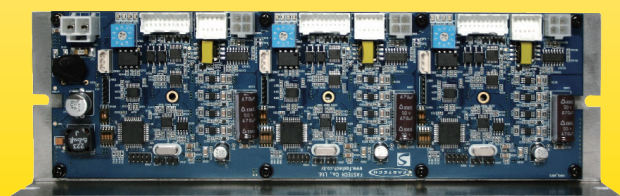
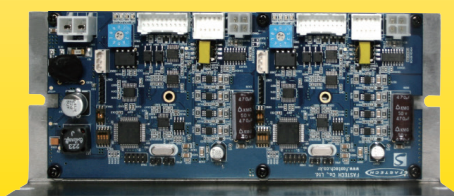


# S-SERVO<sup>®</sup> II

Stepping motor control system without step out

- **Completely free from the Concern of Loss of Position**  
(Alarm Feneration when Step-Out)
- **Perfect Positioning and Completion**  
(Positioning Completion Signal Generation)
- **Don't Care what the Phase of Motor is**  
(Position Accuracy only Related to Endocer Resolution)
- **Reduce the Motor Temperature and Energy Usage**  
(Current Control According to load)
- **Torque Improvement by Run Current Control**  
(Max. 150% Current Control)



CE



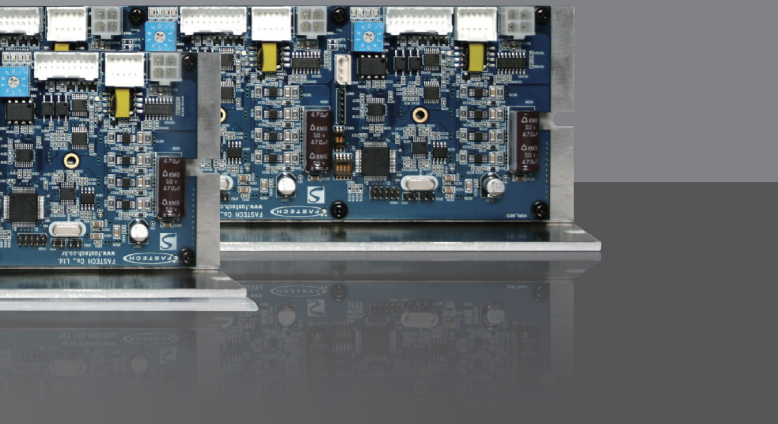
Fast, Accurate, Smooth Motion



*Fast, Accurate, Smooth Motion*

# S-SERVO<sup>®</sup> II

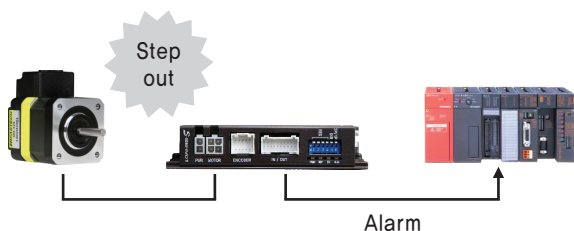
Stepping motor control system without step out



## 1 No Step Out

(Alarm will be generated when step out)

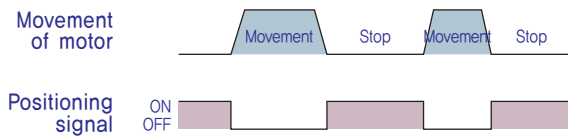
Because of mounted encoder constantly monitor the current position, step out cannot be occurred. If step out occurred by external force of overloads, alarm signal will be sent to upper controller. Thus, upper controller can recognize step out of step motor.



## 2 Perfect Positioning Completion Check

(Positioning completion signal will be generated)

When motor stops at the goal position, encoder detect it and send positioning completion signal to upper controller. Therefore S-SERVO II resolve the problem of unclear positioning of current Open Loop System.



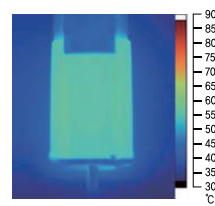
## 3 High Position Accuracy

S-SERVO II controls position by using high precision of encoder. Regardless of motor type (2 Phase or 5 Phase), S-SERVO II position precision is only related to mounted encoder resolution so high precision of positioning is possible unlike open loop micro step motor and driver which adapts 2 Phase or 5 Phase motor.

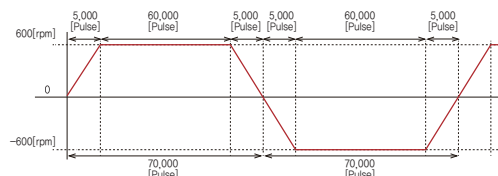
## 4 Heat Reduction / Energy Saving

(Motor Current Control according to load)

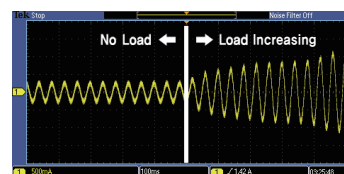
S-SERVO II automatically controls motor current according to load. S-SERVO II reduces motor current when motor load is low and increases motor current when load is high. By optimizing the motor current, motor heat can be minimized and energy can be saved.



Motor temperature [Measured by Thermal Imaging Camera]



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



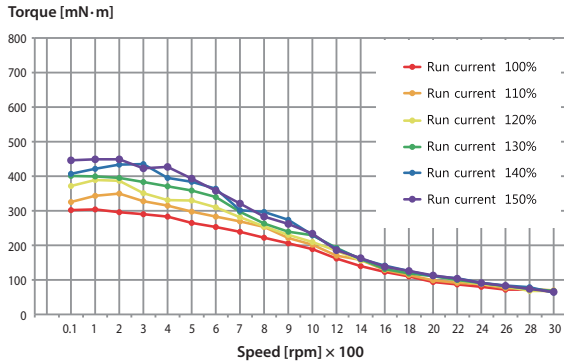
Example of the Motor Current Control according to load

## 5 Torque Improvement

(Motor Current Setting)

S-SERVOII 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.

S-SERVOII can improve the torque in the low speed range by about 30%.

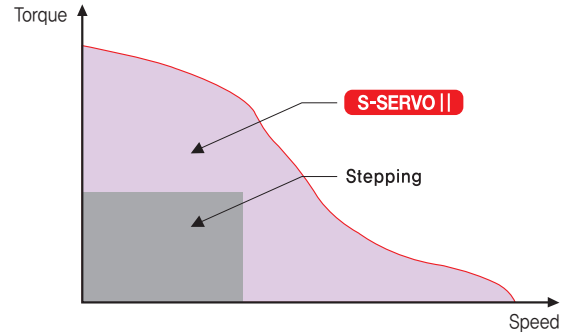


※ The torque at low speed is improved about 30%.

Measured Condition : Drive = S-SERVOII-ST-42L  
 Motor Voltage = 24VDC  
 Input Voltage = 24VDC

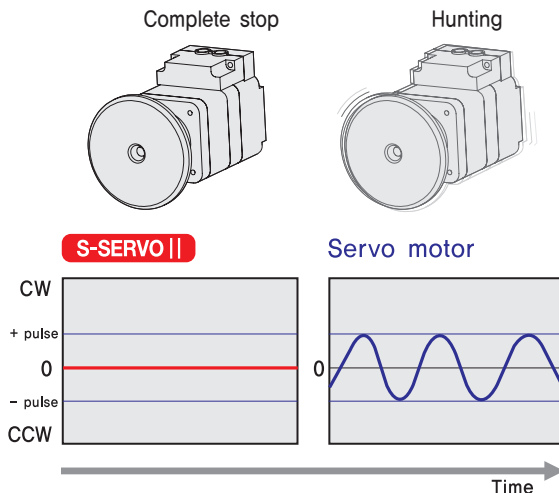
## 7 High Torque

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



## 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 S-SERVOII Motion Control System. S-SERVOII 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.



## 8 Variety of Protection Functions

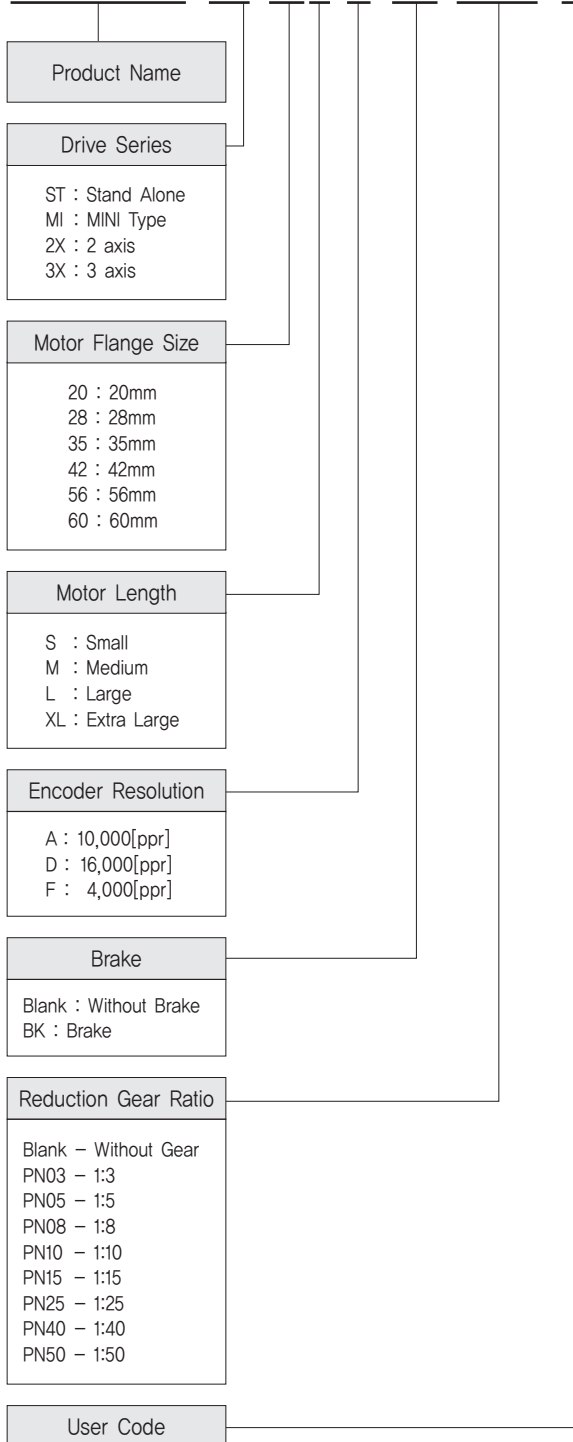
Drive and equipment can be protected by the alarm (11 kinds) of such as motor connection error, encoder connection error etc.

## 9 Variety of Position Command Unit

According to the purpose of usage, S-SERVOII offer 16 stage (500~50,000P/R) of position command unit.

## ● S-SERVO II ST Part Numbering

### S-SERVO II -ST-56L-A-BK-PN05-□



※ S-SERVO II 2X, S-SERVO II 3X product needs 2 or 3 sets of motors for one drive. Combination of drive and motors can be diversified so please contact with sales division or distributor of FASTECH before purchasing product.

## ● Standard Combination

### ◆ S-SERVO II ST series

Unit Part Number	Motor Model Number	Drive Model Number
S-SERVO II -ST-20M-F	SM-20M-F	SV2-PD-20M-F
S-SERVO II -ST-20L-F	SM-20L-F	SV2-PD-20L-F
S-SERVO II -ST-28S-F	SM-28S-F	SV2-PD-28S-F
S-SERVO II -ST-28S-D	SM-28S-D	SV2-PD-28S-D
S-SERVO II -ST-28SM-D	SM-28SM-D	SV2-PD-28S-D
S-SERVO II -ST-28M-F	SM-28M-F	SV2-PD-28M-F
S-SERVO II -ST-28M-D	SM-28M-D	SV2-PD-28M-D
S-SERVO II -ST-28MM-D	SM-28MM-D	SV2-PD-28M-D
S-SERVO II -ST-28L-F	SM-28L-F	SV2-PD-28L-F
S-SERVO II -ST-28L-D	SM-28L-D	SV2-PD-28L-D
S-SERVO II -ST-28LM-D	SM-28LM-D	SV2-PD-28L-D
S-SERVO II -ST-35M-F	SM-35M-F	SV2-PD-35M-F
S-SERVO II -ST-35M-D	SM-35M-D	SV2-PD-35M-D
S-SERVO II -ST-35MM-D	SM-35MM-D	SV2-PD-35M-D
S-SERVO II -ST-35L-F	SM-35L-F	SV2-PD-35L-F
S-SERVO II -ST-35L-D	SM-35L-D	SV2-PD-35L-D
S-SERVO II -ST-35LM-D	SM-35LM-D	SV2-PD-35L-D
S-SERVO II -ST-42S-A	SM-42S-A	SV2-PD-42S-A
S-SERVO II -ST-42S-F	SM-42S-F	SV2-PD-42S-F
S-SERVO II -ST-42M-A	SM-42M-A	SV2-PD-42 M-A
S-SERVO II -ST-42M-F	SM-42M-F	SV2-PD-42M-F
S-SERVO II -ST-42L-A	SM-42L-A	SV2-PD-42L-A
S-SERVO II -ST-42L-F	SM-42L-F	SV2-PD-42L-F
S-SERVO II -ST-42XL-A	SM-42XL-A	SV2-PD-42XL-A
S-SERVO II -ST-42XL-F	SM-42XL-F	SV2-PD-42XL-F
S-SERVO II -ST-56S-A	SM-56S-A	SV2-PD-56S-A
S-SERVO II -ST-56S-F	SM-56S-F	SV2-PD-56S-F
S-SERVO II -ST-56M-A	SM-56M-A	SV2-PD-56M-A
S-SERVO II -ST-56M-F	SM-56M-F	SV2-PD-56M-F
S-SERVO II -ST-56L-A	SM-56L-A	SV2-PD-56L-A
S-SERVO II -ST-56L-F	SM-56L-F	SV2-PD-56L-F
S-SERVO II -ST-60S-A	SM-60S-A	SV2-PD-60S-A
S-SERVO II -ST-60S-F	SM-60S-F	SV2-PD-60S-F
S-SERVO II -ST-60M-A	SM-60M-A	SV2-PD-60M-A
S-SERVO II -ST-60M-F	SM-60M-F	SV2-PD-60M-F
S-SERVO II -ST-60L-A	SM-60L-A	SV2-PD-60L-A
S-SERVO II -ST-60L-F	SM-60L-F	SV2-PD-60L-F

\* When places an order for Stopper type 28, 35mm motor, please write "M" additionally after motor length of unit part number.  
 (Ex: S-SERVO II -ST-28LM-D, S-SERVO II -ST-35LM-D)

## ● Standard Combination

### ◆ S-SERVO II MINI series

Unit Part Number	Motor Model Number	Drive Model Number
S-SERVO II-MI-20M-F	SM-20M-F	SV2-PD-MI-20M-F
S-SERVO II-MI-20L-F	SM-20L-F	SV2-PD-MI-20L-F
S-SERVO II-MI-28S-F	SM-28S-F	SV2-PD-MI-28S-F
S-SERVO II-MI-28S-D	SM-28S-D	SV2-PD-MI-28S-D
S-SERVO II-MI-28SM-D	SM-28SM-D	SV2-PD-MI-28S-D
S-SERVO II-MI-28M-F	SM-28M-F	SV2-PD-MI-28M-F
S-SERVO II-MI-28M-D	SM-28M-D	SV2-PD-MI-28M-D
S-SERVO II-MI-28MM-D	SM-28MM-D	SV2-PD-MI-28M-D
S-SERVO II-MI-28L-F	SM-28L-F	SV2-PD-MI-28L-F
S-SERVO II-MI-28L-D	SM-28L-D	SV2-PD-MI-28L-D
S-SERVO II-MI-28LM-D	SM-28LM-D	SV2-PD-MI-28L-D
S-SERVO II-MI-35M-F	SM-35M-F	SV2-PD-MI-35M-F
S-SERVO II-MI-35M-D	SM-35M-D	SV2-PD-MI-35M-D
S-SERVO II-MI-35MM-D	SM-35MM-D	SV2-PD-MI-35M-D
S-SERVO II-MI-35L-F	SM-35L-F	SV2-PD-MI-35L-F
S-SERVO II-MI-35L-D	SM-35L-D	SV2-PD-MI-35L-D
S-SERVO II-MI-35LM-D	SM-35LM-D	SV2-PD-MI-35L-D
S-SERVO II-MI-42S-A	SM-42S-A	SV2-PD-MI-42S-A
S-SERVO II-MI-42S-F	SM-42S-F	SV2-PD-MI-42S-F
S-SERVO II-MI-42M-A	SM-42M-A	SV2-PD-MI-42M-A
S-SERVO II-MI-42M-F	SM-42M-F	SV2-PD-MI-42M-F
S-SERVO II-MI-42L-A	SM-42L-A	SV2-PD-MI-42L-A
S-SERVO II-MI-42L-F	SM-42L-F	SV2-PD-MI-42L-F
S-SERVO II-MI-42XL-A	SM-42XL-A	SV2-PD-MI-42XL-A
S-SERVO II-MI-42XL-F	SM-42XL-F	SV2-PD-MI-42XL-F

\* When places an order for Stopper type 28, 35mm motor, please write "M" additionally after motor length of unit part number.  
(Ex: S-SERVO II-MI-28LM-D, S-SERVO II-MI-35LM-D)

### ◆ S-SERVO II 2X series

Unit Part Number	Motor Model Number	Drive Model Number
S-SERVO II-2X	SM-20M-F	SV2-PD-2X
	SM-20L-F	
	SM-28S-F	
	SM-28S-D	
	SM-28SM-D	
	SM-28M-F	
	SM-28M-D	
	SM-28MM-D	
	SM-28L-F	
	SM-28L-D	
	SM-28LM-D	
	SM-35M-F	
	SM-35M-D	
	SM-35MM-D	
	SM-35L-F	
	SM-35L-D	
	SM-35LM-D	
	SM-42S-A	
	SM-42S-F	
	SM-42M-A	
	SM-42M-F	
	SM-42L-A	
	SM-42L-F	
	SM-42XL-A	
	SM-42XL-F	
	SM-56S-A	
	SM-56S-F	
	SM-56M-A	
	SM-56M-F	
	SM-56L-A	
	SM-56L-F	
	SM-60S-A	
SM-60S-F		
SM-60M-A		
SM-60M-F		
SM-60L-A		
SM-60L-F		

\* When places an order for Stopper type 28, 35mm motor, please write "M" additionally after motor length of unit part number.  
(Ex: S-SERVO II-2X-28LM-D, S-SERVO II-2X-35LM-D)

## ● Standard Combination

### ◆ S-SERVO II 3X series

Unit Part Number	Motor Model Number	Drive Model Number
S-SERVO II -3X	SM-20M-F	SV2-PD-3X
	SM-20L-F	
	SM-28S-F	
	SM-28S-D	
	SM-28SM-D	
	SM-28M-F	
	SM-28M-D	
	SM-28MM-D	
	SM-28L-F	
	SM-28L-D	
	SM-28LM-D	
	SM-35M-F	
	SM-35M-D	
	SM-35MM-D	
	SM-35L-F	
	SM-35LM-D	
	SM-35L-D	
	SM-42S-A	
	SM-42S-F	
	SM-42M-A	
	SM-42M-F	
	SM-42L-A	
	SM-42L-F	
	SM-42XL-A	
	SM-42XL-F	
	SM-56S-A	
	SM-56S-F	
	SM-56M-A	
	SM-56M-F	
	SM-56L-A	
	SM-56L-F	
	SM-60S-A	
	SM-60S-F	
	SM-60M-A	
	SM-60M-F	
	SM-60L-A	
SM-60L-F		

\* When places an order for Stopper type 28, 35mm motor, please write "M" additionally after motor length of unit part number.  
(Ex: S-SERVO II -3X-28LM-D, S-SERVO II -3X-35LM-D)

## ● Combination with Brake

### ◆ S-SERVO II ST series

Unit Part Number	Motor Model Number	Drive Model Number
S-SERVO II -ST-42S-A-BK	SM-42S-A-BK	SV2-PD-42S-A
S-SERVO II -ST-42S-F-BK	SM-42S-F-BK	SV2-PD-42S-F
S-SERVO II -ST-42M-A-BK	SM-42M-A-BK	SV2-PD-42M-A
S-SERVO II -ST-42M-F-BK	SM-42M-F-BK	SV2-PD-42M-F
S-SERVO II -ST-42L-A-BK	SM-42L-A-BK	SV2-PD-42L-A
S-SERVO II -ST-42L-F-BK	SM-42L-F-BK	SV2-PD-42L-F
S-SERVO II -ST-42XL-A-BK	SM-42XL-A-BK	SV2-PD-42XL-A
S-SERVO II -ST-42XL-F-BK	SM-42XL-F-BK	SV2-PD-42XL-F
S-SERVO II -ST-56S-A-BK	SM-56S-A-BK	SV2-PD-56S-A
S-SERVO II -ST-56S-F-BK	SM-56S-F-BK	SV2-PD-56S-F
S-SERVO II -ST-56M-A-BK	SM-56M-A-BK	SV2-PD-56M-A
S-SERVO II -ST-56M-F-BK	SM-56M-F-BK	SV2-PD-56M-F
S-SERVO II -ST-56L-A-BK	SM-56L-A-BK	SV2-PD-56L-A
S-SERVO II -ST-56L-F-BK	SM-56L-F-BK	SV2-PD-56L-F
S-SERVO II -ST-60S-A-BK	SM-60S-A-BK	SV2-PD-60S-A
S-SERVO II -ST-60S-F-BK	SM-60S-F-BK	SV2-PD-60S-F
S-SERVO II -ST-60M-A-BK	SM-60M-A-BK	SV2-PD-60M-A
S-SERVO II -ST-60M-F-BK	SM-60M-F-BK	SV2-PD-60M-F
S-SERVO II -ST-60L-A-BK	SM-60L-A-BK	SV2-PD-60L-A
S-SERVO II -ST-60L-F-BK	SM-60L-F-BK	SV2-PD-60L-F

