UPS Systems

PowerSentry

Delivering Dependability When You Need it Most

MITSUBISHI ELECTRIC

Mitsubishi Electric Automation, Inc.

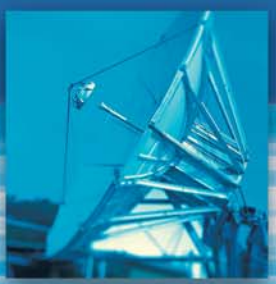
Discover the Many Facets of Mitsubishi Electric. The Power in Automation Solutions.

Overview

Mitsubishi Electric is the world's leading manufacturer of power quality solutions and is at the leading edge of technology and innovation in designing and manufacturing UPS systems. In today's digital economy where downtime is measured in dollars, Mitsubishi Electric delivers a wide range of the highest quality and most reliable Uninterruptible Power Supply (UPS) and Power Management Systems in the industry. Mitsubishi Electric's UPS systems insulate and protect critical applications from ALL power related problems. Wherever there exists recurring power problems that produce harm to critical computer systems or equipment that run or guide our airlines, trains, stock exchanges, banks, laboratories, diagnostic centers, or medical equipment, Mitsubishi Electric is present providing the utmost protection.

With over 80 years of innovation, in-depth knowledge of your applications, continuous technological advances, reliability and world-class services, Mitsubishi Electric is the clear choice to protect the world's most critical applications.




Mitsubishi Electric: A Brief History

Mitsubishi Electric was founded in Japan in 1921. From a humble beginning when we manufactured 10,000 electric fans in 1921, we are now a $27 billion company with over 116,000 employees worldwide. Mitsubishi Electric North America was founded in 1973 by Mitsubishi Electric Corporation to be the preeminent marketer of electronic technologies that revolutionize people's lives. Mitsubishi Electric is a recognized leader in the research, marketing, sales, engineering, and manufacturing of electrical and electronic equipment used in information processing and communications, consumer electronics, industrial technology, energy, transportation and construction.

