# 4006
## Minibin and Power Supply
±6/±12/±24 V

- **Accommodates up to 6 NIM-Standard modules with a compact 24 cm x 32 cm table-top footprint**
- **Regulated DC power: ±6 V @ 4 A, ±12 V @ 1.5 A, ±24 V @ 0.75 A, and 120 V AC @ 0.5A**
- **120 W of DC power at 23°C and 80 W up to 50°C**
- **Over-voltage protection to avoid damage to +5-V and –5.2-V integrated circuits**
- **Short-circuit and overload protection accompanied by LED fault indicators**
- **Operates from 100, 120, 220, or 240 V AC at 50 or 60 Hz**
- **Two standard preamplifier power outlets**

The compact Model 4006 Minibin and Power Supply is the ideal solution where a small number of NIM modules must be located close to the action in a measurement system. Its slim 24-cm x 32-cm footprint minimizes the space required on a table top. It can operate at full power while sitting on a solid surface, because rear intake and exhaust of cooling air eliminates the need to provide free air flow from below. The Model 4006 accommodates up to 6 standard, single-width NIM modules, or a proportionately smaller number of double-width modules. In addition to the standard ±24-V and ±12-V DC power, ±6 V is provided to serve the high-current demands of TTL and ECL logic used extensively in newer NIM modules. The full load of 0.75 A on both of the 24-V supplies, 1.5 A on both of the 12-V supplies, and 4 A on both of the 6-V supplies can be drawn at room temperature (23°C) for a total of 120 W DC power. A total load of 80 W DC can be driven at ambient temperatures up to 50°C. The standard 60 VA of 120 V AC is also available on the module power connectors, independent of the actual AC voltage applied to the main power cord. Two 9-pin D connectors on the rear panel provide a convenient source of ±6-V, ±12-V and ±24-V power for preamplifiers via the industry-standard preamplifier power plug.

Extensive protection is designed into the Model 4006 power supply. Crowbar circuits are included on the ±6-V power lines to protect TTL and ECL integrated circuits against over-voltage. All six of the DC power lines incorporate protective foldback circuits that automatically reduce the output voltage in case of an excessive load current or a short circuit. Green LED indicators turn red when the supply voltage is reduced by an overload. The LEDs extinguish if the voltage is reduced to zero by a low-impedance short circuit. Thermal cut-out switches protect the power supply against excessive temperature. When the heat sink temperature is within 15°C of the maximum safe temperature, the red TEMP warning indicator turns on. When the maximum safe temperature is exceeded, all power to the unit is automatically turned off. Power is recovered automatically when the temperature is reduced below the safe limit. There are no hot, external heat sinks that can be accidentally touched. All heat sinks are internal to the unit and cooled by forced air. The AC power input is protected with a fuse, and the unit meets all CE requirements.

A power input module with the standard IEC connector and selectable 100, 120, 220 and 240 AC input voltages at 50 or 60 Hz makes the Model 4006 compatible with power cords and AC power outlets in virtually all countries.

## Specifications

### BIN

**MECHANICAL TOLERANCES** in accordance with DOE/ER-0457T, providing for interchangeability of all NIM standard modules.

**MODULE CONNECTORS** 6 each. Connectors as specified by DOE/ER-0457T.

**MODULE-CONNECTOR WIRING** All module connectors are wired in parallel for +6 V, –6 V, +12 V, –12 V, +24 V, –24 V, power return, high-quality ground return, and 120 V AC, in accordance with DOE/ER-0457T pin assignments.

**PREAMPLIFIER POWER CONNECTORS** Two, industry standard, female, 9-pin D connectors are mounted on the rear panel and wired with the following pin assignments. These connectors mate with the standard preamplifier power connectors on ORTEC preamplifiers, and preamplifiers supplied by most other NIM manufacturers.

| Pin Number | DC Voltage |
|---|---|
| 1 | Ground |
| 2 | Ground |
| 3 | +6 V |
| 4 | +12 V |
| 5 | –6 V |
| 6 | –24 V |
| 7 | +24 V |
| 8 | No Connection |
| 9 | –12 V |

**CONSTRUCTION** Painted aluminum enclosure with cadmium-plated steel perforated top/bottom module-retainer plates and connector mounting plate. Plastic front bezel and guide-rail inserts. Rubber feet for tabletop protection. All heat sinks are internal and cooled by a forced-air fan. Cooling air flows from the lower rear intake, through the power supply and modules to exhaust at the top rear.