### ◆ S-SERVO II MINI series

Unit Part Number	Motor Model Number	Drive Model Number
S-SERVO II -MI-42S-A-BK	SM-42S-A-BK	SV2-PD-MI-42S-A
S-SERVO II -MI-42S-F-BK	SM-42S-F-BK	SV2-PD-MI-42S-F
S-SERVO II -MI-42M-A-BK	SM-42M-A-BK	SV2-PD-MI-42M-A
S-SERVO II -MI-42M-F-BK	SM-42M-F-BK	SV2-PD-MI-42M-F
S-SERVO II -MI-42L-A-BK	SM-42L-A-BK	SV2-PD-MI-42L-A
S-SERVO II -MI-42L-F-BK	SM-42L-F-BK	SV2-PD-MI-42L-F
S-SERVO II -MI-42XL-A-BK	SM-42XL-A-BK	SV2-PD-MI-42XL-A
S-SERVO II -MI-42XL-F-BK	SM-42XL-F-BK	SV2-PD-MI-42XL-F

# ● Combination with Gearbox

## ◆ S-SERVO II ST series

Unit Part Number	Motor Model Number	Drive Model Number	Reduction gear ratio	
S-SERVO II-ST-42S-A-PN3	SM-42S-A-PN3	SV2-PD-42S	1:3	
S-SERVO II-ST-42S-F-PN3	SM-42S-F-PN3		1:5	
S-SERVO II-ST-42S-A-PN5	SM-42S-A-PN5		1:8	
S-SERVO II-ST-42S-F-PN5	SM-42S-F-PN5		1:10	
S-SERVO II-ST-42S-A-PN8	SM-42S-A-PN8		1:15	
S-SERVO II-ST-42S-F-PN8	SM-42S-F-PN8		1:25	
S-SERVO II-ST-42S-A-PN10	SM-42S-A-PN10		1:40	
S-SERVO II-ST-42S-F-PN10	SM-42S-F-PN10		1:50	
S-SERVO II-ST-42S-A-PN15	SM-42S-A-PN15		SV2-PD-42M	1:3
S-SERVO II-ST-42S-F-PN15	SM-42S-F-PN15			1:5
S-SERVO II-ST-42S-A-PN25	SM-42S-A-PN25			1:8
S-SERVO II-ST-42S-F-PN25	SM-42S-F-PN25			1:10
S-SERVO II-ST-42S-A-PN40	SM-42S-A-PN40			1:15
S-SERVO II-ST-42S-F-PN40	SM-42S-F-PN40			1:25
S-SERVO II-ST-42S-A-PN50	SM-42S-A-PN50			1:40
S-SERVO II-ST-42S-F-PN50	SM-42S-F-PN50	1:50		
S-SERVO II-ST-42M-A-PN3	SM-42M-A-PN3	SV2-PD-42L		1:3
S-SERVO II-ST-42M-F-PN3	SM-42M-F-PN3			1:5
S-SERVO II-ST-42M-A-PN5	SM-42M-A-PN5			1:8
S-SERVO II-ST-42M-F-PN5	SM-42M-F-PN5			1:10
S-SERVO II-ST-42M-A-PN8	SM-42M-A-PN8			1:15
S-SERVO II-ST-42M-F-PN8	SM-42M-F-PN8			1:25
S-SERVO II-ST-42M-A-PN10	SM-42M-A-PN10			1:40
S-SERVO II-ST-42M-F-PN10	SM-42M-F-PN10		1:50	
S-SERVO II-ST-42M-A-PN15	SM-42M-A-PN15		SV2-PD-42XL	1:3
S-SERVO II-ST-42M-F-PN15	SM-42M-F-PN15			1:5
S-SERVO II-ST-42M-A-PN25	SM-42M-A-PN25			1:8
S-SERVO II-ST-42M-F-PN25	SM-42M-F-PN25			1:10
S-SERVO II-ST-42M-A-PN40	SM-42M-A-PN40			1:15
S-SERVO II-ST-42M-F-PN40	SM-42M-F-PN40			1:25
S-SERVO II-ST-42M-A-PN50	SM-42M-A-PN50			1:40
S-SERVO II-ST-42M-F-PN50	SM-42M-F-PN50	1:50		
S-SERVO II-ST-42L-A-PN3	SM-42L-A-PN3	SV2-PD-42XL		1:3
S-SERVO II-ST-42L-F-PN3	SM-42L-F-PN3			1:5
S-SERVO II-ST-42L-A-PN5	SM-42L-A-PN5			1:8
S-SERVO II-ST-42L-F-PN5	SM-42L-F-PN5			1:10
S-SERVO II-ST-42L-A-PN8	SM-42L-A-PN8			1:15
S-SERVO II-ST-42L-F-PN8	SM-42L-F-PN8			1:25
S-SERVO II-ST-42L-A-PN10	SM-42L-A-PN10			1:40
S-SERVO II-ST-42L-F-PN10	SM-42L-F-PN10		1:50	
S-SERVO II-ST-42L-A-PN15	SM-42L-A-PN15		SV2-PD-42XL	1:3
S-SERVO II-ST-42L-F-PN15	SM-42L-F-PN15			1:5
S-SERVO II-ST-42L-A-PN25	SM-42L-A-PN25			1:8
S-SERVO II-ST-42L-F-PN25	SM-42L-F-PN25			1:10
S-SERVO II-ST-42L-A-PN40	SM-42L-A-PN40			1:15
S-SERVO II-ST-42L-F-PN40	SM-42L-F-PN40			1:25
S-SERVO II-ST-42L-A-PN50	SM-42L-A-PN50			1:40
S-SERVO II-ST-42L-F-PN50	SM-42L-F-PN50	1:50		
S-SERVO II-ST-42XL-A-PN3	SM-42XL-A-PN3	SV2-PD-42XL		1:3
S-SERVO II-ST-42XL-F-PN3	SM-42XL-F-PN3			1:5
S-SERVO II-ST-42XL-A-PN5	SM-42XL-A-PN5			1:8
S-SERVO II-ST-42XL-F-PN5	SM-42XL-F-PN5			1:10
S-SERVO II-ST-42XL-A-PN8	SM-42XL-A-PN8			1:15
S-SERVO II-ST-42XL-F-PN8	SM-42XL-F-PN8			1:25
S-SERVO II-ST-42XL-A-PN10	SM-42XL-A-PN10			1:40
S-SERVO II-ST-42XL-F-PN10	SM-42XL-F-PN10		1:50	
S-SERVO II-ST-42XL-A-PN15	SM-42XL-A-PN15		SV2-PD-60S	1:3
S-SERVO II-ST-42XL-F-PN15	SM-42XL-F-PN15			1:5
S-SERVO II-ST-42XL-A-PN25	SM-42XL-A-PN25			1:8
S-SERVO II-ST-42XL-F-PN25	SM-42XL-F-PN25			1:10
S-SERVO II-ST-42XL-A-PN40	SM-42XL-A-PN40			1:15
S-SERVO II-ST-42XL-F-PN40	SM-42XL-F-PN40			1:25
S-SERVO II-ST-42XL-A-PN50	SM-42XL-A-PN50			1:40
S-SERVO II-ST-42XL-F-PN50	SM-42XL-F-PN50	1:50		

Unit Part Number	Motor Model Number	Drive Model Number	Reduction gear ratio	
S-SERVO II-ST-56S-A-PN3	SM-56S-A-PN3	SV2-PD-56S	1:3	
S-SERVO II-ST-56S-F-PN3	SM-56S-F-PN3		1:5	
S-SERVO II-ST-56S-A-PN5	SM-56S-A-PN5		1:8	
S-SERVO II-ST-56S-F-PN5	SM-56S-F-PN5		1:10	
S-SERVO II-ST-56S-A-PN8	SM-56S-A-PN8		1:15	
S-SERVO II-ST-56S-F-PN8	SM-56S-F-PN8		1:25	
S-SERVO II-ST-56S-A-PN10	SM-56S-A-PN10		1:40	
S-SERVO II-ST-56S-F-PN10	SM-56S-F-PN10		1:50	
S-SERVO II-ST-56S-A-PN15	SM-56S-A-PN15		SV2-PD-56M	1:3
S-SERVO II-ST-56S-F-PN15	SM-56S-F-PN15			1:5
S-SERVO II-ST-56S-A-PN25	SM-56S-A-PN25			1:8
S-SERVO II-ST-56S-F-PN25	SM-56S-F-PN25			1:10
S-SERVO II-ST-56S-A-PN40	SM-56S-A-PN40			1:15
S-SERVO II-ST-56S-F-PN40	SM-56S-F-PN40			1:25
S-SERVO II-ST-56S-A-PN50	SM-56S-A-PN50			1:40
S-SERVO II-ST-56S-F-PN50	SM-56S-F-PN50	1:50		
S-SERVO II-ST-56M-A-PN3	SM-56M-A-PN3	SV2-PD-56L		1:3
S-SERVO II-ST-56M-F-PN3	SM-56M-F-PN3			1:5
S-SERVO II-ST-56M-A-PN5	SM-56M-A-PN5			1:8
S-SERVO II-ST-56M-F-PN5	SM-56M-F-PN5			1:10
S-SERVO II-ST-56M-A-PN8	SM-56M-A-PN8			1:15
S-SERVO II-ST-56M-F-PN8	SM-56M-F-PN8			1:25
S-SERVO II-ST-56M-A-PN10	SM-56M-A-PN10			1:40
S-SERVO II-ST-56M-F-PN10	SM-56M-F-PN10		1:50	
S-SERVO II-ST-56M-A-PN15	SM-56M-A-PN15		SV2-PD-60S	1:3
S-SERVO II-ST-56M-F-PN15	SM-56M-F-PN15			1:5
S-SERVO II-ST-56M-A-PN25	SM-56M-A-PN25			1:8
S-SERVO II-ST-56M-F-PN25	SM-56M-F-PN25			1:10
S-SERVO II-ST-56M-A-PN40	SM-56M-A-PN40			1:15
S-SERVO II-ST-56M-F-PN40	SM-56M-F-PN40			1:25
S-SERVO II-ST-56M-A-PN50	SM-56M-A-PN50			1:40
S-SERVO II-ST-56M-F-PN50	SM-56M-F-PN50	1:50		
S-SERVO II-ST-56L-A-PN3	SM-56L-A-PN3	SV2-PD-60S		1:3
S-SERVO II-ST-56L-F-PN3	SM-56L-F-PN3			1:5
S-SERVO II-ST-56L-A-PN5	SM-56L-A-PN5			1:8
S-SERVO II-ST-56L-F-PN5	SM-56L-F-PN5			1:10
S-SERVO II-ST-56L-A-PN8	SM-56L-A-PN8			1:15
S-SERVO II-ST-56L-F-PN8	SM-56L-F-PN8			1:25
S-SERVO II-ST-56L-A-PN10	SM-56L-A-PN10			1:40
S-SERVO II-ST-56L-F-PN10	SM-56L-F-PN10		1:50	
S-SERVO II-ST-56L-A-PN15	SM-56L-A-PN15		SV2-PD-60S	1:3
S-SERVO II-ST-56L-F-PN15	SM-56L-F-PN15			1:5
S-SERVO II-ST-56L-A-PN25	SM-56L-A-PN25			1:8
S-SERVO II-ST-56L-F-PN25	SM-56L-F-PN25			1:10
S-SERVO II-ST-56L-A-PN40	SM-56L-A-PN40			1:15
S-SERVO II-ST-56L-F-PN40	SM-56L-F-PN40			1:25
S-SERVO II-ST-56L-A-PN50	SM-56L-A-PN50			1:40
S-SERVO II-ST-56L-F-PN50	SM-56L-F-PN50	1:50		
S-SERVO II-ST-60S-A-PN3	SM-60S-A-PN3	SV2-PD-60S		1:3
S-SERVO II-ST-60S-F-PN3	SM-60S-F-PN3			1:5
S-SERVO II-ST-60S-A-PN5	SM-60S-A-PN5			1:8
S-SERVO II-ST-60S-F-PN5	SM-60S-F-PN5			1:10
S-SERVO II-ST-60S-A-PN8	SM-60S-A-PN8			1:15
S-SERVO II-ST-60S-F-PN8	SM-60S-F-PN8			1:25
S-SERVO II-ST-60S-A-PN10	SM-60S-A-PN10			1:40
S-SERVO II-ST-60S-F-PN10	SM-60S-F-PN10		1:50	
S-SERVO II-ST-60S-A-PN15	SM-60S-A-PN15		SV2-PD-60S	1:3
S-SERVO II-ST-60S-F-PN15	SM-60S-F-PN15			1:5
S-SERVO II-ST-60S-A-PN25	SM-60S-A-PN25			1:8
S-SERVO II-ST-60S-F-PN25	SM-60S-F-PN25			1:10
S-SERVO II-ST-60S-A-PN40	SM-60S-A-PN40			1:15
S-SERVO II-ST-60S-F-PN40	SM-60S-F-PN40			1:25
S-SERVO II-ST-60S-A-PN50	SM-60S-A-PN50			1:40
S-SERVO II-ST-60S-F-PN50	SM-60S-F-PN50	1:50		

FASTECH S-SERVO II



# ● Combination with Gearbox

## ◆ S-SERVO II MINI series

Unit Part Number	Motor Model Number	Drive Model Number	Reduction gear ratio	
S-SERVO II-ST-60M-A-PN3	SM-60M-A-PN3	SV2-PD-60M	1:3	
S-SERVO II-ST-60M-F-PN3	SM-60M-F-PN3			
S-SERVO II-ST-60M-A-PN5	SM-60M-A-PN5		1:5	
S-SERVO II-ST-60M-F-PN5	SM-60M-F-PN5			
S-SERVO II-ST-60M-A-PN8	SM-60M-A-PN8		1:8	
S-SERVO II-ST-60M-F-PN8	SM-60M-F-PN8			
S-SERVO II-ST-60M-A-PN10	SM-60M-A-PN10		1:10	
S-SERVO II-ST-60M-F-PN10	SM-60M-F-PN10			
S-SERVO II-ST-60M-A-PN15	SM-60M-A-PN15		1:15	
S-SERVO II-ST-60M-F-PN15	SM-60M-F-PN15			
S-SERVO II-ST-60M-A-PN25	SM-60M-A-PN25		1:25	
S-SERVO II-ST-60M-F-PN25	SM-60M-F-PN25			
S-SERVO II-ST-60M-A-PN40	SM-60M-A-PN40		1:40	
S-SERVO II-ST-60M-F-PN40	SM-60M-F-PN40			
S-SERVO II-ST-60M-A-PN50	SM-60M-A-PN50		1:50	
S-SERVO II-ST-60M-F-PN50	SM-60M-F-PN50			
S-SERVO II-ST-60L-A-PN3	SM-60L-A-PN3		SV2-PD-60L	1:3
S-SERVO II-ST-60L-F-PN3	SM-60L-F-PN3			
S-SERVO II-ST-60L-A-PN5	SM-60L-A-PN5			1:5
S-SERVO II-ST-60L-F-PN5	SM-60L-F-PN5			
S-SERVO II-ST-60L-A-PN8	SM-60L-A-PN8	1:8		
S-SERVO II-ST-60L-F-PN8	SM-60L-F-PN8			
S-SERVO II-ST-60L-A-PN10	SM-60L-A-PN10	1:10		
S-SERVO II-ST-60L-F-PN10	SM-60L-F-PN10			
S-SERVO II-ST-60L-A-PN15	SM-60L-A-PN15	1:15		
S-SERVO II-ST-60L-F-PN15	SM-60L-F-PN15			
S-SERVO II-ST-60L-A-PN25	SM-60L-A-PN25	1:25		
S-SERVO II-ST-60L-F-PN25	SM-60L-F-PN25			
S-SERVO II-ST-60L-A-PN40	SM-60L-A-PN40	1:40		
S-SERVO II-ST-60L-F-PN40	SM-60L-F-PN40			
S-SERVO II-ST-60L-A-PN50	SM-60L-A-PN50	1:50		
S-SERVO II-ST-60L-F-PN50	SM-60L-F-PN50			

Unit Part Number	Motor Model Number	Drive Model Number	Reduction gear ratio	
S-SERVO II-MI-42S-A-PN3	SM-42S-A-PN3	SV2-PD-MI-42S	1:3	
S-SERVO II-MI-42S-F-PN3	SM-42S-F-PN3			
S-SERVO II-MI-42S-A-PN5	SM-42S-A-PN5		1:5	
S-SERVO II-MI-42S-F-PN5	SM-42S-F-PN5			
S-SERVO II-MI-42S-A-PN8	SM-42S-A-PN8		1:8	
S-SERVO II-MI-42S-F-PN8	SM-42S-F-PN8			
S-SERVO II-MI-42S-A-PN10	SM-42S-A-PN10		1:10	
S-SERVO II-MI-42S-F-PN10	SM-42S-F-PN10			
S-SERVO II-MI-42S-A-PN15	SM-42S-A-PN15		1:15	
S-SERVO II-MI-42S-F-PN15	SM-42S-F-PN15			
S-SERVO II-MI-42S-A-PN25	SM-42S-A-PN25		1:25	
S-SERVO II-MI-42S-F-PN25	SM-42S-F-PN25			
S-SERVO II-MI-42S-A-PN40	SM-42S-A-PN40		1:40	
S-SERVO II-MI-42S-F-PN40	SM-42S-F-PN40			
S-SERVO II-MI-42S-A-PN50	SM-42S-A-PN50		1:50	
S-SERVO II-MI-42S-F-PN50	SM-42S-F-PN50			
S-SERVO II-MI-42M-A-PN3	SM-42M-A-PN3		SV2-PD-MI-42M	1:3
S-SERVO II-MI-42M-F-PN3	SM-42M-F-PN3			
S-SERVO II-MI-42M-A-PN5	SM-42M-A-PN5			1:5
S-SERVO II-MI-42M-F-PN5	SM-42M-F-PN5			
S-SERVO II-MI-42M-A-PN8	SM-42M-A-PN8	1:8		
S-SERVO II-MI-42M-F-PN8	SM-42M-F-PN8			
S-SERVO II-MI-42M-A-PN10	SM-42M-A-PN10	1:10		
S-SERVO II-MI-42M-F-PN10	SM-42M-F-PN10			
S-SERVO II-MI-42M-A-PN15	SM-42M-A-PN15	1:15		
S-SERVO II-MI-42M-F-PN15	SM-42M-F-PN15			
S-SERVO II-MI-42M-A-PN25	SM-42M-A-PN25	1:25		
S-SERVO II-MI-42M-F-PN25	SM-42M-F-PN25			
S-SERVO II-MI-42M-A-PN40	SM-42M-A-PN40	1:40		
S-SERVO II-MI-42M-F-PN40	SM-42M-F-PN40			
S-SERVO II-MI-42M-A-PN50	SM-42M-A-PN50	1:50		
S-SERVO II-MI-42M-F-PN50	SM-42M-F-PN50			
S-SERVO II-MI-42L-A-PN3	SM-42L-A-PN3	SV2-PD-MI-42L		1:3
S-SERVO II-MI-42L-F-PN3	SM-42L-F-PN3			
S-SERVO II-MI-42L-A-PN5	SM-42L-A-PN5			1:5
S-SERVO II-MI-42L-F-PN5	SM-42L-F-PN5			
S-SERVO II-MI-42L-A-PN8	SM-42L-A-PN8		1:8	
S-SERVO II-MI-42L-F-PN8	SM-42L-F-PN8			
S-SERVO II-MI-42L-A-PN10	SM-42L-A-PN10		1:10	
S-SERVO II-MI-42L-F-PN10	SM-42L-F-PN10			
S-SERVO II-MI-42L-A-PN15	SM-42L-A-PN15		1:15	
S-SERVO II-MI-42L-F-PN15	SM-42L-F-PN15			
S-SERVO II-MI-42L-A-PN25	SM-42L-A-PN25		1:25	
S-SERVO II-MI-42L-F-PN25	SM-42L-F-PN25			
S-SERVO II-MI-42L-A-PN40	SM-42L-A-PN40		1:40	
S-SERVO II-MI-42L-F-PN40	SM-42L-F-PN40			
S-SERVO II-MI-42L-A-PN50	SM-42L-A-PN50		1:50	
S-SERVO II-MI-42L-F-PN50	SM-42L-F-PN50			
S-SERVO II-MI-42XL-A-PN3	SM-42XL-A-PN3		SV2-PD-MI-42XL	1:3
S-SERVO II-MI-42XL-F-PN3	SM-42XL-F-PN3			
S-SERVO II-MI-42XL-A-PN5	SM-42XL-A-PN5			1:5
S-SERVO II-MI-42XL-F-PN5	SM-42XL-F-PN5			
S-SERVO II-MI-42XL-A-PN8	SM-42XL-A-PN8	1:8		
S-SERVO II-MI-42XL-F-PN8	SM-42XL-F-PN8			
S-SERVO II-MI-42XL-A-PN10	SM-42XL-A-PN10	1:10		
S-SERVO II-MI-42XL-F-PN10	SM-42XL-F-PN10			
S-SERVO II-MI-42XL-A-PN15	SM-42XL-A-PN15	1:15		
S-SERVO II-MI-42XL-F-PN15	SM-42XL-F-PN15			
S-SERVO II-MI-42XL-A-PN25	SM-42XL-A-PN25	1:25		
S-SERVO II-MI-42XL-F-PN25	SM-42XL-F-PN25			
S-SERVO II-MI-42XL-A-PN40	SM-42XL-A-PN40	1:40		
S-SERVO II-MI-42XL-F-PN40	SM-42XL-F-PN40			
S-SERVO II-MI-42XL-A-PN50	SM-42XL-A-PN50	1:50		
S-SERVO II-MI-42XL-F-PN50	SM-42XL-F-PN50			

