

FURMAN

Metered Six Series



Owner's Manual



INTRODUCTION

Thank you for your purchase of a Furman Metered Six Power Conditioner, and congratulations on your choice. The Metered Six line of Power Conditioners offer many of the same features that have made Furman Power products preeminent within the music, broadcast, and contractor industries for decades. Now, many of our standard features such as triple stage surge suppression, retractable rack lights, over-under voltage shutdown, and multi stage RFI/EMI filtering, are available with laboratory quality Digital Voltage and True RMS Current meters.

Your Metered Six unit provides comprehensive protection from power line-related transient voltages

and noise, while the 20 amp capable PRO units provide additional protection from wiring faults common to remote power, theaters, convention centers, and AC generators. The Metered Six's fast-acting suppression circuit responds in less than a nanosecond, clamping transient voltages to safe levels. The RFI/EMI filter works to prevent the noises generated by fluorescent lights, lighting dimmers, radio transmitters, and electrical appliances from contaminating the AC line and from there, leaking into sensitive audio, video, or computer circuits.

SAFETY INFORMATION

To obtain best results from your Furman Metered Six 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. Other than the light bulbs, there are no user serviceable parts inside. Refer servicing to qualified personnel only.

The lightning flash with an arrowhead symbol, (within an equilateral triangle) 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 Metered Six unit. Retain these instructions for future reference.
2. Your Metered Six 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 Metered Six unit near heat sources such as radiators, heat registers, stoves, or other appliances that produce heat.
4. The PL-PROD, PL-PRODM, and PM-PRO should only be connected to a 120 VAC, 60Hz, 20 amp grounded electrical outlet. Outlets wired for 20 amps, may be identified by the T-shaped socket opening that accept the perpendicular blades of the PRO unit's power plug. If you don't have a 20-amp outlet, have one installed by a qualified electrician. Do not defeat the ground or change polarization of the power plug.
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 Metered Six unit. To prevent risk of fire or injury, damaged cords and cables should be replaced immediately.
6. Clean your Metered Six unit with a damp cloth only. Do not use solvents or abrasive cleaners. Never pour liquid on or into the unit.
7. Your Metered Six 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 or exhibits a marked change in performance.
 - The unit has been dropped, or the enclosure damaged.
8. Your Metered Six 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. Light bulbs are the only user-serviceable parts in the PL-PLUSD, PL-PLUSDM, PL-PROD, and PL-PRODM. Instructions for replacing them are on page/s 4, 5, 6, and 7. The light tubes and end caps become quite warm to the touch in normal operation. To avoid burning your fingers, allow the cap to cool completely before unscrewing it. If you find that the heat from the tubes is excessive, reduce the dimmer knob setting.
10. Do not attempt to service your Metered Six unit beyond what is described in this manual. All other servicing should be referred to qualified service personnel.

PL-PLUSD PL-PLUSDM PM-8DM

FEATURES

The PL-PLUSD features an advanced digital voltage meter, while the PL-PLUSDM and PM-8DM provide a laboratory grade True RMS digital voltage and current meter. Both meters are located at the center-front panel of their respective units.

A 15 amp circuit breaker is mounted on the front panel, allowing quick, convenient power restoration. Simply pushing the square center tab into the front bezel will re-activate the breaker after an excessive current load has tripped it.

The rear panel contains eight switched AC outlets to power your equipment, (4 for analog equipment and 4 with additional filtering for digital – computer components, see below). These AC outlets are spaced to accommodate up to four plug-mounted power supplies (“wall warts”).

Power is delivered to the unit by a heavy duty 14 AWG AC cord, 10 feet (2.4 m) in length for extra reach and durability on stages and other high-traffic areas.

OPERATION

Retractable Rack Lights and Dimmer Control: The PL-PLUSD and PL-PLUSDM 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.

Light Tubes and Bulb Replacement: The PL-PLUSD and PL-PLUSDM feature the familiar slide-out rack lights pioneered by Furman. These units' lamps come supplied with five-watt night light bulbs. Replacements are available at most hardware stores, and may be purchased from Furman Sound service as well.

BULB REPLACEMENT

Bulbs are easily replaced without removing the unit from the rack.

