FURMAN

PRO SERIES

Power Conditioner/Monitor

MODELS PM-PRO, PM-PRO-E

Owner's Manual

PM-PRO, PM-PRO-E SPECIFICATIONS

Note: Where different, PM-PRO-E specs are in parentheses.

Current rating:	20 Amps, 2400 Watts at 120 VAC
	(16 Amps, 3600 Watts at 230 VAC
Input Voltage Range:	0 to 280 VAC without damage
Meter Accuracy:	Voltmeter:+2(+4) VAC; Ammeter:+2 amps, calibrated with trimpot adjustments
Spike Protection Modes:	Line to neutral, neutral to ground, line to ground
Clamping Voltage, all modes:	TVSS rating 400V peak, L-N, L-G, N-G, tested to UL 1449 (TVSS rating 400V peak, L-N; 680V peak, L-G, N-G
Response time:	1 nanosecond
Maximum surge current:	11,000 amps (8 x 20mS pulse)
Maximum spike energy:	550 joules total
Noise attenuation:	Differential mode: Greater than 40 dB; Common mode: greater than 60 dB; both 1 to 200 MHz
Dimensions:	1.75" (4.45 cm) H x 19" (48.25 cm) W x 8" (25 cm) D.
Weight:	6 lbs. (2.7 kg).
Construction:	Steel chassis, zinc chromate plating; brushed and black anodized aluminum front panel; glass epoxy printed circuit boards.
Power consumption:	32 Watts
Safety Information:	PM-Pro: UL listed. CUL listed. PM-PRO-E: CE
Options:	"-G" Suffix (PM-PRO only): provides "super spec", isolated ground 120V outlets for special applications. Please consult factory before ordering to determine suitability in your application.

The Furman PM-PRO is manufactured in the U.S.A.

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Safety Information

To obtain best results from your Furman PM-PRO, please be sure to read this manual carefully before using it.

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. There are no user serviceable parts inside. Refer servicing to qualified personnel only.
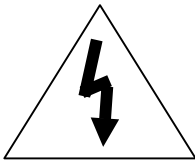
The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated dangerous voltage within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock.

Important Safety Instructions
Please read prior to installation

1. Please read and observe all of the safety and operating instructions before the PM-PRO is operated. Retain these instructions for future reference.

2. The PM-PRO 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. The PM-PRO should be situated so that its location and position do not interfere with its proper ventilation. For example, the PM-PRO must not be placed on a rug, bed, sofa, or similar surface which impedes airflow across the chassis.

4. Do not place the PM-PRO near heat sources such as radiators, heat registers, stoves, or other appliances that produce heat.

5. The PM-PRO should only be connected to a 120 VAC, 60 Hz, 20 amp grounded electrical outlet. Outlets wired for 20 amps may be identified by the T-shaped socket opening that accepts the perpendicular blades of the PM-PRO's power plug. If you don't have a 20 amp outlet available, have one installed by a qualified electrician. Do not defeat the ground or polarization of the power plug.

6. 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 condition of cords and

cables at plugs, and the point where they exit from the PM-PRO. To prevent risk of fire or injury, damaged cords and cables should be replaced immediately.

7. Clean the PM-PRO with a damp cloth only. Do not use solvents or abrasive cleaners. Never pour any liquid on or into the PM-PRO.

8. When left unused for a long period of time, the power cord of the PM-PRO should be unplugged from the outlet.

9. The PM-PRO should be serviced by qualified service personnel when:
    a. The power supply cord or the plug has been frayed, kinked, or cut.
    b. Objects have fallen or liquid has spilled into the unit.
    c. The PM-PRO has been exposed to rain or other moisture.
    d. The PM-PRO does not appear to operate normally or exhibits a marked change in performance.
    e. The PM-PRO has been dropped, or the enclosure damaged.

10. The PM-PRO requires that a safety ground be present for proper operation. Any attempt to operate the PM-PRO without a safety ground is considered improper operation and could invalidate the warranty.

11. There are no user-serviceable parts in the PM-PRO. Refer servicing to qualified service personnel only.

Introduction

Thank you for your purchase of a Furman PM-PRO or PM-PRO-E Power Conditioner / Monitor, and congratulations on your choice. (For simplicity, in this manual the designation "PM-PRO" refers to either the PM-PRO or the PM-PRO-E unless a specific distinction is made. A summary of the differences between the two models appears at the bottom of this page.) The PM-PRO is one of Furman's top-of-the-line PRO Series power conditioners. It is designed to provide maximum protection from the types of hazards faced by delicate analog and digital pro audio and video equipment.

