

MAX® 5400-EX Owner's Guide

LEVEL 5 EMI/RFI Noise Filtration with Isolation Between Outlet Banks:

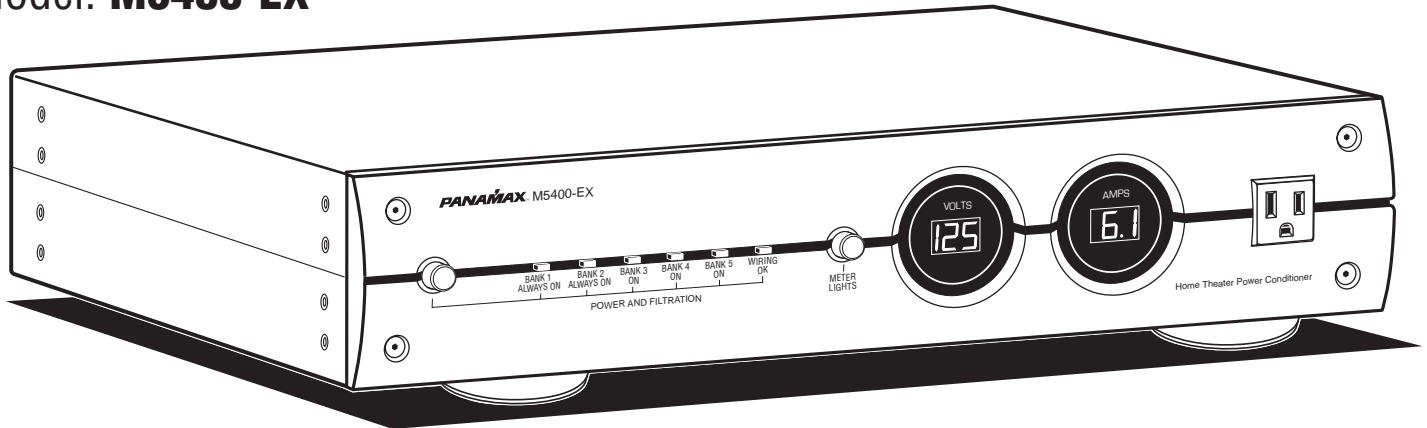
Your audio/video components are constantly being bombarded by electromagnetic interference (EMI) and radio frequency interference (RFI) through their power cords. This contaminated power can affect audio/video equipment

and will degrade the overall performance of your entire system. Common symptoms of contaminated power include pops, hisses, hums and visual artifacts.

The MAX 5400-EX is designed to filter this noise, supply clean power to your system and provide noise isolation between the outlet banks so that any noise created by an A/V com-

ponent can not contaminate the power going to equipment plugged into the other outlet banks.

Model: M5400-EX



Key Features

Sequential Startup/Shutdown:

Complex audio/video systems may be susceptible to voltage transients generated internally at start-up/shutdown if all of the equipment is powered on or off at the same time. This can cause speaker "thumps" which are not only annoying but can also damage the speakers. The MAX® 5400-EX is designed to eliminate these transients by providing a "start-up" delay for the High-Current outlets and a "shutdown" delay for the Switched Outlet Bank. This allows the components plugged into the Switched Outlet Bank to power-up and stabilize before any amplifiers and powered sub-woofers are turned on. This sequence is reversed during shutdown. The amplifiers and powered sub-woofers turn off, their power supplies drain, and then the equipment plugged into the Switched Outlet Bank is turned off.

Voltage Sense Trigger:

This feature provides an ON/OFF trigger for the MAX® 5400-EX using a Direct Current voltage signal. Many components such as pre-amplifiers and receivers have a DC trigger built in, and will transmit a constant power signal when turned on and in use. The presence of this power signal will turn on the MAX® 5400-EX's switched outlets. When the source component is turned off, the voltage trigger signal is also turned off and the MAX® 5400-EX's shutdown sequence is initiated. An AC Adapter of the appropriate voltage, plugged into a switched outlet, may also be used if a DC trigger is not built in.