Here's How: First, pull the light tube(s) all the way out. Unscrew the cap on the end of each tube to get access to the bulb. (Be careful not to push the tubes in after you have removed the caps.) To unscrew the bulb, place your index finger across the hole on the underside of the tube and in contact with the bulb. Use the ball of your finger to rotate the bulb out of its socket. Then remove the bulb from the front of the light tube. Put a new bulb in the tube, rotate it with your finger from the hole in the bottom of the tube and replace the light tube cap(s).

NOTE: The caps and light tubes become quite warm to the touch in normal operation. To avoid burning your fingers, allow the cap to cool completely before unscrewing it. If you find that the heat from the tubes is excessive, try reducing the dimmer knob setting. As an alternative, you may substitute four-watt bulbs or even colored Christmas tree bulbs.

The Tape Trick: In cases where the bulb is still warm, or too tight to unfasten with your fingers, a piece of duct or gaffers tape about 2 inches square can aid in the bulb removal. Simply pinch about a quarter inch of the center portion of tape together, and place the remaining portion of the adhesive backing on the exposed portion



of the bulb. The pinched center section allows some leverage for unscrewing of the bulb, and the tape provides some insulation from the heat.

OPERATION CON'T

Digital Voltmeter: The PL-PLUSD's digital voltmeter continuously measures incoming AC voltages with extraordinary accuracy (+/- 1VAC). The meter reads from 45 to 141 volts in 1-volt steps.

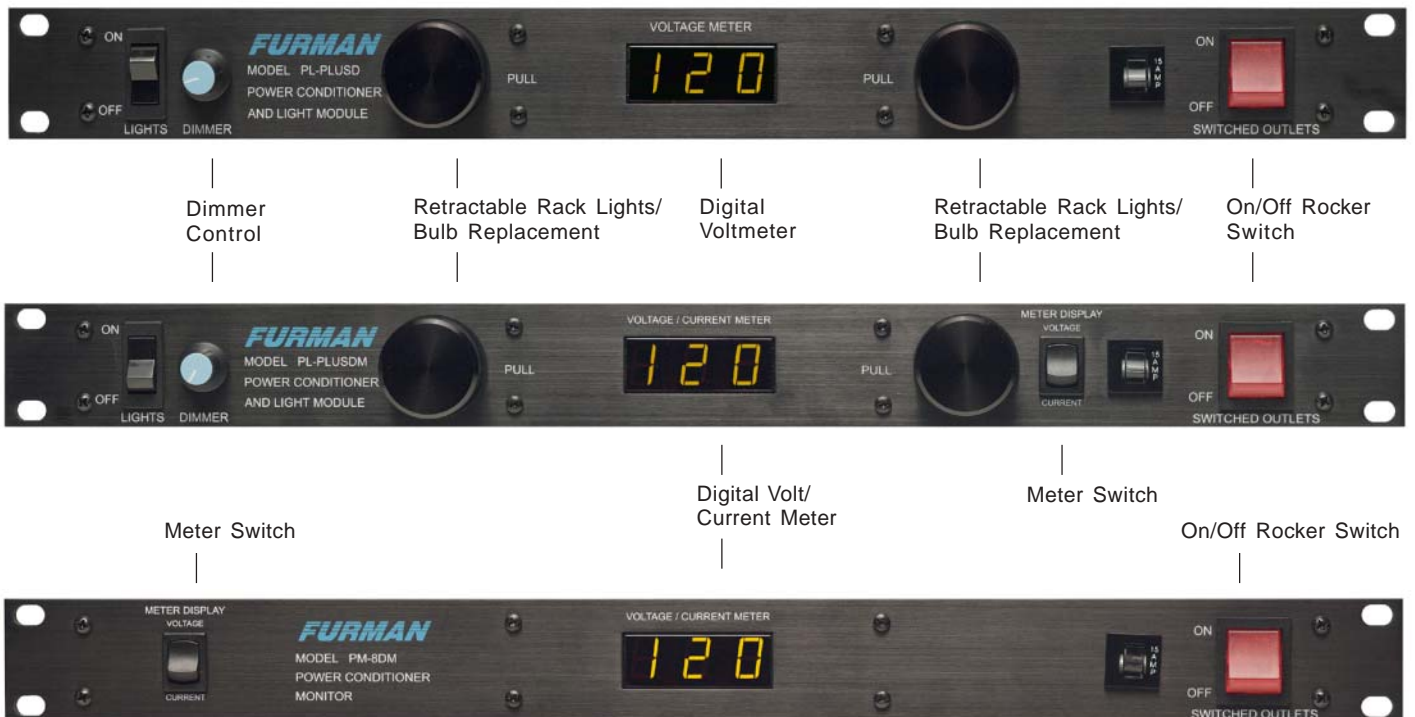
Digital Volt / Current Meter and Meter Switch: The PL-PLUSDM and PM-8DM True R.M.S. digital volt / current meter continuously measures incoming AC voltages with laboratory accuracy (+/- 1VAC). The meter reads from 45 to 141 volts in 1-volt steps. Additionally, when their meter switch is set in the current mode, it will measure the full AC load circulating through either the PL-PLUSDM, or PM-8DM, (+/- 0.1Amp). Because of the True RMS circuitry employed, variable AC line distortions will not affect the accuracy of either measurement.

