Ezi-SERVO®

Closed Loop Stepping System

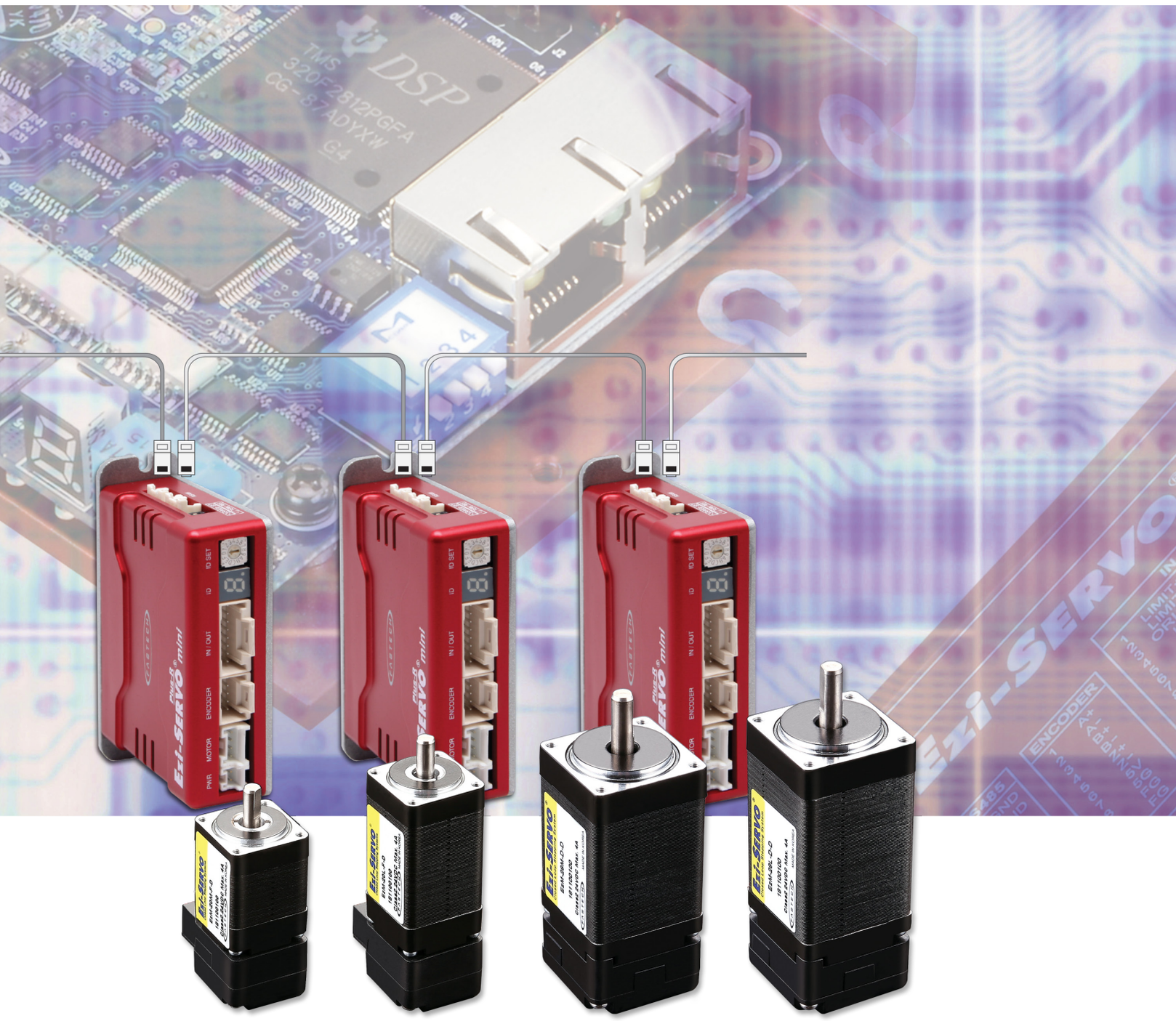
- Space Saving / Reduced Wiring by Compact Drive
- Embedded Motion Controller
- RS-485 Interface
- Position Table
- Closed-Loop Stepping System
- Tuning Not Required / No Hunting
- High Resolution / High Response

Plus-R
MINI



CE

FASTECH
Fast, Accurate, Smooth Motion

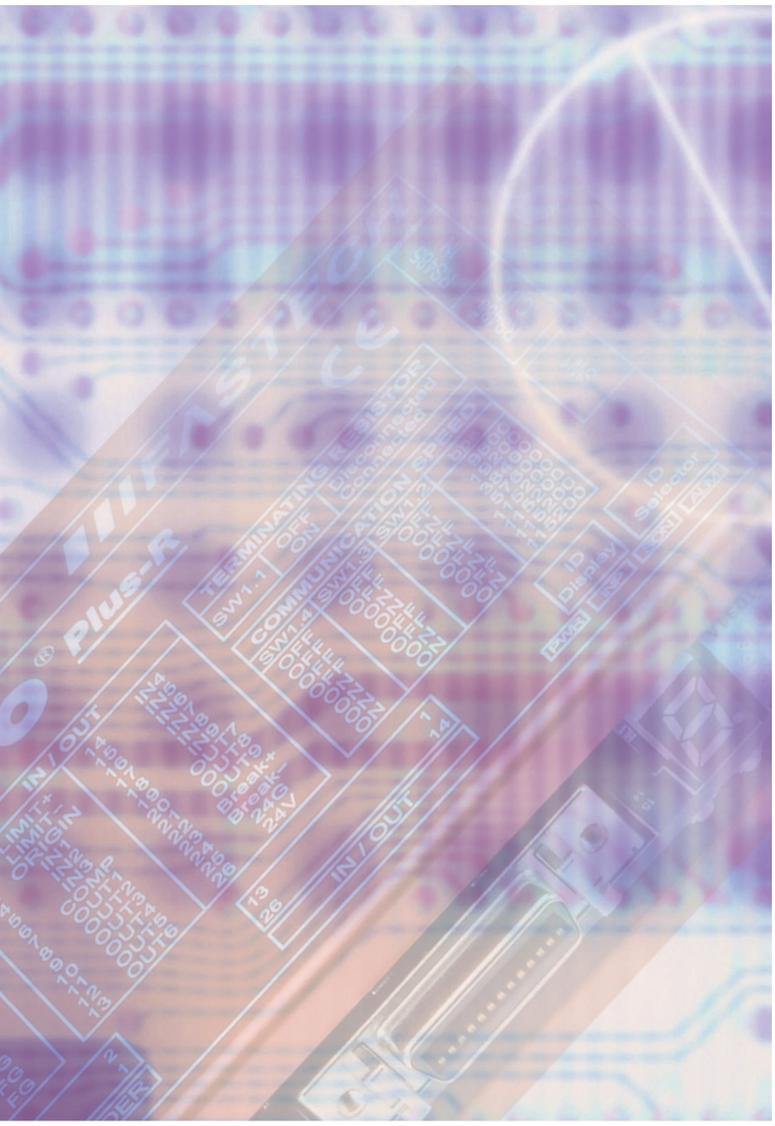


FASTECH

Fast, Accurate, Smooth Motion

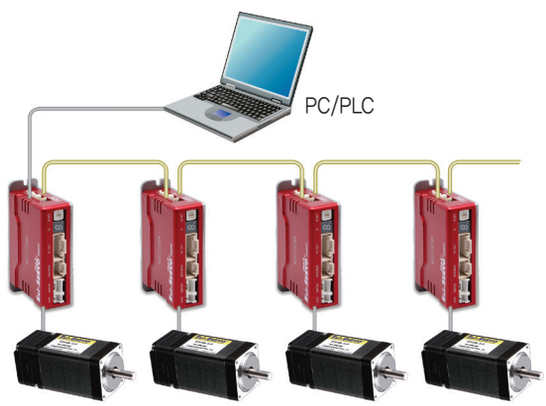
Ezi-SERVO® Plus-R MINI

Closed Loop Stepping System



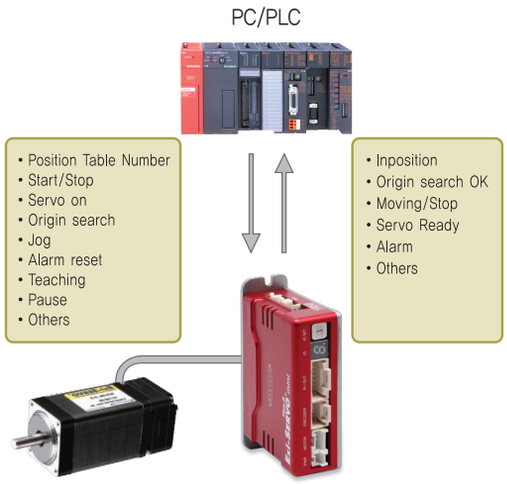
1 RS-485 Based Motion Control

A maximum of 16 axis can be operated from a PC through RS-485 communications. Also, motions are controlled by RS-485, and all of the Motion conditions are set through the network and saved in Flash ROM as a parameter. Motion Library(API) is provided for programming under Windows 7/8/10.



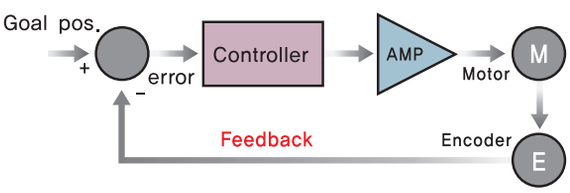
2 Position Table Function

Position Table can be used for motion control by digital input and output signals of host controller.
You can operate the motor directly by sending the position table number, start/stop, origin search and other digital input values from a PC.
The PC can monitor the In-Position, origin search, moving/stop, servo ready and other digital output signals from a drive. A maximum of 64 positioning points can be set from PC.



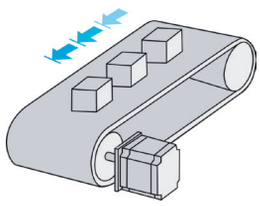
3 Closed-Loop System

Ezi-SERVO 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 to update the current position every 25μs. It allows the Ezi-SERVO drive to compensate for the loss of position, ensuring accurate positioning. For example, due to a sudden load change, a conventional stepping motor and drive could lose a step but Ezi-SERVO automatically correct the position by encoder feedback.



4 Tuning Not Required

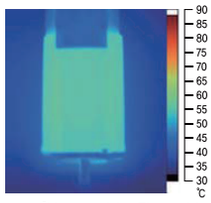
To ensure machine performance, conventional servo systems require the adjustment of its servo's gains as an initial crucial step. Even systems that employ auto-tuning require manual tuning after the system is installed.
Ezi-SERVO employs the best characteristics of the stepping motor to eliminate the need of tedious gain tuning required for conventional closed-loop servo systems. Ezi-SERVO 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.



