

# **Ezi-SERVO<sup>®</sup> II Plus-E ALL**

**Closed Loop Stepping System**

User Manual

Text

( Rev.03)



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# 1 . Safety Pre-caution and Note on Installation

## ※ Before Operation

- Thank you for purchasing our Ezi-SERVOII Plus-E ALL products.
- Ezi-SERVOII Plus-E ALL is a high-performance 32bit ARM chip embedded Full Digital position control stepping driving unit.
- This manual describe the handling, maintenance, repair, diagnosis and troubleshooting of Ezi-SERVOII Plus-E ALL.
- Before start operation of Ezi-SERVOII Plus-E ALL , thoroughly read this manual.
- After reading this manual, keep the manual near Ezi-SERVOII Plus-E ALL , so that any user can read this manual whenever needed.



## 1 - 1 . Precautions

### General Precautions

- Contents of this manual are subject to change without prior notice for functional improvements, change of specifications or user's better understanding. Thoroughly read the manual which is provided with purchased Ezi-SERVOII Plus-E ALL
- In case of manual is damaged or lost, please contact with FASTECH's agent or our company at the address on the last page of this manual.
- Modification of the product by user is beyond the our warranty and FASTECH is not responsible for it.


### ◆ Safety Precaution

- Before installation, operation, repairing the products, thoroughly read the manual and fully understand the contents. Before operating the products, please understand the mechanical characteristics of this products and related safety information and precautions.
- This manual divides safety precautions into **Attention** and **Warning**.



 <b>Attention</b>	If user does not properly handle the products, the user may seriously or slightly injured damages may occur in the machine.
 <b>Warning</b>	If user does not properly handle the products, a dangerous situation (such as an electric shock) may occur resulting in deaths or serious injuries.

- Although precaution is only a **Attention**, a serious result could be caused depending on the situation. Follow safety precaution.



### ◆ Checking the product

 <b>Attention</b>	<p><b>Check for damage or missing parts.</b>          If you install and operate the abnormal product, there is a risk of mechanical damage or injury.</p>
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### ◆ Installation

 <b>Attention</b>	<p><b>Please be careful when carrying.</b>          The product may break if it falls, and there is a risk of injury if dropped on the foot.</p> <p><b>Use non-flammable materials such as metal in the place where the product will be handled.</b>          There is a risk of fire.</p> <p><b>When installing several Ezi-SERVOII Plus-E ALL in one enclosed space, install a cooling fan to keep the temperature around the drive below 50 °C.</b>          Risk of fire or other accidents due to overheating.</p>
 <b>Warning</b>	<p><b>Only qualified personnel should perform installation, connection, operation, operation, inspection and troubleshooting.</b>          It may cause fire, injury or damage to the device.</p>


### ◆ Wiring

 <b>Attention</b>	<p><b>The power input voltage of the drive must be within the rated range.</b>          It may cause fire or failure.</p> <p><b>Connect correctly according to the wiring diagram.</b>          It may cause a fire or malfunction.</p>
 <b>Warning</b>	<p><b>Make sure that the input power is turned off before proceeding.</b>          There is a risk of electric shock or fire.</p> <p><b>Since this Ezi-SERVOII Plus-E ALL case is insulated from the ground of the internal circuit by the capacitor, make sure to ground it.</b>          There is a danger of electric shock or fire, and it may cause product malfunction.</p>

## ◆ Operation &amp; Setting Change

 <b>Attention</b>	<p><b>If the drive's protection function works, remove the cause and release the protection function.</b></p> <p>If you continue operation without removing the cause, the motor and drive may malfunction and cause injury or damage to the device.</p> <p><b>When supplying power to the drive, turn off all control inputs of the drive.</b></p> <p>Injury and device damage may occur due to motor operation.</p> <p><b>All parameter values of this Ezi-SERVOII Plus-E ALL are set properly at the factory. Make sure to read the user's manual thoroughly before changing the settings.</b></p> <p>The machine may be damaged or product failure may occur.</p>
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## ◆ Maintenance and Inspection

 <b>Warning</b>	<p><b>Turn off the main circuit power and repair and check the Ezi-SERVOII Plus-E ALL after sufficient time has passed.</b></p> <p>If power is left in the capacitor, electric shock may occur.</p> <p><b>Do not change wiring while the power is on.</b></p> <p>There is a risk of electric shock, product damage or mechanical damage.</p> <p><b>Never modify the product.</b></p> <p>There is a risk of electric shock, product damage, or mechanical damage.</p>
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**1 - 2 . Notes on Installation**

- 1) It should be used indoors and the ambient temperature should be used between 0 ° and 55 ° C.
- 2) If the case is over 50 ° C, heat dissipation to the outside.
- 3) Avoid direct sunlight, magnetic objects or radiation objects.

## 2 . Specifications of the Drive

### 2 - 1 . Characteristic Table

Type of Drive		Ezi-SERVOII-PE-ALL 42/56/60 series	Ezi-SERVOII-PE-ALL 86 series
Input Voltage		24VDC $\pm$ 10%	40~70VDC
Control Method		Closed loop control with ARM-based 32-bit MCU	
Multi Axes Drive		Maximum 254 axes operating (Selectable IP:1~254)	
Position Table		256 of Motion command steps (Speed, External start, Jump, Loop, Wait and PT finish 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%RH (Non- condensing) In Storage : 10~90%RH (Non-condensing)	
	Viv. Resist	0.5G	
Function	Rotation Speed	0~3,000rpm*1	
	Resolution [P/R]	10,000/Rev Encoder model: 500 1,000 1,600 2,000 3,600 5,000 6,400 7,200 10,000 20,000/Rev Encoder model: 500 1,000 1,600 2,000 3,600 5,000 6,400 7,200 10,000 20,000 (Resolution can be selected by parameter)	
	Protection Function	Overcurrent, Overspeed, Position tracking error, Overload, Overheat, Over back EMF, motor connect error, Encoder connect error, Motor voltage error, Inposition error, ROM error, Position overflow error	
	LED Display	Power status, In-Position status, Enable status, Alarm status	
	In-position selection	0~63 ( Selectable by parameter )	
	Position Gain selection	0~63 ( Selectable by parameter )	
	Rotational Direction	CW/CCW ( Selectable by parameter )	
	RUN Current	50%~150% ( Selectable by parameter ) RUN current is flowing current value in the motor when motor is operating ( rotating ), It is set based on constant current of motor * Default factory setting value : 100%	
	STOP Current	20%~100% ( Selectable by parameter ) It is set as setting value of STOP current 0.1 sec after motor stop. STOP current value is at a ratio against RUN current value of motor * Default factory setting value is : 50%	
I/O Signal	Input signal	3 dedicated input (LIMIT+, LIMIT-, ORIGIN), 3 programmable input ( Photo coupler )	
	Output signal	1 dedicated output (Compare Out), 1 programmable output (Photo coupler), Brake signal	
Communication interface		Ethernet TCP, UDP communication with PC. Dual port Ethernet switch embedded, network speed : 10/100base-T/TX Full duplex DHCP function embedded	
Position Control		Incremental mode / Absolute mode Data range: -134,217,728 to +134,217,727 pulse, Operating speed: Max. 3,000rpm	
Return to Origin		Origin sensor, Z phase, $\pm$ Limit sensor	
GUI		User interface Program for Windows	
Software		Motion Library (DLL) for Windows 7/8/10	

\*1 Maximum rotation speed depends on the resolution. The maximum rotation speed up to 10,000 resolution is 3,000 [rpm].

At higher resolutions, the maximum rotational speed will be decreased



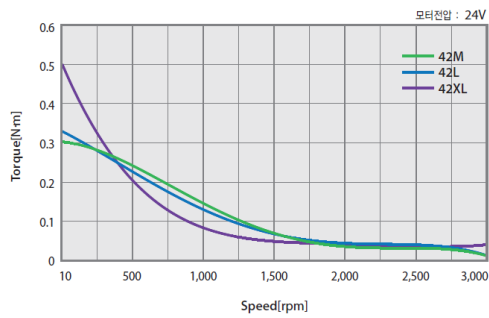


### 3 . Specifications & Size of the Motor

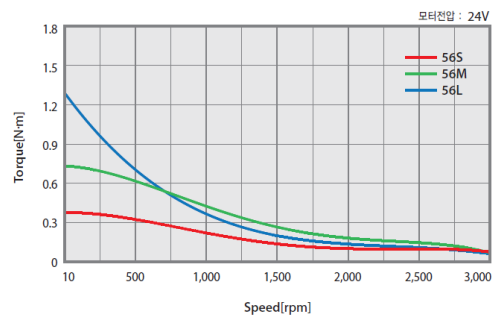
#### 3 - 1 . Motor Specifications and Torque Characteristic

MODEL		UNIT	Ezi-SERVOII-PE-ALL -42 series			Ezi-SERVOII-PE-ALL -56 series		
			42M	42L	42XL	56S	56M	56L
DRIVE METHOD		-	BI-POLAR					
NUMBER OF PHASES		-	2	2	2	2	2	2
VOLTAGE		VDC	4.32	4.56	7.2	1.56	1.62	2.64
CURRENT per PHASE		A	1.2	1.2	1.2	3	3	3
RESISTANCE per PHASE		Ohm	3.6	3.8	6	0.52	0.54	0.88
INDUCTANCE per PHASE		mH	7.2	8	15.6	1.2	2	4
HOLDING TORQUE		N·m	0.44	0.5	0.65	0.64	1	1.5
ROTOR INERTIA		g·cm <sup>2</sup>	54	77	114	180	280	520
WEIGHTS		g	280	350	500	500	720	1150
LENGTH(L)		mm	40	48	60	46	55	80
PERMISSIBLE OVERHUNG LOAD (DISTANCE FROM END OF SHAFT)	3mm	N	22	22	22	52	52	52
	8mm		26	26	26	65	65	65
	13mm		33	33	33	85	85	85
	18mm		46	46	46	123	123	123
PERMISSIBLE THRUST LOAD		N	Lower than motor weight					
INSULATION RESISTANCE		Mohm	100 MIN.(at 500VDC)					
INSULATION CLASS		-	CLASS B(130°C)					
OPERATING TEMPERATURE		°C	0 to 55					

Ezi-SERVOII-PE-ALL-42 series

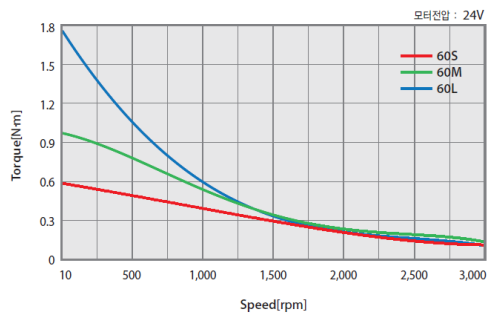


Ezi-SERVOII-PE-ALL-56 series

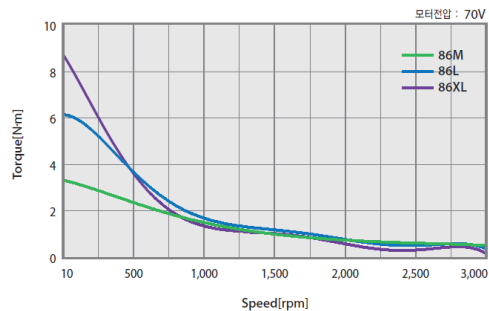


MODEL			Ezi-SERVOII-PE-ALL -60 series			Ezi-SERVOII-PE-ALL -86 series		
			UNIT	60S	60M	60L	86M	86L
DRIVE METHOD		-	BI-POLAR					
NUMBER OF PHASES		-	2	2	2	2	2	2
VOLTAGE		VDC	1.32	1.48	2.2	2.34	3.6	4.8
CURRENT per PHASE		A	4	4	4	6	6	6
RESISTANCE per PHASE		Ohm	0.33	0.37	0.55	0.39	0.6	0.8
INDUCTANCE per PHASE		mH	0.75	1.1	2.7	3	6.5	8.68
HOLDING TORQUE		N·m	0.88	1.28	2.4	4.5	8.5	12
ROTOR INERTIA		g·cm <sup>2</sup>	240	490	690	1800	3600	5400
WEIGHTS		g	280	350	500	500	720	1150
LENGTH(L)		mm	47	56	85	78	117	155
PERMISSIBLE OVERHUNG LOAD (DISTANCE FROM END OF SHAFT)	3mm	N	70	70	270	270	270	52
	8mm		87	87	300	300	300	65
	13mm		114	114	350	350	350	85
	18mm		165	165	400	400	400	400
PERMISSIBLE THRUST LOAD		N	Lower than motor weight					
INSULATION RESISTANCE		Mohm	100 MIN.(at 500VDC)					
INSULATION CLASS		-	CLASS B(130℃)					
OPERATING TEMPERATURE		℃	0 to 55					

Ezi-SERVOII-PE-ALL-60 series



Ezi-SERVOII-PE-ALL-86 series



◆ M Type



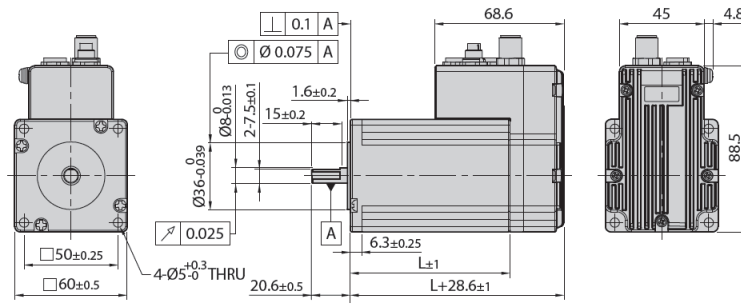
◆ R Type



◆ R Type



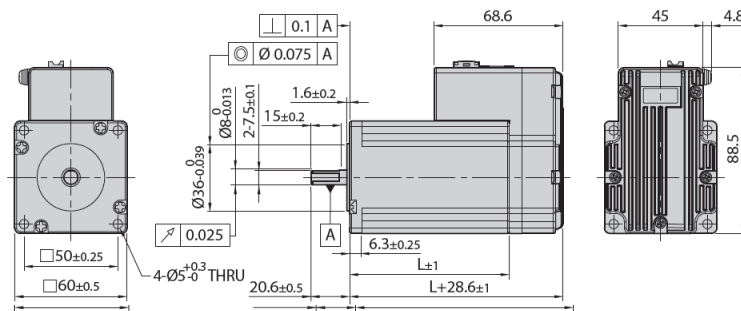
### ◆ M Type



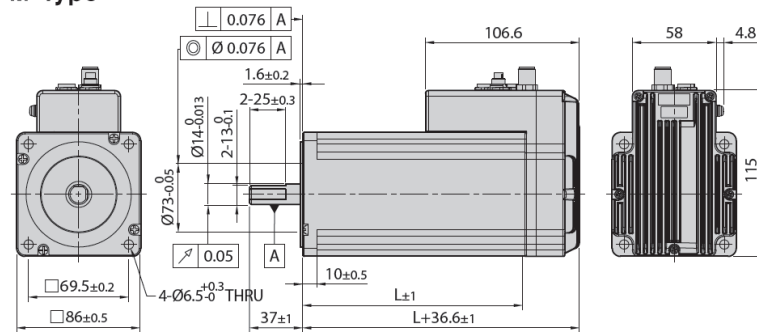
## 60<sub>mm</sub>

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

### ◆ R Type



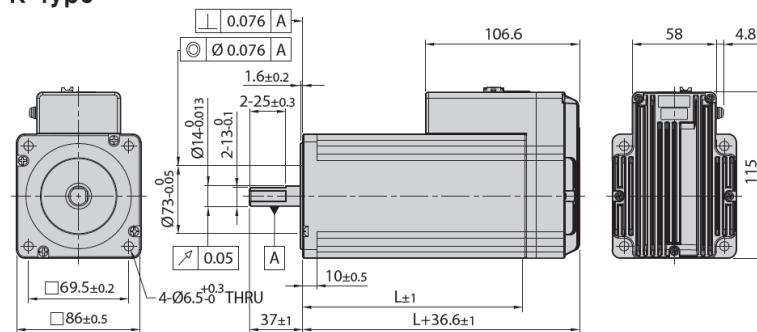
### ◆ M Type



## 86<sub>mm</sub>

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

### ◆ R Type

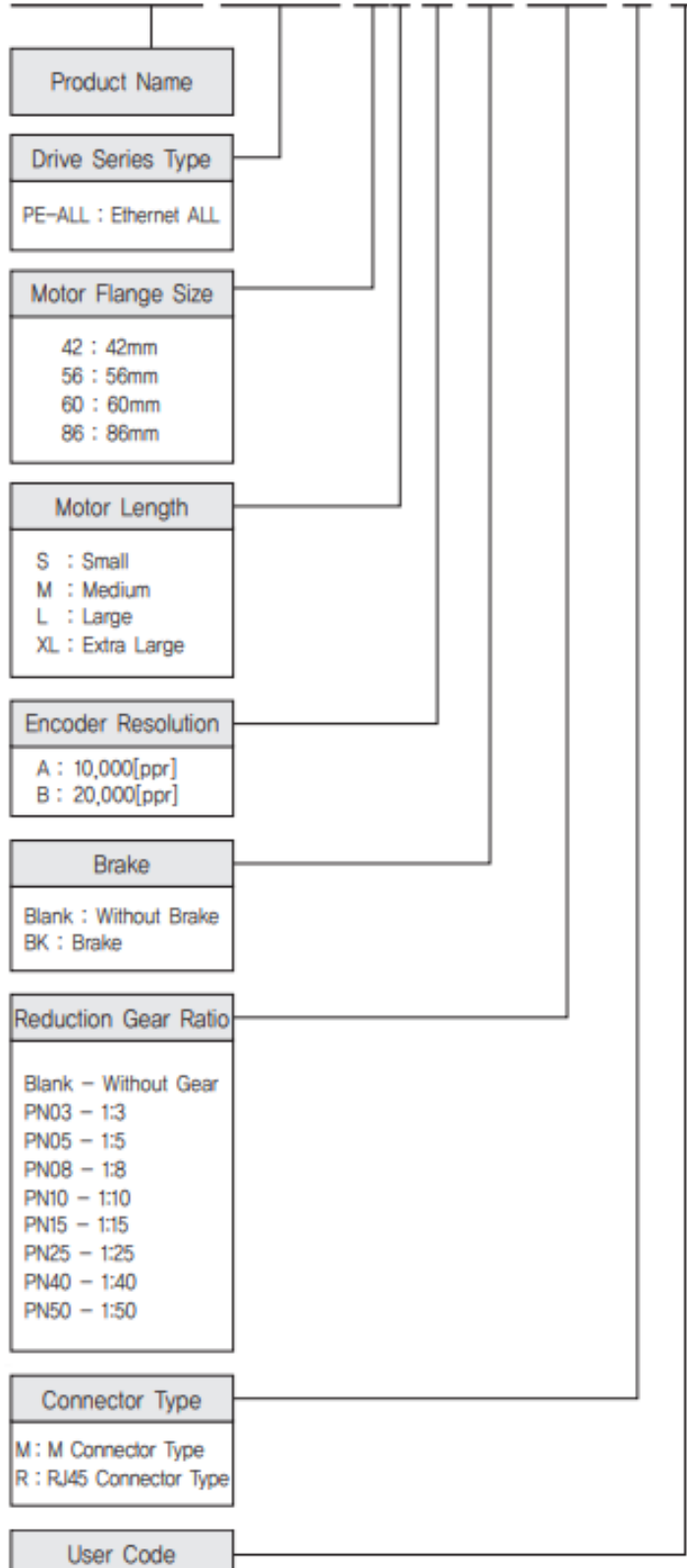


## 4 . Configuration

### 4 - 1 . Combination of motor and drive

#### 1) Ezi-SERVOII Plus-E ALL Part Numbering

**Ezi-SERVOII-PE-ALL-56L-A-BK-PN05-M-□**



## 2) Ezi-SERVOⅡ Plus-E ALL Combination(Standard)

Unit Name	Motor Name	Drive Name
Ezi-SERVOⅡ-PE-ALL-42M-x-y	Motor & Drive All-in-one Type	
Ezi-SERVOⅡ-PE-ALL-42L-x-y		
Ezi-SERVOⅡ-PE-ALL-42XL-x-y		
Ezi-SERVOⅡ-PE-ALL-56S-x-y		
Ezi-SERVOⅡ-PE-ALL-56M-x-y		
Ezi-SERVOⅡ-PE-ALL-56L-x-y		
Ezi-SERVOⅡ-PE-ALL-60S-x-y		
Ezi-SERVOⅡ-PE-ALL-60M-x-y		
Ezi-SERVOⅡ-PE-ALL-60L-x-y		
Ezi-SERVOⅡ-PE-ALL-86M-x-y		
Ezi-SERVOⅡ-PE-ALL-86L-x-y		
Ezi-SERVOⅡ-PE-ALL-86XL-x-y		

- x : A or B (Encoder Resolution)
- y : R or M (Connector type)

## 3) Ezi-SERVOⅡ Plus-E ALL Combination(with Brake)

Unit Name	Motor Name	Drive Name
Ezi-SERVOⅡ-PE-ALL-42M-x-BK-y	Motor & Drive All-in-one Type	
Ezi-SERVOⅡ-PE-ALL-42L-x-BK-y		
Ezi-SERVOⅡ-PE-ALL-42XL-x-BK-y		
Ezi-SERVOⅡ-PE-ALL-56S-x-BK-y		
Ezi-SERVOⅡ-PE-ALL-56M-x-BK-y		
Ezi-SERVOⅡ-PE-ALL-56L-x-BK-y		
Ezi-SERVOⅡ-PE-ALL-60S-x-BK-y		
Ezi-SERVOⅡ-PE-ALL-60M-x-BK-y		
Ezi-SERVOⅡ-PE-ALL-60L-x-BK-y		
Ezi-SERVOⅡ-PE-ALL-86M-x-BK-y		
Ezi-SERVOⅡ-PE-ALL-86L-x-BK-y		
Ezi-SERVOⅡ-PE-ALL-86XL-x-BK-y		

- x : A or B (Encoder Resolution)
- y : R or M (Connector type)

## ● Brake Specification

Unit Name	Motor Name	Electric Brake					Motor Unit Weight [g]	Permitted Overhung Load [N]				Permitted Thrust Load[N]
		Type	Voltage Input (V)	Rated Current (A)	Power Consumption (W)	Static Friction Torque (N·m)		Length from Motor Point [mm]				
								3	8	13	18	
Ezi-SERVOII -PE-ALL-42M-x-BK-y	Motor & Drive All-in-one Type	Non-excitation Type	24 VDC	0.2	5	0.2	570	22	26	33	46	Must be Lower than Unit's Weight
Ezi-SERVOII -PE-ALL-42L-x-BK-y							640					
Ezi-SERVOII -PE-ALL-42XL-x-BK-y							770					
Ezi-SERVOII -PE-ALL-56S-x-BK-y				0.27	6.6	0.7	1030	52	65	85	123	
Ezi-SERVOII -PE-ALL-56M-x-BK-y							1190					
Ezi-SERVOII -PE-ALL-56L-x-BK-y							1630					
Ezi-SERVOII -PE-ALL-60S-x-BK-y				0.27	6.6	0.7	1150	70	87	114	165	
Ezi-SERVOII -PE-ALL-60M-x-BK-y							1350					
Ezi-SERVOII -PE-ALL-60L-x-BK-y							1960					
Ezi-SERVOII -PE-ALL-86M-x-BK-y				0.54	13	4	3600	270	300	350	400	
Ezi-SERVOII -PE-ALL-86L-x-BK-y							5100					
Ezi-SERVOII -PE-ALL-86XL-x-BK-y							6600					

- x : A or B (Encoder Resolution)
- y : R or M (Connector type)

The electromagnetic brake is used to maintain the position when the power is turned off and cannot be used for braking.

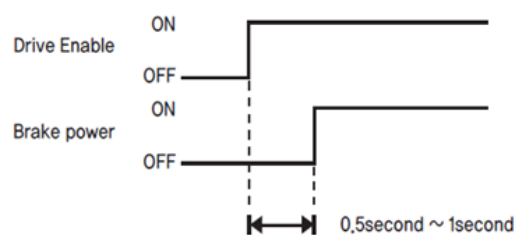
The weight is the weight of the unit combined with the motor and electromagnetic brake.

Motor specifications and torque characteristic are the same as standard motors.

No external power supply (24 VDC) is required when mounting the electronic brake on an 86 mm motor drive.

## ● Brake Operation Timing Chart

- The drive automatically controls the brakes.
- Refer to the Timing Chart below to control the brake from the host controller without using the drive control.
- Otherwise, the drive may malfunction or the load may drop.
- Also, do not operate the brake while the motor is rotating as it may cause malfunction.



