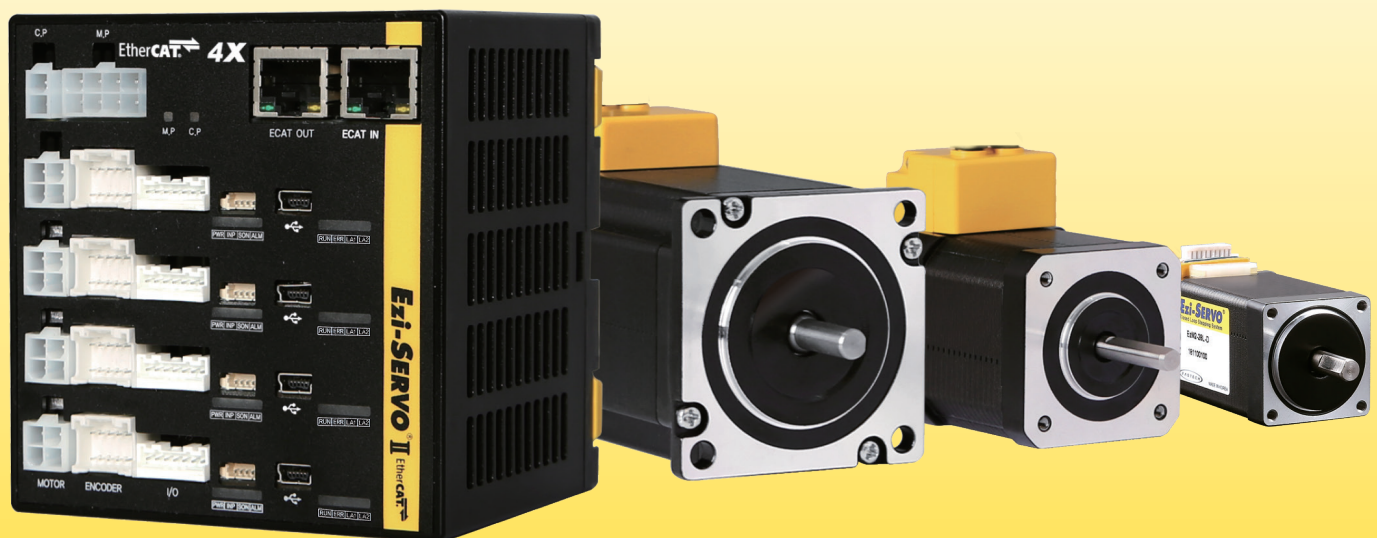


Ezi-SERVO[®] II

Closed Loop Stepping System

- CiA 402 Drive Profile Support
- Closed Loop System
- No Gain Tuning / No Hunting
- Compact 4 Axes Stepping Motor Drive
- Save Space / Reduce Wiring (Reduce Cost)

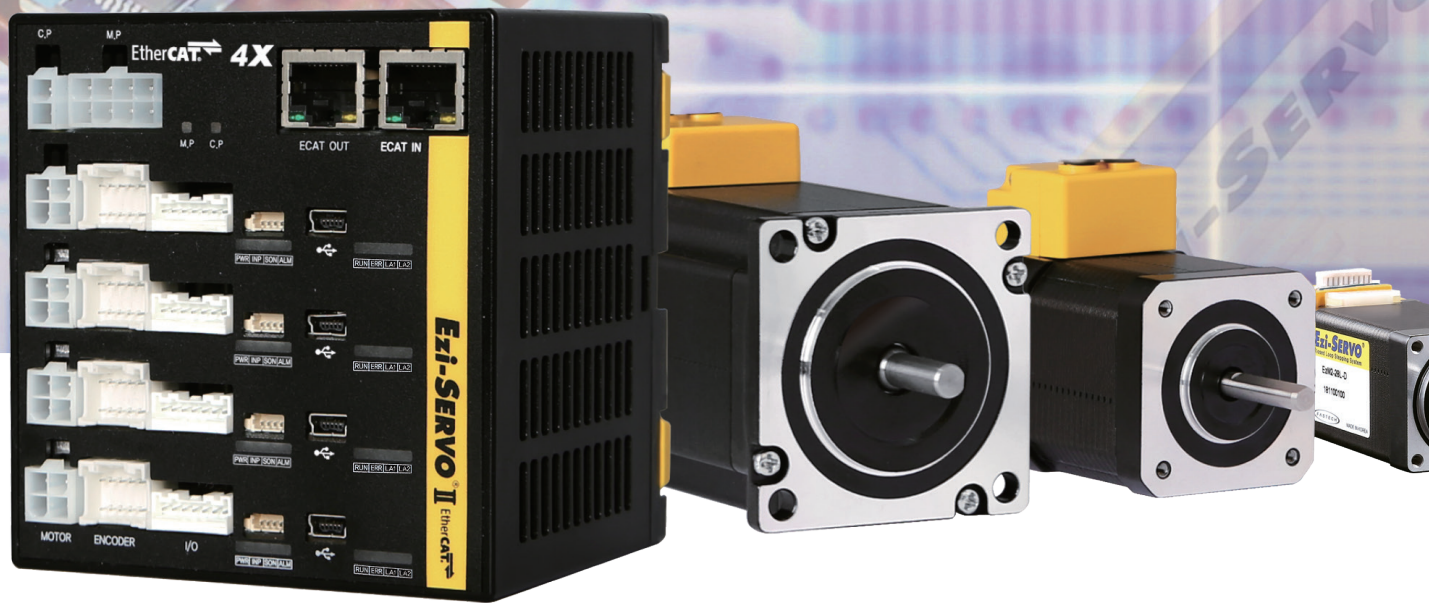
EtherCAT[®] 4X



CE

FASTECH

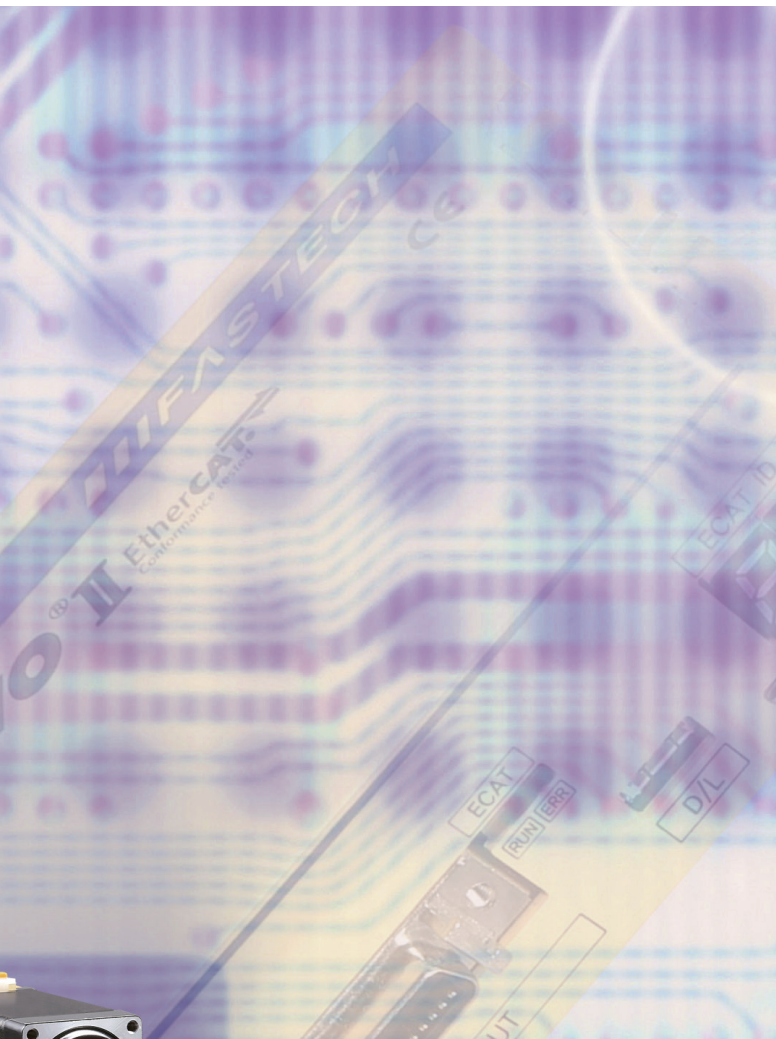
Fast, Accurate, Smooth Motion



Fast, Accurate, Smooth Motion

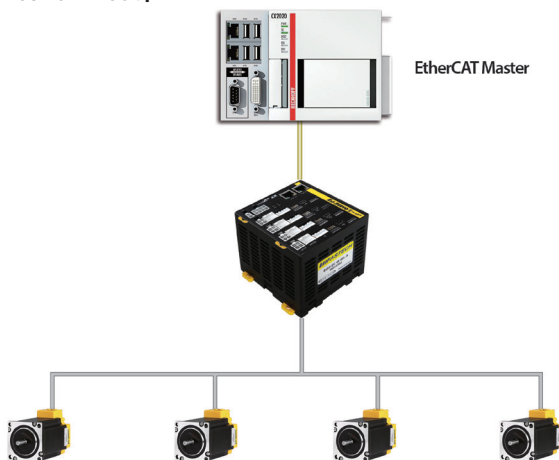
Ezi-SERVO[®] II EtherCAT[®] 4X

Closed Loop Stepping System



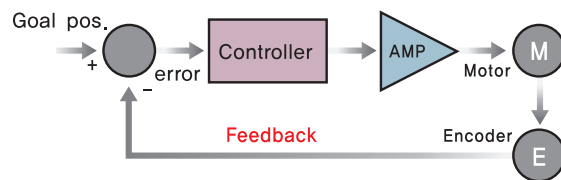
1 EtherCAT Based Motion Control

Ezi-SERVOII EtherCAT 4X is stepping motor control system using EtherCAT, high speed ethernet (100Mbps Full-Duplex) based fieldbus. Ezi-SERVOII EtherCAT 4X is EtherCAT slave module which support CAN application layer over EtherCAT (CoE). CiA 402 Drive Profile implemented. Supported modes are Profile Position Mode, Homing Mode, Cyclic Synchronous Position Mode.



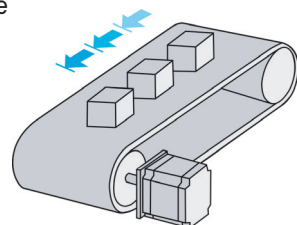
2 Closed Loop System

Ezi-SERVOII is an innovative Closed Loop System that utilizes a high-resolution motor mounted encoder constantly to monitor the current position. The encoder feedback allows the Ezi-SERVOII to update the current position every 50 μ sec. It allows the Ezi-SERVOII 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-SERVOII automatically correct the position by encoder feedback.



3 No Gain Tuning

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-SERVOII 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-SERVOII is optimized for the application and ready to work right out of the box. The Ezi-SERVOII 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-SERVOII 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-SERVOII also performs exceptionally, even under heavy loads and high speeds.

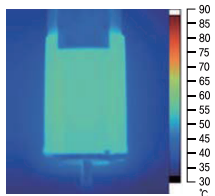


4 Heat Reduction / Energy Saving

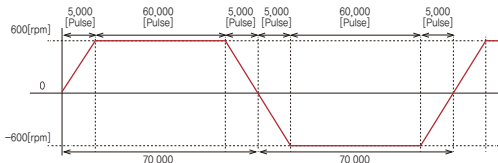
(Motor Current Control according to load)

Ezi-SERVOII automatically controls motor current according to load.

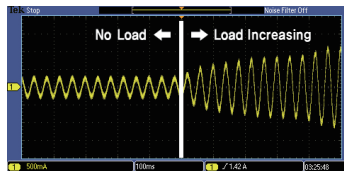
Ezi-SERVOII reduces motor current when motor load is low and increases motor current when load is high. By optimizing the motor current, motor heat can be minimized and energy can be saved.



Motor temperature [Measured by Thermal Imaging Camera]



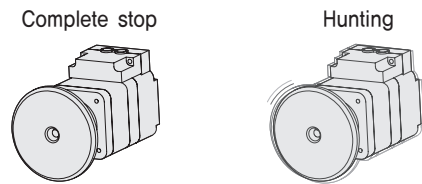
Condition to measure the motor temperature
[4hours operation, Motor surface temperature saturation]



Example of the Motor Current Control according to load

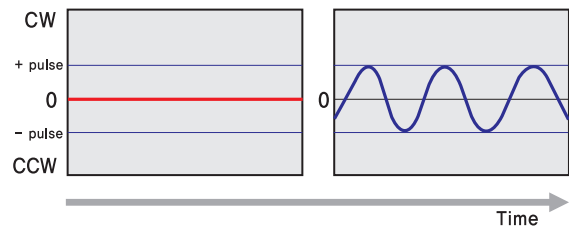
6 No Hunting

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-SERVOII Motion Control System. Ezi-SERVOII 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.



