

Ezi-SERVO® II

EtherCAT®
Conformance tested

Closed Loop Stepping System

- EtherCAT-compatible Closed Loop Stepping System
- CiA402 Drive Profile
- Tuning Not Required, No Hunting
- High Resolution Encoder, Fast Response
- Low Heat Generation, High Torque

CE



Fast Accurate Smooth Motion

Ezi-SERVO[®] II EtherCAT[®]

Conformance tested

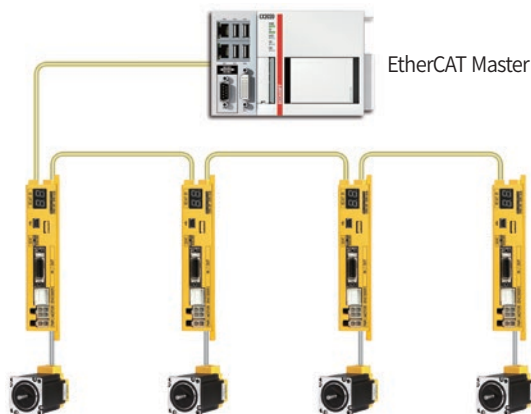
Closed Loop Stepping System



EtherCAT-compatible Motion Control

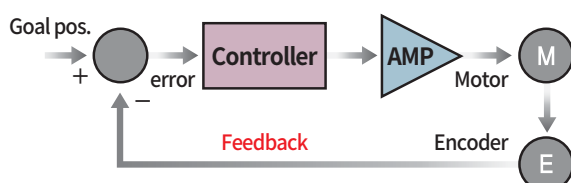
Ezi-SERVO II EtherCAT is stepper motor control system using EtherCAT, high speed ethernet (100 Mbps Full-Duplex) based industrial network.

Ezi-SERVO II EtherCAT is EtherCAT slave module which supports CAN application layer over EtherCAT (CoE). It employs CiA402 Drive Profile and supports Cyclic Synchronous Position Mode (CSP Mode), Profile Position Mode (PP Mode) and Homing Mode (HM Mode).



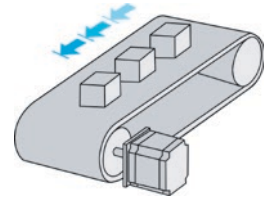
Closed-Loop System

Ezi-SERVO II 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-SERVO II to update the current position every 50 μ s. It 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 but Ezi-SERVO II automatically correct the position by encoder feedback.



Tuning Not Required

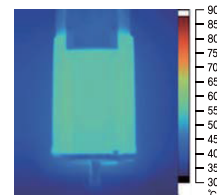
To ensure machine performance, conventional servo systems require the adjustment of its servo's gains as an initial crucial step. Even systems that employ auto-tuning require manual tuning after the system is installed. Ezi-SERVO II employs the best characteristics of the stepper motor to eliminate the need of tedious gain tuning required for conventional closed-loop servo systems. Ezi-SERVO II is especially well suited for low-rigidity loads (e.g., a belt and pulley system) that sometimes require conventional servo systems to use the additional bulky and expensive gearbox.



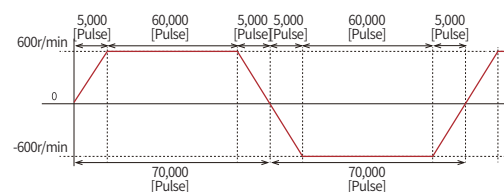
Low Heat Generation / Energy Savings

(Motor Current Control according to load)

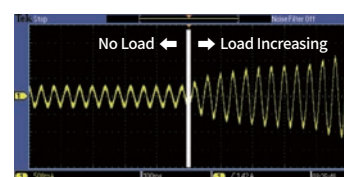
Ezi-SERVO II automatically controls motor current according to load. Ezi-SERVO II reduces motor current when motor load is low and increases motor current when load is high. By optimizing the motor current, motor heat can be minimized and energy can be saved.



Motor temperature [Measured by Thermal Imaging Camera]



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



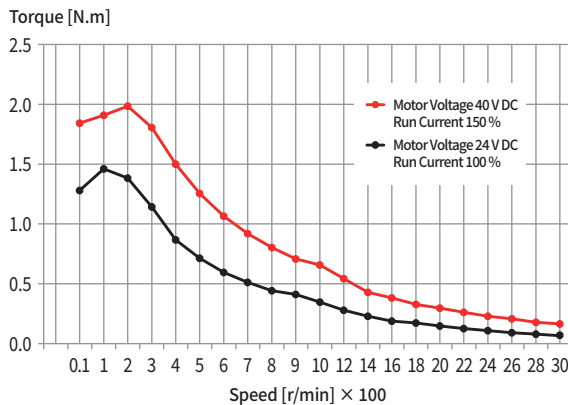
Motor Current

[Example of the Motor Current Control according to load]

High Torque

(Motor Voltage Increasing and Motor Current Setting)

Ezi-SERVO II features an internal voltage boosting circuit that increases the motor supply voltage above the drive's input voltage. This elevated motor voltage enhances torque at high speeds and allows the run current to be set up to 150 %. As a result, torque is also improved at low speeds. Ezi-SERVO II can achieve approximately 30 % torque improvement across the entire speed range.



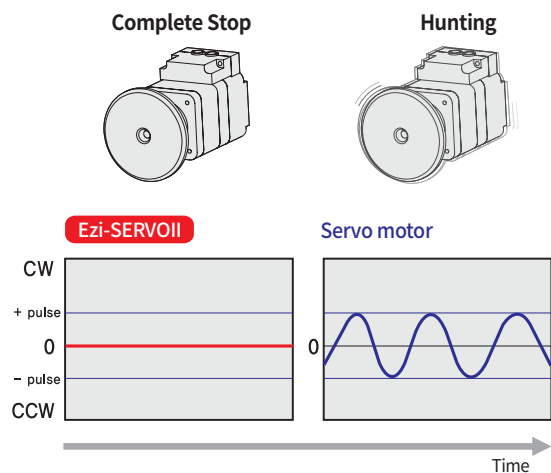
※ Torque is improved by approximately 30 % at both low and high speeds.

Measurement Condition : Drive = Ezi-SERVO II -EC-56L
Motor Voltage = 40 V DC
Input Voltage = 24 V DC

No Hunting

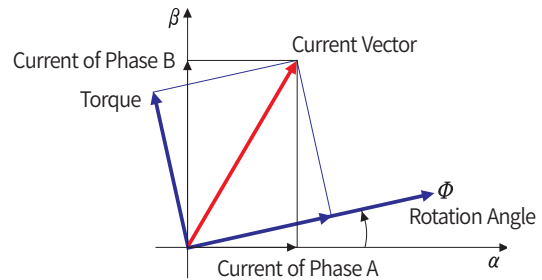
Ezi-SERVO II utilizes the unique characteristics of stepper motors and locks itself into the desired target position, preventing vibration and eliminating Null Hunt which happens to the conventional servo systems.

This feature is especially useful in applications such as vision systems in which system oscillation and vibration could be a problem.



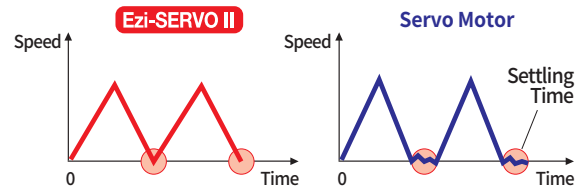
Smooth and Accurate Operation

Ezi-SERVO II is a high-precision servo drive, using a high-resolution encoder with 20,000 pulse/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.



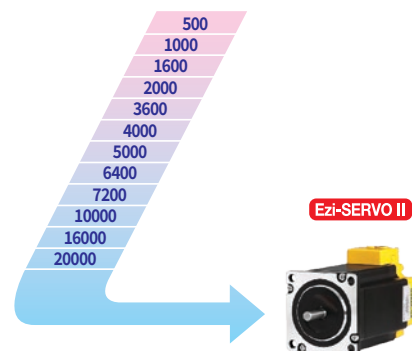
Fast Response

Similar to conventional stepper 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.



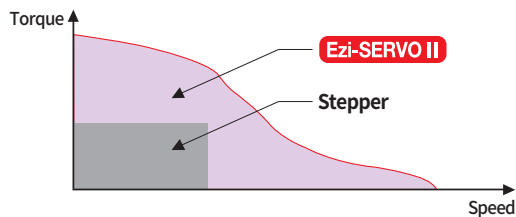
High Resolution

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



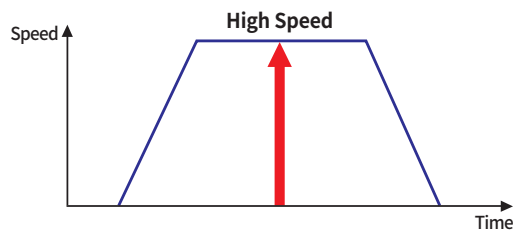
High Torque / Continuous Operation

Compared with common stepper 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.



High Speed

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



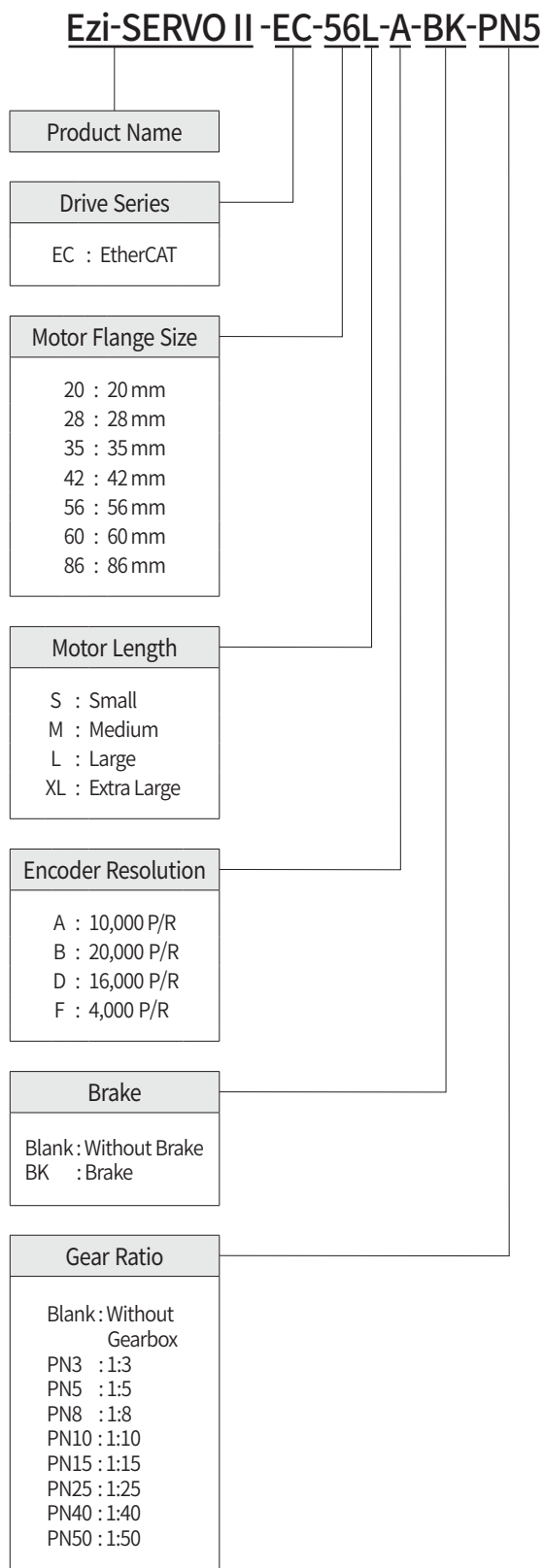
Advantages over Open-Loop Stepper Systems

1. Reliable positioning control without loss of synchronism.
2. Excellent holding torque at standstill, 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 stepper drive that can use up to 50 % of the rated motor torque due to the loss of synchronism.
4. Capability to operate at high speed due to load-dependent current control, open-loop stepper drives use a constant current control at all speed ranges without considering load variations. (Max. Speed : 3,000 r/min)

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 Part Numbering



Standard Combination

Unit Part Number	Motor Model Number	Drive Model Number
Ezi-SERVO II -EC-20M-F	EzM2-20M-F	EzS2-EC-20M-F
Ezi-SERVO II -EC-20L-F	EzM2-20L-F	EzS2-EC-20L-F
Ezi-SERVO II -EC-28S-D	EzM2-28S-D	EzS2-EC-28S-D
Ezi-SERVO II -EC-28SM-D	EzM2-28SM-D	EzS2-EC-28S-D
Ezi-SERVO II -EC-28M-D	EzM2-28M-D	EzS2-EC-28M-D
Ezi-SERVO II -EC-28MM-D	EzM2-28MM-D	EzS2-EC-28M-D
Ezi-SERVO II -EC-28L-D	EzM2-28L-D	EzS2-EC-28L-D
Ezi-SERVO II -EC-28LM-D	EzM2-28LM-D	EzS2-EC-28L-D
Ezi-SERVO II -EC-35M-D	EzM2-35M-D	EzS2-EC-35M-D
Ezi-SERVO II -EC-35MM-D	EzM2-35MM-D	EzS2-EC-35M-D
Ezi-SERVO II -EC-35L-D	EzM2-35L-D	EzS2-EC-35L-D
Ezi-SERVO II -EC-35LM-D	EzM2-35LM-D	EzS2-EC-35L-D
Ezi-SERVO II -EC-42S-A	EzM2-42S-A	EzS2-EC-42S-A
Ezi-SERVO II -EC-42S-B	EzM2-42S-B	EzS2-EC-42S-B
Ezi-SERVO II -EC-42M-A	EzM2-42M-A	EzS2-EC-42M-A
Ezi-SERVO II -EC-42M-B	EzM2-42M-B	EzS2-EC-42M-B
Ezi-SERVO II -EC-42L-A	EzM2-42L-A	EzS2-EC-42L-A
Ezi-SERVO II -EC-42L-B	EzM2-42L-B	EzS2-EC-42L-B
Ezi-SERVO II -EC-42XL-A	EzM2-42XL-A	EzS2-EC-42XL-A
Ezi-SERVO II -EC-42XL-B	EzM2-42XL-B	EzS2-EC-42XL-B
Ezi-SERVO II -EC-56S-A	EzM2-56S-A	EzS2-EC-56S-A
Ezi-SERVO II -EC-56S-B	EzM2-56S-B	EzS2-EC-56S-B
Ezi-SERVO II -EC-56M-A	EzM2-56M-A	EzS2-EC-56M-A
Ezi-SERVO II -EC-56M-B	EzM2-56M-B	EzS2-EC-56M-B
Ezi-SERVO II -EC-56L-A	EzM2-56L-A	EzS2-EC-56L-A
Ezi-SERVO II -EC-56L-B	EzM2-56L-B	EzS2-EC-56L-B
Ezi-SERVO II -EC-60S-A	EzM2-60S-A	EzS2-EC-60S-A
Ezi-SERVO II -EC-60S-B	EzM2-60S-B	EzS2-EC-60S-B
Ezi-SERVO II -EC-60M-A	EzM2-60M-A	EzS2-EC-60M-A
Ezi-SERVO II -EC-60M-B	EzM2-60M-B	EzS2-EC-60M-B
Ezi-SERVO II -EC-60L-A	EzM2-60L-A	EzS2-EC-60L-A
Ezi-SERVO II -EC-60L-B	EzM2-60L-B	EzS2-EC-60L-B
Ezi-SERVO II -EC-86M-A	EzM2-86M-A	EzS2-EC-86M-A
Ezi-SERVO II -EC-86M-B	EzM2-86M-B	EzS2-EC-86M-B
Ezi-SERVO II -EC-86L-A	EzM2-86L-A	EzS2-EC-86L-A
Ezi-SERVO II -EC-86L-B	EzM2-86L-B	EzS2-EC-86L-B
Ezi-SERVO II -EC-86XL-A	EzM2-86XL-A	EzS2-EC-86XL-A
Ezi-SERVO II -EC-86XL-B	EzM2-86XL-B	EzS2-EC-86XL-B