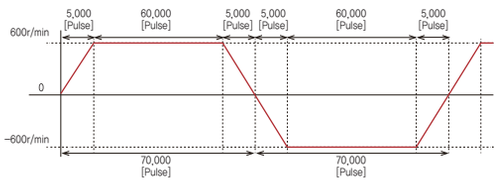
5 Low Heat Generation / Energy Savings

(Motor Current Control according to load)

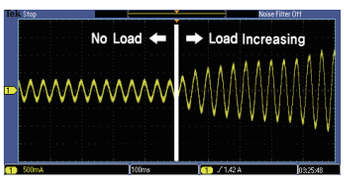
Ezi-SERVO automatically controls motor current according to load.
Ezi-SERVO reduces motor current when motor load is low and increases motor current when load is high. By optimizing the motor current, motor heat can be minimized and energy can be saved.



Motor temperature [Measured by Thermal Imaging Camera]



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

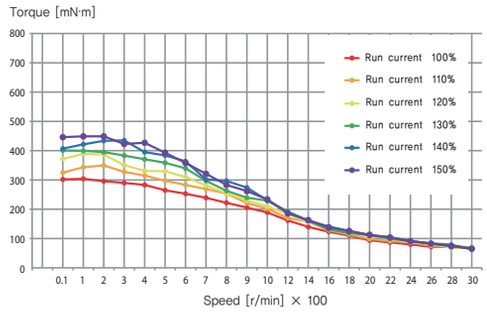


Example of the Motor Current Control according to load

6 High Torque

(Motor Current Setting)

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

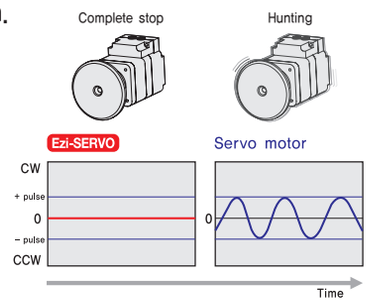


※ The torque at low speed is improved about 30%.

Measured Condition : Drive = Ezi-SERVO-PR-MI-42L
Motor Voltage = DC24V
Input Voltage = DC24V

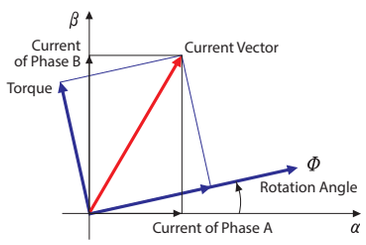
7 No Hunting

Ezi-SERVO utilizes the unique characteristics of stepping 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.



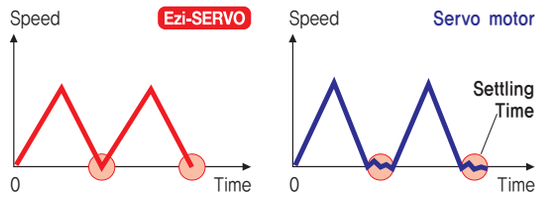
8 Smooth and Accurate Operation

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



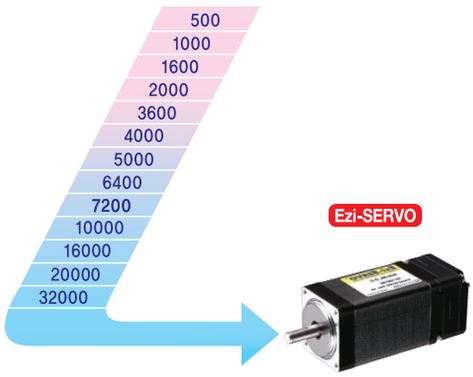
9 High Response

Similar to conventional stepping motors, Ezi-SERVO instantly synchronizes with command pulses providing fast positional response. Ezi-SERVO is the optimal 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.



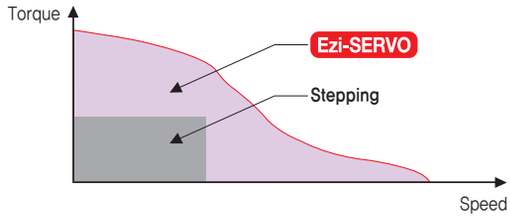
10 High Resolution

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



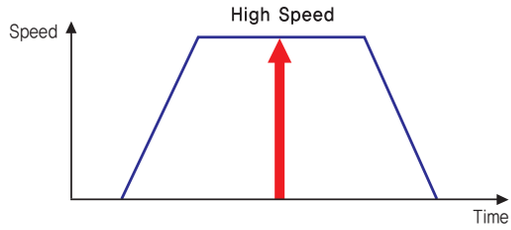
11 High Torque/Continuous Operation

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



12 High Speed

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



● Advantages over Open-Loop Stepping System Drive

1. Positioning is reliable without loss of synchronism.
2. It can hold stable position and automatically recover to the original position even after experiencing positioning error due to external forces, such as mechanical vibration or vertical positional holding.
3. Ezi-SERVO utilizes 100% of 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. Ezi-SERVO can operate at high speed due to load-dependent current control, while open-loop stepping drives use a constant current control at all speed ranges without considering load variations. (Max Speed : 3,000r/min)

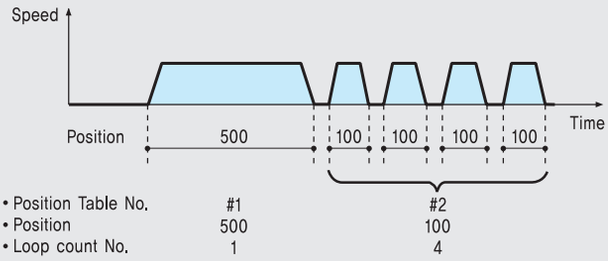
● Advantages over Servo Motor Controller

1. Tuning is not required. (Automatic gain adjustment in response to a load change)
2. It can maintain the stable holding position without oscillation after completion of positioning.
3. Positioning is fast due to the independent control by on-board MCU.
4. Operation is constant during rapid short-stroke movement due to instantaneous positioning.

● Motion Controller Features of Ezi-SERVO

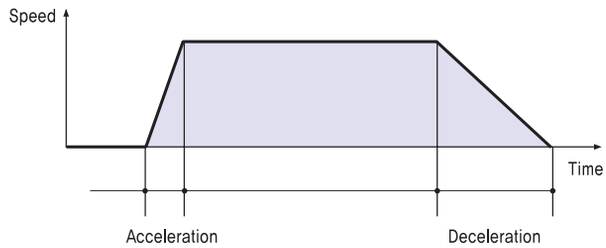
1. Loop Count

This function allows positioning repeatedly according to the Loop Count Number.



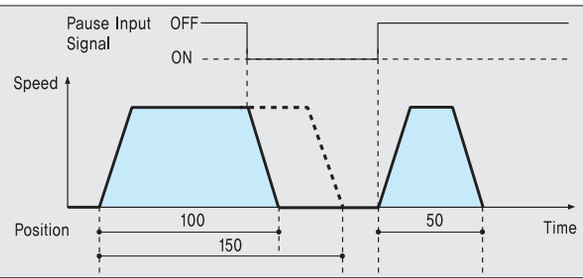
2. Acceleration/Deceleration

For quick acceleration and gradual deceleration, you can set each acceleration and deceleration time separately.



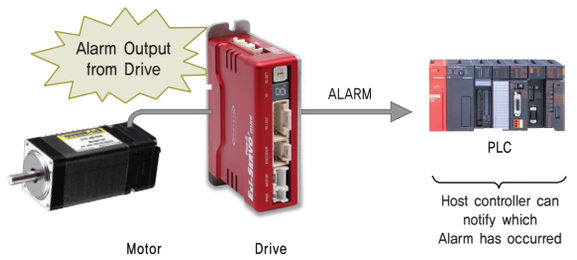
3. Pause

You can pause the motion upon the input of an external signal. When Pause signal change to OFF, the motor will restart to original target position.



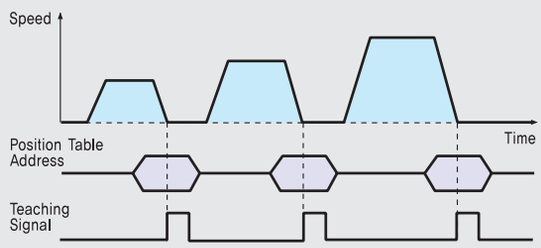
4. Alarm

The number of 7-segment LED display flashing time indicates which Alarm has occurred.



5. Teaching

Teaching signal is used to memorize current Position data into the selected Position Table item.

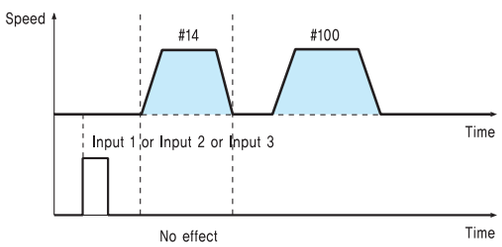


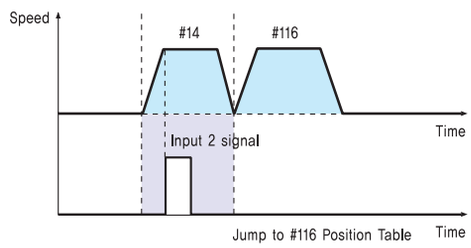
6. Jump

Within one Position Table, you can select various Position Table numbers that you want to jump.
With three external input signal during movement, the next jump Position Table number can be select.

