

FURMAN
PURIFY YOUR POWER

the 15 amp
series II
power conditioners



PL-8 II
PM-8 II
PL-PLUS II
PL-PLUS D

Owner's Manual

SERIES II 15 AMP POWER CONDITIONERS

Furman Series II Features

- SMP+ with extreme voltage shutdown
- LiFT (Linear Filtering Technology) with zero ground contamination
- Eight rear panel outlets and one front panel outlet
- 15 amp rating, with circuit breaker
- Three year limited warranty

PL-8 Series II Additional Features

- Two retractable, long-life, low-heat LED light fixtures with dimmer control for rack illumination
- BNC connector on the rear panel allows you to attach any standard (12VAC 0.5 amp) gooseneck lamp to illuminate the rear of your rack

PL-PLUS Series II Additional Features

- Two retractable, long-life, low-heat LED light fixtures with dimmer control for rack illumination
- BNC connector on the rear panel allows you to attach any standard (12VAC 0.5 amp) gooseneck lamp to illuminate the rear of your rack
- Front panel meter to display incoming line voltage ranging from 90 to 128 volts (D version has a digital meter instead of LED's)

PL-PLUS D Series II Additional Features

- Two retractable, long-life, low-heat LED light fixtures with dimmer control for rack illumination
- BNC connector on the rear panel allows you to attach any standard (12VAC 0.5 amp) gooseneck lamp to illuminate the rear of your rack
- Laboratory precision Digital Voltmeter displays incoming line voltage (+/- 1 VAC)

PM-8 Series II Additional Features

- Laboratory precision Digital Voltmeter displays incoming line voltage (+/- 1 VAC)
- True RMS Current Meter displays power draw (+/- 0.5 amp)
- BNC connector on the rear panel allows you to attach any standard (12VAC 0.5 amp) gooseneck lamp to illuminate the rear of your rack

SERIES II 15 AMP POWER CONDITIONERS

INTRODUCTION

Thank you for purchasing a Furman Series II Power Conditioner, and congratulations on your choice. The Series II power conditioners feature Furman's revolutionary Series Mode Protection Plus (SMP+) circuit, as well as our exclusive Linear Filtering Technology (LiFT). Together, these technologies comprise what is, without question, the world's most advanced and comprehensive transient voltage surge suppressor / conditioner.

SMP+ (Series Mode Protection Plus)

Furman's SMP+ surge suppression virtually eliminates service calls. Traditional surge suppression circuits "sacrifice" themselves when exposed to multiple transient voltage spikes, requiring the dismantling of your system, and repair of your surge suppressor. Not so with SMP+. With Furman's SMP+, damaging transient voltages are safely absorbed, clamped, and dissipated.

Unique to Furman's SMP+ is its unparalleled clamping voltage. While other designs offer clamping voltages that are well above 330 Vpk, Furman's SMP+ clamps at 188 Vpk, (133 VAC RMS) even when tested with multiple 6000 Vpk - 3000 amp surges! This unprecedented level of protection is only available with Furman's SMP+ technology. Additionally, Furman's trusted over-voltage circuitry protects against

all too frequent accidental connections to 208 or 240 VAC, by shutting off the incoming power until the over voltage condition is corrected. *[For E versions: Furman's SMP clamps at 376 VpK, (266 VAC RMS.)]*

LiFT (Linear Filtering Technology)

Unfortunately, traditional AC filter - conditioners have been designed for unrealistic laboratory conditions. Prior technologies, whether multiple pole filter or conventional series mode, could actually harm audio and video performance more than they help, due to the resonant peaking of their antiquated, non-linear designs. Under certain conditions, these designs can actually add more than 10 dB of noise to the incoming AC line! Worse still, lost digital data, the need to re-boot digital pre-sets, or destroyed digital converters are frequently caused by excessive voltage spikes and AC noise contaminating the equipment ground. Furman's SMP with LiFT takes another approach, ensuring optimal performance through linear filtering and no leakage to ground.

SAFETY INFORMATION

To obtain best results from your Furman Series II Power Conditioner, please read this manual carefully before using.

