

## Safety Precautions

- Important Notes on exporting this product or equipment containing this product;  
If the end-user or application of this product is related to military affairs or weapons, its export may be controlled by "Foreign Exchange and Foreign Trade Control Law" of Japan where export license will be required before product can be exported from Japan.
- This product is designed and manufactured for use in General Purpose Industrial Equipment and it is not intended to be used in equipment or system that may cause personal injury or death.
- All servicing such as installation, wiring, operation, maintenance and etc., should be performed by qualified personnel only.
- Tighten mounting screws with an adequate torque by taking into consideration strength of the screws and the characteristics of material to which the product will be mounted. Over tightening can damage the screw and/or material; under tightening can result in loosening.
- Install safety equipment to prevent serious accidents or loss that is expected in case of failure of this product.
- Consult us before using this product under such special conditions and environments as nuclear energy control, aerospace, transportation, medical equipment, various safety equipments or equipments which require a lesser air contamination.
- We have been making the best effort to ensure the highest quality of our products, however, some applications with exceptionally large external noise disturbance and static electricity, or failure in input power, wiring and components may result in unexpected action. It is highly recommended that you make a fail-safe design and secure the safety in the operative range.
- If the motor shaft is not electrically grounded, it may cause an electrolytic corrosion to the bearing, depending on the condition of the machine and its mounting environment, and may result in the bearing noise. Checking and verification by customer is required.
- Failure of this product depending on its content may generate smoke of about one cigarette. Take this into consideration when the application of the machine is clean room related.
- Please be careful when using the product in an environment with high concentrations of sulfur or sulfuric gases, as sulfuration can lead to disconnection from the chip resistor or a poor contact connection.
- Do not input a supply voltage which significantly exceeds the rated range to the power supply of this product. Failure to heed this caution may lead to damage of the internal parts, causing smoke and/ or fire and other troubles.
- The user is responsible for matching between machine and components in terms of configuration, dimensions, life expectancy, characteristics, when installing the machine or changing specification of the machine. The user is also responsible for complying with applicable laws and regulations.
- Manufacturer's warranty will be invalid if the product has been used outside its stated specifications.
- Component parts are subject to minor change to improve performance.
- Read and observe the instruction manual to ensure correct use of the product.

### Repair

Consult to the dealer from whom you have purchased this product for details of repair work.  
When the product is incorporated to the machine you have purchased, consult to the machine manufacturer or its dealer.

### URL

Electronic data of this product (Instruction Manual, CAD data) can be downloaded from the following web site;  
<https://industry.panasonic.com/global/en/>

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- Realtime Express is a high-speed synchronous motion network developed by Panasonic Holdings Corporation.
- EtherCAT is a patented technology and registered trademark licensed by Beckhoff Automation GmbH in Germany.

● Contact to : \_\_\_\_\_

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**Panasonic**  
INDUSTRY

Servo System  
MINAS A7 Family

# MINAS A7

Industry-leading motion performance\* for quick  
and intuitive adaptation to demanding situations

\*As of September 2023, according to in-house research.



# Agile Adaptability

Increase the productivity of machine, people and applications by adapting quickly and intuitively to demanding situations.

## Basic servo performance that further enhances machine performance

The MINAS A7 achieves the industry's highest motion performance\*, follows commands faithfully and provides strong resistance against disturbances.

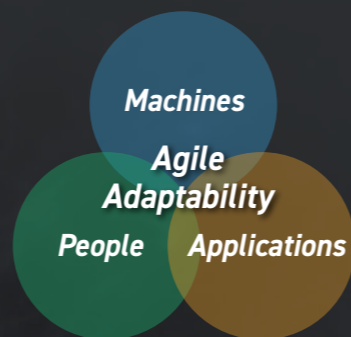
Increased responsiveness to machines enables higher speed and higher precision.

\*As of September 2023, according to in-house research.

## Optimization of man-machine operations through servo intelligence

Making the servo intelligent simplifies setup, which used to take long hours of development, through auto-tuning functions, maintenance functions, and application optimization.

Increase the productivity of machines, people and applications by allowing them to adapt quickly and intuitively to more demanding situations.



# MINAS A7

## Agile Adaptability to Machines

### Immediate response to commands and disturbances

Industry-leading\* basic motion performance is faithful to commands and has strong resistance to disturbances. \*As of September 2023, according to in-house research.

Encoder resolution **27 bit**, Speed response frequency **4.0kHz or more**, Max. motor rotational speed **7150r/min** \*  
\*For MHMG022

## Agile Adaptability to People

### Immediate response at start-up and when trouble occurs

Expanded auto tuning, from easy start-up to automation of high level tuning. Quick response with drive recorder function when trouble occurs.

Ultra-high precision **precAlse TUNING** High precision **One Minute TUNING** Immediate finishing **TUNINGLESS**

## Agile Adaptability to Applications

### Immediate adaptation to specific applications

Application-specific functions are achieved without a controller. Sensor direct input system contributes to highly responsive control.

**Displacement control** **Pressure control** **High-precision gantry control**

Under development

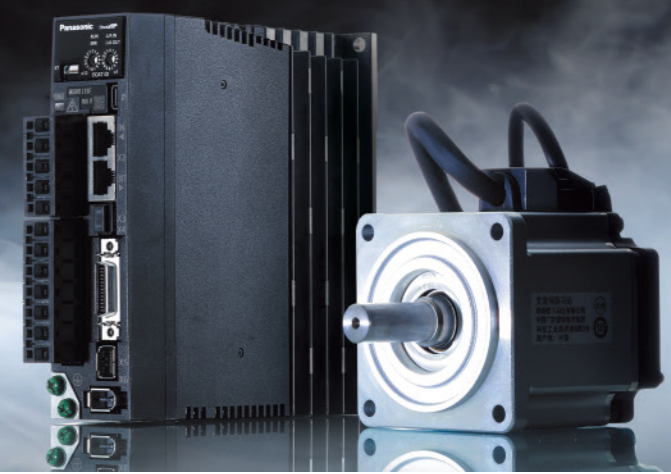
Under development



# MINAS A7 Line-up

Servo system corresponding to various system configurations

# MINAS A7



## SERVO DRIVER

### Rotation type

**EtherCAT**



Servo driver with open network EtherCAT

### MINAS A7B

- Standard type **A7BE**
- Multifunctional type **A7BF**
- Application specialized type **A7BR**

Special order

**RTEX**  
Realtime Express



Servo driver with high-speed comm network Realtime Express

### MINAS A7N

- Standard type **A7NE**
- Multifunctional type **A7NF**
- Application specialized type **A7NR**

