

A woman with long brown hair, wearing a blue patterned off-the-shoulder top and a silver chain necklace, is driving a convertible car. She is smiling and looking out the window towards the sun, which is low on the horizon, creating a bright lens flare. The car's interior and steering wheel are visible. The background shows a landscape with trees and a body of water under a clear sky.

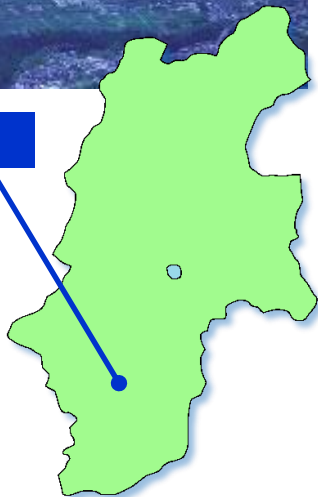
Motion
makes
Emotional.

TAMAGAWA SEIKI CO., LTD

Outline



Iida city, Nagano



Company	Tamagawa Seiki Co., Ltd.
Founded	March 3, 1938
Officers	Yasuo Hagimoto / Chairman and CEO Tadanori Matsuo / President and COO
Capital	100 million JPY
Employees	643 persons
Single sales	JPY 48.1 billion (fiscal year 2025)
Consolidated sales	JPY 83.5 billion (fiscal year 2025)
Product range	▪ Servo Components (AC servomotors, Step motors, Encoders, Resolvers, Rate sensors, Gyros, LVDTs, etc.) ▪ Motor drivers, Controllers, Robots, Inertial Measurement Units, Automatic Control Devices, etc.
Overseas	Tamagawa Trading Co., Ltd.
Business Division	Tamagawa Seiki Suzhou Co., Ltd. Tamagawa Europe GmbH Tamagawa Vietnam Co., Ltd.

History



- 1938 Founded by Hiroichi Hagimoto in Kamata, Tokyo; Started producing instrument motors for remote monitor and automated control purposes.
- 1946~ Started producing instruments motors for industrial and ship applications; Synchros were designed the first time in Japan by Tamagawa in 1959.
- 1997 VR resolvers “Singlsyn” was adopted for Prius Hybrid-Electric Vehicle.
- 2000 Hachinohe Plant was founded in Aomori Prefecture.
- 2003 2nd Plant was established in Iida City.
- 2004 3rd Plant was established in Matsukawa Town near Iida.
- 2005 Awarded for Minister Prize in Japan Manufactures Award by Ministry of Economy, Trade and Industry.
- 2007 Established Tamagawa Hong Kong.
- 2009 Acquired MEMS gyro business.
- 2010 The first overseas manufacturing plant in Taicang City China “Tamagawa Seiki Suzhou Co., Ltd.” was established.
- 2012 “Tamagawa Seiki Representative Office” in Ulm, Germany as a hub in Europe for the first time.
- 2015 The Commercial Aircraft Business was started.
- 2018 Establishment of the Hachinohe Second factory.
- 2019 Established TAICANG TAMAGAWA TRADING CO., LTD.
- 2023 Established TAMAGAWA VIETNAM CO., LTD.



● VR resolvers “Singlsyn”



