

S-SERVO[®]

Stepping Motor Control System Without Step Out

- **Completely free from the Concern of Loss of Position.**
(Alarm Generation 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 Encoder Resolution)
- **Reduce the Motor Temperature and Energy Usage.**
(Current Control According to load)
- **Torque Improvement by Boost Current Control.**
(Max, 150% Current Control)

Plus-R



CE

FASTECH

Fast, Accurate, Smooth Motion

S-SERVO Plus-R adopted closed loop stepping motor system which perfectly resolves the problems of current open loop control stepping motor system such as **Step Out** and **Positioning Completion Check**.

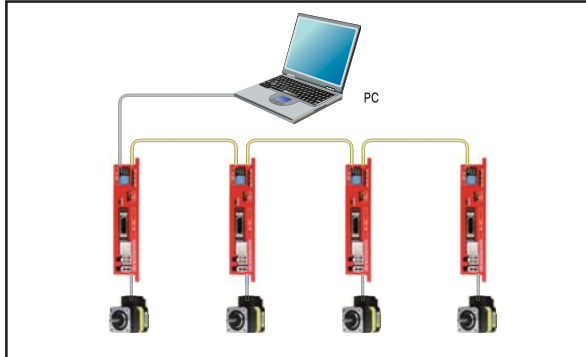
Regardless of motor type (2 Phase, 5 Phase), position precision only related to encoder so **High Precision Positioning** is always possible.

Existing step driver can be heated easily because of constant current goes into the motor regardless of loads magnitude. However S-SERVO Plus-R enables to reduce high temperature of the motor and save **Energy Usage**. In addition, the Acc/Dec characteristics can be improved significantly by **Boost Current** (Up to 150%).

Characteristics

1. Network Based Motion Control

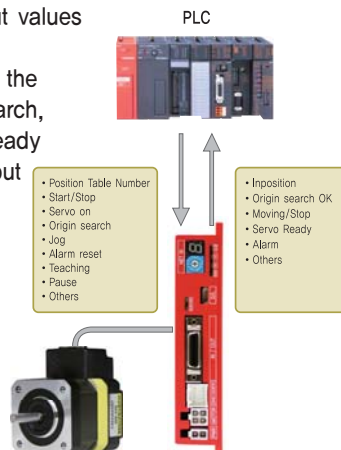
A maximum of 16 axis can be operated from a PC through RS-485 communications. All of the Motion conditions are set through the network and saved in Flash ROM as a parameter. Motion Library(DLL) is provided for programming under Windows 2000/XP/Vista/7/8.



2. Position Table Function

Position Table can be used for motion control by digital input and output signals of host controller. You can operate the motor directly by sending the position table number, start/stop, origin search and other digital input values from a PLC.

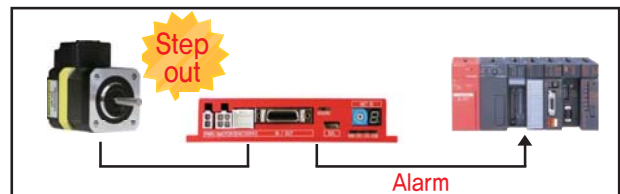
The PLC can monitor the In-Position, origin search, moving/stop, servo ready and other digital output signals from a drive. A maximum of 256 positioning points can be set from PLC.



3. Completely Free from the Concern of Loss of Position.

(Alarm will be generated when step out)

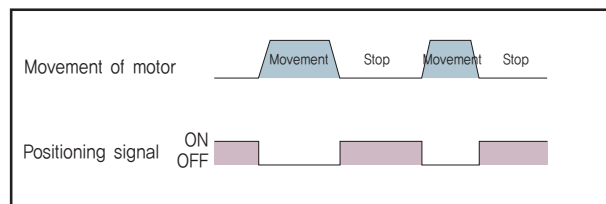
Because of mounted encoder constantly monitor the current position, step out cannot be occurred. If step out occurred by external force of overloads, alarm signal will be sent to upper controller. Thus, upper controller can recognize step out of step motor



4. 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 Plus-R resolve the problem of unclear positioning of current Open Loop System.



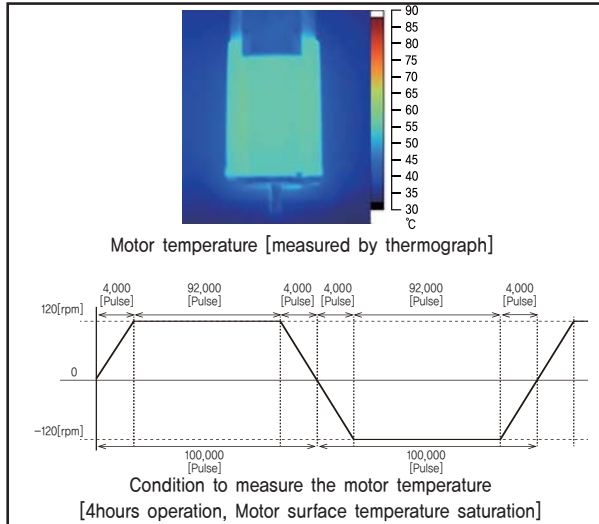
5. Position Precision is Only Related to Encoder

S-SERVO Plus-R controls position by using high precision of encoder. Regardless of motor type (2 Phase or 5 Phase), S-SERVO Plus-R 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.

6. Reduce the Motor Temperature and Energy Usage.

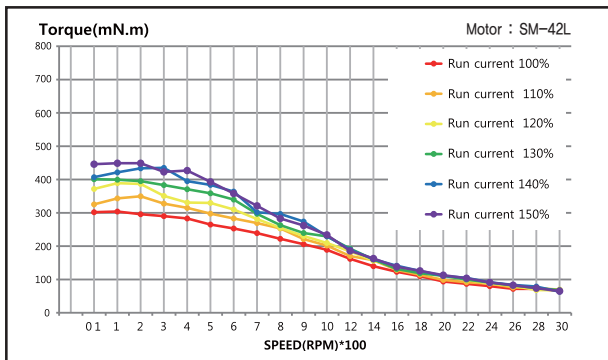
(Current control according to load)

S-SERVO Plus-R automatically control the motor current according to loads. Thus, febricity of motor and drive are minimized so can save the energy as well.



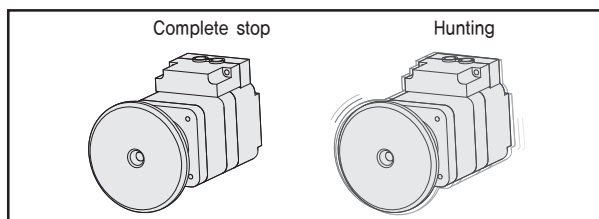
7. Improved acceleration and deceleration characteristics by Boost Current.

By Boost Current Setting from Parameter setting, It enables acceleration and deceleration characteristics to be improved.



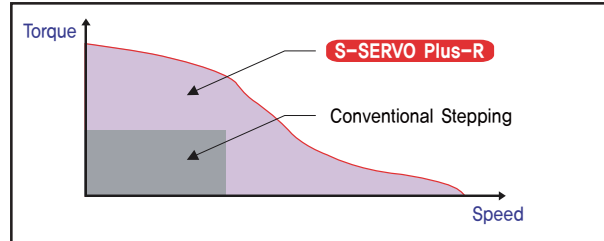
8. Complete Stop

It completely stop when motor stops so hunting cannot be occurred. It is suitable for high speed inspection equipment using vision.



9. High Torque and High Speed

S-SERVO Plus-R detect current position by encoder feedback so can keep the high torque against the 100% loads and high speed. Current Open Loop System cannot drive against 100% loads because of false operation by step out.



10. Variety of Protection Functions and Alarm Signal.

Drive and equipment can be protected by the alarm (12 kinds) of such as motor connection error, encoder connection error etc.

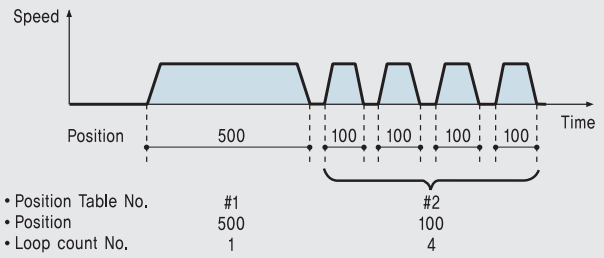
11. Variety of Position Command Unit

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

Features of Motion Controller

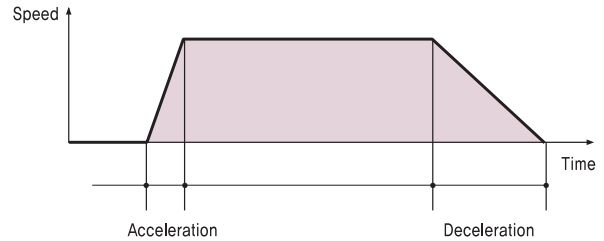
1. Loop Count

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



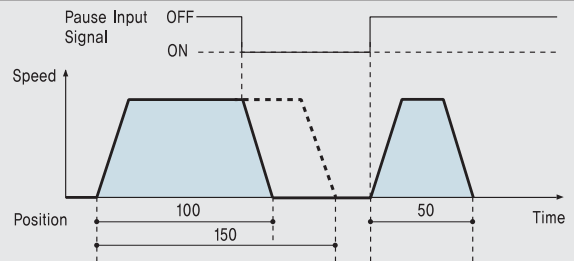
2. Acceleration/Deceleration

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



3. Pause

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



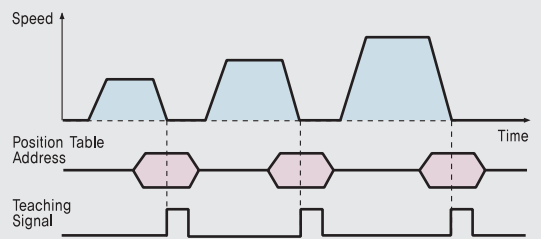
4. Alarm

The number of LED flashing time indicates which Alarm has occurred.