SERIES II 15 AMP POWER CONDITIONERS

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. Refer servicing to qualified personnel only. The lightning flash with an arrowhead symbol is intended to alert the user to the presence of un-insulated dangerous voltage within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock.

IMPORTANT SAFETY INSTRUCTIONS

(Please read prior to installation)

1. Please read and observe all safety and operating instructions before installing your Series II unit. Retain these instructions for future reference.

2. Your Series II unit should not be used near water – for example, near a bathtub, washbowl, kitchen sink, laundry tub, in a wet basement, near a swimming pool, etc.

3. Do not place your Series II unit near heat sources such as radiators, heat registers, stoves, or other appliances that produce heat.

4. The PL-8 II, PL-Plus II, PL-Plus D II, and PM-8 II should only be connected to a 120 VAC, 60Hz, 15 amp grounded electrical outlet. Do not defeat the ground or change polarization of the power plug. (*E- versions 220 – 240 VAC 50 Hz. / J- versions 100 – 120 VAC 50 Hz.*)

5. 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

the condition of the cords and cables at the plugs, and the point where they exit your Series II unit. To prevent risk of fire or injury, damaged cords and cables should be replaced immediately.

6. Clean your Series II unit with a damp cloth only. Do not use solvents or abrasive cleaners. Never pour liquid on or into the unit.

7. Your Series II unit should be serviced by qualified service personnel when:

- The power supply cord or the plug has been frayed, kinked, or cut.
- Objects have fallen or liquid has spilled into the unit.
- The unit has been exposed to rain or other moisture.
- The unit does not appear to operate normally.
- The “Protection OK” indicator is not lit.
- The unit has been dropped, or the enclosure has been damaged.
- The retractable LED lights have failed. (*not applicable to the PM-8 II*)

8. Your Series II unit requires that a safety ground be present for proper operation. Any attempt to operate the unit without a safety ground is considered improper operation and could invalidate the warranty.

9. Do not attempt to service your Series II unit beyond what is described in this manual. All other servicing should be referred to qualified service personnel.

ADDITIONAL FEATURES

PL-8 SERIES II

The PL-8 II features LED rack lights which produce virtually no heat and provide an

SERIES II 15 AMP POWER CONDITIONERS

extremely long life span. A dimmer control for the rack lights allows the user to adjust the level of illumination or simply switch the lights off. Additionally, a rear mounted BNC jack accepts any standard (12VAC 0.5 amp) gooseneck lamp for rear rack illumination. The PL-8 II has a master switch for all outlets that glows red when the power is on. The front-panel circuit breaker can be quickly and easily reset should the unit be overloaded. The PL-8 II also features a 10 foot, 14 gauge heavy-duty power cable.

PL-PLUS SERIES II

The PL-Plus II features LED rack lights which produce virtually no heat and provide an extremely long life span. A dimmer control for the rack lights allows the user to adjust the level of illumination or simply switch the lights off. A rear mounted BNC jack accepts any standard (12VAC 0.5 amp) gooseneck lamp for rear rack illumination.

Additionally, the PL-Plus II offers a 20 segment LED bar-graph meter that displays incoming voltage between 90 and 128 volts in 2-volt steps. The normal range voltages are indicated in green, with moderately and extremely high or low voltages in yellow and red respectively. The voltmeter's accuracy is ± 2 volts. It can easily be re-calibrated, if necessary. *(E- versions 180 – 256 VAC in 4 volt steps / J- versions 80 - 118 VAC in 2 volt steps)*

The PL-Plus II has a master switch for all outlets that glows red when the power is on. The front-panel circuit breaker can be quickly and easily reset should the unit be overloaded. The PL-Plus II also features a 10 foot, 14

gauge heavy-duty power cable.

PL-PLUS D SERIES II

The PL-Plus D II features LED rack lights which produce virtually no heat and provide an extremely long life span. A dimmer control for the rack lights allows the user to adjust the level of illumination or simply switch the lights off. A rear mounted BNC jack accepts any standard (12VAC 0.5 amp) gooseneck lamp for rear rack illumination.

Additionally, the PL-Plus D II offers a laboratory precision digital meter that displays incoming voltage in 1-volt steps. The voltmeter's accuracy is ± 1.5 volt.