◆ Position Table #14

Position	– – –	Next	– – –	Input 1	Input 2	Input 3	– – –
10000		100		115	116	117	





● Ezi-SERVO Plus-R MINI Part Numbering

Ezi-SERVO-PR-MI-42M-A-BK-PN05

Product Name

Drive Series

PR : Plus RS-485
MI : Mini Type

Motor Flange Size

20 : 20mm
28 : 28mm
35 : 35mm
42 : 42mm

Motor Length

S : Small
M : Medium
L : Large
XL : Extra Large

Encoder Resolution

A : 10,000P/R
B : 20,000P/R
C : 32,000P/R
D : 16,000P/R
F : 4,000P/R

Brake

Blank : Without Brake
BK : Brake

Gear Ratio

Blank : Without Gear
PN03 : 1:3
PN05 : 1:5
PN08 : 1:8
PN10 : 1:10
PN15 : 1:15
PN25 : 1:25
PN40 : 1:40
PN50 : 1:50

● Standard Combination

Unit Part Number	Motor Model Numaber	Drive Model Number
Ezi-SERVO-PR-MI-20M-F	EzM-20M-F	EzS-NDR-MI-20M-F
Ezi-SERVO-PR-MI-20L-F	EzM-20L-F	EzS-NDR-MI-20L-F
Ezi-SERVO-PR-MI-28S-D	EzM-28S-D	EzS-NDR-MI-28S-D
Ezi-SERVO-PR-MI-28SM-D	EzM-28SM-D	EzS-NDR-MI-28S-D
Ezi-SERVO-PR-MI-28M-D	EzM-28M-D	EzS-NDR-MI-28M-D
Ezi-SERVO-PR-MI-28MM-D	EzM-28MM-D	EzS-NDR-MI-28M-D
Ezi-SERVO-PR-MI-28L-D	EzM-28L-D	EzS-NDR-MI-28L-D
Ezi-SERVO-PR-MI-28LM-D	EzM-28LM-D	EzS-NDR-MI-28L-D
Ezi-SERVO-PR-MI-35M-D	EzM-35M-D	EzS-NDR-MI-35M-D
Ezi-SERVO-PR-MI-35MM-D	EzM-35MM-D	EzS-NDR-MI-35M-D
Ezi-SERVO-PR-MI-35L-D	EzM-35L-D	EzS-NDR-MI-35L-D
Ezi-SERVO-PR-MI-35LM-D	EzM-35LM-D	EzS-NDR-MI-35L-D
Ezi-SERVO-PR-MI-42S-A	EzM-42S-A	EzS-NDR-MI-42S-A
Ezi-SERVO-PR-MI-42S-B	EzM-42S-B	EzS-NDR-MI-42S-B
Ezi-SERVO-PR-MI-42S-C	EzM-42S-C	EzS-NDR-MI-42S-C
Ezi-SERVO-PR-MI-42M-A	EzM-42M-A	EzS-NDR-MI-42M-A
Ezi-SERVO-PR-MI-42M-B	EzM-42M-B	EzS-NDR-MI-42M-B
Ezi-SERVO-PR-MI-42M-C	EzM-42M-C	EzS-NDR-MI-42M-C
Ezi-SERVO-PR-MI-42L-A	EzM-42L-A	EzS-NDR-MI-42L-A
Ezi-SERVO-PR-MI-42L-B	EzM-42L-B	EzS-NDR-MI-42L-B
Ezi-SERVO-PR-MI-42L-C	EzM-42L-C	EzS-NDR-MI-42L-C
Ezi-SERVO-PR-MI-42XL-A	EzM-42XL-A	EzS-NDR-MI-42XL-A
Ezi-SERVO-PR-MI-42XL-B	EzM-42XL-B	EzS-NDR-MI-42XL-B
Ezi-SERVO-PR-MI-42XL-C	EzM-42XL-C	EzS-NDR-MI-42XL-C

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

Combination with Brake

Unit Part Number	Motor Model Number	Drive Model Number
Ezi-SERVO-PR-MI-42S-A-BK	EzM-42S-A-BK	EzS-NDR-MI-42S-A
Ezi-SERVO-PR-MI-42S-B-BK	EzM-42S-B-BK	EzS-NDR-MI-42S-B
Ezi-SERVO-PR-MI-42S-C-BK	EzM-42S-C-BK	EzS-NDR-MI-42S-C
Ezi-SERVO-PR-MI-42M-A-BK	EzM-42M-A-BK	EzS-NDR-MI-42M-A
Ezi-SERVO-PR-MI-42M-B-BK	EzM-42M-B-BK	EzS-NDR-MI-42M-B
Ezi-SERVO-PR-MI-42M-C-BK	EzM-42M-C-BK	EzS-NDR-MI-42M-C
Ezi-SERVO-PR-MI-42L-A-BK	EzM-42L-A-BK	EzS-NDR-MI-42L-A
Ezi-SERVO-PR-MI-42L-B-BK	EzM-42L-B-BK	EzS-NDR-MI-42L-B
Ezi-SERVO-PR-MI-42L-C-BK	EzM-42L-C-BK	EzS-NDR-MI-42L-C
Ezi-SERVO-PR-MI-42XL-A-BK	EzM-42XL-A-BK	EzS-NDR-MI-42XL-A
Ezi-SERVO-PR-MI-42XL-B-BK	EzM-42XL-B-BK	EzS-NDR-MI-42XL-B
Ezi-SERVO-PR-MI-42XL-C-BK	EzM-42XL-C-BK	EzS-NDR-MI-42XL-C

Combination with Gearbox

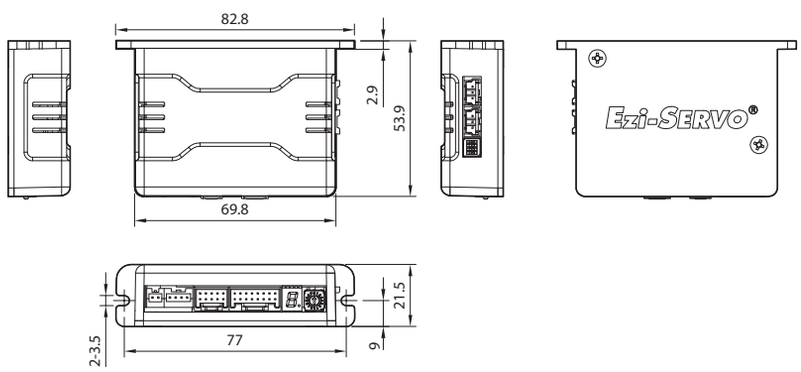
Unit Part Number	Motor Model Number	Drive Model Number	Gear Ratio
Ezi-SERVO-PR-MI-42S-A-PN3	EzM-42S-A-PN3	EzS-NDR-MI-42S-A	1:3
Ezi-SERVO-PR-MI-42S-B-PN3	EzM-42S-B-PN3	EzS-NDR-MI-42S-B	
Ezi-SERVO-PR-MI-42S-A-PN5	EzM-42S-A-PN5	EzS-NDR-MI-42S-A	1:5
Ezi-SERVO-PR-MI-42S-B-PN5	EzM-42S-B-PN5	EzS-NDR-MI-42S-B	
Ezi-SERVO-PR-MI-42S-A-PN8	EzM-42S-A-PN8	EzS-NDR-MI-42S-A	1:8
Ezi-SERVO-PR-MI-42S-B-PN8	EzM-42S-B-PN8	EzS-NDR-MI-42S-B	
Ezi-SERVO-PR-MI-42S-A-PN10	EzM-42S-A-PN10	EzS-NDR-MI-42S-A	1:10
Ezi-SERVO-PR-MI-42S-B-PN10	EzM-42S-B-PN10	EzS-NDR-MI-42S-B	
Ezi-SERVO-PR-MI-42S-A-PN15	EzM-42S-A-PN15	EzS-NDR-MI-42S-A	1:15
Ezi-SERVO-PR-MI-42S-B-PN15	EzM-42S-B-PN15	EzS-NDR-MI-42S-B	
Ezi-SERVO-PR-MI-42S-A-PN25	EzM-42S-A-PN25	EzS-NDR-MI-42S-A	1:25
Ezi-SERVO-PR-MI-42S-B-PN25	EzM-42S-B-PN25	EzS-NDR-MI-42S-B	
Ezi-SERVO-PR-MI-42S-A-PN40	EzM-42S-A-PN40	EzS-NDR-MI-42S-A	1:40
Ezi-SERVO-PR-MI-42S-B-PN40	EzM-42S-B-PN40	EzS-NDR-MI-42S-B	
Ezi-SERVO-PR-MI-42S-A-PN50	EzM-42S-A-PN50	EzS-NDR-MI-42S-A	1:50
Ezi-SERVO-PR-MI-42S-B-PN50	EzM-42S-B-PN50	EzS-NDR-MI-42S-B	
Ezi-SERVO-PR-MI-42M-A-PN3	EzM-42M-A-PN3	EzS-NDR-MI-42M-A	1:3
Ezi-SERVO-PR-MI-42M-B-PN3	EzM-42M-B-PN3	EzS-NDR-MI-42M-B	
Ezi-SERVO-PR-MI-42M-A-PN5	EzM-42M-A-PN5	EzS-NDR-MI-42M-A	1:5
Ezi-SERVO-PR-MI-42M-B-PN5	EzM-42M-B-PN5	EzS-NDR-MI-42M-B	
Ezi-SERVO-PR-MI-42M-A-PN8	EzM-42M-A-PN8	EzS-NDR-MI-42M-A	1:8
Ezi-SERVO-PR-MI-42M-B-PN8	EzM-42M-B-PN8	EzS-NDR-MI-42M-B	
Ezi-SERVO-PR-MI-42M-A-PN10	EzM-42M-A-PN10	EzS-NDR-MI-42M-A	1:10
Ezi-SERVO-PR-MI-42M-B-PN10	EzM-42M-B-PN10	EzS-NDR-MI-42M-B	
Ezi-SERVO-PR-MI-42M-A-PN15	EzM-42M-A-PN15	EzS-NDR-MI-42M-A	1:15
Ezi-SERVO-PR-MI-42M-B-PN15	EzM-42M-B-PN15	EzS-NDR-MI-42M-B	
Ezi-SERVO-PR-MI-42M-A-PN25	EzM-42M-A-PN25	EzS-NDR-MI-42M-A	1:25
Ezi-SERVO-PR-MI-42M-B-PN25	EzM-42M-B-PN25	EzS-NDR-MI-42M-B	
Ezi-SERVO-PR-MI-42M-A-PN40	EzM-42M-A-PN40	EzS-NDR-MI-42M-A	1:40
Ezi-SERVO-PR-MI-42M-B-PN40	EzM-42M-B-PN40	EzS-NDR-MI-42M-B	
Ezi-SERVO-PR-MI-42M-A-PN50	EzM-42M-A-PN50	EzS-NDR-MI-42M-A	1:50
Ezi-SERVO-PR-MI-42M-B-PN50	EzM-42M-B-PN50	EzS-NDR-MI-42M-B	
Ezi-SERVO-PR-MI-42L-A-PN3	EzM-42L-A-PN3	EzS-NDR-MI-42L-A	1:3
Ezi-SERVO-PR-MI-42L-B-PN3	EzM-42L-B-PN3	EzS-NDR-MI-42L-B	
Ezi-SERVO-PR-MI-42L-A-PN5	EzM-42L-A-PN5	EzS-NDR-MI-42L-A	1:5
Ezi-SERVO-PR-MI-42L-B-PN5	EzM-42L-B-PN5	EzS-NDR-MI-42L-B	
Ezi-SERVO-PR-MI-42L-A-PN8	EzM-42L-A-PN8	EzS-NDR-MI-42L-A	1:8
Ezi-SERVO-PR-MI-42L-B-PN8	EzM-42L-B-PN8	EzS-NDR-MI-42L-B	
Ezi-SERVO-PR-MI-42L-A-PN10	EzM-42L-A-PN10	EzS-NDR-MI-42L-A	1:10
Ezi-SERVO-PR-MI-42L-B-PN10	EzM-42L-B-PN10	EzS-NDR-MI-42L-B	
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Ezi-SERVO-PR-MI-42L-B-PN15	EzM-42L-B-PN15	EzS-NDR-MI-42L-B	
Ezi-SERVO-PR-MI-42L-A-PN25	EzM-42L-A-PN25	EzS-NDR-MI-42L-A	1:25
Ezi-SERVO-PR-MI-42L-B-PN25	EzM-42L-B-PN25	EzS-NDR-MI-42L-B	
Ezi-SERVO-PR-MI-42L-A-PN40	EzM-42L-A-PN40	EzS-NDR-MI-42L-A	1:40
Ezi-SERVO-PR-MI-42L-B-PN40	EzM-42L-B-PN40	EzS-NDR-MI-42L-B	
Ezi-SERVO-PR-MI-42L-A-PN50	EzM-42L-A-PN50	EzS-NDR-MI-42L-A	1:50
Ezi-SERVO-PR-MI-42L-B-PN50	EzM-42L-B-PN50	EzS-NDR-MI-42L-B	
Ezi-SERVO-PR-MI-42XL-A-PN3	EzM-42XL-A-PN3	EzS-NDR-MI-42XL-A	1:3
Ezi-SERVO-PR-MI-42XL-B-PN3	EzM-42XL-B-PN3	EzS-NDR-MI-42XL-B	
Ezi-SERVO-PR-MI-42XL-A-PN5	EzM-42XL-A-PN5	EzS-NDR-MI-42XL-A	1:5
Ezi-SERVO-PR-MI-42XL-B-PN5	EzM-42XL-B-PN5	EzS-NDR-MI-42XL-B	
Ezi-SERVO-PR-MI-42XL-A-PN8	EzM-42XL-A-PN8	EzS-NDR-MI-42XL-A	1:8
Ezi-SERVO-PR-MI-42XL-B-PN8	EzM-42XL-B-PN8	EzS-NDR-MI-42XL-B	
Ezi-SERVO-PR-MI-42XL-A-PN10	EzM-42XL-A-PN10	EzS-NDR-MI-42XL-A	1:10
Ezi-SERVO-PR-MI-42XL-B-PN10	EzM-42XL-B-PN10	EzS-NDR-MI-42XL-B	
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Ezi-SERVO-PR-MI-42XL-B-PN15	EzM-42XL-B-PN15	EzS-NDR-MI-42XL-B	
Ezi-SERVO-PR-MI-42XL-A-PN25	EzM-42XL-A-PN25	EzS-NDR-MI-42XL-A	1:25
Ezi-SERVO-PR-MI-42XL-B-PN25	EzM-42XL-B-PN25	EzS-NDR-MI-42XL-B	
Ezi-SERVO-PR-MI-42XL-A-PN40	EzM-42XL-A-PN40	EzS-NDR-MI-42XL-A	1:40
Ezi-SERVO-PR-MI-42XL-B-PN40	EzM-42XL-B-PN40	EzS-NDR-MI-42XL-B	
Ezi-SERVO-PR-MI-42XL-A-PN50	EzM-42XL-A-PN50	EzS-NDR-MI-42XL-A	1:50
Ezi-SERVO-PR-MI-42XL-B-PN50	EzM-42XL-B-PN50	EzS-NDR-MI-42XL-B	