5. Teaching

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

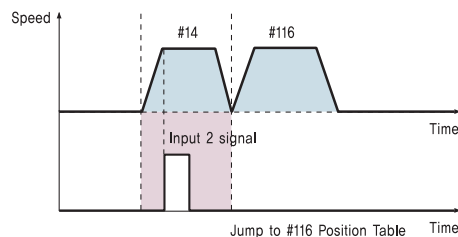
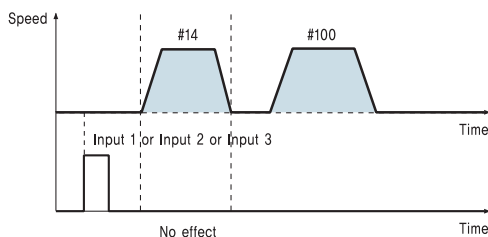


6. Jump

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

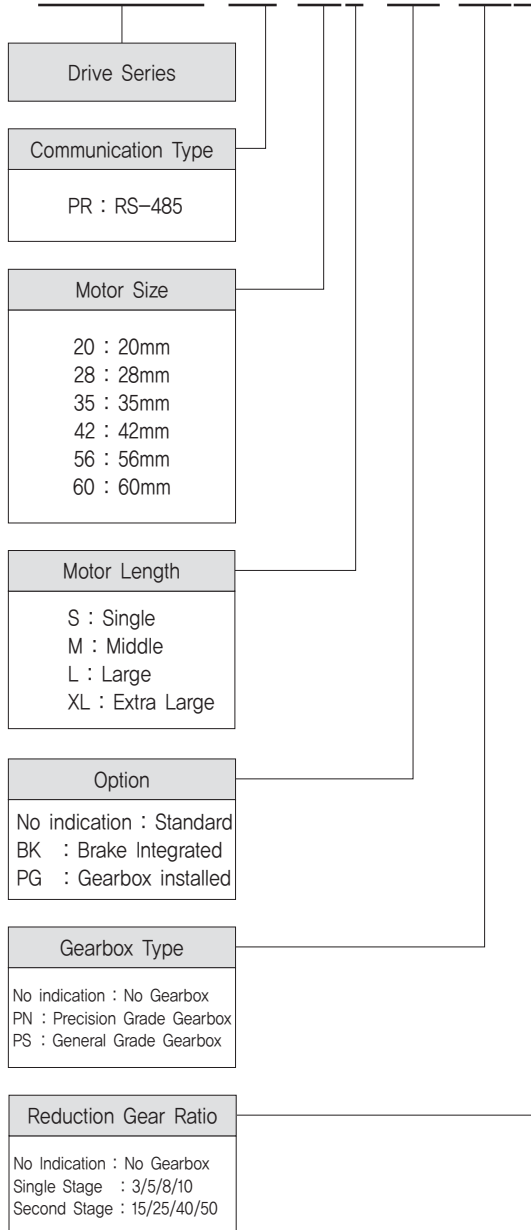
◆ Position Table #14

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



S-SERVO Plus-R Part Numbering

S-SERVO-PR-42S-PG-PN10



Standard Motor, Drive Combination

◆ S-SERVO Plus-R Drive Products

Unit Part Number	Motor Part Number	Drive Part Number
S-SERVO-PR-20M	SM-20M	SV-NDR-20M
S-SERVO-PR-20L	SM-20L	SV-NDR-20L
S-SERVO-PR-28S	SM-28S	SV-NDR-28S
S-SERVO-PR-28M	SM-28M	SV-NDR-28M
S-SERVO-PR-28L	SM-28L	SV-NDR-28L
S-SERVO-PR-35M	SM-35M	SV-NDR-35M
S-SERVO-PR-35L	SM-35L	SV-NDR-35L
S-SERVO-PR-42S	SM-42S	SV-NDR-42S
S-SERVO-PR-42M	SM-42M	SV-NDR-42M
S-SERVO-PR-42L	SM-42L	SV-NDR-42L
S-SERVO-PR-42XL	SM-42XL	SV-NDR-42XL
S-SERVO-PR-56S	SM-56S	SV-NDR-56S
S-SERVO-PR-56M	SM-56M	SV-NDR-56M
S-SERVO-PR-56L	SM-56L	SV-NDR-56L
S-SERVO-PR-60S	SM-60S	SV-NDR-60S
S-SERVO-PR-60M	SM-60M	SV-NDR-60M
S-SERVO-PR-60L	SM-60L	SV-NDR-60L

Brake Integrated Motor, Drive Combination

◆ S-SERVO Plus-R Drive Products

Unit Part Number	Motor Part Number	Drive Part Number
S-SERVO-PR-42S-BK	SM-42S-BK	SV-NDR-42S-BK
S-SERVO-PR-42M-BK	SM-42M-BK	SV-NDR-42M-BK
S-SERVO-PR-42L-BK	SM-42L-BK	SV-NDR-42L-BK
S-SERVO-PR-42XL-BK	SM-42XL-BK	SV-NDR-42XL-BK
S-SERVO-PR-56S-BK	SM-56S-BK	SV-NDR-56S-BK
S-SERVO-PR-56M-BK	SM-56M-BK	SV-NDR-56M-BK
S-SERVO-PR-56L-BK	SM-56L-BK	SV-NDR-56L-BK
S-SERVO-PR-60S-BK	SM-60S-BK	SV-NDR-60S-BK
S-SERVO-PR-60M-BK	SM-60M-BK	SV-NDR-60M-BK
S-SERVO-PR-60L-BK	SM-60L-BK	SV-NDR-60L-BK

Gearbox Integrated Motor, Drive Combination

◆ S-SERVO Plus-R Drive Products

Unit Part Number	Motor Part Number	Drive Part Number	Reduction gear ratio	
S-SERVO-PR-42S-PG-PN3	SM-42S-PG-PN3	SV-NDR-42S	1:3	
S-SERVO-PR-42S-PG-PN5	SM-42S-PG-PN5		1:5	
S-SERVO-PR-42S-PG-PN8	SM-42S-PG-PN8		1:8	
S-SERVO-PR-42S-PG-PN10	SM-42S-PG-PN10		1:10	
S-SERVO-PR-42S-PG-PN15	SM-42S-PG-PN15		1:15	
S-SERVO-PR-42S-PG-PN25	SM-42S-PG-PN25		1:25	
S-SERVO-PR-42S-PG-PN40	SM-42S-PG-PN40		1:40	
S-SERVO-PR-42S-PG-PN50	SM-42S-PG-PN50		1:50	
S-SERVO-PR-42M-PG-PN3	SM-42M-PG-PN3		SV-NDR-42M	1:3
S-SERVO-PR-42M-PG-PN5	SM-42M-PG-PN5			1:5
S-SERVO-PR-42M-PG-PN8	SM-42M-PG-PN8	1:8		
S-SERVO-PR-42M-PG-PN10	SM-42M-PG-PN10	1:10		
S-SERVO-PR-42M-PG-PN15	SM-42M-PG-PN15	1:15		
S-SERVO-PR-42M-PG-PN25	SM-42M-PG-PN25	1:25		
S-SERVO-PR-42M-PG-PN40	SM-42M-PG-PN40	1:40		
S-SERVO-PR-42M-PG-PN50	SM-42M-PG-PN50	1:50		
S-SERVO-PR-42L-PG-PN3	SM-42L-PG-PN3	SV-NDR-42L		1:3
S-SERVO-PR-42L-PG-PN5	SM-42L-PG-PN5			1:5
S-SERVO-PR-42L-PG-PN8	SM-42L-PG-PN8		1:8	
S-SERVO-PR-42L-PG-PN10	SM-42L-PG-PN10		1:10	
S-SERVO-PR-42L-PG-PN15	SM-42L-PG-PN15		1:15	
S-SERVO-PR-42L-PG-PN25	SM-42L-PG-PN25		1:25	
S-SERVO-PR-42L-PG-PN40	SM-42L-PG-PN40		1:40	
S-SERVO-PR-42L-PG-PN50	SM-42L-PG-PN50		1:50	
S-SERVO-PR-42XL-PG-PN3	SM-42XL-PG-PN3		SV-NDR-42XL	1:3
S-SERVO-PR-42XL-PG-PN5	SM-42XL-PG-PN5			1:5
S-SERVO-PR-42XL-PG-PN8	SM-42XL-PG-PN8	1:8		
S-SERVO-PR-42XL-PG-PN10	SM-42XL-PG-PN10	1:10		
S-SERVO-PR-42XL-PG-PN15	SM-42XL-PG-PN15	1:15		
S-SERVO-PR-42XL-PG-PN25	SM-42XL-PG-PN25	1:25		
S-SERVO-PR-42XL-PG-PN40	SM-42XL-PG-PN40	1:40		
S-SERVO-PR-42XL-PG-PN50	SM-42XL-PG-PN50	1:50		
S-SERVO-PR-56S-PG-PN3	SM-56S-PG-PN3	SV-NDR-56S		1:3
S-SERVO-PR-56S-PG-PN5	SM-56S-PG-PN5			1:5
S-SERVO-PR-56S-PG-PN8	SM-56S-PG-PN8		1:8	
S-SERVO-PR-56S-PG-PN10	SM-56S-PG-PN10		1:10	
S-SERVO-PR-56S-PG-PN15	SM-56S-PG-PN15		1:15	
S-SERVO-PR-56S-PG-PN25	SM-56S-PG-PN25		1:25	
S-SERVO-PR-56S-PG-PN40	SM-56S-PG-PN40		1:40	
S-SERVO-PR-56S-PG-PN50	SM-56S-PG-PN50		1:50	
S-SERVO-PR-56M-PG-PN3	SM-56M-PG-PN3		SV-NDR-56M	1:3
S-SERVO-PR-56M-PG-PN5	SM-56M-PG-PN5			1:5
S-SERVO-PR-56M-PG-PN8	SM-56M-PG-PN8	1:8		
S-SERVO-PR-56M-PG-PN10	SM-56M-PG-PN10	1:10		
S-SERVO-PR-56M-PG-PN15	SM-56M-PG-PN15	1:15		
S-SERVO-PR-56M-PG-PN25	SM-56M-PG-PN25	1:25		
S-SERVO-PR-56M-PG-PN40	SM-56M-PG-PN40	1:40		
S-SERVO-PR-56M-PG-PN50	SM-56M-PG-PN50	1:50		
S-SERVO-PR-56L-PG-PN3	SM-56L-PG-PN3	SV-NDR-56L		1:3
S-SERVO-PR-56L-PG-PN5	SM-56L-PG-PN5			1:5
S-SERVO-PR-56L-PG-PN8	SM-56L-PG-PN8		1:8	
S-SERVO-PR-56L-PG-PN10	SM-56L-PG-PN10		1:10	
S-SERVO-PR-56L-PG-PN15	SM-56L-PG-PN15		1:15	
S-SERVO-PR-56L-PG-PN25	SM-56L-PG-PN25		1:25	
S-SERVO-PR-56L-PG-PN40	SM-56L-PG-PN40		1:40	
S-SERVO-PR-56L-PG-PN50	SM-56L-PG-PN50		1:50	