Your PM-PRO provides the most complete and comprehensive protection from power line-related transient voltages, noise and wiring faults available. It combines a high voltage surge and transient suppressor with an RFI/EMI interference filter. The fast-acting suppression circuit responds in less than a nanosecond, clamping transient voltages to safe levels. The filter works to prevent noise from fluorescent lights, certain dimmers, radio transmitters, and similar sources of "electronic pollution" from contaminating the AC line and from there, leaking into sensitive audio, video, or computer circuits.

What sets the Furman Pro Series apart from other conditioners is the quantity, quality, and configuration of its suppression devices. These include MOV's, gas discharge tubes, fast-blow fuses, and high voltage inductors and capacitors. This unique combination can safely absorb and dissipate large spikes from nearby lightning strikes and other sources (up to 11,000 amps across any wiring mode -- hot-neutral, hot-ground, or neutral-ground), as well as highly attenuate audible high frequency noise. Precise high-inrush magnetic circuit breakers avoid the false tripping often encountered with large reactive loads like power amps.

The PM-PRO front panel provides a three-color, 20-LED line voltage meter, a true RMS reading 10-LED AC ammeter, and three status LEDs to indicate abnormal power conditions. The PM-PRO will even keep itself from turning on or shut down under extreme conditions, if the voltage is below 80 volts or above 140 volts (below 160 volts or above 280 volts for PM-PRO-E). The front panel also provides an unswitched outlet (clean, filtered power is provided at the unswitched outlet, too) and a 20 amp (16 amp for PM-PRO-E) magnetic circuit breaker rated for use as an on/off switch.

The rear panel provides eight switched AC outlets to power up all your equipment. These outlets are spaced widely enough to accommodate up to four bulky plug-mounted power supplies ("wall warts"). The heavy duty 12 AWG power cord is 10 feet (2.4 m) in length for extra reach and durability on stages and other high-traffic areas.

PM-PRO Compared to PM-PRO-E

The PM-PRO is intended for use with 120 VAC power and is rated at 20 amps; the PM-PRO-E is for 230 VAC power and rated at 16 amps. Outlets on the PM-PRO-E are IEC-320 types. The GROUND OK feature is not available on the PM-PRO-E. Other differences concern the reading of the voltmeter and ammeter and other specifications, which are described on page 8 and on the rear cover.
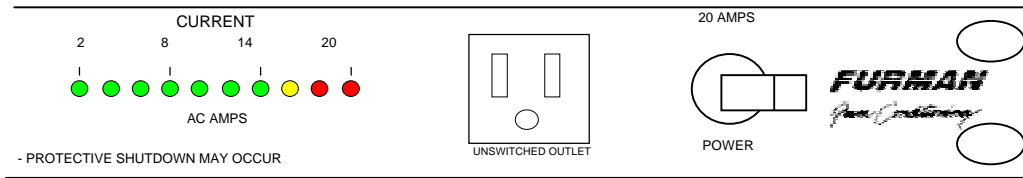
Front Panel Controls
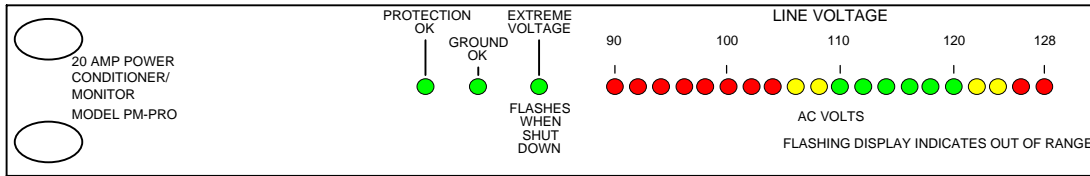
PROTECTION OK: This LED is normally on when the power to the PM-PRO's outlets is switched on. It monitors the integrity of the protection devices and reports if the protection is compromised. If an extremely large spike is encountered that exceeds the PM-PRO's capacity, the main group of input protectors will blow an internal fuse, causing the indicator to go out. If this LED is not lit when the power switch is on, full protection is not functioning. Spike protection may still exist, but will have a reduced capacity to absorb current. If this LED is not lit, please contact the Furman Service Department.