#### 4) Ezi-SERVOⅡ Plus-E ALL Combination(with Gearbox)

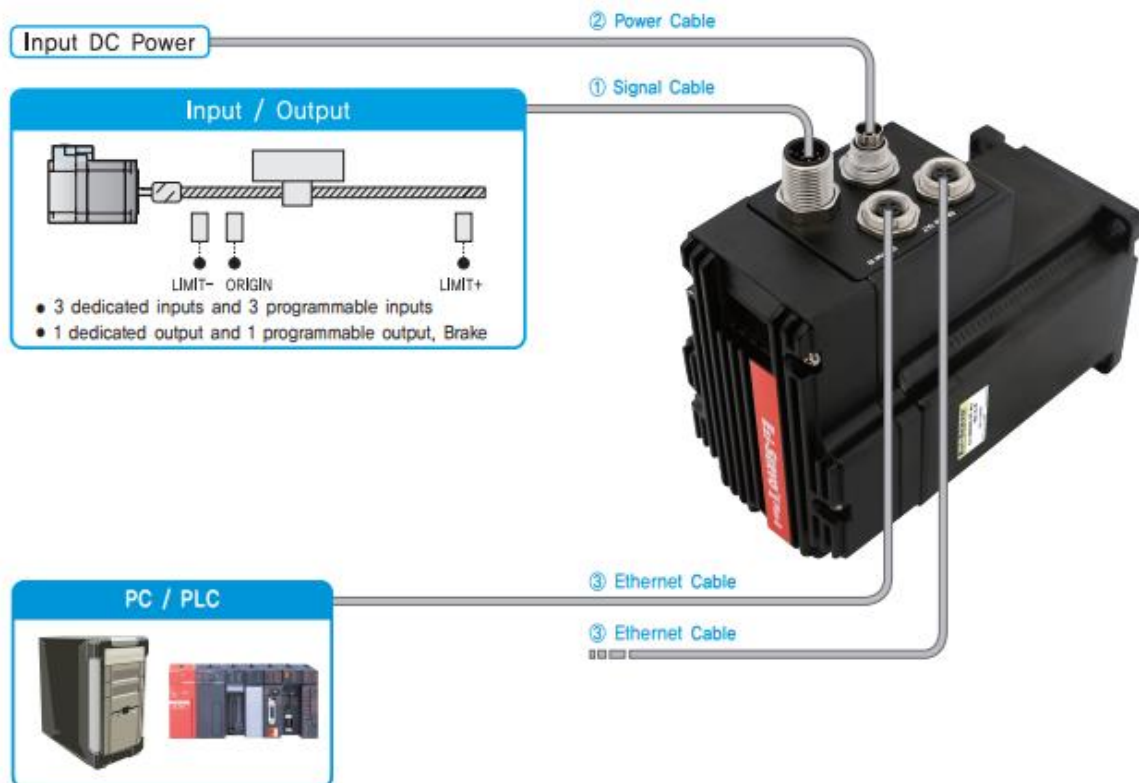
Unit Name	Motor Name	Drive Name
Ezi-SERVOⅡ-PE-ALL-42M-x-PGz-y	Motor & Drive All-in-one Type	
Ezi-SERVOⅡ-PE-ALL-42L-x-PGz-y		
Ezi-SERVOⅡ-PE-ALL-42XL-x-PGz-y		
Ezi-SERVOⅡ-PE-ALL-56S-x-PGz-y		
Ezi-SERVOⅡ-PE-ALL-56M-x-PGz-y		
Ezi-SERVOⅡ-PE-ALL-56L-x-PGz-y		
Ezi-SERVOⅡ-PE-ALL-60S-x-PGz-y		
Ezi-SERVOⅡ-PE-ALL-60M-x-PGz-y		
Ezi-SERVOⅡ-PE-ALL-60L-x-PGz-y		
Ezi-SERVOⅡ-PE-ALL-86M-x-PGz-y		
Ezi-SERVOⅡ-PE-ALL-86L-x-PGz-y		
Ezi-SERVOⅡ-PE-ALL-86XL-x-PGz-y		

- x : A or B (Encoder Resolution)
- y : R or M (Connector type)
- z (Gear Ratio): 3, 5, 8, 10, 15, 25, 40, 50

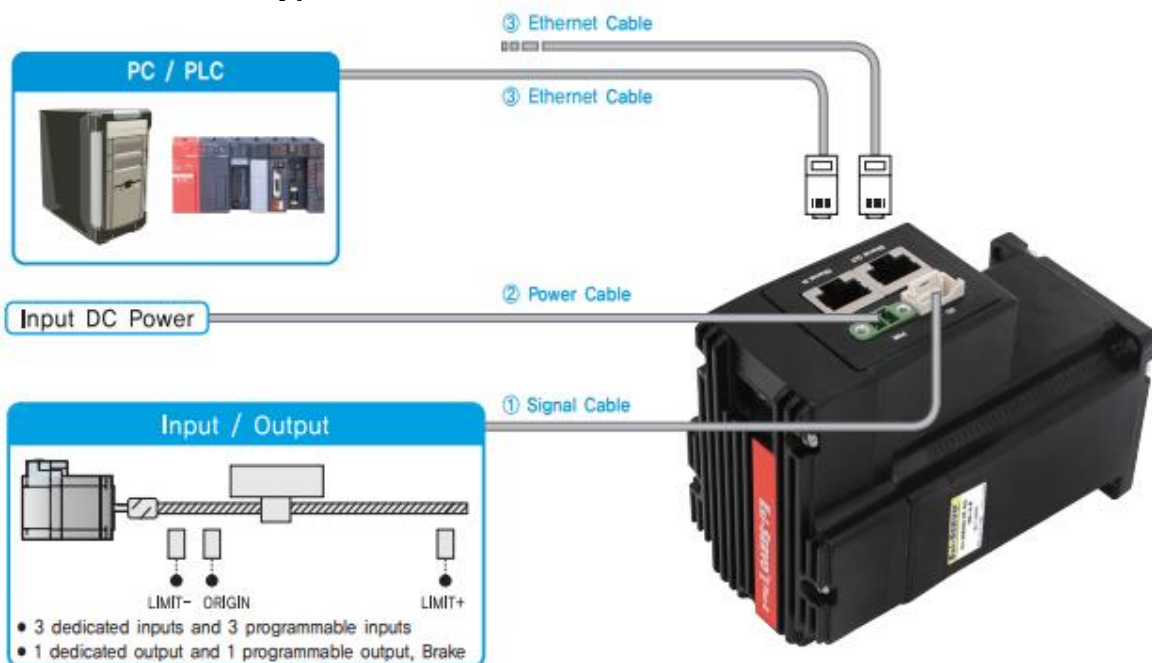


## 4 - 2 . System Configuration

### 1) M connector type

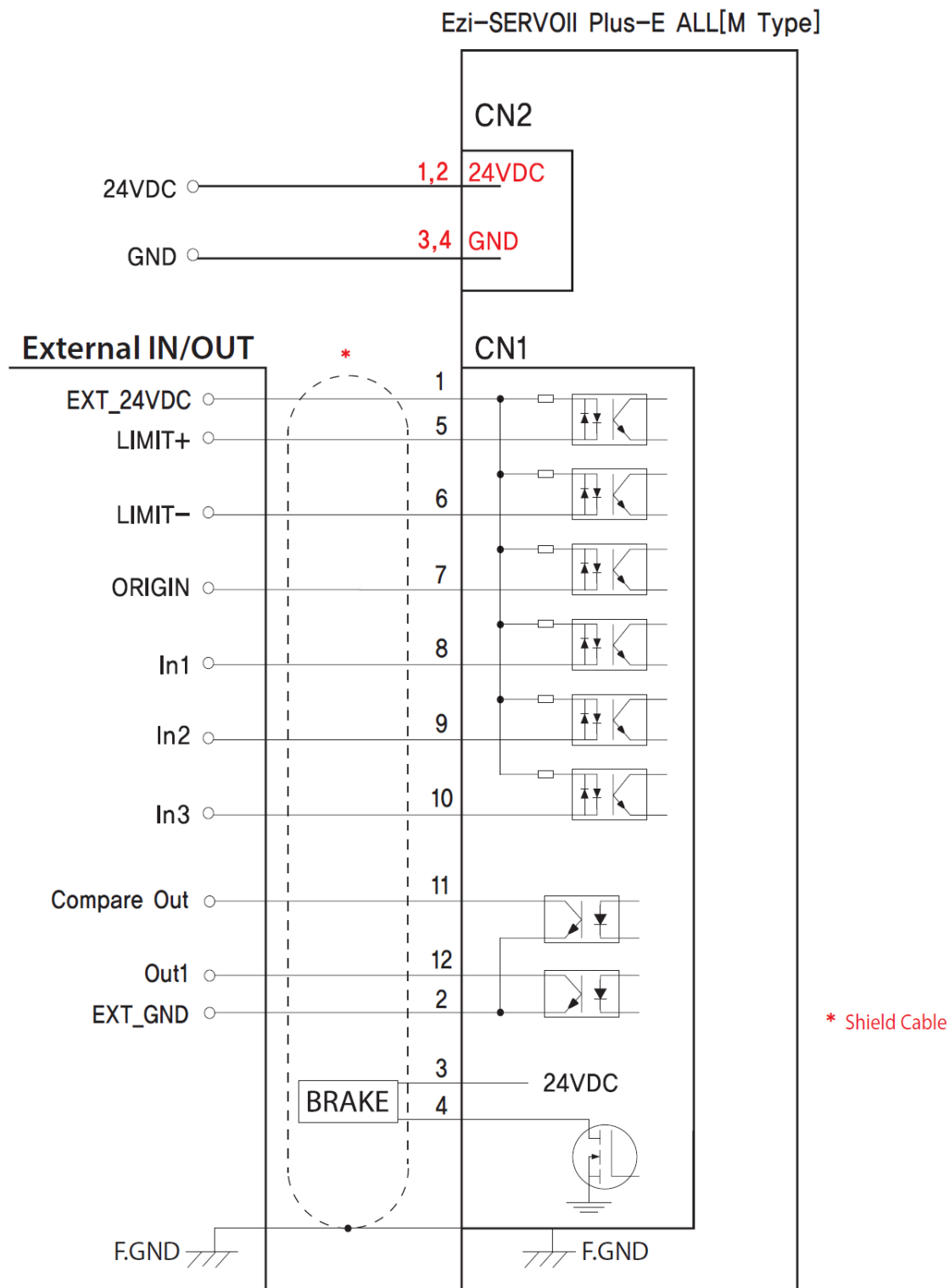


### 2) R connector type



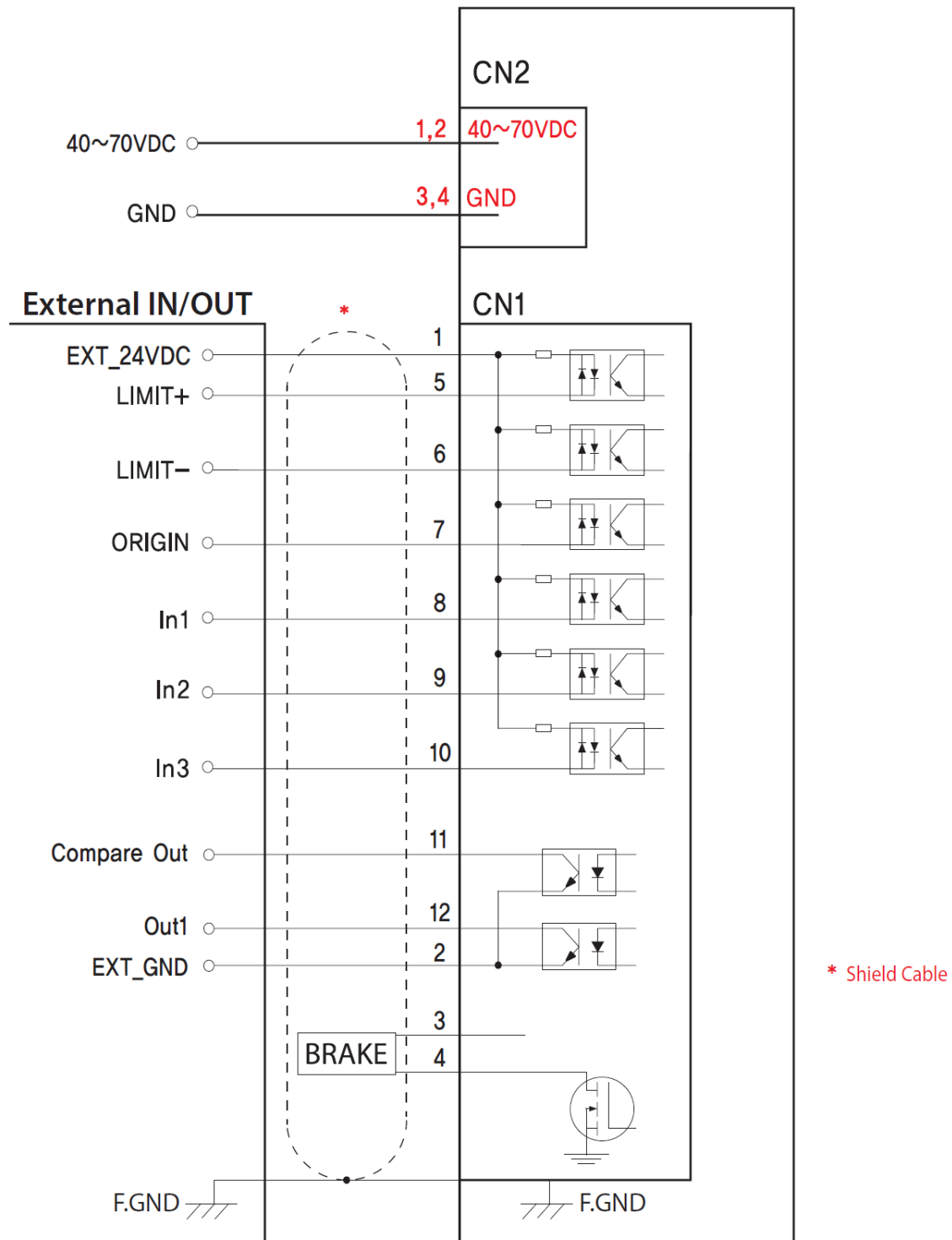
## 4 - 3 . External Wiring Diagram

### 1) M connector type



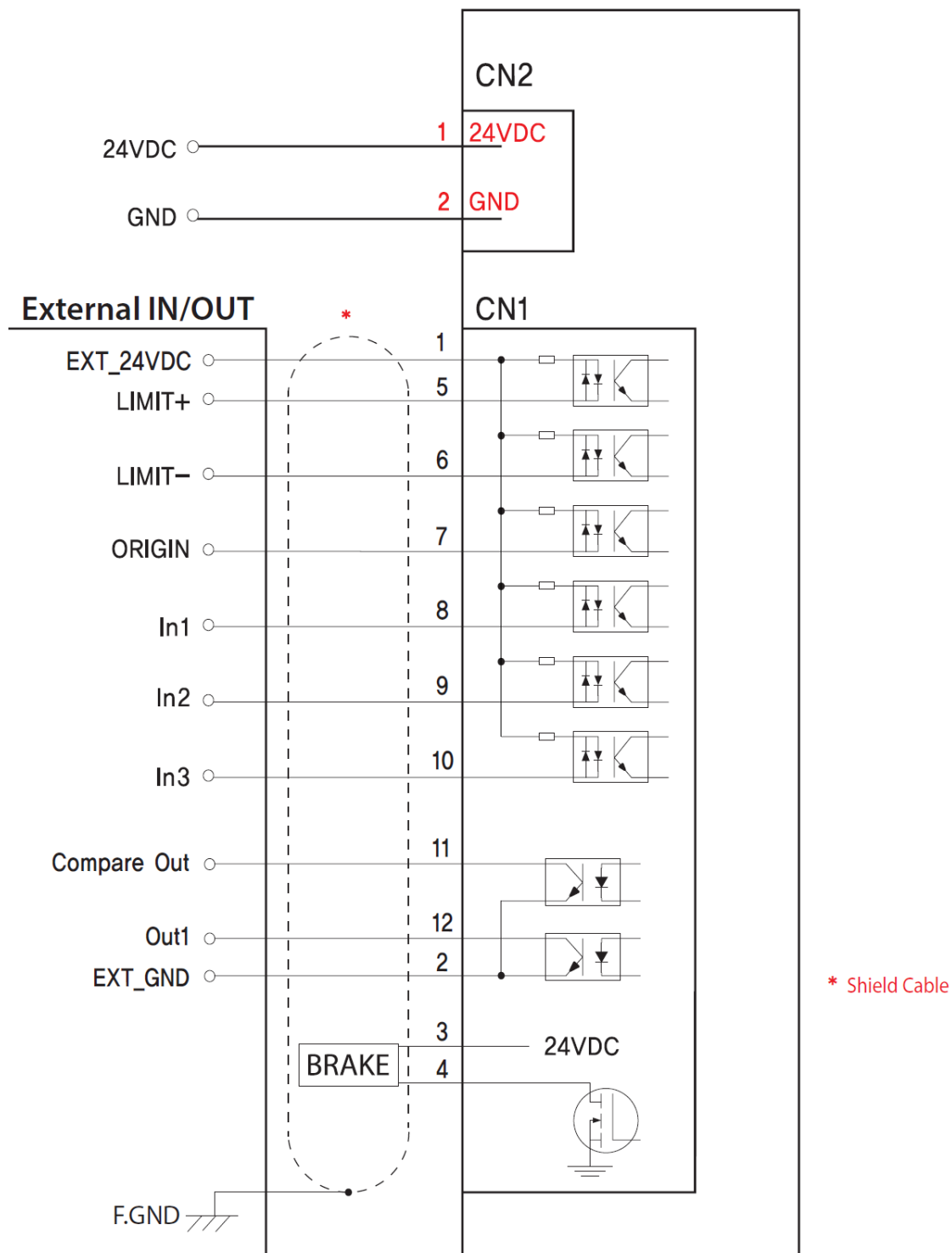
## 2) M connector type(86mm)

Ezi-SERVOII Plus-E ALL[M Type 86mm]



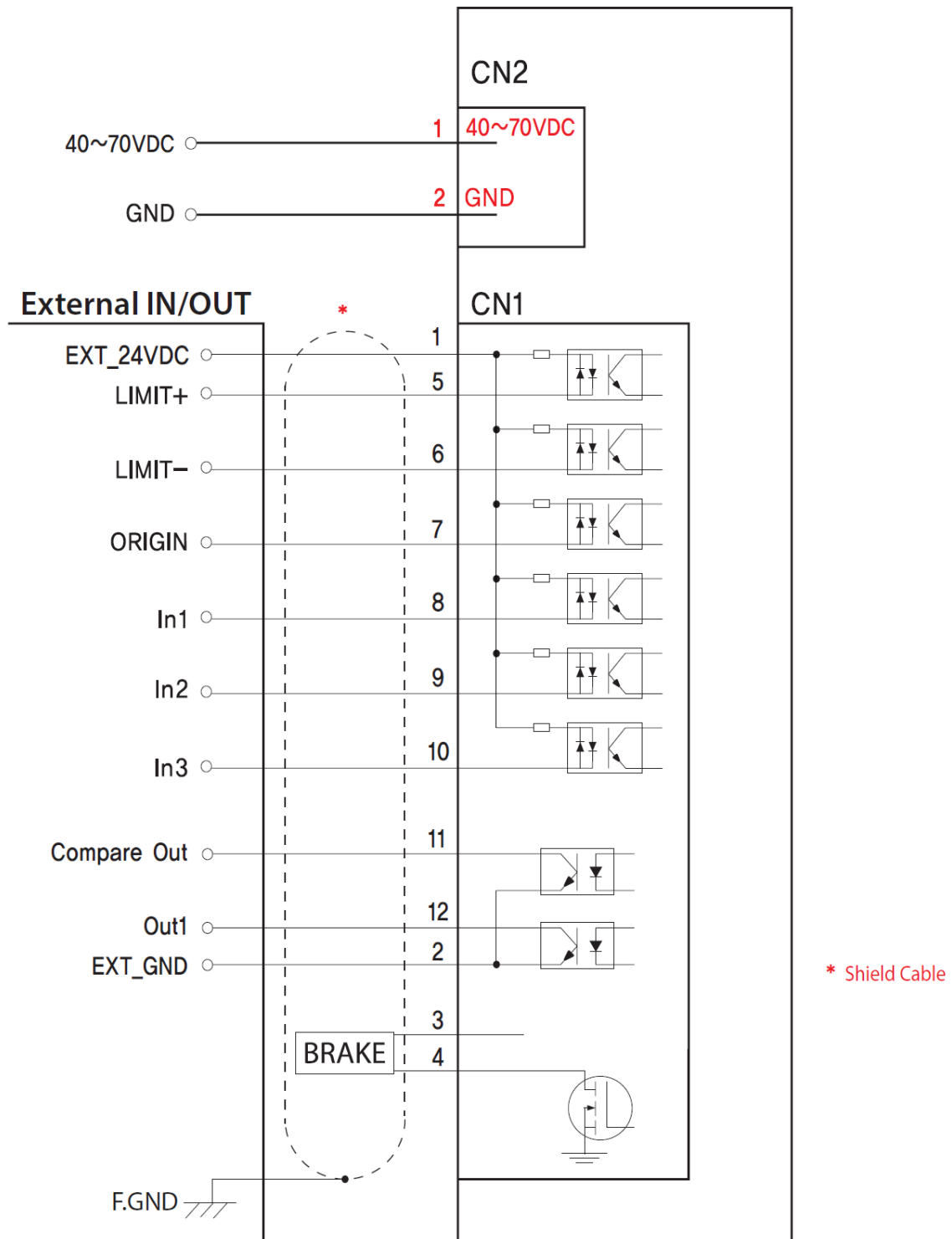
## 3) R connector type

Ezi-SERVOII Plus-E ALL[R Type]



## 4) R connector type(86mm)

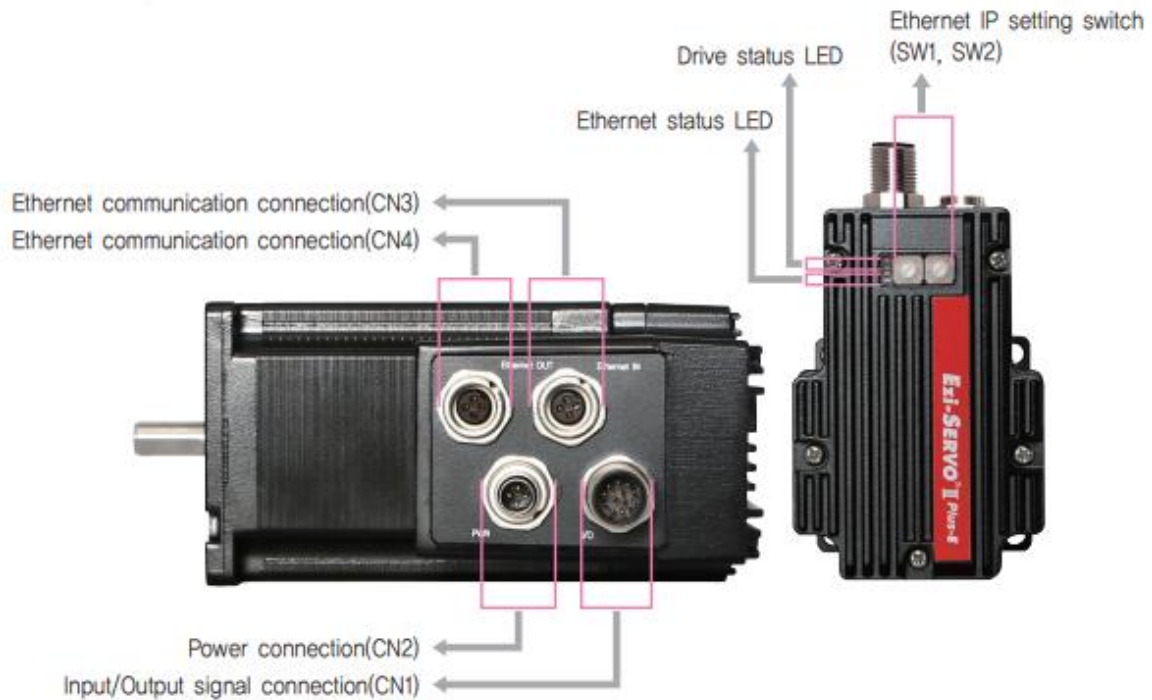
Ezi-SERVOII Plus-E ALL[R Type 86mm]



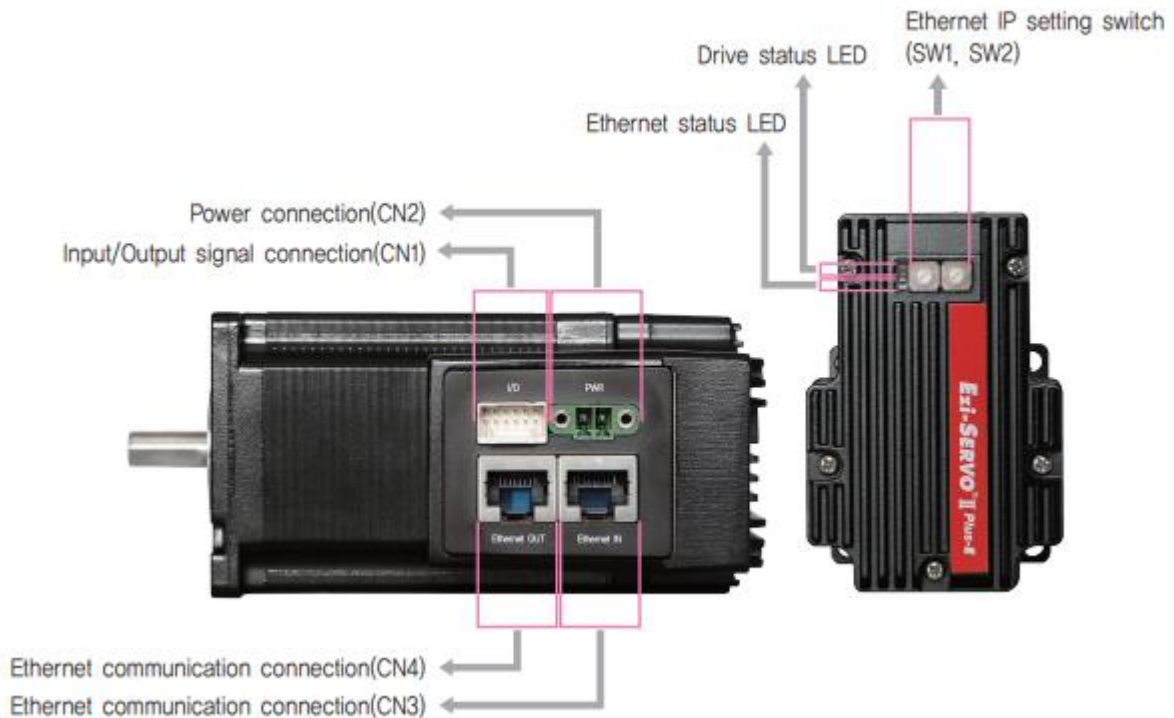
## 5 . Part Name and Function Setting

### 5 - 1 . Part Name






#### 1) M connector type



#### 2) R connector type



## 5 - 2 . Drive Status LED

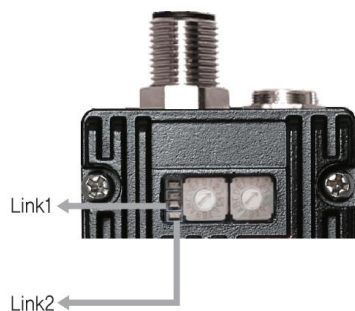
Status	LED		Description
Disable	ST1 ST2		ST1 Blinking, ST2 Off
Enable	ST1 ST2		ST1 On, ST2 Off
In Motion	ST1 ST2		ST1 On, ST2 On
In-position deviation	ST1 ST2		ST1 and ST2 Blink alternately
Alarm	ST1 ST2		Repeat ST2 blinking as many as alarm number (Blinks when Alarm No. 15 or less occurs)



## 5 - 3 . Ethernet Status LED

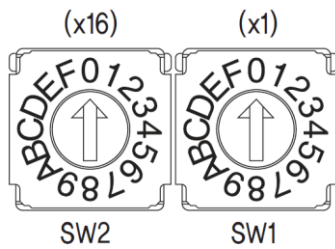
1) LED showing Ethernet Link Status.

