

FURMAN

Power Conditioning

A.C. LINE VOLTAGE REGULATOR, 20 AMP

MODEL AR-1220, AR-1220J



FEATURES

- Delivers a stable 120 \pm 5 VAC whenever the input AC line voltage is between 97V and 141V
- Output capacity 20 amps
- Twelve 20A outlets on the back panel, two 15A outlets on the front
- Eight-tap toroidal autoformer
- 10-LED bar-graph Input Voltage meter
- 10-LED bar-graph Output Current meter
- Extreme overvoltage/undervoltage causes instant shut down, protecting equipment
- Extreme Voltage Shutdown indicator LED
- Output In Regulation indicator
- Low stray magnetic field leakage

DESCRIPTION

The 20 amp **AR-1220 AC Line Voltage Regulator** is intended to protect audio, video, computer and other electronic equipment from problems caused by AC line voltage irregularities—sags, brownouts, or overvoltages that can cause sensitive digital equipment to malfunction, or, in extreme cases, to sustain damage.

The AR-1220 is designed to provide a steady, stable 120 VAC output. It accepts input voltages from 97V to 141V and transforms them to a constant 120V, \pm 5V. Voltages beyond that range may also be converted to usable levels, depending on how far out of range they are. The AR-1220 can handle loads totaling up to 20 amps as long as the input voltage is above 124 volts. For

voltages below that level, its capacity must be derated at approximately .15 ampere per volt.

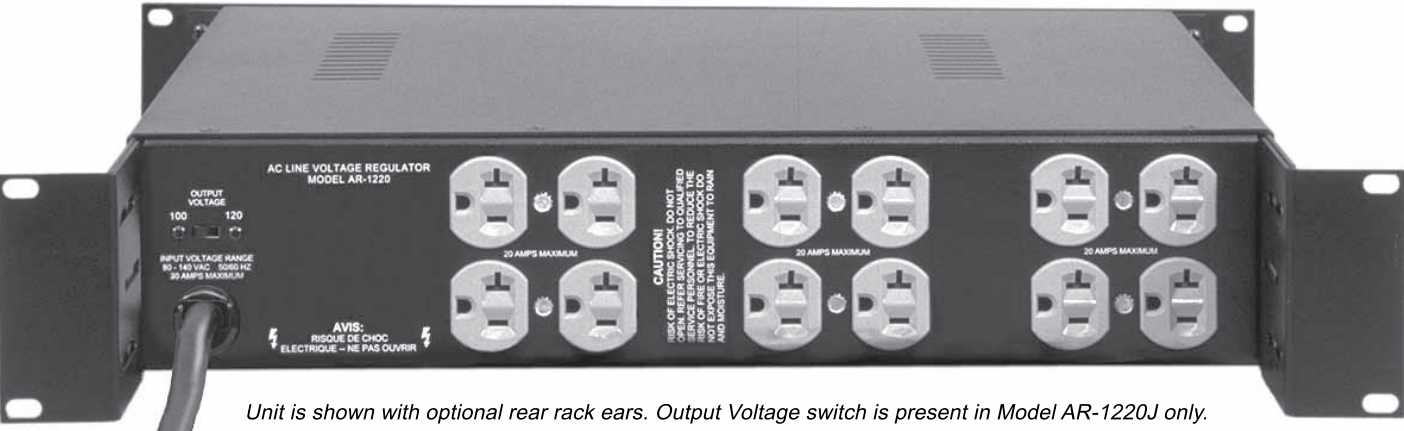
The AR-1220 has been designed specifically with the unique needs of audio and video in mind. Its technology differs from that of computer-oriented voltage regulators in many important ways. For example:

The AR-1220 does not use a ferro-resonant transformer, which would be heavy and bulky, radiate a large magnetic field, and be too frequency-sensitive to be usable with generators. Instead, it uses a design based on an eight-tap toroidal autoformer. The toroidal design assures minimal leakage of stray magnetic fields.

The AR-1220 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. (Most commercial voltage regulators using multiple-tapped transformers switch taps at uncontrolled times, thereby creating voltage spikes, and often creating clicks that can leak into the audio.) Hysteresis of 1.5V in the switching circuits avoids "chatter." The switching devices used in the AR-1220 are individually fused to facilitate field service. The design is not sensitive to small errors in line frequency, making them ideal for use with generators.