The MAX® 5400-EX voltage sense trigger input uses a standard 3.5mm (1/8") mini-plug jack. This jack has an electrically isolated switch built in. If nothing is inserted into the input jack, the voltage sense is bypassed and the Power Button on the front panel has sole control of the startup/shutdown sequence. If a plug is inserted into the input jack, the front panel switch is bypassed and the voltage sense becomes the startup/shutdown trigger. **IMPORTANT, Please Note: The unit needs to be plugged in, and in the powered OFF state before inserting the DC input trigger mini-plug.**

A trigger output is also provided on this model. When a DC trigger is connected to the MAX® 5400-EX's Voltage Sense input, the input signal can be passed through the output jack to control the startup/shutdown of an additional device. There is a 10 second delay between when the MAX® 5400-EX receives the input signal and when it is output to the next device.

Automatic Over & Under Voltage Protection:

Panamax's patent pending power monitoring circuitry constantly monitors the AC line voltage for unsafe voltage conditions such as prolonged over-voltages and under-voltages (brownouts). These unsafe conditions pose a very dangerous threat to all electronic equipment within the home. If the MAX® 5400-EX senses an unsafe power condition, it will automatically **disconnect** your equipment from the power to protect equipment from damage. Once the voltage returns to a safe level, the MAX® 5400-EX will automatically **reconnect** the power.

Protect or Disconnect AC Surge Protection:

When the MAX® 5400-EX is subjected to a high voltage surge, its voltage output is limited to a safe level and the high levels of surge current are diverted away from the connected equipment.

- When subjected to a 6,000V (open circuit voltage) / 500A (short circuit current) surge, the MAX® 5400-EX limits its voltage output to less than 330V peak, UL's best rating. The MAX® 5400-EX will withstand, without damage, 20,000A surges, far exceeding the UL requirement of only 3000 Ampere surges.

- If the magnitude of the surge is greater than the capacity of the surge protection components, the MAX® 5400-EX's Protect or Disconnect Circuitry will disconnect your equipment in order to protect it. The MAX® 5400-EX will need to be repaired or replaced by Panamax if this occurs.

Application Specific Coaxial Signal Line Protection:

Panamax's exclusive SignalPerfect™ Technology provides application specific protection for your satellite and cable TV equipment. Two lines of protection are provided for each type. The satellite connection is for a coaxial cable connected to a DBS (single or dual LNB) satellite dish. The antenna connection is for a non-amplified off-air antenna or cable TV line.

The protection circuitry has been optimized for each application and is not interchangeable. The jacks are not labeled In and Out. The circuitry is bidirectional in both signal transmission and protection capabilities, making it compatible with the latest digital cable and satellite technologies.

Cable TV (Including HDTV) – TV tuners operate at approximately 10 millivolts (0.01 V) and utilize the frequency spectrum up to 950 MHz. The clamping level of the MAX® 5400-EX's cable TV protection circuitry is 1400 millivolts (1.4 volts). That's less than 1 volt above normal operating levels. The circuitry is also shielded to prevent interference.

Satellite TV - Satellite dish LNB's can require up to 24 volts to operate and utilize the frequency range of 950 MHz to 2.2 GHz. The clamping level of the MAX® 5400-EX's satellite protection circuitry is 25 volts - just 1 volt above the maximum operating voltage. The circuitry is also shielded to prevent interference.

Telephone Line Protection:

Digital video recorders and satellite TV receivers require a telephone line connection for TV show scheduling and/or Pay-Per-View services. The MAX® 5400-EX also provides surge protection for this line. One pair of RJ-11 telephone jacks is provided for this. The circuitry utilizes auto-resetting PTCRs and solid-state SIDACTors™ for reliability and unsurpassed protection. The clamping level of the MAX 5400-EX's telephone protector is 260 volts. This will allow typical ring voltage (90-130VAC) and operating battery voltage (-48DC) to pass through the circuit and still protect the modem in your satellite receiver from damage.

