# Power Systems Division

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The following introduces the major products developed by the Power Systems Division in 2012.

First, we developed the "SANUPS K23A (M Type)" to realize effective use of power networks by using battery energy and renewable energy. Next, we developed the "LAN interface card with environmental monitoring" to support visualization of temperature and humidity in server rooms by adding a monitoring function to uninterruptible power systems (UPS). Finally, we developed "SANUPS E33A" models to expand the series of 400 V UPS for use in large scale data centers with a maximum capacity of parallel type 600 kVA and parallel redundant 500 kVA. The following information provides an overview and features for these products.

## ■ Development of the Grid Management Device "SANUPS K23A (M Type)"

After the Tohoku Earthquake, interest in environmental issues has been further heightened. Due to insecurities in the power supply, renewable natural energy sources such as photovoltaic power generation has been promoted, but as it is unstable power generation affected by weather, there are concerns about the effect on the power system. Japan's power supply system is looking into smart grids to plan for even greater energy conservation and a reliable supply of electric power, creating new needs for smart grids in the power market.

To supply stable power while planning for effective use of renewable energy, we released the grid management device "SANUPS K (M type)" series, which can maintain high-quality electrical power within the grid. This device was developed after collaborative research and verification with Aichi Institute of Technology and NTT Facilities about microgrids between 2006 and 2010. By installing this device between variable distributed power supplies, such as photovoltaic power generation, and utility power systems, connecting with and disconnecting from the utility power is possible without momentary power breaks. Furthermore, by adopting lithium ion batteries for storing electricity, when the power consumption for the load becomes larger than the power generated by the photovoltaic power system, the surplus power is used to charge the lithium ion battery through the inverter. When the power consumption for the load becomes smaller than the power generated by the photovoltaic power system, the insufficient power is supplied from the lithium ion battery through the inverter. With this, as well as supplying power continuously during disasters, suppression of peak power became possible without affecting power in the grid and utility power during normal operations, resulting in contributing energy conservation.

## ■ Development of the "LAN Interface Card with Environmental Monitoring"

In recent years, interest in global environmental protection has grown, and with the requests for energy conservation after the Tohoku Earthquake, various industries have begun emphasizing energy conservation.

Even in server rooms using uninterrupted power supplies (UPS), efficient cooling controls for server racks and server rooms have become necessary. Therefore, there has been demand to visualize data in order to obtain environmental information such as temperature and humidity and provide comprehensive management for the power supply and the operating environment.

Previously, specialized devices needed to be purchased to obtain environmental information. This time, a method for obtaining measurements such as internal temperature and humidity and a function to visualize the collected measurements have been added to the LAN interface card introduced in Technical Report No. 34. With this, we can offer a product that meets energy conservation needs without purchasing a special device for environmental measurement. Moreover, by analyzing the collected measurements, we can offer services, such as suggestions for improvements to the environment, to customers. In addition to the conventional functions, such as automatic shutdown and startup of computers, scheduled operations, and remote monitoring of the UPS, by installing this model to a UPS, ambient temperature and humidity can be monitored comprehensively by connecting the newly developed temperature sensor and humidity sensor to the card. Customers also enable comprehensive monitoring of ambient temperature and humidity. With the development of the new model, we have enriched the options for the LAN interface card and now we can offer a product that supports new demands for environmental monitoring.

## ■ Expansion of the "SANUPS E33A" Lineup

In 2008, we developed the 400 V large capacity UPS "SANUPS E33A" that used the parallel processing method. With high efficiency and high quality, we realized the first completely individual parallel operation controls with the parallel processing type. This device, with a 100 kVA UPS basic unit, included a parallel type lineup ranging from 100 kVA to 300 kVA (as noted in Technical Reports No. 26 and No. 27). This time, we expanded the number of UPS units that can connected in parallel and achieved an expanded lineup with parallel type from 100 kVA to 600 kVA and parallel redundant type up to 500 kVA. This series was developed as expandable UPS for growing data centers, but with the parallel processing features, it is more effective than ever in other fields, such as for backup of power equipment, which did not work well with UPS until now. Therefore, we are also expecting implementations as a backup power supply for manufacturing equipment in factories. Because large capacity power is often required for the power equipment backup, installing this system, which can easily be operated in parallel, enables flexible support for large capacity equipment.

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