

# Isolated Symmetrical AC Power Conditioners

MODELS: RI-1210 (10 AMP)  
RI-1220 (20 AMP)

## Instruction Sheet

### Introduction

Thank you for purchasing a Furman Sound Reference Series Isolated Symmetrical AC Power Conditioner, and congratulations on your choice. The RI-1210 and RI-1220 are no-compromise, no-expense-spared designs, with painstaking attention paid to the ultimate sonic and visual impact of every component within each unit. The Reference Series is the flagship AC power regulating and conditioning line of Furman Sound, a company that has been creating AC power products for the most demanding professional audio and video professionals for more than 25 years.

### Features

- Isolated Symmetrical AC Power technology dramatically reduces common mode and transverse AC line noise, typically up to 24dB per total system. All Symmetrical (balanced) AC receptacles are individually ground fault (GFCI) protected to ensure safe operation.
- Includes four sets of positive contact "Super Spec" AC receptacles with additional filtering for digital components.
- Handles 20 Amps (RI-1220) or 10 Amps (RI-1210) continuous power.
- The specially constructed toroidal transformer is the finest available, yielding extremely low magnetic field leakage, and D.C. tolerant, noise-free operation regardless of load or AC source contamination.
- A precision, high-inrush magnetic circuit breaker/power switch provides maximum protection without false tripping while maintaining noise-free, low-contact-resistance operation.
- Precision digital AC voltmeter monitors incoming AC line voltage.
- Static discharge AC ground circuit for high-elevation installations.

### Description

In the home theater/audiophile domain, the need for clean, noise-free AC power is nothing new. But the RI-1210 and RI-1220's unique technology and implementation are.

Many competing designs that claim to reduce AC line noise rely on multiple-pole RFI filters; cheap, inadequate AC outlets; high-resistance thermal circuit breakers; or unrealistic performance from ferrite beads. Unfortunately, these designs can and *frequently do* add ground noise, create AC line distortions such as ringing and gross phase shifts, and raise the AC line impedance to an unacceptable level.

Others use more sophisticated means of electronically turning AC power to DC, then synthesizing a clean AC signal from there. Though this method has its merits for low-current demands, it is highly inefficient, can contain non-linear distortions, and at minimum does nothing to reduce AC ground contamination from the incoming power line.

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The RI-1210 and RI-1220's isolated symmetrical power ensures no ground contamination from your incoming line will affect your filtered AC power, as it is totally isolated. This *total isolation* of both ground and incoming AC power means your critical components will not suffer ground current noise, RF, or EMI contamination from shared AC ground lines. These distortions are commonplace when AC power is shared throughout a building or home. They can cause audible hum and loss of clarity in visual images, and rob your system of resolving power by *significantly increasing the noise floor*.

With Symmetrical Balanced Power, the incoming AC signal is transformed into two legs of half voltage, each with opposite polarity (i.e. 120 VAC Line and 0 VAC Neutral is transformed into 60 VAC Line, 60 VAC Neutral). With these "Balanced" lines in opposing polarity and equal potential, virtually all common-mode noise is cancelled.

With the Reference Series exclusive Isolated Symmetrical Power, video monitors, pre-amplifiers, compact disc transports, power amplifiers, multi-channel processors, digital audio converters and stereo system turntables are fed ultra-low-noise isolated Symmetrical Balanced Power. This ensures a supply of virtually noise-free AC power while preventing noise and magnetic fields from either penetrating or radiating from the AC cords that feed your systems critical components. Additionally, the RI-1210 and RI-1220's GFCI (ground fault) circuit, in tandem with our isolated symmetrical power technology, assures electrical safety.

When using Furman's Reference Series Isolated Symmetrical Power conditioning, you will immediately notice far clearer, stunningly focused sound and visual images from your system. Video presentation will be crisp and colors true. Sonic transients become startlingly fast with bass fundamentals that shake foundations with their weight and visceral impact. Mid and high frequencies will bloom with a precise, non-glaring ease, all the while remaining true to your system's inherent virtues.

## Installation

Before unpacking your unit, inspect the box and packing materials for any obvious severe damage. If internal damage is likely, contact the carrier who delivered the unit before proceeding with unpacking. If after unpacking, shipping damage is evident, contact the carrier. Save all shipping and unpacking materials. You may need them if you ever return the unit to our factory for service.