NOTE: The PL-PLUSD, PL-PLUSDM, and PM-8DM 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 placed by many Power Amplifiers. Additionally, the semi-transparent rocker lights when switched to the "ON" position.

TROUBLE SHOOTING GUIDE

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 Metered Six unit, and push the square re-set tab into the Circuit breaker bezel.
Symptom:	No power to the AC outlets, even after the Circuit breaker has been re-set.
Possible Cause:	Protection devices are damaged.
Action Needed:	Factory service.



PL-PROD PL-PRODM PM-PRODM

The PL-PROD features an advanced digital voltage meter, while the PL-PRODM and PM-PRODM provide a laboratory grade True RMS digital voltage and current meter. Both meters are located at the center-front panel of their respective units.

The front panel also provides a switched convenience outlet (clean, filtered power is provided at this outlet as well).

A premium quality 20 amp magnetic circuit breaker functions as the units ON/OFF switch, located on the far right. To prevent accidental loss of AC power, this circuit breaker switch has a polymer shield with a “snap-in” hinged cover. Simply pull the cover out when you wish to set the switch to the ON or OFF position.

The rear panel contains eight switched AC outlets to power your equipment, (4 for analog equipment and 4 with additional filtering for digital – computer components, see below). These AC outlets are spaced to accommodate up to four plug-mounted power supplies (“wall warts”).

Power is delivered to the unit by a heavy duty 12 AWG AC cord, 10 feet (2.4 m) in length for extra reach and durability on stages and other high-traffic areas.

Additionally, these units feature three status LED’s to indicate abnormal power conditions. Under extreme conditions, these units will even keep themselves from turning on if the voltage is below 90VAC or above 140VAC. During operation, the unit will automatically shut down if the voltage rises above 140 volts.

OPERATION

Retractable Rack Lights and Dimmer Control: The PL-PROD and PL-PRODM utilize a dimmer control for the two retractable front panel light tubes. These light tubes automatically turn off when fully pushed into the front panel (a feature exclusive to Furman). The dimmer knob controls the brightness of both light fixtures. Turn it clockwise to increase brightness; turn it counterclockwise to decrease brightness.

Light Tubes and Bulb Replacement: The PL-PROD and PL-PRODM feature the familiar slide-out rack lights pioneered by Furman. These units’ lamps come supplied with five-watt night light bulbs. Replacements are available at most hardware stores or almost anywhere household light bulbs are sold.

BULB REPLACEMENT

Bulbs are easily replaced without removing the unit from the rack.

Here’s How: First, pull the light tube(s) all the way out. Unscrew the cap on the end of each tube to get access to the bulb. (Be careful not to push the tubes in after you have removed the caps.) To unscrew the



bulb, place your index finger across the hole on the underside of the tube and in contact with the bulb. Use the ball of your finger to rotate the bulb out of its socket. Then remove the bulb from the front of the light tube. Put a new bulb in the tube, rotate it with your finger from the hole in the bottom of the tube and replace the light tube cap(s).

