

Chapter 5 Precision Instruments Sector

5-1 Electric Control Equipment / Electric Measuring Instruments / Analytical Instruments

5-1-1 Supply and demand trends

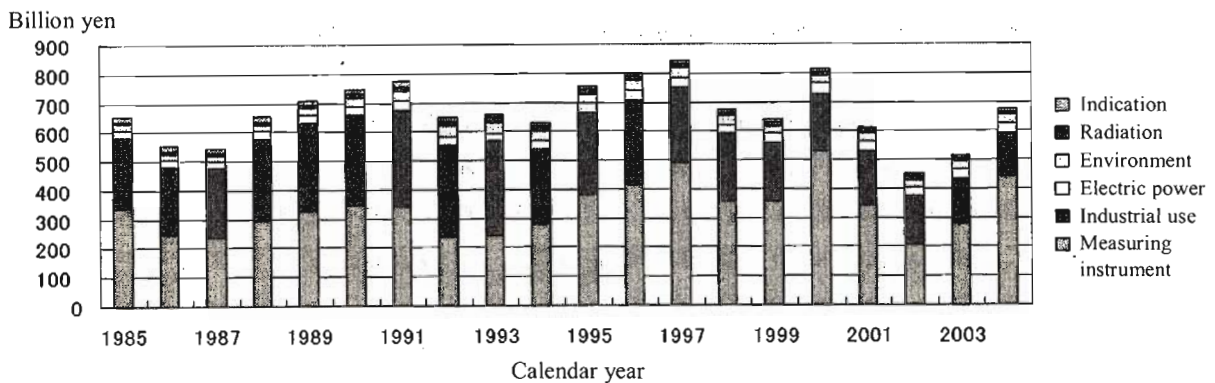
(1) Overview

Here, let us discuss electric measuring instruments (“electric measuring instruments” in the machinery statistics) and analytical instruments that are not included in precision instruments in the machinery statistics but account for a major part of measuring/analytical instruments. We also examine electric control equipment that incorporates electric measuring instruments in their system—it is difficult to draw the line between individual units for these instruments.

Let us start with an overview of electric control equipment that is not considered in the machinery statistics. Their shipment value (domestic and export combined) rapidly decreased in 2001 in the wake of the IT bubble burst and then increased for three consecutive years until 2004 when it reached the year 2000 level when the IT bubble reached its peak (Nippon Electric Control Equipment Industries Association). The reason for this growth is the increased demand driven by expanded equipment investment not only in Asian countries such as China but also domestically due to the growth of household electrical machinery, especially the new three holy durables, domestically and abroad. Increased FA investment including machine tools in the automobile industry also contributed to this growth.

Next, electric measuring instruments in the machinery statistics continued their recovery in 2004 after getting out of the declining demand trend in 2003 for the first time since the IT bubble burst (Diagram 5-1-1). Among major electric measuring instruments, the recovery of general measuring instruments that were weak in 2003 contributed greatly, together with the strong performance of IC/semiconductor testers. The impact of the digital home appliance boom reached widely to the entire machinery industry and electric measuring instruments called mother tools were no exception.

Analytical instruments experienced even higher growth in 2004. Domestic demand was stagnant in 2003 but grew by 10% in 2004, pushing domestic production upward. The trade balance surplus was helped by the 8% growth of exports. The mainspring of this growth is the increasing demand for analytical instruments for factory processes and on-site use due to the progress of industrialization in Asian countries such as China. Similar to the case of mechanical measuring instruments, Japan is strengthening its status as a supply depot in this field, too.



Source: Japan Electric Measurement Instruments Manufacturers' Association

Diagram 5-1-1 Electric measuring instruments (production value)

(2) Production and domestic demand

Looking at the 2004 supply and demand of “switchgears and controlling equipment” that are listed in the machinery statistics under electric control equipment, we recognize that, while domestic demand continued to be sluggish with a decrease of 3%, exports grew by 20%. In spite of the 13% increase of imports, domestic production grew by 9% thanks to the improved trade balance (Diagram 5-1-3). In 2003, when electric measuring instruments in general benefited from the digital home appliance boom, these switches experienced improved business conditions after the long stagnation of domestic production due to sluggish domestic demand and increased imports.