Unit Part Number	Motor Part Number	Drive Part Number	Reduction gear ratio	
S-SERVO-PR-60S-PG-PN3	SM-60S-PG-PN3	SV-NDR-60S	1:3	
S-SERVO-PR-60S-PG-PN5	SM-60S-PG-PN5		1:5	
S-SERVO-PR-60S-PG-PN8	SM-60S-PG-PN8		1:8	
S-SERVO-PR-60S-PG-PN10	SM-60S-PG-PN10		1:10	
S-SERVO-PR-60S-PG-PN15	SM-60S-PG-PN15		1:15	
S-SERVO-PR-60S-PG-PN25	SM-60S-PG-PN25		1:25	
S-SERVO-PR-60S-PG-PN40	SM-60S-PG-PN40		1:40	
S-SERVO-PR-60S-PG-PN50	SM-60S-PG-PN50		1:50	
S-SERVO-PR-60M-PG-PN3	SM-60M-PG-PN3		SV-NDR-60M	1:3
S-SERVO-PR-60M-PG-PN5	SM-60M-PG-PN5			1:5
S-SERVO-PR-60M-PG-PN8	SM-60M-PG-PN8	1:8		
S-SERVO-PR-60M-PG-PN10	SM-60M-PG-PN10	1:10		
S-SERVO-PR-60M-PG-PN15	SM-60M-PG-PN15	1:15		
S-SERVO-PR-60M-PG-PN25	SM-60M-PG-PN25	1:25		
S-SERVO-PR-60M-PG-PN40	SM-60M-PG-PN40	1:40		
S-SERVO-PR-60M-PG-PN50	SM-60M-PG-PN50	1:50		
S-SERVO-PR-60L-PG-PN3	SM-60L-PG-PN3	SV-NDR-60L		1:3
S-SERVO-PR-60L-PG-PN5	SM-60L-PG-PN5			1:5
S-SERVO-PR-60L-PG-PN8	SM-60L-PG-PN8		1:8	
S-SERVO-PR-60L-PG-PN10	SM-60L-PG-PN10		1:10	
S-SERVO-PR-60L-PG-PN15	SM-60L-PG-PN15		1:15	
S-SERVO-PR-60L-PG-PN25	SM-60L-PG-PN25		1:25	
S-SERVO-PR-60L-PG-PN40	SM-60L-PG-PN40		1:40	
S-SERVO-PR-60L-PG-PN50	SM-60L-PG-PN50		1:50	

Drive Specifications

1. Functions / Specifications

Motor Model	SM-20 series	SM-28 series	SM-35 series	SM-42 series	SM-56 series	SM-60 series
Drive Type	SV-NDR-20 series	SV-NDR-28 series	SV-NDR-35 series	SV-NDR-42 series	SV-NDR-56 series	SV-NDR-60 series
Input Voltage	24VDC \pm 10%					
Control Method	Closed Loop control by ARM-based 32-bit MCU					
Multi Axes Drive	Maximum 16 axes through Daisy-Chain					
Position Table	256 motion command steps (Continuous, Wait, Loop, Jump and External start etc.)					
Current Consumption	Max 500mA (Except motor current)					
Operating Condition	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				
Functions	Rotation Speed	0~3,000rpm*1				
	Resolution [P/R]*2	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 (Setting by using parameter)				
	Protection Functions	Over Current, Over Speed, Position Tracking Error, Over Load, Over Temperature, Over Regenerated Voltage, Motor Connection Error, Encoder Connection Error, Motor Voltage Error, In-Position Error, ROM Error, Position Overflow Error				
	LED Display	Power status, In-Position status, Enable status, Alarm status				
	In-Position Selection	0~63 (Selectable by parameter)				
	Position Gain Selection	0~63 (Selectable by parameter)				
	Rotational Direction	CW / CCW (Selectable by parameter)				
	RUN Current	50%~150% (Setting by using 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% (Setting by using 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%					
Input Output Signal	Input Signal Functions	3 dedicated input (LIMIT+, LIMIT-, ORIGIN), 9 programmable input (Photocoupler)				
	Output Signal Functions	1 dedicated output (Compare Out), 9 programmable output (Photocoupler), Brake signal				
Communication Interface	The RS-485 serial communication with PC Transmission speed : 9,600~921,600bps					
Position Control	Incremental mode / Absolute mode Data Range : -134,217,728 to +134,217,727pulse, Operating speed : Max, 3,000rpm					
Return to Origin	Origin Sensor, Z phase, \pm Limit sensor, Torque					
GUI	User Interface Program within Windows					
Software	Motion Library (DLL) for windows 2000/XP/Vista/7/8					

*1 Maximum speed is variable according to resolution, Maximum speed is 3,000rpm until resolution 10,000. Over the 10,000 resolution, maximum rotation speed will be reduced.

*2 Maximum encoder resolution of S-SERVO Plus-R is 4,000 [P/R].
If set resolution is above 4,000[P/R], it is microstepping operation between encoder pulse.

Standard Motor Specification and Size

1. Motor Specification

20

28

35

Model	Unit	SM-20M	SM-20L	SM-28S	SM-28M	SM-28L	SM-35M	SM-35L
Current per Phase	A	0,6	0,6	0,67	0,67	0,67	0,8	1
Holding Torque	N · m	0,020	0,039	0,059	0,093	0,118	0,078	0,137
Rotor Inertia	g · cm ²	2,5	5	9	12	18	10	14
Weight	g	70	80	110	140	200	120	180
Length(L)	mm	33	38	32	45	51	26	36

* Holding Torque is based on 100% Run Current

42

56

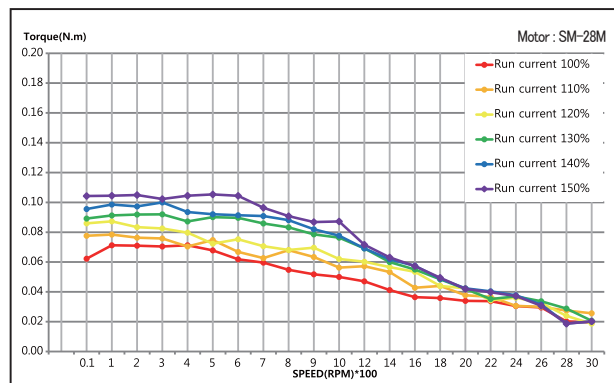
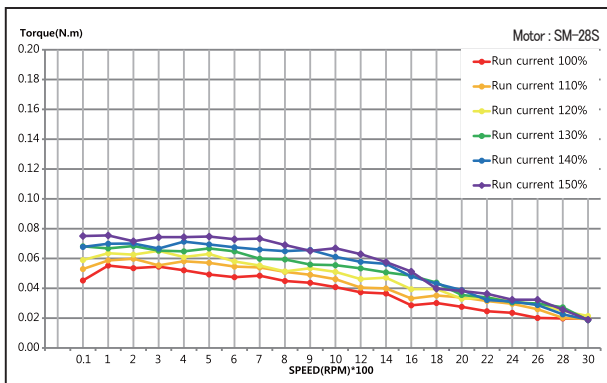
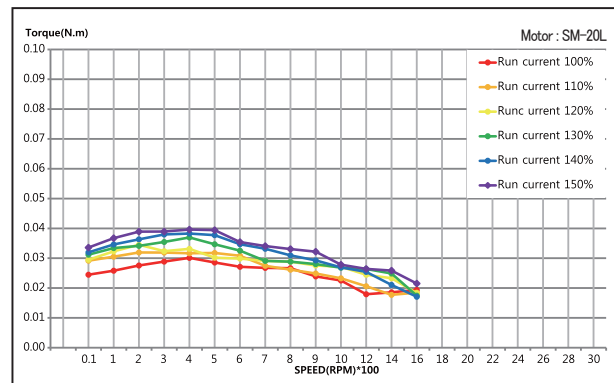
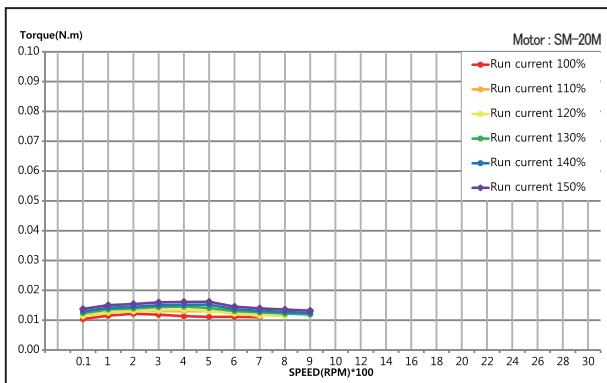
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Model	Unit	SM-42S	SM-42M	SM-42L	SM-42XL	SM-56S	SM-56M	SM-56L	SM-60S	SM-60M	SM-60L
Current per Phase	A	1,33	1,68	1,68	1,2	2,8	2,8	2,8	4	4	4
Holding Torque	N · m	0,216	0,353	0,431	0,65	0,539	1,0	1,716	0,88	1,285	2,40
Rotor Inertia	g · cm ²	35	54	68	114	120	300	480	240	490	690
Weight	g	220	280	350	500	470	700	1000	600	1000	1300
Length(L)	mm	33	39	47	60	41	56	76	47	56	85

