

# NEW PRODUCTS GUIDE

Fast, Accurate, Smooth Motion Control Technology



**Ezi-SERVO**<sup>®</sup>  
Closed Loop Stepping System

**Ezi-IO**<sup>®</sup>  
Input/Output Module

**Ezi-Robo**<sup>®</sup>  
Precise Positioning Actuator System

**Ezi-SPEED**<sup>®</sup>  
BLDC Motor Speed Control System

**Ezi-POS**<sup>®</sup>  
BLDC Motor Positioning System

**Ezi-LINEARSTEP**<sup>®</sup>  
Precision Hybrid Stepper Linear Actuators

EtherCAT<sup>®</sup>

Ethernet

CC-Link I<sup>2</sup>S

PROFINET

Modbus



Fast, Accurate, Smooth Motion

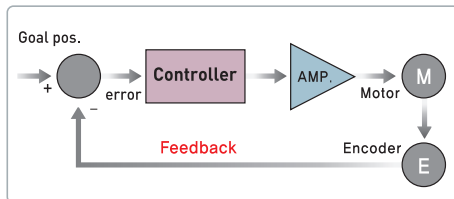
## Advantages over Open-Loop Control Stepping Drive

1. Reliable positioning without loss of synchronism.
2. Holding stable position and automatically recovering to the original position even after experiencing positioning error due to external forces, such as mechanical vibration or vertical positional holding.
3. Ezi-SERVO utilizes 100% of the full range of rated motor torque, contrary to a conventional Open-Loop stepping driver that can use up to 50% of the rated motor torque due to the loss of synchronism.
4. Capability to operate at high speed due to load-dependent current control, Open-Loop stepper drivers use a constant current control at all speed ranges without considering load variations.

## Advantages over Servo Motor Controller

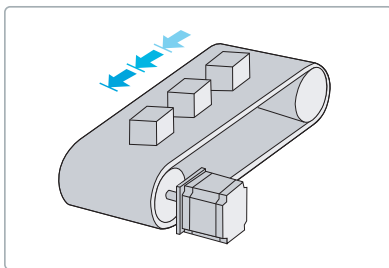
1. No gain tuning (Automatic adjustment of gain in response to a load change.)
2. Maintains the stable holding position without oscillation after completing positioning.
3. Fast positioning due to the independent control by on-board MCU.
4. Continuous operation during rapid short-stroke movement due to instantaneous positioning.

### Closed Loop System



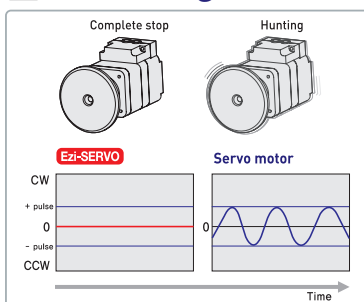
Ezi-SERVO is an innovative Closed Loop Stepping System that utilizes a high-resolution motor mounted encoder constantly to monitor the current position. The encoder feedback allows the Ezi-SERVO to update the current position every 25 micro seconds. It allows the Ezi-SERVO drive to compensate for the loss of position, ensuring accurate positioning. For example, due to a sudden load change, a conventional stepper motor and drive could lose a step but Ezi-SERVO automatically correct the position by encoder feedback.

### Tuning Not Required



To ensure machine performance, smoothness, positional error and low servo noise, conventional servo systems require the adjustment of its servo's gains as an initial crucial step. Even systems that employ auto-tuning require manual tuning after the system is installed, especially if more than one axis are interdependent. Ezi-SERVO employs the best characteristics of stepper, closed loop motion controls and algorithms to eliminate the need of tedious gain tuning required for conventional closed loop servo systems. This means that Ezi-SERVO is optimized for the application and ready to work right out of the box. The Ezi-SERVO system employs the unique characteristics of the closed loop stepping motor control, eliminating these cumbersome steps and giving the engineer a high performance servo system without wasting setup time. Ezi-SERVO is especially well suited for low stiffness loads (for example, a belt and pulley system) that sometime require conventional servo systems to inertia match with the additional expensive and bulky gearbox. Ezi-SERVO also performs exceptionally, even under heavy loads and high speeds.

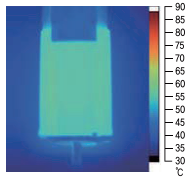
### No Hunting



Traditional servo motor drives overshoot their position and try to correct overshooting by moving the opposite direction, especially in high gain applications. This is called null hunt and is especially prevalent in systems that the break away or static friction is significantly higher than the running friction. The cure is lowering the gain, which affects accuracy or using Ezi-SERVO Motion Control System. Ezi-SERVO utilizes the unique characteristics of stepping motors and locks itself into the desired target position, eliminating Null Hunt. This feature is especially useful in applications such as nanotech manufacturing, semiconductor fabrication, vision systems and ink jet printing in which system oscillation and vibration could be a problem.

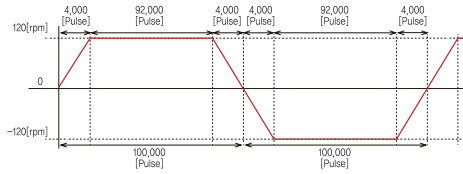
### Low Heat Generation / Energy Savings (Motor Current Control according to load)

Ezi-SERVO automatically controls motor current according to load. Ezi-SERVO reduces motor current when motor load is low, and increases motor current when load is high. By optimizing the motor current, motor heat can be minimized and energy can be saved.



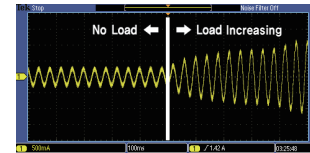
Motor temperature

[Measured by Thermal Imaging Camera]



Condition to measure the motor temperature

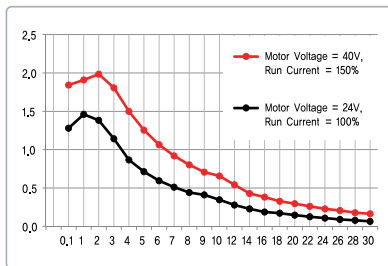
[4hours operation, Motor surface temperature saturation]



Example of the Motor Current Control according to load

### High Torque (Motor Voltage Increasing and Motor Current Setting)

Ezi-SERVO boosts the voltage supplied to the motor by internal DC-DC Converter. The torque at the high speed is increased. In addition, it is possible to set the Run Current up to 150%, whereby the torque at low speed is increased. Torque can be improved by about 30% over the entire speed range.

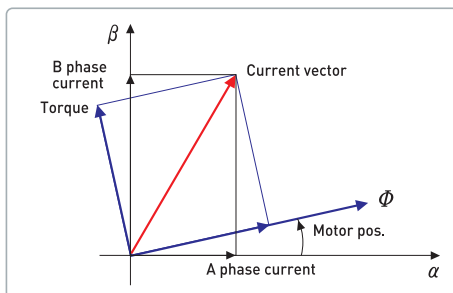


※ The torque at low speed and high speed is improved about 30%.

Measured Condition : Drive = Ezi-SERVO-ST-56L  
Motor Voltage = 40VDC  
Input Voltage = 24VDC

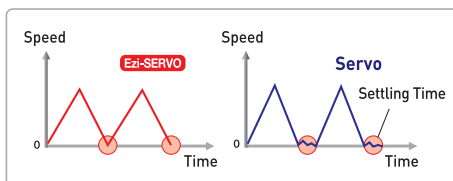
### Smooth and Accurate Operation

Ezi-SERVO is a high-precision servo system, using a high-resolution encoder with 32,000 pulses/revolution. Unlike a conventional Microstep drive, the on-board high performance MCU (Micro Controller Unit) performs vector control and filtering, producing a smooth rotational control with minimum ripples.

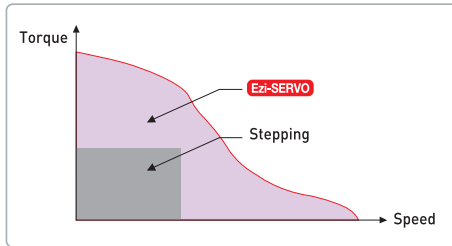


### High Response

Similar to conventional stepping motors, Ezi-SERVO instantly synchronizes with command pulses providing fast positional response. Ezi-SERVO is the optimum choice when zero-speed stability and rapid motions within a short distance are required. Traditional servo motor systems have a natural delay called settling time between the command input signals and the resultant motion because of the constant monitoring of the current position.

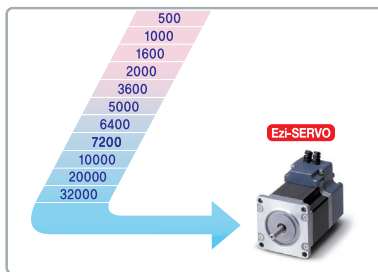


## High Torque / Continuous Operation



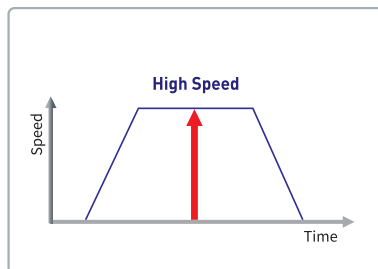
Compared with common step motors and drives, Ezi-SERVO motion control systems can maintain a high torque state over relatively long period of time. This means that Ezi-SERVO continuously operates without loss of position under 100% of the load. Unlike conventional Microstep drives, Ezi-SERVO exploits continuous high torque operation during high speed motion due to its innovative optimum current phase control.

## High Resolution



The unit of the position command can be divided precisely. (Max. 32,000 pulses/revolution)

## High Speed

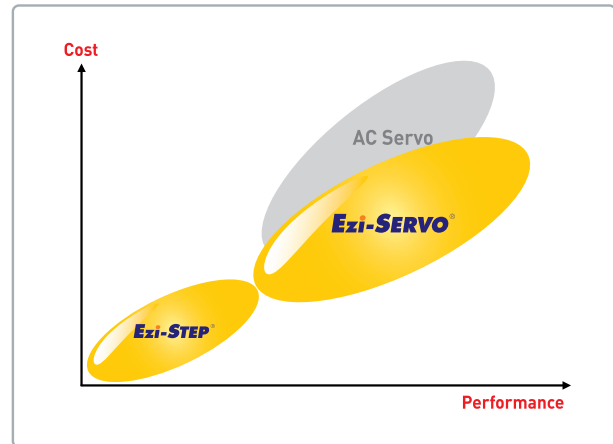


The Ezi-SERVO operates well at high speed without the loss of synchronism or positioning error. Ezi-SERVO's ability of continuous current position monitoring of enables the stepping motor to generate high torque, even under a 100% load condition.



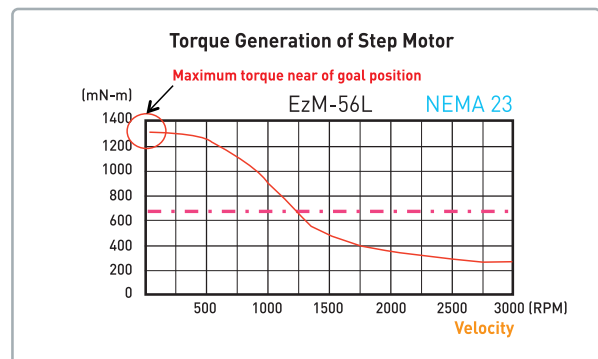
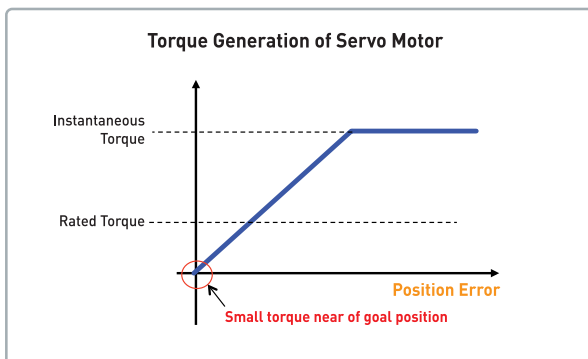
# MARKET OF EZI-SERVO®

## Why the Closed Loop Stepping System has better performance than the Servo Systems?



### TORQUE COMPARISON BETWEEN STEP AND SERVO MOTOR

- Torque from Servo Motor is proportional to position error.
- Torque from Step Motor has no relation to position error.
- Torque from Step Motor has only relation to speed.



