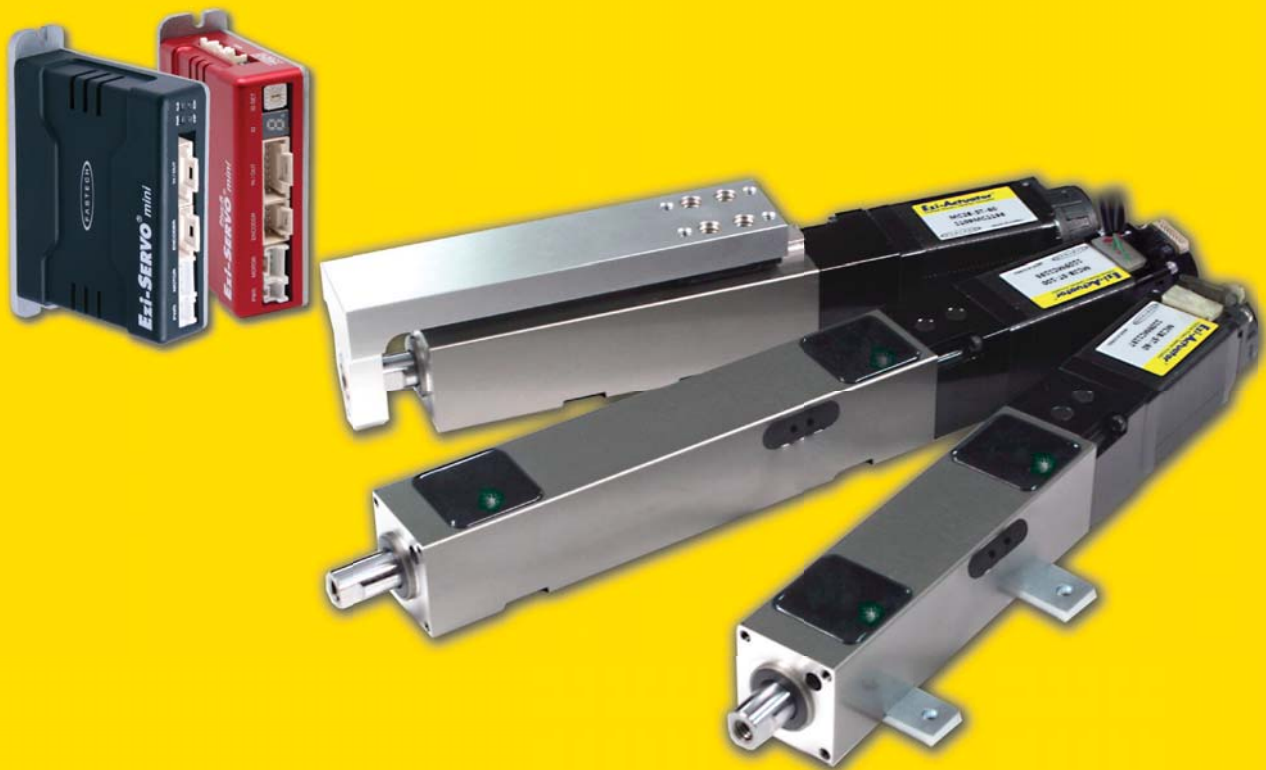


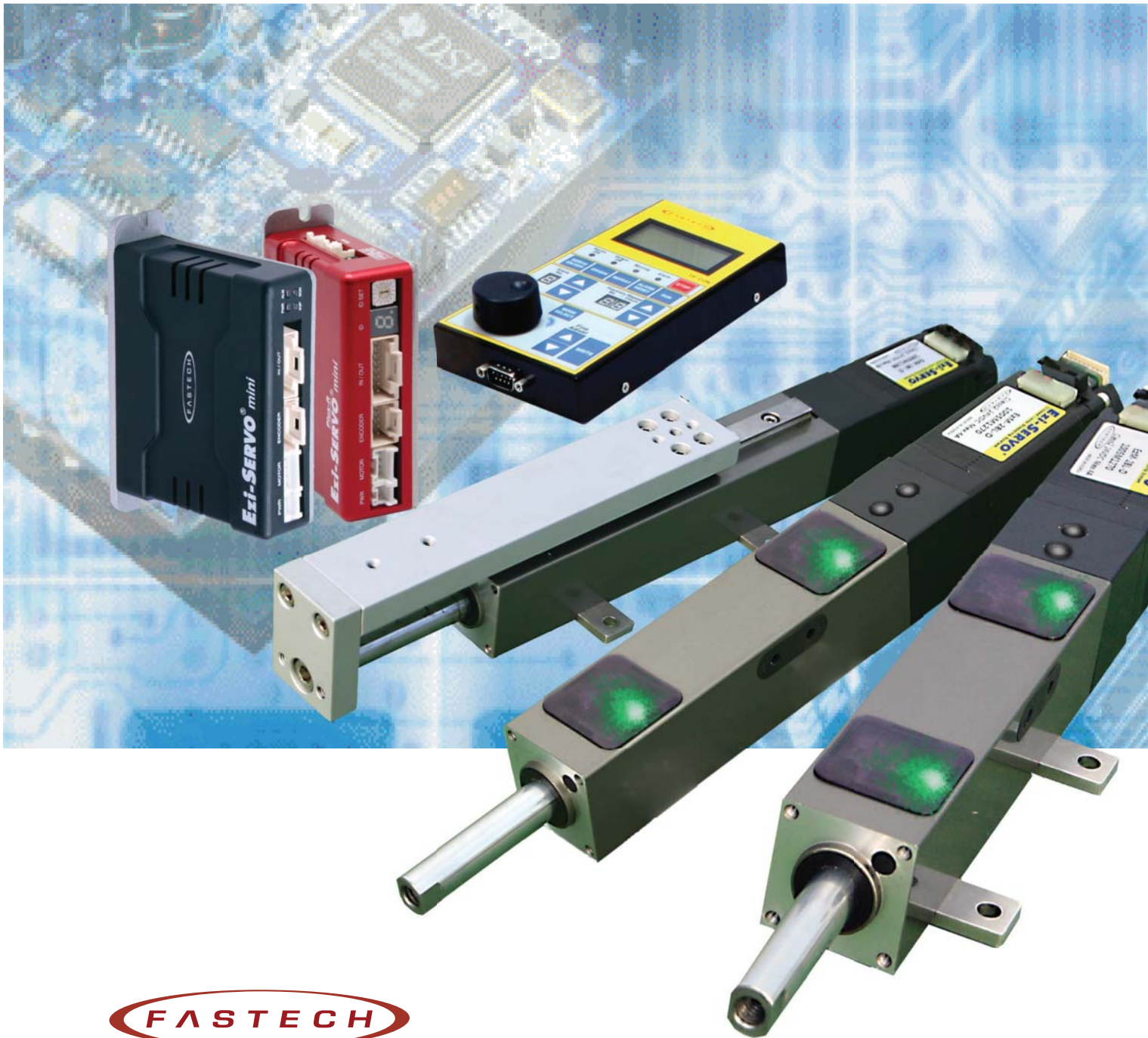
Ezi-Robo[®]

Electric Mini Cylinder Actuator

- High Rigidity
- High Accuracy
- High Speed
- Force Control
- Easy to Use

MC





Ezi-Robo[®] MC

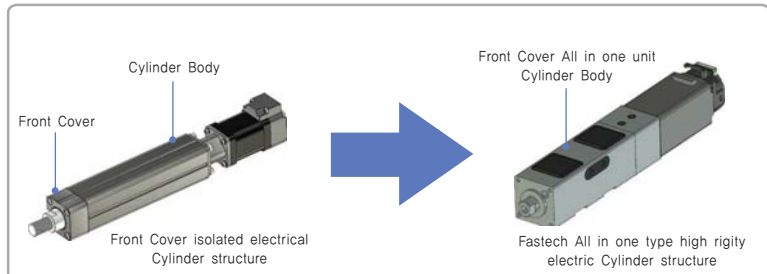
Electric Mini Cylinder Actuator

Ezi-Robo MC Series is High performance of Electric Cylinder Actuator adopts High precision of Mini Cylinder equipped with high precision of lead screw and Ezi-SERVO is high speed, high resolution of closed loop stepping system.



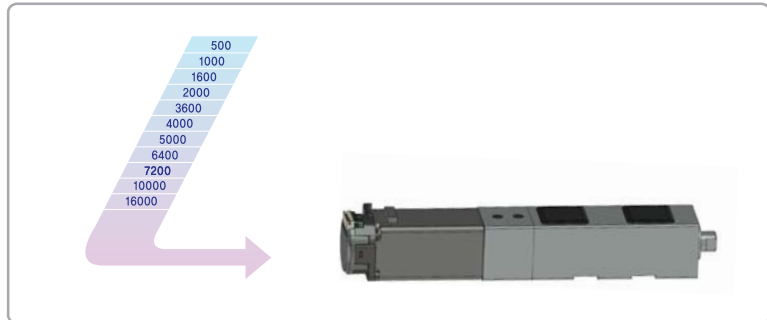
High Rigidity

Cylinder body and Cylinder front are integrated to maximize the rigidity and the material Body composed of composite materials has been promoting the improvement of the durability.



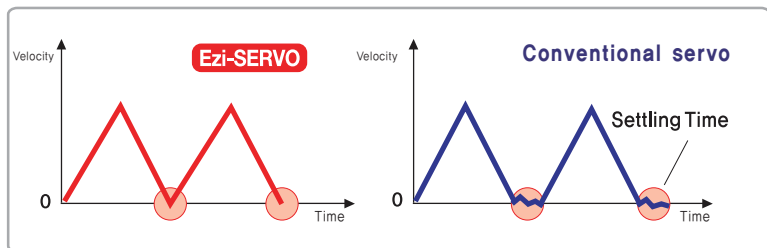
High Accuracy

Long life, low noise and durability proven by employing C7 Level lead screw with high precision to ensure smooth high-Speed operation. In addition, it enables high-precision position control guarantees $\pm 0.01\text{mm}$ repeatability by high resolution position sensors (up to 16000ppr) mounted on a stepper motor drive.



