

# Ezi-SERVO<sup>®</sup> II

## Closed Loop Stepping System

- CiA402 Drive Profile Support
- Closed Loop Stepping System
- No Gain Tuning / No Hunting
- Torque Improvement by Boost Current Control

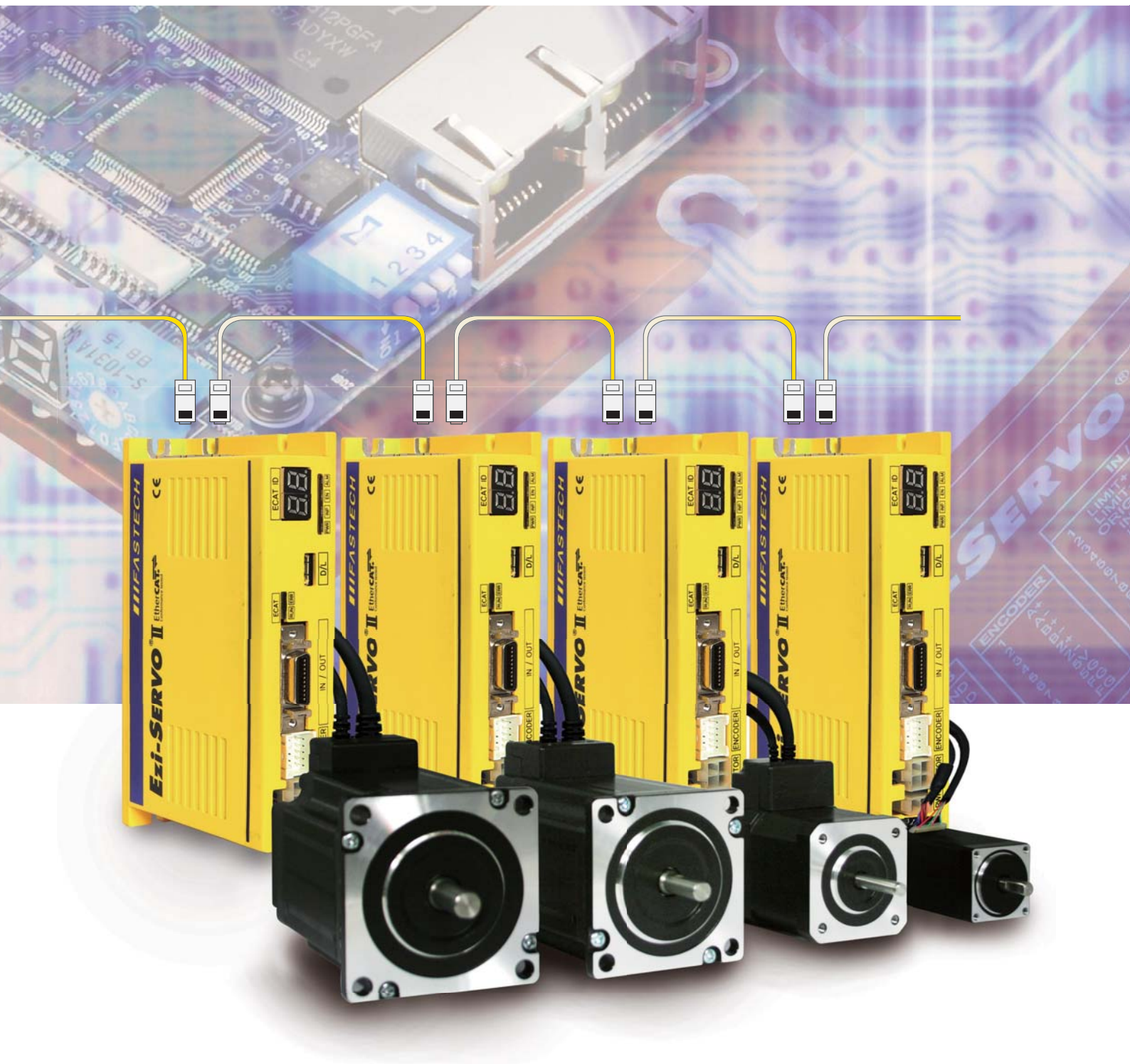
**EtherCAT<sup>®</sup>**   
Conformance tested



**CE** **RoHS**  
COMPLIANT

**FASTTECH**

*Fast, Accurate, Smooth Motion*



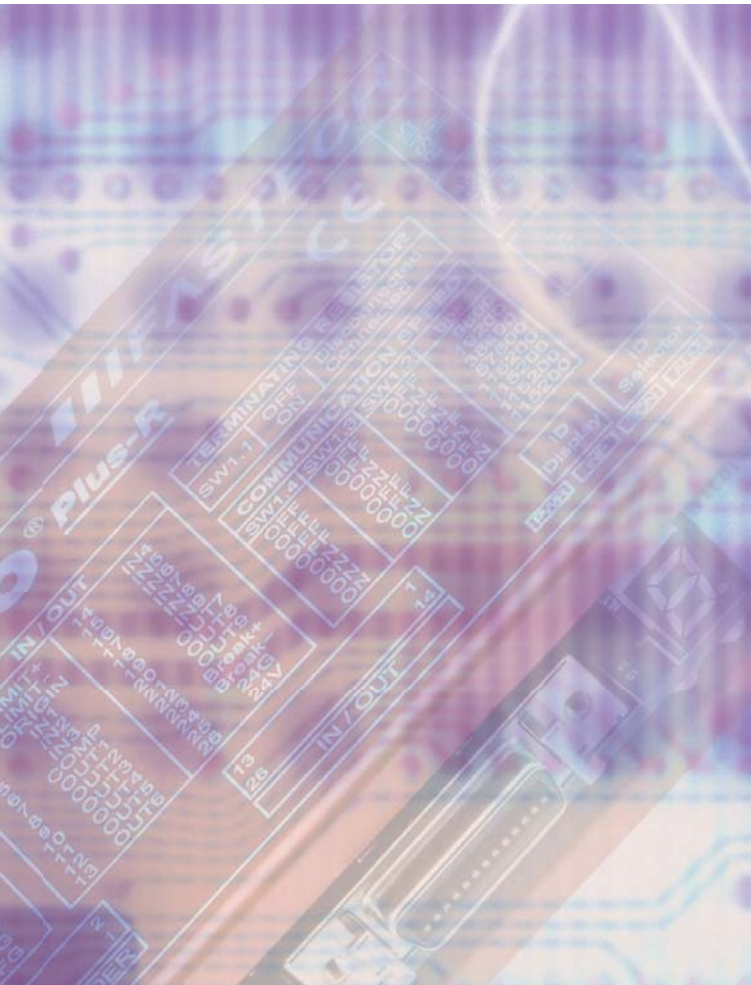
*Fast, Accurate, Smooth Motion*

# **Ezi-SERVO<sup>®</sup> II** EtherCAT<sup>®</sup>

**EtherCAT<sup>®</sup>**  
Conformance tested

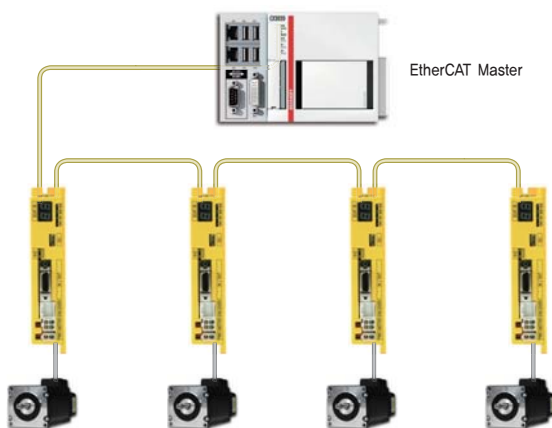
**Closed Loop Stepping System**





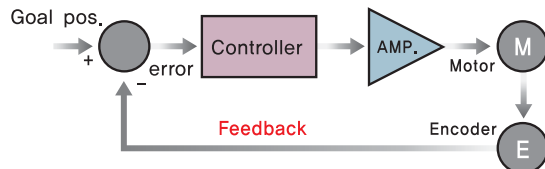
## 1 EtherCAT Based Motion Control

Ezi-SERVO II EtherCAT is stepping motor control system using EtherCAT, high speed ethernet (100Mbps full-duplex) based fieldbus. Ezi-SERVO II EtherCAT is EtherCAT slave module which support CAN application layer over EtherCAT (CoE). CiA402 Drive profile implemented. Supported modes are CSP Profile, Position Profile, Homing Profile.



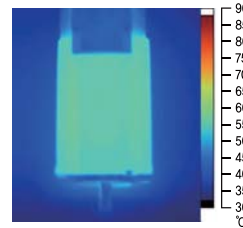
## 2 Closed Loop Stepping System

Ezi-SERVO II is an innovative closed loop stepping motor and controller that utilizes a high-resolution motor mounted encoder to constantly monitor the motor shaft position. The encoder feedback feature allows the Ezi-SERVO II to update the current motor shaft position information every 25 micro seconds. This allows the Ezi-SERVO II 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 creating a positioning error and a great deal of cost to the end user!

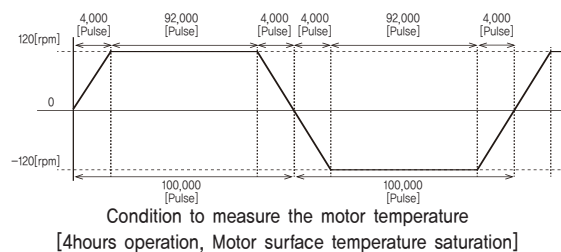


## 3 Current control according to load

Ezi-SERVO II automatically control the motor current according to loads. Thus, febricity of motor and drive are minimized so can save the energy as well.



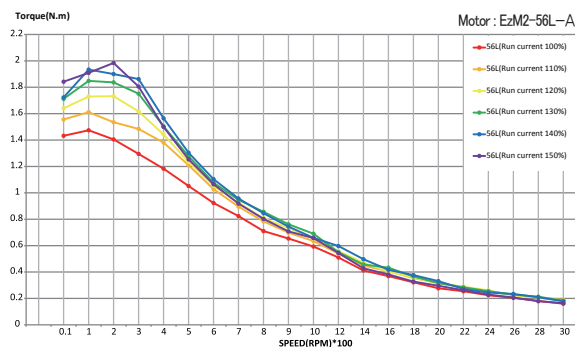
Motor temperature [measured by thermograph]



## 4 Boost Current / Run Current

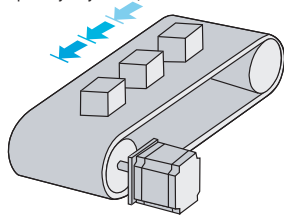
Accel / Decel characteristics can be improved by set the Boost Current Parameters. Torque can be improved when driving by set the Run Current Parameters.

[Example of the Torque Graph according to Run Current setting]



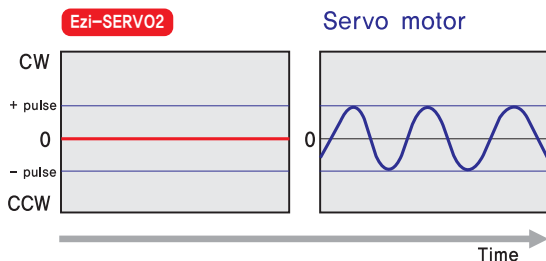
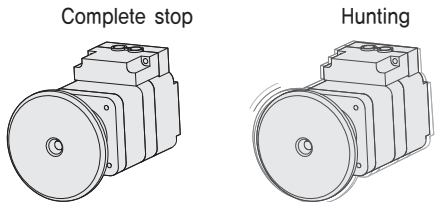
## 5 No Gain Tuning

Conventional servo systems, to ensure machine performance, smoothness, positional error and low servo noise, require the adjustment of its servo's gains as an initial crucial step. Even systems that employ auto-tuning require manual tweaking after the system is installed, especially if more than one axis are interdependent. Ezi-SERVO II employs the best characteristics of stepper and 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 II is optimized for the application and ready to work right out of the box! The Ezi-SERVO II 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 II is especially well suited for low stiffness loads (for example, a belt and pulley system) that some-time require conventional servo systems to inertia match with the added expense and bulk of a gearbox. Ezi-SERVO II also performs exceptionally, even under heavy loads and high speeds!



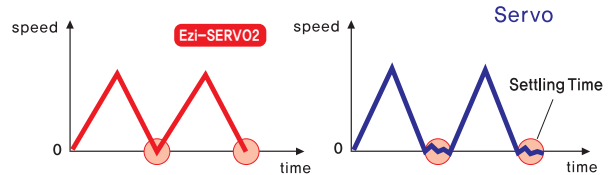
## 6 No Hunting

Traditional servo motor drives overshoot their position and try to correct by overshooting 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 II Motion Control System! Ezi-SERVO II 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.



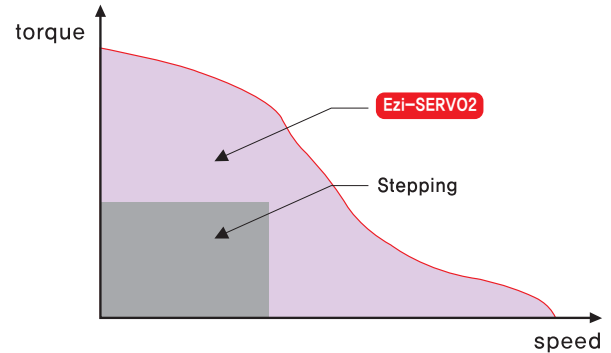
## 7 Fast Response

Similar to conventional stepping motors, Ezi-SERVO II instantly synchronizes with command pulses providing fast positional response. Ezi-SERVO II 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 between the commanding input signals and the resultant motion because of the constant monitoring of the current position, necessitating in a waiting time until it settles, called settling time.



