

Briefing Session on Mid-term Business Plan “YASKAWA IR Day 2023”

Motion Control Segment AC Servo & Controller Business

June 1st, 2023

YASKAWA ELECTRIC CORPORATION

Overview of AC Servo Business

Business Overview

Development, production and sales of main components (AC servo motors, linear motors, machine controllers, etc.) incorporated in manufacturing equipment requiring high precision

Strengths

- World's first servo motor called "Minertia motor" developed in 1958.
 - ⇒World's best performance and quality
 - ⇒Global No.1 brand strength
- Built strong relationship with top companies of various manufacturing equipment
 - ⇒Contributing to the sophistication and enhanced performance of machinery with pursuit of cutting-edge technologies

Business Opportunity

- High value-added manufacturing equipment
- Major investment in the semiconductor industry in each country
- Adoption of EVs

Market Size (Assumption)

【FY2025】
AC servo market :
Approx. 0.9 tn. JPY
(Approx. 0.8 tn. JPY in FY2022)

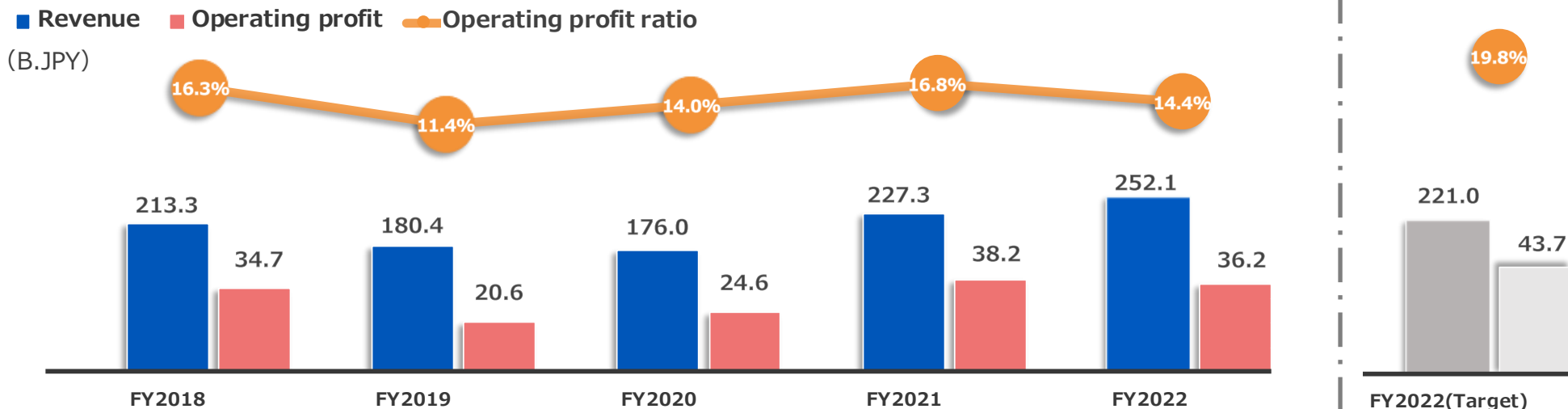
<CAGR>
FY2022→FY2025: +4.0%

*Estimated by Yaskawa

Review of “Challenge 25 Plus” (1)

Revenue target was achieved, while profit (ratio) fell short of the targets.

Performance trends of Motion Control segment




Revenue and profits fell from FY18, when demand was high, due to the impact of the U.S.-China trade dispute.

- **Continued revenue growth** due to favorable demand environment following normalization from COVID crisis
- Profits were significantly affected by procurement difficulties and soaring materials prices.

*Lower text are the comments on AC servo and controller business in Motion Control segment.

Review of “Challenge 25 Plus” (2)

Initiatives of Challenge 25 Plus	Review
<p>① Expand sales in growing markets by implementation of i³-Mechatronics</p>  <p>Sigma-X series AC servo drive YRM controller</p>	<ul style="list-style-type: none">• Enhanced components for i³-Mechatronics by launching Sigma-X series and YRM controller• Communicated our practice of i³-Mechatronics at YASKAWA Solution Factory (hereafter Y'sF) to customers and expanded business
<p>② Expand sales in growing markets including China and Asia</p>	<ul style="list-style-type: none">• Introduced new products (Sigma-X series) to global growth markets (semiconductors, 3C*, new infrastructure, etc.) especially in China and Asia to increase orders• Developed products suitable for applications, such as DD motors and linear motors, and contributed to increasing the added value of customer equipment
<p>③ Enhance production efficiency</p>	<ul style="list-style-type: none">• Y'sF production system which achieved 50% increase in production efficiency was introduced to plants in Japan and China (Shenyang)