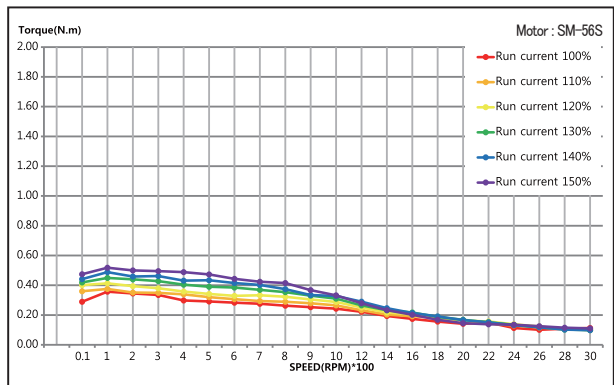
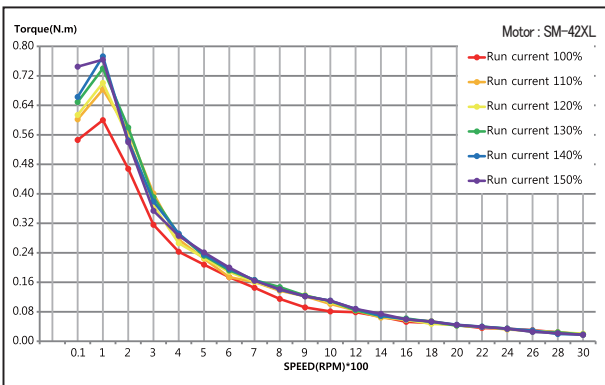
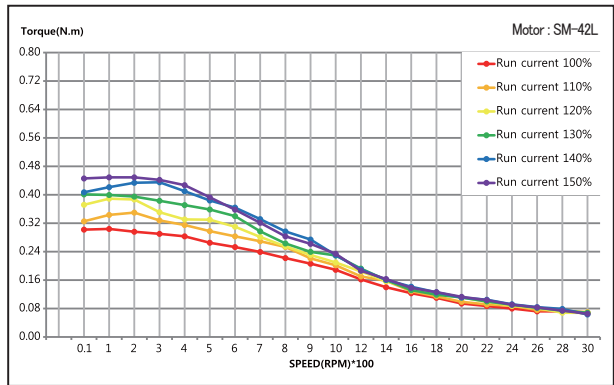
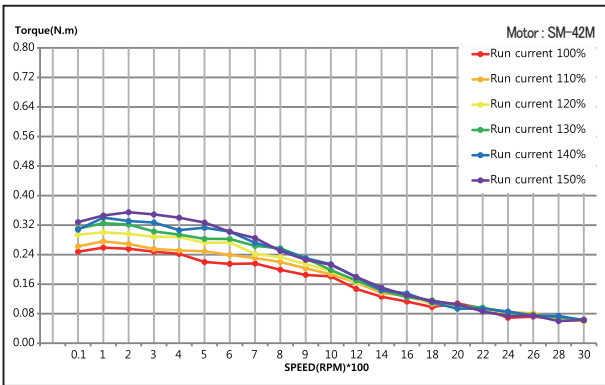
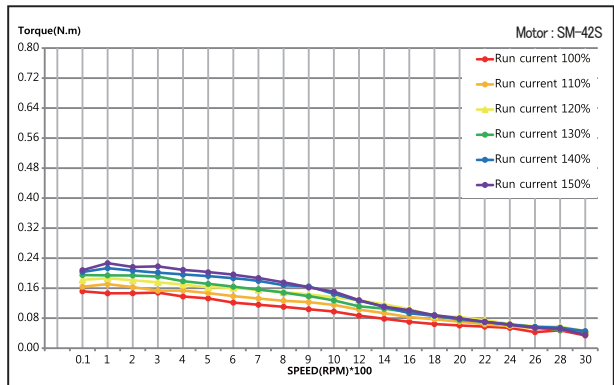
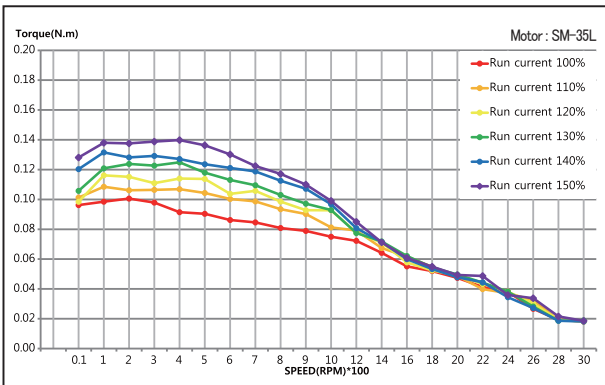
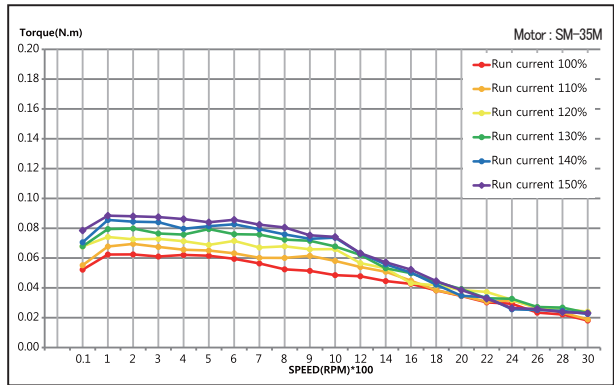
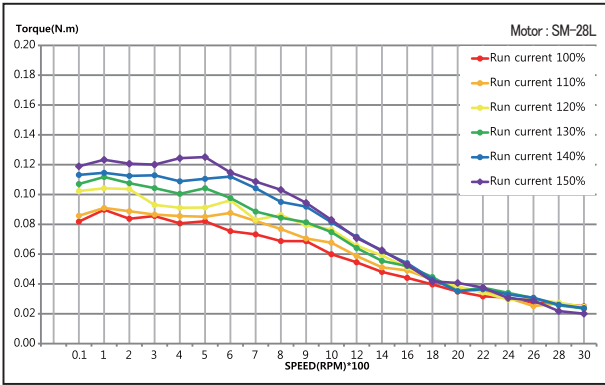
* Holding Torque is based on 100% Run Current

2. Torque Characteristic

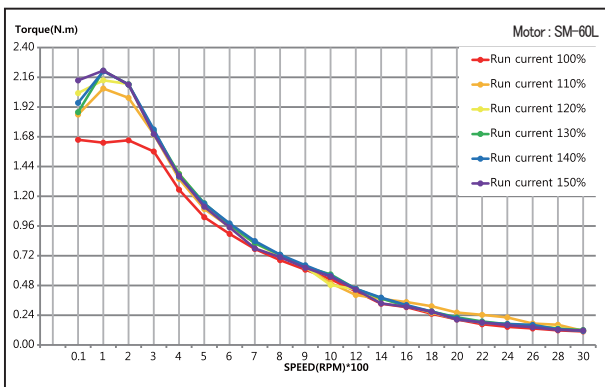
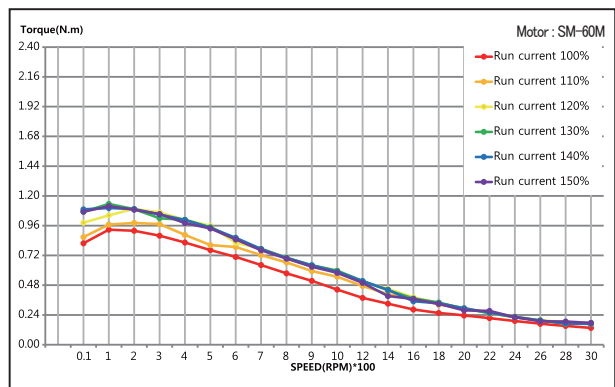
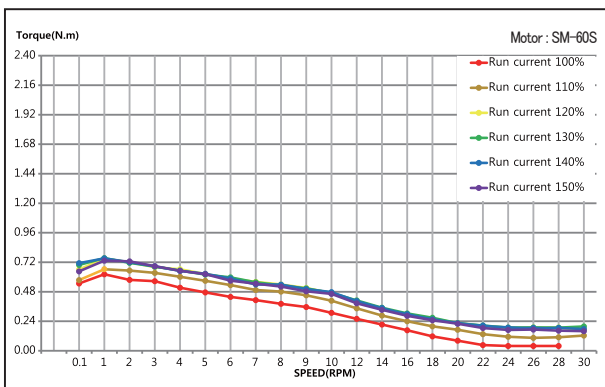
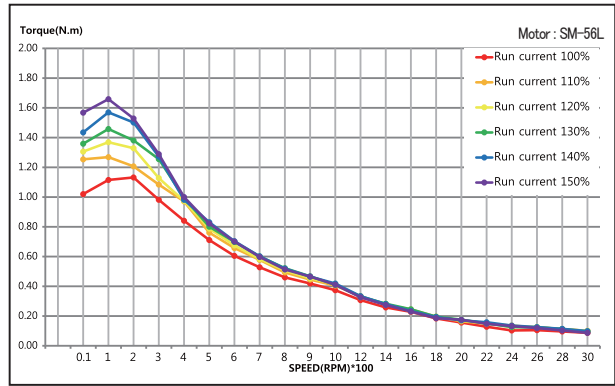
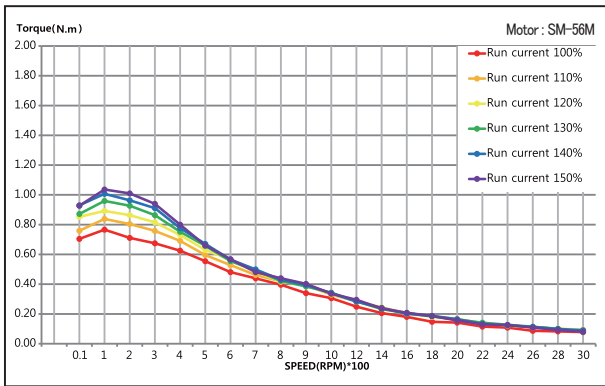
(S-SERVO Plus-R Torque Graph according to Run Current Setting)