Electric control equipment may still be one of the machinery industry products that have growth potential. Though we cannot expect the high-speed growth experienced before the collapse of the IT bubble and it is inevitable that they will suffer the impact of increased offshore production and developing country exports to respond to the demand expansion in Asia, the production of controlling equipment in Japan is likely to maintain its vitality due to the recovery of telecommunication demand and equipment investment domestically as well as the increase of exports to China that will serve as a production base. In fact, in 2004 PLC (programmable controller)/FA system equipment that are top in shipment value on a model/use basis experienced a 10% increase in shipment value—this was driven by equipment investment domestically and abroad. Demand also grew for relays for control at communication base stations, which are second after PLC/FA system equipment in terms of shipment value. Domestic equipment investment for telecommunication including cellphones (relays for control, control equipment for exclusive use = interconnect equipment), factory automation investment at home (PLC/FA, switches for detection), service

automation investment such as automatic vending machines and plant expansion abroad all contributed to the recovery of control equipment shipment.

Electric measuring instruments have similar reasons for their recovery in domestic production. On a by-use basis, the sharpest rise can be seen in electric measuring instruments, with a 58% increase over the previous year. This can be attributed to the high operating rate of semiconductor plants accompanying the growth of digital home appliances and the demand for semiconductor/IC testers due to the investment to increase the production of semiconductors domestically and abroad. In contrast, the production of measuring control equipment for industrial use continued to decline in 2004 for the eighth consecutive year. However, the depth of decline is improving thanks to equipment investment against a background of economic recovery in the basic material industry as well.

Domestic demand for analytical instruments grew as much as 10% because of the active R&D investment with recovering corporate profits. Together with rising exports, this increased the domestic production by 13% (Diagram 5-1-2). On a by-use basis, the trend of research investment has the largest impact (Diagram 5-1-5) because research accounts for 60% of the whole. The R&D budget increased both in the government and in the private sector.

Domestic demand for analytical instruments for use in food factories increases every time a problem of food safety/sanitary control occurs. In Asia, too, analytical instruments for food are now second after those for the electronics industry due to export expansion to Japan.

Diagram 5-1-2 Trend of supply and demand of analytical instruments

(Unit: 1 million yen)

	Domestic production (a)	Exports (b)	Imports (c)	Trade balance (d) (b-c)	Domestic demand (a-d)
2002	316,959	176,205	111,056	65,149	251,810
2003	327,557	194,680	115,359	79,321	248,236
y/y	103%	110%	104%	122%	99%
2004	370,764	209,476	113,009	96,467	274,297
y/y	113%	108%	98%	122%	110%

Note: For domestic production, figures from the voluntary statistics of the Japan Analytical Instruments Manufacturers' Association are used.

Exports and imports are based on the items of HS9027 of the foreign trade statistics.

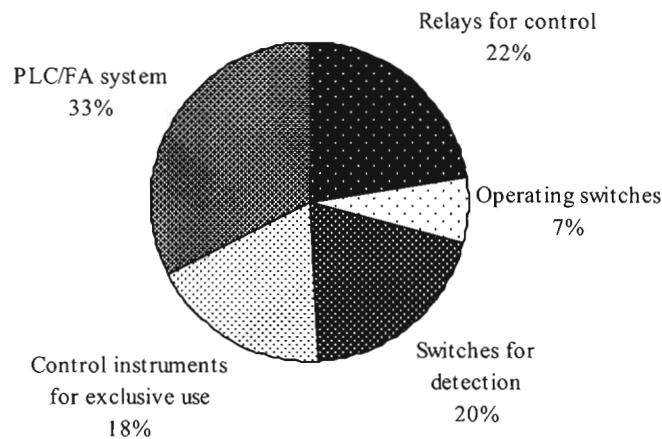
Diagram 5-1-3 Trend of supply and demand of switchgears and controlling equipment

