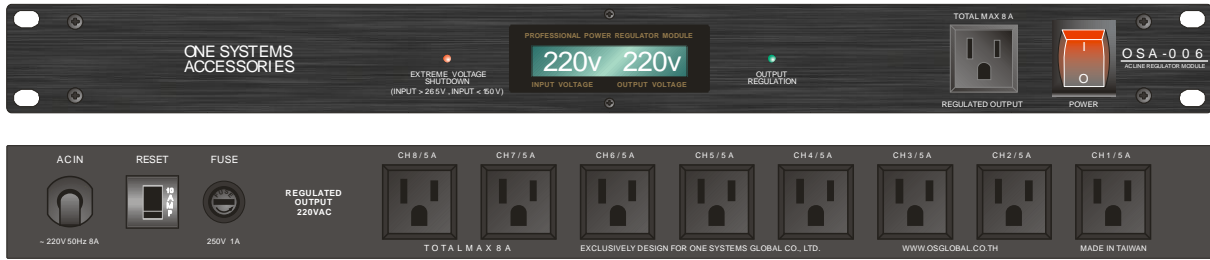


# OSA-006 AC LINE REGULATOR OPERATING MANUAL



Congratulations on your purchase of OSA-006 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

- OSA-006 provides nine regulated, conditioned AC outlets-eight on the rear panel and one on the front
- OSA-006 input capacity is 8A; output capacity is 8A
- Usable range for most equipment 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 OSA-006, please be sure to read this manual carefully.

**WARNING:** 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 OSA-006 is operated. Retain this instruction for future reference.

2. The OSA-006 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 OSA-006 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 OSA-006. To prevent risk of fire or injury, damaged cords and cables should be replaced immediately.
5. Clean the OSA-006 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 OSA-006 should be unplugged from the outlet.
7. The OSA-006 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 OSA-006 has been exposed to rain or other moisture
  - d. The OSA-006 does not appear to operate normally or exhibits a marked change in performance.
  - e. The OSA-006 has been dropped, or the enclosure damaged.
8. The OSA-006 requires that a safety ground be present for proper operation. Any attempt to operate the OSA-006 without a safety ground is considered improper operation and could invalidate the warranty.
9. There are no user serviceable parts in the OSA-006. Refer servicing to qualified service personnel only.

NOMINAL OUTPUT VOLTAGES VS. INPUT “IN-REGULATION” RANGES:

Output Accuracy	Model	Voltage Setting	In-Regulation Range
±10V	OSA-006	220V	195V to 254V

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 ten volts. Voltages approximately ±10% beyond that range may be converted to usable levels, depending on the requirements of the equipment.

The OSA-006 has eight convenience outlets on the rear panel, and one on the front panel. All are functionally interchangeable. The outlets are regulated, spike-suppressed, and filtered against RFI with a 3-pole filter, making the unit a

full-function power conditioner. The OSA-006 has no controls except an on-off switch.

Note: The OSA-006 is for use with AC voltage only. DC voltage should never be applied to it. Also, they do not change or regulate line frequency. The output frequency will always be the same as the incoming frequency.

### **MAXIMUM AND MINIMUM LOAD**

The OSA-006 can handle load totally up to 10 amperes as long as the input voltage is equal to or above 220 volts. For voltage below that level, its capacity must be derated at approximately 62 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 8 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.

### **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 North America, it is 117 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 transient) are absorbed by special components called MOV's in the OSA-006 to provide safe voltage levels to protect your equipment.

**RFI/EMI INTERFERENCE:** Noise from RFI(Radio Frequency Interference) or EMI (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 nearby radio transmitters, 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 OSA-006 includes special circuitry to sense over- and under- voltages and positively shut down the output before possible damage is done. See the specifications on the back page for the exact voltages at which shutdown occurs. 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 265V. The red LED labeled EXTREME VOLTAGE SHUTDOWN indicates the shutdown condition. The output is also shut down for extremely low input voltages.

To provide protection against a catastrophic error in AC mains wiring, dangerously high voltages (those over approximately 300V) 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 OSA-006. In the event that the unit appears to be completely dead (neither the power switch nor and 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 10 amp circuit breaker is accessible at the rear panel without removing the unit from the rack. This breaker will trip if the unit's 10 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 (approximately 300VAC for OSA-006). 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, OSA-006 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 OSA-006 uses a design based on an eight-tap toroidal autoformer. 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, OSA-006 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**

- 220V  $\pm$  10 VAC whenever the input AC line voltage is between 195V to 245V
- Eight outlets on the back panel, one on the front
- Outlet capacity 8A
- 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

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