

Ezi-SERVO[®] II

Closed Loop Stepping System

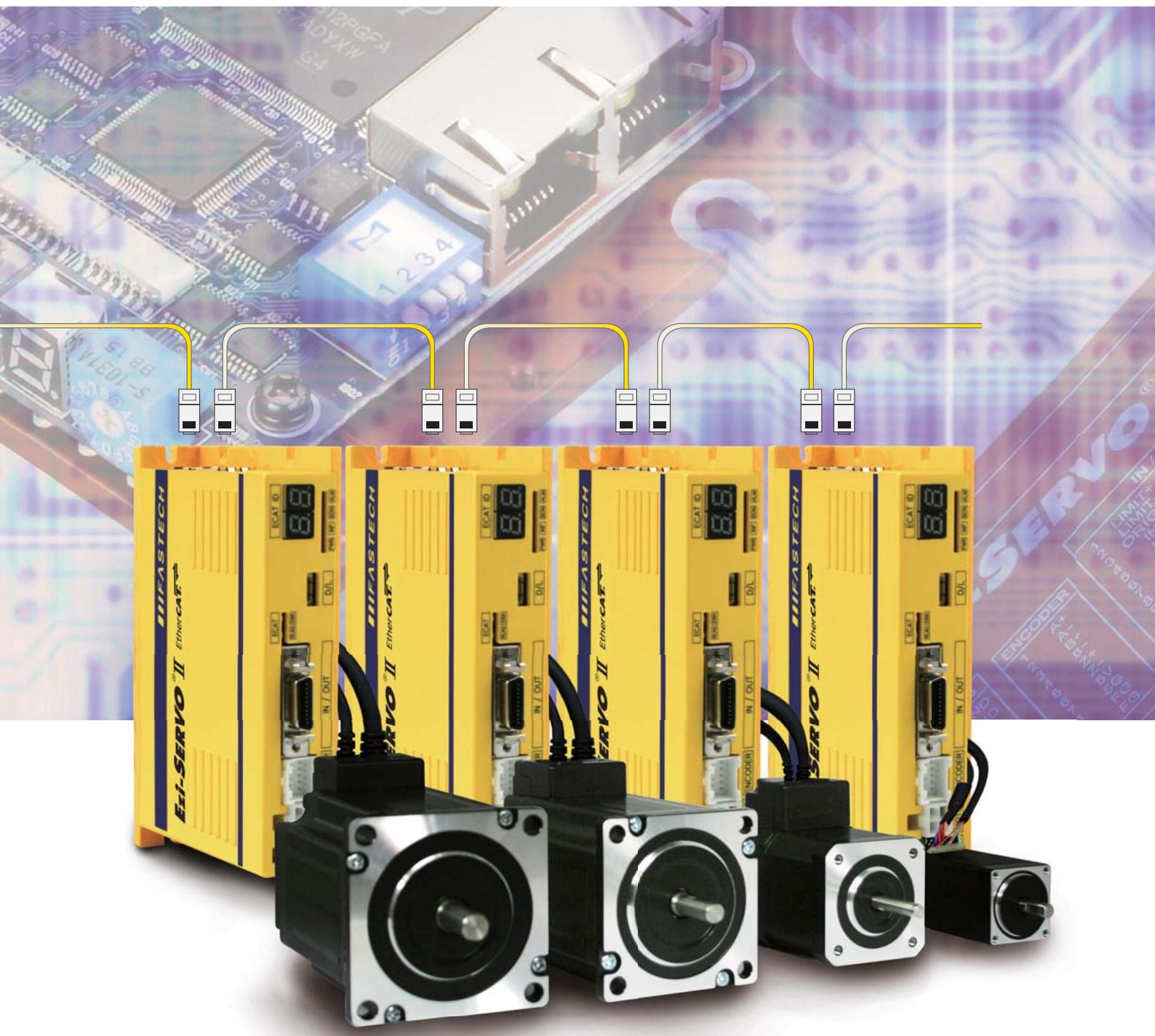
- CiA 402 Drive Profile Support
- Closed Loop Stepping System
- No Gain Tuning / No Hunting
- Torque Improvement by Boost Current Control

EtherCAT[®] 



CE RoHS
COMPLIANT

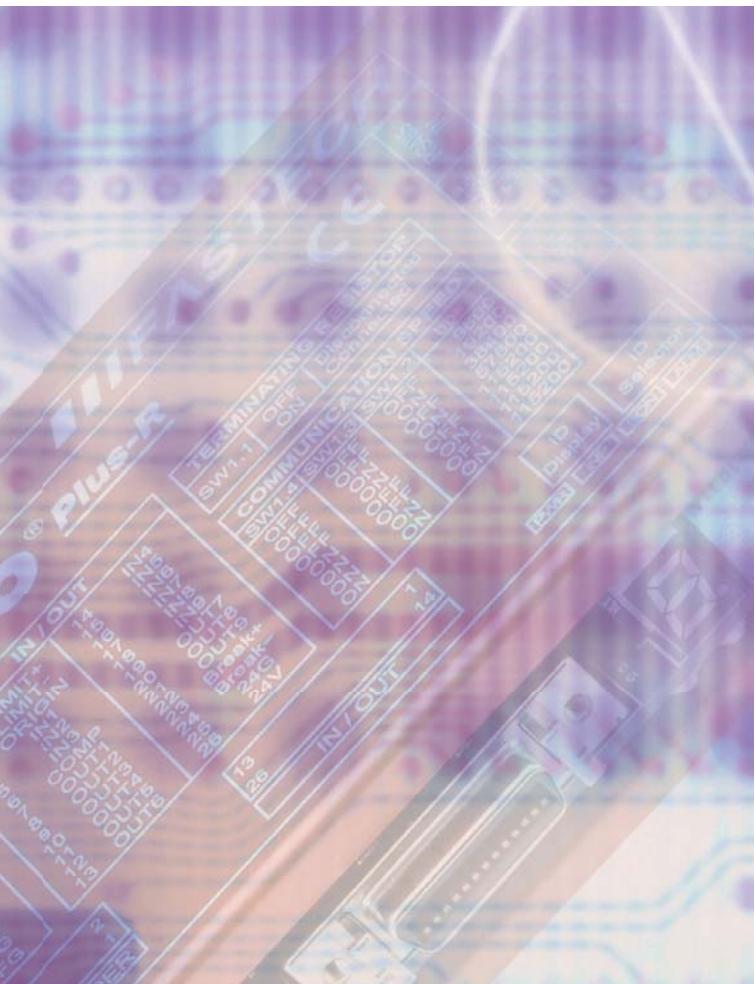

Fast Accurate Smooth Motion



Fast, Accurate, Smooth Motion

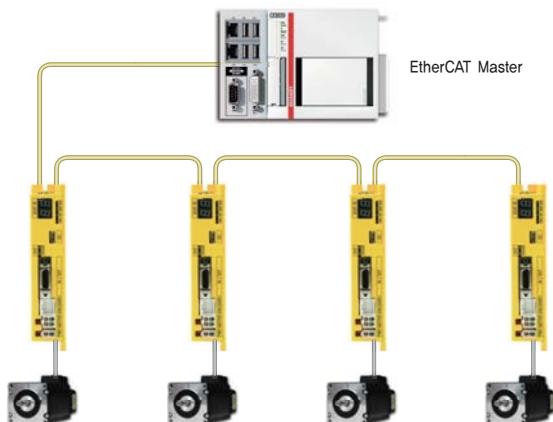
Ezi-SERVO[®] II EtherCAT[®] →

Closed Loop Stepping System



1 EtherCAT Based Motion Control

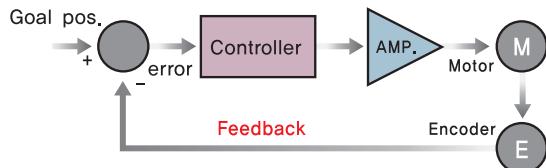
Ezi-SERVO2 EtherCAT is stepping motor control system using EtherCAT, high speed ethernet (100Mbps full-duplex) based fieldbus. Ezi-SERVO2 EtherCAT is EtherCAT slave module which support CAN application layer over EtherCAT (CoE). CIA 402 Drive profile implemented. Supported modes are Profile Position, Profile Velocity, Homing.



2

Closed Loop Stepping System

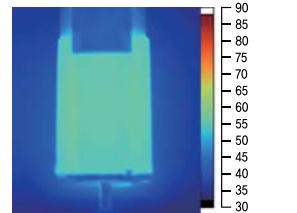
Ezi-SERVO2 is an innovative closed loop stepping motor and controller that utilizes a high-resolution motor mounted encoder to constantly monitor the motor shaft position. The encoder feedback feature allows the Ezi-SERVO2 to update the current motor shaft position information every 25 micro seconds. This allows the Ezi-SERVO2 drive to compensate for the loss of position, ensuring accurate positioning. For example, due to a sudden load change, a conventional stepper motor and drive could lose a step creating a positioning error and a great deal of cost to the end user!



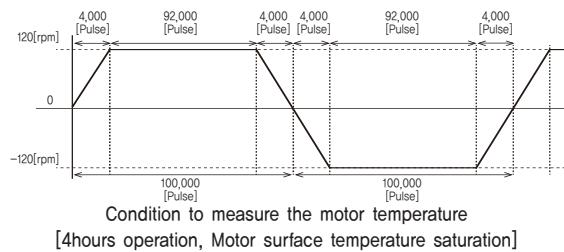
3

Current control according to load

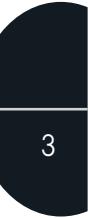
Ezi-SERVO2 automatically control the motor current according to loads. Thus, febricity of motor and drive are minimized so can save the energy as well.



Motor temperature [measured by thermograph]



FASTECH Ezi-SERVO II EtherCAT



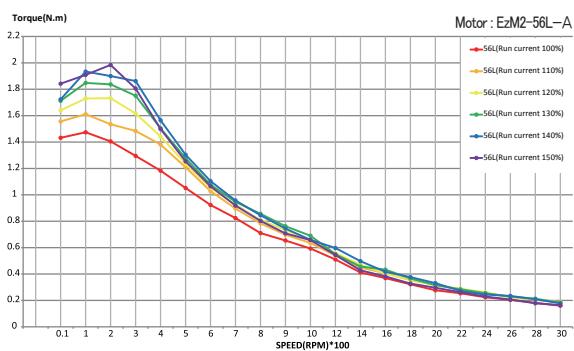
4

Boost Current / Run Current

Accel / Decel characteristics can be improved by set the Boost Current Parameters.

