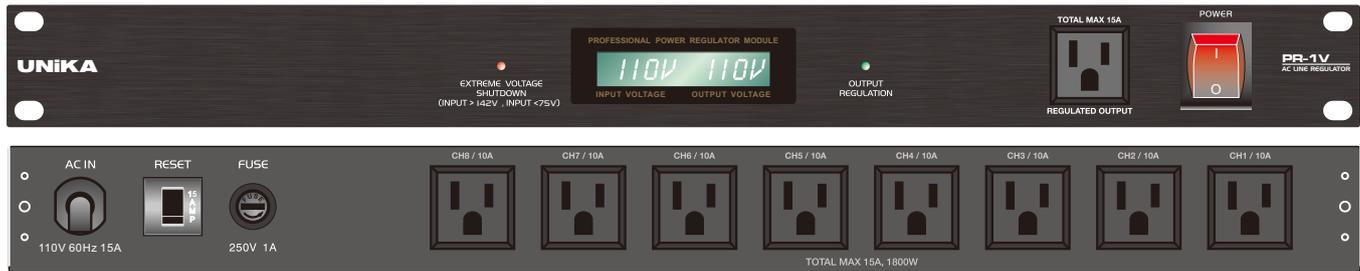


OPERATION MANUAL



Congratulations on your purchase of PR-1V AC Line Voltage Regulator. The regulator is designed specifically for any audio, video or computer rackmount system requiring clean, filtered, and regulated AC power for optimum operation.

FEATURES

- Advanced Power Filtering.
- PR-1V provides nine regulated, conditioned AC outlets- eight on the rear panel and one on the front.
- PR-1V input capacity is 15A; output capacity is 12A to 15A.
- Usable range is an additional 10% above and below the ranges shown in the table below.
- Extreme overvoltage or undervoltage causes instant shutdown, protecting equipment.
- Extreme voltage shutdown indicator LED.
- Output in regulation indicator.
- LCD input/output voltage display.
- Fast-acting user-accessible circuit breaker protects against overload or shorts.
- Very low stray magnetic field leakage.
- On / off switch.
- Compact, lightweight unit weights only 15.4 lbs (7 kgs).

SAFETY INFORMATION

To obtain best results from your PR-1V, please be sure to read this manual carefully.

WARNINGS

To reduce the risk of electrical shock, do not expose this equipment to rain or moisture. Dangerous high voltages are present inside the enclosure. Do not remove the covers. There are no user serviceable parts inside. Refer servicing to qualified personnel only.

IMPORTANT SAFETY INSTRUCTIONS

PLEASE READ PRIOR TO INSTALLATION

1. Please read and observe all of the safety and operating instructions before the PR-1V is operated. Retain this instruction for future reference.
2. The PR-1V should not be used near water – for example, near a bathtub, kitchen sink, in a wet basement, near a swimming pool, etc.
3. Do not place the PR-1V near heat sources such as radiators, heat registers, stoves, or other appliances that produce heat.
4. Route the power cord and other cables so that they are not likely to be walked on, tripped over or stressed. Pay particular attention to condition of cords and cables at plugs, and the point where they exit from the PR-1V. To prevent risk of fire or injury, damaged cords and cables should be replaced immediately.
5. Clean the PR-1V with a damp cloth only. Do not use solvents or abrasive cleaners. Never pour any liquid on or into the unit.
6. When left unused for a long period of time, the power cord of the PR-1V should be unplugged from the outlet.
7. The PR-1V should be serviced by qualified service personnel when:
 - a. The power supply cord or the plug has been frayed, kinked or cut.
 - b. Objects have fallen or liquid has spilled into the unit.
 - c. The PR-1V has been exposed to rain or other moisture
 - d. The PR-1V does not appear to operate normally or exhibits a marked change in performance.
 - e. The PR-1V has been dropped, or the enclosure damaged.
8. The PR-1V requires that a safety ground be present for proper operation. Any attempt to operate the PR-1V without a safety ground is considered improper operation and could invalidate the warranty.
9. There are no user serviceable parts in the PR-1V. Refer servicing to qualified service personnel only.

NOMINAL OUTPUT VOLTAGE VS. INPUT “IN-REGULATION” RANGE:

Output Accuracy	Model	Voltage Setting	In-Regulation Range
±5V	PR-1V	110V	95V to 135V

The Voltage Regulator is intended to protect sensitive electronic equipment from problems caused by AC line voltage irregularities-brownouts or overvoltages that can cause audio tonal changes, digital equipment malfunction (such as loss of MIDI programs or other data), or, in extreme cases, permanent damage. They accept input voltages over a wide AC voltage range (see table on page 2) and convert them to a steady, stable output at the desired standard voltage, plus or minus five volts. Voltages approximately ±10% beyond that range may be converted to usable levels, depending on the requirements of the equipment.

The PR-1V has eight convenience outlets on the rear panel, and one on the front panel. All are functionally interchangeable. The outlets are regulated, spike suppressed, making the unit a full-function power conditioner. The PR-1V has no controls except an on-off switch.

Note: The PR-1V is for use with AC voltage only. DC voltage should never be applied to it. Also, it does not change or regulate line frequency. The output frequency will always be the same as the incoming frequency.

MAXIMUM AND MINIMUM LOAD

The PR-1V can handle load totally up to 15 amperes as long as the input voltage is equal to or above 110 volts. For voltage below that level, its capacity must be derated at approximately 113 milliamperes per volt. As a practical matter, therefore, to cope successfully with worst-case brownout conditions, you should plan your total load so that it does not exceed 15 amps, or 1800 watts. Please note that this refers to the aggregate power requirement of all equipment plugged into the voltage regulator, not to each individual item.

