Ezi-SERVO® II

Closed Loop Stepping System

- Motor + Encoder + Drive
- Closed Loop System
- No Gain Tuning / No Hunting
- High Resolution / Fast Response
- Heat Reduction

BT

CE

FASTECH

Fast, Accurate, Smooth Motion

FASTECH

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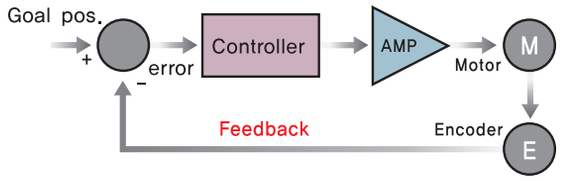
Ezi-SERVO® II BT

Closed Loop Stepping System

2 Closed Loop System

Ezi-SERVO II is an innovative Closed Loop System that utilizes a high-resolution motor mounted encoder constantly to monitor the current position. The encoder feedback allows the Ezi-SERVO II to update the current position every 50 μsec. It allows the Ezi-SERVO II drive to compensate for the loss of position, ensuring accurate positioning. For example, due to a sudden load change, a conventional stepper motor and drive could lose a step but Ezi-SERVO II automatically correct the position by encoder feedback.

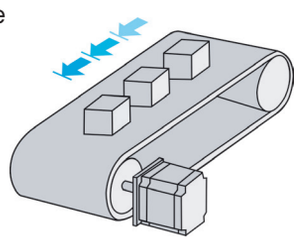


1 Integrated Solution

Ezi-SERVO II BT with integrated Motor and Encoder and Drive has provides the optimum solution that can take full advantage of Ezi-SERVO II by realizing compact size and simple wiring.

3 No Gain Tuning

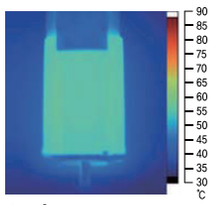
To ensure machine performance, smoothness, positional error and low servo noise, conventional servo systems require the adjustment of its servo's gains as an initial crucial step. Even systems that employ auto-tuning require manual tuning after the system is installed, especially if more that one axis are interdependent. Ezi-SERVO II employs the best characteristics of stepper, closed loop motion controls and algorithms to eliminate the need of tedious gain tuning required for conventional closed loop servo systems. This means that Ezi-SERVO II is optimized for the application and ready to work right out of the box. The Ezi-SERVO II system employs the unique characteristics of the closed loop stepping motor control, eliminating these cumbersome steps and giving the engineer a high performance servo system without wasting setup time. Ezi-SERVO II is especially well suited for low stiffness loads (for example, a belt and pulley system) that sometime require conventional servo systems to inertia match with the additimal expensive and bulky gearbox. Ezi-SERVO II also performs exceptionally, even under heavy loads and high speeds.



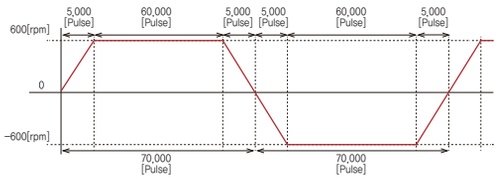
4 Heat Reduction / Energy Saving

(Motor Current Control according to load)

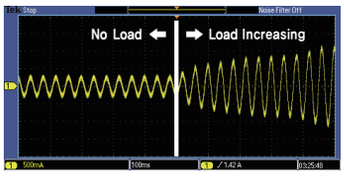
Ezi-SERVO II automatically controls motor current according to load.
Ezi-SERVO II reduces motor current when motor load is low and increases motor current when load is high. By optimizing the motor current, motor heat can be minimized and energy can be saved.



Motor temperature [Measured by Thermal Imaging Camera]



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

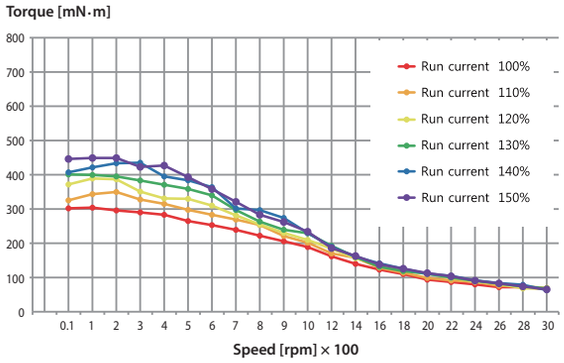


Example of the Motor Current Control according to load

5 Torque Improvement

(Motor Current Setting)

Ezi-SERVO II can increase the motor current up to 150% by setting the Run Current by parameter. Therefore acceleration and deceleration characteristics and torque characteristics at low speed can be increased.
Ezi-SERVO II can improve the torque in the low speed range by about 30%.

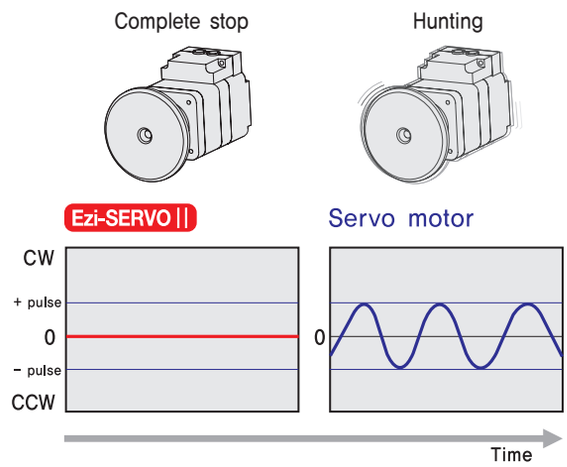


※ The torque at low speed is improved about 30%.

Measured Condition : Drive = Ezi-SERVO II-BT-42L
Motor Voltage = 24VDC
Input Voltage = 24VDC

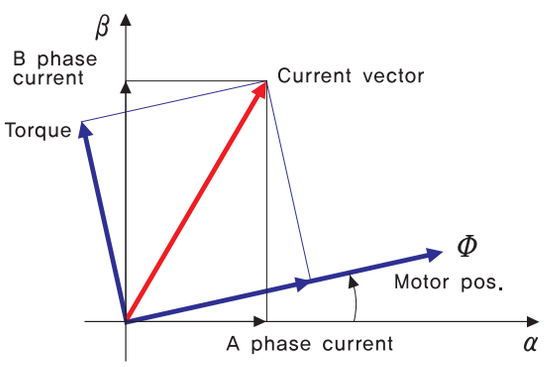
6 No Hunting

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



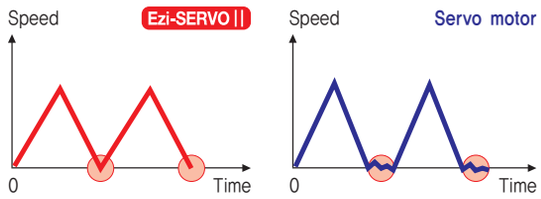
7 Smooth and Accurate

Ezi-SERVO II is a high-precision servo drive, using a high-resolution encoder with 20,000 pulses/revolution. Unlike a conventional Microstep drive, the on-board high performance MCU (Micro Controller Unit) performs vector control and filtering, producing a smooth rotational control with minimum ripples.



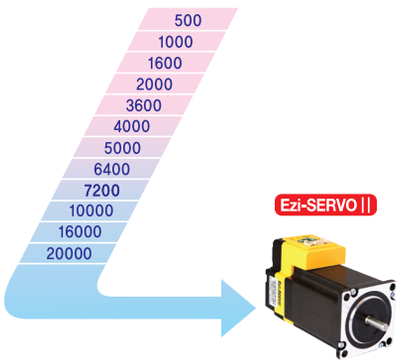
8 Fast Response

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



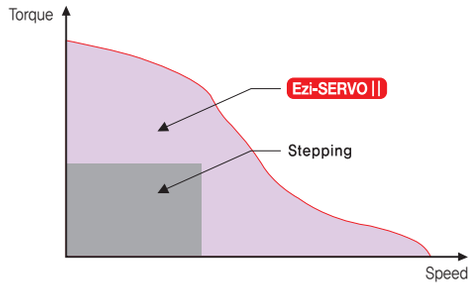
9 High Resolution

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



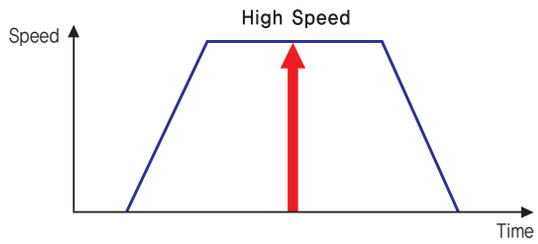
10 High Torque

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



11 High Speed

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



● Advantages over Open-Loop Control Stepping Drive

1. Reliable positioning without loss of synchronism.
2. Holding stable position and automatically recovering to the original position even after experiencing positioning error due to external forces, such as mechanical vibration or vertical positional holding.
3. Ezi-SERVO II utilizes 100% of the full range of rated motor torque, contrary to a conventional open-loop stepping driver that can use up to 50% of the rated motor torque due to the loss of synchronism.
4. Capability to operate at high speed due to load-dependant current control, open-loop stepping drivers use a constant current control at all speed ranges without considering load varitions.

● Advantages over Servo Motor Controller

1. No gain tuning. (Automatic gain adjustment in response to a load change)
2. Maintains the stable holding position without oscillation after completion of positioning.
3. Fast positioning due to the independent control by on-board MCU.
4. Continuous operation during rapid short-stroke movement due to instantaneous positioning.

● Ezi-SERVOII BT Part Numbering

Ezi-SERVOII-BT-42S-A-BK-PN10-□

Product Name	
Drive Series	BT : Built In
Motor Flange Size	28 : 28mm 42 : 42mm 56 : 56mm 60 : 60mm
Motor Length	S : Small M : Medium L : Large XL : Extra Large
Encoder Resolution	A : 10,000[ppr] B : 20,000[ppr] D : 16,000[ppr]
Brake	Blank : Without Brake BK : Brake
Reduction Gear Ratio	Blank – Without Gear PN03 – 1:3 PN05 – 1:5 PN08 – 1:8 PN10 – 1:10 PN15 – 1:15 PN25 – 1:25 PN40 – 1:40 PN50 – 1:50
User Code	

● Standard Combination

Unit Part Number	Motor Model Number	Drive Model Number
Ezi-SERVOII-BT-28S-D	Motor & Drive Integrated	
Ezi-SERVOII-BT-28M-D		
Ezi-SERVOII-BT-28L-D		
Ezi-SERVOII-BT-42S-A		
Ezi-SERVOII-BT-42S-B		
Ezi-SERVOII-BT-42M-A		
Ezi-SERVOII-BT-42M-B		
Ezi-SERVOII-BT-42L-A		
Ezi-SERVOII-BT-42L-B		
Ezi-SERVOII-BT-42XL-A		
Ezi-SERVOII-BT-42XL-B		
Ezi-SERVOII-BT-56S-A		
Ezi-SERVOII-BT-56S-B		
Ezi-SERVOII-BT-56M-A		
Ezi-SERVOII-BT-56M-B		
Ezi-SERVOII-BT-56L-A		
Ezi-SERVOII-BT-56L-B		
Ezi-SERVOII-BT-60S-A		
Ezi-SERVOII-BT-60S-B		
Ezi-SERVOII-BT-60M-A		
Ezi-SERVOII-BT-60M-B		
Ezi-SERVOII-BT-60L-A		
Ezi-SERVOII-BT-60L-B		

● Combination with Brake

Unit Part Number	Motor Model Number	Drive Model Number
Ezi-SERVOII-BT-42S-A-BK	Motor & Drive Integrated	
Ezi-SERVOII-BT-42S-B-BK		
Ezi-SERVOII-BT-42M-A-BK		
Ezi-SERVOII-BT-42M-B-BK		
Ezi-SERVOII-BT-42L-A-BK		
Ezi-SERVOII-BT-42L-B-BK		
Ezi-SERVOII-BT-42XL-A-BK		
Ezi-SERVOII-BT-42XL-B-BK		
Ezi-SERVOII-BT-56S-A-BK		
Ezi-SERVOII-BT-56S-B-BK		
Ezi-SERVOII-BT-56M-A-BK		
Ezi-SERVOII-BT-56M-B-BK		
Ezi-SERVOII-BT-56L-A-BK		
Ezi-SERVOII-BT-56L-B-BK		
Ezi-SERVOII-BT-60S-A-BK		
Ezi-SERVOII-BT-60S-B-BK		
Ezi-SERVOII-BT-60M-A-BK		
Ezi-SERVOII-BT-60M-B-BK		
Ezi-SERVOII-BT-60L-A-BK		
Ezi-SERVOII-BT-60L-B-BK		