### WHY STEP MOTOR SYSTEM IS BETTER FOR BELT & PULLEY SYSTEM?

- Motor revolution generates 62.8mm of linear movement so most of motion must be short pitch of movement.
- Due to less rigidity of load, shaking of load should be directly delivered to motor shaft when motion stops. In case of servo motor, when motor stops, servo motor has very tiny power to keep target position so shaking of load can be easily effected to motor shaft its own vibration.

\* In a step motor's aspect, belt & pulley is short pitch of movement

$L = 2\pi R$

One motor revolution generates 62.8mm of linear motion if Radius is 10mm. (L=62.8mm)

## FASTECH Overview

FASTECH products can be found driving applications such as: LCD/LED manufacturing, semi-conductor fabrication, assembly machines, packaging machines, medical diagnostic equipment, laboratory apparatus, vision inspection systems and many other applications that require precise smooth movement. FASTECH drives have industry standard NEMA mounting flanges and easily adapt to most linear actuators and precision stages.



Innovative closed loop stepping motor control system which utilizes a high resolution encoder to update the motor position every 25µ sec. Using high performance MCU (Micro Controller Unit) technology and software, the drive ensures exact position, no overshooting and smooth motion. It is very innovative closed loop stepping control system which is best selection for Vision Inspection Application.

- Closed-Loop Stepping System
- Tuning Not Required / No Hunting
- Low Heat Generation / High Torque
- High Resolution / High Response



Compact and miniaturized closed loop stepping motor and drive system which utilizes a high resolution encoder to update the motor position every 25µsec. Optimizing high performance MCU (Micro Controller Unit) technology and proprietary software, the drive ensures exact position, no overshooting and smooth motion at 100% load.

- Space Saving / Reduced Wiring by Compact Drive
- Closed-Loop Stepping System
- Tuning Not Required / No Hunting
- Low Heat Generation
- High Resolution / High Response



Innovative closed loop stepping motor control system with an integrated Motion Control. The integrated Motion Controller can be linked up to 16 axis and can be operated from a PC through RS-485 communication. All of the motion conditions are set through the integrated network and saved in FLASH ROM as a parameter. Motion Library(DLL) is provided for programming in Windows XP/7/8/10. A maximum of 256 positions can be saved in FLASH ROM memory.

- Embedded Motion Controller
- RS-485 Interface
- Position Table
- Closed-Loop Stepping System
- Tuning Not Required / No Hunting
- High Resolution / High Response
- Low Heat Generation / High Torque

 **Ezi-SERVO® Plus-R**  
Closed Loop Stepping System **MINI**



Compact and miniaturized closed loop stepping motor, drive and controller system which utilizes a high resolution encoder to update the motor position every 25 $\mu$ sec. The integrated Motion Control can be linked up to 16 axis and can be operated from PC through RS-485 communication. All of the motion conditions are set through the integrated network and saved in FLASH ROM as a parameter. Motion Library(DLL) is provided for programming in Windows XP/7/8/10. A maximum of 64 positions can be saved in FLASH ROM memory.

- Space Saving / Reduced Wiring by Compact Drive
- Embedded Motion Controller
- RS-485 Interface
- Position Table
- Closed-Loop Stepping System
- Tuning Not Required / No Hunting
- High Resolution / High Response

 **Ezi-SERVO® II BT**  
Closed Loop Stepping System



Innovative integrated stepping motor and drive system in one robust package. A high resolution encoder updates the motor position every 50 $\mu$  sec to the integrated drive. Optimizing high performance MCU (Micro Controller Unit) technology and proprietary software, the drive ensures exact position, no overshooting and smooth motion at 100% of load.

- Motor + High-Resolution Encoder + Drive
- Space Saving / Reduced Wiring
- Closed-Loop Stepping System
- Tuning Not Required / No Hunting
- High Resolution / High Response
- Low Heat Generation

 **Ezi-SERVO® ALL**  
Closed Loop Stepping System



Innovative integrated stepping motor, drive and controller system in one robust package. A high resolution encoder updates the motor position every 25 micro-seconds to the integrated drive. The integrated Motion Controller can be linked up to 16 axis and can be operated from a PC through RS-485 communication. All of the motion conditions are set through the integrated network and saved in FLASH ROM as a parameter. Motion Library(DLL) is provided for programming in Windows XP/7/8/10 and MAX 64 positions can be saved in FLASH ROM memory. Especially 60mm series supports IP65 protection and high resolution of absolute encoder (single turn : 262,144rev and multi turn : 4,096rev).

- Motor + High Resolution Encoder + Drive + Motion Controller
- Space Saving / Reduced Wiring
- RS-485 Interface
- Position Table
- Closed-Loop Stepping System
- Tuning Not Required / No Hunting
- Low Heat Generation / High Torque
- IP65 Protection (NEMA 24)



Ezi-SERVO II EtherCAT series is combination package between FASTECH's closed loop stepping motor drive/controller system and Ethernet based Fieldbus EtherCAT. Ezi-SERVO II EtherCAT supports CiA 402 Drive Profile.

- CiA402 Drive Profile Support
- Closed-Loop Stepping system
- Tuning Not Required / No Hunting
- Low Heat Generation / High Torque
- High Resolution / High Response



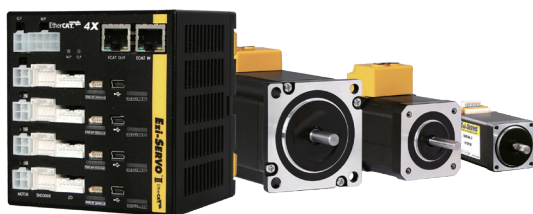
Ezi-SERVO II EtherCAT TO series is combination package between FASTECH's closed loop stepping motor drive/controller system and Ethernet based Fieldbus EtherCAT. Ezi-SERVO II EtherCAT TO supports CiA 402 Drive Profile.

- CiA402 Drive Profile Support
- Closed-Loop Stepping system
- Tuning Not Required / No Hunting
- Low Heat Generation / High Torque
- High Resolution / High Response
- Torque Off Function Supported



Ezi-SERVO II EtherCAT MINI is a closed loop stepping system with the compact design, combined with Ethernet-based fieldbus 'EtherCAT'. Ezi-SERVOII EtherCAT MINI supports CiA 402 Drive Profile.

- CiA402 Drive Profile Support
- Closed-Loop Stepping system
- Tuning Not Required / No Hunting
- Space Saving / Reduced Wiring by Compact Drive
- Low Heat Generation / High Torque
- High Resolution / High Response



Ezi-SERVO II EtherCAT 4X series is combination package between FASTECH's Closed Loop Stepping motor drive/controller system and Ethernet based Fieldbus EtherCAT. Ezi-SERVO II EtherCAT 4X supports CiA 402 Drive Profile.

- CiA402 Drive Profile Support
- Closed-Loop Stepping system
- Tuning Not Required / No Hunting
- Compact Multi Axis Stepping Motor Drive
- Space Saving / Reduced Wiring



 **Ezi-SERVO® II EtherCAT ALL**  
Closed Loop Stepping System

CE



Innovative integrated stepping motor, drive and controller system in one robust package, Ezi-SERVO II EtherCAT ALL is combination package between FASTECH's Closed Loop Stepping motor drive/controller system and Ethernet based Fieldbus EtherCAT. Ezi-SERVO II EtherCAT ALL supports CiA 402 Drive Profile.

- Motor + High Resolution Encoder + Drive + EtherCAT Interface
- Space Saving / Reduced Wiring
- CiA402 Drive Profile Support
- Closed-Loop Stepping System
- Tuning Not Required / No Hunting
- Low Heat Generation / High Torque

 **Ezi-SERVO® II Plus-E**  
Closed Loop Stepping System

CE



The Ezi-SERVO II Plus-E series is a product that combines with FASTECH's closed loop stepping motor drive/controller system and PC/PLC's standard Ethernet communication network. Ezi-SERVO II Plus-E products are providing a single network solution which can control the FASTECH's step motor systems, industrial servo motor systems such as Mitsubishi, Yaskawa, Panasonic and I/O in one system. It is no need to use a motion board, it can reduce the system cost due to reduce the wiring by Daisy-chain connection each drives. It is a multi-axis control system to connect up to 254 axis to 1 Ethernet port for control. Especially, it provides Motion Library and GUI for windows for PC users, This is a user-friendly product which is maximizing the user convenience.

- Embedded Motion Controller
- Ethernet Interface
- Position Table
- Closed-Loop Stepping System
- Tuning Not Required / No Hunting
- High Resolution / High Response
- Low Heat Generation / High Torque

 **Ezi-SERVO® II Plus-E MINI**  
Closed Loop Stepping System

CE



Ezi-SERVO II Plus-E MINI is a closed loop stepping system with the compact design, combined with the PC/PLC standard Ethernet network. It is a multi-axis control system that can control up to 254 axis connected to one Ethernet port. Motion Library (DLL) and Graphic User Interface for windows 7/8/10 are provided free of charge.

- Embedded Motion Controller
- Ethernet Interface
- Position Table
- Closed-Loop Stepping System
- Tuning Not Required / No Hunting
- High Resolution / High Response
- Space Saving / Reduced Wiring by Compact Drive

 **Ezi-SERVO® II Plus-E ALL**  
Closed Loop Stepping System

CE



Innovative integrated stepping motor, drive and controller system in one robust package, Ezi-SERVO II Plus-E ALL is combination package between FASTECH's Closed Loop Stepping motor drive/controller system and PC/PLC's standard Ethernet communication network. It provides Motion Library(DLL) and GUI for Windows 7/8/10 for PC users.

- Motor + High Resolution Encoder + Drive + Motion Controller
- Space Saving / Reduced Wiring
- Ethernet Interface
- Closed-Loop Stepping System
- Tuning Not Required / No Hunting
- Low Heat Generation / High Torque

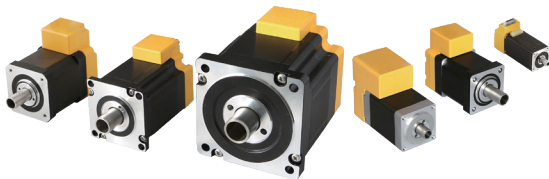
 **Ezi-SERVO® II CC-Link**  
Closed Loop Stepping System



Ezi-SERVO II CC-Link is combination package between FASTECH's Closed Loop Stepping motor drive/controller system and high-speed Fieldbus CC-Link network. This product is a remote device module that supports CC-Link network. It can control multi-function by occupying 1 and 2 station, and processing motion and monitoring functions by device command.

- Embedded Motion Controller
- Position Table
- Closed-Loop Stepping System
- Tuning Not Required / No Hunting
- Low Heat Generation / High Torque

 **Ezi-SERVO® HS**  
Closed Loop Stepping System



Ezi-SERVO HS adapts a closed-loop control solution with high resolution encoder.

This is an innovative product that laser, cable, pneumatic, motor shaft can be used through the hollow shaft of the motor.

- Hollow Shaft Motor with High Resolution Encoder
- Closed-Loop Stepping System
- High Precision Position Control
- Low Heat Generation / High Torque
- EtherCAT, Ethernet, CC-Link Support

## S-SERVOII Characteristics

S-SERVOII adopted closed loop stepping motor system which perfectly resolves the problems of current open loop control stepping motor system such as **Step Out** and **Positioning Completion Check**. Regardless of motor type (2 Phase, 5 Phase), position precision only related to encoder so **High Precision Positioning** is always possible. Existing step driver resolution can be heated easily because of constant current goes into the motor regardless of loads magnitude. However S-SERVOII enables to reduce high temperature of the motor and save **Energy Usage**. In addition, the Acc/Dec characteristics can be improved significantly by **Run Current** (Up to 150%).

### Completely free from the Concern of Loss of Position

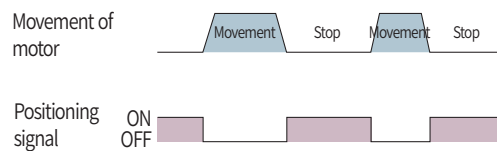
(Alarm will be generated when step out)



Because of mounted encoder constantly monitor the current position, step out cannot be occurred. If step out occurred by external force of overloads, alarm signal will be sent to upper controller. Thus, upper controller can recognize step out of step motor.