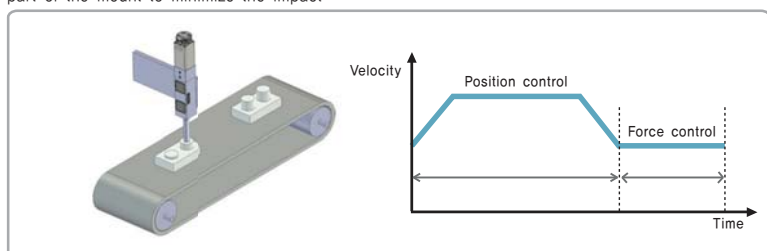
High Speed & Response

Electric Cylinder equipped with minimal friction of lead screw and Ezi-SERVO, High precision of closed loop stepping control system can greatly reduce positioning time for large inertia of lead



Force Control Function

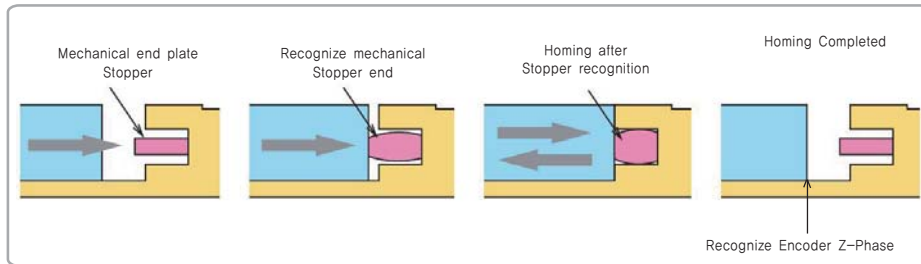
By holding a constant force and keep pressing Rod onto a Work as same as Air Cylinder and pressing power can be set freely by parameter, in other words, Fastech Electric Mini Cylinder offers powerful and convenient force control without an external sensor. Also the position control to force control switching, power control can be converted to the position control and position control mode for the conversion of the control algorithm to minimize changes to the mechanical part of the mount to minimize the impact



Feature

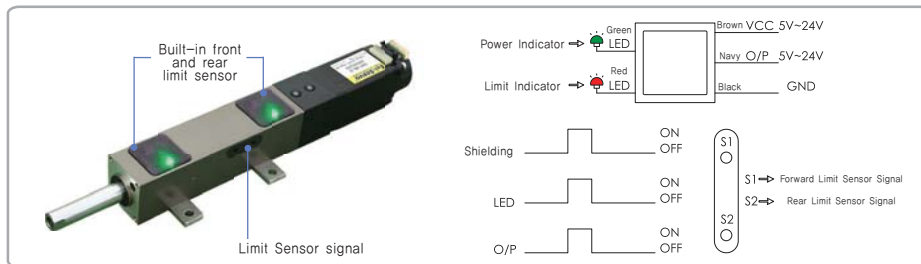
Torque Origin Function

Homing Sensorless parts of the bodies ended after detecting contact with the encoder on the Z-based homing is possible. Therefore, the mechanism of the aging Stopper mounted on the end, regardless of the origin return speed, Always reliable



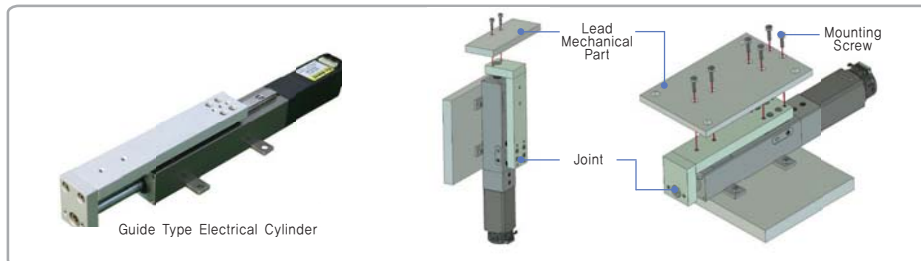
Torque Origin Function

Frequently required in the electric Cylinder to simplify the operation, homing Limit Sensor Set incorporated. All parts necessary for the origin output equipped in this package so it reduces the effort to install origin sensor in the design, manufacture and procurement.



High Rigidity LM Guide Application (Limited to Guided Type)

In case of a Guide Type, by applying a wider rigidity LM Guide, MC serie maximizes payload mass and the moment and load mechanical parts can be directly installed at joint's front and upper unit.

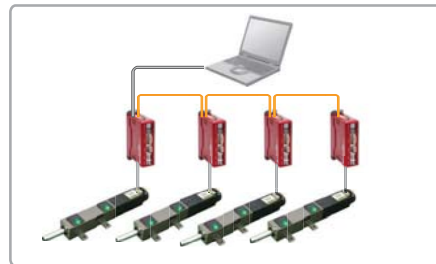


High Performance, Multi-Functional Drive and Controller



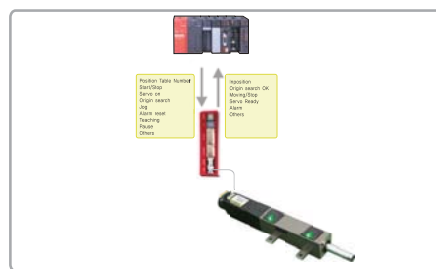
By adopting high performance of closed loop stepping drive, Ezi-SERVO, it is possible to use pulse input drive and controller embedded drive.

 Network Based Multi-Axes Controller



A maximum of 16 axis can be operated from a PC through RS-485 communications. All of the motion conditions are set through the network and saved in Flash ROM as a parameter. Motion Librart(DLL) is provided for programming under windows 2000/XP.

 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 PLC. The PLC can monitor the In-Position, origin search, moving/stop, servo ready and other digital output signals from a drive. A Maximum of 256 positioning points can be set from PLC.

 Various Input/Output Signals and User-Defined Functions

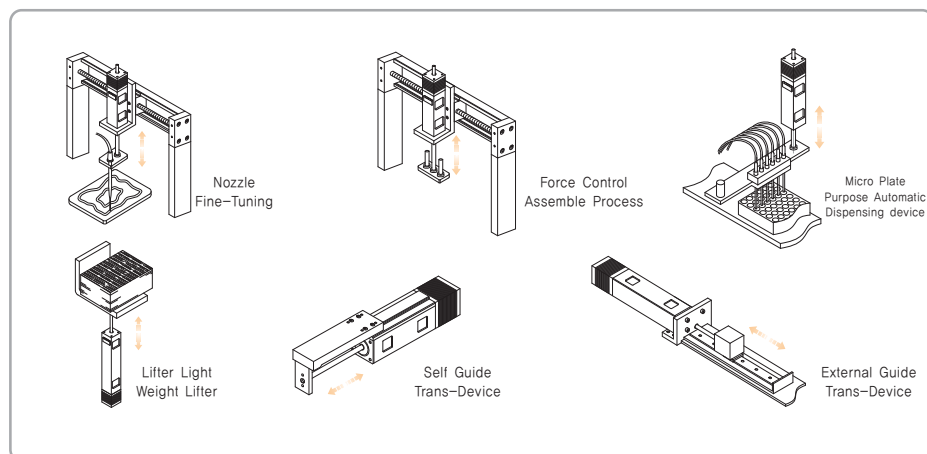
Input 7 Point/Output 1 Point signal can be defined according to user's requirements. Therefore, various features can be used without changing of Input/Output wiring.

 Easy-to use Teaching Pendant



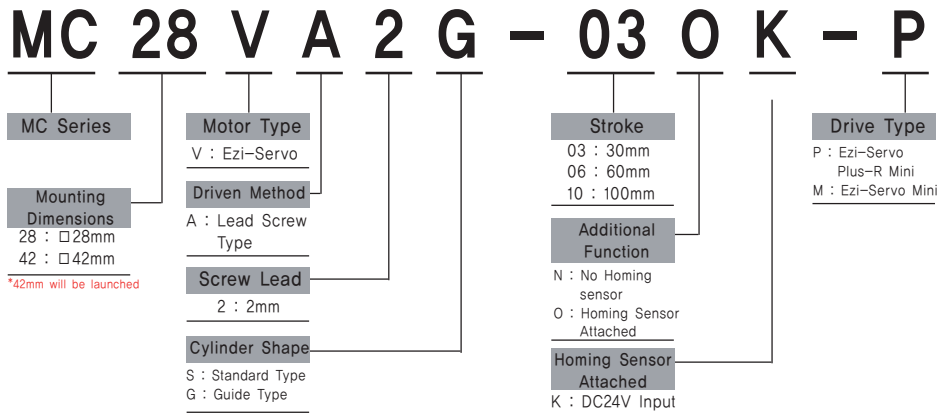
Using the teaching pendant only, where the loacation of a table of data creation and dediting of the program, run, jog function, parameter editing and montioring functions can be Performed.

 Application Example of Ezi-Robo MC Series


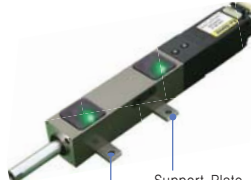



Number /Specifications and Outline

Ezi-Robo MC Part Number



Ezi-Robo MC Series Line-up

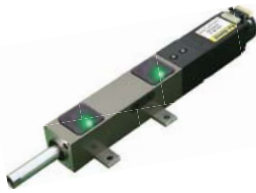
Division	MC28					
Mounting Dimensions	28mm					
Driven Method	Lead Screw					
Cylinder Shape	Standard Type			Guide Type		
	Vertical Type		Horizontal Type			
						
	Support Plate Elimination		Support Plate Installation		Support Plate Installation	
Additional Functions	No Homing Sensor	Built-in Homing Sensor	No Homing Sensor	Built-in Homing Sensor	No Homing Sensor	Built-in Homing Sensor

*Support Plate is provided as free of charge so in case of standard vertical type, please remove support plate.

