Power System Division

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Due to the repercussions of the IT revolution, the year 2000 saw a major rise in the use of UPSs for the uninterruptible power supply of data centers. With some other products developed to meet those needs, here is a description of the major developed products.

The small-capacity UPS developed is "SANUPS ASD", which is Japan's first product to use an individual control system having no common portions and which can be operated in parallel with one or more units of the same model. The parallel run of up to four units of 3.5kVA enables capacity expansion and redundant reliable operation.

We also enriched the line-up by developing "SANUPS ASE", which is designed for small size, lightweight, and high efficiency, "ASC-RM", which is to be mounted on 19-inch racks, 1kVA DC/AC inverters, and other models.

Large- and medium-capacity UPSs were mainly subjected to cost cuts, and conventional products underwent minor changes.

For software to control power supplies, we developed the "SAN GUARD IV Lite". This package requires no LAN interface card, which used to be an option in earlier versions, and is easier to operate and use.

As a power conditioner for photovoltaic power generation systems, we developed the "PMC-TD". We turned our conventional product, the "PMB-TD", into a small-size, lightweight version that contained a utility protective device in each unit. This enables parallel operation by individual control and readily allows larger-capacity operation based on a single operation and build-up system.

Development of small-capacity UPS, "SANUPS ASD"

The advanced information society requires ever-more reliable computer networks. Should the network break down, society cannot afford to stop the data communications for any instant. Furthermore, while the system is extended at times, these computers cannot afford to undergo any blackout for any instant, 24 hours a day, 365 days a year. UPSs have then come to require advanced reliability, maintainability, and larger capacity.

These demands were conventionally addressed to medium- and large-capacity UPSs, but with the progress of the downsizing of computer systems, these demands are now addressed to small-capacity UPSs as well. In small-capacity UPSs, pricing and size are important factors, so that their configurations need to be as small in scale as possible.

To meet these requirements, we developed a small-capacity UPS, the "SANUPS ASD", which needs no common control unit and can be run in parallel by completely individual control.

This UPS model is on the basis that a 3.5kVA unit is one unit, and up to four units of this model can be run in parallel. These features enable initial installations meeting the particular system capacity and a rise in power capacity in the case of subsequent capacity expansions. One unit's worth of leeway is given to meet the load requirement to enable a redundant run based on the N + 1 system.

Small-capacity UPS, "SANUPS ASE"

Small-capacity UPSs come in a line-up of the "SANUPS ASC" and the "SANUPS ASA", thus covering the range from 1kVA to 10kVA. Due to the downsizing and low-pricing of computers, the capacities near 1kVA find the greatest demand. Thus, leading electric appliance firms and many UPS manufacturers are manufacturing them. The market is then joined by overseas manufacturers, thus turning the cost competition into a cut-throat one.

Under these circumstances, we developed the "SANUPS ASE", which achieves the industry's top-efficiency product, with small size, lightweight, and low pricing.

These UPSs are constantly powered by an inverter. To increase efficiency and cut costs, we tackled the challenge of cutting the number of parts used.

We reviewed the configuration of the main circuit, removed waste, and turned the control circuit into a fully digitally controlled one, thus greatly cutting the number of parts, reducing size, and increasing efficiency.

We reduced the number of parts used in order to cut material expenses. This, together with the re-duced number of printed circuit boards, made the product easier to assemble and reduced the number of assembly steps.

To provide new functions, we divided the output system into three lines and provided a constant output and a system capable of sequential control. This enables the detailed setting of ON time from the "SAN GUARD IV Lite".

1kVA DC/AC inverter

NTT and other common carriers have long had a large-capacity rectifier and a large-capacity battery in the power room of each of its buildings in order to keep the power supply of the equipment uninterruptible. The system is designed to supply 48V DC.

This DC power supply is so designed that its system is connected to batteries in parallel and has no switching circuit, thus achieving very high reliability. Equipment with a 48V DC input has also spread to IP equipment, for which power supply reliability is a high priority.

However, not all equipment can be run with DC. Some of the equipment needs 100V AC, and we have developed a DC/AC inverter for supplying AC to systems designed mainly to supply DC.

Conventional DC/AC inverters used low-frequency transformers that were bulky and heavy. However, the combination of a high-frequency DC/DC converter with a PWM inverter has achieved small size and lightweight. Compatible with a 19-inch rack mount, this model has a height of 2U (88.8mm).

UPS control software, "SAN GUARD IV Lite"

UPS control software is designed to shut down and safely stop the computer connected to a UPS when the power fails.

Our control software, the "SAN GUARD IV", has been reinforced in network compatibility so that its connection to a LAN allows the UPS to be easily controlled as a network constituent. To increase functionality and user-friendliness, we developed the "SAN GUARD IV Lite". The "SAN GUARD IV Lite" allows users to control their UPSs with software alone, without the need for a LAN interface card, which used to be a must in conventional configurations. This package also inherits the functions of the conventional "SAN GUARD IV".

The conventional version, the "SAN GUARD IV", had a setting procedure that was difficult to understand. The new version provides a set-up wizard which users need only follow to make basic settings, thus making the software more user-friendly.

For the scheduled control of the output system of "SANUPS ASE", which is about to hit the market, and sequential control, users need only use the "SAN GUARD IV Lite" to make detailed settings.

The development of the Windows version is now complete. We have now begun to develop a Linux version and a UNIX version with the hope of releasing them early.

Development of a power conditioner, the "PMC-TD", for photovoltaic power systems

Demand is growing for photovoltaic power systems as an eco-friendly source of pollution-free energy to address the issue of global warming. The "PMB-TD", which is one of the company's conventional models, consists of a 10kW unit and a rack cabinet on which some of such units are mounted.

The newly-developed "PMC-TD" achieves a capacity of 10kW singly and incorporates a power converter, system utility protective device, display functions, and all other functions constituting a power conditioner. By parallel control through communications, users can run up to five units in parallel.

This model is on a build-up basis so that its capacity can be expanded easily by merely piling a single unit on another. Another new feature is that this model requires no common rack, so that it is space-saving and allows users to build systems of 10 to 50kW easily.

The I/O box can also be equipped with a standalone switching function and an accumulator connection circuit, among other equipment, to make this model flexibly compatible with various systems, such as standalone run, recharged run, thawing run, and peak-cut run.

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