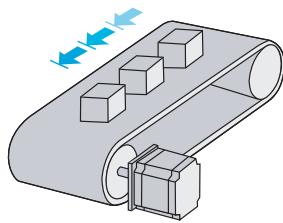
Torque can be improved when driving by set the Run Current Parameters.

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



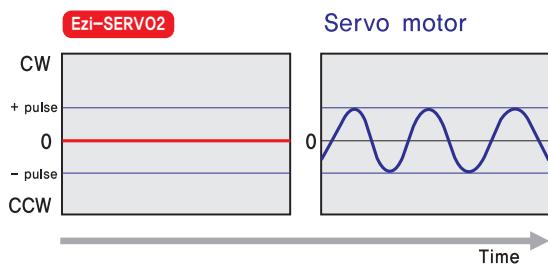
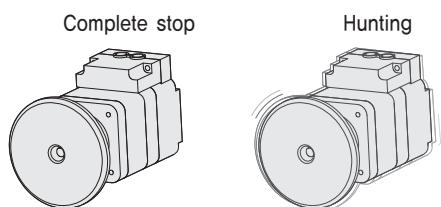
5 No Gain Tuning

Conventional servo systems, to ensure machine performance, smoothness, positional error and low servo noise, require the adjustment of its servo's gains as an initial crucial step. Even systems that employ auto-tuning require manual tweaking after the system is installed, especially if more than one axis are interdependent. Ezi-SERVO2 employs the best characteristics of stepper and closed loop motion controls and algorithms to eliminate the need of tedious gain tuning required for conventional closed loop servo systems. This means that Ezi-SERVO2 is optimized for the application and ready to work right out of the box! The Ezi-SERVO2 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 waisting setup time. Ezi-SERVO2 is especially well suited for low stiffness loads (for example, a belt and pulley system) that some-time require conventional servo systems to inertia match with the added expense and bulk of a gearbox. Ezi-SERVO2 also performs exceptionally, even under heavy loads and high speeds!



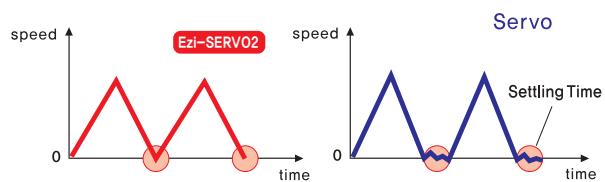
6 No Hunting

Traditional servo motor drives overshoot their position and try to correct by overshooting the opposite direction, especially in high gain applications. This is called null hunt and is especially prevalent in systems that the break away or static friction is significantly higher than the running friction. The cure is lowering the gain, which affects accuracy or using Ezi-SERVO2 Motion Control System! Ezi-SERVO2 utilizes the unique characteristics of stepping motors and locks itself into the desired target position, eliminating Null Hunt. This feature is especially useful in applications such as nanotech manufacturing, semiconductor fabrication, vision systems and ink jet printing in which system oscillation and vibration could be a problem.



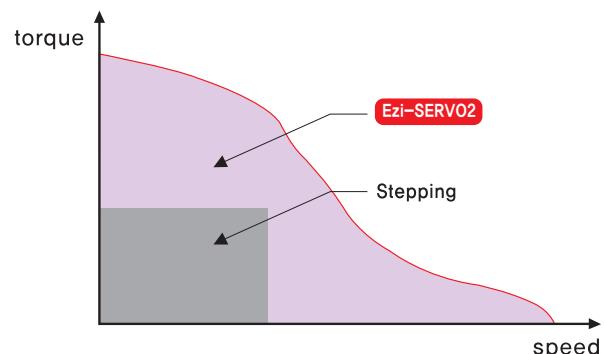
7 Fast Response

Similar to conventional stepping motors, Ezi-SERVO2 instantly synchronizes with command pulses providing fast positional response. Ezi-SERVO2 is the optimum choice when zero-speed stability and rapid motions within a short distance are required. Traditional servo motor systems have a natural delay between the commanding input signals and the resultant motion because of the constant monitoring of the current position, necessitating in a waiting time until it settles, called settling time.



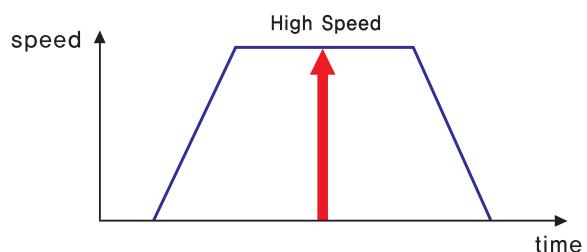
8 High Torque

Compared with common step motors and drives, Ezi-SERVO2 motion control systems can maintain a high torque state over relatively long period of time. This means that Ezi-SERVO2 continuously operates without loss of position under 100% of the load. Unlike conventional Microstep drives, Ezi-SERVO2 exploits continuous high-torque operation during high-speed motion due to its innovative optimum current phase control.



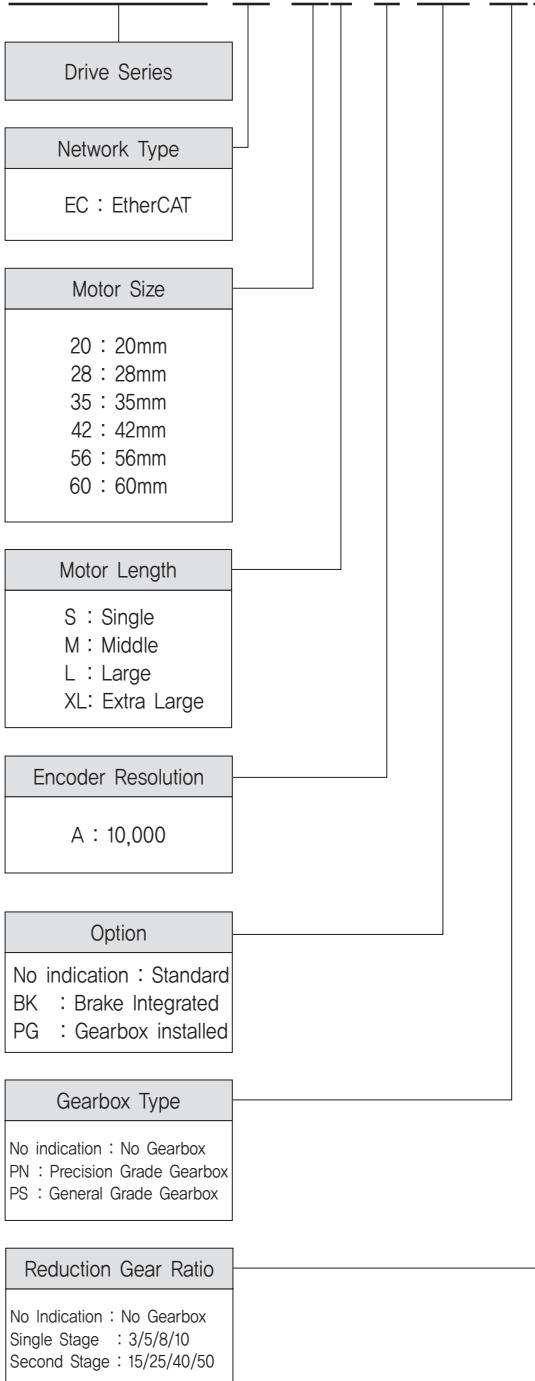
9 High Speed

The Ezi-SERVO2 functions well at high speed without the loss of Synchronism or positioning error. Ezi-SERVO2's ability of continuous monitoring of current position enables the stepping motor to generate high-torque, even under a 100% load condition.



● Ezi-SERVO2 EtherCAT Part Numbering

Ezi-SERVO2-EC-42S-A-PG-PN10



● Standard Motor, Drive Combination

◆ Ezi-SERVO2 EtherCAT Drive Products

Package Part Number	Motor Part Number	Drive Part Number
Ezi-SERVO2-EC-20M-A	EzM2-20M-A	EzS2-EC-20M
Ezi-SERVO2-EC-20L-A	EzM2-20L-A	EzS2-EC-20L
Ezi-SERVO2-EC-28S-A	EzM2-28S-A	EzS2-EC-28S
Ezi-SERVO2-EC-28M-A	EzM2-28M-A	EzS2-EC-28M
Ezi-SERVO2-EC-28L-A	EzM2-28L-A	EzS2-EC-28L
Ezi-SERVO2-EC-35M-A	EzM2-35M-A	EzS2-EC-35M
Ezi-SERVO2-EC-35L-A	EzM2-35L-A	EzS2-EC-35L
Ezi-SERVO2-EC-42S-A	EzM2-42S-A	EzS2-EC-42S
Ezi-SERVO2-EC-42M-A	EzM2-42M-A	EzS2-EC-42M
Ezi-SERVO2-EC-42L-A	EzM2-42L-A	EzS2-EC-42L
Ezi-SERVO2-EC-42XL-A	EzM2-42XL-A	EzS2-EC-42XL
Ezi-SERVO2-EC-56S-A	EzM2-56S-A	EzS2-EC-56S
Ezi-SERVO2-EC-56M-A	EzM2-56M-A	EzS2-EC-56M
Ezi-SERVO2-EC-56L-A	EzM2-56L-A	EzS2-EC-56L
Ezi-SERVO2-EC-60S-A	EzM2-60S-A	EzS2-EC-60S
Ezi-SERVO2-EC-60M-A	EzM2-60M-A	EzS2-EC-60M
Ezi-SERVO2-EC-60L-A	EzM2-60L-A	EzS2-EC-60L

● Brake Integrated Motor, Drive Combination

◆ Ezi-SERVO2 EtherCAT Drive Products

Package Part Number	Motor Part Number	Drive Part Number
Ezi-SERVO2-EC-42S-A-BK	EzM2-42S-A-BK	EzS2-EC-42S-BK
Ezi-SERVO2-EC-42M-A-BK	EzM2-42M-A-BK	EzS2-EC-42M-BK
Ezi-SERVO2-EC-42L-A-BK	EzM2-42L-A-BK	EzS2-EC-42L-BK
Ezi-SERVO2-EC-42XL-A-BK	EzM2-42XL-A-BK	EzS2-EC-42XL-BK
Ezi-SERVO2-EC-56S-A-BK	EzM2-56S-A-BK	EzS2-EC-56S-BK
Ezi-SERVO2-EC-56M-A-BK	EzM2-56M-A-BK	EzS2-EC-56M-BK
Ezi-SERVO2-EC-56L-A-BK	EzM2-56L-A-BK	EzS2-EC-56L-BK
Ezi-SERVO2-EC-60S-A-BK	EzM2-60S-A-BK	EzS2-EC-60S-BK
Ezi-SERVO2-EC-60M-A-BK	EzM2-60M-A-BK	EzS2-EC-60M-BK
Ezi-SERVO2-EC-60L-A-BK	EzM2-60L-A-BK	EzS2-EC-60L-BK