FASTECH S-SERVO II

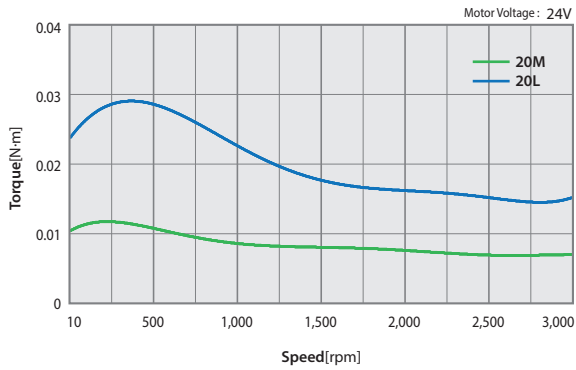
## ● Specifications of Motor

MODEL		SM-20 series		SM-28 series			SM-35 series			
		UNIT	20M	20L	28S	28M	28L	35M	35L	
DRIVE METHOD		—	BI-POLAR							
NUMBER OF PHASES		—	2	2	2	2	2	2	2	
CURRENT per PHASE		A	0,6	0,6	0,67	0,67	0,67	0,8	1,0	
HOLDING TORQUE		N·m	0,018	0,037	0,069	0,098	0,118	0,078	0,137	
ROTOR INERTIA		g·cm <sup>2</sup>	3,0	3,3	9,0	13	18	10	14	
WEIGHTS		g	92	105	146	203	227	152	210	
LENGTH(L)		mm	33	38	32	45	50	26	36	
PERMISSIBLE OVERHUNG LOAD (DISTANCE FROM END OF SHAFT)	3mm	N	18	18	30	30	30	22	22	
	8mm		30	30	38	38	38	26	26	
	13mm		—	—	53	53	53	33	33	
	18mm		—	—	—	—	—	46	46	
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							

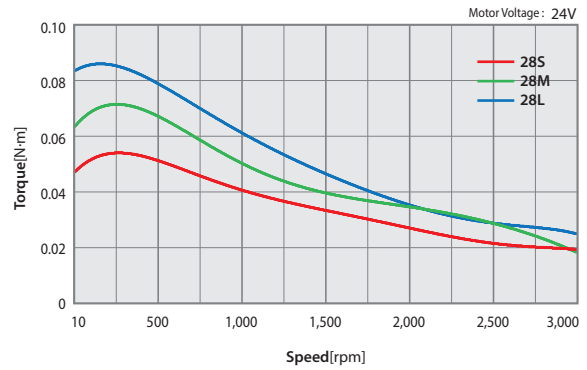
MODEL		SM-42 series				SM-56 series			SM-60 series			
		UNIT	42S	42M	42L	42XL	56S	56M	56L	60S	60M	60L
DRIVE METHOD		—	BI-POLAR									
NUMBER OF PHASES		—	2	2	2	2	2	2	2	2	2	
CURRENT per PHASE		A	1,3	1,68	1,68	1,2	2,8	2,8	2,8	4,0	4,0	4,0
HOLDING TORQUE		N·m	0,216	0,353	0,431	0,650	0,539	1,00	1,72	0,88	1,28	2,40
ROTOR INERTIA		g·cm <sup>2</sup>	35	54	68	114	120	300	480	240	490	690
WEIGHTS		g	278	341	416	566	506	742	1075	700	864	1418
LENGTH(L)		mm	33	39	47	60	41	56	76	47	56	85
PERMISSIBLE OVERHUNG LOAD (DISTANCE FROM END OF SHAFT)	3mm	N	22	22	22	22	52	52	52	70	70	70
	8mm		26	26	26	26	65	65	65	87	87	87
	13mm		33	33	33	33	85	85	85	114	114	114
	18mm		46	46	46	46	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°C)									
OPERATING TEMPERATURE		°C	0 to 55									

# Torque Characteristics of Motor

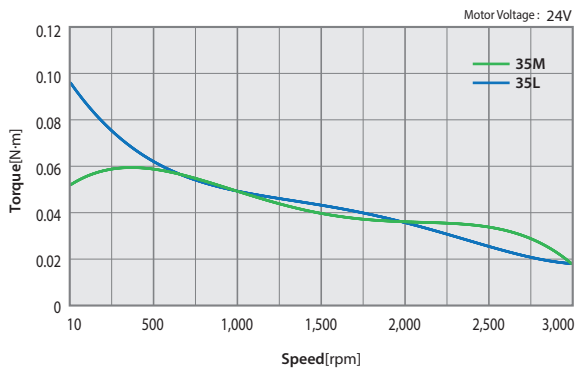
S-SERVO II-ST/MI/2X/3X-20 series



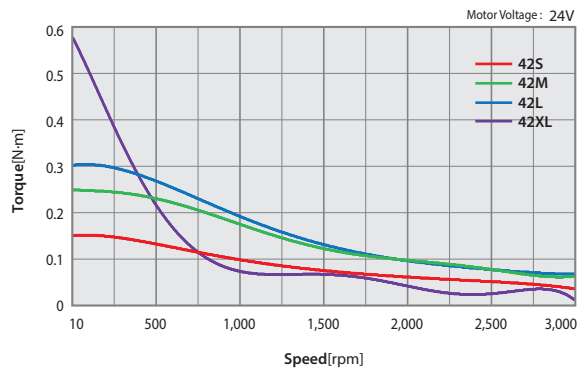
S-SERVO II-ST/MI/2X/3X-28 series



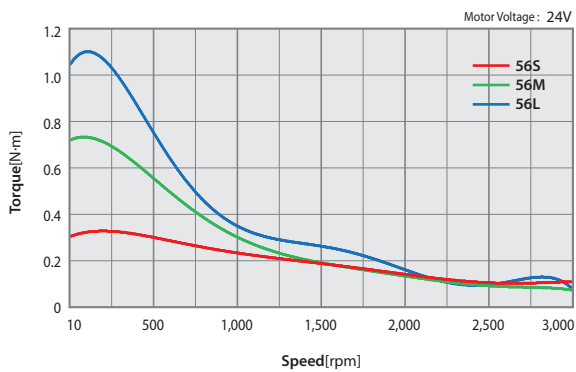
S-SERVO II-ST/MI/2X/3X-35 series



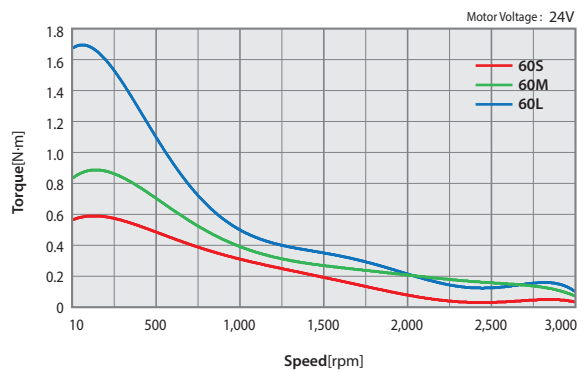
S-SERVO II-ST/MI/2X/3X-42 series



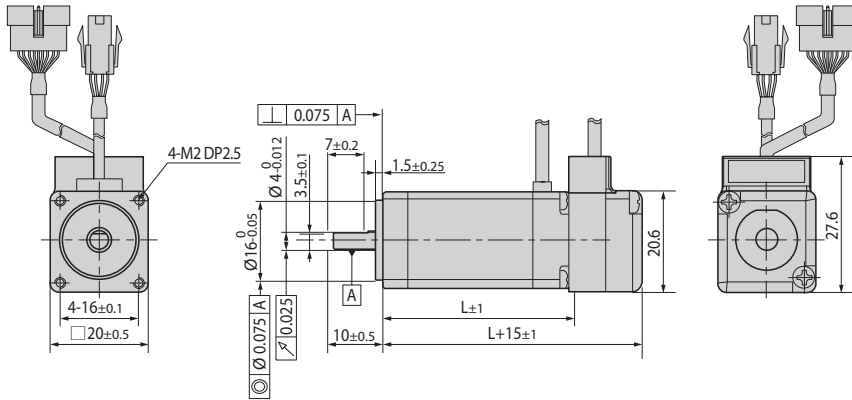
S-SERVO II-ST/2X/3X-56 series



S-SERVO II-ST/2X/3X-60 series

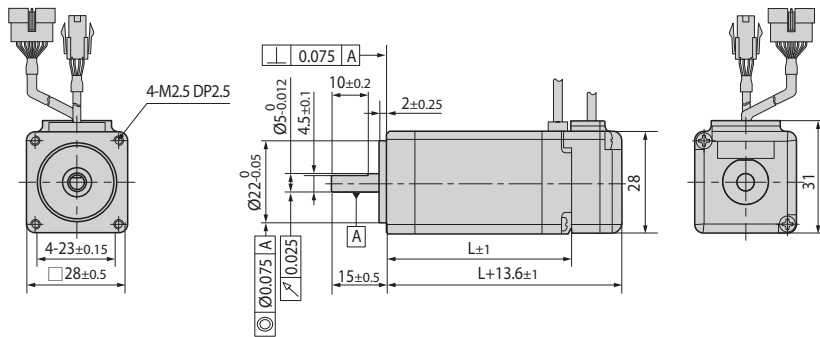


## ● Dimensions of Motor [mm]



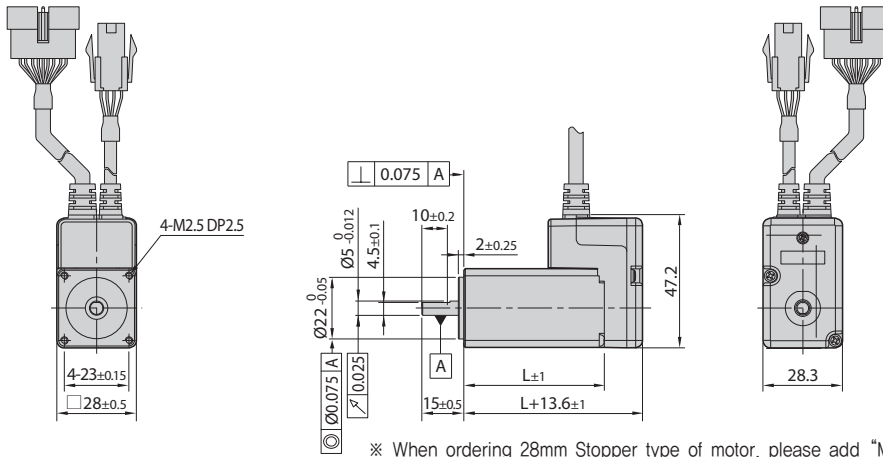
### 20mm

Model name	Length(L)
SM-20M	33
SM-20L	38



### 28mm

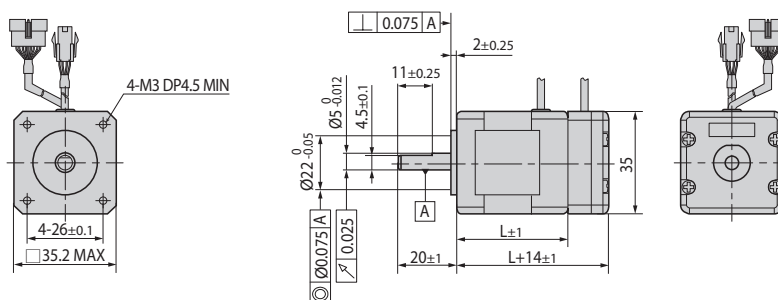
Model name	Length(L)
SM-28S	32
SM-28M	45
SM-28L	50



### 28mm (Stopper type)

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

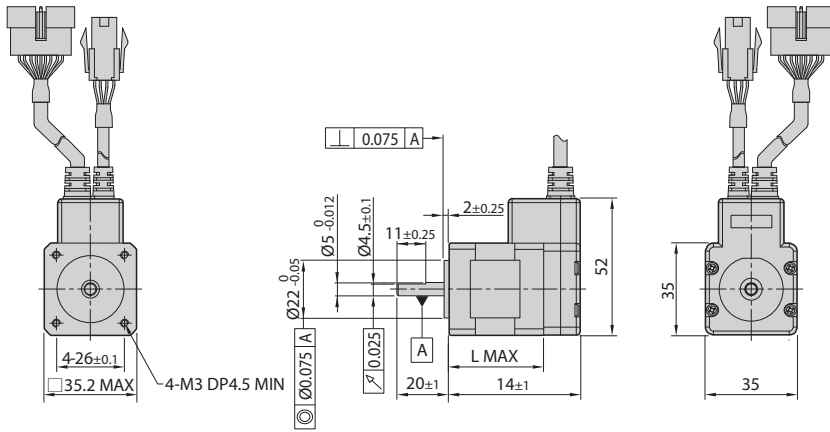
※ When ordering 28mm Stopper type of motor, please add "M" after standard motor model number.



### 35mm

Model name	Length(L)
SM-35M	26
SM-35L	36

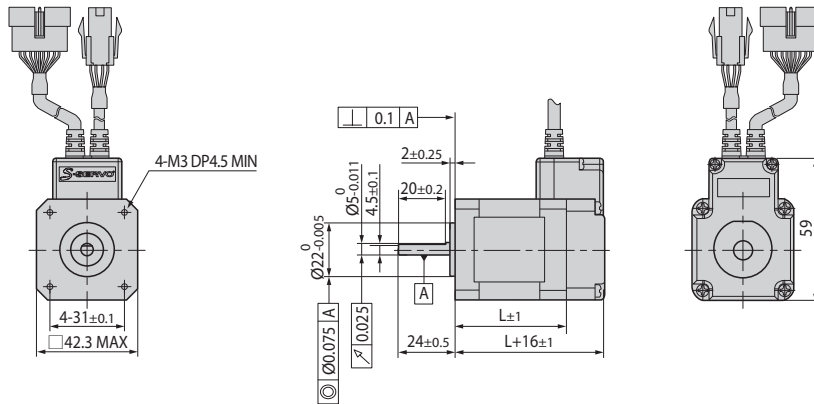
## ● Dimensions of Motor [mm]



### 35mm (Stopper type)

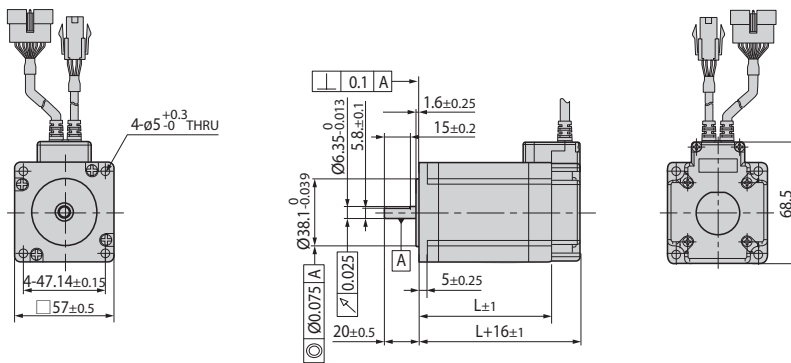
Model name	Length(L)
SM-35MM	26
SM-35LM	36

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



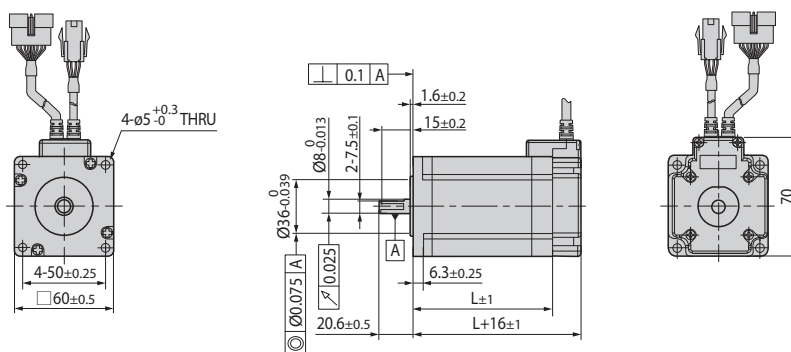
### 42mm

Model name	Length(L)
SM-42S	33
SM-42M	39
SM-42L	47
SM-42XL	60



### 56mm

Model name	Length(L)
SM-56S	41
SM-56M	56
SM-56L	76



### 60mm

Model name	Length(L)
SM-60S	47
SM-60M	56
SM-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]	Static Friction Torque [N·m]		Length from Motor Point [mm]				
								3	8	13	18	
S-SERVO II -ST-42S-■-BK	SM-42S-■-BK	Non-excitation run Type	24VDC ±10%	0.2	5	0.2	540	22	26	33	46	Must be Lower than Unit's Weight
S-SERVO II -MI-42S-■-BK												
S-SERVO II -ST-42M-■-BK	SM-42M-■-BK						600					
S-SERVO II -MI-42M-■-BK												
S-SERVO II -ST-42L-■-BK	SM-42L-■-BK						680					
S-SERVO II -MI-42L-■-BK												
S-SERVO II -ST-42XL-■-BK	SM-42XL-■-BK			830								
S-SERVO II -MI-42XL-■-BK												
S-SERVO II -ST-56S-■-BK	SM-56S-■-BK			930	52	65	85	123				
S-SERVO II -ST-56M-■-BK	SM-56M-■-BK			1160								
S-SERVO II -ST-56L-■-BK	SM-56L-■-BK			1500								
S-SERVO II -ST-60S-■-BK	SM-60S-■-BK			0.27	6.6	0.7	1140	70	87	114	165	
S-SERVO II -ST-60M-■-BK	SM-60M-■-BK						1300					
S-SERVO II -ST-60L-■-BK	SM-60L-■-BK						1860					

- \* The code of encoder resolution will be marked in "■"
- \* S-SERVO II 2X, S-SERVO II 3X product needs 2 or 3 sets of motors for one drive. Combination of drive and motors can be diversified so please contact with sales division or distributor of Fastech before purchasing product.
- \* Electronic Brake cannot be used for braking. Position hold purpose only when power OFF.
- \* The weight means Motor Unit Weight including Motor and Electronic Brake.
- \* Motor Model Number is combined model name of Motor and Brake.
- \* Motor specification and torque characteristic are same as Standard Motor.

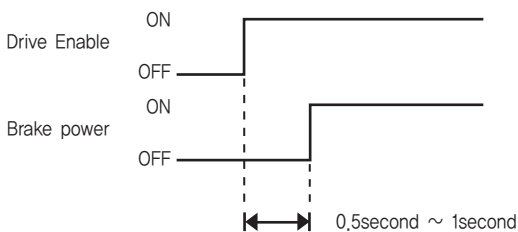
### \* Brake Operation Timing Chart

S-SERVO II control Brake by Drive automatically.

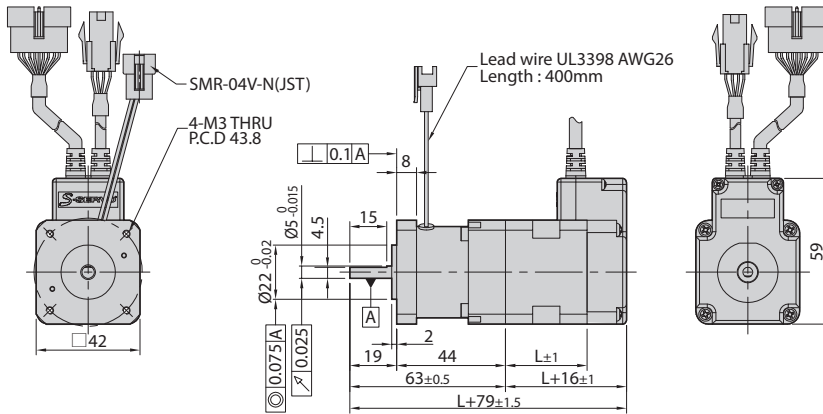
Please refer to below Timing Chart when control Brake from upper controller other than using S-SERVO II Brake control.

Otherwise, Drive malfunctioning and loads can be fall down.