The PL-Plus D II has a master switch for all outlets that glows red when the power is on. The front-panel circuit breaker can be quickly and easily reset should the unit be overloaded. The PL-Plus D II also features a 10 foot, 14 gauge heavy-duty power cable.

PM-8 SERIES II

The PM-8 II features two laboratory precision digital meters that display both incoming voltage in 1-volt steps, and a true R.M.S. current meter that measures the AC power draw within 0.5 amp. A rear mounted BNC jack accepts any standard (12VAC 0.5 amp) gooseneck lamp for rear rack illumination.

The PM-8 II has a master switch for the rear outlets that glows red when the power is on. The front-panel circuit breaker can be quickly and easily reset should the unit be overloaded. The PM-8 II also features a 10 foot, 14 gauge heavy-duty power cable.

SERIES II 15 AMP POWER CONDITIONERS

OPERATION

Retractable Rack Lights, Rear Panel Lamp and Dimmer Control:

The PL-8 II, PL-Plus, and PL-Plus D II utilize a dimmer control for the two retractable front panel light tubes. The dimmer knob controls the brightness of both light fixtures. Turn it clockwise to increase brightness; turn it counterclockwise to decrease brightness. When the lights are not in use, we recommend turning the dimmer fully counterclockwise to maximize the life of the LED's, however, this is not absolutely necessary. Whether the light tubes are retracted or flush with the front panel, there will be no appreciable heat regardless of dimmer setting due to the efficiency of our full light spectrum LED's.

All Series II units feature a rear rack BNC socket which will accept any 12 VAC (0.5A) gooseneck lamp assembly, (such as the Furman GN-LED or GN-I). Simply slide the BNC plug over the socket and rotate clockwise until the connector snaps into the locked position. **The rear rack lamp can be powered on or off with the rear light power switch located on the far left of the front panel.** The Series II's front panel

LED lamps must be replaced by qualified Furman service personnel.

Multi-Segment LED voltmeter: (PL-Plus II only)

This three-color, 20-LED bargraph is an accurate, self checking AC voltmeter that continually measures normal voltages. The meter reads from 90 to 128 volts in 2 volt increments (PL-PLUS E II: 180 to 256 volts, in 4 volt increments). The normal range voltages are indicated in green, with moderate and extremely high or low voltages in yellow and red respectively. The voltmeter provides three special flashing patterns to indicate abnormal conditions.

- (1) If only the single leftmost (beneath the 90V mark – *180V for E version*) LED flashes, the input voltage is marginally low.
- (2) If all of the LED's on the voltmeter flash, the input voltage is marginally high. Power to the PL-Plus's outlets will remain unless the incoming voltage rises above the Extreme Voltage Shutdown cutoff voltage (*135 - 140 volts, 260 – 265 volts E version, 120 - 125 volts J version*).

| Mains Vltg. | Voltage Status | Voltmeter Reading | Outlets |
|-------------|--------------------|---|---------|
| 80-90 | Low Marginal | The LED beneath the 90V mark flashes | ON |
| 90-104 | Low | Meter Reads in Low Red | ON |
| 106-108 | Medium Low | Meter Reads in Low Yellow | ON |
| 110-120 | Normal | Meter Reads in Green | ON |
| 122-124 | Medium High | Meter Reads in High Yellow | ON |
| 126-128 | High | Meter Reads in High Red | ON |
| 130-140 | High Marginal | All Meter LEDs Flash | ON |
| Above 140 | Extreme (Shutdown) | Meter off—Extreme Voltage LED illuminates | OFF |

SERIES II 15 AMP POWER CONDITIONERS

- (3) If none of the LED's on the voltmeter are lit, and the Extreme Voltages LED indicator is illuminated, then the PL-Plus II has shut down power to its outlets because the input voltage is in a range considered extreme (in excess of 135 volts - 260 volts *E version*, 120 volts *J version*).

Digital Voltmeter: **(PL-Plus D II and PM-8 II only)**

Furman's laboratory precision AC digital voltmeter continually measures incoming voltages, within a typical tolerance of +/- 1.5VAC. It should be noted that the voltage reading is incoming. No adjustment should be necessary on these units.