### Perfect Positioning Completion Check

(Positioning completion signal will be generated)



When motor stops at the goal position, encoder detect it and send positioning completion signal to upper controller. Therefore S-SERVOII resolve the problem of unclear positioning of current Open Loop System.

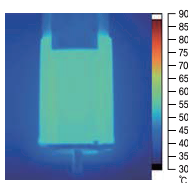
### Position Precision is Only Related to Encoder

S-SERVOII controls position by using high precision of encoder. Regardless of motor type (2 Phase or 5 Phase), S-SERVOII position precision is only related to mounted encoder resolution so high precision of positioning is possible unlike open loop micro step motor and driver which adapts 2 Phase or 5 Phase motor.

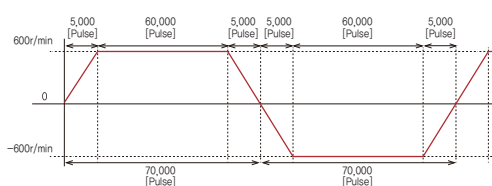
### Reduce the Motor Temperature and Energy Saving.

(Current control according to load)

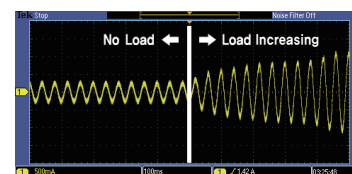
S-SERVOII automatically control the motor current according to loads. Thus febricity of motor and drive are minimized so can save the energy as well.



Motor temperature  
[Measured by Thermal Imaging Camera]

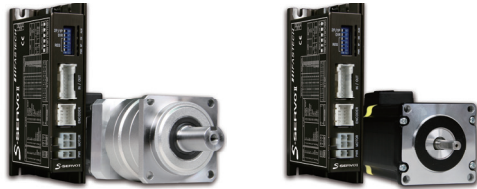


Condition to measure the motor temperature  
[4hours operation, Motor surface temperature saturation]



Example of the Motor Current Control according to load





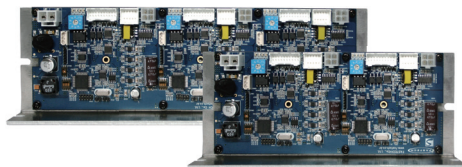
S-SERVO II adopted closed loop stepping motor system which perfectly resolves the problems of current open loop control stepping motor system such as Step Out and Positioning Completion Check. Regardless of motor type (2 Phase, 5 Phase), position precision only related to encoder so High Precision Positioning is always possible. Existing step driver resolution can be heated easily because of constant current goes into the motor regardless of loads magnitude. But S-SERVO II enables to reduce high temperature of the motor and save Energy Saving. In addition, the Acc/Dec characteristics can be improved significantly by Run Current (Up to 150%).

- Completely free from the Concern of Loss of Position
- Perfect Positioning and Completion
- Don't care what the Phase of Motor is
- Reduce the Motor Temperature and Energy Saving



S-SERVO II adopted closed loop stepping motor system which perfectly resolves the problems of current open loop control stepping motor system such as Step Out and Positioning Completion Check. Regardless of motor type (2 Phase, 5 Phase), position precision only related to encoder so High Precision Positioning is always possible. Existing step driver resolution can be heated easily because of constant current goes into the motor regardless of loads magnitude. But S-SERVO II enables to reduce high temperature of the motor and save Energy Saving. In addition, the Acc/Dec characteristics can be improved significantly by Run Current (Up to 150%).

- Completely free from the Concern of Loss of Position
- Perfect Positioning and Completion
- Don't care what the Phase of Motor is
- Reduce the Motor Temperature and Energy Saving



Compact size of 2X, 3X S-SERVO II Multi axis drive product is Closed Loop Product but similar price range product from Open Loop Product. Max. input frequency is 500KHz (Duty 50%) and has 11 kinds of Alarm (protection functions) outputs and 16 kinds of resolution setting (external rotary switch) functions. Also In Position and Position control gain can be set within 0~63 pulse range (parameter setting by RS-232 communication). Velocity and position control command is based on pulse train input method (photo coupler input) and supports Line Drive, Open Collector both. Max. motor size is 60mm to be controlled.

# Ezi-MOTIONLINK®

Network based Motion Controller Plug-in to Servo Drives

## Ezi-MOTIONLINK® Plus-E

Network based Motion Controller Plug-in to Servo Drives



Ezi-MOTIONLINK Plus-E, which can control the Ezi-SERVO series with various servo drives in a single "Ethernet" network, is a one-axis controller product that can be connected directly to a variety of servo drives such as Mitsubishi, Yaskawa and Panasonic.

Up to 254 axis can be controlled by connecting to one Ethernet port and Window Motion Library and GUI for PC users are provided in free of charge, and Position table function is provided to maximize user convenience. In addition, there is no need to use a motion board and it can be achieved through overall cost reduction by simplifying wiring through daisy-chain connection.

### [Applicable Servo]

- MITSUBISHI
- PANASONIC
- LS MECAPION
- DELTA
- YASKAWA
- SANYO DENKI
- RS AUTOMATION

\* Before making a purchase, please consult with FASTECH sales team to check whether it is possible to attach the product to your servo drive.

## Ezi-MOTIONLINK® Plus-R

Network based Motion Controller Plug-in to Servo Drives



Ezi-MOTIONLINK Plus-R enables to link Ezi-SERVO Series and various AC Servo Drives under single RS-485 network and this product can be plugged into various servo drives in the market to connect FASTECH product and Servo drives under single network in a machine. It provides Motion Library(DLL) and GUI program for Windows XP/7/8/10 for PC users and support Position Table function to maximize user convenience. Also no need to use Motion Board so it can realize simple wiring by network connection and ultimately cost reduction.

### [Applicable Servo]

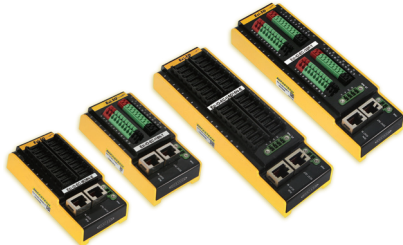
- MITSUBISHI
- YASKAWA
- NIDEC SANKYO
- LS MECAPION, HIGEN, RS AUTOMATION(Released soon)
- PANASONIC
- SANYO DENKI

# Ezi-IO<sup>®</sup>

Input/Output Module



CE



- EtherCAT Based Digital I/O Module
- All EtherCAT Synchronization Modes Supported
- CiA 401 Profile Supported
- Simple and Easy Wiring



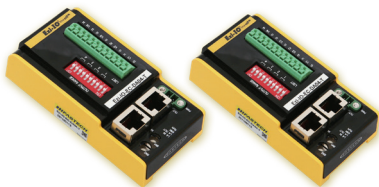
CE



- EtherCAT Based Analog Input Module
- All EtherCAT Synchronization Modes Supported
- CiA 401 Profile Supported
- Simple and Easy Wiring
- Input Mode and Range Configurable
- Moving Average Filtering



CE



- EtherCAT Based Analog Output Module
- All EtherCAT Synchronization Modes Supported
- CiA 401 Profile Supported
- Simple and Easy Wiring
- Output Range Configurable
- Calibration for Output Deviation



CE



- EtherCAT Based High Speed Counter Module
- All EtherCAT Synchronization Modes Supported
- Simple and Easy Wiring
- Line receiver and DC input type provided
- Equipped with comparison output function

 **Ezi-IO® Ethernet**  
Input/Output Module **DIO**

CE



- Ethernet Based Digital I/O Module
- Plus-E Series Communication Protocol Supported
- Simple and Easy Wiring

 **Ezi-IO® Ethernet**  
Input/Output Module **AD**

CE



- Ethernet Based Analog Input Module
- Simple and Easy Wiring
- Input Mode and Range Configurable
- Moving Average Filtering

 **Ezi-IO® Ethernet**  
Input/Output Module **DA**

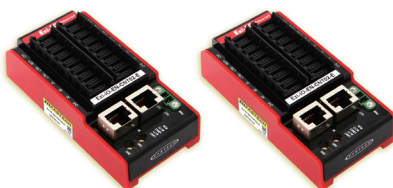
CE



- Ethernet Based Analog Output Module
- Simple and Easy Wiring
- Output Range Configurable
- Calibration for Output Deviation

 **Ezi-IO® Ethernet**  
Input/Output Module **CNT**

CE



- Ethernet Based High Speed Counter Module
- Simple and Easy Wiring
- Line receiver and DC input type provided
- Equipped with comparison output function

 **Ezi-IO**® **RS-485**  
Input/Output Module **DIO**

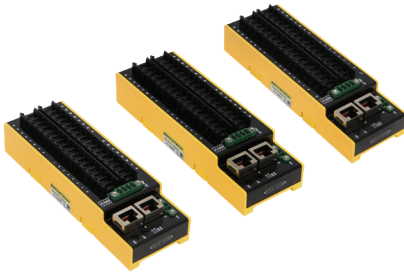
CE



- RS-485 Based Digital I/O Module
- RS-485 Series Communication Protocol Supported
- Simple and Easy Wiring

 **Ezi-IO**® **CC-Link IE TSN**  
Input/Output Module **DIO**

CE



- CC-Link IE TSN Based Digital I/O Module
- CC-Link IE TSN Authentication Class B
- Input Filter Function
- Simple and Easy Wiring

 **Ezi-IO**® **PROFINET**  
Input/Output Module **DIO**



- PROFINET Based Digital I/O Module
- Support RT (Realtime) & IRT (Isochronous Realtime) Communication
- Simple and Easy Wiring
- DIN rail mounting

# Ezi-LINEARSTEP<sup>®</sup>

Precision Hybrid Stepper Linear Actuators



Ezi-LINEARSTEP Hybrid Stepping Linear Actuator series with high resolution Encoder offers High Precision and Durability for various applications. Anti-Backlash Nut adoption enables Minimization of Backlash ( $\pm 0.0127\text{mm}$ ) and maximizes Anti-Abrasion and Efficiency of screw (Max. 85%) by Teflon Coated Screw. Life cycle of screw and nut has much improved (Max. Over 5Mil Cycles). In addition, Ball screw option and various Customization is available.

Also combination with Ezi-SERVO and S-SERVOII Series are available to support various Field Networks.

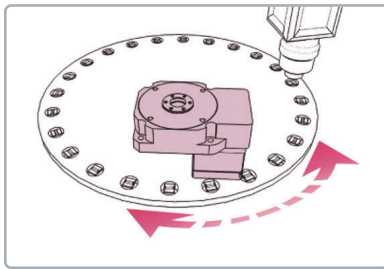
- Non-Captive / External / Captive / Kaptive Type series with high resolution Encoder
- Closed-Loop Stepping System
- Tuning Not Required / No Hunting
- High Resolution / High Response



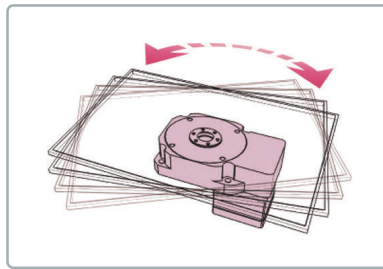
The HG Series features a Compact hollow output table that enables large-inertia discs and arms to be installed directly. High Rigidity, High Accuracy and Best Output.

- Ezi-SERVO + Hollow Rotary Index Table
- Hollow Diameter : Max. Ø85mm
- Permissible Torque : Max. 170N · m
- Permissible Axial Load : Max. 4000N
- Repeatability :  $\pm 10$ arcsec
- EtherCAT, Ethernet, CC-Link Support

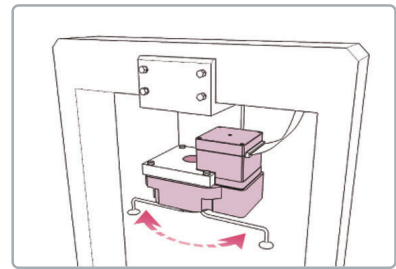
## Applications



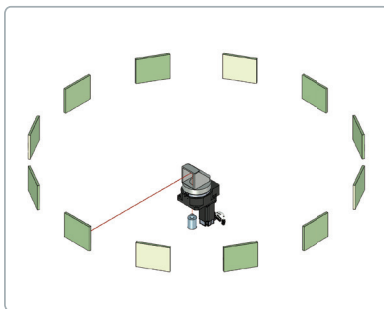
Laser Engraving, typing, CCD Inspection.



