Operational Review (Consolidated Basis)

Electrical Equipment

Control/Information Systems and Electronic Devices

Consumer-Related and Other Products
Main Products

- Electric motors
- Variable speed motors and inverters
- Induction heating equipment
- Induction furnaces
- Industrial power supplies
- Clean-room systems
- Emergency power supplies
- Uninterruptible power supplies for computers
- Electrical equipment for ships
- Electrical equipment for rolling stock
- Transformers
- Circuit breakers
- Gas-insulated switchgear
- Converters
- Nuclear power plant equipment
- Thermal power plant equipment
- Hydroelectric power plant equipment
- Power generating units
- New energy generating systems
- Centralized supervisory control systems for electric power equipment
- Computer control equipment for electric power equipment
- Induction motors
- Geared motors
- Brake motors
- Fans
- Pumps
- Blowers
- Magnetic contactors
- Operation indicators
- Industrial relays
- Time delay relays
- Gas detectors
- Molded-case circuit breakers
- Earth-leakage circuit breakers
- Current-limiting fuses
- High-voltage distribution equipment
- Cast-resin transformers
- Power factor regulators
- AC power regulators
- Proximity limit switches
- Optical sensors
- Programmable logic controllers
- Programmable operation displays
- Multiplex transmission systems
- General-purpose inverters
- Servomotor systems
- Induction heating inverters
- Variable-speed controlled motors

Net Sales by Group

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- Computer control equipment
- Electric power distribution system simulators
- Watt-hour meters
- Radiation monitoring systems
- Centralized supervisory control systems
- Microcontrollers
- Control systems for water supply and sewage treatment facilities
- Water quality measuring and control equipment
- Remote control equipment
- Ozone purification systems
- Tunnel ventilation systems
- Measuring information and communication control systems
- Laser devices
- Image processing applied devices
- Industrial measuring equipment
- Radiation monitoring equipment
- Magnetic disks
- Photoconductive drums for copiers and printers
- Bipolar power transistors
- Power modules
- Smart-power devices
- Rectifying diodes
- Monolithic ICs
- Hybrid ICs
- Surge absorbers
- Semiconductor sensors
- Vending machines
- Coin and currency mechanisms
- Bill validators
- Currency systems
- Beverage dispensers
- Tea servers
- Open freezing and refrigerated showcases
- Hotel vendor systems
- Card systems
Electrical Equipment

Consolidated net sales of electrical equipment grew 4.9% to ¥369,015 million. In the energy area, a number of projects supported solid results, including the High Temperature Engineering Test Reactor (HTTR) and large-scale hydroelectric power equipment overseas. In the electrical equipment and machinery area, however, a fall off in large-scale overseas projects led to a sales decline. In the electric distribution & control (ED&C) and drive systems area, overall domestic sales were stagnant although overseas sales were firm, mainly led by inverters.
ENERGY

For the electric power industry, Fuji Electric provides thermal, hydro and nuclear power plants and related equipment as well as power transmission and distribution systems. We are also developing combined-cycle generation technology and such new generating technologies as fuel cells and photovoltaic cells. To stay in step with global market trends, we are promoting our engineering, procurement and construction (EPC) business, especially for geothermal projects.

In the thermal power generation area, we were awarded an order for a 600 MW steam turbine generator for a domestic thermal power station and for a 3.3 MW geothermal power plant from an electric power company in Japan, which is our first order for a domestic commercial geothermal project. We also received numerous overseas orders, including a full turnkey contract in Indonesia for 2 x 110 MW geothermal turbines with the world’s largest single cylinder.

In the hydropower area, Fuji Electric received orders for pumped-storage hydropower equipment in India and a hydro-power generating facility in Vietnam, among others. Consequently, orders exceeded those of the previous fiscal year. We delivered a 3 x 33 MW bulb turbine generator to a customer in China and a 7 x 23 MW bulb turbine generator to a customer in Pakistan.

In the nuclear power area, we delivered major equipment to HTTR, Japan’s first HTGR. Efforts are currently underway, primarily by the client, to achieve first criticality of the HTTR.

In the substation, power transmission and distribution systems area, we have a solid record for providing equipment and systems for Japan’s electric power industry. During the term, we delivered eight large-capacity generator transformers that were completely assembled with all accessories mounted at the factory and transported to the power plant site, thus enabling a very short time required for installation and commissioning work at the site.
In the electrical equipment and machinery area, Fuji Electric provides industrial power application systems for industry and railway use. In industrial power application systems, the Company received large orders for such facilities as large-scale steel sheet mills and clean rooms. However, orders declined overall amid weak private-sector capital investment in Japan and falling export demand owing to currency turmoil in Southeast Asia during the second half of the term. Sales during the term included a low-speed high-powered diesel generator unit, our largest such product to date, to an electric power company in the Bahamas. Despite this achievement, sales declined as a result of a falloff in a number of large-scale overseas projects.