Special order

### Analog/Pulse train Modbus comms

Under development

### MINAS A7S

- Position control type **A7SE**
- Multifunctional type **A7SF**
- Application specialized type **A7SR**

Special order

### Linear DD motor type

Special order

Under development

**EtherCAT**

- Standard type **A7BL**
- Multifunctional type **A7BM**
- Application specialized type **A7BV**

**RTEX**  
Realtime Express

- Standard type **A7NL**
- Multifunctional type **A7NM**
- Application specialized type **A7NV**

### Analog/Pulse train Modbus comms

- Position control type **A7SL**
- Multifunctional type **A7SM**
- Application specialized type **A7SV**

## SERVO MOTOR



### High inertia

### MHMG

- 50 W to 1.0 kW (3000 r/min rated)
- 1.0 kW to 1.5 kW (2000 r/min rated)
- 2.0 kW to 5.0 kW (2000 r/min rated)

Under development

### Medium inertia

### MDMG

- 1.0 kW , 1.5 kW (2000 r/min rated)
- 2.0 kW to 5.0 kW (2000 r/min rated)

Under development

### Low speed large torque

### Medium inertia

### MGMG

- 850 W , 1.3 kW (1500 r/min rated)
- 1.8 kW , 4.4 kW (1500 r/min rated)

Under development

### Low inertia

### MSMG

- 50 W to 1.0 kW (□80) (3000 r/min rated)
- 1.0 kW (□100), 1.5 kW (3000 r/min rated)
- 2.0 kW to 5.0 kW (3000 r/min rated)

Under development

Under development

## EtherCAT/RTEX Controller



### Motion Controller

### GM1

### PLC programming standardized

- EC61131-3 standard compliance, PLCopen, LD/ST/FBD/SFC/L/CFC

### PLC and motion integrated

- Shortest cycle: 500 μs, Multitask control

### Expansive communication interface

- RTEX, EtherCAT
- OPC UA server, FTP server
- Ethernet/IP, Modbus, CodesysV3 communication

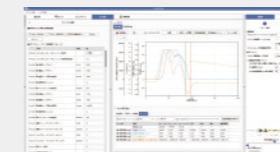
## Support Tools



PANATERM

### Servo motor setup support software

It supports the setup of servomotors, setup, test driving, monitoring, maintenance and troubleshooting, with extensive adjustment functions.



### Servo motor selection software

This tool is used to select the motor capacity by combination of mechanism elements. Optional items can also be selected.



# Motor List

		50 W	100 W	200 W	400 W	750 W	850 W	1.0 kW		1.3 kW	1.5 kW	1.8 kW	2.0 kW	2.4 kW	2.9 kW	3.0 kW	4.0 kW	4.4 kW	5.0 kW	
High inertia GMHM	100 V	40 3000 r/min (7150 r/min)	40 3000 r/min (7150 r/min)	60 3000 r/min (6700 r/min)	60 3000 r/min (6700 r/min)															
	200 V	40 3000 r/min (7150 r/min)	40 3000 r/min (7150 r/min)	60 3000 r/min (6700 r/min)	60 3000 r/min (6700 r/min)	80 3000 r/min (6000 r/min)		80 3000 r/min (6700 r/min) 130 2000 r/min (3000 r/min)			130		180			2000 r/min (3000 r/min)	180	180		180
Medium inertia GMDM <small>Under development</small>	200 V							130 2000 r/min (3000 r/min)		130		130			2000 r/min (3000 r/min)	130	180		180	
Medium inertia/ Low-speed torque GMM <small>Under development</small>	200 V							130		130		130		180	180	<b>Under development</b>				
Low inertia GMM	100 V	38 3000 r/min (7150 r/min)	38 3000 r/min (7150 r/min)	60 3000 r/min (6700 r/min)	60 3000 r/min (6700 r/min)															
	200 V	38 3000 r/min (7150 r/min)	38 3000 r/min (7150 r/min)	<b>Under development</b> 60 3000 r/min (6700 r/min)	60 3000 r/min (6700 r/min)	80 3000 r/min (6000 r/min)		80 3000 r/min (6700 r/min) 100			100		100			3000 r/min (5000 r/min)	120	130		130

(How to read the table)

60 — Flange angle  
3000 r/min (6700 r/min) — Rated rotation speed (maximum rotation speed)

# Driver List

## Open network EtherCAT-compatible servo driver

	Rotation type			Linear/DD motor type <small>Special order product Under development</small>		
	Standard type A7BE type	Multi-function type A7BF type	Application specialized type A7BR type	Standard type A7BL type	Multi-function type A7BM type	Application specialized type A7BV type
<b>Control method</b>						
Position/Velocity/Torque control	●	●	●	●	●	●
Full-closed control		●	●			
<b>Interface</b>						
External scale		●	▲		●	●
Safety connector		●	●		●	●
Sensor feedback			●			●

▲ : Varies depending on the model. Please contact us for details.

## High-speed communication Realtime Express-compatible network servo driver

	Rotation type			Linear/DD motor type <small>Special order product Under development</small>		
	Standard type A7NE type	Multi-function type A7NF type	Application specialized type A7NR type	Standard type A7NL type	Multi-function type A7NM type	Application specialized type A7NV type
<b>Control method</b>						
Position/Velocity/Torque control	●	●	●	●	●	●
Full-closed control		●	●			
<b>Interface</b>						
External scale		●	●		●	●
Safety connector		●	●		●	●
Sensor feedback			●			●

## Analog/pulse train Modbus communication

	Rotation type <small>Under development</small>			Linear/DD motor type <small>Special order product Under development</small>		
	Position control type A7SE type	Multi-function type A7SF type	Application specialized type A7SR type	Position control type A7SL type	Multi-function type A7SM type	Application specialized type A7SV type
<b>Control method</b>						
Position control	●	●	●	●	●	●
Block operation	External contact only	External contact or Modbus communication	External contact or Modbus communication	External contact only	External contact or Modbus communication	External contact or Modbus communication
Velocity control	●	●	●	●	●	●
Internal velocity command	External contact only	External contact or Modbus communication	External contact or Modbus communication	External contact only	External contact or Modbus communication	External contact or Modbus communication
Torque control		●	●		●	●
Full-closed control		●	●			
Block operation		External contact or Modbus communication	External contact or Modbus communication			
<b>Interface</b>						
Pulse	●	●	●	●	●	●
Analog		●	●		●	●
Modbus		●	●		●	●
External scale		●	●	●	●	●
RS-232, RS-485		●	●		●	●
Safety connector		●	●		●	●
Sensor feedback			●			●

# Improved basic performance directly linked to equipment performance Servo system boasting industry-leading motion performance\*

\*As of September 2023, according to in-house research.