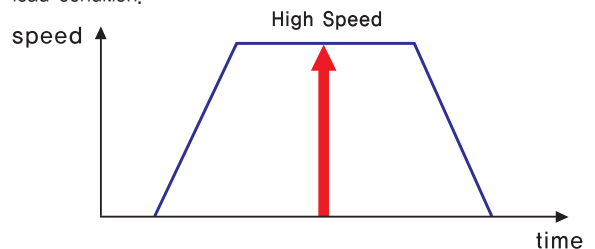
## 8 High Torque

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



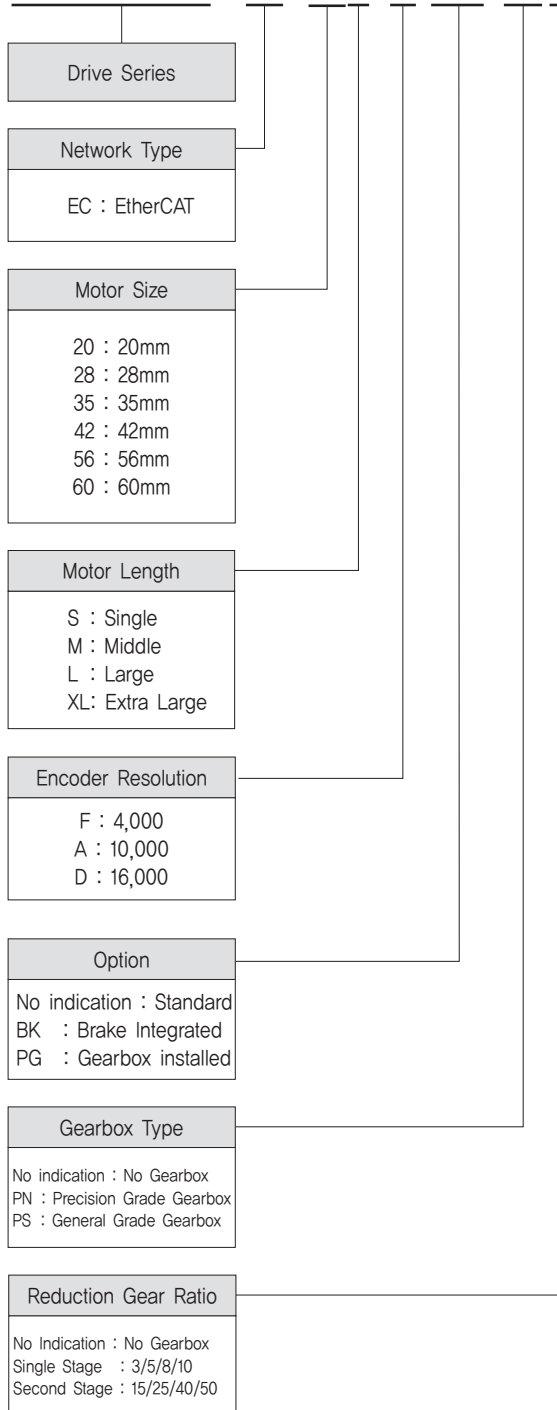
## 9 High Speed

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



## ● Ezi-SERVO II EtherCAT Part Numbering

### Ezi-SERVO II -EC-42S-A-PG-PN10



## ● Standard Motor, Drive Combination

### ◆ Ezi-SERVO II EtherCAT Drive Products

| Package Part Number     | Motor Part Number | Drive Part Number |
|-------------------------|-------------------|-------------------|
| Ezi-SERVO II -EC-20M-A  | EzM2-20M-A        | EzS2-EC-20M       |
| Ezi-SERVO II -EC-20L-A  | EzM2-20L-A        | EzS2-EC-20L       |
| Ezi-SERVO II -EC-28S-A  | EzM2-28S-A        | EzS2-EC-28S       |
| Ezi-SERVO II -EC-28M-A  | EzM2-28M-A        | EzS2-EC-28M       |
| Ezi-SERVO II -EC-28L-A  | EzM2-28L-A        | EzS2-EC-28L       |
| Ezi-SERVO II -EC-35S-D  | EzM2-35S-D        | EzS2-EC-35S       |
| Ezi-SERVO II -EC-35M-D  | EzM2-35M-D        | EzS2-EC-35M       |
| Ezi-SERVO II -EC-35L-D  | EzM2-35L-D        | EzS2-EC-35L       |
| Ezi-SERVO II -EC-35XL-D | EzM2-35XL-D       | EzS2-EC-35XL      |
| Ezi-SERVO II -EC-42S-A  | EzM2-42S-A        | EzS2-EC-42S       |
| Ezi-SERVO II -EC-42M-A  | EzM2-42M-A        | EzS2-EC-42M       |
| Ezi-SERVO II -EC-42L-A  | EzM2-42L-A        | EzS2-EC-42L       |
| Ezi-SERVO II -EC-42XL-A | EzM2-42XL-A       | EzS2-EC-42XL      |
| Ezi-SERVO II -EC-56S-A  | EzM2-56S-A        | EzS2-EC-56S       |
| Ezi-SERVO II -EC-56M-A  | EzM2-56M-A        | EzS2-EC-56M       |
| Ezi-SERVO II -EC-56L-A  | EzM2-56L-A        | EzS2-EC-56L       |
| Ezi-SERVO II -EC-60S-A  | EzM2-60S-A        | EzS2-EC-60S       |
| Ezi-SERVO II -EC-60M-A  | EzM2-60M-A        | EzS2-EC-60M       |
| Ezi-SERVO II -EC-60L-A  | EzM2-60L-A        | EzS2-EC-60L       |

## ● Brake Integrated Motor, Drive Combination

### ◆ Ezi-SERVO II EtherCAT Drive Products

| Package Part Number        | Motor Part Number | Drive Part Number |
|----------------------------|-------------------|-------------------|
| Ezi-SERVO II -EC-42S-A-BK  | EzM2-42S-A-BK     | EzS2-EC-42S-BK    |
| Ezi-SERVO II -EC-42M-A-BK  | EzM2-42M-A-BK     | EzS2-EC-42M-BK    |
| Ezi-SERVO II -EC-42L-A-BK  | EzM2-42L-A-BK     | EzS2-EC-42L-BK    |
| Ezi-SERVO II -EC-42XL-A-BK | EzM2-42XL-A-BK    | EzS2-EC-42XL-BK   |
| Ezi-SERVO II -EC-56S-A-BK  | EzM2-56S-A-BK     | EzS2-EC-56S-BK    |
| Ezi-SERVO II -EC-56M-A-BK  | EzM2-56M-A-BK     | EzS2-EC-56M-BK    |
| Ezi-SERVO II -EC-56L-A-BK  | EzM2-56L-A-BK     | EzS2-EC-56L-BK    |
| Ezi-SERVO II -EC-60S-A-BK  | EzM2-60S-A-BK     | EzS2-EC-60S-BK    |
| Ezi-SERVO II -EC-60M-A-BK  | EzM2-60M-A-BK     | EzS2-EC-60M-BK    |
| Ezi-SERVO II -EC-60L-A-BK  | EzM2-60L-A-BK     | EzS2-EC-60L-BK    |

# ● Gearbox Integrated Motor, Drive Combination

## ◆ Ezi-SERVO II EtherCAT Drive Products

| Package Part Number            | Motor Part Number   | Drive Part Number | Reduction gear ratio |     |
|--------------------------------|---------------------|-------------------|----------------------|-----|
| Ezi-SERVO II-EC-42S-A-PG-PN3   | EzM2-42S-A-PG-PN3   | EzS2-EC-42S       | 1:3                  |     |
| Ezi-SERVO II-EC-42S-A-PG-PN5   | EzM2-42S-A-PG-PN5   |                   | 1:5                  |     |
| Ezi-SERVO II-EC-42S-A-PG-PN8   | EzM2-42S-A-PG-PN8   |                   | 1:8                  |     |
| Ezi-SERVO II-EC-42S-A-PG-PN10  | EzM2-42S-A-PG-PN10  |                   | 1:10                 |     |
| Ezi-SERVO II-EC-42S-A-PG-PN15  | EzM2-42S-A-PG-PN15  |                   | 1:15                 |     |
| Ezi-SERVO II-EC-42S-A-PG-PN25  | EzM2-42S-A-PG-PN25  |                   | 1:25                 |     |
| Ezi-SERVO II-EC-42S-A-PG-PN40  | EzM2-42S-A-PG-PN40  |                   | 1:40                 |     |
| Ezi-SERVO II-EC-42S-A-PG-PN50  | EzM2-42S-A-PG-PN50  |                   | 1:50                 |     |
| Ezi-SERVO II-EC-42M-A-PG-PN3   | EzM2-42M-A-PG-PN3   |                   | EzS2-EC-42M          | 1:3 |
| Ezi-SERVO II-EC-42M-A-PG-PN5   | EzM2-42M-A-PG-PN5   |                   |                      | 1:5 |
| Ezi-SERVO II-EC-42M-A-PG-PN8   | EzM2-42M-A-PG-PN8   | 1:8               |                      |     |
| Ezi-SERVO II-EC-42M-A-PG-PN10  | EzM2-42M-A-PG-PN10  | 1:10              |                      |     |
| Ezi-SERVO II-EC-42M-A-PG-PN15  | EzM2-42M-A-PG-PN15  | 1:15              |                      |     |
| Ezi-SERVO II-EC-42M-A-PG-PN25  | EzM2-42M-A-PG-PN25  | 1:25              |                      |     |
| Ezi-SERVO II-EC-42M-A-PG-PN40  | EzM2-42M-A-PG-PN40  | 1:40              |                      |     |
| Ezi-SERVO II-EC-42M-A-PG-PN50  | EzM2-42M-A-PG-PN50  | 1:50              |                      |     |
| Ezi-SERVO II-EC-42L-A-PG-PN3   | EzM2-42L-A-PG-PN3   | EzS2-EC-42L       |                      | 1:3 |
| Ezi-SERVO II-EC-42L-A-PG-PN5   | EzM2-42L-A-PG-PN5   |                   |                      | 1:5 |
| Ezi-SERVO II-EC-42L-A-PG-PN8   | EzM2-42L-A-PG-PN8   |                   | 1:8                  |     |
| Ezi-SERVO II-EC-42L-A-PG-PN10  | EzM2-42L-A-PG-PN10  |                   | 1:10                 |     |
| Ezi-SERVO II-EC-42L-A-PG-PN15  | EzM2-42L-A-PG-PN15  |                   | 1:15                 |     |
| Ezi-SERVO II-EC-42L-A-PG-PN25  | EzM2-42L-A-PG-PN25  |                   | 1:25                 |     |
| Ezi-SERVO II-EC-42L-A-PG-PN40  | EzM2-42L-A-PG-PN40  |                   | 1:40                 |     |
| Ezi-SERVO II-EC-42L-A-PG-PN50  | EzM2-42L-A-PG-PN50  |                   | 1:50                 |     |
| Ezi-SERVO II-EC-42XL-A-PG-PN3  | EzM2-42XL-A-PG-PN3  |                   | EzS2-EC-42XL         | 1:3 |
| Ezi-SERVO II-EC-42XL-A-PG-PN5  | EzM2-42XL-A-PG-PN5  |                   |                      | 1:5 |
| Ezi-SERVO II-EC-42XL-A-PG-PN8  | EzM2-42XL-A-PG-PN8  | 1:8               |                      |     |
| Ezi-SERVO II-EC-42XL-A-PG-PN10 | EzM2-42XL-A-PG-PN10 | 1:10              |                      |     |
| Ezi-SERVO II-EC-42XL-A-PG-PN15 | EzM2-42XL-A-PG-PN15 | 1:15              |                      |     |
| Ezi-SERVO II-EC-42XL-A-PG-PN25 | EzM2-42XL-A-PG-PN25 | 1:25              |                      |     |
| Ezi-SERVO II-EC-42XL-A-PG-PN40 | EzM2-42XL-A-PG-PN40 | 1:40              |                      |     |
| Ezi-SERVO II-EC-42XL-A-PG-PN50 | EzM2-42XL-A-PG-PN50 | 1:50              |                      |     |
| Ezi-SERVO II-EC-56S-A-PG-PN3   | EzM2-56S-A-PG-PN3   | EzS2-EC-56S       |                      | 1:3 |
| Ezi-SERVO II-EC-56S-A-PG-PN5   | EzM2-56S-A-PG-PN5   |                   |                      | 1:5 |
| Ezi-SERVO II-EC-56S-A-PG-PN8   | EzM2-56S-A-PG-PN8   |                   | 1:8                  |     |
| Ezi-SERVO II-EC-56S-A-PG-PN10  | EzM2-56S-A-PG-PN10  |                   | 1:10                 |     |
| Ezi-SERVO II-EC-56S-A-PG-PN15  | EzM2-56S-A-PG-PN15  |                   | 1:15                 |     |
| Ezi-SERVO II-EC-56S-A-PG-PN25  | EzM2-56S-A-PG-PN25  |                   | 1:25                 |     |
| Ezi-SERVO II-EC-56S-A-PG-PN40  | EzM2-56S-A-PG-PN40  |                   | 1:40                 |     |
| Ezi-SERVO II-EC-56S-A-PG-PN50  | EzM2-56S-A-PG-PN50  |                   | 1:50                 |     |
| Ezi-SERVO II-EC-56M-A-PG-PN3   | EzM2-56M-A-PG-PN3   |                   | EzS2-EC-56M          | 1:3 |
| Ezi-SERVO II-EC-56M-A-PG-PN5   | EzM2-56M-A-PG-PN5   |                   |                      | 1:5 |
| Ezi-SERVO II-EC-56M-A-PG-PN8   | EzM2-56M-A-PG-PN8   | 1:8               |                      |     |
| Ezi-SERVO II-EC-56M-A-PG-PN10  | EzM2-56M-A-PG-PN10  | 1:10              |                      |     |
| Ezi-SERVO II-EC-56M-A-PG-PN15  | EzM2-56M-A-PG-PN15  | 1:15              |                      |     |
| Ezi-SERVO II-EC-56M-A-PG-PN25  | EzM2-56M-A-PG-PN25  | 1:25              |                      |     |
| Ezi-SERVO II-EC-56M-A-PG-PN40  | EzM2-56M-A-PG-PN40  | 1:40              |                      |     |
| Ezi-SERVO II-EC-56M-A-PG-PN50  | EzM2-56M-A-PG-PN50  | 1:50              |                      |     |
| Ezi-SERVO II-EC-56L-A-PG-PN3   | EzM2-56L-A-PG-PN3   | EzS2-EC-56L       |                      | 1:3 |
| Ezi-SERVO II-EC-56L-A-PG-PN5   | EzM2-56L-A-PG-PN5   |                   |                      | 1:5 |
| Ezi-SERVO II-EC-56L-A-PG-PN8   | EzM2-56L-A-PG-PN8   |                   | 1:8                  |     |
| Ezi-SERVO II-EC-56L-A-PG-PN10  | EzM2-56L-A-PG-PN10  |                   | 1:10                 |     |
| Ezi-SERVO II-EC-56L-A-PG-PN15  | EzM2-56L-A-PG-PN15  |                   | 1:15                 |     |
| Ezi-SERVO II-EC-56L-A-PG-PN25  | EzM2-56L-A-PG-PN25  |                   | 1:25                 |     |
| Ezi-SERVO II-EC-56L-A-PG-PN40  | EzM2-56L-A-PG-PN40  |                   | 1:40                 |     |
| Ezi-SERVO II-EC-56L-A-PG-PN50  | EzM2-56L-A-PG-PN50  |                   | 1:50                 |     |

| Package Part Number           | Motor Part Number  | Drive Part Number | Reduction gear ratio |     |
|-------------------------------|--------------------|-------------------|----------------------|-----|
| Ezi-SERVO II-EC-60S-A-PG-PN3  | EzM2-60S-A-PG-PN3  | EzS2-EC-60S       | 1:3                  |     |
| Ezi-SERVO II-EC-60S-A-PG-PN5  | EzM2-60S-A-PG-PN5  |                   | 1:5                  |     |
| Ezi-SERVO II-EC-60S-A-PG-PN8  | EzM2-60S-A-PG-PN8  |                   | 1:8                  |     |
| Ezi-SERVO II-EC-60S-A-PG-PN10 | EzM2-60S-A-PG-PN10 |                   | 1:10                 |     |
| Ezi-SERVO II-EC-60S-A-PG-PN15 | EzM2-60S-A-PG-PN15 |                   | 1:15                 |     |
| Ezi-SERVO II-EC-60S-A-PG-PN25 | EzM2-60S-A-PG-PN25 |                   | 1:25                 |     |
| Ezi-SERVO II-EC-60S-A-PG-PN40 | EzM2-60S-A-PG-PN40 |                   | 1:40                 |     |
| Ezi-SERVO II-EC-60S-A-PG-PN50 | EzM2-60S-A-PG-PN50 |                   | 1:50                 |     |
| Ezi-SERVO II-EC-60M-A-PG-PN3  | EzM2-60M-A-PG-PN3  |                   | EzS2-EC-60M          | 1:3 |
| Ezi-SERVO II-EC-60M-A-PG-PN5  | EzM2-60M-A-PG-PN5  |                   |                      | 1:5 |
| Ezi-SERVO II-EC-60M-A-PG-PN8  | EzM2-60M-A-PG-PN8  | 1:8               |                      |     |
| Ezi-SERVO II-EC-60M-A-PG-PN10 | EzM2-60M-A-PG-PN10 | 1:10              |                      |     |
| Ezi-SERVO II-EC-60M-A-PG-PN15 | EzM2-60M-A-PG-PN15 | 1:15              |                      |     |
| Ezi-SERVO II-EC-60M-A-PG-PN25 | EzM2-60M-A-PG-PN25 | 1:25              |                      |     |
| Ezi-SERVO II-EC-60M-A-PG-PN40 | EzM2-60M-A-PG-PN40 | 1:40              |                      |     |
| Ezi-SERVO II-EC-60M-A-PG-PN50 | EzM2-60M-A-PG-PN50 | 1:50              |                      |     |
| Ezi-SERVO II-EC-60L-A-PG-PN3  | EzM2-60L-A-PG-PN3  | EzS2-EC-60L       |                      | 1:3 |
| Ezi-SERVO II-EC-60L-A-PG-PN5  | EzM2-60L-A-PG-PN5  |                   |                      | 1:5 |
| Ezi-SERVO II-EC-60L-A-PG-PN8  | EzM2-60L-A-PG-PN8  |                   | 1:8                  |     |
| Ezi-SERVO II-EC-60L-A-PG-PN10 | EzM2-60L-A-PG-PN10 |                   | 1:10                 |     |
| Ezi-SERVO II-EC-60L-A-PG-PN15 | EzM2-60L-A-PG-PN15 |                   | 1:15                 |     |
| Ezi-SERVO II-EC-60L-A-PG-PN25 | EzM2-60L-A-PG-PN25 |                   | 1:25                 |     |
| Ezi-SERVO II-EC-60L-A-PG-PN40 | EzM2-60L-A-PG-PN40 |                   | 1:40                 |     |
| Ezi-SERVO II-EC-60L-A-PG-PN50 | EzM2-60L-A-PG-PN50 |                   | 1:50                 |     |