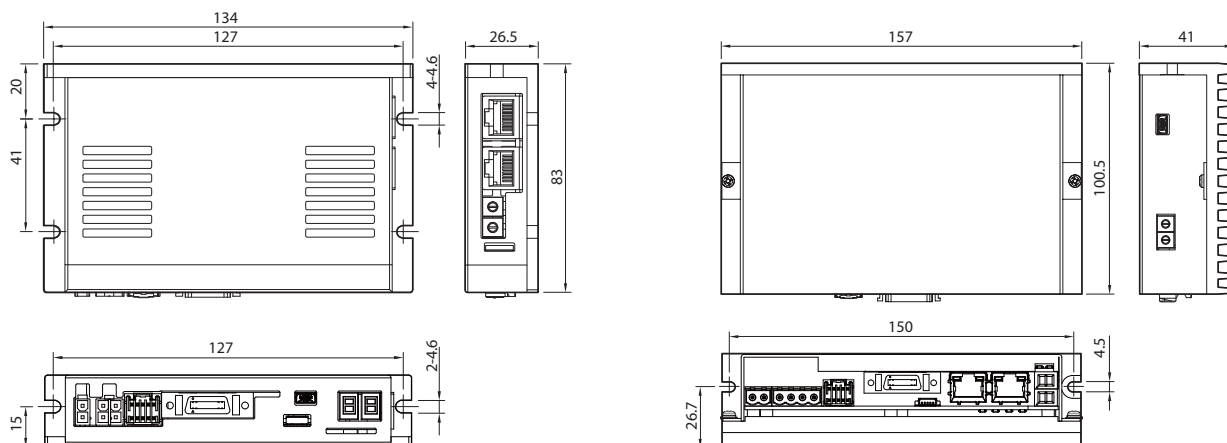
※ When places an order for Stopper type 28 mm, 35 mm motor, please write "M" additionally after motor length of unit product number.
(e.g., Ezi-SERVO II -EC-28LM-D, Ezi-SERVO II -EC-35LM-D)

Specifications of Drive

Motor Model		EzM2-20 series	EzM2-28 series	EzM2-35 series	EzM2-42 series	EzM2-56 series	EzM2-60 series	EzM2-86 series					
Drive Model		EzS2-EC-20 series	EzS2-EC-28 series	EzS2-EC-35 series	EzS2-EC-42 series	EzS2-EC-56 series	EzS2-EC-60 series	EzS2-EC-86 series					
Input Voltage		24 V DC ± 10 %							40 ~ 70 V DC				
Control Method		Closed loop control with 32bit MCU											
Current Consumption		Max. 500 mA (Except motor current)											
Operating Condition	Ambient Temperature	· In Use : 0 ~ 50 °C · In Storage: -20 ~ 70 °C											
	Humidity	· In Use : 35 ~ 85 % RH (Non-Condensing) · In Storage: 10 ~ 90 % RH (Non-Condensing)											
	Vib. Resist.	0.5 g											
Function	Rotation Speed	0 ~ 3,000 r/min ^{*1}											
	Resolution	Encoder Resolution [P/R]		Configurable Resolution [P/R]									
		4,000		500	1,000	1,600	2,000	3,600	4,000	5,000	6,400	7,200	10,000
		10,000		500	1,000	1,600	2,000	3,600	5,000	6,400	7,200	10,000	
		16,000		500	1,000	1,600	2,000	3,600	5,000	6,400	7,200	10,000	16,000
		20,000		500	1,000	1,600	2,000	3,600	5,000	6,400	7,200	10,000	20,000
	(Selectable by parameter)												
	Error Type	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 (CiA402 Drive Profile), FoE (Firmware Download)											
	Operation Mode	Cyclic Synchronous Position Mode(CSP), Profile Position Mode(PP), Homing Mode(HM)											
	Synchronization	Free Run, SM Event, DC SYNC Event											
I/O Signal	Input Signals	3 dedicated inputs (LIMIT+, LIMIT-, ORIGIN), 7 user inputs (Photocoupler Input)											
	Output Signals	6 user outputs (Photocoupler Output), 1 Brake output											

^{*1}: Up to the resolution of 10,000 P/R, maximum speed can be reached by 3,000 r/min and with the resolution more than 10,000 P/R, maximum speed shall be reduced accordingly.

Dimensions of Drive [mm]



※ 86 mm motor drive (EzS2-EC-86 series)

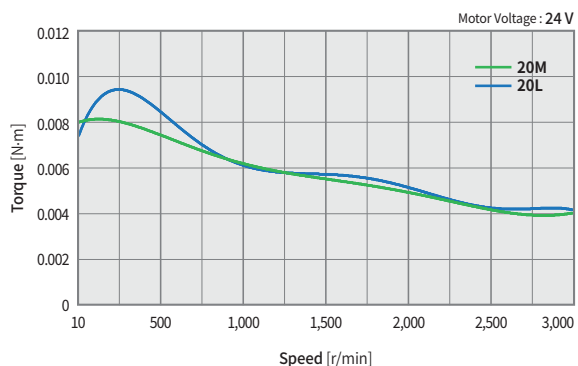
100

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			-	Bipolar										
Number of phase			-	2 Phase										
Current per Phase			A/Phase	0.5	0.5	0.95	0.95	0.95	1.5	1.5	1.2	1.2	1.2	1.2
Maximum 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
Weight			kg	0.080	0.104	0.147	0.204	0.232	0.194	0.226	0.294	0.357	0.426	0.564
Length (L)			mm	28	38	32	45	50	32	36	34	40	48	60
Permissible Radial Load	Distance From End of Shaft	3 mm	N	18	18	30	30	30	22	22	22	22	22	22
		8 mm		30	30	38	38	38	26	26	26	26	26	26
		13 mm		-	-	53	53	53	33	33	33	33	33	33
		18 mm		-	-	-	-	-	46	46	46	46	46	46
Permissible Axial Load			N	Lower than motor unit's weight										
Insulation Resistance			MΩ	Min. 100 (When measured with a 500 V DC insulation resistance meter)										
Insulation Class			-	Class B (130 °C)										
Operating Temperature			°C	0 ~ 55										

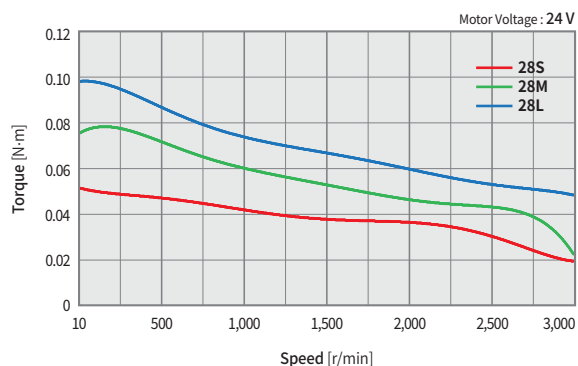
MODEL			EzM2-56 series			EzM2-60 series			EzM2-86 series			
			UNIT	56S	56M	56L	60S	60M	60L	86M	86L	86XL
Drive method			-	Bipolar								
Number of phase			-	2 Phase								
Current per Phase			A/Phase	3.0	3.0	3.0	4.0	4.0	4.0	6.0	6.0	6.0
Maximum Holding Torque			N·m	0.64	1.0	1.5	0.88	1.28	2.4	4.5	8.5	12
Rotor Inertia			g·cm ²	180	280	520	240	490	690	1800	3600	5400
Weight			kg	0.608	0.784	1.230	0.693	0.856	1.419	2.355	3.941	5.453
Length (L)			mm	46	55	80	47	56	85	78	117	155
Permissible Radial Load	Distance From End of Shaft	3 mm	N	52	52	52	70	70	70	270	270	270
		8 mm		65	65	65	87	87	87	300	300	300
		13 mm		85	85	85	114	114	114	350	350	350
		18 mm		123	123	123	165	165	165	400	400	400
Permissible Axial Load			N	Lower than motor unit's weight								
Insulation Resistance			MΩ	Min. 100 (When measured with a 500 V DC insulation resistance meter)								
Insulation Class			-	Class B (130 °C)								
Operating Temperature			°C	0 ~ 55								

Torque Characteristics of Motor

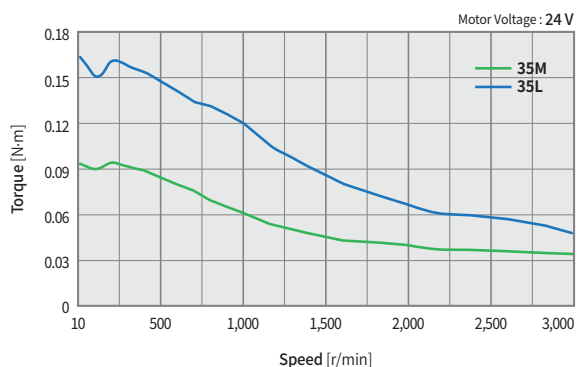
Ezi-SERVO II -EC-20 series



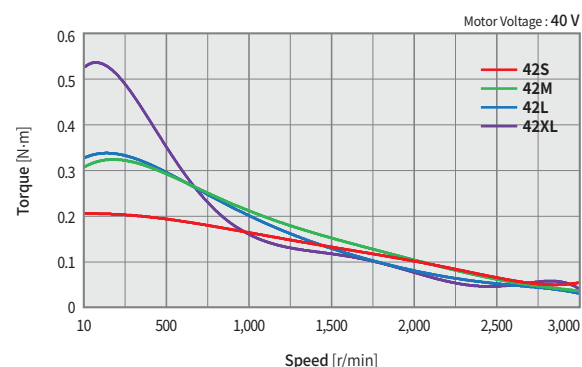
Ezi-SERVO II -EC-28 series



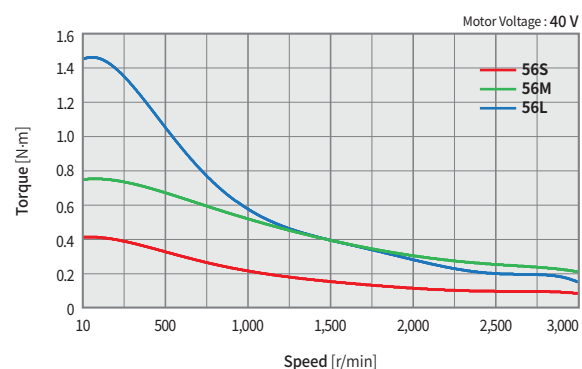
Ezi-SERVO II -EC-35 series



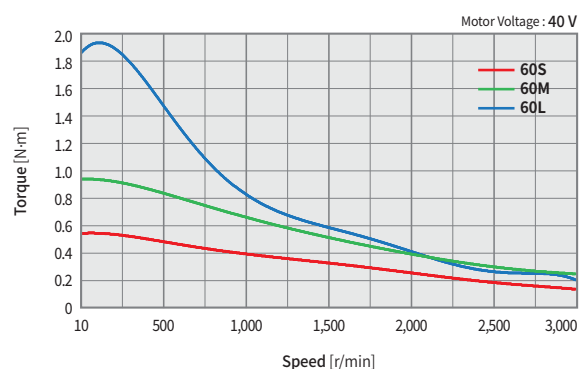
Ezi-SERVO II -EC-42 series



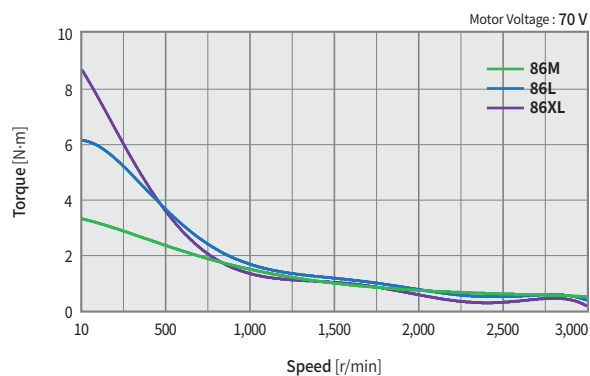
Ezi-SERVO II -EC-56 series



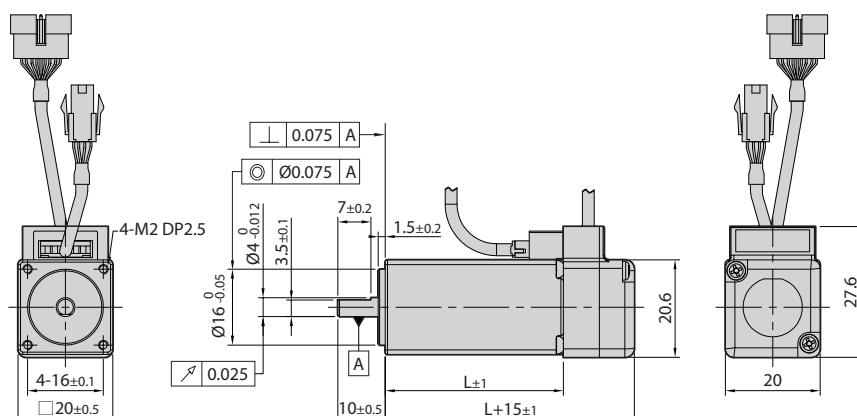
Ezi-SERVO II -EC-60 series



Ezi-SERVO II -EC-86 series

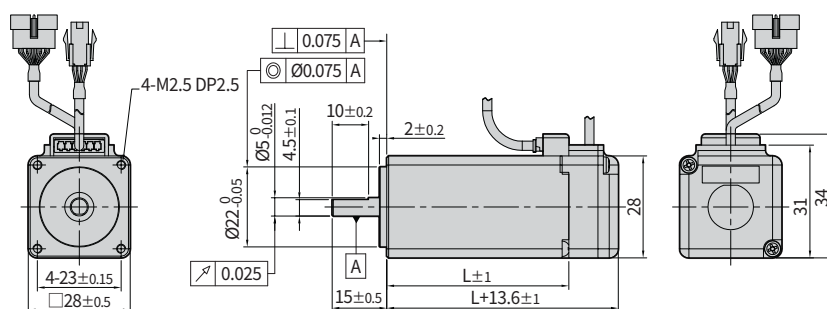


Dimensions of Motor [mm]