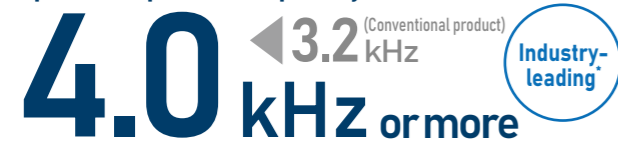
## Increasing gain by improving basic performance allows for immediate response to commands and disturbances



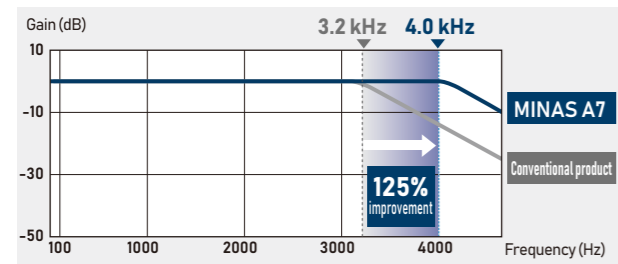
### High precision Control performance that achieves smoother and more accurate operation

#### Improved machining quality through high response control

Speed response frequency



Velocity response frequency has been increased to 125% compared to conventional models. As gain can be increased, an immediate response to both commands and disturbances is possible, improving machining quality.



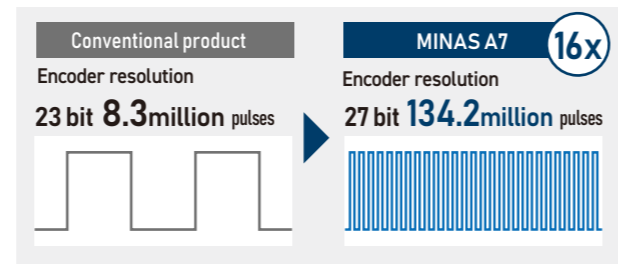
\*As of September 2023, according to in-house research.

#### Improved positioning performance

Encoder resolution



Thanks to the industry's highest\* resolution, positioning performance is greatly improved with smooth movement to the target position and accurate stopping.



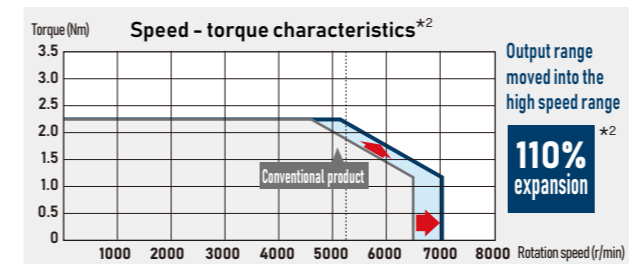
\*As of September 2023, according to in-house research.

### High speed Increased speed for a shorter takt time

#### Increased output without changing the size of the motor



The MINAS A7 is smaller than conventional models, and the operation range has been expanded to 110%\*. By expanding output to the high speed range, equipment velocity has been improved without changing to a larger motor.

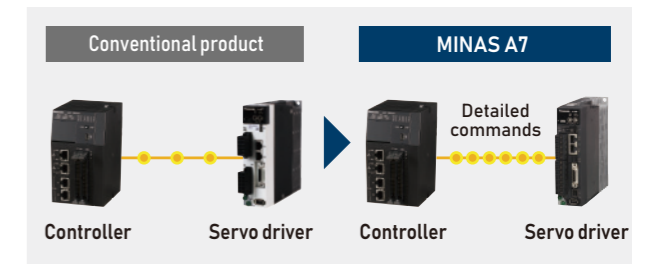


\*1: For MHMG022  
\*2: Compared to 200 W motor

#### High precision with detailed command output



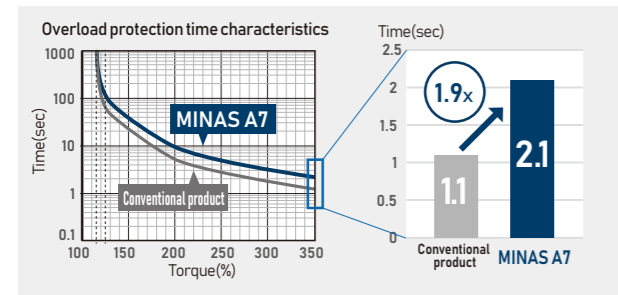
The minimum communication cycle is 1/2 that of conventional models. It can respond to the control cycle of controllers that are becoming ever faster, allowing for more detailed control.



### Stable operation Increased durability

#### Extending overload operation time

Reducing the heat generation of the motor extends operating time during overload by 1.9 times compared to conventional models. This contributes to the stable operation of equipment that operates for long periods of time in high-load areas, such as press machines and robots.

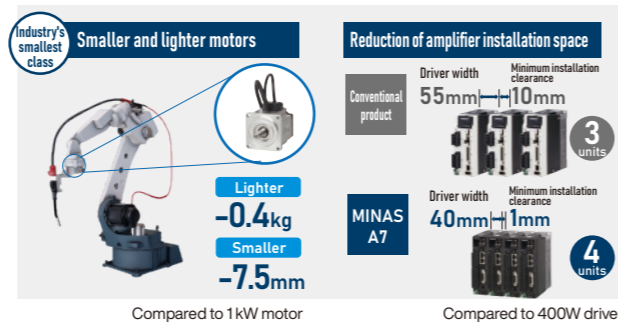


\*Example of 350% load (while rotating) with a 200 W motor

### Space saving More flexible installation

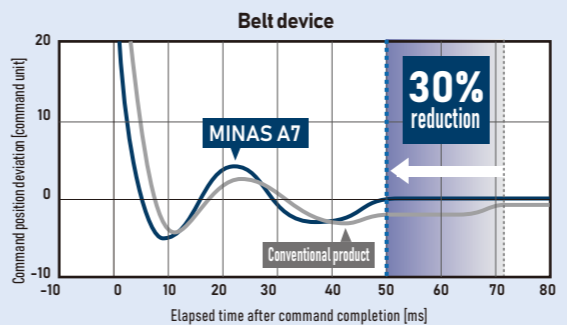
#### Further miniaturization and weight reduction

Both servo motors and amplifiers have been further miniaturized. The motors contribute to improved control performance by reducing the size, weight, and inertia of robots and equipment in which the motors are used.