NOTE: The caps and light tubes become quite warm to the touch in normal operation. To avoid burning your fingers, allow the cap to cool completely before unscrewing it. If you find that the heat from the tubes is excessive, try reducing the setting of the dimmer knob. As an alternative, you may substitute four-watt bulbs or even colored Christmas tree bulbs.

The Tape Trick: In cases where the bulb is still warm, or too tight to unfasten with your fingers, a piece of duct or gaffers tape about 2 inches square can aid in the bulb removal. Simply pinch about a quarter inch of the center portion of tape together, and place the remaining portion of the adhesive backing on the exposed portion of the bulb. The pinched center section allows some leverage for unscrewing of the bulb, and the tape provide some insulation from the heat.

OPERATION CON'T

Extreme Voltage Shutdown Indicator: This LED is normally off. It monitors a hazard unfortunately common in the entertainment industry: wiring faults – for example, accidental connection to 220VAC where 120VAC is expected. The PL-PROD, PL-PRODM, and PM-PRODM sense voltages that are so high or low that operation would be impossible and shuts the power down before damage can occur. The cutoff voltages are under 90V or over 140V. Upon initially applying power to these units, the Extreme Voltage indicator LED will be lit if the input voltage is above the high 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 140V, 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.

While all Metered Six products provide superior protection from voltage surges and noise, the three PRO models (PL-PROD, PL-PRODM, PM-PRODM)



feature the greatest level of protection available. These units include multiple 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 attenuate audible high frequency noise. All PRO models feature precise high-inrush magnetic circuit breakers, virtually eliminating the false tripping often encountered with large reactive loads like power amps.

Protection OK Indicator: This LED is normally lit when the PL-PROD, PL-PRODM, or PM-PRODM's are 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 unit'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 Indicator: This LED is normally on when the power to the PL-PROD, PL-PRODM, or PM-PRODM's outlets are 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 unit is either improperly grounded, or the AC source has its Line and Neutral wiring reversed. Unplug the AC cord and correct the ground or AC service.

Digital Voltmeter: The PL-PROD's digital voltmeter continuously measures incoming AC voltages with extraordinary accuracy (+/- 1VAC). The meter reads from 45 to 141 volts in 1-volt steps.

Digital Volt / Current Meter and Meter Switch: The PL-PRODM and PM-PRODM True R.M.S. digital volt / current meter continuously measures incoming AC voltages with laboratory accuracy (+/- 1VAC). The meter reads from 45 to 141 volts in 1-volt steps. Additionally, when their meter switch is set in the current mode, it will measure the full AC load circulating through either the PL-PRODM, or PM-PRODM, (+/- 0.1Amp). Because of the True RMS circuitry employed, variable AC line distortions will not affect the accuracy of either measurement.

NOTE: The PL-PROD, PL-PRODM, and PM-PRODM 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.

Switched Outlet (front panel): This convenience outlet provides conditioned power when the unit is plugged in and the circuit breaker is switched to the ON position.

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 tripped falsely by the transient high inrush currents often encountered when turning on large reactive loads like power amps. Its trip point is unaffected by ambient temperature. If it trips, reduce the unit's load by removing one piece of equipment, then switch it back to the ON position.

TROUBLE SHOOTING GUIDE

The PL-PROD, PL-PRODM, and PM-PRODM's status LEDs will inform you of abnormal conditions at a glance:

Symptom: PROTECTION OK indicator not lit.

Possible Cause: Protection devices are damaged.

Action Needed: Factory service.

Symptom: GROUND OK indicator not lit.

Possible Cause: Either no building ground, or reversed Line and Neutral wiring at the outlet.

Action Needed: Locate a properly wired, grounded outlet.

Symptom: EXTREME VOLTAGE indicator lit.

Possible Cause: Input voltage is above 140 volts, causing power to the unit's outlets to be shut down. Additionally, if the voltage is below 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.