### POWER SUPPLY

**INPUT** 100, 120, 220, 240 V AC, 50 or 60 Hz, 400 VA max., EMI filtered per IEC801. Overvoltage category II, Pollution degree 2. Voltage regulation allows a range of +10% to –12% of the nominal voltage. Input current at 120 V AC is typically 3 A rms for a 120-W DC load. A power-entry module on the rear provides a standard IEC plug for connecting power cords that are compatible with local AC voltage outlets. The power-entry module provides selection of the required input voltage, and contains the input fuse. Fuse ratings are 4 A, 250 V (SLO-BLO) size 3AG for 100 or 120 V AC, and 2 A, 250 V (T) size 5 x 20 mm for 220 or 240 V AC.

**DC OUTPUT** Maximum rated currents for each voltage supplied to the 6 module power connectors and 2 preamplifier power connectors are:

| DC Voltage | Maximum Current | DC Voltage | Maximum Current |
|---|---|---|---|
| +24 V | 0.75 A | –24 V | 0.75 A |
| +12 V | 1.5 A | –12 V | 1.5 A |
| +6 V | 4 A | –6 V | 4 A |

Maximum total DC output power: 120 W at 23°C, 80 W up to 50°C ambient air temperature.

**120 V AC OUTPUT** Limited only by the power entry fuse when operating from 120 V AC. Limited to 60 VA when the DC load is 80 W and the input voltage is 100, 220, or 240 V AC.

**DC 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 warm-up.

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**OUTPUT IMPEDANCE** <0.3 Ω at any frequency up to 100 kHz.

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

**TEMPERATURE COEFFICIENT** DC output voltages change <±0.02%/°C over a range of 0 to 50°C.

**NOISE AND RIPPLE** <3 mV peak-to-peak as observed on an oscilloscope with a 50-MHz bandwidth.

**VOLTAGE ADJUSTMENT** ±5% 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 voltage change within the rated range or for a change of load current from 10% to 100% of full load.

**CIRCUIT PROTECTION** The input power line includes a fuse. The power supply is automatically turned off by an internal switch if the temperature of the internal heat sink exceeds 110°C. Recovery is automatic when the temperature decreases to a safe value. A red light on the front panel turns on when the heat sink temperature exceeds 95°C to warn that the maximum temperature is being approached. 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 the overload is removed. Over-voltage 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.

**COOLING** Rear-panel fan forces cooling air over the internal power supply heat sinks and up through any installed NIM modules to exhaust at the top rear. Consequently, there are no hot external heat sinks exposed for accidental contact.

**ENVIRONMENTAL** Temperature 0 to 50°C. Indoor use. 95% maximum relative humidity, non-condensing. Altitude up to 2,000 meters. Installation category II. Pollution degree 2. Meets all CE requirements.

### CONTROLS AND INDICATORS

**POWER** Front-panel, two-position, rocker switch turns both sides of the AC power to the unit ON or OFF.

**AC** Front-panel, green light indicates the AC Power ON condition when illuminated. Power indicator light and output power turn off if the internal heat-sink temperature exceeds 110°C.

**TEMP** Front-panel red light turns on when the internal heat-sink temperature exceeds 95°C to warn that the shut-down temperature limit is being approached. The TEMP light turns off if power has been shut off by exceeding the heat-sink temperature limit.

**STATUS** Six, front-panel lights indicate when the respective DC voltage is out of regulation because of a current overload or a short circuit. Green indicates normal operation (within ±5% of the nominal voltage), while red indicates an out-of-regulation fault, and a light turned off implies zero voltage due to a short circuit or lack of AC input power. The lights are labeled with the supply voltage (–6 V, +6 V, –12 V, +12 V, –24 V, and +24 V) and the maximum rated load current for each supply voltage.

**CALIBRATION** Six potentiometers mounted inside on the printed wiring board permit precise adjustment of the six DC output voltages.

### MECHANICAL

**WEIGHT**
**Net** 12 kg (26 lb)
**Shipping** 14 kg (31 lb)

**DIMENSIONS** 24.0 cm W x 32.0 cm D x 35.2 cm H (9.4 in. W x 12.6 in. D x 13.9 in. H)

## Ordering Information

| Model | Description |
|---|---|
| 4006 | Minibin and Power Supply |




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