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

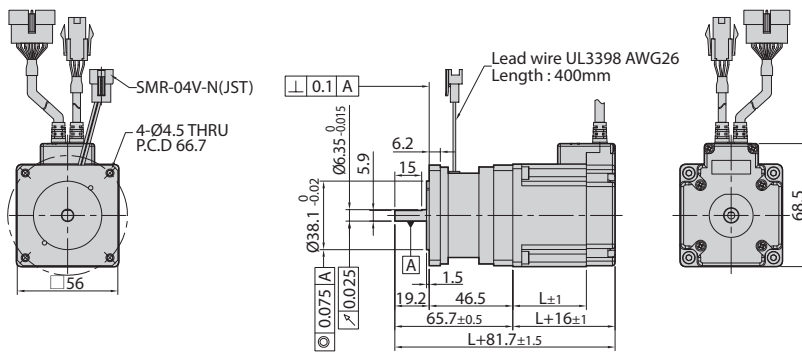


## ● Dimensions of Motor with Brake [mm]



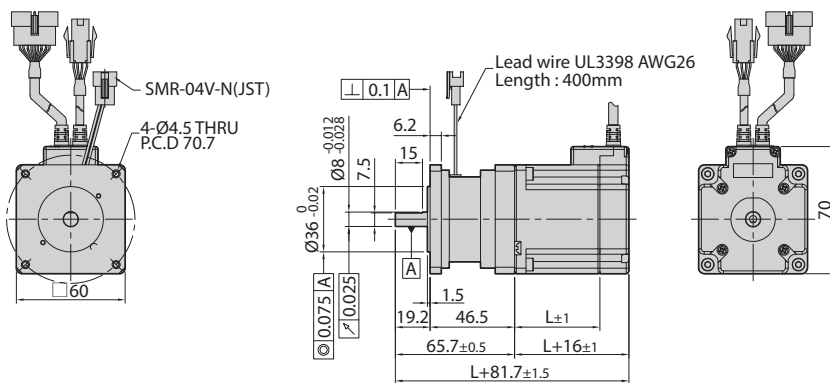
### 42mm

Model Name	Length(L)	Weight(kg)
SM-42S	33	0.54
SM-42M	39	0.60
SM-42L	47	0.68
SM-42XL	60	0.83



### 56mm

Model Name	Length(L)	Weight(kg)
SM-56S	41	0.93
SM-56M	56	1.16
SM-56L	76	1.50



### 60mm

Model Name	Length(L)	Weight(kg)
SM-60S	47	1.14
SM-60M	56	1.30
SM-60L	85	1.86

## ● How to Read Specifications

Model Name	① Maximum Holding Torque [N·m]	② Rotor Inertia Moment [kg·m <sup>2</sup> ]	③ Backlash [min]	④ Angle Transmission Error [min]	⑤ Reduction Gear Ratio	⑥ Resolution (4,000 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]	Permitted Thrust Load [N]
											Axis Center Standard	
S-SERVO II-ST-42S-■-PN3 S-SERVO II-MI-42S-■-PN3	0.43	35×10 <sup>-7</sup>	3	5	3	0.03°	6	12	0~1000	0.74	240	270
S-SERVO II-ST-42S-■-PN5 S-SERVO II-MI-42S-■-PN5	0.72				5	0.018°	9	18	0~600		290	330
S-SERVO II-ST-42S-■-PN8 S-SERVO II-MI-42S-■-PN8	1.15				8	0.01125°	9	18	0~375		340	410
S-SERVO II-ST-42S-■-PN10 S-SERVO II-MI-42S-■-PN10	1.44				10	0.009°	6	12	0~300		360	450
S-SERVO II-ST-42S-■-PN15 S-SERVO II-MI-42S-■-PN15	2.09		5	7	15	0.006°	6	12	0~200	0.90	410	540
S-SERVO II-ST-42S-■-PN25 S-SERVO II-MI-42S-■-PN25	3.49				25	0.0036°	9	18	0~120		490	640
S-SERVO II-ST-42S-■-PN40 S-SERVO II-MI-42S-■-PN40	5.59				40	0.00225°	9	18	0~75		570	640
S-SERVO II-ST-42S-■-PN50 S-SERVO II-MI-42S-■-PN50	6.99				50	0.0018°	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

Model Name	Maximum Holding Torque [N·m]	Rotor Inertia Moment [kg·m <sup>2</sup> ]	Backlash [min]	Angle Transmission Error [min]	Reduction Gear Ratio	Resolution (4,000 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]				
S-SERVO II -ST-42S-■-PN3 S-SERVO II -MI-42S-■-PN3	0.43	35×10 <sup>-7</sup>	3	5	3	0.03°	6	12	0~1000	0.74	240	270				
S-SERVO II -ST-42S-■-PN5 S-SERVO II -MI-42S-■-PN5	0.72				5	0.018°	9	18	0~600		290	330				
S-SERVO II -ST-42S-■-PN8 S-SERVO II -MI-42S-■-PN8	1.15				8	0.01125°	9	18	0~375		340	410				
S-SERVO II -ST-42S-■-PN10 S-SERVO II -MI-42S-■-PN10	1.44				10	0.009°	6	12	0~300		360	450				
S-SERVO II -ST-42S-■-PN15 S-SERVO II -MI-42S-■-PN15	2.09		5	7	15	0.006°	6	12	0~200	0.90	410	540				
S-SERVO II -ST-42S-■-PN25 S-SERVO II -MI-42S-■-PN25	3.49				25	0.0036°	9	18	0~120		490	640				
S-SERVO II -ST-42S-■-PN40 S-SERVO II -MI-42S-■-PN40	5.59				40	0.00225°	9	18	0~75		570	640				
S-SERVO II -ST-42S-■-PN50 S-SERVO II -MI-42S-■-PN50	6.99				50	0.0018°	9	18	0~60		620	640				
S-SERVO II -ST-42M-■-PN3 S-SERVO II -MI-42M-■-PN3	0.70				54×10 <sup>-7</sup>	3	5	3	0.03°		6	18	0~1000	0.80	240	270
S-SERVO II -ST-42M-■-PN5 S-SERVO II -MI-42M-■-PN5	1.17							5	0.018°		9	18	0~600		290	330
S-SERVO II -ST-42M-■-PN8 S-SERVO II -MI-42M-■-PN8	1.88	8	0.01125°	9				18	0~375	340	410					
S-SERVO II -ST-42M-■-PN10 S-SERVO II -MI-42M-■-PN10	2.35	10	0.009°	6				12	0~300	360	450					
S-SERVO II -ST-42M-■-PN15 S-SERVO II -MI-42M-■-PN15	3.42	5	7	15		0.006°	6	12	0~200	0.96	410	540				
S-SERVO II -ST-42M-■-PN25 S-SERVO II -MI-42M-■-PN25	5.70			25		0.0036°	9	18	0~120		490	640				
S-SERVO II -ST-42M-■-PN40 S-SERVO II -MI-42M-■-PN40	9.00			40		0.00225°	9	18	0~75		570	640				
S-SERVO II -ST-42M-■-PN50 S-SERVO II -MI-42M-■-PN50	9.00			50		0.0018°	9	18	0~60		620	640				
S-SERVO II -ST-42L-■-PN3 S-SERVO II -MI-42L-■-PN3	0.86			68×10 <sup>-7</sup>		3	5	3	0.03°		6	18	0~1000	0.87	240	270
S-SERVO II -ST-42L-■-PN5 S-SERVO II -MI-42L-■-PN5	1.43							5	0.018°		9	18	0~600		290	330
S-SERVO II -ST-42L-■-PN8 S-SERVO II -MI-42L-■-PN8	2.29	8	0.01125°		9			18	0~375	340	410					
S-SERVO II -ST-42L-■-PN10 S-SERVO II -MI-42L-■-PN10	2.86	10	0.009°		6			12	0~300	360	450					
S-SERVO II -ST-42L-■-PN15 S-SERVO II -MI-42L-■-PN15	4.16	5	7		15	0.006°	6	12	0~200	1.03	410	540				
S-SERVO II -ST-42L-■-PN25 S-SERVO II -MI-42L-■-PN25	6.94				25	0.0036°	9	18	0~120		490	640				
S-SERVO II -ST-42L-■-PN40 S-SERVO II -MI-42L-■-PN40	9.00				40	0.00225°	9	18	0~75		570	640				
S-SERVO II -ST-42L-■-PN50 S-SERVO II -MI-42L-■-PN50	9.00				50	0.0018°	9	18	0~60		620	640				
S-SERVO II -ST-42XL-■-PN3 S-SERVO II -MI-42XL-■-PN3	1.55				114×10 <sup>-7</sup>	3	5	3	0.03°		6	18	0~1000	1.03	240	270
S-SERVO II -ST-42XL-■-PN5 S-SERVO II -MI-42XL-■-PN5	2.59							5	0.018°		9	18	0~600		290	330
S-SERVO II -ST-42XL-■-PN8 S-SERVO II -MI-42XL-■-PN8	4.15	8	0.01125°	9				18	0~375	340	410					
S-SERVO II -ST-42XL-■-PN10 S-SERVO II -MI-42XL-■-PN10	5.18	10	0.009°	6				12	0~300	360	450					
S-SERVO II -ST-42XL-■-PN15 S-SERVO II -MI-42XL-■-PN15	6.00	5	7	15		0.006°	6	12	0~200	1.95	410	540				
S-SERVO II -ST-42XL-■-PN25 S-SERVO II -MI-42XL-■-PN25	9.00			25		0.0036°	9	18	0~120		490	640				
S-SERVO II -ST-42XL-■-PN40 S-SERVO II -MI-42XL-■-PN40	9.00			40		0.00225°	9	18	0~75		570	640				
S-SERVO II -ST-42XL-■-PN50 S-SERVO II -MI-42XL-■-PN50	9.00			50		0.0018°	9	18	0~60		620	640				

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

## ● Specifications of Motor with Gearbox

# 56<sub>mm</sub>

Model Name	Maximum Holding Torque [N·m]	Rotor Inertia Moment [kg·m <sup>2</sup> ]	Backlash [min]	Angle Transmission Error [min]	Reduction Gear Ratio	Resolution (4,000 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]		
S-SERVO II-ST-56S-■-PN3	0,8	120×10 <sup>-7</sup>	3	5	3	0,03°	18	35	0~1000	1,65	430	310		
S-SERVO II-ST-56S-■-PN5	1,3				5	0,018°	27	50	0~600		510	390		
S-SERVO II-ST-56S-■-PN8	2,1				8	0,01125°	27	50	0~375		600	480		
S-SERVO II-ST-56S-■-PN10	2,7				10	0,009°	18	35	0~300		640	530		
S-SERVO II-ST-56S-■-PN15	3,9				1,95			15	0,006°	18	35	0~200	740	630
S-SERVO II-ST-56S-■-PN25	6,6							25	0,0036°	27	50	0~120	870	790
S-SERVO II-ST-56S-■-PN40	10,6							40	0,00225°	27	50	0~75	1000	970
S-SERVO II-ST-56S-■-PN50	13,2							50	0,0018°	27	50	0~60	1100	1000
S-SERVO II-ST-56M-■-PN3	2,0	300×10 <sup>-7</sup>	3	5	3	0,03°	18	35	0~1000	1,88	430	310		
S-SERVO II-ST-56M-■-PN5	3,3				5	0,018°	27	50	0~600		510	390		
S-SERVO II-ST-56M-■-PN8	5,3				8	0,01125°	27	50	0~375		600	480		
S-SERVO II-ST-56M-■-PN10	6,6				10	0,009°	18	35	0~300		640	530		
S-SERVO II-ST-56M-■-PN15	9,7				2,19			15	0,006°	18	35	0~200	740	630
S-SERVO II-ST-56M-■-PN25	16,1							25	0,0036°	27	50	0~120	870	790
S-SERVO II-ST-56M-■-PN40	25,9							40	0,00225°	27	50	0~75	1000	970
S-SERVO II-ST-56M-■-PN50	27,0							50	0,0018°	27	50	0~60	1100	1000
S-SERVO II-ST-56L-■-PN3	2,9	480×10 <sup>-7</sup>	3	5	3	0,03°	18	35	0~1000	2,22	430	310		
S-SERVO II-ST-56L-■-PN5	4,8				5	0,018°	27	50	0~600		510	390		
S-SERVO II-ST-56L-■-PN8	7,7				8	0,01125°	27	50	0~375		600	480		
S-SERVO II-ST-56L-■-PN10	9,6				10	0,009°	18	35	0~300		640	530		
S-SERVO II-ST-56L-■-PN15	14,0				2,52			15	0,006°	18	35	0~200	740	630
S-SERVO II-ST-56L-■-PN25	23,4							25	0,0036°	27	50	0~120	870	790
S-SERVO II-ST-56L-■-PN40	27,0							40	0,00225°	27	50	0~75	1000	970
S-SERVO II-ST-56L-■-PN50	27,0							50	0,0018°	27	50	0~60	1100	1000

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

## ● Specifications of Motor with Gearbox

# 60<sub>mm</sub>

Model Name	Maximum Holding Torque [N·m]	Rotor Inertia Moment [kg·m <sup>2</sup> ]	Backlash [min]	Angle Transmission Error [min]	Reduction Gear Ratio	Resolution (4,000 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]		
S-SERVO II-ST-60S-■-PN3	1,5	240×10 <sup>-7</sup>	3	5	3	0,03°	18	35	0~1000	1,84	430	310		
S-SERVO II-ST-60S-■-PN5	2,5				5	0,018°	27	50	0~600		510	390		
S-SERVO II-ST-60S-■-PN8	4,1				8	0,01125°	27	50	0~375		600	480		
S-SERVO II-ST-60S-■-PN10	5,1				10	0,009°	18	35	0~300		640	530		
S-SERVO II-ST-60S-■-PN15	7,5				2,14	50	0~200	15	0,006°	27	50	0~120	740	630
S-SERVO II-ST-60S-■-PN25	12,5							25	0,0036°	27	50	0~75	870	790
S-SERVO II-ST-60S-■-PN40	20,1							40	0,00225°	27	50	0~60	1000	970
S-SERVO II-ST-60S-■-PN50	25,1							50	0,0018°	27	50	0~60	1100	1000
S-SERVO II-ST-60M-■-PN3	2,3	490×10 <sup>-7</sup>	3	5	3	0,03°	18	35	0~1000	2,01	430	310		
S-SERVO II-ST-60M-■-PN5	3,8				5	0,018°	27	50	0~600		510	390		
S-SERVO II-ST-60M-■-PN8	6,2				8	0,01125°	27	50	0~375		600	480		
S-SERVO II-ST-60M-■-PN10	7,7				10	0,009°	18	35	0~300		640	530		
S-SERVO II-ST-60M-■-PN15	11,2				2,30	50	0~200	15	0,006°	27	50	0~120	740	630
S-SERVO II-ST-60M-■-PN25	18,8							25	0,0036°	27	50	0~75	870	790
S-SERVO II-ST-60M-■-PN40	27,0							40	0,00225°	27	50	0~60	1000	970
S-SERVO II-ST-60M-■-PN50	27,0							50	0,0018°	27	50	0~60	1100	1000
S-SERVO II-ST-60L-■-PN3	4,7	690×10 <sup>-7</sup>	3	5	3	0,03°	18	35	0~1000	2,60	430	310		
S-SERVO II-ST-60L-■-PN5	7,8				5	0,018°	27	50	0~600		510	390		
S-SERVO II-ST-60L-■-PN8	12,5				8	0,01125°	27	50	0~375		600	480		
S-SERVO II-ST-60L-■-PN10	15,7				10	0,009°	18	35	0~300		640	530		
S-SERVO II-ST-60L-■-PN15	18,0				2,86	50	0~200	15	0,006°	18	35	0~120	740	630
S-SERVO II-ST-60L-■-PN25	27,0							25	0,0036°	27	50	0~75	870	790
S-SERVO II-ST-60L-■-PN40	27,0							40	0,00225°	27	50	0~60	1000	970
S-SERVO II-ST-60L-■-PN50	27,0							50	0,0018°	27	50	0~60	1100	1000

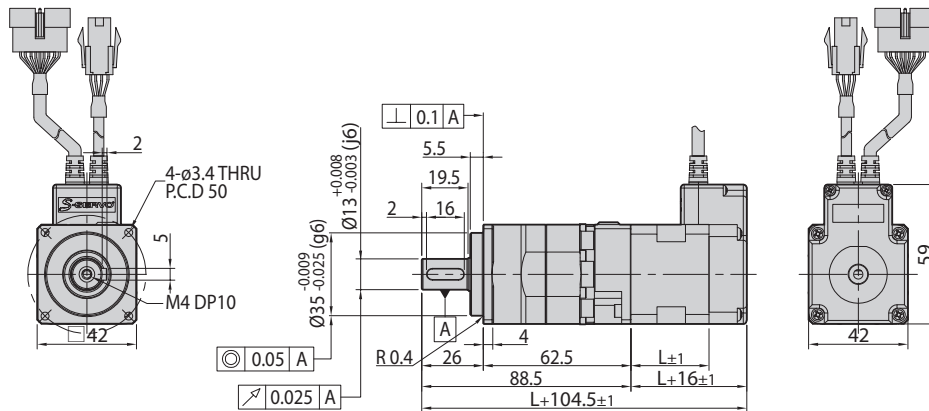
\* The code of encoder resolution will be marked in "■"

## ● Dimensions of Motor with Gearbox [mm]

# 42mm

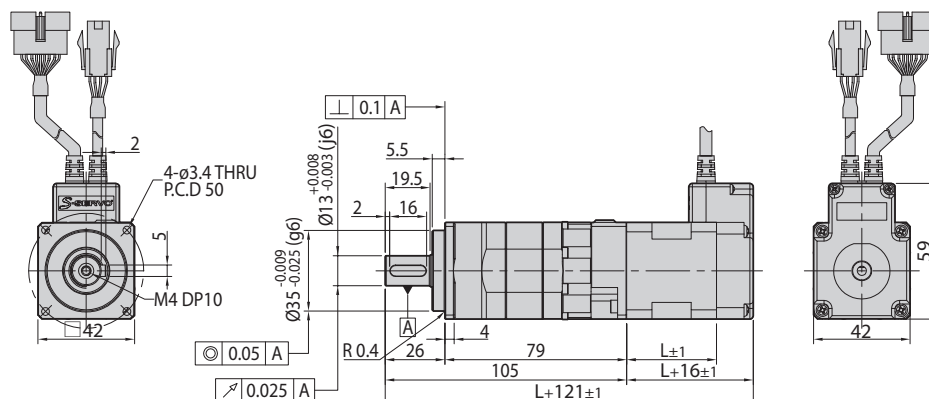
Unit Part Number	Motor	Stage	□ Reduction Gear Ratio	L Length [mm]
S-SERVO II-ST-42S-■-PN□ S-SERVO II-MI-42S-■-PN□	SM-42S-■-PN□	Single Stage	3, 5, 8, 10	33
S-SERVO II-ST-42M-■-PN□ S-SERVO II-MI-42M-■-PN□	SM-42M-■-PN□		3, 5, 8, 10	39
S-SERVO II-ST-42L-■-PN□ S-SERVO II-MI-42L-■-PN□	SM-42L-■-PN□		3, 5, 8, 10	47
S-SERVO II-ST-42XL-■-PN□ S-SERVO II-MI-42XL-■-PN□	SM-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]
S-SERVO II-ST-42S-■-PN□ S-SERVO II-MI-42S-■-PN□	SM-42S-■-PN□	Double Stage	15, 25, 40, 50	33
S-SERVO II-ST-42M-■-PN□ S-SERVO II-MI-42M-■-PN□	SM-42M-■-PN□		15, 25, 40, 50	39
S-SERVO II-ST-42L-■-PN□ S-SERVO II-MI-42L-■-PN□	SM-42L-■-PN□		15, 25, 40, 50	47
S-SERVO II-ST-42XL-■-PN□ S-SERVO II-MI-42XL-■-PN□	SM-42XL-■-PN□		15, 25, 40, 50	60

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

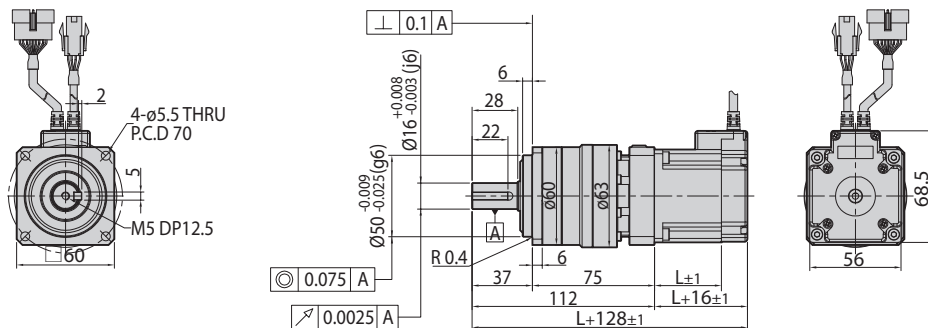


## ● Dimensions of Motor with Gearbox [mm]

# 56<sub>mm</sub>

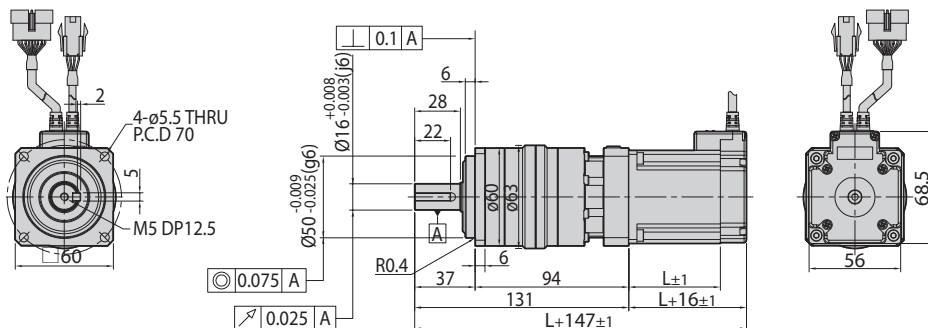
Unit Part Number	Motor	Stage	□ Reduction Gear Ratio	L Length [mm]
S-SERVO II -ST-56S-■-PN□	SM-56S-■-PN□	Single Stage	3, 5, 8, 10	41
S-SERVO II -ST-56M-■-PN□	SM-56M-■-PN□		3, 5, 8, 10	56
S-SERVO II -ST-56L-■-PN□	SM-56L-■-PN□		3, 5, 8, 10	76

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



Unit Part Number	Motor	Stage	□ Reduction Gear Ratio	L Length [mm]
S-SERVO II -ST-56S-■-PN□	SM-56S-■-PN□	Double Stage	15, 25, 40, 50	41
S-SERVO II -ST-56M-■-PN□	SM-56M-■-PN□		15, 25, 40, 50	56
S-SERVO II -ST-56L-■-PN□	SM-56L-■-PN□		15, 25, 40, 50	76