Standard Motor Specification and Size



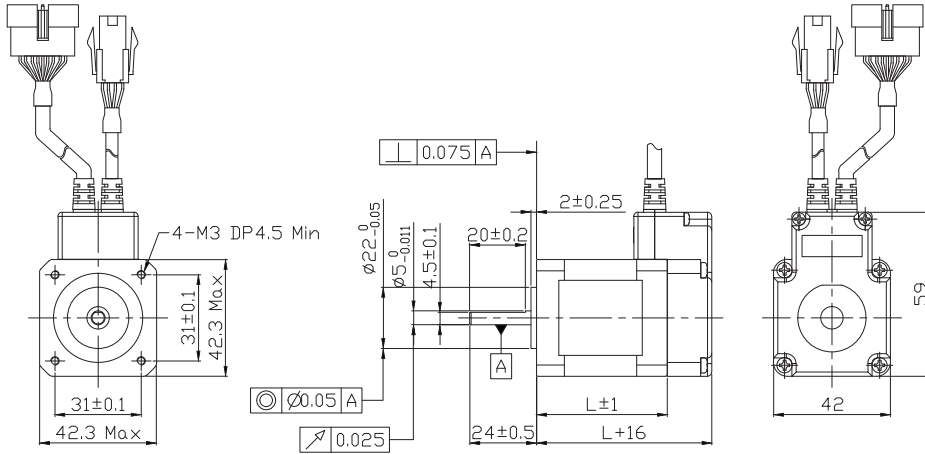
Standard Motor Specification and Size



Standard Motor Specification and Size

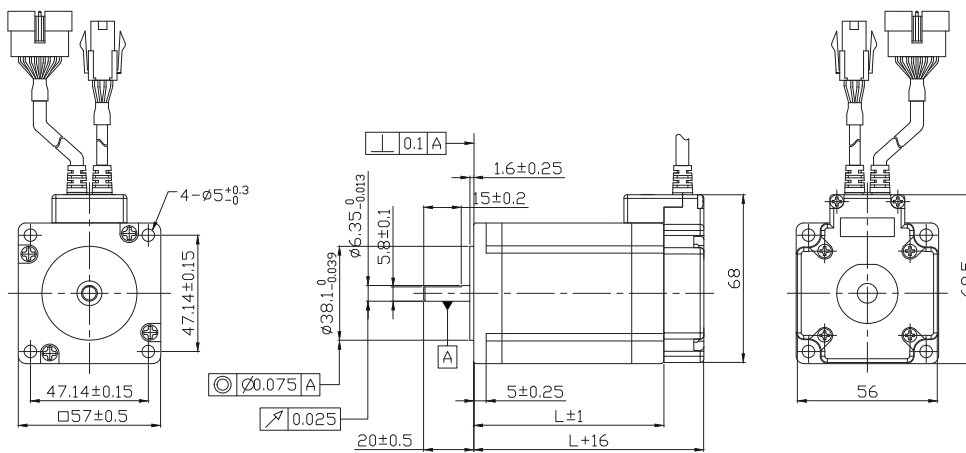
3. Motor Size(mm)

42



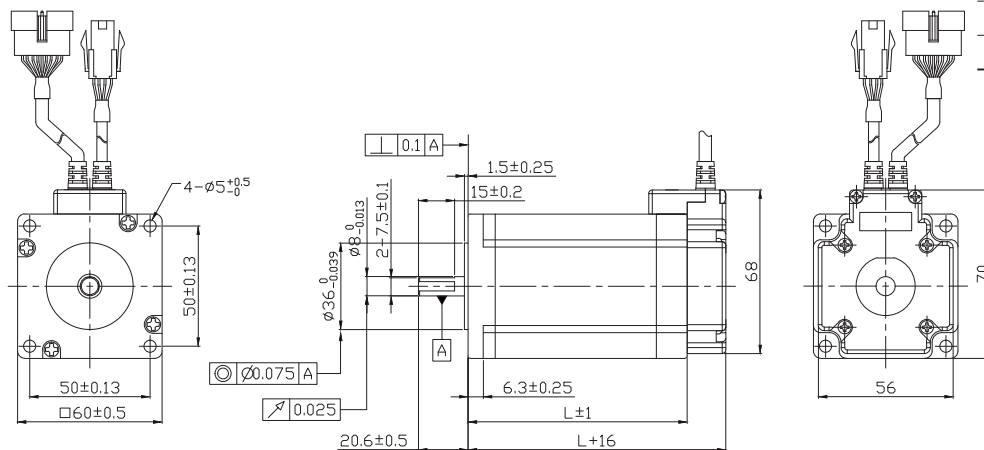
Model name	Length(L)
SM-42S	33mm
SM-42M	39mm
SM-42L	47mm
SM-42XL	60mm

56



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

60



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

Brake Installed Motor Specification and Size

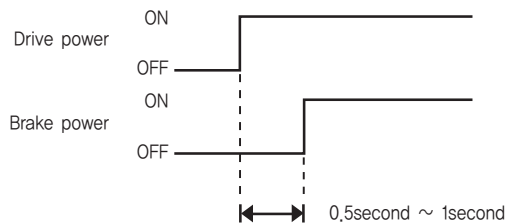
1. Motor Specification

Unit Part Number	Model Name	Electronic Brake					Motor Unit Weight (g)	Permitted Overhung Load (N)				Permitted Thrust Load (N)
		Type	Voltage Input (V)	Rated Current (A)	Power Consumption	Statical Friction Torque (N · m)		Length from Motor Point (mm)				
								3	8	13	18	
S-SERVO-PR-42S-BK	SM-42S-BK	Non-excitation run Type	24VDC ±10%	0,3A ±10%	8,2	0,2	510	22	26	33	46	Must be Lower than Unit's Weight
S-SERVO-PR-42M-BK	SM-42M-BK						570					
S-SERVO-PR-42L-BK	SM-42L-BK						640					
S-SERVO-PR-42XL-BK	SM-42XL-BK						770					
S-SERVO-PR-56S-BK	SM-56S-BK				7,5	0,7	870	52	65	85	123	
S-SERVO-PR-56M-BK	SM-56M-BK						1190					
S-SERVO-PR-56L-BK	SM-56L-BK						1380					
S-SERVO-PR-60S-BK	SM-60S-BK				7,5	0,7	1150	70	87	114	165	
S-SERVO-PR-60M-BK	SM-60M-BK						1350					
S-SERVO-PR-60L-BK	SM-60L-BK						1960					

- * 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 Name is combined model name of Motor and Brake.
- * Motor specification and torque characteristic are same as Standard Motor.

* Brake Operation Timing Chart

S-SERVO Plus-R control Brake by Drive automatically.
 Please refer to below Timing Chart when control Brake from upper controller other than using S-SERVO Plus-R Brake control.
 Otherwise, Drive malfunctioning and loads can be fall down.
 Also, please do not operate Brake while motor operation to prevent damage.