Name	Color	Status	Description
Link1/ Link2	Green	OFF	Link Deactivated
		ON	Link Activated



## 5 - 4 . IP Address Selection Switch (SW1, SW2)

- The address can be set from 1 to 254. Set the IP so that it does not overlap.
  - "0" and "255" cannot be used for the IP setting. Be sure to set it to "1 ~ 254".
  - The default gateway is set at 192.168.0.1. If you set the switch to "1", change the gateway. Refer to [Manual-User Program 2-4] for how to change. If the IP Address and Gateway are the same, Alarm (201 or 202) will occur.
  - It is recommended to use IP setting between "2 ~ 254". (Factory default SW1: 2, SW2: 0)
- The default setting is "192.168.0.xxx" and xxx is set by the switch.



Ex.) In case of SW2 : 6, SW1 : 9

$$6 * 16 + 9 * 1 = 105$$

IP address : 192.168.0.105

3) If set to switch as 255(FF), IP Address is setting automatically.

Because it uses DHCP, IP address is set automatically only when using router.

(Connect the Ethernet to Ethernet IN connector)

- When connecting directly to the controller (PC/PLC), it needs to be sure to set the IP address with switch.
- Set the IP address automatically only when you do not use the default IP address. If IP is set automatically, connect the user program (GUI) and save the IP address. And turn off the power and set the last number of IP with switch.
- When the switch is set to 0, the IP setting becomes the initial (default) value.  
In the initial state, communication is not connected.
- Basic IP Address : 192.168.0.xxx, Subnet Mask : 255.255.255.0, Gateway : 192.168.0.1

## 5 - 5 . Power Connection Connector(CN2)

1) M connector type

No.	Function	Input/Output	
1	24VDC	Input	
2	24VDC	Input	
3	GND	Input	
4	GND	Input	

2) M connector type(86mm)

No.	Function	Input/Output	
1	40~70VDC	Input	
2	40~70VDC	Input	
3	GND	Input	
4	GND	Input	

3) R connector type

No.	Function	Input/Output	
1	24VDC	Input	
2	GND	Input	

4) R connector type(86mm)

No.	Function	Input/Output	
1	40~70VDC	Input	
2	GND	Input	



## 5 - 6 . I/O signal connector(CN1)

No.	Function	I/O
1	EXT_24VDC	Input
2	EXT_GND	Input
3	+24V (Output) for Brake	Output
4	Control signal(Output) for Brake	Output
5	LIMIT+ (Dedicated Input)	Input
6	LIMIT- (Dedicated Input)	Input
7	ORIGIN (Dedicated Input)	Input
8	Digital In1 (Programmable Input)	Input
9	Digital In2 (Programmable Input)	Input
10	Digital In3 (Programmable Input)	Input
11	Compare Out (Dedicated Output)	Output
12	Digital Out1 (Programmable Output)	Output

◆ M Type

◆ R Type

The programmable input/output pin is set by using the user program (GUI) or DLL library.

**Caution**

**Connect the Brake (current consumption is under 600[mA]) for pin4.**  
**Refer to 6.4 Output signal for the Brake that is over 600[mA].**

## 5 - 7 . Ethernet Connector

### 1) M connector type

No.	Function
1	TD+
2	TD-
3	RD+
4	RD-
Connection hood	F.GND

### 2) R connector type

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



## 6 . Control I/O Signal

### 6 - 1 . Signal Wiring

All control I/O signals use connector CN1 as specified below.

1) **Input** : 「Limit+」, 「Limit-」, 「Origin」 signals are fixed to CN1 No. 1,2,3.

Other signals as like 'Reset' and others are assigned to IN1~IN3 terminal blocks.

3 dedicated input + 3 programmable input = total 6 input pins

CN1 No.	Signal Name	Function
5	Limit+	Positive Limit sensor Signal
6	Limit-	Negative Limit sensor Signal
7	Origin	Origin sensor Signal
8	IN1	Clear Pos Position Table A0 ~ Position Table A7 (PT A0~PT A7) Position Table start execution (PT Start) Soft Stop(Stop)
9	IN2	Jog+, Jog- Alarm Reset, Servo ON Pause, Origin Search, Teaching Emergency Stop(E-Stop)
10	IN3	Jump Position Table input 0 ~ Jump Position Table input 2 (JPT IN 0~ JPT IN 2) Jump Position Table start (JPT Start) User input 0 ~ User input 8 (User IN 0 ~ User IN 8) Jog0~Jog2*

2) **Output** : 「COMP」 signal is fixed on each assigned No.

Other signals like In-position are assigned to OUT1

1 dedicated output + 1 programmable output = total 2 output pins

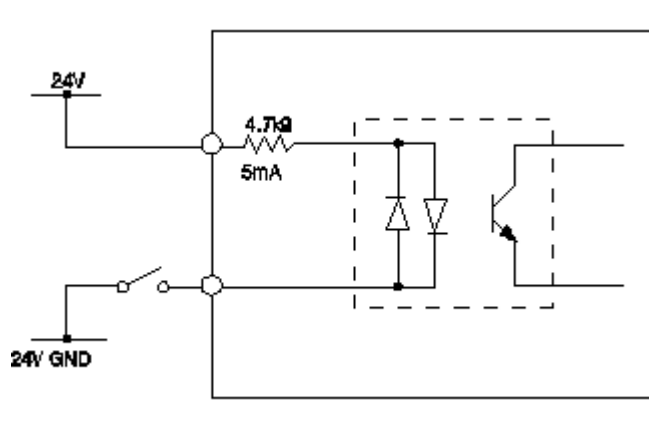
CN1 No.	Signal Name	Function
11	COMP	Dedicated output signal(Compare Out)
12	OUT1	InPosition, Alarm, Moving Acc/Dec ACK, END OriginSearchOK ServoReady Brake Position Table output 0 ~ Position Table output 2 (PT OUT 0 ~ PT OUT 2) User Output

## 6 - 2 . Connection Circuit

All drive I/O signals are insulated by a photo coupler. The signals display the internal photo coupler status - [ON: Conduction] and [OFF: Non- Conduction], not the signal voltage level.

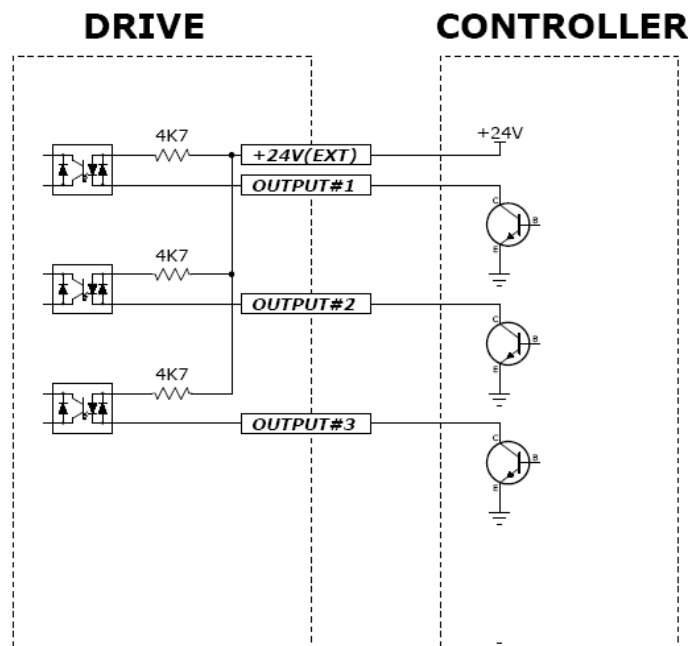
### 1) Input Circuit

Input circuit power of  $DC24V \pm 10\%$  (consumed current : about 5mA/circuit) should be separately prepared.



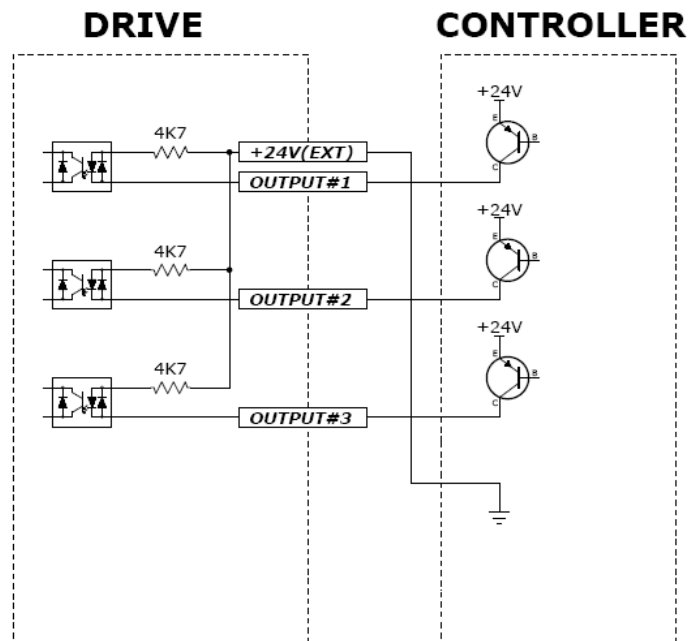
- **Connect NPN type Input signal**

Connect the '+24V external' signal of drive to '+24V' of Controller.



### ● Connect PNP type Input signal

Connect the '+24V external' signal of drive to 'GND' of Controller.

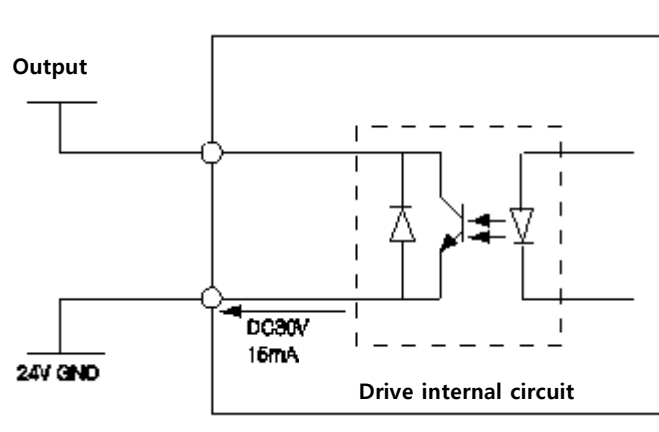


### 2) Output Circuit

Output circuit power should be separately prepared. This may share input circuit power. In this case, working power capacity should add output power capacity to input power capacity.

Applied voltage and power capacity in the control output port are as follows.

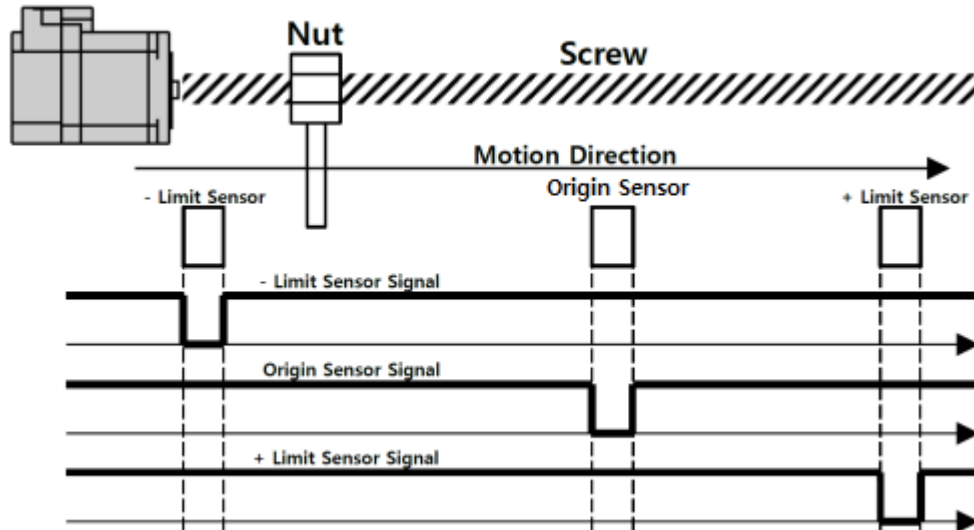
- Applied voltage  $\leq 30V$
- Electrified current  $\leq 15mA$



## 6 - 3 . Input Signal

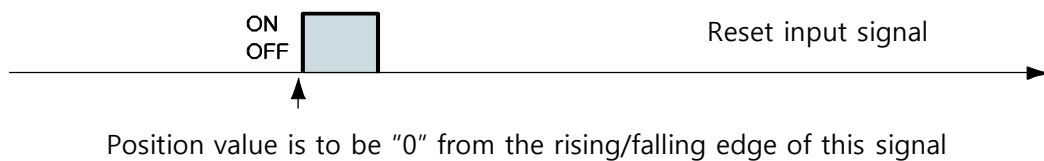
### 1) Limit Sensor and Origin Sensor

Limit sensor and origin sensor are assigned to LIMIT+, LIMIT- , and ORIGIN pin in the CN1 connector respectively. LIMIT+ and LIMIT- sensors are used to limit the motion of each axis to prevent mechanical collision. Origin sensor is to set the origin of equipment



### 2) Clear Pos

This input signal sets the command position and the actual position to 0 in relation to motion position control. The reset signal pulse scale is 10ms or more.



### 3) Position Table A0 ~A7 (PT A0~A7) Input

The position table supports the machine so that its motion can be controlled by I/O signals of central controller. It can directly transmit commands such as position table number, start/stop and origin return to the machine through the PLC. Also, the user can check output signals such as in-position, completion of origin return and Servo ready through the PLC.

「Position Table A0~A7」 Inputs are total 8 bits of input signal. It is used to set 256 position table numbers. There are two application methods as follows

- 1) To set position table number (0~255) to be set by 'PT start' input signal.
- 2) To set position table number (0~255) to save current position values by 'Teaching' input signal.

By using PT A0~A7 signals, the position table address can be set from 0 to 255 with a binary number. A0 is least significant bit and A7 is most significant bit. The following table shows how to assign position table number.

\*1. Save signal cabling: If 'PT A0~A7'signal is not connected when motioning by 'PT Start' signal, the position table number will be '0'.

A7	A6	A5 ~ A3	A2	A1	A0	PT No.
0	0	0	0	0	0	0
0	0	0	0	0	1	1
0	0	0	0	1	0	2
0	0	0	0	1	1	3
0	0	0	1	0	0	4
... ..						
1	1	1	1	1	0	254
1	1	1	1	1	1	255

\*2. 'PT A5/UserIN 6' 'PT A6/UserIN 7' 'PT A7/UserIN 8' signal setting :

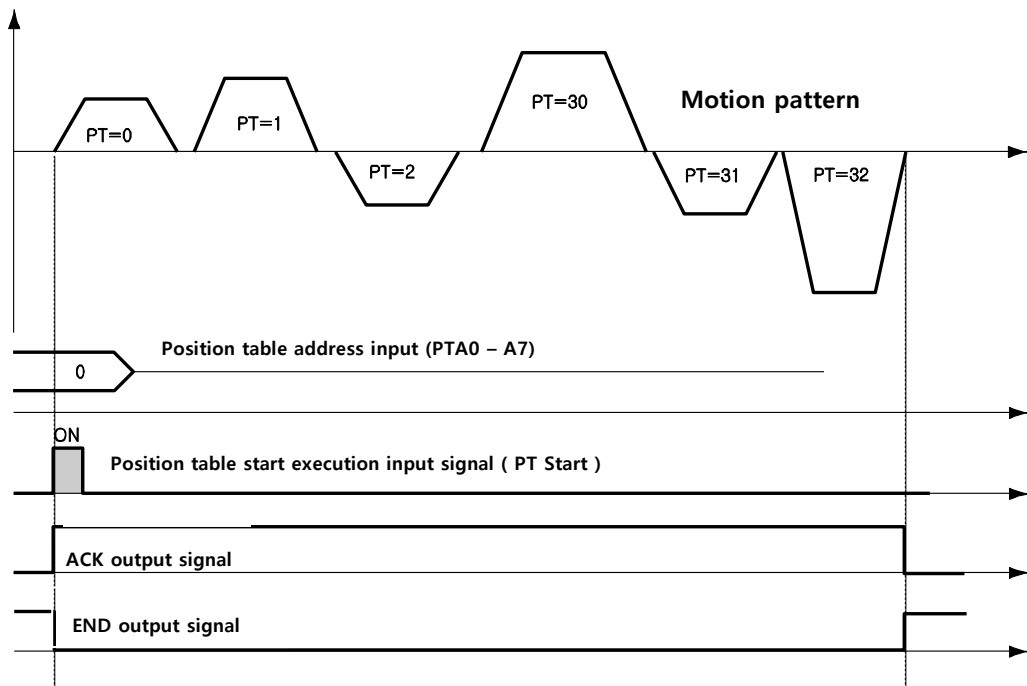
This signal can be used as 'PT A5~A7', and also can be used as 'User IN6~IN8'signal when the input signal 'User IN0~IN5'is not enough.

#### 4) Position Table start (PT Start) Input

By using PT A0~A7 signals, set and input the running PT start number. Then the motion pattern corresponds to the PT No. will be executed.

Following example shows that total 6 motion patterns are in order to execute from No.0 to No.32 and then stopped.

- 1) All of PT A0~A7 is set to '0' and PT number is set to '0'.
- 2) Set PT Start signal to [ON], and PT No.0 motion pattern will be executed.
- 3) When the motion pattern is started by PT, ACK signal and END signal are displayed to [ON] at CN1 output port as illustrated below. The signal is kept until one motion pattern loop is stopped. After all motions are stopped, the output signal level is set to [OFF].
- 4) PT Start signal is **edge trigger** type and pulse scale is 10ms or more.

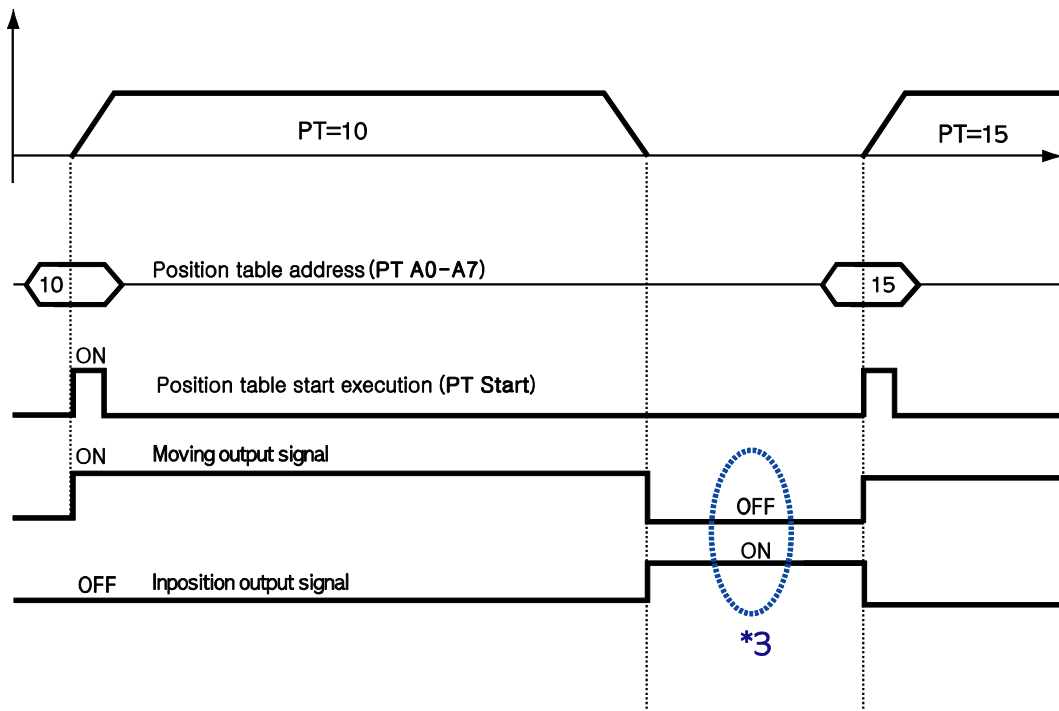


\*1. Timing of signals : PT A0~A7 signals must be set before(50msec) PT Start signal set to [ON].

\*2. If the PT A0~A7 signals are not used and the PT Start signal is [ON], the PT No. 0 will be executed.

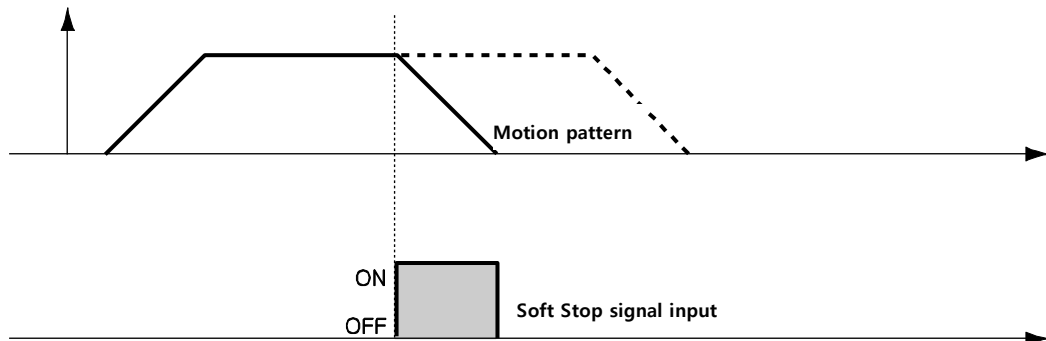
\*3. When using the 'PT Start' command continuously, check the motion operation status ('Moving' signal and 'Inposition' signal) before executing the next 'PT Start' command.





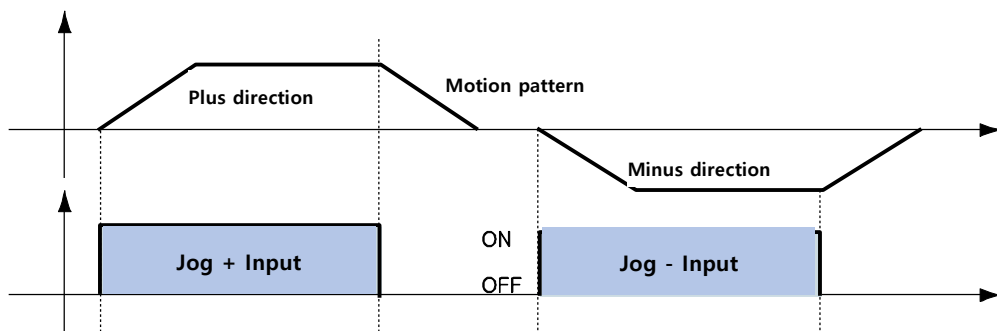
### 5) Stop Input

Soft stop input signal is to stop motion patterns under operation. The deceleration condition until they stop complies with the deceleration time value and the start speed value set previously. The soft stop signal is active in ON level and pulse scale is 10ms or more.



### 6) Jog+ and Jog- Input

When Jog+ or Jog- signal is ON, the motor rotates clockwise or counterclockwise until it reaches the hardware limit or the software limit. Jog motion pattern is subject to jog related parameters (No.7: start speed, No.6: speed, No.8: Acc Dec time).




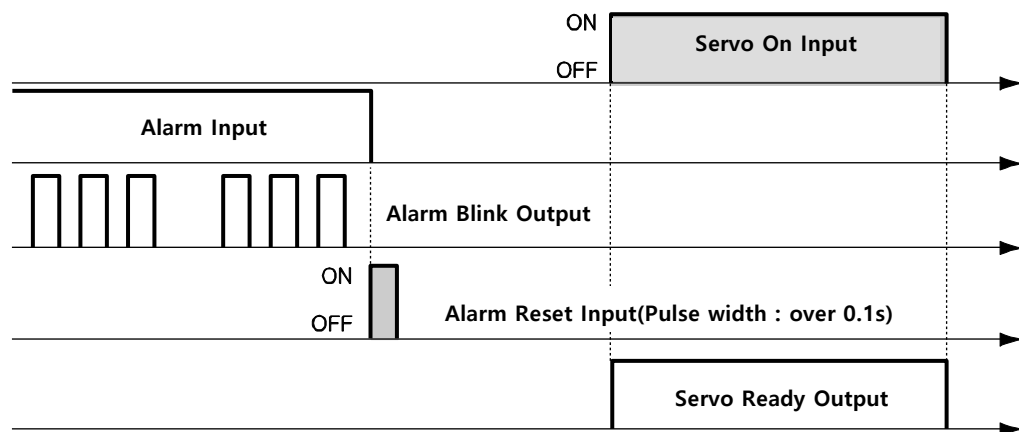
## 7) Servo ON and Alarm Reset Input

When the protective function of drive executes, alarm output is released. When AlarmReset input is set to ON, alarm output and alarm blink output are released. Before releasing alarm output, the user must remove any cause of alarm operating.