● Combination with Gearbox

Unit Part Number	Motor Model Number	Drive Model Number	Reduction gear ratio
Ezi-SERVO II-BT-42S-A-PN3	Motor & Drive Integrated		1:3
Ezi-SERVO II-BT-42S-B-PN3			
Ezi-SERVO II-BT-42S-A-PN5			1:5
Ezi-SERVO II-BT-42S-B-PN5			
Ezi-SERVO II-BT-42S-A-PN8			1:8
Ezi-SERVO II-BT-42S-B-PN8			
Ezi-SERVO II-BT-42S-A-PN10			1:10
Ezi-SERVO II-BT-42S-B-PN10			
Ezi-SERVO II-BT-42S-A-PN15			1:15
Ezi-SERVO II-BT-42S-B-PN15			
Ezi-SERVO II-BT-42S-A-PN25			1:25
Ezi-SERVO II-BT-42S-B-PN25			
Ezi-SERVO II-BT-42S-A-PN40			1:40
Ezi-SERVO II-BT-42S-B-PN40			
Ezi-SERVO II-BT-42S-A-PN50			1:50
Ezi-SERVO II-BT-42S-B-PN50			
Ezi-SERVO II-BT-42M-A-PN3			1:3
Ezi-SERVO II-BT-42M-B-PN3			
Ezi-SERVO II-BT-42M-A-PN5			1:5
Ezi-SERVO II-BT-42M-B-PN5			
Ezi-SERVO II-BT-42M-A-PN8			1:8
Ezi-SERVO II-BT-42M-B-PN8			
Ezi-SERVO II-BT-42M-A-PN10			1:10
Ezi-SERVO II-BT-42M-B-PN10			
Ezi-SERVO II-BT-42M-A-PN15			1:15
Ezi-SERVO II-BT-42M-B-PN15			
Ezi-SERVO II-BT-42M-A-PN25			1:25
Ezi-SERVO II-BT-42M-B-PN25			
Ezi-SERVO II-BT-42M-A-PN40			1:40
Ezi-SERVO II-BT-42M-B-PN40			
Ezi-SERVO II-BT-42M-A-PN50			1:50
Ezi-SERVO II-BT-42M-B-PN50			
Ezi-SERVO II-BT-42L-A-PN3			1:3
Ezi-SERVO II-BT-42L-B-PN3			
Ezi-SERVO II-BT-42L-A-PN5			1:5
Ezi-SERVO II-BT-42L-B-PN5			
Ezi-SERVO II-BT-42L-A-PN8			1:8
Ezi-SERVO II-BT-42L-B-PN8			
Ezi-SERVO II-BT-42L-A-PN10			1:10
Ezi-SERVO II-BT-42L-B-PN10			
Ezi-SERVO II-BT-42L-A-PN15			1:15
Ezi-SERVO II-BT-42L-B-PN15			
Ezi-SERVO II-BT-42L-A-PN25			1:25
Ezi-SERVO II-BT-42L-B-PN25			
Ezi-SERVO II-BT-42L-A-PN40			1:40
Ezi-SERVO II-BT-42L-B-PN40			
Ezi-SERVO II-BT-42L-A-PN50			1:50
Ezi-SERVO II-BT-42L-B-PN50			
Ezi-SERVO II-BT-42XL-A-PN3			1:3
Ezi-SERVO II-BT-42XL-B-PN3			
Ezi-SERVO II-BT-42XL-A-PN5			1:5
Ezi-SERVO II-BT-42XL-B-PN5			
Ezi-SERVO II-BT-42XL-A-PN8			1:8
Ezi-SERVO II-BT-42XL-B-PN8			
Ezi-SERVO II-BT-42XL-A-PN10			1:10
Ezi-SERVO II-BT-42XL-B-PN10			
Ezi-SERVO II-BT-42XL-A-PN15			1:15
Ezi-SERVO II-BT-42XL-B-PN15			
Ezi-SERVO II-BT-42XL-A-PN25			1:25
Ezi-SERVO II-BT-42XL-B-PN25			
Ezi-SERVO II-BT-42XL-A-PN40			1:40
Ezi-SERVO II-BT-42XL-B-PN40			
Ezi-SERVO II-BT-42XL-A-PN50			1:50
Ezi-SERVO II-BT-42XL-B-PN50			

● Combination with Gearbox

Unit Part Number	Motor Model Number	Drive Model Number	Reduction gear ratio
Ezi-SERVO II-BT-56S-A-PN3	Motor & Drive Integrated		1:3
Ezi-SERVO II-BT-56S-B-PN3			
Ezi-SERVO II-BT-56S-A-PN5			1:5
Ezi-SERVO II-BT-56S-B-PN5			
Ezi-SERVO II-BT-56S-A-PN8			1:8
Ezi-SERVO II-BT-56S-B-PN8			
Ezi-SERVO II-BT-56S-A-PN10			1:10
Ezi-SERVO II-BT-56S-B-PN10			
Ezi-SERVO II-BT-56S-A-PN15			1:15
Ezi-SERVO II-BT-56S-B-PN15			
Ezi-SERVO II-BT-56S-A-PN25			1:25
Ezi-SERVO II-BT-56S-B-PN25			
Ezi-SERVO II-BT-56S-A-PN40			1:40
Ezi-SERVO II-BT-56S-B-PN40			
Ezi-SERVO II-BT-56S-A-PN50			1:50
Ezi-SERVO II-BT-56S-B-PN50			
Ezi-SERVO II-BT-56M-A-PN3			1:3
Ezi-SERVO II-BT-56M-B-PN3			
Ezi-SERVO II-BT-56M-A-PN5			1:5
Ezi-SERVO II-BT-56M-B-PN5			
Ezi-SERVO II-BT-56M-A-PN8			1:8
Ezi-SERVO II-BT-56M-B-PN8			
Ezi-SERVO II-BT-56M-A-PN10			1:10
Ezi-SERVO II-BT-56M-B-PN10			
Ezi-SERVO II-BT-56M-A-PN15			1:15
Ezi-SERVO II-BT-56M-B-PN15			
Ezi-SERVO II-BT-56M-A-PN25			1:25
Ezi-SERVO II-BT-56M-B-PN25			
Ezi-SERVO II-BT-56M-A-PN40			1:40
Ezi-SERVO II-BT-56M-B-PN40			
Ezi-SERVO II-BT-56M-A-PN50			1:50
Ezi-SERVO II-BT-56M-B-PN50			
Ezi-SERVO II-BT-56L-A-PN3			1:3
Ezi-SERVO II-BT-56L-B-PN3			
Ezi-SERVO II-BT-56L-A-PN5			1:5
Ezi-SERVO II-BT-56L-B-PN5			
Ezi-SERVO II-BT-56L-A-PN8			1:8
Ezi-SERVO II-BT-56L-B-PN8			
Ezi-SERVO II-BT-56L-A-PN10			1:10
Ezi-SERVO II-BT-56L-B-PN10			
Ezi-SERVO II-BT-56L-A-PN15			1:15
Ezi-SERVO II-BT-56L-B-PN15			
Ezi-SERVO II-BT-56L-A-PN25			1:25
Ezi-SERVO II-BT-56L-B-PN25			
Ezi-SERVO II-BT-56L-A-PN40			1:40
Ezi-SERVO II-BT-56L-B-PN40			
Ezi-SERVO II-BT-56L-A-PN50			1:50
Ezi-SERVO II-BT-56L-B-PN50			
Ezi-SERVO II-BT-60S-A-PN3			1:3
Ezi-SERVO II-BT-60S-B-PN3			
Ezi-SERVO II-BT-60S-A-PN5			1:5
Ezi-SERVO II-BT-60S-B-PN5			
Ezi-SERVO II-BT-60S-A-PN8			1:8
Ezi-SERVO II-BT-60S-B-PN8			
Ezi-SERVO II-BT-60S-A-PN10			1:10
Ezi-SERVO II-BT-60S-B-PN10			
Ezi-SERVO II-BT-60S-A-PN15			1:15
Ezi-SERVO II-BT-60S-B-PN15			
Ezi-SERVO II-BT-60S-A-PN25			1:25
Ezi-SERVO II-BT-60S-B-PN25			
Ezi-SERVO II-BT-60S-A-PN40			1:40
Ezi-SERVO II-BT-60S-B-PN40			
Ezi-SERVO II-BT-60S-A-PN50			1:50
Ezi-SERVO II-BT-60S-B-PN50			

● Combination with Gearbox

Unit Part Number	Motor Model Number	Drive Model Number	Reduction gear ratio
Ezi-SERVO II-BT-60M-A-PN3	Motor & Drive Integrated		1:3
Ezi-SERVO II-BT-60M-B-PN3			
Ezi-SERVO II-BT-60M-A-PN5			1:5
Ezi-SERVO II-BT-60M-B-PN5			
Ezi-SERVO II-BT-60M-A-PN8			1:8
Ezi-SERVO II-BT-60M-B-PN8			
Ezi-SERVO II-BT-60M-A-PN10			1:10
Ezi-SERVO II-BT-60M-B-PN10			
Ezi-SERVO II-BT-60M-A-PN15			1:15
Ezi-SERVO II-BT-60M-B-PN15			
Ezi-SERVO II-BT-60M-A-PN25			1:25
Ezi-SERVO II-BT-60M-B-PN25			
Ezi-SERVO II-BT-60M-A-PN40			1:40
Ezi-SERVO II-BT-60M-B-PN40			
Ezi-SERVO II-BT-60M-A-PN50			1:50
Ezi-SERVO II-BT-60M-B-PN50			
Ezi-SERVO II-BT-60L-A-PN3			1:3
Ezi-SERVO II-BT-60L-B-PN3			
Ezi-SERVO II-BT-60L-A-PN5			1:5
Ezi-SERVO II-BT-60L-B-PN5			
Ezi-SERVO II-BT-60L-A-PN8			1:8
Ezi-SERVO II-BT-60L-B-PN8			
Ezi-SERVO II-BT-60L-A-PN10			1:10
Ezi-SERVO II-BT-60L-B-PN10			
Ezi-SERVO II-BT-60L-A-PN15			1:15
Ezi-SERVO II-BT-60L-B-PN15			
Ezi-SERVO II-BT-60L-A-PN25			1:25
Ezi-SERVO II-BT-60L-B-PN25			
Ezi-SERVO II-BT-60L-A-PN40			1:40
Ezi-SERVO II-BT-60L-B-PN40			
Ezi-SERVO II-BT-60L-A-PN50			1:50
Ezi-SERVO II-BT-60L-B-PN50			

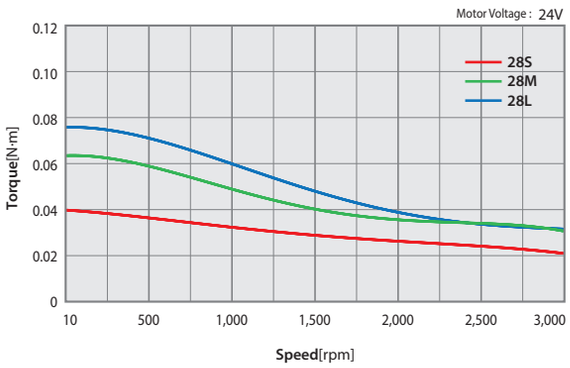
● Specifications of Motor

MODEL			Ezi-SERVO II-BT-28 series			Ezi-SERVO II-BT-42 series			
		UNIT	28S	28M	28L	42S	42M	42L	42XL
DRIVE METHOD		–	BI-POLAR						
NUMBER OF PHASES		–	2	2	2	2	2	2	2
CURRENT per PHASE		A	0.95	0.95	0.95	1.2	1.2	1.2	1.2
HOLDING TORQUE		N·m	0.069	0.098	0.118	0.32	0.44	0.5	0.65
ROTOR INERTIA		$g \cdot cm^2$	9.0	13	18	35	54	77	114
WEIGHTS		g	170	227	257	340	400	470	600
LENGTH(L)		mm	32	45	50	34	40	48	60
PERMISSIBLE OVERHUNG LOAD (DISTANCE FROM END OF SHAFT)	3mm	N	30	30	30	22	22	22	22
	8mm		38	38	38	26	26	26	26
	13mm		53	53	53	33	33	33	33
	18mm		–	–	–	46	46	46	46
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						