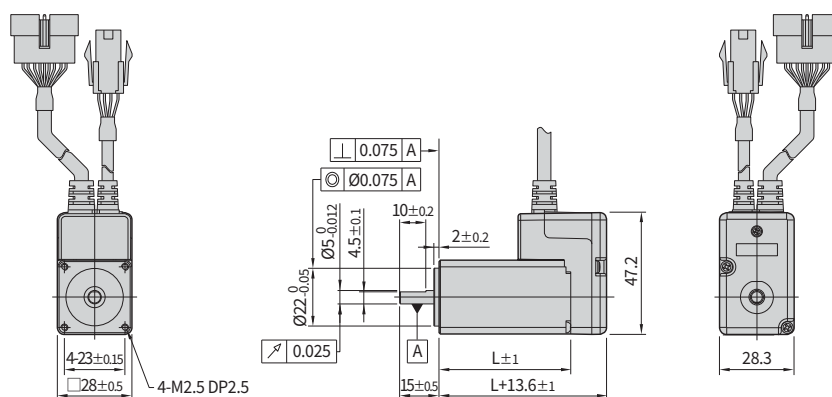
20 mm

Model name	Length (L)
EzM2-20M	27.3
EzM2-20L	37.6



28 mm

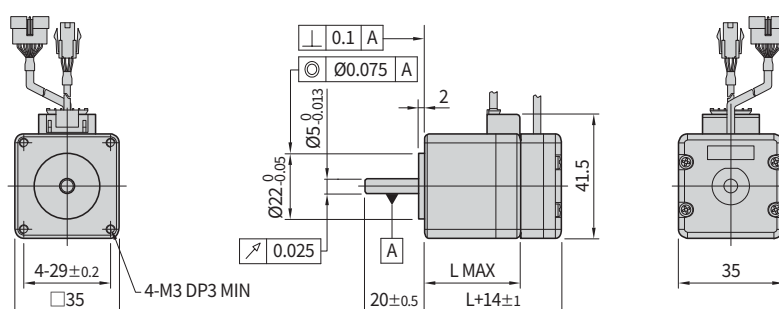
Model name	Length (L)
EzM2-28S	32
EzM2-28M	45
EzM2-28L	50



28 mm (Stopper type)

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

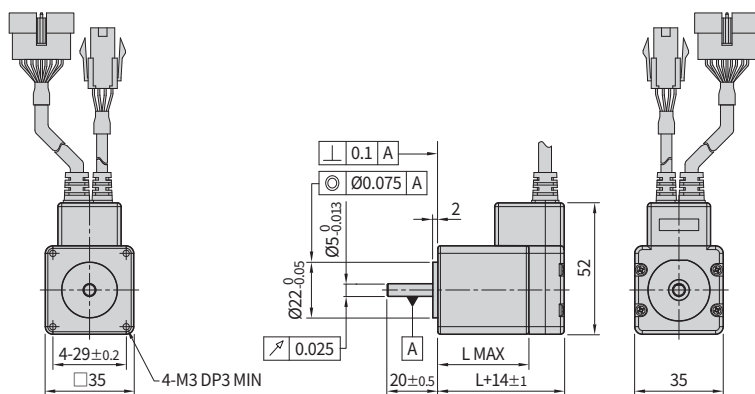
※ When ordering 28 mm Stopper type of motor, please add "M" after standard motor model number.



35 mm

Model name	Length (L)
EzM2-35M	32
EzM2-35L	36

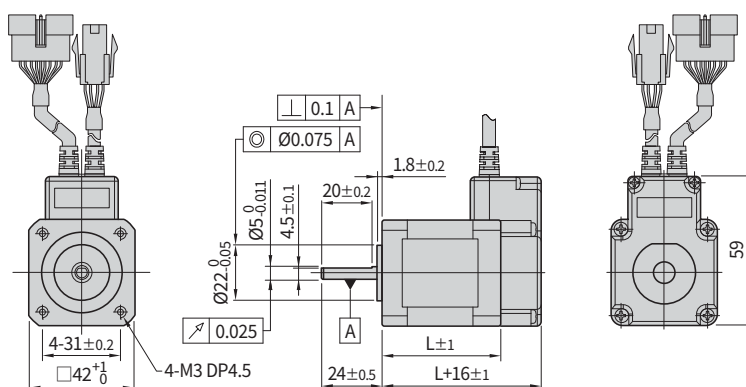
Dimensions of Motor [mm]



35 mm (Stopper type)

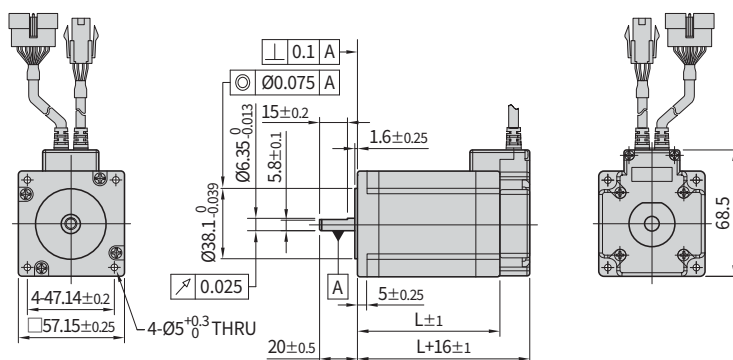
Model name	Length (L)
EzM2-35MM	32
EzM2-35LM	36

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



42 mm

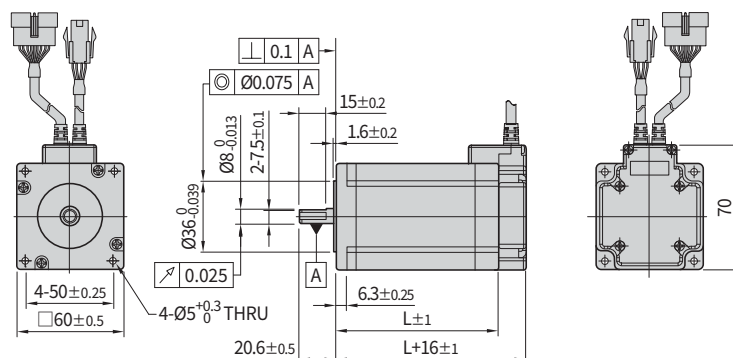
Model name	Length (L)
EzM2-42S	34
EzM2-42M	40
EzM2-42L	48
EzM2-42XL	60



56 mm

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

※ There are 2 kinds of size of front shaft diameter for EzM2-56 series as $\varnothing 6.35$ and $\varnothing 8.0$



60 mm

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

10



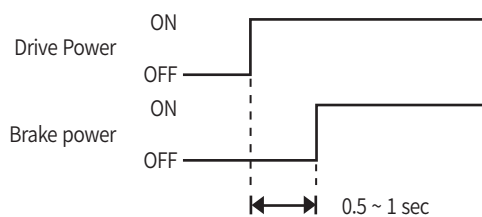
Model name	Length (L)
EzM2-86M	78
EzM2-86L	117
EzM2-86XL	155

Unit Part Number	Motor Model Number	Electromagnetic Brake					Motor Unit Weight [kg]	Permissible Radial Load [N]				Permissible Axial Load [N]			
		Type	Voltage Input [V]	Rated Current [A]	Power Consumption [W]	Static Friction Torque [N·m]		Distance from End of Shaft [mm]							
								3	8	13	18				
Ezi-SERVO II -EC-42S-■-BK	EzM2-42S-■-BK	Non-excitation run Type	24 V DC ± 10 %	0.2	5	0.2	0.55	22	26	33	46	Must be Lower than Motor Unit Weight			
Ezi-SERVO II -EC-42M-■-BK	EzM2-42M-■-BK						0.62								
Ezi-SERVO II -EC-42L-■-BK	EzM2-42L-■-BK						0.69								
Ezi-SERVO II -EC-42XL-■-BK	EzM2-42XL-■-BK						0.82								
Ezi-SERVO II -EC-56S-■-BK	EzM2-56S-■-BK			0.27	6.6	0.7	1.03	52	65	85	123				
Ezi-SERVO II -EC-56M-■-BK	EzM2-56M-■-BK						1.20								
Ezi-SERVO II -EC-56L-■-BK	EzM2-56L-■-BK						1.65								
Ezi-SERVO II -EC-60S-■-BK	EzM2-60S-■-BK						1.11								
Ezi-SERVO II -EC-60M-■-BK	EzM2-60M-■-BK						1.30	70	87	114	165				
Ezi-SERVO II -EC-60L-■-BK	EzM2-60L-■-BK						1.86								
Ezi-SERVO II -EC-86M-■-BK	EzM2-86M-■-BK						0.54	13	4	3.66	270		300	350	400
Ezi-SERVO II -EC-86L-■-BK	EzM2-86L-■-BK									5.24					
Ezi-SERVO II -EC-86XL-■-BK	EzM2-86XL-■-BK			6.75											

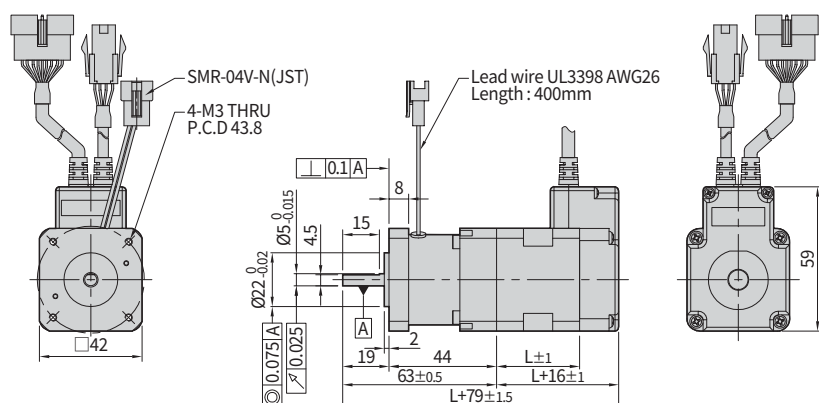
- * The code of encoder resolution is marked in “■”.
- * The electromagnetic brake is intended for holding the position when the power is OFF. Please do not use it for braking during motion.
- * The listed weight refers to the total weight of the motor unit, including the motor and the electromagnetic brake.
- * The motor model name indicates the combined unit of the motor and brake.
- * The motor specifications and torque characteristics are the same as those of the standard motor.
- * An external power supply (24 V DC) is not required when installing the Electric Brake on the 86 mm motor drive.

* Brake Operation Timing Chart

Ezi-SERVO II EtherCAT controls Brake by Drive automatically. Please refer to timing chart on the right when Brake is controlled by the upper controller other than using Ezi-SERVO II EtherCAT Brake control. Otherwise, Drive might malfunction and loads might fall down. Also, please do not operate Brake during motor operation to prevent damage.