GROUND OK: This LED is normally on when the power to the PM-PRO's outlets is switched on. It monitors the integrity of the grounding, and reports if the grounding is compromised. It lights if a reasonably good safety ground exists. If this LED is not lit when the power is on, the PM-PRO is not properly grounded. Unplug the PM-PRO and correct the ground. (Not available on PM-PRO-E.)

EXTREME VOLTAGE SHUTDOWN: This LED status indicator is normally off. It monitors a hazard unfortunately common in the entertainment industry: wiring faults -- for example, accidental connection to 220V where 120V is expected. The PM-PRO senses voltages that are so high or low that operation would be impossible and shuts the power down before damage can occur. For the PM-PRO, the cutoff voltages are under 80V or over 140V; for the PM-PRO-E, under 160V or over 280V. Upon initially applying power to the PM-PRO, this indicator will be lit if the input voltage is below the low cutoff or above the high cutoff, and power will not be applied to the PM-PRO's outlets. If the unit has been operating within an acceptable input voltage and then that voltage goes out of the acceptable range, the PM-PRO will shut power to the outlet and this LED will begin flashing.
NOTE: If the mains power is below the low cutoff voltage and has caused the PM-PRO to remove power from its outlets, the PM-PRO will not restore power to the outlets until the mains voltage rises to more than 10V above the cutoff. Similarly, if the mains power is above the high cutoff and has caused a shutdown, the PM-PRO will not restore power to the outlets until the mains voltage falls more than 10V below the cutoff. The reason for this is to prevent the power oscillating on and off in marginal conditions.

LED VOLTMETER: 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 steps (PM-Pro-E: 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 (see chart on

CURRENT
2   8   14   20

AC AMPS

- PROTECTIVE SHUTDOWN MAY OCCUR

UNSWITCHED OUTLET

20 AMPS

POWER

FURMAN

page 8). The voltmeter provides three special flashing patterns to indicate abnormal power conditions:

(1) If only the single leftmost LED flashes, the input voltage is marginally low. Power to the PM-PRO's outlets will remain on unless the incoming voltage falls below the Extreme Voltage Shutdown low cutoff.

(2) If all of the LEDs on the voltmeter flash, the input voltage is marginally high. Power to the PM-PRO's outlets will remain on unless the incoming voltage rises above the Extreme Voltage Shutdown high cutoff.

(3) If none of the LEDs on the voltmeter are lit, and the Extreme Voltage LED indicator is flashing continuously, then the PM-PRO has shut down power to its switched outlets because the input voltage is in a range considered extreme.

The PM-PRO's voltmeter has a basic accuracy of plus or minus two volts, and extreme cold or heat may cause an additional one volt of error (four volts and two volts for the PM-PRO-E). Please note that the voltage reading is advisory only. The PM-PRO does 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.

LED AMMETER: This three-color, 10 LED ammeter will give you a reliable indication of current draw even for highly nonlinear loads, like amplifiers and switching power supplies. It reads AC current from 0 to 20 amps, in two-amp steps (PM-PRO-E: 0 to 16 amps in 1.6 amp steps). When using audio power amps with the PM-PRO, it is normal for the current draw to fluctuate considerably, increasing on musical peaks and decreasing at quiet times. To avoid tripping the PM-PRO's circuit breaker, adjust your levels so that the highest peaks do not exceed the rated current.
NOTE: The Voltmeter, Ammeter, and status LEDs stay on even when the power switch is off. This feature allows you to check voltage and current before powering up your equipment. Both of these LED meters are designed for continuous, ongoing use. They consume little power, just a few cents worth a month, much like a clock.

UNSWITCHED OUTLET: This outlet provides conditioned power at all times when the PM-PRO is plugged in and operating under normal conditions.

CIRCUIT BREAKER/ON-OFF SWITCH: This appears to be an ordinary toggle switch, but in fact is a precision magnetic circuit breaker. Because its operation is magnetic, not thermal, it is much more accurate in its tripping current, yet it

will not be tripped falsely by the transient high inrush currents often encoun-
tered when turning on large reactive loads like power amps. Its trip point is
unaffected by ambient temperature. The breaker/switch controls power to the
eight switched rear panel outlets, but does not affect the voltmeter, the amme-
ter, or the status LEDs. If it trips, reduce the load on the PM-PRO and push it
back to the ON position. (Note: The PM-PRO-E's circuit breaker is not mag-
netic.)

Voltmeter Displays

The PM-PRO informs you of voltage problems at a glance. The following chart
summarizes how the PM-PRO's voltmeter responds to input voltages from extremely
low to extremely high.