● 2nd Plant



● Tamagawa Seiki Suzhou China



● Founding products

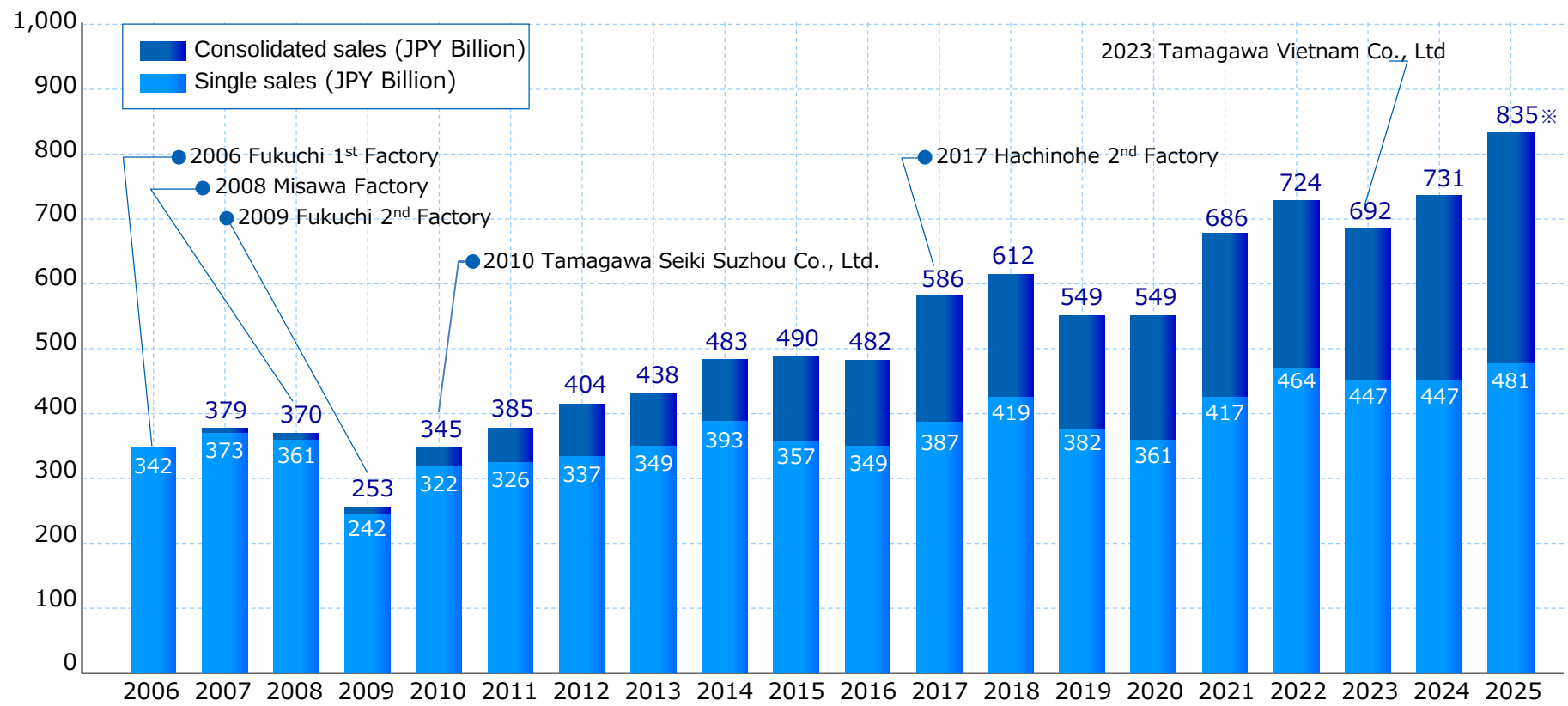


● Minister Prize in Japan Manufactures Award



● 3rd Plant

Sales volume



Footprint

Nagano

TAMAGAWA SEIKI

Headquarters/First Plant, Second Plant, Third Plant

TAMAGAWA TRADING

Headquarters, Nagano Office



Aomori

Hachinohe Plant

(First Hachinohe Factory, Second Hachinohe Factory, First Fukuchi Factory, Second Fukuchi Factory, Misawa Factory)



Tokyo

Tokyo Office



Kitakanto Office

Fukuoka Office

Osaka Office

Nagoya Office

Chubu Office

Nishikanto Office

Headquarters/First

1879 Oyasumi, Iida-shi, Nagano, 395-8515, Japan

Site area 138,200m²

Factory floor area 29,600m²

Management division, and design and manufacture for the products related to Aerospace and Defense.

Design Division : Spacetronics Laboratory



Second Plant

1020 Kega, Iida-shi, Nagano, 395-8520, Japan

Site area 44,000m²

Factory floor area 23,200m²

Design and manufacture of Resolver for HEV and BEV, and various products for Railway application, and Encoder for Factory automation.

Design Division : Sensortronics Laboratory, Motortronics Laboratory



Third Plant

3174-22 Motoojima, Matsukawa-machi, Shimoina-gun, Nagano, 399-3303, Japan

Site area 35,400m²

Factory floor area 11,300m²

Manufactures of Resolver for HEV and BEV, and Disks for encoder, and Camera stabilization system.



Hachinohe Plant

First Hachinohe Factory

1-3-47 Kitainter Kogyodanchi, Hachinohe-shi, Aomori, 039-2245, Japan

Headquarter of factories in Hachinohe plant, and manufacture for large size servo motors.



Second Hachinohe Factory

1-147 Kitainter Kogyodanchi, Hachinohe-shi, Aomori, 039-2245, Japan

Design and manufacture of MEMS Gyro.

Design Division : Spacetronics Laboratory



First Fukuchi Factory

1-1 Kanuemonyama, Hoshioka, Nanbu-cho, Sannohe-gun, Aomori, 039-0811, Japan

Manufacture of Encoders, Drivers, Trackballs, and Sheet metal business.



Second Fukuchi Factory

3-23 Niuemonyama, Hoshioka, Nanbu-cho, Sannohe-gun, Aomori, 039-0811, Japan

Design and manufacture of Servo motor and Resolvers.

Design Division : Sensortronics Laboratory, Motortronics Laboratory



Misawa Factory

2-100-1 Otsu, Misawa-shi, Aomori, 033-0134, Japan

Manufactures of Resolver for HEV and BEV.



TAMAGAWA EUROPE GmbH
(Ulm, Germany)



TAMAGAWA SEIKI SUZHOU CO., LTD.
(Taicang, China)

TAICANG TAMAGAWA TRADING CO., LTD.
(Taicang, China)



TAMAGAWA VIETNAM CO., LTD
(Quang Ninh, Vietnam)





- Start operation of new facility on March 2026
- Total area: 20,690 m² -> 41,700 m²
- **Production Capacity will increase to 170 - 200%**

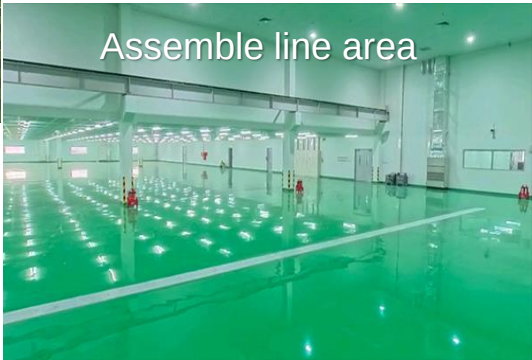
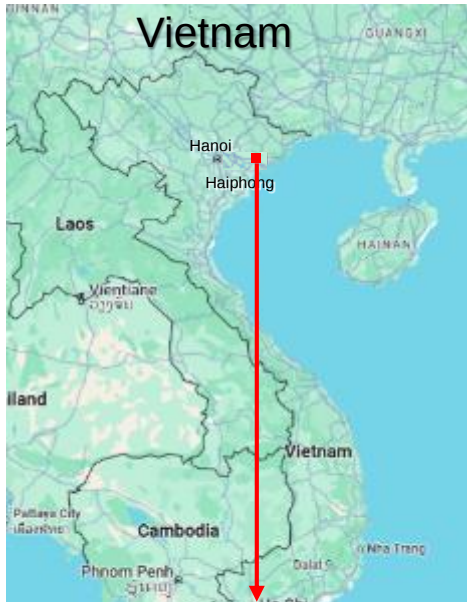


Topics

TAMAGAWA VIETNAM



- 2025 JAN : Completion of Phase-1 Building
- 2025 MAR : Start Operation
- 2025 JUL : Start Production of Resolver



Application and Products

01 Defense/Space



Reaction Wheels for Microsatellite
Accelerates and decelerates the rotation of the rotor inside the wheel, controlling the satellite's attitude.

FOG/IRUs for Microsatellite

Resolvers for the Mars rover

3-axis IMUs

02 Factory Automation



AC Servo Motors/Drivers
Mounted on the moving parts of industrial robots, it controls arm movement, position, and speed.