PL-PLUSD PL-PLUSDM PM-8DM

SPECIFICATIONS

Current rating:	15 amps, 1800 watts at 120 VAC
Input Voltage:	0 to 135 VAC without damage
Meter Accuracy:	Voltmeter: +/- 1VAC; Ammeter: +/- 0.1 amps
Spike Protection Modes:	Line to Neutral, Neutral to Ground, Line to Ground
Clamping Voltage, all modes:	Initial turn-on at 200 volts; TVSS rating of 400 volts peak at 500 amps, L-N, N-G, L-G (tested to UL-1449)
Response time:	1 nanosecond
Maximum surge current:	6,500 amps
Maximum spike energy:	80 joules per mode; 240 joules total
Noise attenuation:	Differential mode: Greater than 40 dB; Common mode: greater than 60 dB; Both 1 to 200 MHz
Mechanical:	
Dimensions:	1.75" H x 19" W x 8" D.
Weight:	6 lbs (2.7 kg).
Construction:	Steel chassis, zinc chromate plating; .125" brushed and black anodized aluminum front panel; glass epoxy circuit boards.
Power consumption:	12 watts
Safety Information:	The PL-PLUSD, PL-PLUSDM, and PM-8DM are N.R.T.L.-C listed.

PL-PROD PL-PRODM PM-PRODM

SPECIFICATIONS

Current rating:	20 amps, 2400 watts at 120 VAC
Input Voltage Range:	0 to 250 VAC without damage
Meter Accuracy:	Voltmeter: +/- 1VAC; Ammeter: +/- 0.1 amps
Spike Protection Modes:	Line to Neutral, Neutral to Ground, Line to Ground
Clamping Voltage, all modes:	Initial turn-on at 200 volts; TVSS rating 400V peak at 500 amps, L-N, L-G, N-G, (tested to UL1449) (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 10" (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:	12 watts
Safety Information:	The PL-PROD, PL-PRODM, and PM-PRODM are N.R.T.L.-C listed.

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 any product 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 entire Metered Six Line will absorb the excess voltage invisibly and harmlessly. However, if lightning strikes the actual building where one of these units is installed (or somewhere very nearby), some damage may be unavoidable due to the extremely high voltage and current present. If this does occur, the damage is usually limited to the Metered Six unit itself, and will affect only certain spike suppression components (called varistors or MOV's). In this "suicide" mode, the unit 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 Electrical Code.

Any Metered Six unit 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 any Power Conditioner, Regulator, or Surge Suppression product as the sole means of protection 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.

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.

LIMITED WARRANTY

Furman Sound Inc. , warrants this product against failures due to defective parts or faulty workmanship. The original owner is eligible for a three year limited warranty if registration is mailed within 30 days of purchase. Otherwise this product carries a one year warranty. During this period, Furman Sound will make any necessary repairs without charge for parts or labor.

FURMAN SOUND INC. MAKES NO FURTHER REPRESENTATION, EXPRESS OR IMPLIED, REGARDING THIS PRODUCT. WE EXPRESSLY DISCLAIM ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. FURTHERMORE, FURMAN SOUND, INC. SHALL NOT BE LIABLE FOR ANY DIRECT, INDIRECT OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, DAMAGES ASSOCIATED WITH LOST REVENUE, LOST PROFITS, BUSINESS INTERRUPTION, AND SO FORTH) ARISING FROM THE USE OF OR MISUSE RELATED TO ANY PRODUCT PURCHASED FROM FURMAN SOUND.

This warranty may be cancelled by Furman Sound Inc. at its sole discretion, if the unit has been subjected to physical abuse or has been modified in any way without written authorization from Furman Sound. Furman Sound's liability under this warranty is limited to repair of the defective unit. 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. 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 by any company or individual other than the Furman factory or one of its Authorized Repair Stations.

All equipment being returned for repair must have a Return Authorization (R/A) Number. To get an R/A number, please call the Furman Service Department at (707) 763-1010 ext 121, between the hours of 8:00 am and 5:00 pm US Pacific Time. When returning equipment for repair, please use the original packaging to ship the product. Also, please enclose a note giving your name, address, phone number, e-mail address, and a description of the problem. Please display your R/A Number prominently on the front of all packages.

No problem found, (NPF), is subject to a fifty dollar bench charge. To avoid this charge please make certain that the person who contacts our Customer Service Department is familiar with the equipment and problem.

OTHER FURMAN PRODUCTS

Please contact us by phone, fax or e-mail for a free copy of our latest color catalog.

FURMAN

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Designed and engineered in the U.S.A. - Manufactured in China.