The box should contain the RI-1210 or RI-1220 unit, detachable AC power cord, owner's manual, and warranty registration card. If anything is missing, please contact Furman Customer Service.

Fill out and return your warranty registration card. Registration is recommended because it can be used to establish whether the unit is within the warranty period if your original ownership document is lost, and can assist us in informing you about upgrades or other vital information.

The power source to which a RI-1220 is connected must be adequate for use at 20 Amps continuous operation. Though the unit will function with a 15 Amp panel circuit breaker, it is not recommended, as vastly inferior performance and substandard protection (depending on your systems total current demands) could result. If your system includes power amplifiers or projectors with more than modest power demands, a panel circuit breaker with at least a rating of 20 Amps is essential for optimum performance. If other electrical loads are used on the same branch circuit, and your systems continuous current load is in well in excess of 10 Amps, we recommend a 30 Amp panel breaker wired with #10 gauge wire. For installations, which must comply with NEC codes, a 20 Amp panel circuit breaker with a dedicated line (branch circuit) is the minimum requirement. The RI-1210 will function well with standard household 15 Amp panel breakers and a 15 Amp branch circuit. If other electrical loads are used on the same branch circuit, they should be relatively modest, (well below 5 Amps total). If this is not the case, you will need to use a 20 Amp panel breaker and branch circuit. If in doubt consult your dealer or local electrician.

The RI-1210 and RI-1220 are manufactured with four rubber feet for placement on any table, cabinet, shelf, or floor capable of supporting their weight. Because of the Reference Series' low-flux density transformer design, placement or proximity to other components is not critical, and the RI-1210 and RI-1220 do not produce any appreciable heat.

The Reference Series may also be rack mounted in a standard 19" rack by attaching the optional rack ears. These rack ears mount parallel to the back of the Reference Series' front panel. These optional rack ears come with the necessary hardware and mounting instructions. The RI-1210 requires a Furman HRKIT-7, while the RI-1220 requires a HRKIT-8. Due to the weight of the Reference Series' components, we recommend mounting these units at the bottom of your rack.

Once the unit is placed, the detachable AC cord must be attached to the rear panel IEC male socket. When facing the rear of the unit, it is located in the lower left-hand corner of the rear panel. Next, the male NEMA-15 connector must be plugged into the appropriate AC socket. This AC cord will carry substantial unbalanced AC current, so it should be dressed away from critical signal carrying cables, or at the very least, crossed at a 90-degree angle. All three-prong AC cords exiting the RI-1210 or RI-1220 will radiate virtually no field at all, so their placement is not critical.

The RI-1210 and RI-1220 feature additional filtering for digital components, or any component or processor with a switching power supply. These four outlets are clearly labeled on the rear panel of your Reference unit. The remaining six outlets are for analog components, (units without digital audio conversion, processing, or switching power supplies). There is absolutely no danger in connecting any component (analog or digital) to either outlet; there is a subtle improvement in performance when they are connected to their intended AC outlets. For those who wish to experiment, you may find optimum performance is obtained through a less than obvious combination of digital and analog AC outlets. Feel free to experiment or consult your dealer.

Your RI-1210 or RI-1220 contains a precision AC voltmeter. This meter continuously monitors the incoming AC voltage and is accurate within +/- 1.0 volts. It should be understood that the purpose of Reference Series Isolated Symmetrical Power Conditioning is the reduction of AC power line noise. The RI-1210 and RI-1220 will not correct or compensate for fluctuating AC line *voltage*. For installations where AC voltage is commonly 2.5 volts above or below 120VAC, or continuously fluctuates by 2 VAC or more, the inclusion of a *Furman Reference Series AC Power Regulator* – RA-1210 (10 Amp) or RA-1220 (20 Amp) is highly recommended.

For installations in very high altitudes, or where static electricity is problematic, we have included a static discharge circuit. The circuit is activated with a small slide switch located on the rear panel, above the IEC AC power input connector. It bleeds a very small amount of the incoming earth ground to the otherwise totally isolated AC outlet grounds. It is rare for an installation to require this feature, so the unit should always be tried first with the switch in the *off* position. However, if a tiny static crackling sound occurs in 30 – 60 minute intervals, switching the discharge circuit to the on position will eliminate the problem. This slight crackling sound is the result of an amplifier's power supply discharging a very low current – high voltage build-up due to the RI-1210 or RI-1220's total isolation from the incoming AC power grounds in an environment prone to generating gross static electricity.