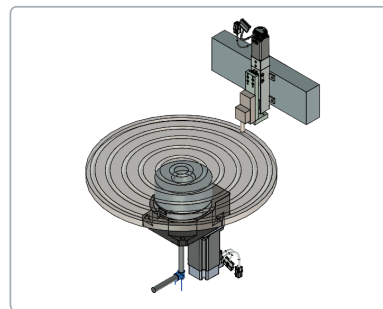
Module, Alignment Big Inertia of Rotation at 90°, 180° or any other degree.



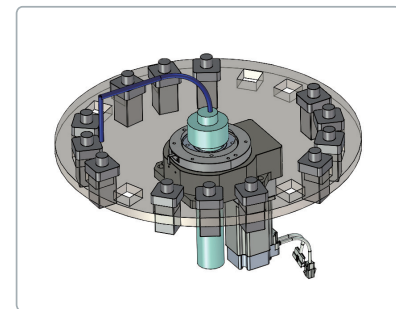
Axis Rotation Application.



Applications for optical applications using hollow bore



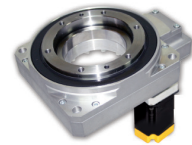
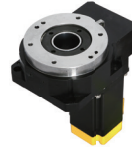
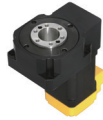
Applications for a precise positioning using hollow bore



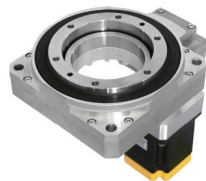
Applications for air absorption using hollow bore



## Product Line-up



Product	HG60	HG100	HG130S
Permissible Torque	4.5 N·m	12 N·m	34 N·m
Gear Ratio	1:5	1:8	1:18
Repeatability	$\pm 10(\pm 0.0028^\circ)$ arcsec	$\pm 10(\pm 0.0028^\circ)$ arcsec	$\pm 10(0.0028^\circ)$ arcsec
Motor Size	42mm [NEMA17]	60mm [NEMA24]	60mm [NEMA24]



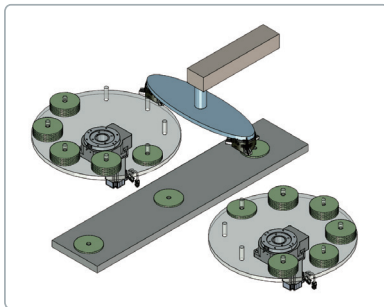
Product	HG170S	
Permissible Torque	170 N·m	107 N·m
Gear Ratio	1:20	1:36
Repeatability	$\pm 10(0.0028^\circ)$ arcsec	
Motor Size	60mm [NEMA24] or 86mm [NEMA34]	



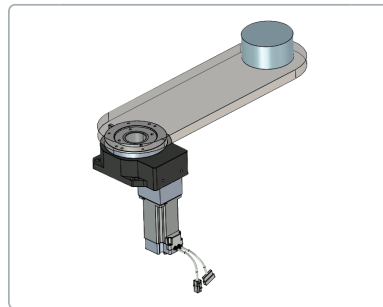
High performance and Economical diffusion of Hollow Rotary Actuator, Ezi-Robo HB series is extremely low back lash Timing Belt is driven into the hollow rotary table combines to high speed, high accuracy of closed loop stepping control system, Ezi-SERVO.

- Ezi-SERVO + Hollow Rotary Index Table
- Hollow Diameter : Max. Ø55mm
- Permissible Torque : Max. 12.8N·m
- Permissible Axial Load : Max. 500N
- Repeatability :  $\pm 30$ arcsec
- EtherCAT, Ethernet, CC-Link Support

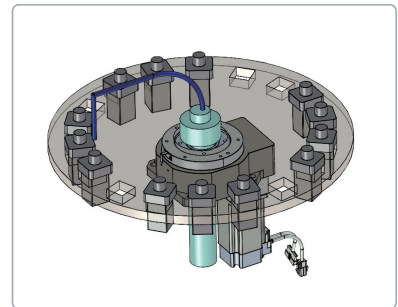
## Applications



Applications support to changing load inertia fluctuation



Applications support moment load

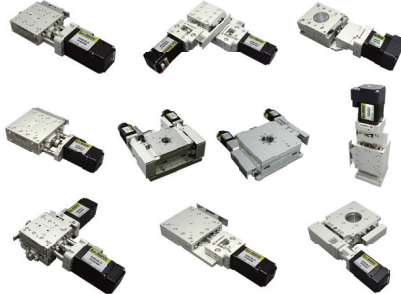


Applications for a precise positioning using hollow bore

## Product Line-up



Product	HB60	HB85	HB130
Permissible torque	2.7 N·m	2.7 N·m	12.8 N·m
Gear ratio	1:5	1:5	1:5
Repeatability	$\pm 30(0.0083^\circ)$ arcsec	$\pm 30(0.0083^\circ)$ arcsec	$\pm 30(0.0083^\circ)$ arcsec
Motor Size	42mm [NEMA17]	56mm [NEMA23]	60mm [NEMA24]


**Ezi-Robo® PMS**  
 Precise Positioning Actuator System



Ezi-Robo PMS series which is an unit product by combined Ezi-SERVO series which is optimal product to drive alignment stage on PC environment with high precision KOHZU stage which enables to high precise positioning, is an ultra-thin stage product which is designed to realize ultra-precise alignment in the minimum space with 1-axis, 2-axis integrated type, rotary axis, goniometer and 3-axis integrated structure. It provides Motion Library(DLL) and GUI program for Windows 7/8/10 for PC users and support Position Table function to maximize user convenience. and ultimately it does not need to use motion board so it can be realized overall cost reduction by simplified network wiring.


**Ezi-Robo® CLA**  
 Precise Positioning Actuator System

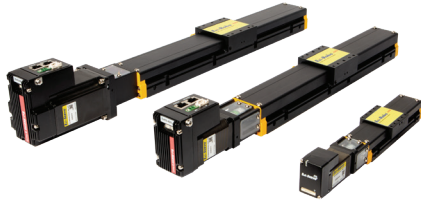

- Compact Linear Ball Screw Actuator with Hollow Shaft Motor
- Space Saving and Reducing Installation time
- Various Field Networks Supported such as EtherCAT, Ethernet, CC-Link, Pulse Input
- High Resolution Encoder (Max. 20,000P/R)
- Size Line-up (□20mm, □28mm, □42mm, □56mm)


**Ezi-Robo® VLR**  
 Precise Positioning Actuator System


- Vacuum(V) + Linear(L) + Rotary(R) Actuator
- Hollow Shaft Motor + Miniature Ball Screw with Ball Spline
- Space Saving with Super Slim body
- No wear powder from Belt & Pulley with Direct structure
- Various Field Networks Supported (EtherCAT, Ethernet, CC-Link, etc.)
- High Resolution Encoder (Max. 20,000P/R)


**Ezi-Robo® SMS**  
 Precise Positioning Actuator System


- Steel Mono Stage with Integrated Drive
- Linear Guide units on both side faces (Compact)
- Integrated Drive (Motor + Encoder + Drive + Motion Controller)
- Various Field Network Supported such as EtherCAT, Ethernet
- High Resolution Encoder (Max. 20,000P/R)
- Size Line-up (SMS15: 30x15mm, SMS23: 50.5x23mm, SMS30: 60.5x30mm)



- Aluminum Mono Stage with Integrated Drive
- Linear Guide units on both side faces (Compact)
- Integrated Drive (Motor + Encoder + Drive + Motion Controller)
- Various Field Networks Supported such as EtherCAT, Ethernet
- High Resolution Encoder (Max. 20,000P/R)
- Size Line-up (AMS30 : 37x29mm, AMS40 : 42x38mm, AMS50 : 52x45mm, AMS60 : 60x45mm)

# Ezi-STEP<sup>®</sup>

## Micro Stepping System

### Ezi-STEP Characteristics

Ezi-STEP is an all in one unit incorporating the stepper drive into the motor housing. This helps eliminate wiring, ensures reliability and provides a low cost compact package. FASTECH's unique integrated software provides sensor-less detection of the loss of step synchronization, dampening that provides smooth motion and no vibration at the low speed range.

HIGH Speed and precision are ensured by the high performance onboard MCU (Micro Controller Unit) and proprietary algorithms constantly monitoring the motor's performance and making corrections.

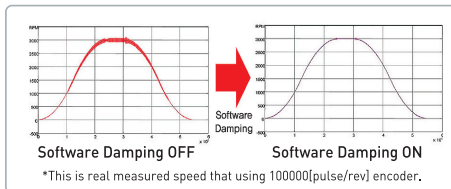
The MCU even detects missed steps during high speed operation (over 300 [r/min]) and built in damping provides smooth operation at low speeds. The resolution of the Ezi-STEP can be adjusted from 1.8 ° motor step angle to 0.0072 ° step angle for super precision. Ezi-STEP also generates alarms and running signals to monitor its operation remotely.

### Microstep and Filtering

Ezi-STEP features a High Precision Microstep function and Filtering. (Patent pending)

The high-performance Digital Signal Processor (MCU) and proprietary algorithms improves the basic motor resolution of 1.8 ° up to maximum 0.0072 ° (1/250 steps). Ezi-STEP adjusts the PWM control signal in every 25µ sec, unlike conventional drivers, which makes it possible for more precise current control and provides high-precision microstep operation.

### Software Damping



Vibration suP/Ression and High-speed operation (Patent pending)

Motor vibration is created by magnetic flux variations of the motor, lower current from the drive due to back-EMF from the motor at high speeds and lowering of phase voltages from the drive. Ezi-STEP drive detects these problems and the MCU adjusts the phase of the current according to the pole position of the motor, drastically suP/Ressing vibration. This allows the smooth operation of the motor at high speeds.

### Signal Output for Motion Monitoring

Ezi-STEP provides loss of step, run/stop, over-current, over-heat, over-voltage, power and motor connection alarms that can be monitored by the controller and visible by a motor-mounted flashing LED indicator.

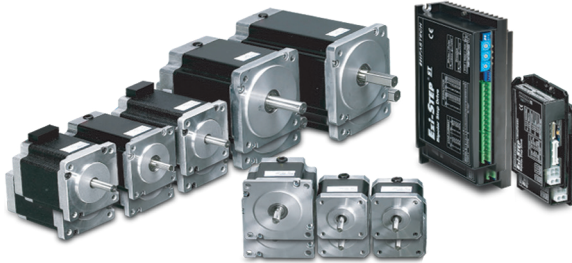
### Improved High-speed Operation Performance

Depending on the speed of the stepping motor, Ezi-STEP automatically increases the supply voltage and prevents torque lowering due to low operating voltage to the motor caused by back-EMF voltage, this enables high-speed operation.

Additionally, the software damping algorithm minimizes the vibration and prevents the loss-of-synchronization at high-speed.

 **Ezi-STEP<sup>®</sup> ST**  
Micro Stepping System

CE



For high Speed and high precision drive of stepping motors, Ezi-STEP ST is unique drive that adopts a new control scheme due to an on-board high performance MCU (Micro Controller Unit) and software.

- Microstepping
- Software Damping
- High Torque
- Run/Stop Signal Output

 **Ezi-STEP<sup>®</sup> MINI**  
Micro Stepping System

CE



Completion of MINI Series For high speed and high precision drive of stepping motors, Ezi-STEP MINI is a unique drive that adopts a new control scheme due to an on-board high performance MCU (Micro Controller Unit) and software.