When Servo ON/OFF signal is set to OFF, the drive stops supplying the current to the motor and so the user can directly adjust the output position. When Servo ON/OFF signal is set to ON, the drive restarts to supply the current to the motor and its torque is recovered. Before operating the motor, the user must set it to ON.

When the drive is set to Servo ON, CN1 connector's <ServoReady > output signal is set to ON.

 <b>Caution</b>	<b>If the 'Servo ON' signal is assigned to input pin, ServoON command from GUI or DLL library will not executed.</b>
--	--



\*1. In the state of 'SERVO On' by input signal, No. 0: Pulse per Revolution of 'Parameter List' item cannot be changed.

\*2. If 'SERVO ON' is set in the input signal, the Step ON command is not executed in the user program (GUI). Likewise, the 'FAS\_ServoEnable' command in the DLL program will not run.

\*3. After 'ServoON' is executed, the 'Command Position' value will be changed as same as 'Actual Position' value to remove 'Position Error'.

### 8) Pause Input

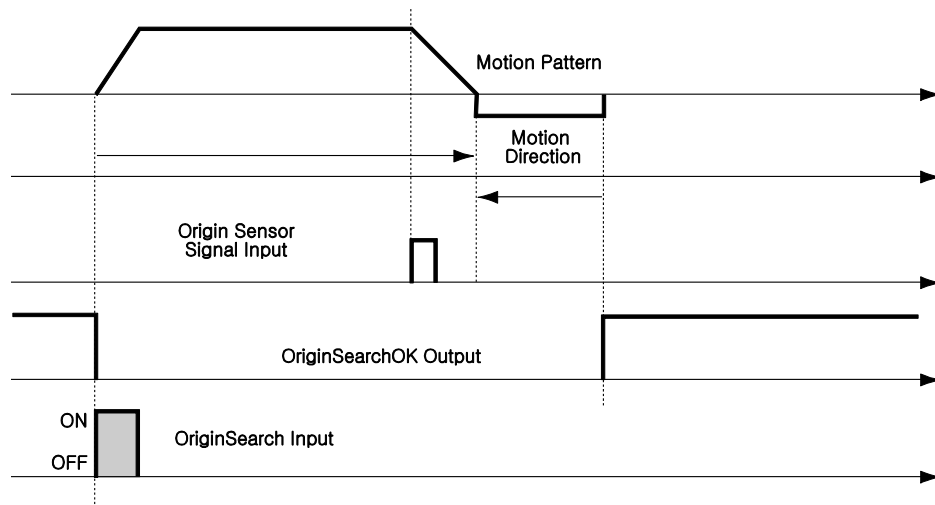
When the pause signal is [ON], the motion in operation stops.

To start the motion again, set the pause signal to [OFF].

The pulse width of the pause signal is more than 10ms.

### 9) Origin SearchInput

When 'Origin Search' signal is set to ON (10ms or more), it starts to search the origin position according to selected conditions. The conditions are subject to parameters such as No.20:Org Method, No.17:Org Speed, No.18:Org Search Speed, No.19:Org AccDec Time, No.21:Org Dir. (For more information, refer to '11. Parameter'.) When the origin search command is completed, 'Origin Search OK' signal is set to ON to CN1 connector's output port.

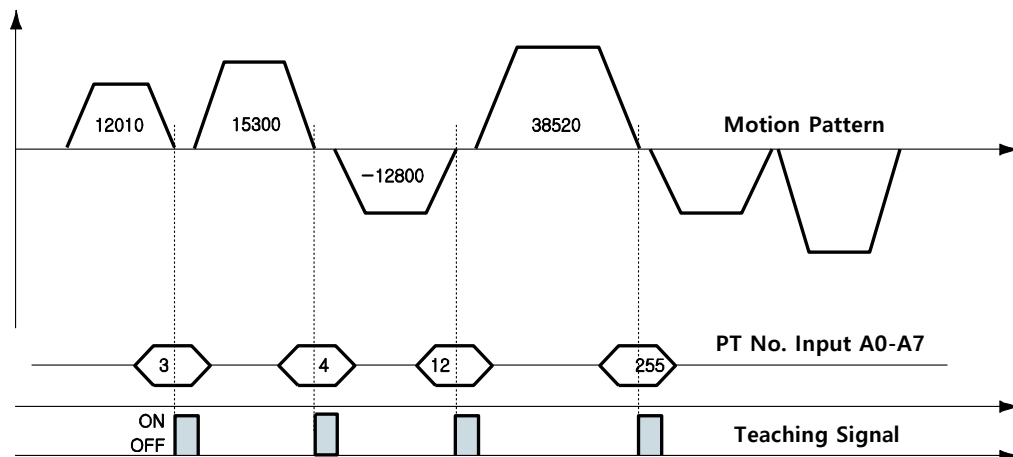


## 10) Teaching Input

[Teaching] signal functions that the position value [pulse] being working can be automatically inputted into a 'position' value of a specific position table. If it is hard to calculate the exact moving distance (position value) of specific motion mechanically, the user can measure and set the distance (position value) easily by using this signal.

- 1) By using User Program (GUI), set a command type of corresponding PT number among 4 kinds of **absolute moving commands (Absolute Move)**.
- 2) By using input signal (PT A0~A7), select corresponding PT number.
- 3) When Teaching signal is set to ON, the position value [pulse] is saved to the position value of corresponding PT. At this time, it becomes the absolute position value.
- 4) Teaching signal pulse scale is 10ms or more.

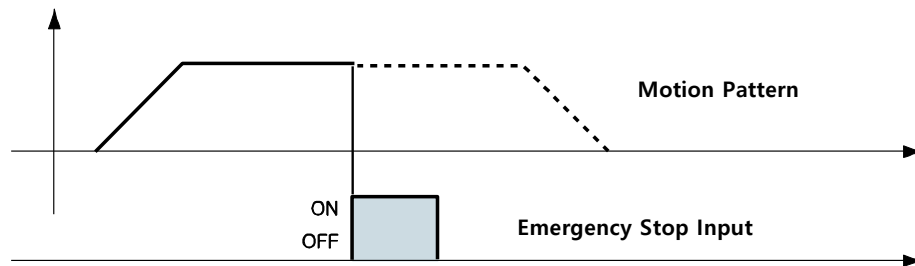
- \* 1. After executing Teaching, click 'Refresh' icon, and the position value will be displayed to the position table.
- \* 2. Click 'Save to ROM' icon, and the position value will be saved to the ROM area.
- \* 3. Teaching signal can be used by two methods; the user assigns actual signal to the motor, or he clicks 'Teaching' icon at the 'I/O Monitoring' window of User Program(GUI).



PT No.	Position Value [pulse] of Corresponding PT
3	12010
4	15300
12	-12800
255	38520

### 11) E-Stop Input

When [Emergency stop] signal is set to [ON] the current motion is stopped immediately without deceleration. E-Stop signal is active in ON level and pulse scale is 10ms or more.



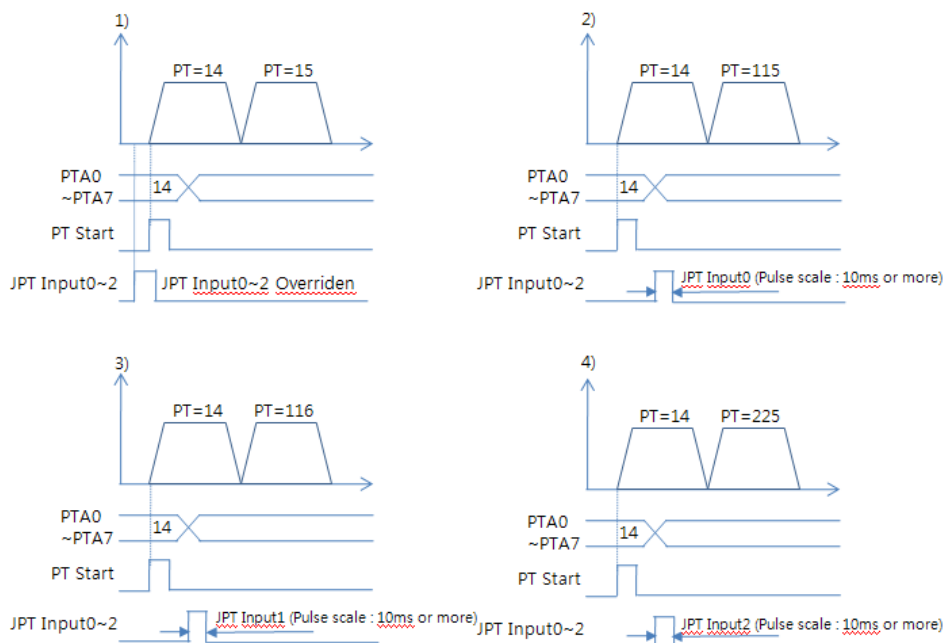
### 12) JPT Input0~Input2 (Jump Position Table Input) Input

Select motion pattern (position table number) to be subsequently executed according to input signal conditions.

【Example】 If PT 14 motion operates, when there is no other input signal, next motion becomes PT 15 as shown in Figure 1). However, if 'JPT Input0~Input2' input signal is set to ON while PT 14 is executing, each corresponding position number is executed as shown in Figure 2)~4).

PT 14 Data

PT No.	...	JP Table No.	JPT 0	JPT 1	JPT 2
14	...	15	115	116	225



### 13) JPT(Jump Position Table) Start Input

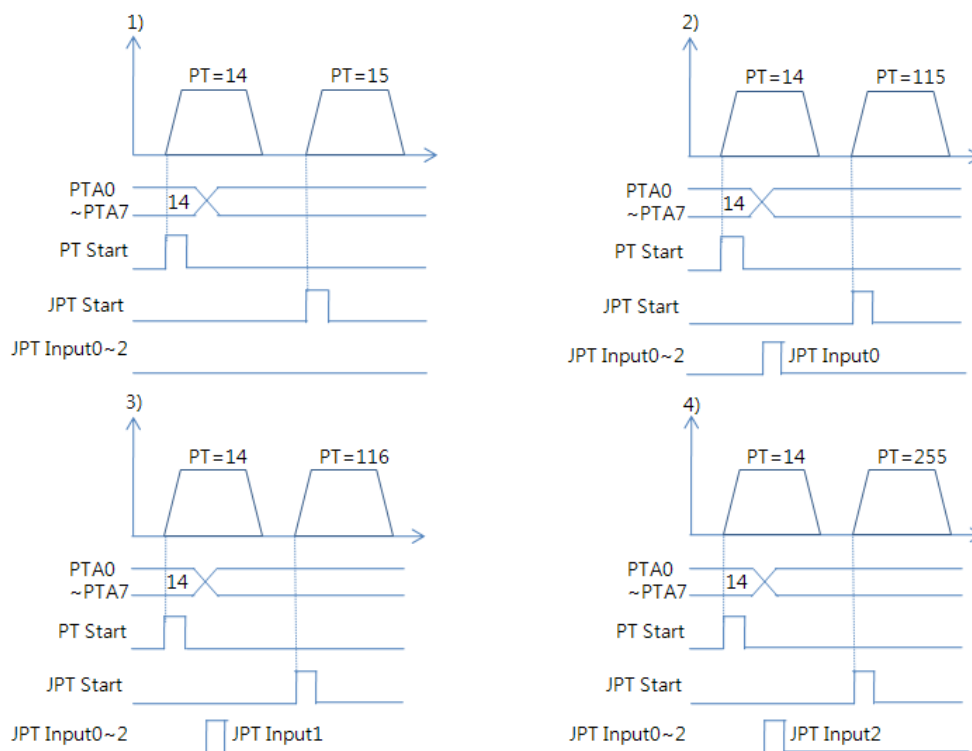
To select motion pattern (position table number) to be subsequently executed according to input signal conditions. The difference from Paragraph 「12) 'JPT Input0~Input2 Input」 is:

- 1) PT number to be jumped must be composed to 10XXX;
- 2) Next motion is not executed until 'JPT Start' is set to ON. If 'Wait Time' value of PT data is more than '0', the time lapses additionally and then next motion is executed.

【Example】

PT 14 Data

PT No.	...	Wait Time	JP Table No	JPT 0	JPT 1	JPT 2
14	...	500	10015	10115	10116	10255



## 6 - 4 . Output Signal

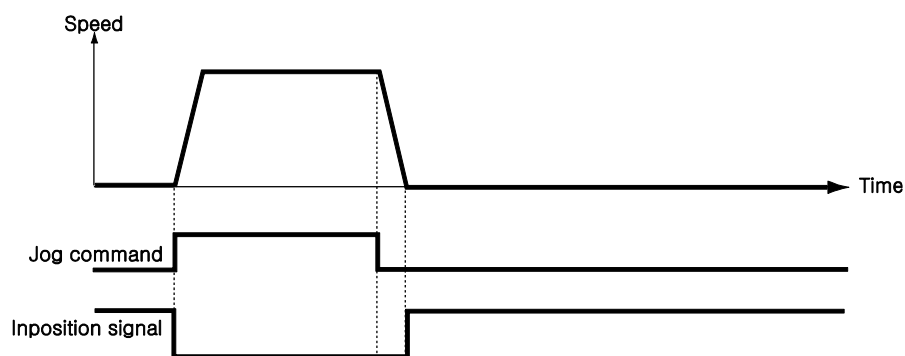
### 1) Compare Out/Trigger Pulse Output

'Trigger Pulse Output' signal is displayed when specific conditions are performed. It is fixed to CN1 connector's COMP (Compare Out) pin. And it is available when the motor needs to be synchronously controlled by an external controller. Refer to 「8.5 Trigger Pulse Output」.

### 2) Inposition Output

If the motor finds the target position correctly in Servo ON status, it outputs an [ON] signal.

The output condition of this signal is determined by the parameter 'Position Loop Gain' and 'Inpos Value'.



\* Time delay of the output signal according to the parameter 'Inpos Value' value :

Value	Mode	Description
0~63	Fast mode	Signal is output within 1 [msec] after reaching the target position.
64~127	Accurate mode	Signal is output within 100 [msec] after reaching the target position. (Need to confirm the exact target position)

### 3) Alarm

The "Alarm" output is turned "OFF" in the normal state, and turned "ON" when the protection function is activated.

The host controller detects this alarm signal and stops the motor operation command.

If an abnormality such as overload or overcurrent occurs during motor operation, the drive detects this and cuts off the motor current.

In addition, alarm output is turned ON and the ST2 LED blinks to indicate the type of alarm generation.

### 4) PT ACK and PT End output

The `` PT ACK `` and `` PT End `` signals are applied only when the motion is activated by the position table.

When the motion starts, the PT ACK signal turns [ON] and the END signal turns [OFF].

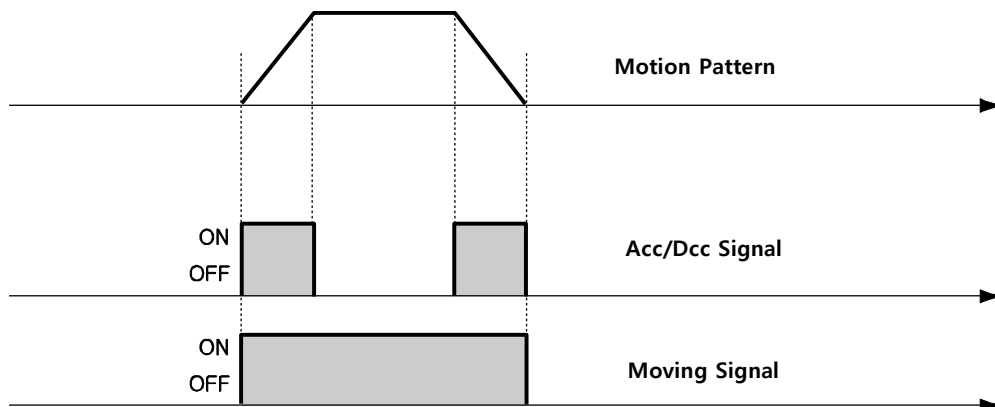
When all motion loops are finished, the PT ACK signal turns [OFF] and the PT End signal turns [ON].

If the wait time value of PT items is not 0, PT End signal turns [ON] after that time value has elapsed.

Refer to [「Ezi-SERVOII Plus-E ALL User Manual – Position Table Function」](#)

### 5) Moving and Acc/Dec output

As shown below, the position starts to move by motion command, and Moving signal becomes ON and Acc/Dec signal becomes ON in the acceleration and deceleration section only.



\* Moving signal is not related to actual position. The signal becomes to [OFF] Just after the 'position command' is finished.

### 6) Org Search OK Output

When the origin return motion is executed by origin search command, 'Origin Search OK' signal is set to OFF. When the origin return motion is normally finished by the origin sensor, 'Origin Search OK' is set to ON.

Refer to [「6-3. Input Signal 9\)Origin Search Input」](#).

### 7) Servo Ready Output

When the drive supplies power to the motor by Servo ON signal or command and is ready to perform motion command, 'ServoReady' signal displays ON signal.

[「6-3. Input Signal 7\) Servo ON and Alarm Reset Input」](#).

### 8) PT(Position Table) Output 0~2 output

Control output used for 'Start/Stop Message Function'. When these items are set, this signal enables the user to check if corresponding PT motion starts or stops through control output signal. If 'Start/Stop Message Function' is not used, this signal should be set to 0 or 8. At the position set with other values, the motion operates as follows.

- If PT set items are set to '1~7', when the position starts to move, PT Output HEX value is displayed to 'PT Output 0 ~ PT Output 2'.
- If PT set items are set to '9~15', the position motion is finished and then PT Output HEX value is displayed to 'PT Output 0 ~ PT Output 2'.



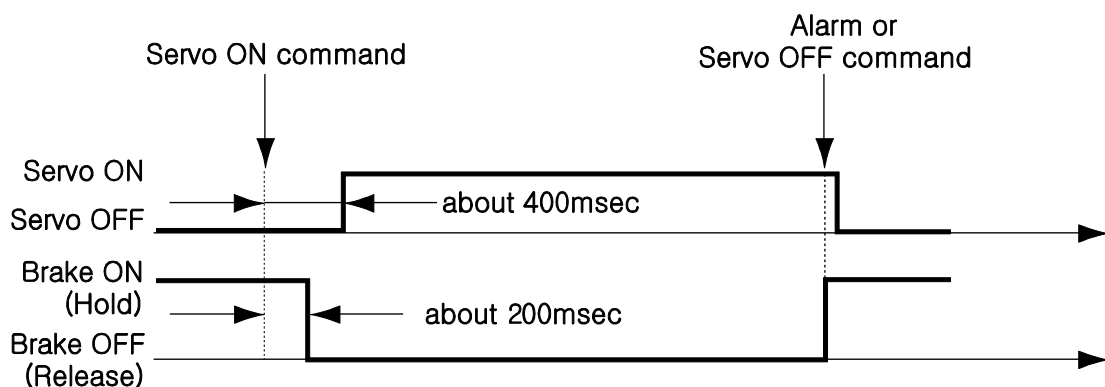
For more information, refer to 「[Ezi-SERVOII Plus-E ALL User Manual – Position Table Function](#)」.

### 9) BRAKE+ and BRAKE-

This brake function is to prevent motor rotation in Step OFF state by using pin3 and pin4 of CN1. 'BRAKE +' is + 24V for Brake and 'BRAKE-' is the output signal for actual brake control.

The control signal is automatically output depending on the Step ON / OFF status and alarm occurrence.

Use this output function only when the current consumption of the brake is 600 [mA] / 24 VDC or less.



### 10) Brake for High Current

This function can be used when the Brake signal is assigned to OUTPUT1 of CN1 connector. This is used for preventing motor rotation in Servo ON status. The signal timing diagram between Servo ON command and Brake signal is same as 9) 'BRAKE+' and 'BRAKE-' Output. This signal used for the Brake that is over 600[mA]/DC24V of current consumption. Brake, Relay and diode is needed for this function.

## 7 . Operation

### 7 - 1 . Power Supply Timing

The power supply of Ezi-SERVOII Plus-E ALL is supplied to the motor through the drive module.

Therefore, connect the cable between the drive and the motor before supplying power and supply power to the drive module.

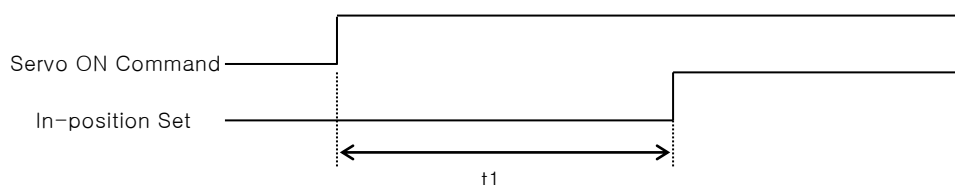
After power is supplied, the default setting of Ezi-SERVOII Plus-E ALL is Servo OFF.

### 7 - 2 . Servo ON Operation

After power is supplied, set the drive module to Servo ON as follows.

- ① Click 'Servo ON' button in the User Program (GUI).
- ② Give the drive a command via DLL library.
- ③ Assign 'Servo ON' to control input pin, and supply the drive with signal through the pin.

After Servo ON command is given, In-position is finished to the time as shown below.



T1 differs depending on the rise time of the power supply and the state of the motor.



**Caution**

**If the Servo ON signal is assigned to the control input, the Servo ON command by the user program (GUI) or DLL Library will not be executed.**

### 7 - 3 . Operation Mode

This drive can control operation in three modes of I / O command, network command (DLL program) and user GUI program.

#### (1) I/O Command Mode

This controller can execute control operation like in-position by I/O command transmitted from the upper controller. The in-position control operation is executed by operating position table with I/O command.

#### (2) Network Command Mode

This controller can execute control operation like in-position by network command transmitted from the upper controller. The in-position control operation is executed by operating position table with I/O command

#### Position Table Operation Sequence

Continuous operation by position table is available in I / O command mode.

- ① Set PT No. to operate by input signal of PT A0 ~ PT A7 or DLL program.
- ② In case of Step OFF status, make it Step ON status through communication program or Step ON control input.
- ③ Start operation by rising edge of PT Start input signal or communication program.

### Stopping Continuous Operation of Position Table

If the position table is continuously operated with Ezi-STEP II Plus-E, the position table in progress can be stopped by the following method.

- ① Use DLL program or control input signal corresponding to "Stop" and "E-Stop".

In this case, it is completely terminated and will not be connected to the next operation.

- ② Click Pause in the user GUI program to pause.

In this case, click `` Pause `` again to execute the rest operation.

### Position Control Operation

In case of operating by parameter set by user GUI program or DLL program.

(Regardless of driving by position table)

Once the position control operation is started, the operation command by the position table is ignored. Likewise, the position control operation command is ignored when the operation by position table is in progress. The following parameters apply to the position control operation, and all the values in the position table are ignored.

Parameter Name	Description	Range
Axis Max Speed	Constant operating speed after accelerating	1~500,000[pps]
Axis Start Speed	Operation start speed before acceleration	1~35,000[pps]
Axis Acc Time	Required time until the motor reaches the axis max speed from stop status	1~9,999[ms]
Axis Dec Time	Required time until the motor reaches from the axis max speed to the stop status	1~9,999[ms]
Motion Dir	Selection of driving direction (CW or CCW)	0~1
Pulse per Revolution	The number of pulses per motor revolution. The range of Axis Max Speed is determined by this value.	0~15

### Teaching Function

Teaching can be done by GUI program and control input signal.

For details, refer to 「[User Manual – Position Table Function](#)」.

## 8 . Other Operation Functions

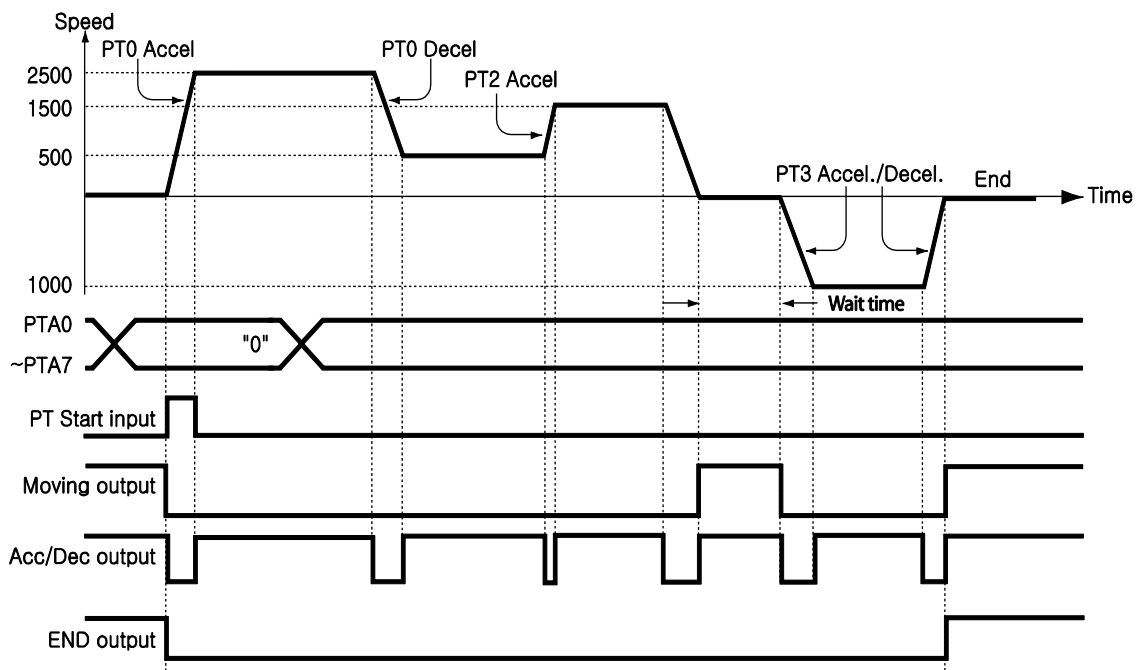
### 8 - 1 . Example of Position Table(PT) Operation

Speed control operation is performed by designating PT number by inputting 'PT A0 ~ PT A7' and inputting 'PT Start' signal. For details, refer to [「User Manual – Position Table Function」](#).