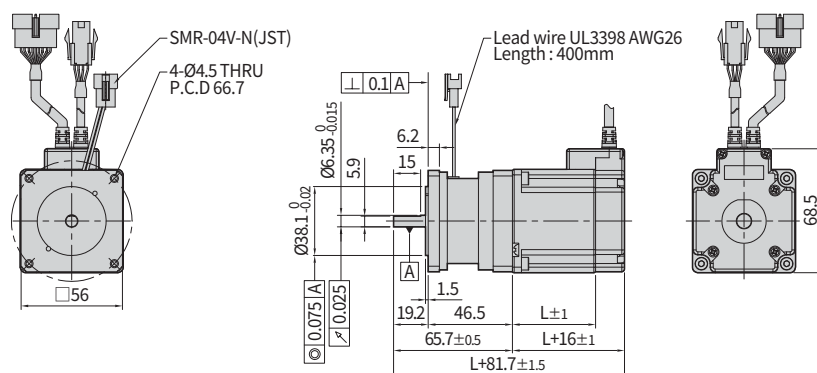


Dimensions of Motor with Brake [mm]



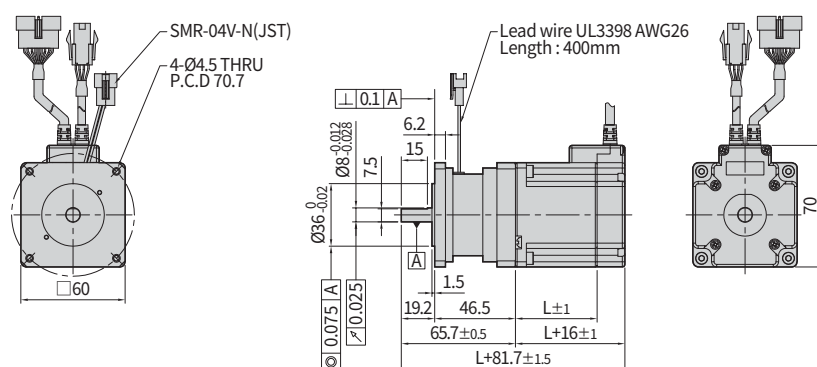
42 mm

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



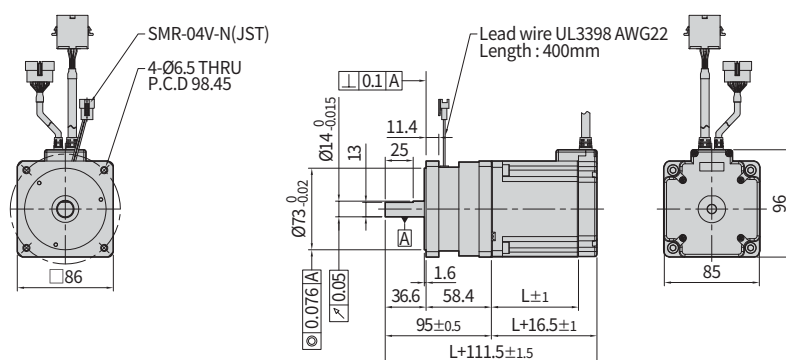
56 mm

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



60 mm

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



86 mm

Model name	Length (L)
EzM2-86M	78
EzM2-86L	117
EzM2-86XL	155

How to Read Specifications

Unit Part Number	① Maximum Holding Torque [N·m]	② Rotor Inertia Moment [kg·m ²]	③ Backlash [arc-min]	④ Angle Transmission Error [arc-min]	⑤ Gear Ratio	⑥ Resolution (10,000 P/R Standard)	⑦ Permissible Torque [N·m]	⑧ Instantaneous Maximum Torque [N·m]	⑨ Permissible Speed Range [r/min]	⑩ Unit Weight [kg]	⑪ Permissible Radial Load (At Center of Axis) [N]	⑫ Permissible Axial Load [N]
Ezi-SERVO II -EC-42S-■-PN3	0.57	35 x 10 ⁻⁷	3	5	3	0.012 °	6	12	0 ~ 1000	0.76	240	270
Ezi-SERVO II -EC-42S-■-PN5	0.95				5	0.0072 °	9	18	0 ~ 600		290	330
Ezi-SERVO II -EC-42S-■-PN8	1.52				8	0.0045 °	9	18	0 ~ 375		340	410
Ezi-SERVO II -EC-42S-■-PN10	1.90				10	0.0036 °	6	12	0 ~ 300		360	450
Ezi-SERVO II -EC-42S-■-PN15	2.76	5	5	7	15	0.0024 °	6	12	0 ~ 200	0.91	410	540
Ezi-SERVO II -EC-42S-■-PN25	4.60				25	0.00144 °	9	18	0 ~ 120		490	640
Ezi-SERVO II -EC-42S-■-PN40	7.36				40	0.0009 °	9	18	0 ~ 75		570	640
Ezi-SERVO II -EC-42S-■-PN50	9.00				50	0.00072 °	9	18	0 ~ 60		620	640

Description of Specification Items

No.	Item	Description
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 the torque below the permissible 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	Gear Ratio	It is the value obtained by dividing the number of output rotation by the number of input rotation.
⑥	Resolution	This is the angle at which the gearbox output shaft moves when the motor is driven by 1 pulse.
⑦	Permissible Torque	It refers to the maximum value of the torque that can be continuously applied to the output shaft of the gearbox during constant speed operation. (When the input rotation speed is 3,000 r/min and the lifetime of the motor becomes 20,000 hours)
⑧	Instantaneous Maximum Torque	This is the maximum torque allowed to the output shaft of the gearbox during acceleration/deceleration.
⑨	Permissible 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.
⑪	Permissible Radial Load	It is the maximum value of the load applied in the direction perpendicular to the gearbox output shaft.
⑫	Permissible Axial Load	It is the maximum value of the load applied in the axial direction to the gearbox output shaft.

Specifications of Motor with Gearbox

42 mm

Unit Part Number	Maximum Holding Torque [N·m]	Rotor Inertia Moment [kg·m ²]	Backlash [arc-min]	Angle Transmission Error [arc-min]	Gear Ratio	Resolution (10,000 P/R Standard)	Permissible Torque [N·m]	Instantaneous Maximum Torque [N·m]	Permissible Speed Range [r/min]	Unit Weight [kg]	Permissible Radial Load (At Center of Axis) [N]	Permissible Axial Load [N]
Ezi-SERVO II -EC-42S-■-PN3	0.57	35 x 10 ⁻⁷	3	5	3	0.012 °	6	12	0~1000	0.76	240	270
Ezi-SERVO II -EC-42S-■-PN5	0.95				5	0.0072 °	9	18	0~600		290	330
Ezi-SERVO II -EC-42S-■-PN8	1.52				8	0.0045 °	9	18	0~375		340	410
Ezi-SERVO II -EC-42S-■-PN10	1.90				10	0.0036 °	6	12	0~300		360	450
Ezi-SERVO II -EC-42S-■-PN15	2.76		5	7	15	0.0024 °	6	12	0~200	0.91	410	540
Ezi-SERVO II -EC-42S-■-PN25	4.60				25	0.00144 °	9	18	0~120		490	640
Ezi-SERVO II -EC-42S-■-PN40	7.36				40	0.0009 °	9	18	0~75		570	640
Ezi-SERVO II -EC-42S-■-PN50	9.00				50	0.00072 °	9	18	0~60		620	640
Ezi-SERVO II -EC-42M-■-PN3	0.85	54 x 10 ⁻⁷	3	5	3	0.012 °	6	12	0~1000	0.81	240	270
Ezi-SERVO II -EC-42M-■-PN5	1.42				5	0.0072 °	9	18	0~600		290	330
Ezi-SERVO II -EC-42M-■-PN8	2.28				8	0.0045 °	9	18	0~375		340	410
Ezi-SERVO II -EC-42M-■-PN10	2.85				10	0.0036 °	6	12	0~300		360	450
Ezi-SERVO II -EC-42M-■-PN15	4.14		5	7	15	0.0024 °	6	12	0~200	0.97	410	540
Ezi-SERVO II -EC-42M-■-PN25	6.90				25	0.00144 °	9	18	0~120		490	640
Ezi-SERVO II -EC-42M-■-PN40	9.00				40	0.0009 °	9	18	0~75		570	640
Ezi-SERVO II -EC-42M-■-PN50	9.00				50	0.00072 °	9	18	0~60		620	640
Ezi-SERVO II -EC-42L-■-PN3	0.92	77 x 10 ⁻⁷	3	5	3	0.012 °	6	12	0~1000	0.89	240	270
Ezi-SERVO II -EC-42L-■-PN5	1.54				5	0.0072 °	9	18	0~600		290	330
Ezi-SERVO II -EC-42L-■-PN8	2.47				8	0.0045 °	9	18	0~375		340	410
Ezi-SERVO II -EC-42L-■-PN10	3.09				10	0.0036 °	6	12	0~300		360	450
Ezi-SERVO II -EC-42L-■-PN15	4.49		5	7	15	0.0024 °	6	12	0~200	1.04	410	540
Ezi-SERVO II -EC-42L-■-PN25	7.49				25	0.00144 °	9	18	0~120		490	640
Ezi-SERVO II -EC-42L-■-PN40	9.00				40	0.0009 °	9	18	0~75		570	640
Ezi-SERVO II -EC-42L-■-PN50	9.00				50	0.00072 °	9	18	0~60		620	640
Ezi-SERVO II -EC-42XL-■-PN3	1.45	114 x 10 ⁻⁷	3	5	3	0.012 °	6	12	0~1000	1.03	240	270
Ezi-SERVO II -EC-42XL-■-PN5	2.42				5	0.0072 °	9	18	0~600		290	330
Ezi-SERVO II -EC-42XL-■-PN8	3.87				8	0.0045 °	9	18	0~375		340	410
Ezi-SERVO II -EC-42XL-■-PN10	4.84				10	0.0036 °	6	12	0~300		360	450
Ezi-SERVO II -EC-42XL-■-PN15	6.00		5	7	15	0.0024 °	6	12	0~200	1.18	410	540
Ezi-SERVO II -EC-42XL-■-PN25	9.00				25	0.00144 °	9	18	0~120		490	640
Ezi-SERVO II -EC-42XL-■-PN40	9.00				40	0.0009 °	9	18	0~75		570	640
Ezi-SERVO II -EC-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

56 mm

Unit Part Number	Maximum Holding Torque [N·m]	Rotor Inertia Moment [kg·m ²]	Backlash [arc-min]	Angle Transmission Error [arc-min]	Gear Ratio	Resolution (10,000 P/R Standard)	Permissible Torque [N·m]	Instantaneous Maximum Torque [N·m]	Permissible Speed Range [r/min]	Unit Weight [kg]	Permissible Radial Load (At Center of Axis) [N]	Permissible Axial Load [N]
Ezi-SERVO II -EC-56S-■-PN3	1.1	180 x 10 ⁻⁷	3	5	3	0.012 °	18	35	0~1000	1.75	430	310
Ezi-SERVO II -EC-56S-■-PN5	1.9				5	0.0072 °	27	50	0~600		510	390
Ezi-SERVO II -EC-56S-■-PN8	3.0				8	0.0045 °	27	50	0~375		600	480
Ezi-SERVO II -EC-56S-■-PN10	3.8				10	0.0036 °	18	35	0~300		640	530
Ezi-SERVO II -EC-56S-■-PN15	5.5				15	0.0024 °	18	35	0~200	2.05	740	630
Ezi-SERVO II -EC-56S-■-PN25	9.3				25	0.00144 °	27	50	0~120		870	790
Ezi-SERVO II -EC-56S-■-PN40	14.9				40	0.0009 °	27	50	0~75		1000	970
Ezi-SERVO II -EC-56S-■-PN50	18.6				50	0.00072 °	27	50	0~60		1100	1100
Ezi-SERVO II -EC-56M-■-PN3	2.0	280 x 10 ⁻⁷	3	5	3	0.012 °	18	35	0~1000	1.92	430	310
Ezi-SERVO II -EC-56M-■-PN5	3.4				5	0.0072 °	27	50	0~600		510	390
Ezi-SERVO II -EC-56M-■-PN8	5.4				8	0.0045 °	27	50	0~375		600	480
Ezi-SERVO II -EC-56M-■-PN10	6.8				10	0.0036 °	18	35	0~300		640	530
Ezi-SERVO II -EC-56M-■-PN15	9.9				15	0.0024 °	18	35	0~200	2.23	740	630
Ezi-SERVO II -EC-56M-■-PN25	16.6				25	0.00144 °	27	50	0~120		870	790
Ezi-SERVO II -EC-56M-■-PN40	27.0				40	0.0009 °	27	50	0~75		1000	970
Ezi-SERVO II -EC-56M-■-PN50	27.0				50	0.00072 °	27	50	0~60		1100	1100
Ezi-SERVO II -EC-56L-■-PN3	4.0	520 x 10 ⁻⁷	3	5	3	0.012 °	18	35	0~1000	2.37	430	310
Ezi-SERVO II -EC-56L-■-PN5	6.8				5	0.0072 °	27	50	0~600		510	390
Ezi-SERVO II -EC-56L-■-PN8	10.8				8	0.0045 °	27	50	0~375		600	480
Ezi-SERVO II -EC-56L-■-PN10	13.6				10	0.0036 °	18	35	0~300		640	530
Ezi-SERVO II -EC-56L-■-PN15	18.0				15	0.0024 °	18	35	0~200	2.67	740	630
Ezi-SERVO II -EC-56L-■-PN25	27.0				25	0.00144 °	27	50	0~120		870	790
Ezi-SERVO II -EC-56L-■-PN40	27.0				40	0.0009 °	27	50	0~75		1000	970
Ezi-SERVO II -EC-56L-■-PN50	27.0				50	0.00072 °	27	50	0~60		1100	1100

* The code of encoder resolution will be marked in “■”