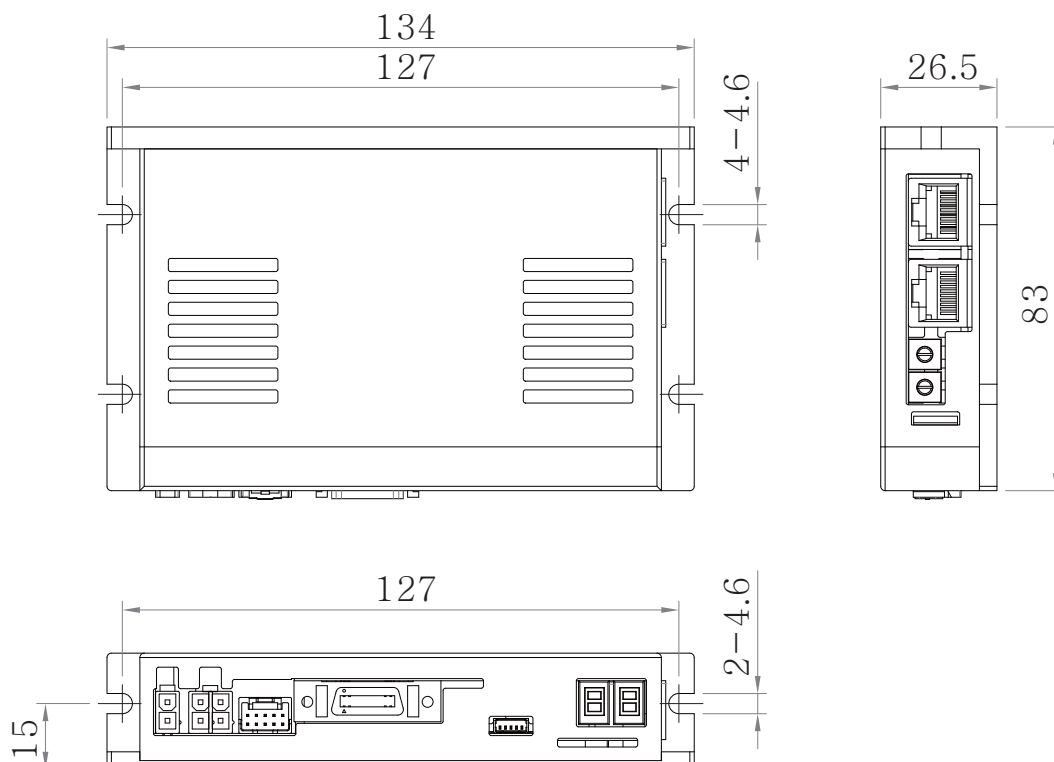
FASTECH Ezi-SERVO II EtherCAT

## ● Drive Specifications

### 1. Functions / Specifications

| Motor               | EzM2-20-A series                            | EzM2-28-A saeries  | EzM2-35-D saeries | EzM2-42-A series  | EzM2-56-A series  | EzM2-60-A series  |
|---------------------|---|--|-------------------|-------------------|-------------------|-------------------|
| Drive               | EzS2-EC-20 series                           | EzS2-EC-28 series  | EzS2-EC-35 series | EzS2-EC-42 series | EzS2-EC-56 series | EzS2-EC-60 series |
| Input Voltage       | 24VDC $\pm$ 10%                             |  |                   |                   |                   |                   |
| Control Method      | Closed Loop control by ARM-based 32-bit MCU |  |                   |                   |                   |                   |
| Current Consumption | Max 500mA (Except motor current)            |  |                   |                   |                   |                   |
| Operating Condition | Temperature                                 | In use : 0~50°C<br>In Storage : -20~70°C   |                   |                   |                   |                   |
|                     | Humidity                                    | In use : 35~85%RH (Non-condensing)<br>In Storage : 10~90%RH (Non-condensing)   |                   |                   |                   |                   |
|                     | Vib, Resist                                 | 0,5G   |                   |                   |                   |                   |
| Drive               | Rotation Speed                              | 0~3,000rpm   |                   |                   |                   |                   |
|                     | Resolution                                  | 10,000 [P/R]   |                   |                   |                   |                   |
|                     | Protection Functions                        | Over Current, Over Speed, Position Tracking Error, Over Load, Over Temperature, Over Regenerated Voltage, Motor Connection Error, Encoder Connection Error, Motor Voltage Error, In-Position Error, ROM Error, Position Overflow Error |                   |                   |                   |                   |
|                     | LED Display                                 | Power status, In-Position status, Servo On status, Alarm status  |                   |                   |                   |                   |
| EtherCAT            | Supported Protocol                          | CoE (CiA402 Drive profile)<br>FoE (Firmware download)  |                   |                   |                   |                   |
|                     | Supported Mode                              | Cyclic Synchronous position profile,<br>Position profile,<br>Homing Profile,   |                   |                   |                   |                   |
|                     | Synchronization                             | Free Run,<br>SM Event,<br>DC SYNC Event,   |                   |                   |                   |                   |
| IN/OUT Signal       | Input Signal Functions                      | 3 dedicated inputs (Limit+, Limit-, Origin), 7 user inputs   |                   |                   |                   |                   |
|                     | Output Signal Functions                     | 2 dedicated outputs (Brake+, Brake-), 6 user outputs (photocoupler)  |                   |                   |                   |                   |

## ● Drive Size[mm]





# Standard Motor Specification and Size

## 1. Motor Specification

20

28

35

| Motor             | Unit                | EzM2-20M-F | EzM2-20L-F | EzM2-28S-A | EzM2-28M-A | EzM2-28L-A | EzM2-35S-D | EzM2-35M-D | EzM2-35L-D | EzM2-35XL-D |
|-------------------|---------------------|------------|------------|------------|------------|------------|------------|------------|------------|-------------|
| Current per Phase | A                   | 0,6        | 0,6        | 0,95       | 0,95       | 0,95       | 0,6        | 0,6        | 0,85       | 0,7         |
| Holding Torque    | N · m               | 0,02       | 0,039      | 0,065      | 0,12       | 0,14       | 0,034      | 0,050      | 0,176      | 0,225       |
| Rotor Inertia     | g · cm <sup>2</sup> | 2,5        | 5          | 9          | 13         | 18         | 5          | 8          | 11         | 32          |
| Weight            | g                   | 70         | 80         | 110        | 140        | 200        | 105        | 120        | 200        | 300         |
| Length(L)         | mm                  | 33         | 38         | 32         | 46         | 53         | 22         | 26         | 38         | 53          |

\* Holding Torque is based on 100% Run Current

42

56

60

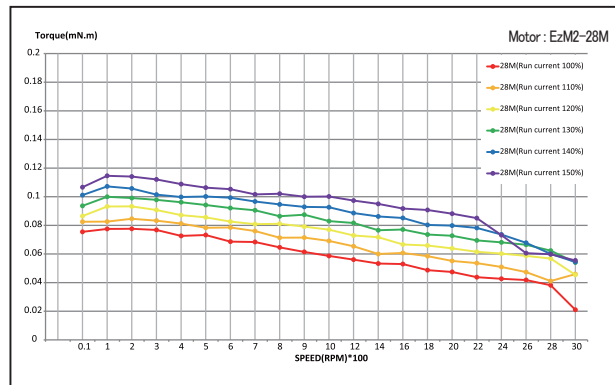
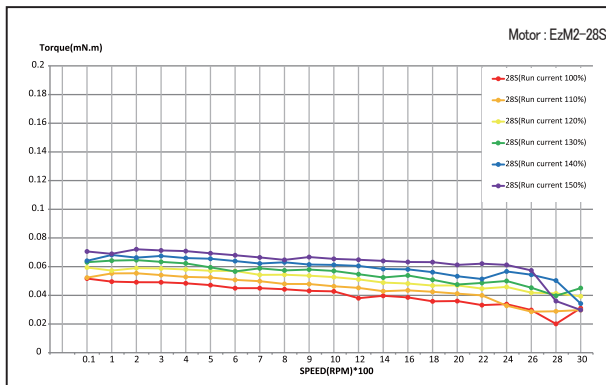
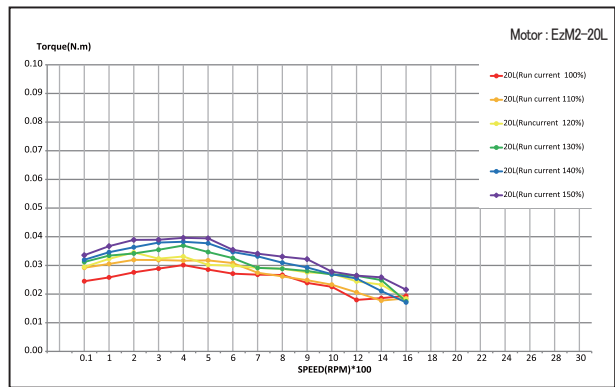
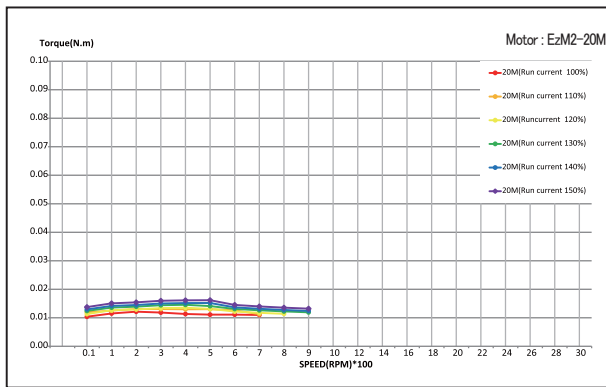
| Motor             | Unit                | EzM2-42S-A | EzM2-42M-A | EzM2-42L-A | EzM2-42XL-A | EzM2-56S-A | EzM2-56M-A | EzM2-56L-A | EzM2-60S-A | EzM2-60M-A | EzM2-60L-A |
|-------------------|---------------------|------------|------------|------------|-------------|------------|------------|------------|------------|------------|------------|
| Current per Phase | A                   | 1,2        | 1,2        | 1,2        | 1,2         | 3          | 3          | 3          | 4          | 4          | 4          |
| Holding Torque    | N · m               | 0,32       | 0,44       | 0,5        | 0,65        | 0,64       | 1          | 1,5        | 0,88       | 1,28       | 2,4        |
| Rotor Inertia     | g · cm <sup>2</sup> | 35         | 54         | 77         | 114         | 180        | 280        | 520        | 240        | 490        | 690        |
| Weight            | g                   | 250        | 280        | 350        | 500         | 500        | 720        | 1150       | 600        | 1000       | 1300       |
| Length(L)         | mm                  | 34         | 40         | 48         | 60          | 46         | 55         | 80         | 47         | 56         | 85         |

\* Holding Torque is based on 100% Run Current

## 2. Torque Characteristic

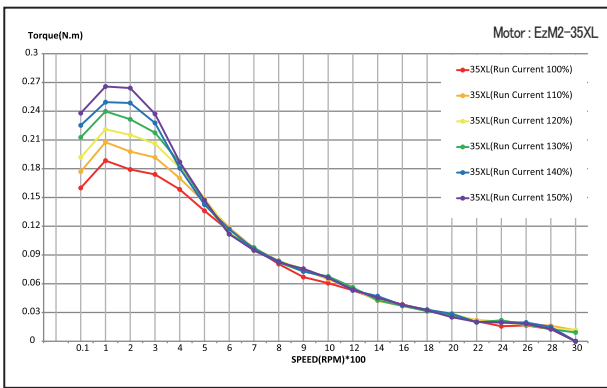
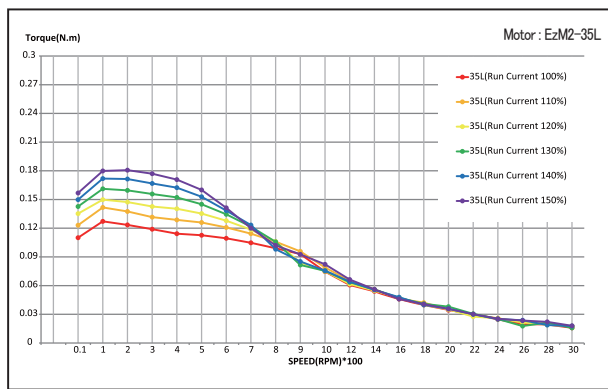
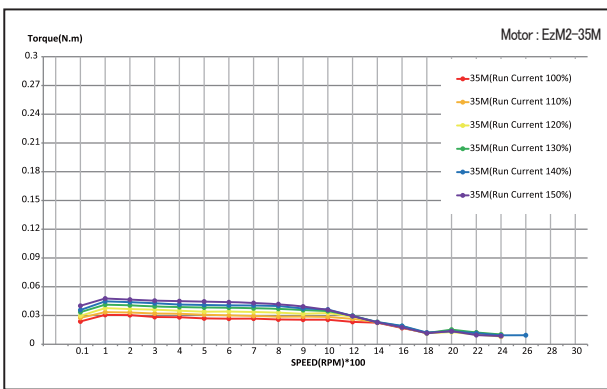
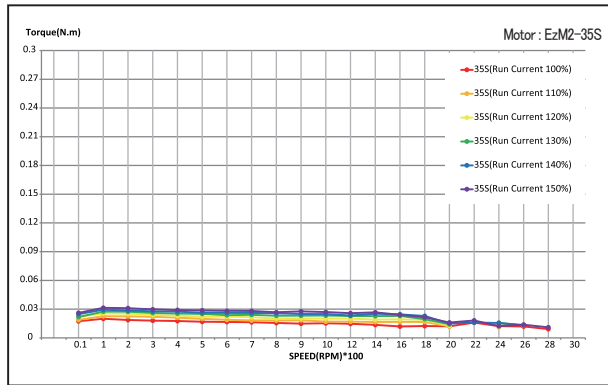
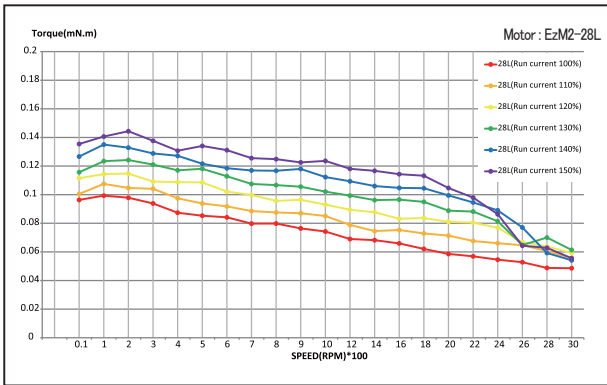
### (Ezi-SERVO II EtherCAT Torque Graph according to Run Current Setting)

\* Measured Condition Motor Voltage = 24VDC / Motor Current = Rated Current (Refer to Motor Specification) / Drive = Ezi-SERVO II EtherCAT