### **Ground Fault Interrupter (GFCI)**

As the RI-1210 and RI-1220 incorporate Isolated Symmetrical – Balanced Power, it is necessary to guard against catastrophic failure in Reference components. Under normal conditions, Symmetrical Balanced Power is safe for use in any home or professional installation. With the addition of Furman's *Isolated Symmetrical Technology*, any form of electrical shock (under normal use) is a virtual impossibility. Never the less, to safeguard against even the most remote electrical abnormalities, we have included a GFCI (ground fault interrupter) as an integral component within the Reference units output circuit. This GFCI will immediately disconnect the output voltage when it detects in excess of five milli-amps current flow from either line potential to ground. This ensures that even if one of your components experiences a catastrophic failure, there will be no possibility of electric shock resulting from the normal recommended use of the RI-1210 or RI-1220.

Because the GFCI relies on the detection of current leakage from AC line to ground, it is occasionally possible to false trip the GFCI if additional filters with unacceptable levels of current leakage to ground are used in conjunction with the Reference unit. As these designs can actually create as much noise as they attempt to reduce, we recommended they *not* be used. If you experience a false tripping of the GFCI, just press the reset tab in the center of the GFCI. If the RI-1210 or RI-1220's GFCI protection circuit is activated, the blue AC output indicator will not light, and there will be no power delivered to your systems components. The GFCI is located on the rear panel, and its AC outlets make up two of the six Analog AC outlets.

### **Surge Protection**

The RI-1210 and RI-1220 are capable of suppressing virtually any instantaneous voltage surge caused by lightning or commercial power. However, the protection device may be damaged if the over-voltage surge or spike is sustained. The same is true if the device is made to absorb a *direct lightning hit*. The device in conjunction with the magnetic circuit breaker will protect your valued equipment, but in extreme circumstances, the protection device may be damaged. If so, the circuit breaker/power switch will not stay in the "on" position. If this happens, your Reference unit must be serviced.

### **Safety Information**

Please read and observe all of the safety and operating instructions before the RI-1210 or RI-1220 is operated. Retain these instructions for future reference.

- Do not disassemble or modify in any way. No user serviceable parts inside.
- Keep away from moisture and extreme humidity.
- Do not allow liquids or foreign objects to enter the unit.
- Lighting equipment may not be connected to the RI-1210 or RI-1220, as light sockets are not designed for Balanced Power. In accordance with the N.E.C.'s standards for use of Balanced Power, we recommend that the Reference unit be limited to use with audio, video and computer equipment.

The RI-1210 and RI-1220 should be serviced by qualified service personnel when:

- The power supply AC cord has been frayed or cut.
- Objects have fallen on or liquid has spilled into the unit.
- The unit has been exposed to rain or extreme moisture.
- The unit will not operate, or function normally, showing a marked change in performance.
- The unit has been dropped, or its enclosure has been damaged.
- The power indicator will not light, even after resetting the GFCI.

The RI-1210 and RI-1220 require that the safety ground be utilized from the source AC power to the input of the Reference unit. This ground connection is necessary for optimum performance. Any attempt to operate the RI-1210 or RI-1220 without the incoming safety ground is considered improper operation and will invalidate the warranty.

### **RI-1210 / RI-1220 SPECIFICATIONS**

Input: 120 VAC 20 Amps maximum (RI-1220)  
120 VAC 10 Amps maximum (RI-1210)

Output: 120 VAC 2400 Watts RMS (combined output – RI-1220)  
120 VAC 1200 Watts RMS (combined output – RI-1210)

Outlets: 6 (Isolated Symmetrical Balanced Analog outlets)  
4 (Isolated Symmetrical Balanced Digital outlets with additional filtering)

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Protection: GFCI circuit protection – all AC outlets

Voltage spike protection – 400V peak@ 6500 Amps maximum surge pulse.

Noise Attenuation: Transverse and Common Mode – Greater than 80dB. 1-200 MHz.

Transformer: Breakdown voltage 1500V minimum  
Capacitance 300pf. Maximum  
Turns ratio 1:1 windings separated by Faraday shield  
Regulation at full load 3%

Dimensions: RI-1210: 3.5" H x 17.25" W x 17" D  
RI-1220: 5.25" H x 17.25" W x 17" D

Weight: RI-1210: 43 lbs.  
RI-1220: 71 lbs.

***Include Three Year Warranty template here***