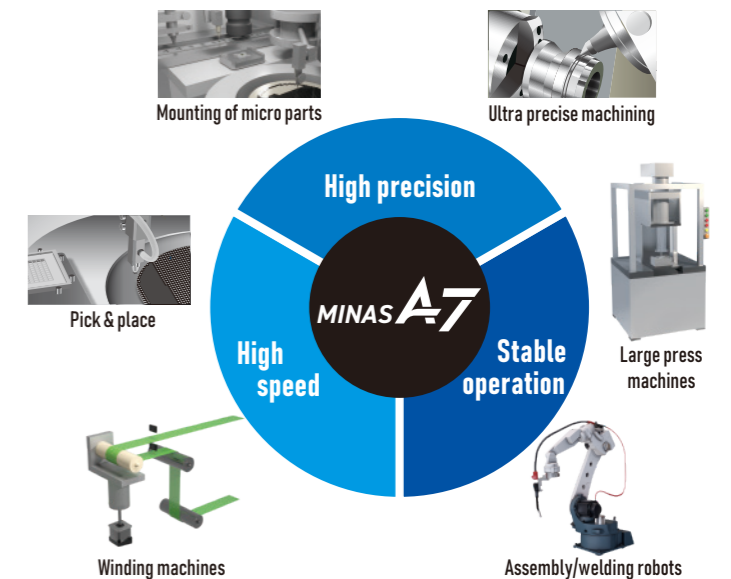


#### Stop precisely at the target position Improved positioning setting time

In addition to improved motor and encoder performance and an evolution of our proprietary positioning algorithm, resonance and mechanical vibration are automatically removed for highly accurate positioning.



### Contributing to improved equipment performance



# From simple tuning to ultra-high precision tuning that require expert skill Automatic tuning reduces startup engineering man-hours

Optimal man-machine coordination during tuning is achieved through servo intelligence

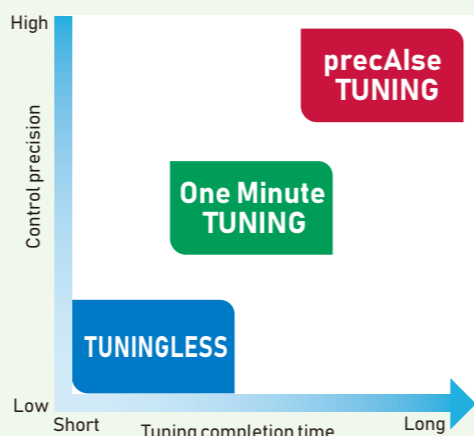
## Immediate response even at start-up

Three tuning settings can be selected according to whether you wish to prioritize tuning time or control precision

### TUNE COMPASS

It is possible to select the optimal tuning method to match customer requests, from situations that require tuning difficult for even expert engineers to those that require immediate operation.

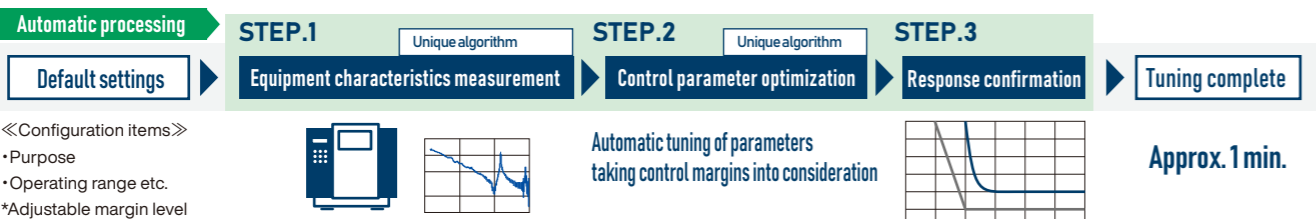
- precAlse TUNING** **Priority on control precision** Ultra-high precision From half a day  
Ultra-high precision automatic tuning that exceeds the abilities of experts
- One Minute TUNING** **Balance on accuracy and time** High precision Approx. 1 min.  
High precision automatic tuning according to equipment characteristics
- TUNINGLESS** **Priority on tuning time** Immediate operation 0 sec.  
Simple real-time automatic tuning according to equipment load



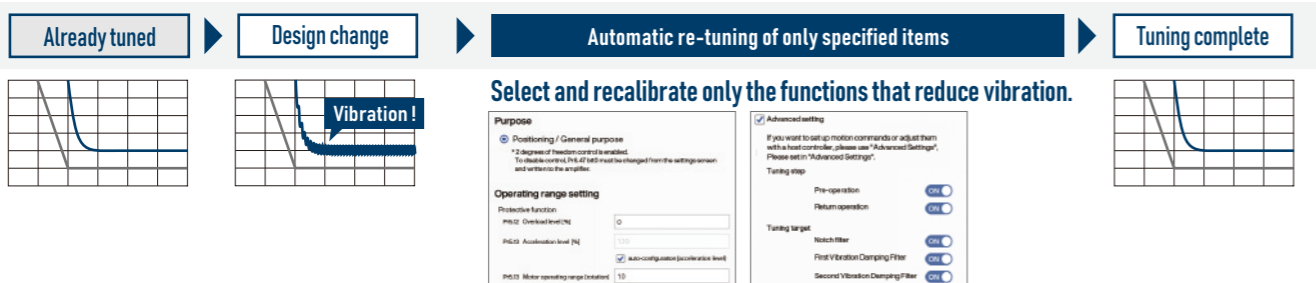
**High precision** The driver understands equipment characteristics and implements tuning while taking control margins into consideration.

### One Minute TUNING

Optimized to fit the equipment in a short time with a 3-step operation. Adjustment margins for aging and individual differences can also be considered.



Automatic re-tuning of specific items with pinpoint accuracy in response to material and location changes



**Immediate operation** Automatic tuning according to the equipment load during operation, to effortlessly achieve stable operation

### TUNINGLESS

Every time the equipment is moved, the servo driver automatically carries out simple real-time tuning according to the equipment load.