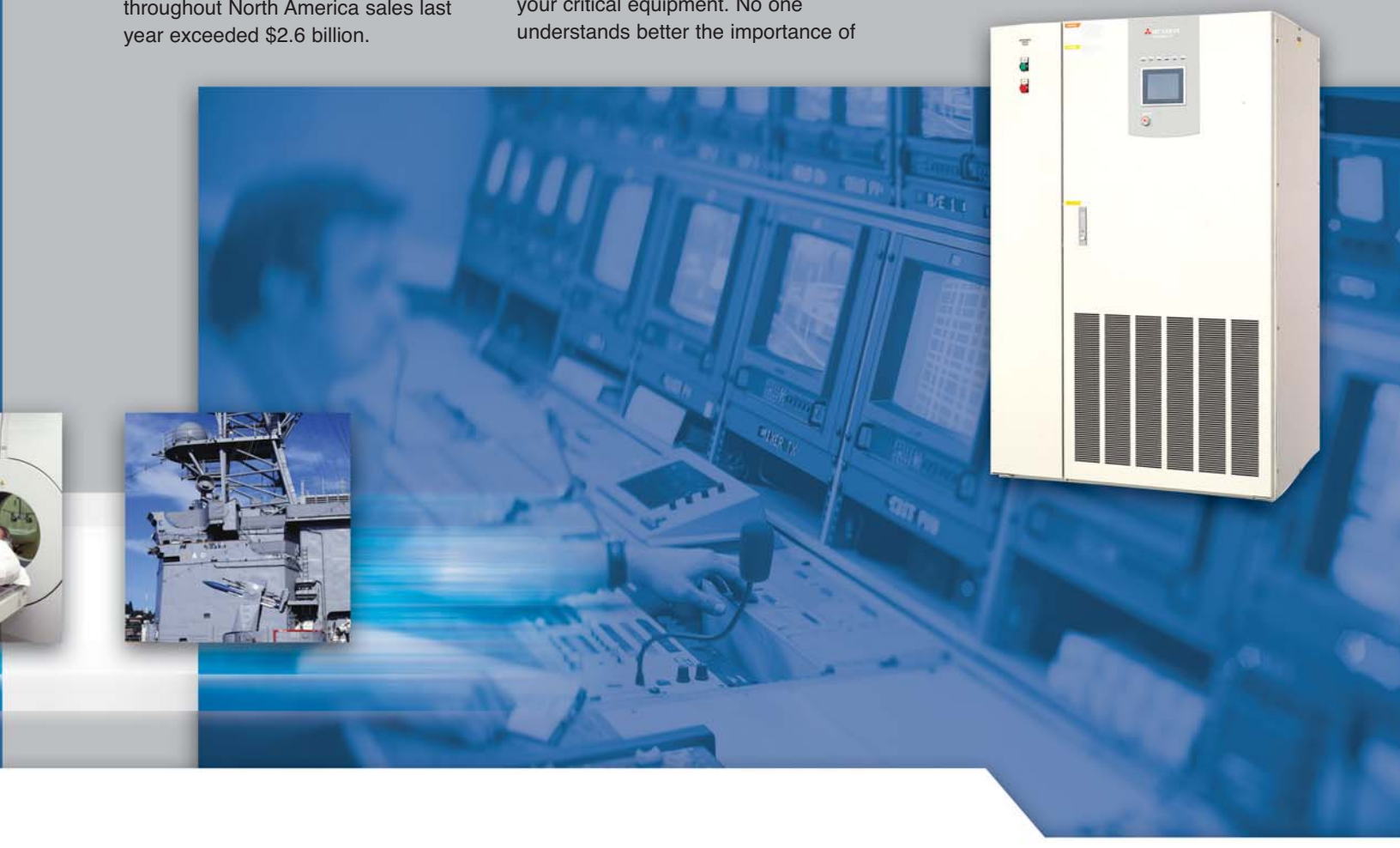
With 6,000 employees in 30 locations throughout North America sales last year exceeded $2.6 billion.

Mitsubishi Electric's tradition of technological leadership and innovation for more than 80 years enables us to be recognized as a world leader in the manufacturing, marketing and sales of Uninterruptible Power Supply Systems. We hold extensive UPS installation references throughout a broad range of business sectors. Other accomplishments include:

- Top share in the Japanese UPS marketplace.
- One of the premier UPS companies in the North and Latin America marketplace.
- One of the premier UPS companies in the Asian marketplace

Mitsubishi Electric gives you the confidence you need to protect all of your critical equipment. No one understands better the importance of protecting your equipment from undesired power problems and failures than Mitsubishi Electric.

Mitsubishi Electric offers the most complete technologically advanced power protection and management solutions for critical equipment in the industry. Mitsubishi Electric's quality, technology, customer service and reliability continue to earn customer confidence and add to our impressive customer base.