(Unit: 1 million yen)

	Domestic production (a)	Export (b)	Import (c)	Trade balance (d) (b-c)	Domestic demand (a-d)
2002	1,199,929	702,268	210,859	491,409	708,520
2003	1,181,422	759,964	233,238	526,726	654,696
y/y	98%	108%	111%	107%	92%
2004	1,283,401	912,196	264,633	647,563	635,838
y/y	109%	120%	113%	123%	97%

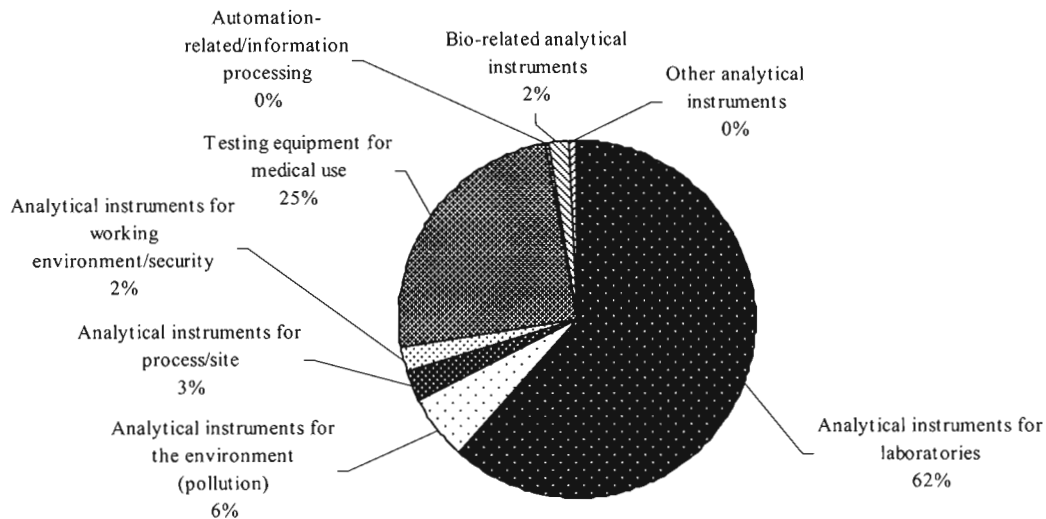
Note: For domestic production, figures for the switchgears and controlling equipment of the machinery statistics (current survey of industrial production) are used.

Exports and imports are based on the items of HS8535-8537 of the foreign trade statistics.



Source: Nippon Electric Control Equipment Industries Association

Diagram 5-1-4 Shipment value composition of electric control equipment (2004)



Source: Japan Analytical Instruments Manufacturers' Association

Diagram 5-1-5 By-use composition of analytical instruments (2004)

(3) Exports and imports

Looking at the composition of export destinations of electric control equipment, we can see that Asia (mostly China) now accounts for more than half of the exports (Diagram 5-1-6, Nippon Electric Control Equipment Industries Association). In 2004, however, it was believed that the share of China declined by about 10% as a consequence of the credit squeeze. The next place is occupied by Europe followed by North America. In Europe, business recovery and investment by Japanese companies may have led to export demand that exceeded that of North America also in 2004.

Next, looking at the composition of export destinations of electric measuring instruments, we see that Asia accounts for two-thirds of the exports (Diagram 5-1-7). Here Asia's share is greater than in control instruments but it has the same trend. North America and Europe each accounts for around 15% but the share of Europe is slightly higher, which may reflect the preference of equipment investment by Japanese companies, as seen in the case of electric control equipment.