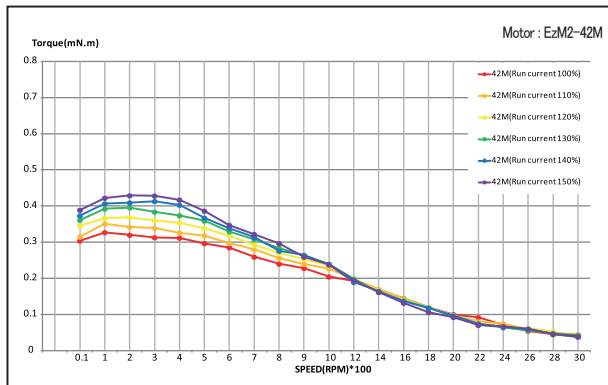
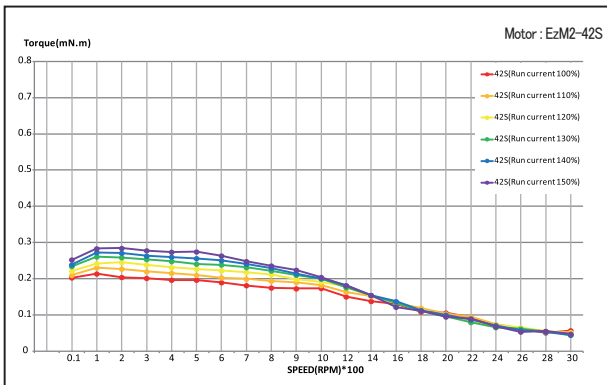




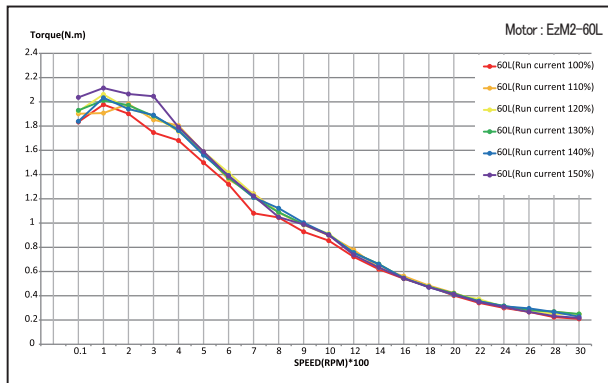
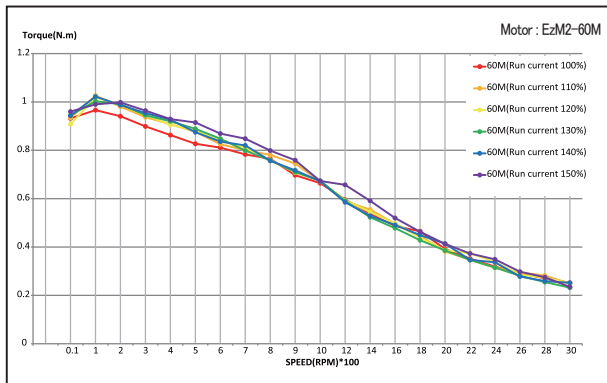
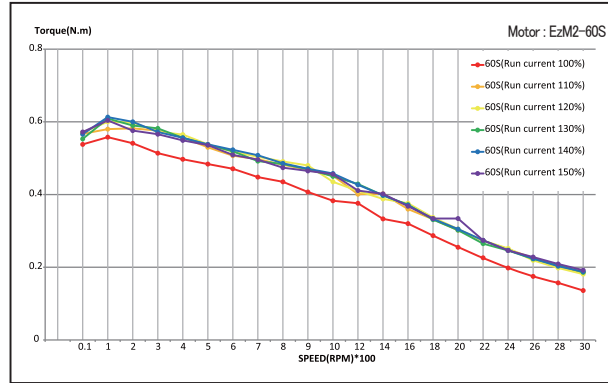
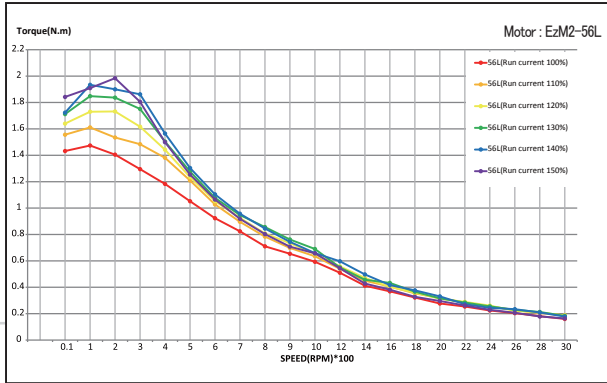
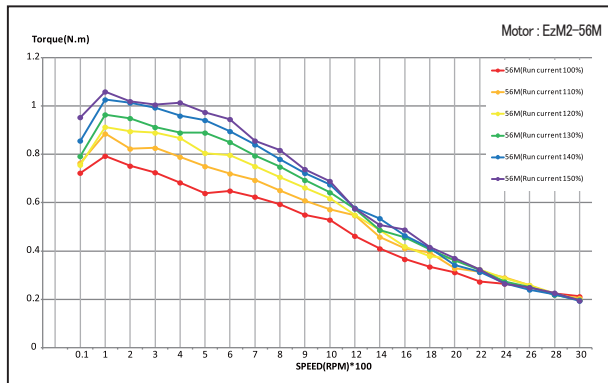
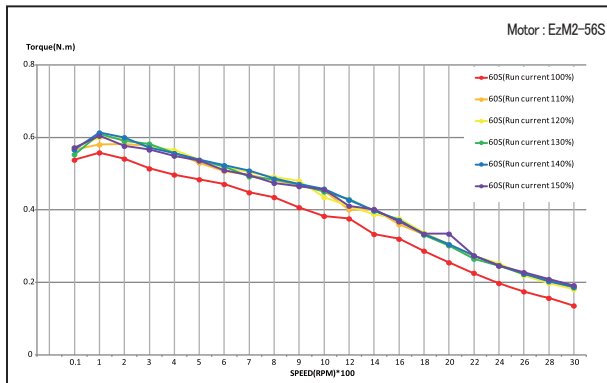
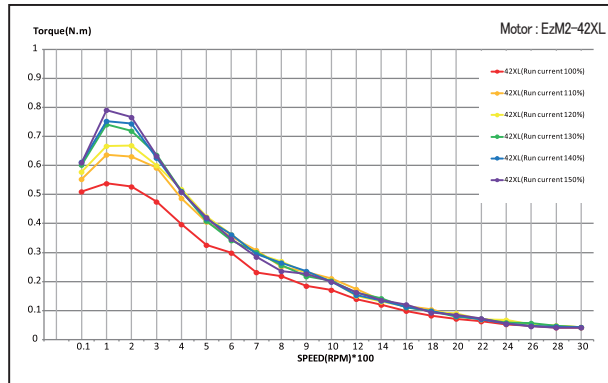
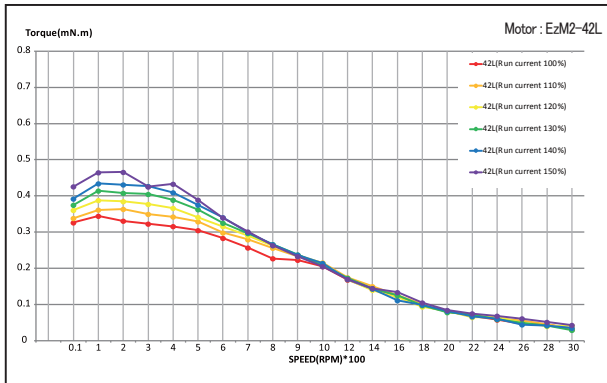
## ● Standard Motor Specification and Size



\* Measured Condition Motor Voltage = 40VDC / Motor Current = Rated Current (Refer to Motor Specification) / Drive = Ezi-SERVO II EtherCAT



# Standard Motor Specification and Size

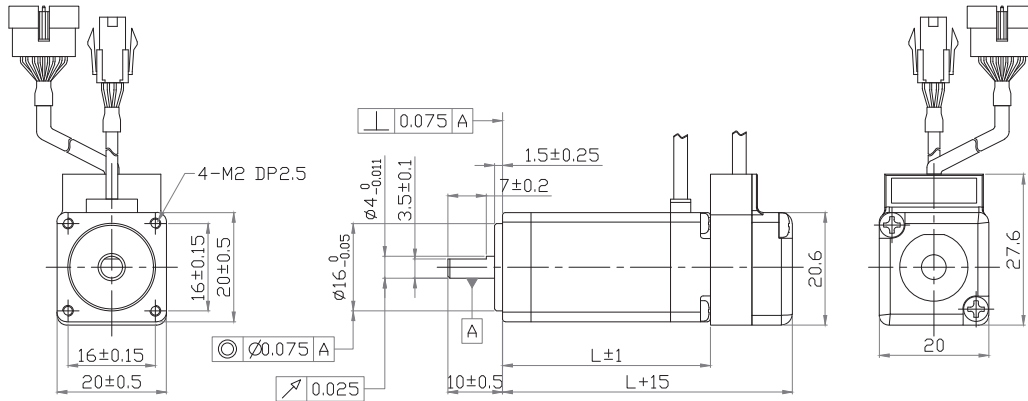


## Standard Motor Specification and Size

### 3. Motor Size(mm)

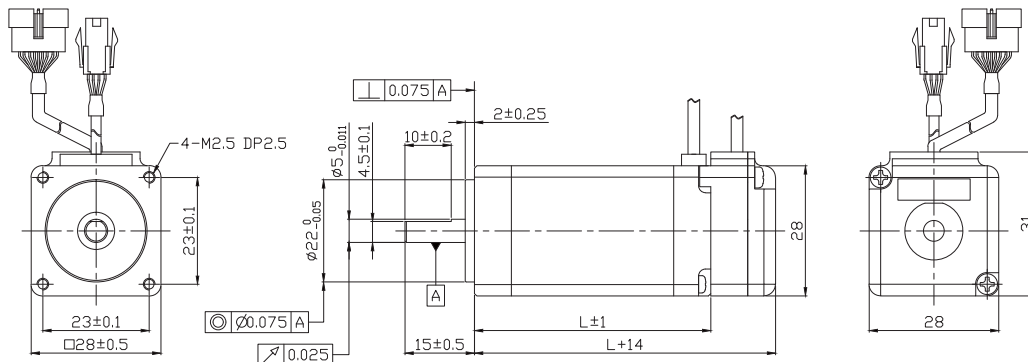
# 20

| Motor      | Length(L) |
|------------|-----------|
| EzM2-20M-A | 28mm      |
| EzM2-20L-A | 38mm      |



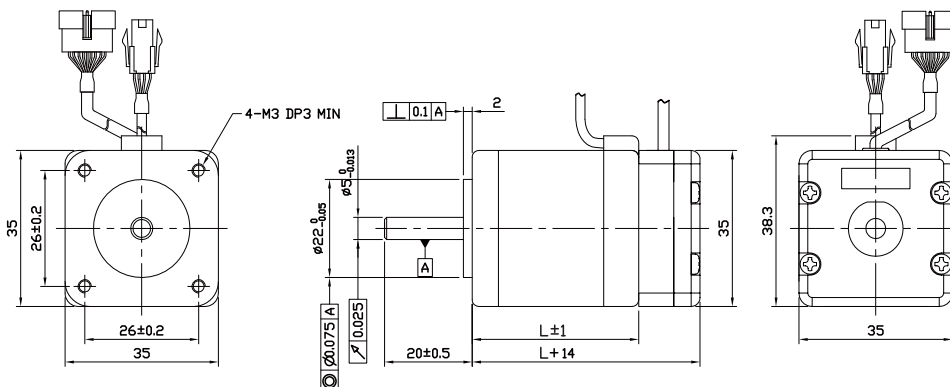
# 28

| Motor      | Length(L) |
|------------|-----------|
| EzM2-28S-A | 32mm      |
| EzM2-28M-A | 45mm      |
| EzM2-28L-A | 50mm      |



# 35

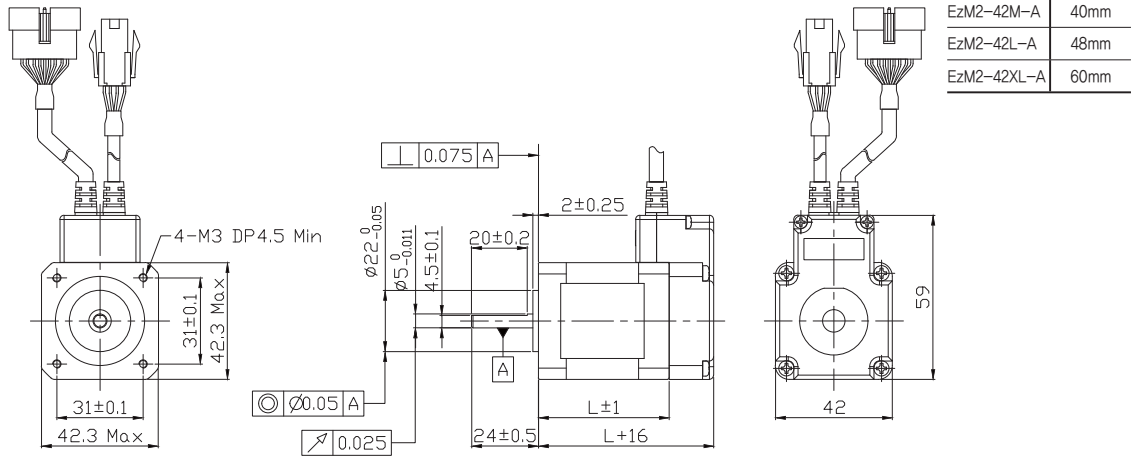
| Motor       | Length(L) |
|-------------|-----------|
| EzM2-35S-D  | 22mm      |
| EzM2-35M-D  | 26mm      |
| EzM2-35L-D  | 38mm      |
| EzM2-35XL-D | 53mm      |