Step Motors/Drivers

Encoders

Resolvers

03 Vehicle



Resolvers
This rotational angle sensor efficiently controls the drive motor and electric power steering.

R/D Converters

Gyros

Torque Sensors

04 Civil Aircraft



Various Actuators (Drive Devices)
Landing gear actuators are used to raise and lower the landing gear of business jets.

Throttle Quadrant Assembly

Various Sensors and Motors

05 Railway



Speed Sensor
It can reliably detect speed even in the harsh, vibration-prone environment of rail vehicles.

Clinometer Sensors **Thermal Sensors** **Monitoring Sensors** **AC Servo Motors**

06 Elevator



Encoders
This sensor is attached to the elevator hoist and detects the rotation speed (angle).

AC Servo Motors **Resolvers**

07 Construction/Agriculture



Gyros
Detects and communicates the vehicle's attitude and position, and performs attitude control such as rollover prevention and straight-line driving assistance.

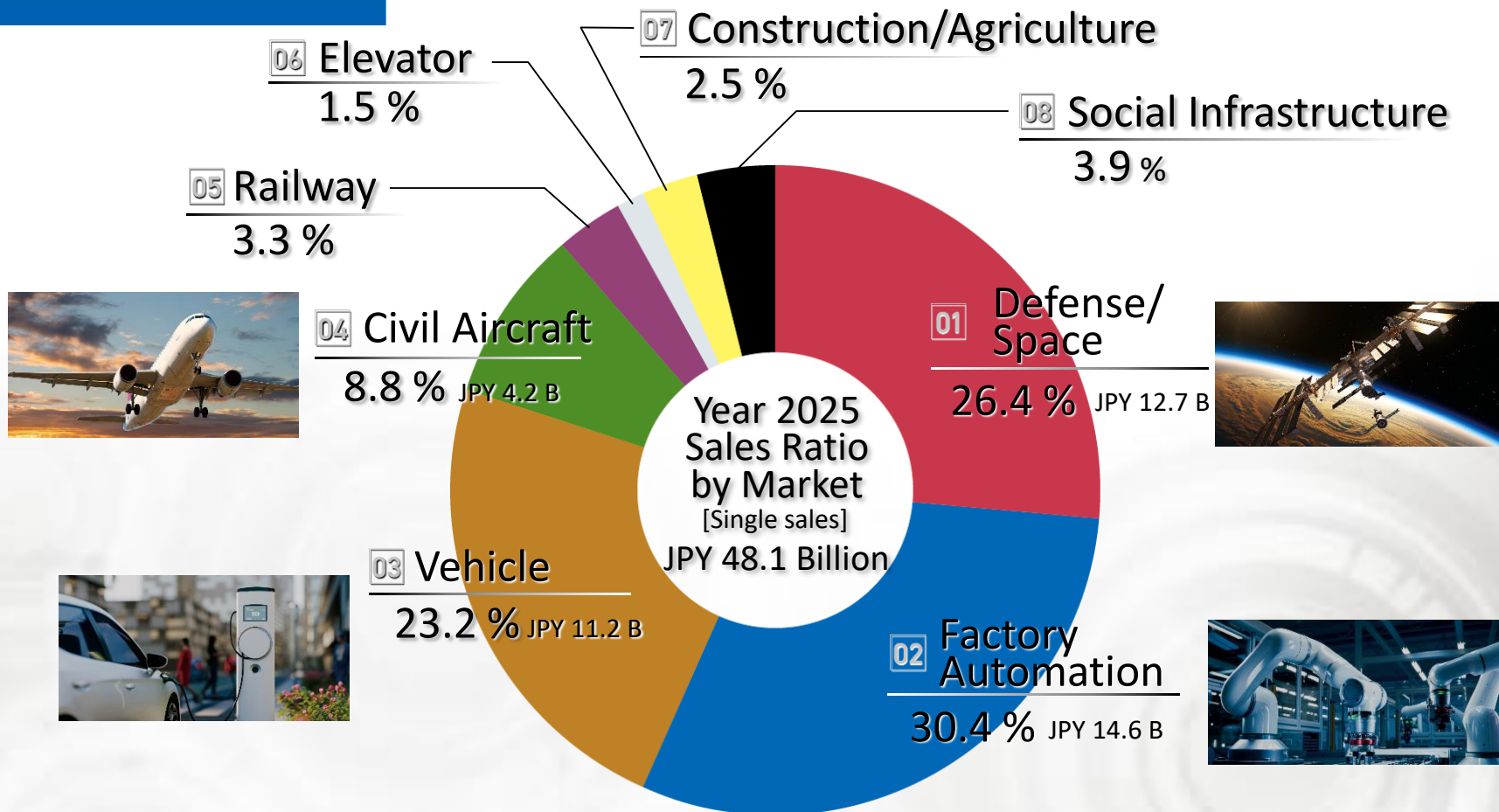
Resolvers **AC Servo Motors/ Drivers**

08 Social Infrastructure



Measurement system for borehole and underground pipe pathways
This measurement device combines a gyro and an accelerometer. By passing a probe equipped with a sensor through an underground pipe, it is possible to accurately determine the hole curvature, which cannot be seen from above ground.

Resolvers **Magnetic beads for Protein Purification** **Trackballs**



Servo actuators used in
“Kibou” (Japan Experimental
Model) in International Space
Station;
Aircraft pumps and valves;
Sensors and motors for
aircraft pilot control systems;
Camera stabilizers for aircraft
and ships;
All made through our
technological competence.