Specifications of Drive

Motor Model		EzM-20 series	EzM-28 series	EzM-35 series	EzM-42 series
Drive Model		EzS-NDR-MI-20 series	EzS-NDR-MI-28 series	EzS-NDR-MI-35 series	EzS-NDR-MI-42 series
Input Voltage		DC24V±10%			
Control Method		Closed-loop control with 32 bit MCU			
Multi Axis Drive		Max. 16 axis operating (Daisy Chain)			
Position Table		64 motion command steps			
Current Consumption		Max. 500mA (Except motor current)			
Operating Condition	Ambient Temperature	· In Use: 0~50℃ · In Storage: -20~70℃			
	Humidity	· In Use: 35~85% RH (Non-Condensing) · In Storage: 10~90% RH (Non-Condensing)			
	Vib. Resist.	0.5g			
Function	Rotation Speed	0~3,000r/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 32,000 / 500 1,000 1,600 2,000 3,600 5,000 6,400 7,200 10,000 32,000 (Selectable by parameter)			
	Error Types	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, System Error, ROM Error, Position Overflow Error			
	7-Segment LED Display	Network ID, Drive Status			
	In-Position Selection	0~15 (Set by parameter)			
	Position Gain Selection	0~15 (Set by parameter)			
	Rotation Direction	CW/CCW (Set by parameter)			
I/O Signal	Input Signals	3 dedicated inputs (LIMIT+, LIMIT-, ORIGIN), 7 programmable inputs (Photocoupler Input)			
	Output Signals	1 dedicated output (Compare Out), 1 programmable output (Photocoupler Output), 1 Brake output			
Communication Interface		· RS-485 Communication · Baud Rate : 9,600~921,600bps			
Position Control		· Incremental mode / Absolute mode Data Range: -134,217,728 to +134,217,727 [pulse] · Operating speed: Max. 3,000 r/min			
Return to Origin		Origin Sensor, Z phase, ±Limit sensor, Torque			
GUI		User Interface Program within Windows			
Library		Motion Library (API) for Windows 7/8/10			

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

Dimensions of Drive [mm]

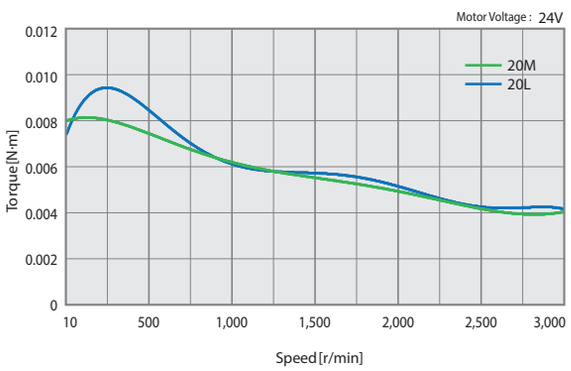


Specifications of Motor

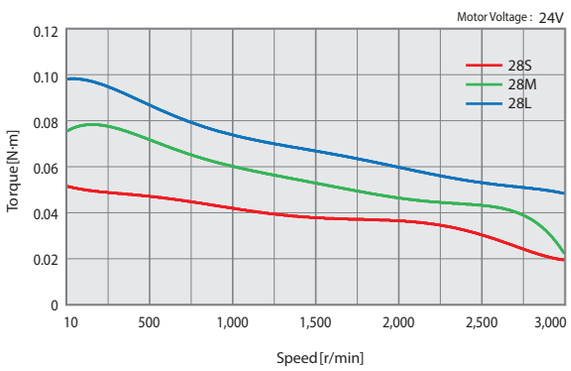
MODEL				EzM-20 series		EzM-28 series			EzM-35 series		EzM-42 series			
			UNIT	20M	20L	28S	28M	28L	35M	35L	42S	42M	42L	42XL
DRIVE METHOD			–	Bipolar										
NUMBER OF PHASES			–	2 Phase										
CURRENT per PHASE			A/Phase	0.5	0.5	0.95	0.95	0.95	1.5	1.5	1.2	1.2	1.2	1.2
MAXIMUM HOLDING TORQUE			N·m	0.016	0.025	0.069	0.098	0.118	0.13	0.23	0.32	0.44	0.5	0.65
ROTOR INERTIA			$g \cdot cm^2$	2.5	3.3	9.0	13	18	15	20	35	54	77	114
WEIGHTS			kg	0.079	0.104	0.147	0.204	0.232	0.194	0.226	0.299	0.364	0.433	0.567
LENGTH(L)			mm	28	38	32	45	50	32	36	34	40	48	60
PERMISSIBLE RADIAL LOAD	DIS-TANCE FROM END OF SHAFT	3mm	N	18	18	30	30	30	22	22	22	22	22	22
		8mm		30	30	38	38	38	26	26	26	26	26	26
		13mm		–	–	53	53	53	33	33	33	33	33	33
		18mm		–	–	–	–	–	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 DC500V insulation resistance meter)										
INSULATION CLASS			–	CLASS B(130℃)										
OPERATING TEMPERATURE			℃	0 ~ 55										

Torque Characteristics of Motor

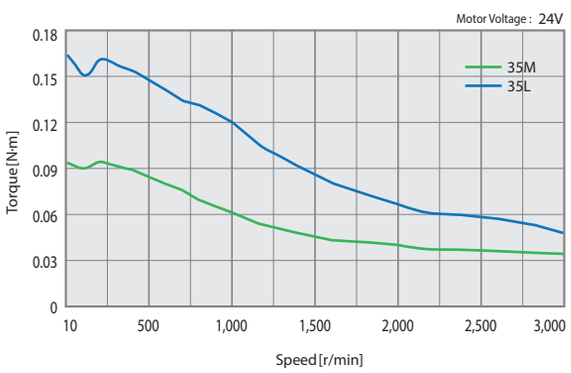
Ezi-SERVO-PR-MI-20 series



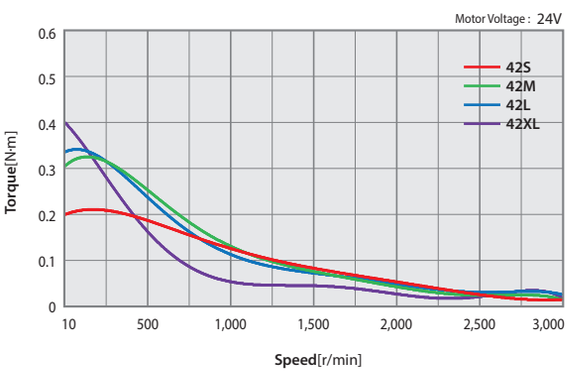
Ezi-SERVO-PR-MI-28 series



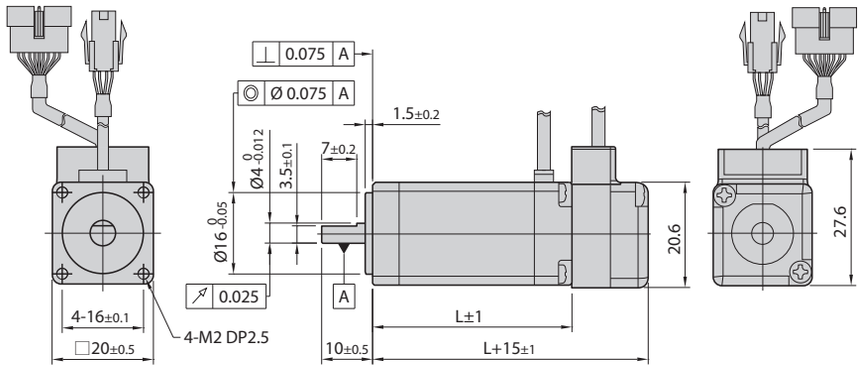
Ezi-SERVO-PR-MI-35 series



Ezi-SERVO-PR-MI-42 series

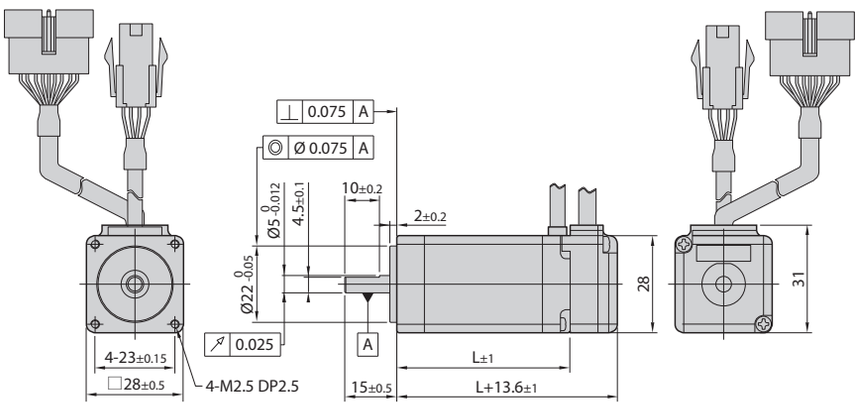


● Dimensions of Motor [mm]



