600 Series of low-cost benchtop power supplies give you the performance of system power supplies at a decent price. All E3600 family members provide clean power with excellent regulation and a fast transient response. The E3600 Series single-output non-programmable models are described on this page. Refer to page 3 for information on dual-output and triple-output non-programmable models.

Single-output models

All E3600 Series single-output non-programmable power supplies feature separate digital-panel meters for monitoring voltage and current simultaneously, giving you precise reading and control capability. All models also feature 10-turn potentiometers for accurate adjustment of voltage and current output settings.

With 0.01 percent load and line regulation, these instruments keep the output steady when power line and load changes occur.

The low normal mode noise specification of less than 200 μ Vrms ensures clean power for precision circuitry.

In all single-output models, either the positive or negative terminal can be connected to ground, providing a positive or negative voltage output. Outputs can also be floated up to 240 V from ground.

These instruments also feature adjustable current limits, letting you set the safest current limit without having to short the output.

E3610A, E3611A, and E3612A single-output, dual range models

These popular 30-watt bench supplies are designed for general laboratory use. The constant-voltage, constant-current output allows operation as either a voltage or current source. The changeover occurs automatically, based on the load. Each of these models has two ranges, allowing more current at a lower voltage. For higher output voltages, supplies can be connected in series. These models also feature overload protection. A continuously acting constant current circuit protects the power supply against all overloads including a direct short placed across the terminals in a constant voltage operation.

E3614A, E3615A, E3616A and E3617A models feature overvoltage protection, remote sensing and remote programming

These flexible 60-watt, single-range power supplies can be used as either voltage or current sources. When the output terminal voltage increases to a preset shut-down level, an overvoltage protection circuit disables the output to protect the device under test (DUT) for damage. The overvoltage protection feature can be easily monitored and adjusted from the front panel.

Using the remote sensing capability, these instruments automatically compensate for voltage drop in the load leads, so you obtain an accurate voltage at the DUT.

Using the remote analog voltage programming capability, these instruments can remotely vary the voltage, so you are able to control the regulation output voltage or current.

You can combine multiple units in auto-parallel, auto-series and auto-tracking configurations for greater output voltage or current capacity. Front and rear output terminals allow for a flexible configuration. The output voltage and current can be controlled with external 0– to 10– volt analog voltage or variable resistance.

Multiple-output non-programmable models

With multiple supplies in a compact unit, the E3620A and E3630A provide excellent performance while saving space on your bench. Both instruments feature a tight 0.01 percent line and load regulation and a low normal mode noise specification of less than 0.35 mV to ensure clean power for precision circuitry. With a common mode current specification of less than 1 μ A, both multiple-output power supplies minimize the power line current injection.

Like the single-output models in the E3600 Series, the E3620A and E3630A feature separate digital panel meters so you can monitor the voltage and current simultaneously. They also protect your DUT against overload and short-circuit damage.

Smooth turn-on and turn-off transitions keep power spikes out of your circuits. Auto-tracking permits equal or proportional voltage sharing, and allows control of output voltage from one master unit. The master and slave supplies have the same output polarity with respect to a common bus or ground. This operation is useful where simultaneous turn-up, turn-down or proportional control of all power supplies is required.

E3620A dual-output power supply

The 50-watt E3620A dual-output power supply provides two 0 V to 25 Vdc outputs with the maximum current of 1 A to satisfy most bench requirements. The outputs are completely independent and isolated.

E3630A triple-output power supply with auto-tracking feature

The 35-watt E3630A triple-output power supply provides three DC outputs: 0 to 6 V with a maximum current of 1 to 2.5 A and 0 to 20 V and 0 to -20 V with a maximum current of 0.5 A. An auto-tracking feature lets you use one voltage control to adjust the +20 V and -20 V outputs simultaneously. The outputs track each other to within 1 percent, making it easy to adjust the power supply for circuits requiring balanced voltages.