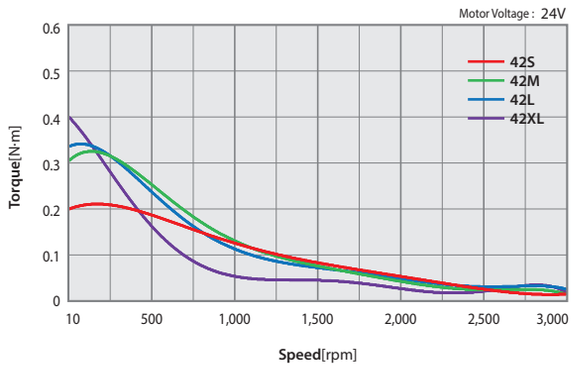
MODEL			Ezi-SERVO II-BT-56 series			Ezi-SERVO II-BT-60 series		
		UNIT	56S	56M	56L	60S	60M	60L
DRIVE METHOD		–	BI-POLAR					
NUMBER OF PHASES		–	2	2	2	2	2	2
CURRENT per PHASE		A	3.0	3.0	3.0	4.0	4.0	4.0
HOLDING TORQUE		N·m	0.64	1.0	1.5	0.88	1.28	2.4
ROTOR INERTIA		$g \cdot cm^2$	180	280	520	240	490	690
WEIGHTS		g	640	800	1320	1075	1240	1800
LENGTH(L)		mm	46	55	80	47	56	85
PERMISSIBLE OVERHUNG LOAD (DISTANCE FROM END OF SHAFT)	3mm	N	52	52	52	70	70	70
	8mm		65	65	65	87	87	87
	13mm		85	85	85	114	114	114
	18mm		123	123	123	165	165	165
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					

Torque Characteristics of Motor

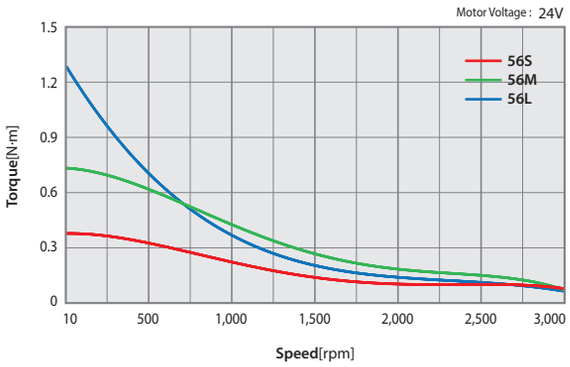
Ezi-SERVOII-BT-28 series



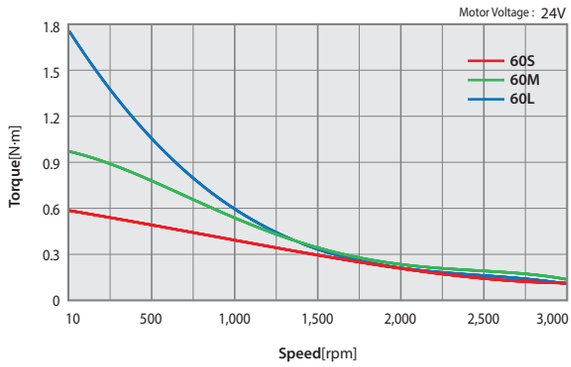
Ezi-SERVOII-BT-42 series



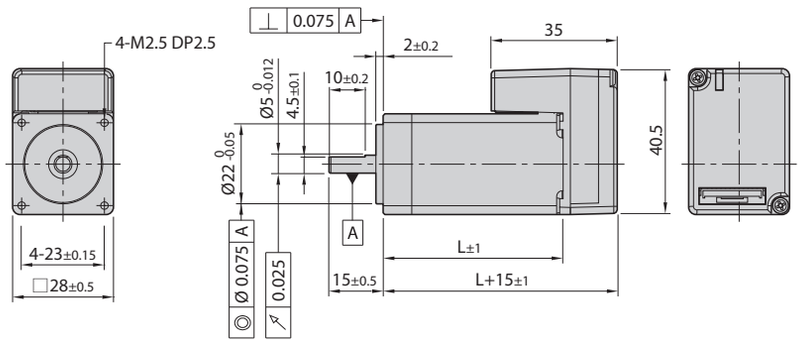
Ezi-SERVOII-BT-56 series



Ezi-SERVOII-BT-60 series

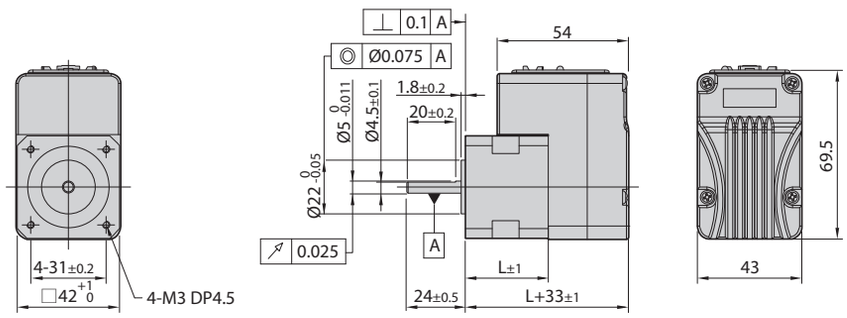


● Dimensions of Motor [mm]



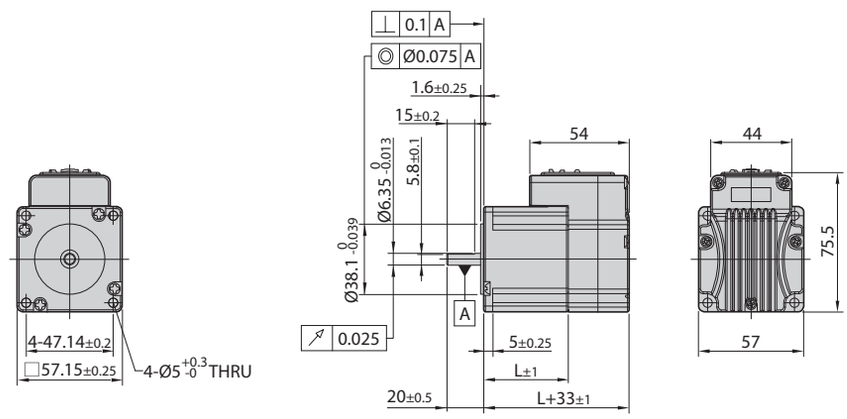
28mm

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



42mm

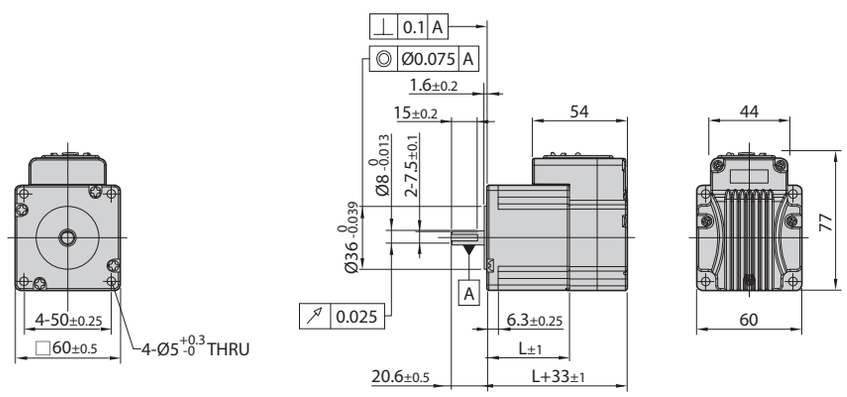
Model name	Length(L)
42S	34
42M	40
42L	48
42XL	60



※ There are 2 kinds size of front shaft diameter for Ezi-SERVO II-BT-56 series as Ø6.35 and Ø8.0.

56mm

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



60mm

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

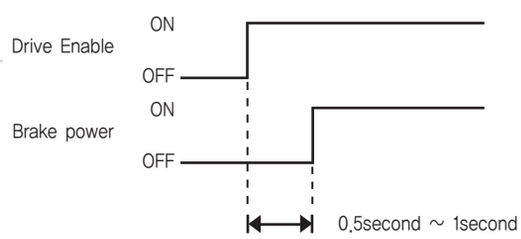
● Specifications of Motor with Brake

Unit Part Number	Motor Model Number	Electronic Brake					Motor Unit Weight [g]	Permitted Overhung Load [N]				Permitted Thrust Load [N]
		Type	Voltage Input [V]	Rated Current [A]	Power Consumption [W]	Statical Friction Torque [N·m]		Length from Motor Point [mm]				
								3	8	13	18	
Ezi-SERVO II-BT-42S-■-BK	Motor & Drive Integrated	Non-excitation run Type	24VDC ±10%	0.2	5	0.2	680	22	26	33	46	Must be Lower than Unit's Weight
Ezi-SERVO II-BT-42M-■-BK							770					
Ezi-SERVO II-BT-42L-■-BK							840					
Ezi-SERVO II-BT-42XL-■-BK							950					
Ezi-SERVO II-BT-56S-■-BK				0.27	6.6	0.7	1260	52	65	85	123	
Ezi-SERVO II-BT-56M-■-BK							1360					
Ezi-SERVO II-BT-56L-■-BK							1890					
Ezi-SERVO II-BT-60S-■-BK							1555	70	87	114	165	
Ezi-SERVO II-BT-60M-■-BK							1520					
Ezi-SERVO II-BT-60L-■-BK							2380					

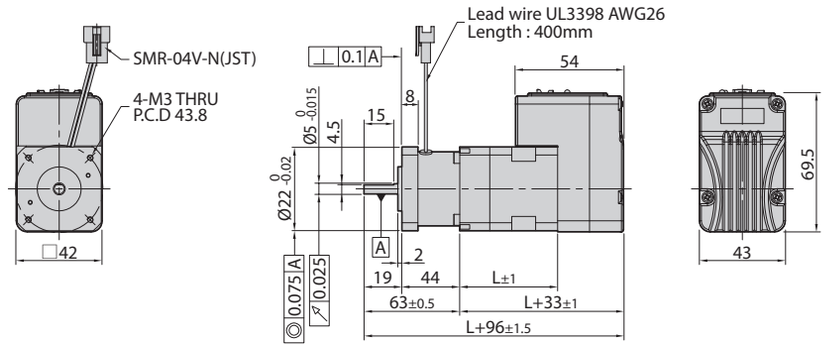
* The code of encoder resolution will be marked in "■"
* Electronic Brake cannot be used for braking. Position hold purpose only when power OFF.
* The weight means Motor Unit Weight including Motor and Electronic Brake.
* Motor specification and torque characteristic are same as Standard Motor.

* Brake Operation Timing Chart

Ezi-SERVO II-BT-56/60/60 series control Brake by Drive automatically.
Please refer to below Timing Chart when control Brake from upper controller other than using Ezi-SERVO II-BT-56/60/60 series Brake control.
Otherwise, Drive malfunctioning and loads can be fall down.
Also, please do not operate Brake while motor operation to prevent damage.
Ezi-SERVO II-BT-28 series has no brake control function.