Specifications of Motor with Gearbox

60 mm

Unit Part Number	Maximum Holding Torque [N·m]	Rotor Inertia Moment [kg·m ²]	Backlash [arc-min]	Angle Transmission Error [arc-min]	Gear Ratio	Resolution (10,000 P/R Standard)	Permissible Torque [N·m]	Instantaneous Maximum Torque [N·m]	Permissible Speed Range [r/min]	Unit Weight [kg]	Permissible Radial Load (At Center of Axis) [N]	Permissible Axial Load [N]
Ezi-SERVO II -EC-60S-■-PN3	1.5	240 x 10 ⁻⁷	3	5	3	0.012 °	18	35	0~1000	1.84	430	310
Ezi-SERVO II -EC-60S-■-PN5	2.5				5	0.0072 °	27	50	0~600		510	390
Ezi-SERVO II -EC-60S-■-PN8	4.0				8	0.0045 °	27	50	0~375		600	480
Ezi-SERVO II -EC-60S-■-PN10	5.1				10	0.0036 °	18	35	0~300		640	530
Ezi-SERVO II -EC-60S-■-PN15	7.4				15	0.0024 °	18	35	0~200	2.13	740	630
Ezi-SERVO II -EC-60S-■-PN25	12.3				25	0.00144 °	27	50	0~120		870	790
Ezi-SERVO II -EC-60S-■-PN40	19.8				40	0.0009 °	27	50	0~75		1000	970
Ezi-SERVO II -EC-60S-■-PN50	24.7				50	0.00072 °	27	50	0~60		1100	1100
Ezi-SERVO II -EC-60M-■-PN3	2.6	490 x 10 ⁻⁷	3	5	3	0.012 °	18	35	0~1000	1.20	430	310
Ezi-SERVO II -EC-60M-■-PN5	4.4				5	0.0072 °	27	50	0~600		510	390
Ezi-SERVO II -EC-60M-■-PN8	7.0				8	0.0045 °	27	50	0~375		600	480
Ezi-SERVO II -EC-60M-■-PN10	8.8				10	0.0036 °	18	35	0~300		640	530
Ezi-SERVO II -EC-60M-■-PN15	12.8				15	0.0024 °	18	35	0~200	2.30	740	630
Ezi-SERVO II -EC-60M-■-PN25	21.4				25	0.00144 °	27	50	0~120		870	790
Ezi-SERVO II -EC-60M-■-PN40	27.0				40	0.0009 °	27	50	0~75		1000	970
Ezi-SERVO II -EC-60M-■-PN50	27.0				50	0.00072 °	27	50	0~60		1100	1100
Ezi-SERVO II -EC-60L-■-PN3	5.2	690 x 10 ⁻⁷	3	5	3	0.012 °	18	35	0~1000	2.61	430	310
Ezi-SERVO II -EC-60L-■-PN5	8.7				5	0.0072 °	27	50	0~600		510	390
Ezi-SERVO II -EC-60L-■-PN8	13.9				8	0.0045 °	27	50	0~375		600	480
Ezi-SERVO II -EC-60L-■-PN10	18.0				10	0.0036 °	18	35	0~300		640	530
Ezi-SERVO II -EC-60L-■-PN15	18.0				15	0.0024 °	18	35	0~200	2.86	740	630
Ezi-SERVO II -EC-60L-■-PN25	27.0				25	0.00144 °	27	50	0~120		870	790
Ezi-SERVO II -EC-60L-■-PN40	27.0				40	0.0009 °	27	50	0~75		1000	970
Ezi-SERVO II -EC-60L-■-PN50	27.0				50	0.00072 °	27	50	0~60		1100	1100

* The code of encoder resolution will be marked in “■”

Specifications of Motor with Gearbox

86 mm

Unit Part Number	Maximum Holding Torque [N·m]	Rotor Inertia Moment [kg·m ²]	Backlash [arc-min]	Angle Transmission Error [arc-min]	Gear Ratio	Resolution (10,000 P/R Standard)	Permissible Torque [N·m]	Instantaneous Maximum Torque [N·m]	Permissible Speed Range [r/min]	Unit Weight [kg]	Permissible Radial Load (At Center of Axis) [N]	Permissible Axial Load [N]
Ezi-SERVO II -EC-86M-■-PN3	9.6	1800 x 10 ⁻⁷	3	5	3	0.012 °	50	80	0~1000	5.74	810	930
Ezi-SERVO II -EC-86M-■-PN5	16.0				5	0.0072 °	75	125	0~600		960	1200
Ezi-SERVO II -EC-86M-■-PN8	25.7				8	0.0045 °	75	125	0~375		1100	1400
Ezi-SERVO II -EC-86M-■-PN10	32.1				10	0.0036 °	50	80	0~300		1200	1600
Ezi-SERVO II -EC-86M-■-PN15	46.6				15	0.0024 °	50	80	0~200	6.54	1200	1900
Ezi-SERVO II -EC-86M-■-PN25	75.0				25	0.00144 °	75	125	0~120		1600	2200
Ezi-SERVO II -EC-86M-■-PN40	75.0				40	0.0009 °	75	125	0~75		1900	2200
Ezi-SERVO II -EC-86M-■-PN50	75.0				50	0.00072 °	75	125	0~60		2100	2200
Ezi-SERVO II -EC-86L-■-PN3	17.1	3600 x 10 ⁻⁷	3	5	3	0.012 °	50	80	0~1000	7.33	810	930
Ezi-SERVO II -EC-86L-■-PN5	28.5				5	0.0072 °	75	125	0~600		960	1200
Ezi-SERVO II -EC-86L-■-PN8	45.6				8	0.0045 °	75	125	0~375		1100	1400
Ezi-SERVO II -EC-86L-■-PN10	50.0				10	0.0036 °	50	80	0~300		1200	1600
Ezi-SERVO II -EC-86L-■-PN15	50.0				15	0.0024 °	50	80	0~200	8.12	1200	1900
Ezi-SERVO II -EC-86L-■-PN25	75.0				25	0.00144 °	75	125	0~120		1600	2200
Ezi-SERVO II -EC-86L-■-PN40	75.0				40	0.0009 °	75	125	0~75		1900	2200
Ezi-SERVO II -EC-86L-■-PN50	75.0				50	0.00072 °	75	125	0~60		2100	2200
Ezi-SERVO II -EC-86XL-■-PN3	23.6	5400 x 10 ⁻⁷	3	5	3	0.012 °	50	80	0~1000	8.84	810	930
Ezi-SERVO II -EC-86XL-■-PN5	39.4				5	0.0072 °	75	125	0~600		960	1200
Ezi-SERVO II -EC-86XL-■-PN8	63.0				8	0.0045 °	75	125	0~375		1100	1400
Ezi-SERVO II -EC-86XL-■-PN10	50.0				10	0.0036 °	50	80	0~300		1200	1600
Ezi-SERVO II -EC-86XL-■-PN15	50.0				15	0.0024 °	50	80	0~200	9.64	1200	1900
Ezi-SERVO II -EC-86XL-■-PN25	75.0				25	0.00144 °	75	125	0~120		1600	2200
Ezi-SERVO II -EC-86XL-■-PN40	75.0				40	0.0009 °	75	125	0~75		1900	2200
Ezi-SERVO II -EC-86XL-■-PN50	75.0				50	0.00072 °	75	125	0~60		2100	2200

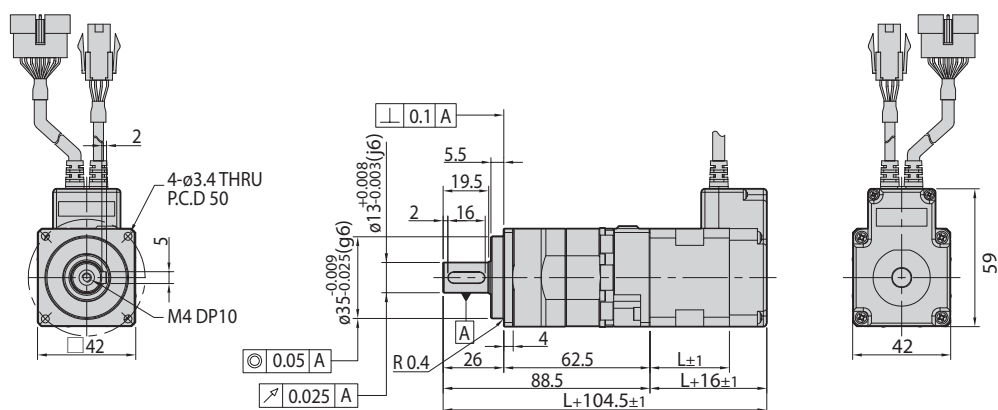
* The code of encoder resolution will be marked in “■”

Dimensions of Motor with Gearbox [mm]

42 mm

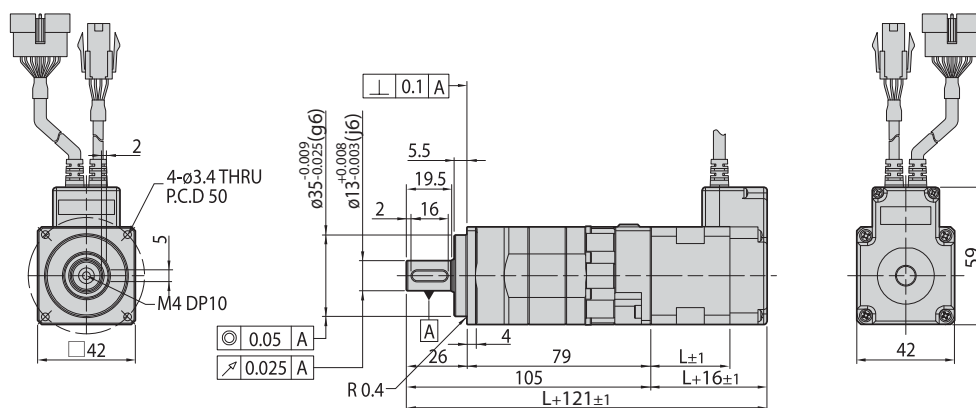
Unit Part Number	Motor	Stage	□ Gear Ratio	L [mm]
Ezi-SERVO II -EC-42S-■-PN□	EzM2-42S-■-PN□	Single Stage	3, 5, 8, 10	34
Ezi-SERVO II -EC-42M-■-PN□	EzM2-42M-■-PN□		3, 5, 8, 10	40
Ezi-SERVO II -EC-42L-■-PN□	EzM2-42L-■-PN□		3, 5, 8, 10	48
Ezi-SERVO II -EC-42XL-■-PN□	EzM2-42XL-■-PN□		3, 5, 8, 10	60

* The code of encoder resolution will be marked in “■”



Unit Part Number	Motor	Stage	□ Gear Ratio	L [mm]
Ezi-SERVO II -EC-42S-■-PN□	EzM2-42S-■-PN□	Double Stage	15, 25, 40, 50	34
Ezi-SERVO II -EC-42M-■-PN□	EzM2-42M-■-PN□		15, 25, 40, 50	40
Ezi-SERVO II -EC-42L-■-PN□	EzM2-42L-■-PN□		15, 25, 40, 50	48
Ezi-SERVO II -EC-42XL-■-PN□	EzM2-42XL-■-PN□		15, 25, 40, 50	60

* The code of encoder resolution will be marked in “■”

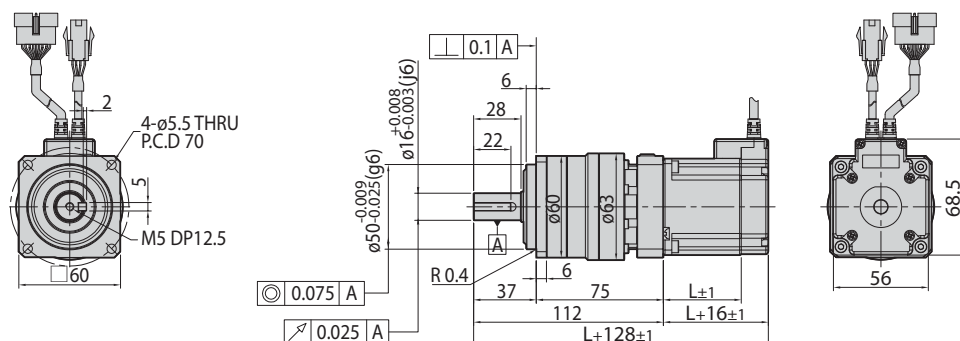


Dimensions of Motor with Gearbox [mm]

56 mm

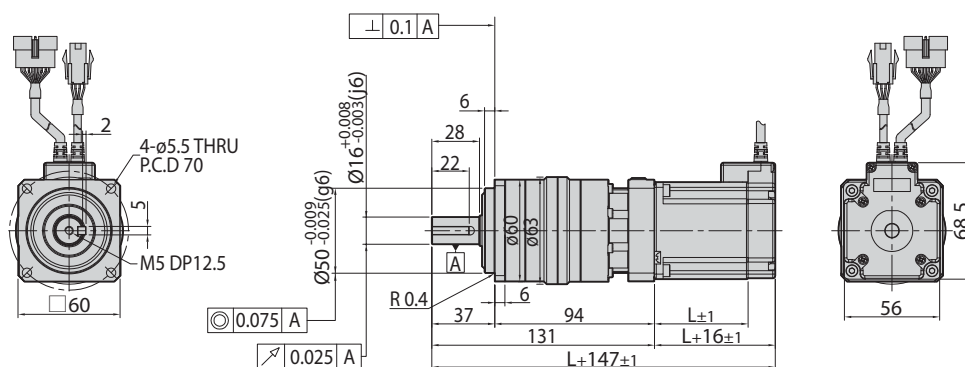
Unit Part Number	Motor	Stage	□ Gear Ratio	L [mm]
Ezi-SERVO II -EC-56S-■-PN□	EzM2-56S-■-PN□	Single Stage	3, 5, 8, 10	46
Ezi-SERVO II -EC-56M-■-PN□	EzM2-56M-■-PN□		3, 5, 8, 10	55
Ezi-SERVO II -EC-56L-■-PN□	EzM2-56L-■-PN□		3, 5, 8, 10	80

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



Unit Part Number	Motor	Stage	□ Gear Ratio	L [mm]
Ezi-SERVO II -EC-56S-■-PN□	EzM2-56S-■-PN□	Double Stage	15, 25, 40, 50	46
Ezi-SERVO II -EC-56M-■-PN□	EzM2-56M-■-PN□		15, 25, 40, 50	55
Ezi-SERVO II -EC-56L-■-PN□	EzM2-56L-■-PN□		15, 25, 40, 50	80

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

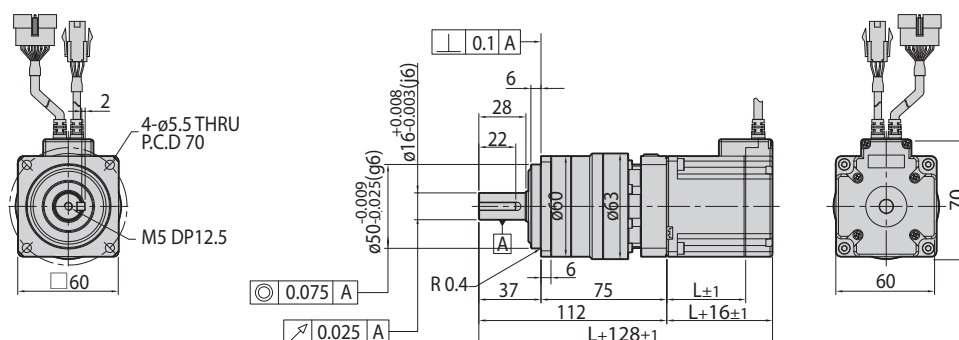


Dimensions of Motor with Gearbox [mm]