- Ezi-SERVOII Plus-E ALL has less input / output than Ezi-SERVOII Plus-E, so its function is limited.

【Position Table Setting】

PT No	Command type	Position	Low Speed	High Speed	Accel. time	Decel. time	Wait time	Continuous Action	JP Table No.
0	3	10000	1	2500	50	300	0	1	1
1	3	1000	1	500	-	-	0	1	2
2	3	5000	1	1500	50	300	300	0	3
3	3	-2500	1	1000	300	300	0	0	-

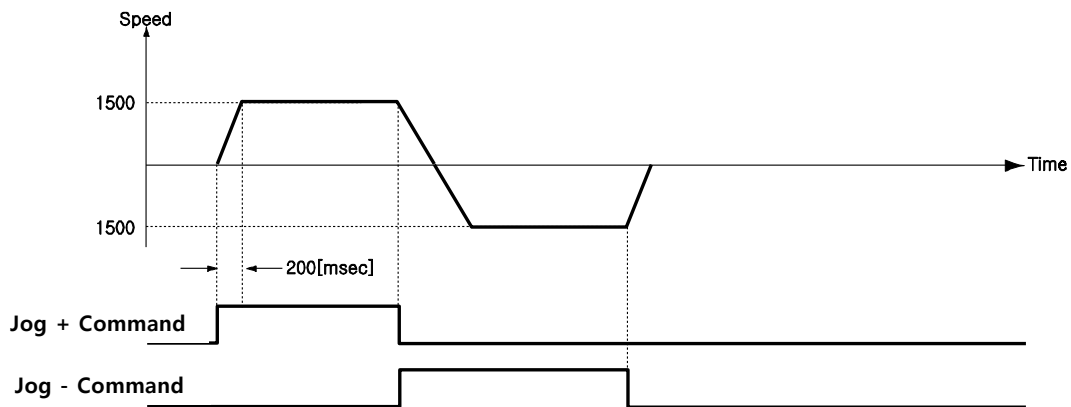


## 8 - 2 . Example of Jog Operation

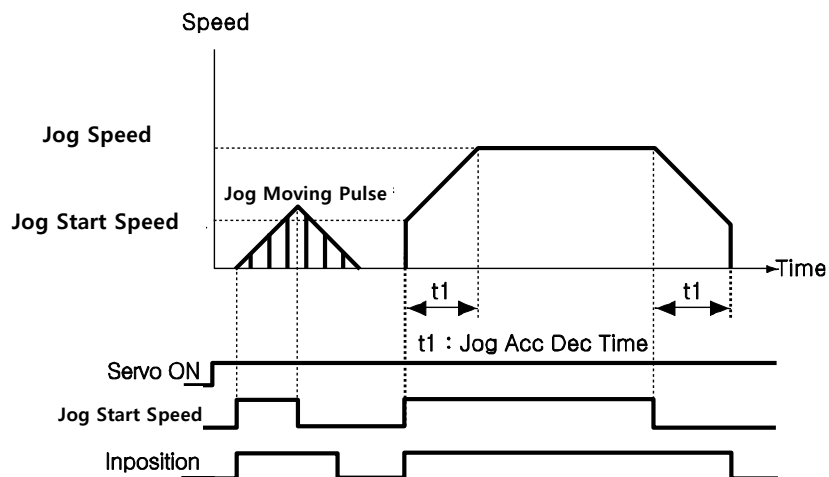
The machine executes speed control operation at the speed set by parameters according to 'Jog+' and 'Jog-' signal input.

【Parameter Setting】

No.	Parameter Name	Setting Value	Unit
6	Jog Speed	1500	[pps]
7	Jog Start Speed	100	[pps]
8	Jog Acc Dec Time	200	[msec]



Also, the relationship between Jog command and Run when non-zero value is set in 'Jog Start Speed' item among parameters can be expressed as the following figure.



## 8 - 3 . Origin Return

When operating in I / O command mode, home return can be performed by inputting the "Origin Search" signal. In addition, the origin return can be executed by the GUI program or DLL command.

The types of parameters related to origin return are as follows.

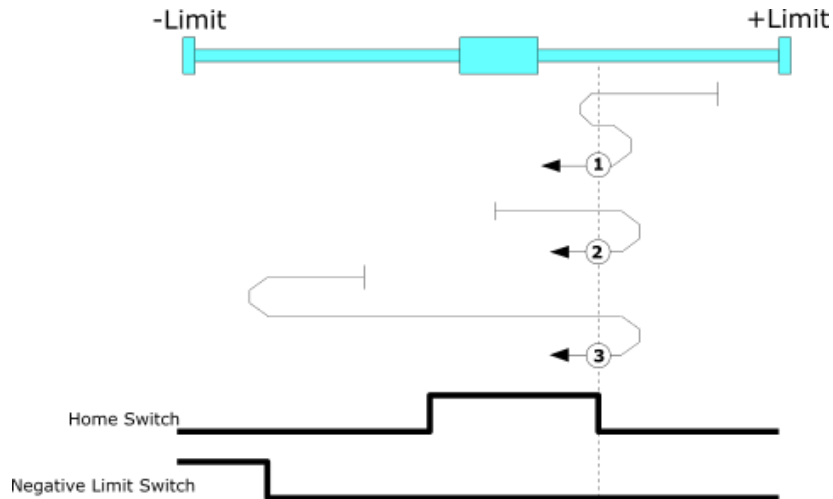
Parameter Name	Description	Range
Org Speed	Operation speed at origin return start	1~500,000[pps]
Org Search Speed	Low speed operation after origin sensor detection. Also, the starting speed at the origin return.	1~50,000[pps]
Org Acc Dec Time	Assigned time of acceleration / deceleration section at the beginning and the end of homing motion.	1~9,999[ms]
Org Method	Origin return method selection (6 types).	0~7
Org Dir	Selection of driving direction (CW or CCW).	0~1
Org Offset	Stop after additional movement as much as the setting value after homing.	-134,217,728 ~ 134,217,727
Org Position Set	Set 'Command Pos' as this setting after origin return.	-134,217,728~ 134,217,727
Org Sensor Logic	Set signal level of home sensor	0~1
Org Torque Ratio	Set the ratio of force to stop during Torque Origin	10~100[%]

### (1) Setting Origin Return Method

The following "Org Method" parameter must be set in order to perform origin return.

- The arrow in the figure is the direction of operation.
- In the figure, ○ is the origin completion position.  
(Numbers in ○ mark indicate the sensor Dog position or following example of origin direction. )
- Index Pulse is Z Phase.
- In case of origin return by Z-pulse, origin return is completed by repeating Z-pulse origin return twice at the speed of 10 [pps] (fixed speed) after completion of low speed origin return of 'Org Search Speed' value. (This method is for accurate Z-pulse origin return.)
- If a limit sensor is detected, it stops with the stop method set in the H / W Limit Stop Method (parameter 12, E-STOP / Stop) and executes the rest origin return routine.

## 1) Origin (If Org Method = 0)

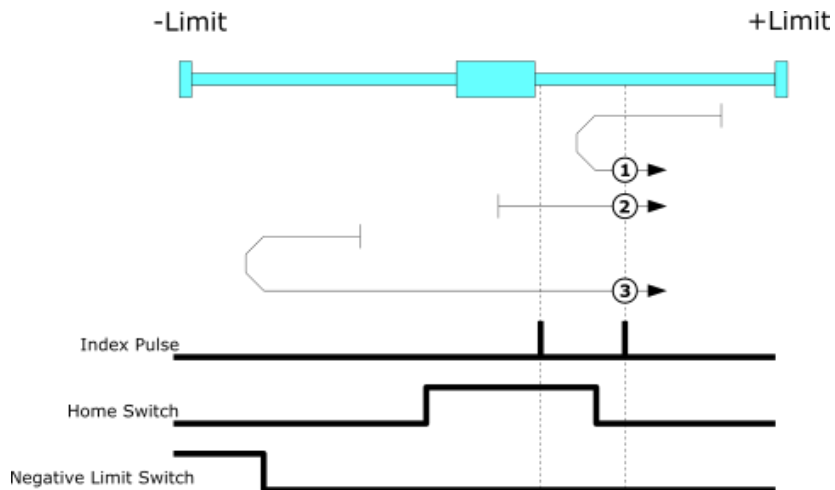


① : When the sensor dog is between the origin and the + Limit Sensor

② : When sensor dog is in origin sensor

③ : When the sensor dog is between the origin and the -Limit Sensor

## 2) Z Origin (If Org Method = 1)

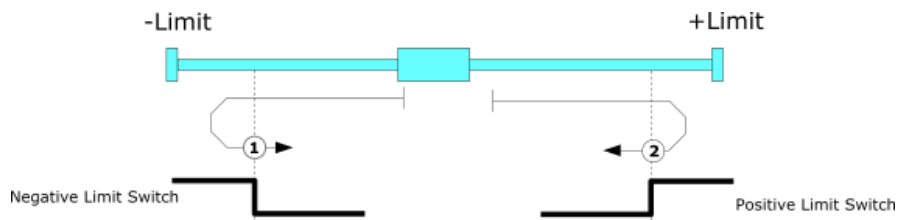


① : When the sensor dog is between the origin and the + Limit Sensor

② : When sensor dog is in origin sensor

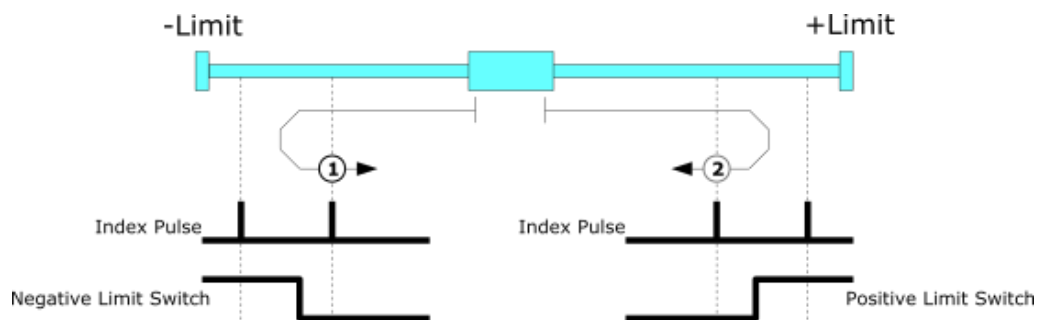
③ : When the sensor dog is between the origin and the -Limit Sensor

## 3) Limit Origin (If Org Method = 2)



- ① : If Org Dir is 1(CCW)
- ② : If Org Dir is 0(CW)
  - Home search is completed when the Limit Sensor is off.

## 4) Z Limit Origin (If Org Method = 3)

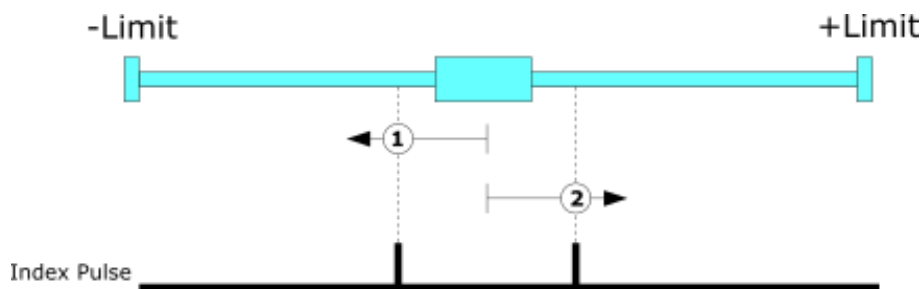


- ① : If Org Dir is 1(CCW)
- ② : If Org Dir is 0(CW)

## 5) Set Origin (If Org Method = 4)

Set the current mechanical position as the origin regardless of the sensor.

## 6) Z Phase (If Org Method = 5)



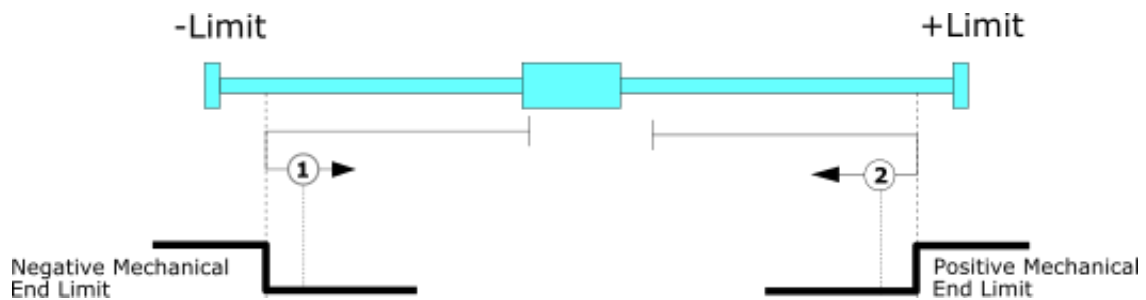
- ① : If Org Dir is 1(CCW)
- ② : If Org Dir is 0(CW)

## 7) Torque Origin (if Org Method=6)

When the force equal to 'Org Torque Ratio' is detected by touching a certain object during the movement by 'Org Speed' value, it stops, and moves the certain position in the opposite direction of the origin movement, and then finishes homing.

This method can be used on systems that do not support origin sensors or limit sensors.



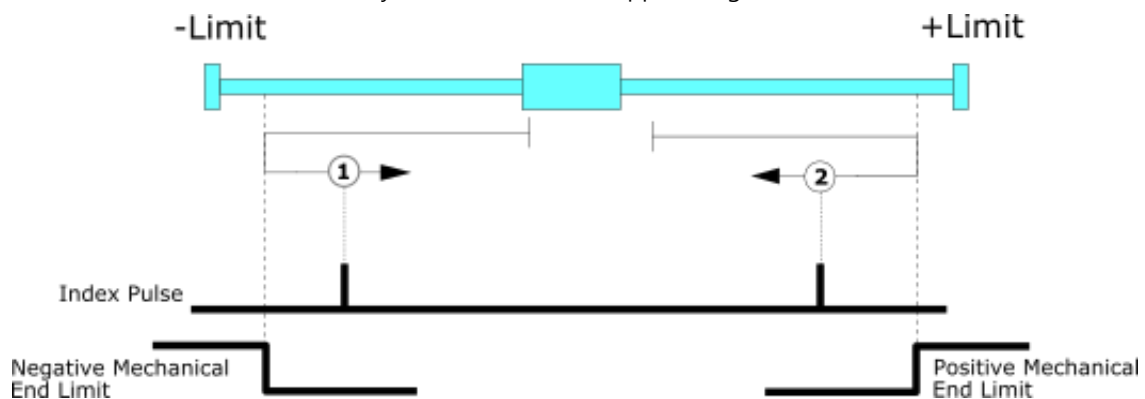


- ① : If Org Dir is 1(CCW)
- ② : If Org Dir is 0(CW)

#### 8) Torque Origin + Z Phase(if Org Method=7)

When the force equal to 'Org Torque Ratio' is detected by touching a specific object during movement by 'Org Speed' value, it stops and moves in the opposite direction of origin movement. After that, when Z phase is detected, the homing is terminated.

This method can be used on systems that do not support origin sensors or limit sensors.



- ① : If Org Dir is 1(CCW)
- ② : If Org Dir is 0(CW)

### (2) Origin return procedure

Origin return is performed in the following order.

- ① Set the parameters for origin return.
- ② If the step is OFF (reset the alarm when an alarm occurs), enter Step ON for control or send a network program to Step ON.
- ③ Input the "Origin Search" ON signal to the control or start the origin return operation using the network program command.

### (3) Interruption of Origin Return

It stops by 'Stop' or 'E-Stop' command during origin return operation. In this case, the origin of the machine is not updated and the origin return is canceled..

### (4) 'Origin return complete' output

The completion of origin search can be confirmed by the value of the corresponding bit(Origin Search OK ) in 「Axis status」 of the communication program, or by the control output 「Origin Search OK」.

## 8 - 4 . Stop Operation

Stop and emergency stop commands can be entered in two ways: control input and network program command. Even if the emergency stop command is input, the motor will not be Servo off.

In case of emergency stop, it stops immediately without deceleration, so pay attention to the impact of the machine.

## 8 - 5 . Trigger Pulse Output

It is used to output the signal periodically from a specific position during movement by position command.

### (1) Control Method

Control is possible only with the DLL program method by network.

You can run this command during a position command, or you can set this command before the position command.

The control commands are shown in the following table. For details, refer to the [「User Manual Communication Function」](#).

Setting item	Description	Range
Start/Stop	Specifies the start or end of the output	0~1
Start Position	Initial start position value for signal output	-134,217,728~134,217,727
Pulse Period	Set period of output signal (0: Pulse is output only once at the starting position.)	0~134,217,727 [pulse]
Pulse Width	Sets the width of the output signal	1~1000[ms]

- Trigger output is normally output when **the pulse period is over 2 [ms] (including pulse width)**.  

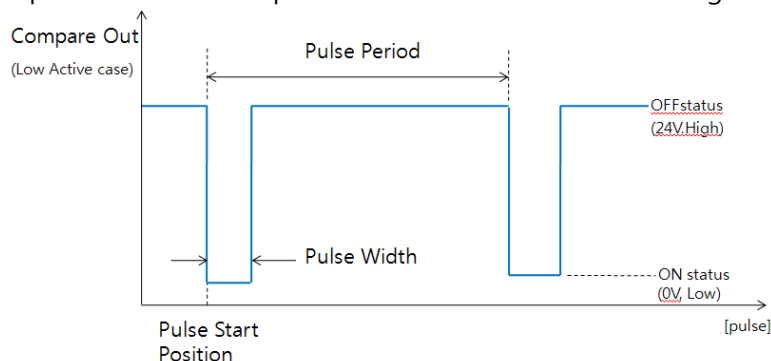
$$\text{Pulse Period[ms]} = \text{Pulse Period[pulse]} / \text{Movement Speed[pps]} * 1000 (\text{Unit Conversion Constant [s]} \rightarrow [\text{ms}]) + \text{Pulse Width[ms]}$$

ex) Pulse Period : 100[pulse], Movement Speed: 10,000[pps], Pulse Width : 1[ms]  

$$\text{Pulse Period[ms]} = 100/10000 * 1000 + 1 = 11$$
- The trigger output is activated when a move command with a target position is sent without start / end set to '0'.
- After executing the trigger output, if a command without a target position, such as a Jog command, is issued, the start / end is automatically set to '0'.

### (2) Output Signal

The output pin is fixed to 'Compare Out' of CN1 connector. The signal type is as follows.



### (3) Output Status Check

You can check whether the signal output function is working or not through the DLL program.

For more information, refer to 「[User Manual – Communication Function](#)」.

## 8 - 6 . Push Motion Function

While moving by position command, it moves while maintaining a fixed force from a certain position. When it comes into contact with work during movement, it stops movement (Stop mode method), but it keeps the force.

### (1) Function

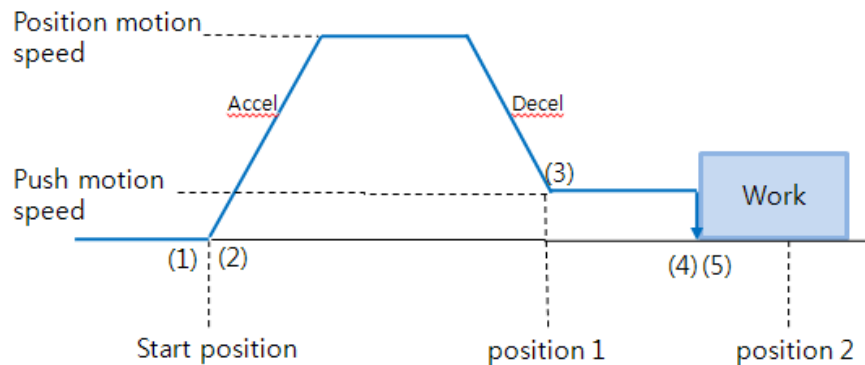
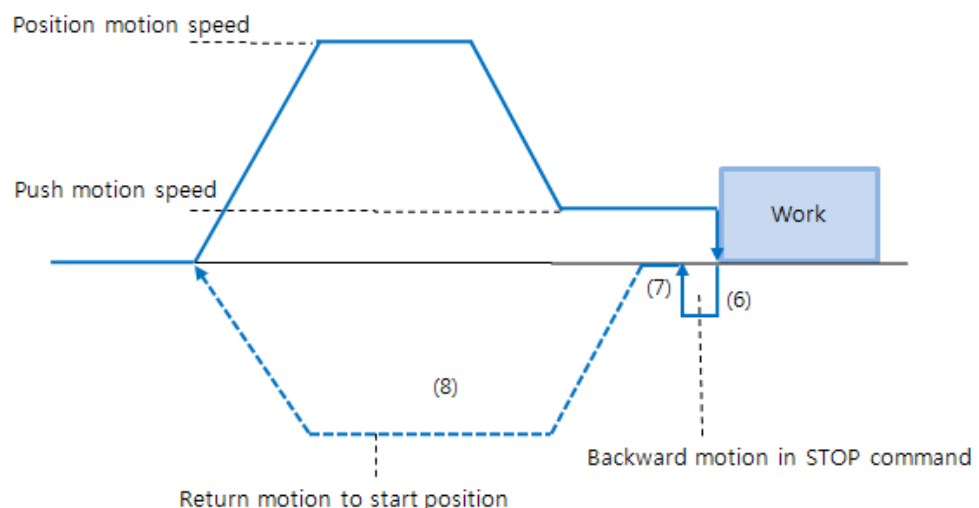


그림 10.6.1

- ① Issue Push Motion command
- ② Run the normal position motion command. (position mode status)
- ③ Decelerate in normal position motion to reach **push motion** speed. (The speed at this time should be less than 200 [rpm].)
- ④ Move while maintaining a fixed force until the work comes in contact. (**push mode** status)
- ⑤ If Push mode is set to 'Stop mode' :  
It stops when it comes in contact with the work but maintains the force. At this time, the completion signal of Inposition / PT Stopped / END is generated. The holding force is automatically changed to Servo ON (push mode release and switch to position mode) during stop command or normal position motion command.
- If Push mode is set to 'Non-stop mode' :  
When it comes into contact with the work, it does not stop and keeps pushing and maintaining strength. At this time, completion signal of Inposition / PT Stopped / END is generated.
- ⑥ You will also need to perform the following steps.



Flg 10.6.2

You must run 'Stop' before executing the next motion command.

(However, in Stop mode, there is no need to 'stop' if there is no impact on the mechanism.)



At this time, it moves in the opposite direction by the value of 'Push mode setting' to alleviate the impact on the instrument.

Therefore, if you do not use the stop command, no backward motion will be executed.

At this time, the speed of backward motion is fixed at 5,000 [pps].

⑦ Depending on the condition of the equipment, it may take some time to relieve shock from stopping to returning to position.

⑧ Return to the starting position.

 <b>Caution</b>	<b>In case of non-stop mode, <b>separate 'Stop' command must be executed</b> after the work contact and before the next motion command.</b>
 <b>Caution</b>	<b>If an impact occurs on the machine when the position is returned, <b>a certain amount of time is required</b> to alleviate the impact.</b>

### (3) Control Method

This function is applicable only in the absolute coordinate system. When the work is in contact, the position error value may appear depending on the material of the work.

There are two ways to implement this function: Ethernet communication (DLL library) or external digital input signal (PT Start command).

#### ① DLL library Method

The control commands are shown in the following table. For details, refer to 「[User Manual – Communication Function](#)」. It also provides a control command to track the progress of the current push motion command.

All position values used in Push Motion command are **absolute values**.

Setting Item	Description	Range *1
Position command Start speed	Start speed value of position motion	1~500000[pps]
Position command Moving speed	Moving speed of position motion	1~500000[pps]
Position command Target position	Absolute target position value of position command ('position 1' of Figure 10.6.1)	-134,217,728 ~ 134,217,727
Accel time	Accel time of position motion	1~9,999[ms]
Deceleration time	Decelerate time of position motion	1~9,999[ms]
Push ratio	Motor torque value in push mode	20~90[%]
Push command Moving speed	Moving speed of Push motion (max 200[rpm])	1~33333[pps]
Push command Target position	Absolute target position value of push command ('position 2' of Figure 10.6.1) *Non-stop mode : the value must be set more than 'Position command Target Position' value.	-134,217,728 ~ 134,217,727
Push mode	Set Stop mode(0) or Non-stop mode(1~10000) after the work detect. In case of Non-stop mode, the motor move backward as much as this value[pulse] distances.	0~10,000

\*1 : Unit value[pps] of setting range is based on 10,000 [ppr] drive resolution..

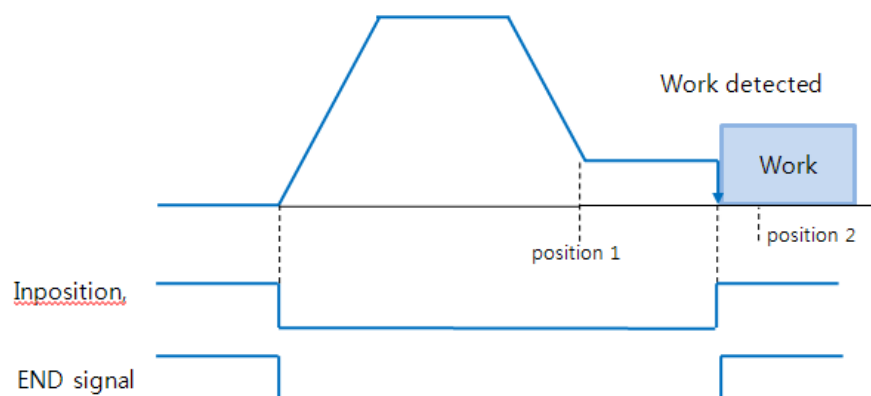
## ② Input signal(PT Start) command

It is a method to input push motion command in position table in advance and execute it with external signal. Refer to 「[User Manual – Position Table Function](#)」 for details.