- Microstepping
- Space Saving / Reduced Wiring by Compact Drive
- Software Damping
- Run/Stop Signal Output

 **Ezi-STEP<sup>®</sup> Plus-R**  
Micro Stepping System

CE



Innovative, open loop stepping motor and motion control system which is suitable for low cost applications. A maximum of 16 axis can be operated from a PC through RS-485 communication and it can be connected to Ezi-SERVO Plus-R as well. All of the motion conditions are set through the network and are saved in FLASH ROM as a parameter. The Motion Library(DLL) is provided for programming in Windows XP/7/8/10. A maximum of 256 positions can be saved in FLASH ROM memory.

- Embedded Motion Controller
- RS-485 Interface
- Position Table
- Microstepping
- Software Damping
- Run/Stop Signal Output

 **Ezi-STEP<sup>®</sup> Plus-R MINI**  
Micro Stepping System

CE



A maximum of 16 axis can be operated from a PC through RS-485 communications. All of the Motion conditions are set through the network and saved in FLASH ROM as a parameter. Motion Library(DLL) is provided for programming in Windows XP/7/8/10.

- Embedded Motion Controller
- RS-485 Interface
- Space Saving / Reduced Wiring by Compact Drive
- Position Table
- Microstepping
- Software Damping
- Run/Stop Signal Output





**Ezi-STEP<sup>®</sup> BT**  
Micro Stepping System

CE



High Speed, high precision drive and stepping motor integrated into one package, Ezi-STEP is unique as it adopts a new control scheme based on a built in high performance MCU (Micro Controller Unit) and software.

- Microstepping
- Space Saving / Reduced Wiring
- Software Damping
- Run/Stop Signal Output



**Ezi-STEP<sup>®</sup> ALL**  
Micro Stepping System

CE



High Speed precision microstep drive, controller and stepping motor integrated into one robust package, Ezi-STEP ALL is unique due to its new control scheme based on a built in high performance MCU (Micro Controller Unit) and software. The onboard controller eliminates costly support systems and can easily digitally network up to 16 axis together to a host controller or operate stand alone.

- Motor + Drive + Motion Controller + Network
- Space Saving / Reduced Wiring
- Embedded Motion Controller
- RS-485 Interface
- Microstepping
- Software Damping
- Run/Stop Signal Output



**Ezi-STEP<sup>®</sup> II EtherCAT<sup>™</sup>**  
Micro Stepping System Conformance tested

CE



Ezi-STEP II EtherCAT is a high-precision microstepping motor control system that supports EtherCAT, an Ethernet-based fieldbus.

- CiA402 Drive Profile Support
- Microstepping
- Software Damping
- High Torque



**Ezi-STEP<sup>®</sup> II EtherCAT<sup>™</sup>**  
Micro Stepping System **MINI**

CE

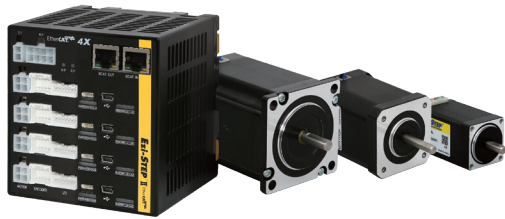


Ezi-STEP II EtherCAT MINI is a high-precision microstepping motor control system with the compact design, combined with Ethernet-based fieldbus 'EtherCAT'. Ezi-SERVOII EtherCAT MINI supports CiA 402 Drive Profile.

- CiA402 Drive Profile Support
- Microstepping
- Software Damping
- Space Saving / Reduced Wiring by Compact Drive



 **Ezi-STEP® II EtherCAT™**  
Micro Stepping System **4X**



Ezi-STEP II EtherCAT is a high-precision microstepping motor control system that supports EtherCAT, an Ethernet-based fieldbus.

- CiA402 Drive Profile Support
- Microstepping
- Software Damping
- Compact Multi Axis Stepping Motor Drive
- Space Saving / Reduced Wiring

 **Ezi-STEP® II Plus-E**  
Micro Stepping System



The Ezi-STEP II Plus-E series is a product that combines with high-precision microstepping motor control system and PC/PLC's standard Ethernet communication network. Ezi-STEP II Plus-E products are providing a single network solution which can control the FASTECH's step motor systems, industrial servo motor systems such as Mitsubishi, Yaskawa, Panasonic and I/O in one system. It is no need to use a motion board, it can reduce the system cost due to reduce the wiring by Daisy-chain connection each drives. It is a multi-axis control system to connect up to 254 axis to 1 Ethernet port for control. Especially, it provides Motion Library and GUI for windows 7/8/10 for PC users. This is a user-friendly product which is maximizing the user convenience.

- Embedded Controller
- Ethernet Interface
- Position Table
- Microstepping
- Software Damping
- High Torque

 **Ezi-STEP® II Plus-E**  
Micro Stepping System **MINI**



Ezi-SERVO II Plus-E MINI is a high-precision microstepping motor control system with the compact design, combined with the PC/PLC standard Ethernet network. It is a multi-axis control system that can control up to 254 axis connected to one Ethernet port. Motion Library (DLL) and Graphic User Interface for windows 7/8/10 are provided free of charge.

- Embedded Controller
- Ethernet Interface
- Position Table
- Microstepping
- Software Damping
- Space Saving / Reduced Wiring by Compact Drive

 **Ezi-STEP® II CC-Link**  
Micro Stepping System



Ezi-STEP II CC-Link is combination package between high-precision microstepping motor control system and high-speed Fieldbus CC-Link network. This product is a remote device module that supports CC-Link network. It can control multi-function by occupying 1 and 2 station, and processing motion and monitoring functions by device command.

- Embedded Motion Controller
- CC-Link Interface
- Microstepping
- Software Damping
- High Torque

# OPTION

## Brake



FASTECH's Brake unit product maximizes User's operational convenience with integration between stepping motor of Ezi-SERVO series and non-excitation electromagnetic brake which has big braking friction torque and rapid brake timing.

- Apply non-excitation electromagnetic brake
- Automatic Braking during power cutoff or blackout
- Long Durability
- Rapid Brake Timing

Name of Product	Motor Brake Size			
	42mm	56mm	60mm	86mm
Ezi-SERVO ST / Plus-R				
Ezi-SERVO MINI / Plus-R MINI				
Ezi-SERVO II EtherCAT / Plus-E				
Ezi-SERVO II EtherCAT MINI				
Ezi-SERVO II EtherCAT 4X				
Ezi-SERVO II EtherCAT ALL				
Ezi-SERVO II Plus-E MINI				
Ezi-SERVO II Plus-E ALL				
Ezi-SERVO II CC-Link				
Ezi-SERVO II BT				
Ezi-SERVO ALL				
S-SERVO II ST / 2X / 3X				
S-SERVO II MINI				
Ezi-STEP ST / Plus-R				
Ezi-STEP MINI / Plus-R MINI				
Ezi-STEP BT				
Ezi-STEP ALL				
Ezi-STEP II EtherCAT				
Ezi-STEP II EtherCAT MINI				
Ezi-STEP II EtherCAT 4X				
Ezi-STEP II Plus-E				
Ezi-STEP II Plus-E MINI				
Ezi-STEP II CC-Link				



# Ezi-SPEED®

BLDC Motor Speed Control System



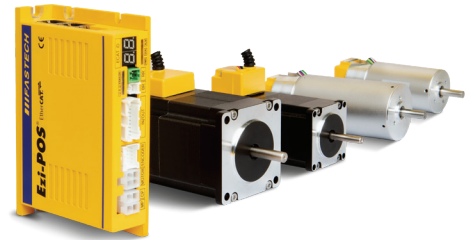
- AC Input (220V) BLDC Motor Speed Control System
- Compact·Light Weight·High Power·High Efficiency Brushless Motor
- Wide Speed Control Range (50~4000r/min)
- Stable Speed Control by Vector Control (Speed Regulation within 0.2%)
- Easy Connection, Easy Operation
- Various Product Line-Up (30, 60, 120, 200, 400W)



- AC Input (220V) BLDC Motor Speed Control System
- RS-485 Modbus-RTU based BLDC Motor & Drive
- Compact·Light Weight·High Power·High Efficiency Brushless Motor
- Wide Speed Control Range (50~4000r/min)
- Stable Speed Control by Vector Control (Speed Regulation within 0.2%)
- Torque Limit and Load Holding Function
- Various Product Line-Up (30, 60, 120, 200, 400W)

# Ezi-POS<sup>®</sup>

BLDC Motor Positioning System

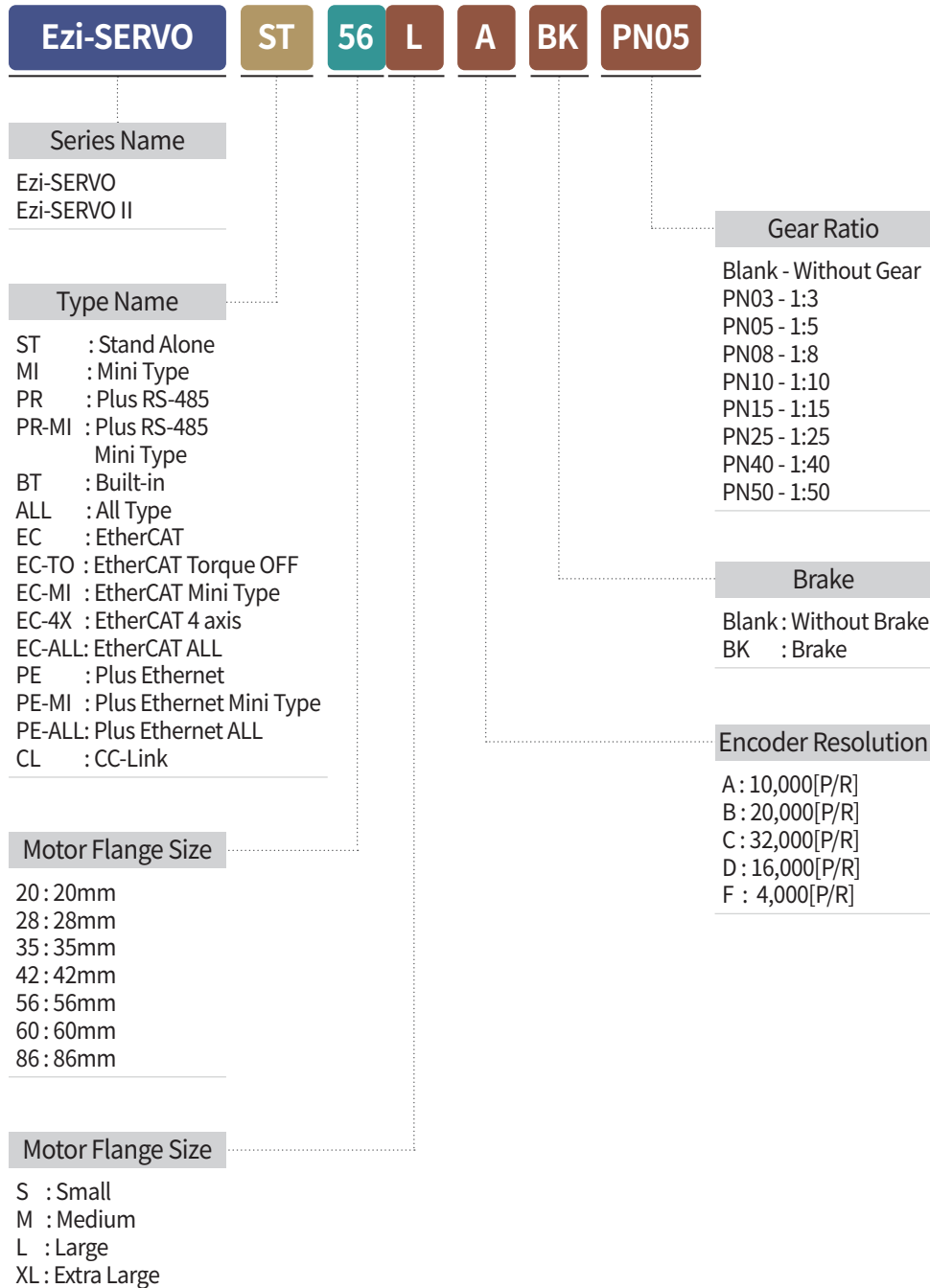


- EtherCAT based BLDC Motor & Drive
- DC Power Supply Input
- CiA402 Drive Profile Support
- Auto-tuning
- Various Motor & Position Sensor Options