Digital Current Meter: (PM-8 II only)

Furman's laboratory precision AC digital current meter continually measures the total circuit AC load, within a typical tolerance of +/- 0.5 amp. Because these meters feature true R.M.S. technology, the current readings are accurate regardless of load conditions (capacitive, inductive or resistive).

NOTE: The PL-8 II, PL-Plus II, PL-Plus D II, and PM-8 II do not compensate for high or low line voltage. If you frequently move your rack to different locations, derive power from generators, use long extension cords, travel internationally, or are in an area prone to brownouts, you may benefit from the use of one of Furman's AC Line Voltage Regulators.

On/Off Rocker Switch:

This 15 amp capacity power switch is specifically designed to stand up to the enormous high inrush current demands of

many Power Amplifiers. Additionally, the semi-transparent rocker lights when switched to the "ON" position. (*E-versions feature 10 amp capacity*)

Extreme Voltage Shutdown Indicator:

This LED is normally off. It monitors a hazard common in the entertainment industry: wiring faults – for example, accidental connection to 220VAC where 120VAC is expected, or an open neutral from a 208 or 240VAC feed. The Series II SMP+ circuit senses voltages that are so high that operation would be impossible and shuts the power down before damage can occur. Upon initially applying power to these units, the Extreme Voltage indicator LED will light if the input voltage is above the extreme voltage cutoff, and power will not be applied to the unit's outlets. If the unit has been operating with an acceptable input voltage and subsequently that voltage exceeds 135V, it will shut off power to the outlet and the Extreme Voltage LED will light.

E version: over voltage shut down is 260 VAC

J version: over voltage shut down is 125 VAC

Guards against open neutral and accidental connection to 300+ VAC

Protection OK Indicator:

Although the Furman SMP circuit assures virtually free protection from transient voltage spikes and surges, nature has a way of occasionally creating electrical forces that are beyond the capabilities of *any* TVSS device to absorb without some degree of damage. In the rare instance that this occurs, the green "Protection OK" LED indicator located on your front panel will dim. If this happens, some level of protection from voltage surges will remain, but the Furman's clamping voltage rating will be compromised. The unit must be returned to Furman Sound, or an authorized Furman Service center for repair.

SERIES II 15 AMP POWER CONDITIONERS

NOTE: If the mains power is above the high cutoff voltage and has caused the unit to remove power from its outlets, it cannot restore power without the operator manually turning the unit off, then on again. Avoid turning the unit back on, without first checking the source of the problem, and perhaps changing the AC source.

TROUBLE SHOOTING GUIDE

1.) Symptom: No power to the AC outlets.

Possible Cause: Circuit breaker has tripped due to excessive load.

Action Needed: Remove one piece of equipment from the Series II unit, and push the square re-set tab into the Circuit breaker bezel.

2.) Symptom: No power to the AC outlets, "Protection OK" indicator is not lit.

Possible Cause: Either the AC outlet to which your Series II device is connected has no AC voltage present, or the unit has been subjected to a *sustained* voltage in excess of 400 Volts.

Action Needed: Plug the Series II unit into an AC receptacle where AC voltage is present. If the problem persists, the protection circuit may be damaged, and require factory service.

3.) Symptom: Extreme Voltage indicator lit.

Possible Cause: Input voltage is above 135- 140 volts (*260 – 265 volts E version, 120 - 125 volts J version*), causing power to the unit's outlets to be shut down. Additionally, if the voltage

is below 85 - 90 volts at turn on, the unit will not allow AC voltage to reach the outlets.

Action Needed: Correct the line voltage, then turn the unit on. Consider installing a Furman voltage regulator.

DEFINITIONS

SPIKE: This is 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 caused unpredictably by electric motors switching on or off (on the premises or outside), utility company maintenance operations, lightning strikes and other factors. Spikes (also called surges or transients) are absorbed by special components in the PL-8 and PL-PLUS 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 damage, but it can certainly be annoying, producing static in audio circuits, "snow" on video screens, or garbled data in computers. Noise can be introduced into AC lines by nearby radio transmitters, certain kinds of lighting, electric motors, and other sources. Because noise occurs at higher

SERIES II 15 AMP POWER CONDITIONERS

frequencies than the 50 or 60 Hz AC line, it can be effectively reduced through use of low-pass filtering.