● Drive Specifications

1. Functions / Specifications

Motor	EzM2-20-A series	EzM2-28-A series	EzM2-42-A series	EzM2-56-A series	EzM2-60-A series
Drive	EzS2-EC-20 series	EzS2-EC-28 series	EzS2-EC-42 series	EzS2-EC-56 series	EzS2-EC-60 series
Input Voltage	24VDC ± 10%				
Control Method	Closed Loop control by ARM-based 32-bit MCU				
Current Consumption	Max 500mA (Except motor current)				
Operating Condition	Temperature	In use : 0~50°C In Storage : -20~70°C			
	Humidity	In use : 35~85%RH (Non-condensing) In Storage : 10~90%RH (Non-condensing)			
	Vib, Resist	0.5G			
Drive	Rotation Speed	0~3,000rpm			
	Resolution	10,000 [P/R]			
	Protection Functions	Over Current, Over Speed, Position Tracking Error, Over Load, Over Temperature, Over Regenerated Voltage, Motor Connection Error, Encoder Connection Error, Motor Voltage Error, In-Position Error, ROM Error, Position Overflow Error			
	LED Display	Power status, In-Position status, Servo On status, Alarm status			
EtherCAT	Supported Mode	Cyclic Synchronous position profile, Position profile. Homing Profile.			
	Synchronization	Free Run. SM Event, DC SYNC Event.			
	Supported Protocol	CoE (CiA 402 Drive profile) FoE (Firmware download)			
IN/OUT Signal	Input Signal Functions	3 dedicated inputs (Limit+, Limit-, Origin), 7 user inputs			
	Output Signal Functions	2 dedicated outputs (Brake+, Brake-), 6 user outputs (photocoupler)			

● Standard Motor Specification and Size

1. Motor Specification

20

28

42

Motor	Unit	EzM2-20M-A	EzM2-20L-A	EzM2-28S-A	EzM2-28M-A	EzM2-28L-A	EzM2-42S-A	EzM2-42M-A	EzM2-42L-A	EzM2-42XL-A
Current per Phase	A	0.6	0.6	0.67	0.67	0.67	1.33	1.68	1.68	1.2
Holding Torque	N · m	0,020	0,039	0,059	0,093	0,118	0,21	0,35	0,43	0,65
Rotor Inertia	g · cm ²	2,5	5	9	12	18	35	54	68	114
Weight	g	70	80	110	140	200	220	280	350	500
Length(L)	mm	33	38	32	45	51	33	39	47	59

* Holding Torque is based on 100% Run Current

56

60

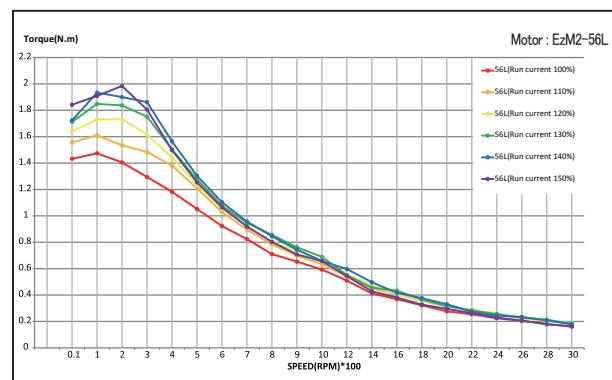
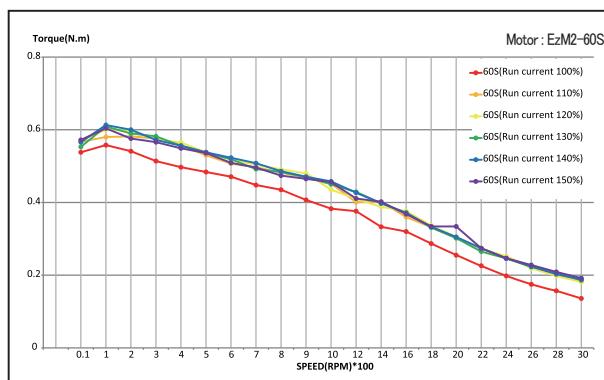
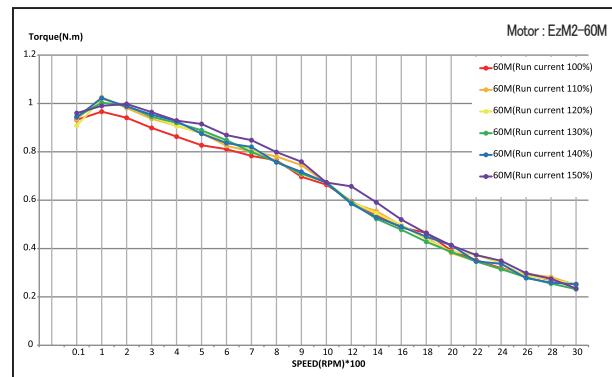
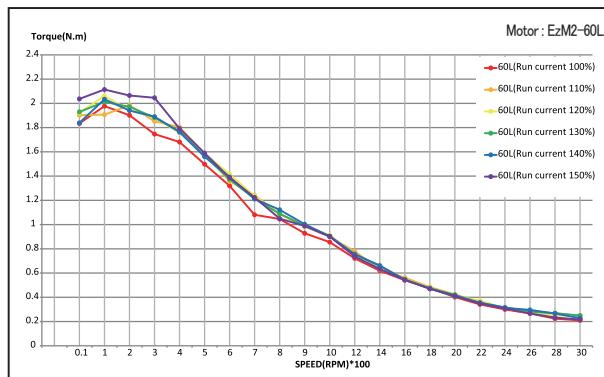
Motor	Unit	EzM2-56S-A	EzM2-56M-A	EzM2-56L-A	EzM2-60S-A	EzM2-60M-A	EzM2-60L-A
Current per Phase	A	2,8	2,8	2,8	4	4	4
Holding Torque	N · m	0,53	1,23	1,85	0,87	1,28	2,40
Rotor Inertia	g · cm ²	120	275	480	140	320	800
Weight	g	470	700	1000	600	900	1600
Length(L)	mm	41	56	76	46	56	85

* Holding Torque is based on 100% Run Current

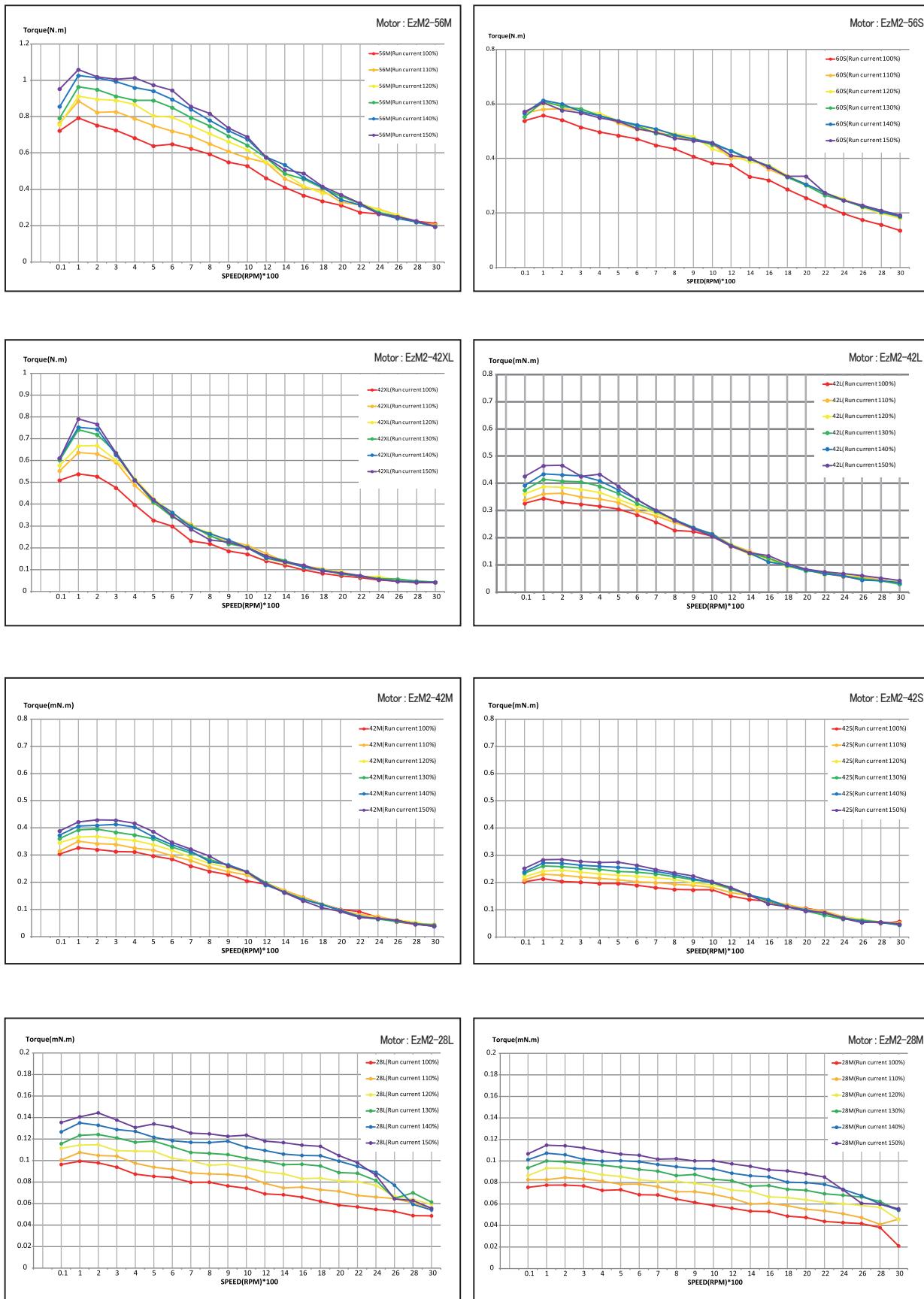
2. Torque Characteristic

(Ezi-SERVO2 EtherCAT Torque Graph according to Run Current Setting)

