ORTEC®

AMETEK®

4002E
BLACK MAX
Power Supply for NIM Bins

- **Higher power for high-density NIMs**
- **Regulated DC power of ±6 V @ 12 A, ±12 V @ 4 A, and ±24 V @ 2 A; 115 V AC @ 0.5 A**
- **300 W of DC output power from 0 to 50°C**
- **Over-voltage protection**
- **Short-circuit and overload protected**
- **Operates from 100, 115, 200, or 220 V AC at 47 to 63 Hz**



The ORTEC Model 4002E BLACK MAX™ Power Supply is designed to supply DC power to a NIM bin when the application demands exceptionally high power. The BLACK MAX power supply can be purchased separately for use with existing NIM bins, or it can be ordered attached to a Model 4001C NIM Bin. Mounting hardware is supplied to make the Model 4002E compatible with all ORTEC NIM bins. With minor mounting modifications the Model 4002E can be used with most standard NIM bins. The ORTEC Model 4001C NIM Bin is strongly recommended for use with the Model 4002E because the Model 4001C distributes the power with copper bus bars to minimize the voltage drop at each module's power plug. The BLACK MAX Power Supply is designed to exceed recommended power supply specifications for Type V-H supplies as defined in DOE/ER-0457T.

Regulated DC power supplied to the attached bin by the BLACK MAX is conservatively rated at +6 V @ 12 A, –6 V @ 12 A, +12 V @ 4 A, –12 V @ 4A, +24 V @ 2 A, and –24 V @ 2 A, provided the total output DC power does not exceed 300 W at ambient temperatures up to 50°C. In addition, 115 V AC is available up to 0.5 A.

Protection against overload is provided in several ways. When the heat sink temperature exceeds 95°C, the red warning indicator is illuminated on the attached bin control panel. When the heat sink temperature exceeds 110°C, the power supply is automatically shut down, causing both the power and temperature indicator lights to turn off. Recovery from thermal overload is automatic when the thermal load is reduced. Output currents from the DC supplies are internally limited to 120% of their rated values by foldback circuits. This provides overload and short-circuit protection. On the +6 V and –6 V DC supplies, crowbar circuits limit the output voltage to 7.5 V to protect integrated circuits. Fuses protect the AC inputs to the power supply.

An external slide switch allows selection of either 115 or 220 V AC as the power input. By changing pins on an internal connector, this selection can be altered to 100 and 200 V AC. An international standard IEC power connector permits power cords and plugs that meet local electrical standards to be used for the input power. Control of the primary power is provided by the On/Off switch on the NIM bin control panel.

Connection of power and control lines to the NIM bin is provided by the standard interface connector specified in DOE/ER-0457T. Mechanical mounting of the power supply to the NIM bin is with brackets utilizing the standard bolt pattern specified in DOE/ER-0457T.

Specifications

INPUT 103–129 or 200–258 V AC, 47–63 Hz. An external slide switch selects nominal input voltages of 115 or 220 V AC. Changing pins on an internal connector allows operation at 88–110 V or 191–239 V AC, 47-63 Hz, with the external slide switch selecting nominal voltages of 100 or 200 V AC. Input current at 115 V AC is nominally 7 A for a 300-W DC output simultaneous with a 0.5-A, 115-V AC output. Dual fuse input uses 8-A SB U.S.A. standard fuses for 100 or 115 V AC, 60 Hz and 5-A SB metric fuses for 200 and 220 V AC, 50 Hz operation.

DC OUTPUTS Maximum rated output currents are:

DC Voltage	Maximum Current	DC Voltage	Maximum Current
+6 V	12 A	–6 V	12 A
+12 V	4 A	–12 V	4 A
+24 V	2A	–24 V	2A

Maximum DC output power from 0 to 50°C is 300 W. Derate 3%/°C for 50 to 60°C.

115 V AC OUTPUT Unregulated voltage. Maximum current limited only by the input fuses when operated in the 100- or 115-V AC settings. Limited to 0.5 A on the 200- and 220-V AC settings when the DC load is 300 W. Output voltage is nominally 115 V AC in the 115-V and 220-V input modes. Output voltage is nominally 100 V AC in the 100-V and 200-V input modes.

REGULATION <±0.1% (typically ±0.05%) for ±12 V and ±24 V, and <±0.2% (typically ±0.1%) for ±6 V over the combined range of zero to full load with the specified input voltage range for measurements made within a 1 minute period. Regulation <±0.3% for ±12 V and ±24 V, and <±0.6% for ±6 V over any 24 hour period at constant ambient temperature for the same load and input ranges after a 60 minute warmup.

LONG-TERM STABILITY DC output voltages change <±0.5% (after a 60-minute warmup) over a 6-month period at constant load, line voltage, and ambient temperature.

OUTPUT IMPEDANCE <0.3 Ω at any frequency up to 100 kHz for the DC outputs.

TEMPERATURE COEFFICIENT <0.02%/°C, 0 to 60°C.

NOISE AND RIPPLE <3 mV peak-to-peak for any output as observed on a 50-MHz bandwidth oscilloscope.

VOLTAGE ADJUSTMENT ±2% minimum range. Resettability <±0.05% of the supply voltage.

RECOVERY TIME <100 µs to return to within ±0.1% of the rated voltage for all DC outputs for any input voltage change within the rated range or for a change of load current from 10% to 100% of full load.

CIRCUIT PROTECTION Both input power lines include fuses. The power supply is automatically turned off by an internal switch if the temperature of the heat sinks exceeds 110°C. Recovery is automatic when the temperature decreases to a safe value. Provision is made for activating a temperature warning light on the NIM bin control panel to advise that the temperature limit is being approached. This warning occurs at and above a heat sink temperature of 95°C. All DC outputs include a current foldback circuit to limit the output current to nominally 120% of the rated value. This feature provides short-circuit and overload protection. Recovery is

automatic after removal of the overload condition. Overvoltage protection for the ±6-V outputs prevents these outputs from exceeding ±7.5 V, respectively, to protect the integrated circuits that are commonly powered by these supply voltages.

WEIGHT 13.6 kg (30 lb) net weight, 18.1 kg (40 lb) shipping weight.

DIMENSIONS 43.2 cm (17.0 in.) wide, 26.9 cm (10.6 in.) deep, and 8.9 cm (3.5 in.) high, except for rear-mounted, 15.2-cm (6.0-n.) high heat sink.

REQUIREMENTS FOR ATTACHED BIN The Model 4002E should only be fitted to a Model 4001A NIM Bin Rev. F or later or Model 4001C NIM Bin Rev. H or later.

Ordering Information

The Model 4002E Power Supply may be ordered separately or in combination with a NIM bin, using the model numbers shown below.

Model	Description
4002E	300-W BLACK MAX Power Supply (with ±6 V, ±12 V, ±24 V)
4001C/4002E	NIM Bin (with copper bus bars) and 300-W BLACK MAX Power Supply (with ±6 V, ±12 V, ±24 V)

ORTEC®
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www.ortec-online.com
Tel. (865) 482-4411 ortec.info@ametek.com
801 South Illinois Avenue, Oak Ridge, TN 37830 U.S.A.
Visit Our Website For International Office Locations

Specifications subject to change
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