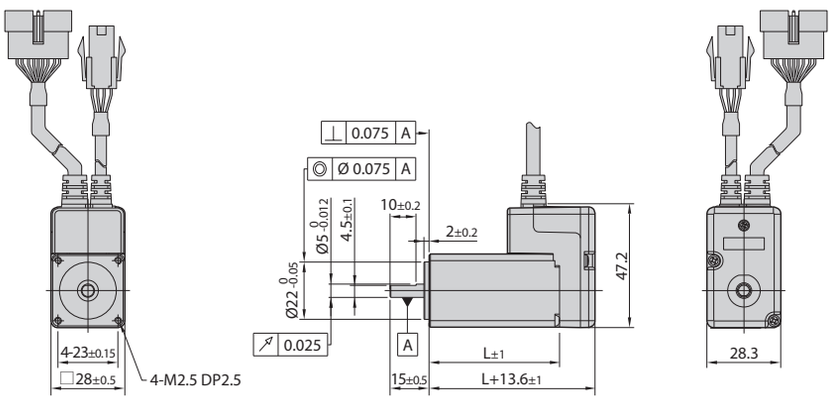
20mm

Model name	Length(L)
EzM-20M	28
EzM-20L	38



28mm

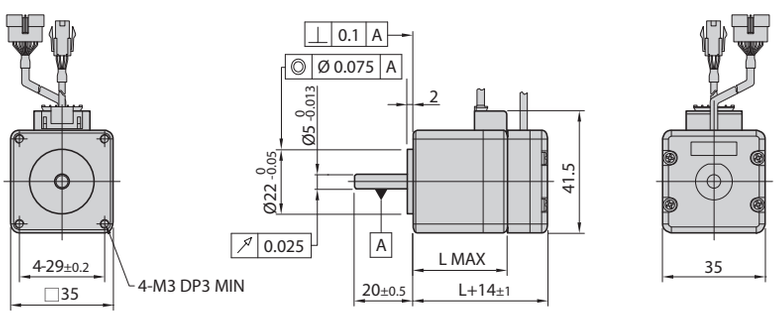
Model name	Length(L)
EzM-28S	32
EzM-28M	45
EzM-28L	50



28mm (Stopper type)

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

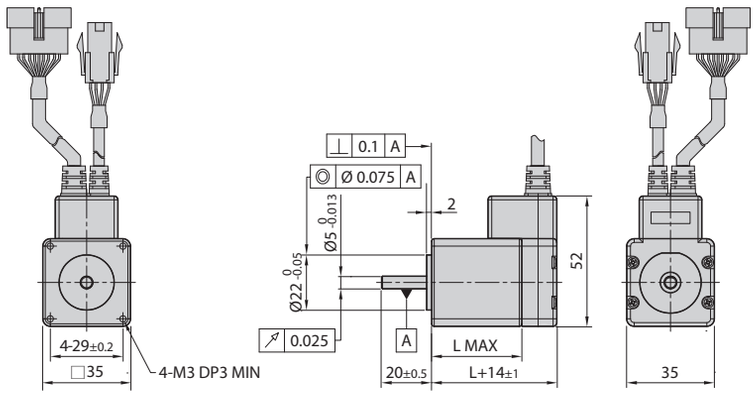
※ When ordering 28mm Stopper type of motor, please add "M" after standard motor model number.



35mm

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

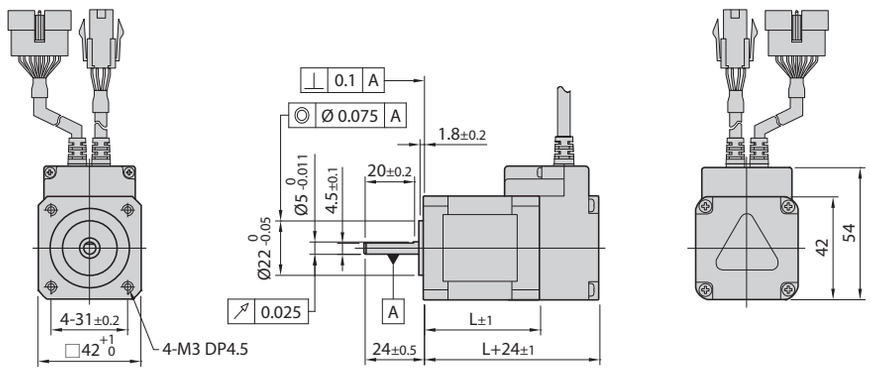
● Dimensions of Motor [mm]



35mm
(Stopper type)

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

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



42mm

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

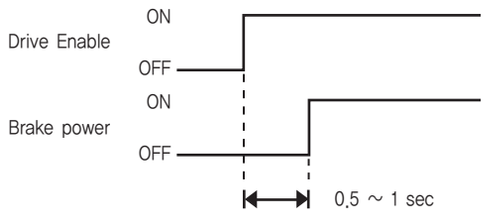
● Specifications of Motor with Brake

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-PR-MI-42S-■-BK	EzM-42S-■-BK	Non-excitation run Type	24VDC ±10%	0.2	5	0.2	0.56	22	26	33	46	Must be Lower than Motor Unit Weight
Ezi-SERVO-PR-MI-42M-■-BK	EzM-42M-■-BK						0.62					
Ezi-SERVO-PR-MI-42L-■-BK	EzM-42L-■-BK						0.69					
Ezi-SERVO-PR-MI-42XL-■-BK	EzM-42XL-■-BK						0.83					

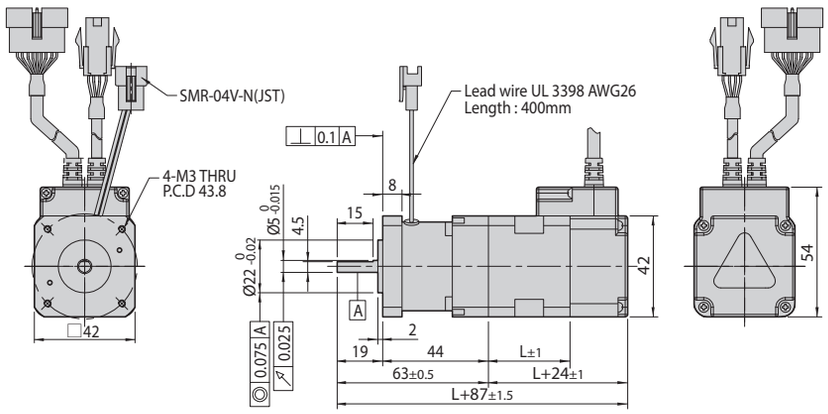
* The code of encoder resolution will be marked in "■"
* Electronic Brake cannot be used for braking. Position hold purpose only when power OFF.
* The weight means Motor Unit Weight including Motor and Electronic Brake.
* Motor Model Number is combined model name of Motor and Brake.
* Motor specification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

* Brake Operation Timing Chart

Ezi-SERVO Plus-R MINI controls Brake by Drive automatically.
Please refer to below Timing Chart when Brake is controlled by the upper controller other than using Ezi-SERVO Plus-R MINI 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]



42mm

Model Name	Length(L)
EzM-42S	34
EzM-42M	40
EzM-42L	48
EzM-42XL	60

● How to Read Specifications

Unit Part Number	① Maximum Holding Torque [N·m]	② Rotor Inertia Moment [kg·m²]	③ Back-lash [arcmin]	④ Angle Trans-mission Error [arcmin]	⑤ Gear Ratio	⑥ Resolution (10,000 P/R Standard)	⑦ Permis-sible Torque [N·m]	⑧ Instan-taneous Max-imum Torque [N·m]	⑨ Permis-sible Speed Range [r/min]	⑩ Unit Weight [kg]	⑪ Permissi-ble Radial Load (At Center of Axis) [N]	⑫ Permissi-ble Axial Load [N]
Ezi-SERVO-PR-MI-42S-■-PN3	0.55	$35x10^{-7}$	3	5	3	0.012°	6	12	0~1000	0.76	240	270
Ezi-SERVO-PR-MI-42S-■-PN5	0.92				5	0.0072°	9	18	0~600		290	330
Ezi-SERVO-PR-MI-42S-■-PN8	1.47				8	0.0045°	9	18	0~375		340	410
Ezi-SERVO-PR-MI-42S-■-PN10	1.84				10	0.0036°	6	12	0~300		360	450
Ezi-SERVO-PR-MI-42S-■-PN15	2.67		5	7	15	0.0024°	6	12	0~200	0.92	410	540
Ezi-SERVO-PR-MI-42S-■-PN25	4.46				25	0.00144°	9	18	0~120		490	640
Ezi-SERVO-PR-MI-42S-■-PN40	7.13				40	0.0009°	9	18	0~75		570	640
Ezi-SERVO-PR-MI-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 3,000r/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