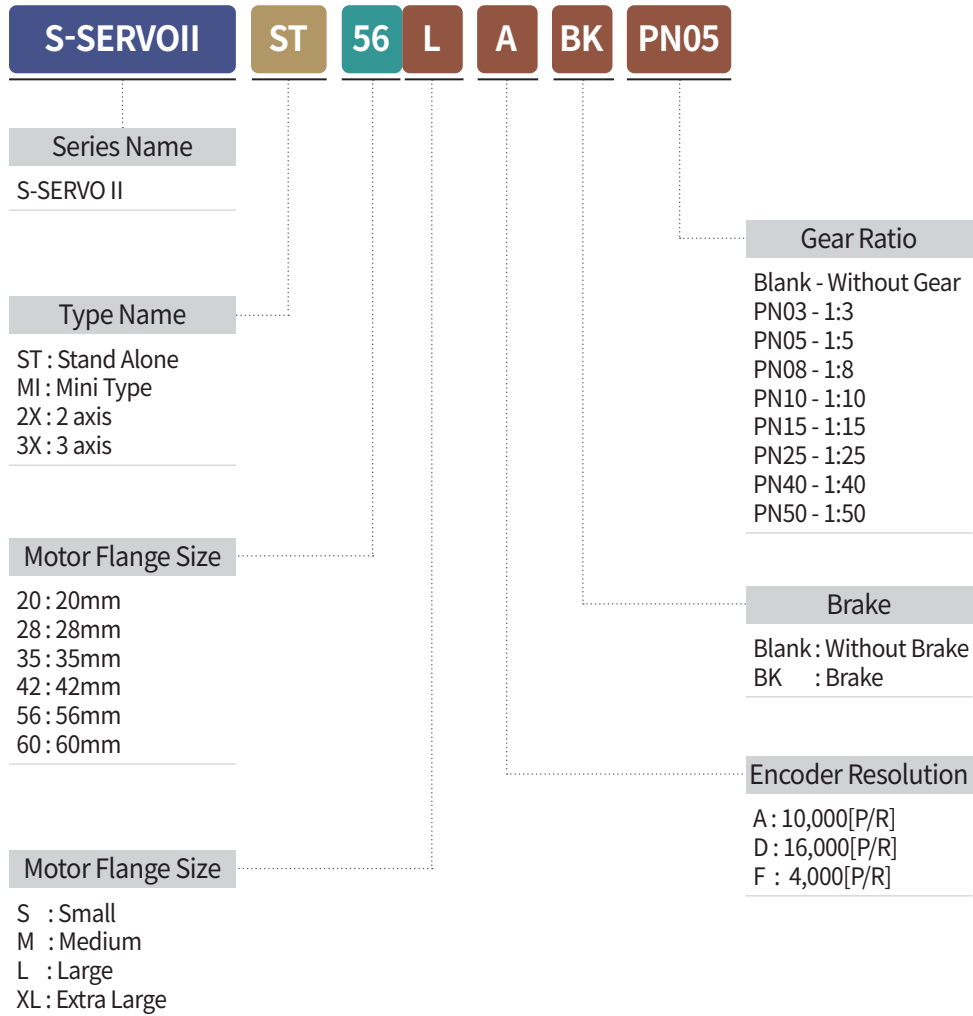
# PART NUMBERING



## Ezi-SERVO series



## S-SERVOII series







### Ezi-STEP series



**Series Name**  
 Ezi-STEP  
 Ezi-STEP II

**Type Name**  
 MPB : Mini Power  
 HPB : High Power  
 MI : Mini Type  
 PR : Plus RS-485  
 PR-MI : Plus RS-485 Mini Type  
 BT : Built In  
 ALL : All Type  
 EC : EtherCAT  
 EC-MI : EtherCAT Mini Type  
 EC-4X : EtherCAT 4 axis  
 PE : Plus Ethernet  
 PE-MI : Plus Ethernet Mini Type  
 CL : CC-Link

**Motor Flange Size**  
 20 : 20mm  
 28 : 28mm  
 42 : 42mm  
 56 : 56mm  
 60 : 60mm  
 86 : 86mm

**Motor Flange Size**  
 S : Small  
 M : Medium  
 L : Large  
 XL : Extra Large

**Brake**  
 Blank : Without Brake  
 BK : Brake

## Ezi-IO MOTIONLINK series



Series Name

Type Name

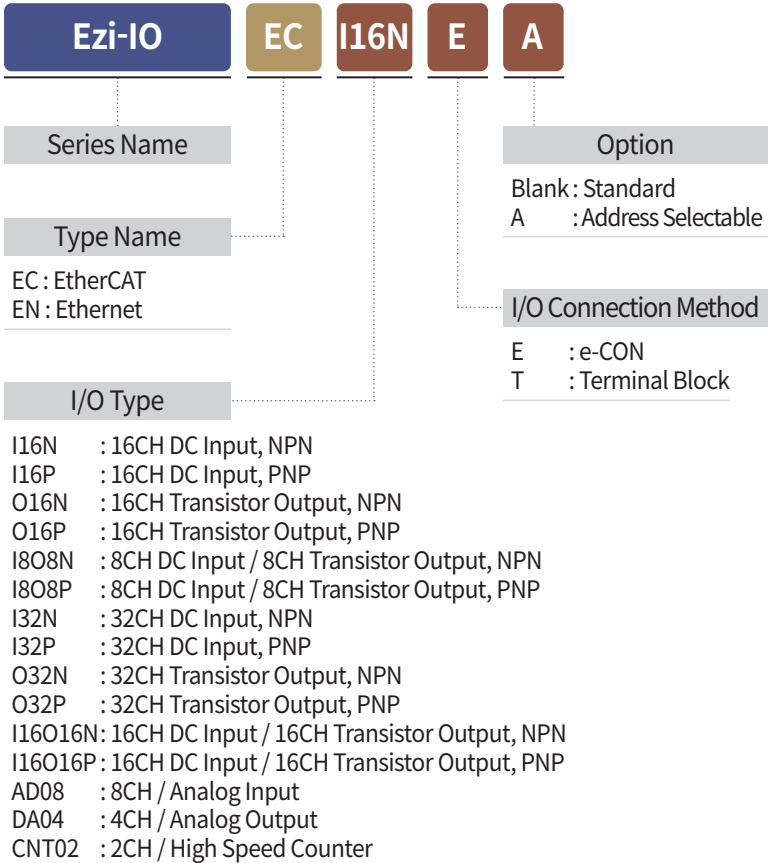
PE : Plus Ethernet  
PR : Plus RS-485

Drive Series

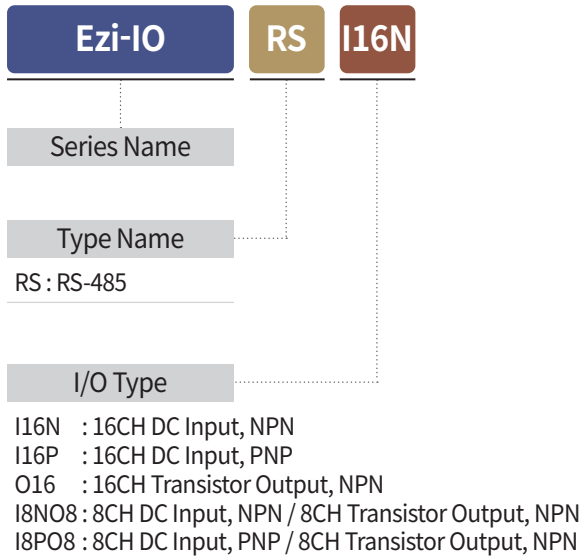
YAS : Yaskawa Sigma 2,3,5,7  
MIT : Mitsubishi MR-J3,J4,J5  
PAN : Panasonic Minus A,A3,A4,A5,A6  
SAN : Sanyo Denki  
NIS : Nidec-Sankyo  
RSA : RS Automation CSD7  
LSS : LS Mecapion L7S  
DEL : DELTA ASD-A2  
DEL A3 : DELTA ASD-A3



