

A.C. LINE VOLTAGE REGULATOR 30 AMP, WORLD WIDE USE

MODEL AR-PRO



FEATURES

- Delivers 120 VAC $\pm 4\%$ anywhere within capture ranges of 88 to 134 and 170 to 264 volts AC, 50/60 Hz
- Extends usable range for most equipment to 80 to 267 VAC
- Input voltmeter bar-graph with 21 LED's
- Output ammeter bar-graph with 21 LED's
- Output Monitor indicates low, normal, or high output voltage
- Fourteen regulated, 20A conditioned outlets (2 front, 12 rear)
- Input capacity 30 amps; output capacity 22.5 to 30 amps
- Provision for remote turn-on/turn-off; multiple units may be turned on simultaneously or in a delayed sequence
- Multiple-stage spike and RFI suppression
- Low stray magnetic field leakage
- May be switched for 100V output for use in Japan
- Compact 3.5" rackmount unit weighs only 50 lbs (23 kg)

DESCRIPTION

The **AR-PRO AC Line Voltage Regulator** is intended to protect computer, audio, video 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. It accepts single phase input AC voltages anywhere within two capture ranges, 88 to 134 or 170 to 264 volts, and converts them to the North American standard 120 volts (or, if desired, 100V). Voltages outside the ranges may be converted to usable levels, depending on how far out of range they are and what is considered usable. For example, any voltage from 80 to 267 will be converted to 120V +9, -11. For details, see Figure 1 on the reverse side.

The AR-PRO can handle loads totalling up to 30 amperes as long as the input voltage is equal to or above 120V (low range) or 240V (high range). For voltages below that level, its capacity must be derated at approximately 250 mA per volt. See Figure 2.

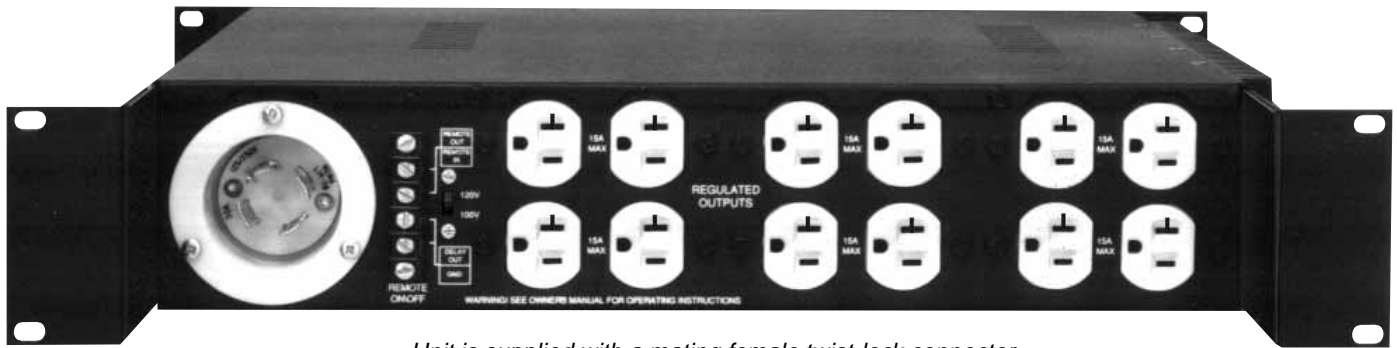
Because the AR-PRO requires no switching to discriminate between a nominal 120V or a nominal 240V source, it can protect against a catastrophic error in AC mains wiring (for example, in live performance situations, where each act requires a special AC configuration, accidental connection to 220V occurs surprisingly often). This feature also makes the AR-PRO ideal as a component of a power distribution scheme suitable for worldwide use, accommodating national voltages of 100, 120, 220, 240, or others with equal ease and without need for readjustment.

The AR-PRO uses a design based on a 25-tap toroidal autoformer. The toroidal design assures minimal leakage of stray magnetic fields and a highly efficient, compact package. The AR-PRO's circuitry monitors the incoming line voltage with each cycle. If a voltage change requires that a different tap be selected, the new tap is electronically switched in precisely at the zero-crossing, to avoid distorting the AC waveform. If necessary, the AR-PRO can switch taps as often as once each cycle. Most commercial voltage regulators using multiple-tapped transformers switch taps with relays at uncontrolled times, thereby creating voltage spikes! And unlike voltage regulators that employ ferro-resonant transformers, the AR-PRO is not sensitive to small errors in line frequency, making it ideal for use with generators.

The AR-PRO has twelve 20-amp outlets on its 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 a master circuit breaker, which serves as an on-off switch. Two bar-graph meters each comprised of 21 LED's each indicate input voltage and output current, while three other LED's indicate proper function (i.e., that the output voltage is within $\pm 5\%$ of the selected voltage, or above or below that range). One or more units may be turned on remotely, either simultaneously or in sequence, with a simple low voltage switch closure.

The AR-PRO is housed in a double space (3.5" high and 16" deep) rackmount chassis, and weighs only 50 lbs (23 kg). It is made of extremely rugged heavy-gauge black powder-coated steel, including adjustable rear rack ears to allow it to be secured in both front and rear. It is supplied with a mating female twist-lock connector ready to terminate your custom supply cable.

AR-PRO Rear View



Unit is supplied with a mating female twist-lock connector.

