Electrical Equipment

This group consists of three areas: energy; electrical equipment and machinery; and electric distribution and control (ED&C) and drive systems. Consolidated sales increased 5.6% to ¥349,418 million, and operating income climbed 100.9% to ¥5,474 million.

Control/Information Systems and Electronic Devices

This group consists of three areas: plant control systems; information equipment; and electronic devices. Consolidated sales declined 2.1% to ¥244,995 million, however operating income increased 13.4% to ¥5,395 million.

Consumer-related and Other Products

This group includes such consumer-related products as vending machines and freezing and refrigerated showcases, and such specialty appliances as hotel vendor systems and card systems. Consolidated sales rose 7.5% to ¥295,999 million, however operating income declined 0.8% to ¥10,647 million.
- 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 generator 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 molded transformers
- electric power control equipment • programmable logic controllers
- programmable operation displays • multiplex transmission systems
- general-purpose inverters • servomotor systems • induction heating inverters
- variable-speed controlled motors • AC power regulators • proximity limit switches
- variable-voltage regulators • temperature control systems
- optical sensors
- 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
- remote control equipment • ozone purification systems
- tunnel ventilation systems • FA systems
- FA personal computers • automated call-receiving equipment • laser devices
- video sensors • industrial measuring equipment and instrumentation • analyzers
- radiation monitoring equipment • optical character readers
- sputtered magnetic recording disks
- photoconductive drums for copiers and printers • bipolar power transistors
- thyristors • silicon diodes • integrated circuits • power hybrid ICs • surge absorbers
- semiconductor sensors • switching power supply units
- vending machines • coin and currency mechanisms • bill validators • currency systems
- beverage dispensers • tea servers • open freezing and refrigerated showcases
- hotel vendor systems • refrigerators • card systems • ultrasonic diagnostic equipment
- water alkalizers
Electrical Equipment

Consolidated sales of the Electrical Equipment group rose 5.6% to ¥349,418 million, accounting for 39.2% of net sales. Sales growth was supported by strong performance in the energy area, reflecting favorable market conditions for geothermal power generation stations, especially in Southeast Asia. In the electrical equipment and machinery area, the Company secured large-scale orders for power transmission and distribution equipment. In the ED&C and drive systems area, export sales of inverters to the European, North American and Asian markets were brisk. Sales of motors for machine tools, fans and pumps increased, and demand expanded for control systems and power and distribution related systems for power and distribution equipment and industrial machinery.
Energy

In the energy area, Fuji Electric manufactures thermal, hydroelectric and nuclear power generating units and related equipment, as well as power transmission and distribution systems. The Company is also developing combined cycle generation technology and promising new energy sources, including fuel cells and photovoltaic cells.

In the thermal power generation field, Fuji Electric received an order for three 59.5 MW geothermal power units from Indonesia and delivered four 20 MW geothermal power units to the National Power Corporation of the Philippines during the term. The Company made strong efforts to secure orders for geothermal power plants, particularly in Southeast Asia. To complete an order from Taiwan, the Company is now manufacturing four 600 MW steam turbine-generator units. Shipment of the first unit is scheduled for the end of 1996.

In the hydroelectric power generation field, Fuji Electric delivered a 24 MW large-capacity bulb turbine-generator unit to one of Japan’s electric power companies. We also supplied a 26.8 MW hydroelectric generating unit. We worked to boost demand for inspection and maintenance services, and for the renewal of various existing power generation and substation equipment.

In the power transmission and distribution system field, the Company supplied two banks of 500 kV, 750 MVA transformers during the period. We also delivered underground substation equipment, including gas-insulated transformers and switchgear. In the field of power network protection and control, we developed and delivered a directly grounded, 187 kV transmission line, fault-location detector to aid in rapid repair and restoration during power disruptions.

Turbine-generators at the Palimpinion Geothermal Power Station are of the skid-mounted type so that each can be easily moved as a single unit to any site where the wells are able to produce sufficient steam flow. The installation period has also been greatly shortened.