* 3C: Digital communication devices for consumers (Acronym for Computer, Communication, Consumer Electronics)

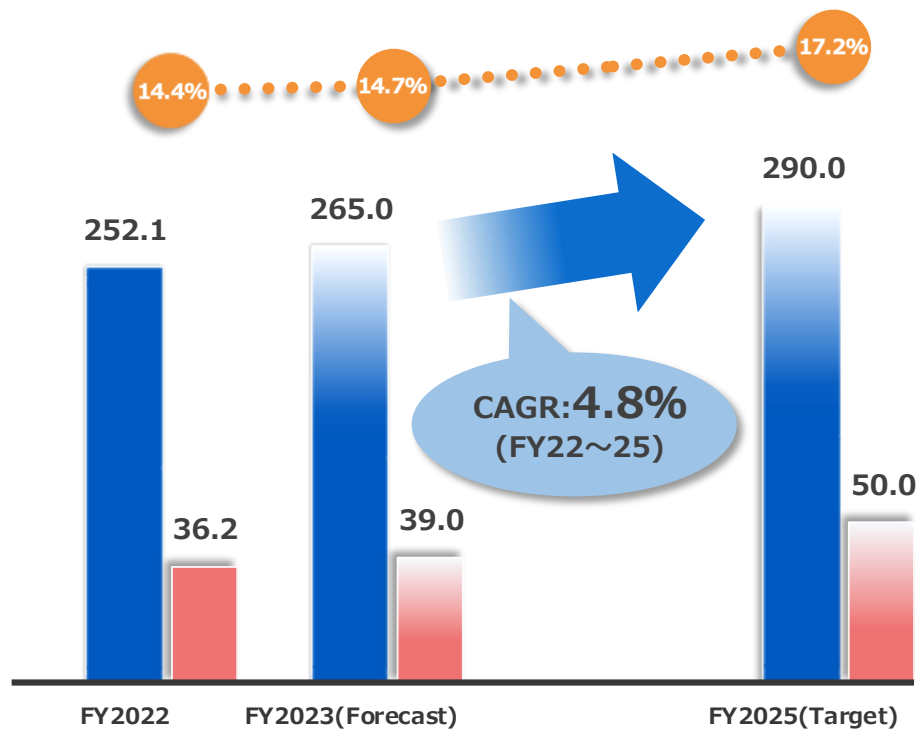
Mid-term Business Plan “Realize 25” Policies and Goals

- Expansion of value added through demonstration of i³-Mechatronics
- Enhancement of profit structure by improving production efficiency and expanding local production

Performance Target of the Motion Control Segment

■ Revenue ■ Operating profit — Operating profit ratio

(B. JPY)