Ezi-Robo MC Series Type

Mounting Dimensions [mm]	Driven Method	Drive type	Shape	Additional Functions	
				No Homing Sensor	Built-in Homing Sensor
				Number	Number
□28	Lead Screw	Ezi-Servo Plus-R Mini	Standard Type	MC-28VA2S-03NK-P	MC-28VA2S-03OK-P
				MC-28VA2S-06NK-P	MC-28VA2S-06OK-P
			Guide Type	MC-28VA2S-10NK-P	MC-28VA2S-10OK-P
				MC-28VA2G-06NK-P	MC-28VA2G-06OK-P
		Ezi-Servo Mini	Standard Type	MC-28VA2S-10NK-P	MC-28VA2G-10OK-P
				MC-28VA2S-03NK-M	MC-28VA2S-03OK-M
			Guide Type	MC-28VA2S-06NK-M	MC-28VA2S-06OK-M
				MC-28VA2S-10NK-M	MC-28VA2S-10OK-M
			MC-28VA2G-06NK-M	MC-28VA2G-06OK-M	
			MC-28VA2G-10NK-M	MC-28VA2G-10OK-M	

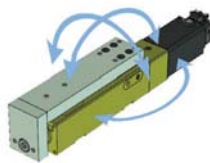
 MC28 Standard Type Specifications



Part Number	MC-28VA2S-03NK-P MC-28VA2S-06NK-P MC-28VA2S-10NK-P MC-28VA2S-03OK-P MC-28VA2S-06OK-P MC-28VA2S-10OK-P		MC-28VA2S-03NK-M MC-28VA2S-06NK-M MC-28VA2S-10NK-M MC-28VA2S-03OK-M MC-28VA2S-06OK-M MC-28VA2S-10OK-M	
	Division			
Driven Method	-			
	Lead Screw			
Max. Acceleration	m/s ²		0,2	
Max. Velocity	mm/s		12	24
Vertical direction of Max. payload mass	Kg		4	3
Max. Thrust Force	N		40	30
Max. Holding Power	N		65	
Positioning Repeatability	mm		±0,01	
Lost Motion	mm		0,1	
Lead	mm		2	
Resolution (16000ppr)	μ m		0,125	
Stroke	mm		03 : 30	06 : 60 10 : 100
Weight	Kg		03 : 0,36 06 : 0,43 10 : 0,51	03 : 0,36 06 : 0,43 10 : 0,51

- * Max. Velocity : Highest Speed can be driven with attachment of variable mass.
- * Vertical direction of Max. payload mass : Max. Load can be driven vertically under rated velocity.
- * Max. Thrust Force : Maximum force of the pushing during constant speed without load on the moving parts.
- * Max. Holding Power : Max. Power Actuator can withstand as stopping status after power input.

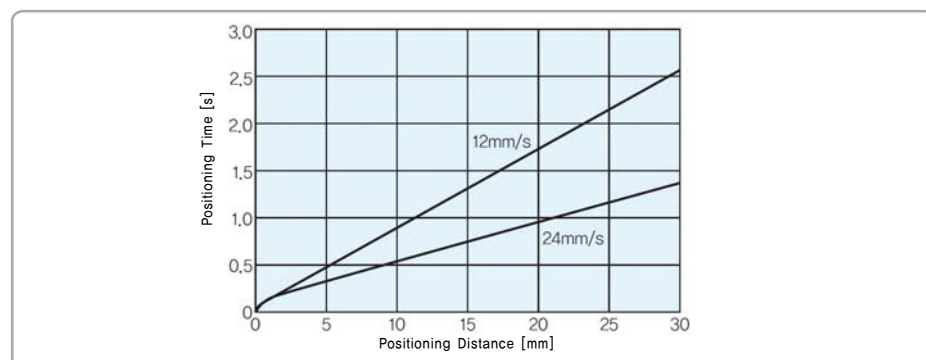
 MC28 Guided Type Specifications



Part Number	MC-28VA2G-06NK-P MC-28VA2G-10NK-P MC-28VA2G-06OK-P MC-28VA2G-10OK-P			MC-28VA2G-06NK-M MC-28VA2G-10NK-M MC-28VA2G-06OK-M MC-28VA2G-10OK-M					
	Division								
driven Method	-								
	Lead Screw								
Max. Acceleration	m/s ²			0,2					
Max. Velocity	mm/s			12	24	12	24		
Vertical direction of Max. payload mass	Kg			4	3	4	3		
Max. payload Mass for Horizontal Direction	Kg			3	3	3	3		
Max. Thrust Force	N			40	30	40	30		
Max. Holding Power	N			75					
Max. Load Moment	N · m			Mp : 0,4	My : 0,25	Mr : 1,5	Mp : 0,4	My : 0,25	Mr : 1,5
Positioning Repeatability	mm			±0,01					
Lost Motion	mm			0,1					
Lead	mm			2					
Resolution (16000ppr)	μ m			0,125					
Stroke	mm			06 : 60	10 : 100	06 : 60	10 : 100		
Weight	Kg			06 : 0,66	10 : 0,83	06 : 0,66	10 : 0,83		

- * Max. Velocity : Highest Speed can be driven with attachment of variable mass.
- * Vertical direction of Max. payload mass : Max. Load can be driven vertically under rated velocity.
- * Max. Thrust Force : Maximum force of the pushing during constant speed without load on the moving parts.
- * Max. Holding Power : Max. Power Actuator can withstand as stopping status after power input.

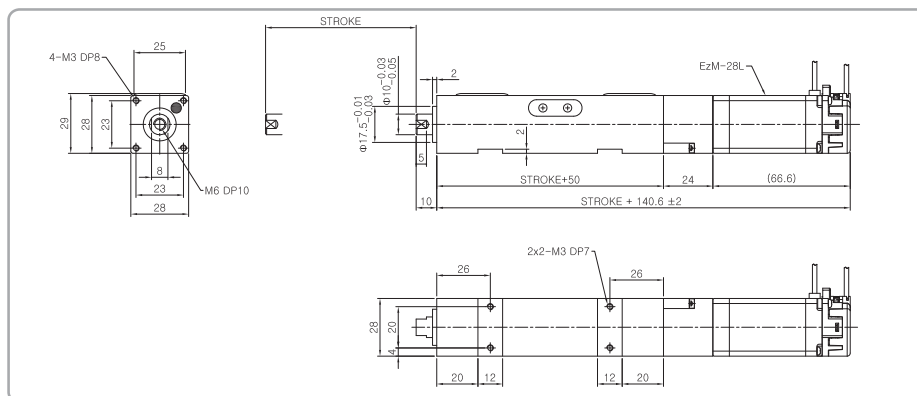
 Type Positioning Distance-Positioning Time (Guide Type is Same)



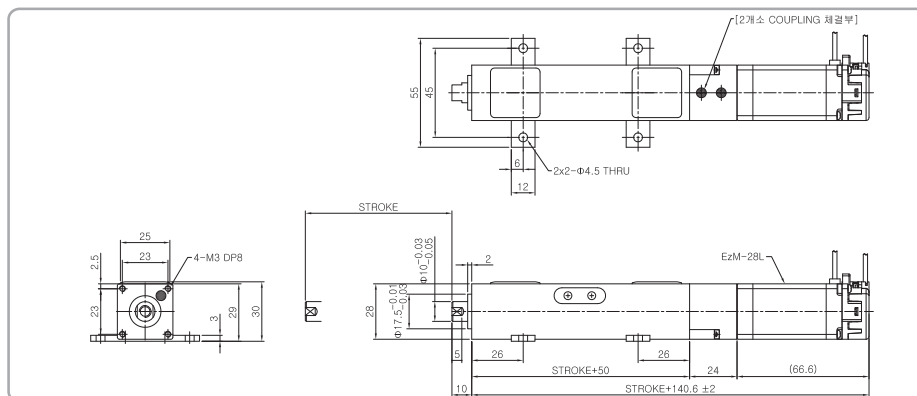
Specifications and Outline

MC Series Outline (mm)

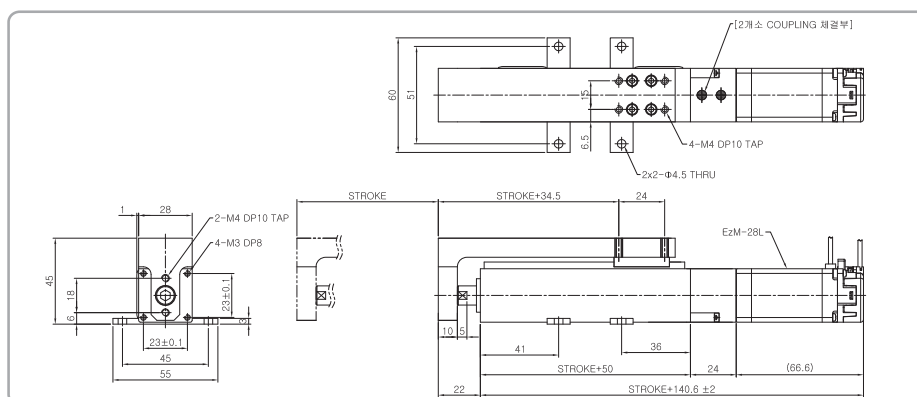
■MC28 Standard Vertical Type



■MC28 Standard Horizontal Type



■MC28 Guide Type



*1 : if drives beyond the stipulated Maximum stroke, ball can be broken away from LM block so please be careful to use

 Pulse Input Drive and Motor Combination

Pulse Input Drive and Motor Combination		Motor Model Number	Drive Model Number
Standard Type	MC-28VA2S-03NK-P MC-28VA2S-06NK-P MC-28VA2S-10NK-P MC-28VA2S-03OK-P MC-28VA2S-06OK-P MC-28VA2S-10OK-P	EzM-28L-D	EzS-PD-MI-28L-D
Guide Type	MC-28VA2G-06NK-M MC-28VA2G-10NK-M MC-28VA2G-06OK-M MC-28VA2G-10OK-M	EzM-28L-D	EzS-PD-MI-28L-D


 Controller Embedded Drive and Motor Combination

Pulse Input Drive and Motor Combination		Motor Model Number	Drive Model Number
Standard Type	MC-28VA2S-03NK-P MC-28VA2S-06NK-P MC-28VA2S-10NK-P MC-28VA2S-03OK-P MC-28VA2S-06OK-P MC-28VA2S-10OK-P	EzM-28L-D	EzS-NDR-MI-28L-D
Guide Type	MC-28VA2G-06NK-P MC-28VA2G-10NK-P MC-28VA2G-06OK-P MC-28VA2G-10OK-P	EzM-28L-D	EzS-NDR-MI-28L-D