60 mm

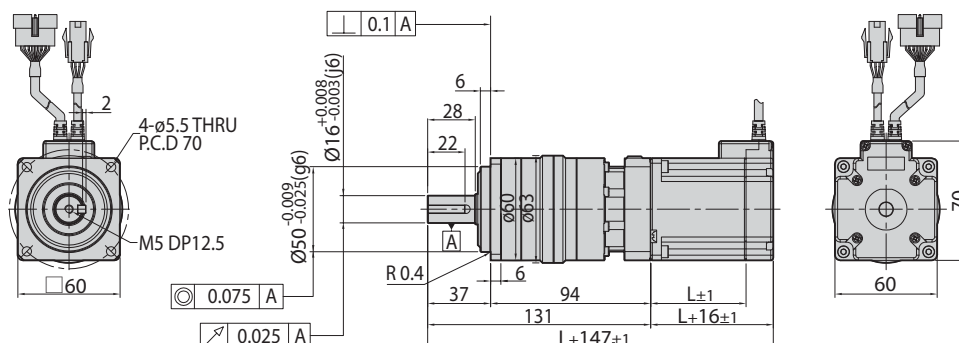
Unit Part Number	Motor	Stage	□ Gear Ratio	L [mm]
Ezi-SERVO II -EC-60S-■-PN□	EzM2-60S-■-PN□	Single Stage	3, 5, 8, 10	47
Ezi-SERVO II -EC-60M-■-PN□	EzM2-60M-■-PN□		3, 5, 8, 10	56
Ezi-SERVO II -EC-60L-■-PN□	EzM2-60L-■-PN□		3, 5, 8, 10	85

* The code of encoder resolution will be marked in “■”



Unit Part Number	Motor	Stage	□ Gear Ratio	L [mm]
Ezi-SERVO II -EC-60S-■-PN□	EzM2-60S-■-PN□	Double Stage	15, 25, 40, 50	47
Ezi-SERVO II -EC-60M-■-PN□	EzM2-60M-■-PN□		15, 25, 40, 50	56
Ezi-SERVO II -EC-60L-■-PN□	EzM2-60L-■-PN□		15, 25, 40, 50	85

* The code of encoder resolution will be marked in “■”

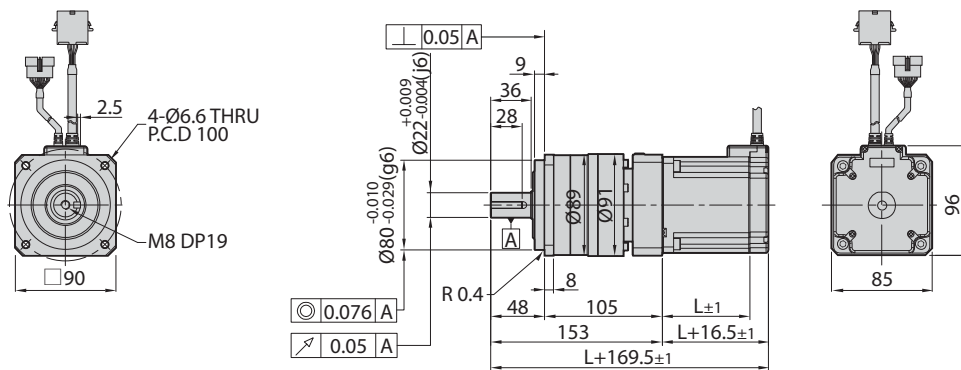


Dimensions of Motor with Gearbox [mm]

86 mm

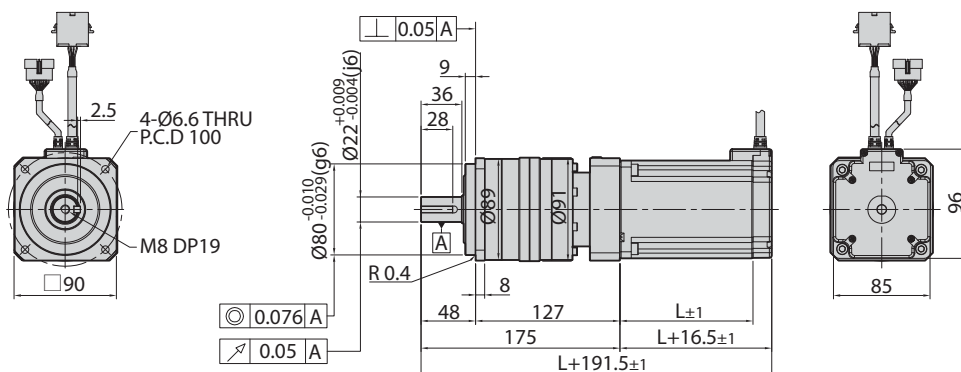
Unit Part Number	Motor	Stage	□ Gear Ratio	L [mm]
Ezi-SERVO II -EC-86M-■-PN□	EzM2-86M-■-PN□	Single Stage	3, 5, 8, 10	78
Ezi-SERVO II -EC-86L-■-PN□	EzM2-86L-■-PN□		3, 5, 8, 10	117
Ezi-SERVO II -EC-86XL-■-PN□	EzM2-86XL-■-PN□		3, 5, 8, 10	155

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

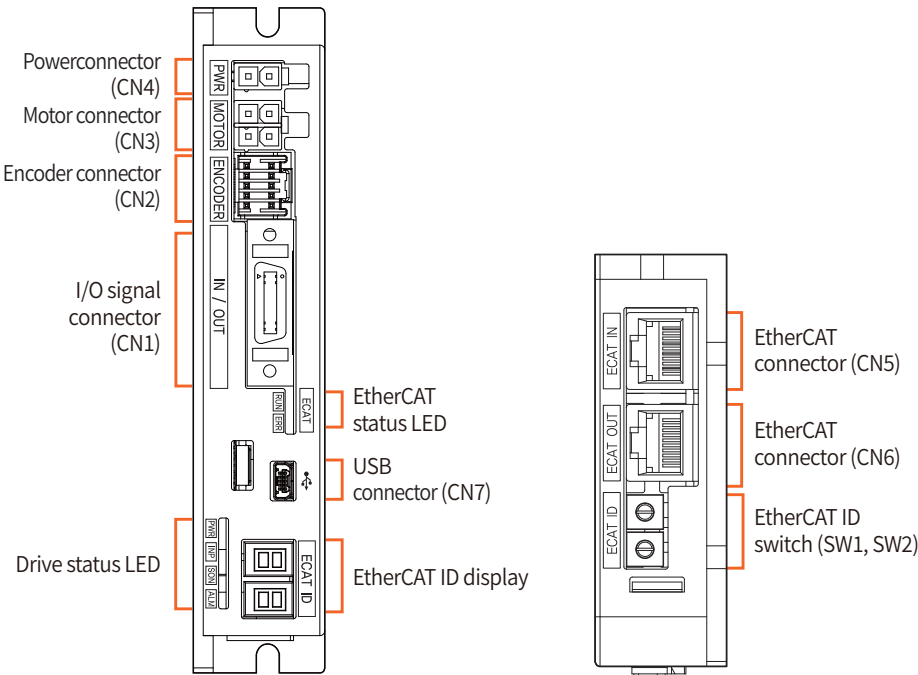


Unit Part Number	Motor	Stage	□ Gear Ratio	L [mm]
Ezi-SERVO II -EC-86M-■-PN□	EzM2-86M-■-PN□	Double Stage	15, 25, 40, 50	78
Ezi-SERVO II -EC-86L-■-PN□	EzM2-86L-■-PN□		15, 25, 40, 50	117
Ezi-SERVO II -EC-86XL-■-PN□	EzM2-86XL-■-PN□		15, 25, 40, 50	155

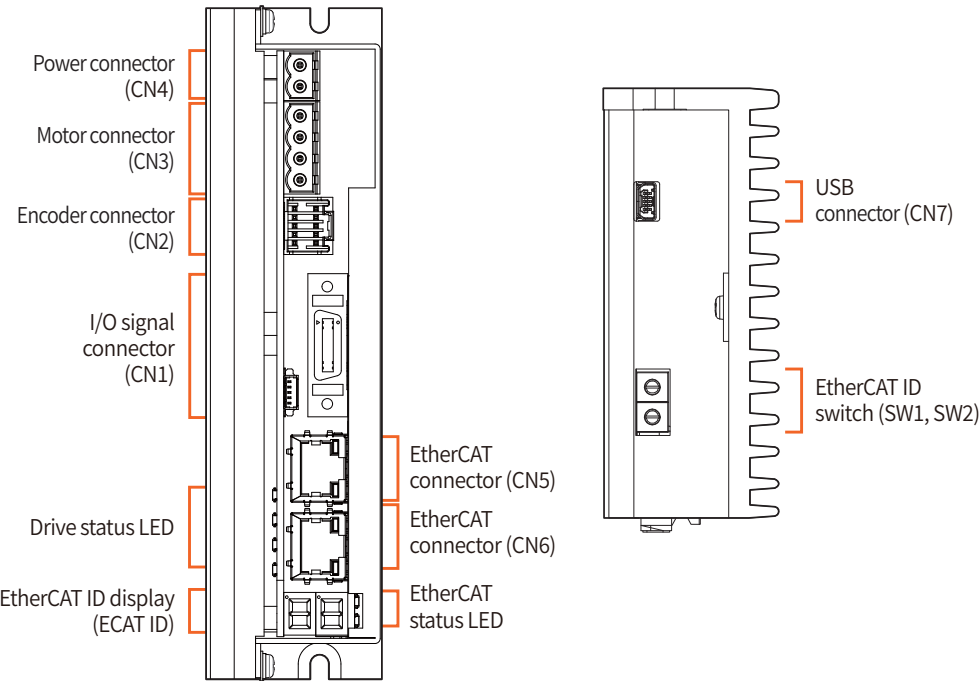
* The code of encoder resolution will be marked in "■"



Settings and Operation

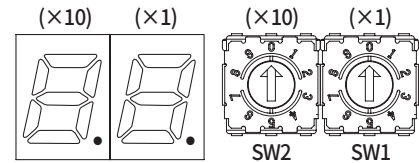


86 mm Motor Drive (EzS2-EC-86 series)



1. EtherCAT ID Display and Setting Switch(SW1, SW2)

These switches are used to set the EtherCAT ID (ECAT Device ID) node address in decimal format. SW1 sets the units digit ($\times 1$), and SW2 sets the tens digit ($\times 10$).



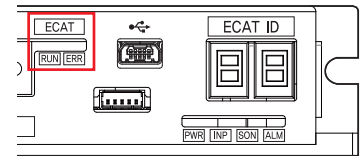
2. EtherCAT Status LED

The LED indicators show the communication status of EtherCAT.
A Link / Activity LED is present on each EtherCAT port.

Indication	Color	Status	Description
RUN	Green	OFF	INIT state or Power OFF
		Blinking	PRE-OPERATIONAL state
		Single Flash	SAFE-OPERATIONAL state
		ON	OPERATIONAL state
		Flickering	BOOTSTRAP state

Indication	Color	Status	Description
ERR	Red	OFF	No Error or Power OFF
		Blinking	Communication configuration error
		Single Flash	Communication Data Error
		Double Flash	Watchdog Time Out

Indication	Color	Status	Description
Link / Activity	Green	OFF	Link inactive
		ON	Link active
		Flickering	Link active and communicating



3. Drive Status LED

LED informs operation status of the drive.

Indication	Color	Function	Description
PWR	Green	Power Input Indication	Lights up when power is supplied.
INP	Yellow	Complete Positioning Motion	LED is turned ON when Positioning error reaches within the preset pulse after the positioning is complete.
SON	Orange	Servo ON / OFF Indication	Lights up when Servo is On; turns off when Servo is Off.
ALM	Red	Alarm Indication	Blinks repeatedly when an error occurs.

List of error types by the the number of LED blinking

No.	Error Code ^{*4}	Error Type	Causes
1	E-001	Over Current Error	Excessive current flowed through the motor drive components. ^{*1}
2	E-002	Over Speed Error	The motor speed exceeds 3,000 r/min
3	E-003	Position Tracking Error	Position error value is greater than the reference value while the motor is running ^{*2}
4	E-004	Over Load Error	The motor is continuously operated more than 5 seconds under a load exceeding the Max. torque.
5	E-005	Over Temperature Error	Internal temperature of the drive exceeds 85 °C
6	E-006	Regeneration Overvoltage Error	Motor back EMF caused the drive voltage to exceed its limit. ^{*3}
7	E-007	Motor Connection Error	Abnormal connection between the drive and motor.
8	E-008	Encoder Connection Error	Abnormal connection between the drive and encoder.
10	E-010	In-Position Error	After operation is finished, position error larger than 1 pulse is continued for more than 3 seconds
12	E-012	ROM Error	Abnormality occurred in the parameter storage device (ROM).
15	E-015	Position Overflow Error	Position error value is greater than the reference value while the motor is stopped ^{*2}

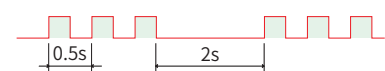
^{*1}: The overcurrent threshold varies depending on the motor. (Refer to the user manual.)

^{*2}: The regenerative voltage limit caused by the motor's back EMF varies depending on the motor. (Refer to the user manual.)

^{*3}: Voltage limit of Back-EMF depends on motor model. (Refer to the user manual.)

^{*4}: When an alarm occurs, the 7-segment LED will display the error code instead of the EtherCAT ID.

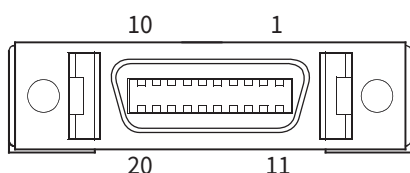
※ For more details, please refer to the respective user manuals.