42mm

Unit Part Number	Maximum Holding Torque [N·m]	Rotor Inertia Moment [kg·m²]	Back-lash [arcmin]	Angle Trans-mission Error [arcmin]	Gear Ratio	Resolution (10,000 P/R Standard)	Permis-sible Torque [N·m]	Instan-taneous Max-imum Torque [N·m]	Permis-sible Speed Range [r/min]	Unit Weight [kg]	Permissi-ble Radial Load (At Center of Axis) [N]	Permissi-ble Axial Load [N]
Ezi-SERVO-PR-MI-42S-■-PN3	0.55	$35x10^{-7}$	3	5	3	0.012°	6	12	0~1000	0.76	240	270
Ezi-SERVO-PR-MI-42S-■-PN5	0.92				5	0.0072°	9	18	0~600		290	330
Ezi-SERVO-PR-MI-42S-■-PN8	1.47				8	0.0045°	9	18	0~375		340	410
Ezi-SERVO-PR-MI-42S-■-PN10	1.84				10	0.0036°	6	12	0~300		360	450
Ezi-SERVO-PR-MI-42S-■-PN15	2.67		5	7	15	0.0024°	6	12	0~200	0.92	410	540
Ezi-SERVO-PR-MI-42S-■-PN25	4.46				25	0.00144°	9	18	0~120		490	640
Ezi-SERVO-PR-MI-42S-■-PN40	7.13				40	0.0009°	9	18	0~75		570	640
Ezi-SERVO-PR-MI-42S-■-PN50	9.00				50	0.00072°	9	18	0~60		620	640
Ezi-SERVO-PR-MI-42M-■-PN3	0.85	$54x10^{-7}$	3	5	3	0.012°	6	12	0~1000	0.83	240	270
Ezi-SERVO-PR-MI-42M-■-PN5	1.42				5	0.0072°	9	18	0~600		290	330
Ezi-SERVO-PR-MI-42M-■-PN8	2.28				8	0.0045°	9	18	0~375		340	410
Ezi-SERVO-PR-MI-42M-■-PN10	2.85				10	0.0036°	6	12	0~300		360	450
Ezi-SERVO-PR-MI-42M-■-PN15	4.14		5	7	15	0.0024°	6	12	0~200	0.98	410	540
Ezi-SERVO-PR-MI-42M-■-PN25	6.90				25	0.00144°	9	18	0~120		490	640
Ezi-SERVO-PR-MI-42M-■-PN40	9.00				40	0.0009°	9	18	0~75		570	640
Ezi-SERVO-PR-MI-42M-■-PN50	9.00				50	0.00072°	9	18	0~60		620	640
Ezi-SERVO-PR-MI-42L-■-PN3	0.93	$77x10^{-7}$	3	5	3	0.012°	6	12	0~1000	0.89	240	270
Ezi-SERVO-PR-MI-42L-■-PN5	1.55				5	0.0072°	9	18	0~600		290	330
Ezi-SERVO-PR-MI-42L-■-PN8	2.48				8	0.0045°	9	18	0~375		340	410
Ezi-SERVO-PR-MI-42L-■-PN10	3.10				10	0.0036°	6	12	0~300		360	450
Ezi-SERVO-PR-MI-42L-■-PN15	4.51		5	7	15	0.0024°	6	12	0~200	1.05	410	540
Ezi-SERVO-PR-MI-42L-■-PN25	7.52				25	0.00144°	9	18	0~120		490	640
Ezi-SERVO-PR-MI-42L-■-PN40	9.00				40	0.0009°	9	18	0~75		570	640
Ezi-SERVO-PR-MI-42L-■-PN50	9.00				50	0.00072°	9	18	0~60		620	640
Ezi-SERVO-PR-MI-42XL-■-PN3	1.42	$114x10^{-7}$	3	5	3	0.012°	6	12	0~1000	1.03	240	270
Ezi-SERVO-PR-MI-42XL-■-PN5	2.38				5	0.0072°	9	18	0~600		290	330
Ezi-SERVO-PR-MI-42XL-■-PN8	3.80				8	0.0045°	9	18	0~375		340	410
Ezi-SERVO-PR-MI-42XL-■-PN10	4.76				10	0.0036°	6	12	0~300		360	450
Ezi-SERVO-PR-MI-42XL-■-PN15	6.00		5	7	15	0.0024°	6	12	0~200	1.18	410	540
Ezi-SERVO-PR-MI-42XL-■-PN25	9.00				25	0.00144°	9	18	0~120		490	640
Ezi-SERVO-PR-MI-42XL-■-PN40	9.00				40	0.0009°	9	18	0~75		570	640
Ezi-SERVO-PR-MI-42XL-■-PN50	9.00				50	0.00072°	9	18	0~60		620	640

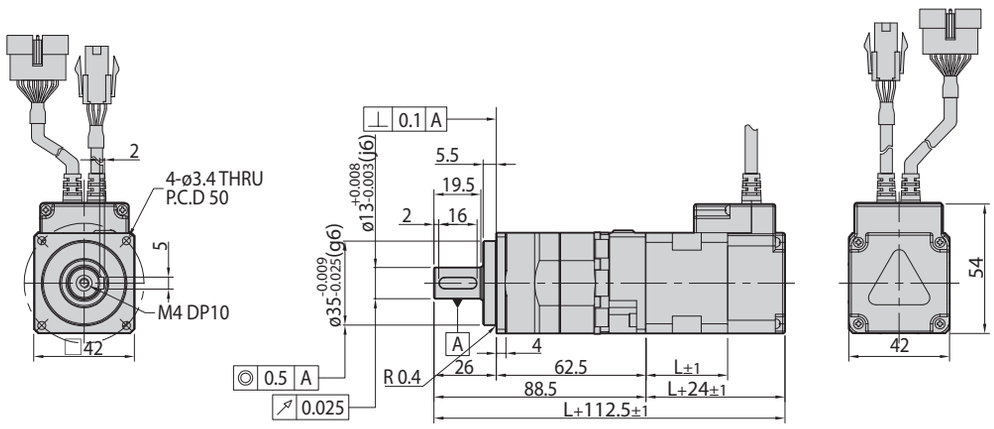
* The code of encoder resolution will be marked in "■"

● Dimensions of Motor with Gearbox [mm]

42mm

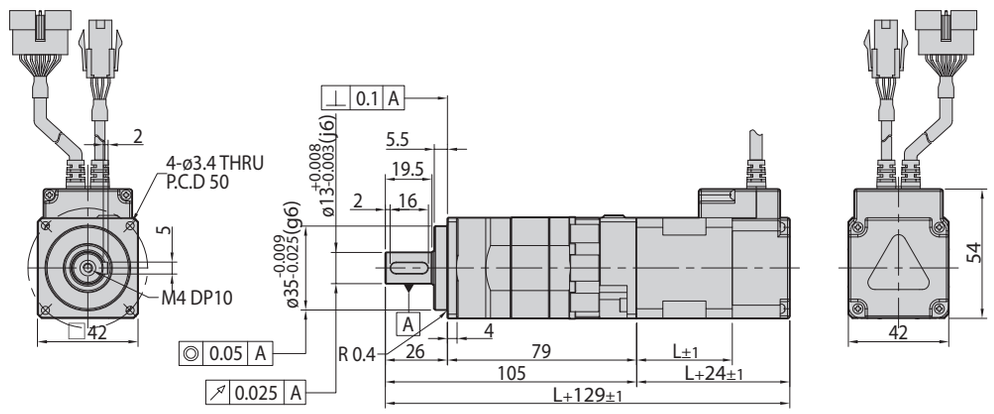
Unit Part Number	Motor	Stage	□Gear Ratio	L [mm]
Ezi-SERVO-PR-MI-42S-■-PN□	EzM-42S-■-PN□	Single Stage	3, 5, 8, 10	34
Ezi-SERVO-PR-MI-42M-■-PN□	EzM-42M-■-PN□		3, 5, 8, 10	40
Ezi-SERVO-PR-MI-42L-■-PN□	EzM-42L-■-PN□		3, 5, 8, 10	48
Ezi-SERVO-PR-MI-42XL-■-PN□	EzM-42XL-■-PN□		3, 5, 8, 10	60

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

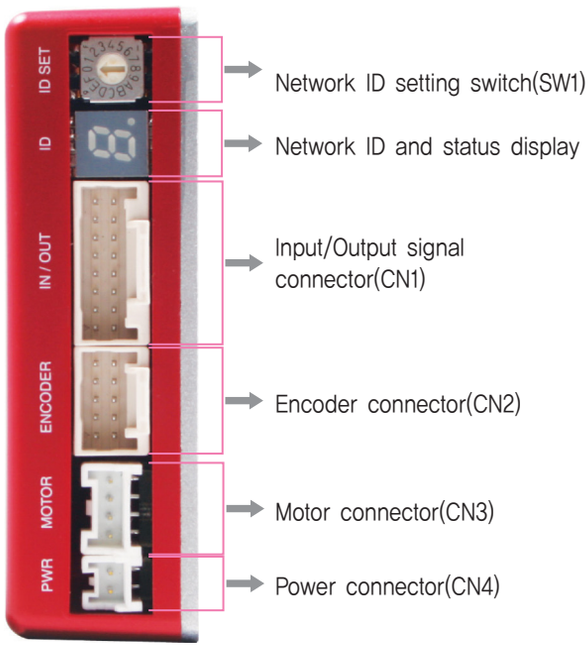


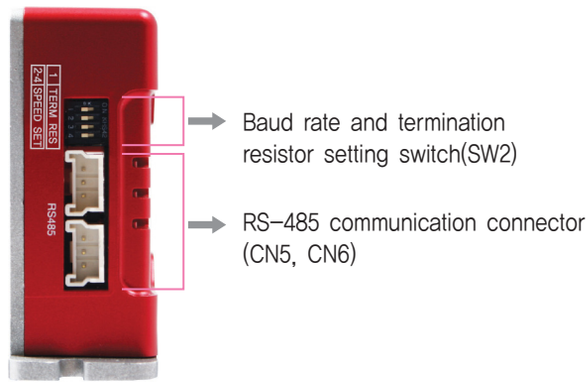
Unit Part Number	Motor	Stage	□Gear Ratio	L [mm]
Ezi-SERVO-PR-MI-42S-■-PN□	EzM-42S-■-PN□	Double Stage	15, 25, 40, 50	34
Ezi-SERVO-PR-MI-42M-■-PN□	EzM-42M-■-PN□		15, 25, 40, 50	40
Ezi-SERVO-PR-MI-42L-■-PN□	EzM-42L-■-PN□		15, 25, 40, 50	48
Ezi-SERVO-PR-MI-42XL-■-PN□	EzM-42XL-■-PN□		15, 25, 40, 50	60

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



Settings and Operation





1. List of error types by the number of 7-segment LED display blinking

No.	Error Type	Causes
1	Over Current Error	The current through power devices in drive exceeds the limit.*1
2	Over Speed Error	The motor speed exceeds 3,000r/min.
3	Position Tracking Error	Position error value is greater than the reference value while the motor is running.*2
4	Over Load Error	The motor is continuously operated more than 5 seconds under a load exceeding the max. torque.
5	Over Temperature Error	Internal temperature of the drive exceeds 85℃.
6	Over Regenerative Voltage Error	Back-EMF is higher than limit value.*3
7	Motor Connect Error	There is a problem with the connection between the drive and the motor.
8	Encoder Connect Error	There is a problem with the connection between the drive and the encoder.
10	In-Position Error	After operation is finished, position error larger than 1 pulse is continued for more than 3 seconds.
11	System Error	There is a problem in the drive system (Watchdog Timer Out)
12	ROM Error	Error occurs in parameter storage device(ROM).
15	Position Overflow Error	Position error value is greater than the reference value while the motor is stopped*2

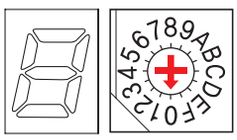
*1 : Limit value depends on motor model. (Refer to the Manual)
*2 : The default reference value is 180 ˚, and it can be changed by parameter. (Refer to the Manual)
*3 : Voltage limit of Back-EMF depends on motor model. (Refer to the Manual)
※ Please refer to user Manual for the details of protection functions.