Surveillance Camera System



Aircraft Fuel pump



Motor & sensors for the aircraft



High Precision Resolver
for Outer



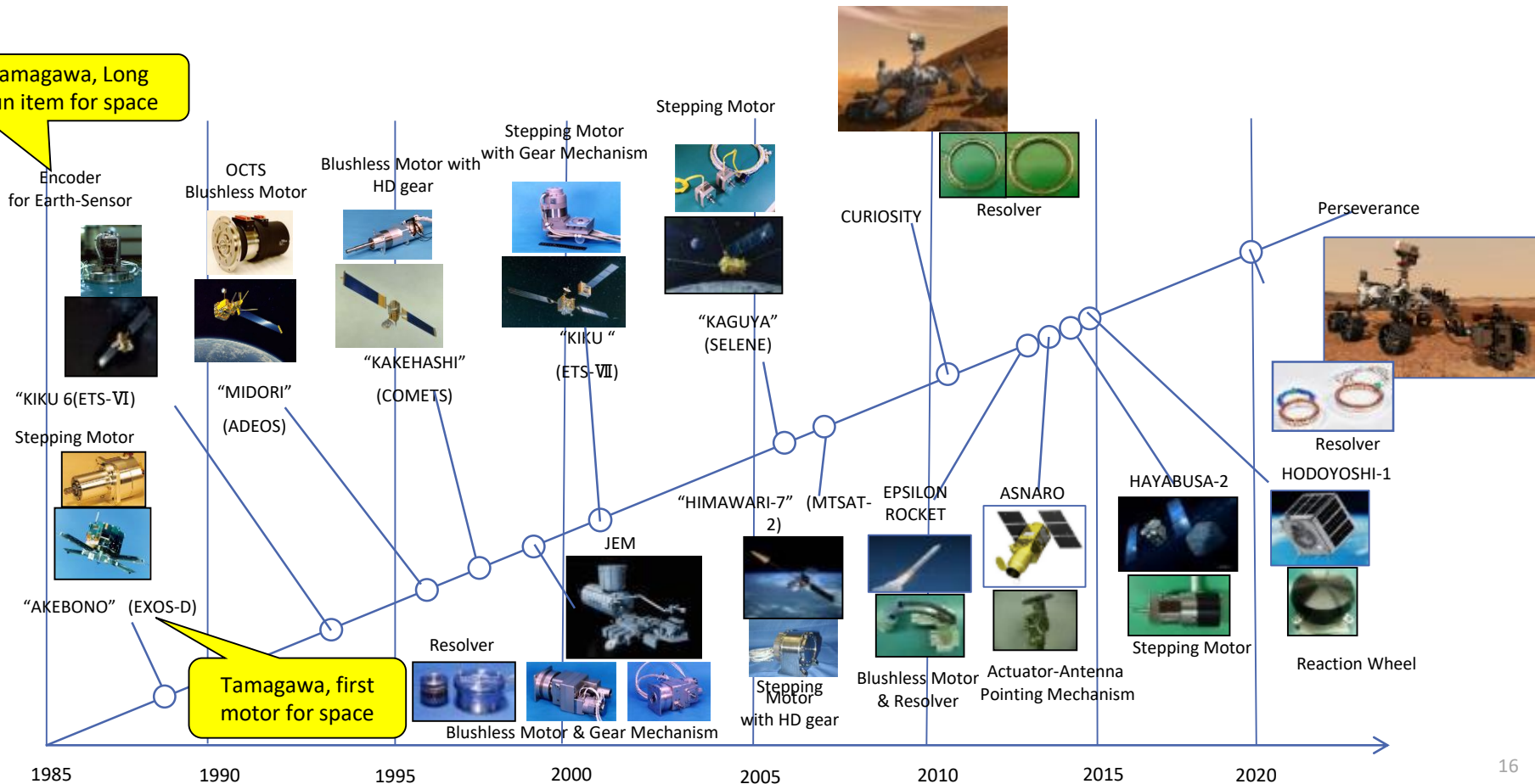
Actuator used in “Kibou”