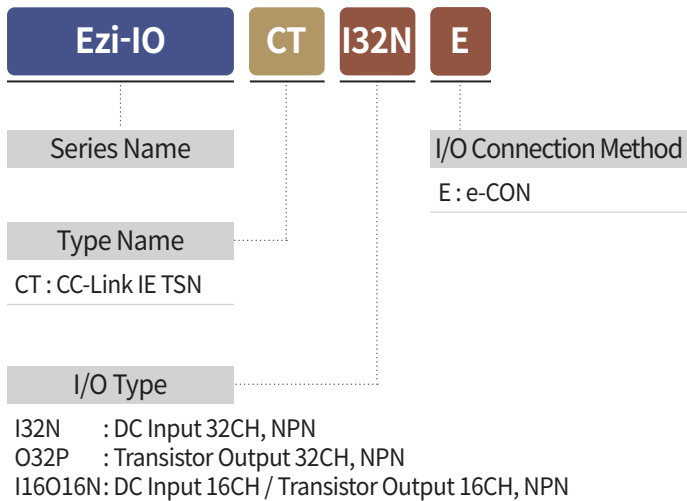
### Ezi-IO EtherCAT, Ethernet series



## Ezi-IO RS-485 series

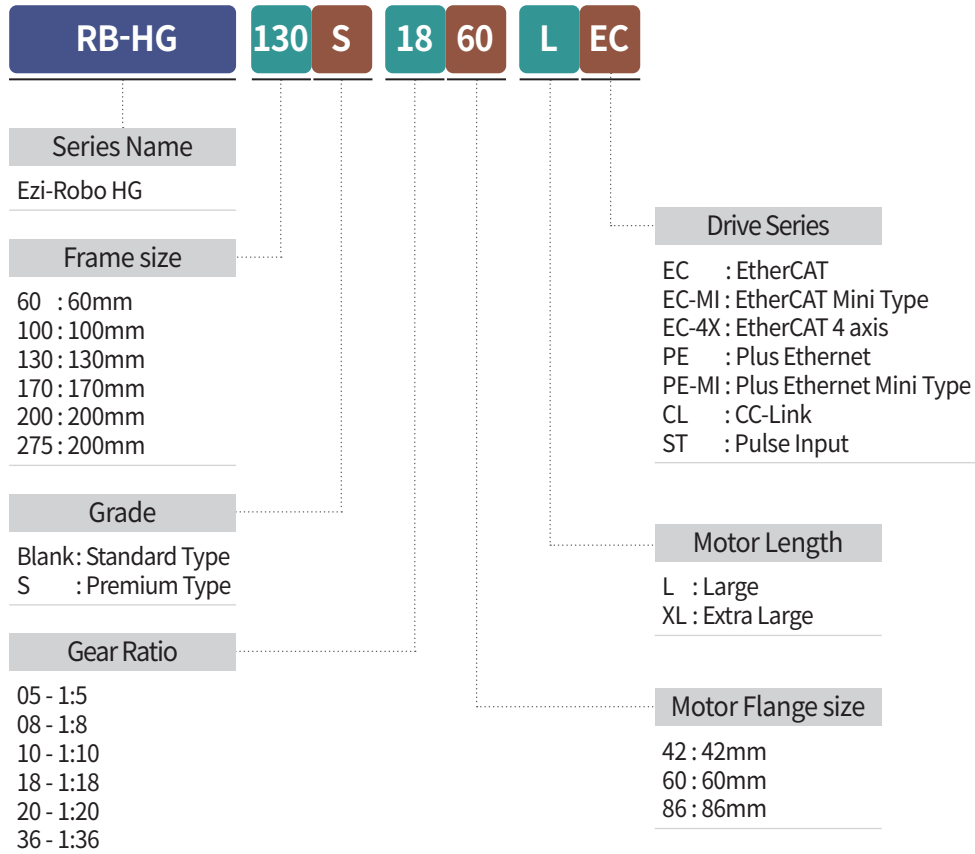


## Ezi-IO CC-Link IE TSN DIO series

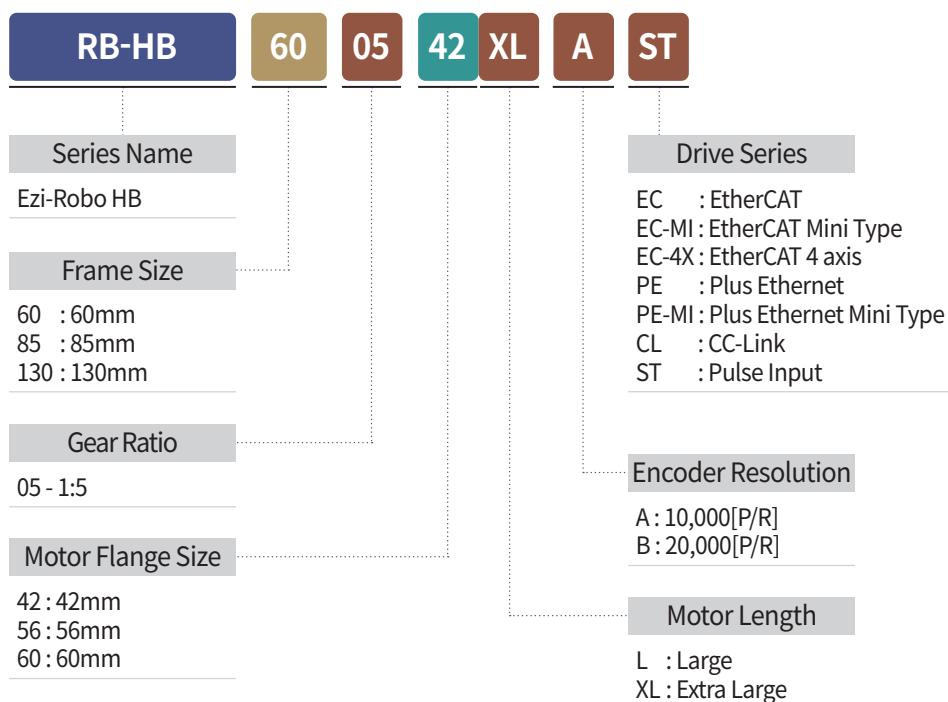




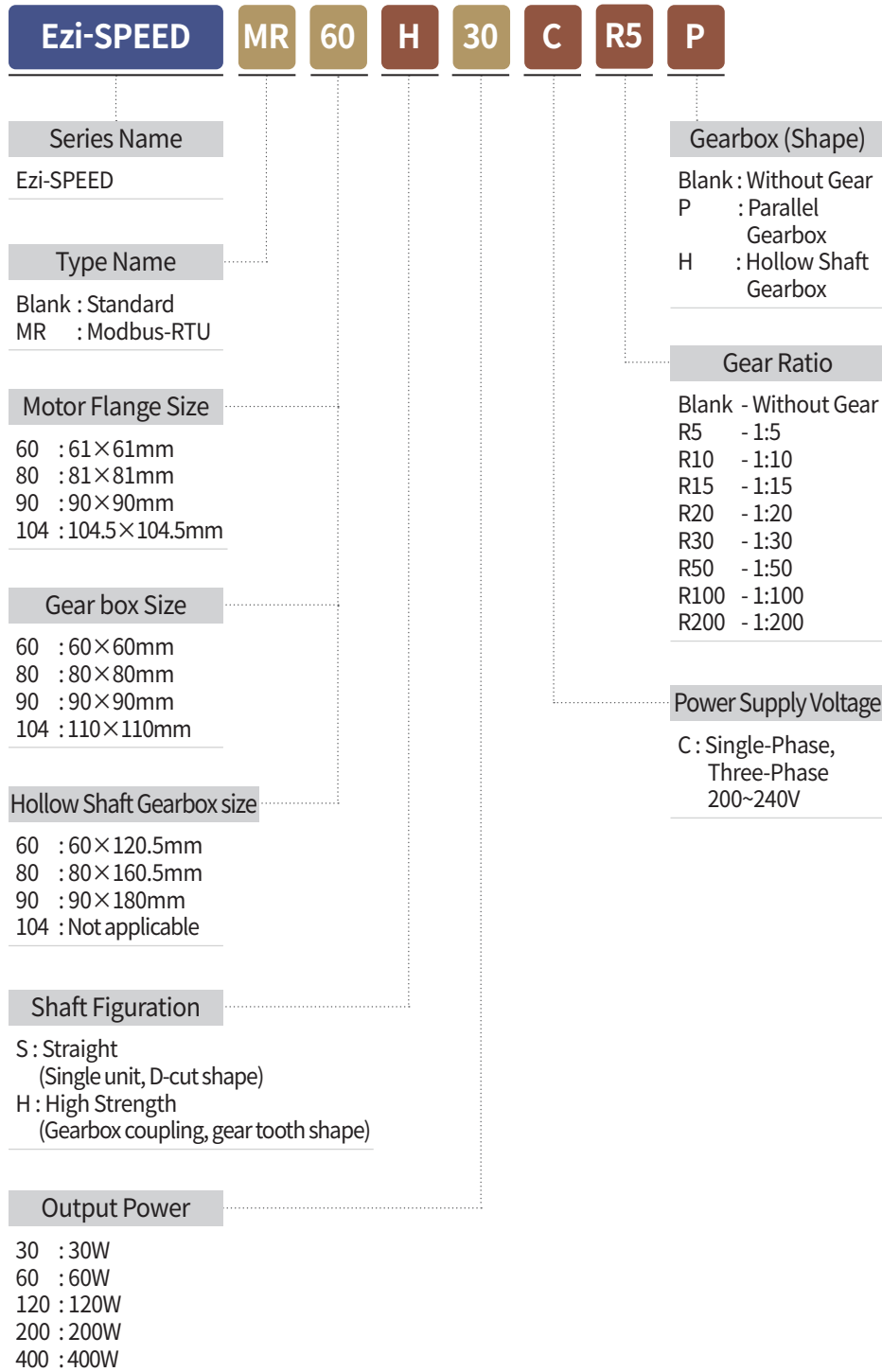
## Ezi-Robo HG series



## Ezi-Robo HB series



## Ezi-SPEED series



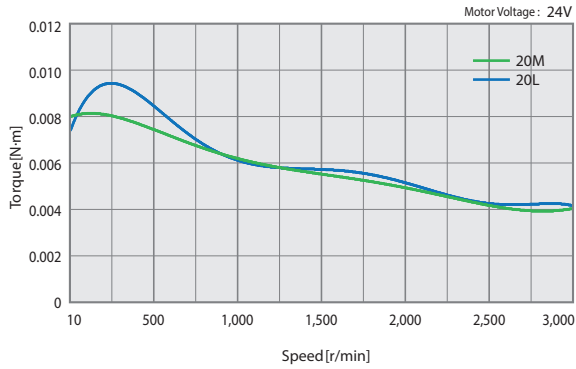


# TORQUE CHARACTERISTICS

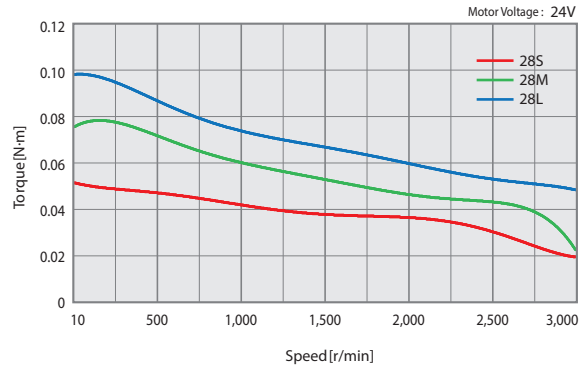


ST Plus-R EtherCAT TO Plus-E CC-Link

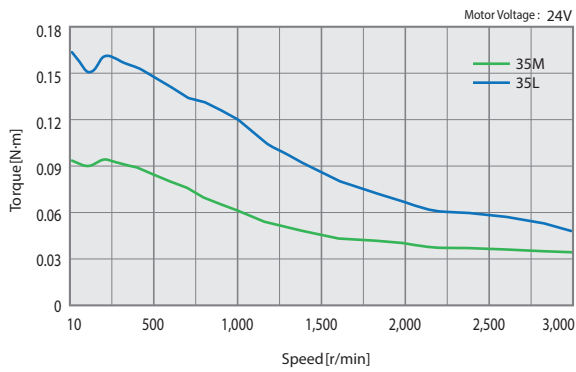
## 20 series



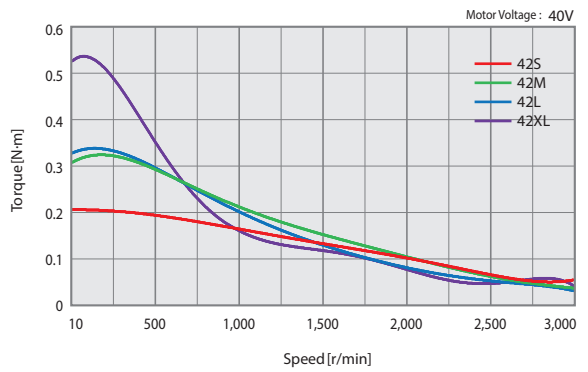
## 28 series



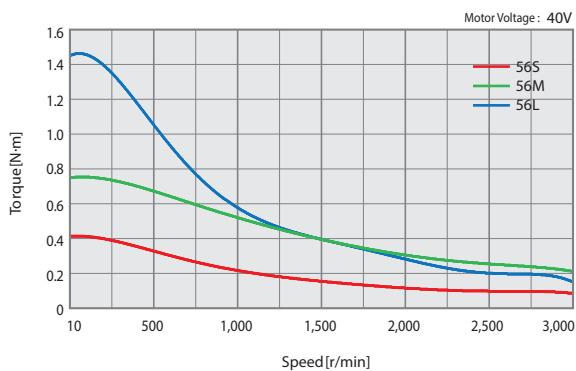
## 35 series



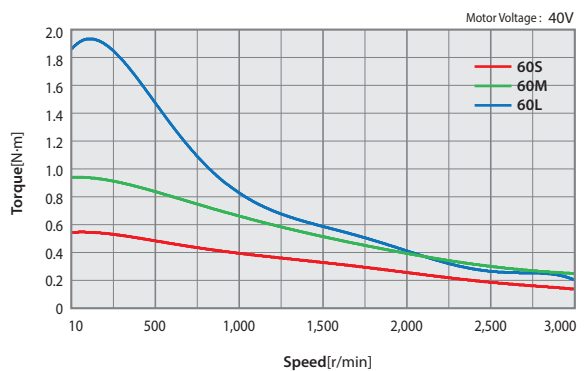
## 42 series



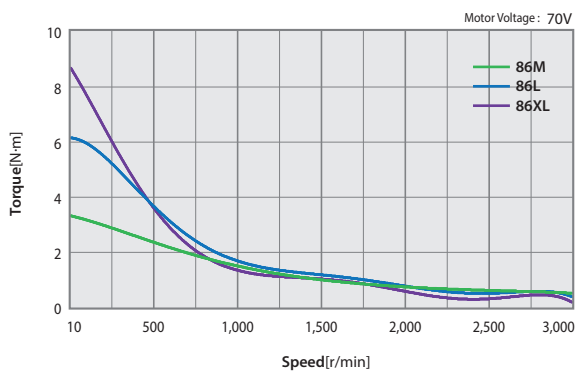
## 56 series



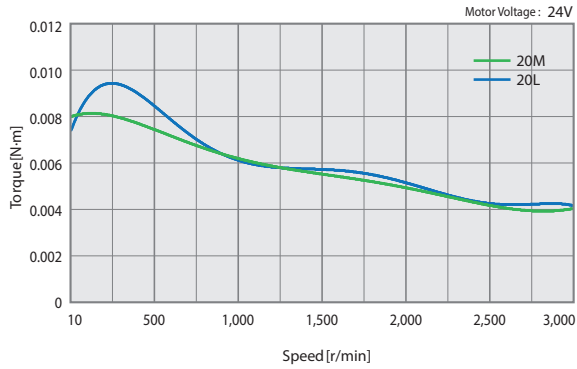
## 60 series



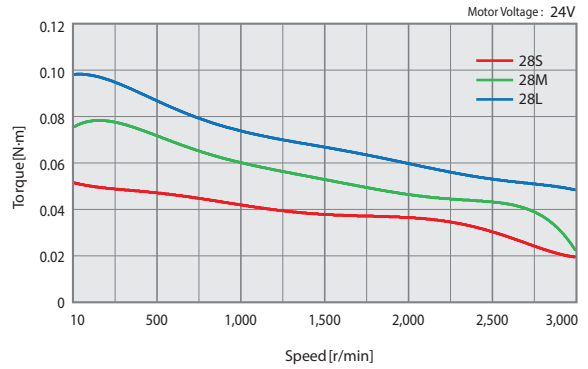
## 86 series



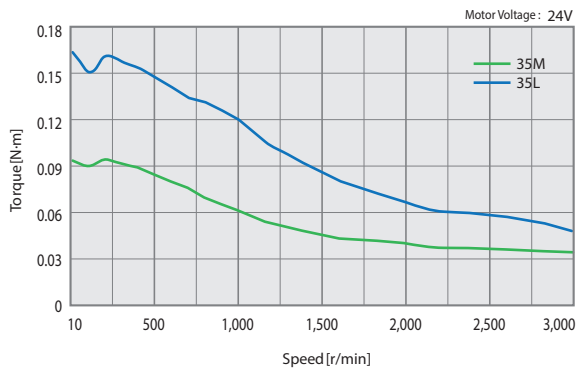
### 20 series



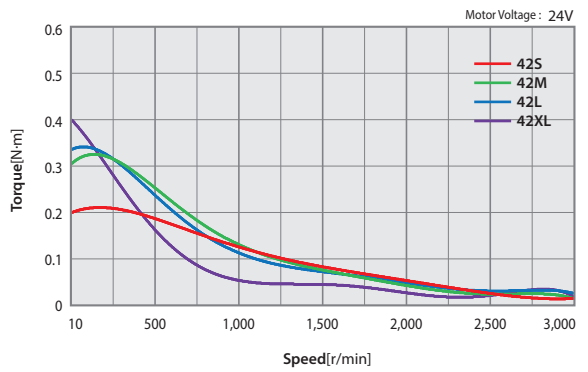
### 28 series



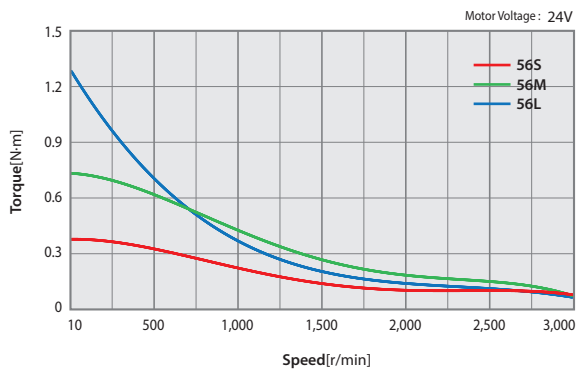