**Ultra-high precision** The AI uses expert judgment to easily achieve ultra-high precision tuning

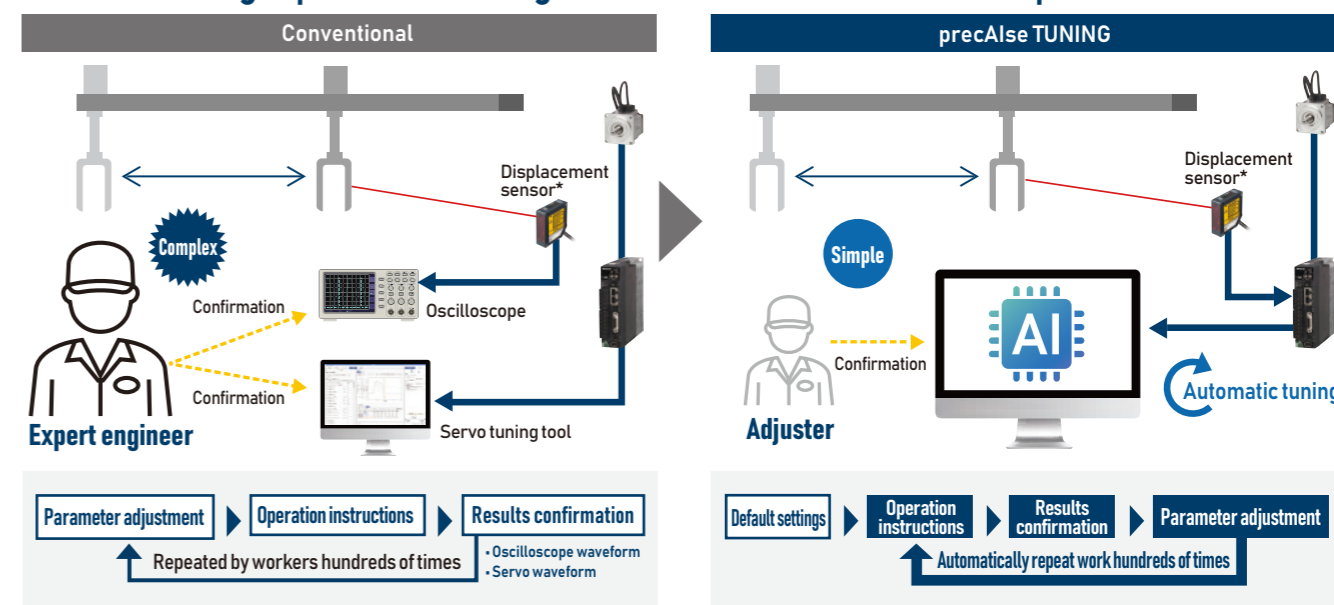
### precAlse TUNING

Complex tuning that take several days even for expert engineers are automatically optimized by AI just by setting the conditions, making  $\mu\text{m}$  level ultra-high precision tuning easily achievable.



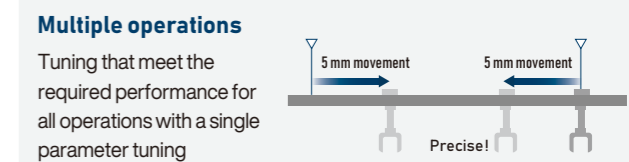
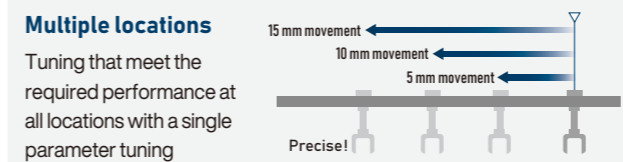
[Applicable equipment] Equipment such as mounters, coating equipment and processing machines which require ultra-precise positioning accuracy

AI achieves high-precision tuning that exceeds the abilities of experts.



\*When using a Displacement sensor to detect vibration at the tip of the device

High level of automatic tuning satisfies performance requirements for all locations and operations

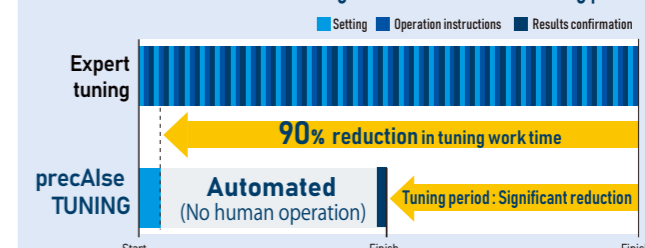


**Merit ①** Achieves positioning accuracy exceeding that of an expert



\* Measured in our experimental environment. Measurement of the settling time required for the position deviation to settle within a specified settling range.

**Merit ②** 90% reduction in work time and significant reduction in tuning period



\* Measured in our experimental environment. Measured time required for tuning work to bring the position deviation within the specified settling range.

Increase productivity from start-up to maintenance  
**Monitoring/diagnostic function**

Optimal man-machine coordination during maintenance work is achieved through servo intelligence  
**Immediate response even for maintenance work**

When trouble occurs	Before trouble occurs
<p><b>Understand the cause and resolve</b></p> <p>By recording data before and after trouble occurs, the cause can be analyzed and the issue quickly solved.</p>	<p><b>Prevent trouble from occurring</b></p> <p>Detects signs of abnormal equipment characteristics, notifying the user before an error occurs. The timing of mechanical adjustments and parts replacement can be understood before equipment stops due to an error.</p>
<p><b>Drive recorder function</b></p>	<p><b>Deterioration diagnosis function</b></p>

**When trouble occurs** Record signal waveforms and error information before and after trouble occurs, on a single servo driver

**Drive recorder function** Under development\*

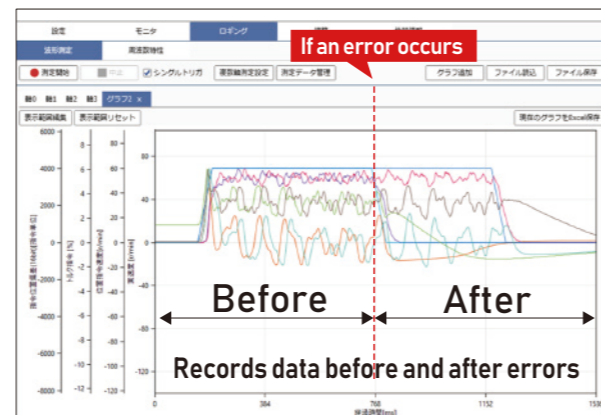
Servo drivers are equipped with a logging function. Since data can be recorded and saved in the servo itself, it is possible to collect data in detailed cycles, allowing for a detailed analysis of what happened when an error occurs.



**Servo driver with logging function**

- Complete functionality inside the servo**
- Simple setup
  - High-speed logging
  - Transmission to a host system not required
  - Data security ensured

Up to 32 data sets can be saved



**Analysis is possible on multiple axes together with time series data**

The time stamp function can be used to understand the details of alarm occurrence times for each axis, making it possible to identify the axis on which the alarm occurred first, the axis with the accompanying alarm, etc., allowing for an analysis of the root cause of the problem.