Realize 25

〈Financial Target〉

Revenue : 290.0 B.JPY
 Op. profit : 50.0 B.JPY
 Op. profit ratio : 17.2%


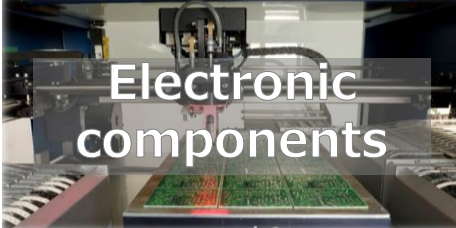


*Motion Control segment overall

〈Keywords〉

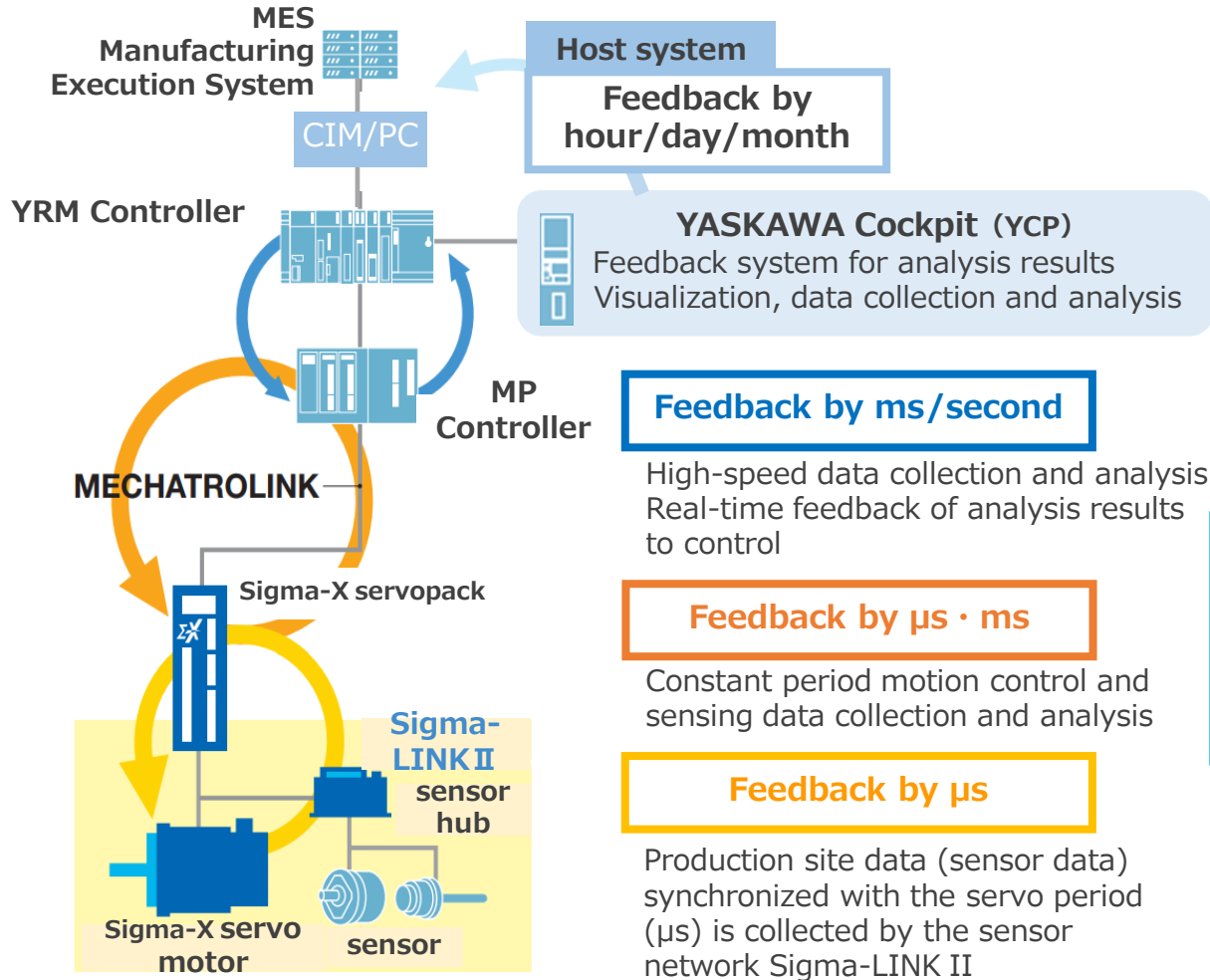
- Sales:** Accelerate approach to growth markets by providing digital data solutions
- Development:** Expand solution coverage by expanding YRM Controller and Sigma-X series
- Production:** Improve production efficiency by using Yaskawa products and expand local production

Key Markets in Mid-term Business Plan “Realize 25”

Key Markets in Mid-term Business Plan “Realize 25”

Markets				
Trends	<ul style="list-style-type: none"> • Large-scale investment plans continue globally, in Europe, the U.S., South Korea and Japan • Potential demand for IoT and other services is firm and expected to recover from the second half of fiscal 23 	<ul style="list-style-type: none"> • Smartphone demand remains weak, but in-vehicle and solar-related applications remain strong • Potential demand for IT-related products remains strong, and demand is expected to grow steadily 	<ul style="list-style-type: none"> • Market expansion is expected to continue as EVs are adopted globally to reduce environmental impact • Use in other industries is expected to further expand the market 	<ul style="list-style-type: none"> • The automobile industry transition due to the adoption of EVs cause demand to increase in new markets and fields • Expansion of processing applications caused by the recovery of the Chinese domestic demand
Customer applications	<ul style="list-style-type: none"> • Semiconductor Production Equipment <Front-end> Film deposition equipment, cleaning equipment <Back-end> Dicer, die bonder 	<ul style="list-style-type: none"> • Chip moulder • Electronic component manufacturing machine • Solar panel manufacturing machine 	<ul style="list-style-type: none"> • Lithium-ion battery manufacturing equipment Coater for electrode foil processing Winding machine for electrode layer manufacturing 	<ul style="list-style-type: none"> • Machine tool Lathe, machining center, turning center
Needs	<ul style="list-style-type: none"> • Non-stop • High throughput • Miniaturization • Downsizing 	<ul style="list-style-type: none"> • Non-stop • High throughput • High precision 	<ul style="list-style-type: none"> • Automation • Multifunction • High throughput 	<ul style="list-style-type: none"> • Non-stop • High throughput • High machining accuracy