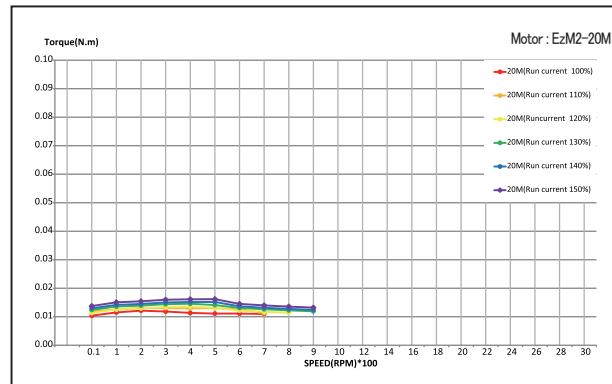
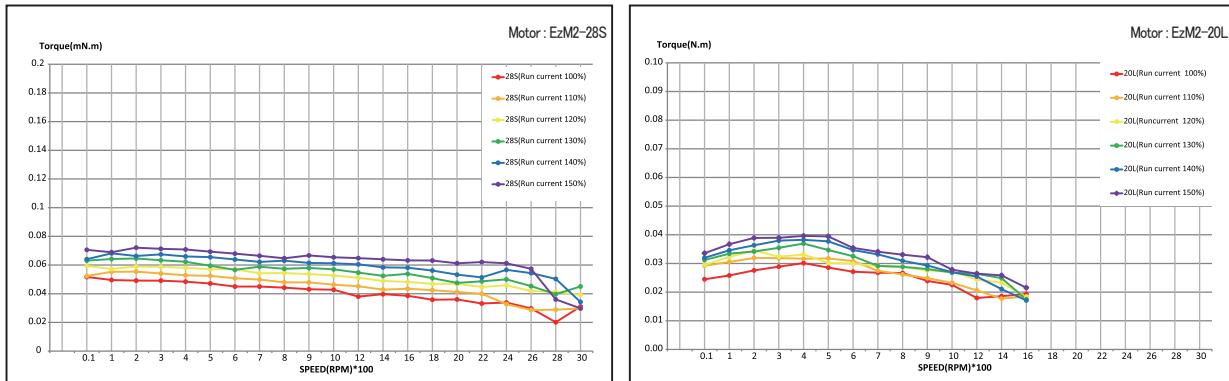
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● Standard Motor Specification and Size



● Standard Motor Specification and Size

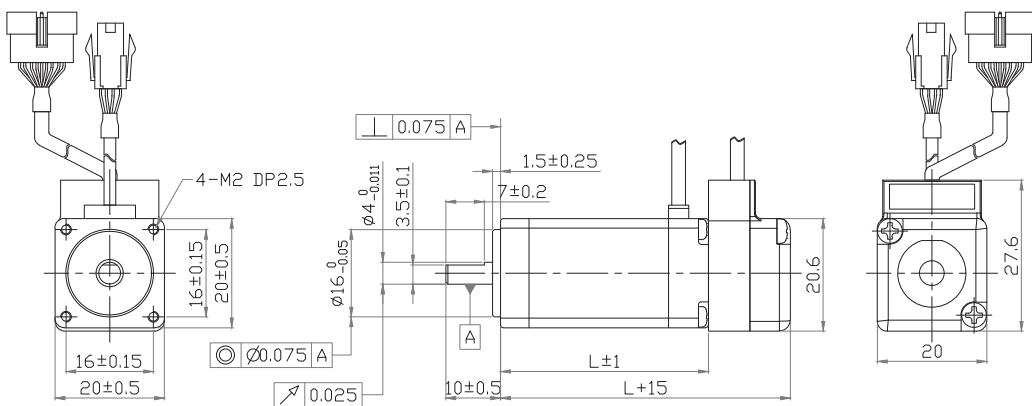


● Standard Motor Specification and Size

3. Motor Size(mm)

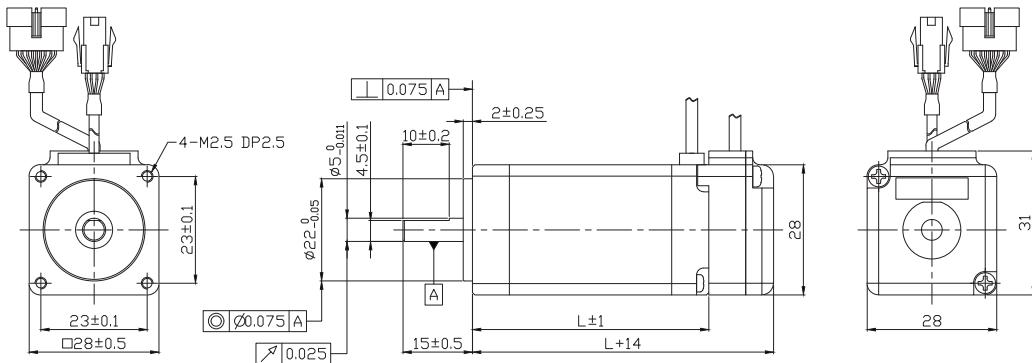
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Motor	Length(L)
EzM2-20M-A	33mm
EzM2-20L-A	38mm



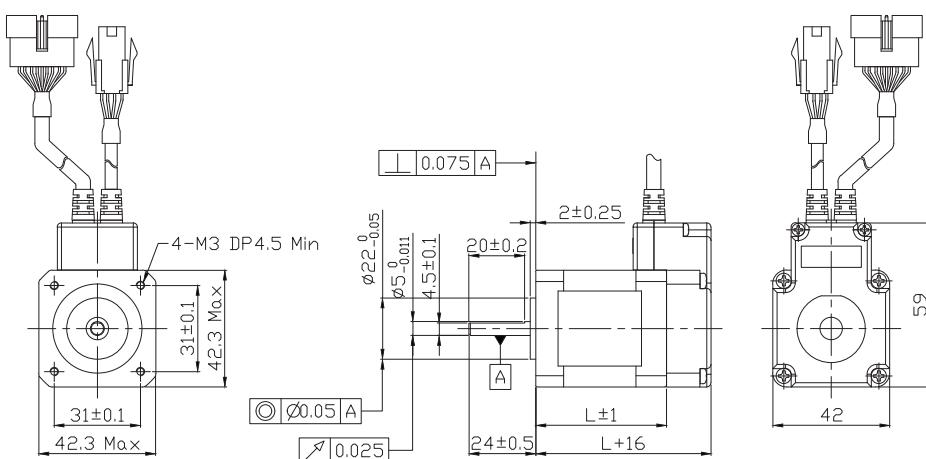
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Motor	Length(L)
EzM2-28S-A	32mm
EzM2-28M-A	45mm
EzM2-28L-A	51mm



42

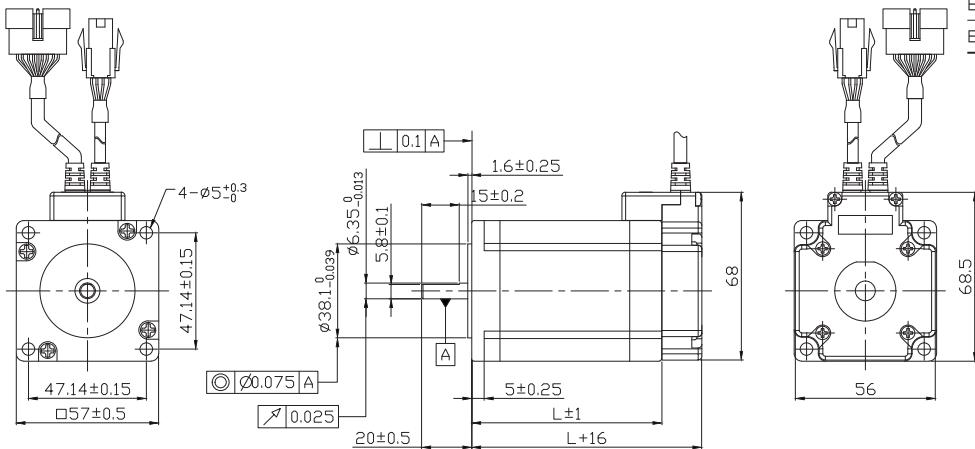
Motor	Length(L)
EzM2-42S-A	33mm
EzM2-42M-A	39mm
EzM2-42L-A	47mm
EzM2-42XL-A	59mm



● Standard Motor Specification and Size

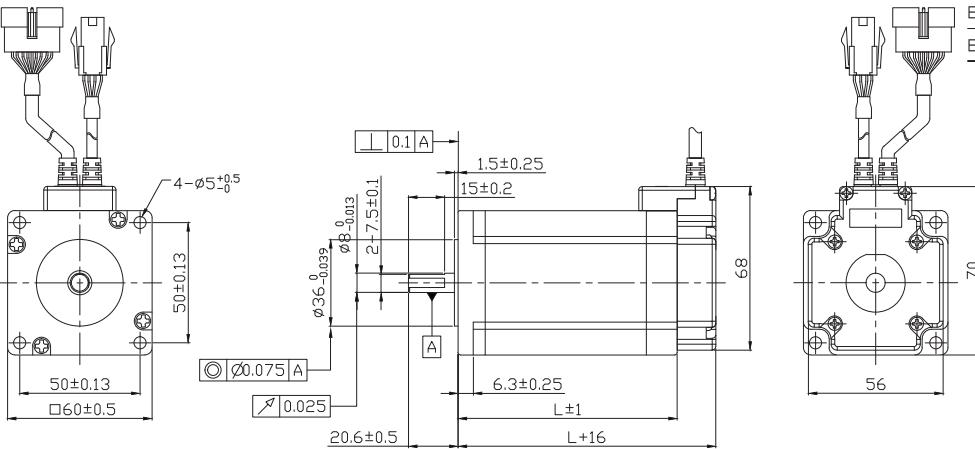
3. Motor Size(mm)