Ezi-SERVO II

Servo motor

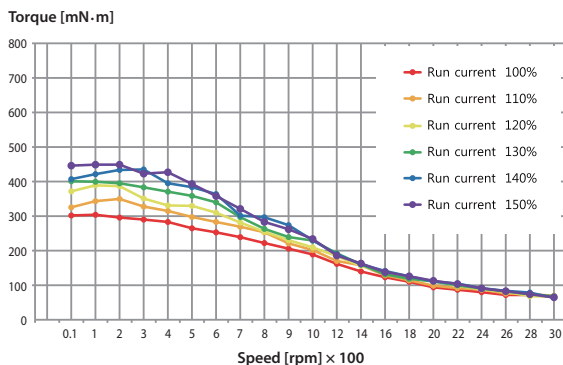


5 Torque Improvement

(Motor Current Setting)

Ezi-SERVOII can increase the motor current up to 150% by setting the Run Current by parameter. Therefore acceleration and deceleration characteristics and torque characteristics at low speed can be increased.

Ezi-SERVOII can improve the torque in the low speed range by about 30%.

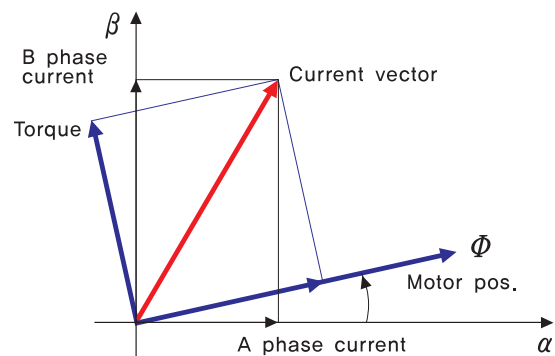


※ The torque at low speed is improved about 30%.

Measured Condition : Drive = Ezi-SERVO II-EC-4X-42L
Motor Voltage = 24VDC
Input Voltage = 24VDC

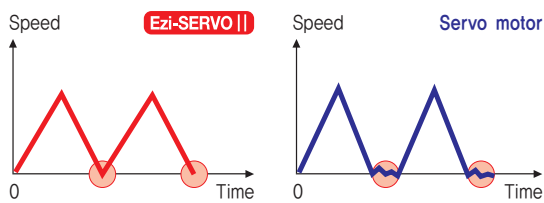
7 Smooth and Accurate

Ezi-SERVOII is a high-precision servo drive, using a high-resolution encoder with 20,000 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.



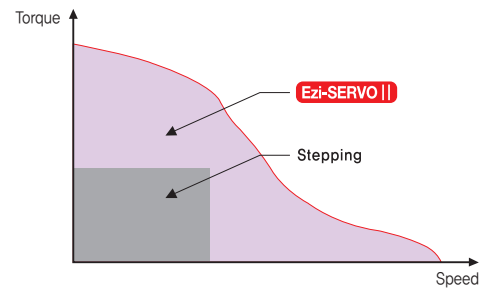
8 Fast Response

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 called settling time between the command input signals and the resultant motion because of the constant monitoring of the current position.



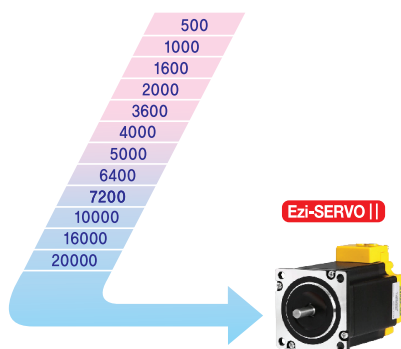
10 High Torque

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.



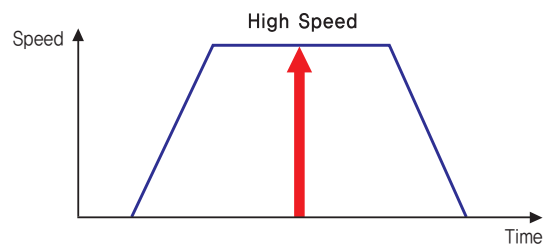
9 High Resolution

The unit of the position command can be divided precisely. (Max. 20,000 pulses/revolution)



11 High Speed

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



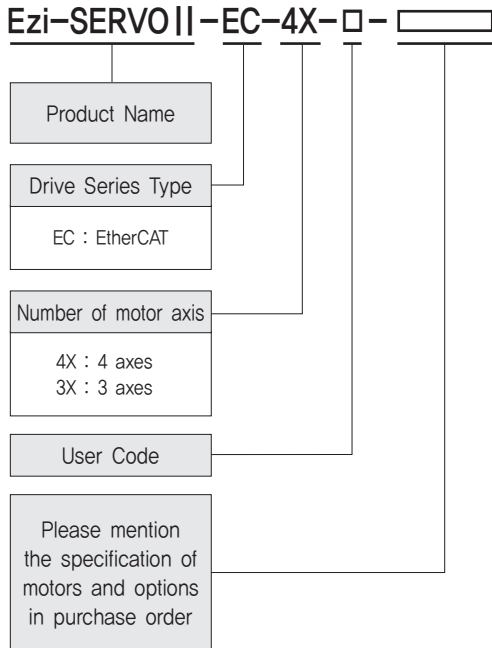
Advantages over Open-Loop Control Stepping Drive

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 II 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 stepping drivers use a constant current control at all speed ranges without considering load variations.

Advantages over Servo Motor Controller

1. No gain tuning. (Automatic gain adjustment in response to a load change)
2. Maintains the stable holding position without oscillation after completion of 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.

● Ezi-SERVO II EtherCAT 4X Part Numbering



● Combination with Standard Motor / Brake

Ezi-SERVO II EtherCAT 4X can use up to 4 motors in one drive. Available motors include Standard Motor, Motor with Brake and Motor with Gearbox. Different Motor Number can be used for each axis. Refer to the Motor Model Number below.

| Motor Model Number | Motor Model Number | Motor Model Number with Brake |
|--------------------|--------------------|-------------------------------|
| EzM2-20M-F | EzM2-56S-A | EzM2-42S-A-BK |
| EzM2-20L-F | EzM2-56S-B | EzM2-42S-B-BK |
| EzM2-28S-D | EzM2-56M-A | EzM2-42M-A-BK |
| EzM2-28SM-D | EzM2-56M-B | EzM2-42M-B-BK |
| EzM2-28M-D | EzM2-56L-A | EzM2-42L-A-BK |
| EzM2-28MM-D | EzM2-56L-B | EzM2-42L-B-BK |
| EzM2-28L-D | EzM2-60S-A | EzM2-42XL-A-BK |
| EzM2-28LM-D | EzM2-60S-B | EzM2-42XL-B-BK |
| EzM2-35M-D | EzM2-60M-A | EzM2-56S-A-BK |
| EzM2-35MM-D | EzM2-60M-B | EzM2-56S-B-BK |
| EzM2-35L-D | EzM2-60L-A | EzM2-56M-A-BK |
| EzM2-35LM-D | EzM2-60L-B | EzM2-56M-B-BK |
| EzM2-42S-A | | EzM2-56L-A-BK |
| EzM2-42S-B | | EzM2-56L-B-BK |
| EzM2-42M-A | | EzM2-60S-A-BK |
| EzM2-42M-B | | EzM2-60S-B-BK |
| EzM2-42L-A | | EzM2-60M-A-BK |
| EzM2-42L-B | | EzM2-60M-B-BK |
| EzM2-42XL-A | | EzM2-60L-A-BK |
| EzM2-42XL-B | | EzM2-60L-B-BK |

* When places an order for Stopper type 28mm motor, please write "M" additionally after motor length of unit part number.(Ex: EzM2-28LM-D, EzM2-35LM-D)

● Motor Model Number with Gearbox

Ezi-SERVOII EtherCAT 4X can use up to 4 motors in one drive. Available motors include Standard Motor, Motor with Brake and Motor with Gearbox. Different Motor Number can be used for each axis. Refer to the Motor Model Number below.

| Motor Model Number | Reduction gear ratio |
|--------------------|----------------------|
| EzM2-42S-A-PN3 | 1:3 |
| EzM2-42S-B-PN3 | |
| EzM2-42S-A-PN5 | 1:5 |
| EzM2-42S-B-PN5 | |
| EzM2-42S-A-PN8 | 1:8 |
| EzM2-42S-B-PN8 | |
| EzM2-42S-A-PN10 | 1:10 |
| EzM2-42S-B-PN10 | |
| EzM2-42S-A-PN15 | 1:15 |
| EzM2-42S-B-PN15 | |
| EzM2-42S-A-PN25 | 1:25 |
| EzM2-42S-B-PN25 | |
| EzM2-42S-A-PN40 | 1:40 |
| EzM2-42S-B-PN40 | |
| EzM2-42S-A-PN50 | 1:50 |
| EzM2-42S-B-PN50 | |
| EzM2-42M-A-PN3 | 1:3 |
| EzM2-42M-B-PN3 | |
| EzM2-42M-A-PN5 | 1:5 |
| EzM2-42M-B-PN5 | |
| EzM2-42M-A-PN8 | 1:8 |
| EzM2-42M-B-PN8 | |
| EzM2-42M-A-PN10 | 1:10 |
| EzM2-42M-B-PN10 | |
| EzM2-42M-A-PN15 | 1:15 |
| EzM2-42M-B-PN15 | |
| EzM2-42M-A-PN25 | 1:25 |
| EzM2-42M-B-PN25 | |
| EzM2-42M-A-PN40 | 1:40 |
| EzM2-42M-B-PN40 | |
| EzM2-42M-A-PN50 | 1:50 |
| EzM2-42M-B-PN50 | |
| EzM2-42L-A-PN3 | 1:3 |
| EzM2-42L-B-PN3 | |
| EzM2-42L-A-PN5 | 1:5 |
| EzM2-42L-B-PN5 | |
| EzM2-42L-A-PN8 | 1:8 |
| EzM2-42L-B-PN8 | |
| EzM2-42L-A-PN10 | 1:10 |
| EzM2-42L-B-PN10 | |
| EzM2-42L-A-PN15 | 1:15 |
| EzM2-42L-B-PN15 | |
| EzM2-42L-A-PN25 | 1:25 |
| EzM2-42L-B-PN25 | |
| EzM2-42L-A-PN40 | 1:40 |
| EzM2-42L-B-PN40 | |
| EzM2-42L-A-PN50 | 1:50 |
| EzM2-42L-B-PN50 | |
| EzM2-42XL-A-PN3 | 1:3 |
| EzM2-42XL-B-PN3 | |
| EzM2-42XL-A-PN5 | 1:5 |
| EzM2-42XL-B-PN5 | |
| EzM2-42XL-A-PN8 | 1:8 |
| EzM2-42XL-B-PN8 | |
| EzM2-42XL-A-PN10 | 1:10 |
| EzM2-42XL-B-PN10 | |
| EzM2-42XL-A-PN15 | 1:15 |
| EzM2-42XL-B-PN15 | |
| EzM2-42XL-A-PN25 | 1:25 |
| EzM2-42XL-B-PN25 | |
| EzM2-42XL-A-PN40 | 1:40 |
| EzM2-42XL-B-PN40 | |
| EzM2-42XL-A-PN50 | 1:50 |
| EzM2-42XL-B-PN50 | |