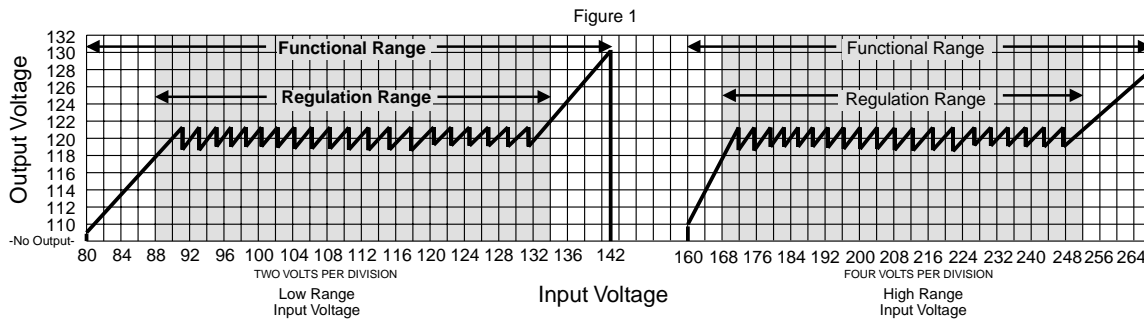


Figure 1: Output Voltage vs. Input Voltage

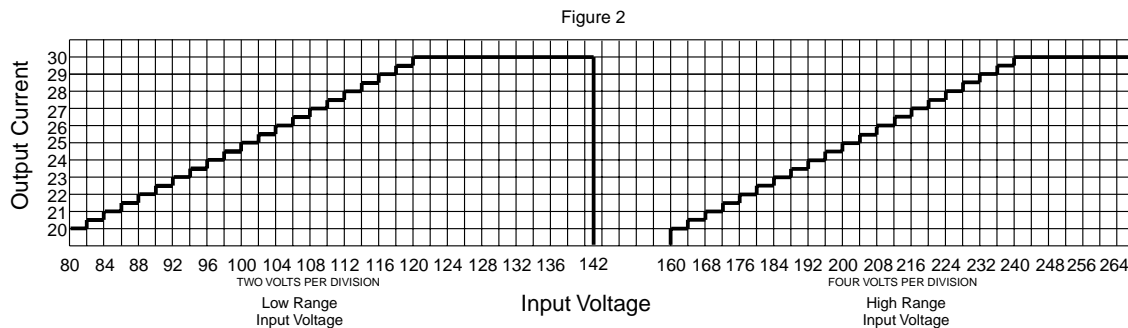


Figure 2: Available Output Current vs. Input Voltage

Architects and Engineers Specifications

The A.C. Line Voltage Regulator shall mount in a standard 19" rack, and shall occupy no more than two rack units (3.5") of rack space. It shall deliver its rated nominal output voltage of 120 VAC within $\pm 4\%$ whenever it receives an input in either of the ranges of 88 to 134 VAC or 170 to 264 VAC. Its nominal input capacity shall be 30 amperes; the available output current shall be not less than 24 amperes provided the input voltage is equal to or greater than 96 VAC, and not less than 30 amperes provided the input voltage is equal to or greater than 120 VAC. Voltage transformations shall be accomplished through use of a toroidal autotransformer with no fewer than 25 taps. To minimize distortion of the AC waveform, switching between taps shall be done only at voltage zero crossings. The unit shall provide spike suppression and RFI filtering in addition to voltage regulation.

Input power shall be received through a connector rated at 30A, 120/240V. Outlets rated at 20A, 120V shall be provided for regulated outputs. There shall be at least twelve on the rear panel and two on the front panel. A circuit breaker functioning as an on/off switch shall be provided on the front panel. Bar-graph type meters shall be provided for monitoring the input line voltage and output current, and shall have a resolution of at least 21 LED's. Additional LED's shall also be provided on the front panel to indicate when the output voltage is high, low, or in regulation.

The unit shall provide a screw terminal strip with an internally supplied low control voltage and provision to use it to turn on one or more units, either simultaneously or in a time-delayed sequence. The chassis shall be no more than 14.25" deep (front panel to rear panel), and shall weigh no more than 50 lbs. It shall be equipped with adjustable rear rack ears for secure mounting. The unit shall be the Furman Sound AR-PRO A.C. Line Voltage Regulator.

Three-Year Limited Warranty

The Furman Sound AR-PRO is protected by a three-year limited warranty covering defects in materials and workmanship.

AR-PRO SPECIFICATIONS

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| Current rating: | 30 amperes for input voltages of 120 (low range) or 240 (high range) or higher; derate at 250 mA per volt to a minimum of 22.5A |
| Input Voltage Ranges: | Functional range 80 to 267 VAC; provides regulation $\pm 4\%$ in ranges 88-134 and 170-264 VAC |
| Efficiency: | 97% |
| Meter Accuracy: | Voltmeter ± 2 VAC; Ammeter, $\pm 10\%$; factory calibr. |
| Spike Protection Modes: | Line to neutral, neutral to ground, line to ground |
| Spike Clamping Voltage: | TVSS rating 400V peak, L-N, N-G, L-G (tested to UL 1449) |
| Response time: | 1 nanosecond |
| Maximum surge current: | 6,500 amps (8 x 20 μ s pulse) |
| Maximum spike energy: | 320 joules |
| Noise attenuation: | Transverse and common mode: 20 dB at 200 kHz, rising to >40 dB, 1 to 100 MHz |
| RFI Filter Approvals: | UL, CSA, VDE |
| Dimensions: | 3.5" H x 14.25" W x 17" D |
| Weight: | 50 lbs (23 kg) |