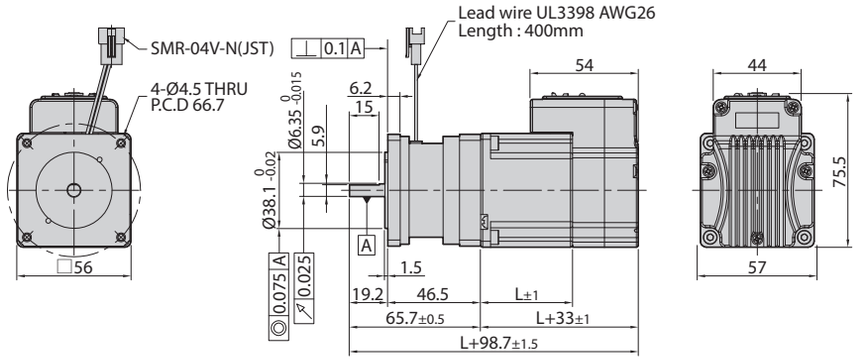


● Dimensions of Motor with Brake [mm]



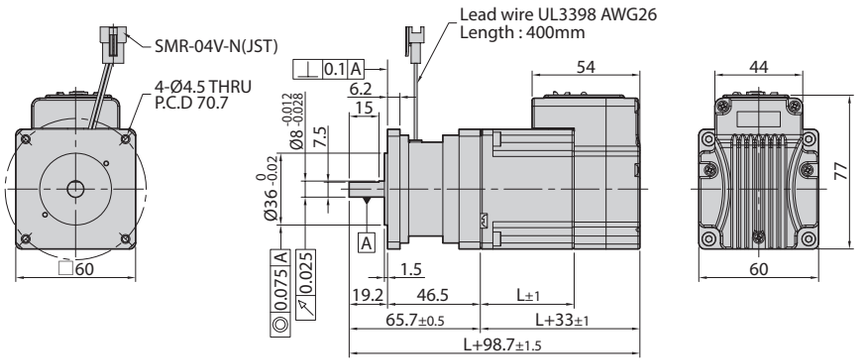
42mm

Model Name	Length(L)	Weight(kg)
42S	34	0.68
42M	40	0.77
42L	48	0.84
42XL	60	0.95



56mm

Model Name	Length(L)	Weight(kg)
56S	46	1.26
56M	55	1.36
56L	80	1.89



60mm

Model Name	Length(L)	Weight(kg)
60S	47	1.55
60M	56	1.52
60L	85	2.38

● How to Read Specifications

Unit Part Number	① Maximum Holding Torque [N·m]	② Rotor Inertia Moment [kg·m^2]	③ Back-lash [min]	④ Angle Trans-mission Error [min]	⑤ Re-duction Gear Ratio	⑥ Resolution (10,000 [ppr] Standard)	⑦ Permitted Torque [N·m]	⑧ Maximum Torque [N·m]	⑨ Permitted Speed Range [rpm]	⑩ Unit Weight [kg]	Permitted Overhung Load [N] Axis Center Standard	Permitted Thrust Load [N]
Ezi-SERVO II-BT-42S-■-PN3	0.55	35x10^{-7}	3	5	3	0.012°	6	12	0~1000	0.80	240	270
Ezi-SERVO II-BT-42S-■-PN5	0.92				5	0.0072°	9	18	0~600		290	330
Ezi-SERVO II-BT-42S-■-PN8	1.47				8	0.0045°	9	18	0~375		340	410
Ezi-SERVO II-BT-42S-■-PN10	1.84				10	0.0036°	6	12	0~300		360	450
Ezi-SERVO II-BT-42S-■-PN15	2.67		5	7	15	0.0024°	6	12	0~200	0.96	410	540
Ezi-SERVO II-BT-42S-■-PN25	4.46				25	0.00144°	9	18	0~120		490	640
Ezi-SERVO II-BT-42S-■-PN40	7.13				40	0.0009°	9	18	0~75		570	640
Ezi-SERVO II-BT-42S-■-PN50	9.00				50	0.00072°	9	18	0~60		620	640

Description of Specification Items

① **Maximum Holding Torque** — This is the maximum torque that can be exerted through the gearbox when the motor is stopped. (Based on 100% of stop current) Use below the maximum torque of the gearbox.

② **Rotor Inertia Moment** — It is the value of the moment of inertia of the motor.

③ **Backlash** — It is the gap between the gear and the gear, and it is the angle at which the gearbox shaft moves without external force when stopped.

④ **Angle Transmission Error** — This is the transmission characteristic of the gearbox, which means the difference between the theoretical rotation angle and the actual rotation angle of the output shaft.

⑤ **Reduction Gear Ratio** — It is the value obtained by dividing the number of output rotation by the number of input rotation.

⑥ **Resolution(10,000[ppr] Standard)** — This is the angle at which the gearbox output shaft moves when the motor is driven by 1 pulse.

⑦ **Permissible Torque** — This value is a torque value at which the life of the motor becomes 20,000 hours when the input rotation speed is 3,000rpm. It refers to the permissible continuous torque.

⑧ **Maximum Torque** — This is the maximum torque allowed during acceleration/deceleration.

⑨ **Permitted Speed Range** — It is the range of rotation speed based on the output shaft of the gearbox.

⑩ **Unit Weight** — It is the sum of the weight of the gearbox and the motor.

● Specifications of Motor with Gearbox

42mm

Unit Part Number	Maximum Holding Torque [N·m]	Rotor Inertia Moment [kg·m²]	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-BT-42S-■-PN3	0.55	$35x10^{-7}$	3	5	3	0.012°	6	12	0~1000	0.80	240	270
Ezi-SERVO II-BT-42S-■-PN5	0.92				5	0.0072°	9	18	0~600		290	330
Ezi-SERVO II-BT-42S-■-PN8	1.47				8	0.0045°	9	18	0~375		340	410
Ezi-SERVO II-BT-42S-■-PN10	1.84				10	0.0036°	6	12	0~300		360	450
Ezi-SERVO II-BT-42S-■-PN15	2.67		5	7	15	0.0024°	6	12	0~200	0.96	410	540
Ezi-SERVO II-BT-42S-■-PN25	4.46				25	0.00144°	9	18	0~120		490	640
Ezi-SERVO II-BT-42S-■-PN40	7.13				40	0.0009°	9	18	0~75		570	640
Ezi-SERVO II-BT-42S-■-PN50	9.00				50	0.00072°	9	18	0~60		620	640
Ezi-SERVO II-BT-42M-■-PN3	0.85	$54x10^{-7}$	3	5	3	0.012°	6	12	0~1000	0.86	240	270
Ezi-SERVO II-BT-42M-■-PN5	1.42				5	0.0072°	9	18	0~600		290	330
Ezi-SERVO II-BT-42M-■-PN8	2.28				8	0.0045°	9	18	0~375		340	410
Ezi-SERVO II-BT-42M-■-PN10	2.85				10	0.0036°	6	12	0~300		360	450
Ezi-SERVO II-BT-42M-■-PN15	4.14		5	7	15	0.0024°	6	12	0~200	1.02	410	540
Ezi-SERVO II-BT-42M-■-PN25	6.90				25	0.00144°	9	18	0~120		490	640
Ezi-SERVO II-BT-42M-■-PN40	9.00				40	0.0009°	9	18	0~75		570	640
Ezi-SERVO II-BT-42M-■-PN50	9.00				50	0.00072°	9	18	0~60		620	640
Ezi-SERVO II-BT-42L-■-PN3	0.93	$77x10^{-7}$	3	5	3	0.012°	6	12	0~1000	0.93	240	270
Ezi-SERVO II-BT-42L-■-PN5	1.55				5	0.0072°	9	18	0~600		290	330
Ezi-SERVO II-BT-42L-■-PN8	2.48				8	0.0045°	9	18	0~375		340	410
Ezi-SERVO II-BT-42L-■-PN10	3.10				10	0.0036°	6	12	0~300		360	450
Ezi-SERVO II-BT-42L-■-PN15	4.51		5	7	15	0.0024°	6	12	0~200	1.09	410	540
Ezi-SERVO II-BT-42L-■-PN25	7.52				25	0.00144°	9	18	0~120		490	640
Ezi-SERVO II-BT-42L-■-PN40	9.00				40	0.0009°	9	18	0~75		570	640
Ezi-SERVO II-BT-42L-■-PN50	9.00				50	0.00072°	9	18	0~60		620	640
Ezi-SERVO II-BT-42XL-■-PN3	1.42	$114x10^{-7}$	3	5	3	0.012°	6	12	0~1000	1.06	240	270
Ezi-SERVO II-BT-42XL-■-PN5	2.38				5	0.0072°	9	18	0~600		290	330
Ezi-SERVO II-BT-42XL-■-PN8	3.80				8	0.0045°	9	18	0~375		340	410
Ezi-SERVO II-BT-42XL-■-PN10	4.76				10	0.0036°	6	12	0~300		360	450
Ezi-SERVO II-BT-42XL-■-PN15	6.00		5	7	15	0.0024°	6	12	0~200	1.22	410	540
Ezi-SERVO II-BT-42XL-■-PN25	9.00				25	0.00144°	9	18	0~120		490	640
Ezi-SERVO II-BT-42XL-■-PN40	9.00				40	0.0009°	9	18	0~75		570	640
Ezi-SERVO II-BT-42XL-■-PN50	9.00				50	0.00072°	9	18	0~60		620	640

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

● Specifications of Motor with Gearbox

56mm

Unit Part Number	Maximum Holding Torque [N·m]	Rotor Inertia Moment [kg·m²]	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-BT-56S-■-PN3	1	$180x10^{-7}$	3	5	3	0.012°	18	35	0~1000	1.78	430	310
Ezi-SERVO II-BT-56S-■-PN5	1.7				5	0.0072°	27	50	0~600		510	390
Ezi-SERVO II-BT-56S-■-PN8	2.8				8	0.0045°	27	50	0~375		600	480
Ezi-SERVO II-BT-56S-■-PN10	3.5				10	0.0036°	18	35	0~300		640	530
Ezi-SERVO II-BT-56S-■-PN15	5.1				15	0.0024°	18	35	0~200	2.08	740	630
Ezi-SERVO II-BT-56S-■-PN25	8.6				25	0.00144°	27	50	0~120		870	790
Ezi-SERVO II-BT-56S-■-PN40	13.8				40	0.0009°	27	50	0~75		1000	970
Ezi-SERVO II-BT-56S-■-PN50	17.2				50	0.00072°	27	50	0~60		1100	1100
Ezi-SERVO II-BT-56M-■-PN3	2.0	$280x10^{-7}$	3	5	3	0.012°	18	35	0~1000	1.94	430	310
Ezi-SERVO II-BT-56M-■-PN5	3.4				5	0.0072°	27	50	0~600		510	390
Ezi-SERVO II-BT-56M-■-PN8	5.5				8	0.0045°	27	50	0~375		600	480
Ezi-SERVO II-BT-56M-■-PN10	6.9				10	0.0036°	18	35	0~300		640	530
Ezi-SERVO II-BT-56M-■-PN15	10				15	0.0024°	18	35	0~200	2.24	740	630
Ezi-SERVO II-BT-56M-■-PN25	16.7				25	0.00144°	27	50	0~120		870	790
Ezi-SERVO II-BT-56M-■-PN40	27.0				40	0.0009°	27	50	0~75		1000	970
Ezi-SERVO II-BT-56M-■-PN50	27.0				50	0.00072°	27	50	0~60		1100	1100
Ezi-SERVO II-BT-56L-■-PN3	3.6	$520x10^{-7}$	3	5	3	0.012°	18	35	0~1000	2.49	430	310
Ezi-SERVO II-BT-56L-■-PN5	6				5	0.0072°	27	50	0~600		510	390
Ezi-SERVO II-BT-56L-■-PN8	9.7				8	0.0045°	27	50	0~375		600	480
Ezi-SERVO II-BT-56L-■-PN10	12.1				10	0.0036°	18	35	0~300		640	530
Ezi-SERVO II-BT-56L-■-PN15	18.0				15	0.0024°	18	35	0~200	2.76	740	630
Ezi-SERVO II-BT-56L-■-PN25	27.0				25	0.00144°	27	50	0~120		870	790
Ezi-SERVO II-BT-56L-■-PN40	27.0				40	0.0009°	27	50	0~75		1000	970
Ezi-SERVO II-BT-56L-■-PN50	27.0				50	0.00072°	27	50	0~60		1100	1100