The Mitsubishi Advantage

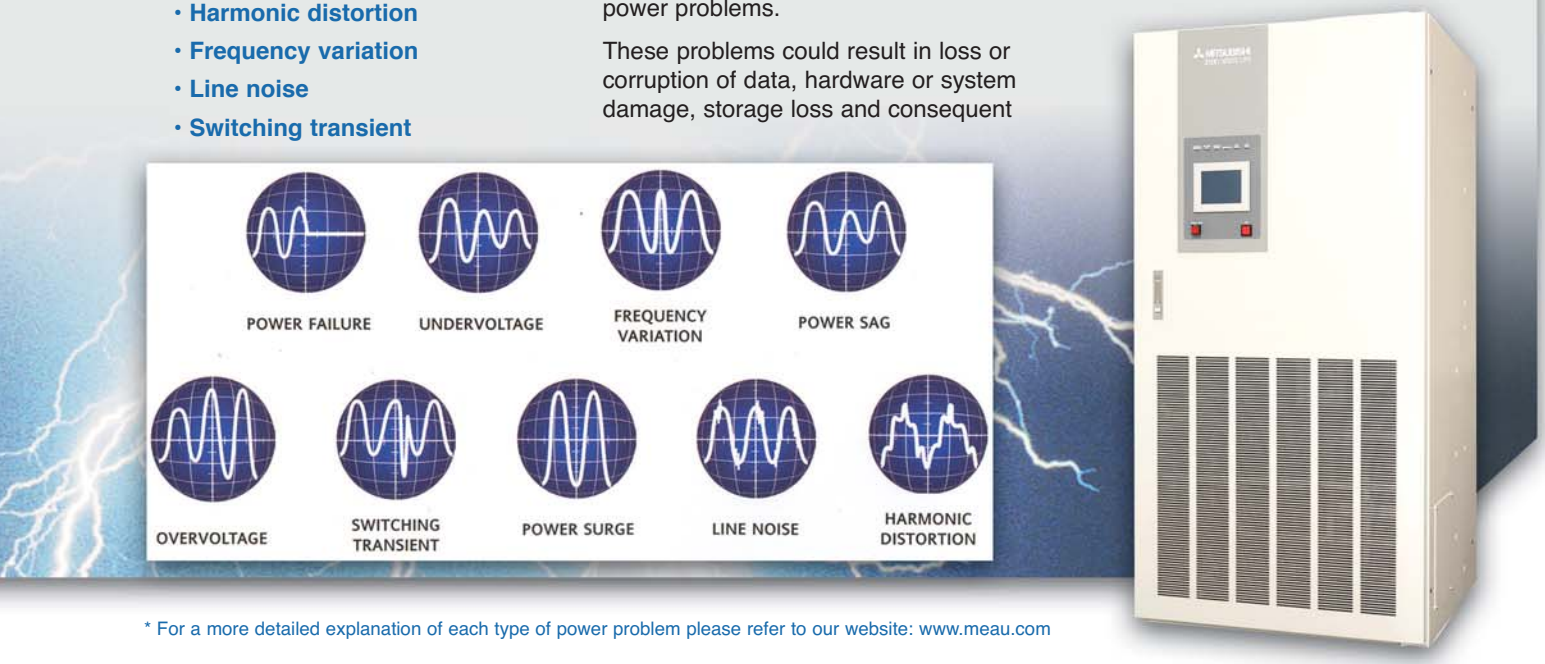
COMMON TYPES OF POWER PROBLEMS

There are 9 types of power problems* that may affect your critical systems:

- **Power failure**
- **Under voltage**
- **Over voltage**
- **Power surge**
- **Power sag**
- **Harmonic distortion**
- **Frequency variation**
- **Line noise**
- **Switching transient**

Power blackouts may seem uncommon, but are not completely impossible. Power grids do shut down to isolate power blackouts to minimize the affect to smaller areas and stop it from spreading. The larger concern is other power problems such as under/over voltage or power sag/surge which account for 98% of recurring power problems.

These problems could result in loss or corruption of data, hardware or system damage, storage loss and consequent associated costs in rebuilding and fixing them. Mitsubishi Electric's technologically superior UPS systems are designed precisely to insulate your systems from these problems and to provide you with the most dependable power source to keep your systems running without interruption.



* For a more detailed explanation of each type of power problem please refer to our website: www.meau.com

MITSUBISHI ELECTRIC SYSTEM ADVANTAGES

One of the most critical factors in making a decision about a UPS system is its ultimate "dependability". Mitsubishi Electric's dependability is constantly enhanced with on-going research, development and its commitment to technological excellence. That is the reason Mitsubishi Electric makes a significant investment in research, (approximately $1.5 Billion annually). It is this investment which results in the dependability that's built-in all the technologically superior UPS products for our customers.