New products included a zinc-removal induction-type steel melting system to upgrade product quality and improve the working environment in the pig iron casting industry. Our uninterruptible power supply (UPS) systems contribute to the stable operation of information processing equipment. During the term, we implemented a full model change of our UPS product line that upgraded function and performance for advanced computers, ranging from PCs and workstations to large mainframe models.

In electrical power equipment for railway use, orders declined overall despite new contracts for substation equipment arising from the construction of a new subway. For advanced train systems, Fuji Electric has developed compact, highly functional converter/inverters that use our newly developed 2.5 kV/1.8 kA-rated flat-packaged IGBTs, which have the largest capacity of their kind in the world. The new IGBTs have been incorporated into experimental rolling stock for the new series of Shinkansen trains.
Fuji Electric has developed open-system programmable logic controllers (PLCs) that adjust to international standards. The PLCs comprise hardware PLCs, which can achieve command processing speeds of 20 nanoseconds, and software PLCs that are compatible and able to operate with existing computer hardware.

We have expanded the lineup of PODs from 5.7-inch medium-sized displays to 10.4-inch large ones. Models with color liquid crystal displays (LCDs) feature user-friendly operation and vivid 16-color graphics.

ELECTRIC DISTRIBUTION & CONTROL (ED&C) AND DRIVE SYSTEMS

The ED&C and drive systems area is composed of electric distribution systems, control systems and drive systems. ED&C systems comprise such control equipment as magnetic motor starters, push-button switches and programmable logic controllers (PLCs); as well as electric distribution equipment, including molded-case circuit breakers (MCCBs) and earth-leakage circuit breakers (ELCBs). Drive systems are represented by induction motors, motor-related equipment and inverters.

In the domestic market, we strengthened our engineering sales support systems and continued to make aggressive marketing efforts. However, the economic slowdown in the second half of the term led to flat sales. On the other hand, exports benefited from the yen’s depreciation. We have established subsidiaries to manufacture vacuum circuit breakers, distribution panels and motor-related equipment.

Our inverters bear the marks of CE and TUV of Europe, UL of the United States and cUL of Canada, demonstrating that these products have been adapted to major international standards.
Consolidated net sales in this group increased 4.7% to ¥302,643 million. In the plant control systems area, social infrastructure systems recorded favorable sales performance, although sales for the area were essentially unchanged from the previous term. Sales in the information equipment area increased, mainly owing to robust demand for magnetic disks. Exports of organic photoconductive drums also contributed to improved results. In the electronic devices area, sales of discrete devices were unchanged, integrated circuits (ICs) increased slightly, and power modules advanced as a result of growth in integrated gate bipolar transistor (IGBT) shipments.
PLANT CONTROL SYSTEMS

In the plant control systems area, Fuji Electric’s extensive product line up comprises social infrastructure-related systems, such as water treatment equipment and systems; tunnel monitoring and ventilation systems; electric power system controls and automated electric power distribution systems; factory automation (FA) systems for large-scale factories; and measuring control systems for a wide variety of industrial plants.

Despite curbs on public-sector capital investment, orders of public and infrastructure-related systems were firm. In water treatment systems, Fuji Electric received large-scale orders for advanced water purification systems for the construction of new treatment plants as well as for drainage treatment electrical equipment and monitoring systems to be used in the renovation of water purification plants. In addition, we delivered a number of highly sensitive particle-counting turbidimeters that were newly developed and help to further improve water quality.

Orders for social infrastructure systems remained in line with the previous term because of restrained public-sector capital investment, which led to a decline in orders for road-related works. However, sales exceeded the previous term’s level, supported by the delivery of electrostatic precipitator equipment for road tunnels and remote road-monitoring and control system equipment for highways.

Sales of power systems declined from the previous term. The measuring control systems area was also stagnant, despite strong...
Based on our fiber-optic field instrumentation (FFI) system, which has demonstrated solid performance in petroleum refineries and chemical plants, we developed an optical fieldbus system with superior anti-noise characteristics. The system has been delivered to a pilot plant of the Shell International Oil Products (SIOP), and we are working toward further market penetration.

Fuji Electric provided the power distribution system for the Akashi Kaikyo Bridge in Japan, the world's longest suspension bridge. Our system supports safe transportation by ensuring a stable supply of energy for such electronic equipment as street lights, traffic surveillance equipment and security communications.