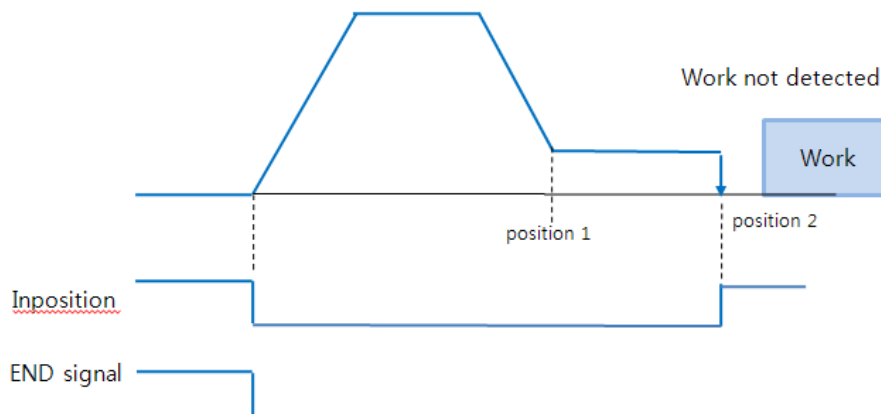
## (4) Output status check

The progress of the current push motion command can be checked with the DLL library, and at the same time, the flag (Inposition and END signals) can be checked as follows.

### ① When work is detected



## ② If work is not detected (Stop mode)



In non-stop mode, if no work contact is made, the 'Inposition' signal will remain off. The motion stops at the position of 'position 2' (the absolute position of the push command).

## 9 . Communication Function

- 1) Built-in 2 Port Ethernet switching Hub enables daisy-chain connection.
- 2) Use TCP and UDP protocol.
- 3) If you use TCP, you can connect the drive at the same time from GUI and application
- 4) 4) When using UDP, the drive can be accessed from the GUI and one or more applications at the same time. If you connect more than 2 applications, communication delay may occur.
- 5) Please refer to 「[4-2 System Configuration](#)」 for the example of PC connection.
- 6) Signal contents of the RJ45 connector of the drive are as follows.

(Same as general Ethernet 10/100 Base-T)

RJ45 Pin No.	Function
1	TD+
2	TD
3	-
4	-
5	RD+
6	RD-
7	-
8	-
case	Frame GND

- 7) Default IP Address : 192.168.0.xxx  
 Default Gateway : 192.168.0.1  
 Default Subnet Mask : 255.255.255.0

## 1 0 . Parameter

### 1 0 - 1 . Parameter List

No.	Name	Unit	Lower Limit	Upper Limit	Default
0	Pulse Per Revolution		0	8	8
1	Axis Max Speed	[pps]	1	500,000	500,000
2	Axis Start Speed	[pps]	1	35,000	1
3	Axis Acc Time	[msec]	1	9,999	100
4	Axis Dec Time	[msec]	1	9,999	100
5	Speed Override	[%]	1	500	100
6	Jog Speed	[pps]	1	500,000	5,000
7	Jog Start Speed	[pps]	1	500,000	1
8	Jog Acc Dec Time	[msec]	1	9,999	100
9	S/W Limit Plus Value	[pulse]	-134,217,728	134,217,727	134,217,727
10	S/W Limit Minus Value	[pulse]	-134,217,728	134,217,727	-134,217,728
11	S/W Limit Stop Method		0	2	2
12	H/W Limit Stop Method		0	1	0
13	Limit Sensor Logic		0	1	0
14	Org Speed	[pps]	1	500,000	5,000
15	Org Search Speed	[pps]	1	50,000	1,000
16	Org Acc Dec Time	[msec]	1	9,999	50
17	Org Method		0	7	0
18	Org Dir		0	1	1
19	Org OffSet	[pulse]	-134,217,728	134,217,727	0
20	Org Position Set	[pulse]	-134,217,728	134,217,727	0
21	Org Sensor Logic		0	1	0
22	Position Loop Gain		0	127	4
23	Inpos Value		0	63	0
24	Pos Tracking Limit	[pulse]	1	134,217,727	5,000
25	Motion Dir		0	1	0
26	Limit Sensor Dir		0	1	0
27	Org Torque Ratio	[%]	20	90	50
28	Pos. Error Overflow Limit	[pulse]	1	134,217,727	5,000
29*	Brake Delay Time	[msec]	10	5,000	200
30	Run Current	*10[%]	5	15	10
31	Boost Current	*50[%]	0	7	0
32	Stop Current	*10[%]	2	10	5
33	JOG EXT FUNC USE		0	1	0
34	Jog Speed1	[pps]	1	500,000	5,000



35	Jog Speed2	[pps]	1	500,000	5,000
36	Jog Speed3	[pps]	1	500,000	5,000
37	Jog Speed4	[pps]	1	500,000	5,000
38	Jog Speed5	[pps]	1	500,000	5,000
39	Jog Speed6	[pps]	1	500,000	5,000
40	Jog Speed7	[pps]	1	500,000	5,000
41	Use Motion Queue		0	1	0
42	Disconnection Option		0	4	0
43	Communication Timeout	msec	100	60,000	100
44	Motion Profile		0	1	0

\*1 The parameter is not used for drives for 86 [mm] motors.

- Parameter No. 44 is available for Firmware [ver.6.1.20.18] or higher version.

## 1 0 - 2 . Parameter Description

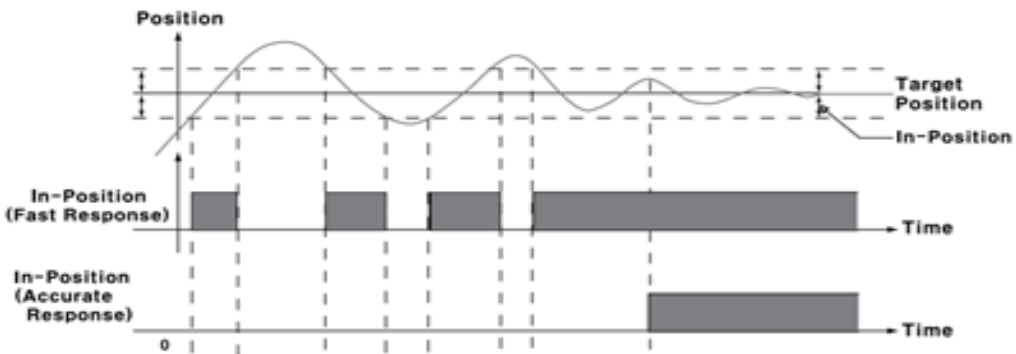
No.	Description	Unit	Lower Limit	Upper Limit	Default																																				
0	<p><b>Pulse per Revolution :</b></p> <p>The number of pulses per motor revolution.</p> <p>Changing this value sets the motor to the Servo OFF.</p> <table><tr><th>Value</th><th>Pulse/Revolution</th><th>Value</th><th>Pulse/Revolution</th></tr><tr><td>0</td><td>500</td><td>8</td><td>10,000</td></tr><tr><td>1</td><td>1,000</td><td></td><td></td></tr><tr><td>2</td><td>1,600</td><td></td><td></td></tr><tr><td>3</td><td>2,000</td><td></td><td></td></tr><tr><td>4</td><td>3,600</td><td></td><td></td></tr><tr><td>5</td><td>5,000</td><td></td><td></td></tr><tr><td>6</td><td>6,400</td><td></td><td></td></tr><tr><td>7</td><td>7,200</td><td></td><td></td></tr></table> <p>● If you use 20000[ppr] Encoder, you can input 20000 instead of integer of 0-8..</p> <p>● Pulse per revolution cannot be not changed when the motor is 'Servo On' by the input signal.</p>	Value	Pulse/Revolution	Value	Pulse/Revolution	0	500	8	10,000	1	1,000			2	1,600			3	2,000			4	3,600			5	5,000			6	6,400			7	7,200				0		8
Value	Pulse/Revolution	Value	Pulse/Revolution																																						
0	500	8	10,000																																						
1	1,000																																								
2	1,600																																								
3	2,000																																								
4	3,600																																								
5	5,000																																								
6	6,400																																								
7	7,200																																								
1	<p><b>Axis Max Speed :</b></p> <p>It specifies the maximum speed that can be operated during the position move command (absolute move, incremental move) so that in no case is the speed faster than this value. The value is set in units of [pps]. The upper limit range varies depending on the pulse per resolution value.</p>	pps	1	500,000	500,000																																				
2	<p><b>Axis Start Speed :</b></p> <p>Sets the operation start speed value in units of [pps] during the position move command (absolute move, incremental move).</p>	pps	1	500,000	1																																				
3	<p><b>Axis Acc Time :</b></p> <p>Set the acceleration section time value in the unit of [msec] at the start of operation when moving position command(absolute move, incremental move).</p> <p>The applicable range <b>depends on the Axis Speed</b>.</p> <p>(ex 1) Axis Start Speed=1,Move Speed=400000 : 1~1430 [msec]</p> <p>(ex 2) Axis Start Speed=1,Move Speed=10000 : 1~350 [msec]</p>	msec	1	9,999	100																																				
4	<p><b>Axis Dec Time :</b></p> <p>Sets the deceleration section time value in the unit of [msec] at the end of operation during position movement command(absolute move, incremental move).</p> <p><b>Depending on the Axis Speed</b>, the specified range will be limited like 'Axis Acc Time'.</p>	msec	1	9,999	100																																				
5	<p><b>Speed Override :</b></p> <p>In case of position movement command(absolute move, incremental move), operation speed changes according to the ratio value specified in 'Move Speed' currently specified. (Ex) If Move Speed is 10,000 and Speed Override is 200, the actual motion speed will be 20,000.</p>	%	1	500	100																																				

No.	Description	Unit	Lower Limit	Upper Limit	Default
6	<b>Jog Speed :</b> In Jog position movement command, set the motor rotation speed value in [pps].	pps	1	500,000	5,000
7	<b>Jog Start Speed :</b> When jog position movement command(absolute move, incremental move), the speed value at the moment of starting operation is set in [pps].	pps	1	500,000	1
8	<b>Jog Acc Dec Time :</b> In Jog operation, set the time value of acceleration section and deceleration section in [msec].	msec	1	9,999	100
9	<b>S/W Limit Plus Value :</b> In case of position movement command(absolute move, incremental move, Jog), set the maximum input limit within 28bits.	pulse	-134,217,728	+134,217,727	+134,217,727
10	<b>S/W Limit Minus Value :</b> In case of position movement command(absolute move, incremental move, Jog), set the minimum input limit within 28bits.	pulse	-134,217,728	+134,217,727	-134,217,728
11	<b>S/W Limit Stop Method :</b> It sets the method when stopping by 'SW Limit Plus / Minus Value', not stop operation by Limit sensor.  ◆ 0 : Stop immediately as an emergency stop method. ◆ 1 : Soft Stop after deceleration. ◆ 2 : Do not use S / W Limit.		0	2	0
12	<b>H/W Limit Stop Method:</b> Set the stop method when stopped by Limit sensor.  ◆ 0 : Stop immediately as an emergency stop method. ◆ 1 : Soft Stop after deceleration.  The above stop method is applied when Limit Sensor is detected during Home Search.		0	1	0
13	<b>Limit Sensor Logic :</b> It is used to set the level of the signal to recognize the input state of limit sensor as [ON].  ◆ 0 : 0 V (Active low level) ◆ 1 : 24V (Active high level)		0	1	0
14	<b>Org Speed :</b> Set the operation speed in [pps] until the origin sensor is detected at the origin search command.	pps	1	500,000	5,000

No.	Description	Unit	Lower Limit	Upper Limit	Default
15	<b>Org Search Speed :</b> Sets the low speed operation speed value in [pps] for the precise origin return after the origin sensor is detected at the origin return command.	pps	1	500,000	1,000
16	<b>Org Acc Dec Time :</b> Set the time value of acceleration / deceleration section of operation start / end part in [msec] when origin return command.	msec	1	9,999	50
17	<b>Org Method :</b> Select the type of origin return command. ◆0 : After moving to the origin sensor point by 'Org Speed' value, precision origin return is performed with low speed 'Org Search Speed' value. ◆1 : After moving to origin sensor point by 'Org Speed' value, Z-pulse origin return is performed with 'Org Search Speed' value of low speed. ◆2 : It stops immediately after moving to the limit sensor detection point by 'Org Speed' value. ◆3 : After moving to the limit sensor detection point by 'Org Speed' value, Z-pulse origin return is performed with 'Org Search Speed' value of low speed. ◆4 : Used to set the current position as the origin. ◆5 : Z-pulse origin return is performed with low speed 'Org Search Speed'. ◆6 : After moving by 'Org Speed' value, it stops immediately when it touches a certain object. Used to detect (set) the origin without a sensor. ◆7 : 'After moving by 'Org Speed' value, if it touches a specific object, Z-pulse origin return is performed with 'Org Search Speed' value at low speed. Used to detect (set) the origin without a sensor.  For more details, refer to <a href="#">「8-3 Origin Return」</a>  ※ In case of origin return by Z-pulse, origin return is completed by repeating Z-pulse origin return twice at the speed of 10 [pps] (fixed speed) after completion of origin return with low speed of 'Org Search Speed'. (This method is for precise return to Z-pulse origin.)		0	7	0
18	<b>Org Dir :</b> Sets the rotation direction of the motor during origin return.  ◆0 : Move clockwise. ◆1 : Move counterclockwise.		0	1	0

No.	Description	Unit	Lower Limit	Upper Limit	Default
19	<b>Org Offset :</b> After origin return, it stops after moving as much as the setting value and sets 'Command Pos / Actual Pos' to '0'.	pulse	-134,217,728	+134,217,727	0
20	<b>Org Position Set :</b> After origin return, set the 'Command Pos / Actual Pos' value to this setting.	pulse	-134,217,728	+134,217,727	0
21	<b>Org Sensor Logic :</b> Used to set the level of the signal to recognize the input of origin sensor as [ON]. ◆0 : 0 V (low level) ◆1 : 24V (high level)		0	1	0

No.	Description	Unit	Lower Limit	Upper Limit	Default																																																																																																																																																																																																						
22	<p><b>Position Loop Gain :</b></p> <p>This function is to adjust the response according to the load on the motor after the motor stops. This value is relative, not the actual value used inside the drive. For example, changing this value from 3 to 6 does not double the response time.</p> <p>The smaller this parameter value is, the more sensitive the motor stops, the less time it takes to stop. The larger the value, the less sensitive the motor stops, and the longer it takes for the motor to stop. The setting method is as follows.</p> <p>1) Set the value to '0'.</p> <p>2) Increase the value until the motor response stabilizes.</p> <p>3) Finely adjust the current setting value by one step or two step.</p>																																																																																																																																																																																																										
	<table><tr><th>Value</th><th>Integral Part's Time Constant*</th><th>Proportional Gain*</th><th>Value</th><th>Integral Part's Time Constant*</th><th>Proportional Gain*</th></tr><tr><td>0</td><td>1</td><td>1</td><td>32</td><td>5</td><td>1</td></tr><tr><td>1</td><td>1</td><td>2</td><td>33</td><td>5</td><td>2</td></tr><tr><td>2</td><td>1</td><td>3</td><td>34</td><td>5</td><td>3</td></tr><tr><td>3</td><td>1</td><td>4</td><td>35</td><td>5</td><td>4</td></tr><tr><td>4</td><td>1</td><td>5</td><td>36</td><td>5</td><td>5</td></tr><tr><td>5</td><td>1</td><td>6</td><td>37</td><td>5</td><td>6</td></tr><tr><td>6</td><td>1</td><td>7</td><td>38</td><td>5</td><td>7</td></tr><tr><td>7</td><td>1</td><td>2</td><td>39</td><td>5</td><td>2</td></tr><tr><td>8</td><td>2</td><td>1</td><td>40</td><td>6</td><td>1</td></tr><tr><td>9</td><td>2</td><td>2</td><td>41</td><td>6</td><td>2</td></tr><tr><td>10</td><td>2</td><td>3</td><td>42</td><td>6</td><td>3</td></tr><tr><td>11</td><td>2</td><td>4</td><td>43</td><td>6</td><td>4</td></tr><tr><td>12</td><td>2</td><td>5</td><td>44</td><td>6</td><td>5</td></tr><tr><td>13</td><td>2</td><td>6</td><td>45</td><td>6</td><td>6</td></tr><tr><td>14</td><td>2</td><td>7</td><td>46</td><td>6</td><td>7</td></tr><tr><td>15</td><td>2</td><td>8</td><td>47</td><td>6</td><td>8</td></tr><tr><td>16</td><td>3</td><td>1</td><td>48</td><td>7</td><td>1</td></tr><tr><td>17</td><td>3</td><td>2</td><td>49</td><td>7</td><td>2</td></tr><tr><td>18</td><td>3</td><td>3</td><td>50</td><td>7</td><td>3</td></tr><tr><td>19</td><td>3</td><td>4</td><td>51</td><td>7</td><td>4</td></tr><tr><td>20</td><td>3</td><td>5</td><td>52</td><td>7</td><td>5</td></tr><tr><td>21</td><td>3</td><td>6</td><td>53</td><td>7</td><td>6</td></tr><tr><td>22</td><td>3</td><td>7</td><td>54</td><td>7</td><td>7</td></tr><tr><td>23</td><td>3</td><td>2</td><td>55</td><td>7</td><td>2</td></tr><tr><td>24</td><td>4</td><td>1</td><td>56</td><td>8</td><td>1</td></tr><tr><td>25</td><td>4</td><td>2</td><td>57</td><td>8</td><td>2</td></tr><tr><td>26</td><td>4</td><td>3</td><td>58</td><td>8</td><td>3</td></tr><tr><td>27</td><td>4</td><td>4</td><td>59</td><td>8</td><td>4</td></tr><tr><td>28</td><td>4</td><td>5</td><td>60</td><td>8</td><td>5</td></tr><tr><td>29</td><td>4</td><td>6</td><td>61</td><td>8</td><td>6</td></tr><tr><td>30</td><td>4</td><td>7</td><td>62</td><td>8</td><td>7</td></tr><tr><td>31</td><td>4</td><td>8</td><td>63</td><td>8</td><td>8</td></tr></table>	Value	Integral Part's Time Constant*	Proportional Gain*	Value	Integral Part's Time Constant*	Proportional Gain*	0	1	1	32	5	1	1	1	2	33	5	2	2	1	3	34	5	3	3	1	4	35	5	4	4	1	5	36	5	5	5	1	6	37	5	6	6	1	7	38	5	7	7	1	2	39	5	2	8	2	1	40	6	1	9	2	2	41	6	2	10	2	3	42	6	3	11	2	4	43	6	4	12	2	5	44	6	5	13	2	6	45	6	6	14	2	7	46	6	7	15	2	8	47	6	8	16	3	1	48	7	1	17	3	2	49	7	2	18	3	3	50	7	3	19	3	4	51	7	4	20	3	5	52	7	5	21	3	6	53	7	6	22	3	7	54	7	7	23	3	2	55	7	2	24	4	1	56	8	1	25	4	2	57	8	2	26	4	3	58	8	3	27	4	4	59	8	4	28	4	5	60	8	5	29	4	6	61	8	6	30	4	7	62	8	7	31	4	8	63	8	8		0	63	4
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No.	Description	Unit	Lower Limit	Upper Limit	Default
23	<p><b>Inpos Value :</b></p> <p>Set the output condition of the inposition signal. When the position deviation from the target position after the position command pulse is within the set 'Inpos Value' value, the inposition signal is output.</p> <p>Position deviation that can output Inposition is 0 ~ 63.</p> <p>Depending on the control mode, the setting values are as follows.</p> <p>1) Fast Response Mode : 0~63</p> <p>2) Accurate Response Mode : 64~127</p> <p>The position deviation range for each mode is 0 to 63.</p> <p>Fast Response and Accurate Response control methods are as follows.</p> 		0	127	3
24	<p><b>Pos Tracking Limit :</b></p> <p>It is a function to protect the motor and drive. If the value of 'Position Error' is greater than this value while the motor is running, an alarm is generated to cut off the current supply to the motor and Servo OFF.</p>	pulse	1	+134,217,727	5,000
25	<p><b>Motion Dir :</b></p> <p>Sets the rotation direction of the motor during operation by position command.</p> <p>◆ 0 : Move clockwise.</p> <p>◆ 1 : Move counterclockwise.</p>		0	1	0
26	<p><b>Limit Sensor Dir :</b></p> <p>This is the function to set the direction of the limit sensor to stop during operation to the limit point. In general system, it is set the same as parameter '28'.</p> <p>◆ 0 : When the operation direction is clockwise, it stops when sensor signal of Limit + is input.</p> <p>◆ 1 : When the operation direction is clockwise, it stops when sensor signal of Limit - is input.</p>		0	1	0
27	<p><b>Org Torque Ratio :</b></p> <p>If the 'Origin Method' parameter is set to '5' or '6', this sets the maximum torque value to stop.</p>	%	20	90	50

No.	Description	Unit	Lower Limit	Upper Limit	Default
28	<b>Pos. Error Overflow Limit :</b> It is a function to protect the motor and the drive. If the 'Position Error' value becomes larger than this while the motor is stopped in Servo ON, an alarm is generated to cut off the current supply to the motor and Servo OFF.	pulse	1	+134,217,727	5,000
29	<b>Brake Delay Time :</b> You can set the time to release the brake after the Step ON command. ※ For the 86[mm] drive, Brake Delay Time value does not apply.	msec	10	5,000	200
30	<b>Run Current:</b> Run Current is value of running current during the operating of motor, it is set based on rated current of motor. This value is related with torque in operating of motor, if this value is big, motor torque getting high in operation. So, in case of lack of torque, it can be raising the torque by increasing the run current value. Precaution) 1) To be notified If Run Current value is high, heat temperature can be increasing. 2) Maximum set value of Run Current (150%) is limited by 4[A]. So, in case of motor (56,60mm) of rated current value is exceed 2.7[A], set value is not increased as much as set-up, even increasing the set value. 3) Run Current is automatically controlled according to load, so please use in case of lacking torque in operation.	*10[%]	5	15	10
31	<b>Boost Current :</b> This parameter is used to increase the current to the motor to improve the acceleration characteristics when the acceleration time cannot be set sufficiently. (Applies only to acceleration.) Ex) ※ EzM-42XL (Current: 1.2[A]) ※ Run Current : 10(100[%]) ※ Boost Current : 1(50[%]) ※ Control Current during acceleration : 1.2[A ]+1.2[A]*50[%] = 1.8[A]  <b>The set maximum value (150%) of Run Current is limited to 4 [A]. Therefore, motor (56, 60) whose rated current value exceeds 2.7 [A] does not increase by the set value even if the set value is increased.</b>	*50[%]	0	7	0



No.	Description	Unit	Lower Limit	Upper Limit	Default																																				
32	<b>Stop Current:</b> Stop Current is the current of the motor which is set automatically 0.1 seconds after the motor stops running. This parameter is used to reduce heat when the motor is stopped for a long time. Also, if it is set over 60%, the temperature of the motor may rise.	*10[%]	20	10	5																																				
33	<b>Jog EXT FUNC USE:</b> It is used to change Jog movement command by input signal to other speed than parameter 6 setting speed. ◆ 0 : Disable Jog speed extension function ◆ 1 : Enable Jog speed extension function  In addition, seven speed values can be set, and the speed values can be selected using the input signals Jog0, Jog1, and Jog2. <table><tr><th>Jog2</th><th>Jog1</th><th>Jog0</th><th>Selected Speed Value</th></tr><tr><td>OFF</td><td>OFF</td><td>OFF</td><td>Parameter No.6</td></tr><tr><td>OFF</td><td>OFF</td><td>ON</td><td>Parameter No.34</td></tr><tr><td>OFF</td><td>ON</td><td>OFF</td><td>Parameter No.35</td></tr><tr><td>OFF</td><td>ON</td><td>ON</td><td>Parameter No.36</td></tr><tr><td>ON</td><td>OFF</td><td>OFF</td><td>Parameter No.37</td></tr><tr><td>ON</td><td>OFF</td><td>ON</td><td>Parameter No.38</td></tr><tr><td>ON</td><td>ON</td><td>OFF</td><td>Parameter No.39</td></tr><tr><td>ON</td><td>ON</td><td>ON</td><td>Parameter No.40</td></tr></table> ※ 1) Applies only to the speed of jog operation by input. 2) Since JOG0 ~ JOG2 uses the same signal as PT5 ~ 7, the number of position table may be limited when using the above function.  3) Jog0 ~ Jog2 should be input before Jog movement command by input signal.	Jog2	Jog1	Jog0	Selected Speed Value	OFF	OFF	OFF	Parameter No.6	OFF	OFF	ON	Parameter No.34	OFF	ON	OFF	Parameter No.35	OFF	ON	ON	Parameter No.36	ON	OFF	OFF	Parameter No.37	ON	OFF	ON	Parameter No.38	ON	ON	OFF	Parameter No.39	ON	ON	ON	Parameter No.40		0	1	0
Jog2	Jog1	Jog0	Selected Speed Value																																						
OFF	OFF	OFF	Parameter No.6																																						
OFF	OFF	ON	Parameter No.34																																						
OFF	ON	OFF	Parameter No.35																																						
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ON	OFF	ON	Parameter No.38																																						
ON	ON	OFF	Parameter No.39																																						
ON	ON	ON	Parameter No.40																																						
34 ~40	<b>Jog Speed1~Jog Speed7:</b> Set Jog speed additionally used according to input signal Jog0, Jog1, Jog2.	pps	1	500,000	5000																																				
41	<b>Use Motion Queue:</b> This function is to execute the next move command right after completing the current move command when another move command is received before the move command is completed.  ◆ 0 : Activate Motion Queue Function		0	1	0																																				

No.	Description	Unit	Lower Limit	Upper Limit	Default
	<p>◆ 1 : Deactivate Motion Queue Function (Return error (0x85) if another move command is received during the move.)</p> <p>※ Move commands are only available for Incremental / Absolute commands.</p> <p>If more than one command is received, only one is executed and the other commands return error.</p>				
42	<p><b>Disconnection Option Code:</b> This function is to stop move command when communication end or communication cable disconnection occurs while move command is being executed.</p> <p>◆ 0 (None) : Keep executing move command ◆ 1 (Stop) : Stop with deceleration ◆ 2 (E-Stop) : Emergency Stop ◆ 3 (Stop&amp;Servo Off) : Servo Off after stop with deceleration ◆ 4 (E-Stop&amp;Servo Off) : Servo Off after emergency stop</p> <p>※ Only available when connecting with TCP. The above function does not apply when GUI program connection is terminated.</p>		0	4	0
43	<p><b>Communication Timeout:</b> This parameter sets the timeout value for communication.</p> <p>※ If timeout occurs, it executes the function set in parameter 42.</p>	msec	100	60,000	100

## 1 1 . Protective Function

### 1 1 - 1 . Alarm Type

- 1) If an alarm occurs during drive operation, the red LED blinks. The LED blinks in the same way as the alarm number, and the protection functions shown in the following table are activated.
- 2) For alarm number higher than 15, alarm LED does not blink.