The Power Specialists Since 1975

PANAMAX

INS0787E Rev A 5/05

M5400 -EX Front Panel Features

Power Button

Press and hold for 2 seconds to turn Outlet Banks 3, 4 and 5 ON or OFF. This switch is bypassed if the rear panel DC Trigger input is being used.

Power LEDs

Indicates the status of the rear panel outlets. LEDs for each outlet bank will be lit when the outlets are turned ON. They will flash during the start-up and shutdown process.

Wiring OK LED

Normally On. Indicates that the wall outlet is properly grounded and Line/Neutral polarity is correct.

Meter Dimmer

Pushbutton control for meter LED brightness. Cycles between Off, Low, Medium and High.

Voltmeter

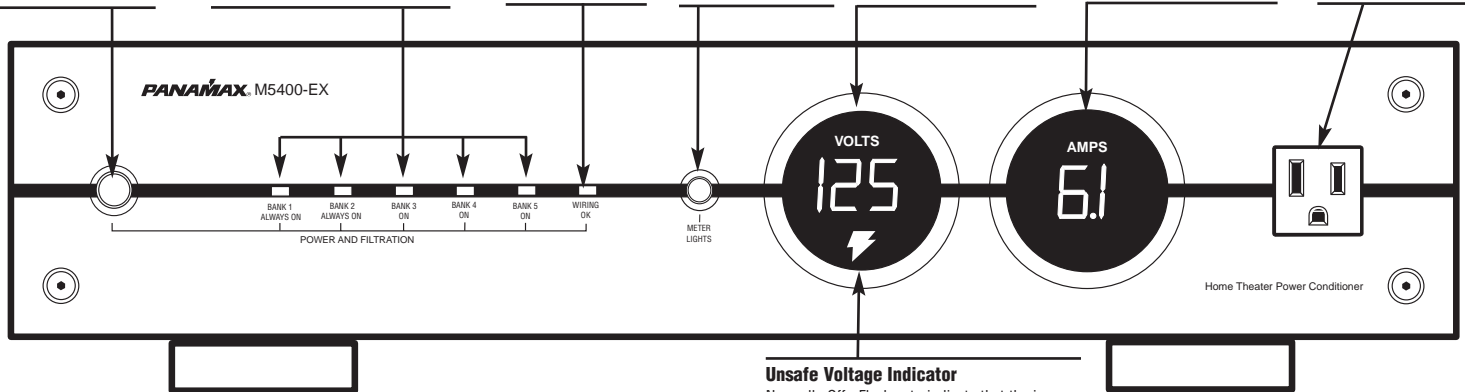
Digital LED voltmeter indicates incoming line voltages between 90-140VAC.

Ammeter

Shows the actual current draw (0-15A) of all your connected components, giving a visual reference as to how your system is functioning under a variety of conditions.

Convenience Outlet

Provides a quick convenient way to plug in components such as camcorders and video game systems.



Unsafe Voltage Indicator

Normally Off. Flashes to indicate that the incoming line voltage is unsafe and the unit has disconnected the power to protect your equipment.

M5400 -EX Back Panel Connection Features

Circuit Breaker

Automatically opens when the current load is greater than 15 Amps. Push to reset.

Outlet Banks 3 & 4

Two switched outlets per bank. ON/OFF status is controlled by the front panel Power Button or the DC Trigger input. They will turn on immediately and turn off after 10 seconds. EMI/RFI noise filtration is provided by the Isolation Transformer in conjunction with a three-stage balanced Pi filter. Banks 3 and 4 are noise isolated from each other as well as all other outlet banks.