Besides the dependability, Mitsubishi Electric's UPS systems give 3 other distinct benefits to our customers:

- Lower cost per kilowatt
- Lower cost because no additional filters are necessary
- Lower maintenance costs because of extended battery life

Mitsubishi Electric offers a complete line of UPS products for Small, Medium and Large Scale Systems. Our Systems are available in Single Phase and Three Phase in both Single Module or Multi-Module configuration and come in the broadest range of UPS system kVA capacity in the industry. Our product specifications are designed to meet or exceed any local regulations and standards: North and Latin America standards - UL certified and stamped Japanese and Asia standards. Our TQC (Total Quality Control) process assures high reliability and ISO 9001 and 14001 quality.

Mitsubishi Electric has been developing and manufacturing Uninterruptible Power Supply (UPS) components and systems for more than three decades. That experience and the continuous application of new power-device technologies to further improve products, clearly makes Mitsubishi Electric a dominant player in the world UPS market.

TECHNICAL HIGHLIGHTS & BENEFITS

Mitsubishi Electric's UPS systems use the latest in power semiconductor device technologies that are based on our constant research and development efforts. Mitsubishi Electric manufactures all the components for our UPS systems and knows best how to integrate them for the most effective UPS systems, unlike other manufacturers who integrate parts from different sources. In fact, Mitsubishi Electric's IGBTs and components are sought after by other UPS manufacturers. Our UPS products incorporate the Mitsubishi Electric 4th Generation IGBT and other high quality components that result in the following superior features:

Excellent Performance Characteristics

- Large power capabilities
- High Ampacity Transistors
- High Speed Switching
- Low Control Power Consumption

Low Input Current Harmonics (THD)

- 4% maximum (100% load)
- 5% maximum (75% load)
- 7% maximum (50% load)

Generator Powered (UPS) Applications

1:1 (UPS kVA/Generator kW)

Low Heat Loss / High Efficiency

Use of Intelligent Power Module (IPM) transistors enables efficient high-speed switching, thus reducing heat dissipation in the UPS. Low harmonic distortion signatures and high Input Power Factors assure generator compatibility and stability.

Extended Battery Life

Unnecessary battery discharge for up to 100% rated step loads is no longer required with the installation of IPM transistors in both the converter and the inverter. Many competitors UPS systems require assistance from batteries when the converter is unable to supply the required current. This cycling of batteries causes shorter life. All Mitsubishi Electric UPS systems are capable of maintaining critical loads without any battery support or discharge.

Hot Swappable Batteries

Replacement of batteries for our single phase products is made safe and easy with the hot-swap feature. There is no need to turn the UPS system off. Battery change-out is performed while the system is running connected to AC power.

Mitsubishi UPS Technology Summary of Typical UPS Characteristics and Features:

- Advanced PWM technology with advanced IGBT switching application
- Energy Saving and Clean Power Supply Environment
- Superior Input and Output Performance
- Unique Optimum Control and High Reliability Technology
- DSP (Digital Signal Processor) applied Direct Digital Control (DDC)
- Special Development ASIC (Application Specific Integrated Chip)

POWER MONITORING & MANAGEMENT SOLUTIONS

DiamondLink is advanced user-customizable power monitoring, management and shutdown software, designed to provide information about the power conditions of the UPS. DiamondLink will monitor the health and status of your UPS and, when critical events occur, will perform a graceful, unattended shutdown.

NetCom is an SNMP/Web agent hardware adapter which runs an embedded Simple Network Management Protocol (SNMP) software agent.

MUCM (ModBus adapter) card allows the customer to integrate Mitsubishi Electric's UPS system into their current building management solutions. Through the ModBus protocol converter all of the UPS system's variables and alarms can be monitored.

SERVICE

Mitsubishi Electric offers a wide variety of service programs to support your UPS System application. Our programs include field services, depot repair services, training programs, and on-site, as well as factory witness testing.

Field Services

Mitsubishi Electric offers both remedial and preventive maintenance services on all Three Phase and Single Phase UPS systems. These services are offered during and after the standard product warranty period. Field services are offered direct from Mitsubishi Electric or through authorized service centers in North and South America.