Specifications

| | E3610A | E3611A | E3612A | E3614A | E3615A | E3616A | E3617A | E3620A | E3630A | |
|---|---|-----------------------------|------------------------------|--|--------------------------------|----------------|------------------|--|--|--|
| Features | Dual range, 10 turn pots, Constant Voltage (CV), Constant Current (CC) modes. | | | Adjustable overvoltage protection, voltage & resistance programming, remote sense, rear outputs, ten turn pots, CV, CC modes. Multiple supplies can be connected for tracking or higher power. | | | | Isolated dual outputs, 10 turn pots CV, CL | Tracking, CV, CL (± 20 V) CV, CF (+6 V) | |
| Number of outputs | 1 | | | | | | | 2 | 3 | |
| Number of Output Ranges | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | |
| DC Output Rating | 8 V, 3 A 15 V, 2 A | 20 V, 1.5 A 35 V, 0.85 A | 60 V, 0.5 A 120 V, 0.25 A | 8 V, 6 A | 20 V, 3 A | 35 V, 1.7 A | 60 V, 1 A | 25 V, 1 A 25 V, 1 A | +6 V, 2.5 A +20 V, 0.5 A -20 V, 0.5 A | |
| Load and Line Regulation | < 0.01% + 2 mV | | | | | | | | | |
| Ripple and Noise (20 Hz to 20 MHz) | | | | | | | | | | |
| Normal mode voltage | < 200 μ Vrms, < 2 mVpp | | | < 200 μ Vrms, < 1 mVpp | | | | < 350 μ Vrms, < 1.5 mVpp | | |
| Normal mode current | < 200 μ Arms, < 1 mVpp | | | < 0.02% + 3 mA | < 0.02% + 1.5 mA | < 0.02% + 1 mA | < 0.02% + 0.5 mA | - | | |
| Common mode current | Not specified | | | | | | | < 1 μ Arms | | |
| Transient Response Time | < 50 μ sec following a change in output current from full load to half load for output to recover within: | | | | | | | | | |
| | 10 mV | | | 15 mV | | | | | | |
| Meter Accuracy | $\pm 0.5\%$ + 2 counts at 25 $^{\circ}$ C ± 5 $^{\circ}$ C | | | | | | | | | |
| Meter Resolution | | | | | | | | | | |
| Voltage | 10 mV | 100 mV | 100 mV | 10 mV | 10 mV (0-20 V), 100 mV (>20 V) | | | | 10 mV | |
| Current | 10 mA | 10 mA | 1 mA | 10 mA | 10 mA | 1 mA | 1 mA | 1 mA | 10 mA | |
| Isolation | 240 Vdc | | | | | | | | | |