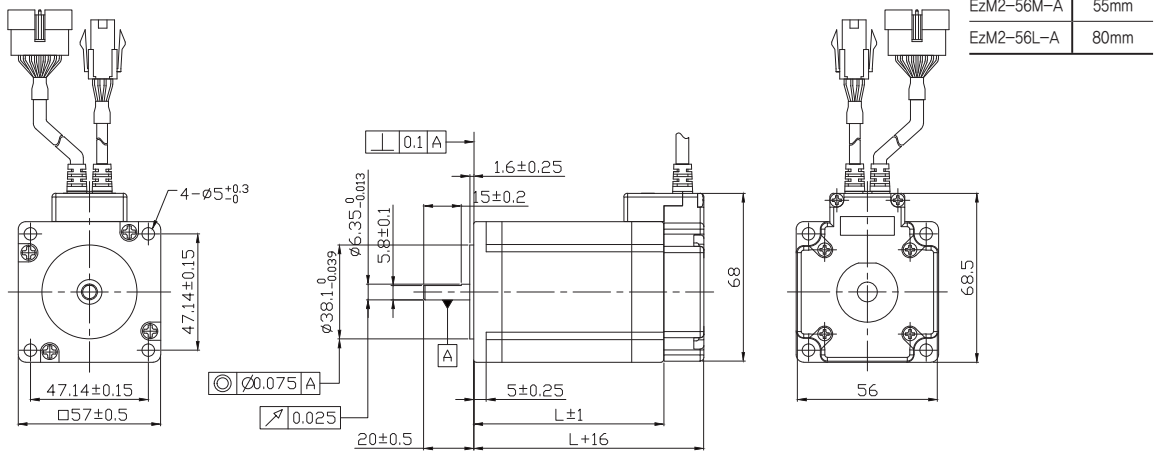
● Standard Motor Specification and Size

3. Motor Size(mm)

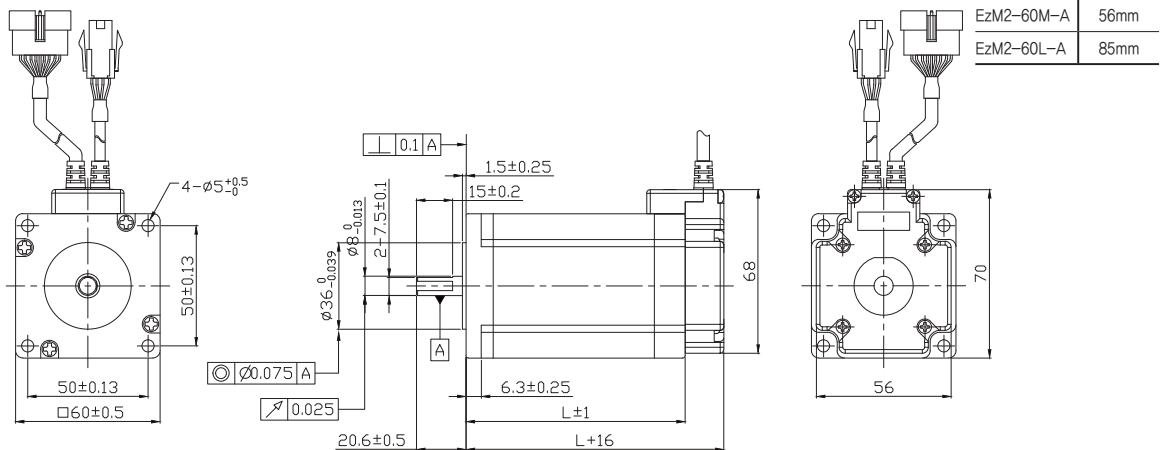
42



56



60





## ● Brake Installed Motor Specification and Size

### 1. Motor Specification

| Package                   | Motor          | Electronic Brake        |                   |                   |                   |                                | Motor Unit Weight (g) | Permitted Overhung Load (N)  |     |    |    | Permitted Thrust Load (N)        |
|---------------------------|----------------|-------------------------|-------------------|-------------------|-------------------|--------------------------------|-----------------------|------------------------------|-----|----|----|----------------------------------|
|                           |                | Type                    | Voltage Input (V) | Rated Current (A) | Power Consumption | Static Friction Torque (N · m) |                       | Length from Motor Point (mm) |     |    |    |                                  |
|                           |                |                         |                   |                   |                   |                                |                       | 3                            | 8   | 13 | 18 |                                  |
| Ezi-SERVO II-EC-42S-A-BK  | EzM2-42S-A-BK  | Non-excitation run Type | 24VDC ±10%        | 0,3A ±10%         | 8,2               | 0,2                            | 510                   | 22                           | 26  | 33 | 46 | Must be Lower than Unit's Weight |
| Ezi-SERVO II-EC-42M-A-BK  | EzM2-42M-A-BK  |                         |                   |                   |                   |                                | 570                   |                              |     |    |    |                                  |
| Ezi-SERVO II-EC-42L-A-BK  | EzM2-42L-A-BK  |                         |                   |                   |                   |                                | 640                   |                              |     |    |    |                                  |
| Ezi-SERVO II-EC-42XL-A-BK | EzM2-42XL-A-BK |                         |                   |                   |                   |                                | 770                   |                              |     |    |    |                                  |
| Ezi-SERVO II-EC-56S-A-BK  | EzM2-56S-A-BK  |                         |                   |                   | 870               | 52                             | 65                    | 85                           | 123 |    |    |                                  |
| Ezi-SERVO II-EC-56M-A-BK  | EzM2-56M-A-BK  |                         |                   |                   | 1190              |                                |                       |                              |     |    |    |                                  |
| Ezi-SERVO II-EC-56L-A-BK  | EzM2-56L-A-BK  |                         |                   |                   | 1380              | 70                             | 87                    | 114                          | 165 |    |    |                                  |
| Ezi-SERVO II-EC-60S-A-BK  | EzM2-60S-A-BK  |                         |                   |                   | 1150              |                                |                       |                              |     |    |    |                                  |
| Ezi-SERVO II-EC-60M-A-BK  | EzM2-60M-A-BK  |                         |                   |                   | 1350              |                                |                       |                              |     |    |    |                                  |
| Ezi-SERVO II-EC-60L-A-BK  | EzM2-60L-A-BK  |                         |                   |                   | 1960              |                                |                       |                              |     |    |    |                                  |

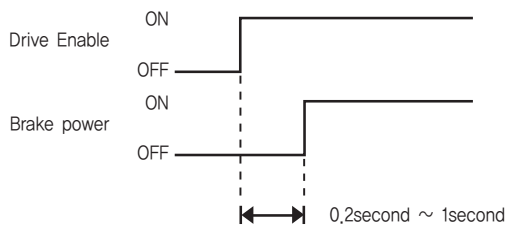
- \* Electronic Brake cannot be used for braking, Position hold purpose only when power OFF.
- \* The weight means Motor Unit Weight including Motor and Electronic Brake.
- \* Motor Model Name is combined model name of Motor and Brake.
- \* Motor specification and torque characteristic are same as Standard Motor.

#### \* Brake Operation Timing Chart

Ezi-SERVO II control Brake by Drive automatically.

Please refer to below Timing Chart when control Brake from upper controller other than using Ezi-SERVO II Brake control. Otherwise, Drive malfunctioning and loads can be fall down.

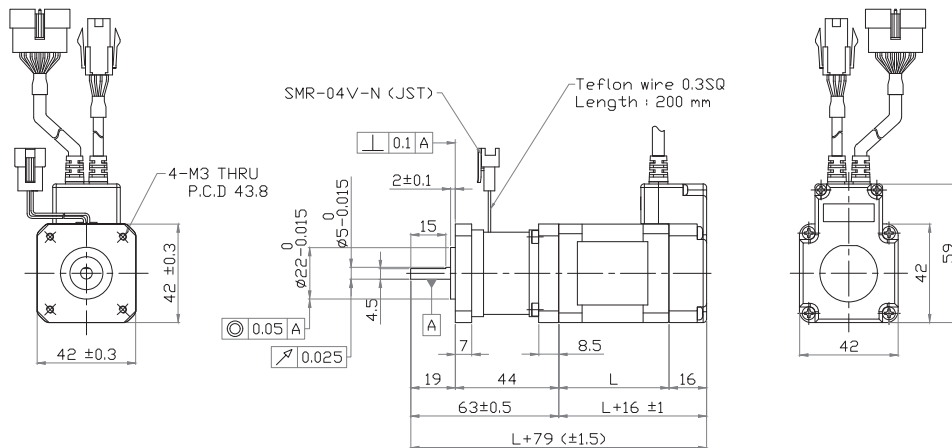
Also, please do not operate Brake while motor operation to prevent damage.



● Brake Installed Motor Specification and Size

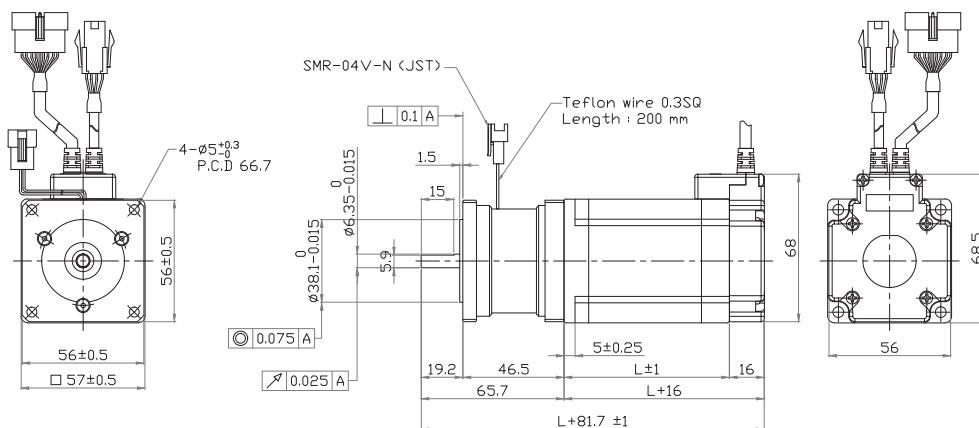
2. Motor Size(mm)

42



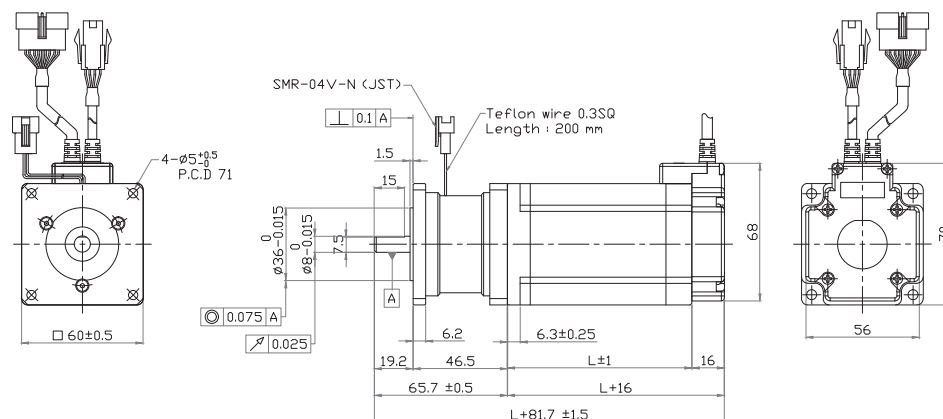
| Motor       | Length(L) |
|-------------|-----------|
| EzM2-42S-A  | 34mm      |
| EzM2-42M-A  | 40mm      |
| EzM2-42L-A  | 48mm      |
| EzM2-42XL-A | 60mm      |

56



| Motor      | Length(L) |
|------------|-----------|
| EzM2-56S-A | 46mm      |
| EzM2-56M-A | 55mm      |
| EzM2-56L-A | 80mm      |

60



| Motor      | Length(L) |
|------------|-----------|
| EzM2-60S-A | 47mm      |
| EzM2-60M-A | 56mm      |
| EzM2-60L-A | 85mm      |

## ● Gearbox Installed Motor Specification and Size

### 1. Gearbox for 42mm Motor Specification

| Package                        | Maximum Holding Torque (N · m) | Rotor Inertia Moment (Kg · m <sup>2</sup> ) | Backlash (min) | Angle Transmission Error (min) | Reduction Gear Ratio | Resolution (10,000ppr Standard) | Permitted Torque (N · m) | Maximum Torque (N · m) | Permitted Speed Range (rpm) | Unit Weight (Kg) | Permitted Overhung Load (N) |                 | Permitted Thrust Load (N) |     |
|--------------------------------|--------------------------------|---|----------------|--------------------------------|----------------------|---------------------------------|--------------------------|------------------------|-----------------------------|------------------|-----------------------------|-----------------|---------------------------|-----|
|                                |                                |   |                |                                |                      |                                 |                          |                        |                             |                  | Axis                        | Center Standard |                           |     |
| Ezi-SERVO II-EC-42S-A-PG-PN3   | 0.8                            | 35x10 <sup>-7</sup>                         | 3              | 5                              | 3                    | 0,012 °                         | 6                        | 18                     | 0~1000                      | 0.89             | 240                         | 270             | 270                       |     |
| Ezi-SERVO II-EC-42S-A-PG-PN5   | 1.4                            |   |                |                                | 5                    | 0,0072 °                        | 9                        | 18                     | 0~600                       |                  | 290                         | 330             |                           |     |
| Ezi-SERVO II-EC-42S-A-PG-PN8   |                                |   |                |                                | 8                    | 0,0045 °                        | 9                        | 18                     | 0~375                       |                  | 340                         | 410             |                           |     |
| Ezi-SERVO II-EC-42S-A-PG-PN10  |                                |   |                |                                | 10                   | 0,0036 °                        | 6                        | 12                     | 0~333                       |                  | 360                         | 450             |                           |     |
| Ezi-SERVO II-EC-42S-A-PG-PN15  | 4.0                            |   | 5              | 7                              | 15                   | 0,0024 °                        | 6                        | 12                     | 0~300                       | 0.99             | 410                         | 540             |                           | 640 |
| Ezi-SERVO II-EC-42S-A-PG-PN25  | 6.6                            |   |                |                                | 25                   | 0,00144 °                       | 9                        | 18                     | 0~120                       |                  | 490                         | 640             |                           |     |
| Ezi-SERVO II-EC-42S-A-PG-PN40  | 9.0                            |   |                |                                | 40                   | 0,0009 °                        | 9                        | 18                     | 0~75                        |                  | 570                         | 640             |                           |     |
| Ezi-SERVO II-EC-42S-A-PG-PN50  |                                |   |                |                                | 50                   | 0,00072 °                       | 9                        | 18                     | 0~60                        |                  | 620                         | 640             |                           |     |
| Ezi-SERVO II-EC-42M-A-PG-PN3   | 1.1                            | 54x10 <sup>-7</sup>                         | 3              | 5                              | 3                    | 0,012 °                         | 6                        | 18                     | 0~1000                      | 0.96             | 240                         | 270             | 270                       |     |
| Ezi-SERVO II-EC-42M-A-PG-PN5   | 1.9                            |   |                |                                | 5                    | 0,0072 °                        | 9                        | 18                     | 0~600                       |                  | 290                         | 330             |                           |     |
| Ezi-SERVO II-EC-42M-A-PG-PN8   |                                |   |                |                                | 8                    | 0,0045 °                        | 9                        | 18                     | 0~375                       |                  | 340                         | 410             |                           |     |
| Ezi-SERVO II-EC-42M-A-PG-PN10  |                                |   |                |                                | 10                   | 0,0036 °                        | 6                        | 12                     | 0~333                       |                  | 360                         | 450             |                           |     |
| Ezi-SERVO II-EC-42M-A-PG-PN15  | 5.4                            |   | 5              | 7                              | 15                   | 0,0024 °                        | 6                        | 12                     | 0~300                       | 1.06             | 410                         | 540             |                           | 640 |
| Ezi-SERVO II-EC-42M-A-PG-PN25  | 9.0                            |   |                |                                | 25                   | 0,00144 °                       | 9                        | 18                     | 0~120                       |                  | 490                         | 640             |                           |     |
| Ezi-SERVO II-EC-42M-A-PG-PN40  |                                |   |                |                                | 40                   | 0,0009 °                        | 9                        | 18                     | 0~75                        |                  | 570                         | 640             |                           |     |
| Ezi-SERVO II-EC-42M-A-PG-PN50  |                                |   |                |                                | 50                   | 0,00072 °                       | 9                        | 18                     | 0~60                        |                  | 620                         | 640             |                           |     |
| Ezi-SERVO II-EC-42L-A-PG-PN3   | 1.4                            | 77x10 <sup>-7</sup>                         | 3              | 5                              | 3                    | 0,012 °                         | 6                        | 18                     | 0~1000                      | 1.02             | 240                         | 270             | 270                       |     |
| Ezi-SERVO II-EC-42L-A-PG-PN5   | 2.4                            |   |                |                                | 5                    | 0,0072 °                        | 9                        | 18                     | 0~600                       |                  | 290                         | 330             |                           |     |
| Ezi-SERVO II-EC-42L-A-PG-PN8   | 3.8                            |   |                |                                | 8                    | 0,0045 °                        | 9                        | 18                     | 0~375                       |                  | 340                         | 410             |                           |     |
| Ezi-SERVO II-EC-42L-A-PG-PN10  | 4.7                            |   |                |                                | 10                   | 0,0036 °                        | 6                        | 12                     | 0~333                       |                  | 360                         | 450             |                           |     |
| Ezi-SERVO II-EC-42L-A-PG-PN15  | 6.0                            |   | 5              | 7                              | 15                   | 0,0024 °                        | 6                        | 12                     | 0~300                       | 1.12             | 410                         | 540             |                           | 640 |
| Ezi-SERVO II-EC-42L-A-PG-PN25  | 9.0                            |   |                |                                | 25                   | 0,00144 °                       | 9                        | 18                     | 0~120                       |                  | 490                         | 640             |                           |     |
| Ezi-SERVO II-EC-42L-A-PG-PN40  |                                |   |                |                                | 40                   | 0,0009 °                        | 9                        | 18                     | 0~75                        |                  | 570                         | 640             |                           |     |
| Ezi-SERVO II-EC-42L-A-PG-PN50  |                                |   |                |                                | 50                   | 0,00072 °                       | 9                        | 18                     | 0~60                        |                  | 620                         | 640             |                           |     |
| Ezi-SERVO II-EC-42XL-A-PG-PN3  | 1.8                            | 114x10 <sup>-7</sup>                        | 3              | 5                              | 3                    | 0,012 °                         | 6                        | 18                     | 0~1000                      | 1.15             | 240                         | 270             | 270                       |     |
| Ezi-SERVO II-EC-42XL-A-PG-PN5  | 3.0                            |   |                |                                | 5                    | 0,0072 °                        | 9                        | 18                     | 0~600                       |                  | 290                         | 330             |                           |     |
| Ezi-SERVO II-EC-42XL-A-PG-PN8  | 4.8                            |   |                |                                | 8                    | 0,0045 °                        | 9                        | 18                     | 0~375                       |                  | 340                         | 410             |                           |     |
| Ezi-SERVO II-EC-42XL-A-PG-PN10 | 6.0                            |   |                |                                | 10                   | 0,0036 °                        | 6                        | 12                     | 0~333                       |                  | 360                         | 450             |                           |     |
| Ezi-SERVO II-EC-42XL-A-PG-PN15 |                                |   | 9.0            | 15                             | 0,0024 °             | 6                               | 12                       | 0~300                  | 410                         | 540              |                             |                 |                           |     |
| Ezi-SERVO II-ST-42XL-A-PG-PN25 | 25                             |   |                | 0,00144 °                      | 9                    | 18                              | 0~120                    | 490                    | 640                         |                  |                             |                 |                           |     |
| Ezi-SERVO II-EC-42XL-A-PG-PN40 | 40                             |   |                | 0,0009 °                       | 9                    | 18                              | 0~75                     | 570                    | 640                         |                  |                             |                 |                           |     |
| Ezi-SERVO II-EC-42XL-A-PG-PN50 | 50                             |   |                | 0,00072 °                      | 9                    | 18                              | 0~60                     | 620                    | 640                         |                  |                             |                 |                           |     |