Alarm LED flash (e.g., Position tracking error)

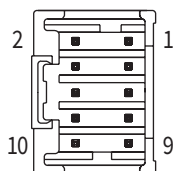
4. Input/Output Signal Connector (CN1)

No.	Function	I/O
1	LIMIT+	Input
2	LIMIT-	Input
3	ORIGIN	Input
4	Digital In1	Input
5	Digital In2	Input
6	Digital In3	Input
7	Digital In4	Input
8	Digital In5	Input
9	Digital In6	Input
10	Digital In7	Input
11	Digital Out1	Output
12	Digital Out2	Output
13	Digital Out3	Output
14	Digital Out4	Output
15	Digital Out5	Output
16	Digital Out6	Output
17	BRAKE+	Output
18	BRAKE-	Output
19	EXT_GND	Input
20	EXT_24 V DC	Input



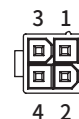
5. Encoder Connector (CN2)

No.	Function	I/O
1	A+	Input
2	A-	Input
3	B+	Input
4	B-	Input
5	Z+	Input
6	Z-	Input
7	5 V DC	Output
8	GND	Output
9	F.GND	----
10	F.GND	----

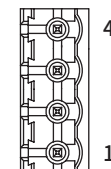


6. Motor Connector (CN3)

No.	Function	I/O
1	A Phase	Output
2	B Phase	Output
3	$\bar{A}$ Phase	Output
4	$\bar{B}$ Phase	Output



No.	Function	I/O
1	$\bar{B}$ Phase	Output
2	B Phase	Output
3	$\bar{A}$ Phase	Output
4	A Phase	Output



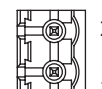
※ 86 mm motor drive.

7. Main Power Connector (CN4)

No.	Function	I/O
1	24 V DC	Input
2	GND	Input



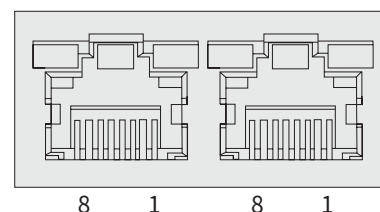
No.	Function	I/O
1	GND	Input
2	40 ~ 70 V DC	Input



※ 86 mm motor drive.

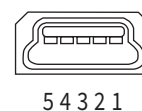
8. EtherCAT Connector (CN5, CN6)

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

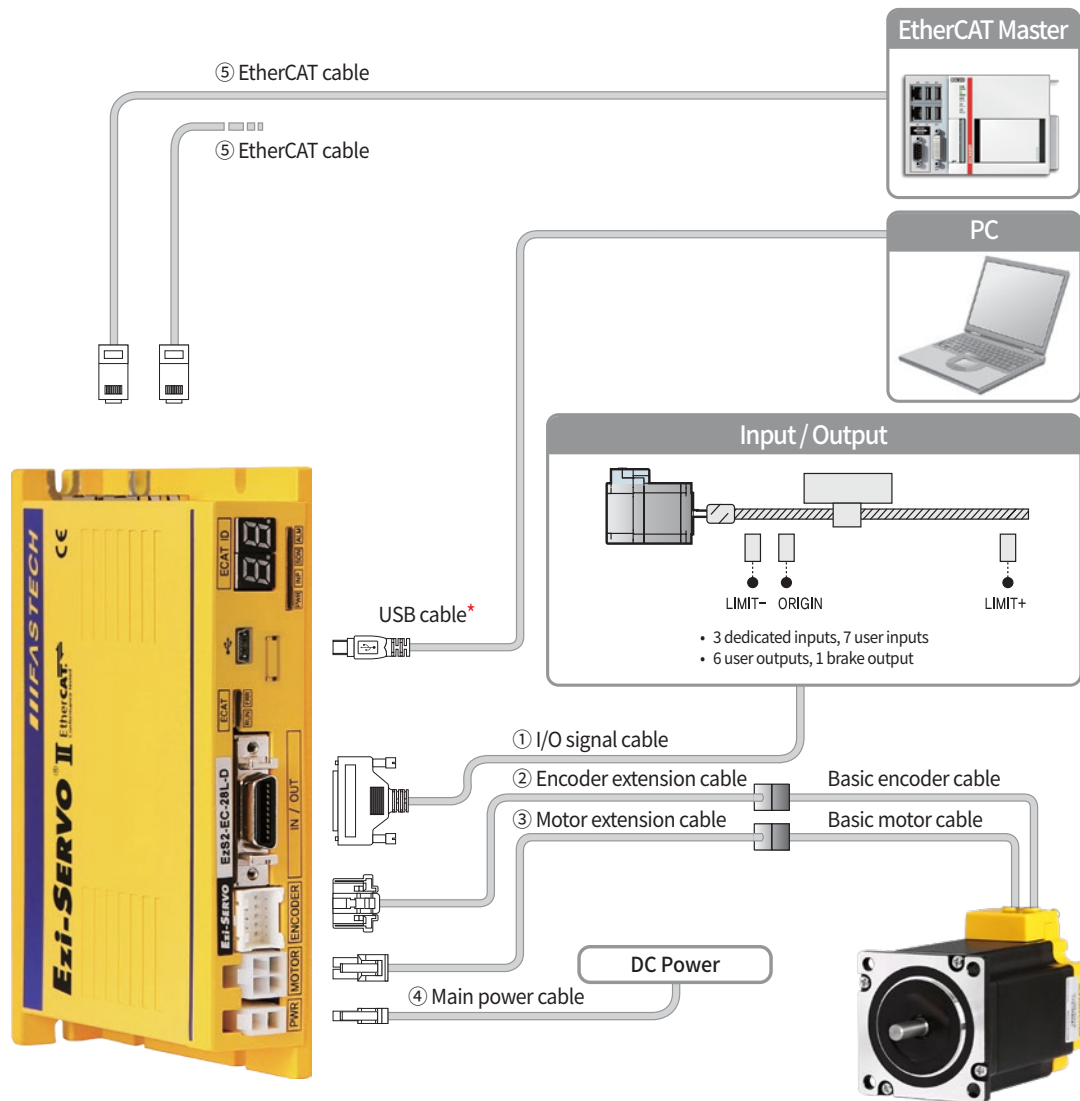


9. USB Connector (CN7)

No.	Function
1	V _{BUS}
2	D-
3	D+
4	---
5	GND



System Configuration



Cable Type	Max. Cable Length	Remarks
① I/O Signal Cable	20 m	Options (Sold separately)
② Encoder Extension Cable	20 m	
③ Motor Extension Cable	20 m	
④ Power Cable	2 m	
⑤ EtherCAT Cable	100 m	Basic cables are attached to motors.
Basic Encoder Cable	0.3 m (Basic length)	
Basic Motor Cable	0.3 m (Basic length)	
USB Cable	5 m	* USB cables are not provided by FASTECH. We recommend using a standard USB cable (USB 2.0 Mini Type B).

1. Accessories

Connectors

These are connector specifications for drive cabling.

Purpose		Item	Part Number	Manufacturer
Power (CN4)		Housing	5557-02R	MOLEX
		Terminal	5556T	
Motor	Drive Side (CN3)	Housing	5557-04R	MOLEX
		Terminal	5556T	
	Motor Side	Housing	5557-04R	MOLEX
		Terminal	5556T	
Encoder	Drive Side (CN2)	Housing	51353-1000	MOLEX
		Terminal	56134-9000	
	Encoder Side	Housing	SMP-09V-NC	JST
		Terminal	SHF-001T-0.8BS	
I/O Signal (CN1)		Connector	10120-3000PE (DF02P020F22A1)	3M (JAE)
		Connector Cover	10320-52A0-008 (DF02D020B22)	

※ The connectors above are supplied with the product. If you are using other parts, please make sure they meet the specifications.

2. Options

① I/O Signal Cable

These are the cables to connect Ezi-SERVO II EtherCAT drive and other input / output devices.

Purpose	Part Number	Length [m]	Cable Type	Remarks
Drive - I/O Device Connection	CSVN-S-001F	1	Fixed Cable	Max. Cable Length: 20 m
	CSVN-S-002F	2		
	CSVN-S-003F	3		
	CSVN-S-005F	5		
	CSVN-S-001M	1	Flexible Cable	
	CSVN-S-002M	2		
	CSVN-S-003M	3		
	CSVN-S-005M	5		

* If you need cables with length(in units of 1 m) not listed on the table, please contact FASTECH for more information.

② Encoder Extension Cable

These are the cables to connect Ezi-SERVO II EtherCAT drive and the encoder.

Purpose	Part Number	Length [m]	Cable Type	Remarks
Drive - Basic Encoder Cable Connection	CSVO-E-001F	1	Fixed Cable	Max. Cable Length: 20 m
	CSVO-E-002F	2		
	CSVO-E-003F	3		
	CSVO-E-005F	5		
	CSVO-E-001M	1	Flexible Cable	
	CSVO-E-002M	2		
	CSVO-E-003M	3		
	CSVO-E-005M	5		

* If you need cables with length(in units of 1 m) not listed on the table, please contact FASTECH for more information.

③ Motor Extension Cable

These are the cables to connect Ezi-SERVO II EtherCAT drive and the motor.

Purpose	Part Number	Length [m]	Cable Type	Remarks
Drive - Basic Motor Cable Connection	CSVO-M-001F	1	Fixed Cable	Max. Cable Length: 20 m
	CSVO-M-002F	2		
	CSVO-M-003F	3		
	CSVO-M-005F	5		
	CSVO-M-001M	1	Flexible Cable	
	CSVO-M-002M	2		
	CSVO-M-003M	3		
	CSVO-M-005M	5		

* If you need cables with length(in units of 1 m) not listed on the table, please contact FASTECH for more information.

④ Power Cable

These are the cables to connect Ezi-SERVO II EtherCAT drive and the power.

Purpose	Part Number	Length [m]	Cable Type	Remarks
Drive - Power Connection	CSVO-P-001F	1	Fixed Cable	Max. Cable Length: 2 m
	CSVO-P-002F	2		
	CSVO-P-001M	1	Flexible Cable	
	CSVO-P-002M	2		

⑤ EtherCAT Cable

Purpose	Part Number	Length [m]	Remarks
EtherCAT Connection	CGNR-EC-001F	1	• STP(Shielded Twisted Pair) Cable • Category 5e or higher • Max. Cable Length: 100 m • Fixed Cable
	CGNR-EC-002F	2	
	CGNR-EC-003F	3	
	CGNR-EC-005F	5	

* If you need cables with length(in units of 1 m) not listed on the table or robot cables, please contact FASTECH for more information.

[Option] TB-Plus Interface Board

This is an interface board to connect Ezi-SERVO II EtherCAT drive and I/O signals more conveniently.

Purpose	Part Number	Product Image
Interface Board between Drive and I/O Signals	TB-Plus	

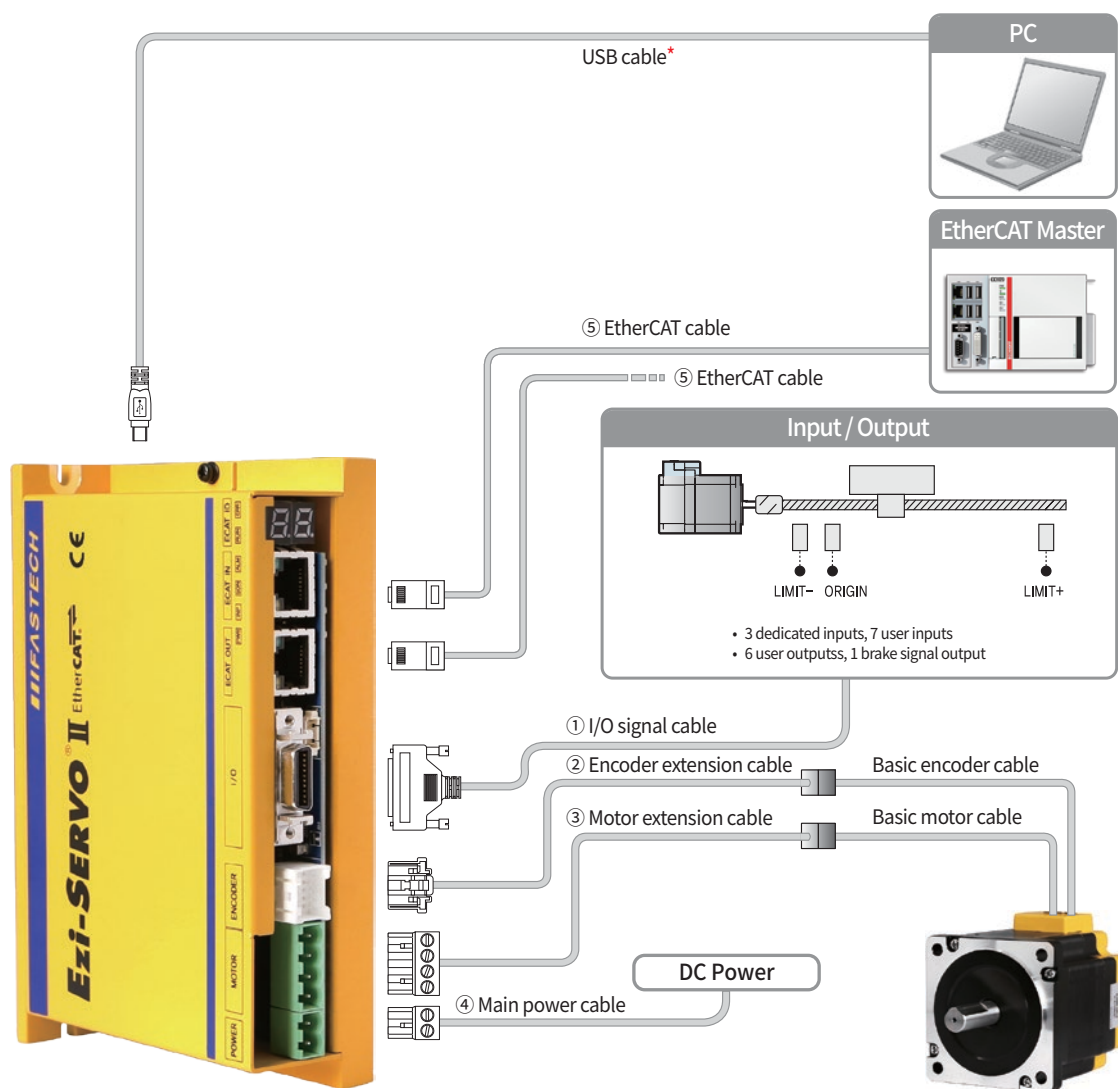
[Option] TB-Plus Interface Cable

These are the cables to connect Ezi-SERVO II EtherCAT drive and TB-Plus interface board.