THREE YEAR LIMITED WARRANTY

Furman Sound, Inc., having its principal place of business at 1997 South McDowell Blvd., Petaluma, CA 94954 ("Manufacturer") warrants its 15 amp Series II Power Conditioners (the "Product") as follows:

Manufacturer warrants to the original Purchaser of the Product that the Product sold hereunder will be free from defects in material and workmanship for a period of three years from the date of purchase. The Purchaser of the product is allowed fifteen days from the date of purchase to complete warranty registration by mail or on-line at the Furman website. If the Product does not conform to this Limited Warranty during the warranty period (as herein above specified), Purchaser shall notify Manufacturer in writing of the claimed defects. If the defects are of such type and nature as to be covered by this warranty, Manufacturer shall authorize Purchaser to return the Product to the Furman factory or to an authorized Furman repair location. Warranty claims should be accompanied by a copy of the original purchase invoice showing the purchase date; this is not necessary if the Warranty Registration was completed either via the mailed in warranty card or on-line website registration. Shipping charges to the Furman factory or to an authorized repair location must be prepaid by the Purchaser of the product. Manufacturer shall, at its own expense, furnish a replacement Product or, at Manufacturer's option, repair the defective Product. Return shipping charges back to Purchaser will be paid by Manufacturer

THE FOREGOING IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. Manufacturer does not warrant against damages or defects arising out of improper or abnormal use of handling of the Product; against defects or damages arising from improper installation, against defects in products or components not manufactured by Manufacturer, or against damages resulting from such non-Manufacturer made products or components. This warranty shall be cancelable by Manufacturer at its sole discretion if the product is modified in any way without written authorization from Furman Sound. This warranty also does not apply to Products upon which repairs have been affected or attempted by persons other than pursuant to written authorization by Manufacturer.

THIS WARRANTY IS EXCLUSIVE. The sole and exclusive obligation of Manufacturer shall be to repair or replace the defective Product in the manner and for the period provided above. Manufacturer shall not have any other obligation with respect to the Products or any part thereof, whether based on contract, tort, strict liability or otherwise. Under no circumstances, whether based on this Limited Warranty or otherwise, shall Manufacturer be liable for incidental, special, or consequential damages. Manufacturer's employees or representatives' ORAL OR OTHER WRITTEN STATEMENTS DO NOT CONSTITUTE WARRANTIES, shall not be relied upon by Purchaser, and are not a part of the contract for sale or this limited warranty. This Limited Warranty states the entire obligation of Manufacturer with respect to the Product. If any part of this Limited Warranty is determined to be void or illegal, the remainder shall remain in full force and effect.

SERIES II 15 AMP POWER CONDITIONERS

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.

NOTE: All equipment being returned for repair must have a Return Authorization (RA) Number. To get an RA Number, please call the Furman Service Department: (707) 763-1010, ext. 121. Please display your RA Number prominently on the front of all packages.

Make sure to pick up one of Furman's gooseneck lights - the perfect accessory for your Series II unit.



SPECIFICATIONS

Current rating:

15 amps ("E" versions 10 amps)

Operating Voltage:

90 to 140 VAC ("E" versions 180 to 260 VAC)

Over Voltage Shutdown:

140 VAC typically ("E" versions 260 VAC typically, "J" versions 125 VAC typically)

Voltmeter Accuracy:

PL-PLUS II only: ± 2 VAC, calibrated with internal trimpot adjustments
PL-PLUS D & PM-8: ± 1.5 VAC,
Current meter: ± 0.5 A

Spike Protection Modes:

Line to neutral, zero ground leakage

Spike Clamping Voltage:

188 Vpk @ 3,000 amps, (133 VAC RMS)
("E" Version: 376 Vpk (266 VAC RMS))

Response time:

1 nanosecond

Maximum surge current:

6,500 amps

Noise attenuation:

10 dB @ 10 kHz
40 dB @ 100 kHz
100 dB @ 10 MHz
Linear attenuation curve from 0.05 - 100 ohms line impedance