Depot Repair Services

Depot exchange/repair services are offered on all single phase UPS Systems, 5 kVA and below. Repairs are made in-house by trained engineers using the latest tools and techniques.

Training Programs

Mitsubishi Electric offers training programs for end users designed to enhance their working knowledge of their UPS System. In addition, we offer technical training for all Authorized Service Centers, as well as select customers.

Witness Testing

Mitsubishi Electric offers on-site or factory witness testing programs on any of our UPS systems. These programs are designed to demonstrate the capabilities and specifications of the UPS.

PowerSentry UPS Products

The PowerSentry UPS systems ranges from 1kVA to 750 kVA to meet all single phase to three phase applications.

Model	Description	Phase / Voltage		Product Options	Product Features	Markets / Applications
PowerSentry 7011A 	The 7011A products at an input range of 40V to 160VAC, with 40 to 120 HZ is the widest range in the industry while maintaining 100% load without using the battery. This series' true on-line double conversion UPS provides our load complete power conditioning. This product is recommended when long battery protection, or the use of emergency generators are required and for complete protection for voltage-sensitive equipment.	Single-Phase Input: 120 or 208-240 VAC Output 120-208-240 VAC		1, 1.5, 2, 3, 6, 8, 10, 12kVA	• IGBT Design • Generator Compatible • Low audible noise • Low Input Current THD • Hot-Swappable Batteries • Smart Battery Charger • Compact Design • Maintenance Bypass Switch • Automatic restart after power outage • Internal Battery • Three (3) Year Warranty	• Individual computers • Network server farms • LAN gateways • Bridges • Routers • Telecommunications systems • Security systems • Process control units • Banking systems • Point of sales
PowerSentry 2033C 	The 2033C uses Insulated Gate Bipolar Transistors (IGBTs) in both the rectifier and inverter sections. This UPS was designed with the whole electrical system in mind. This advanced technology provides the best input and output performance available in the industry. The 6kHZ Digital Signal Process (DSP) logic will supply your non-linear loads with high resolution output capable of 200 adjustments each cycle. The IGBT rectifier will minimize the upstream effects by limiting the current distortion to less than 6% without using a filter. The design will allow you to aggressively size your emergency generator 1:1.	Three Phase Input: 208 or 480 VAC Output: 120-208-480 VAC		7.5, 10, 15, 20 30, 40, 50kVA	• IGBT (Converter/Inverter) • Compact Design • Quiet Operations • Low Input Harmonics • Touch Screen Display • Internal Maintence Bypass • Internal Batter on 7.5 – 30kVA models • Two (2) year parts and labor warranty	• Retail • Education • Industrial • Financial/Insurance • Government
PowerSentry 2033A 	The 2033A uses Insulated Gate Bipolar Transistors (IGBTs) in both the rectifier and inverter sections. This UPS was designed with the whole electrical system in mind. This advanced technology provides the best input and output performance available in the industry. The 6kHz Digital Signal Process (DSP) logic will supply your non-linear loads with high resolution output, capable of 200 adjustments each cycle. The IGBT rectifier will minimize the upstream effects by limiting the current distortion to less than 6% without using a filter. The design will allow you to aggressively size your emergency generator 1:1.	Three Phase Input: 208 or 480 VAC Output: 120-208-480 VAC		30, 40, 50, 75kVA	• IGBT Design • Dual input design, Low Input Harmonics • Internal Maintenance Bypass • 1:1 Generator sizing • Front access only • Advanced touch screen monitoring • Two (2) year parts and labor warranty	• Healthcare • Financial/Insurance • Education • Industrial • Government
PowerSentry 2033D 	The 2033D Series is a true on-line double conversion UPS module with 480V input and 480V or 208V output. The 2033D Series has the ability for parallel operating of two UPS modules of the same capacity rating to provide system redundancy. Each UPS module provides low input current harmonics without the need for additional filtering, and all systems are equipped with an internal wrap-around "zero energy" bypass system for greater maintenance flexibility. The 2033D Series UPS provides cost savings on installation and operation. The 2033D Series UPS systems have a 1:1 generator sizing ratio, eliminating the need to oversize the generator requirement rating.	Three Phase Input: 480 VAC Output: 208-480 VAC		30, 50, 80kVA	• IGBT Design • Low Input Harmonics • Internal Maintenance Bypass • 1:1 Generator Sizing • Available for parallel redundant applications • Two (2) year parts and labor warranty	• Healthcare • Industrial • Financial/Insurance • Education • Data Centers
PowerSentry 9700 Series 	The 9700 uses Insulated Gate Bipolar Transistors (IGBT's) in both the rectifier and inverter sections. This UPS was designed to support you entire data center and network. This advanced technology provides the best input and output performance available in the industry. The 6kHZ Digital Signal Process (DSP) logic will supply your non-linear loads with high resolution output capable of 200 adjustments each cycle. The IGBT rectifier will minimize the upstream effects by limiting the current distortion to less than 6% without using a filter. The design will allow you to aggressively size your emergency generator 1:1.	Three Phase Input: 208 or 480 VAC Output: 120-208 VAC		100, 150, 225kVA	• IGBT Design • Low Input Harmonics • Internal Static Bypass • Real-Time Battery Monitoring • 1:1 Generator Sizing • Designed for Isolated Redundant Applications • Two (2) year parts and labor warranty	• Financial/Insurance • Healthcare • Industrial • Telecom • Transmitters • Government
PowerSentry 9800 AD Series 	The 9800AD Series UPS will supply your entire data center with UPS power. For reliability, the 9800AD can be added to another UPS system to form an isolated redundant configuration or Multi-Module (Parallel configuration on 300/375/500/750kVA). The IGBT inverter will handle 100% step loads without battery discharge which benefits isolated redundant systems. The load response along with the superior transient response (±2)% lends itself well to industrial applications.	Three Phase Input: 480-600 VAC Output: 208-480-600 VAC		100, 150, 225, 300, 375, 500, 750kVA	• IGBT Inverter • Diode Bridge Rectifier Design • Low Input Harmonics • Internal Static Bypass • Front access only • 1:1 Generator Sizing • Available for parallel redundant applications • Available for parallel capacity to 4000 kVA • Two (2) year parts and labor warranty	• Financial/Insurance • Healthcare • Industrial • Government • Telecom • Transmitters • Retail • Data Centers