56



Motor	Length(L)
EzM2-56S-A	41mm
EzM2-56M-A	56mm
EzM2-56L-A	76mm

60



Motor	Length(L)
EzM2-60S-A	46mm
EzM2-60M-A	56mm
EzM2-60L-A	85mm

● Brake Installed Motor Specification and Size

1. Motor Specification

Package	Motor	Electronic Brake					Motor Unit Weight (g)	Permitted Overhung Load (N)				Permitted Thrust Load (N)		
		Type	Voltage Input (V)	Rated Current (A)	Power Consumption	Static Friction Torque (N · m)		Length from Motor Point (mm)						
								3	8	13	18			
Ezi-SERVO2-EC-42S-A-BK	EzM2-42S-A-BK	Non-excitation run Type	24VDC ±10%	0,3A ±10%	8,2	0,2	510	22	26	33	46	Must be Lower than Unit's Weight		
Ezi-SERVO2-EC-42M-A-BK	EzM2-42M-A-BK						570							
Ezi-SERVO2-EC-42L-A-BK	EzM2-42L-A-BK						640							
Ezi-SERVO2-EC-42XL-A-BK	EzM2-42XL-A-BK						770							
Ezi-SERVO2-EC-56S-A-BK	EzM2-56S-A-BK			7,5	0,7	870	52	65	85	123				
Ezi-SERVO2-EC-56M-A-BK	EzM2-56M-A-BK					1190								
Ezi-SERVO2-EC-56L-A-BK	EzM2-56L-A-BK					1380								
Ezi-SERVO2-EC-60S-A-BK	EzM2-60S-A-BK			7,5	0,7	1150	70	87	114	165				
Ezi-SERVO2-EC-60M-A-BK	EzM2-60M-A-BK					1350								
Ezi-SERVO2-EC-60L-A-BK	EzM2-60L-A-BK					1960								

* Electronic Brake cannot be used for braking. Position hold purpose only when power OFF.

* The weight means Motor Unit Weight including Motor and Electronic Brake.

* Motor Model Name is combined model name of Motor and Brake.

* Motor specification and torque characteristic are same as Standard Motor.

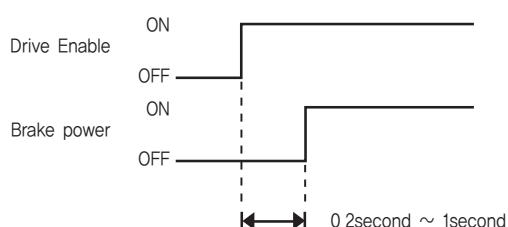
* Brake Operation Timing Chart

Ezi-SERVO2 control Brake by Drive automatically.

Please refer to below Timing Chart when control Brake from upper controller other than using Ezi-SERVO2 Brake control.

Otherwise, Drive malfunctioning and loads can be fall down.

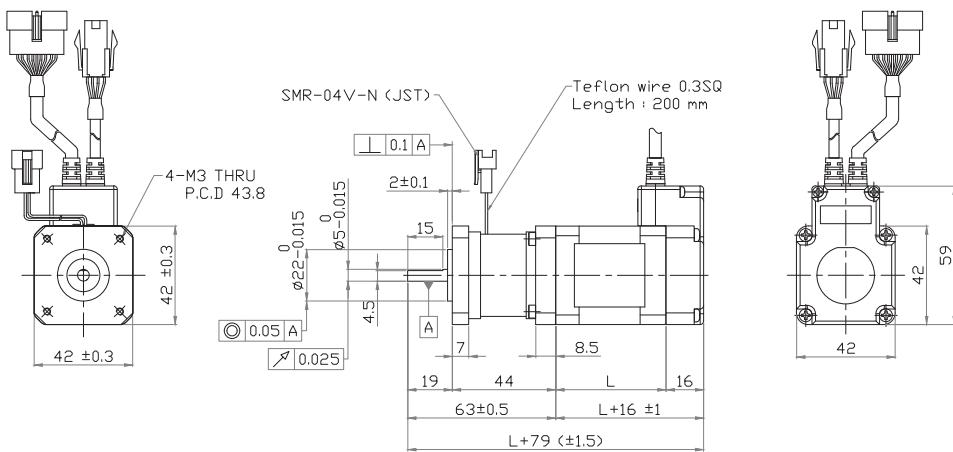
Also, please do not operate Brake while motor operation to prevent damage.



● Brake Installed Motor Specification and Size

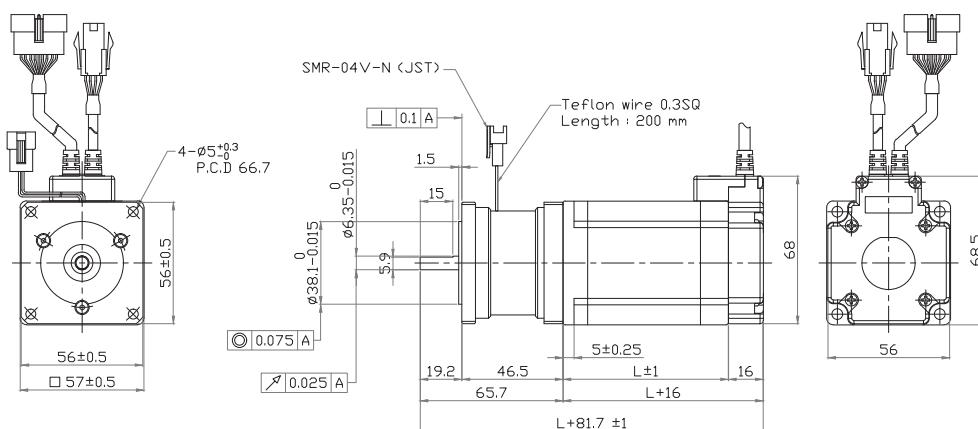
2. Motor Size(mm)

42



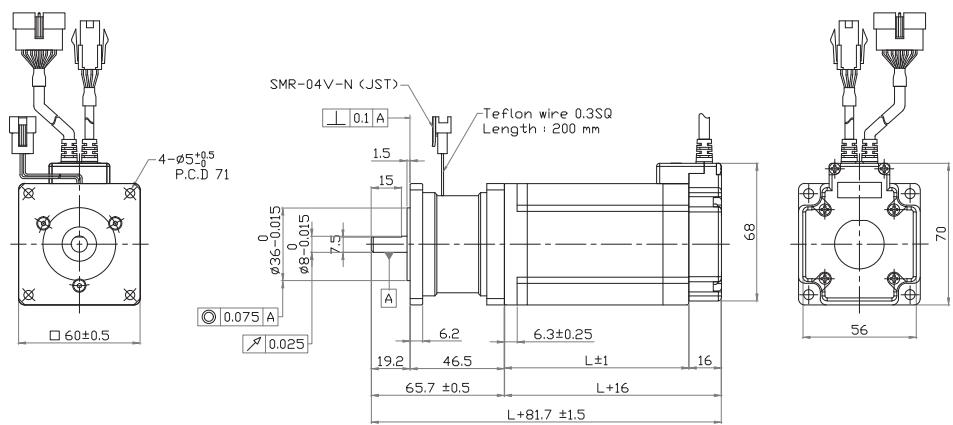
Motor	Length(L)
EzM2-42S-A	33mm
EzM2-42M-A	39mm
EzM2-42L-A	47mm
EzM2-42XL-A	59mm

56



Motor	Length(L)
EzM2-56S-A	41mm
EzM2-56M-A	56mm
EzM2-56L-A	76mm

60



Motor	Length(L)
EzM2-60S-A	46mm
EzM2-60M-A	56mm
EzM2-60L-A	85mm

● Gearbox Installed Motor Specification and Size

2. Gearbox for 56mm Motor Specification

Package	Maximum Holding Torque (N · m)	Rotor Inertia Moment (Kg · m ²)	Backlash (min)	Angle Transmission Error (min)	Reduction Gear Ratio	Resolution (10,000ppr Standard)	Permitted Torque (N · m)	Maximum Torque (N · m)	Permitted Speed Range (rpm)	Unit Weight (Kg)	Permitted Overhung Load (N)	Permitted Thrust Load (N)		
											Axis Center Standard	Axis Center Standard		
Ezi-SERVO2-EC-56S-A-PG-PN3	1,6	120×10^{-7}	3	5	3	0,012 °	27	50	0~1000	1,34	430	310		
Ezi-SERVO2-EC-56S-A-PG-PN5	2,7				5	0,0072 °	27	50	0~600	1,88	510	390		
Ezi-SERVO2-EC-56S-A-PG-PN8	4,3				8	0,0045 °	27	50	0~375		600	480		
Ezi-SERVO2-EC-56S-A-PG-PN10	5,3				10	0,0036 °	18	35	0~333		640	530		
Ezi-SERVO2-EC-56S-A-PG-PN15	7,7				15	0,0024 °	18	35	0~300	2,08	740	630		
Ezi-SERVO2-EC-56S-A-PG-PN25	12,9				25	0,00144 °	27	50	0~120		870	790		
Ezi-SERVO2-EC-56S-A-PG-PN40	20,6				40	0,0009 °	27	50	0~75		1000	970		
Ezi-SERVO2-EC-56S-A-PG-PN50	25,8				50	0,00072 °	27	50	0~60		1100	1000		
Ezi-SERVO2-EC-56M-A-PG-PN3	2,6	200×10^{-7}	3	5	3	0,0012 °	18	35	0~1000	1,4	430	310		
Ezi-SERVO2-EC-56M-A-PG-PN5	4,4				5	0,0072 °	27	50	0~600	2,15	510	390		
Ezi-SERVO2-EC-56M-A-PG-PN8	7,0				8	0,0045 °	27	50	0~375		600	480		
Ezi-SERVO2-EC-56M-A-PG-PN10	8,7				10	0,0036 °	18	35	0~333		640	530		
Ezi-SERVO2-EC-56M-A-PG-PN15	12,7				15	0,0024 °	18	35	0~300	2,35	740	630		
Ezi-SERVO2-EC-56M-A-PG-PN25	21,1				25	0,00144 °	27	50	0~120		870	790		
Ezi-SERVO2-EC-56M-A-PG-PN40		27,0			40	0,0009 °	27	50	0~75		1000	970		
Ezi-SERVO2-EC-56M-A-PG-PN50					50	0,00072 °	27	50	0~60		1100	1000		
Ezi-SERVO2-EC-56L-A-PG-PN3	4,3	480×10^{-7}	3	5	3	0,012 °	18	35	0~1000	1,1	430	310		
Ezi-SERVO2-EC-56L-A-PG-PN5	7,2				5	0,0072 °	27	50	0~600	2,22	510	390		
Ezi-SERVO2-EC-56L-A-PG-PN8	11,4				8	0,0045 °	27	50	0~375		600	480		
Ezi-SERVO2-EC-56L-A-PG-PN10	14,3				10	0,0036 °	18	35	0~333		640	530		
Ezi-SERVO2-EC-56L-A-PG-PN15	18,0				15	0,0024 °	18	35	0~300	2,42	740	630		
Ezi-SERVO2-EC-56L-A-PG-PN25		27,0			25	0,00144 °	27	50	0~120		870	790		
Ezi-SERVO2-EC-56L-A-PG-PN40					40	0,0009 °	27	50	0~75		1000	970		
Ezi-SERVO2-EC-56L-A-PG-PN50					50	0,00072 °	27	50	0~60		1100	1000		