Reaction wheel

Application for Space Products for Space

Tamagawa, Long Run item for space



Application for Space

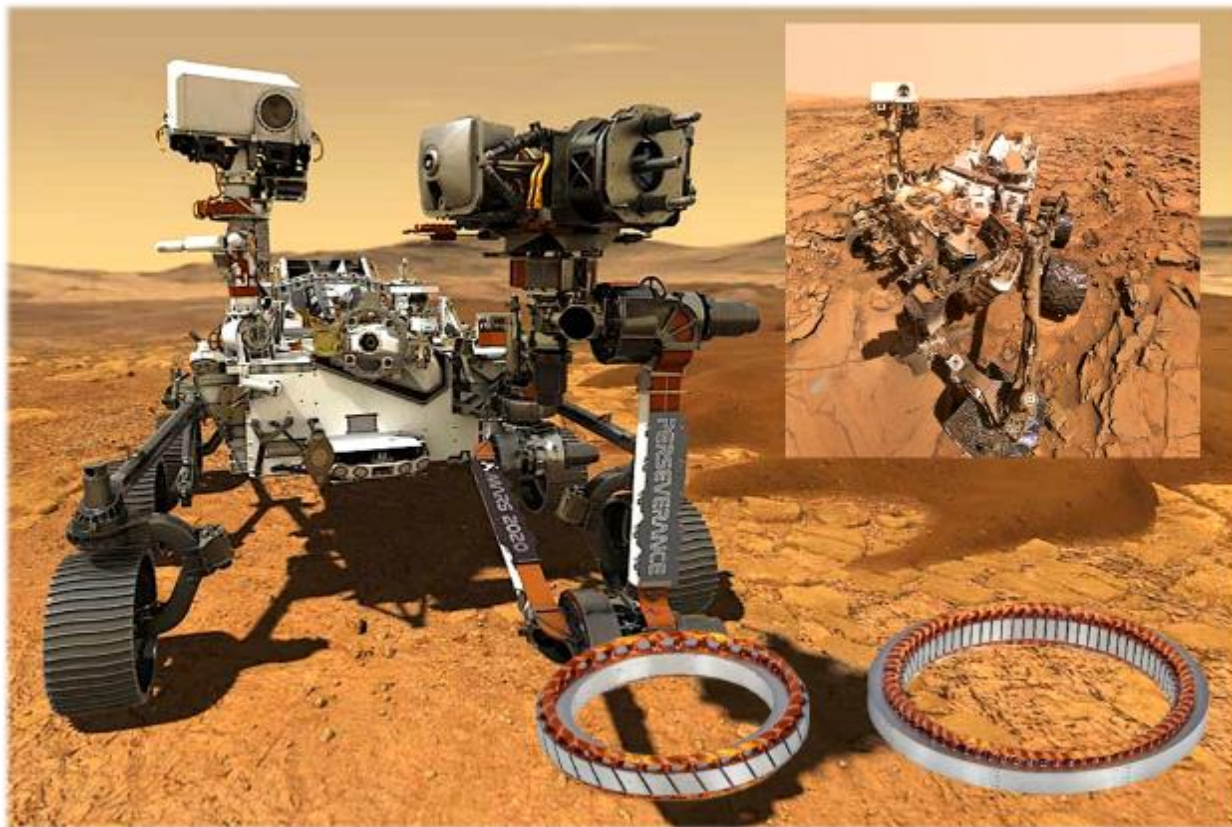
Mars Rover

Perseverance

Mars 2020

Curiosity

Mars Science Laboratory (MSL)



Credit: NASA / JPL

Factory Application

Accurate positioning and speed control are possible by our sensing and control technology in industrial robots, NC machine tools, semiconductor manufacturing machines, packaging machines, etc.

FA Factory Application

Products of Factory Automation



AC servomotors / Drivers



Rotary Encoders



Brushless Resolvers
"Smartsyn"



Stepping motor / Drivers

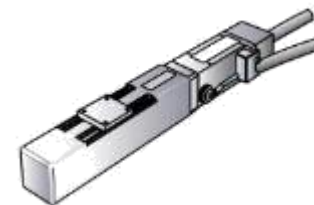


Electronic Cam system
"Smartcam"

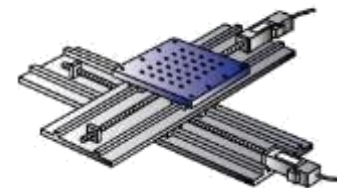
Motors & Sensors for Robotic Industries



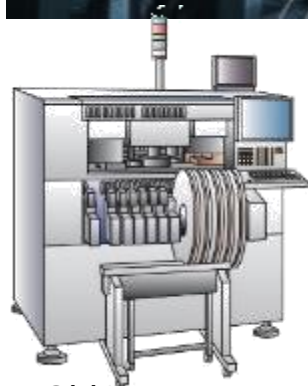
Motors for Industrial-Use



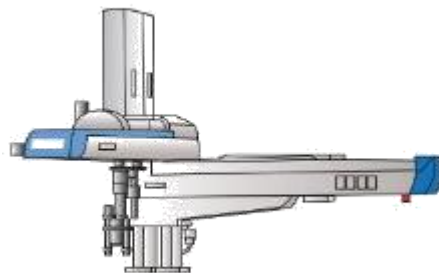
Single Axis Actuator



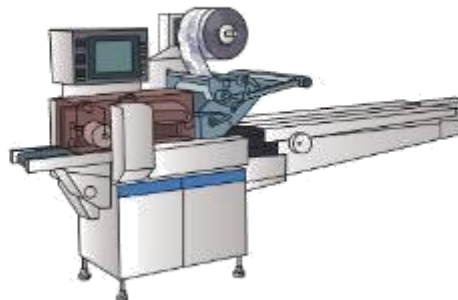
X-Y Table



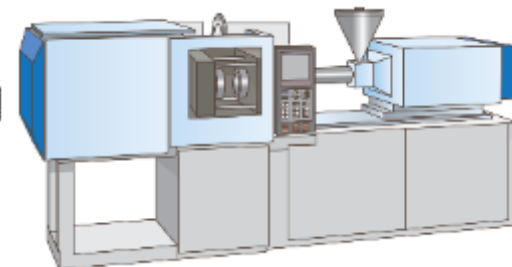
Chip Mounter



Pick-up Machine



Packaging Machine



Injection Molding Machine

More and more vehicles, like hybrid cars, bullet trains, escalators, elevators, need reliable yet accurate sensors and motors for electric control of speed, position, inclination, etc.

Products for Transportation



EPS Angle Sensor
"Singlsyn"



VR Resolvers
"Singlsyn"



Brushless Resolvers
"Smartsyn"