Gearbox Installed Motor Specification and Size

1. Gearbox for 42mm Motor Specification

Model Name	Maximum Holding Torque (N · m)	Rotor Inertia Moment (Kg · m ²)	Backlash (min)	Angle Transmission Error (min)	Reduction Gear Ratio	Resolution (10,000ppr Standard)	Permitted Torque (N · m)	Maximum Torque (N · m)	Permitted Speed Range (rpm)	Unit Weight (Kg)	Permitted Overhung Load (N)		Permitted Thrust Load (N)
											Axis Center Standard		
S-SERVO-PR-42S-PG-PN3	0,8	35x10 ⁻⁷	3	5	3	0,012 °	6	18	0~1000	0,89	240	270	
S-SERVO-PR-42S-PG-PN5	1,4				5	0,0072 °	9	18	0~600		290	330	
S-SERVO-PR-42S-PG-PN8					8	0,0045 °	9	18	0~375		340	410	
S-SERVO-PR-42S-PG-PN10					10	0,0036 °	6	12	0~333		360	450	
S-SERVO-PR-42S-PG-PN15	4,0		5	7	15	0,0024 °	6	12	0~300	0,99	410	540	
S-SERVO-PR-42S-PG-PN25	6,6				25	0,00144 °	9	18	0~120		490	640	
S-SERVO-PR-42S-PG-PN40	9,0				40	0,0009 °	9	18	0~75		570	640	
S-SERVO-PR-42S-PG-PN50					50	0,00072 °	9	18	0~60		620	640	
S-SERVO-PR-42M-PG-PN3	1,1	54x10 ⁻⁷	3	5	3	0,012 °	6	18	0~1000	0,96	240	270	
S-SERVO-PR-42M-PG-PN5	1,9				5	0,0072 °	9	18	0~600		290	330	
S-SERVO-PR-42M-PG-PN8					8	0,0045 °	9	18	0~375		340	410	
S-SERVO-PR-42M-PG-PN10					3,7	10	0,0036 °	6	12		0~333	360	450
S-SERVO-PR-42M-PG-PN15	5,4		5	7	15	0,0024 °	6	12	0~300	1,06	410	540	
S-SERVO-ST-42M-PG-PN25	9,0				25	0,00144 °	9	18	0~120		490	640	
S-SERVO-PR-42M-PG-PN40					40	0,0009 °	9	18	0~75		570	640	
S-SERVO-PR-42M-PG-PN50					50	0,00072 °	9	18	0~60		620	640	
S-SERVO-PR-42L-PG-PN3	1,4	77x10 ⁻⁷	3	5	3	0,012 °	6	18	0~1000	1,02	240	270	
S-SERVO-PR-42L-PG-PN5	2,4				5	0,0072 °	9	18	0~600		290	330	
S-SERVO-ST-42L-PG-PN8	3,8				8	0,0045 °	9	18	0~375		340	410	
S-SERVO-PR-42L-PG-PN10	4,7				10	0,0036 °	6	12	0~333		360	450	
S-SERVO-PR-42L-PG-PN15	6,0		5	7	15	0,0024 °	6	12	0~300	1,12	410	540	
S-SERVO-PR-42L-PG-PN25	9,0				25	0,00144 °	9	18	0~120		490	640	
S-SERVO-ST-42L-PG-PN40					40	0,0009 °	9	18	0~75		570	640	
S-SERVO-PR-42L-PG-PN50					50	0,00072 °	9	18	0~60		620	640	
S-SERVO-PR-42XL-PG-PN3	1,8	114x10 ⁻⁷	3	5	3	0,012 °	6	18	0~1000	1,15	240	270	
S-SERVO-PR-42XL-PG-PN5	3,0				5	0,0072 °	9	18	0~600		290	330	
S-SERVO-PR-42XL-PG-PN8	4,8				8	0,0045 °	9	18	0~375		340	410	
S-SERVO-PR-42XL-PG-PN10	6,0				10	0,0036 °	6	12	0~333		360	450	
S-SERVO-PR-42XL-PG-PN15			5	7	15	0,0024 °	6	12	0~300	1,25	410	540	
S-SERVO-PR-42XL-PG-PN25	25				0,00144 °	9	18	0~120	490		640		
S-SERVO-PR-42XL-PG-PN40	9,0				40	0,0009 °	9	18	0~75		570	640	
S-SERVO-PR-42XL-PG-PN50					50	0,00072 °	9	18	0~60		620	640	

Gearbox Installed Motor Specification and Size

2. Gearbox for 56mm Motor Specification

Model Name	Maximum Holding Torque (N · m)	Rotor Inertia Moment (Kg · m ²)	Backlash (min)	Angle Transmission Error (min)	Reduction Gear Ratio	Resolution (10,000ppr Standard)	Permitted Torque (N · m)	Maximum Torque (N · m)	Permitted Speed Range (rpm)	Unit Weight (Kg)	Permitted Overhung Load (N)		Permitted Thrust Load (N)
											Axis Center Standard		
S-SERVO-PR-56S-PG-PN3	1,6	120x10 ⁻⁷	3	5	3	0,012 °	27	50	0~1000	1,34	430	310	
S-SERVO-PR-56S-PG-PN5	2,7				5	0,0072 °	27	50	0~600		1,88	510	390
S-SERVO-PR-56S-PG-PN8	4,3				8	0,0045 °	27	50	0~375			600	480
S-SERVO-PR-56S-PG-PN10	5,3				10	0,0036 °	18	35	0~333			640	530
S-SERVO-PR-56S-PG-PN15	7,7				15	0,0024 °	18	35	0~300	2,08	740	630	
S-SERVO-PR-56S-PG-PN25	12,9				25	0,00144 °	27	50	0~120		870	790	
S-SERVO-PR-56S-PG-PN40	20,6				40	0,0009 °	27	50	0~75		1000	970	
S-SERVO-PR-56S-PG-PN50	25,8				50	0,00072 °	27	50	0~60		1200	1000	
S-SERVO-PR-56M-PG-PN3	2,6	200x10 ⁻⁷	3	5	3	0,0012 °	18	35	0~1000	1,4	430	310	
S-SERVO-PR-56M-PG-PN5	4,4				5	0,0072 °	27	50	0~600		2,15	510	390
S-SERVO-PR-56M-PG-PN8	7,0				8	0,0045 °	27	50	0~375			600	480
S-SERVO-PR-56M-PG-PN10	8,7				10	0,0036 °	18	35	0~333			640	530
S-SERVO-PR-56M-PG-PN15	12,7				15	0,0024 °	18	35	0~300	2,35	740	630	
S-SERVO-PR-56M-PG-PN25	21,1				25	0,00144 °	27	50	0~120		870	790	
S-SERVO-PR-56M-PG-PN40	27,0				40	0,0009 °	27	50	0~75		1000	970	
S-SERVO-PR-56M-PG-PN50					50	0,00072 °	27	50	0~60		1200	1000	
S-SERVO-PR-56L-PG-PN3	4,3	480x10 ⁻⁷	3	5	3	0,012 °	18	35	0~1000	1,1	430	310	
S-SERVO-PR-56L-PG-PN5	7,2				5	0,0072 °	27	50	0~600		2,22	510	390
S-SERVO-PR-56L-PG-PN8	11,4				8	0,0045 °	27	50	0~375			600	480
S-SERVO-PR-56L-PG-PN10	14,3				10	0,0036 °	18	35	0~333			640	530
S-SERVO-PR-56L-PG-PN15	18,0				15	0,0024 °	18	35	0~300	2,42	740	630	
S-SERVO-PR-56L-PG-PN25	27,0				25	0,00144 °	27	50	0~120		870	790	
S-SERVO-PR-56L-PG-PN40					40	0,0009 °	27	50	0~75		1000	970	
S-SERVO-PR-56L-PG-PN50					50	0,00072 °	27	50	0~60		1200	1000	

Gearbox Installed Motor Specification and Size

3. Gearbox for 60mm Motor Specification

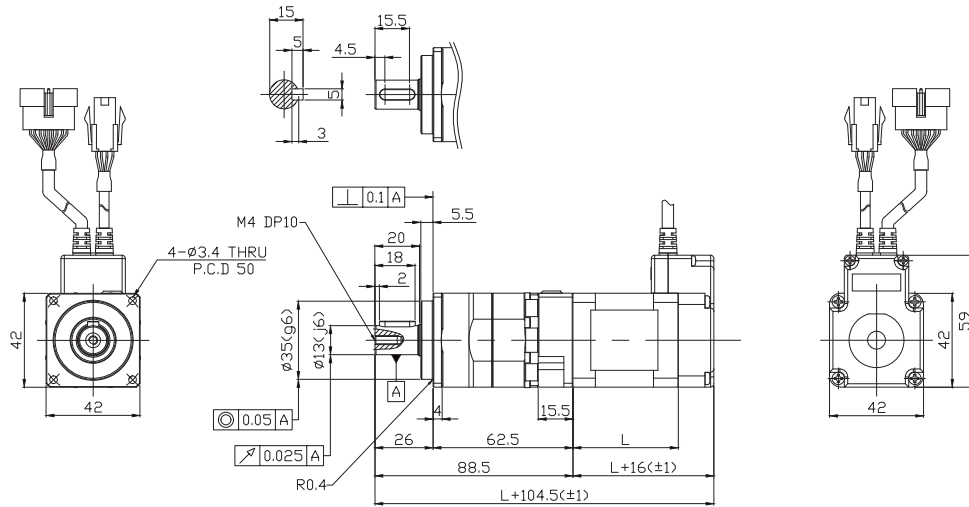
Model Name	Maximum Holding Torque (N · m)	Rotor Inertia Moment (Kg · m ²)	Backlash (min)	Angle Transmission Error (min)	Reduction Gear Ratio	Resolution (10,000ppr Standard)	Permitted Torque (N · m)	Maximum Torque (N · m)	Permitted Speed Range (rpm)	Unit Weight (Kg)	Permitted Overhung Load (N)	Permitted Thrust Load (N)	
											Axis Center Standard		
S-SERVO-PR-60S-PG-PN3	2.6	140x10 ⁻⁷	3	5	3	0.012 °	18	35	0~1000	1.4	430	310	
S-SERVO-PR-60S-PG-PN5	4.4										2.0	510	390
S-SERVO-PR-60S-PG-PN8	7.0											600	480
S-SERVO-PR-60S-PG-PN10	8.8										640	530	
S-SERVO-PR-60S-PG-PN15	12.7									2.2	740	630	
S-SERVO-PR-60S-PG-PN25	21.2										870	790	
S-SERVO-PR-60S-PG-PN40	27.0										1000	970	
S-SERVO-PR-60S-PG-PN50											1200	1000	
S-SERVO-PR-60M-PG-PN3	3.6	320x10 ⁻⁷	3	5	3	0.012 °	18	35	0~1000	1.4	430	310	
S-SERVO-PR-60M-PG-PN5	6.0										2.3	510	390
S-SERVO-PR-60M-PG-PN8	9.6											600	480
S-SERVO-PR-60M-PG-PN10	12.0										640	530	
S-SERVO-PR-60M-PG-PN15	17.4									2.5	740	630	
S-SERVO-ST-60M-PG-PN25	27.0										870	790	
S-SERVO-PR-60M-PG-PN40											1000	970	
S-SERVO-PR-60M-PG-PN50											1200	1000	
S-SERVO-PR-60L-PG-PN3	7.1	800x10 ⁻⁷	3	5	3	0.012 °	18	35	0~1000	1.4	430	310	
S-SERVO-PR-60L-PG-PN5	11.9										3.0	510	390
S-SERVO-PR-60L-PG-PN8	19.0											600	480
S-SERVO-PR-60L-PG-PN10	18.0										640	530	
S-SERVO-PR-60L-PG-PN15										3.2	740	630	
S-SERVO-PR-60L-PG-PN25	870										790		
S-SERVO-PR-60L-PG-PN40	1000										970		
S-SERVO-PR-60L-PG-PN50	1200										1000		