AC VOLTS
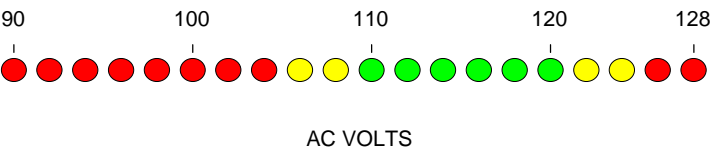
Mains *	Voltage Status	PM-PRO Voltmeter Reading	Outlets
Below 80V	Extreme (Shutdown)	Meter off--Extreme Voltage LED flashes	OFF
80-90	Low Marginal	The LED beneath the 90V mark flashes	ON
90-104	Low	Meter Reads in Low Red	ON
106-108	Medium Low	Meter Reads in Low Yellow	ON
110-120	Normal	Meter Reads in 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 Flashes	OFF

* For PM-PRO-E, double all indicated voltages.

Power Status LEDs

PROTECTION
OK

EXTREME
VOLTAGE

GROUND
OK

FLASHES
WHEN
SHUT
DOWN
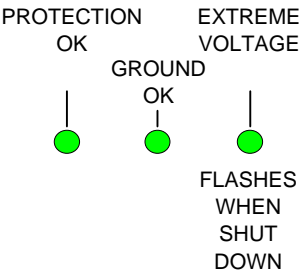
Symptom:	PROTECTION OK Indicator not lit.
Possible Cause:	Protection devices are damaged.
Action Needed:	Factory Service.
Symptom:	Ground OK Indicator not lit.
Possible Cause:	No building ground, bad outlet.
Action Needed:	Locate good ground, run ground wire.
Symptom:	Flashing voltmeter display.
Possible Cause:	Input voltage is marginally high or marginally low.
Action Needed:	Correct line voltage. Consider installing a Furman voltage regulator.
Symptom:	EXTREME VOLTAGE Indicator is flashing.
Possible Cause:	Input voltage is extremely high or extremely low, causing power to the PM-PRO's outlets to be shut down.
Action Needed:	Correct line voltage. Consider installing a Furman voltage regulator.

Effects of Lightning

Lightning is a natural phenomenon of overwhelming force that represents the most difficult circumstance faced by a power protection product. The degree of protection a PM-PRO can offer depends on the intensity of the strike. If lightning strikes a distant power line and causes a relatively small disturbance to reach your location, the spike suppressors in the PM-PRO will absorb the excess voltage invisibly and harmlessly. However, if lightning strikes the actual building where the PM-PRO is installed (or somewhere very nearby), some damage may be unavoidable due to the extremely high voltage and current present. If this does occur, most likely damage will be limited to the PM-PRO itself and will affect only certain spike suppression components (called varistors or MOV's.) In this "suicide" mode, the PM-PRO may sustain minor damage but generally will protect all equipment plugged into it from much more serious and costly damage as long as that equipment is properly grounded. Proper grounding requires the use of three-prong AC cords, and that the building's outlets are actually grounded to earth as specified by the National Electric Code.

Any PM-PRO known to have taken a direct lightning hit should be checked by a qualified technician or the Furman factory to determine whether the MOV's need replacement. (If the PROTECTION OK indicator is not lit, there is definitely some damage. Some spike suppression capability may still be available by MOV Bank #2, but there is no guarantee of this.)

For optimum protection, you should not rely exclusively on the PM-PRO to protect against a direct lightning hit. The first line of defense against lightning should be a lightning arrestor installed on your building's electrical service entrance. If your building does not have one, contact your local power company or a contractor to have one installed.

Limited Warranty

> *Important Note:* To be sure of obtaining full protection under the terms of the Three Year Limited Warranty in case your ownership documents are lost, please fill out and return the Warranty Registration Card immediately. Please verify that the serial number shown on the Warranty Card matches the serial number on your unit.

The Furman PM-PRO is warranted against failures due to defective parts or faulty workmanship for a period of three years after delivery to the original owner. During this period, Furman will make any necessary repairs without charge for parts or labor. Shipping charges to the factory or repair station must be prepaid by the owner; return shipping charges (via UPS Ground) will be paid by Furman.

This warranty applies only to the original owner and is not transferable. Also, it does not apply to repairs done other than by the Furman factory or Authorized Repair Stations.