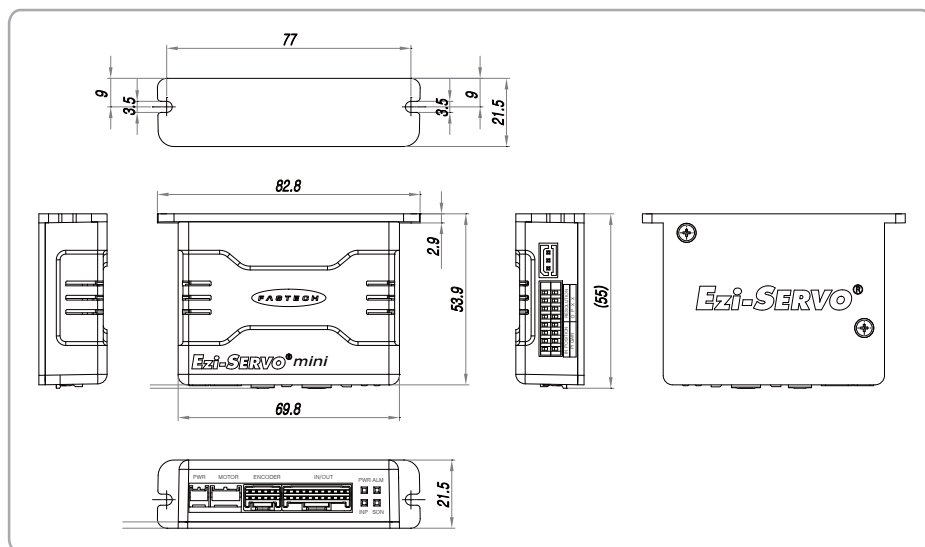


Pulse Input Drive

Pulse Input Drive and Motor Combination

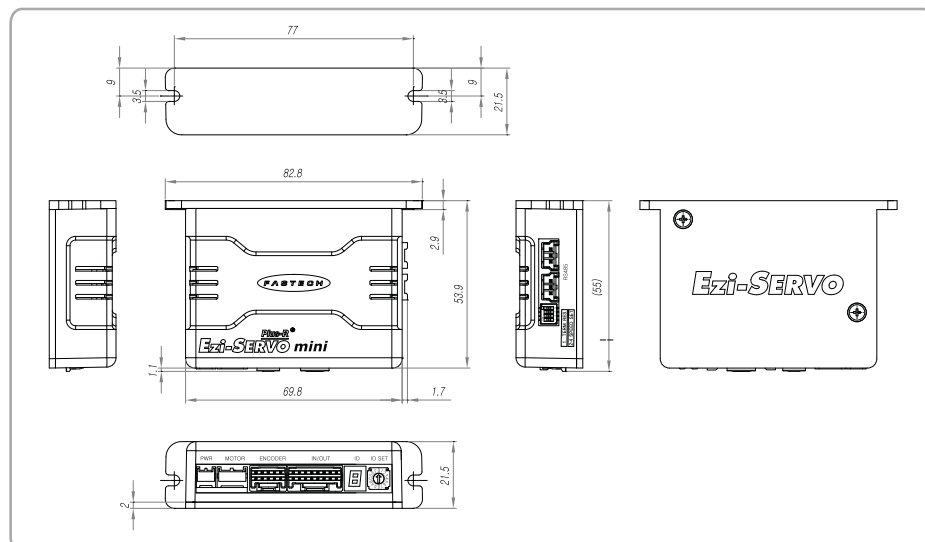
Motor Model	EzM-28 series	
Driver Model	EzS-PD-MI-28 series	
Input Voltage	24VDC±10%	
Control Method	Closed loop control with 32bit DSP	
Current Consumption	Max 500mA (Except motor current)	
Operating Condition	Ambient Temperature	In Use : 0~50°C In Storage : -20~70°C
	Humidity	In Use : 35~85% (Non-Condensing) In Storage : 10~90% (Non-Condensing)
	Vib. Resist.	0,5G
Function	Rotation Speed	0~3,000rpm
	Resolution(P/R)	16,000/Rev. Encoder model : 500 1,000 1,600 2,000 3,600 5,000 6,400 7,200 10,000 16,000
	Max. Input Pulse Frequency	500KHz (Duty 50%)
	Protection Functions	Over current, Over speed, Position tracking error, Over load, Over temperature, Over regenerated voltage, Motor connect error, Encoder connect error, Motor voltage error, In-Position error, System error, ROM error, Position overflow error
	LED Display	Power status, Alarm status, In-Position status, Servo On status
	In-Position Selection	0~F (Selectable with DIP switch)
	Position Gain Selection	0~F (Selectable with DIP switch)
	Pulse Input Method	1-Pulse / 2-Pulse (Selectable with DIP switch)
	Rotational Direction	CW / CCW (Selectable with DIP switch)
	Speed/Position Control Command	Pulse train input
I/O Signal	Input Signals	Position command pulse, Servo On/Off, Alarm reset (Photocoupler input)
	Output Signals	In-Position, Alarm (Photocoupler output) Encoder signal (A+, A-, B+, B-, Z+, Z-, 26C31 of Equivalent) (Line Driver output)

Pulse Input Drive Size[mm]



 Pulse Input Drive and Motor Combination

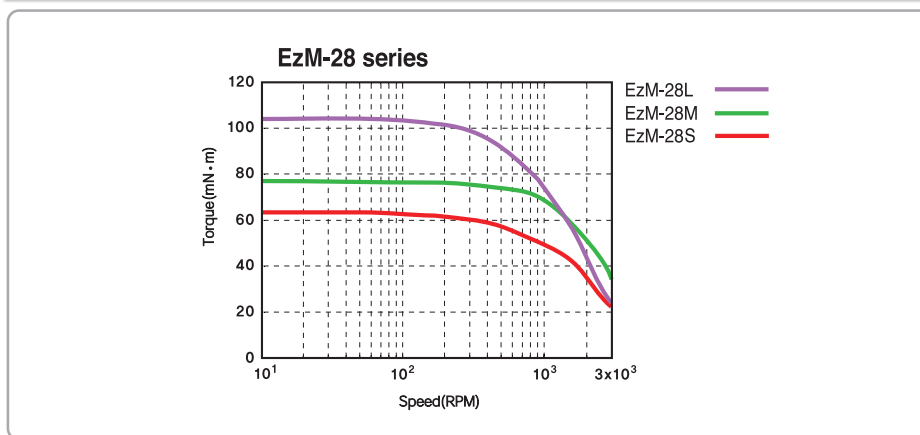
Motor Model	EzM-28 series	
Driver Model	EzS-NDR-MI-28 series	
Input Voltage	24VDC $\pm 10\%$	
Control Method	Closed loop control with 32bit DSP	
Multi Axes Drive	Maximum 16 axes through Daisy-Chain	
Position Table	64 motion command steps (Continuous, Wait, Loop, Jump and External start etc.)	
Current Consumption	Max 500mA (Except motor current)	
Operating Condition	Ambient Temperature	In Use : 0~50°C In Storage : -20~70°C
	Humidity	In Use : 35~85% (Non-condensing) In Storage : 10~90% (Non-condensing)
	Vib. Resist.	0.5G
Function	Rotation Speed	0~3,000rpm
	Resolution(P/R)	16,000/Rev. Encoder model : 500 1,000 1,600 2,000 3,600 5,000 6,400 7,200 10,000 16,000
	Protection Functions	Over current, Over speed, Position tracking error, Over load, Over temperature, Over regenerated voltage, Motor connect error, Encoder connect error, Motor voltage error, In-Position error, System error, ROM error, Position overflow error
	In-Position Selection	0~15 (Selectable by parameter)
	Position Gain Selection	0~15 (Selectable by parameter)
	Rotational Direction	CW / CCW (Selectable by parameter)
I/O Signal	Input Signal	3 dedicated input (LIMIT+, LIMIT-, ORIGIN), 7 programmable input (Photocoupler)
	Output Signal	1 dedicated output (Compare Out), 1 programmable output (Photocoupler), Brake signal
Communication Interface	The RS-485 serial communication with PC Transmission speed : 9,600~921,600bps	
Position Control	Incremental mode / Absolute mode Data Range : -134,217,727 to +134,217,727pulse, Operating speed : Max. 3,000rpm	
Return to Origin	Origin Sensor, Z phase, \pm Limit sensor, Torque	
GUI	User Interface Program within Windows	
Software	Motion Library (DLL) for windows 2000/XP	

 Pulse Input Drive Size[mm]