Flash Count	Alarm Name	Description
1	Overcurrent	The current through power devices in inverter exceeds the limit value *1
2	Overspeed	Command speed for motor exceeds 3300[rpm].
3	Position Tracking	Position error value is higher than specified value*2 while in motion.
4	Overload	The motor is continuously operated more than 5 second under a load exceeding the max. torque.
5	Overheat	If the internal temperature of the drive exceeds 85 ° C
6	Over regenerative voltage	If the back EMF voltage of the motor exceeds the limit *3
7	Motor connection	If there is an error in the connection between the drive and motor
8	Encoder connection	If there is an error in the connection between the drive and encoder
10	Inposition error	When position error (1 pulse or more) occurs for more than 3 seconds after operation is completed
12	ROM error	When an error occurs in the parameter storage device (ROM)
15	Pos error overflow	When the position error value is bigger than the given value*4 after completion of position command
50	Internal communication error	If a communication error between components in the drive occurs
51	SERVO ON failure	If the SERVO ON command fails
60		
201	IP setting error	If IP and Gateway is same
202	IP conflict	If there is a product with the same IP in the connected network (Including other products)

\*1 Detection current : 4.5A

\*2 The value of the parameter 'Pos Tracking Limit[No.24]'

\*3 Limit : 70V

\*4 The value of the parameter 'Pos Error Overflow Limit[No.28]'

### 1 1 - 2 . Acquiring the Alarm Information

If an alarm occurs, the motor goes to Servo OFF status and stops if it was operating. At the same time, control output "Alarm" is output.

Outputs repeatedly until the alarm is canceled by the "Alarm Reset" command or signal.



## 1 1 - 3 . Alarm check and Release

If an alarm occurs, remove the cause and clear the alarm. Here's how to turn it off. Alarms that are marked as invalid in the 'Reset' column can only be cleared by turning off the power.

Flash Count	Alarm Name	Description	Reset
1	Overcurrent	1) Check the short circuit condition of the motor wires (A / A, B / B). 2) Check the parameter settings and the load status of the machine.	Valid
2	Overspeed	1) Check the parameter setting and motor malfunction. 2) Check the speed command of master controller(ex:PLC)	Valid
3	Position Tracking	1) Reduce the load or increase the acceleration / deceleration value. 2) Check the assembly of the mechanism. 3) Check the brake cable. 4) Check motor line short or disconnection. 5) Check the wiring of the encoder cable. 6) Check the setting value of parameter 24.	Valid
4	Overload	1) Compare motor torque and load size. 2) Check the assembly of the mechanism. 3) Check SW Limit value among parameters. 4) Check if the sensor is working properly. 5) Check if the motor DB of the used motor matches the drive. 6) Check motor line short or disconnection.	Valid
5	Overheat	1) Lower the ambient temperature or install a cooling fan. 2) Check if the distance between drives is more than 50mm.	Valid
6	Over regenerative voltage	1) Check if acceleration / deceleration value is small at high speed operation.	Valid
7	Motor connection	1) Check the connection between the drive and the motor.	Invalid
8	Encoder connection	1) Check for damage to the encoder or the encoder wire, or loosened encode fixing screw.	Invalid
10	Inposition error	1) Check the parameter setting and overload. 2) Check the vibration of the mechanism and the belt tension. 3) Check the wiring status of the motor and encoder.	Valid
12	ROM error	1) Contact to distributor.	Invalid
15	Pos error overflow	1) Reduce the load or increase the acceleration / deceleration value. 2) Check if brake and encoder are operating normally.	Valid
50	Internal communication error	1) Reapply power to the drive.	Invalid
51,60	SERVO ON failure	1) Resend the SERVO ON command. 2) Reapply power to the drive.	Valid

201	IP setting error	1) Set the last number of IP and Gateway differently. 2) When using the default IP address, set the IP setting between 2 and 254.	Invalid
202	IP conflict	1) The IP has conflicted with other drives (including other products). Check the settings of each drive (including other products).	Invalid

## 1 2 . Appendix

### 1 2 - 1 . Option for Motor Drive

#### ■ I/O connection cable

Available to connect between drive and I/O

Item	Length[m]	Remark
CSEM-S-□□□F	□□□	Normal Cable, M type
CSEM-S-□□□M	□□□	Robot Cable, M type
CSER-S-□□□F	□□□	Normal Cable, R type
CSER-S-□□□M	□□□	Robot Cable, R type

□ is the cable length.

Unit is 1 [m] and the maximum length is 20 [m].

Refer to ① of 「4-2 Controller Configuration」.

#### ■ Drive power cable

The cable used to connect the drive to a power source.

Name	Length[m]	Remark
CWPA-P-□□□F	□□□	Normal Cable, M type
CWPA-P-□□□M	□□□	Robot Cable, M type
CSVA-P-□□□F	□□□	Normal Cable, R type
CSVA-P-□□□M	□□□	Robot Cable, R type
CSPA-P-□□□F	□□□	Normal Cable, R type 86mm
CSPA-P-□□□M	□□□	Robot Cable, R type 86mm

□ is the cable length.

Unit is 1 [m] and the maximum length is 2 [m].

Refer to ① of 「4-2 Controller Configuration」.

#### ■ Ethernet Cable for Ezi-SERVOⅡ Plus-E ALL ALL

Use STP (Shielded Twisted Pair) cable (CAT5E)

Item	Length[m]	Remark
CGNM-EC-□□□F	□□□	Normal Cable, M type
CGNM-EC-□□□M	□□□	Robot Cable, M type
CGNR-EC-□□□F	□□□	Normal Cable, R type
CGNR-EC-□□□M	□□□	Robot Cable, R type

□ is the cable length.

Unit is 1 [m] and the maximum length is 100 [m].

Refer to ① of 「4-2 Controller Configuration」.

## ■ Connectors for cables

Specifications of the connector used to connect to the drive.

### 1) M connector type

Type	ITEM	Specification	Maker
I/O connection(CN1)	Connector	99 0492 52 12	BINDER
Power connection(CN2)	Connector	99 0410 70 04	BINDER
Ethernet network (CN3, CN4)	Connector	99 0409 70 04	BINDER

### 2) R connector type

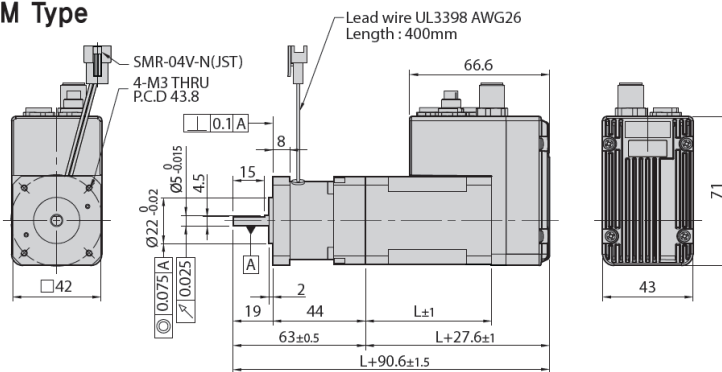
Type	ITEM	Specification	Maker
I/O connection(CN1)	Housing	501646-1200	MOLEX
	Terminal	501648-1000(AWG26~28)	
Power connection(CN2)	Terminal Block	MC421-38104	DECA

※ The above connectors are the most suitable for Ezi-STEP II Plus-E. Equivalent or alternative can also be used.



## 1 2 - 2 . Brake-Mounted Motor Specifications and Sizes

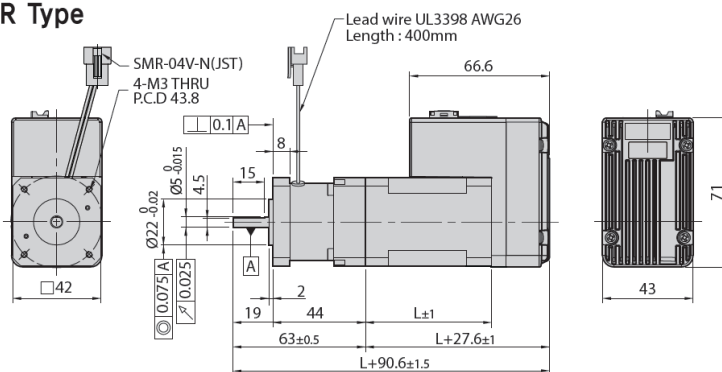
### ◆ M Type



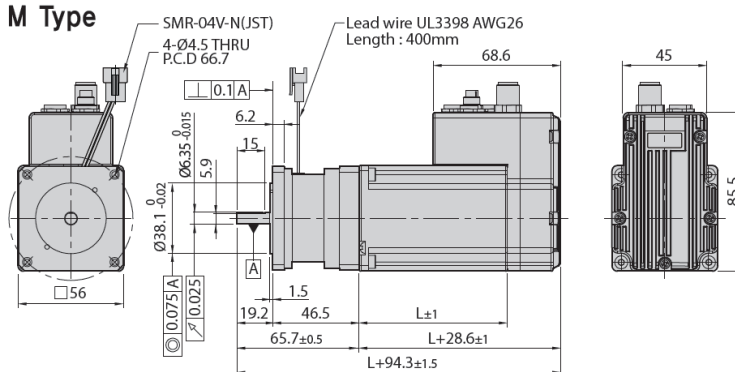
# 42mm

Model Name	Length(L)	Weight(kg)
42M	40	0.57
42L	48	0.64
42XL	60	0.77

### ◆ R Type



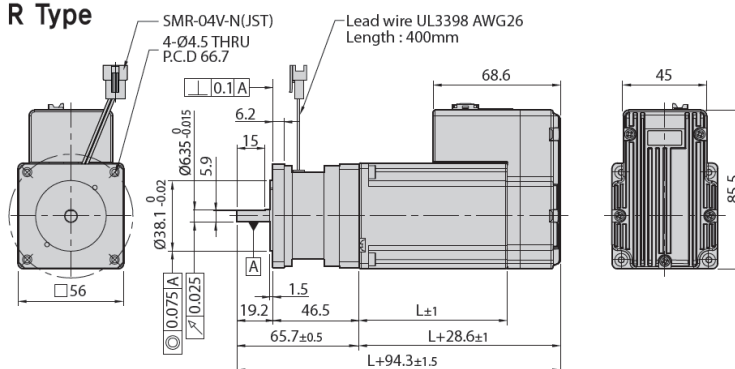
### ◆ M Type



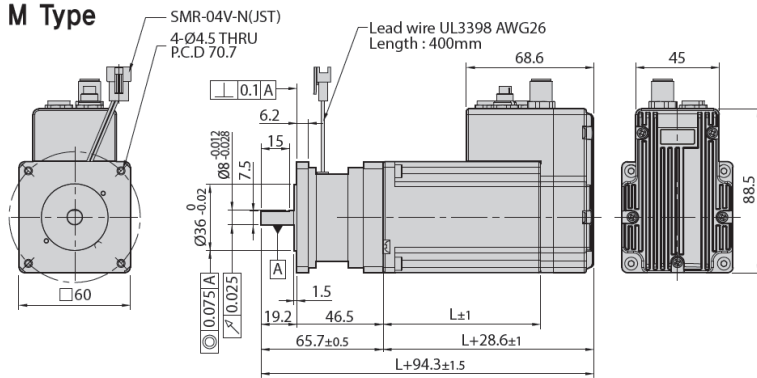
# 56mm

Model Name	Length(L)	Weight(kg)
56S	46	1.03
56M	55	1.19
56L	80	1.63

### ◆ R Type



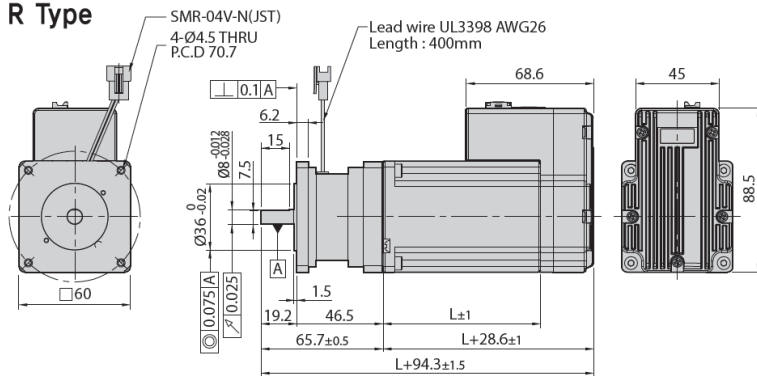
## ◆ M Type



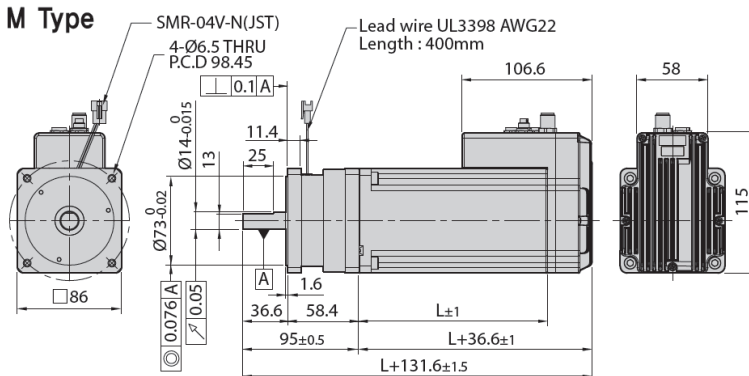
60mm

Model Name	Length(L)	Weight(kg)
60S	47	1,15
60M	56	1,35
60L	85	1,96

## ◆ R Type



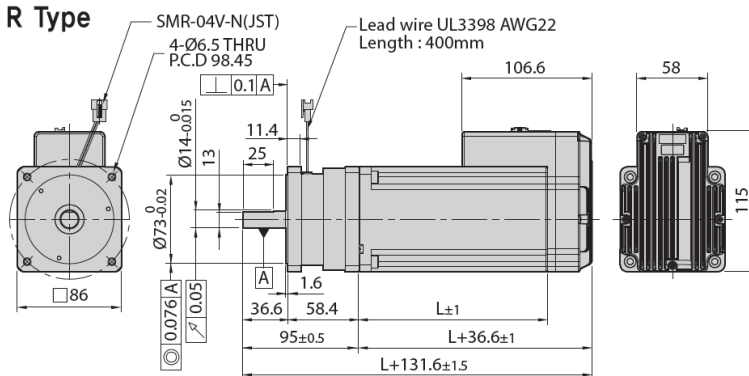
## ◆ M Type



86mm

Model Name	Length(L)	Weight(kg)
86M	78	3,6
86L	117	5,1
86XL	155	6,6

## ◆ R Type



# 1 2 - 3 . Gearbox-Mounted Motor Specifications and Sizes

## 1) Specifications of Gearbox for 42mm Motors

Unit Part Number	Maximum Holding Torque [N·m]	Rotor Inertia Moment [kg·m <sup>2</sup> ]	Back-lash [min]	Angle Trans-mission Error [min]	Re-duction Gear Ratio	Resolution (10,000 [ppr] Standard)	Permitted Torque [N·m]	Maximum Torque [N·m]	Permitted Speed Range [rpm]	Unit Weight [kg]	Permitted Overhung Load [N] Axis Center Standard	Permitted Thrust Load [N]
Ezi-SERVO II -PE-ALL-42M-■-PN3-▲	0,85	54x10 <sup>-7</sup>	3	5	3	0,012°	6	12	0~1000	0,96	240	270
Ezi-SERVO II -PE-ALL-42M-■-PN5-▲	1,42				5	0,0072°	9	18	0~600		290	330
Ezi-SERVO II -PE-ALL-42M-■-PN8-▲	2,28				8	0,0045°	9	18	0~375		340	410
Ezi-SERVO II -PE-ALL-42M-■-PN10-▲	2,85				10	0,0036°	6	12	0~300		360	450
Ezi-SERVO II -PE-ALL-42M-■-PN15-▲	4,14		5	7	15	0,0024°	6	12	0~200	1,06	410	540
Ezi-SERVO II -PE-ALL-42M-■-PN25-▲	6,90				25	0,00144°	9	18	0~120		490	640
Ezi-SERVO II -PE-ALL-42M-■-PN40-▲	9,00				40	0,0009°	9	18	0~75		570	640
Ezi-SERVO II -PE-ALL-42M-■-PN50-▲	9,00				50	0,00072°	9	18	0~60		620	640
Ezi-SERVO II -PE-ALL-42L-■-PN3-▲	0,92	77x10 <sup>-7</sup>	3	5	3	0,012°	6	12	0~1000	1,02	240	270
Ezi-SERVO II -PE-ALL-42L-■-PN5-▲	1,54				5	0,0072°	9	18	0~600		290	330
Ezi-SERVO II -PE-ALL-42L-■-PN8-▲	2,47				8	0,0045°	9	18	0~375		340	410
Ezi-SERVO II -PE-ALL-42L-■-PN10-▲	3,09				10	0,0036°	6	12	0~300		360	450
Ezi-SERVO II -PE-ALL-42L-■-PN15-▲	4,49		5	7	15	0,0024°	6	12	0~200	1,12	410	540
Ezi-SERVO II -PE-ALL-42L-■-PN25-▲	7,49				25	0,00144°	9	18	0~120		490	640
Ezi-SERVO II -PE-ALL-42L-■-PN40-▲	9,00				40	0,0009°	9	18	0~75		570	640
Ezi-SERVO II -PE-ALL-42L-■-PN50-▲	9,00				50	0,00072°	9	18	0~60		620	640
Ezi-SERVO II -PE-ALL-42XL-■-PN3-▲	1,45	114x10 <sup>-7</sup>	3	5	3	0,012°	6	12	0~1000	1,15	240	270
Ezi-SERVO II -PE-ALL-42XL-■-PN5-▲	2,42				5	0,0072°	9	18	0~600		290	330
Ezi-SERVO II -PE-ALL-42XL-■-PN8-▲	3,87				8	0,0045°	9	18	0~375		340	410
Ezi-SERVO II -PE-ALL-42XL-■-PN10-▲	4,84				10	0,0036°	6	12	0~300		360	450
Ezi-SERVO II -PE-ALL-42XL-■-PN15-▲	6,00		5	7	15	0,0024°	6	12	0~200	1,25	410	540
Ezi-SERVO II -PE-ALL-42XL-■-PN25-▲	9,00				25	0,00144°	9	18	0~120		490	640
Ezi-SERVO II -PE-ALL-42XL-■-PN40-▲	9,00				40	0,0009°	9	18	0~75		570	640
Ezi-SERVO II -PE-ALL-42XL-■-PN50-▲	9,00				50	0,00072°	9	18	0~60		620	640

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

\* The code of connector type will be marked in "▲"

## 2) Specifications of Gearbox for 56mm Motors

Unit Part Number	Maximum Holding Torque [N·m]	Rotor Inertia Moment [kg·m <sup>2</sup> ]	Back-lash [min]	Angle Transmission Error [min]	Reduction Gear Ratio	Resolution (10,000 [ppr] Standard)	Permitted Torque [N·m]	Maximum Torque [N·m]	Permitted Speed Range [rpm]	Unit Weight [kg]	Permitted Overhung Load [N] Axis Center Standard	Permitted Thrust Load [N]
Ezi-SERVO II-PE-ALL-56S-■-PN3-▲	1,1	180x10 <sup>-7</sup>	3	5	3	0,012°	18	35	0~1000	1,94	430	310
Ezi-SERVO II-PE-ALL-56S-■-PN5-▲	1,9				5	0,0072°	27	50	0~600		510	390
Ezi-SERVO II-PE-ALL-56S-■-PN8-▲	3,0				8	0,0045°	27	50	0~375		600	480
Ezi-SERVO II-PE-ALL-56S-■-PN10-▲	3,8				10	0,0036°	18	35	0~300		640	530
Ezi-SERVO II-PE-ALL-56S-■-PN15-▲	5,5				15	0,0024°	18	35	0~200	2,14	740	630
Ezi-SERVO II-PE-ALL-56S-■-PN25-▲	9,3				25	0,00144°	27	50	0~120		870	790
Ezi-SERVO II-PE-ALL-56S-■-PN40-▲	14,9				40	0,0009°	27	50	0~75		1000	970
Ezi-SERVO II-PE-ALL-56S-■-PN50-▲	18,6				50	0,00072°	27	50	0~60		1100	1100
Ezi-SERVO II-PE-ALL-56M-■-PN3-▲	2,0	280x10 <sup>-7</sup>	3	5	3	0,012°	18	35	0~1000	2,15	430	310
Ezi-SERVO II-PE-ALL-56M-■-PN5-▲	3,4				5	0,0072°	27	50	0~600		510	390
Ezi-SERVO II-PE-ALL-56M-■-PN8-▲	5,4				8	0,0045°	27	50	0~375		600	480
Ezi-SERVO II-PE-ALL-56M-■-PN10-▲	6,8				10	0,0036°	18	35	0~300		640	530
Ezi-SERVO II-PE-ALL-56M-■-PN15-▲	9,9				15	0,0024°	18	35	0~200	2,35	740	630
Ezi-SERVO II-PE-ALL-56M-■-PN25-▲	16,6				25	0,00144°	27	50	0~120		870	790
Ezi-SERVO II-PE-ALL-56M-■-PN40-▲	27,0				40	0,0009°	27	50	0~75		1000	970
Ezi-SERVO II-PE-ALL-56M-■-PN50-▲	27,0				50	0,00072°	27	50	0~60		1100	1100
Ezi-SERVO II-PE-ALL-56L-■-PN3-▲	4,0	520x10 <sup>-7</sup>	3	5	3	0,012°	18	35	0~1000	2,52	430	310
Ezi-SERVO II-PE-ALL-56L-■-PN5-▲	6,8				5	0,0072°	27	50	0~600		510	390
Ezi-SERVO II-PE-ALL-56L-■-PN8-▲	10,8				8	0,0045°	27	50	0~375		600	480
Ezi-SERVO II-PE-ALL-56L-■-PN10-▲	13,6				10	0,0036°	18	35	0~300		640	530
Ezi-SERVO II-PE-ALL-56L-■-PN15-▲	18,0				15	0,0024°	18	35	0~200	2,72	740	630
Ezi-SERVO II-PE-ALL-56L-■-PN25-▲	27,0				25	0,00144°	27	50	0~120		870	790
Ezi-SERVO II-PE-ALL-56L-■-PN40-▲	27,0				40	0,0009°	27	50	0~75		1000	970
Ezi-SERVO II-PE-ALL-56L-■-PN50-▲	27,0				50	0,00072°	27	50	0~60		1100	1100

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

\* The code of connector type will be marked in "▲"

### 3) Specifications of Gearbox for 60mm Motors 60mm

Unit Part Number	Maximum Holding Torque [N·m]	Rotor Inertia Moment [kg·m <sup>2</sup> ]	Back-lash [min]	Angle Transmission Error [min]	Reduction Gear Ratio	Resolution (10,000 [ppr] Standard)	Permitted Torque [N·m]	Maximum Torque [N·m]	Permitted Speed Range [rpm]	Unit Weight [kg]	Permitted Overhung Load [N] Axis Center Standard	Permitted Thrust Load [N]
Ezi-SERVO II-PE-ALL-60S-■-PN3-▲	1,5	240x10 <sup>-7</sup>	3	5	3	0,012°	18	35	0~1000	2,0	430	310
Ezi-SERVO II-PE-ALL-60S-■-PN5-▲	2,5				5	0,0072°	27	50	0~600		510	390
Ezi-SERVO II-PE-ALL-60S-■-PN8-▲	4,0				8	0,0045°	27	50	0~375		600	480
Ezi-SERVO II-PE-ALL-60S-■-PN10-▲	5,1				10	0,0036°	18	35	0~300		640	530
Ezi-SERVO II-PE-ALL-60S-■-PN15-▲	7,4				15	0,0024°	18	35	0~200	2,2	740	630
Ezi-SERVO II-PE-ALL-60S-■-PN25-▲	12,3				25	0,00144°	27	50	0~120		870	790
Ezi-SERVO II-PE-ALL-60S-■-PN40-▲	19,8				40	0,0009°	27	50	0~75		1000	970
Ezi-SERVO II-PE-ALL-60S-■-PN50-▲	24,7				50	0,00072°	27	50	0~60		1100	1100
Ezi-SERVO II-PE-ALL-60M-■-PN3-▲	2,6	490x10 <sup>-7</sup>	3	5	3	0,012°	18	35	0~1000	2,0	430	310
Ezi-SERVO II-PE-ALL-60M-■-PN5-▲	4,4				5	0,0072°	27	50	0~600		510	390
Ezi-SERVO II-PE-ALL-60M-■-PN8-▲	7,0				8	0,0045°	27	50	0~375		600	480
Ezi-SERVO II-PE-ALL-60M-■-PN10-▲	8,8				10	0,0036°	18	35	0~300		640	530
Ezi-SERVO II-PE-ALL-60M-■-PN15-▲	12,8				15	0,0024°	18	35	0~200	2,2	740	630
Ezi-SERVO II-PE-ALL-60M-■-PN25-▲	21,4				25	0,00144°	27	50	0~120		870	790
Ezi-SERVO II-PE-ALL-60M-■-PN40-▲	27,0				40	0,0009°	27	50	0~75		1000	970
Ezi-SERVO II-PE-ALL-60M-■-PN50-▲	27,0				50	0,00072°	27	50	0~60		1100	1100
Ezi-SERVO II-PE-ALL-60L-■-PN3-▲	5,2	690x10 <sup>-7</sup>	3	5	3	0,012°	18	35	0~1000	3,0	430	310
Ezi-SERVO II-PE-ALL-60L-■-PN5-▲	8,7				5	0,0072°	27	50	0~600		510	390
Ezi-SERVO II-PE-ALL-60L-■-PN8-▲	13,9				8	0,0045°	27	50	0~375		600	480
Ezi-SERVO II-PE-ALL-60L-■-PN10-▲	18,0				10	0,0036°	18	35	0~300		640	530
Ezi-SERVO II-PE-ALL-60L-■-PN15-▲	18,0				15	0,0024°	18	35	0~200	3,2	740	630
Ezi-SERVO II-PE-ALL-60L-■-PN25-▲	27,0				25	0,00144°	27	50	0~120		870	790
Ezi-SERVO II-PE-ALL-60L-■-PN40-▲	27,0				40	0,0009°	27	50	0~75		1000	970
Ezi-SERVO II-PE-ALL-60L-■-PN50-▲	27,0				50	0,00072°	27	50	0~60		1100	1100