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

● Specifications of Motor with Gearbox

60mm

Motor Model Number	Maximum Holding Torque [N·m]	Rotor Inertia Moment [kg·m^2]	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-BT-60S-■-PN3	1.5	240x10^{-7}	3	5	3	0.012°	18	35	0~1000	2.22	430	310
Ezi-SERVO II-BT-60S-■-PN5	2.5				5	0.0072°	27	50	0~600		510	390
Ezi-SERVO II-BT-60S-■-PN8	4.0				8	0.0045°	27	50	0~375		600	480
Ezi-SERVO II-BT-60S-■-PN10	5.1				10	0.0036°	18	35	0~300		640	530
Ezi-SERVO II-BT-60S-■-PN15	7.4				15	0.0024°	18	35	0~200	2.51	740	630
Ezi-SERVO II-BT-60S-■-PN25	12.3				25	0.00144°	27	50	0~120		870	790
Ezi-SERVO II-BT-60S-■-PN40	19.8				40	0.0009°	27	50	0~75		1000	970
Ezi-SERVO II-BT-60S-■-PN50	24.7				50	0.00072°	27	50	0~60		1100	1100
Ezi-SERVO II-BT-60M-■-PN3	2.6	490x10^{-7}	3	5	3	0.012°	18	35	0~1000	2.38	430	310
Ezi-SERVO II-BT-60M-■-PN5	4.4				5	0.0072°	27	50	0~600		510	390
Ezi-SERVO II-BT-60M-■-PN8	7.0				8	0.0045°	27	50	0~375		600	480
Ezi-SERVO II-BT-60M-■-PN10	8.8				10	0.0036°	18	35	0~300		640	530
Ezi-SERVO II-BT-60M-■-PN15	12.8				15	0.0024°	18	35	0~200	2.68	740	630
Ezi-SERVO II-BT-60M-■-PN25	21.4				25	0.00144°	27	50	0~120		870	790
Ezi-SERVO II-BT-60M-■-PN40	27.0				40	0.0009°	27	50	0~75		1000	970
Ezi-SERVO II-BT-60M-■-PN50	27.0				50	0.00072°	27	50	0~60		1100	1100
Ezi-SERVO II-BT-60L-■-PN3	5.2	690x10^{-7}	3	5	3	0.012°	18	35	0~1000	2.94	430	310
Ezi-SERVO II-BT-60L-■-PN5	8.7				5	0.0072°	27	50	0~600		510	390
Ezi-SERVO II-BT-60L-■-PN8	13.9				8	0.0045°	27	50	0~375		600	480
Ezi-SERVO II-BT-60L-■-PN10	18.0				10	0.0036°	18	35	0~300		640	530
Ezi-SERVO II-BT-60L-■-PN15	18.0				15	0.0024°	18	35	0~200	3.24	740	630
Ezi-SERVO II-BT-60L-■-PN25	27.0				25	0.00144°	27	50	0~120		870	790
Ezi-SERVO II-BT-60L-■-PN40	27.0				40	0.0009°	27	50	0~75		1000	970
Ezi-SERVO II-BT-60L-■-PN50	27.0				50	0.00072°	27	50	0~60		1100	1100

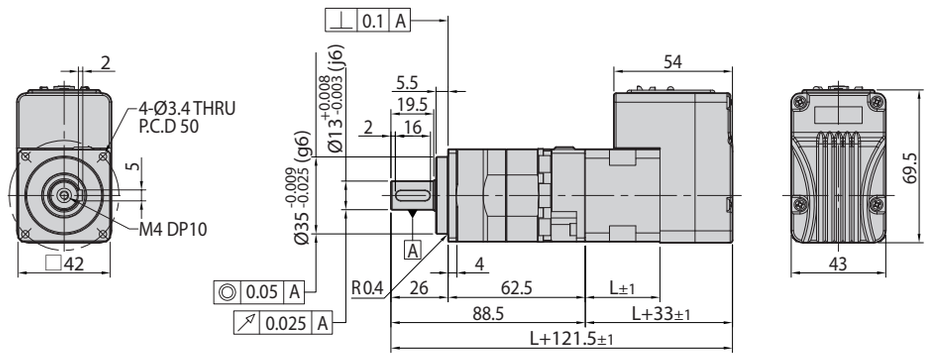
* The code of encoder resolution will be marked in "■"

● Dimensions of Motor with Gearbox [mm]

42mm

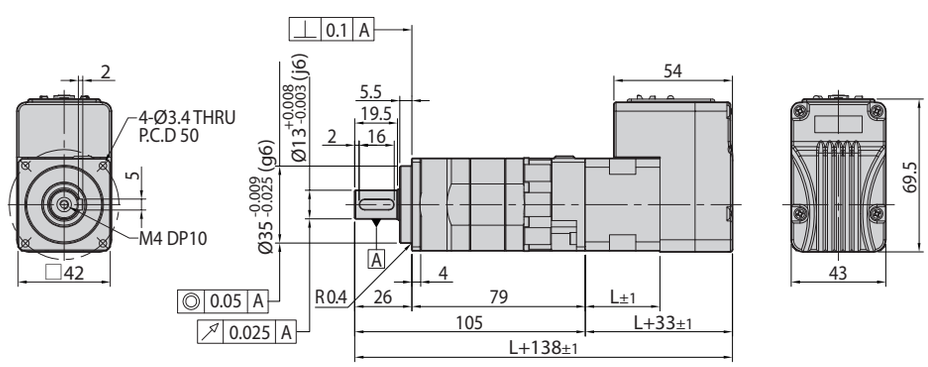
Unit Part Number	Motor	Stage	□Reduction Gear Ratio	L Length [mm]
Ezi-SERVO II-BT-42S-■-PN□	Motor & Drive Integrated	Single Stage	3, 5, 8, 10	34
Ezi-SERVO II-BT-42M-■-PN□			3, 5, 8, 10	40
Ezi-SERVO II-BT-42L-■-PN□			3, 5, 8, 10	48
Ezi-SERVO II-BT-42XL-■-PN□			3, 5, 8, 10	60

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



Unit Part Number	Motor	Stage	□Reduction Gear Ratio	L Length [mm]
Ezi-SERVO II-BT-42S-■-PN□	Motor & Drive Integrated	Double Stage	15, 25, 40, 50	34
Ezi-SERVO II-BT-42M-■-PN□			15, 25, 40, 50	40
Ezi-SERVO II-BT-42L-■-PN□			15, 25, 40, 50	48
Ezi-SERVO II-BT-42XL-■-PN□			15, 25, 40, 50	60

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

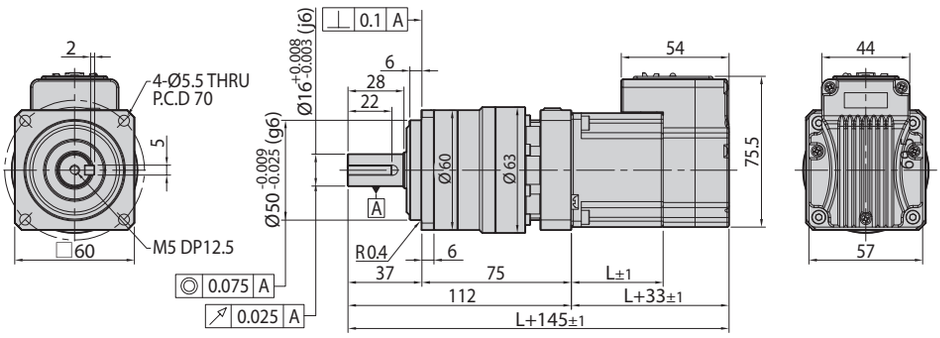


● Dimensions of Motor with Gearbox [mm]

56mm

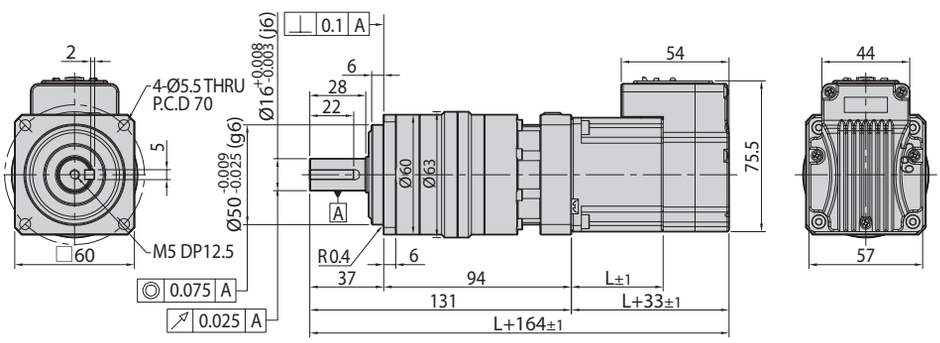
Unit Part Number	Motor	Stage	□Reduction Gear Ratio	L Length [mm]
Ezi-SERVO II-BT-56S-■-PN□	Motor & Drive Integrated	Single Stage	3, 5, 8, 10	46
Ezi-SERVO II-BT-56M-■-PN□			3, 5, 8, 10	55
Ezi-SERVO II-BT-56L-■-PN□			3, 5, 8, 10	80

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



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

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

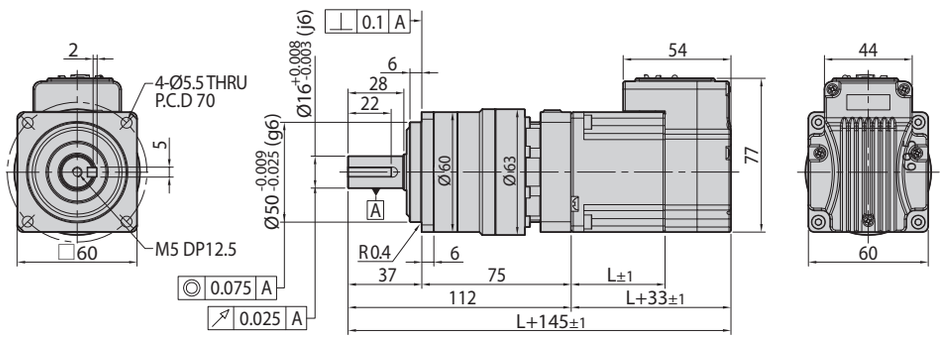


● Dimensions of Motor with Gearbox [mm]

60mm

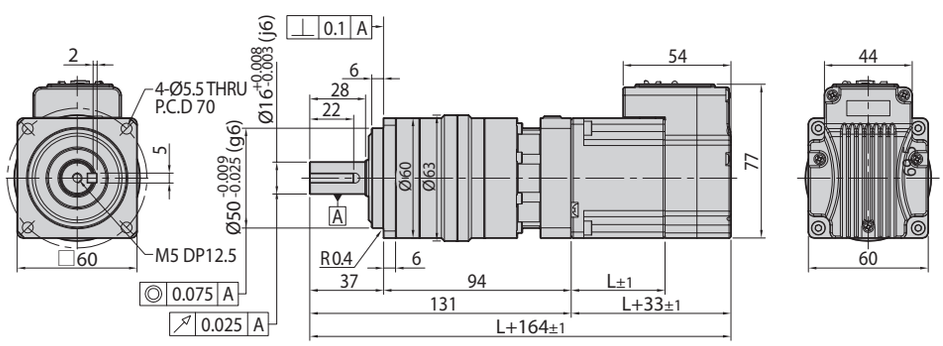
Unit Part Number	Motor	Stage	□Reduction Gear Ratio	L Length [mm]
Ezi-SERVO II-BT-60S-■-PN□	Motor & Drive Integrated	Single Stage	3, 5, 8, 10	47
Ezi-SERVO II-BT-60M-■-PN□			3, 5, 8, 10	56
Ezi-SERVO II-BT-60L-■-PN□			3, 5, 8, 10	85

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



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

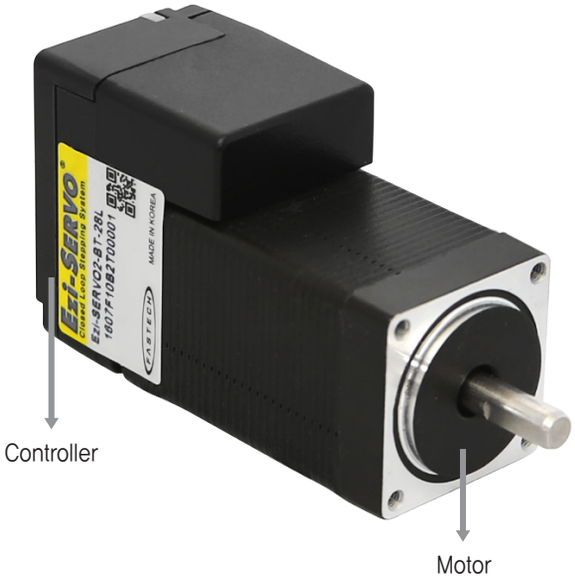
* The code of encoder resolution will be marked in "■"



● Specifications of Drive [Ezi-SERVO II-BT-28 series]

Model		Ezi-SERVO II-BT-28 series
Input Voltage		24VDC ±10%
Control Method		Closed loop control with 32bit MCU
Current Consumption		Max 500mA (Except motor current)
Operating Condition	Ambient Temperature	· In Use: 0~40℃ · In Storage: -20~70℃
	Humidity	· In Use: 35~85% RH (Non-Condensing) · In Storage: 10~90% RH (Non-Condensing)
	Vib. Resist.	0.5g
Function	Rotation Speed	0~3,000 [rpm]
	Resolution [ppr]	500 1,000 1,600 2,000 3,600 5,000 6,400 7,200 10,000 16,000 (Selectable by parameter) * Default: 16,000
	Max. Input Pulse Frequency	500kHz (Duty 50%)
	Protection Functions	Over Current Error, Over Speed Error, Position Tracking Error, Over Load Error, Over Temperature Error, Motor Connect Error, Encoder Connect Error, In-Position Error, ROM Error, Position Overflow Error
	In-Position Selection	0~63 (Selectable by parameter) * Default: 0
	Position Gain Selection	0~63 (Selectable by parameter) * Default: 3
	Pulse Input Method	1-Pulse / 2-Pulse (Selectable by parameter) * Default: 2-Pulse Mode
	Rotational Direction	CW/CCW (Selectable by parameter)
	Speed/Position Control Command	Pulse Train Input
I/O Signal	Input Signals	Position Command Pulse, Servo On/Off, Alarm Reset
	Output Signals	In-Position, Alarm

● Settings and Operation [Ezi-SERVO II-BT-28 series]



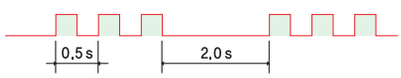
1. Drive Status LED

In the case of Ezi-SERVO II-BT-28 series products, LED can be checked by LED color, lighting, On/Off and blinking.