The category that accounts for the largest part of electric measuring instruments is electric test and measuring equipment. Dividing them

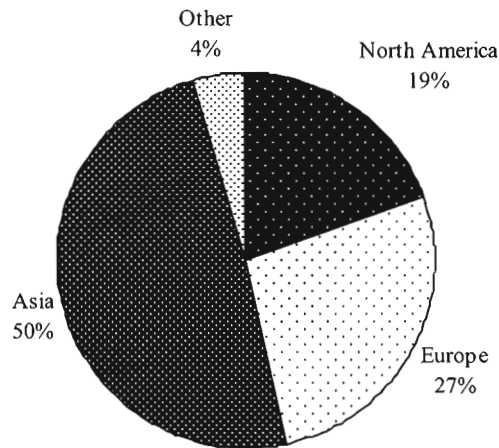
into general measuring instruments (Diagram 5-1-8) and semiconductor/IC measuring instruments (Diagram 5-1-9), we recognize that the domestic demand for the former, which had been on a downward trend, showed huge expansion in 2004. Their exports also show a slight increase that was exceeded by the import increase, resulting in the reduction of the trade surplus but contributing to the recovery of their domestic production nevertheless. This was a result of the activated equipment investment. General measuring instruments are believed to have a tendency towards local-production/local consumption.

In contrast, semiconductor/IC measuring instruments, in spite of the great business fluctuation, have grown as major export products because the export market expanded more than domestic demand (Diagram 5-1-9). However, their imports are also growing rapidly, showing the progress of the international division of labor and the sophistication of the domestic industrial structure.

As regards analytical instruments, the composition of export destinations is not clear. However, it is believed that their exports to

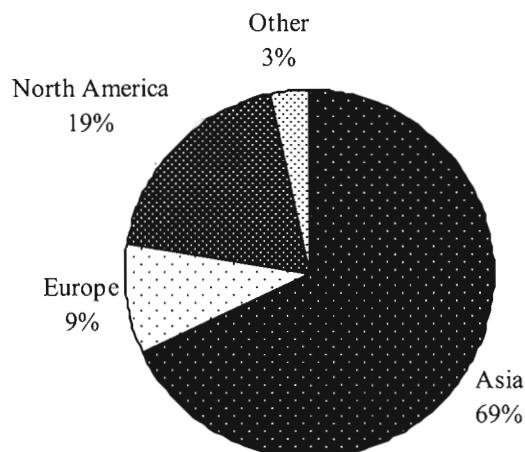
China and Russia have increased recently while that to North America is decreasing for laboratory use as well as electronics/food industry use. Japan is strong in material research and exports in this field are growing. High import figures are also characteristic for analytical instruments. They are mostly imported from the US to meet

the demand for instruments in the biological field where Japan is not strong. In fact, the market for domestic instruments for biological use is shrinking. The fact that the surplus is nevertheless growing shows the fundamental strength of Japanese precision instruments.



Source: Nippon Electric Control Equipment Industries Association

Diagram 5-1-6 Composition of the export destinations of electric control equipment (2004)



Source: Japan Electric Measurement Instruments Manufacturers' Association

Diagram 5-1-7 Composition of export destinations of electric measuring instruments (2004)

Diagram 5-1-8 Trend of supply and demand of electric measuring instruments

(Unit: 1 million yen)

	Domestic production (a)	Exports (b)	Imports (c)	Trade balance (d) (b-c)	Domestic demand (a-d)
2002	122,148	67,707	35,788	31,919	90,229
2003	114,667	70,834	39,094	31,740	82,927
y/y	94%	105%	109%	99%	92%
2004	150,542	76,340	47,244	29,096	121,446
y/y	131%	108%	121%	92%	146%

Note: For domestic production, figures for the electric measuring instruments of the machinery statistics (current survey of industrial production) are used.

Exports and imports are based on the items of HS9028, 9029 and HS four-digit 9030 (excluding 82, 89 and 90) of the foreign trade statistics.

