

Power Management 101

Technology & Applications

Protecting Audio Video Systems
from Power Problems










FURMAN

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Advanced Audio Video Power Management Solutions

Power Management 101 - Technology and Applications

Problem: Electrical - AC Transient Spikes	Problem: Brownouts and Over-voltages	Problem: AC Line Noise	Problem: Unstable AC Voltage Conditions	Problem: AC Blackouts	Problem: Current Compression	Problem: AC Ground Noise
Definition and Cause Extremely brief increases in delivered AC voltage and current (spike). Caused by lighting (most severe) or, far more commonly, spikes caused by the utility substation and major appliances switching on and off.	Definition and Cause Brownouts are commonly caused by overuse on the grid or utilities temporarily cutting back on available power. Over voltages are commonly caused by wiring faults within a home, generators, or downed power lines.	Definition and Cause AC line distortion caused by radio frequency interference, electromagnetic interference, and signals induced into the AC line by electronic components and switch mode power supplies.	Definition and Cause Voltage consistently or intermittently outside of the "ideal" range. Caused by many factors, including: Utility adjustment for peak demand, faulty utility delivery, or large variances in load on grid.	Definition and Cause Short or extended interruptions in power (0 Volts delivery). Commonly caused by faults in transmission infrastructure or downed power lines in a storm or accident.	Definition and Cause Restricted or insufficient electrical current for power amplifier's power supplies. Instantaneous current is required to reproduce audio dynamics. When current is limited or "compressed" the amplifier's ability to fully reproduce dynamics is compromised.	Definition and Cause Buzzing - Vidoe Hum Bars Presence of circulating AC noise currents (ground loop). Caused by the voltage difference on two or more system component grounds when compared to the AC line or neutral.
Effect on A/V Equipment: Lightning can destroy an entire system with one strike. The multiple daily AC spikes slowly break down sensitive circuits, causing lockups, decreased performance, and premature equipment failure.	Effect on A/V Equipment: When subject to extended periods of voltage under 90V or over 140V, components can sustain permanent damage or fail completely.	Effect on A/V Equipment: Compromised picture and sound quality due to the masking of high definition audio/video signal. Higher levels manifest as audible clicks, pops, radio interference, or visual "snow".	Effect on A/V Equipment: AC Voltages outside the ideal range can cause component power supplies to overheat, while others will exhibit unreliable behaviour and compromised performance.	Effect on A/V Equipment: Failure of data storage (media hard drives), loss of data stored in volatile ("flash") memory. Failure of components that need a fan to cool after use (such as projectors).	Effect on A/V Equipment: Anemic, weak audio reproduction, even with premium components. Causes audio to sound muddy, losing definition, bass extension, and visceral impact.	Effect on A/V Equipment: Compromised picture and sound quality at low noise levels dues to masking of audio/video signals. Higher levels manifest as 60-cycle audible "hum" or rolling horizontal lines on video.
Solution:	Solution:	Solution:	Solution:	Solution:	Solution:	Solution:
Surge and Spike Protection	Extreme Voltage Protection	Linear Noise Filtration	AC Voltage Regulation	Battery Backup / UPS	Power Factor Technology	Symmetrically Balanced Isolated Power
						
System Benefit: Protection from small to catastrophic events, resulting in improved reliability, longevity and performance.	System Benefit: Maximized system life due to protection from extreme or catastrophic voltage events.	System Benefit: Increased audio and video performance, increased reliability of digital components.	System Benefit: Increased component reliability and longevity. <i>(note: the majority of residences do not need voltage regulation)</i>	System Benefit: Protection from data loss and increased longevity of components such as bulb-based projectors.	System Benefit: Amplification equipment can "tap" current reservoir when needed resulting in uncompromised audio reproduction.	System Benefit: The most comprehensive hum elimination and filtration solution available, resulting in maximum audio/video performance.
Avaiable in:	Avaiable in:	Avaiable in:	Avaiable in:	Avaiable in:	Avaiable in:	Avaiable in:
All Furman power management products.	All Furman power management products.	All Furman power management component products. Typically, superior filtration and additional isolation is found as you move up in price point.	Furman SPR-20i Furman F1000-UPS Furman F1500-UPS	Furman F1000-UPS Furman F1500-UPS	Furman Elite-15 PF i Furman Elite-20 PF i Furman IT-Reference 15i Furman IT-Reference 20i	Furman IT-Reference 15i Furman IT-Reference 20i



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For additional product information, please visit www.furmansound.co.nz

Furman Product Recommendation Guide

Premium Level Home Theater or Entertainment System	2 Channel / Audiophile / Dedicated Listening Room	Professional Level Dedicated Theater
		
Audio/Video Receiver (AVR)	Integrated Amp or Separates	Separates
Preferred Power Solutions	Premium Power Solutions	Premium Power Solutions
Component Class + UPS	Component / Reference + UPS	Reference Class + UPS
<p>Good</p> <p>Furman Elite-15 PF i</p> <p>Complete protection and Linear Filtration for improved picture and sound. Power Factor Technology lowers impedance for greater bass, audio definition, and impact from amps and subs.</p>	<p>Good</p> <p>Furman Elite-20 PF i</p> <p>Complete protection and Linear Filtration for improved picture and sound. Power Factor Technology lowers impedance for greater bass, audio definition, and impact from amps and subs. 20A capacity.</p>	<p>Better</p> <p>Furman IT-Reference 15i</p> <p>Complete protection and 100% isolated balanced power with Linear Filtration for uncompromised picture and sound. Power Factor Technology lowers impedance for greater bass, audio definition, and impact from amps and subs.</p> <p><small>(Note: Large systems may require multiple IT-Reference units due to current demands)</small></p>
<p>Better</p> <p>Furman Elite-20 PF i</p> <p>Step-Up Advantages over Elite-15 PF i:</p> <p>Increased current capacity (20A), higher level of filtration and power factor correction.</p>	<p>Better</p> <p>Furman IT-Reference 15I</p> <p>Step-Up Advantages over Elite-20 PF i:</p> <p>Symmetrically Balanced power and 100% isolation provide pristine performance for connected equipment.</p> <p><small>(Note: 15A capacity)</small></p>	<p>Best</p> <p>Furman IT-Reference 20i</p> <p>Step-Up Advantages over IT Reference 15i:</p> <p>Higher current capacity (20A). Greater filtration, isolation, and current reservoir yield highest level of picture and sound performance available.</p> <p><small>(Note: Large systems may require multiple IT-Reference units due to current demands)</small></p>
<p>Best</p> <p>Furman Elite-IT-Reference 15i</p> <p>Step-Up Advantages over Elite-20 PF i:</p> <p>Balanced power and 100% isolation provide pristine performance for connected equipment.</p> <p><small>(Note: 15A capacity)</small></p>	<p>Best</p> <p>Furman IT-Reference 20i</p> <p>Step-Up Advantages over IT-Reference 15i:</p> <p>Higher current capacity (20A). Greater filtration, isolation, and current reservoir yield highest level of picture and sound performance available.</p>	
For Complete Power Management, add:		For Complete Power Management, add:
Furman F1000		Furman F1500
Provides battery for game consoles, DVRs, and digital media devices.		Provides IP control and battery backup for media devices.
		<small>(Note: Large systems may require multiple UPS units due to current demands)</small>