Display flash
(e.g., Position tracking error)

2. Network ID Setting Switch(SW1)

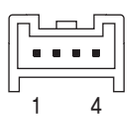
Value	ID No.	Value	ID No.
0	0	8	8
1	1	9	9
2	2	A	10
3	3	B	11
4	4	C	12
5	5	D	13
6	6	E	14
7	7	F	15



※ ID No. is displayed on 7-segment LED display
※ Up to 16 axis can be operated with one network.

3. Motor Connector(CN3)

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



3. Baud Rate and Termination Resistor Setting Switch(SW2)

Termination Resistor Setting Switch(SW2.1)

When using multiple drives, set a termination resistor for the drive installed at the end of the network for stable operation.

· SW2.1 ON: Termination resistor is set

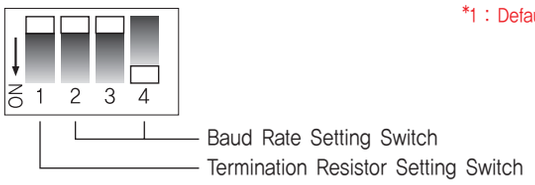
· SW2.1 OFF: Termination resistor is not set

Baud Rate Setting Switch(SW2.2~SW2.4)

Baud rate is set by SW2.2~SW2.4 as follows.

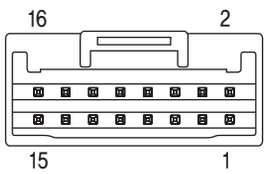
SW2.1	SW2.2	SW2.3	SW2.4	Baud Rate [bps]
–	OFF	OFF	OFF	9,600
–	ON	OFF	OFF	19,200
–	OFF	ON	OFF	38,400
–	ON	ON	OFF	57,600
–	OFF	OFF	ON	115,200*1
–	ON	OFF	ON	230,400
–	OFF	ON	ON	460,800
–	ON	ON	ON	921,600

*1 : Default Value



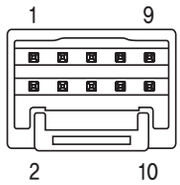
5. Input/Output Signal Connector(CN1)

No.	Function	I/O
1	EXT_DC24V	Input
2	EXT_GND	Input
3	BRAKE+	Output
4	BRAKE–	Output
5	LIMIT+	Input
6	LIMIT–	Input
7	ORIGIN	Input
8	Digital In1	Input
9	Digital In2	Input
10	Digital In3	Input
11	Digital In4	Input
12	Digital In5	Input
13	Digital In6	Input
14	Digital In7	Input
15	Compare Out	Output
16	Digital Out1	Output



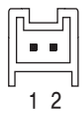
6. Encoder Connector(CN2)

No.	Function	I/O
1	A+	Input
2	A–	Input
3	B+	Input
4	B–	Input
5	Z+	Input
6	Z–	Input
7	DC5V	Output
8	GND	Output
9	F.GND	-----
10	F.GND	-----



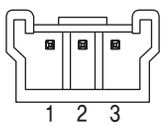
7. Power Connector(CN4)

No.	Function	I/O
1	DC24V	Input
2	GND	Input

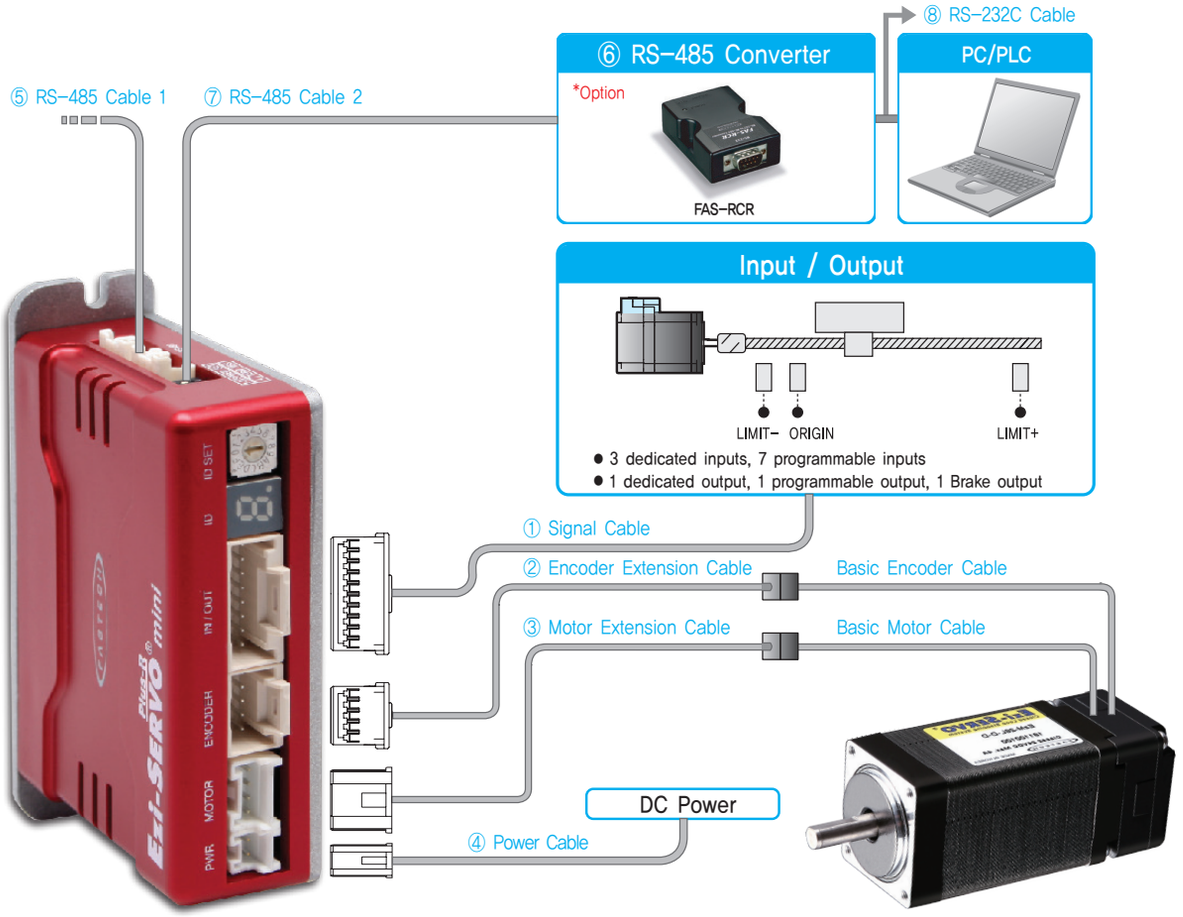


8. RS-485 Communication Connector(CN5, CN6)

No.	Function
1	Data+
2	Data–
3	GND



System Configuration



Cable Type	Max. Length	Remarks
① Signal Cable	20m	Options (Sold separately)
② Encoder Extension Cable	20m	
③ Motor Extension Cable	20m	
④ Power Cable	2m	
⑤ RS-485 Cable 1	30m	
⑦ RS-485 Cable 2	30m	
Basic Encoder Cable	0.3m (Basic length)	Basic cables are attached to motors.
Basic Motor Cable	0.3m (Basic length)	

1. Accessories

Connectors

These are connector specifications for drive cabling.

Purpose		Item	Part Number	Manufacturer
RS-485 (CN5, CN6)		Housing	35507-0300	MOLEX
		Terminal	50212-8100	
Power (CN4)		Housing	PAP-02V-S	JST
		Terminal	SPHD-001T-P0.5	
Motor	Drive Side (CN3)	Housing	PAP-04V-S	JST
		Terminal	SPHD-001T-P0.5	
	Motor Side	Housing	5557-04R	MOLEX
		Terminal	5556T	
Encoder	Drive Side (CN2)	Housing	501646-1000	MOLEX
		Terminal	501648-1000(AWG 26~28)	
	Encoder Side	Housing	SMP-09V-NC	JST
		Terminal	SHF-001T-0.8BS	
Signal (CN1)		Housing	501646-1600	MOLEX
		Terminal	501648-1000(AWG 26~28)	

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

2. Options

① Signal Cable

These are the cables to connect Ezi-SERVO Plus-R MINI drive and other input/output devices.

Purpose	Part Number	Length [m]	Cable Type	Remarks
Drive – I/O Device Connection	CSVA-S-001F	1	Normal Cable	Maximum Length: 20m
	CSVA-S-002F	2		
	CSVA-S-003F	3		
	CSVA-S-005F	5		
	CSVA-S-001M	1	Robot Cable	
	CSVA-S-002M	2		
	CSVA-S-003M	3		
	CSVA-S-005M	5		

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

② Encoder Extension Cable

These are the cables to connect Ezi-SERVO Plus-R MINI drive and the encoder.

Purpose	Part Number	Length [m]	Cable Type	Remarks
Drive – Basic Encoder Cable Connection	CSVI-E-001F	1	Normal Cable	Maximum Length: 20m
	CSVI-E-002F	2		
	CSVI-E-003F	3		
	CSVI-E-005F	5		
	CSVI-E-001M	1	Robot Cable	
	CSVI-E-002M	2		
	CSVI-E-003M	3		
	CSVI-E-005M	5		

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

③ Motor Extension Cable

These are the cables to connect Ezi-SERVO Plus-R MINI drive and the motor.

Purpose	Part Number	Length [m]	Cable Type	Remarks
Drive – Basic Motor Cable Connection	CMNB-M-001F	1	Normal Cable	Maximum Length: 20m
	CMNB-M-002F	2		
	CMNB-M-003F	3		
	CMNB-M-005F	5		
	CMNB-M-001M	1	Robot Cable	
	CMNB-M-002M	2		
	CMNB-M-003M	3		
	CMNB-M-005M	5		

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

④ Drive Power Cable

These are the cables to connect Ezi-SERVO Plus-R MINI drive and the power.