### 35 series



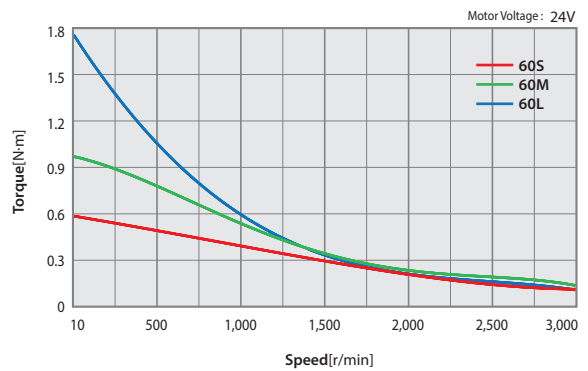
### 42 series



### 56 series



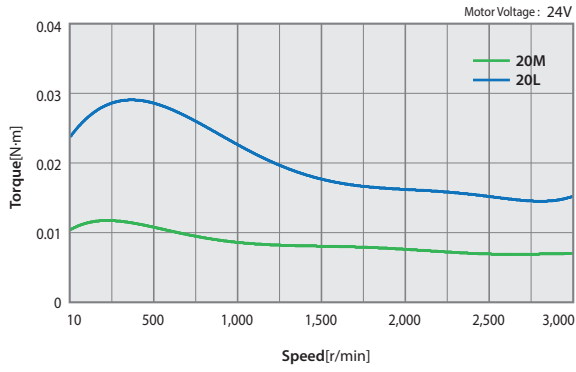
### 60 series



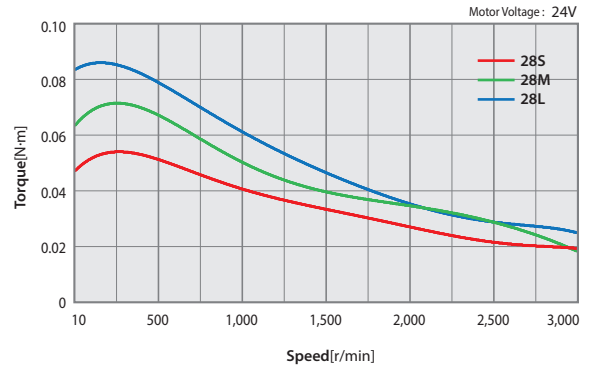


**ST MINI 2X 3X**

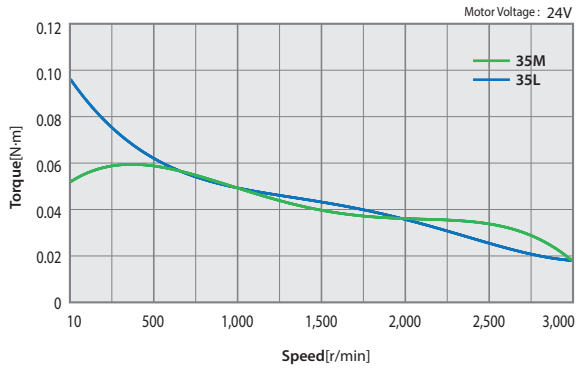
**20 series**



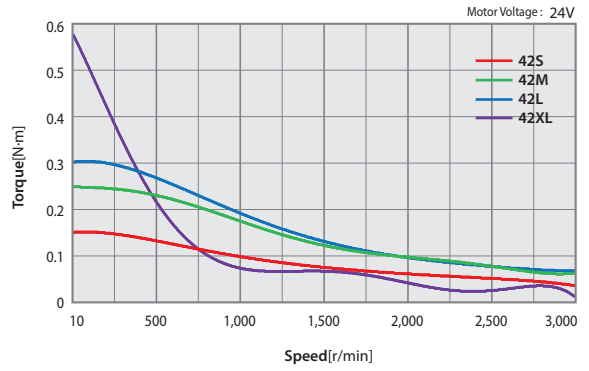
**28 series**



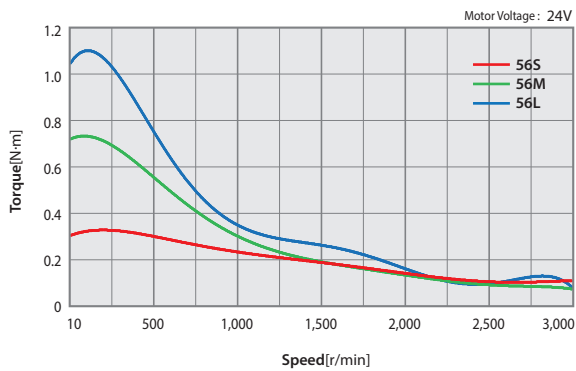
**35 series**



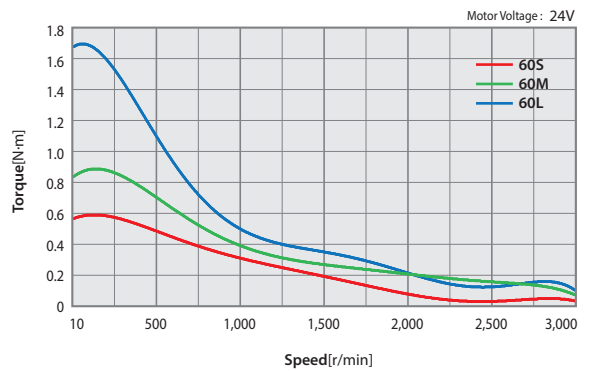
**42 series**



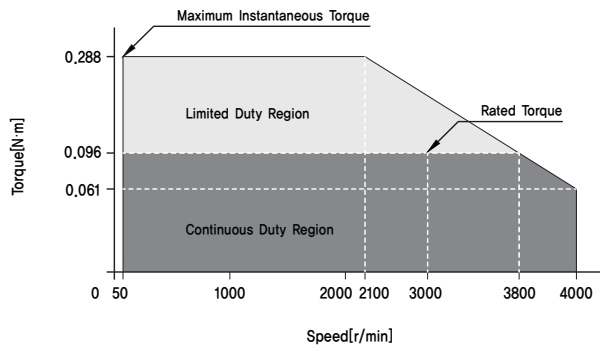
**56 series**



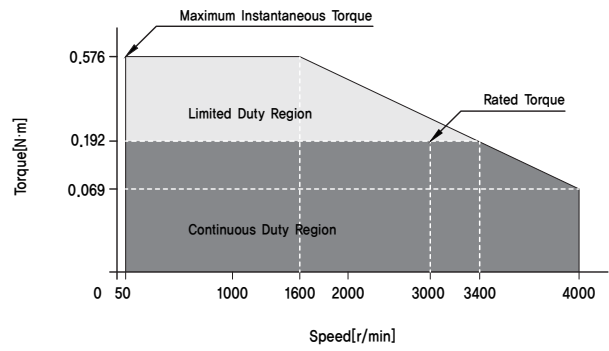
**60 series**



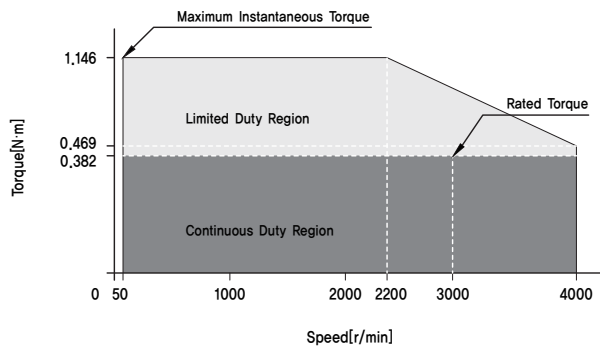
### Ezi-SPEED-30W



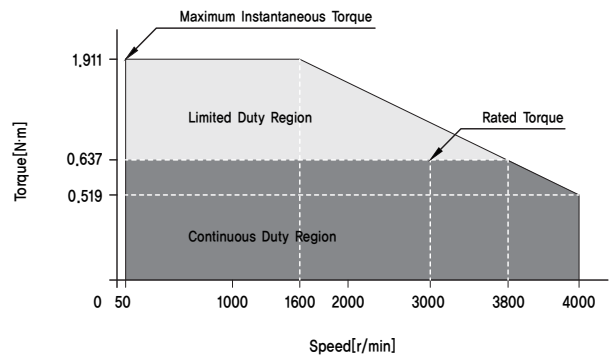
### Ezi-SPEED-60W



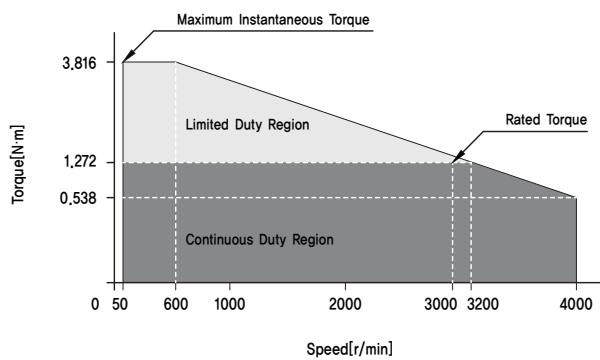
### Ezi-SPEED-120W



### Ezi-SPEED-200W



### Ezi-SPEED-400W



**MEMO**

A large, empty rectangular box with a yellow border, intended for writing a memo.

## *Global Network*



Motion Controller and Motor Drive as FASTECH's main products have been exported to 50 countries thru by entire 80 global distributors, FASTECH is achieving global business.