● Gearbox Installed Motor Specification and Size

3. Gearbox for 60mm Motor Specification

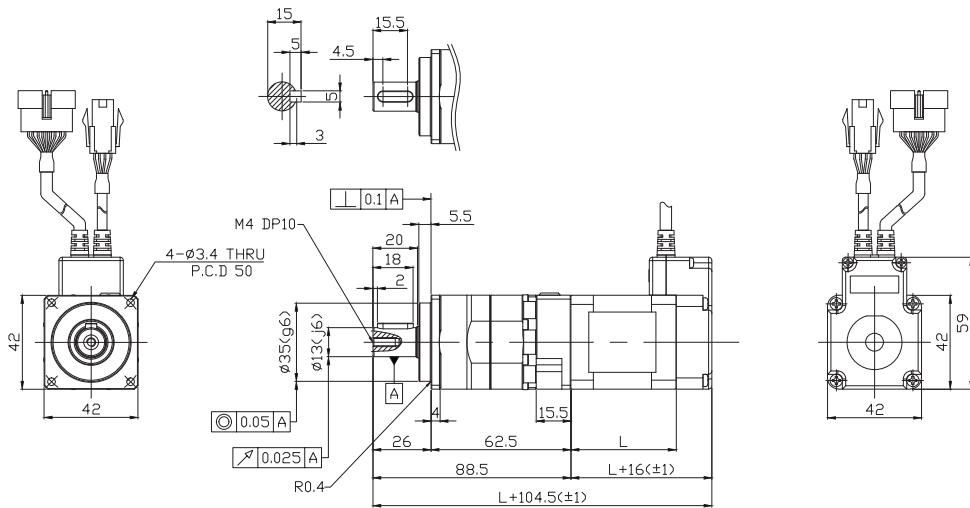
Package	Maxi-mum Holding Torque (N · m)	Rotor Inertia Moment (Kg · m ²)	Backlash (min)	Angle Transmis-sion Error (min)	Reduc-tion Gear Ratio	Resolution (10,000ppr Standard)	Permitted Torque (N · m)	Maximum Torque (N · m)	Permitted Speed Range (rpm)	Unit Weight (Kg)	Permitted Overhung Load (N)	Permitted Thrust Load (N)			
											Axis Center Standard				
Ezi-SERVO2-EC-60S-A-PG-PN3	2,6	140×10^{-7}	3	5	3	0,012 °	18	35	0~1000	1,4	430	310			
Ezi-SERVO2-EC-60S-A-PG-PN5	4,4				5	0,0072 °	27	50	0~600	2,0	510	390			
Ezi-SERVO2-EC-60S-A-PG-PN8	7,0				8	0,0045 °	27	50	0~375		600	480			
Ezi-SERVO2-EC-60S-A-PG-PN10	8,8				10	0,0036 °	18	35	0~333		640	530			
Ezi-SERVO2-EC-60S-A-PG-PN15	12,7				15	0,0024 °	18	35	0~300	2,2	740	630			
Ezi-SERVO2-EC-60S-A-PG-PN25	21,2				25	0,00144 °	27	50	0~120		870	790			
Ezi-SERVO2-EC-60S-A-PG-PN40	27,0				40	0,0009 °	27	50	0~75		1000	970			
Ezi-SERVO2-EC-60S-PG-PN50					50	0,00072 °	27	50	0~60		1100	1000			
Ezi-SERVO2-EC-60M-A-PG-PN3	3,6	320×10^{-7}	3	5	3	0,012 °	18	35	0~1000	1,4	430	310			
Ezi-SERVO2-EC-60M-A-PG-PN5	6,0				5	0,0072 °	27	50	0~600	2,3	510	390			
Ezi-SERVO2-EC-60M-A-PG-PN8	9,6				8	0,0045 °	27	50	0~375		600	480			
Ezi-SERVO2-EC-60M-A-PG-PN10	12,0				10	0,0036 °	18	35	0~333		640	530			
Ezi-SERVO2-EC-60M-A-PG-PN15	17,4				15	0,0024 °	18	35	0~300	2,5	740	630			
Ezi-SERVO2-EC-60M-A-PG-PN25	27,0				25	0,00144 °	27	50	0~120		870	790			
Ezi-SERVO2-EC-60M-A-PG-PN40					40	0,0009 °	27	50	0~75		1000	970			
Ezi-SERVO2-EC-60M-A-PG-PN50					50	0,00072 °	27	50	0~60		1100	1000			
Ezi-SERVO2-EC-60L-A-PG-PN3	7,1	800×10^{-7}	3	5	3	0,012 °	18	35	0~1000	1,4	430	310			
Ezi-SERVO2-EC-60L-A-PG-PN5	11,9				5	0,0072 °	27	50	0~600	3,0	510	390			
Ezi-SERVO2-EC-60L-A-PG-PN8	19,0				8	0,0045 °	27	50	0~375		600	480			
Ezi-SERVO2-EC-60L-A-PG-PN10	18,0				10	0,0036 °	18	35	0~333		640	530			
Ezi-SERVO2-EC-60L-A-PG-PN15					15	0,0024 °	18	35	0~300	3,2	740	630			
Ezi-SERVO2-EC-60L-A-PG-PN25	27,0				25	0,00144 °	27	50	0~120		870	790			
Ezi-SERVO2-EC-60L-A-PG-PN40					40	0,0009 °	27	50	0~75		1000	970			
Ezi-SERVO2-EC-60L-A-PG-PN50					50	0,00072 °	27	50	0~60		1100	1000			

● Gearbox Installed Motor Specification and Size

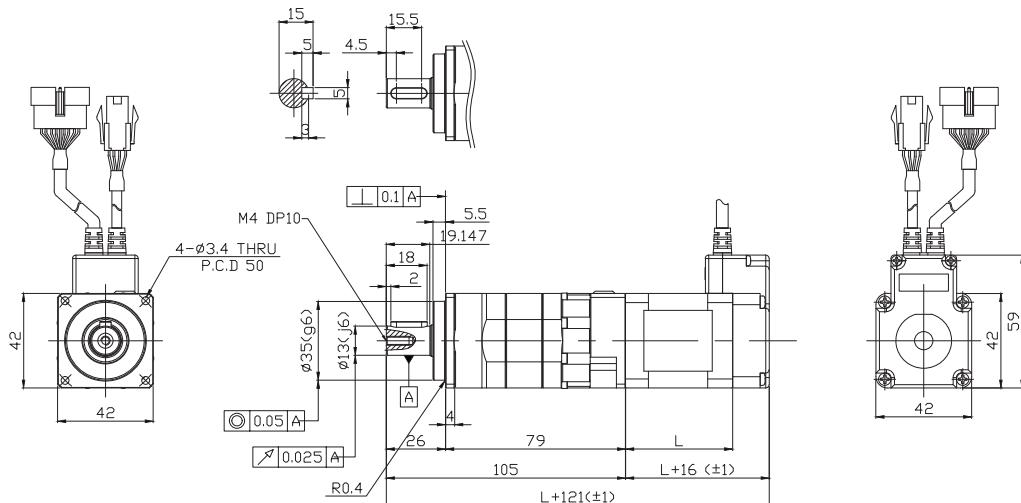
4. Motor Size(mm)

42

Package	Motor	Stage	Second Stage	L Length (mm)
Ezi-SERVO2-EC-42S-A-PG-PN	EzM2-42S-A-PG-PN	Single Stage	3, 5, 8, 10	33
Ezi-SERVO2-EC-42M-A-PG-PN	EzM2-42M-A-PG-PN		3, 5, 8, 10	39
Ezi-SERVO2-EC-42L-A-PG-PN	EzM2-42L-A-PG-PN		3, 5, 8, 10	47
Ezi-SERVO2-EC-42XL-A-PG-PN	EzM2-42XL-A-PG-PN		3, 5, 8, 10	59



Package	Motor	Stage	Second Stage	L Length (mm)
Ezi-SERVO2-EC-42S-A-PG-PN	EzM2-42S-A-PG-PN	Second Stage	15, 25, 40, 50	33
Ezi-SERVO2-EC-42M-A-PG-PN	EzM2-42M-A-PG-PN		15, 25, 40, 50	39
Ezi-SERVO2-EC-42L-A-PG-PN	EzM2-42L-A-PG-PN		15, 25, 40, 50	47
Ezi-SERVO2-EC-42XL-A-PG-PN	EzM2-42XL-A-PG-PN		15, 25, 40, 50	59