 Pulse Input Drive and Motor Combination

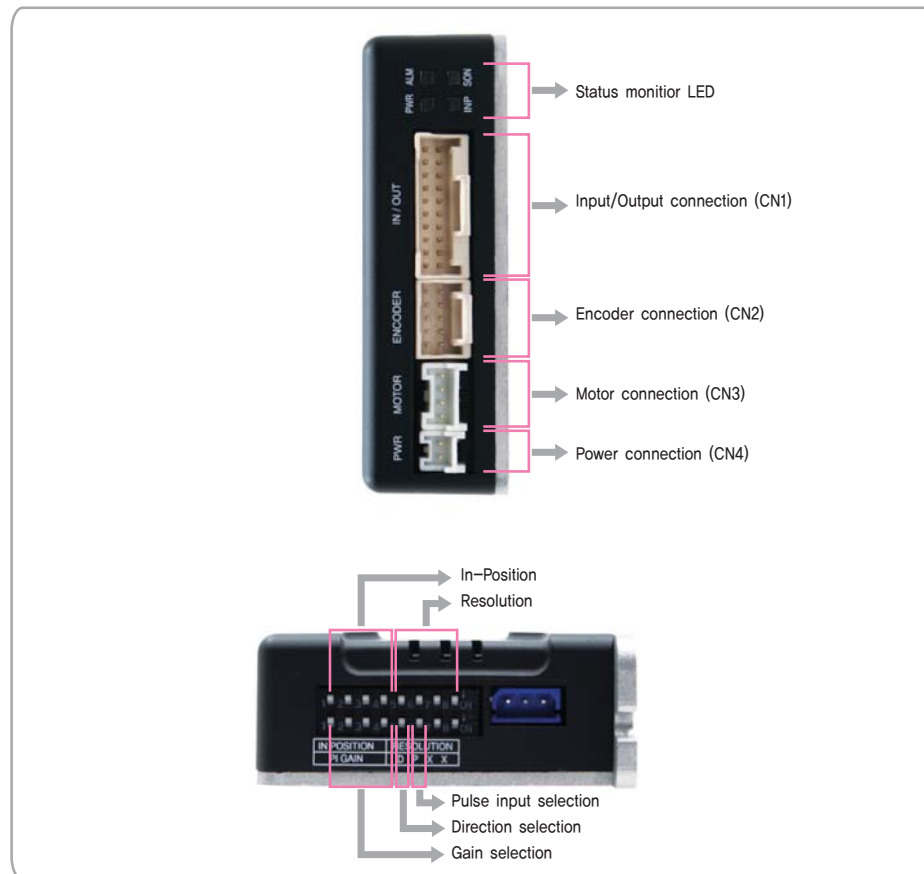
MODEL		EzM-28L-D
DRIVE METHOD	-	BI-POLAR
NUMBER OF PHASES	-	2
VOLTAGE	VDC	3,42
CURRENT per PHASE	A	0,95
RESISTANCE per PHASE	Ohm	3,6
INDUCTANCE per PHASE	mH	5,8
HOLDING TORQUE	N · m	0,14
ROTOR INERTIA	g · cm ²	18
WEIGHTS	g	200
LENGTH	mm	52
ALLOWABLE THRUST LOAD	N	Lower than motor weight
INSULATION RESISTANCE	MOhm	100min ₁ (at 500VDC)
INSULATION CLASS	-	CLASS B
OPERATING TEMPERATURE	°C	0 to 55

 Motor Torque Characteristics (Pulse Input Drive and Contoller Embedded Drive are Common)



Pulse Input Drive Setting and Operating

Setting and Operating



■ Status Monitor LED

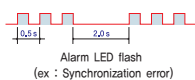
Indication	Color	Function	ON/OFF Condition
PWR	Green	Power input indication	LED is turned ON when power is applied
INP	Yellow	Complete Positioning Motion	Lights On when positioning error reaches within the preset pulse selected by DIP switch
SON	Orange	Servo on/off Indication	Servo On : Light On, Servo Off : Light Off
ALM	Red	Alarm Indication	Flash when protection function is activated (Indefinite which protection mode is activated by counting the blinking times)

Pulse Input Drive Setting and Operating

Setting and Operating

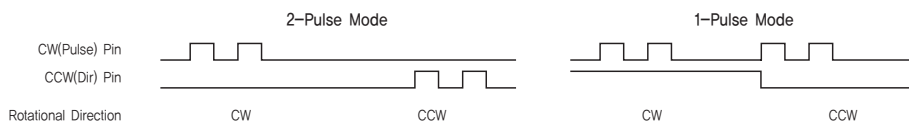
Protection Functions and Flash Times

Times	Protection	Conditions
1	Over current	The current through power devices in inverter exceeds the limit value
2	Over speed	Motor speed exceed 3,000rpm
3	Position tracking error	Position error value is higher than 90° in motor run state
4	Over load	The motor is continuously operated more than 5 second under a load exceeding the max. torque
5	Over temperature	Inside temperature of drive exceeds 55°C
6	Over regenerated voltage	Back-EMF more than 50V
7	Motor connect error	The power is ON without connection of the motor cable to drive
8	Encoder connect error	Cable connection error with Encoder connector in drive
9	Motor voltage error	Motor voltage less than 20V
10	In-Position error	After operation is finished, a position error occurs
11	System error	Error occurs in drive system
12	ROM error	Error occurs in parameter storage device(ROM)
15	Position overflow error	Position error value is higher than 90° in motor stop state



Pulse Input Selection Switch

Indication	Switch Name	Functions
2P/1P	selecting pulse input mode	Selectable 1-pulse input mode or 2-pulse input mode as pulse input signal. ON : 1-pulse mode OFF : 2-pulse mode *Default : pulse mode



Rotational Direction Selection Switch

Indication	Switch Name	Functions
DIR	Rotational Direction Select Switch	Based on CW(+ signal) input to drive. 1 : CCW(-Direction) 0 : CW(-Direction) *CW mode



 Setting and Operating

Resolution Selection Switch

switch position				Pulse/Revolution	switch position				Pulse/Revolution
8	7	6	5		8	7	6	5	
ON	ON	ON	ON	6,000*1	OFF	ON	ON	ON	7,200
ON	ON	ON	OFF	500	OFF	ON	ON	OFF	10,000
ON	ON	OFF	ON	1,000	OFF	ON	OFF	ON	NC
ON	ON	OFF	OFF	1,600	OFF	ON	OFF	OFF	NC
ON	OFF	ON	ON	2,000	OFF	OFF	ON	ON	NC
ON	OFF	ON	OFF	3,600	OFF	OFF	ON	OFF	NC
ON	OFF	OFF	ON	5,000	OFF	OFF	OFF	ON	NC
ON	OFF	OFF	OFF	6,400	OFF	OFF	OFF	OFF	NC

*1 : Default = 16,000

Position Controller Gain Selection Switch

The Position Controller Gain Switch allows for the correction of the motor position deviation after stopping caused by load and friction. Depending on the motor load, the user may have to select a different gain position to stabilize and to correct positional error quickly.

To tune the controller

1. Set the switch to "ON" position.
2. Start to rotate the switch until system becomes stable.
3. Rotate the switch 1~2 position to reach better performance.

switch position				Time Constant of the Integral Part	Proportional Gain*1
4	3	2	1		
ON	ON	ON	ON	1	1
ON	ON	ON	OFF	1	2
ON	ON	OFF	ON	1	3
ON	ON	OFF	OFF	1	4*2
ON	OFF	ON	ON	1	5
ON	OFF	ON	OFF	1	6
ON	OFF	OFF	ON	2	1
ON	OFF	OFF	OFF	2	2
OFF	ON	ON	ON	2	3
OFF	ON	ON	OFF	2	4
OFF	ON	OFF	ON	2	5
OFF	ON	OFF	ON	3	1
OFF	OFF	ON	ON	3	2
OFF	OFF	ON	OFF	3	3
OFF	OFF	OFF	ON	3	4
OFF	OFF	OFF	OFF	3	5

*1 : Value in the columns are in relative units. They only show the parameter changes depending on the switch's position.

*2 : Default = ON ON OFF OFF

In-Position Value Setting Switch

To select the output condition of In-position signal, In-position output signal is generated when the pulse number of positional error is lower than selected In-position value set by this switch after positioning command is executed.

switch position				In-Position Value[Pulse] Fast Response	switch position				In-Position Value[Pulse] Fast Response
4	3	2	1		4	3	2	1	
ON	ON	ON	ON	0*1	OFF	ON	ON	ON	0
ON	ON	ON	OFF	1	OFF	ON	ON	OFF	1
ON	ON	OFF	ON	2	OFF	ON	OFF	ON	2
ON	ON	OFF	OFF	3	OFF	ON	OFF	OFF	3
ON	OFF	ON	ON	4	OFF	OFF	ON	ON	4
ON	OFF	ON	OFF	5	OFF	OFF	ON	OFF	5
ON	OFF	OFF	ON	6	OFF	OFF	OFF	ON	6
ON	OFF	OFF	OFF	7	OFF	OFF	OFF	OFF	7

*1 : Default = 0

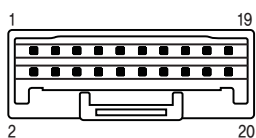
※Please refer to User Manual for setup.

Pulse Input Drive Setting and Operating

Setting and Operating

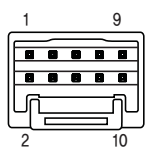
Input/Output Signal(CN1)

NO.	Function	I/O
1	CW+(Pulse+)	Input
2	CW-(Pulse-)	Input
3	CCW+(Dir+)	Input
4	CCW-(Dir-)	Input
5	A+	Output
6	A-	Output
7	B+	Output
8	B-	Output
9	Z+	Output
10	Z-	Output
11	Alarm	Output
12	In-Position	Output
13	Servo On/Off	Input
14	Alarm Reset	Input
15	NC	----
16	BRAKE+	Output
17	BRAKE-	Output
18	S-GND	Output
19	24VDC GND	Input
20	24VDC	Input



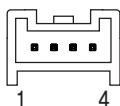
Encoder Connector(CN2)

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



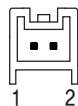
Motor Connector(CN3)

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

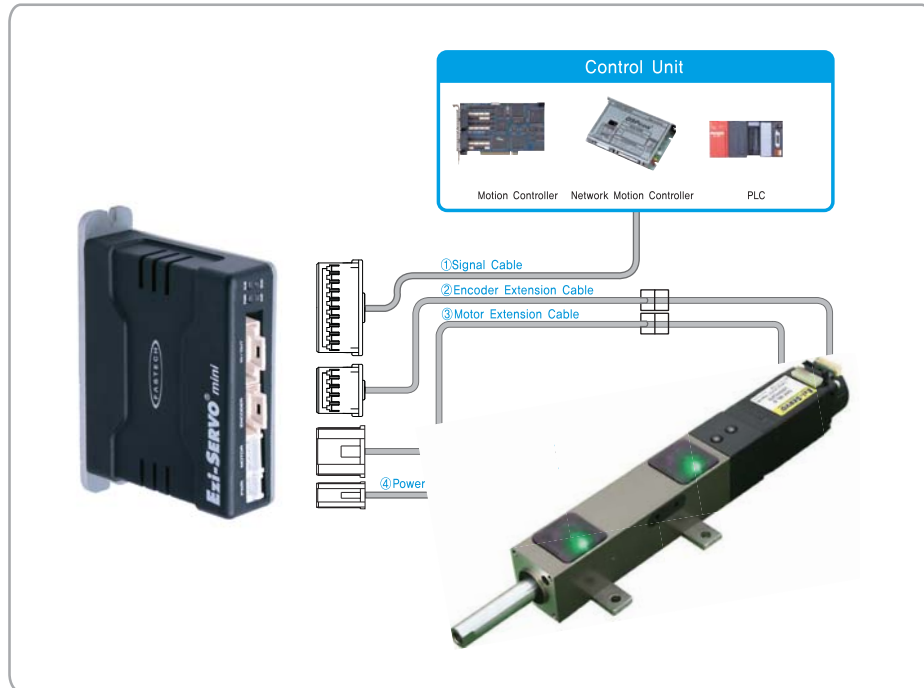


Power Connector(CN4)