## ● Gearbox Installed Motor Specification and Size

### 2. Gearbox for 56mm Motor Specification

| Package                        | Maximum Holding Torque (N · m) | Rotor Inertia Moment (Kg · m <sup>2</sup> ) | Backlash (min) | Angle Transmission Error (min) | Reduction Gear Ratio | Resolution (10,000ppr Standard) | Permitted Torque (N · m) | Maximum Torque (N · m) | Permitted Speed Range (rpm) | Unit Weight (Kg) | Permitted Overhung Load (N) |                 | Permitted Thrust Load (N) |
|--------------------------------|--------------------------------|---|----------------|--------------------------------|----------------------|---------------------------------|--------------------------|------------------------|-----------------------------|------------------|-----------------------------|-----------------|---------------------------|
|                                |                                |   |                |                                |                      |                                 |                          |                        |                             |                  | Axis                        | Center Standard |                           |
| Ezi-SERVO II -EC-56S-A-PG-PN3  | 1,6                            | 120x10 <sup>-7</sup>                        | 3              | 5                              | 3                    | 0,012 °                         | 27                       | 50                     | 0~1000                      | 1,34             | 430                         | 310             |                           |
| Ezi-SERVO II -EC-56S-A-PG-PN5  | 2,7                            |   |                |                                | 5                    | 0,0072 °                        | 27                       | 50                     | 0~600                       |                  | 510                         | 390             |                           |
| Ezi-SERVO II -EC-56S-A-PG-PN8  | 4,3                            |   |                |                                | 8                    | 0,0045 °                        | 27                       | 50                     | 0~375                       | 1,88             | 600                         | 480             |                           |
| Ezi-SERVO II -EC-56S-A-PG-PN10 | 5,3                            |   |                |                                | 10                   | 0,0036 °                        | 18                       | 35                     | 0~333                       |                  | 640                         | 530             |                           |
| Ezi-SERVO II -EC-56S-A-PG-PN15 | 7,7                            |   |                |                                | 15                   | 0,0024 °                        | 18                       | 35                     | 0~300                       | 2,08             | 740                         | 630             |                           |
| Ezi-SERVO II -EC-56S-A-PG-PN25 | 12,9                           |   |                |                                | 25                   | 0,00144 °                       | 27                       | 50                     | 0~120                       |                  | 870                         | 790             |                           |
| Ezi-SERVO II -EC-56S-A-PG-PN40 | 20,6                           |   |                |                                | 40                   | 0,0009 °                        | 27                       | 50                     | 0~75                        |                  | 1000                        | 970             |                           |
| Ezi-SERVO II -EC-56S-A-PG-PN50 | 25,8                           |   |                |                                | 50                   | 0,00072 °                       | 27                       | 50                     | 0~60                        | 1100             | 1000                        |                 |                           |
| Ezi-SERVO II -EC-56M-A-PG-PN3  | 2,6                            | 200x10 <sup>-7</sup>                        | 3              | 5                              | 3                    | 0,0012 °                        | 18                       | 35                     | 0~1000                      | 1,4              | 430                         | 310             |                           |
| Ezi-SERVO II -EC-56M-A-PG-PN5  | 4,4                            |   |                |                                | 5                    | 0,0072 °                        | 27                       | 50                     | 0~600                       |                  | 510                         | 390             |                           |
| Ezi-SERVO II -EC-56M-A-PG-PN8  | 7,0                            |   |                |                                | 8                    | 0,0045 °                        | 27                       | 50                     | 0~375                       | 2,15             | 600                         | 480             |                           |
| Ezi-SERVO II -EC-56M-A-PG-PN10 | 8,7                            |   |                |                                | 10                   | 0,0036 °                        | 18                       | 35                     | 0~333                       |                  | 640                         | 530             |                           |
| Ezi-SERVO II -EC-56M-A-PG-PN15 | 12,7                           |   |                |                                | 15                   | 0,0024 °                        | 18                       | 35                     | 0~300                       | 2,35             | 740                         | 630             |                           |
| Ezi-SERVO II -EC-56M-A-PG-PN25 | 21,1                           |   |                |                                | 25                   | 0,00144 °                       | 27                       | 50                     | 0~120                       |                  | 870                         | 790             |                           |
| Ezi-SERVO II -EC-56M-A-PG-PN40 | 27,0                           |   |                |                                | 40                   | 0,0009 °                        | 27                       | 50                     | 0~75                        |                  | 1000                        | 970             |                           |
| Ezi-SERVO II -EC-56M-A-PG-PN50 |                                |   |                |                                | 50                   | 0,00072 °                       | 27                       | 50                     | 0~60                        | 1100             | 1000                        |                 |                           |
| Ezi-SERVO II -EC-56L-A-PG-PN3  | 4,3                            | 480x10 <sup>-7</sup>                        | 3              | 5                              | 3                    | 0,012 °                         | 18                       | 35                     | 0~1000                      | 1,1              | 430                         | 310             |                           |
| Ezi-SERVO II -EC-56L-A-PG-PN5  | 7,2                            |   |                |                                | 5                    | 0,0072 °                        | 27                       | 50                     | 0~600                       |                  | 510                         | 390             |                           |
| Ezi-SERVO II -EC-56L-A-PG-PN8  | 11,4                           |   |                |                                | 8                    | 0,0045 °                        | 27                       | 50                     | 0~375                       | 2,22             | 600                         | 480             |                           |
| Ezi-SERVO II -EC-56L-A-PG-PN10 | 14,3                           |   |                |                                | 10                   | 0,0036 °                        | 18                       | 35                     | 0~333                       |                  | 640                         | 530             |                           |
| Ezi-SERVO II -EC-56L-A-PG-PN15 | 18,0                           |   |                |                                | 15                   | 0,0024 °                        | 18                       | 35                     | 0~300                       | 2,42             | 740                         | 630             |                           |
| Ezi-SERVO II -EC-56L-A-PG-PN25 | 27,0                           |   |                |                                | 25                   | 0,00144 °                       | 27                       | 50                     | 0~120                       |                  | 870                         | 790             |                           |
| Ezi-SERVO II -EC-56L-A-PG-PN40 |                                |   |                |                                | 40                   | 0,0009 °                        | 27                       | 50                     | 0~75                        |                  | 1000                        | 970             |                           |
| Ezi-SERVO II -EC-56L-A-PG-PN50 |                                |   |                |                                | 50                   | 0,00072 °                       | 27                       | 50                     | 0~60                        | 1100             | 1000                        |                 |                           |

FASTECH Ezi-SERVO II EtherCAT



## ● Gearbox Installed Motor Specification and Size

### 3. Gearbox for 60mm Motor Specification

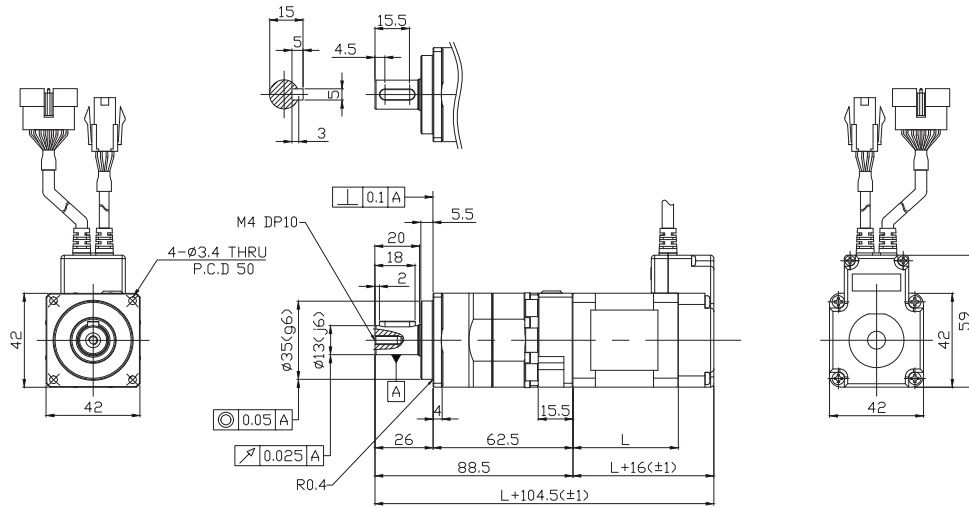
| Package                       | Maximum Holding Torque (N · m) | Rotor Inertia Moment (Kg · m <sup>2</sup> ) | Backlash (min)       | Angle Transmission Error (min) | Reduction Gear Ratio | Resolution (10,000ppr Standard) | Permitted Torque (N · m) | Maximum Torque (N · m) | Permitted Speed Range (rpm) | Unit Weight (Kg) | Permitted Overhung Load (N) | Permitted Thrust Load (N) |      |
|-------------------------------|--------------------------------|---|----------------------|--------------------------------|----------------------|---------------------------------|--------------------------|------------------------|-----------------------------|------------------|-----------------------------|---------------------------|------|
|                               |                                |   |                      |                                |                      |                                 |                          |                        |                             |                  | Axis Center Standard        |                           |      |
| Ezi-SERVO II-EC-60S-A-PG-PN3  | 2.6                            | 140x10 <sup>-7</sup>                        | 3                    | 5                              | 3                    | 0,012 °                         | 18                       | 35                     | 0~1000                      | 1.4              | 430                         | 310                       |      |
| Ezi-SERVO II-EC-60S-A-PG-PN5  | 4.4                            |   |                      |                                |                      |                                 |                          |                        |                             |                  | 510                         | 390                       |      |
| Ezi-SERVO II-EC-60S-A-PG-PN8  | 7.0                            |   |                      |                                |                      |                                 |                          |                        |                             |                  | 2.0                         | 600                       | 480  |
| Ezi-SERVO II-EC-60S-A-PG-PN10 | 8.8                            |   |                      |                                |                      |                                 |                          |                        |                             |                  |                             | 640                       | 530  |
| Ezi-SERVO II-EC-60S-A-PG-PN15 | 12.7                           |   |                      |                                |                      |                                 |                          |                        |                             |                  | 2.2                         | 740                       | 630  |
| Ezi-SERVO2-EC-60S-A-PG-PN25   | 21.2                           |   |                      |                                |                      |                                 |                          |                        |                             |                  |                             | 870                       | 790  |
| Ezi-SERVO II-EC-60S-A-PG-PN40 | 27.0                           |   |                      |                                |                      |                                 |                          |                        |                             |                  |                             | 1000                      | 970  |
| Ezi-SERVO II-EC-60S-PG-PN50   |                                |   |                      |                                |                      |                                 |                          |                        |                             |                  |                             | 1100                      | 1000 |
| Ezi-SERVO II-EC-60M-A-PG-PN3  | 3.6                            | 320x10 <sup>-7</sup>                        | 3                    | 5                              | 3                    | 0,012 °                         | 18                       | 35                     | 0~1000                      | 1.4              | 430                         | 310                       |      |
| Ezi-SERVO II-EC-60M-A-PG-PN5  | 6.0                            |   |                      |                                |                      |                                 |                          |                        |                             |                  | 510                         | 390                       |      |
| Ezi-SERVO II-EC-60M-A-PG-PN8  | 9.6                            |   |                      |                                |                      |                                 |                          |                        |                             |                  | 2.3                         | 600                       | 480  |
| Ezi-SERVO II-EC-60M-A-PG-PN10 | 12.0                           |   |                      |                                |                      |                                 |                          |                        |                             |                  |                             | 640                       | 530  |
| Ezi-SERVO II-EC-60M-A-PG-PN15 | 17.4                           |   |                      |                                |                      |                                 |                          |                        |                             |                  | 2.5                         | 740                       | 630  |
| Ezi-SERVO II-EC-60M-A-PG-PN25 | 27.0                           |   |                      |                                |                      |                                 |                          |                        |                             |                  |                             | 870                       | 790  |
| Ezi-SERVO II-EC-60M-A-PG-PN40 |                                |   |                      |                                |                      |                                 |                          |                        |                             |                  |                             | 1000                      | 970  |
| Ezi-SERVO II-EC-60M-A-PG-PN50 |                                |   |                      |                                |                      |                                 |                          |                        |                             |                  |                             | 1100                      | 1000 |
| Ezi-SERVO II-EC-60L-A-PG-PN3  |                                | 7.1   | 800x10 <sup>-7</sup> | 3                              | 5                    | 3                               | 0,012 °                  | 18                     | 35                          | 0~1000           | 1.4                         | 430                       | 310  |
| Ezi-SERVO II-EC-60L-A-PG-PN5  | 11.9                           | 510   |                      |                                |                      |                                 |                          |                        |                             |                  |                             | 390                       |      |
| Ezi-SERVO II-EC-60L-A-PG-PN8  | 19.0                           | 3.0   |                      |                                |                      |                                 |                          |                        |                             |                  |                             | 600                       | 480  |
| Ezi-SERVO II-EC-60L-A-PG-PN10 | 18.0                           |   |                      |                                |                      |                                 |                          |                        |                             |                  |                             | 640                       | 530  |
| Ezi-SERVO II-EC-60L-A-PG-PN15 |                                | 3.2   |                      |                                |                      |                                 |                          |                        |                             |                  |                             | 740                       | 630  |
| Ezi-SERVO II-EC-60L-A-PG-PN25 |                                |   |                      |                                |                      |                                 |                          |                        |                             |                  |                             | 870                       | 790  |
| Ezi-SERVO II-EC-60L-A-PG-PN40 |                                |   |                      |                                |                      |                                 |                          |                        |                             |                  |                             | 1000                      | 970  |
| Ezi-SERVO II-EC-60L-A-PG-PN50 | 27.0                           |   |                      |                                |                      |                                 |                          |                        |                             |                  |                             | 1100                      | 1000 |

● Gearbox Installed Motor Specification and Size

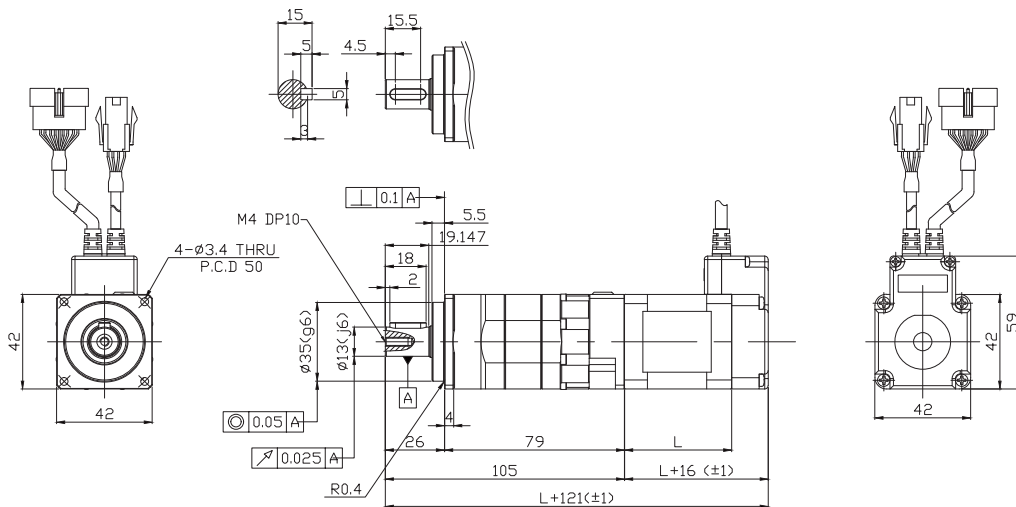
4. Motor Size(mm)