This warranty shall be cancellable by Furman at its sole discretion if the PM-PRO unit has been subjected to physical abuse, has been operated without a proper safety ground, or has been modified in any way without written authorization from Furman. Furman's liability under this warranty is limited to repair or replacement of the defective unit.

Furman will not be responsible for incidental or consequential damages resulting from the use or misuse of its products. Some states do not allow the exclusion of incidental or consequential damages, so the above limitations may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

Warranty claims should be accompanied by a copy of the original purchase invoice showing the purchase date (if a Warranty Registration Card was mailed in at the time of purchase, this is not necessary). Before returning any equipment for repair, please read the important information on service below.

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. 40. Please display your RA Number prominently on the front of all packages.

Other Furman Products

Power Conditioning & Distribution

PL-8, PL-PLUS	Power Conditioner & Light Module, 15A
PL-PRO	Power Conditioner & Light Module, 20A
PL-TUNER	Power Conditioner/Instrument Tuner, 15A
PLH-15	Power and Light Center, 15A
PM-8	Power Conditioner/Monitor, 15A
PS-8, PS-8R	Power Conditioner/Sequencer, 15A
PS-PRO	Power Conditioner/Sequencer, 20A
PowerLink	Remote AC Power Sequence Controller
PowerPort	Remote AC Power Controller
MiniPort-15	Power Relay, 15A
MiniPort-20	Power Relay, 20A
MiniPort-15Q	Power Relay for Quad Box Mount, 15A
MiniPort-20Q	Power Relay for Quad Box Mount, 20A
RS-1	System Control Panel, Maintained Switching
RS-2	System Control Panel, Momentary Switching
AR-1215	AC Line Voltage Regulator, 15A, 120V
AR-2306	AC Line Voltage Regulator, 6A, 230V
AR-1220	AC Line Voltage Regulator, 20A, 120/100V
AR-1230	AC Line Voltage Regulator, 30A, 120/100V
AR-2330	AC Line Voltage Regulator, 30A, 220/230/240V
AR-2330D	AC Line Voltage Regulator, 30A, 24,,230,220V, N. America Use
AR-PRO	AC Line Voltage Regulator, 30A, 120V, Worldwide Use
BP-1000	On-Line Uninterruptible Power Supply, 1KVA
ACD-100	Power Distro, 100A
ASD-120	Sequenced Power Distro, 120A
IT-1210	Isolation Transformer, Balanced AC Power, 10A
IT-1220	Isolation Transformer, Balanced AC Power, 20A
IT-1230	Isolation Transformer, Balanced AC Power, 30A
PlugLock	Locking Outlet Strip
PlugLock-PRO	Locking Outlet Strips, Vertical Mount
WartStrap	PlugLock WartStrap "Wall Wart" Retention Kit

Power Conditioning & Distribution

PQ-3 Reissue	Parametric Equalizer, Instrument Preamp
PQ-4	Parametric Equalizer, 4 band
Q-151, Q-152	Dual 15-Band Graphic Equalizer
Q-301, Q-302	30-Band Graphic Equalizer
Q-602	Dual 30-Band Graphic Equalizer
Q-541	Quad 5-band Stereo Graphic EQ
PUNCH-10	Bass Enhancement System
X-312	12 dB Crossover
X-324	2-Way/3-Way 24 dB Crossover
X-424	3-Way/4,5-Way 24 dB Crossover
X-524	4-Way 24 dB Crossover
C-132	Compressor/Limiter
LC-6	Stereo Compressor/Gate
QN-44	Quad Noise Gate
SP-20A	Stereo Half rack Power Amp, 20W per channel
HA-6A	Headphone/Monitor Amp
HR-2	Headphone Passive Remote Box
HDS-6	Headphone Distribution System
HR-6	Personal Headphone Mixer for use with HDS-6
PB-48	48-Point Patch Bay with TRS Connectors
PB-48D	48-Point Patch Bay with TRS and D-Sub Connectors
	(Full range of patch cords also available)
MM-3	Three Input Mic Mixer
MM-4A	4 x 1 Rack Mount Mixer
MM-8A	4 x 2 Rack Mount Mixer
DJM-6	DJ Production Mixer
DJM-8	DJ Production Mixer
SM-3	Stereo Mixer with Ducking
IP-8	Iso-Patch, Isolated Patch Bay, 8 Channel
IP-2, IP-2B	Iso-Patch, Dual Isolator, 2 Channel
VU-40	System Monitor (Power/VU Meter)
SC-1,2	Security Covers