| Motor Model Number | Reduction gear ratio |
|--------------------|----------------------|
| EzM2-56S-A-PN3 | 1:3 |
| EzM2-56S-B-PN3 | |
| EzM2-56S-A-PN5 | 1:5 |
| EzM2-56S-B-PN5 | |
| EzM2-56S-A-PN8 | 1:8 |
| EzM2-56S-B-PN8 | |
| EzM2-56S-A-PN10 | 1:10 |
| EzM2-56S-B-PN10 | |
| EzM2-56S-A-PN15 | 1:15 |
| EzM2-56S-B-PN15 | |
| EzM2-56S-A-PN25 | 1:25 |
| EzM2-56S-B-PN25 | |
| EzM2-56S-A-PN40 | 1:40 |
| EzM2-56S-B-PN40 | |
| EzM2-56S-A-PN50 | 1:50 |
| EzM2-56S-B-PN50 | |
| EzM2-56M-A-PN3 | 1:3 |
| EzM2-56M-B-PN3 | |
| EzM2-56M-A-PN5 | 1:5 |
| EzM2-56M-B-PN5 | |
| EzM2-56M-A-PN8 | 1:8 |
| EzM2-56M-B-PN8 | |
| EzM2-56M-A-PN10 | 1:10 |
| EzM2-56M-B-PN10 | |
| EzM2-56M-A-PN15 | 1:15 |
| EzM2-56M-B-PN15 | |
| EzM2-56M-A-PN25 | 1:25 |
| EzM2-56M-B-PN25 | |
| EzM2-56M-A-PN40 | 1:40 |
| EzM2-56M-B-PN40 | |
| EzM2-56M-A-PN50 | 1:50 |
| EzM2-56M-B-PN50 | |
| EzM2-56L-A-PN3 | 1:3 |
| EzM2-56L-B-PN3 | |
| EzM2-56L-A-PN5 | 1:5 |
| EzM2-56L-B-PN5 | |
| EzM2-56L-A-PN8 | 1:8 |
| EzM2-56L-B-PN8 | |
| EzM2-56L-A-PN10 | 1:10 |
| EzM2-56L-B-PN10 | |
| EzM2-56L-A-PN15 | 1:15 |
| EzM2-56L-B-PN15 | |
| EzM2-56L-A-PN25 | 1:25 |
| EzM2-56L-B-PN25 | |
| EzM2-56L-A-PN40 | 1:40 |
| EzM2-56L-B-PN40 | |
| EzM2-56L-A-PN50 | 1:50 |
| EzM2-56L-B-PN50 | |

| Motor Model Number | Reduction gear ratio |
|--------------------|----------------------|
| EzM2-60S-A-PN3 | 1:3 |
| EzM2-60S-B-PN3 | |
| EzM2-60S-A-PN5 | 1:5 |
| EzM2-60S-B-PN5 | |
| EzM2-60S-A-PN8 | 1:8 |
| EzM2-60S-B-PN8 | |
| EzM2-60S-A-PN10 | 1:10 |
| EzM2-60S-B-PN10 | |
| EzM2-60S-A-PN15 | 1:15 |
| EzM2-60S-B-PN15 | |
| EzM2-60S-A-PN25 | 1:25 |
| EzM2-60S-B-PN25 | |
| EzM2-60S-A-PN40 | 1:40 |
| EzM2-60S-B-PN40 | |
| EzM2-60S-A-PN50 | 1:50 |
| EzM2-60S-B-PN50 | |
| EzM2-60M-A-PN3 | 1:3 |
| EzM2-60M-B-PN3 | |
| EzM2-60M-A-PN5 | 1:5 |
| EzM2-60M-B-PN5 | |
| EzM2-60M-A-PN8 | 1:8 |
| EzM2-60M-B-PN8 | |
| EzM2-60M-A-PN10 | 1:10 |
| EzM2-60M-B-PN10 | |
| EzM2-60M-A-PN15 | 1:15 |
| EzM2-60M-B-PN15 | |
| EzM2-60M-A-PN25 | 1:25 |
| EzM2-60M-B-PN25 | |
| EzM2-60M-A-PN40 | 1:40 |
| EzM2-60M-B-PN40 | |
| EzM2-60M-A-PN50 | 1:50 |
| EzM2-60M-B-PN50 | |
| EzM2-60L-A-PN3 | 1:3 |
| EzM2-60L-B-PN3 | |
| EzM2-60L-A-PN5 | 1:5 |
| EzM2-60L-B-PN5 | |
| EzM2-60L-A-PN8 | 1:8 |
| EzM2-60L-B-PN8 | |
| EzM2-60L-A-PN10 | 1:10 |
| EzM2-60L-B-PN10 | |
| EzM2-60L-A-PN15 | 1:15 |
| EzM2-60L-B-PN15 | |
| EzM2-60L-A-PN25 | 1:25 |
| EzM2-60L-B-PN25 | |
| EzM2-60L-A-PN40 | 1:40 |
| EzM2-60L-B-PN40 | |
| EzM2-60L-A-PN50 | 1:50 |
| EzM2-60L-B-PN50 | |

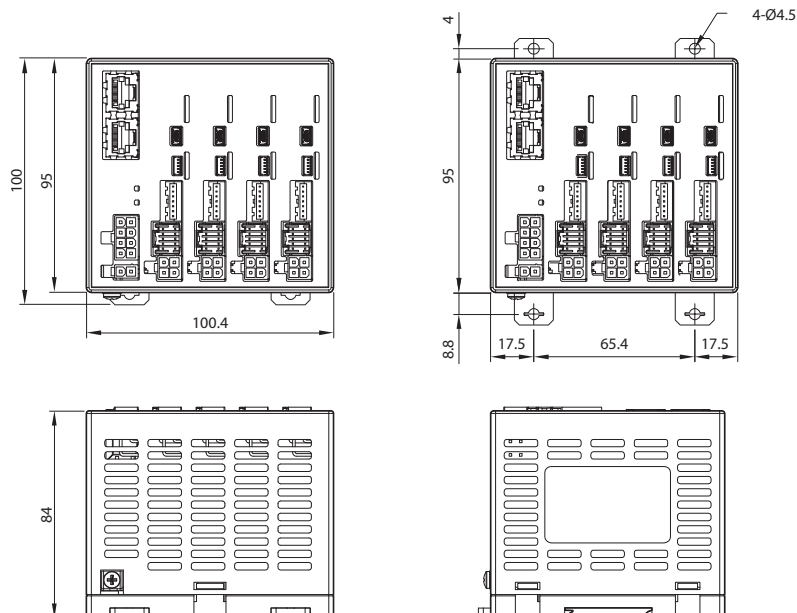
● Specifications of Drive

| Motor Model | EzM2-20 series | EzM2-28 series | EzM2-35 series | EzM2-42 series | EzM2-56 series | EzM2-60 series |
|---------------------|---------------------------------------|---|----------------|----------------|----------------|----------------|
| Driver Model | EzS2-EC-4X, 3X series | | | | | |
| Input Voltage | 24VDC \pm 10% | | | | | |
| Control Method | Closed loop control with 32bit MCU | | | | | |
| Current Consumption | Max 500mA/axis (Except motor current) | | | | | |
| Operating Condition | Ambient Temperature | <ul style="list-style-type: none"> · In Use: 0~50°C · In Storage: -20~70°C | | | | |
| | Humidity | <ul style="list-style-type: none"> · In Use: 35~85% RH (Non-Condensing) · In Storage: 10~90% RH (Non-Condensing) | | | | |
| | Vib. Resist. | 0,5g | | | | |
| Function | Rotation Speed | 0~3,000 [rpm] *1 | | | | |
| | Resolution [ppr] | 4,000/Rev. Encoder model: 500 1,000 1,600 2,000 3,600 5,000 6,400 7,200 10,000 4,000 10,000/Rev. Encoder model: 500 1,000 1,600 2,000 3,600 5,000 6,400 7,200 10,000 16,000/Rev. Encoder model: 500 1,000 1,600 2,000 3,600 5,000 6,400 7,200 10,000 16,000 20,000/Rev. Encoder model: 500 1,000 1,600 2,000 3,600 5,000 6,400 7,200 10,000 20,000 (Selectable by parameter) *2 | | | | |
| | Protection Functions | Over Current Error, Over Speed Error, Position Tracking Error, Over Load Error, Over Temperature Error, Over Regenerated Voltage Error, Motor Connect Error, Encoder Connect 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 (CiA 402 Drive Profile), FoE (Firmware Download) | | | | |
| | Supported Mode | Profile Position Mode, Homing Mode, Cyclic Synchronous Position Mode | | | | |
| | Synchronization | Free Run, SM Event, DC SYNC Event | | | | |
| I/O Signal | Input Signals | 3 dedicated inputs (LIMIT+, LIMIT-, ORIGIN) | | | | |
| | Output Signals | Brake | | | | |

*1 : Up to the resolution of 10,000[ppr], maximum speed can be reached by 3,000[rpm] and with the resolution more than 10,000[ppr], maximum speed shall be reduced accordingly.

*2 : When selected resolution is more than encoder resolution, motor shall be operated by microstep between pulses.

● Dimensions of Drive [mm]



※ Can be installed on DIN Rail, (35mm)

※ Outer dimension of 3X drive is the same as 4X.

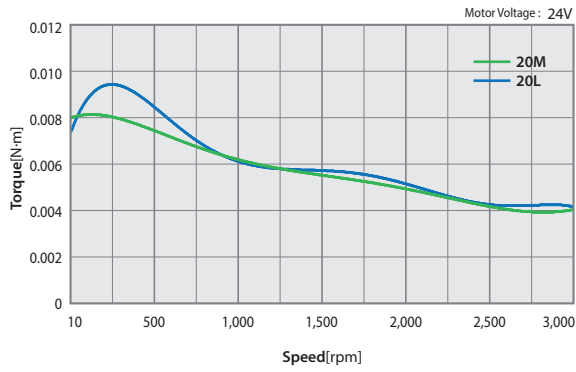
● Specifications of Motor

| MODEL | | EzM2-20 series | | EzM2-28 series | | | EzM2-35 series | | EzM2-42 series | | | | | |
|--|--|-------------------|-------------------------|----------------|-------|-------|----------------|------|----------------|------|------|-----|------|----|
| | | UNIT | 20M | 20L | 28S | 28M | 28L | 35M | 35L | 42S | 42M | 42L | 42XL | |
| DRIVE METHOD | | – | BI-POLAR | | | | | | | | | | | |
| NUMBER OF PHASES | | – | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | | |
| CURRENT per PHASE | | A | 0,5 | 0,5 | 0,95 | 0,95 | 0,95 | 1,5 | 1,5 | 1,2 | 1,2 | 1,2 | 1,2 | |
| HOLDING TORQUE | | N·m | 0,016 | 0,025 | 0,069 | 0,098 | 0,118 | 0,13 | 0,23 | 0,32 | 0,44 | 0,5 | 0,65 | |
| ROTOR INERTIA | | g·cm ² | 2,5 | 3,3 | 9,0 | 13 | 18 | 15 | 20 | 35 | 54 | 77 | 114 | |
| WEIGHTS | | g | 80 | 104 | 147 | 204 | 232 | 194 | 226 | 294 | 357 | 426 | 564 | |
| LENGTH(L) | | mm | 28 | 38 | 32 | 45 | 50 | 32 | 36 | 34 | 40 | 48 | 60 | |
| PERMISSIBLE OVERHUNG LOAD (DISTANCE FROM END OF SHAFT) | | 3mm | N | 18 | 18 | 30 | 30 | 30 | 22 | 22 | 22 | 22 | 22 | |
| | | 8mm | | 30 | 30 | 38 | 38 | 38 | 26 | 26 | 26 | 26 | 26 | |
| | | 13mm | | – | – | 53 | 53 | 53 | 33 | 33 | 33 | 33 | 33 | 33 |
| | | 18mm | | – | – | – | – | – | 46 | 46 | 46 | 46 | 46 | 46 |
| PERMISSIBLE THRUST LOAD | | N | Lower than motor weight | | | | | | | | | | | |
| INSULATION RESISTANCE | | Mohm | 100 MIN.(at 500VDC) | | | | | | | | | | | |
| INSULATION CLASS | | – | CLASS B(130°C) | | | | | | | | | | | |
| OPERATING TEMPERATURE | | °C | 0 to 55 | | | | | | | | | | | |