High-value-added digital data solutions based on the YRM controller and taking full advantage of the Sigma-X series sensing functions



i³-Mechatronics

Respond to market needs by creating high value-added cells and equipment through data-driven

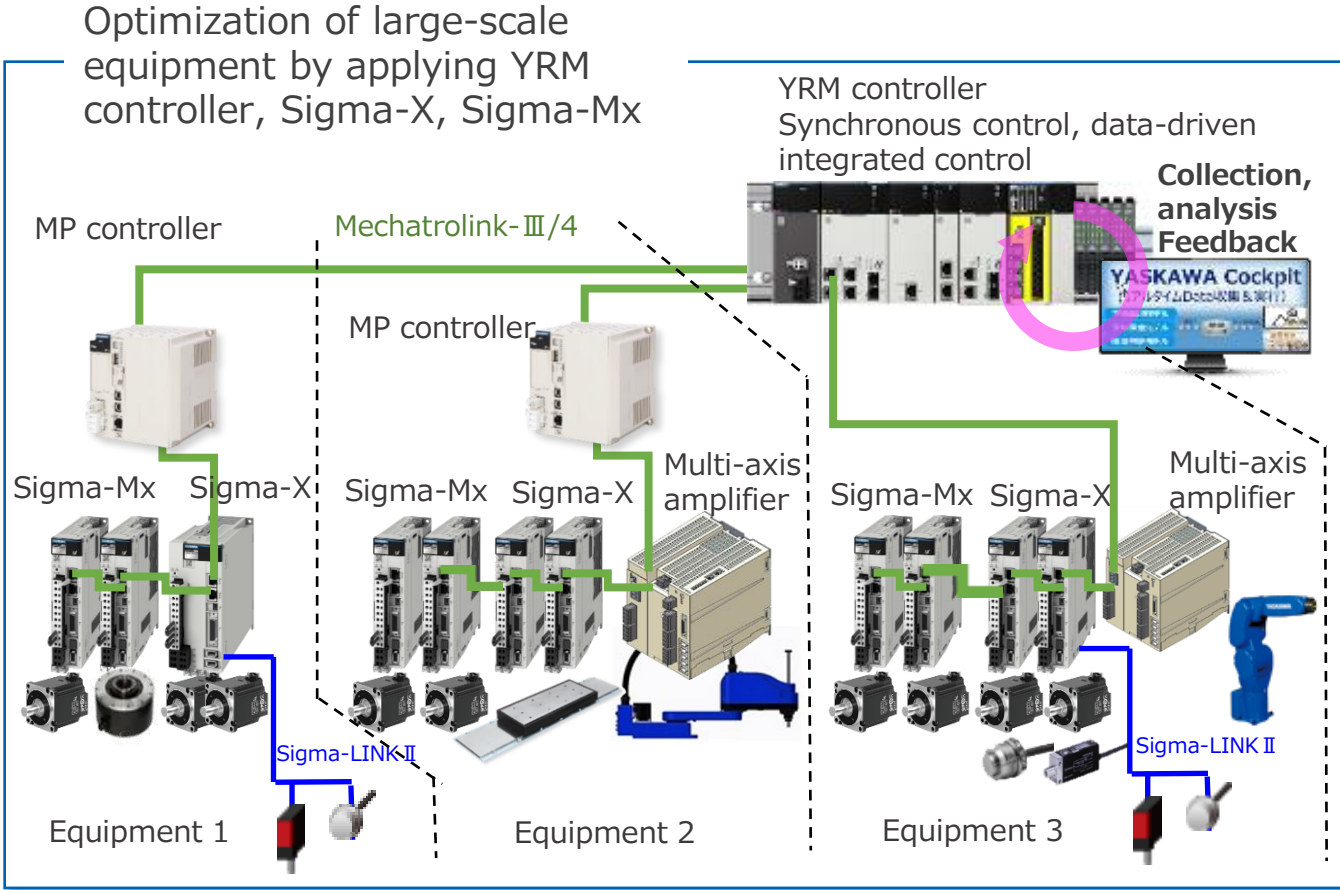
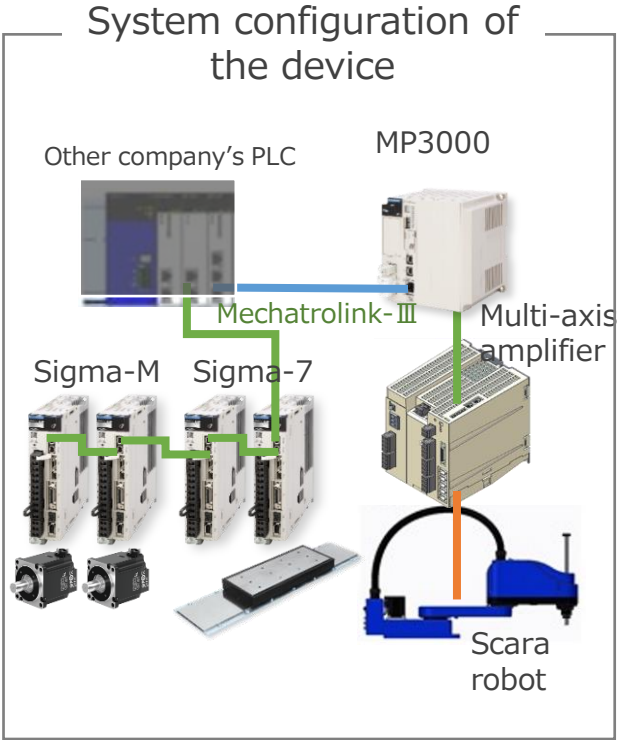
■ **Semiconductor market**
Non-stop/High throughput/
Miniaturization/Downsizing