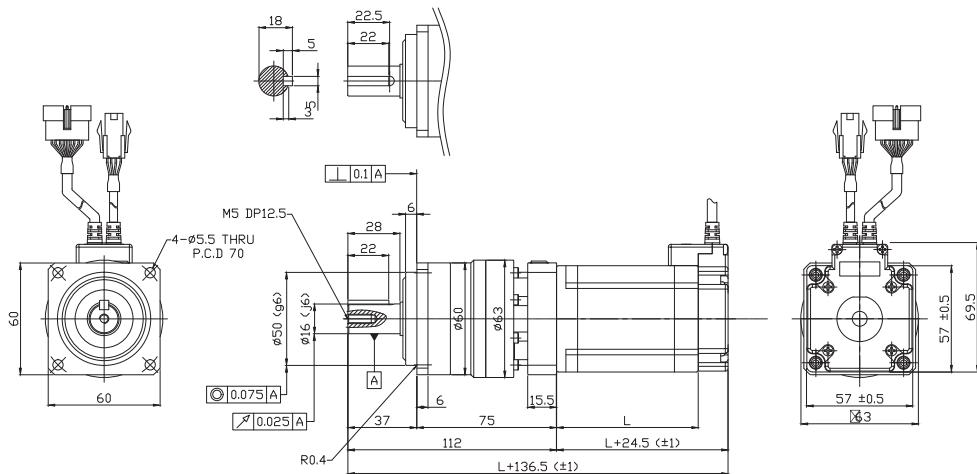


● Gearbox Installed Motor Specification and Size

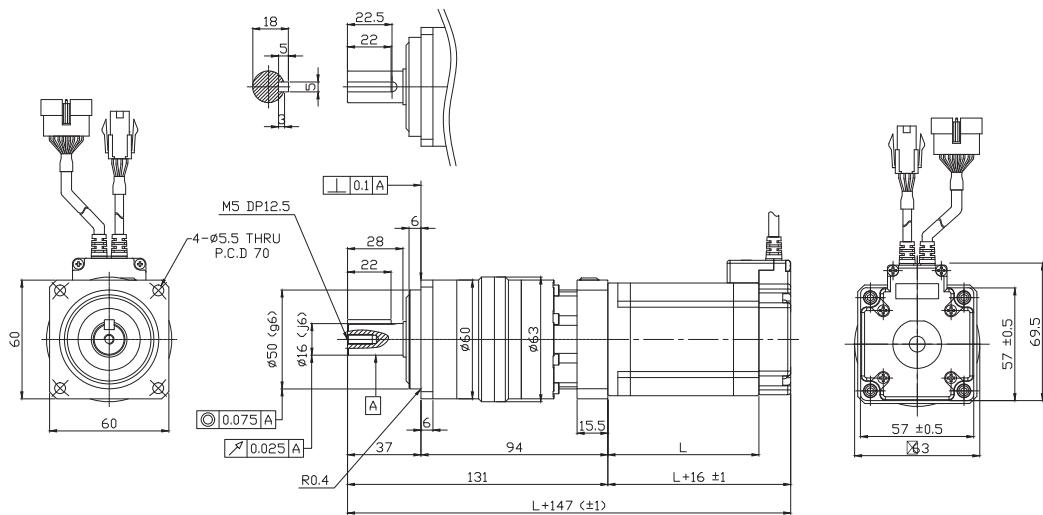
4. Motor Size(mm)

56

Package	Motor	Stage	Second Stage	L Length (mm)
Ezi-SERVO2-EC-56S-A-PG-PN	EzM2-56S-A-PG-PN	Single Stage	3, 5, 8, 10	41
Ezi-SERVO2-EC-56M-A-PG-PN	EzM2-56M-A-PG-PN		3, 5, 8, 10	56
Ezi-SERVO2-EC-56L-A-PG-PN	EzM2-56L-A-PG-PN		3, 5, 8, 10	76



Package	Motor	Stage	Second Stage	L Length (mm)
Ezi-SERVO2-EC-56S-A-PG-PN	EzM2-56S-A-PG-PN	Second Stage	15, 25, 40, 50	41
Ezi-SERVO2-EC-56M-A-PG-PN	EzM2-56M-A-PG-PN		15, 25, 40, 50	56
Ezi-SERVO2-EC-56L-A-PG-PN	EzM2-56L-A-PG-PN		15, 25, 40, 50	76

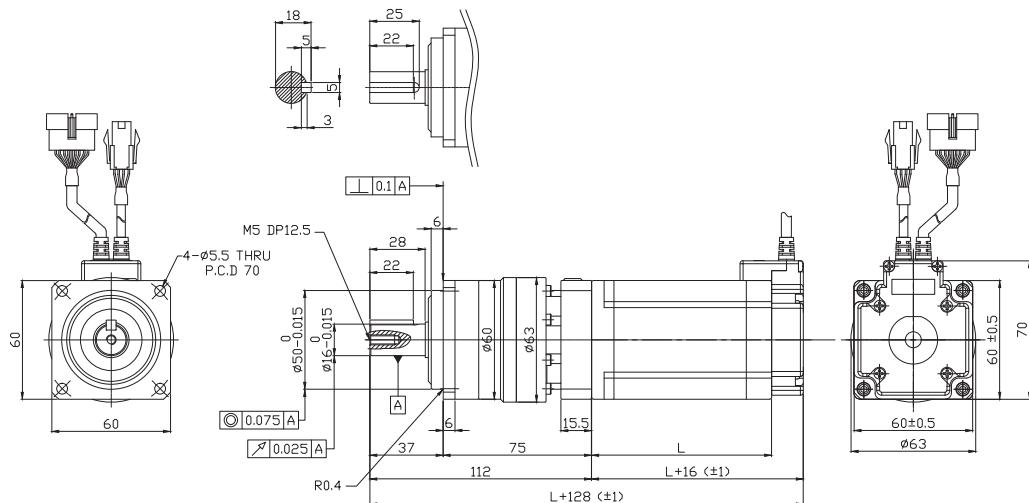


● Gearbox Installed Motor Specification and Size

4. Motor Size(mm)

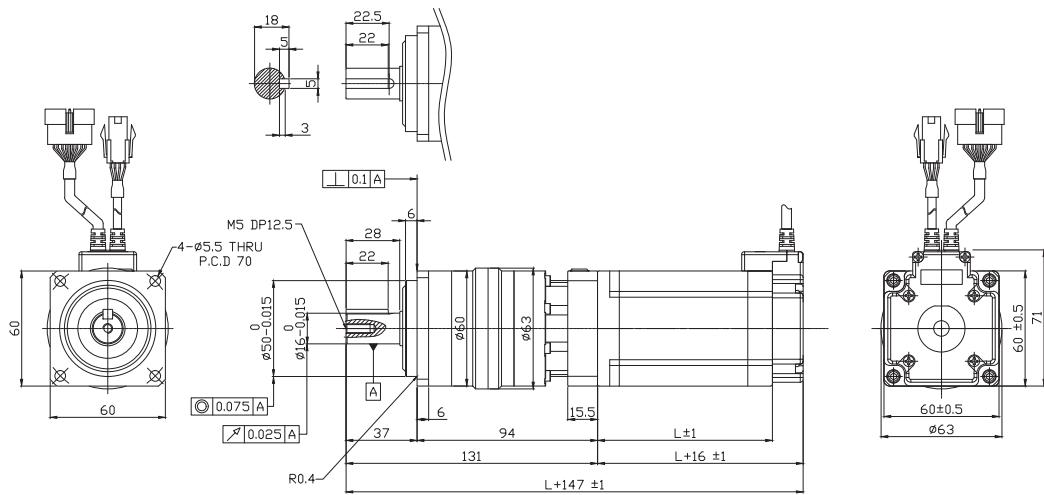
60

Package	Motor	Stage	Second Stage	L Length (mm)
Ezi-SERVO2-EC-60S-A-PG-PN	EzM2-60S-A-PG-PN	Single Stage	3, 5, 8, 10	46
Ezi-SERVO2-EC-60M-A-PG-PN	EzM2-60M-A-PG-PN		3, 5, 8, 10	56
Ezi-SERVO2-EC-60L-A-PG-PN	EzM2-60L-A-PG-PN		3, 5, 8, 10	85

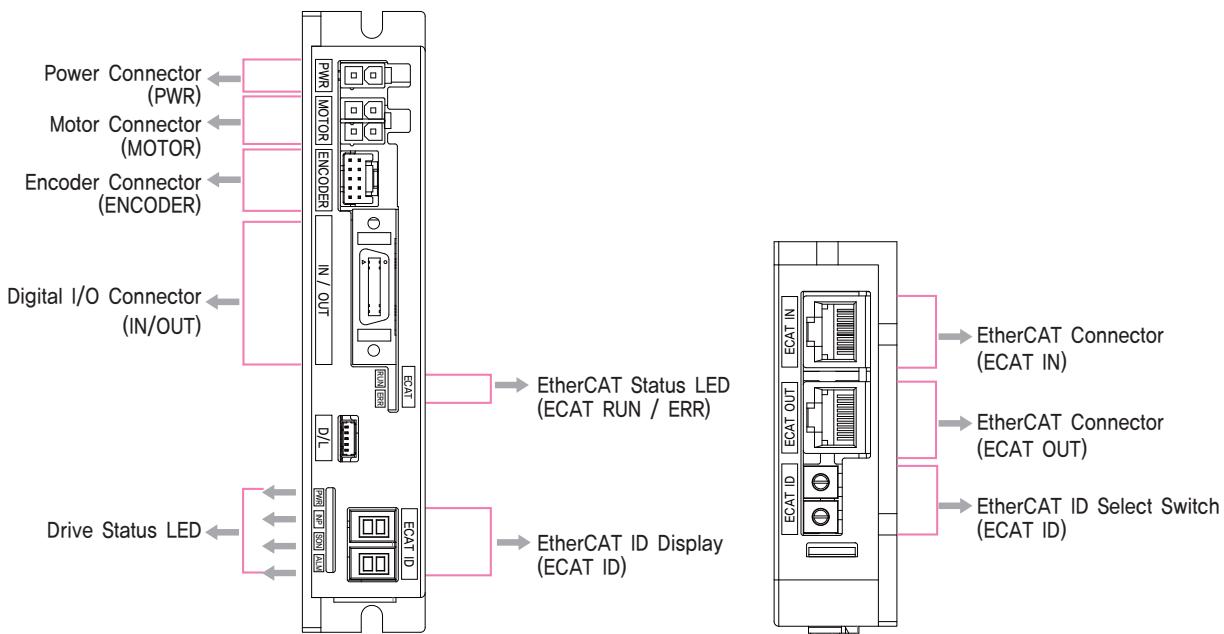


FASTECH Ezi-SERVO II EtherCAT

Package	Motor	Stage	Second Stage	L Length (mm)
Ezi-SERVO2-EC-60S-A-PG-PN	EzM2-60S-A-PG-PN	Second Stage	15, 25, 40, 50	46
Ezi-SERVO2-EC-60M-A-PG-PN	EzM2-60M-A-PG-PN		15, 25, 40, 50	56
Ezi-SERVO2-EC-60L-A-PG-PN	EzM2-60L-A-PG-PN		15, 25, 40, 50	85

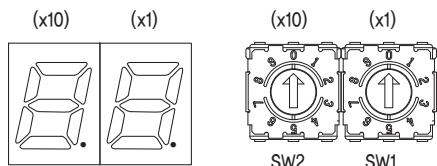


● Setting and Operation [Ezi-SERVO2 EtherCAT]