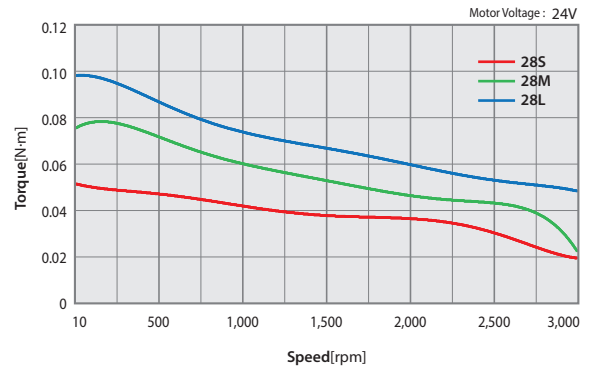
| MODEL | | EzM2-56 series | | | EzM2-60 series | | | | |
|--|--|-------------------|-------------------------|-----|----------------|------|------|------|-----|
| | | UNIT | 56S | 56M | 56L | 60S | 60M | 60L | |
| DRIVE METHOD | | – | BI-POLAR | | | | | | |
| NUMBER OF PHASES | | – | 2 | 2 | 2 | 2 | 2 | 2 | |
| CURRENT per PHASE | | A | 3,0 | 3,0 | 3,0 | 4,0 | 4,0 | 4,0 | |
| HOLDING TORQUE | | N·m | 0,64 | 1,0 | 1,5 | 0,88 | 1,28 | 2,4 | |
| ROTOR INERTIA | | g·cm ² | 180 | 280 | 520 | 240 | 490 | 690 | |
| WEIGHTS | | g | 608 | 784 | 1230 | 693 | 856 | 1419 | |
| LENGTH(L) | | mm | 46 | 55 | 80 | 47 | 56 | 85 | |
| PERMISSIBLE OVERHUNG LOAD (DISTANCE FROM END OF SHAFT) | | 3mm | N | 52 | 52 | 52 | 70 | 70 | 70 |
| | | 8mm | | 65 | 65 | 65 | 87 | 87 | 87 |
| | | 13mm | | 85 | 85 | 85 | 114 | 114 | 114 |
| | | 18mm | | 123 | 123 | 123 | 165 | 165 | 165 |
| PERMISSIBLE THRUST LOAD | | N | Lower than motor weight | | | | | | |
| INSULATION RESISTANCE | | Mohm | 100 MIN.(at 500VDC) | | | | | | |
| INSULATION CLASS | | – | CLASS B(130°C) | | | | | | |
| OPERATING TEMPERATURE | | °C | 0 to 55 | | | | | | |

Torque Characteristics of Motor

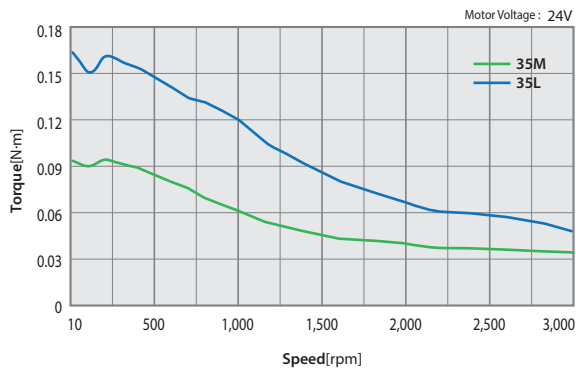
Ezi-SERVOII-EC-4X-20 series



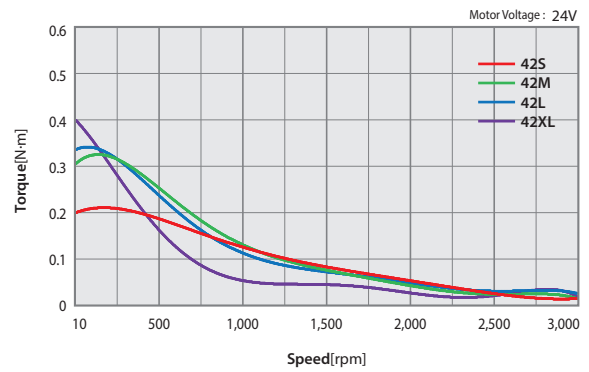
Ezi-SERVOII-EC-4X-28 series



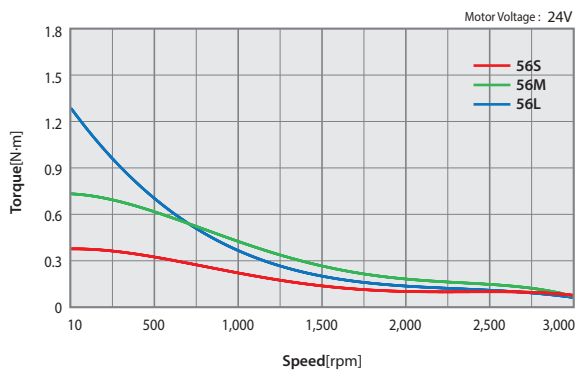
Ezi-SERVOII-EC-4X-35 series



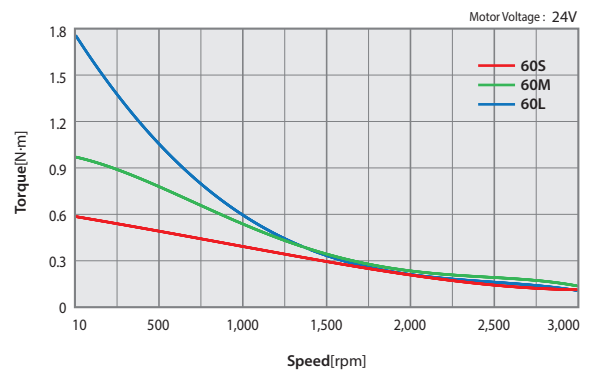
Ezi-SERVOII-EC-4X-42 series



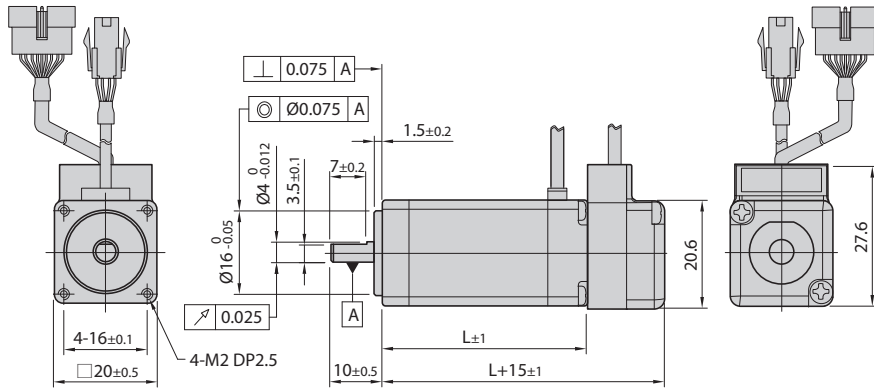
Ezi-SERVOII-EC-4X-56 series



Ezi-SERVOII-EC-4X-60 series

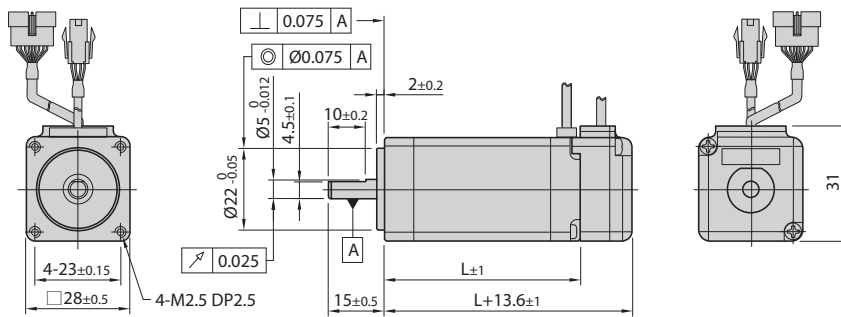


● Dimensions of Motor [mm]



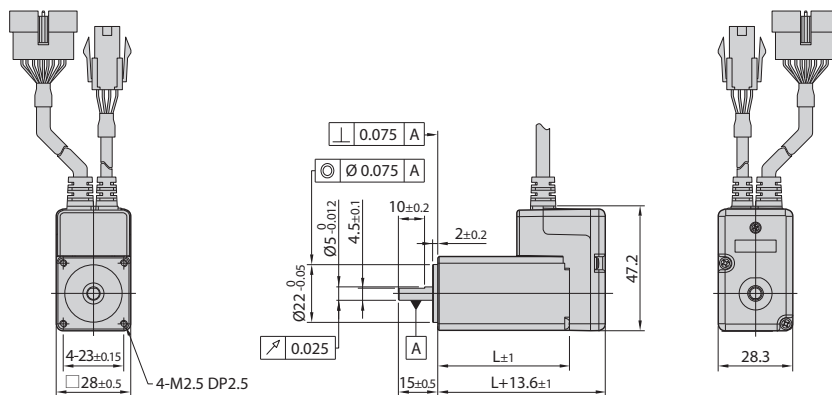
20mm

| Model name | Length(L) |
|------------|-----------|
| EzM2-20M | 28 |
| EzM2-20L | 38 |



28mm

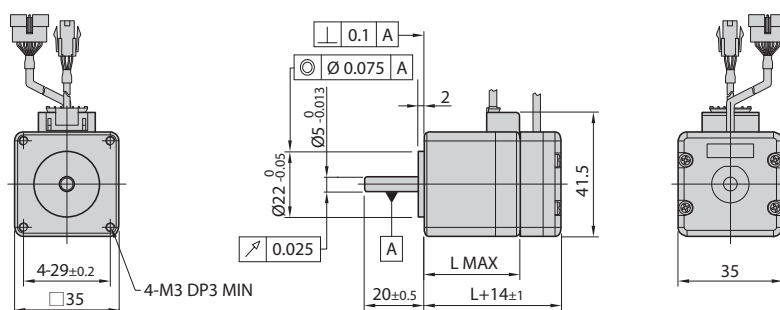
| Model name | Length(L) |
|------------|-----------|
| EzM2-28S | 32 |
| EzM2-28M | 45 |
| EzM2-28L | 50 |



28mm (Stopper type)

| Model name | Length(L) |
|------------|-----------|
| EzM2-28SM | 32 |
| EzM2-28MM | 45 |
| EzM2-28LM | 50 |

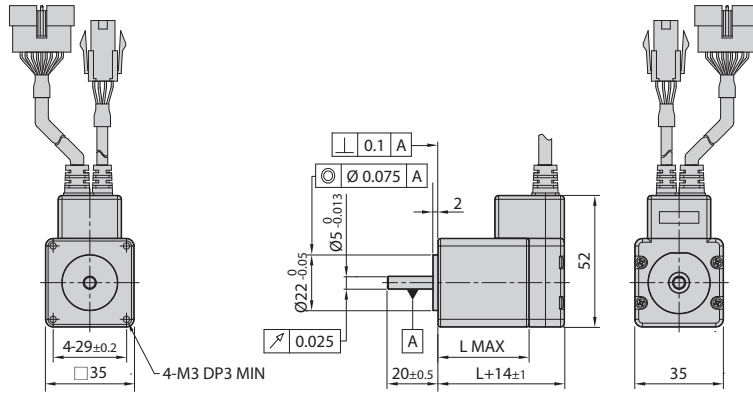
※ When ordering 28mm Stopper type of motor, please add "M" after standard motor model number.



35mm

| Model name | Length(L) |
|------------|-----------|
| EzM2-35M | 26 |
| EzM2-35L | 38 |

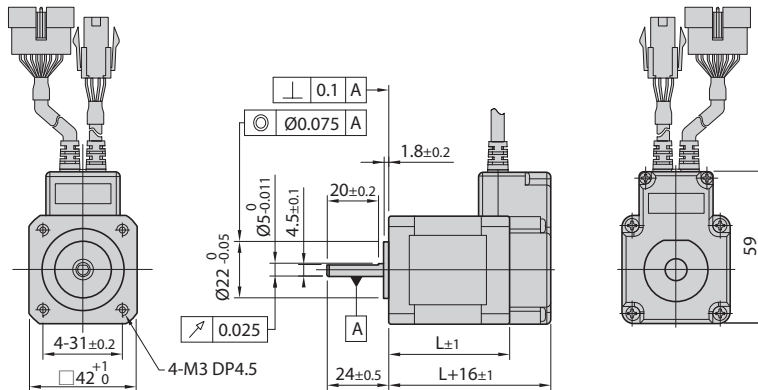
● Dimensions of Motor [mm]



35mm (Stopper type)

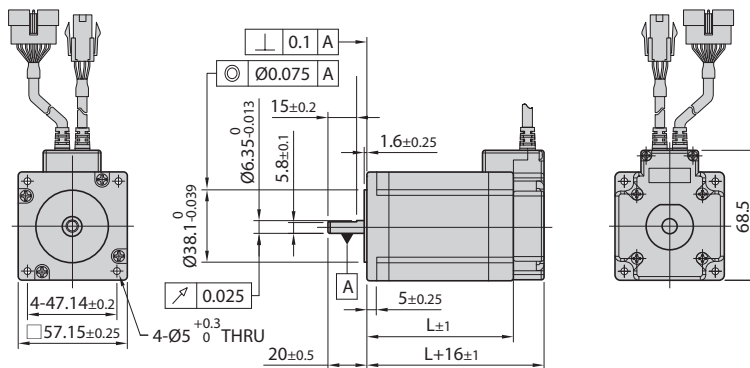
| Model name | Length(L) |
|------------|-----------|
| EzM2-35MM | 32 |
| EzM2-35LM | 36 |

※ When ordering 35mm Stopper type of motor, please add "M" after standard motor model number.