**Before trouble occurs** Monitor servo motor status in real time to predict and prevent trouble before it occurs

**Deterioration diagnosis function** Under development\*

Catch unusual equipment/motor characteristics during operation

Equipment in operation	When signs are detected/during periodic maintenance
<p><b>Catch signs of changes to characteristics</b></p> <p><b>Load characteristics estimation</b> Are there any changes in load characteristics?</p> <p><b>Torque command diagnosis</b> Is there torque outside the expected range?</p>	<p><b>Proactive maintenance of detected suspect areas</b></p> <p>Mechanical adjustment/parts replacement for suspect areas <b>Immediate response</b></p> <p><b>Abnormal noise risk estimation</b> <span style="color: red;">Under development</span></p> <p>Is there any deterioration of the ball screw mechanism, etc., for the specified servo axis?</p>

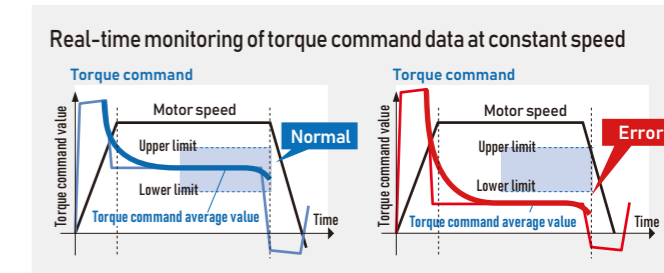
**Load characteristics estimation**

Continuously diagnoses changes in load characteristics to detect signs that a motor is not moving as smoothly as usual.

- Monitor servo data in real time**
- Estimate the load characteristics**
  - Inertia ratio estimate
  - Offset load estimate
  - Dynamic friction estimate
  - Viscous friction estimate
- Warn if an estimate is out of the set range**

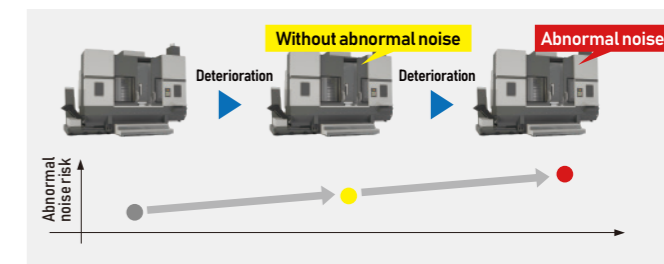
**Torque command diagnosis**

Constantly diagnoses torque commands during operation at a constant speed to detect issues in drive parts and the motor itself before a malfunction occurs.



**Abnormal noise risk estimation**

Under development  
 The risk of abnormal noise due to oscillation can be estimated and diagnosed before it occurs.



\*Release schedule will vary depending on the series and capacity. Please contact us for details.

Specialized for applications  
Simple installation with no need for a host controller program

Application specialized type

Sensor direct feedback (Displacement control)

Sensor direct feedback (Pressure control) Under development

High-precision gantry control Under development

EtherCAT

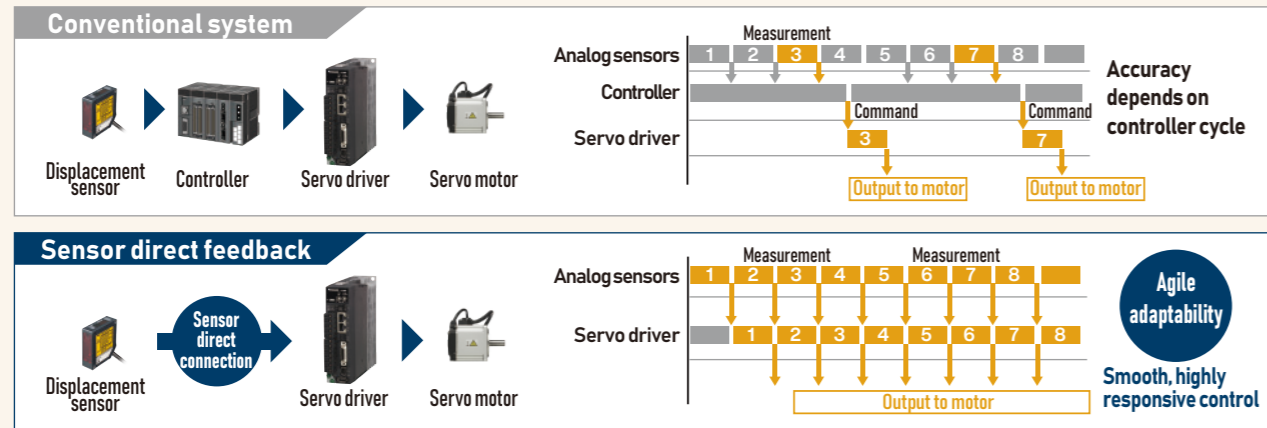
RTEX Realtime Express

Analog, pulse train, Modbus



High responsiveness and smooth control not dependent on a controller  
Sensor direct feedback

Analog data from sensors, etc., is directly input to the servo driver, allowing high-speed response control simply by setting up the servo driver. This makes it possible to eliminate complex host controller programs required in the past.



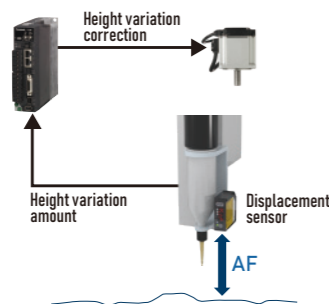
Sensor direct feedback Accurate position correction according to workpiece variation

Displacement control (Auto-focus control, meandering control)

Full-closed control that is completed within the driver through direct input of the displacement sensor to the servo driver. The high-speed feedback control is not dependent on a host controller, providing a high-speed response to workpiece variations.

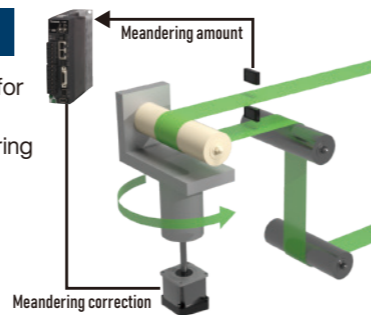
Auto-focus control

Achieves high-quality processing/coating with a constant clearance, even for workpieces with varying heights



Meandering control

No special unit is required for meandering correction, as high-precision meandering control is achieved with the servo



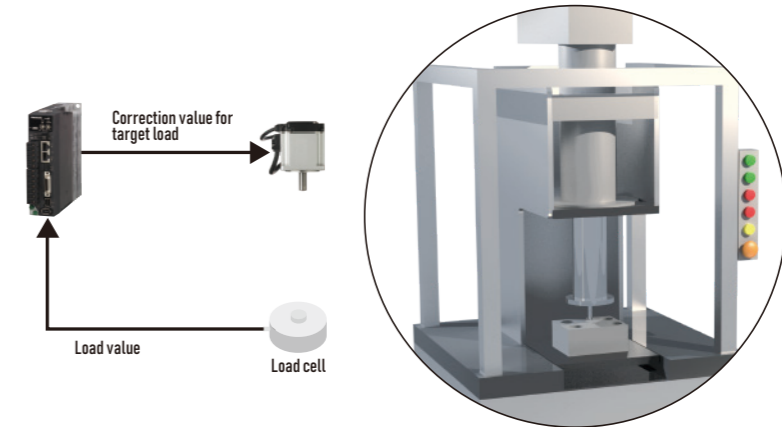
- Example applications: Dispensers, Display bonding equipment, Scribing devices, Laser processing machines, Lithium-ion battery winding machines, Packing machines

Sensor direct feedback

Simplifies complex control programs for stable, highly precise pressure control

Pressure control Under development\*

High response and stable operation control is achieved through full-closed control that is completed within the driver by directly inputting the pressure sensor output signal to the servo driver.