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

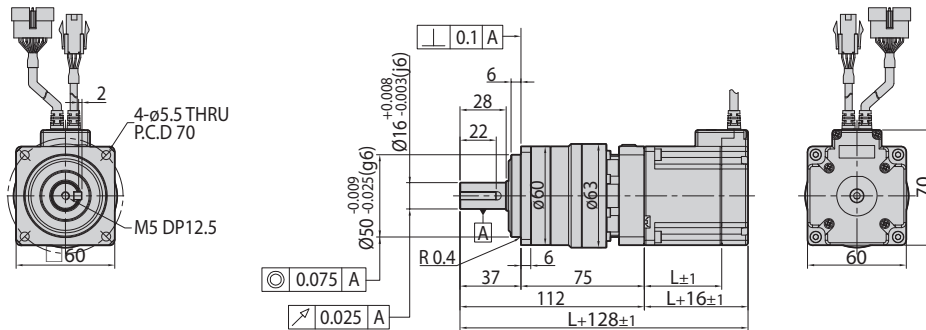


## ● Dimensions of Motor with Gearbox [mm]

# 60mm

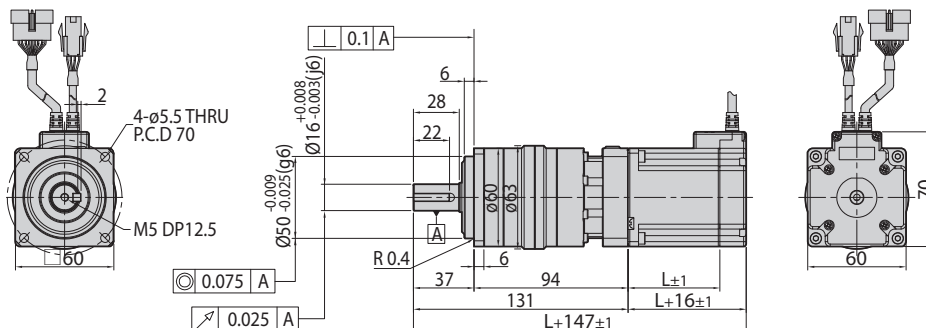
Unit Part Number	Motor	Stage	□ Reduction Gear Ratio	L Length [mm]
S-SERVO II-ST-60S-■-PN□	SM-60S-■-PN□	Single Stage	3, 5, 8, 10	47
S-SERVO II-ST-60M-■-PN□	SM-60M-■-PN□		3, 5, 8, 10	56
S-SERVO II-ST-60L-■-PN□	SM-60L-■-PN□		3, 5, 8, 10	85

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



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

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



## ● Specifications of Drive [S-SERVOII ST]

Motor Model	SM-20 series	SM-28 series	SM-35 series	SM-42 series	SM-56 series	SM-60 series
Driver Model	SV2-PD-20 series	SV2-PD-28 series	SV2-PD-35 series	SV2-PD-42 series	SV2-PD-56 series	SV2-PD-60 series
Input Voltage	24VDC $\pm$ 10%					
Control Method	Closed loop control with 32bit MCU					
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)				
	Vib. Resist.	0.5g				
Function <sup>*2</sup>	Rotation Speed	0~3,000 [rpm] <sup>*1</sup>				
	Resolution [ppr] <sup>*4</sup>	500 1,000 1,600 2,000 3,200 3,600 4,000 5,000 6,400 8,000 10,000 20,000 25,000 36,000 40,000 50,000 (Selectable by DIP Switch) <sup>*6</sup>				
	Maximum 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				
	LED Display	Power status, In-Position status, Enable status, Alarm status				
	RUN Current <sup>*5</sup>	50%~150% (Selectable by parameter) RUN current is current value which flows onto the motor during operation (rotation) of the motor and it is set based on rated current of the motor. * Default: 100%				
	STOP Current	20%~100% (Selectable by parameter) When motor stop operation, 0.1 second after motor current will be set to STOP current value. STOP current value is a percentage of the rated current of motor. * Default: 50%				
	Pulse Input Method	1 Pulse / 2 Pulse (Selectable by DIP Switch) * Default: 2 Pulse				
	Rotational Direction	CW/CCW (Selectable by DIP Switch) * Default: CW				
	Speed/Position Control Command	Pulse Train Input				
I/O Signal <sup>*3</sup>	Input Signals	Position Command Pulse, Enable, Alarm Reset (Photocoupler Input)				
	Output Signals	In-Position, Alarm (Photocoupler 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.

\*2 : Please refer to 「Settings and Operating」, to obtain detailed function information.

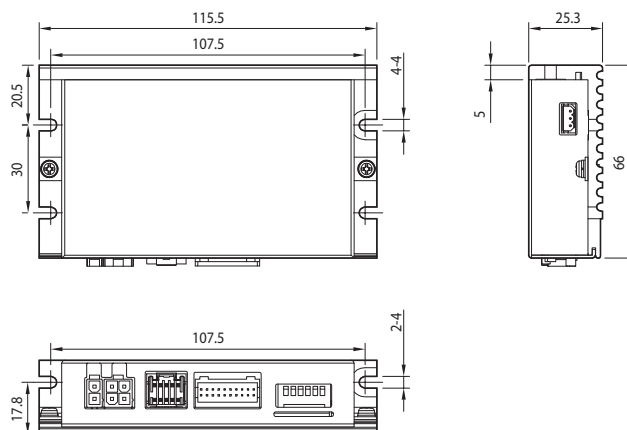
\*3 : Please refer to 「Control Input/Output Explanation」 to obtain detailed Input/Output signal information.

\*4 : When selected resolution is more than encoder resolution, motor shall be operated by microstep between pulses.

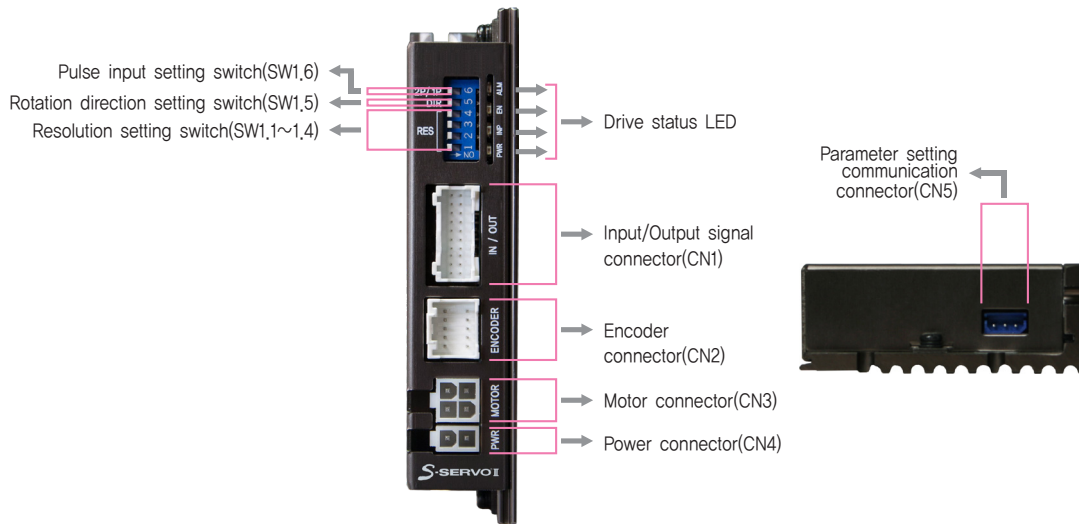
\*5 : For more detail information of RUN Current, please refer to the [Parameter Setting GUI].

\*6 : Please refer to the manual for detail information.

## ● Dimensions of Drive [mm] [S-SERVOII ST]



# ● Settings and Operation [S-SERVO II ST]



## 1. Drive Status LED

Indication	Color	Function	ON/OFF Condition
PWR	Green	Power input indication	LED is turned ON when power is applied
INP	Yellow	Complete Positioning Motion	Light on when Position Deviation located within preset value*1 from target position, after Position Command Pulse Input is completed
EN	Orange	Motor Enable Status	Enable: Lights On, Disable: Lights Off
ALM	Red	Alarm indication	Flash when protection function is activated (Identifiable which protection mode is activated by counting the blinking times)

\*1 : Default = 0  
Can be selected by parameter setting GUI

## ◆ Protection functions and LED flash times

Times	Protection	Conditions
1	Over Current Error	The current through power devices in drive exceeds 4,8A
2	Over Speed Error	Motor speed exceed 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 second under a load exceeding the max. torque
5	Over Temperature Error	Inside temperature of drive exceeds 85°C
6	Over Regenerative Voltage Error	Back-EMF more 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 in Encoder connection of 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. Resolution Setting Switch(SW1,1~SW1,4)

The Number of pulse per revolution,

Position				Pulse/Revolution	Position				Pulse/Revolution
1	2	3	4		1	2	3	4	
ON	ON	ON	ON	500	OFF	ON	ON	ON	6,400
ON	ON	ON	OFF	1,000	OFF	ON	ON	OFF	8,000
ON	ON	OFF	ON	1,600	OFF	ON	OFF	ON	10,000
ON	ON	OFF	OFF	2,000	OFF	ON	OFF	OFF	20,000
ON	OFF	ON	ON	3,200	OFF	OFF	ON	ON	25,000
ON	OFF	ON	OFF	3,600	OFF	OFF	ON	OFF	36,000
ON	OFF	OFF	ON	4,000	OFF	OFF	OFF	ON	40,000
ON	OFF	OFF	OFF	5,000	OFF	OFF	OFF	OFF	50,000*1

\* Please refer to the manual for detail information.

\*1 : In case of products with an encoder resolution of 16,000, the corresponding pulse/rotation is 16,000.



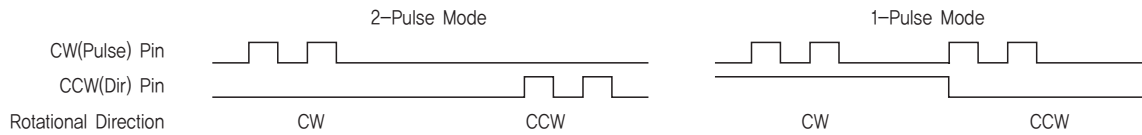
### 3. Rotational Direction Setting Switch(SW1,5)

Indication	Switch Name	Functions
DIR	Switching Rotational Direction	Based on CW(+Dir signal) input to driver. ON: CCW(-Direction) OFF: CW(+Direction) ※ Default: CW mode



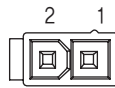
### 4. Pulse Input Setting Switch(SW1,6)

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



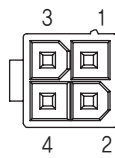
### 5. Power Connector(CN4)

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



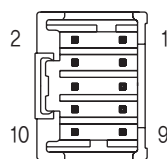
### 6. Motor Connector(CN3)

NO.	Function	I/O
1	A Phase	Output
2	B Phase	Output
3	/A Phase	Output
4	/B Phase	Output



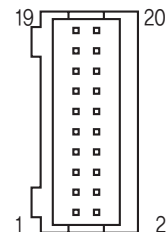
### 7. Encoder Connector(CN2)

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



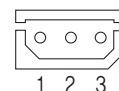
### 8. Input/Output Signal Connector(CN1)

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

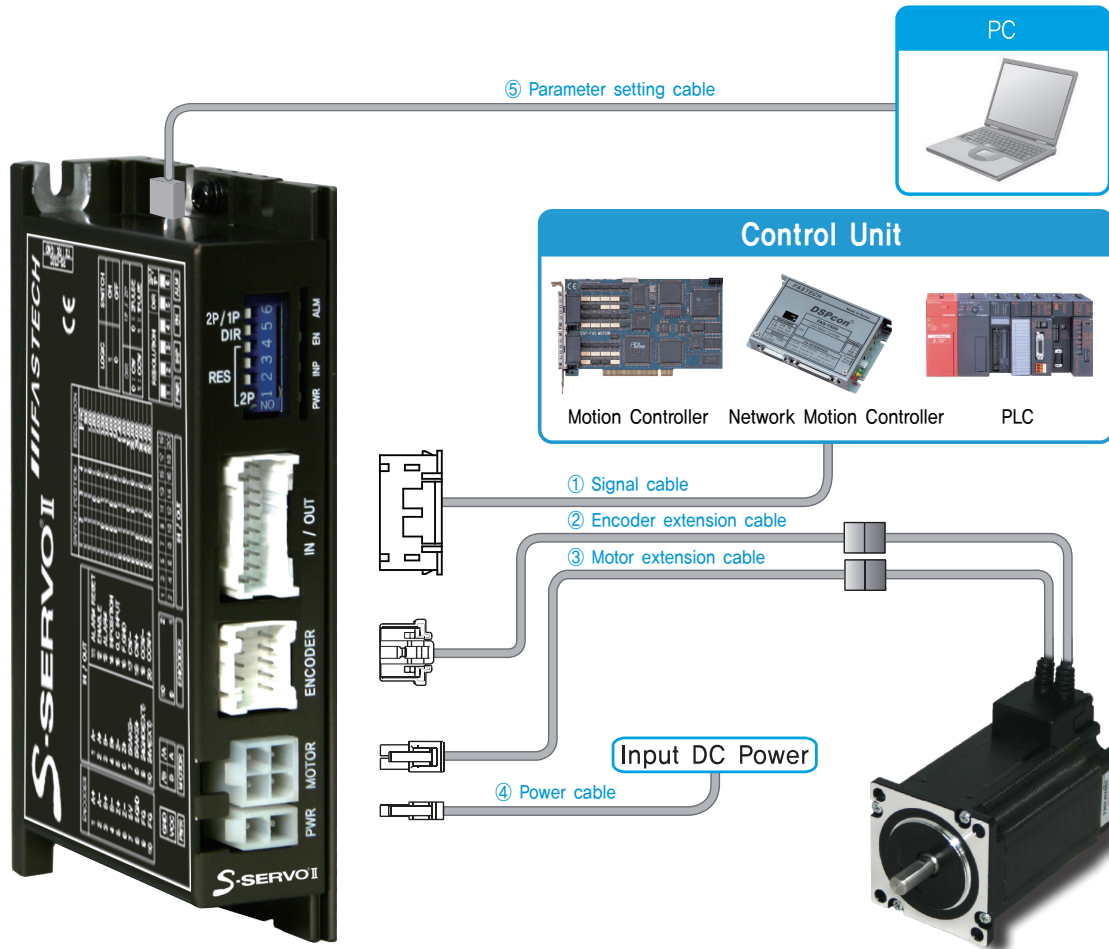


### 9. Parameter Setting Communication Connector(CN5)

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



# ● System Configuration [S-SERVO II ST]



Type	Signal Cable	Encoder Cable	Motor Cable	Power Cable	Parameter Setting Cable
Length supplied	-	30cm	30cm	-	-
Max. Length	20m	20m	20m	2m	3m

FASTECH S-SERVO II

## 1. Options

### ① Signal Cable

Item	Length [m]	Remark
CSS2-S-□□□F	□□□	Normal Cable
CSS2-S-□□□M	□□□	Robot Cable

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

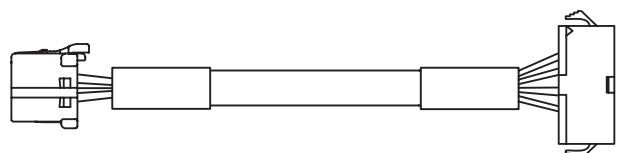


Manufacturer : JST  
Housing : PADP-20V-1-S  
Terminal : SPH-002T-P0,5L

### ② Encoder Extension Cable

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

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



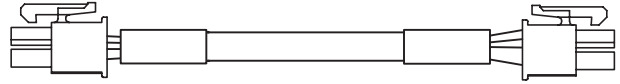
Manufacturer : MOLEX  
Housing : 51353-1000  
Terminal : 56134-9000

JST : Manufacturer  
SMP-09V-NC : Housing  
SHF-001T-0,8BS : Terminal

### ③ Motor Extension Cable

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

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



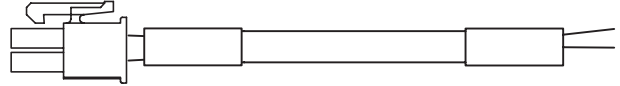
Manufacturer : MOLEX  
Housing : 5557-04R  
Terminal : 5556T

MOLEX : Manufacturer  
5557-04R : Housing  
5556T : Terminal

### ④ Power Cable

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

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

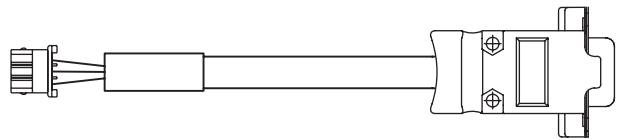


Manufacturer : MOLEX  
Housing : 5557-02R  
Terminal : 5556T

### ⑤ Parameter Setting Cable

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

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



Manufacturer : MOLEX  
Housing : 5264-03  
Terminal : 5263

AMPHENOL : Manufacturer  
L177SDE09S : Connector  
17E-1657-09 : Backshell

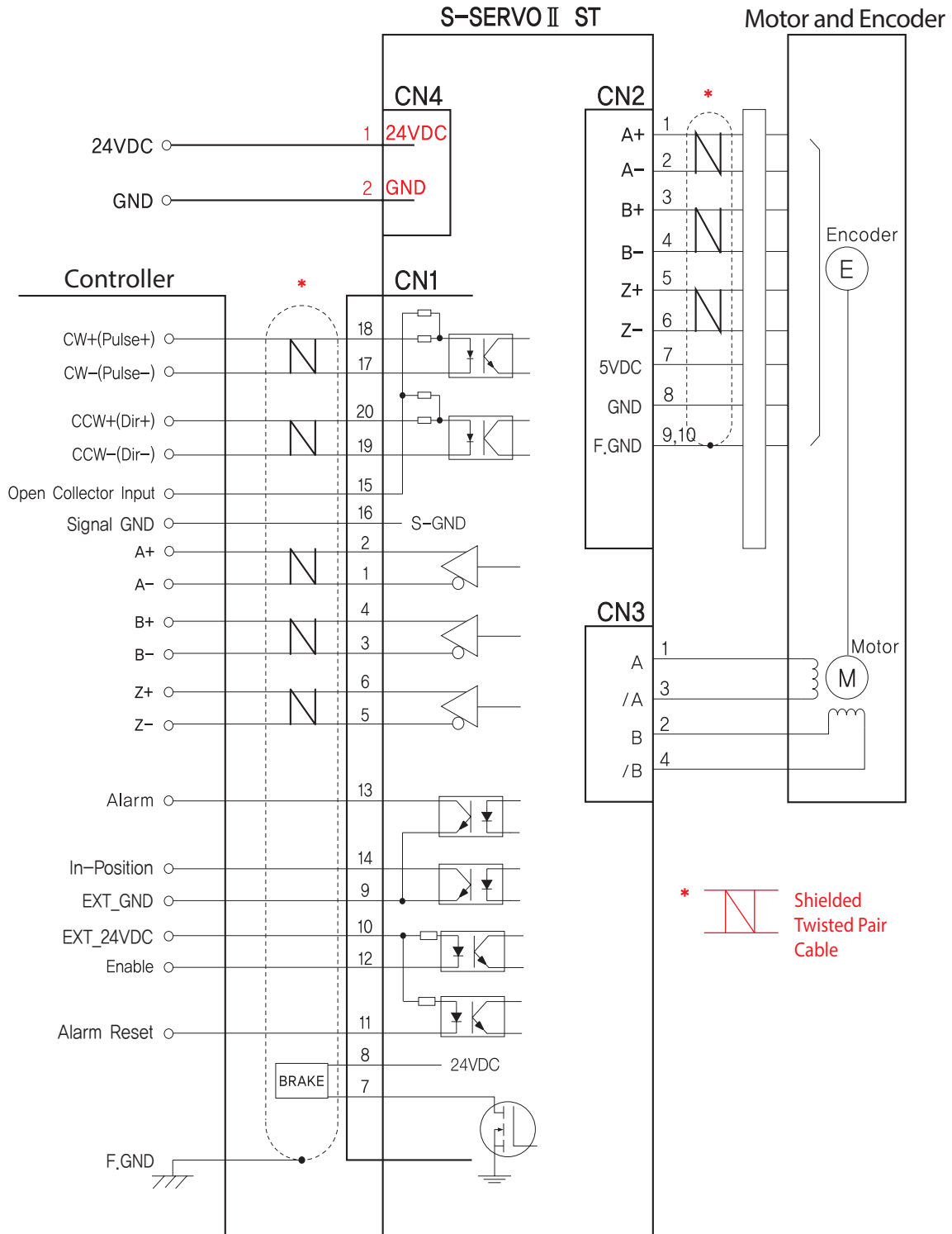
## 2. Connector Specifications

Connector specifications for cabling to drive.

Purpose		Item	Part Number	Manufacturer
I/O (CN1)		Housing Terminal	PAPD-20V-1S SPH-002T-P0,5L	JST
Encoder	Drive Side (CN2)	Housing Terminal	51353-1000 56134-9000	MOLEX
	Encoder Side	Housing Terminal	SMP-09V-NC SHF-001T-0,8BS	JST
Motor	Drive Side (CN3)	Housing Terminal	5557-04R 5556T	MOLEX
	Motor Side	Housing Terminal	5557-04R 5556T	MOLEX
Power (CN4)		Housing Terminal	5557-02R 5556T	MOLEX

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

# External Wiring Diagram [S-SERVO II ST]



FASTECH S-SERVO II

※ 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.

**CAUTION**

Please refer to the Manual when connects motor extension cable. Careful connection will be required to protect the drive from any damages.

