

# ***FURMAN***



## **PF-Pro E**



## **PF-Pro R E**

# **POWER FACTOR PRO OWNER'S MANUAL**

*Owner's Manual*

## PF-PRO E FEATURES

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- *Clear Tone Technology provides Power Factor correction with 45 amps peak current reservoir*
- *SMP+ (Series Multi-Stage Protection Plus) with Extreme Voltage Shutdown (EVS)*
- *LiFT (Linear Filtering Technology) with zero ground contamination*
- *Four rear panel outlets*
- *Three year limited warranty*
- *Front panel meter to display incoming line voltage ranging from 180 to 256 volts*

## PF-PRO R E ADDITIONAL FEATURES

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- *Compact rack-mountable design*
- *10 rear panel outlets plus one convenient front panel outlet*
- *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*

## INTRODUCTION

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Congratulations on your purchase of a Furman Power Factor Pro (Model PF-Pro E or PF-Pro R E). Both Power Factor Pro units feature Furman's revolutionary Clear Tone Technology, and Series Multi-Stage Protection Plus (SMP+) circuit, as well as our exclusive Linear Filtering Technology (LiFT). Together these technologies comprise the world's first comprehensive AC power conditioner for instrument amplifiers.

Today's AC power is contaminated. Whether you play in a stadium, bar, or rehearsal space, they all have one thing in common: the AC power is supplied from your local utility. What's worse is that the "power factor" supplied from your building's AC outlet is typically poor, thanks to increasingly over taxed power lines and raised line impedance.

In fact, the quality of AC power has been so poor for so long, most musicians have no idea how great their amplifiers could really sound. When the AC power factor is poor, amplifiers sound muddy because their power supplies can't deliver when pushed. The scream and cry from a guitar loses bite and harmonics, bass guitars lose their punch and weight, keyboards sound nasally, losing clarity, attack, and extension.

Furman's Power Factor Pro units address this issue - allowing your amplifier to sound its best while protecting it at the same time.

## DESCRIPTION

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The Power Factor Pro's "Clear Tone Technology" actually lowers the AC line impedance supplied by your wall outlet, while storing energy for peak current demands. In fact, there are over 45 amps (peak charge) of instantaneous current reserve in the Power Factor Pro. Additionally, "Linear Filtering Technology" dramatically lowers AC line noise to unprecedented levels in the critical audio frequency band. What does this mean? Just plug in your current-starved amplifier, crank up the volume, and listen to the dynamics, harmonics, and clarity you've been missing!

Additionally, the Power Factor Pro units are the most comprehensive power protection device ever created for the serious musician. Furman's Series Multi-Stage Protection Plus (SMP+) guards your equipment from voltage spikes that can damage your amplifier or other connected equipment.

Furman's SMP+ features unparalleled clamping voltage. While other designs offer clamping voltages that are well above 450 Vpk, SMP+ clamps at 376 Vpk (266 VAC RMS) even when tested with multiple 6000Vpk - 3000 amp surges! And, our pro level over-voltage auto shutdown circuit assures you will never see your prized amplifier go up in flames due to a sustained voltage overload.

The PF-Pro E has a generous 7 amp R.M.S. capacity, a convenient 20 segment AC voltmeter, a detachable-locking AC cord, and (4) AC outlets, all contained in a small convenient, floor standing package. The PF-Pro R E has the same features except it has (10) rear outlets and (1) front panel outlet. It also features a BNC connector on the rear panel to allow attachment of any standard gooseneck lamp (such as Furman's model GN-I or GN-LED) to illuminate the rear of your rack.

## SAFETY INFORMATION

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To obtain best results from your Furman Power Factor Pro Power Conditioner, please be sure to read this manual carefully before using.

**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)

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1. Please read and observe all safety and operating instructions before installing your Power Factor Pro unit. Retain these instructions for future reference.
2. Your Power Factor Pro 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 Power Factor Pro unit near heat sources such as radiators, heat registers, stoves, or other appliances that produce heat.
4. The PF-Pro E and PF-Pro R E should only be connected to a 220 VAC, 10 amp grounded electrical outlet. Do not defeat the ground or change polarization of the power plug.
5. Pay particular attention to the condition of the cords and cables at the plugs. To prevent risk of fire or injury, damaged cords and cables should be replaced immediately.
6. Clean your Power Factor Pro unit with a damp cloth only. Do not use solvents or abrasive cleaners. Never pour liquid on or into the unit.

7. Your Power Factor Pro unit should be serviced by qualified service personnel when:

- The power supply cord or the plug has been frayed 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 *seriously* damaged.

8. Your Power Factor Pro 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 Power Factor Pro unit beyond what is described in this manual. All other servicing should be referred to qualified service personnel.

## FEATURES

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Both Power Factor Pro units have a master switch for the rear outlets that glows red when the power is on. The circuit breaker is located adjacent to the power switch for the PF-Pro E and on the rear panel for the PF-Pro R E. It can be quickly and easily reset should the unit be overloaded. Both models also feature a detachable 8 foot, 10A heavy-duty power cable.

The Power Factor Pro, offers a 20 segment LED bar-graph meter that displays incoming voltage between 180 and 256 volts in 4-volt increments. 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  $\pm 4$  volts. It can easily be recalibrated, if necessary.

The PF-Pro R E features 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.