■ **Electronic component market**
Non-stop/High throughput/
High precision

■ **Battery market**
Automation/Multifunction/
High throughput

■ **Machine tool market**
Non-stop/High throughput/
High machining accuracy

Achieve "total optimization" of the production system in the Chinese market as it becomes larger-scale (automation and multifunction through equipment integration) with the YRM controller at the core



[Development] Expand Solution Coverage by Expanding YRM Controller and Sigma-X Series

Expand the lineup of YRM controllers and Sigma-X series to expand the range that solutions are applied and achieve high added value for customer equipment

YRM Controller

- Integrated data-driven control
- Total optimization of each autonomous device

YRM Controller



Meet market needs by expanding the range that solutions are applied by expansion of the lineup

Sigma-X series

① Speed frequency response

Sigma-7
3.1kHz



Sigma-X
3.5kHz

The highest performance in the industry

<Merits>

Stable operation of equipment

② Maximum motor rotation speed

Sigma-7
6000min⁻¹



Sigma-X
7000min⁻¹

<Merits>

Reduction of tact time
Improvement of productivity

③ Encoder resolution

Sigma-7
Encoder resolution
24bit
≒16 million pulses/rev



Sigma-X
Encoder resolution
26bit
≒67 million pulses/rev

4 times finer

<Merits>

Smooth movement to stop precisely
Improvement of accuracy of machined surfaces

Sigma-X series



■ Semiconductor market
Non-stop/**High throughput/**
Miniaturization/Downsizing

■ Electronic component market
Non-stop/**High throughput/**
High precision

■ Battery market
Automation/Multifunction/
High throughput

■ Machine tool market
Non-stop/High throughput/
High machining accuracy

Strengthen profit structure by improving production efficiency, increasing local production, and optimizing supply chain to ensure stable supply

(1) Strengthen production capacity by expanding models produced in demand areas

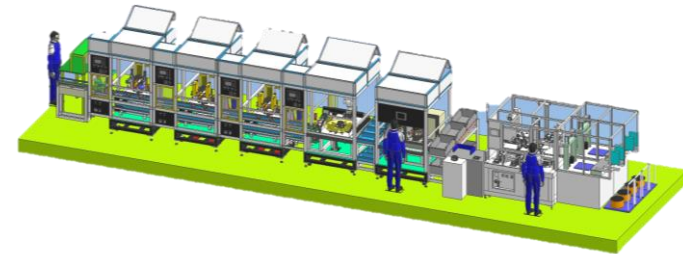
- Expand production of Sigma-X and Sigma-Mx in China
- Expand production of DD motors* in the U.S.

(2) Accelerate global expansion of production system of Y'sF

- Expand automated assembly lines to China

(3) Optimize supply chain for stable procurement

- Strengthen centralized purchasing system in Japan (semiconductor parts, etc.)
- Establish multiple purchasing system by utilizing Yaskawa Technology Center



Example of production in Yaskawa Solution factory
Automatic assembly line for Motor stator

* DD motors : A motor that outputs high torque even at low speeds so that a controlled object can be driven directly. High-precision control is possible without rattling or loss of mechanism parts.

YASKAWA