Rotary Encoders



Speed sensor
for the train



Motor & sensors
for the aircraft

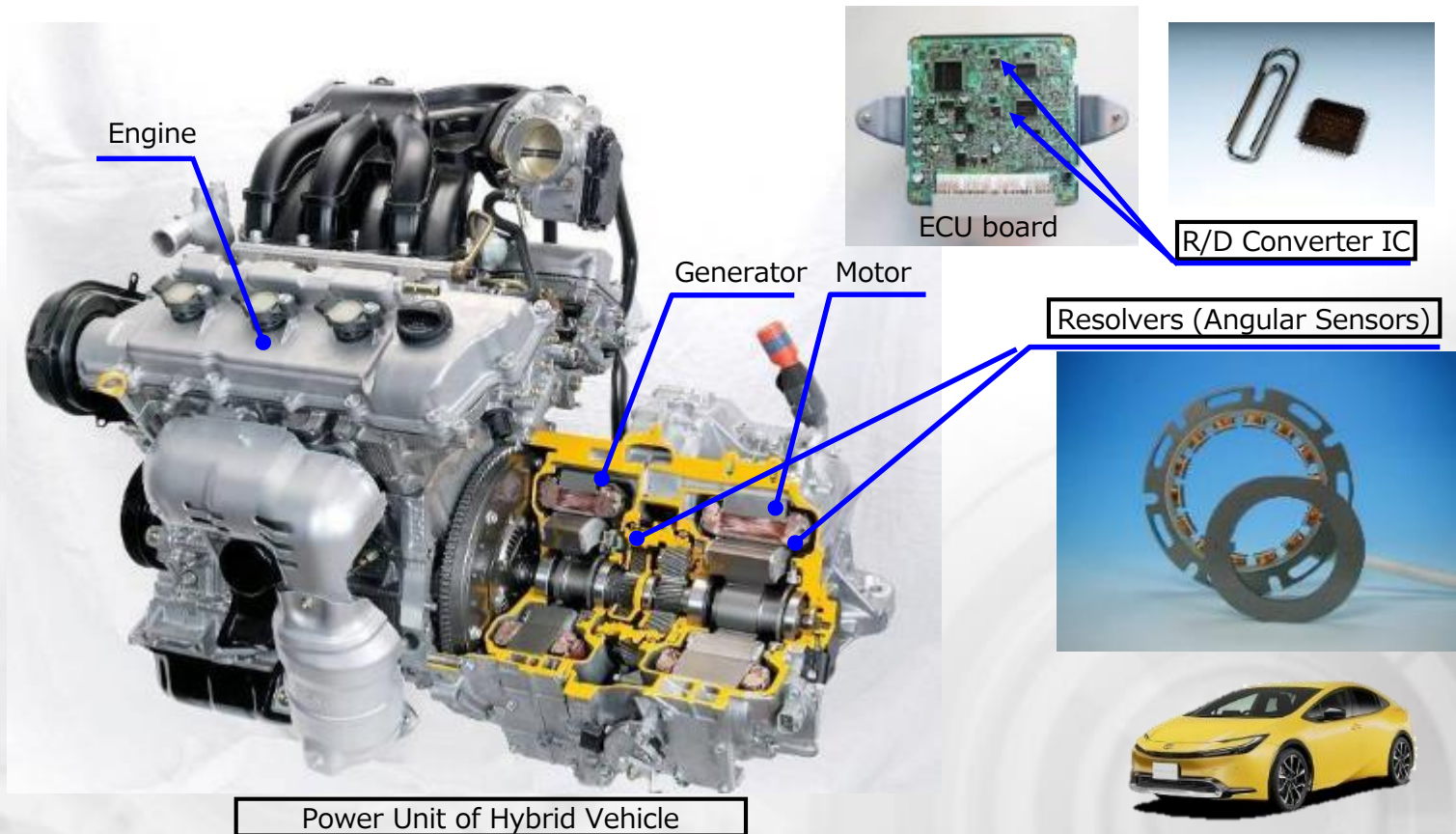


Gryo



2-phase Step Motors

VR-Resolver for Automobile



Power Unit of Hybrid Vehicle

ECU board

R/D Converter IC

Resolvers (Angular Sensors)

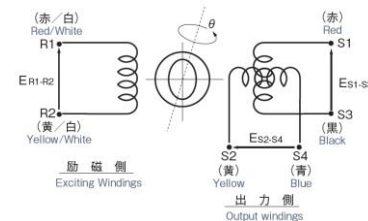
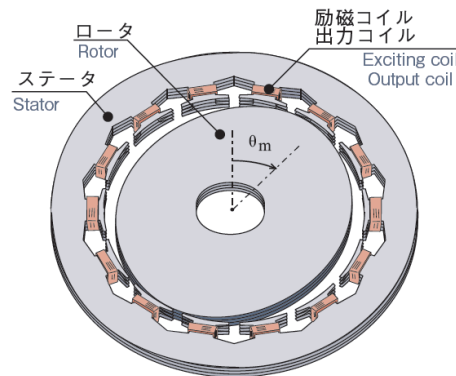
What is a VR Resolver?

CONFIDENTIAL

An angle sensor utilizing the principle of a transformer

< Structural Features >

- The output voltage changes in a $\text{SIN}(\theta)$ pattern and a $\text{COS}(\theta)$ pattern according to the rotor's rotation angle.
- No windings on the rotor (Output voltage varies with changes in magnetic resistance)
- For automotive sensors, VR types are the mainstream.



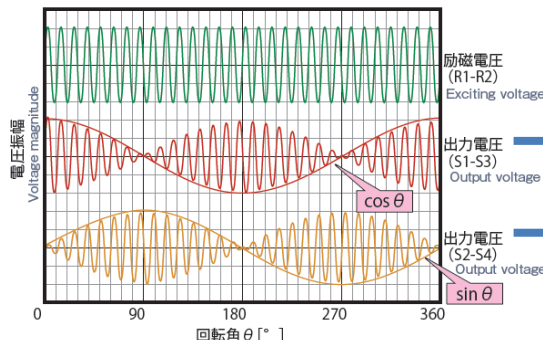
< Wiring Diagram >

$$\text{Excitation } E_{R1-R2} = E \cdot \sin \omega t$$

$$\text{Output } E_{S1-S3} = E \cdot \sin \omega t \cdot \cos \theta$$

$$\text{Output } E_{S2-S4} = E \cdot \sin \omega t \cdot \sin \theta$$

< Output Voltage Equation >



$$\theta = \tan^{-1} \frac{\text{SIN電圧}}{\text{COS電圧}}$$

< Output voltage variation >

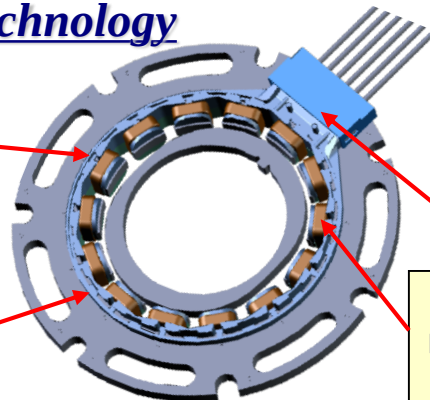
Features of VR Resolver (Singlsyn)

- 1) Thin flat shape with large bore-hole
- 2) Absolute electrical angle detection per one lobe of rotor
- 3) Wide operating temperature range of $-40 \sim +150^{\circ}\text{C}$
- 4) Excellent environmental resistance /Vibration /Shock /Oil-resistant
- 5) High resolution in the combination with Smartcoder (R/D converter)
- 6) Zero speed detection is possible
- 7) High speed rotation is possible : $> 30000\text{rpm}$

Tamagawa's Advanced Resolver-Technology

- The less number of slots with multi-pole winding technology realized small size and high accuracy and low cost.
- The patented windings can cancel the electric magnetic motor noise.