NO.	Function
1	24VDC ±10%
2	GND



 System Configuration of Pulse Input Drive



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

■ Cable Option

1. Signal Cable

Available to connect between control System and Ezi-SERVO-MINI

Item	Length[m]	Remark
CSV1-S-□□□F	□□□	Normal Cable
CSV1-S-□□□M	□□□	Robot Cable

□ is for cable Length, the unit is 1m Max, 20m length

2. Encoder Extension Cable

Available to Extended connection between Encoder and Ezi-SERVO-MINI

Item	Length[m]	Remark
CSV1-E-□□□F	□□□	Normal Cable
CSV1-E-□□□M	□□□	Robot Cable

□ is for cable Length, the unit is 1m Max, 20m length

3. Motor Extension Cable

Available to Extended connection between Motor and Ezi-SERVO-MINI

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

□ is for cable Length, the unit is 1m Max, 20m length

4. Power Cable

Available to connection between Power and Ezi-SERVO-MINI

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

□ is for cable Length, the unit is 1m Max, 20m length

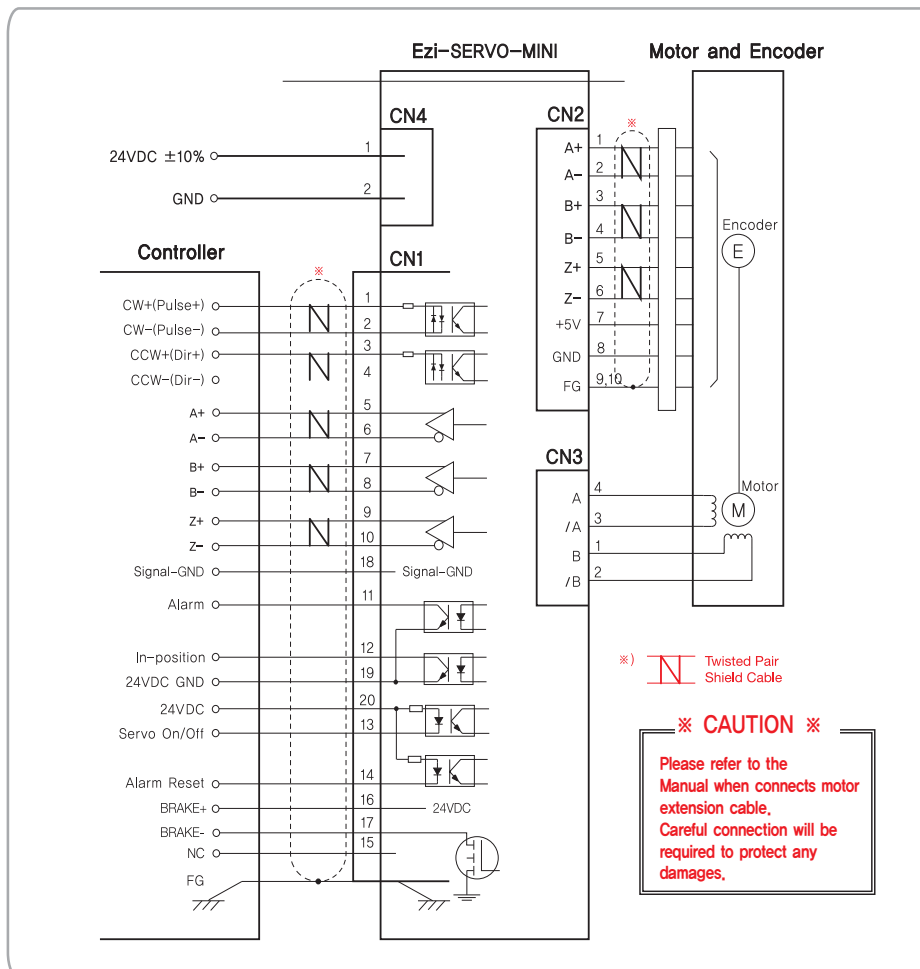
Connector for Cabling

ITEM		Specification	Maker
Signal Connector(CN1)	Housing	501646-2000	MOLEX
	Terminal	501648-1000(AWG 26~28)	MOLEX
EncoderConnector(CN2)	Housing	501646-1000	MOLEX
	Terminal	501648-1000(AWG 26~28)	MOLEX
Motor Connector(CN3)	Housing	PAP-04V-S	JST
	Terminal	SPHD-001T-P0,5	JST
Power Connector(CN4)	Housing	PAP-02V-S	JST
	Terminal	SPHD-001T-P0,5	JST

※These connectors are serviced together with Ezi-SERVO MINI when Purchasing option cable.
 ※Above connector is the most suitable produce for Ezi-SERVO MINI. Another equivalent connector can be used.

External Wiring Diagram

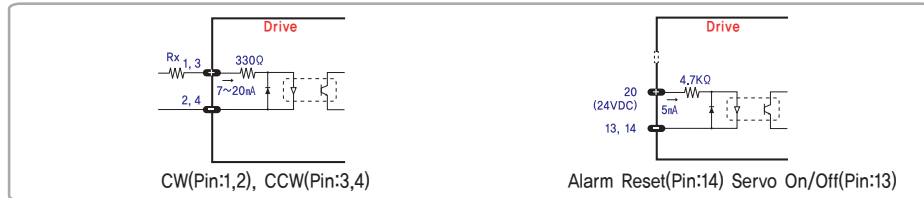
External Wiring Diagram



Pulse Input Drive Setting and Operating Control I/O Signals

Input Signal

Input signals of the drive are all photocoupler protected. The signal shows the status of internal photocouplers [ON: conduction], [OFF: Non-conduction], not displaying the voltage levels of the signal.

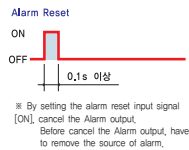


■ CW,CCW Input

This signal can be used to receive a positioning pulse command from a user host motion controller. The user can select 1-pulse input mode or 2-pulse input mode (refer to switch No.1, SW1). The input schematic of CW, CCW is designed for 5V TTL level. When using 5V level as an input signal, the resistor Rx is not used and connect to the driver directly. When the level of input signal is more than 5V, Rx resistor is required. If the resistor is absent, the drive will be damaged! If the input signal level is 12V, Rx value is 2.2Kohm and 24V, Rx value is 4.7Kohm.

■ Servo On/Off Input

This input can be used only to adjust the position by manually moving the motor shaft from the load-side. By setting the signal [ON], the driver cuts off the power supply to the motor. Then, one can manually adjust output position. When setting the signal back to [OFF], the driver resumes the power to the motor and recovers the holding torque. When driving a motor, one needs to set the signal [OFF].

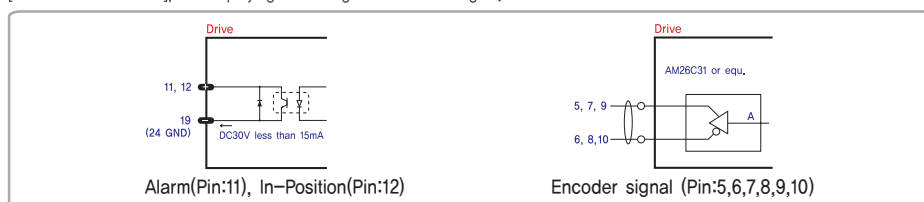


■ Alarm Reset Input

When a protection mode has been activated, a signal to this alarm reset input cancels the Alarm output.

Output Signal

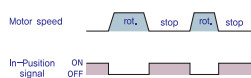
Output signals from the driver are photocoupler protected: Alarm, In-Position and the Line Driver Outputs (encoder signal). In the case of photocoupler outputs, the signal indicates the status of internal photocouplers [ON: conduction], [OFF: Non-conduction], not displaying the voltage levels of the signal.



■ Alarm Output

The Alarm output indicates [ON] when the driver is in a normal operation. If a protection mode has been activated, it goes [OFF]. A host controller needs to detect this signal and stop sending a motor driving command. When the driver detects an abnormal operation such as overload or over current of the motor, it sets the Alarm output to [OFF], flashes the Alarm LED, disconnect the power to a motor and stops the motor simultaneously.

[Caution] Only at the Alarm output port, the photocoupler isolation is in reverse. When the driver is in normal operation the Alarm output is [ON]. On the contrary when the driver is in abnormal operation that start protection mode, the Alarm output is [OFF].