Mechanical:

Dimensions: 1.75" H x 19" W x 10.5" D.
Weight: 11 lbs (5 kg).
Construction: Steel chassis, .125" brushed and black anodized aluminum front panel; glass epoxy printed circuit boards

Power Consumption:

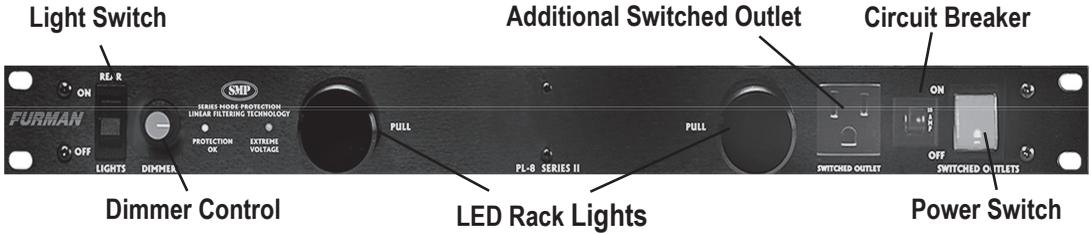
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PL-PLUS II, 12 watts
PL-PLUS D II, 12 watts
PM-8 II, 12 watts

Safety Agency Listings:

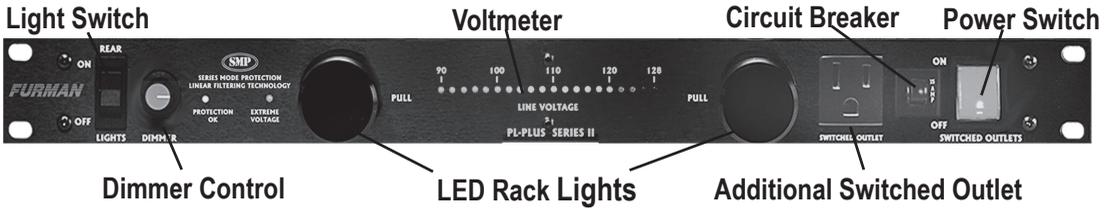
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SERIES II 15 AMP POWER CONDITIONERS

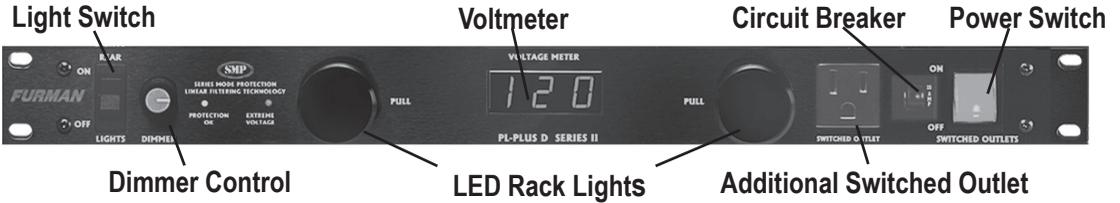
PL-8 Series II



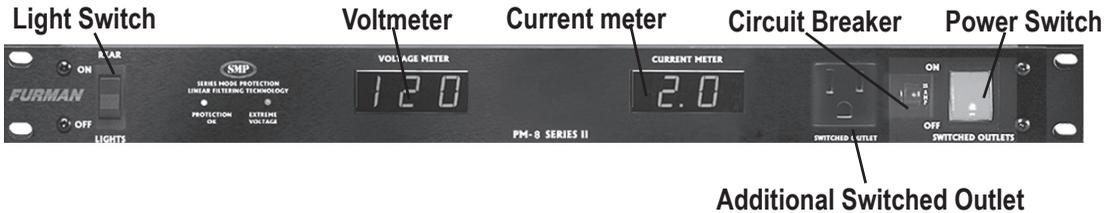
PL-PLUS Series II



PL-PLUS D Series II



PM-8 Series II



Rear of all



FURMAN

Furman Sound, Inc.
1997 South McDowell Blvd.
Petaluma, California 94954-6919 USA
Phone: 707-763-1010 Fax: 707-763-1310
Web: www.furmansound.com
E-mail: info@furmansound.com