- The integrated molded structure can mate the structure strength.



- Direct connector structure can apply mass production application.

- Automating wire binding achieved cost reduction and reliability improvement
- Lead free by adopting the TIG welding .

VR-Resolver for Automobile

We provide Resolver and RD for HEV/PHEV/EV and EPS motor angle sensor of **Worldwide customers.**



VR-Resolver for Automobile

Since 1996, we are providing Resolver for worldwide customers and it is achieved to..

Resolver:



2025: 22.3 million pcs

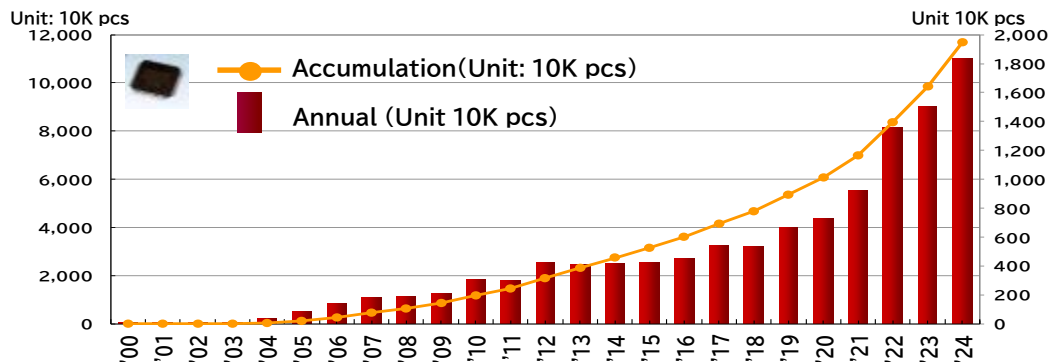
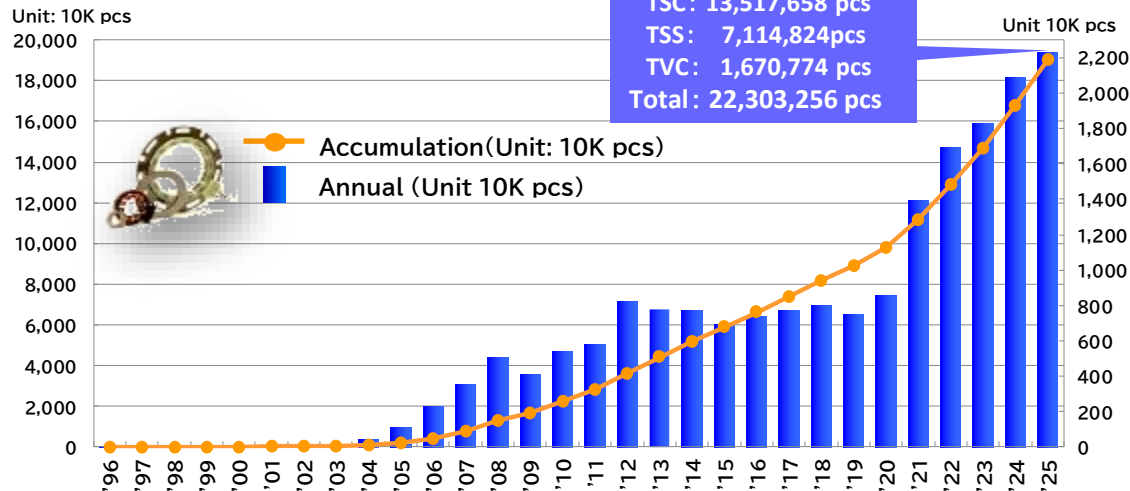
Total: 193 million pcs

RD IC Chip:



2024: 18.4 million pcs

Total: 117 million pcs





**BUREAU
VERITAS**

Certificate of Approval

AWARDED TO

TAMAGAWA SEIKI CO., LTD.

3174-22, Motoohjima, Matsukawa-machi, Shimoina-gun, Nagano, 399-3303, Japan

IATF USI: TRGWHH

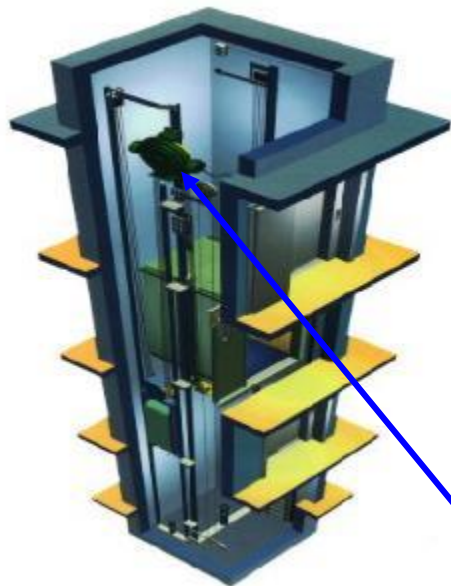
Bureau Veritas Certification certify that the Quality Management System of the above organisation has been audited and found to be in accordance with the requirements of