Gearbox Installed Motor Specification and Size

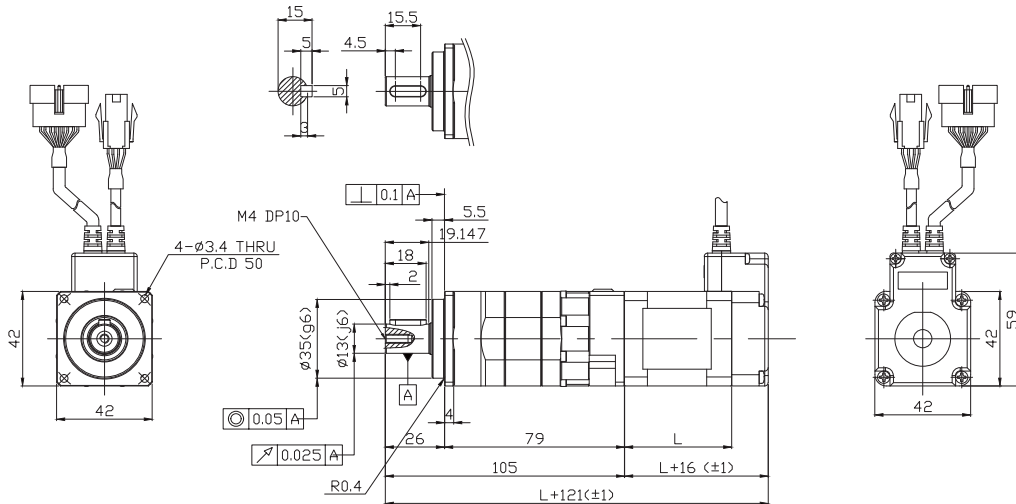
4. Motor Size(mm)

42

Model Name	Applied Motor Model Name	Stage	□ Second Stage	L Length (mm)
S-SERVO-PR-42S-PG-PN□	SM-42S-PG-PN□	Single Stage	3, 5, 8, 10	33
S-SERVO-PR-42M-PG-PN□	SM-42M-PG-PN□		3, 5, 8, 10	39
S-SERVO-PR-42L-PG-PN□	SM-42L-PG-PN□		3, 5, 8, 10	47
S-SERVO-PR-42XL-PG-PN□	SM-42XL-PG-PN□		3, 5, 8, 10	60



Model Name	Applied Motor Model Name	Stage	□ Second Stage	L Length (mm)
S-SERVO-PR-42S-PG-PN□	SM-42S-PG-PN□	Second Stage	15, 25, 40, 50	33
S-SERVO-PR-42M-PG-PN□	SM-42M-PG-PN□		15, 25, 40, 50	39
S-SERVO-PR-42L-PG-PN□	SM-42L-PG-PN□		15, 25, 40, 50	47
S-SERVO-PR-42XL-PG-PN□	SM-42XL-PG-PN□		15, 25, 40, 50	60

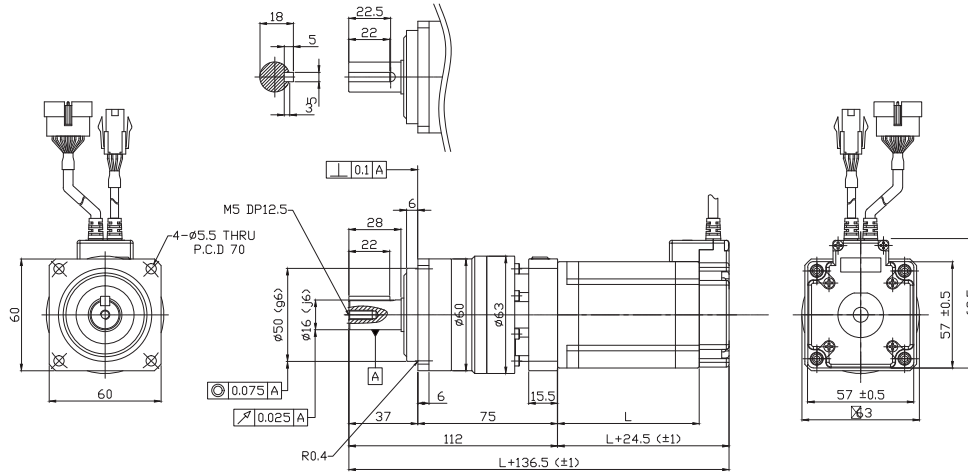


Gearbox Installed Motor Specification and Size

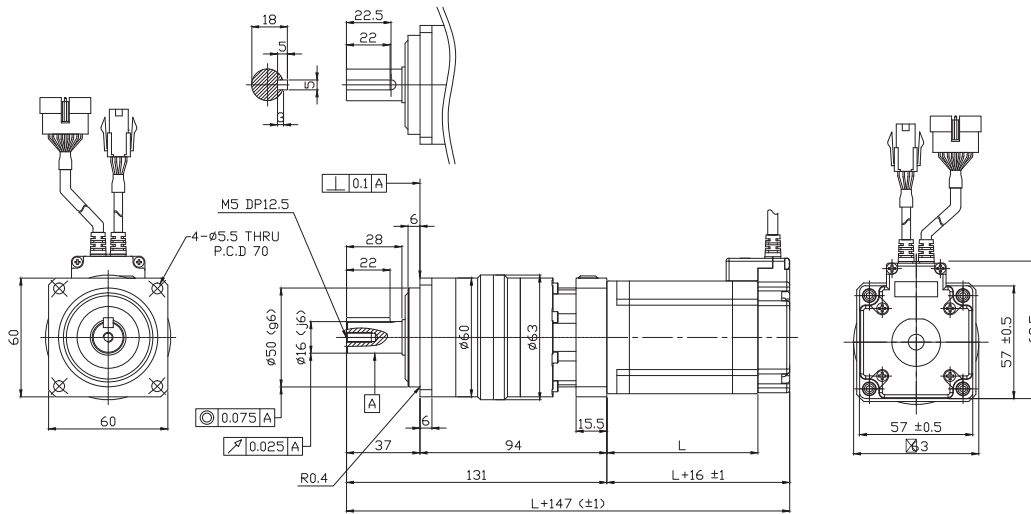
4. Motor Size(mm)

56

Model Name	Applied Motor Model Name	Stage	□Second Stage	L Length (mm)
S-SERVO-PR-56S-PG-PN □	SM-56S-PG-PN □	Single Stage	3, 5, 8, 10	41
S-SERVO-PR-56M-PG-PN □	SM-56M-PG-PN □		3, 5, 8, 10	56
S-SERVO-PR-56L-PG-PN □	SM-56L-PG-PN □		3, 5, 8, 10	76



Model Name	Applied Motor Model Name	Stage	□Second Stage	L Length (mm)
S-SERVO-PR-56S-PG-PN □	SM-56S-PG-PN □	Second Stage	15, 25, 40, 50	41
S-SERVO-PR-56M-PG-PN □	SM-56M-PG-PN □		15, 25, 40, 50	56
S-SERVO-PR-56L-PG-PN □	SM-56L-PG-PN □		15, 25, 40, 50	76