Outlet Banks 1 & 2

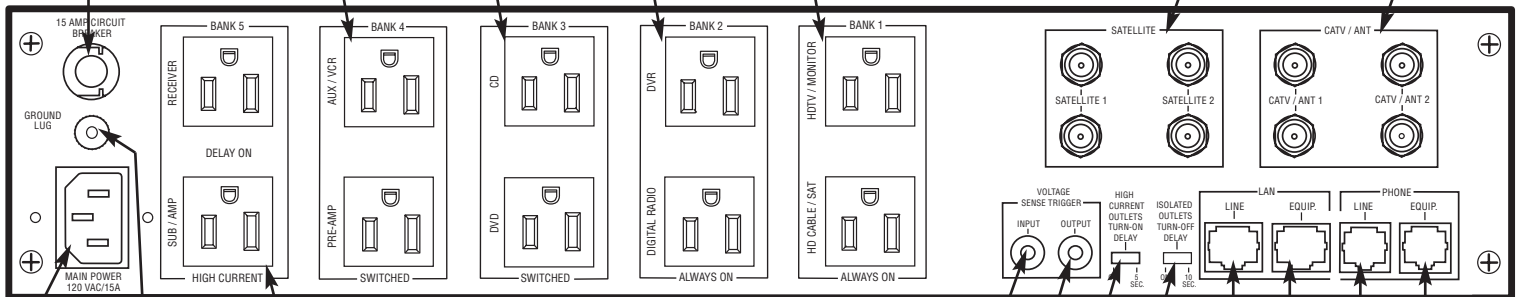
Two always on outlets per bank. Power will only be turned off under a fault condition. (See specifications for over-voltage and under-voltage thresholds) Power for each bank is cleaned by a four-stage balanced Pi filter. Banks 1 and 2 are noise isolated from each other as well as all other outlet banks.

Satellite TV Coax Jacks

Bidirectional protection circuit optimized for satellite TV signal lines. Do not use for cable TV off-air antennas and cable modems.

Cable TV Coax Jacks

Bidirectional protection circuit optimized for cable TV, off-air antennas and cable modem signal lines. Do not use for Satellite TV.



Main Power

Must be plugged into a properly wired & grounded 3-wire outlet

Ground Lug

Provides a common grounding point for equipment with separate ground leads.

Outlet Bank 5

Two switched, high current outlets controlled by the front panel Power Button or the DC Trigger input. Bank 5 has a 5 second turn on delay and turns off immediately. The High Current outlets provide power from a low impedance noise filtration circuit that does not limit the current to your equipment. Its output is noise isolated from all of the other outlet banks.

Voltage Sense Trigger Input

3.5mm (1/8") Mini-Plug jack. Connect to a remote trigger device that uses a DC output to trigger a startup/shutdown sequence. This bypasses the front panel power switch. **Important, Please Note:** The unit needs to be plugged in, and in the powered OFF state before inserting the DC input trigger mini-plug.

Voltage Sense Trigger Output

3.5mm (1/8") Mini-Plug jack. Connecting a trigger wire to the Voltage Sense Output jack will allow the input signal to pass through the MAX@ 5400-EX to control the startup/shutdown of an additional device.

High Current Outlets Delay Switch For Outlet Bank 5

Allows the outlet bank to be set as "Always ON" or with a 5 second turn-on delay

Switched Outlets Delay Switch For Outlet Banks 3 & 4

Allows the outlet banks to be set as "Always ON" or with a 5 second turn-off delay

LAN Jacks

Protection circuits for 10/100 baseT Ethernet lines. Incoming LAN line **MUST** be plugged into the LINE jack. Patch cord to the equipment **MUST** be plugged into the EQUIP jacks.

Phone Jacks

Protection circuits for standard telephone or pay-per-view lines. Phone circuit is auto-resetting. Incoming phone cord **MUST** be plugged into the LINE jack. Patch cords to the equipment (satellite receiver, digital video recorder, telephone, etc.) **MUST** be plugged into the EQUIP jacks.

Note to CATV Installers:

This reminder is provided to call attention to Article 820-40 of the NEC. That article provides specific guidelines for proper grounding. It specifies that the cable ground shall be connected to the grounding system of the building and as close to the point of entry as practical.