NOTE: While there is no minimum load requirement for the PR-1V, you may experience an audible mechanical hum coming directly from the unit when the power switch is on with nothing plugged in. This effect will disappear as soon as you plug in an equipment drawing 40 to 50 watts total.

DEFINITIONS

VOLTAGE REGULATION: The AC line voltage is a number indicating the nominal electrical potential that has been adopted in a region for powering electrical equipment of all kinds. In the countries of 110 volts AC, the actual voltage can fall below or rise above this nominal level due to brownouts, power cutbacks, use of substandard wiring, and other causes. These deviations can cause poor performance or a malfunction. A regulator is a device which, through use of a transformer, corrects the voltage deviation by stepping it up or down so that it is as close as possible to the nominal level.

SPIKE: A pulse of energy on the power line. Spikes can have voltages as high as 6000 volts. Though they are usually of very short duration, the energy they contain can be considerable, enough to damage sensitive solid-state components in audio and computer equipment. Spikes can also foul switch contacts and degrade wiring insulation. They are an unavoidable component of electric power. They are used unpredictably by electric motors switching on or off (on the premises or outside), utility company maintenance operations, nearby lightning strikes, and other factors. Spikes (also called surges or transients) are absorbed by special components called MOV's in the PR-1V to provide safe voltage levels to protect your equipment..

ADVANCED POWER FILTERING: Noise from Electro Magnetic Interference involves lower voltages and less energy than is found in spikes, but it is continuous rather than transient in nature. It is not likely to cause physical damage, but it can certainly be annoying, producing static in audio circuits, “snow” on video screen, or garbled data in computers. Noise can be introduced into AC lines by certain kinds of lighting, electric motors and others. Because noise occurs at higher frequencies than the 50 or 60 Hz AC line, it can be effectively reduced through use of low-pass filtering.

EXTREME VOLTAGE PROTECTION

The PR-1V includes special circuitry to sense over- and under- voltages and positively shut down the output before possible damage is done. When the input voltage exceeds the limit, the power will cut off. It will come back on automatically when the overvoltage is removed as long as the voltage has not exceeded 142V. The red LED labeled EXTREME VOLTAGE SHUTDOWN indicates the shutdown condition. The output is also shut down for extremely low input voltages at 75V.

To provide protection against a catastrophic error in AC mains wiring, dangerously high voltages will cause an internal fuse to blow, but equipment plugged into the Voltage Regulator will not be damaged.

FUSE AND CIRCUIT BREAKERS

There is one fuse and one circuit breaker in the PR-1V. In the event that the unit appears to be completely dead (neither the power switch nor any LED's light up), unplug the power cord and the load and check the breaker. If the circuit breaker is tripped, push it back in to reset it. The purpose of these circuit protection devices are:

1. A fast-blow 15 amp circuit breaker is accessible at the rear panel without removing the unit from the rack. This breaker will trip if the unit's 15 amp capacity is exceeded at any time.
2. A fast-blow 1A amp fuse is located at rear panel. This fuse will blow if the unit has been connected to a voltage that is above the range of Extreme Voltage Shutdown circuitry. To replace it, the unit must be completely disconnected from all power and removed from its rack.

INPUT VOLTAGE / OUTPUT VOLTAGE MONITORING

The LCD display at the front panel indicates INPUT VOLTAGE and OUTPUT VOLTAGE.

INSTALLATION

Because of their toroidal transformer design, PR-1V Voltage Regulator may be positioned near most other equipment without fear that the other equipment will be disrupted by leakage of strong 50/60 Hz magnetic field. Nevertheless, suggested rack locations would be either at the top or bottom.

DESIGN

The PR-1V uses a design based on an eight-tap toroidal autotransformer. The toroidal design assures minimal leakage of stray magnetic fields, and, because of its high efficiency, a very compact size for its rating. The Voltage Regulator's circuitry monitors the incoming line voltage with each cycle, comparing it to an extremely precise voltage reference, accurate to $\pm 0.15\%$. If a voltage fluctuation requires that a different tap be selected, the new tap is electronically switched exactly at the zero-crossing, to avoid distorting the AC waveform, if necessary, it can switch taps as often as once each cycle. Most commercial voltage regulators using multiple-tapped transformers switch taps at uncontrolled times, thereby creating voltage spikes and clicks that can leak into the audio! Hysteresis in the switching circuits avoids "chatter" or unnecessary switching back and forth between adjacent taps. Unlike those voltage regulators that employ ferro-resonant transformers, PR-1V Voltage Regulator is not sensitive to small errors in line frequency, making them ideal for use with generators.

SERVICE

Before returning any equipment for repair, please be sure that it is adequately packed and cushioned against damage in shipment, and that it is insured. We suggest that you save the original packaging and use it to ship the product for servicing. Also please enclose a note giving your name, address, phone number and a description of the problem.

SPECIFICATIONS

- Advanced Power Filtering
- 110V \pm 5 VAC whenever the input AC line voltage is between 95V to 135V
- Eight outlets on the back panel, one on the front
- Outlet capacity 15A
- Eight tap toroidal transformer
- LCD input / output voltage display
- Extreme over voltage/under voltage causes instant shut down, protecting equipment
- Extreme voltage shutdown indicator LED
- Output in regulation indicator LED
- Low stray magnetic field leakage