Example applications

- Press machines, Bonding equipment, Assembly equipment, Press fitting equipment, Capping devices, Screw tightening equipment

Gantry control model

Advanced coordination control, ease of use and safety functions ideal for gantry mechanisms

High-precision gantry control Under development\*

Precise Gantry torsion correction (table)

Measure positional deviation between two axes beforehand and save as a table to correct torsion and improve positioning accuracy.

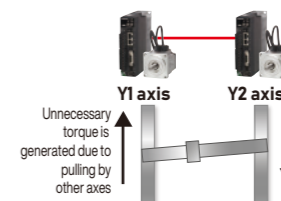
Correct by creating and operating a position correction table in advance

Y1 axis position (mm)	Y2 axis position (mm)	Y2 axis position correction amount (mm)
0	0	0
1000	999.95	0.05
2000	2000.02	-0.02
3000	3000	0

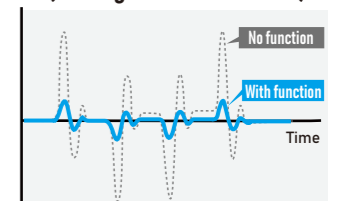
Faster Gantry torsion correction (real-time)

Torque interference is reduced by detecting and correcting torsion between axes in real time, enabling high speed operation.

Coordinated communication between axes



Torsion (misalignment of two axes)



Simpler Gain tuning optimization

Gantry mechanism tuning, which used to require complex tuning, is now quicker and easier.

Safer Coordinated stoppage during an alarm

When an alarm occurs on one axis, the two axes are stopped in a coordinated manner to prevent mechanical damage.

Example applications

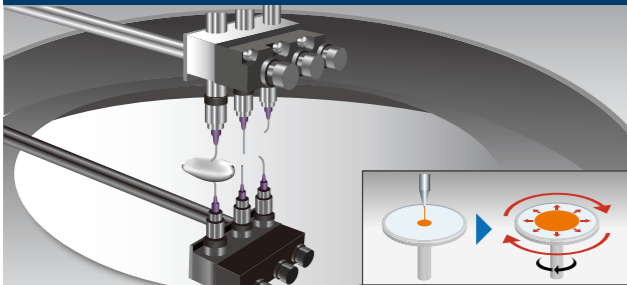
- Bonding equipment, Substrate inspection equipment, Scribing devices, Grinding equipment, Mounters, Laser processing machines

\*Response time will vary depending on the series and capacity. Please contact us for details.

## Semiconductor manufacturing process

In response to the demand for miniaturization and multi-layering of semiconductor chips, higher speed and higher precision control is required in each manufacturing process.

### Spin coaters



Chemical solutions are evenly spread by rotating the wafer. The high-speed rotation contributes to increased thickness.

Max. motor rotational speed 7150 r/min

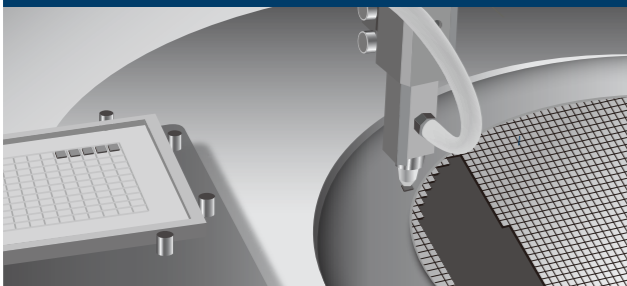
### Dicing saws



By improving positioning accuracy, micro IC chips can be formed from wafers.

Improved positioning accuracy

### Chip transfer machines



Suppresses minute tip vibrations and realizes high-speed pick & place of microscopic IC chips.

precAIs TUNING

### Bonding equipment



High-response load control prevents mounting failures and damage to microchips during substrate mounting.

Sensor direct feedback (Pressure control)

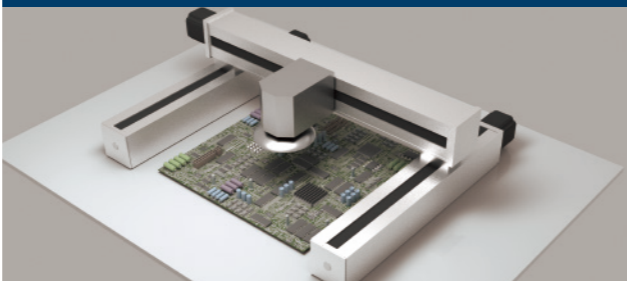
### IC handlers



Abnormal stops due to overloading are reduced, even when quick acceleration/deceleration is repeated under high load conditions.

Extending overload operation time

### Substrate inspection equipment



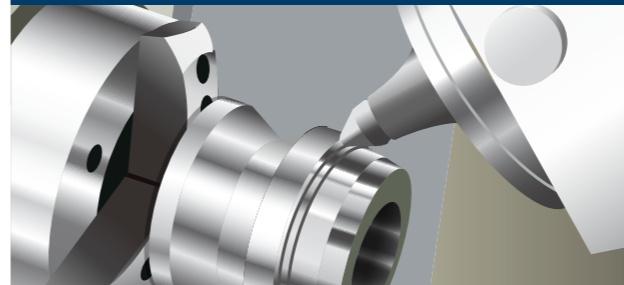
The dual axes of the gantry mechanism allow for smooth, high-speed operation, enabling high-speed inspection.

High-precision gantry control

## Processing machinery

As products become denser and more sophisticated, higher precision control is required for all machines, even those that process the individual parts making up the product.