1. EtherCAT ID Display and Select Switch

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



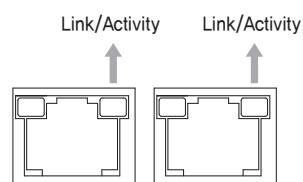
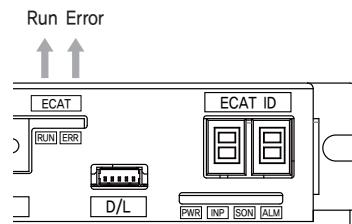
2. EtherCAT Status LED

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

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

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

Name	Color	Status	Explanation
Link/ Activity	Green	OFF	Link not Established
		ON	Link Established
		Flickering	Link Established and in Operation



3. Drive Status LED

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

◆ Drive Protection Functions

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

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

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

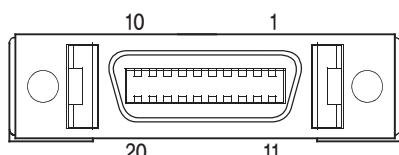
*3 : Rated value of input voltage to the drive is depends on model (Please refer to the manual)

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

4. Input/Output Signal (IN / OUT)

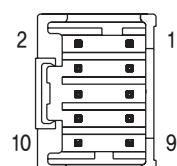
NO.	Function	I/O
1	LIMIT+	Input
2	LIMIT-	Input
3	ORIGIN	Input
4	Digital Input 1	Input
5	Digital Input 2	Input
6	Digital Input 3	Input
7	Digital Input 4	Input
8	Digital Input 5	Input
9	Digital Input 6	Input
10	Digital Input 7	Input
11	Digital Output 1	Output
12	Digital Output 2	Output
13	Digital Output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

*BRAKE function is optional.



5. Encoder Connector (ENCODER)

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



6. Motor Connector (MOTOR)

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



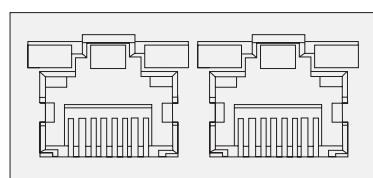
7. Power Connector(PWR)

NO.	Function
1	24VDC ±10%
2	GND



8. EtherCAT Communication Connector

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



◆ Connector for Cabling

These connectors are serviced together with Ezi-SERVO2 EtherCAT except when purchasing option cables.

Input/Output Connector (IN/OUT)

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

Motor Connector (MOTOR)

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

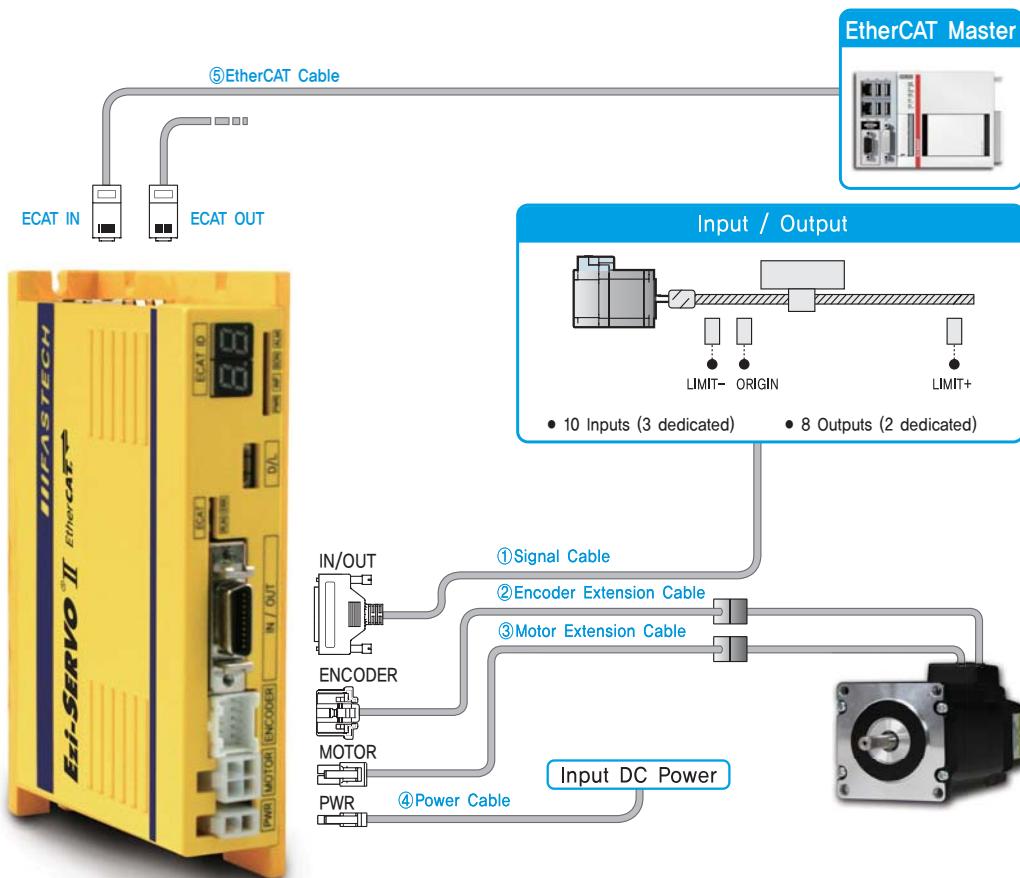
Encoder Connector (ENCODER)

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

Power Connector (PWR)

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

● System Configuration [Ezi-SERVO2 EtherCAT]



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

1. Cable Option

① Signal Cable

Available to connect between Ezi-SERVO2 EtherCAT and Input/Output signals.

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

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

② Encoder Extension Cable

Available to extended connection between Encoder and Ezi-SERVO2 EtherCAT.

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-SERVO2 EtherCAT.

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

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

④ Power Cable

Available to connect between Power and Ezi-SERVO2 EtherCAT.

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

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

⑤ EtherCAT Cable

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

Item	Length[m]	Remark
CGNR-EC-0R6F	0,6	
CGNR-EC-001F	1	
CGNR-EC-1R5F	1,5	
CGNR-EC-002F	2	
CGNR-EC-003F	3	
CGNR-EC-005F	5	

2. Option

① TB-Plus(Interface Board)

Available to connect more conveniently between Input/Output signal and Ezi-SERVO2 EtherCAT.



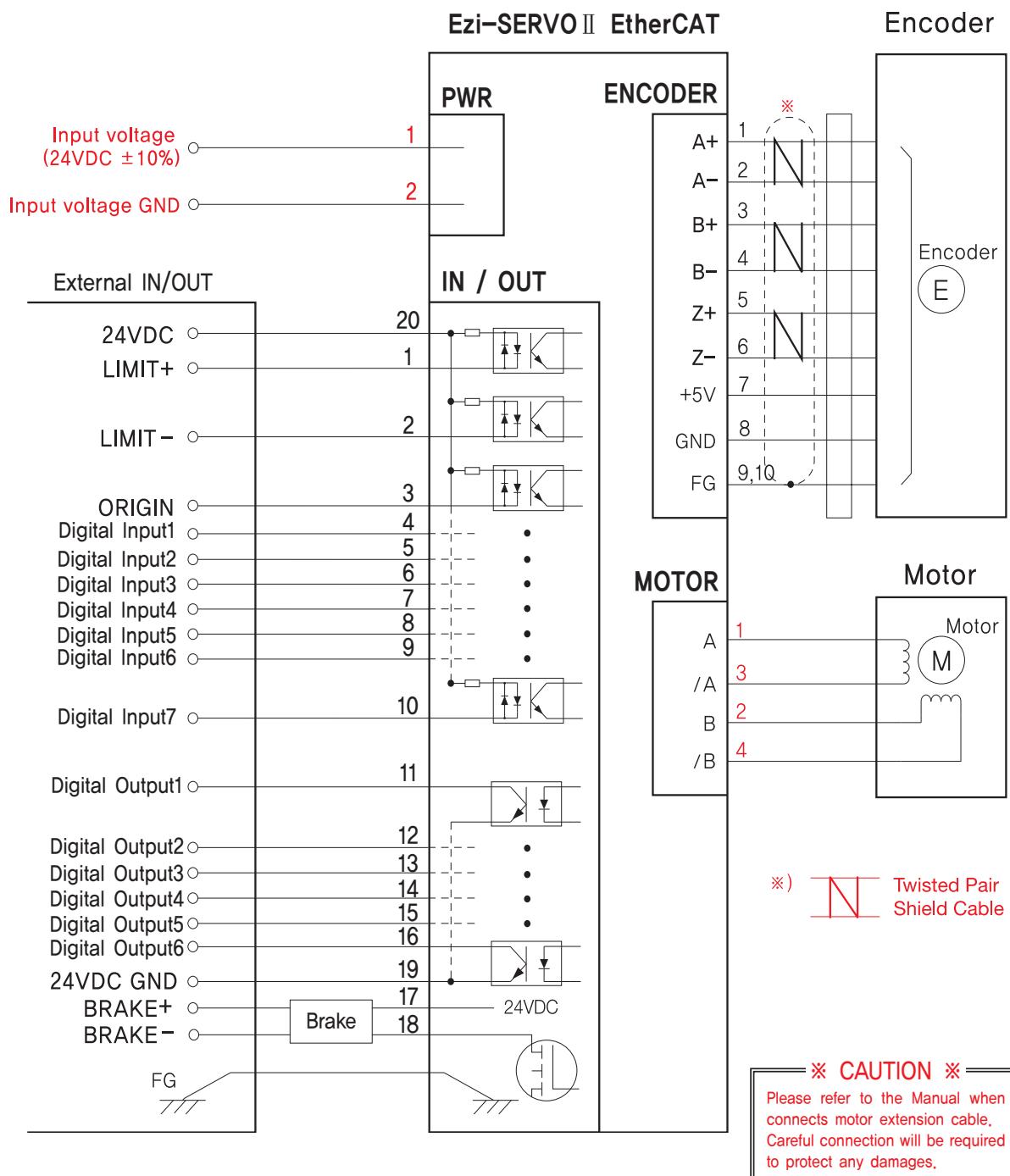
② Interface Cable

Available to Connect between TB-Plus Interface Board and Ezi-SERVO2 EtherCAT.

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

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

● External Wiring Diagram [Ezi-SERVO2 EtherCAT]





Fast, Accurate, Smooth Motion

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