42mm

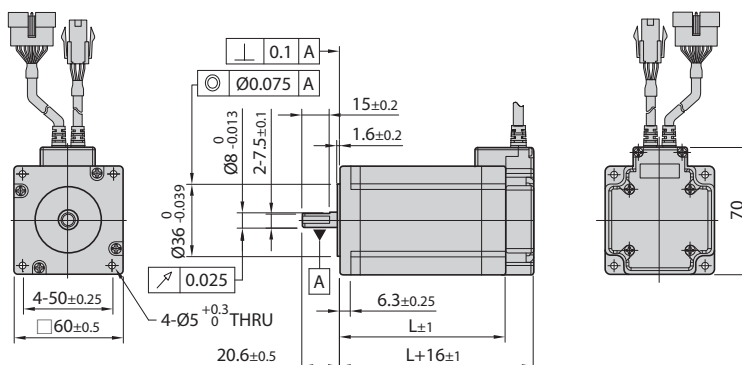
| Model name | Length(L) |
|------------|-----------|
| EzM2-42S | 34 |
| EzM2-42M | 40 |
| EzM2-42L | 48 |
| EzM2-42XL | 60 |



56mm

| Model name | Length(L) |
|------------|-----------|
| EzM2-56S | 46 |
| EzM2-56M | 55 |
| EzM2-56L | 80 |

※ There are 2 kinds size of front shaft diameter for EzM2-56 series as Ø6.35 and Ø8.0.



60mm

| Model name | Length(L) |
|------------|-----------|
| EzM2-60S | 47 |
| EzM2-60M | 56 |
| EzM2-60L | 85 |

● Specifications of Motor with Brake

| Motor Model Number | Electronic Brake | | | | | Motor Unit Weight [g] | Permitted Overhung Load [N] | | | | Permitted Thrust Load [N] | |
|--------------------|-------------------------|-------------------|-------------------|-----------------------|--------------------------------|-----------------------|------------------------------|----|----|-----|----------------------------------|-----|
| | Type | Voltage Input [V] | Rated Current [A] | Power Consumption [W] | Statical Friction Torque [N·m] | | Length from Motor Point [mm] | | | | | |
| | | | | | | | 3 | 8 | 13 | 18 | | |
| EzM2-42S-■-BK | Non-excitation run Type | 24VDC ±10% | 0,2 | 5 | 0,2 | 550 | 22 | 26 | 33 | 46 | Must be Lower than Unit's Weight | |
| EzM2-42M-■-BK | | | | | | 620 | | | | | | |
| EzM2-42L-■-BK | | | | | | 690 | | | | | | |
| EzM2-42XL-■-BK | | | | | | 820 | | | | | | |
| EzM2-56S-■-BK | | | 0,27 | 6,6 | 0,7 | 1030 | 52 | 65 | 85 | 123 | | |
| EzM2-56M-■-BK | | | | | | 1200 | | | | | | |
| EzM2-56L-■-BK | | | | | | 1650 | | | | | | |
| EzM2-60S-■-BK | | | | | | 1110 | | | | | | |
| EzM2-60M-■-BK | | | 70 | 87 | 114 | 165 | 1300 | 70 | 87 | 114 | | 165 |
| EzM2-60L-■-BK | | | | | | | 1860 | | | | | |

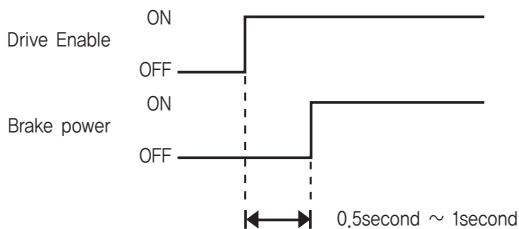
- * The code of encoder resolution will be marked in "■"
- * Electronic Brake cannot be used for braking, Position hold purpose only when power OFF.
- * The weight means Motor Unit Weight including Motor and Electronic Brake.
- * Motor Model Number is combined model name of Motor and Brake.
- * Motor specification and torque characteristic are same as Standard Motor.

* Brake Operation Timing Chart

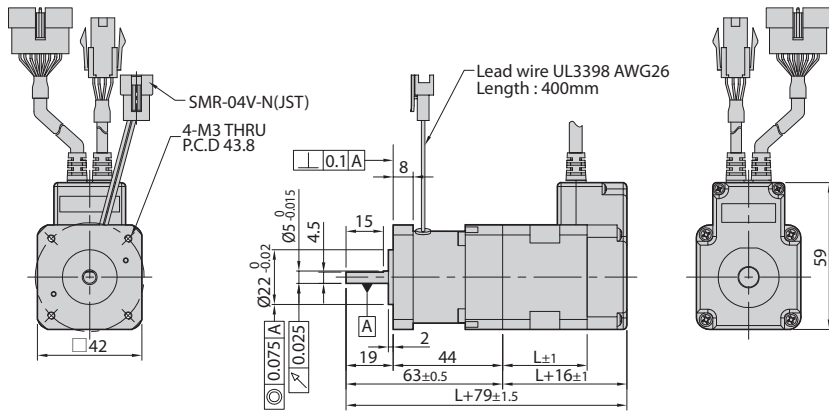
Ezi-SERVO II EtherCAT 4X controls Brake by Drive automatically.

Please refer to below Timing Chart when Brake is controlled by the upper controller other than using Ezi-SERVO II EtherCAT 4X Brake control. Otherwise, Drive malfunctioning and loads can be fall down.

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

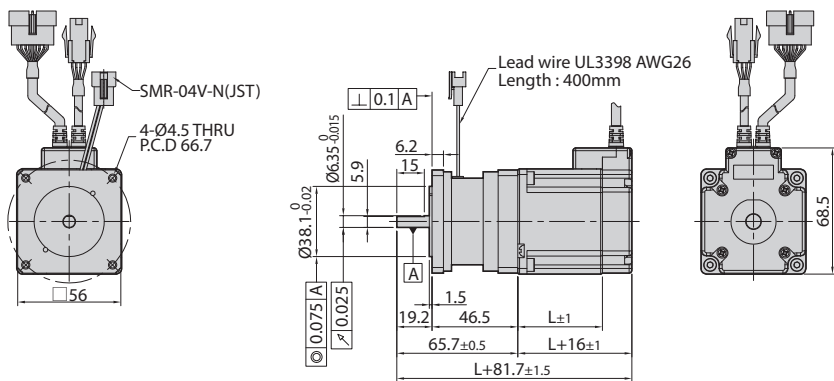


● Dimensions of Motor with Brake [mm]



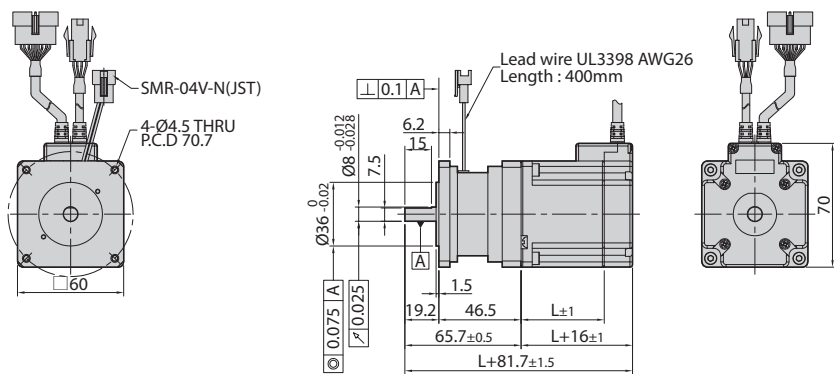
42mm

| Model Name | Length(L) | Weight(kg) |
|------------|-----------|------------|
| EzM2-42S | 34 | 0,55 |
| EzM2-42M | 40 | 0,62 |
| EzM2-42L | 48 | 0,69 |
| EzM2-42XL | 60 | 0,82 |



56mm

| Model Name | Length(L) | Weight(kg) |
|------------|-----------|------------|
| EzM2-56S | 46 | 1,03 |
| EzM2-56M | 55 | 1,20 |
| EzM2-56L | 80 | 1,65 |



60mm

| Model Name | Length(L) | Weight(kg) |
|------------|-----------|------------|
| EzM2-60S | 47 | 1,11 |
| EzM2-60M | 56 | 1,30 |
| EzM2-60L | 85 | 1,86 |

● How to Read Specifications

| Motor Model Number | ① Maximum Holding Torque [N·m] | ② Rotor Inertia Moment [kg·m ²] | ③ Backlash [min] | ④ Angle Transmission Error [min] | ⑤ Reduction Gear Ratio | ⑥ Resolution (10,000 [ppr] Standard) | ⑦ Permitted Torque [N·m] | ⑧ Maximum Torque [N·m] | ⑨ Permitted Speed Range [rpm] | ⑩ Unit Weight [kg] | Permitted Overhung Load [N] | Permitted Thrust Load [N] |
|--------------------|--------------------------------|---|------------------|----------------------------------|------------------------|--------------------------------------|--------------------------|------------------------|-------------------------------|--------------------|-----------------------------|---------------------------|
| | | | | | | | | | | | Axis Center Standard | |
| EzM2-42S-■-PN3 | 0,57 | 35x10 ⁻⁷ | 3 | 5 | 3 | 0,012° | 6 | 12 | 0~1000 | 0,76 | 240 | 270 |
| EzM2-42S-■-PN5 | 0,95 | | | | 5 | 0,0072° | 9 | 18 | 0~600 | | 290 | 330 |
| EzM2-42S-■-PN8 | 1,52 | | | | 8 | 0,0045° | 9 | 18 | 0~375 | | 340 | 410 |
| EzM2-42S-■-PN10 | 1,90 | | | | 10 | 0,0036° | 6 | 12 | 0~300 | | 360 | 450 |
| EzM2-42S-■-PN15 | 2,76 | | 5 | 7 | 15 | 0,0024° | 6 | 12 | 0~200 | 0,91 | 410 | 540 |
| EzM2-42S-■-PN25 | 4,60 | | | | 25 | 0,00144° | 9 | 18 | 0~120 | | 490 | 640 |
| EzM2-42S-■-PN40 | 7,36 | | | | 40 | 0,0009° | 9 | 18 | 0~75 | | 570 | 640 |
| EzM2-42S-■-PN50 | 9,00 | | | | 50 | 0,00072° | 9 | 18 | 0~60 | | 620 | 640 |

Description of Specification Items

- ① **Maximum Holding Torque** This is the maximum torque that can be exerted through the gearbox when the motor is stopped. (Based on 100% of stop current) Use below the maximum torque of the gearbox.
- ② **Rotor Inertia Moment** It is the value of the moment of inertia of the motor.
- ③ **Backlash** It is the gap between the gear and the gear, and it is the angle at which the gearbox shaft moves without external force when stopped.
- ④ **Angle Transmission Error** This is the transmission characteristic of the gearbox, which means the difference between the theoretical rotation angle and the actual rotation angle of the output shaft.
- ⑤ **Reduction Gear Ratio** It is the value obtained by dividing the number of output rotation by the number of input rotation.
- ⑥ **Resolution(10,000[ppr] Standard)** This is the angle at which the gearbox output shaft moves when the motor is driven by 1 pulse.
- ⑦ **Permissible Torque** This value is a torque value at which the life of the motor becomes 20,000 hours when the input rotation speed is 3,000rpm. It refers to the permissible continuous torque.
- ⑧ **Maximum Torque** This is the maximum torque allowed during acceleration/deceleration.
- ⑨ **Permitted Speed Range** It is the range of rotation speed based on the output shaft of the gearbox.
- ⑩ **Unit Weight** It is the sum of the weight of the gearbox and the motor.

Specifications of Motor with Gearbox

Ezi-SERVO II EtherCAT 4X can use up to 4 motors in one drive. Different Motor Model Number can be used for each axis. The following table shows the Gearbox integrated Motor Models that can be used with Ezi-SERVO II EtherCAT 4X. Refer to the Motor Model Number below.