Status	LED	Description
Disable	Green : Red :	Green light flashing, Red light off
Enable	Green : Red :	Green light on, Red light off
In motion	Green : Red :	Green light on, Red light on
In-position deviation	Green : Red :	Green and Red light alternately flashing
Alarm	Green : Red :	Red light flashing repeatedly as many as alarm number

◆ Protection functions and LED flash times

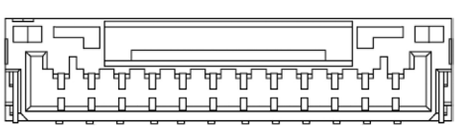
Times	Protection	Conditions
1	Over Current Error	The current through power devices in inverter exceeds 4.8A
2	Over Speed Error	Motor speed exceeds 3,000 [rpm]
3	Position Tracking Error	Position error value is higher than 180° in motor run state
4	Over Load Error	The motor is continuously operated more than 5 seconds under a load exceeding the max. torque
5	Over Temperature Error	Inside temperature of drive exceeds 85℃
6	Over Regeneratived Voltage Error	Back-EMF is higher than 48V
7	Motor Connect Error	The power is ON without connection of the motor cable to drive
8	Encoder Connect Error	Cable connection error with Encoder connection in drive
10	In-Position Error	After operation is finished, position error more than 1 pulse is continued for more than 3 seconds
12	ROM Error	Error occurs in parameter storage device(ROM)
15	Position Overflow Error	Position error value is higher than 180° in motor stop state



Alarm LED flash
(Ex, Position tracking error)

2. Power Input/Output Signal Connector(CN1)

NO.	Function	I/O
1	GND	Input
2	24VDC	Input
3	Tx	Output
4	Rx	Input
5	Alarm	Output
6	In-Position	Output
7	Servo On/Off	Input
8	Alarm Reset	Input
9	CCW+(Dir+)	Input
10	CCW-(Dir-)	Input
11	CW+(Pulse+)	Input
12	CW-(Pulse-)	Input



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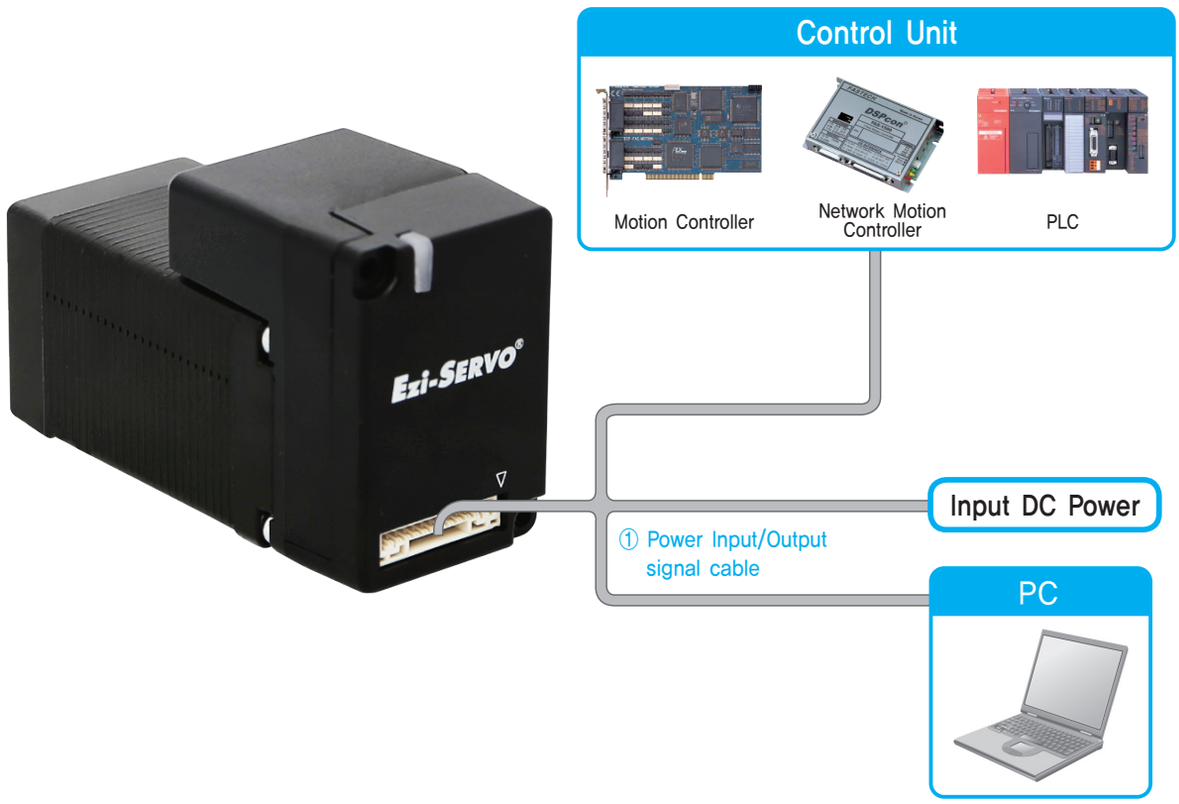
● System Configuration [Ezi-SERVO II-BT-28 series]



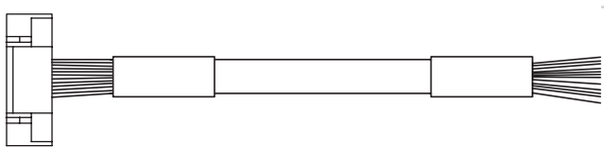
Type	Signal Cable	Power Cable	Parameter Setting Cable
Length supplied	–	–	–
Max. Length	20m	2m	3m

1. Options

① Power Input/Output Signal Cable

Item	Length [m]	Remark
CSVB-A-OR4F	0.4m	Normal Cable

※ This cable is provide item as standard option.



Manufacturer : JST
Housing : GHR-12V-S
Terminal : SSHL-002T-P0.2

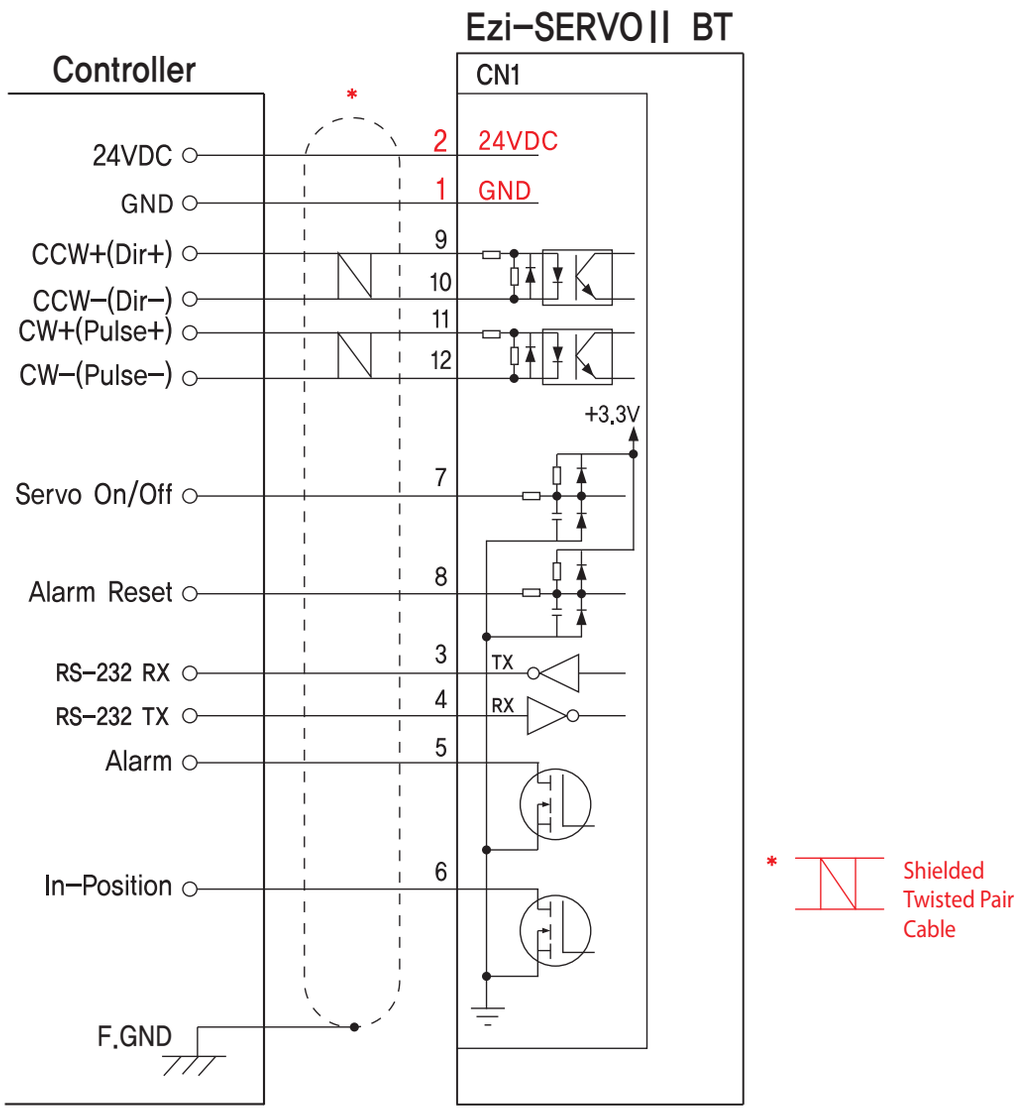
2. Connector Specifications

Connector specifications for cabling to drive.

Purpose	Item	Part Number	Manufacturer
Signal	Housing Terminal	GHR-12V-S SSHL-002T-P0.2	JST

※ Above connector is the most suitable product for the drive applied. Another equivalent connector can be used.

● External Wiring Diagram [Ezi-SERVOII-BT-28 series]

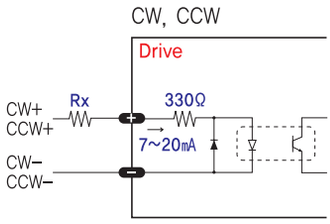


※ When connects I/O cable between controller and drive, please turn off the power of both controller and drive, in order to protect the drive from any damage.

● Control Signal Input/Output Description [Ezi-SERVO II-BT-28 series]

1 Input Signal

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

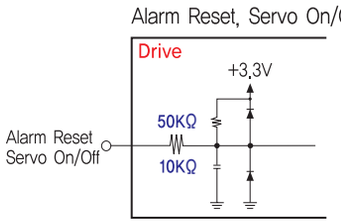


Pin No.	Function
11	CW+
12	CW-
9	CCW+
10	CCW-

◆ CW, CCW Input

This signal can be used to receive a positioning pulse command from a customer host motion controller.
The customer can select 1-Pulse Input mode or 2-Pulse Input mode(refer to switch No.1, SW 1). The input schematic of CW, CCW is designed for 5V TTL level. When using 5V level as an input signal, the resistor Rx is not used and connect to the drive directly. When the level of input signal is more than 5V, Rx resistor is required. If the resistor is absent, the drive will be damaged! If the input signal level is 12V, Rx value is 680ohm and 24V, Rx value is 1.8Kohm.

Servo On / Off and Alarm Reset of the drive are operated with voltage level [ON : High] and [OFF : Low].



Pin No.	Function
7	Servo On/Off
8	Alarm Reset

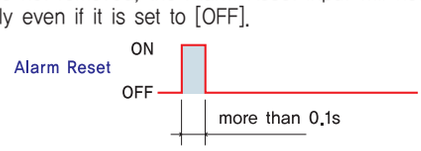
※ Please use the input voltage 5-24VDC. If the input is not connected, it is in the High state. If the input voltage is less than 0.6V, it is the Low state.