M5400-EX Specifications

AC Power

Line Voltage:	120V, 60Hz
Total Current Capacity:	15 A
UL1449 Suppression Rating:	330V
Protection Modes:	L-N, L-G, N-G
Initial Clamping Level:	200V
Energy Dissipation:	1815 Joules
Peak Impulse Current:	73,000 Amps
Catastrophic Surge Circuit:	Yes
Thermal Fusing:	Yes
Over-voltage shutoff:	142 VAC \pm 5 VAC
Under-voltage shutoff:	90 VAC \pm 3 VAC
EMI/RFI Noise Filtration	
Banks 1 - 4:	100 db, 100 KHz – 2 MHz
Bank 5, High Current Outlets:	60 db, 100 KHz – 2 MHz

DC Trigger Input

Jacks:	3.5mm (1/8") mini-plug
Voltage and Polarity:	3 - 24V DC, bidirectional
Current Requirement:	4.6 mA @3V, 58 mA @24V

DC Trigger Output

Voltage:	<15V
Current:	<500 mA
Short-circuit protection:	Yes
Delay on output:	10 seconds

LAN Circuit

Clamping Level:	.8V \pm 2V
Jacks:	RJ-45
Wires Protected:	4-Wires, Pins 1, 2, 3 & 6

Telephone Circuit

Fuseless/Auto-resetting:	Yes
Clamping Level:	260V
Capacitance:	30pf (approx.)
Suppression Modes:	Metallic & Longitudinal
Jacks:	RJ-11
Wires Protected:	2-Wire, Pins 4 & 5

Satellite TV Circuit

Bidirectional:	Yes
Shielded:	Yes
Clamping Level:	25V
Attenuation:	< 1db from 950MHz -2.05GHz < 2.4db @ 2.2GHz
Connections:	Female "F", Gold Plated

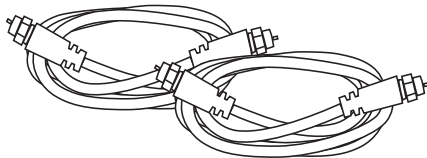
Cable TV Circuit

Bidirectional:	Yes
Shielded:	Yes
Clamping Level:	1.4V
Attenuation:	< 1db up to 950MHz
Connections:	Female "F", Gold Plated

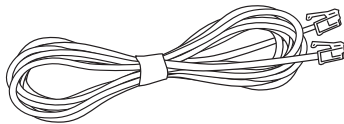
Specifications are subject to changes due to product upgrades and improvements.

Contents

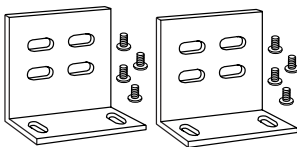
Two coaxial cables



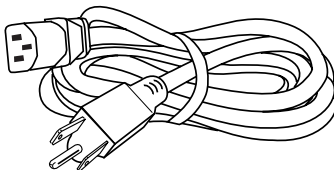
One telephone patch cord



Rack mount bracket kit



Power Cord



Product warranty (see back panel)

Contacting Panamax

Panamax
1690 Corporate Circle
Petaluma, CA 94954
Phone - 707-283-5900 or 800-472-5555
Fax - 707-283-5901
Web - www.panamax.com

Customer Relations

7:30 AM – 4:30 PM, M-F
Email - custrelations@panamax.com

The Power Specialists Since 1975
PANAMAX[®]

Panamax Power Conditioner Limited Product Warranty

Panamax warrants to the purchaser of this Panamax audio/video component style power conditioner, for a period of three (3) years from the date of purchase, that the unit shall be free of defects in design, material or workmanship, and Panamax will repair or replace any defective unit. For product replacement see "NOTIFICATION" below.