Product Applications

PowerSentry is a product that suits every one of your needs no matter what your industry and meets the most important and core need of dependability. This partial list of our customers that is a testimony of our product application in diverse industries includes Fortune 500 companies like Federal Aviation Administration, NASA, US Air Force, National Weather Service, American Express, Siemens Medical Imaging, Cisco, SBS, Wal-Mart, Walgreen's, CVS, Albertson's, Qwest Communications, Merck Pharmaceuticals, Hughes Network Systems, MCI, L3 Communications, P&G, Hyatt Hotels, United Airlines, HP, Boeing, Bank of America, Citibank, Merrill Lynch, Goldman Sachs, Fidelity Investments, Sony, Paramount, Time Warner Cable, Verizon, 3-Com, Bell Canada, Phillips Medical, Royal Bank and several others.

No matter whether it is a simple power surge or sag, or any other power problem, or even a catastrophic power failure, nothing gets by the dependable PowerSentry UPS from Mitsubishi Electric. Nothing expect clean power and the protection where you need it most.

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MITSUBISHI ELECTRIC
Changes for the Better

Mitsubishi Electric Automation, Inc.

Discover the Many Facets of Mitsubishi Electric. The Power in Automation Solutions.

Automation Platforms • Industrial Computers • Programmable Logic Controllers • Servo Systems • Motion Control • Variable Frequency Drives • Human Machine Interfaces
Uninterruptible Power Supply Systems • Software • Computerized Numerical Controls • PC Based Control • Robots • Industrial Sewing Equipment