◆ Servo On/Off Input

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

◆ Alarm Reset Input

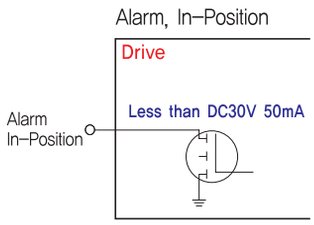
Release the alarm output of the drive where the protection function is activated. When the Alarm Reset input is set to [OFF], the alarm output is canceled. Remove the cause of the alarm before releasing the alarm output. If the cause of the alarm is not removed, the Alarm Reset input will not operate normally even if it is set to [OFF].



※ By setting the alarm reset input signal [ON], cancel the Alarm output. Before cancel the Alarm output, have to remove the source of alarm.

2 Output Signal

Alarm and In-Position signals of the drive are operated by [ON : Conduction] and [OFF : Non-conduction] of open-drain circuit.



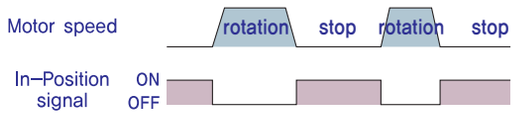
Pin No.	Function
5	Alarm
6	In-Position

◆ Alarm Output

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

◆ In-Position Output

The In-Position output is used to send motor motion to the host controller. When the movement of the motor is completed, the In-Position output becomes [ON].
In-Position output is [ON] when the motor stops within the position deviation set value.

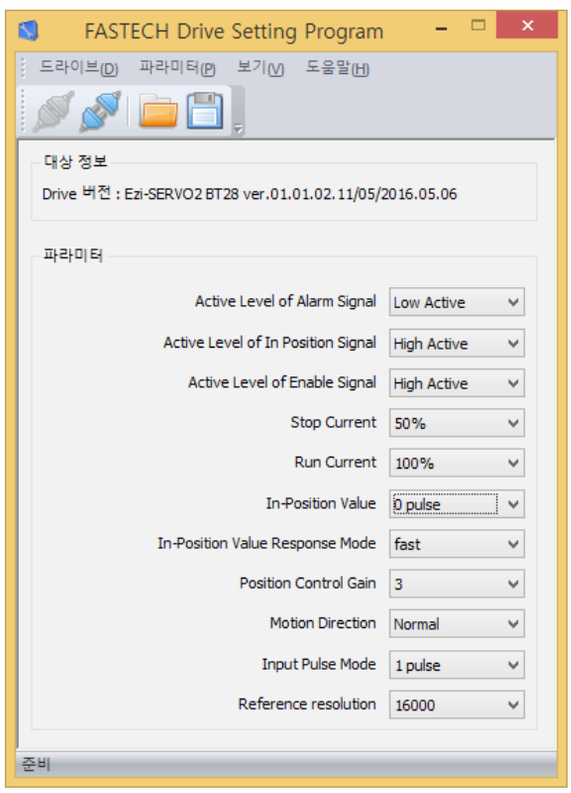


● Parameter Settings [Ezi-SERVOII-BT-28 series]

1 Parameter Setting GUI

(User Interface)

Ezi-SERVOII BT drive utilizes various parameters for operation and some parameters can be changed upon the needs of the user. Ezi-SERVOII BT provides Drive Setting Program for more convenient use. The screen shot in right side is the sample of Drive Setting Program which is used for drive setting and parameter change. User can change and set the parameter such as level of Alarm Reset, Alarm, In-Position Signal, Enable signal and so on. By using this drive setting program, user can find the optimal condition to Ezi-SERVOII BT to fit with the user's own system. Please be noticed that connection for drive setting program shall be done when the Ezi-SERVOII BT is disable staus for safety reason.



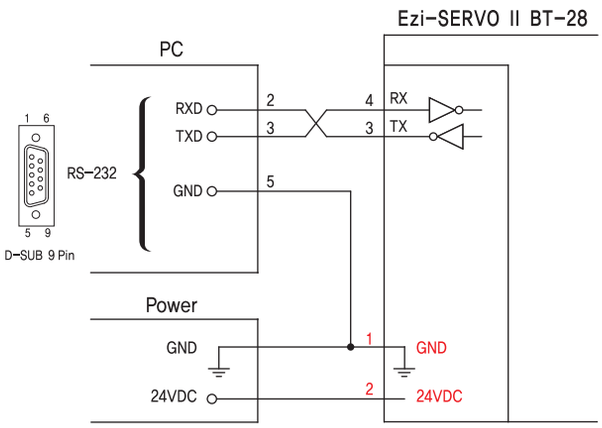
※ Graphic User Interface(GUI) Program can be downloaded from website. (www.fastech.co.kr)

※ Graphic User Interface(GUI) Program can support Window 7/8/10.

※ Graphic User Interface(GUI) Program can be update without prior notice for improving the performance or convenience of user.

2 Parameter Setting wiring Diagram

(Ezi-SERVOII-BT-28 Series)

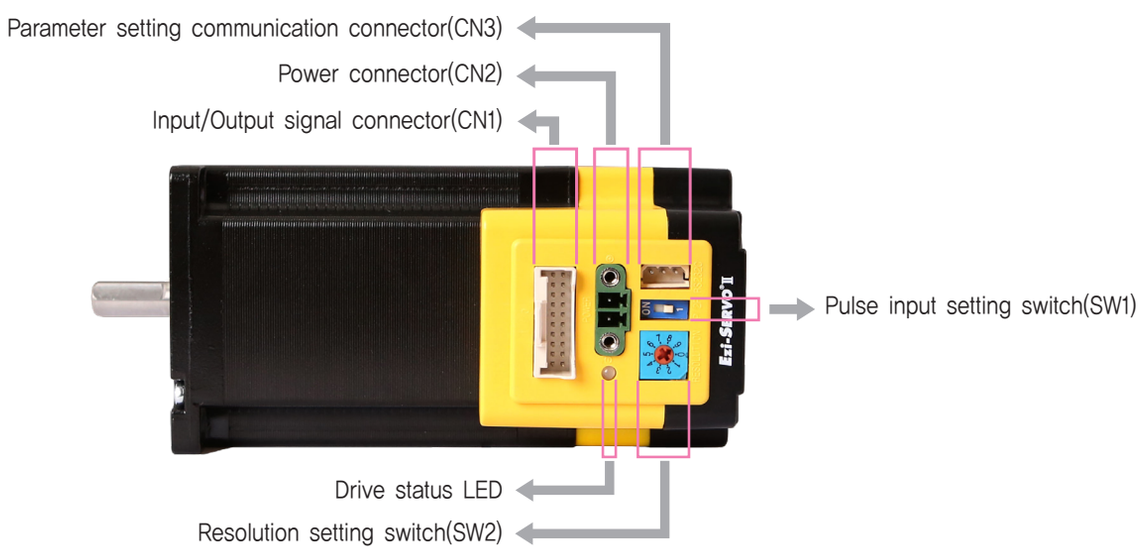


● Specifications of Drive [Ezi-SERVO II-BT-42/56/60 series]

Model		Ezi-SERVO II-BT-42 series	Ezi-SERVO II-BT-56 series	Ezi-SERVO II-BT-60 series
Input Voltage		24VDC ±10%		
Control Method		Closed loop control with 32bit MCU		
Current Consumption		Max 500mA (Except motor current)		
Operating Condition	Ambient Temperature	· In Use: 0~50℃ · In Storage: -20~70℃		
	Humidity	· In Use: 35~85% RH (Non-Condensing) · In Storage: 10~90% RH (Non-Condensing)		
	Vib. Resist.	0.5g		
Function	Rotation Speed	0~3,000 [rpm] *1		
	Resolution [ppr]	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 (Selectable with Rotary Switch)		
	Max. Input Pulse Frequency	500kHz (Duty 50%)		
	Protection Functions	Over Current Error, Over Speed Error, Position Tracking Error, Over Load Error, Over Temperature Error, Over Regenerated Voltage Error, Motor Connect Error, Encoder Connect Error, In-Position Error, ROM Error, Position Overflow Error		
	In-Position Selection	0~63 (Selectable by parameter) * Default: 0		
	Position Gain Selection	0~63 (Selectable by parameter) * Default: 3		
	Pulse Input Method	1-Pulse / 2-Pulse (Selectable with DIP switch) * Default: 2-Pulse Mode		
	Speed/Position Control Command	Pulse Train Input		
I/O Signal	Input Signals	Position Command Pulse, Servo On/Off, Alarm Reset (Photocoupler Input)		
	Output Signals	In-Position, Alarm (Photocoupler output) Encoder signal (A+, A-, B+, B-, Z+, Z-, 26C31 of Equivalent) (Line Driver output), Brake		

*1 : Up to the resolution of 10,000[ppr], maximum speed can be reached by 3,000[rpm] and with the resolution more than 10,000[ppr], maximum speed shall be reduced accordingly.

● Settings and Operation [Ezi-SERVO II-BT-42/56/60 series]

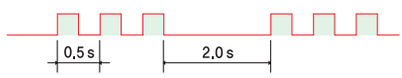


1. Drive status LED

Indication	Color	Function	ON/OFF Condition
PWR	Green	Power input indication	LED is turned ON when power is applied
ALM	Red	Alarm indication	Flash when protection function is activated (Identifiable which protection mode is activated by counting the blinking times)

◆ Protection functions and LED flash times

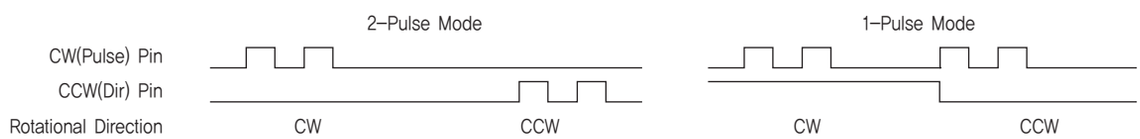
Times	Protection	Conditions
1	Over Current Error	The current through power devices in inverter exceeds the 4.8A
2	Over Speed Error	Motor speed exceeds 3,000 [rpm]
3	Position Tracking Error	Position error value is higher than 180° in motor run state
4	Over Load Error	The motor is continuously operated more than 5 seconds under a load exceeding the max. torque
5	Over Temperature Error	Inside temperature of drive exceeds 85℃
6	Over Regeneratived Voltage Error	Back-EMF is higher than 48V
7	Motor Connect Error	The power is ON without connection of the motor cable to drive
8	Encoder Connect Error	Cable connection error with Encoder connection in drive
10	In-Position Error	After operation is finished, position error more than 1 pulse is continued for more than 3 seconds
12	ROM Error	Error occurs in parameter storage device(ROM)
15	Position Overflow Error	Position error value is higher than 180° in motor stop state



Alarm LED flash
(Ex, Position tracking error)

2. Pulse Input Setting Switch(SW1)

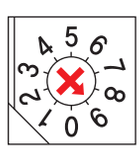
Indication	Switch Name	Functions
2P/1P	Selecting pulse input mode	Selectable 1-Pulse input mode or 2-Pulse input mode as Pulse input signal. ON: 1-Pulse mode OFF: 2-Pulse mode ※ Default: 2-Pulse mode



3. Resolution Setting Switch(SW2)

The Number of pulse per revolution.

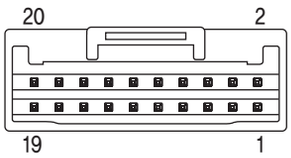
Position	Pulse/Revolution	Position	Pulse/Revolution
0	500 *1	5	3,600
1	500	6	5,000
2	1,000	7	6,400
3	1,600	8	7,200
4	2,000	9	10,000



*1 : Resolution of position "0" will be different according to the resolution of encoder adopted to the product.
But in case of the encoder with 10,000[ppr] resolution, it will be set as 500.
※ Selected resolution is more then encoder resolution, motor shall be operated by microstep between pulses.