## ● Specifications of Drive [S-SERVOII MINI]

Motor Model	SM-20 series	SM-28 series	SM-35 series	SM-42 series
Driver Model	SV2-PD-MI-20 series	SV2-PD-MI-28 series	SV2-PD-MI-35 series	SV2-PD-MI-42 series
Input Voltage	24VDC $\pm$ 10%			
Control Method	Closed loop control with 32bit MCU			
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)		
	Vib. Resist.	0.5g		
Function <sup>*2</sup>	Rotation Speed	0~3,000 [rpm] <sup>*1</sup>		
	Resolution [ppr] <sup>*4</sup>	500 1,000 1,600 2,000 3,200 3,600 4,000 5,000 6,400 8,000 10,000 20,000 25,000 36,000 40,000 50,000 (Selectable by DIP Switch) <sup>*6</sup>		
	Maximum 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		
	LED Display	Power status, In-Position status, Enable status, Alarm status		
	RUN Current <sup>*5</sup>	50%~150% (Selectable by parameter) RUN current is current value which flows onto the motor during operation (rotation) of the motor and it is set based on rated current of the motor. * Default: 100%		
	STOP Current	20%~100% (Selectable by parameter) When motor stop operation, 0.1 second after motor current will be set to STOP current value. STOP current value is a percentage of the rated current of motor. * Default: 50%		
	Pulse Input Method	1 Pulse / 2 Pulse (Selectable by DIP Switch) * Default: 2 Pulse		
	Rotational Direction	CW/CCW (Selectable by DIP Switch) * Default: CW		
	Speed/Position Control Command	Pulse Train Input		
I/O Signal <sup>*3</sup>	Input Signals	Position Command Pulse, Enable, Alarm Reset (Photocoupler Input)		
	Output Signals	In-Position, Alarm (Photocoupler 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.

\*2 : Please refer to 「Settings and Operating」 to obtain detailed function information.

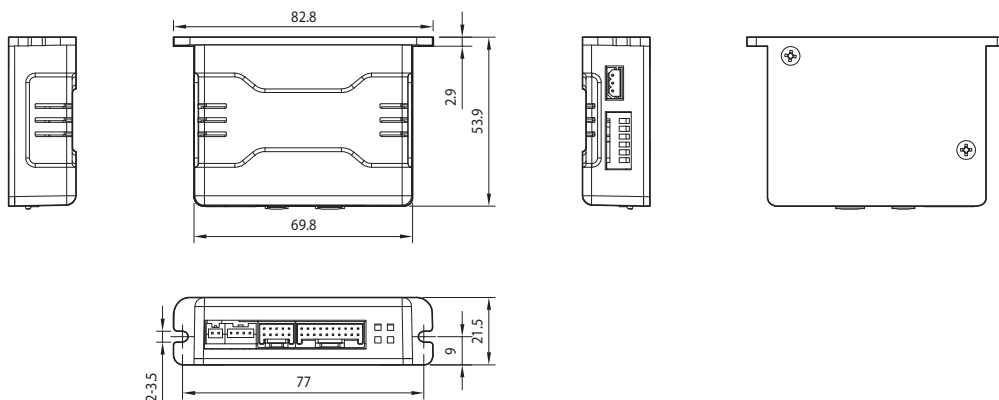
\*3 : Please refer to 「Control Input/Output Explanation」 to obtain detailed Input/Output signal information.

\*4 : When selected resolution is more than encoder resolution, motor shall be operated by microstep between pulses.

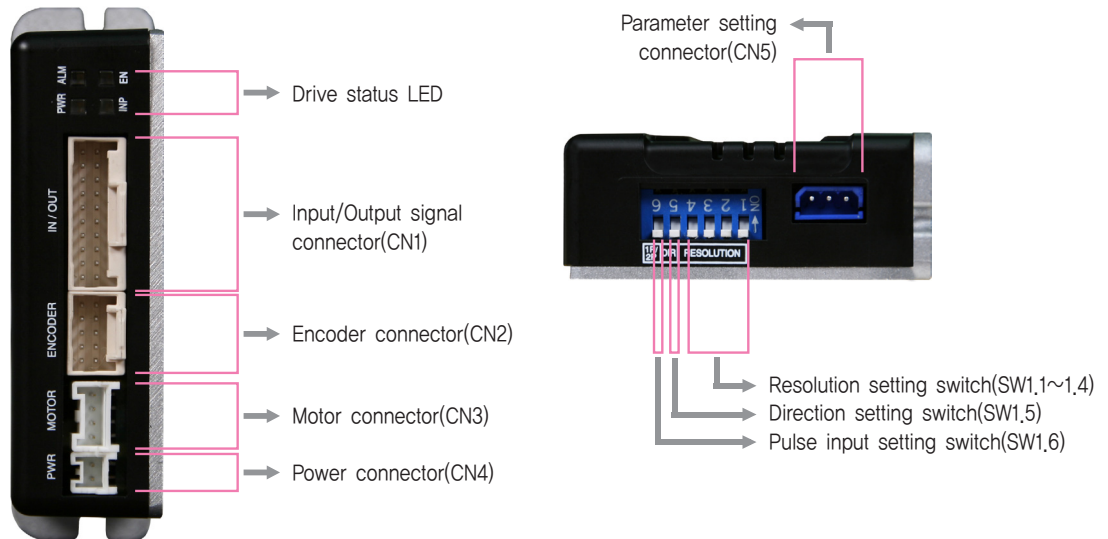
\*5 : For more detail information of RUN Current, please refer to the [Parameter Setting GUI].

\*6 : Please refer to the manual for detail information.

## ● Dimensions of Drive [mm] [S-SERVOII MINI]



# ● Settings and Operation [S-SERVOII MINI]



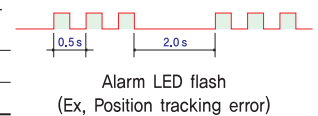
## 1. Drive Status LED

Indication	Color	Function	ON/OFF Condition
PWR	Green	Power input indication	LED is turned ON when power is applied
INP	Yellow	Complete Positioning Motion	Light on when Position Deviation located within preset value*1 from target position, after Position Command Pulse Input is completed
EN	Orange	Motor Enable Status	Enable: Lights On, Disable: Lights Off
ALM	Red	Alarm indication	Flash when protection function is activated (Identifiable which protection mode is activated by counting the blinking times)

\*1 : Default = 0  
Can be selected by parameter setting GUI

### ◆ Protection functions and LED flash times

Times	Protection	Conditions
1	Over Current Error	The current through power devices in drive exceeds 4.8A
2	Over Speed Error	Motor speed exceed 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 second under a load exceeding the max. torque
5	Over Temperature Error	Inside temperature of drive exceeds 85°C
6	Over Regeneratived Voltage Error	Back-EMF more 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 in Encoder connection of 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



## 2. Resolution Setting Switch(SW1.1~SW1.4)

The Number of pulse per revolution,

Position				Pulse/Revolution	Position				Pulse/Revolution
1	2	3	4		1	2	3	4	
ON	ON	ON	ON	500	OFF	ON	ON	ON	6,400
ON	ON	ON	OFF	1,000	OFF	ON	ON	OFF	8,000
ON	ON	OFF	ON	1,600	OFF	ON	OFF	ON	10,000
ON	ON	OFF	OFF	2,000	OFF	ON	OFF	OFF	20,000
ON	OFF	ON	ON	3,200	OFF	OFF	ON	ON	25,000
ON	OFF	ON	OFF	3,600	OFF	OFF	ON	OFF	36,000
ON	OFF	OFF	ON	4,000	OFF	OFF	OFF	ON	40,000
ON	OFF	OFF	OFF	5,000	OFF	OFF	OFF	OFF	50,000*1

\* Please refer to the manual for detail information.

\*1 : In case of products with an encoder resolution of 16,000, the corresponding pulse/rotation is 16,000.

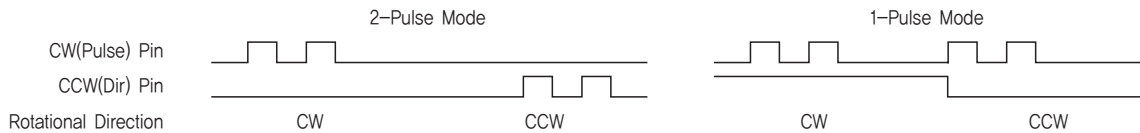
### 3. Rotational Direction Setting Switch(SW1,5)

Indication	Switch Name	Functions
DIR	Switching Rotational Direction	Based on CW(+Dir signal) input to driver. ON: CCW(-Direction) OFF: CW(+Direction) ※ Default: CW mode



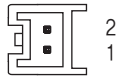
### 4. Pulse Input Setting Switch(SW1,6)

Indication	Switch Name	Functions
1P/2P	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



### 5. Power Connector(CN4)

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

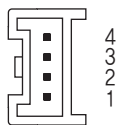


### 8. Input/Output Signal Connector(CN1)

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	Enable	Input
14	Alarm Reset	Input
15	O.C Input	Input
16	BRAKE+	Output
17	BRAKE-	Output
18	S-GND	Output
19	EXT_GND	Input
20	EXT_24VDC	Input

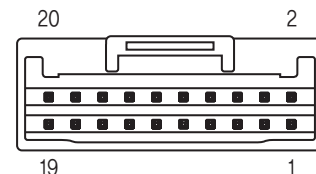
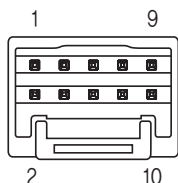
### 6. Motor Connector(CN3)

NO.	Function	I/O
1	B Phase	Output
2	/B Phase	Output
3	/A Phase	Output
4	A Phase	Output



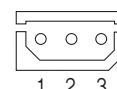
### 7. Encoder Connector(CN2)

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

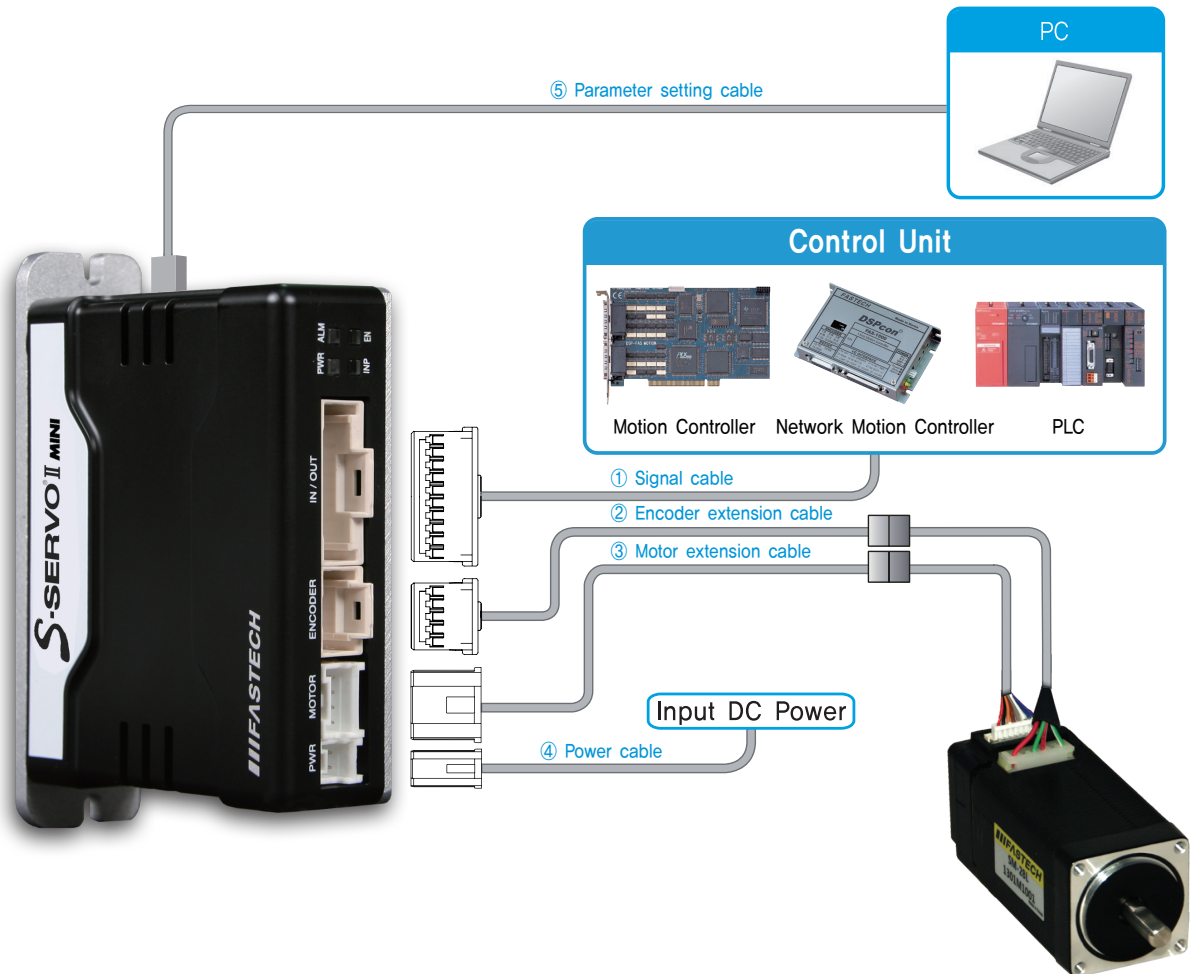


### 9. Parameter Setting Connector(CN5)

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



# System Configuration [S-SERVOII MINI series]



Type	Signal Cable	Encoder Cable	Motor Cable	Power Cable	Parameter Setting Cable
Length supplied	-	30cm	30cm	-	-
Max. Length	20m	20m	20m	2m	3m

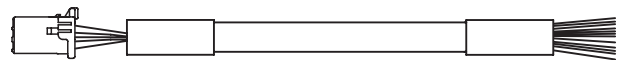
FASTECH S-SERVO II

## 1. Options

### ① Signal Cable

Item	Length [m]	Remark
CSM3-S-□□□F	□□□	Normal Cable
CSM3-S-□□□M	□□□	Robot Cable

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

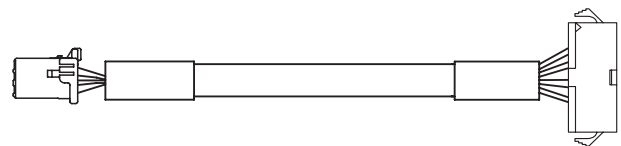


Manufacturer : MOLEX  
Housing : 501646-2000  
Terminal : 501648-1000

### ② Encoder Extension Cable

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

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



Manufacturer : MOLEX  
Housing : 501646-1000  
Terminal : 501648-1000

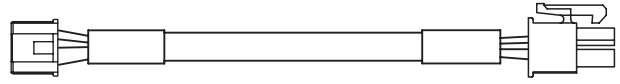
JST : Manufacturer  
SMP-09V-NC : Housing  
SHF-001T-0.8BS : Terminal



### ③ Motor Extension Cable

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

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



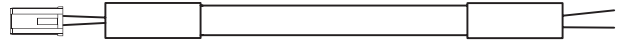
Manufacturer : JST  
Housing : PAP-04V-S  
Terminal : SPHD-001T-P0,5

MOLEX : Manufacturer  
5557-04R : Housing  
5556T : Terminal

### ④ Power Cable

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

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

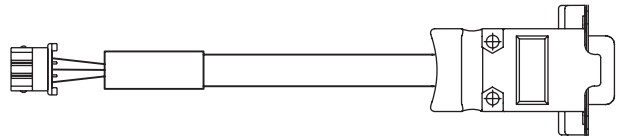


Manufacturer : JST  
Housing : PAP-02V-S  
Terminal : SPHD-001T-P0,5

### ⑤ Parameter Setting Cable

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

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



Manufacturer : MOLEX  
Housing : 5264-03  
Terminal : 5263

AMPHENOL : Manufacturer  
L177SDE09S : Connector  
17E-1657-09 : Backshell

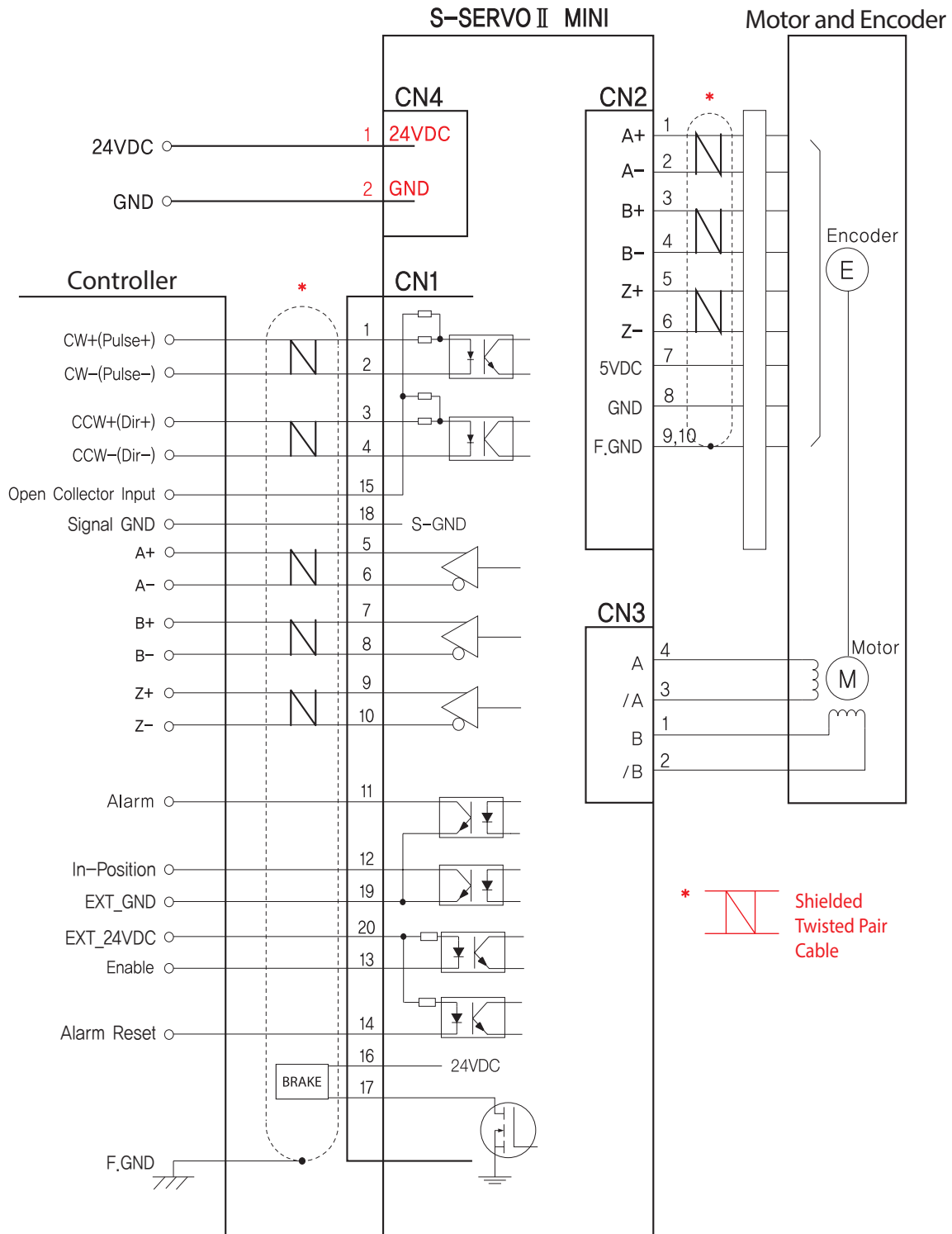
## 2. Connector Specifications

Connector specifications for cabling to drive.

Purpose	Item	Part Number	Manufacturer
I/O (CN1)	Housing	501646-2000	MOLEX
	Terminal	501648-1000	
Encoder	Drive Side (CN2)	501646-1000 501648-1000	MOLEX
	Encoder Side	SMP-09V-NC SHF-001T-0,8BS	JST
Motor	Drive Side (CN3)	PAP-04V-S SPHD-001T-P0,5	JST
	Motor Side	5557-04R 5556T	MOLEX
Power (CN4)	Housing Terminal	PAP-02V-S SPHD-004T-P0,5	JST

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

# External Wiring Diagram [S-SERVO II MINI]



**CAUTION**

Please refer to the Manual when connects motor extension cable. Careful connection will be required to protect the drive from any damages.

※ 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.

## ● Specifications of Drive [S-SERVOII 2X]

Driver Model		S-SERVOII-2X
Input Voltage		24VDC $\pm$ 10%
Control Method		Closed loop control with 32bit MCU
Current Consumption		Max 1A (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)
	Vib. Resist.	0.5g
Function <sup>*2</sup>	Rotation Speed	0~3,000 [rpm] <sup>*1</sup>
	Resolution [ppr] <sup>*4</sup>	500 1,000 1,600 2,000 3,200 3,600 4,000 5,000 6,400 8,000 10,000 20,000 25,000 36,000 40,000 50,000 (Selectable by DIP Switch) <sup>*6</sup>
	Maximum 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
	LED Display	Power status, In-Position status, Enable status, Alarm status
	RUN Current <sup>*5</sup>	50%~150% (Selectable by parameter) RUN current is current value which flows onto the motor during operation (rotation) of the motor and it is set based on rated current of the motor. * Default: 100%
	STOP Current	20%~100% (Selectable by parameter) When motor stop operation, 0.1 second after motor current will be set to STOP current value. STOP current value is a percentage of the rated current of motor. * Default: 50%
	Pulse Input Method	1 Pulse / 2 Pulse (Selectable by DIP Switch) * Default: 2 Pulse
	Rotational Direction	CW/CCW (Selectable by DIP Switch) * Default: CW
	Speed/Position Control Command	Pulse Train Input
I/O Signal <sup>*3</sup>	Input Signals	Position Command Pulse, Enable, Alarm Reset (Photocoupler Input)
	Output Signals	In-Position, Alarm (Photocoupler 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.

\*2 : Please refer to 「Settings and Operating」 to obtain detailed function information.