Diagram 5-1-9 Trend of supply and demand of semiconductor/IC measuring instruments

(Unit: 1 million yen)

	Domestic production (a)	Exports (b)	Imports (c)	Trade balance (d) (b-c)	Domestic demand (a-d)
2002	83,142	69,498	9,574	59,924	23,218
2003	165,447	121,058	6,953	114,105	51,342
y/y	199%	174%	73%	190%	221%
2004	291,978	231,891	13,660	218,231	73,747
y/y	176%	192%	196%	191%	144%

Note: For domestic production, figures for semiconductor/IC measuring instruments of the machinery statistics (current survey of industrial production) are used.

Exports and imports are based on the 100 items of 82 and 89 among HS four-digit 9030s.

5-1-2 Industry and business trends

(1) Corporate performance

Matsushita Electric Works, Ltd. is not specialized but it is the major electric control instrument company whose performance benefited greatly from the recovery of the control instrument business. In 2004, control instruments such as FAs and connectors for cellphones were especially strong. OMRON Corporation, the biggest among a small number of specialized control equipment companies, had a marked increase both in sales and profits against a background of a strong demand for control equipment as Matsushita Electric Works completely overcame the legacy of the IT bubble. KEYENCE Corporation, a measuring/control equipment manufacturer, posted record profits for four quarters since the collapse of the IT bubble. Digital-appliance-related equipment investment

demand such as semiconductor and LCD and demands for sensors as components contributed to its good performance.

There are only a small number of major specialized electric measuring instrument companies. Among them, Yokogawa Electric Corporation is a leading company that is fully enjoying the benefit of the demand for semiconductors/IC testers due to the digital home appliance boom described above, greatly improving its performance in 2004. The company, which had been suffering from a slump in industrial control equipment among control equipment and general measuring instruments among measuring instruments due to stagnant plant investment domestically and abroad as well as eroded cost competitiveness abroad is at last succeeding in

shifting its business structure.

Among specialized manufacturers of analytical equipment, Shimadzu Corporation is the top company, followed by JEOL Ltd., which is strong in electron microscopes. Of the two, Shimadzu Corporation enjoyed greater per-

(2) Future prospects and challenges

The electric control equipment, electric measuring instruments, and analytical instruments discussed herein are still growing and are promising fields among precision instruments in the medium to long term.

In the short term, business conditions will deteriorate and performance will stagnate as we have entered the downward phase of the so-called silicon cycle but the Japanese market of electric control equipment and electric measuring instruments is expected to recover rapidly because the economy will come out of the temporary lull into the material industry while automobiles will remain strong. The problem is foreign demand. Though China is now in an adjustment phase, risk is higher in the US. Demand is brisk in Europe but greatly depends on the investment trend by Japanese companies. The industry is hoping for 2004 level growth both for control and measuring equipment but it would be wiser to prepare for a slight slowdown.

In the medium to long term, Japan can expect an expansion of the export market in its home territory including China while domestically it is likely to see the development of new

performance improvement as a result of successful business selection and concentration. JEOL, whose business performance was declining due to price competition, is now going upward against the background of the nanotech boom.

devices in which Japan is strong as well as an increase in the demand for automation and robots as a consequence of the falling birthrate and aging population. In order to bring such demands to the surface, further increase of R&D investment is required.

A short-term forecast is difficult for analytical equipment. In the medium to long term, however, it is certain that the market for laboratory equipment including those in Japan is good and that it shall continue to expand domestically and abroad because of intensifying global R&D competition. Japan is strong in material-related analytical equipment such as nanotech but weak in bio and life science. A delay in developing measurement/analytical technology, etc. in these cutting-edge areas could lead to a loss of competitive edge not only for the analytical instrument industry but for the entire manufacturing industry.

To avoid this, it is important to establish a systematic and strategic R&D framework for measurement and analysis, in the field of instrumentation. Against this background, there is a plan to promote the "analysis industry."