42mm

| Motor Model Number | Maximum Holding Torque [N·m] | Rotor Inertia Moment [kg·m ²] | Back-lash [min] | Angle Transmission Error [min] | Reduction Gear Ratio | Resolution (10,000 [ppr] Standard) | Permitted Torque [N·m] | Maximum Torque [N·m] | Permitted Speed Range [rpm] | Unit Weight [kg] | Permitted Load [N] | |
|--------------------|------------------------------|---|-----------------|--------------------------------|----------------------|------------------------------------|------------------------|----------------------|-----------------------------|------------------|----------------------|-----------------------|
| | | | | | | | | | | | Axis Center Standard | Permitted Thrust Load |
| EzM2-42S-■-PN3 | 0,57 | 35x10 ⁻⁷ | 3 | 5 | 3 | 0,012° | 6 | 12 | 0~1000 | 0,76 | 240 | 270 |
| EzM2-42S-■-PN5 | 0,95 | | | | 5 | 0,0072° | 9 | 18 | 0~600 | | 290 | 330 |
| EzM2-42S-■-PN8 | 1,52 | | | | 8 | 0,0045° | 9 | 18 | 0~375 | | 340 | 410 |
| EzM2-42S-■-PN10 | 1,90 | | | | 10 | 0,0036° | 6 | 12 | 0~300 | | 360 | 450 |
| EzM2-42S-■-PN15 | 2,76 | | 5 | 7 | 15 | 0,0024° | 6 | 12 | 0~200 | 0,91 | 410 | 540 |
| EzM2-42S-■-PN25 | 4,60 | | | | 25 | 0,00144° | 9 | 18 | 0~120 | | 490 | 640 |
| EzM2-42S-■-PN40 | 7,36 | | | | 40 | 0,0009° | 9 | 18 | 0~75 | | 570 | 640 |
| EzM2-42S-■-PN50 | 9,00 | | | | 50 | 0,00072° | 9 | 18 | 0~60 | | 620 | 640 |
| EzM2-42M-■-PN3 | 0,85 | 54x10 ⁻⁷ | 3 | 5 | 3 | 0,012° | 6 | 12 | 0~1000 | 0,81 | 240 | 270 |
| EzM2-42M-■-PN5 | 1,42 | | | | 5 | 0,0072° | 9 | 18 | 0~600 | | 290 | 330 |
| EzM2-42M-■-PN8 | 2,28 | | | | 8 | 0,0045° | 9 | 18 | 0~375 | | 340 | 410 |
| EzM2-42M-■-PN10 | 2,85 | | | | 10 | 0,0036° | 6 | 12 | 0~300 | | 360 | 450 |
| EzM2-42M-■-PN15 | 4,14 | | 5 | 7 | 15 | 0,0024° | 6 | 12 | 0~200 | 0,97 | 410 | 540 |
| EzM2-42M-■-PN25 | 6,90 | | | | 25 | 0,00144° | 9 | 18 | 0~120 | | 490 | 640 |
| EzM2-42M-■-PN40 | 9,00 | | | | 40 | 0,0009° | 9 | 18 | 0~75 | | 570 | 640 |
| EzM2-42M-■-PN50 | 9,00 | | | | 50 | 0,00072° | 9 | 18 | 0~60 | | 620 | 640 |
| EzM2-42L-■-PN3 | 0,92 | 77x10 ⁻⁷ | 3 | 5 | 3 | 0,012° | 6 | 12 | 0~1000 | 0,89 | 240 | 270 |
| EzM2-42L-■-PN5 | 1,54 | | | | 5 | 0,0072° | 9 | 18 | 0~600 | | 290 | 330 |
| EzM2-42L-■-PN8 | 2,47 | | | | 8 | 0,0045° | 9 | 18 | 0~375 | | 340 | 410 |
| EzM2-42L-■-PN10 | 3,09 | | | | 10 | 0,0036° | 6 | 12 | 0~300 | | 360 | 450 |
| EzM2-42L-■-PN15 | 4,49 | | 5 | 7 | 15 | 0,0024° | 6 | 12 | 0~200 | 1,04 | 410 | 540 |
| EzM2-42L-■-PN25 | 7,49 | | | | 25 | 0,00144° | 9 | 18 | 0~120 | | 490 | 640 |
| EzM2-42L-■-PN40 | 9,00 | | | | 40 | 0,0009° | 9 | 18 | 0~75 | | 570 | 640 |
| EzM2-42L-■-PN50 | 9,00 | | | | 50 | 0,00072° | 9 | 18 | 0~60 | | 620 | 640 |
| EzM2-42XL-■-PN3 | 1,45 | 114x10 ⁻⁷ | 3 | 5 | 3 | 0,012° | 6 | 12 | 0~1000 | 1,03 | 240 | 270 |
| EzM2-42XL-■-PN5 | 2,42 | | | | 5 | 0,0072° | 9 | 18 | 0~600 | | 290 | 330 |
| EzM2-42XL-■-PN8 | 3,87 | | | | 8 | 0,0045° | 9 | 18 | 0~375 | | 340 | 410 |
| EzM2-42XL-■-PN10 | 4,84 | | | | 10 | 0,0036° | 6 | 12 | 0~300 | | 360 | 450 |
| EzM2-42XL-■-PN15 | 6,00 | | 5 | 7 | 15 | 0,0024° | 6 | 12 | 0~200 | 1,18 | 410 | 540 |
| EzM2-42XL-■-PN25 | 9,00 | | | | 25 | 0,00144° | 9 | 18 | 0~120 | | 490 | 640 |
| EzM2-42XL-■-PN40 | 9,00 | | | | 40 | 0,0009° | 9 | 18 | 0~75 | | 570 | 640 |
| EzM2-42XL-■-PN50 | 9,00 | | | | 50 | 0,00072° | 9 | 18 | 0~60 | | 620 | 640 |

* The code of encoder resolution will be marked in "■"

● Specifications of Motor with Gearbox

Ezi-SERVO II EtherCAT 4X can use up to 4 motors in one drive. Different Motor Model Number can be used for each axis. The following table shows the Gearbox integrated Motor Models that can be used with Ezi-SERVO II EtherCAT 4X. Refer to the Motor Model Number below.

56_{mm}

| Motor Model Number | Maximum Holding Torque [N·m] | Rotor Inertia Moment [kg·m ²] | Back-lash [min] | Angle Transmission Error [min] | Reduction Gear Ratio | Resolution (10,000 [ppr] 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 | | |
| EzM2-56S-■-PN3 | 1,1 | 180x10 ⁻⁷ | 3 | 5 | 3 | 0,012° | 18 | 35 | 0~1000 | 1,75 | 430 | 310 | |
| EzM2-56S-■-PN5 | 1,9 | | | | | | | | | | 510 | 390 | |
| EzM2-56S-■-PN8 | 3,0 | | | | | | | | | | 600 | 480 | |
| EzM2-56S-■-PN10 | 3,8 | | | | | | | | | | 640 | 530 | |
| EzM2-56S-■-PN15 | 5,5 | | | | | | | | | | 2,05 | 740 | 630 |
| EzM2-56S-■-PN25 | 9,3 | | | | | | | | | | | 870 | 790 |
| EzM2-56S-■-PN40 | 14,9 | | | | | | | | | | | 1000 | 970 |
| EzM2-56S-■-PN50 | 18,6 | | | | | | | | | | | 1100 | 1100 |
| EzM2-56M-■-PN3 | 2,0 | 280x10 ⁻⁷ | 3 | 5 | 3 | 0,012° | 18 | 35 | 0~1000 | 1,92 | 430 | 310 | |
| EzM2-56M-■-PN5 | 3,4 | | | | | | | | | | 510 | 390 | |
| EzM2-56M-■-PN8 | 5,4 | | | | | | | | | | 600 | 480 | |
| EzM2-56M-■-PN10 | 6,8 | | | | | | | | | | 640 | 530 | |
| EzM2-56M-■-PN15 | 9,9 | | | | | | | | | | 2,23 | 740 | 630 |
| EzM2-56M-■-PN25 | 16,6 | | | | | | | | | | | 870 | 790 |
| EzM2-56M-■-PN40 | 27,0 | | | | | | | | | | | 1000 | 970 |
| EzM2-56M-■-PN50 | 27,0 | | | | | | | | | | | 1100 | 1100 |
| EzM2-56L-■-PN3 | 4,0 | 520x10 ⁻⁷ | 3 | 5 | 3 | 0,012° | 18 | 35 | 0~1000 | 2,37 | 430 | 310 | |
| EzM2-56L-■-PN5 | 6,8 | | | | | | | | | | 510 | 390 | |
| EzM2-56L-■-PN8 | 10,8 | | | | | | | | | | 600 | 480 | |
| EzM2-56L-■-PN10 | 13,6 | | | | | | | | | | 640 | 530 | |
| EzM2-56L-■-PN15 | 18,0 | | | | | | | | | | 2,67 | 740 | 630 |
| EzM2-56L-■-PN25 | 27,0 | | | | | | | | | | | 870 | 790 |
| EzM2-56L-■-PN40 | 27,0 | | | | | | | | | | | 1000 | 970 |
| EzM2-56L-■-PN50 | 27,0 | | | | | | | | | | | 1100 | 1100 |

* The code of encoder resolution will be marked in "■"

● Specifications of Motor with Gearbox

Ezi-SERVO II EtherCAT 4X can use up to 4 motors in one drive. Different Motor Model Number can be used for each axis. The following table shows the Gearbox integrated Motor Models that can be used with Ezi-SERVO II EtherCAT 4X. Refer to the Motor Model Number below.

60mm

| Motor Model Number | Maximum Holding Torque [N·m] | Rotor Inertia Moment [kg·m ²] | Back-lash [min] | Angle Trans-mission Error [min] | Re-duction Gear Ratio | Resolution (10,000 [ppr] 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 | |
| EzM2-60S-■-PN3 | 1,5 | 240x10 ⁻⁷ | 3 | 5 | 3 | 0,012° | 18 | 35 | 0~1000 | 1,84 | 430 | 310 |
| EzM2-60S-■-PN5 | 2,5 | | | | | | | | | | 510 | 390 |
| EzM2-60S-■-PN8 | 4,0 | | | | | | | | | | 600 | 480 |
| EzM2-60S-■-PN10 | 5,1 | | | | | | | | | | 640 | 530 |
| EzM2-60S-■-PN15 | 7,4 | | | | | | | | | 2,13 | 740 | 630 |
| EzM2-60S-■-PN25 | 12,3 | | | | | | | | | | 870 | 790 |
| EzM2-60S-■-PN40 | 19,8 | | | | | | | | | | 1000 | 970 |
| EzM2-60S-■-PN50 | 24,7 | | | | | | | | | | 1100 | 1100 |
| EzM2-60M-■-PN3 | 2,6 | 490x10 ⁻⁷ | 3 | 5 | 3 | 0,012° | 18 | 35 | 0~1000 | 1,20 | 430 | 310 |
| EzM2-60M-■-PN5 | 4,4 | | | | | | | | | | 510 | 390 |
| EzM2-60M-■-PN8 | 7,0 | | | | | | | | | | 600 | 480 |
| EzM2-60M-■-PN10 | 8,8 | | | | | | | | | | 640 | 530 |
| EzM2-60M-■-PN15 | 12,8 | | | | | | | | | 2,30 | 740 | 630 |
| EzM2-60M-■-PN25 | 21,4 | | | | | | | | | | 870 | 790 |
| EzM2-60M-■-PN40 | 27,0 | | | | | | | | | | 1000 | 970 |
| EzM2-60M-■-PN50 | 27,0 | | | | | | | | | | 1100 | 1100 |
| EzM2-60L-■-PN3 | 5,2 | 690x10 ⁻⁷ | 3 | 5 | 3 | 0,012° | 18 | 35 | 0~1000 | 2,61 | 430 | 310 |
| EzM2-60L-■-PN5 | 8,7 | | | | | | | | | | 510 | 390 |
| EzM2-60L-■-PN8 | 13,9 | | | | | | | | | | 600 | 480 |
| EzM2-60L-■-PN10 | 18,0 | | | | | | | | | | 640 | 530 |
| EzM2-60L-■-PN15 | 18,0 | | | | | | | | | 2,86 | 740 | 630 |
| EzM2-60L-■-PN25 | 27,0 | | | | | | | | | | 870 | 790 |
| EzM2-60L-■-PN40 | 27,0 | | | | | | | | | | 1000 | 970 |
| EzM2-60L-■-PN50 | 27,0 | | | | | | | | | | 1100 | 1100 |

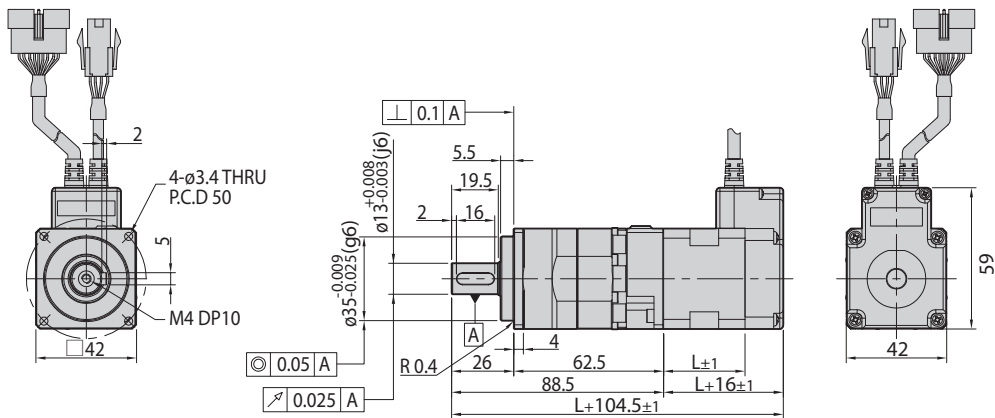
* The code of encoder resolution will be marked in "■"