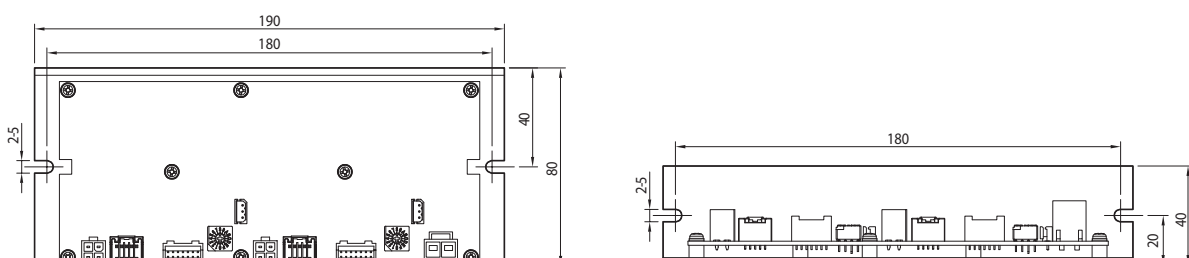
\*3 : Please refer to 「Control Input/Output Explanation」 to obtain detailed Input/Output signal information.

\*4 : When selected resolution is more than encoder resolution, motor shall be operated by microstep between pulses.

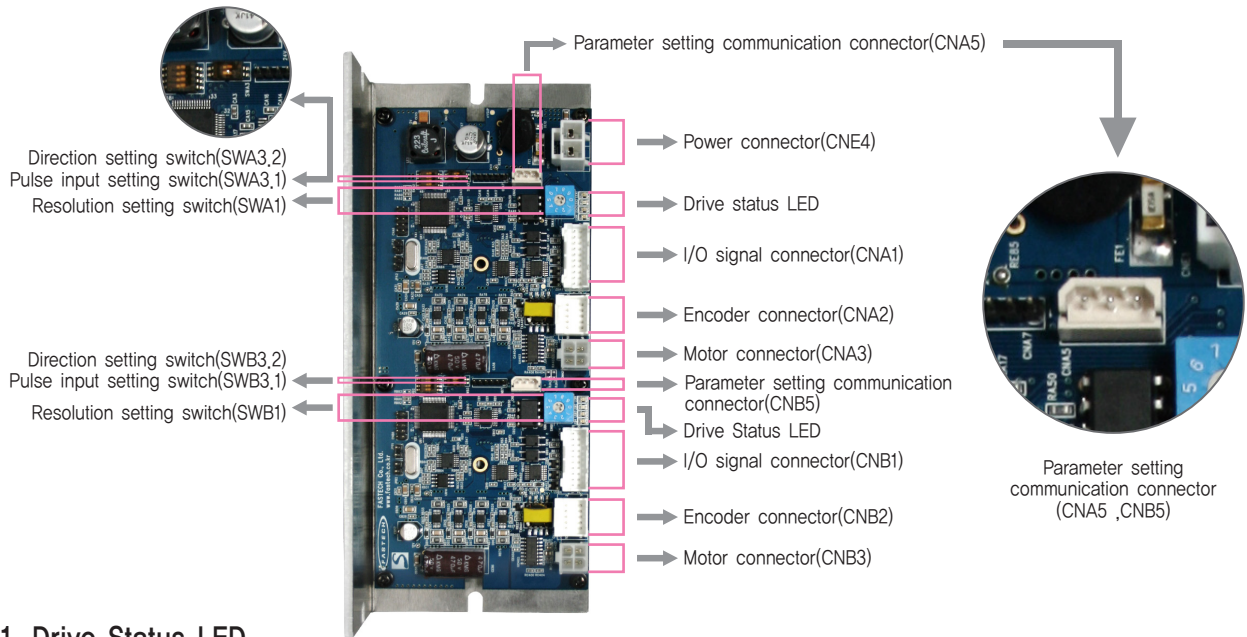
\*5 : For more detail information of RUN Current, please refer to the [Parameter Setting GUI].

\*6 : Please refer to the manual for detail information.

## ● Dimensions of Drive [mm] [S-SERVOII 2X]



# Settings and Operation [S-SERVO II 2X]



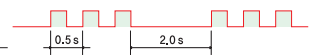
## 1. Drive Status LED

Indication	Color	Function	ON/OFF Condition
PWR	Green	Power input indication	LED is turned ON when power is applied
INP	Yellow	Complete Positioning Motion	Light on when Position Deviation located within preset value*1 from target position, after Position Command Pulse Input is completed
EN	Orange	Motor Enable Status	Enable: Lights On, Disable: Lights Off
ALM	Red	Alarm indication	Flash when protection function is activated (Identifiable which protection mode is activated by counting the blinking times)

\*1 : Default = 0  
Can be selected by parameter setting GUI

### ◆ Protection functions and LED flash times

Times	Protection	Conditions
1	Over Current Error	The current through power devices in drive exceeds 4.8A
2	Over Speed Error	Motor speed exceed 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 second under a load exceeding the max. torque
5	Over Temperature Error	Inside temperature of drive exceeds 85°C
6	Over Regenerative Voltage Error	Back-EMF more 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 in Encoder connection of 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

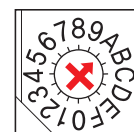


Alarm LED flash  
(Ex, Position tracking error)

## 2. Resolution Setting Switch(SWA1, SWB1)

The Number of pulse per revolution,

Position	Pulse/Revolution	Position	Pulse/Revolution
0	500	8	6,400
1	1,000	9	8,000
2	1,600	A	10,000
3	2,000	B	20,000
4	3,200	C	25,000
5	3,600	D	36,000
6	4,000	E	40,000
7	5,000	F	50,000*1



\* Please refer to the manual for detail information,

\*1 : In case of products with an encoder resolution of 16,000, the corresponding pulse/rotation is 16,000.

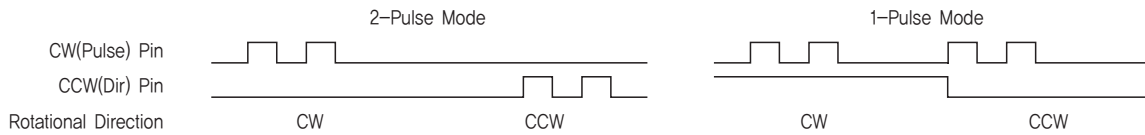
### 3. Rotational Direction Setting Switch(SWA3.2, SWB3.2)

Indication	Switch Name	Functions
DIR	Switching Rotational Direction	Based on CW(+Dir signal) input to driver. ON: CCW(-Direction) OFF: CW(+Direction) ※ Default: CW mode



### 4. Pulse Input Setting Switch(SWA3.1, SWB3.1)

Indication	Switch Name	Functions
1P/2P	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



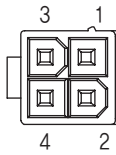
### 5. Power Connector(CNE4)

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



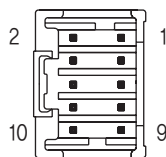
### 6. Motor Connector(CNA3, CNB3)

NO.	Function	I/O
1	A Phase	Output
2	B Phase	Output
3	/A Phase	Output
4	/B Phase	Output



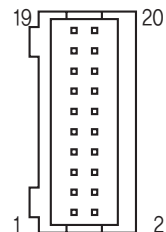
### 7. Encoder Connector(CNA2, CNB2)

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



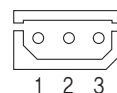
### 8. Input/Output Signal Connector(CNA1, CNB1)

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

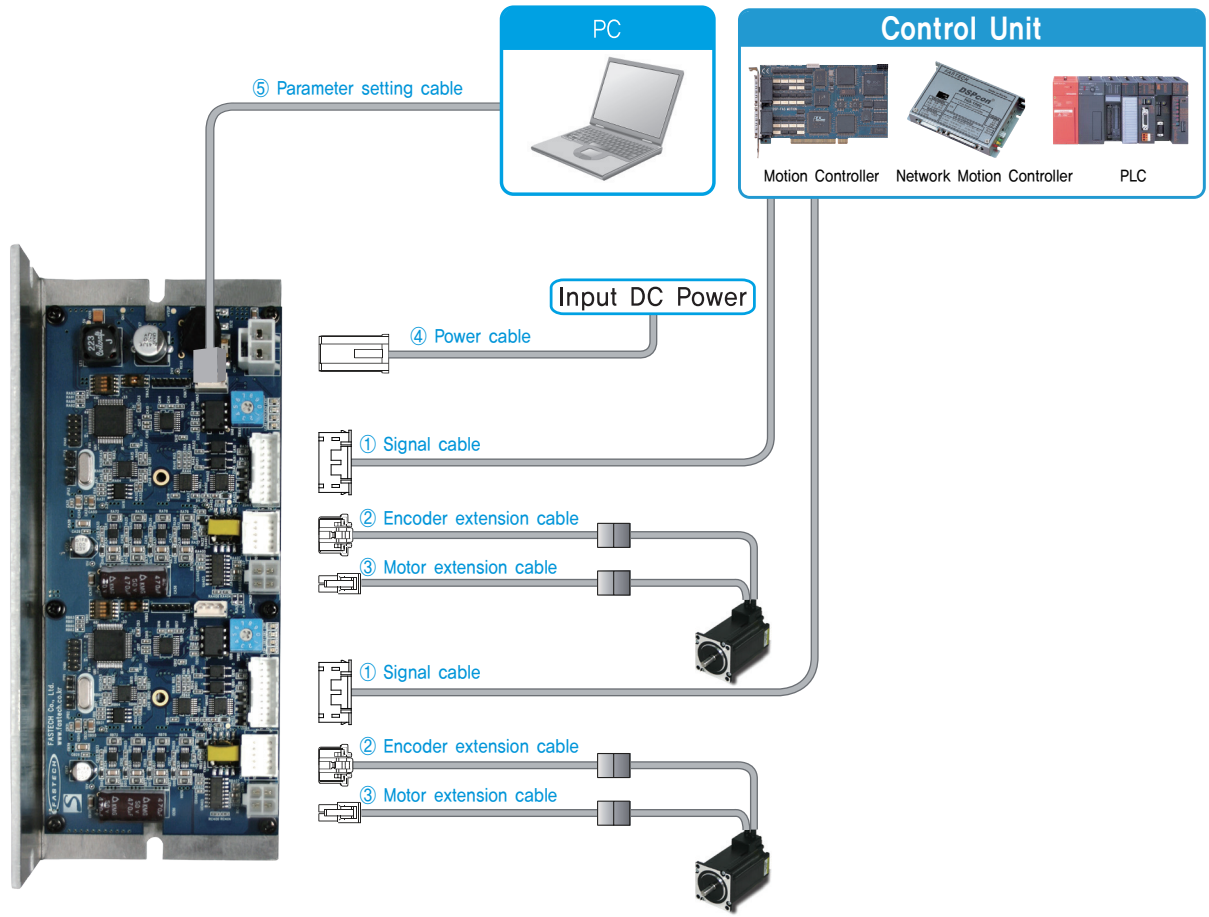


### 9. Parameter Setting Communication Connector(CNA5, CNB5)

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



# System Configuration [S-SERVO II 2X]



Type	Signal Cable	Encoder Cable	Motor Cable	Power Cable	Parameter Setting Cable
Length supplied	-	30cm	30cm	-	-
Max. Length	20m	20m	20m	2m	3m

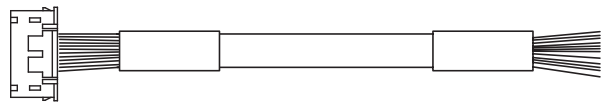
FASTECH S-SERVO II

## 1. Options

### ① Signal Cable

Item	Length [m]	Remark
CSS2-S-□□□F	□□□	Normal Cable
CSS2-S-□□□M	□□□	Robot Cable

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

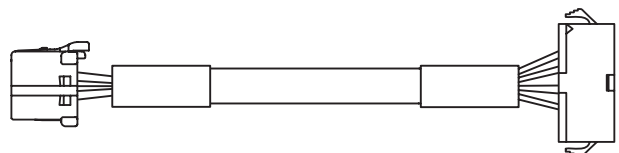


Manufacturer : JST  
Housing : PADP-20V-1-S  
Terminal : SPH-002T-P0,5L

### ② Encoder Extension Cable

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

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



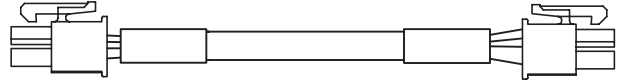
Manufacturer : MOLEX  
Housing : 51353-1000  
Terminal : 56134-9000

JST : Manufacturer  
SMP-09V-NC : Housing  
SHF-001T-0,8BS : Terminal

### ③ Motor Extension Cable

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

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



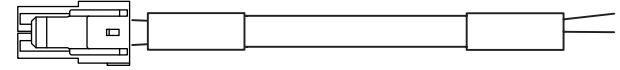
Manufacturer : MOLEX  
Housing : 5557-04R  
Terminal : 5556T

MOLEX : Manufacturer  
5557-04R : Housing  
5556T : Terminal

### ④ Power Cable

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

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

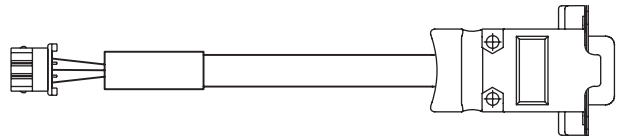


Manufacturer : JST  
Housing : VLP-02V  
Terminal : SVF-61T-P2,0

### ⑤ Parameter Setting Cable

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

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



Manufacturer : MOLEX  
Housing : 5264-03  
Terminal : 5263

AMPHENOL : Manufacturer  
L177SDE09S : Connector  
17E-1657-09 : Backshell

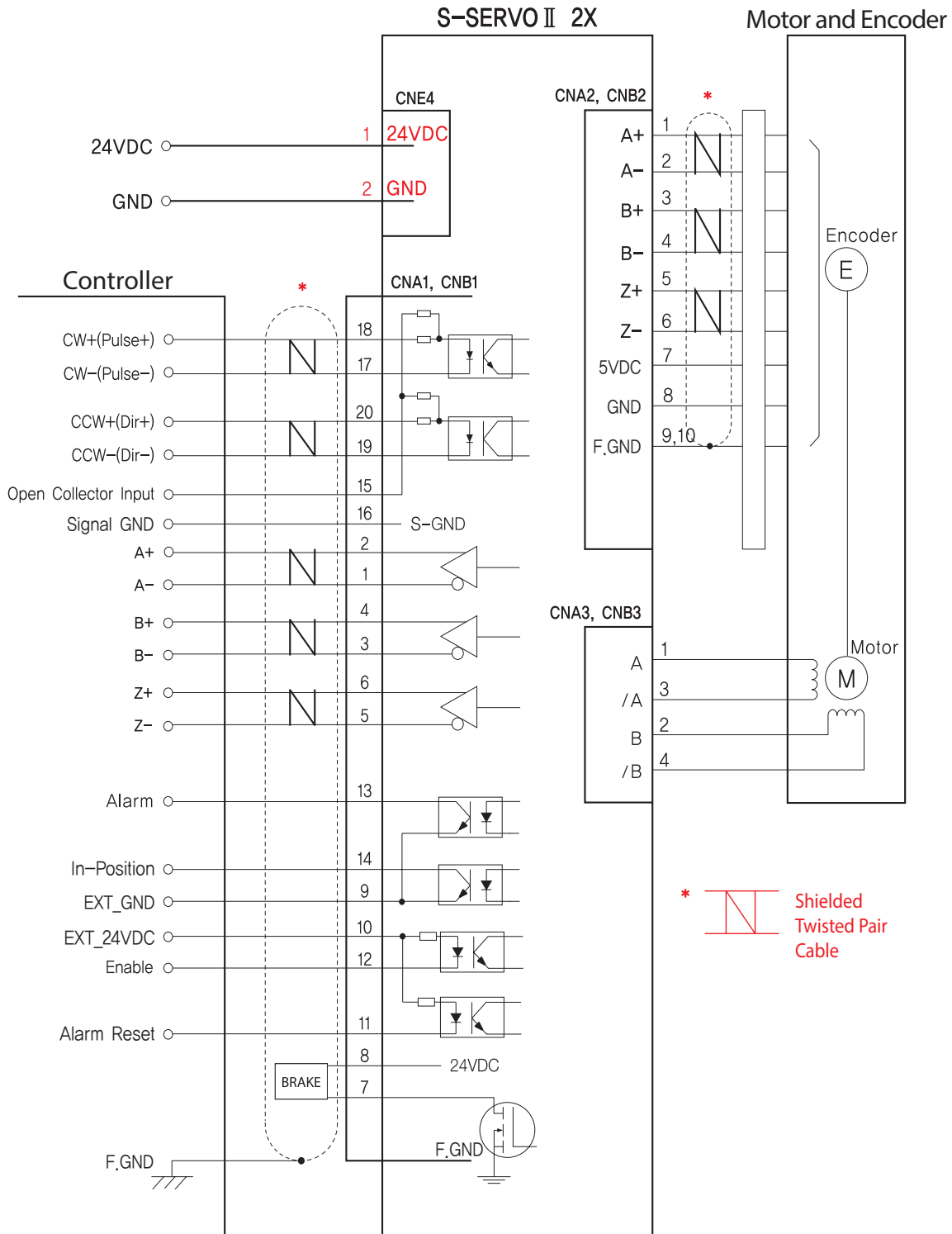
## 2. Connector Specifications

Connector specifications for cabling to drive.

Purpose	Item	Part Number	Manufacturer
I/O (CNA1, CNB1)	Housing	PADP-20V-1-S	JST
	Terminal	SPH-002T-P0,5L	
Encoder	Drive Side (CNA2, CNB2)	51353-1000 56134-9000	MOLEX
	Encoder Side	SMP-09V-NC SHF-001T-0,8BS	JST
Motor	Drive Side (CNA3, CNB3)	5557-04R 5556T	MOLEX
	Motor Side	5557-04R 5556T	MOLEX
Power (CNE4)	Housing Terminal	VLP-02V SVF-61T-P2,0	JST

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

# External Wiring Diagram [S-SERVO II 2X]



FASTECH S-SERVO II

- ※ Except common usage of power of S-SERVO II 2X, 3X, external wiring diagram for each drive of motor, encoder and I/O are all same.
- ※ 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.

**CAUTION**

Please refer to the Manual when connects motor extension cable. Careful connection will be required to protect the drive from any damages.



## ● Specifications of Drive [S-SERVOII 3X]

Driver Model		S-SERVOII-3X
Input Voltage		24VDC $\pm$ 10%
Control Method		Closed loop control with 32bit MCU
Current Consumption		Max 1,5A (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)
	Vib. Resist.	0,5g
Function <sup>*2</sup>	Rotation Speed	0~3,000 [rpm] <sup>*1</sup>
	Resolution [ppr] <sup>*4</sup>	500 1,000 1,600 2,000 3,200 3,600 4,000 5,000 6,400 8,000 10,000 20,000 25,000 36,000 40,000 50,000 (Selectable by DIP Switch) <sup>*6</sup>
	Maximum 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
	LED Display	Power status, In-Position status, Enable status, Alarm status
	RUN Current <sup>*5</sup>	50%~150% (Selectable by parameter) RUN current is current value which flows onto the motor during operation (rotation) of the motor and it is set based on rated current of the motor. * Default: 100%
	STOP Current	20%~100% (Selectable by parameter) When motor stop operation, 0,1 second after motor current will be set to STOP current value. STOP current value is a percentage of the rated current of motor. * Default: 50%
	Pulse Input Method	1 Pulse / 2 Pulse (Selectable by DIP Switch) * Default: 2 Pulse
	Rotational Direction	CW/CCW (Selectable by DIP Switch) * Default: CW
	Speed/Position Control Command	Pulse Train Input
I/O Signal <sup>*3</sup>	Input Signals	Position Command Pulse, Enable, Alarm Reset (Photocoupler Input)
	Output Signals	In-Position, Alarm (Photocoupler 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.

\*2 : Please refer to 「Settings and Operating」 to obtain detailed function information.

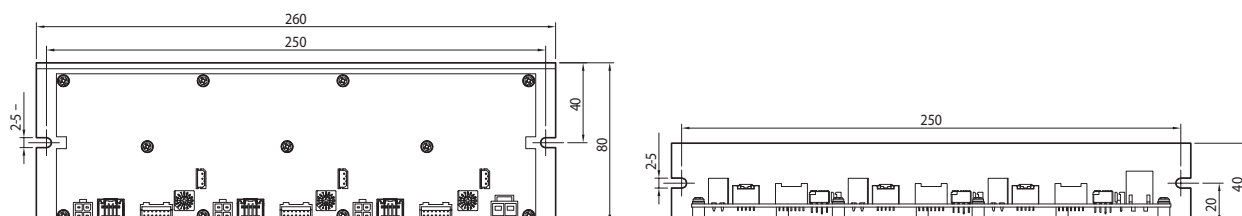
\*3 : Please refer to 「Control Input/Output Explanation」 to obtain detailed Input/Output signal information.

\*4 : When selected resolution is more than encoder resolution, motor shall be operated by microstep between pulses.