CAUTION

Audio/Video, computer and/or telephone system installations can be very complex systems, which consist of many interconnected compo-

nents. Due to the nature of electricity and surges, a single protector may not be able to completely protect complex installations. In those cases, a systemic approach using multiple protectors must be employed. Systemic protection requires professional design. AC power, satellite cables, CATV cables, telephone/network lines or any other signal lines entering the system that do not pass through this surge protector may render the Panamax Connected Equipment Protection Policy null and void. For additional information on how to protect your system, please contact Panamax

before connecting your equipment to the surge protector.

WARNING NOTICE

Panamax products purchased through the Internet do not carry a valid Product Warranty or Connected Equipment Protection Policy unless purchased from an Authorized Panamax Internet Dealer and the original factory serial numbers are intact (they must not have been removed, defaced or replaced in any way). Authorized Panamax Internet Dealers have sufficient expertise to insure warranty compliant

installations. For a list of Authorized Panamax Internet Dealers go to www.panamax.com

More detailed information is available at www.panamax.com

If you have any questions regarding these requirements, please contact Panamax Customer Relations

Panamax Power Conditioner Limited Connected Equipment Protection Warranty

Valid only in the United States and Canada.

It is the policy of Panamax that it will, at its election, either replace, pay to replace at fair market value, or pay to repair, up to the dollar amount specified below, equipment that is damaged by an AC power, cable, telephone, or lightning surge while connected to a properly installed Panamax power conditioner. Panamax must determine that the power conditioner shows signs of surge damage or is operating outside of design specifications, relative to its surge protection capability, and under all of the circumstances failed to protect your connected equipment.

M4300-EX:	\$5,000,000
M5300-EX:	\$5,000,000
M5510-Pro:	\$5,000,000
M4310:	\$5,000,000
M5400-EX:	\$5,000,000
ML4200:	\$5,000,000
M4400:	\$5,000,000
M5410:	\$5,000,000
M5100-EX:	\$5,000,000
M5500-EX:	\$5,000,000

THIS WARRANTY IS SUBJECT TO THE FOLLOWING CONDITIONS:

1. ORIGINAL OWNERSHIP REQUIREMENT:

Panamax's connected equipment policy extends to the original purchaser of the Panamax product only and is non-transferable. Original purchase receipts must accompany any product return or claim for connected equipment damage.

2. PROPER INSTALLATION:

Panamax AC protectors must be directly plugged into a properly grounded 3-wire AC outlet. Extension cords*, non-grounded two prong adapters, or other non-Panamax surge products must not be used. Building wiring and other connections to protected equipment must conform to applicable codes (NEC or CEC). No other ground wires or ground connections may be used. All wires (including, e.g., AC power lines, telephone lines, signal/data lines, coaxial cable, antenna lead-ins) leading into the protected equipment must first pass through a single Panamax protector designed for the particular application. The protector and the equipment to be protected must be indoors in a dry location, and in the same building. Panamax installation instructions and diagrams must be followed.

3. NOTIFICATION: You must notify Panamax within ten days of any event precipitating a request for product replacement or payment for connected equipment damage. A return merchandise authorization (RMA) number must first be obtained from the Panamax Customer Relations Department at www.panamax.com/support ** before returning the protector to Panamax. At this time, you must notify Panamax if you believe you have a claim for damaged connected equipment.

Once you obtain an RMA number, please mark the number on the bottom of the unit and pack it in a shipping carton/box with enough packing material to protect it during transit. The RMA number must also be clearly marked on the outside of the carton. Ship the unit to Panamax. Please note that you are responsible for any and all charges related to shipping the unit to Panamax.

If connected equipment damage was indicated on your RMA request, Panamax will mail you a claim kit to be completed and returned within 30 days. *A connection diagram of your system will be required as part of the claim kit. Be sure to note its configuration before disconnecting your equipment.*

4. DETERMINATION OF FAILURE:

Panamax will evaluate the protector for surge damage. The Panamax protector must show signs of surge damage or must be performing outside (>10%) of design specifications relative to its surge protection capability. Opening the enclosure, tampering with, or modifying the unit in any way shall be grounds for an automatic denial of your request for payment. Panamax, after evaluating all information provided, shall determine whether or not your request is eligible for payment.

