



EG&G ORTEC 402D POWER SUPPLY

1. DESCRIPTION

The EG&G ORTEC 402D Power Supply is designed to be mounted in the space provided on the rear of the 4001A(B) Modular System Bin. The Supply was designed to exceed the recommended power supply specifications, Appendix A of TID-20893 (Rev 3), Type V-H, adopted by the AEC Committee on Nuclear Instrument Modules (adopted by DOE).

The 402D was designed for worldwide usage. Input voltage mains of 117 V ac or 230 V ac, 47-63 Hz, may be used. A convenience indicating switch clearly identifies the intended main to use.

The Supply furnishes six standard dc voltages, +24 V at 1 A, -24 V at 1 A, +12 V at 2 A, -12 V at 2 A, +6 V at 8 A and -6 V at 8 A, with a maximum power capability of 132 W at 50°C. The dc outputs are regulated, short-circuit protected, current limited, and thermal protected.

The 117 V ac is supplied to the Bin connector independent of input mains. The 117-V ac power available is limited only by the Power Supply fuse when operating from 117-V ac mains. When operating from 230-V ac mains, the 117-V ac is derived by autotransformer action and is limited to 60 VA output with a dc load on the Power Supply of 132 W.

A control panel is provided on the EG&G ORTEC 4001A(B) Bin for operating and monitoring the 402D Power Supply. An On-Off switch, a power indicating lamp, a thermal warning lamp, and convenience dc monitor jacks are provided. The thermal warning lamp is lighted when the internal temperature rises to within 20°C of the maximum safe operating temperature. The Power Supply is automatically cut off by an internal switch should the temperature exceed the maximum safe operating temperature.

The power transistors are virtually indestructible due to their power handling capability, current limiting, and short-circuit protection. Silicon semiconductors, 85°C capacitors with conservative working voltage ratings, high-quality-carbon resistors, and metal film resistors are combined to produce the 402D Power Supply, which exceeds the TID-20893 (Rev) requirements.

The dc output voltages are adjustable through holes in the top of the Power Supply cover plate, over a $\pm 2\%$ range from their nominal ratings. The adjustment potentiometers are 20-turn cermet potentiometers for superior adjustment resolution and resettability of the output voltages.

2. SPECIFICATIONS

INPUT 100 to 129 V ac, 57-63 Hz, or 200 to 258 V ac, 47-53 Hz. Input current at 117 V is 3.5 A for a 132-W dc output.

DC OUTPUTS The Supply provides six simultaneous dc outputs with the following current ratings:

VOLTAGE (V)	CURRENT (A)
+24.00	0 to 1
-24.00	0 to 1
+12.00	0 to 2
-12.00	0 to 2
+ 6.00	0 to 8
- 6.00	0 to 8

Maximum output power from 0 to 50°C ambient is 132 W. Operation to 60°C ambient, with current derated not more than 3%/°C for temperatures above 50°C.

117-V AC OUTPUT 117-V ac output is limited only by

the Supply fuses when operating from 117-V ac mains. Output is limited to 60 VA at 132-W dc load while operating from 230-V ac mains.

REGULATION

$\pm 0.1\%$ (typically $\pm 0.05\%$) for ± 12 V and ± 24 V, and $\pm 0.2\%$ (typically $\pm 0.1\%$) for ± 6 V over the combined range of zero to full load and input voltage of 100 to 129 V ac or 200 to 258 V ac, when measurements are made within a period of 1 min.

$\pm 0.3\%$ (± 12 V and ± 24 V) and $\pm 0.6\%$ (± 6 V) over any 24-hr period at constant ambient temperature over the combined range of no load to full load and input voltage of 100 to 129 V ac or 200 to 258 V ac, after a 60-min warmup.

STABILITY Long-term stability over a 6-month period is better than $\pm 0.5\%$ after a 1-hr warmup at constant load, line, and ambient temperature.

OUTPUT IMPEDANCE $<0.15\Omega$ for the ± 6 -V outputs and $<0.3\Omega$ for all other outputs at any frequency to 100 kHz.

TEMPERATURE COEFFICIENT $<0.02\%/^{\circ}\text{C}$ over a range of 0 to 60°C .

TEMPERATURE PROTECTION A thermal warning switch will close when the supply temperature approaches within 20°C of the safe operating value. A thermal cutout switch disables the Power Supply when the temperature exceeds the safe operating value.

NOISE AND RIPPLE <3 mV peak-to-peak for all six outputs, as observed on a 50-MHz bandwidth oscilloscope.

VOLTAGE ADJUSTMENTS $\pm 2\%$ minimum range, reset-ability $\pm 0.05\%$ of Supply voltage.

RECOVERY TIME $<100\ \mu\text{s}$ to return to within $\pm 0.1\%$ of rated voltage for all six outputs for any change in input voltage and load current from 10% to 100% full load.

CIRCUIT PROTECTION Both sides of the input line to the power supply are fused. In addition, output current foldback limiting to prevent damage to the Supply and automatic recovery when the demand is removed are provided by electronic circuitry.

All six supplies are protected so that any one can be shorted to any other one without resulting in permanent damage.

Overvoltage protection is provided on ± 6 V so that these outputs will not exceed 7.5 V maximum.

OUTPUT CONNECTOR All power and control circuits terminate in a connector, specified by TID-20893 (Rev 3), which mates the Bin interface connector, completing the necessary control and Power Supply wiring.

DIMENSIONS Conform to AEC drawing ND-515 and paragraph L, page A-10, of TID-20893 (Rev 3).

WEIGHT

Net 8.9 kg (20 lb); with 4001A(B) 13.6 kg (30 lb).

Shipping 12.3 kg (27 lb); with 4001A(B) 19.6 kg (43 lb).

3. INSTALLATION

The 402D Power Supply is normally supplied factory-connected to an EG&G ORTEC 4001A(B) Modular System Bin. However, the Supply is designed to TID-20893 (Rev) specifications and may be attached, in the space provided, to any bin manufactured to TID-20893 (Rev) specifications.

For attachment to other than an EG&G ORTEC 4001A(B) Bin, refer to the appropriate instruction manual. The On-Off switch and other controls necessary to operate the supply are part of the Bin and are not furnished with the Power Supply.

For attachment to the EG&G ORTEC 4001A(B) Bin the following steps are advised:

1. Place the Bin on a table with the back part facing you. Place the Power Supply in the proper mounting position, leaving enough space between it and the Bin to attach the interface connector.

2. Mate the interface connector, being careful to align the polarizing pins. Fold and form all wiring close to the connector edges to prevent any wires from being pinched and producing a short circuit in succeeding steps.

3. Mount the Supply to the Bin by securely tightening the four 10-32 screws, being careful not to pinch any wires or to use undue force on any parts.

Unless otherwise specified, the 402D is shipped with transformer connections appropriate for operation on nominal 117 or 230 V mains, according to the selection made with the rear panel slide switch. To change the connections for operation on 100 or 200 V power mains, use the following steps:

1. Remove the top cover.
2. Move the wires from lug #3 of T1 to its lug #2.
3. Move the wires from lug #6 of T1 to its lug #5.
4. Replace the top cover.
5. Set the rear panel slide switch at 117 for 100 V operation or at 230 for 200 V operation.