42

| Package                         | Motor               | Stage        | □Second Stage | L Length (mm) |
|---------------------------------|---------------------|--------------|---------------|---------------|
| Ezi-SERVO II -EC-42S-A-PG-PN □  | EzM2-42S-A-PG-PN □  | Single Stage | 3, 5, 8, 10   | 34            |
| Ezi-SERVO II -EC-42M-A-PG-PN □  | EzM2-42M-A-PG-PN □  |              | 3, 5, 8, 10   | 40            |
| Ezi-SERVO II -EC-42L-A-PG-PN □  | EzM2-42L-A-PG-PN □  |              | 3, 5, 8, 10   | 48            |
| Ezi-SERVO II -EC-42XL-A-PG-PN □ | EzM2-42XL-A-PG-PN □ |              | 3, 5, 8, 10   | 60            |



| Package                         | Motor               | Stage        | □Second Stage  | L Length (mm) |
|---------------------------------|---------------------|--------------|----------------|---------------|
| Ezi-SERVO II -EC-42S-A-PG-PN □  | EzM2-42S-A-PG-PN □  | Second Stage | 15, 25, 40, 50 | 34            |
| Ezi-SERVO II -EC-42M-A-PG-PN □  | EzM2-42M-A-PG-PN □  |              | 15, 25, 40, 50 | 40            |
| Ezi-SERVO II -EC-42L-A-PG-PN □  | EzM2-42L-A-PG-PN □  |              | 15, 25, 40, 50 | 48            |
| Ezi-SERVO II -EC-42XL-A-PG-PN □ | EzM2-42XL-A-PG-PN □ |              | 15, 25, 40, 50 | 60            |

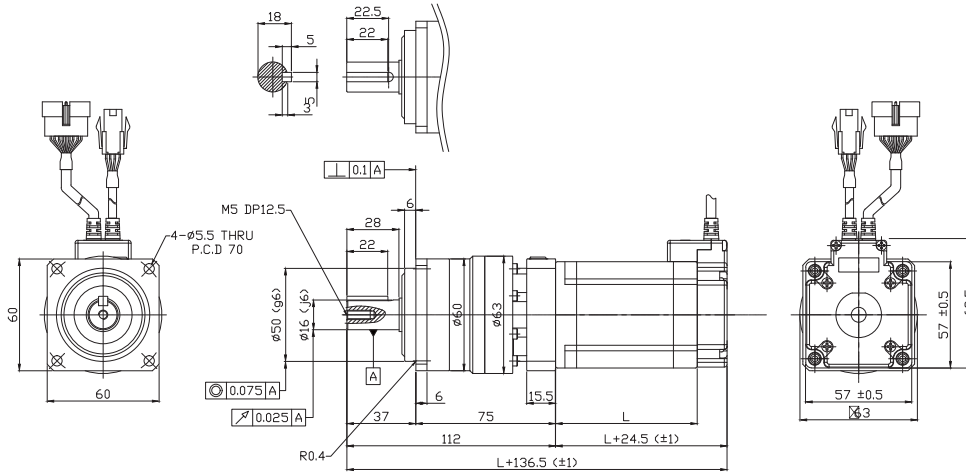


## ● Gearbox Installed Motor Specification and Size

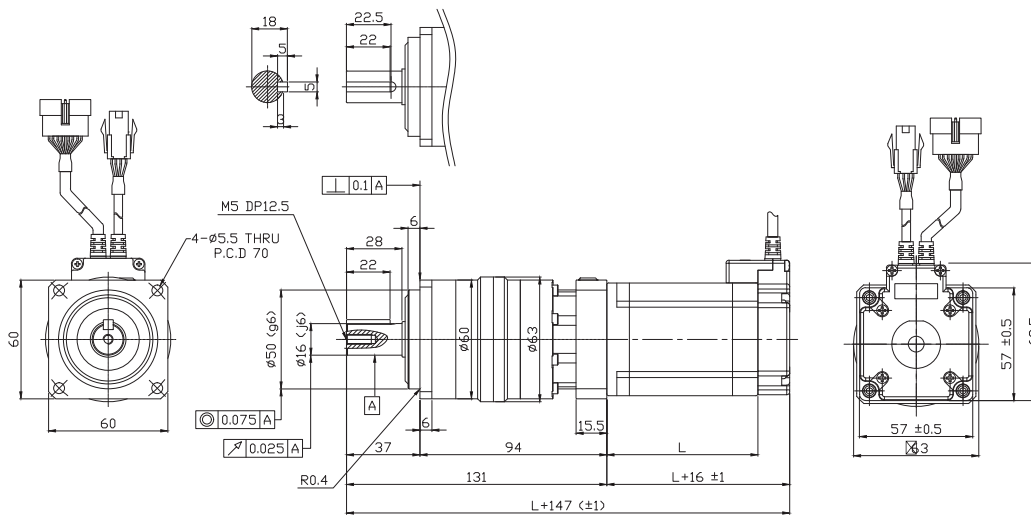
### 4. Motor Size(mm)

# 56

| Package                      | Motor             | Stage        | □Second Stage | L Length (mm) |
|------------------------------|-------------------|--------------|---------------|---------------|
| Ezi-SERVO II-EC-56S-A-PG-PN□ | EzM2-56S-A-PG-PN□ | Single Stage | 3, 5, 8, 10   | 46            |
| Ezi-SERVO II-EC-56M-A-PG-PN□ | EzM2-56M-A-PG-PN□ |              | 3, 5, 8, 10   | 55            |
| Ezi-SERVO II-EC-56L-A-PG-PN□ | EzM2-56L-A-PG-PN□ |              | 3, 5, 8, 10   | 80            |



| Package                      | Motor             | Stage        | □Second Stage  | L Length (mm) |
|------------------------------|-------------------|--------------|----------------|---------------|
| Ezi-SERVO II-EC-56S-A-PG-PN□ | EzM2-56S-A-PG-PN□ | Second Stage | 15, 25, 40, 50 | 46            |
| Ezi-SERVO II-EC-56M-A-PG-PN□ | EzM2-56M-A-PG-PN□ |              | 15, 25, 40, 50 | 55            |
| Ezi-SERVO II-EC-56L-A-PG-PN□ | EzM2-56L-A-PG-PN□ |              | 15, 25, 40, 50 | 80            |

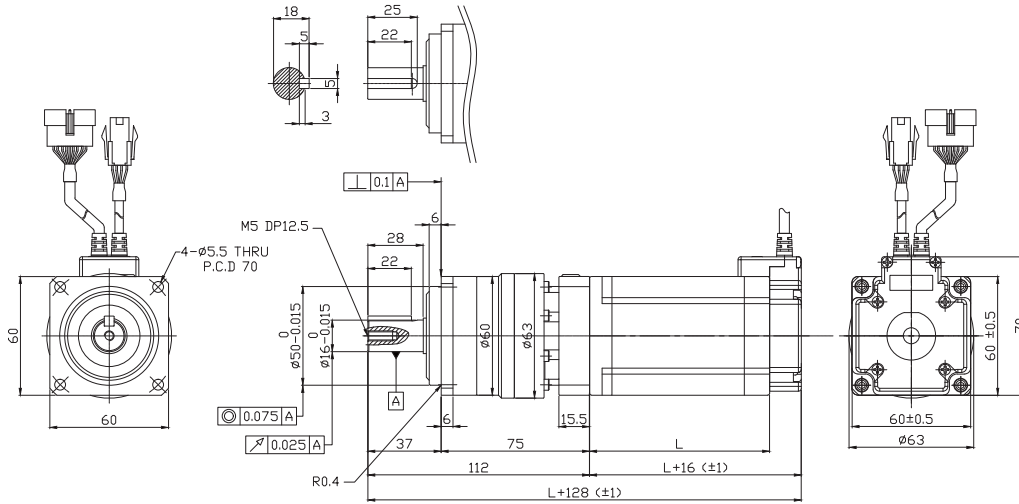


## ● Gearbox Installed Motor Specification and Size

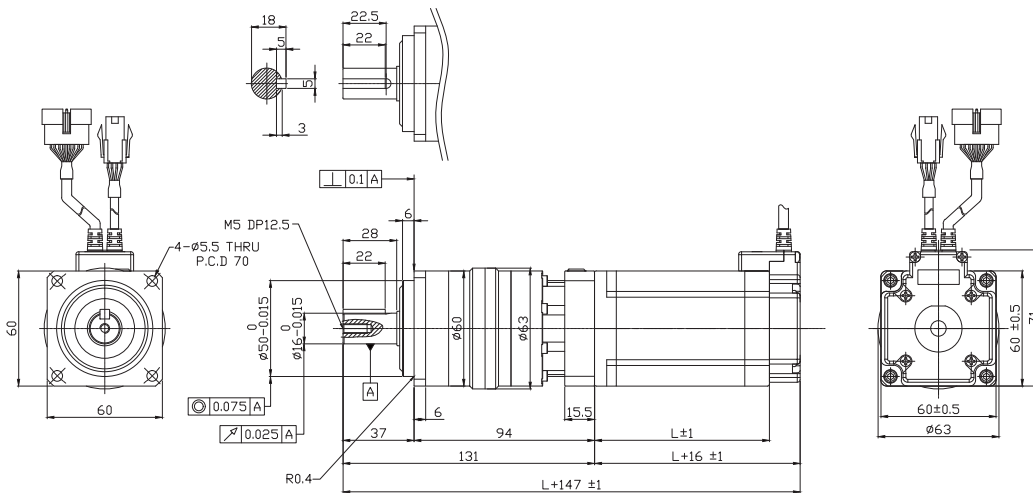
### 4. Motor Size(mm)

# 60

| Package                      | Motor             | Stage        | □Second Stage | L Length (mm) |
|------------------------------|-------------------|--------------|---------------|---------------|
| Ezi-SERVO II-EC-60S-A-PG-PN□ | EzM2-60S-A-PG-PN□ | Single Stage | 3, 5, 8, 10   | 47            |
| Ezi-SERVO II-EC-60M-A-PG-PN□ | EzM2-60M-A-PG-PN□ |              | 3, 5, 8, 10   | 56            |
| Ezi-SERVO II-EC-60L-A-PG-PN□ | EzM2-60L-A-PG-PN□ |              | 3, 5, 8, 10   | 85            |

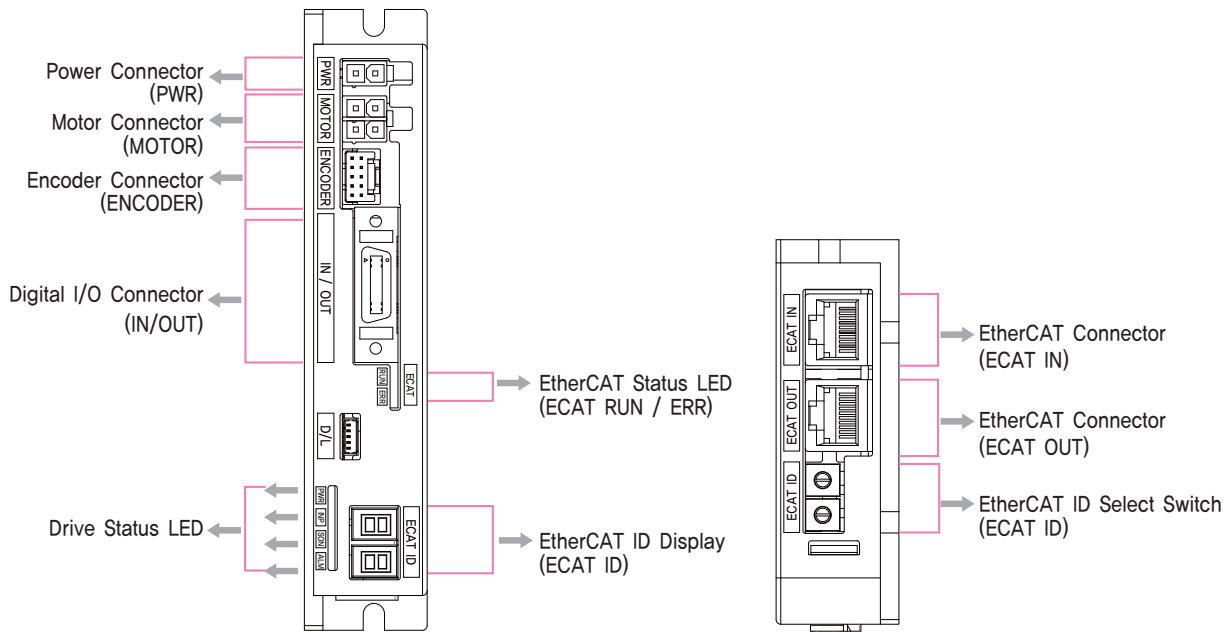


| Package                      | Motor             | Stage        | □Second Stage  | L Length (mm) |
|------------------------------|-------------------|--------------|----------------|---------------|
| Ezi-SERVO II-EC-60S-A-PG-PN□ | EzM2-60S-A-PG-PN□ | Second Stage | 15, 25, 40, 50 | 47            |
| Ezi-SERVO II-EC-60M-A-PG-PN□ | EzM2-60M-A-PG-PN□ |              | 15, 25, 40, 50 | 56            |
| Ezi-SERVO II-EC-60L-A-PG-PN□ | EzM2-60L-A-PG-PN□ |              | 15, 25, 40, 50 | 85            |



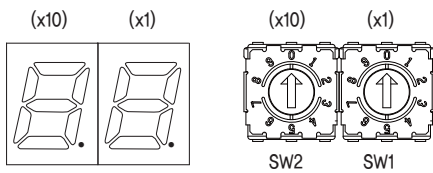


## ● Setting and Operation [Ezi-SERVO II EtherCAT]



### 1. EtherCAT ID Display and Select Switch

There are two Rotary Switches to set value of EtherCAT ID (ECAT Device ID). Switch on the right side indicates the ones' place(X1), and Switch on the left side indicates the tens' place(X10).