● Dimensions of Motor with Gearbox [mm]

42mm

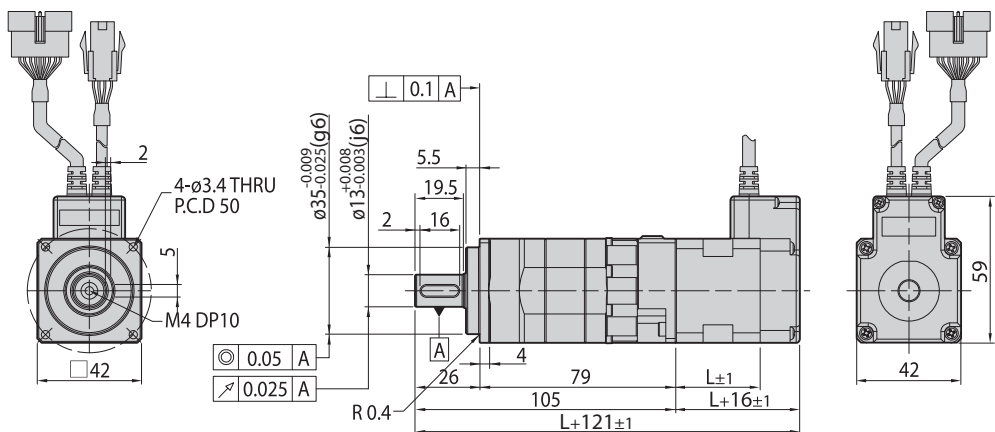
| Motor | Stage | □ Reduction Gear Ratio | L Length [mm] |
|-----------------|--------------|------------------------|---------------|
| EzM2-42S-■-PN□ | Single Stage | 3, 5, 8, 10 | 34 |
| EzM2-42M-■-PN□ | | 3, 5, 8, 10 | 40 |
| EzM2-42L-■-PN□ | | 3, 5, 8, 10 | 48 |
| EzM2-42XL-■-PN□ | | 3, 5, 8, 10 | 60 |

* The code of encoder resolution will be marked in "■"



| Motor | Stage | □ Reduction Gear Ratio | L Length [mm] |
|-----------------|--------------|------------------------|---------------|
| EzM2-42S-■-PN□ | Double Stage | 15, 25, 40, 50 | 34 |
| EzM2-42M-■-PN□ | | 15, 25, 40, 50 | 40 |
| EzM2-42L-■-PN□ | | 15, 25, 40, 50 | 48 |
| EzM2-42XL-■-PN□ | | 15, 25, 40, 50 | 60 |

* The code of encoder resolution will be marked in "■"

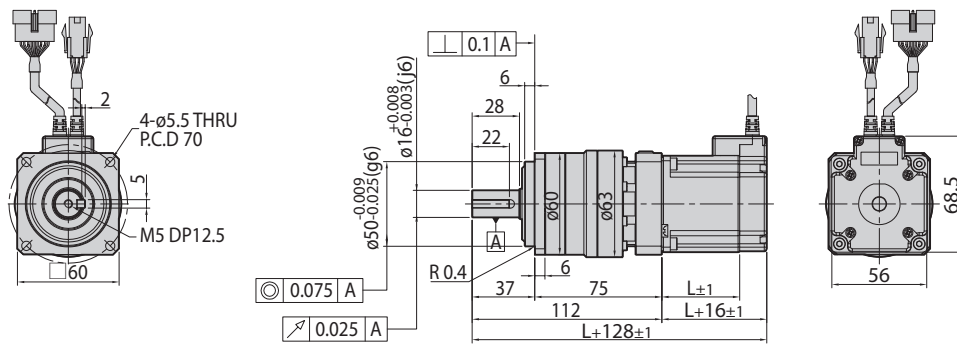


● Dimensions of Motor with Gearbox [mm]

56mm

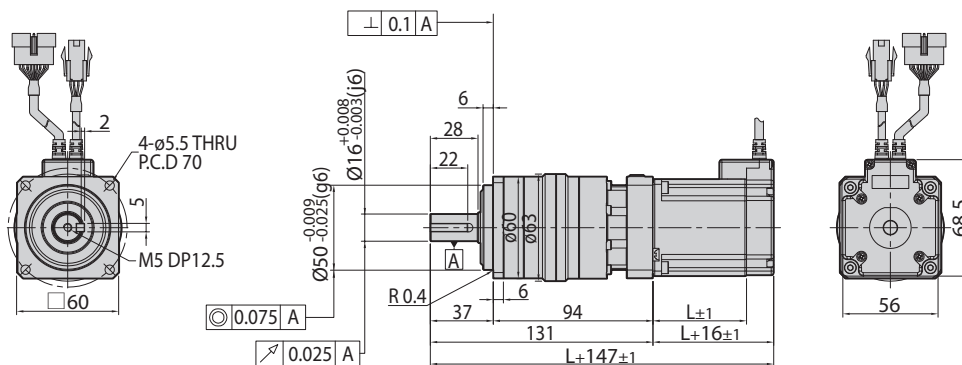
| Motor | Stage | □ Reduction Gear Ratio | L Length [mm] |
|----------------|--------------|------------------------|---------------|
| EzM2-56S-■-PN□ | Single Stage | 3, 5, 8, 10 | 46 |
| EzM2-56M-■-PN□ | | 3, 5, 8, 10 | 55 |
| EzM2-56L-■-PN□ | | 3, 5, 8, 10 | 80 |

* The code of encoder resolution will be marked in "■"



| Motor | Stage | □ Reduction Gear Ratio | L Length [mm] |
|----------------|--------------|------------------------|---------------|
| EzM2-56S-■-PN□ | Double Stage | 15, 25, 40, 50 | 46 |
| EzM2-56M-■-PN□ | | 15, 25, 40, 50 | 55 |
| EzM2-56L-■-PN□ | | 15, 25, 40, 50 | 80 |

* The code of encoder resolution will be marked in "■"

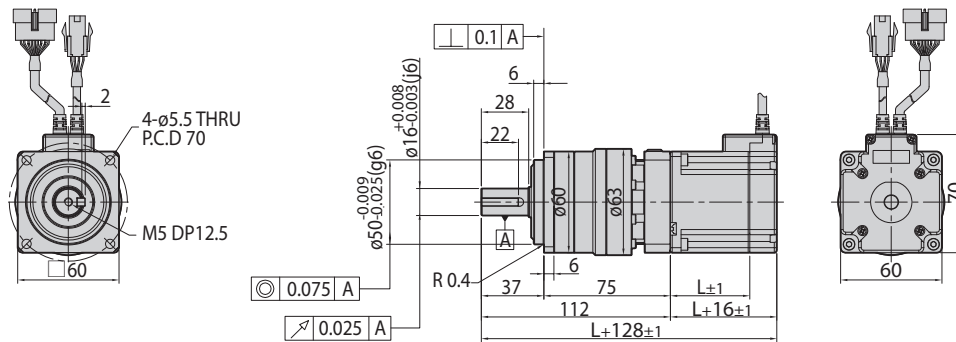


● Dimensions of Motor with Gearbox [mm]

60mm

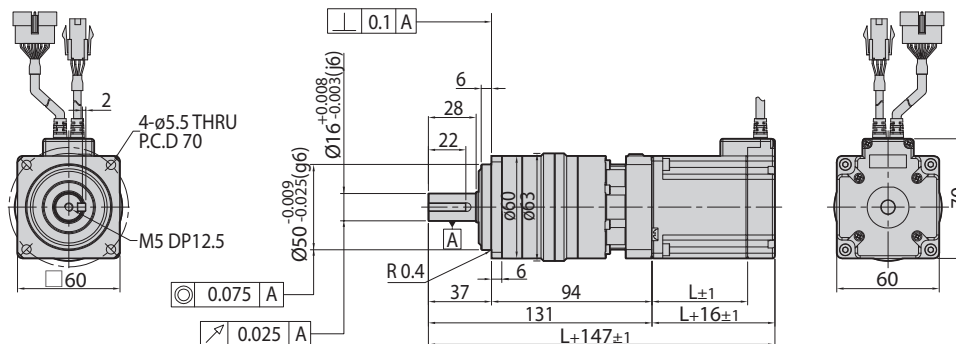
| Motor | Stage | □ Reduction Gear Ratio | L Length [mm] |
|----------------|--------------|------------------------|---------------|
| EzM2-60S-■-PN□ | Single Stage | 3, 5, 8, 10 | 47 |
| EzM2-60M-■-PN□ | | 3, 5, 8, 10 | 56 |
| EzM2-60L-■-PN□ | | 3, 5, 8, 10 | 85 |

* The code of encoder resolution will be marked in "■"



| Motor | Stage | □ Reduction Gear Ratio | L Length [mm] |
|----------------|--------------|------------------------|---------------|
| EzM2-60S-■-PN□ | Double Stage | 15, 25, 40, 50 | 47 |
| EzM2-60M-■-PN□ | | 15, 25, 40, 50 | 56 |
| EzM2-60L-■-PN□ | | 15, 25, 40, 50 | 85 |

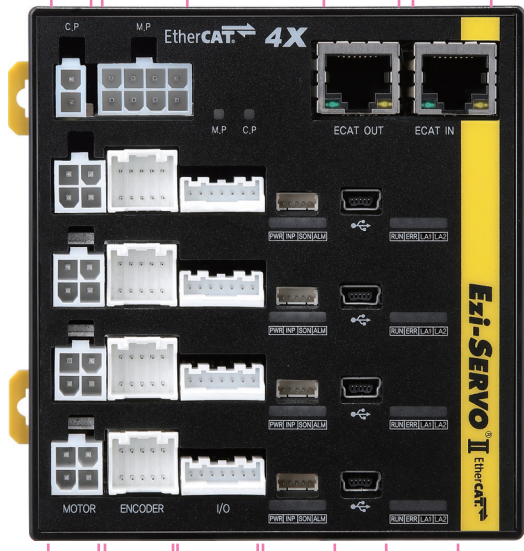
* The code of encoder resolution will be marked in "■"



● Settings and Operation

Main power connection(CN5) ←
 Control power connection(CN4) ←

→ EtherCAT communication connection(CN6)
 → EtherCAT communication connection(CN7)



Motor connection(CN3) ←
 Encoder connection(CN2) ←
 Input/Output signal connection(CN1) ←

→ EtherCAT status LED
 → Drive status LED



Protective earth terminal ←

FASTECH Ezi-SERVO II EtherCAT 4X



※ Basic configuration of 3X drive is the same as 4X and only difference is number of axis.

1. EtherCAT Status LED

LED indicates communication status of EtherCAT.

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



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

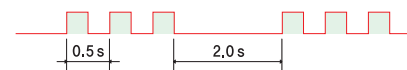
| Name | Indication | Color | Status | Explanation |
|-------------------|------------|-------|------------|-----------------------------------|
| Link/ Activity | LA1 LA2 | Green | OFF | Link not Established |
| | | | ON | Link Established |
| | | | Flickering | Link Established and in Operation |

2. 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 parameter |
| SON | Orange | Servo On/Off Indication | Servo On: Lights On, Servo Off: Lights Off |
| ALM | Red | Alarm indication | Flash when protection function is activated (Identifiable which protection mode is activated by counting the blinking times) |

◆ Protection functions and LED flash times

| Times | Protection | Conditions |
|-------|--------------------------------|--|
| 1 | Over Current Error | The current through power devices in inverter exceeds 4.8A |
| 2 | Over Speed Error | Motor speed exceeds 3,000 [rpm] |
| 3 | Position Tracking Error | Position error value is higher than 180° in motor run state *1 |
| 4 | Over Load Error | The motor is continuously operated more than 5 seconds under a load exceeding the max. torque |
| 5 | Over Temperature Error | Inside temperature of drive exceeds 85°C |
| 6 | Over Regenerated Voltage Error | Back-EMF is higher than 48V |
| 7 | Motor Connect Error | The power is ON without connection of the motor cable to drive |
| 8 | Encoder Connect Error | Cable connection error in Encoder connection of drive |
| 10 | In-Position Error | After operation is finished, position error more than 1 pulse is continued for more than 3 seconds |
| 12 | ROM Error | Error occurs in parameter storage device(ROM) |
| 15 | Position Overflow Error | Position error value is higher than 180° in motor stop state *1 |



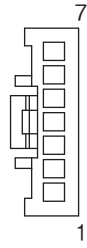
Alarm LED flash
(Ex, Position Tracking Error)

*1 : Default value can be changed by parameter.
(Refer to the Manual)

※ For the details, please refer to the Manual.

