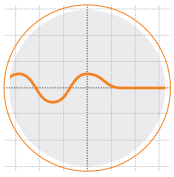
10 COMMON **POWER PROBLEMS**

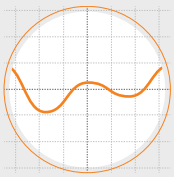
Power problems inside and outside the home can interfere with audio-visual signals, corrupt data files, damage electronics and even cause fires.

ARE YOU AT RISK?



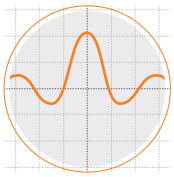
BLACKOUT

An AC blackout is a complete loss of power due to the absence of electricity. Also known as an outage, blackouts typically occur when there is a failure in the external power grid such as a downed line or blown transformer. Blackouts don't typically damage electronics during the power outage, but rather when the power is restored due to a sudden surge in voltage and intermittent power cycling that can overload circuits, motors, compressors and other sensitive components.



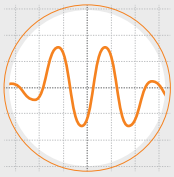
POWER SAG

A power sag is a brief drop in voltage often due to turning on or off large loads, short circuits in power lines and loose connections. Also known as a voltage dip, power sags are common when large, power-hungry devices such as air conditioners, power tools, vacuums, appliances and motors power on thereby reducing the normal power level by 10% or more. Unlike brownouts, power sags are usually brief in nature; however, their impact on electronics can still cause failures due to the erratic power flow.



POWER SURGE

A power surge is a sudden, brief spike in electrical voltage that exceeds normal power levels. Power surges are often caused by lightning strikes, power grid fluctuations, the powering on of large appliances or motors, and faulty wiring. Power surges can be catastrophic to electronics and other electrical devices, as the short burst of high electricity can overload their circuits. In extreme surge events any device connected to the power grid can experience damage including circuit failure and the combustion of metal and plastic components.



OVERVOLTAGE

Overvoltage is an increase in electrical voltage that exceeds normal power levels. Unlike a power surge which is a brief spike, overvoltage occurs on a longer basis and is often permanently present unless addressed in the power infrastructure or with conditioning equipment. A major cause of overvoltage is electromagnetic interference which induces unwanted voltage spikes on electronics. Switching power supplies, motors, high-speed electronics, appliances and lighting fixtures are common sources of interference, as are simple power lines with high current fluctuations.

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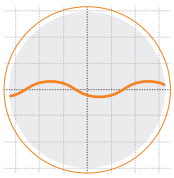
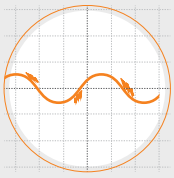


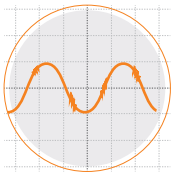
BROWNOUT

An AC brownout is a longer-term drop in voltage within an electrical power system. Brownouts are usually caused by the utility company reducing power during periods of peak energy usage, such as during extremely hot or cool weather. Brownouts are often indicated by dimming lights when the voltage drops, and this voltage reduction is what typically damages sensitive electronic circuits and, in extreme prolonged events, can even lead to electrical fires.



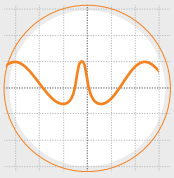
NORMAL MODE NOISE

Normal mode noise, also known as differential mode noise, is electrical noise that travels in opposite directions on a pair of wires and can distort electrical signals and affect electronic device performance. Normal mode noise is typically caused by poorly connected conductors, erratic noise in the power source or load components, improper ground currents or circuit imbalances. It's also a common problem with low-cost switching power supplies and unbalanced signal transmission lines.



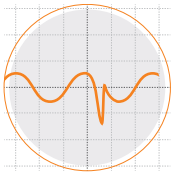
COMMON MODE NOISE

Unlike normal mode noise, common mode noise travels in the same direction on a pair of wires, often creating an uneven ground potential in the electrical system. Common mode noise tends to be more problematic than normal mode noise because it's harder to filter out and can more easily spread to other circuits. It's also a greater issue when dealing with long cable lengths and high-speed data signals.



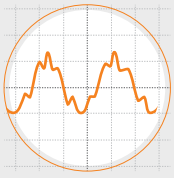
FREQUENCY VARIATION

Electrical frequency variations occur when there is an imbalance between the amount of electricity being generated and the actual demand for power, causing the alternating current to cycle at a faster or slower rate than normal. Frequency variations can cause flickering lights, motors to run slower or faster than specification, clocks to lose time and other electronic device and appliance failures. In extreme cases, excessive frequency variations will cause devices to operate inefficiently and generate excess heat, ultimately leading to expensive repairs and creating a fire risk.



SWITCHING TRANSIENT

A switching transient is a short-lived voltage or current fluctuation that occurs in an electrical circuit when there is a change in circuit conditions. Switching transients are typically brief periods of instability, such as when a light switch is turned on or off or when a breaker is opened or closed. Unlike a power surge, switching transients have oscillating wave forms and the power circuit typically quickly settles into a steady state. However, like a power surge, switching transients can cause damage to sensitive electronics, motors and even the power infrastructure itself creating a fire risk.



HARMONIC DISTORTION

Harmonic distortion occurs when the electrical voltage isn't a smooth wave but has added spikes and irregularities due to the presence of additional frequencies. They are often caused by devices that draw power in pulses rather than a smooth sine wave, such as computers, hard drives, servers and LED lights. Harmonic distortion can lead to the overheating of electronics, transformers, appliances and other devices with motors, ultimately leading to premature failure, data loss and expensive repairs.

Power optimization products from Future Ready Solutions and Xtreme Power Conversion address issues and ensure your investments are protected. Contact us to discuss our industry-leading range of whole-home and point-of-service solutions.

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