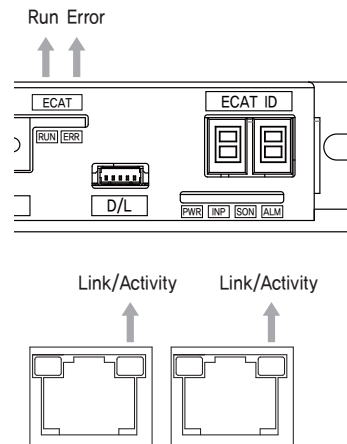
## 2. EtherCAT Status LED

LED indicates communication status of EtherCAT. Link/Activity LED exists on each port of EtherCAT.

| Name | Color | Status       | Explanation             |
|------|-------|--------------|-------------------------|
| Run  | Green | OFF          | State INIT or Power OFF |
|      |       | Blinking     | State PRE-OPERATIONAL   |
|      |       | Single Flash | State SAFE-OPERATIONAL  |
|      |       | ON           | State OPERATIONAL       |
|      |       | Flickering   | State BOOTSTRAP         |

| Name  | Color | Status       | Explanation           |
|-------|-------|--------------|-----------------------|
| Error | Red   | OFF          | No Error or Power OFF |
|       |       | Blinking     | Invalid Configuration |
|       |       | Single Flash | Local Error           |
|       |       | Double Flash | Watchdog Time Out     |

| Name              | Color | Status     | Explanation                       |
|-------------------|-------|------------|-----------------------------------|
| Link/<br>Activity | Green | OFF        | Link not Established              |
|                   |       | ON         | Link Established                  |
|                   |       | Flickering | Link Established and in Operation |



## 3. Drive Status LED

| Indication | Color  | Function                    | ON/OFF Condition   |
|------------|--------|-----------------------------|--|
| PWR        | Green  | Power Input Indication      | LED is turned ON when power is applied   |
| INP        | Yellow | Complete Positioning Motion | Lights On when Positioning error reaches within the preset pulse selected by rotary switch |
| SON        | Orange | Servo On / Off Indication   | Servo On : Lights On, Servo Off : Lights Off   |
| ALM        | Red    | Alarm indication            | Flash when protection function is activated  |

### ◆ Drive Protection Functions

| Error Code*4 | Protection                      | Conditions   |
|--------------|---------------------------------|--|
| E-001        | Over current Error              | The current through power devices in inverter exceeds the limit value                        |
| E-002        | Over speed Error                | Motor speed exceed 3,000rpm  |
| E-003        | Position tracking Error         | Position error value is higher than 90° in motor run state                                   |
| E-004        | Over load Error                 | The motor is continuously operated more than 5 second under a load exceeding the max. torque |
| E-005        | Over temperature Error          | Temperature of inside of drive exceed 85°C   |
| E-006        | Over regenerative voltage Error | Back EMF of motor exceeds limit value*1  |
| E-007        | Motor connect Error             | The power is ON without connection of the motor cable to drive                               |
| E-008        | Encoder connect Error           | There is connection error between drive and encoder  |
| E-009        | Motor voltage Error             | Motor voltage is out of limited value*2  |
| E-010        | In-Position Error               | After operation is finished, a position error occurs   |
| E-011        | System Error                    | Error occurs in drive system   |
| E-012        | ROM Error                       | Error occurs in parameter storage device(ROM)  |
| E-014        | Input voltage Error             | Power source voltage is out of limited value*3   |
| E-015        | Position overflow Error         | Position error value is higher than 90° in motor stop state                                  |

\*1 : Voltage limit of Back-EMF depends on motor model (Please refer to the manual)

\*2 : Limit voltage value of Motor is depends on motor model (Please refer to the manual)

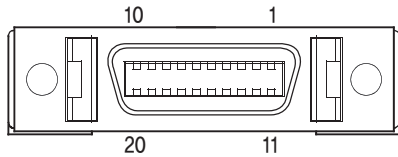
\*3 : Rated value of input voltage to the drive is depends on model (Please refer to the manual)

\*4 : When an alarm occurs, error code is displayed instead of EtherCAT ID on the EtherCAT ID Display (ECAT ID).

#### 4. Input/Output Signal (IN / OUT)

| NO. | Function         | I/O    |
|-----|------------------|--------|
| 1   | LIMIT+           | Input  |
| 2   | LIMIT-           | Input  |
| 3   | ORIGIN           | Input  |
| 4   | Digital Input 1  | Input  |
| 5   | Digital Input 2  | Input  |
| 6   | Digital Input 3  | Input  |
| 7   | Digital Input 4  | Input  |
| 8   | Digital Input 5  | Input  |
| 9   | Digital Input 6  | Input  |
| 10  | Digital Input 7  | Input  |
| 11  | Digital Output 1 | Output |
| 12  | Digital Output 2 | Output |
| 13  | Digital Output 3 | Output |
| 14  | Digital Output 4 | Output |
| 15  | Digital Output 5 | Output |
| 16  | Digital Output 6 | Output |
| 17  | BRAKE+           | Output |
| 18  | BRAKE-           | Output |
| 19  | 24VDC GND        | Input  |
| 20  | 24VDC            | Input  |

※BRAKE function is optional.



#### 6. Motor Connector (MOTOR)

| NO. | Function |
|-----|----------|
| 1   | A Phase  |
| 2   | B Phase  |
| 3   | /A Phase |
| 4   | /B Phase |



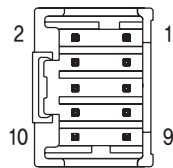
#### 7. Power Connector(PWR)

| NO. | Function   |
|-----|------------|
| 1   | 24VDC ±10% |
| 2   | GND        |



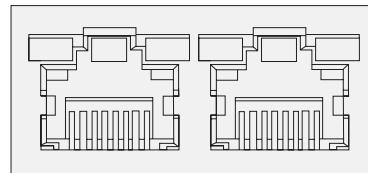
#### 5. Encoder Connector (ENCODER)

| NO. | Function  | I/O    |
|-----|-----------|--------|
| 1   | A+        | Input  |
| 2   | A-        | Input  |
| 3   | B+        | Input  |
| 4   | B-        | Input  |
| 5   | Z+        | Input  |
| 6   | Z-        | Input  |
| 7   | 5VDC      | Output |
| 8   | 5VDC GND  | Output |
| 9   | Frame GND | ----   |
| 10  | Frame GND | ----   |



#### 8. EtherCAT Communication Connector

| NO. | Function | NO.            | Function |
|-----|----------|----------------|----------|
| 1   | TD+      | 6              | RD-      |
| 2   | TD-      | 7              | ----     |
| 3   | RD+      | 8              | ----     |
| 4   | ----     | Connector hood | FG       |
| 5   | ----     |                |          |



## ◆ Connector for Cabling

These connectors are serviced together with Ezi-SERVO II EtherCAT except when purchasing option cables.

### Input/Output Connector (IN/OUT)

| Item      | Specification  | Maker |
|-----------|----------------|-------|
| Connector | 10120-3000PE   | 3M    |
| Shell     | 10320-52FO-008 | 3M    |

### Motor Connector (MOTOR)

| Item     | Specification | Maker |
|----------|---------------|-------|
| Housing  | 5557-04R      | MOLEX |
| Terminal | 5556T         | MOLEX |

### Encoder Connector (ENCODER)

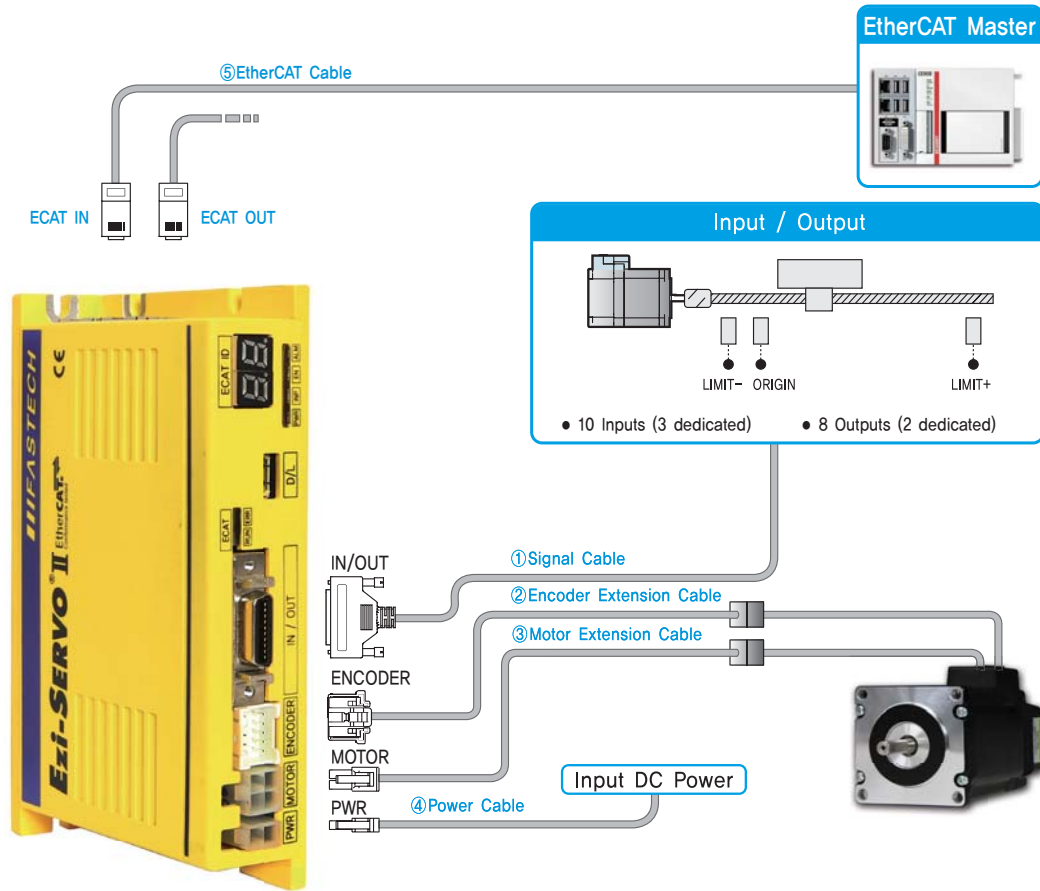
| Item     | Specification | Maker |
|----------|---------------|-------|
| Housing  | 51353-1000    | MOLEX |
| Terminal | 56134-9000    | MOLEX |

### Power Connector (PWR)

| Item     | Specification | Maker |
|----------|---------------|-------|
| Housing  | 5557-02R      | MOLEX |
| Terminal | 5556T         | MOLEX |



## ● System Configuration [Ezi-SERVO II EtherCAT]



| Type            | Signal Cable | Encoder Cable | Motor Cable | Power Cable | EtherCAT Cable |
|-----------------|--------------|---------------|-------------|-------------|----------------|
| Standard Length | -            | 30cm          | 30cm        | -           | -              |
| Max. Length     | 20m          | 20m           | 20m         | 2m          | 100m           |

### 1. Cable Option

#### ① Signal Cable

Available to connect between Ezi-SERVO II EtherCAT and Input/Output signals.

| Item        | Length[m] | Remark       |
|-------------|-----------|--------------|
| CSVN-S-□□□F | □ □ □     | Normal Cable |
| CSVN-S-□□□M | □ □ □     | Robot Cable  |

□ is for Cable Length. The unit is 1m and Max. 20m length.

#### ② Encoder Extension Cable

Available to extended connection between Encoder and Ezi-SERVO II EtherCAT.

| Item        | Length[m] | Remark       |
|-------------|-----------|--------------|
| CSV0-E-□□□F | □ □ □     | Normal Cable |
| CSV0-E-□□□M | □ □ □     | Robot Cable  |

□ is for Cable Length. The unit is 1m and Max. 20m length.

### ③ Motor Extension Cable

Available to extended connection between motor and Ezi-SERVO II EtherCAT.

| Item        | Length[m] | Remark       |
|-------------|-----------|--------------|
| CSVO-M-□□□F | □ □ □     | Normal Cable |
| CSVO-M-□□□M | □ □ □     | Robot Cable  |

□ is for Cable Length. The unit is 1m and Max, 20m length.

### ④ Power Cable

Available to connect between Power and Ezi-SERVO II EtherCAT.

| Item        | Length[m] | Remark       |
|-------------|-----------|--------------|
| CSVO-P-□□□F | □ □ □     | Normal Cable |
| CSVO-P-□□□M | □ □ □     | Robot Cable  |

□ is for Cable Length. The unit is 1m and Max, 2m length.

### ⑤ EtherCAT Cable

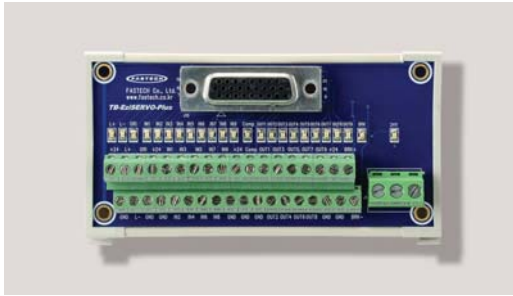
Shielded twisted pair(STP) cable of category 5 or higher.

| Item         | Length[m] | Remark       |
|--------------|-----------|--------------|
| CGNR-EC-001F | 1         | Normal Cable |
| CGNR-EC-002F | 2         |              |
| CGNR-EC-003F | 3         |              |
| CGNR-EC-005F | 5         |              |

## 2. Option

### ① TB-Plus(Interface Board)

Available to connect more conveniently between Input/Output signal and Ezi-SERVO II EtherCAT.



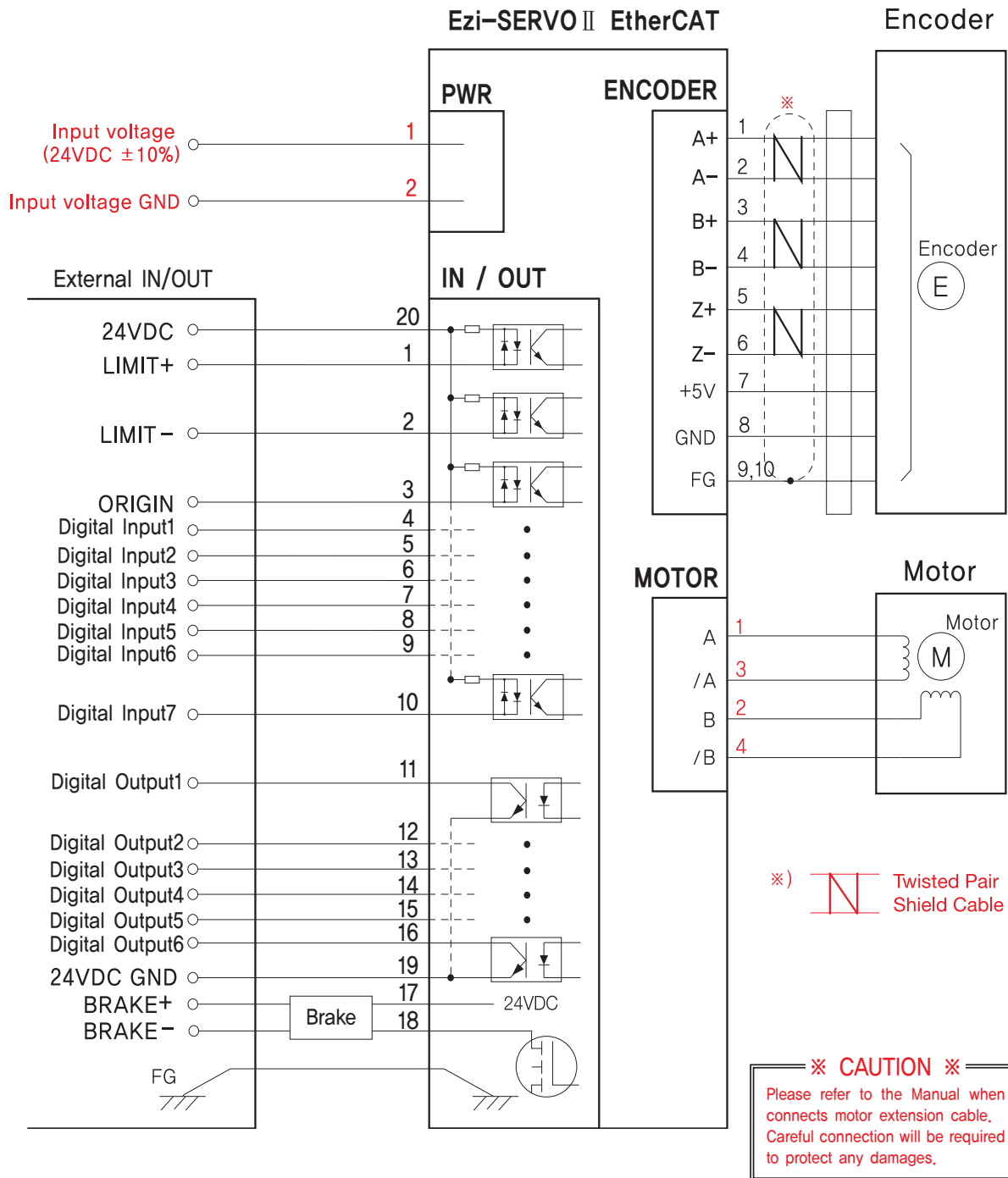
### ② Interface Cable

Available to Connect between TB-Plus Interface Board and Ezi-SERVO II EtherCAT.

| Item        | Length[m] | Remark       |
|-------------|-----------|--------------|
| CIFN-S-□□□F | □ □ □     | Normal Cable |
| CIFN-S-□□□M | □ □ □     | Robot Cable  |

□ is for Cable Length. The unit is 1m and Max, 20m length.

● External Wiring Diagram [Ezi-SERVO II EtherCAT]





*Fast, Accurate, Smooth Motion*

**FASTECH Co., Ltd.**

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