Demand for garbage treatment facilities. Among new products, we are developing an optical fieldbus system that conforms with IEC standards.

In FA systems, sales decreased as a result of a drop in large-scale contracts for lasers, inspection devices and conveyance systems. In measuring instruments, Fuji Electric concentrated its operations and established Fuji Electric Instruments Co., Ltd. as a manufacturer specializing in these instruments. These measures have created a business structure capable of a rapid response to market changes and customer needs.

INFORMATION EQUIPMENT

Fuji Electric's main products in the information equipment area encompass magnetic disks for hard disk drives, and photoconductive drums for copiers and printers.

In magnetic disks, we expanded and strengthened production lines to meet market requirements for higher density and higher capacity and introduced next-generation products. As a result, sales increased in spite of sluggish demand for PCs in the second half of the term.

Sales of photoconductive drums posted strong growth, supported by a rise in exports of such new products as organic photoconductive drums with enhanced performance. To reinforce our magnetic disk production system, we completed construction of a manufacturing facility at our domestic manufacturing base and built a factory in Malaysia. These facilities began full-scale operation in the current fiscal year.
In magnetic disks, through improvements to layer consistency by finer control of disk surface roughness and texture precision, we have minimized the flying height of the head. This enables a density of 3.2 gigabits/inch², creating the possibility of a 3.5-inch hard disk with 4.0 gigabyte memory capacity.

Fuji Electric has developed an all-silicon chipped insulated gate bipolar transistor (IGBT) that can directly measure the temperature at contact points and protect against excessive heat. This intelligent power module currently offers the lowest cost, highest dependability and easiest system planning.

Our semiconductor pressure sensors meet the strict requirements for reliability in automotive applications. We reduced size and weight by completely integrating the sensor and signal processing circuits onto a single chip.

**ELECTRONIC DEVICES**

Our major products in the electronic devices area comprise power devices, discrete devices and integrated circuit (IC) products.

Sales of power modules surged strongly due to a rise in orders for our insulated gate bipolar transistor (IGBT) modules, used primarily in numerical control (NC) machine tools and inverters. However, sales of discrete devices remained flat because of deteriorating market conditions for PCs and peripheral equipment.

In IC products, overall sales grew only slightly. Although both power ICs used in video cameras and mobile telephones and automotive pressure sensors recorded a solid sales increase, it was offset by stagnant demand in the second half of the term.

During the fiscal year, we developed the R Series of third-generation intelligent power modules (IPMs), which have applications for inverters and many other fields. These IPMs are able to directly measure the temperature at contact points and protect output drivers against excessive heat. In the area of switch-mode power supply ICs, one of Fuji Electric's main strengths, the Company made further advances in the development of miniaturization, power conservation and low turn-on resistance technologies. Consequently, many of these devices have been incorporated in notebook PCs, mobile telephones and digital cameras.
Consolidated net sales of consumer-related and other products increased 2.2% to ¥311,105 million. Sales growth of mainline vending machines was limited by ongoing price declines, despite steady volume growth. Sales of mineral water beverage dispensers increased. In card systems, we recorded sales of a new series of lift gate systems. However, sales of freezing and refrigerated showcases declined amid weak capital investment in the supermarket industry, and coin and currency equipment also recorded lower sales.
The Consumer-Related and Other Products group encompasses vending machines, freezing and refrigerated showcases, card systems, hotel vendors and coin and currency equipment.

Sales of mainline vending machines increased firmly in volume due to firm replacement demand for drink machines and sales promotion to new cigarette machine customers, but rose slightly on a value basis owing to continued price declines. In new products, we launched vending machines designed for 500-milliliter PET bottles. To promote the use of vending machines in new locations, we also broadened our product lineup by introducing see-through machines, which display the products for purchase, and compact interior machines suitable for small offices.

The market for food-related equipment, including soft drink and draft beer dispensers as well as automatic tea-serving machines, recorded continued growth, and Fuji Electric actively bolstered its product lineup in this area. We also launched dispensers for frozen soft drinks, and sales of mineral water dispensers increased.

In the specialty appliance field, we completed the development of a standardized series of lift gate systems for ski resorts, entry and exit systems for facilities, and card systems for cafeterias. In addition, our new series of lift gate systems employing wireless data transmission recorded favorable performance.

Sales of freezing and refrigerated showcases declined due to a drop in capital investment in the supermarket industry.

In the coin and currency field, in response to the needs of the retail industry facing deregulation, we made advances in commercializing a series of compact and low-priced automatic change machines. The price of coin mechanisms and bill validators for vending machines continued falling, however, leading to an overall sales decline.