IATF 16949 - FIRST EDITION

and the applicable customer specific requirements



Elevator Application



Encoder for lifting
motor of Elevator



Glass-disk production at Tamagawa

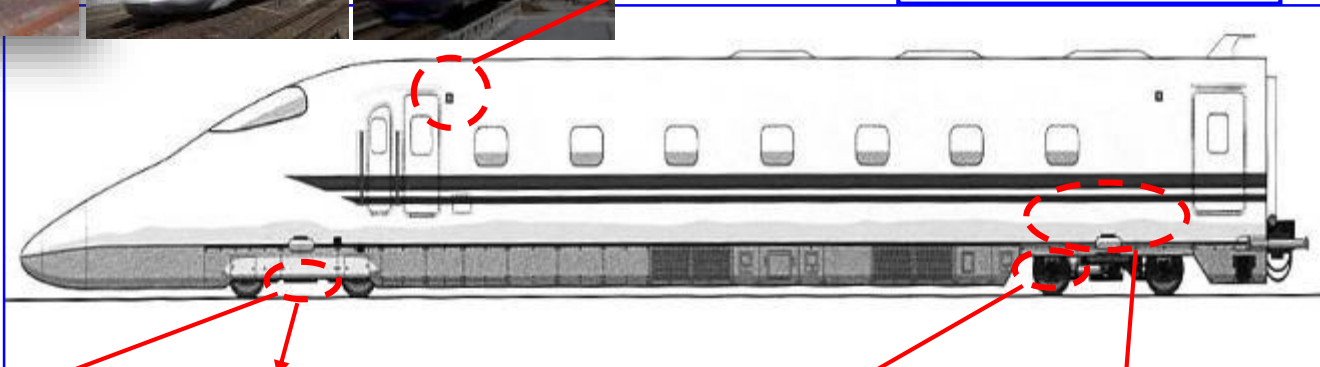


Encoder for commodity
Servo-Motor

Train Application



Door Sensor



Actuator



Thermal Sensor

EU5416



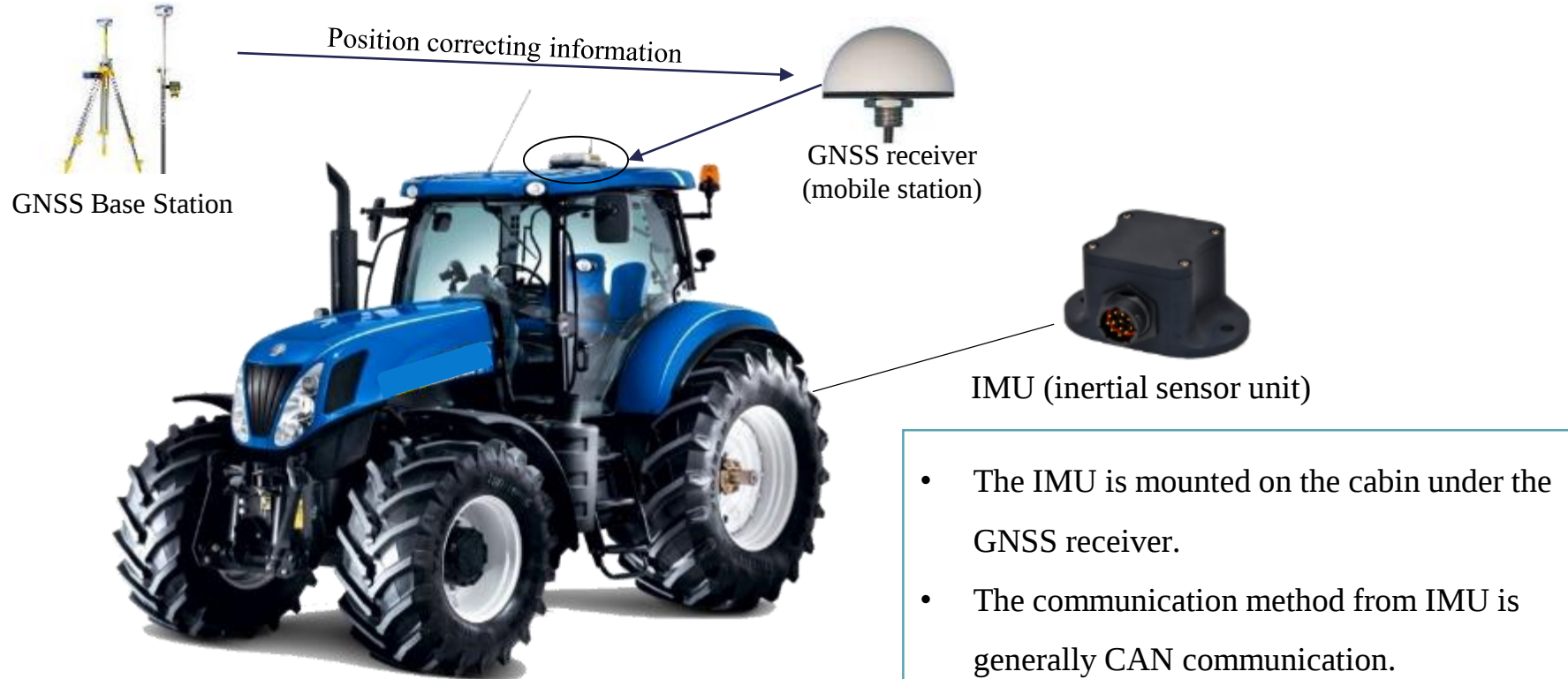
Speed Sensor



Level Sensor



Application for Agriculture IMU example



※ The picture is an image and it is not an actual machine installed with IMU.

In addition to tractors, IMUs are also used in smart agriculture, such as straight driving support for rice transplanters, combine harvesters, and attitude angle measurement of drones for spraying pesticides. In smart agriculture, IMU is an essential sensor.

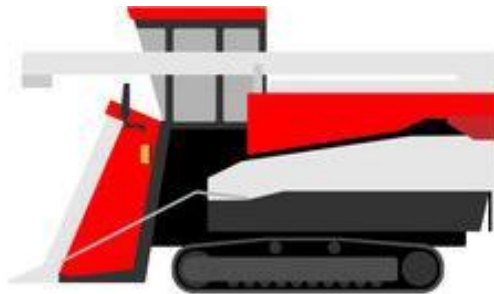
■ Tractor



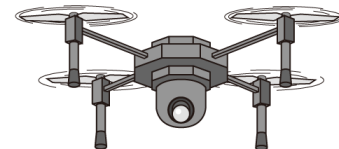
■ Rice planter



■ Combine harvesters



■ Drones for spraying agricultural chemicals



[Summary] IMU use in smart agriculture

- ① Straight driving support: Accurate measurement of body inclination and correction of antenna misalignment
- ② Automated farming realizes high-precision position estimation using an advanced dead reckoning algorithm
- ③ Implements control: attitude measurement of implements
- ④ Falling prevention
- ⑤ Detection(shock) of contacting obstacle

We are eager to begin this
professional journey together.