Fuji Electric delivered a 24 MW large-capacity bulb turbine-generator unit to the Kansai Electric Power Co., Inc. Among generators using a fin-cooling method, this has the world’s largest capacity.
**Electrical Equipment and Machinery**

In the electrical equipment and machinery area, Fuji Electric’s main products are industrial power application systems for industry and railway use.

Domestic orders for electrical power application systems for industry fell sharply because of a slump in capital investment by steel companies and other major industrial companies. However, Fuji Electric received significant orders from overseas, such as for electrical equipment for cogeneration and a substation in Taiwan and for DC power conversion equipment for aluminum smelting in Australia.

The Company developed compact, lightweight, low-loss, high-performance inverters, which use power semiconductor IGBTs, for industrial plants and general industrial use. Also, a cycloconverter-driven, permanent-magnet synchronous motor was developed and delivered to a domestic coal mining company.

In electrical power applications for railway use, sales and orders were supported by firm capital investment by domestic railway companies. Fuji Electric developed a main converter/inverter incorporating 2.5 kV/1 kA-rated flat-packaged IGBTs for the Shinkansen. The equipment is being evaluated through actual run performance tests. In new products for railway use, a door driving system that uses a synchronous linear motor was developed to open and close platform barriers and trains doors.

Fuji Electric has received an order for four 600 MW steam turbine-generator units for a coal-fired power plant in Taiwan. This is a large-scale project even by international standards.

Fuji Electric has delivered 110 kV underground substation equipment to the Chubu Electric Power Co., Inc. for use in a multiple purpose building. The gas-insulated transformer of 40 MVA at 110 kV is the largest made by Fuji Electric.

We developed this direct-current, common bus-line voltage PWM-control FRENIC 4000 V4M Series inverter for industrial plants. It incorporates the latest advances in miniaturization, performance and function.
Fuji Electric developed low-noise, highly efficient converter/inverter units incorporating 2.5 kV/1 kA-rated flat-packaged IGBTs for the 300 series Shinkansen.

**Electric Distribution & Control and Drive Systems**

This area can be divided into the electric distribution and control (ED&C) system and the drive system fields. Major products in the ED&C system field include control equipment, such as magnetic motor contactors, push-button switches and programmable logic controllers (PLCs), and electrical distribution equipment, such as molded-case circuit breakers and earth-leakage circuit breakers. Major products in drive systems include induction motors, motor-related equipment and inverters.

In ED&C systems, demand for machine tools and other machinery was robust, and an upturn in demand for electrical distribution equipment finally materialized as well. As a result, production and sales of ED&C systems were strong throughout the year. Among new products, sales of the compact, high-performance MICREX-F55 Series of PLCs and the new AR series of push-button switches expanded steadily.

In drive systems, inverter sales benefited from strong domestic markets for air conditioners, fans and pumps. Higher exports, mostly to Europe, North America and Asia, also contributed to strong sales growth. Sales of motors improved, supported by favorable demand for conveyor equipment, fans and pumps.

This hoist for inclined mine shafts moves worker transport cars farther and faster than any other hoist in the world. Using the latest controller theory to develop this system, Fuji Electric cut transport time by one-third.
Consolidated sales declined 2.1% to ¥244,995 million, comprising 27.5% of net sales. In the plant control systems area, the Company received orders for equipment used in such social infrastructure projects as advanced water treatment systems and tunnel ventilation systems. In addition, we delivered a cogeneration system to a hospital. In the information equipment area, sales of magnetic disks increased sharply due to strong demand for hard disk drives in line with high growth in the personal computer market. In the electronic devices area, power devices and discrete devices recorded steady sales.
This high-precision inspection device uses image density to judge the similarity between inspected objects and a normal pattern. It solves many problems in the external inspection of electronic components and printed packages.
Information Equipment

The main products in the information equipment area include magnetic disks, copier and printer photoconductive drums and electroluminescent (EL) displays.