Supplemental Characteristics

| | E3610A | E3611A | E3612A | E3614A | E3615A | E3616A | E3617A | E3620A | E3630A |
|---------------------------------------|--|--------|--|---------------------|-------------------|---|---|---|-------------------------------------|
| Control Mode | CV/CC | | | | | | CV/CL | | CV/CL (± 20 V) CV/CF (+6 V) |
| Temperature Coefficient per °C | | | | | | | | | |
| Voltage | < 0.02% + 1 mV | | < 0.02% + 500 μ V | | | | < 0.02% + 1 mV | | |
| Current | < 0.02% + 2 mA | | < 0.02% + 3 mA | < 0.02% + 1.5 mA | < 0.02% + 1 mA | < 0.02% + 0.5 mA | - | | |
| Output Drift | | | | | | | | | |
| Voltage | Less than 0.1% + 5 mV total drift for 8 hours after initial warm-up of 30 minutes | | | | | | | | |
| Current | Less than 0.1% + 10 mA total drift for 8 hours after initial warm-up of 30 minutes | | | | | | N/A | | |
| Temperature Range | | | | | | | | | |
| | 0 to 40 °C for full rated output. Derate output current 1% per °C between 40 °C to 55 °C | | | | | | Derate output current 50% between 40 to 55 °C | | |
| Cooling | Convection cooling | | | | | | | | |
| Isolation | ± 240 Vdc | | | | | | | | |
| AC Input | 100 Vac $\pm 10\%$, 47–63 Hz (opt. 0E9) 115 Vac $\pm 10\%$, 47–63 Hz (std) 230 Vac $\pm 10\%$, 47–63 Hz (0E3) | | | | | | | | |
| Weight | 3.8 kg (8.4lbs) net, 4.2 kg (9.3 lbs) shipping | | 5.5 kg (12.1 lbs) net, 6.75 kg (14.9 lbs) shipping | | | 5.0 kg (11.0 lbs) net, 6.25 kg (13.8 lbs) shipping | | 3.8 kg (8.4 lbs) net, 5.1 kg (11.3 lbs) shipping | |
| Size | 88.1 mm H x 212.3 mm W x 318.4 mm D 3.5" H x 8.4" W x 12.5" D | | 88.1 mm H x 212.3 mm W x 373.4 mm D 3.5" H x 8.4" W x 14.7" D | | | 88.1 mm H x 212.3 mm W x 392.4 mm D 3.5" H x 8.4" W x 15.4" D | | Same as E3610A | |
| Warranty | One year for E3600 series power supplies Three months for standard shipped accessories | | | | | | | | |
| Product Regulation | Certified to CSA 22.2 No. 231; conforms to IEC 1010-1; carries CE mark; complies with CISPR-11, Group 1, Class A | | | | | | | | |

Ordering Information

E3600 Series Power Supplies

E3610A 30-Watt Power Supply
E3611A 30-Watt Power Supply
E3612A 30-Watt Power Supply
E3614A 48-Watt Power Supply
E3615A 60-Watt Power Supply
E3616A 60-Watt Power Supply
E3617A 60-Watt Power Supply
E3620A Dual-output Power Supply
E3630A Triple-output Power Supply

Standard Shipped Accessories

User's guide, Product Reference CD,
power cord

Power Options

Opt. 0E3 230 Vac $\pm 10\%$
Opt. 0EM 115 Vac $\pm 10\%$
Opt. 0E9 100 Vac $\pm 10\%$

Other Options

Opt. 1CM Rackmount kit* (E3614A,
E3615A, E3616A, E3617A, E3620A)
Opt. 0L2 Extra manual
Opt. UK6 Commercial calibration with
test result data
E3600A-100 Test lead kit

Extra Manual Sets

E3610A/11A/12A Manual
(P/N 5959-5304)
E3614A/15A/16A/17A Manual
(P/N 5959-5310)
E3620A Manual
(P/N E3620-90001)
E3630A Manual
(P/N 5959-5329)

Rackmount Kits*

E3614A/15A/16A/17A/20A

To rackmount two instruments side-
by-side

- Lock-link Kit (P/N 5061-9694)
- Flange Kit (P/N 5063-9212)

To rackmount one or two instruments
in a sliding support shelf

- Support Shelf (P/N 5063-9255)
- Slide Kit (P/N 1494-0015)
required for support shelf

For a single instrument, also order
filler panel (P/N 5002-3999)

* Rackmounting with 1CM or lock-
link/flange kit requires

- Agilent or customer support rails
- Agilent Support Rails-E3663AC.



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Agilent Open simplifies the process of connecting and programming test systems to help engineers design, validate and manufacture electronic products. Agilent offers open connectivity for a broad range of system-ready instruments, open industry software, PC-standard I/O and global support, which are combined to more easily integrate test system development.

Remove all doubt

Our repair and calibration services will get your equipment back to you, performing like new, when promised. You will get full value out of your Agilent equipment throughout its lifetime. Your equipment will be serviced by Agilent-trained technicians using the latest factory calibration procedures, automated repair diagnostics and genuine parts. You will always have the utmost confidence in your measurements.

Agilent offers a wide range of additional expert test and measurement services for your equipment, including initial start-up assistance onsite education and training, as well as design, system integration, and project management.

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www.agilent.com/find/removealldoubt

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