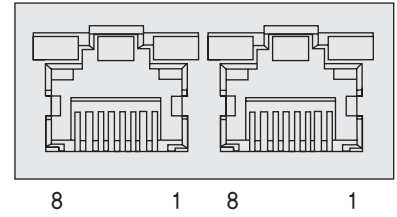
3. Input/Output Signal Connector(CN1)

| NO. | Function | I/O |
|-----|-----------|--------|
| 1 | EXT_24VDC | Input |
| 2 | EXT_GND | Input |
| 3 | LIMIT+ | Input |
| 4 | LIMIT- | Input |
| 5 | ORIGIN | Input |
| 6 | BRAKE+ | Output |
| 7 | BRAKE- | Output |



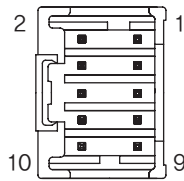
8. EtherCAT Communication Connector(CN6, CN7)

| NO. | Function | NO. | Function |
|-----|----------|-----------------|----------|
| 1 | TD+ | 6 | RD- |
| 2 | TD- | 7 | ---- |
| 3 | RD+ | 8 | ---- |
| 4 | ---- | Connection hood | F.GND |
| 5 | ---- | | |



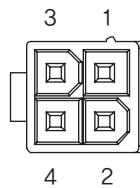
4. Encoder Connector(CN2)

| 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 | GND | Output |
| 9 | F.GND | ---- |
| 10 | F.GND | ---- |



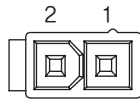
5. Motor Connector(CN3)

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



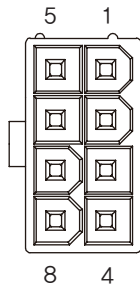
6. Control Power Connector(CN4)

| NO. | Function | I/O |
|-----|----------|-------|
| 1 | 24VDC | Input |
| 2 | GND | Input |

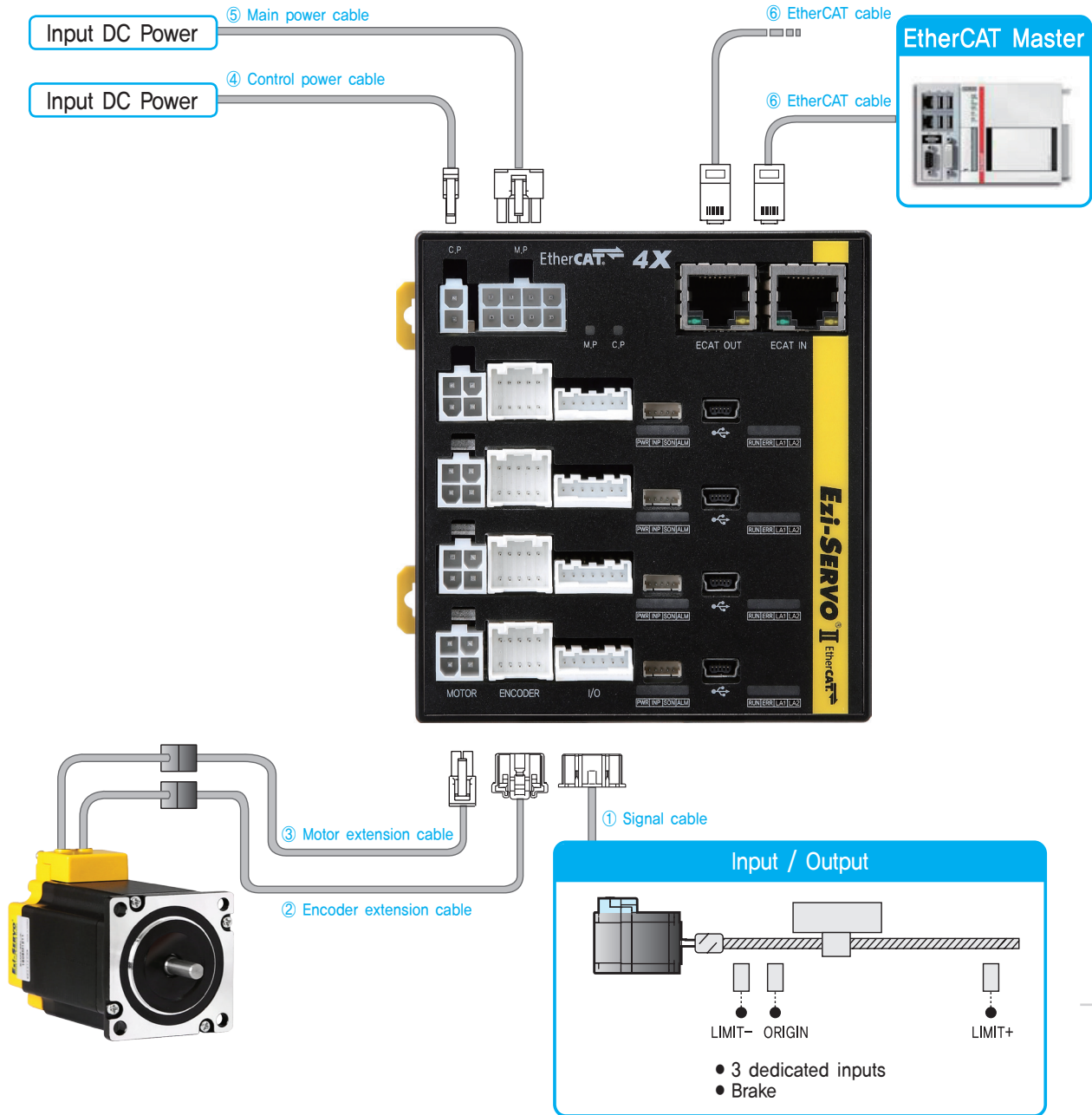


7. Main Power Connector(CN5)

| NO. | Function | I/O |
|-----|----------|-------|
| 1 | 24VDC | Input |
| 2 | 24VDC | Input |
| 3 | 24VDC | Input |
| 4 | F.GND | ---- |
| 5 | GND | Input |
| 6 | GND | Input |
| 7 | GND | Input |
| 8 | F.GND | ---- |



System Configuration



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

※ Basic configuration of 3X drive is the same as 4X and only difference is number of axis.

1. Options

① Signal Cable

Available to connect between Input/Output signals and Ezi-SERVO II EtherCAT 4X.

| Item | Length [m] | Remark |
|-------------|------------|--------------|
| CECM-S-□□□F | □□□ | Normal Cable |
| CECM-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 4X.

| Item | Length [m] | Remark |
|-------------|------------|--------------|
| CSVO-E-□□□F | □□□ | Normal Cable |
| CSVO-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 4X.

| 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 Control Power Cable

Available to connect between Power and Ezi-SERVO II EtherCAT 4X.

| 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 Main Power Cable

Available to connect between Main Power and Ezi-SERVO II EtherCAT 4X.

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

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

⑥ EtherCAT Cable

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

| Item | Length [m] | Remark |
|--------------|------------|--------------|
| CGNR-EC-□□□F | □□□ | Normal Cable |

□ is for Cable Length. The unit is 1m and Max, 100m length.

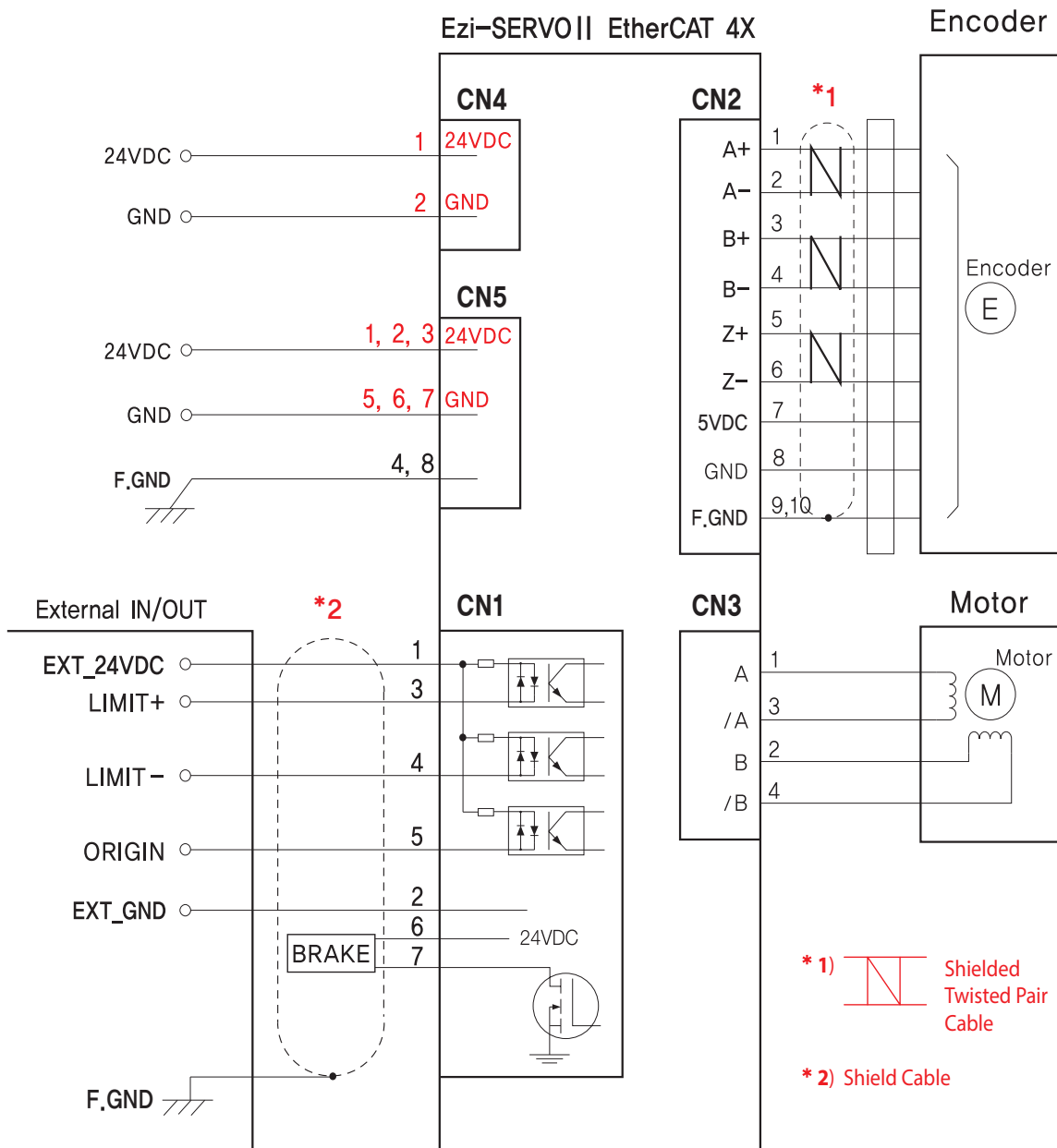
2. Connector Specifications

Connector specifications for cabling to drive.

| Purpose | Item | Part Number | Manufacturer |
|---------------------|------------------|------------------------------|--------------|
| Main Power (CN5) | Housing | 5557-08R | MOLEX |
| | Terminal | 5556T | |
| Control Power (CN4) | Housing | 5557-02R | MOLEX |
| | Terminal | 5556T | |
| Motor | Drive Side (CN3) | 5557-04R 5556T | MOLEX |
| | Motor Side | 5557-04R 5556T | |
| Encoder | Drive Side (CN2) | 51353-1000 56134-9000 | MOLEX |
| | Encoder Side | SMP-09V-NC SHF-001T-0.8BS | |
| Signal (CN1) | Housing | PAP-07V-S SPHD-001T-P0,5 | JST |

※ Above Connector is the most suitable product for the drive applied. Another equivalent Connector can be used.

External Wiring Diagram



※ When connects I/O cable between controller and drive, please turn off the power of both controller and drive, in order to protect the drive from any damage.

CAUTION

Please refer to the Manual when connects motor extension cable. Careful connection will be required to protect the drive from any damages.



Fast, Accurate, Smooth Motion

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