Demand is surging for hard disk drives due to the strong growth of the personal computer market. Fuji Electric is responding to growing demand for high-volume magnetic disks used in increased capacity hard disk drives. As part of our investment in the development of next-generation magnetic disks, we strengthened our research and development facilities and significantly increased production capacity by upgrading existing production facilities and building new ones. As a result, sales outpaced those of last year by a wide margin. In photoconductive drums and other electronic specialty devices, Fuji Electric introduced a number of new products to the market, and replied to customer needs with the development of an organic photoconductive drum with enhanced sensitivity and resolution. However, sales growth was hindered by sluggish sales of selenium photoconductive drums and lower prices for organic photoconductive drums due in part to the high value of the yen.

We developed a highly sensitive, high-resolution organic photoconductive drum for printers to extend the advantages of electronic photography to new applications. This product meets customer demands for quality, function and value.

Fuji Electric used zone-texture technology to develop 3.5-inch magnetic disks with a low-flying height and a capacity exceeding one gigabyte/platter suitable for sensitive MR heads.
Control/Information Systems and Electronic Devices

Electronic Devices

The main products of the electronic devices area are power devices, discrete devices and integrated circuit (IC) products.

In the power semiconductor market, our overseas sales were increased by adapting to a globalized market. However, in the second half of the period, growth was limited by lackluster market conditions in the European and American markets. In industrial applications, sales of our new N Series of insulated gate bipolar transistor (IGBT) modules increased drastically. And metal-oxide semiconductor field-effect transistors (MOSFETs) for use in personal computer power sources sold well. We also succeeded in producing power-MOSFETs for highly efficient power sources.

In IC products, we made every effort to make smaller products with improved energy efficiency to keep up with the popularity of portable electronic devices. Finally, we expanded the spectrum of our power IC products through integrating analog circuits with complementary metal-oxide semiconductors (CMOSs) on a single chip using low-power-loss chip technology.

A power-MOSFET is a power semiconductor that functions as a switch, with low-power-loss and superior capability to withstand voltage surges. Our broad lineup includes power-MOSFETs for switching mode power supplies and battery-use products.
Consolidated sales increased 7.5% to ¥295,999 million, or 33.3% of net sales. In consumer-related products, sales of vending machines were essentially unchanged. On the other hand, sales of freezing and refrigerated showcases grew sharply, reflecting strong capital investment in the retail industry. In specialty appliances, sales of card systems, especially gate systems for leisure facilities, increased significantly. Sales of coin mechanisms and bill validators for vending machines rose.
The main products of the Consumer-related and Other Products group are vending machines, freezing and refrigerated showcases, card systems, hotel vendors and coin and currency equipment.

In vending machines, the group’s main product line, sales declined slightly because of lower market prices, despite a recovery in demand for beverage vending machines in the second half of the fiscal year. Fuji Electric, in cooperation with the Tokyo Electric Power Co., Inc. and Coca-Cola Japan Co., Inc., developed and introduced the EcoVendor cold beverage vending machine, which reduces the peak summertime demand for electricity by chilling beverages at off-peak times.

Sales of freezing and refrigerated showcases were brisk, benefiting from new store construction, store renovations and replacement demand by the supermarket and convenience store industries in response to the liberalization of the Large-Scale Retail Store Law. Moreover, showcase sales increased sharply, due to the development and introduction of the FreshMax Series, a full line of freezing and refrigerated showcases with enhanced product presentation functions. In addition, sales of beverage dispensers showed impressive growth due to strong marketing efforts.

In the specialty appliance field, Fuji Electric recorded solid sales growth of card systems. We delivered noncontact scanner lift gate systems to a number of domestic ski resorts, as well as noncontact scanner entrance-gate systems for leisure and research facilities.

In refrigerator vending systems for hotels and inns, Fuji Electric worked to increase sales of a noiseless refrigerator that uses an electronic refrigeration method, and introduced a hotel vendor of a startling new design that displays products lengthwise.

As part of our effort to increase sales of specialty products, we introduced general-purpose ultrasound scanners that make possible the full-scale diagnosis of circulatory organs. In the coin and currency field, sales of coin mechanisms and bill validators increased due to a recovery in demand for beverage vending machines and expanded production of cigarette vending machines. However, sales of bill validators for banking machines and retail-related systems fell sharply, owing to weakness in the financial sector and rapid changes in retail operating formats.