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

\* The code of connector type will be marked in "▲"

## 4) Specifications of Gearbox for 86mm Motors

Unit Part Number	Maximum Holding Torque [N·m]	Rotor Inertia Moment [kg·m <sup>2</sup> ]	Back-lash [min]	Angle Transmission Error [min]	Reduction Gear Ratio	Resolution (10,000 [ppr] Standard)	Permitted Torque [N·m]	Maximum Torque [N·m]	Permitted Speed Range [rpm]	Unit Weight [kg]	Permitted Overhung Load [N] Axis Center Standard	Permitted Thrust Load [N]
Ezi-SERVO II-PE-ALL-86M-■-PN3-▲	9,6	1800x10 <sup>-7</sup>	3	5	3	0,012°	50	80	0~1000	6,0	810	930
Ezi-SERVO II-PE-ALL-86M-■-PN5-▲	16,0				5	0,0072°	75	125	0~600		960	1200
Ezi-SERVO II-PE-ALL-86M-■-PN8-▲	25,7				8	0,0045°	75	125	0~375		1100	1400
Ezi-SERVO II-PE-ALL-86M-■-PN10-▲	32,1				10	0,0036°	50	80	0~300		1200	1600
Ezi-SERVO II-PE-ALL-86M-■-PN15-▲	46,6				15	0,0024°	50	80	0~200	6,5	1200	1900
Ezi-SERVO II-PE-ALL-86M-■-PN25-▲	75,0				25	0,00144°	75	125	0~120		1600	2200
Ezi-SERVO II-PE-ALL-86M-■-PN40-▲	75,0				40	0,0009°	75	125	0~75		1900	2200
Ezi-SERVO II-PE-ALL-86M-■-PN50-▲	75,0				50	0,00072°	75	125	0~60		2100	2200
Ezi-SERVO II-PE-ALL-86L-■-PN3-▲	17,1	3600x10 <sup>-7</sup>	3	5	3	0,012°	50	80	0~1000	7,5	810	930
Ezi-SERVO II-PE-ALL-86L-■-PN5-▲	28,5				5	0,0072°	75	125	0~600		960	1200
Ezi-SERVO II-PE-ALL-86L-■-PN8-▲	45,6				8	0,0045°	75	125	0~375		1100	1400
Ezi-SERVO II-PE-ALL-86L-■-PN10-▲	50,0				10	0,0036°	50	80	0~300		1200	1600
Ezi-SERVO II-PE-ALL-86L-■-PN15-▲	50,0				15	0,0024°	50	80	0~200	8,0	1200	1900
Ezi-SERVO II-PE-ALL-86L-■-PN25-▲	75,0				25	0,00144°	75	125	0~120		1600	2200
Ezi-SERVO II-PE-ALL-86L-■-PN40-▲	75,0				40	0,0009°	75	125	0~75		1900	2200
Ezi-SERVO II-PE-ALL-86L-■-PN50-▲	75,0				50	0,00072°	75	125	0~60		2100	2200
Ezi-SERVO II-PE-ALL-86XL-■-PN3-▲	23,6	5400x10 <sup>-7</sup>	3	5	3	0,012°	50	80	0~1000	9,0	810	930
Ezi-SERVO II-PE-ALL-86XL-■-PN5-▲	39,4				5	0,0072°	75	125	0~600		960	1200
Ezi-SERVO II-PE-ALL-86XL-■-PN8-▲	63,0				8	0,0045°	75	125	0~375		1100	1400
Ezi-SERVO II-PE-ALL-86XL-■-PN10-▲	50,0				10	0,0036°	50	80	0~300		1200	1600
Ezi-SERVO II-PE-ALL-86XL-■-PN15-▲	50,0				15	0,0024°	50	80	0~200	9,5	1200	1900
Ezi-SERVO II-PE-ALL-86XL-■-PN25-▲	75,0				25	0,00144°	75	125	0~120		1600	2200
Ezi-SERVO II-PE-ALL-86XL-■-PN40-▲	75,0				40	0,0009°	75	125	0~75		1900	2200
Ezi-SERVO II-PE-ALL-86XL-■-PN50-▲	75,0				50	0,00072°	75	125	0~60		2100	2200

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

\* The code of connector type will be marked in "▲"

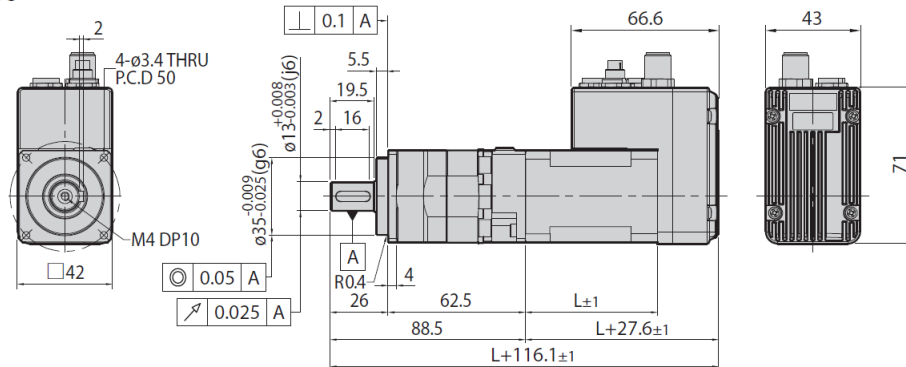
## 5) Size of 42mm Motors with Gearbox

Unit Part Number	Motor	Stage	Reduction Gear Ratio	L Length [mm]
Ezi-SERVO II-PE-ALL-42M-■-PN□-▲	Motor & Drive Integrated	Single Stage	3, 5, 8, 10	40
Ezi-SERVO II-PE-ALL-42L-■-PN□-▲			3, 5, 8, 10	48
Ezi-SERVO II-PE-ALL-42XL-■-PN□-▲			3, 5, 8, 10	60

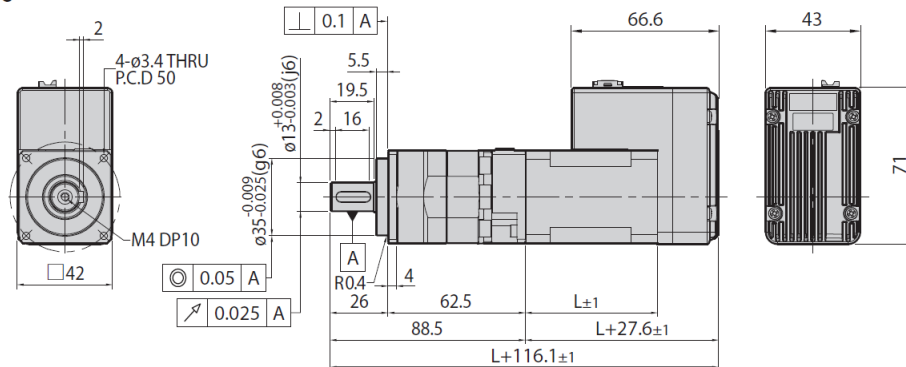
\* The code of encoder resolution will be marked in "■"

\* The code of connector type will be marked in "▲"

### ◆ M Type



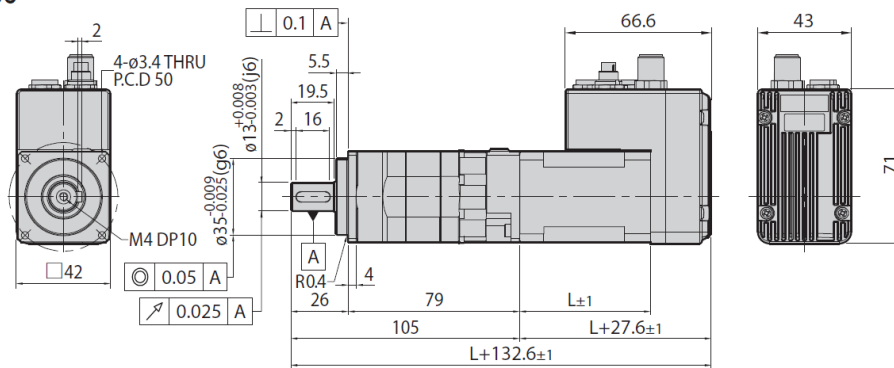
### ◆ R Type



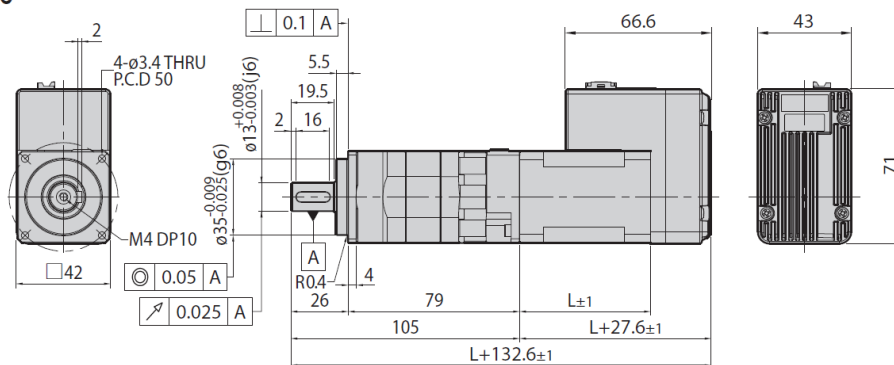
Unit Part Number	Motor	Stage	Reduction Gear Ratio	L Length [mm]
Ezi-SERVO II-PE-ALL-42M-■-PN□-▲	Motor & Drive Integrated	Double Stage	15, 25, 40, 50	40
Ezi-SERVO II-PE-ALL-42L-■-PN□-▲			15, 25, 40, 50	48
Ezi-SERVO II-PE-ALL-42XL-■-PN□-▲			15, 25, 40, 50	60

- \* The code of encoder resolution will be marked in "■"
- \* The code of connector type will be marked in "▲"

### ◆ M Type



### ◆ R Type





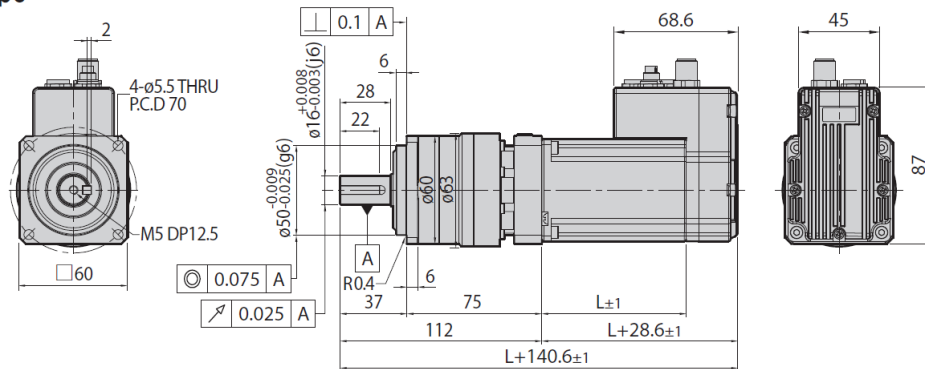
## 6) Size of 56mm Motors with Gearbox

Unit Part Number	Motor	Stage	Reduction Gear Ratio	L Length [mm]
Ezi-SERVO II-PE-ALL-56S-■-PN□-▲	Motor & Drive Integrated	Single Stage	3, 5, 8, 10	46
Ezi-SERVO II-PE-ALL-56M-■-PN□-▲			3, 5, 8, 10	55
Ezi-SERVO II-PE-ALL-56L-■-PN□-▲			3, 5, 8, 10	80

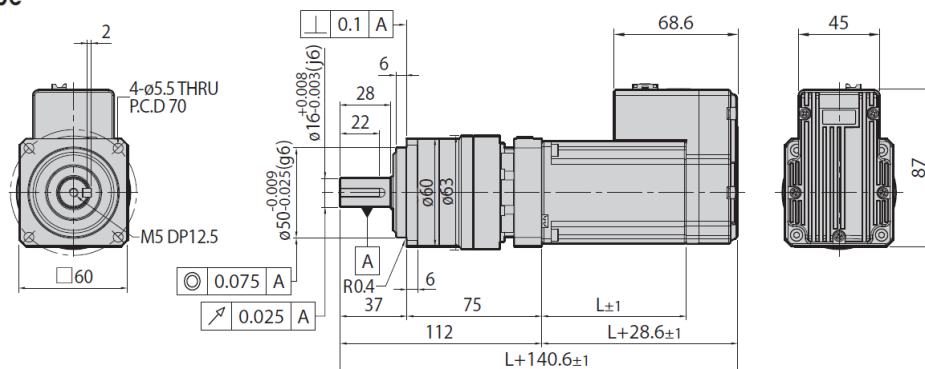
\* The code of encoder resolution will be marked in "■"

\* The code of connector type will be marked in "▲"

### ◆ M Type



### ◆ R Type

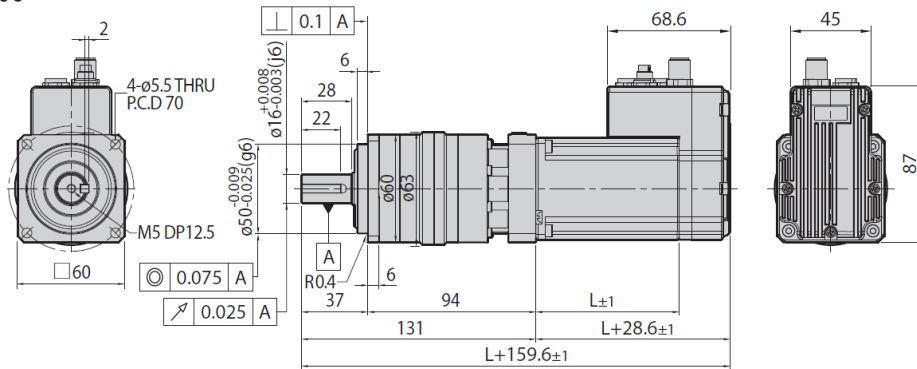


Unit Part Number	Motor	Stage	□Reduction Gear Ratio	L Length [mm]
Ezi-SERVO II -PE-ALL-56S-■-PN□-▲	Motor & Drive Integrated	Double Stage	15, 25, 40, 50	46
Ezi-SERVO II -PE-ALL-56M-■-PN□-▲			15, 25, 40, 50	55
Ezi-SERVO II -PE-ALL-56L-■-PN□-▲			15, 25, 40, 50	80

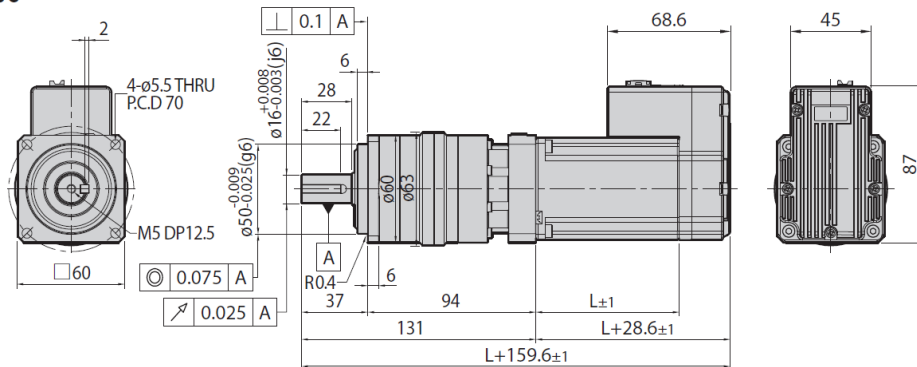
\* The code of encoder resolution will be marked in "■"

\* The code of connector type will be marked in "▲"

◆ M Type



◆ R Type



Unit Part Number	Motor	Stage	Reduction Gear Ratio	L Length [mm]
Ezi-SERVO II -PE-ALL-60S-■-PN□-▲	Motor & Drive Integrated	Single Stage	3, 5, 8, 10	47
Ezi-SERVO II -PE-ALL-60M-■-PN□-▲			3, 5, 8, 10	56
Ezi-SERVO II -PE-ALL-60L-■-PN□-▲			3, 5, 8, 10	85

\* The code of connector type will be marked in "▲"

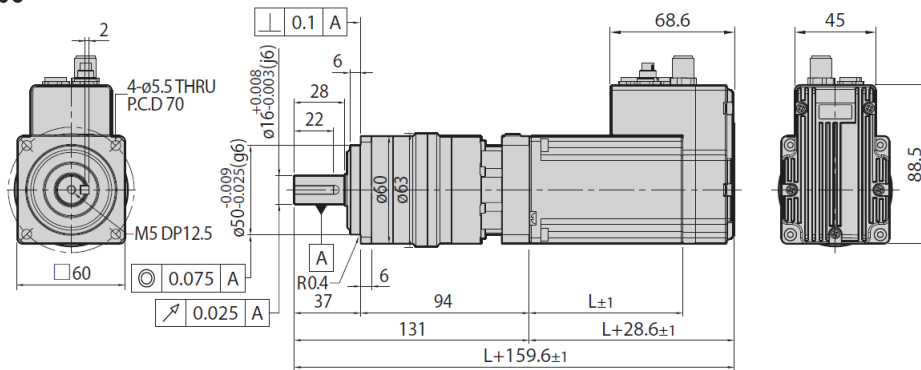
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Unit Part Number	Motor	Stage	□Reduction Gear Ratio	L Length [mm]
Ezi-SERVO II -PE-ALL-60S-■-PN□-▲	Motor & Drive Integrated	Double Stage	15, 25, 40, 50	47
Ezi-SERVO II -PE-ALL-60M-■-PN□-▲			15, 25, 40, 50	56
Ezi-SERVO II -PE-ALL-60L-■-PN□-▲			15, 25, 40, 50	85

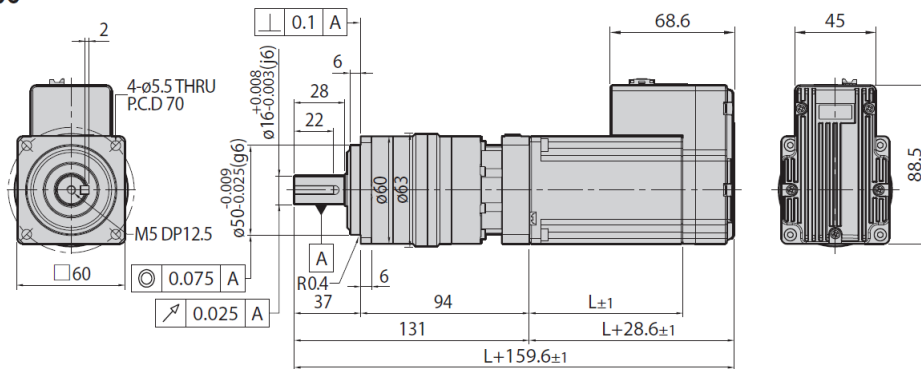
\* The code of connector type will be marked in "▲"

\* The code of connector type will be marked in "▲"

◆ M Type



◆ R Type



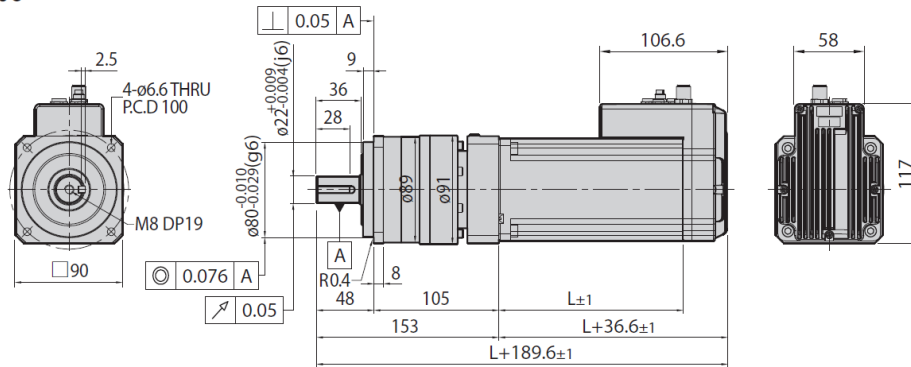
## 8) Size of 86mm Motors with Gearbox

Unit Part Number	Motor	Stage	Reduction Gear Ratio	L Length [mm]
Ezi-SERVO II-PE-ALL-86M-■-PN□-▲	Motor & Drive Integrated	Single Stage	3, 5, 8, 10	78
Ezi-SERVO II-PE-ALL-86L-■-PN□-▲			3, 5, 8, 10	117
Ezi-SERVO II-PE-ALL-86XL-■-PN□-▲			3, 5, 8, 10	155

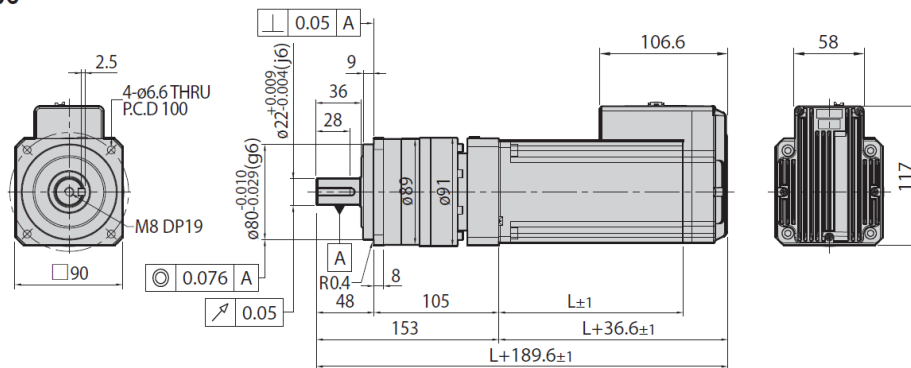
\* The code of encoder resolution will be marked in "■"

\* The code of connector type will be marked in "▲"

### ◆ M Type



### ◆ R Type

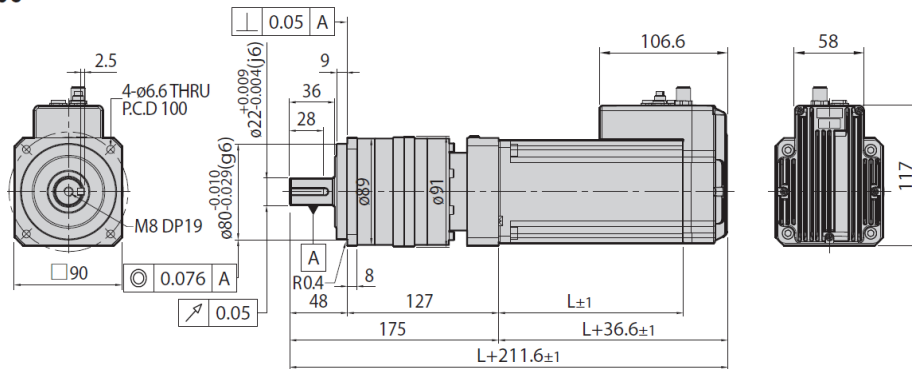


Unit Part Number	Motor	Stage	□ Reduction Gear Ratio	L Length [mm]
Ezi-SERVO II -PE-ALL-86M-■-PN□-▲	Motor & Drive Integrated	Double Stage	15, 25, 40, 50	78
Ezi-SERVO II -PE-ALL-86L-■-PN□-▲			15, 25, 40, 50	117
Ezi-SERVO II -PE-ALL-86XL-■-PN□-▲			15, 25, 40, 50	155

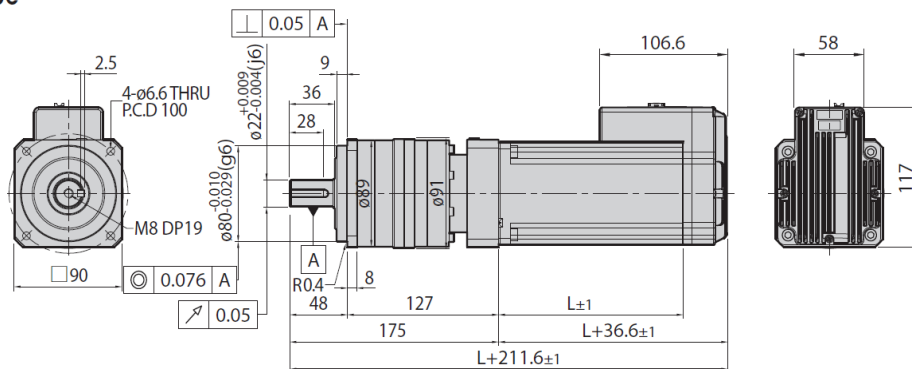
\* The code of encoder resolution will be marked in "■"

\* The code of connector type will be marked in "▲"

◆ M Type



### ◆ R Type





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