## OPERATION

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### **Multi-Segment LED Voltmeter:**

This three-color, 20-LED bar graph is an accurate, self checking AC voltmeter that continually measures input voltages. The meter reads from 180 to 256 volts, in 4 volt steps. 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) On initial turn on, the voltmeter will scan for smart chip integrity.
- (2) If only the single left most (beneath the 180V mark) LED flashes, the input voltage is marginally low.
- (3) If all of the LEDs on the voltmeter flash, the input voltage is marginally high. Power to the Power Factor Pro's outlets will remain on unless the incoming voltage rises above the

Extreme Voltage Shutdown (EVS)  
cutoff voltage (280 volts).

The Power Factor Pro's voltmeter has a basic accuracy of plus or minus four volts, and extreme cold or heat may cause an additional two volts of error.

**NOTE:** Although the Power Factor correction will more than compensate for peak current demands, the Power Factor Pro does not compensate for *sustained* high or low line voltage. If you derive power from generators, travel internationally, or are in an area prone to extreme brownouts, you may benefit from the use of one of Furman's AC Line Voltage Regulators.

**On/Off Rocker Switch:**

This 10 amp capacity power switch is specifically designed to stand up to the enormous high inrush current demands placed by many instrument amplifiers. Additionally, the semi-transparent rocker lights when switched to the "ON" position.

**Extreme Voltage Shutdown (EVS) Indicator:**

This LED is normally off. It monitors a hazard

unfortunately common in the entertainment industry: wiring faults – for example, accidental connection to 380 VAC where 240VAC is expected, or an open neutral from a 208 or 240VAC feed. The Power Factor Pro's 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 be lit 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 then that voltage goes above 280V, it will shut off power to the outlet and the Extreme Voltage LED will light.

**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 checking the source of the problem first, and perhaps changing the AC source.

Multi-Segment LED Voltmeter Readings

Mains Vltg.	Voltage Status	Voltmeter Reading	Outlets
166-179	Low Marginal	The LED beneath the 180V mark flashes	ON
180-211	Low	Meter Reads in Low Red	ON
212-219	Medium Low	Meter Reads in Low Yellow	ON
220-240	Normal	Meter Reads in Green	ON
241-248	Medium High	Meter Reads in High Yellow	ON
249-256	High	Meter Reads in High Red	ON
257-265	High Marginal	All Meter LEDs Flash	ON
Above 280	Extreme (Shutdown)	Meter off—Extreme Voltage LED illuminates	OFF

## TROUBLE-SHOOTING GUIDE

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**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 Power Factor Pro 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 that your Power Factor Pro device is connected to has no AC voltage present, or the unit has been subjected to a *sustained* voltage in excess of 400 volts.

**Action Needed:** Plug the Power Factor Pro unit into an AC receptacle where AC voltage is present. If the problem persists, the protection circuit may be damaged factory service may be required.

**3.) Symptom:** Extreme Voltage indicator lit.

**Possible Cause:** Input voltage is above 270 - 280 volts, causing power to the unit's outlets to be shut down.

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

## THREE YEAR LIMITED WARRANTY

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Furman Sound, LLC., having its principal place of business at 1690 Corporate Circle, Petaluma, CA 94954 ("Manufacturer") warrants its PF-Pro E and PF-Pro R E (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 web site. 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.

## SERVICE

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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.



## Important Note:

***The Power Factor Pro must be the first AC power component connected to the AC mains!***

Regulators such as the Furman AR-2315 or UPS systems such as the SB-1000 E must be connected to the Power Factor Pro's output. This is due to the fact that the PF-Pro's current reservoir may hinder the performance of a regulator, and worst case may cause damage in extreme power environments.

As long as the Power Factor Pro is connected *prior* to the Regulator or UPS both components may be used.

## SPECIFICATIONS

### AC Current Capacity:

Input - 10 Amps capacity required

Output - 7 - 10 Amps RMS (maximum, all outlets combined - continuous)\*

### Operating Voltage:

180 to 280 VAC

### Over Voltage Shutdown:

280 VAC typically

### Voltmeter Accuracy:

±4 VAC, calibrated with internal trimpot adjustments

### Spike Protection Modes:

Line to neutral, zero ground leakage

### Spike Clamping Voltage:

376 Vpk (266 VAC RMS)

*\* (Due to the power factor correction circuit, available RMS power varies with the reactance of the load (vector). However, this only affects the circuit breaker for continuous RMS current draw. Since power amplifiers will require high transient current demands, the Elite-15 PF will never succumb to current compression. Quite the opposite, in fact, it will buffer the power amplifier's power supply, while lowering the AC input impedance, allowing power amplifiers to work more efficiently).*

### Response time:

1 nanosecond

### Maximum surge current:

6,500 amps

### Noise attenuation:

40 dB @ 10 kHz

40 dB @ 100 kHz

100 dB @ 10 MHz

Linear attenuation curve from 0.05 - 100 ohms line impedance

### Transient Current Reservoir:

45 amps peak

### Mechanical:

#### Dimensions:

PF-Pro E: 5.25" H (with feet) x 8.125" W x 12.5" D.

PF-Pro R E: 19" W x 11.63" D x 1.75" H

#### Weight:

PF-Pro E: 11 lbs (5 kg).

PF-Pro R E: 9.7 lbs (4.39 kg)

### Power Consumption:

6 watts (resistive)

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