Purpose	Part Number	Length [m]	Cable Type	Remarks
Drive – Power Connection	CMNB-P-001F	1	Normal Cable	Maximum Length: 2m
	CMNB-P-002F	2		
	CMNB-P-001M	1	Robot Cable	
	CMNB-P-002M	2		

⑤ RS-485 Cable 1

These are the cables to connect Ezi-SERVO Plus-R MINI with RS-485 network.

Purpose	Part Number	Length [m]	Cable Type
RS-485 Connection	CGNB-R-0R6F	0.6	Normal Cable
	CGNB-R-001F	1	
	CGNB-R-1R5F	1.5	
	CGNB-R-002F	2	
	CGNB-R-003F	3	
	CGNB-R-005F	5	

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

⑥ RS-485 Converter

Purpose	Part Number	Specifications		Product Image
RS-232C to RS-485 Converter	FAS-RCR	Baud Rate	Max. 115.2kbps	
		Comm. Distance	RS-232C: Max. 15m RS-485: Max. 1.2km	
		Connector	RS-232C: DB9 Female RS-485: RJ-45	
		Dimensions	50X75X23mm	
		Weight	38g	
		Power	Power supplied by RS-232C (DC5~24V external power can be applied)	

⑦ RS-485 Cable 2

These are the cables to connect Ezi-SERVO Plus-R MINI drive and FAS-RCR.

Purpose	Part Number	Length [m]	Cable Type
RS-485 Connection	CGNA-R-0R6F	0.6	Normal Cable
	CGNA-R-001F	1	
	CGNA-R-1R5F	1.5	
	CGNA-R-002F	2	
	CGNA-R-003F	3	
	CGNA-R-005F	5	

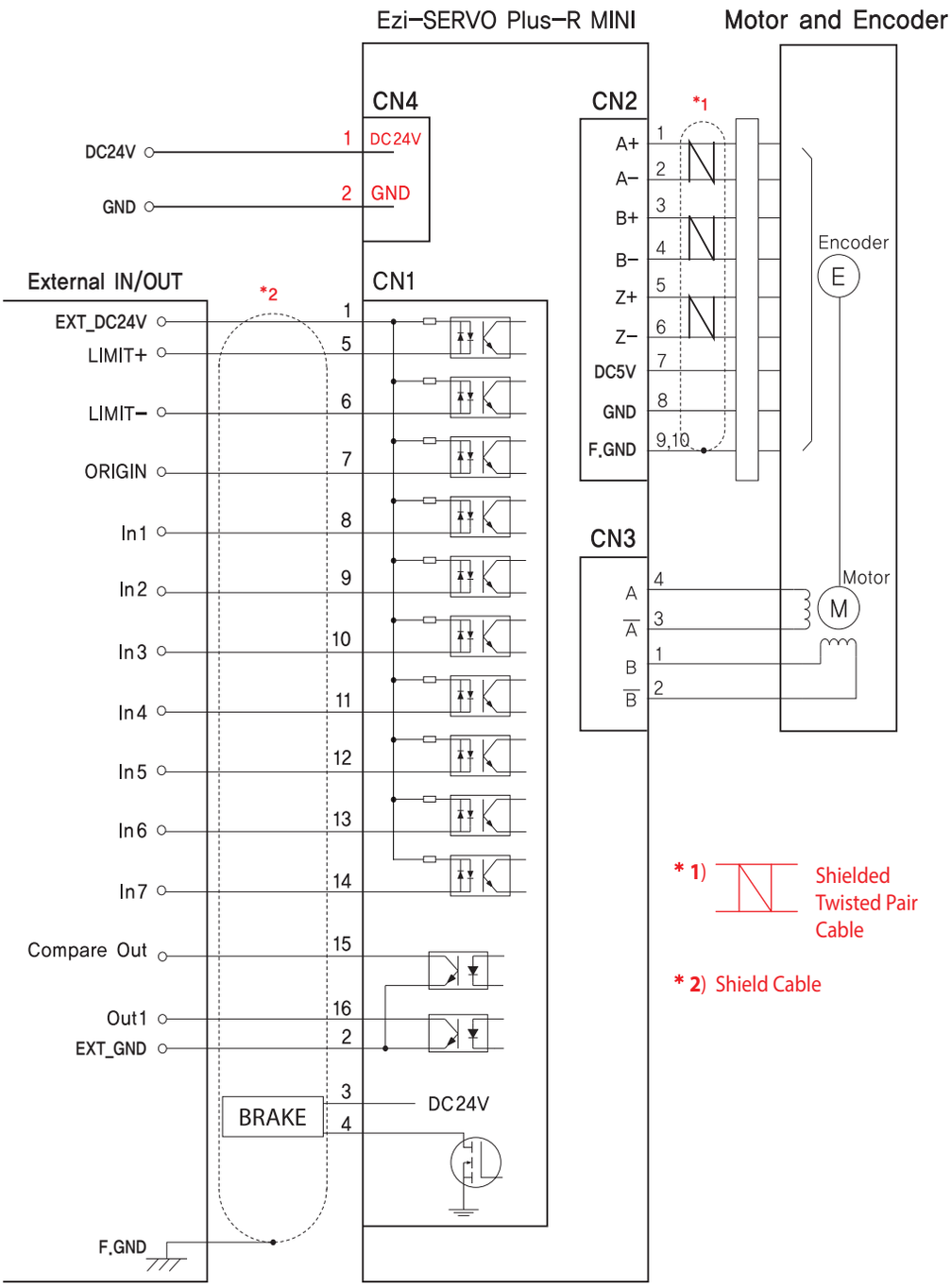
* If you need cables with length(in units of 1m) not listed on the table, please contact FASTECH for more information.

⑧ RS-232C Cable

These are the cables to connect FAS-RCR and RS-232C port of the host controller.

Purpose	Part Number	Length [m]	Cable Type
FAS-RCR – RS-232C Connection	CGNR-C-002F	2	Normal Cable
	CGNR-C-003F	3	
	CGNR-C-005F	5	

External Wiring Diagram



* 1) Shielded Twisted Pair Cable

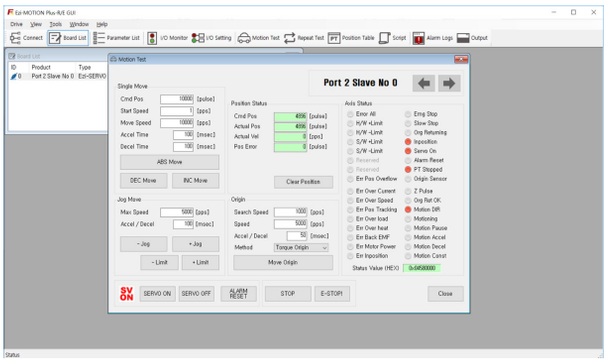
* 2) Shield Cable

※ When connecting I/O cable between controller and drive, please turn off the power of both controller and drive to prevent electric shock or to protect the drive from any damage.

CAUTION

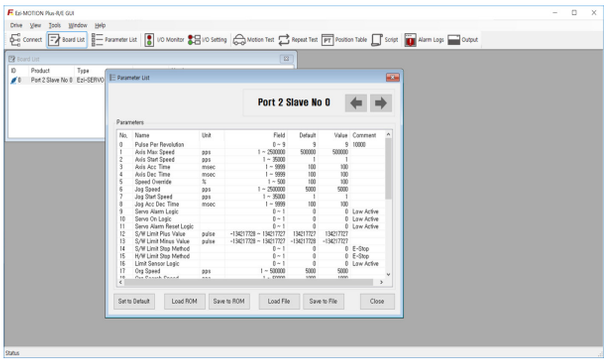
In order to use the products listed in this catalog safely and correctly, be sure to read the instruction manual before using the product.

● GUI(Graphic User Interface) Program



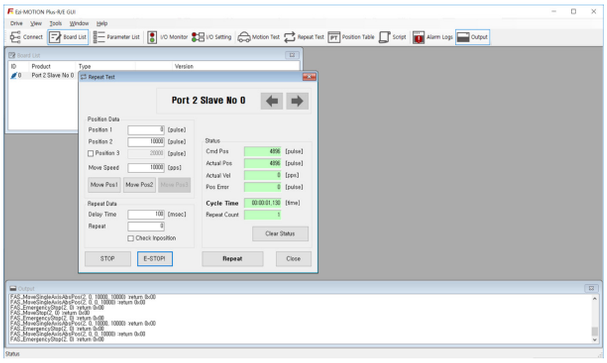
◆ Product List and Motion Test

The product list shows the products connected to the host controller. You can test single position movements, jog movements, and origin search operations, and monitor the operation status on the motion test window.



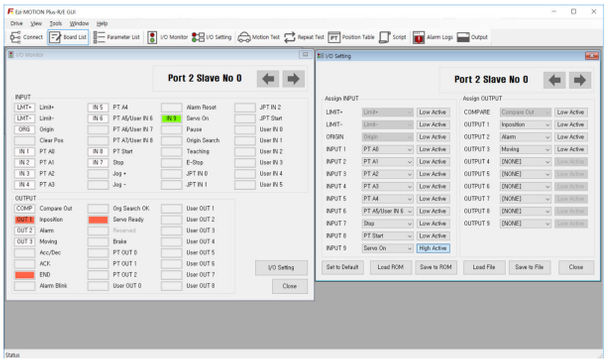
◆ Parameter List

All of the parameters are displayed and modified on this screen.



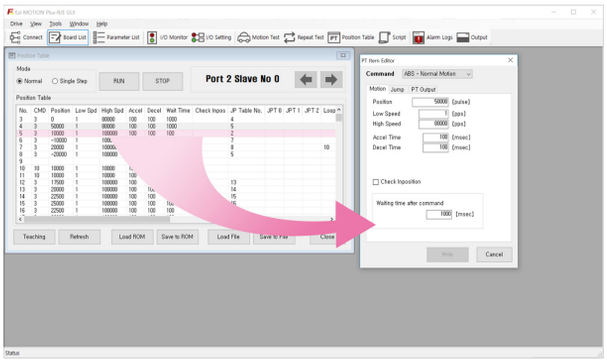
◆ Motion Repeat and Status Monitoring

You can set the target position value, speed, delay time and number of repetitions for repeated motion test. A motion library(API) is also displayed on the screen.



◆ I/O Monitoring and Setting

You can check the status of input/output signals related to the current operation status, and you can assign the signals to the desired input/output channels.



◆ Position Table

You can configure the data for the position table function or drive the motor with the position table. The position table is a function that allows you to easily operate the motor with motion data stored in memory in advance.

※ GUI Program(Ezi-MOTIONLINK Plus-R) can be downloaded from website. (www.fastech-motions.com)
※ GUI Program(Ezi-MOTIONLINK Plus-R) supports Windows 7/8/10.
※ GUI Program(Ezi-MOTIONLINK Plus-R) is subject to change without prior notice for performance improvement.

MEMO

MEMO

FASTECH

Fast, Accurate, Smooth Motion

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