The AR-1220 also features power conditioning that is truly in a class by itself, thanks to the quantity, quality and configuration of the overvoltage suppression devices used. These include MOV's,

AR-1220 Rear View



Unit is shown with optional rear rack ears. Output Voltage switch is present in Model AR-1220J only.

high voltage inductors and capacitors, and precise high-inrush magnetic circuit breakers. This unique combination can safely divert large spikes as well as filter audible high frequency noise.

An additional feature, Extreme Voltage Shutdown, senses dangerously high or low voltages and shuts down the output before any damage is done. The output remains off until the overvoltage or undervoltage is removed, with an LED indicating the shutdown condition. This invaluable feature provides positive protection to your equipment from accidental connection to incorrect line voltages (for example, 220V when 120V is expected—a not uncommon hazard in the entertainment industries.

The AR-1220 has 12 outlets on the rear panel, and two on the front panel. All outlets are regulated, spike-suppressed, and filtered against RFI with a 3-pole filter. There are no controls except the circuit breaker/on-off switch. A bar-graph meter comprised of 10 LED's indicates input voltage, while another LED indicates "In Regulation" status (i.e., that the output voltage is within $\pm 5V$ of 120V.) Also provided is a 10-LED bar graph meter to indicate output current. The unit is housed in a compact, two-space rack-mount chassis, 3.5" high and 17" deep (8.9 x 43.2 cm) and weighs only 35 lbs. (16 kg).

OPTIONAL ACCESSORY

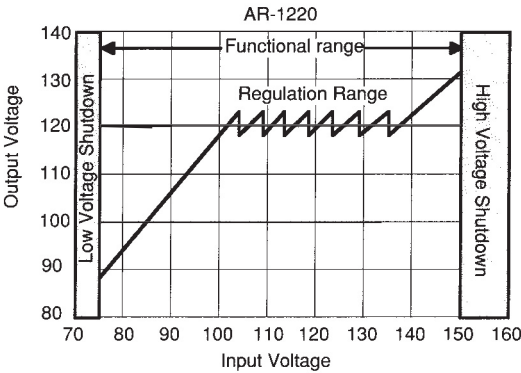
- **RRM-2 Rear Rack Mount Ears:** Adjustable rear rack ears so the AR-1220 can be securely attached both in front and in back.

RELATED MODEL

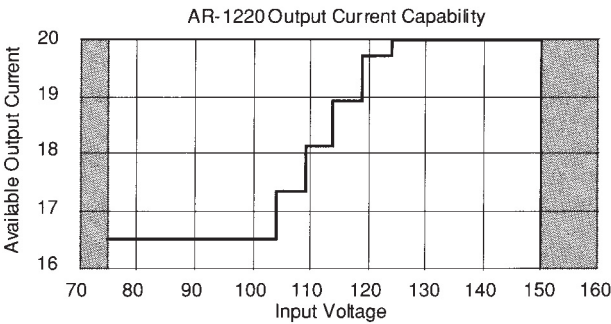
- **Model AR-1220J:** Has a rear-panel Output Voltage switch, allowing for either 100V or 120V operation.

Three Year Warranty

Output Voltage vs. Input Voltage (120V Setting)



Available Output Current vs. Input Voltage (120V Setting)



AR-1220, AR-1220J SPECIFICATIONS

Current Rating:	20 amperes for input voltages of 104/124* or higher; derate at 150 mA per volt to a minimum of 16.5A
"In Regulation" Ranges:	Provides regulation $\pm 5V$ in 120V mode from 97 to 141V; (AR-1220J only: provides regulation $\pm 4V$ in 100V mode from 80 to 122V)
Shutdown Range:	120V mode: Below 75V or above 150V. (AR-1220J only: 100V mode: Below 65V or above 135V)
Voltmeter Accuracy:	$\pm 5V$
Spike Protection Modes:	Line to neutral, neutral to ground, line to ground

Spike Clamping Voltage:	Initial turn-on at 200V; TVSS rating of 400 volts peak at 500 A, L-N, N-G, L-G (tested to UL-1449)
Response Time:	1 nanosecond
Maximum Surge Current:	6,500 amps (8 x 20 ms pulse)
Maximum Spike Energy:	80 joules per node; 240 joules total
Noise Attenuation:	Differential mode: Greater than 40 dB Transverse and common modes: Greater than 60 dB, 1-200 MHz
Dimensions:	3.5" H x 19" W x 17" D (8.9 x 48.3 x 43.2 cm)
Weight:	35 lbs. (16 kg)

* Depending on Output Voltage switch setting