Purpose	Part Number	Length [m]	Cable Type	Remarks
Drive - Interface(TB-Plus) Connection	CIFN-S-001F	1	Fixed Cable	Max. Cable Length: 20 m
	CIFN-S-002F	2		
	CIFN-S-003F	3		
	CIFN-S-005F	5		
	CIFN-S-001M	1	Flexible Cable	
	CIFN-S-002M	2		
	CIFN-S-003M	3		
	CIFN-S-005M	5		

* If you need cables with length(in units of 1 m) not listed on the table, please contact FASTECH for more information.

System Configuration [86 mm Motor Drive]



Cable Type	Max. Cable Length	Remarks
① I/O Signal Cable	20 m	Options (Sold separately)
② Encoder Extension Cable	20 m	
③ Motor Extension Cable	20 m	
④ Power Cable	2 m	
⑤ EtherCAT Cable	100 m	Basic cables are attached to motors.
Basic Encoder Cable	0.3 m (Basic length)	
Basic Motor Cable	0.3 m (Basic length)	

1. Accessories

Connectors

These are connector specifications for drive cabling.

Purpose		Item	Part Number	Manufacturer
Power (CN4)		Terminal Block	AK950-2	PTR
Motor	Drive Side (CN3)	Terminal Block	AK950-4	PTR
	Motor Side	Housing Terminal	3191-4R1 1381T	MOLEX
Encoder	Drive Side (CN2)	Housing Terminal	51353-1000 56134-9000	MOLEX
	Encoder Side	Housing Terminal	SMP-09V-NC SHF-001T-0.8BS	JST
I/O Signal (CN1)		Connector	10120-3000PE (DF02P020F22A1)	3M (JAE)
		Connector Cover	10320-52A0-008 (DF02D020B22)	

※ The connectors above are supplied with the product. If you are using other parts, please make sure they meet the specifications.

2. Options

① I/O Signal Cable

These are the cables to connect Ezi-SERVO II EtherCAT drive and other input / output devices.

Purpose	Part Number	Length [m]	Cable Type	Remarks
Drive - I/O Device Connection	CSVN-S-001F	1	Fixed Cable	Max. Cable Length: 20 m
	CSVN-S-002F	2		
	CSVN-S-003F	3		
	CSVN-S-005F	5		
	CSVN-S-001M	1	Flexible Cable	
	CSVN-S-002M	2		
	CSVN-S-003M	3		
	CSVN-S-005M	5		

* If you need cables with length(in units of 1 m) not listed on the table, please contact FASTECH for more information.

② Encoder Extension Cable

These are the cables to connect Ezi-SERVO II EtherCAT drive and the encoder.

Purpose	Part Number	Length [m]	Cable Type	Remarks
Drive - Basic Encoder Cable Connection	CSVO-E-001F	1	Fixed Cable	Max. Cable Length: 20 m
	CSVO-E-002F	2		
	CSVO-E-003F	3		
	CSVO-E-005F	5		
	CSVO-E-001M	1	Flexible Cable	
	CSVO-E-002M	2		
	CSVO-E-003M	3		
	CSVO-E-005M	5		

* If you need cables with length(in units of 1 m) not listed on the table, please contact FASTECH for more information.

③ Motor Extension Cable

These are the cables to connect Ezi-SERVO II EtherCAT drive and the motor.

Purpose	Part Number	Length [m]	Cable Type	Remarks
Drive - Basic Motor Cable Connection	CSVP-M-001F	1	Fixed Cable	Max. Cable Length: 20 m
	CSVP-M-002F	2		
	CSVP-M-003F	3		
	CSVP-M-005F	5		
	CSVP-M-001M	1	Flexible Cable	
	CSVP-M-002M	2		
	CSVP-M-003M	3		
	CSVP-M-005M	5		

* If you need cables with length (in units of 1 m) not listed on the table, please contact FASTECH for more information.

④ Power Cable

These are the cables to connect Ezi-SERVO II EtherCAT drive and the power.

Purpose	Part Number	Length [m]	Cable Type	Remarks
Drive - Power Connection	CSVP-P-001F	1	Fixed Cable	Max. Cable Length: 2 m
	CSVP-P-002F	2		
	CSVP-P-001M	1	Flexible Cable	
	CSVP-P-002M	2		

⑤ EtherCAT Cable

Purpose	Part Number	Length [m]	Remarks
EtherCAT Connection	CGNR-EC-001F	1	• STP(Shielded Twisted Pair) Cable • Category 5e or higher • Max. Cable Length: 100 m • Fixed Cable
	CGNR-EC-002F	2	
	CGNR-EC-003F	3	
	CGNR-EC-005F	5	

* If you need cables with length (in units of 1 m) not listed on the table or robot cables, please contact FASTECH for more information.

[Option] TB-Plus Interface Board

This is an interface board to connect Ezi-SERVO II EtherCAT drive and I/O signals more conveniently.

Purpose	Part Number	Product Image
Interface Board between Drive and I/O Signals	TB-Plus	

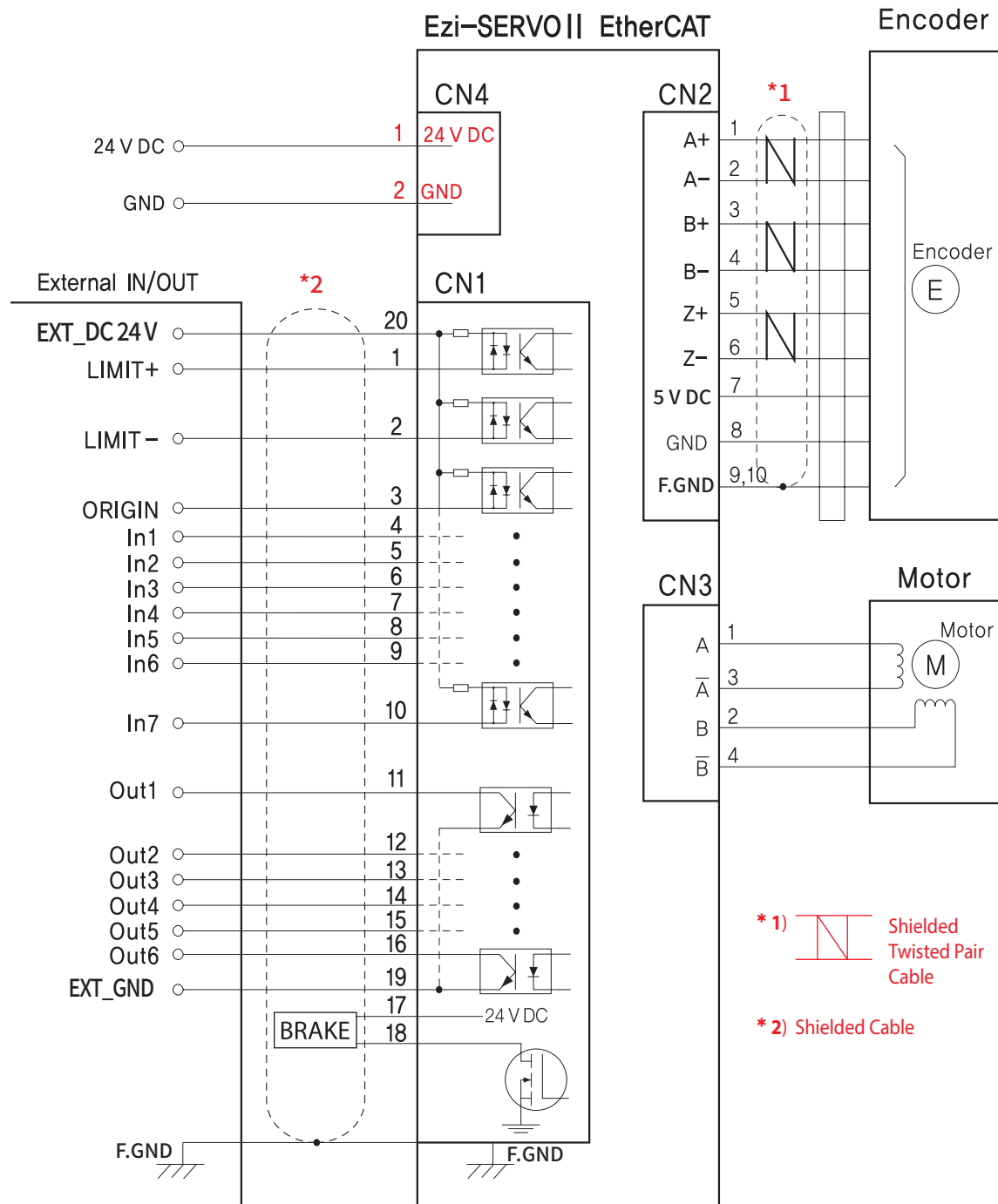
[Option] TB-Plus Interface Cable

These are the cables to connect Ezi-SERVO II EtherCAT drive and TB-Plus interface board.

Purpose	Part Number	Length [m]	Cable Type	Remarks
Drive - Interface(TB-Plus) Connection	CIFN-S-001F	1	Fixed Cable	Max. Cable Length: 20 m
	CIFN-S-002F	2		
	CIFN-S-003F	3		
	CIFN-S-005F	5		
	CIFN-S-001M	1	Flexible Cable	
	CIFN-S-002M	2		
	CIFN-S-003M	3		
	CIFN-S-005M	5		

* If you need cables with length(in units of 1 m) not listed on the table, please contact FASTECH for more information.

External Wiring Diagram

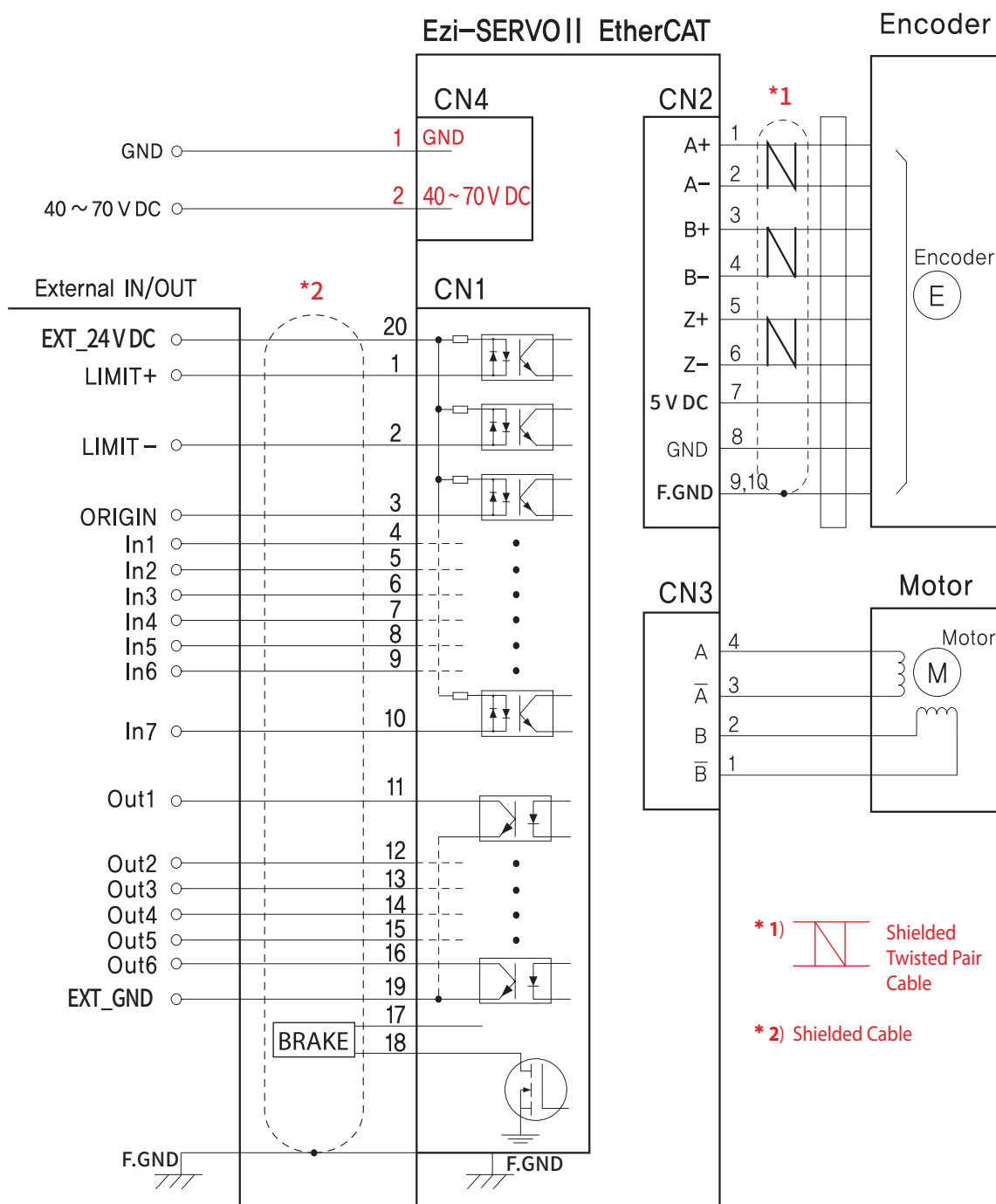


※ When connecting the I/O cable between the drive and the host controller, be sure to turn off the power to both the host controller and the drive.
Failure to do so may result in electric shock or product damage.

CAUTION

To ensure the safe and proper use of the products listed in this catalog, please be sure to read the user manual thoroughly before use.

External Wiring Diagram [86 mm Motor Drive]



※ When connecting the I/O cable between the drive and the host controller, be sure to turn off the power to both the host controller and the drive.
Failure to do so may result in electric shock or product damage.

CAUTION

To ensure the safe and proper use of the products listed in this catalog, please be sure to read the user manual thoroughly before use.

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Fast Accurate Smooth Motion

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※ Please note that the color and size of the products in this catalog may different depending on the measurement method
and the specifications can be changed without prior notice for quality improvement.