If the surge protector shows no signs of AC power or signal line surge damage and is working within design specifications, Panamax will return the unit to you with a letter explaining the test results and notifying you of the rejection of your claim. Exceptions: If a dealer or installer replaces the protector for the customer, a replacement will be returned to the dealer or installer; or if the protector is a pre-1996 model, it will be replaced; or, for a Canadian customer, the protector will be replaced.

Panamax reserves the right to inspect the damaged connected equipment, parts, or circuit boards. Please note that you are responsible for any and all charges related to shipping the damaged equipment to Panamax. Panamax also reserves the right to inspect the customer's facility. Damaged equipment deemed uneconomical to repair must remain available for inspection by Panamax until the claim is finalized.

5. REQUEST PAYMENTS: Once Panamax has determined that you are entitled to compensation, Panamax will, at its election, either pay you the present fair market value of the damaged equipment, or pay for the cost of the repair, or send you replacement equipment, or pay the equivalence of replacement equipment.

6. OTHER INSURANCE/WARRANTIES: This coverage is secondary to any existing manufacturer's warranty, implied or expressed, or any insurance and/or service contract that may cover the loss.

7. EXCLUSIONS: THE PANAMAX CONNECTED EQUIPMENT PROTECTION POLICY DOES NOT APPLY TO: THE PANAMAX CONNECTED EQUIPMENT PROTECTION POLICY DOES NOT APPLY TO: Service charges, installation costs, reinstallation costs; setup cost; diagnostic charges; periodic checkups; routine maintenance; loss of use of the product; costs or expenses arising out of reprogramming or loss of programming and/or data; shipping charges or fees; service calls; loss or damage occasioned by fire, theft, flood, wind, accident, abuse or misuse, and products subject to manufacturer's recall or similar event.

8. DISPUTE RESOLUTION: Any controversy or claim arising out of or relating to Panamax's Connected Equipment Protection Policy, or the alleged breach thereof, shall be settled by arbitration administered by the American Arbitration Association under its Commercial Arbitration Rules. You may file for arbitration at any AAA location in the United States upon the payment of the applicable filing fee. The arbitration will be conducted before a single arbitrator, and will be limited solely to the dispute

or controversy between you and Panamax. The arbitration shall be held in any mutually agreed upon location in person, by telephone, or online. Any decision rendered in such arbitration proceedings will be final and binding on each of the parties, and judgment may be entered thereon in a court of competent jurisdiction. The arbitrator shall not award either party special, exemplary, consequential, punitive, incidental or indirect damages, or attorney's fees. The parties will share the costs of arbitration (including the arbitrator's fees, if any) in the proportion that the final award bears to the amount of the initial claim.

9. GENERAL: If you have any questions regarding the product warranty or the connected equipment protection warranty, please contact the Panamax Customer Relations Department at www.panamax.com/support. This warranty supersedes all previous warranties. THIS IS THE ONLY WARRANTY PROVIDED WITH THE PROTECTOR AND ANY OTHER IMPLIED OR EXPRESSED WARRANTIES ARE NON-EXISTENT. This warranty may not be modified except in writing, signed by an officer of the Panamax Corporation.

* The use of a Panamax extension cord or equivalent (UL or CSA listed, minimum 14AWG, 3-wire grounded) will not invalidate the warranty

** Forms are available on the Panamax web site for requesting RMAs and opening a claim for connected equipment damage.

Effective Date 06/05 Q01L0049 Rev. A

Product Upgrade Program

Valid only in the United States and Canada

If your Panamax power conditioner sacrifices itself while protecting your connected equipment, you have an option to upgrade to the latest technology. Please go to our web site www.panamax.com/rma or contact Panamax Customer Relations at **800-472-5555** for details.

The Power Specialists Since 1975

PANAMAX

www.panamax.com

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