■ In-position Output

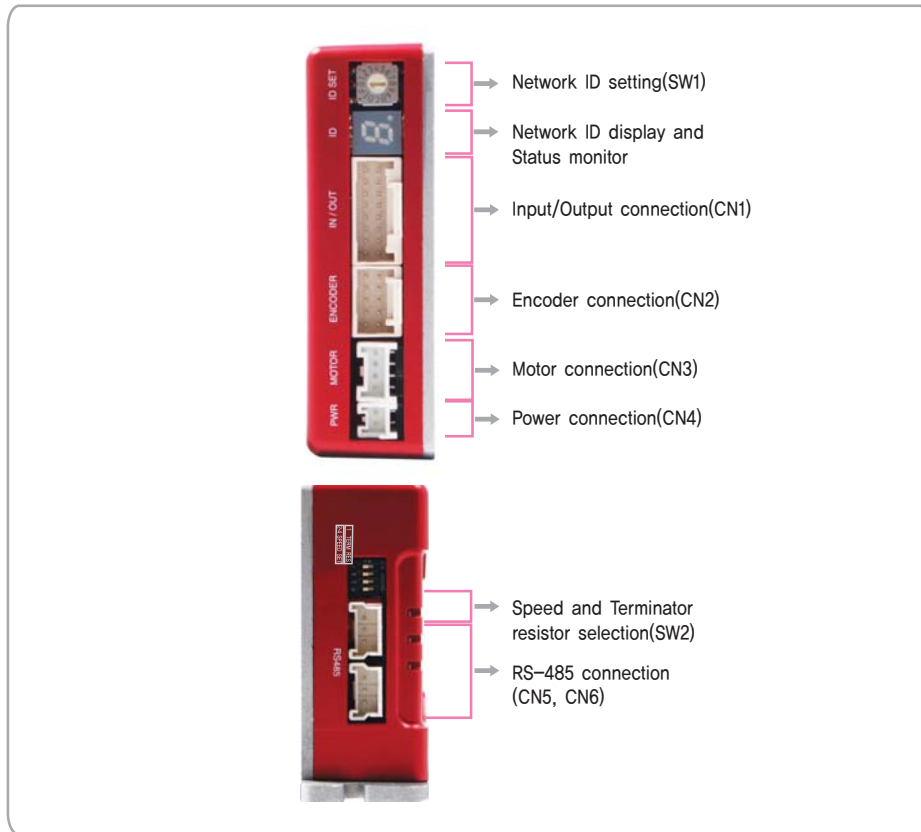
In-Position signal is [ON] when positioning is completed. This signal is [ON] when the motor position error is within the value set by the switch SW4.

■ Encoder Output

The encoder signal is a line driver output. This can be used to confirm the stop position.

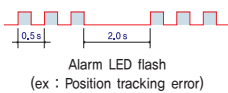
Controller Embedded Drive Setting and Operating

Setting and Operating



Input/Output Signal

Times	Protection	Conditions
1	Over current	The current through power devices in inverter exceeds the limit value
2	Over speed	Motor speed exceed 3,000rpm
3	Position tracking error	Position error value is higher than 90° in motor run state*1
4	Over load	The motor is continuously operated more than 5 second under a load exceeding the max. torque
5	Over temperature	Inside temperature of drive exceeds 55°C
6	Over regenerated voltage	Back-EMF more than 50V
7	Motor connect error	The power is ON without connection of the motor cable to drive
8	Encoder connect error	Cable connection error with Encoder connector in drive
9	Motor voltage error	Motor voltage is less than 20V
10	In-Position error	After operation is finished, a position error occurs
11	System error	Error occurs in drive system
12	ROM error	Error occurs in parameter storage device(ROM)
14	Input Voltage error	Power source Voltage is higher than limited value
15	Position overflow error	Position error value is higher than 90° in motor stop state*1



 Pulse Input Drive and Motor Combination

■ Network ID Selection Switch(SW1)

Position	ID Number	Position	ID Number
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



※Maximum 16 axis can be connected in one network

■ Speed and Terminator Resistor Selection Switch(SW2)

The Purpose of this is to setting the communication speed and connect a terminator resistor if drive is installed at the end of network

SW2.1 used for connecting the terminator resistor.

SW2.2~SW2.4 used for setting speed as follows.

SW 2,1	SW 2,2	SW 2,3	SW 2,4	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



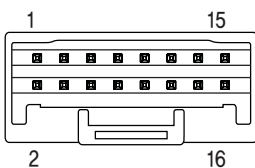
It is available to use common purpose of PCI BUS Type RS-485 Communication board for high speed communication, (Please contact with local distributor to get more information)

*1 : Default setting value

If SW2,1 is OFF, terminator resistor is disconnected, If SW2,2 is ON, terminator resistor is connected.

■ Input/Output Signal(CN1)

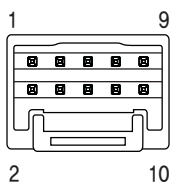
NO.	Function	I/O
1	24VDC	Input
2	24VDC GND	Input
3	BRAKE+	Output
4	BRAKE-	Output
5	+Limit Sensor	Input
6	-Limit Sensor	Input
7	Origin Sensor	Input
8	Digital IN 1	Input
9	Digital IN 2	Input
10	Digital IN 3	Input
11	Digital IN 4	Input
12	Digital IN 5	Input
13	Digital IN 6	Input
14	Digital IN 7	Input
15	Compare Out	Output
16	Digital OUT 1	Output



Controller Embedded Drive Setting and Operating

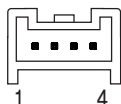
Setting and Operating

■ Encoder Connector(CN2)



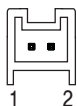
NO.	Function	I/O
1	A+	Input
2	A-	Input
3	B+	Input
4	B-	Input
5	Z+	Input
6	Z-	Input
7	5VDC	Output
8	5VDC GND	Output
9	F. GND	----
10	F. GND	----

■ Motor Connector(CN3)



Position	ID Number
1	B phase
2	/B phase
3	/A phase
4	A phase

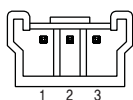
■ Power Connector(CN4)



NO.	Function
1	24VDC ±10%
2	GND

■ RS-485 Communication(CN5, CN6)

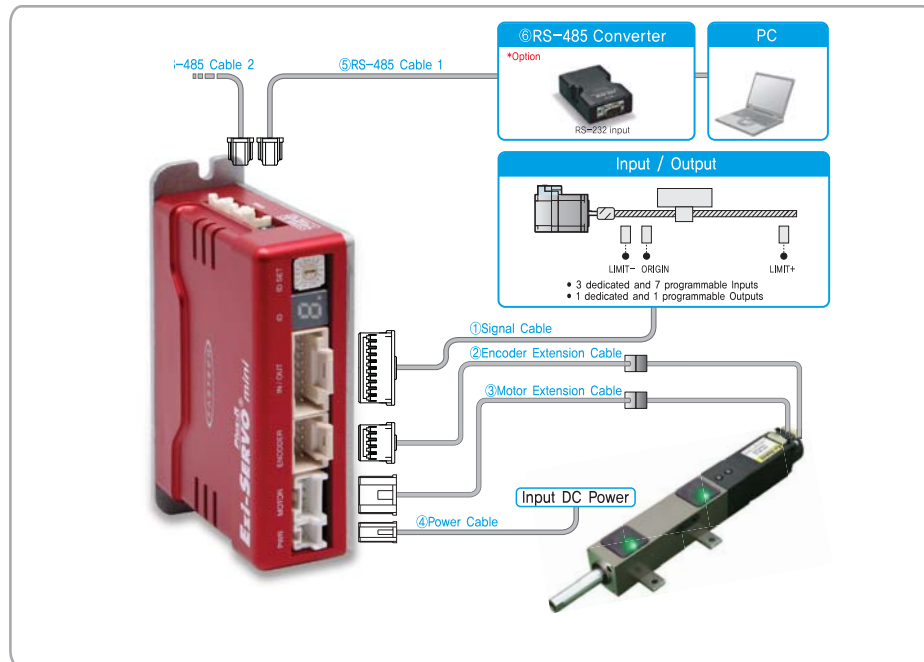
RS-485 Communication Port to connect with Host controller.



NO.	Function
1	+DATA
2	-DATA
3	GND

Controller Embedded Drive System Configurations

Controller Embedded Drive System Configurations



Type	Signal	Encoder cable	Motor cable	Power cable	RS-485 Cable
Standard Length	—	30cm	30cm	—	—
Max. Length	20m	20m	20m	2m	30m

■ Cable Option

1. Signal Cable

Available to connect between control System and Ezi-SERVO-PR MI

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

□ is for cable Length, the unit is 1m Max, 20 length.

2. Encoder Extension Cable

Available to Extended connection between Encoder and Ezi-SERVO-PR MI

Item	Length [m]	Remark
CSV1-E-□□□F	□□□	Normal Cable
CSV1-E-□□□M	□□□	Robot Cable

□ is for cable Length, the unit is 1m Max, 20 length.

3. Motor Extension Cable

Available to Extended connection between Motor and Ezi-SERVO-PR MI

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

□ is for cable Length, the unit is 1m Max, 20 length.

4. Power Cable

Available to connection between Power and Ezi-SERVO-PR MI

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

□ is for cable Length, the unit is 1m Max, 20 length.

Setting Configurations

RS-485 Cable 1

(FAS-RCR to Ezi-SERVO-ALL, FAS-RCR to Ezi-STEP-ALL, FAS-RCR to Ezi-SERVO-MINI-Plus R, FAS-RCR to Ezi-MotionLink)

Item	Length[m]	Remark
CGNB-R-0R6F	0.5	Normal Cable
CGNB-R-001F	1	
CGNB-R-1R5F	1.5	
CGNB-R-002F	2	
CGNB-R-003F	3	
CGNB-R-005F	5	

■ Option

⑥FAS-RCR (RS-232C to RS-485 Converter)

Item	Specification
Comm.Speed	Max, 115,2Kbps
Comm.Distance	RS-232C : Max, 15m / RS-485 : Max, 1,2km
Connector Type	RS-232C : DB9 Female / RS-485 : RJ-45
Dimension	50X75X23mm
Weight	38g
Power	Powered from PC (Usable for external DC5~24V)

RS-485 Cable 2

(FAS-RCR to Ezi-SERVO-ALL, FAS-RCR to Ezi-STEP-ALL, FAS-RCR to Ezi-SERVO-Plus R-MINI, FAS-RCR to Ezi-MotionLink)

Item	Length[m]	Remark
CGNA-R-0R6F	0.5	Normal Cable
CGNA-R-001F	1	
CGNA-R-1R5F	1.5	
CGNA-R-002F	2	
CGNA-R-003F	3	
CGNA-R-005F	5	