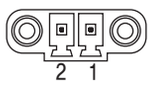
4. Input/Output Signal Connector(CN1)

NO.	Function	I/O
1	CW+(Pulse+)	Input
2	CW−(Pulse−)	Input
3	CCW+(Dir+)	Input
4	CCW−(Dir−)	Input
5	A+	Output
6	A−	Output
7	B+	Output
8	B−	Output
9	Z+	Output
10	Z−	Output
11	Alarm	Output
12	In−Position	Output
13	Servo On/Off	Input
14	Alarm Reset	Input
15	NC	----
16	BRAKE+	Output
17	BRAKE−	Output
18	S−GND	Output
19	EXT_GND	Input
20	EXT_24VDC	Input



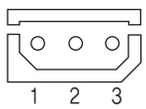
5. Power Connector(CN2)

NO.	Function	I/O
1	24VDC	Input
2	GND	Input



6. Parameter Setting Communication Connector(CN3)

NO.	Function	I/O
1	Tx	Output
2	Rx	Input
3	GND	----



● System Configuration [Ezi-SERVO II-BT-42/56/60 series]

Type	Signal Cable	Power Cable	Parameter Setting Cable
Length supplied	–	–	–
Max. Length	20m	2m	3m

1. Options

① Signal Cable

Available to connect between Control System and Ezi-SERVO II BT.

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

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

② Power Cable

Available to connect between Power and Ezi-SERVO II BT.

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

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

③ Parameter Setting Cable

Cable to connect Ezi-SERVO II BT series and computer. Please use this cable to change parameter of Drive.

Item	Length [m]	Remark
CBTS-C-□□□F	□□□	Normal Cable

□ is for Cable Length. The unit is 1m and Max. 3m length.

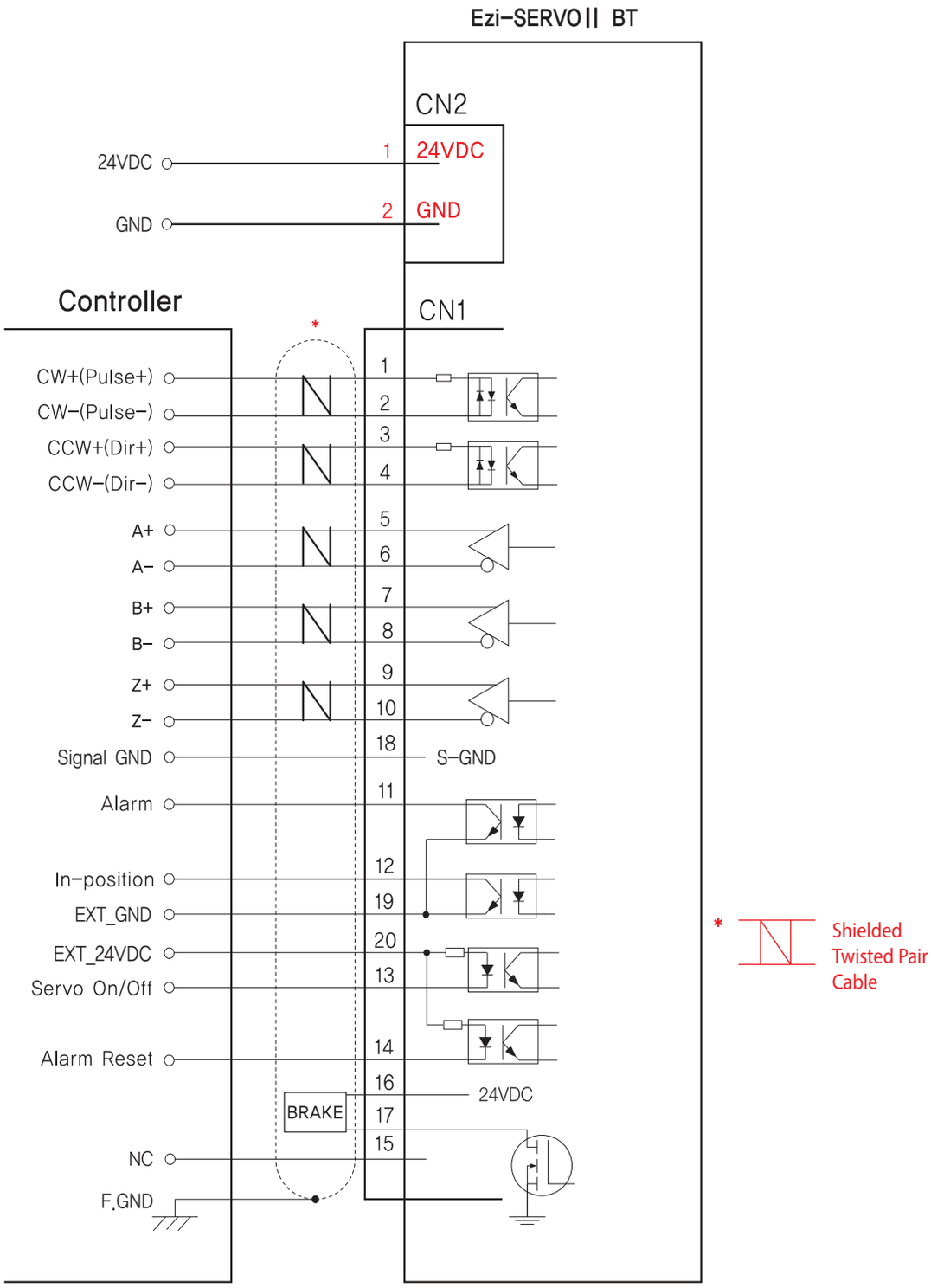
2. Connector Specifications

Connector specifications for cabling to drive.

Purpose	Item	Part Number	Manufacturer
Power (CN2)	Terminal Block	MC421-38102	DECA
Signal (CN1)	Housing Terminal	501646-2000 501648-1000(AWG 26~28)	MOLEX
Parameter setting (CN3)	Housing Terminal	5264-03 5263PBTL	MOLEX

※ Above connector is the most suitable product for the drive applied. Another equivalent connector can be used.

● External Wiring Diagram [Ezi-SERVOII-BT-42/56/60 series]

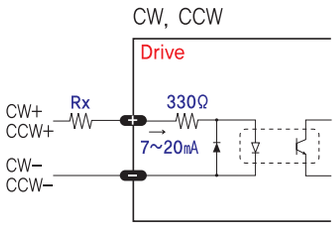


※ When connects I/O cable between controller and drive, please turn off the power of both controller and drive, in order to protect the drive from any damage.

● Control Signal Input/Output Description [Ezi-SERVOII-BT-42/56/60 series]

1 Input Signal

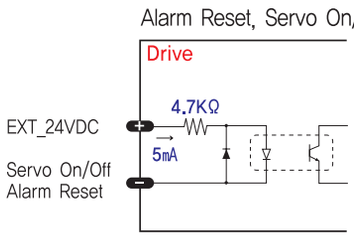
Input signals of the drive are all photocoupler protected. The signal shows the status of internal photocouplers [ON: conduction], [OFF: Non-conduction], not displaying the voltage levels of the signal.



Pin No.	Function
1	CW+
2	CW-
3	CCW+
4	CCW-

◆ CW, CCW Input

This signal can be used to receive a positioning pulse command from a user host motion controller. The user can select 1-pulse input mode or 2-pulse input mode (refer to switch No.1, SW1).
The input schematic of CW, CCW is designed for 5V TTL level. When using 5V level as an input signal, the resistor Rx is not used and connect to the driver directly.
When the level of input signal is more than 5V, Rx resistor is required. If the resistor is absent, the drive will be damaged. If the input signal level is 12V, Rx value is 680ohm and 24V, Rx value is 1.8Kohm.



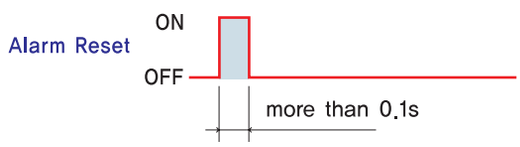
Pin No.	Function
13	Servo On/Off
14	Alarm Reset
20	EXT_24VDC

◆ Servo On/Off Input

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

◆ Alarm Reset Input

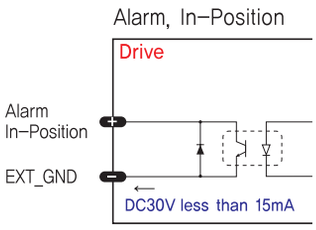
When a protection mode has been activated, a signal to this alarm reset input cancels the Alarm output.



※ By setting the alarm reset input signal [ON], cancel the Alarm output. Before cancel the Alarm output, have to remove the source of alarm.

2 Output Signal

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



Pin No.	Function
11	Alarm
12	In-Position
19	EXT_GND

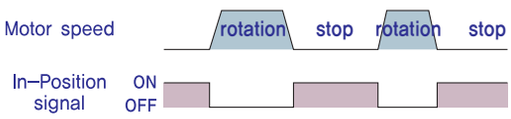
◆ Alarm Output

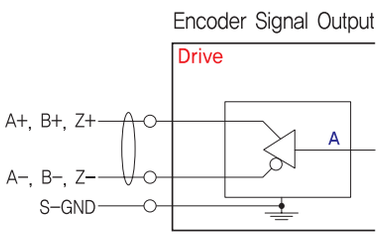
The Alarm output indicates [ON] when the driver is in a normal operation. If a protection mode has been activated, it goes [OFF]. A host controller needs to detect this signal and stop sending a motor driving command. When the driver detects an abnormal operation such as overload or over current of the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

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

◆ In-Position Output

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





Pin No.	Function
5	A+
6	A-
7	B+
8	B-
9	Z+
10	Z-
18	S-GND

◆ Encoder Signal Output

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

● Parameter Settings [Ezi-SERVOII-BT-42/56/60 series]

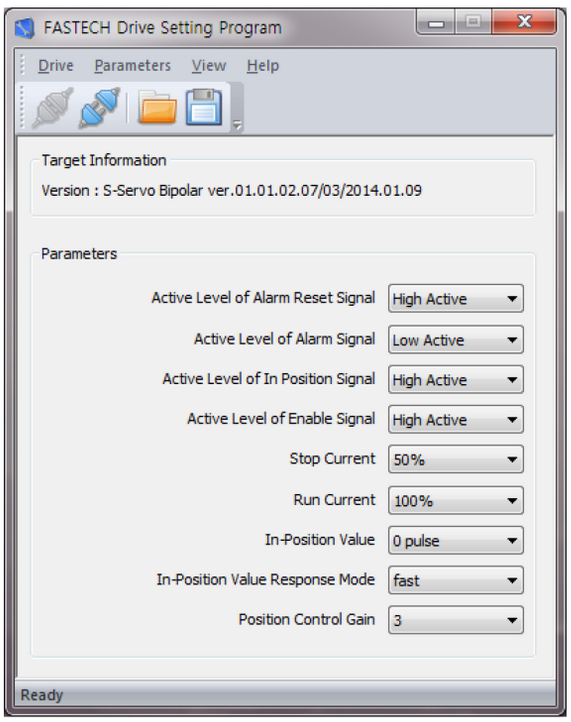
1 Parameter Settings GUI

(User Interface)

Ezi-SERVO II BT driver utilizes various parameters for operation.
Some parameters need to be adjusted once users feel inconvenience to use or in order to maximize efficiency.
Ezi-SERVO II BT provides parameter modification program for convenience of product usage for users.

The screen shot as below is computer program (GUI) which used for operation process. Users can change and set the parameters of drive for Enable Level, Alarm Reset Level, In-Position Level, Alarm Output Level. Users can use Ezi-SERVO II BT according to its own system.

Please connect parameter setting GUI when Ezi-SERVO II BT is Disable state.
For safety reason, Ezi-SERVO II BT can not be connected to setting GUI when it is Enable state.



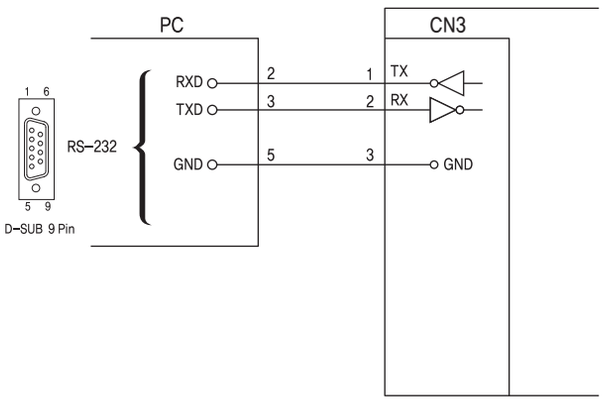
※ Graphic User Interface(GUI) Program can be downloaded from website. (www.fastech.co.kr)

※ Graphic User Interface(GUI) Program can support Window 7/8/10.

※ Graphic User Interface(GUI) Program can be update without prior notice for improving the performance or convenience of user.

2 Parameter Settings wiring Diagram

(Ezi-SERVO II-BT-42/56/60 Series)



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