### Metal processing machines

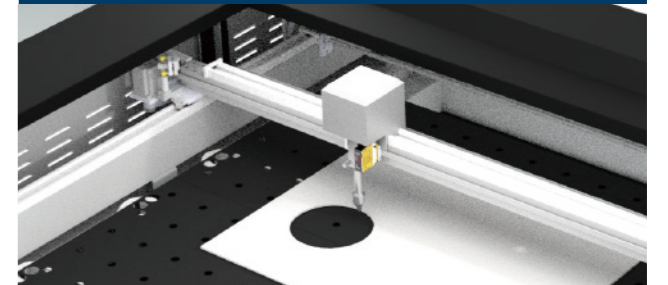


Improved basic performance can increase the gain, enabling ultra-precise, nanometer-order machining.

Encoder resolution 27 bit

Velocity response frequency 4.0 kHz or more

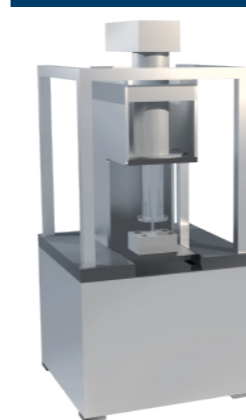
### Laser processing machines



High-quality machining is achieved by correcting unevenness with regard to height with a high level of responsiveness.

Sensor direct connection auto-focus control

### Press machines



Operation patterns for high-response pressure control can easily be constructed without a host program.

Block operation function

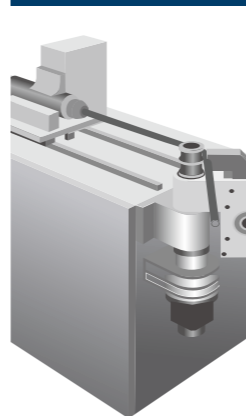
### Injection molding machines



High-response pressure control stabilizes filling pressure and suppresses filling defects and burrs.

Sensor direct feedback (Pressure control)

### Pipe bending machines



Both position control and pressure control are fully closed within the servo system, achieving high speed and accurate bending.

Sensor direct feedback (Pressure control)



An extensive lineup of high-speed, high-torque, compact and lightweight servo system

## MINAS A6 Family

- Encoder resolution: 23 bit
- Encoder: Absolute, Incremental, Battery-less absolute
- Velocity response frequency: 3.2 kHz
- Motor capacity: 50 W to 22 kW



### Servo driver

#### [ Rotation type ]

Analog/Pulse train input/  
Modbus communication

**MINAS A6S**

- Position control type: **A6SE**
- General-purpose communication type: **A6SG** Special order
- Multifunction type: **A6SF**

**RTEX**  
Realtime Express

High speed communication  
For Realtime Express Network  
servo driver

**MINAS A6N**

- Standard type: **A6NE**
- Multifunction type: **A6NF**

**EtherCAT** Special order

Open network  
EtherCAT communication  
servo driver

**MINAS A6B**

- Standard type: **A6BE**
- Multifunction type: **A6BF**
- Application-optimized type Special order
  - Displacement control: **A6BU**
  - Gantry control\*: **A6BN**

\*: Linear motors supported

#### [ Linear and DD motor types ]

Special order

**MINAS A6L**

Pulse train/Modbus  
RTEX-compatible  
EtherCAT-compatible

#### [ DC 24 V / DC 48 V ]

Special order

**MINAS A6 Frame V**

Pulse train/Modbus  
RTEX-compatible  
EtherCAT-compatible

#### [ Dual-axis servo driver ]

Special order

**RTEX**  
Realtime Express

### Servo motor

#### Low inertia



**MSMF**  
100 V 50 W to 400 W  
200 V 50 W to 5.0 kW

#### Medium inertia Flat type



**MQMF**  
100 V 100 W to 400 W  
200 V 100 W to 400 W

#### Medium inertia



**MDMF**  
200 V 1.0 kW to 22.0 kW

#### Medium inertia Low-speed, high torque



**MGMF**  
200 V 850 W to 5.5 kW

#### High inertia



**MHMF** 100 W to 750 W  
100 V 50 W to 400 W  
200 V 50 W to 7.5 kW

G A lineup of geared motors is also available \*We offer a connector type and a lead wire type.

### Sustainability

## Panasonic Industry practices sustainable management, contributing to the future of the earth and the development of society

#### Panasonic GREEN IMPACT

The Panasonic Group has established "Panasonic GREEN IMPACT", a long-term environmental vision aimed at achieving better living and a sustainable global environment. Through this vision we aim to reduce CO<sub>2</sub> emissions associated with our business to virtually zero by 2030, and by 2050, we aim to create a reduce contributions by\* 300 million tons, or roughly 1% of current global emissions (approx. 33 billion tons).

\*Energy-related CO<sub>2</sub> emissions in 2019: 33.6 billion tons (source: IEA). 300 million tons calculated using 2020 emission factors

### Reducing our environmental impact

#### - Compact and lightweight

Achieves a 15% reduction compared to previous models  
The MINAS A7 Family of AC servo motors, used in industrial machinery and industrial robots, have achieved industry-leading high speeds and large torques while reducing weight by 15% (500 g) compared to our conventional models.

#### - Reducing the environmental impact of packaging materials

We have reviewed packaging materials from the ground up, and are switching to paper materials with a low environmental impact.

#### - Front panel model nameplate changed to laser printing

This conserves model nameplate stamps, taking the environmental impact into consideration.



### Chemical substance-based initiatives

#### - Lead-free and RoHS-compliant

All solder used at our manufacturing sites is free of lead and conforms to the regulations preventing the inclusion of the six substances in the EU RoHS directive 2011/65/EU and the four substances in the EU RoHS directive 2015/863/EU. We have also confirmed that there is no intentional use exceeding the threshold for said substances.

(Responding to overseas environmental regulations)

- RoHS (China)
- Toxic Substances Control Act (TSCA, United States)
- K-Reach (South Korea)
- RoHS (Europe)

\*Compared with 1.0 kW motors

### Website Information



#### Panasonic Industry Automation Controls website

URL <https://industry.panasonic.com/global/en/>

We provide extensive technical information that ranges from motor selection to materials useful for design.

<b>Product information</b>	<b>What's new</b>	<b>Design</b>	<b>Download</b>	<b>Selection</b>	<b>Servo motor selection software</b> <small>Online tool</small>
	<ul style="list-style-type: none"> <li>New product information</li> <li>Motor news</li> <li>Software version upgrade information</li> </ul>		<ul style="list-style-type: none"> <li>Manuals</li> <li>Technical documents</li> <li>Standard specifications</li> <li>CAD</li> <li>Software</li> </ul>		Automatically selects items ranging from machine elements and operation patterns, to motors, drivers and optional products!