RS-232C Cable

Item	Length[m]	Remark
CGNR-C-002F	2	Normal Cable
CGNR-C-003F	3	
CGNR-C-005F	5	

■ Connector for Cabling

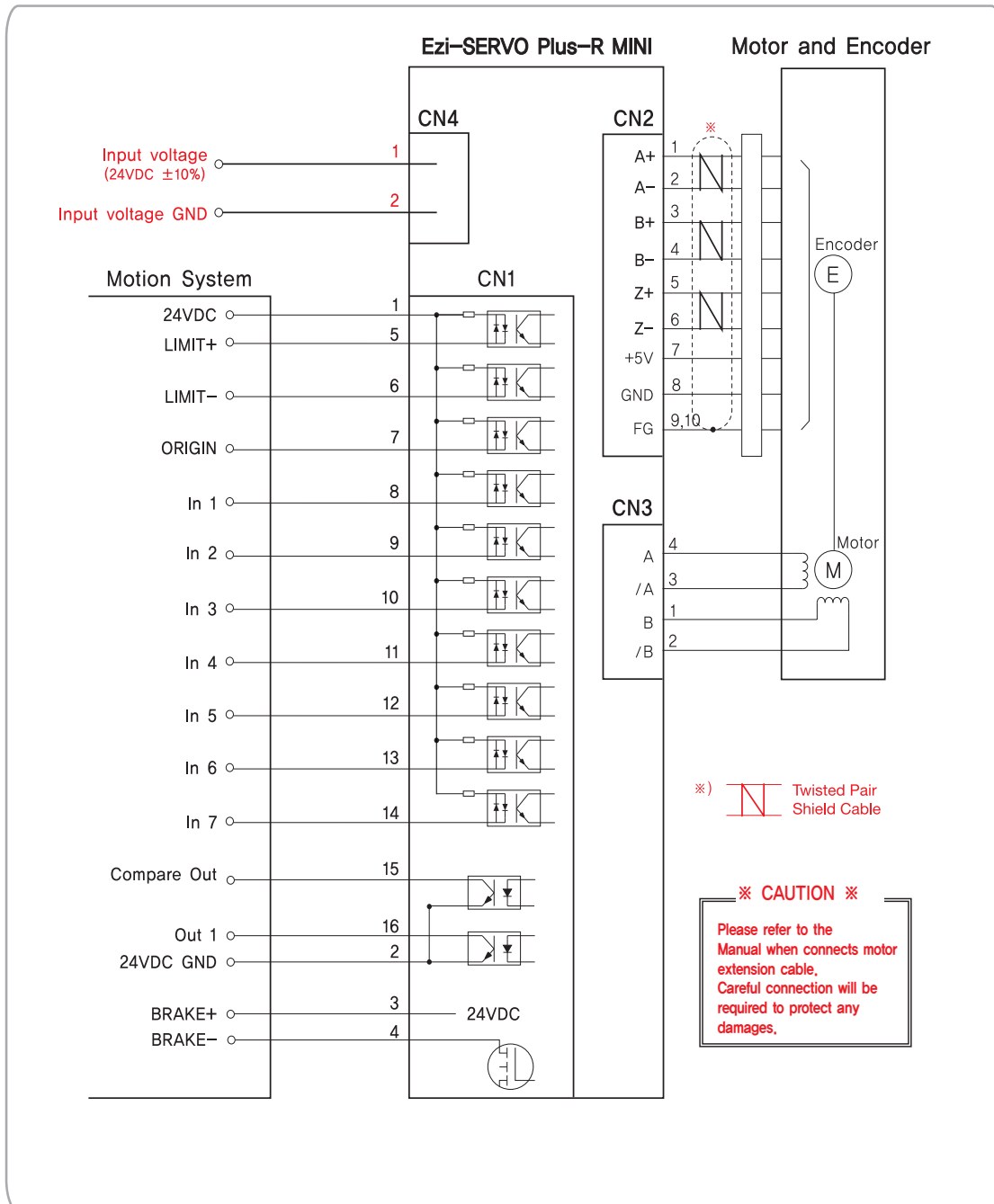
ITEM		Specification	Remark
Signal Connector(CN1)	Housing	501646-1600	MOLEX
	Terminal	501648-1000(AWG 26~28)	MOLEX
Encoder Connector (CN2)	Housing	501646-1000	MOLEX
	Terminal	501648-1000(AWG 26~28)	MOLEX
Motor Connector (CN3)	Housing	PAP-04V-S	JST
	Terminal	SPHD-001T-P0,5	JST
Power Connector (CN4)	Housing	PAP-02V-S	JST
	Terminal	SPHD-001T-P0,5	JST
RS-485 Connector (CN5, CN6)	Housing	33507-0300	MOLEX
	Terminal	50212-8100	MOLEX

※These connectors are serviced together with Ezi-SERVO Plus-R MINI except when purchasing option cables.

※Above connector is the most suitable product for Ezi-SERVO Plus-R MINI. Another equivalent connector can be used

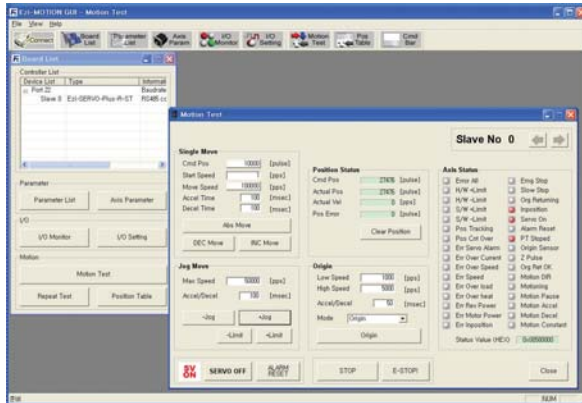
External Wiring Diagram

 External Wiring Diagram



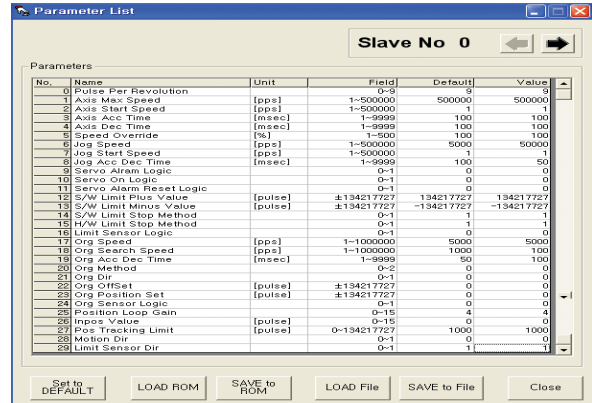
GUI (Graphic User Interface) Screen Shop

Controller Embedded Drive User GUI



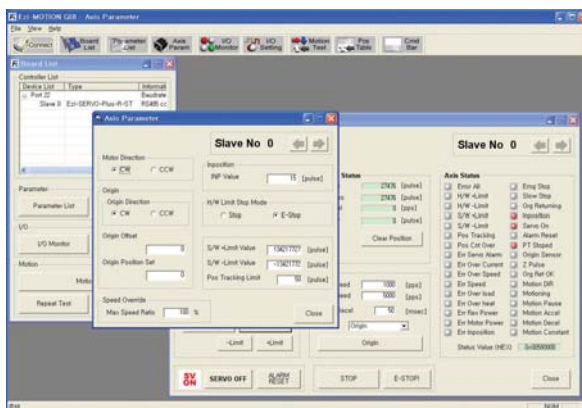
◆ Controller Lists and Motion Test

This screen display the controller list that connected to system, You can make a single move, jog and origin command and also the motor status is displayed.



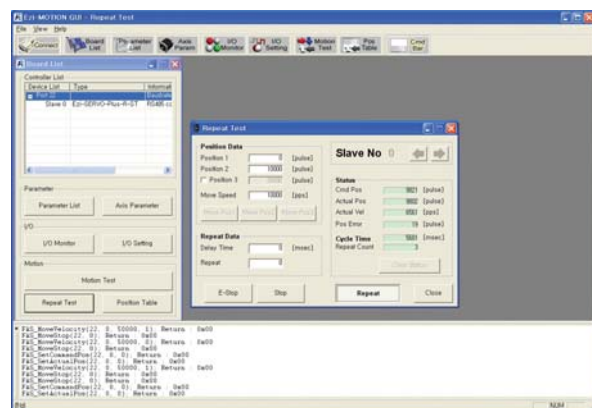
◆ Parameter List

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



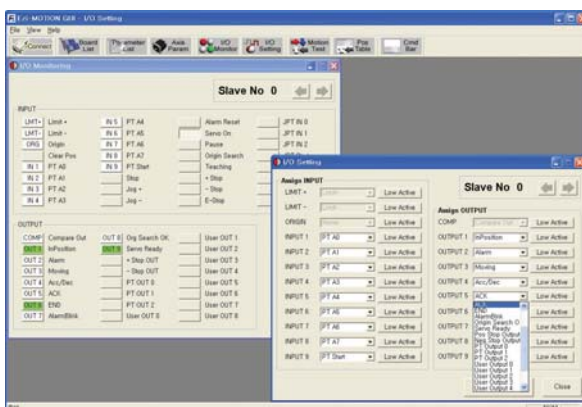
◆ Axis Parameter Setup

You can select various parameters that frequently used, (ex : sensor input logic)



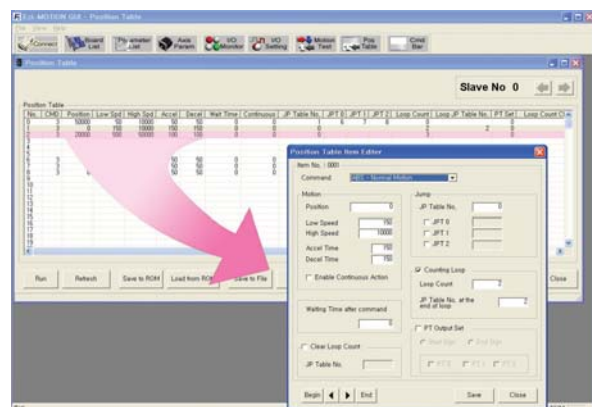
◆ Motion Repeat and Monitor Status

Target position, speed, delay time and repeat count are selected for repeat motion test, Motion library(DLL) is also displayed on screen,



◆ I/O Monitoring and Setting

You can select various digital input and output signals of controller,



◆ Position Table

You can edit the position table and execute it, The position table data can be saved and loaded from Flash ROM and Windows file,

MEMO



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