ORTEC®

AMETEK®

4002D
160-W Power Supply for NIM Bins
±6/±12/±24 V

- Regulated DC power of ±6 V @ 10 A, ±12 V @ 3 A, and ±24 V @ 1.5 A; 115 V AC @ 0.5 A
- 160 W of DC output up to 50°C
- Over-voltage protection to avoid damage to +5-V and –5.2-V integrated circuits
- Short-circuit and overload protected



The ORTEC Model 4002D Power Supply is designed to supply DC power to a NIM bin when the application requires ±6 V, ±12 V, and ±24 V power. The 4002D Power Supply can be purchased separately for use with existing NIM bins, or it can be ordered attached to either a 4001A NIM Bin or a 4001C NIM Bin. Mounting hardware is supplied to make the Model 4002D compatible with all ORTEC NIM bins. With minor mounting modifications the 4002D can be used with most standard NIM bins. The ORTEC 4001C NIM Bin is recommended for use with Model 4002D because Model 4001C distributes the power with copper bus bars to minimize the voltage drop at each module's power plug. The 4002D Power Supply is compatible with recommended power supply specifications for Type V-H supplies as defined in DOE/ER-0457T.

Regulated DC power supplied to the attached bin by Model 4002D is conservatively rated at +6 V @ 10 A, –6 V @ 10 A, +12 V @ 3 A, –12 V @ 3 A, +24 V @ 1.5 A, and –24 V @1.5 A. These maximum output currents can be delivered in any combination, provided the total output DC power does not exceed 160 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. 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 bin is with brackets utilizing the standard bolt pattern specified in DOE/ER-0457T.

Specifications

INPUT 115–120 or 220–240 V AC, 50–60 Hz, 490 VA (plus any load on 115 V AC OUTPUT). An external slide switch selects nominal input voltages of 115 or 220 V AC.

DC OUTPUTS Maximum rated output currents are:

DC Voltage	Max Current	DC Voltage	Max Current
+6 V	10 A	–6 V	10 A
+12 V	3 A	–12 V	3 A
+24 V	1.5 A	–24 V	1.5 A

ENVIRONMENTAL Maximum DC output power from 0 to 50°C is 160 W. Derate 3%/°C for 50 to 60°C. Relative Humidity 0% to 80% noncondensing

115 V AC OUTPUT Unregulated voltage. Maximum current limited only by the input fuses when operated at 115 V AC settings. Limited to 0.5 A on the 220 V AC settings when the DC load is 160 W. Output voltage is nominally 115 V AC in the 115 V and 220 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.

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

NOISE AND RIPPLE <6 mV peak-to-peak for any output as observed on a 20-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
Net 11.3 kg (25 lb).
Shipping 15.9 kg (35 lb).

DIMENSIONS 43.2 cm (17.0 in.) wide, 26.9 cm (10.6 in.) deep, and 8.9 cm (3.5 in.) high.

RECOMMENDATIONS FOR ATTACHED BIN The 4002D Power Supply is designed to provide high currents to NIM modules that contain heavy loads. The NIM bin used with this power supply must be capable of handling the large currents demanded by those loads. The power On/Off switch mounted on the bin and its associated primary circuit wiring must be rated to handle 5 A. The bin wiring distributing the DC voltages must also have an impedance low enough to yield negligible voltage drops at the rated currents for the supply. The ORTEC Model 4001A NIM Bin will function acceptably with the 4002D Power Supply, but the Model 4001C NIM Bin is recommended as the more desirable choice. The ORTEC Model 4001C NIM Bin employs copper bus bars for power distribution. This typically results in more than a factor of 10 lower voltage drop at maximum current.

Ordering Information

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

Model	Description
4002D	160-W Power Supply (with ±6 V, ±12 V, ±24 V)
4001A/4002D	NIM Bin and 160-W Power Supply (with ±6 V, ±12 V, ±24 V)
4001C/4002D	NIM Bin (with copper bus bars) and 160-W Power Supply (with ±6 V, ±12 V, ±24 V)

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Specifications subject to change
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