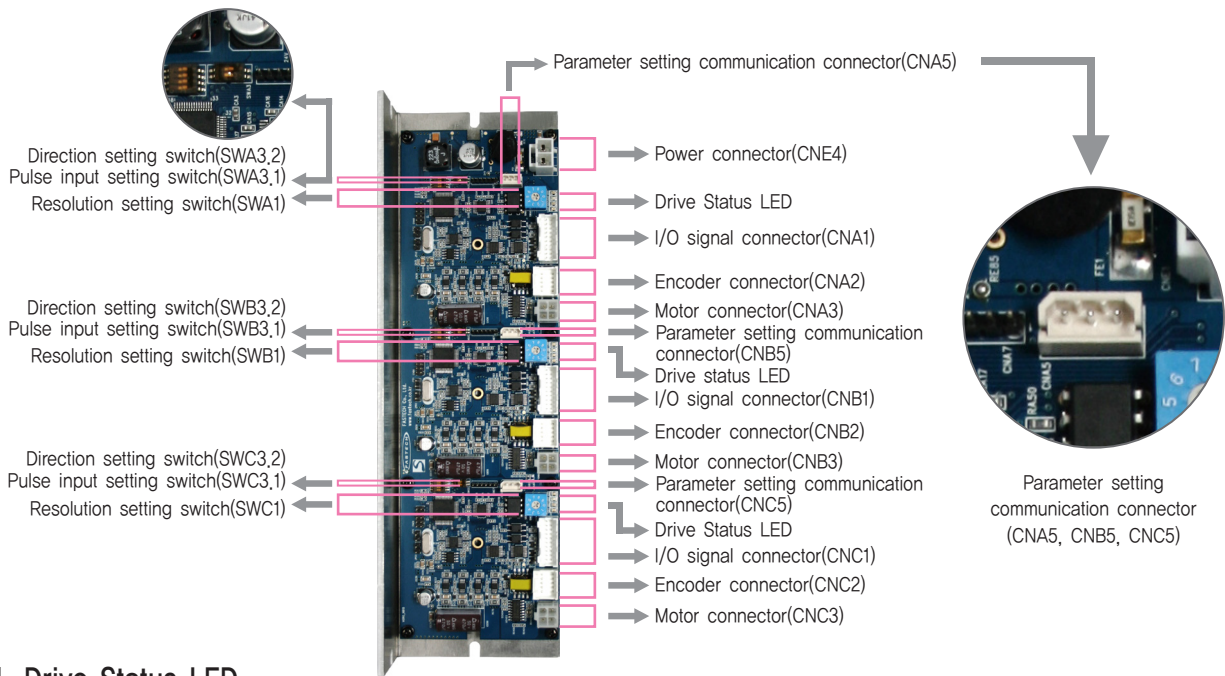
\*5 : For more detail information of RUN Current, please refer to the [Parameter Setting GUI].

\*6 : Please refer to the manual for detail information.

## ● Dimensions of Drive [mm] [S-SERVOII 3X]



# ● Settings and Operation [S-SERVO II 3X]



## 1. Drive Status LED

Indication	Color	Function	ON/OFF Condition
PWR	Green	Power input indication	LED is turned ON when power is applied
INP	Yellow	Complete Positioning Motion	Light on when Position Deviation located within preset value*1 from target position, after Position Commando Pulse Input is completed
EN	Orange	Motor Enable Status	Enable: Lights On, Disable: Lights Off
ALM	Red	Alarm indication	Flash when protection function is activated (Identifiable which protection mode is activated by counting the blinking times)

\*1 : Default = 0  
Can be selected by parameter setting GUI

### ◆ Protection functions and LED flash times

Times	Protection	Conditions
1	Over Current Error	The current through power devices in drive exceeds 4.8A
2	Over Speed Error	Motor speed exceed 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 second under a load exceeding the max. torque
5	Over Temperature Error	Inside temperature of drive exceeds 85°C
6	Over Regenerated Voltage Error	Back-EMF more 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 in Encoder connection of 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

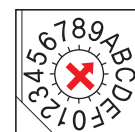


Alarm LED flash  
(Ex, Position tracking error)

## 2. Resolution Setting Switch(SWA1, SWB1, SWC1)

The Number of pulse per revolution,

Position	Pulse/Revolution	Position	Pulse/Revolution
0	500	8	6,400
1	1,000	9	8,000
2	1,600	A	10,000
3	2,000	B	20,000
4	3,200	C	25,000
5	3,600	D	36,000
6	4,000	E	40,000
7	5,000	F	50,000*1



\* Please refer to the manual for detail information.

\*1 : In case of products with an encoder resolution of 16,000, the corresponding pulse/rotation is 16,000.

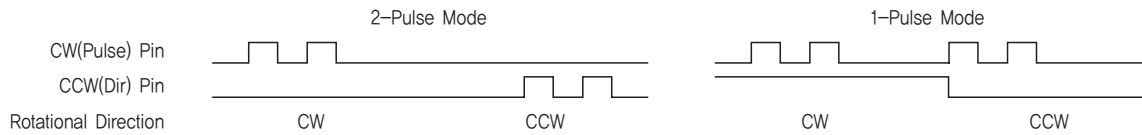
### 3. Rotational Direction Setting Switch(SWA3.2, SWB3.2, SWC3.2)

Indication	Switch Name	Functions
DIR	Switching Rotational Direction	Based on CW(+Dir signal) input to driver. ON: CCW(-Direction) OFF: CW(+Direction) ※ Default: CW mode



### 4. Pulse Input Setting Switch(SWA3.1, SWB3.1, SWC3.1)

Indication	Switch Name	Functions
1P/2P	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



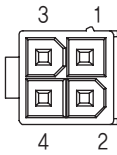
### 5. Power Connector(CNE4)

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



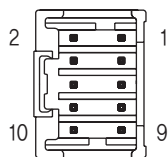
### 6. Motor Connector(CNA3, CNB3, CNC3)

NO.	Function	I/O
1	A Phase	Output
2	B Phase	Output
3	/A Phase	Output
4	/B Phase	Output



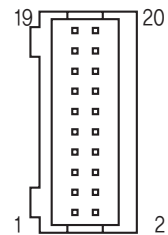
### 7. Encoder Connector(CNA2, CNB2, CNC2)

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



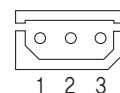
### 8. Input/Output Signal Connector(CNA1, CNB1, CNC1)

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

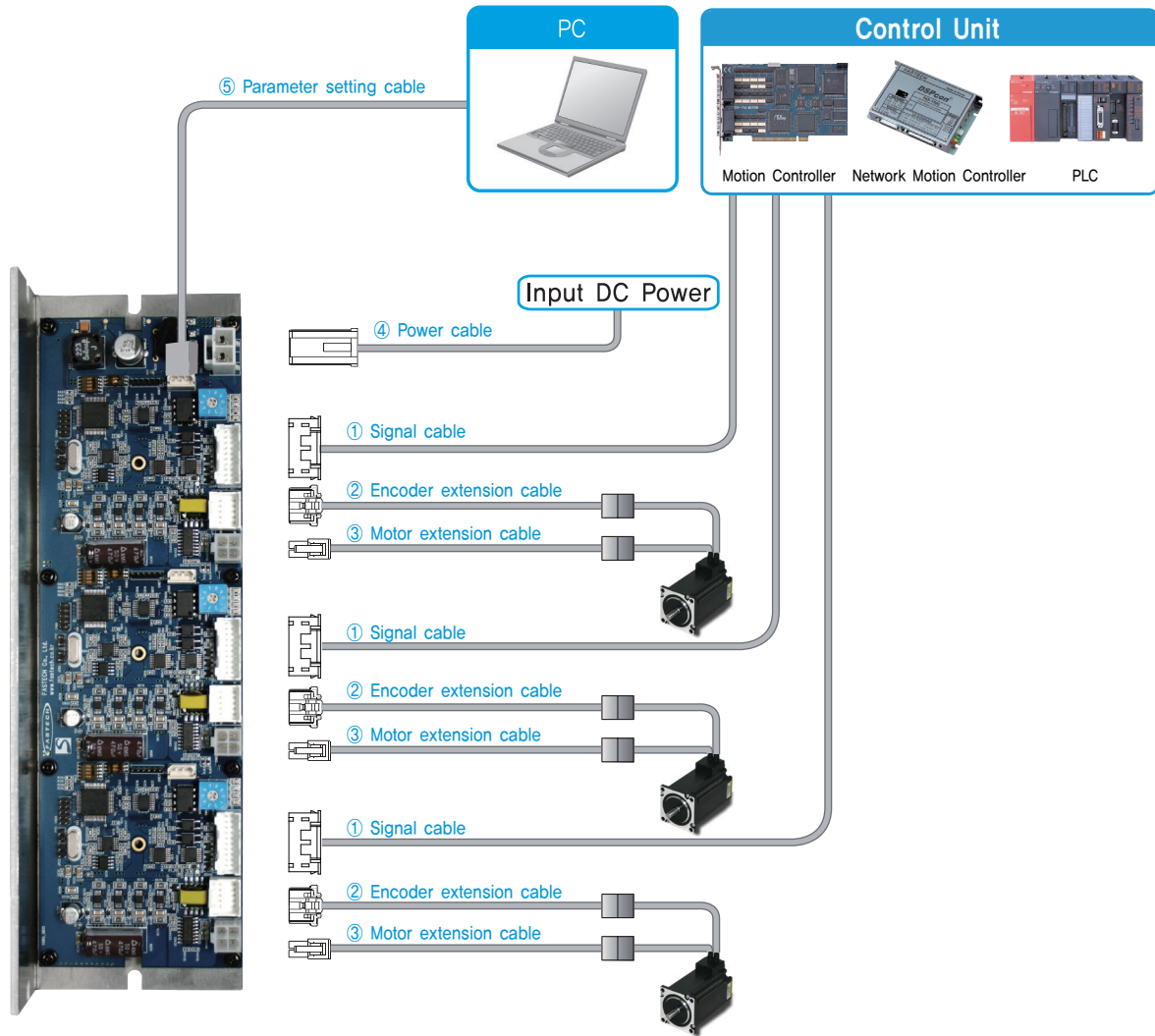


### 9. Parameter Setting Communication Connector(CNA5, CNB5, CNC5)

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



# ● System Configuration [S-SERVOII 3X]



FASTECH S-SERVO II

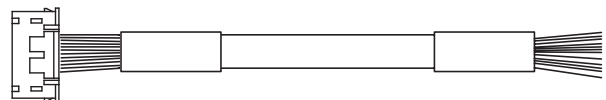
Type	Signal Cable	Encoder Cable	Motor Cable	Power Cable	Parameter Setting Cable
Length supplied	—	30cm	30cm	—	—
Max. Length	20m	20m	20m	2m	3m

## 1. Options

### ① Signal Cable

Item	Length [m]	Remark
CSS2-S-□□□F	□□□	Normal Cable
CSS2-S-□□□M	□□□	Robot Cable

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

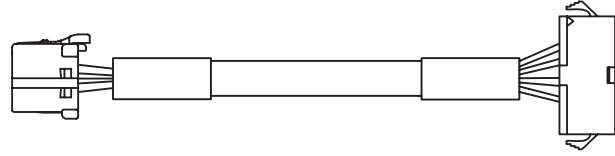


Manufacturer : JST  
 Housing : PADP-20V-1-S  
 Terminal : SPH-002T-P0,5L

## ② Encoder Extension Cable

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

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



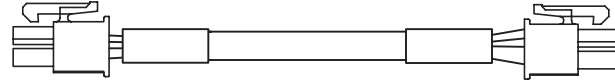
Manufacturer : MOLEX  
Housing : 51353-1000  
Terminal : 56134-9000

JST : Manufacturer  
SMP-09V-NC : Housing  
SHF-001T-0,8BS : Terminal

## ③ Motor Extension Cable

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

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



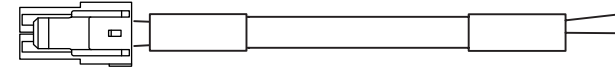
Manufacturer : MOLEX  
Housing : 5557-04R  
Terminal : 5556T

MOLEX : Manufacturer  
5557-04R : Housing  
5556T : Terminal

## ④ Power Cable

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

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

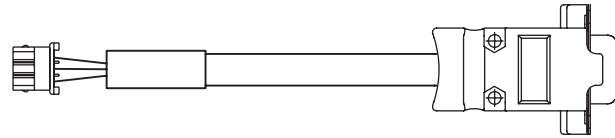


Manufacturer : JST  
Housing : VLP-02V  
Terminal : SVF-61T-P2,0

## ⑤ Parameter Setting Cable

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

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



Manufacturer : MOLEX  
Housing : 5264-03  
Terminal : 5263

AMPHENOL : Manufacturer  
L177SDE09S : Connector  
17E-1657-09 : Backshell

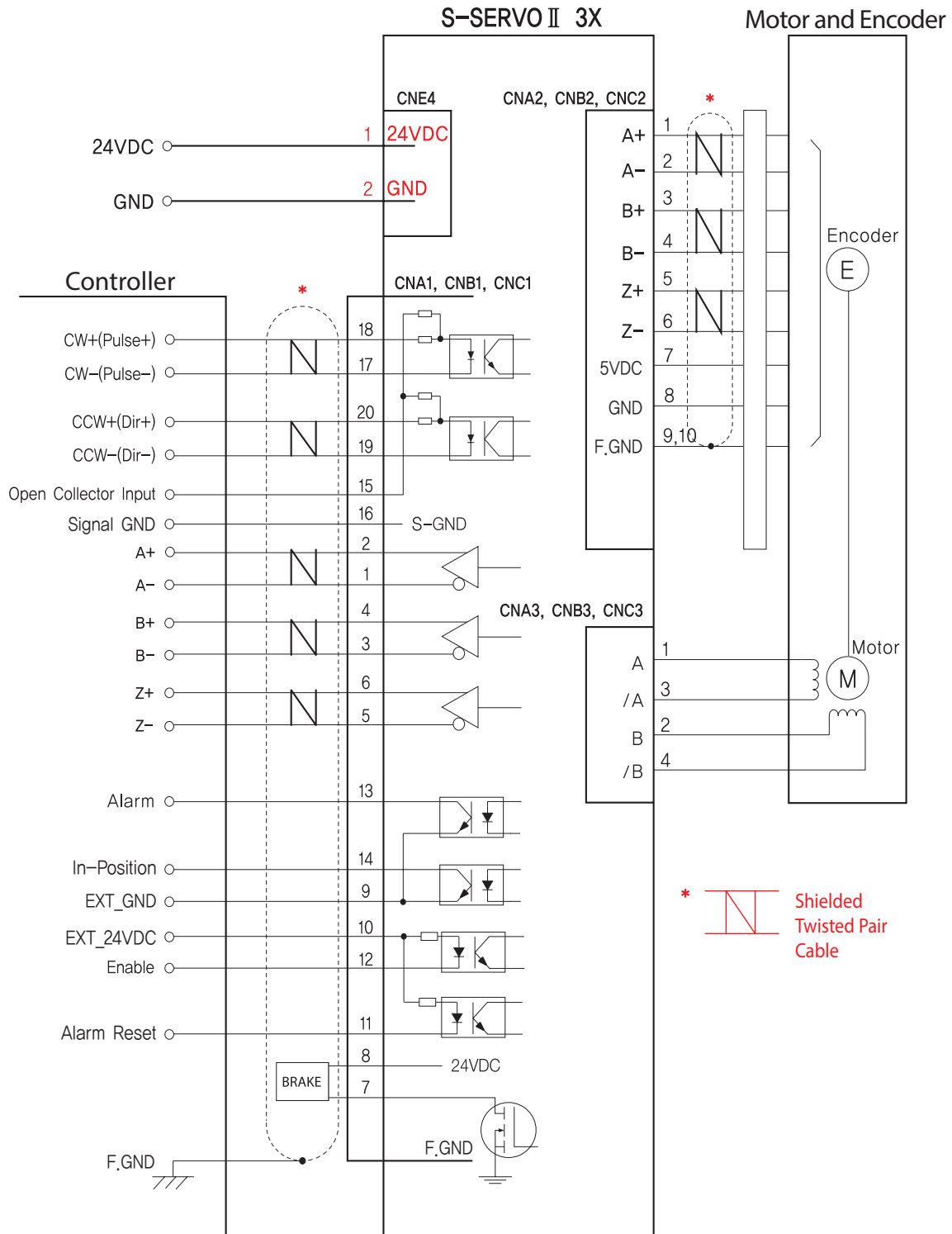
## 2. Connector Specifications

Connector specifications for cabling to drive.

Purpose	Item	Part Number	Manufacturer
I/O (CNA1, CNB1, CNC1)	Housing Terminal	PADP-20V-1-S SPH-002T-P0,5L	JST
Encoder	Drive Side (CNA2, CNB2, CNC2)	51353-1000 56134-9000	MOLEX
	Encoder Side	SMP-09V-NC SHF-001T-0,8BS	JST
Motor	Drive Side (CNA3, CNB3, CNC3)	5557-04R 5556T	MOLEX
	Motor Side	5557-04R 5556T	MOLEX
Power (CNE4)	Housing Terminal	VLP-02V SVF-61T-P2,0	JST

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

# External Wiring Diagram [S-SERVO II 3X]



FASTECH S-SERVO II

- ※ Except common usage of power of S-SERVO II 2X, 3X, external wiring diagram for each drive of motor, encoder and I/O are all same.
- ※ 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.

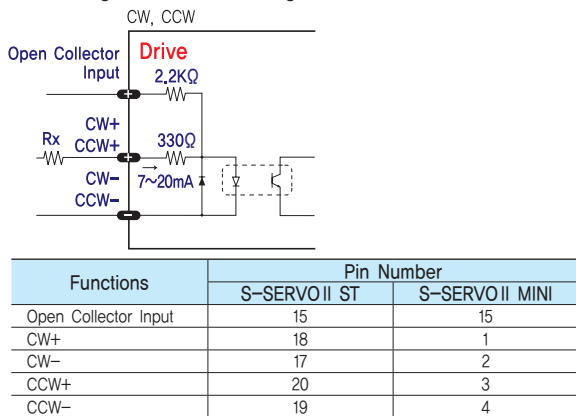
**CAUTION**

Please refer to the Manual when connects motor extension cable. Careful connection will be required to protect the drive from any damages.

# Control Signal Input/Output Description

## 1 Input Signal

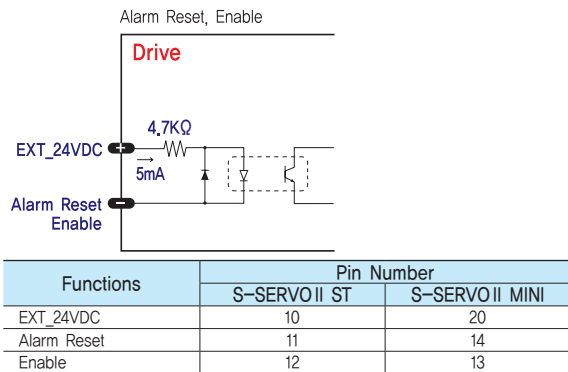
Input signals of the drive are all photocoupler protected. The signal shows the status of internal photocouplers [ON: conduction], [OFF: Non-conduction], not displaying the voltage levels of the signal.



※ S-SERVO II 2X and 3X's pin number is the same as S-SERVO II ST.

### ◆ 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. 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, Please use Open Collector Input.



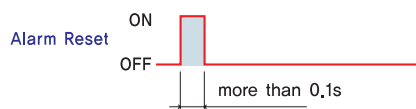
※ S-SERVO II 2X and 3X's pin number is the same as S-SERVO II ST.

### ◆ Enable 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

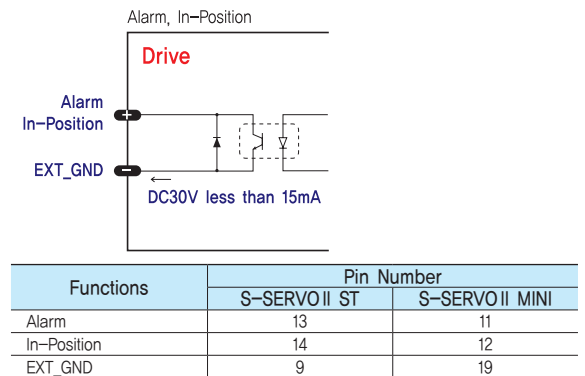
When a protection mode has been activated, a signal to this alarm reset input cancels the Alarm output.



※ 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. The signal indicates the status of internal photocouplers [ON: conduction], [OFF: Non-conduction], not displaying the voltage levels of the signal.



※ S-SERVO II 2X and 3X's pin number is the same as S-SERVO II ST.

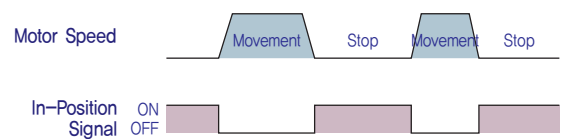
### ◆ Alarm Output

The Alarm output indicates [ON] when the driver is in abnormal 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].

### ◆ In-Position Output

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



## ● Parameter Settings GUI [User Interface]

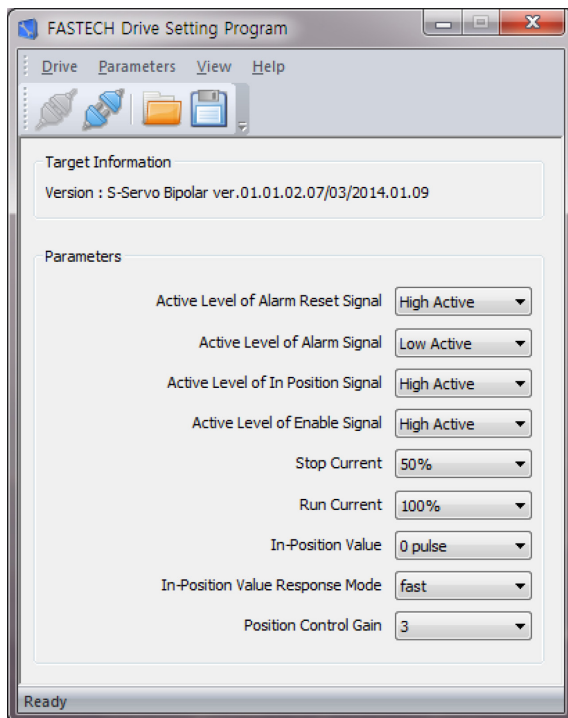
S-SERVO II driver utilizes various parameters for operation.

Some parameters need to be adjusted once users feel inconvenience to use or in order to maximize efficiency. S-SERVO II 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 S-SERVO II according to its own system.

Please connect parameter setting GUI when S-SERVO II is Disable state.

For safety reason, S-SERVO II 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](http://www.fastech.co.kr))

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

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



**MEMO**

# MEMO

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