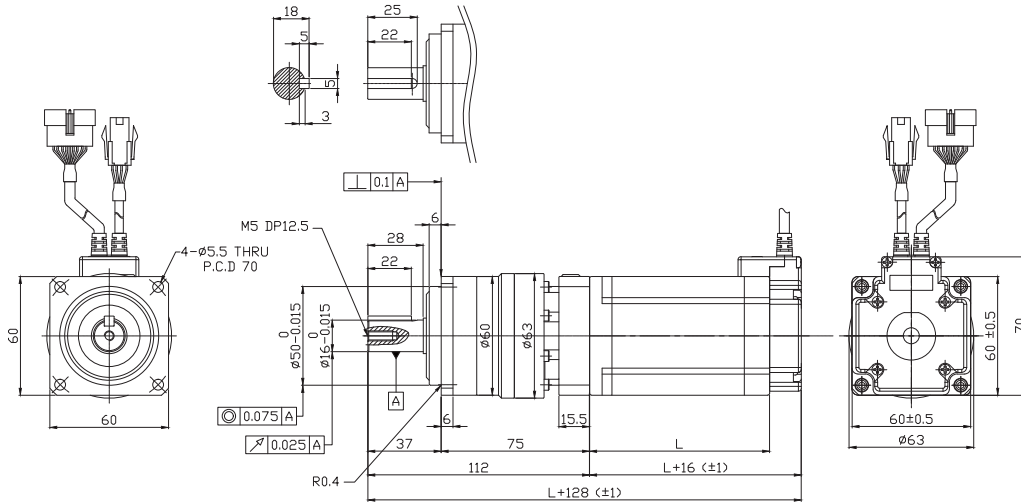


Gearbox Installed Motor Specification and Size

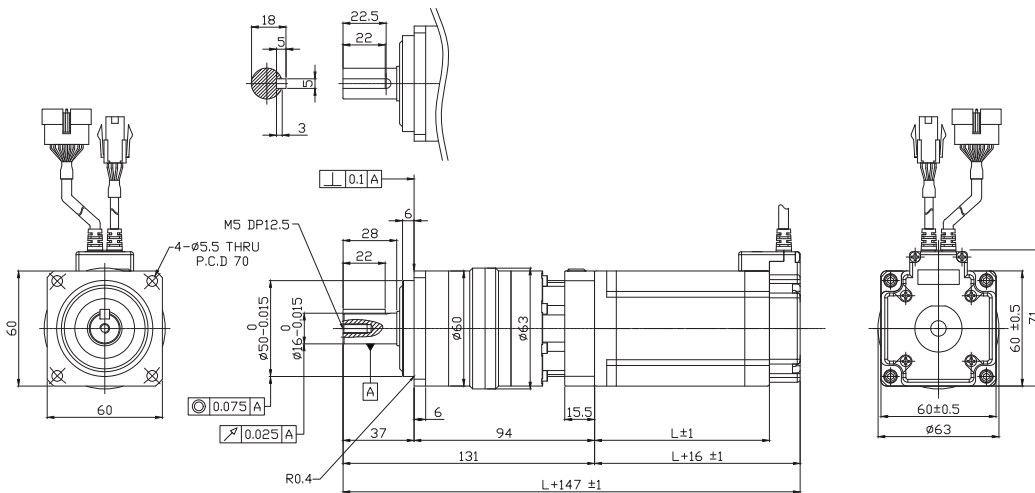
4. Motor Size(mm)

60

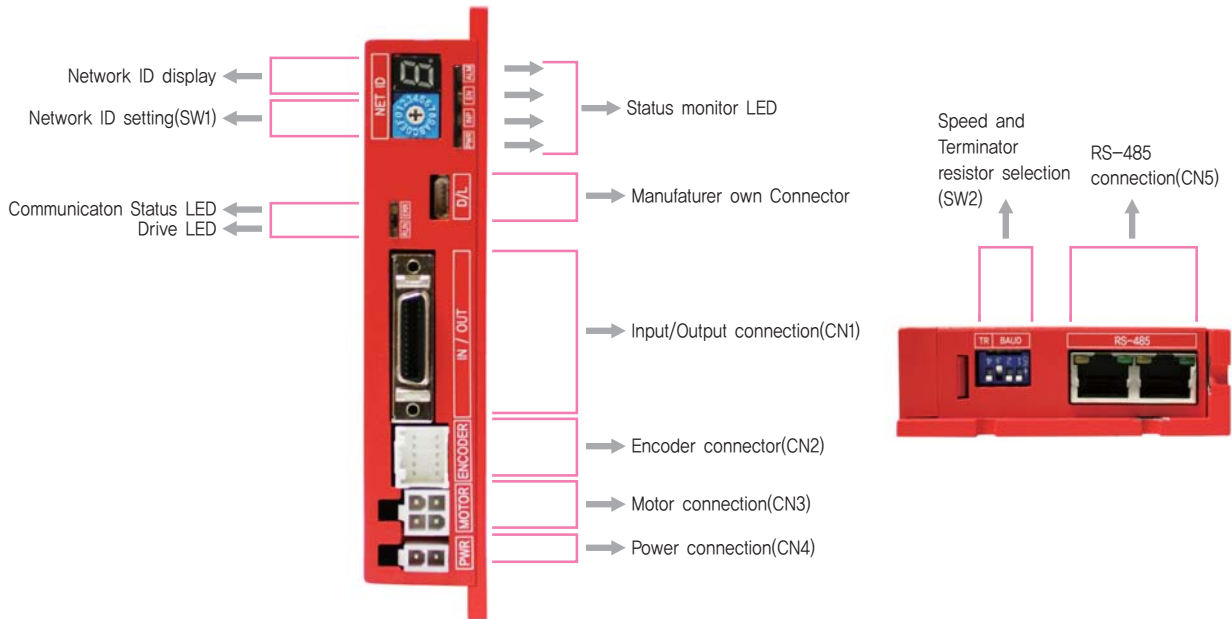
Model Name	Applied Motor Model Name	Stage	□Second Stage	L Length (mm)
S-SERVO-PR-60S-PG-PN□	SM-60S-PG-PN□	Single Stage	3, 5, 8, 10	47
S-SERVO-PR-60M-PG-PN□	SM-60M-PG-PN□		3, 5, 8, 10	56
S-SERVO-PR-60L-PG-PN□	SM-60L-PG-PN□		3, 5, 8, 10	85



Model Name	Applied Motor Model Name	Stage	□Second Stage	L Length (mm)
S-SERVO-PR-60S-PG-PN□	SM-60S-PG-PN□	Second Stage	15, 25, 40, 50	47
S-SERVO-PR-60M-PG-PN□	SM-60M-PG-PN□		15, 25, 40, 50	56
S-SERVO-PR-60L-PG-PN□	SM-60L-PG-PN□		15, 25, 40, 50	85



Setting and Operation [S-SERVO Plus-R]



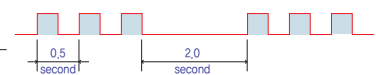
1. Status Monitor LED

Indication	Color	Function	ON/OFF Condition
PWR	Green	Power Input Indication	LED is turned ON when power is applied
INP	Yellow	Complete Positioning Motion	Light on when Position Deviation located within preset value* 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)

* Default = 0
Can be selected by parameter setting GUI

◆ Protection functions and LED flash times

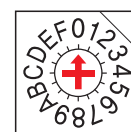
Times	Protection	Conditions
1	Over Current Error	The current through power devices in inverter exceeds the limit value
2	Over Speed Error	Motor speed exceed 3,000rpm
3	Position Tracking Error	Position error value is higher than 85° in motor run state
4	Over Load Error	The motor is continuously operated more than 5 second under a load exceeding the max. torque
5	Over Temperature Error	Inside temperature of drive exceeds 65°C
6	Over Regenerated Voltage Error	Back-EMF more than 40V
7	Motor Connect Error	The power is ON without connection of the motor cable to drive
8	Encoder Connect Error	Cable connection error with Encoder connector in drive
9	Motor Voltage Error	Motor voltage less than 20V
10	In-Position Error	After operation is finished, a position error occurs
12	ROM Error	Error occurs in parameter storage device(ROM)
15	Position Overflow error	Position error value is higher than 90° in motor stop state



Alarm LED flash (ex: Position tracking error)

2. Network ID Selection Switch(SW1)

Position	ID number	Position	ID number
0	0	8	8
1	1	9	9
2	2	A	10
3	3	B	11
4	4	C	12
5	5	D	13
6	6	E	14
7	7	F	15



※Maximum 16 axis can be connected in one network.

3. Speed and Terminator Resistor Selection Switch(SW2)

The purpose of this is to set the communication speed and connect a terminator resistor if drive is installed at the end of network.

SW 2,4 used for connecting the terminator resistor.
SW 2,1~SW 2,3 used for setting speed as follows.

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

*1 : Default setting value

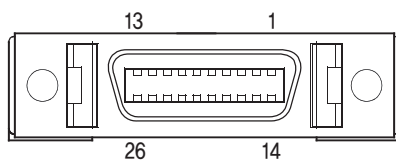
If SW2,4 is OFF, terminator resistor is disconnected.
If SW2,4 is ON, terminator resistor is connected.



4. Input/Output Signal(CN1)

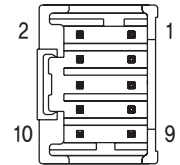
NO.	Function	I/O
1	LIMIT+	Input
2	LIMIT-	Input
3	ORIGIN	Input
4	Digital In1	Input
5	Digital In6	Input
6	Digital In7	Input
7	Compare Out1	Output
8	Digital Out1	Output
9	Digital Out2	Output
10	Digital Out3	Output
11	Digital Out4	Output
12	Digital Out5	Output
13	Digital Out6	Output
14	Digital In2	Input
15	Digital In3	Input
16	Digital In4	Input
17	Digital In5	Input
18	Digital In8	Input
19	Digital In9	Input
20	Digital Out7	Output
21	Digital Out8	Output
22	Digital Out9	Output
23	BRAKE+	Output
24	BRAKE-	Output
25	24VDC GND	Input
26	24VDC	Input

※BRAKE function is optional.



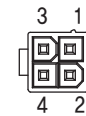
5. Encoder Connector(CN2)

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



6. Motor Connector(CN3)

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



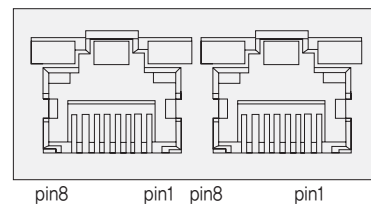
7. Power Connector(CN4)

NO.	Function
1	24VDC ±10%
2	GND



8. RS-485 Communication Connector(CN5)

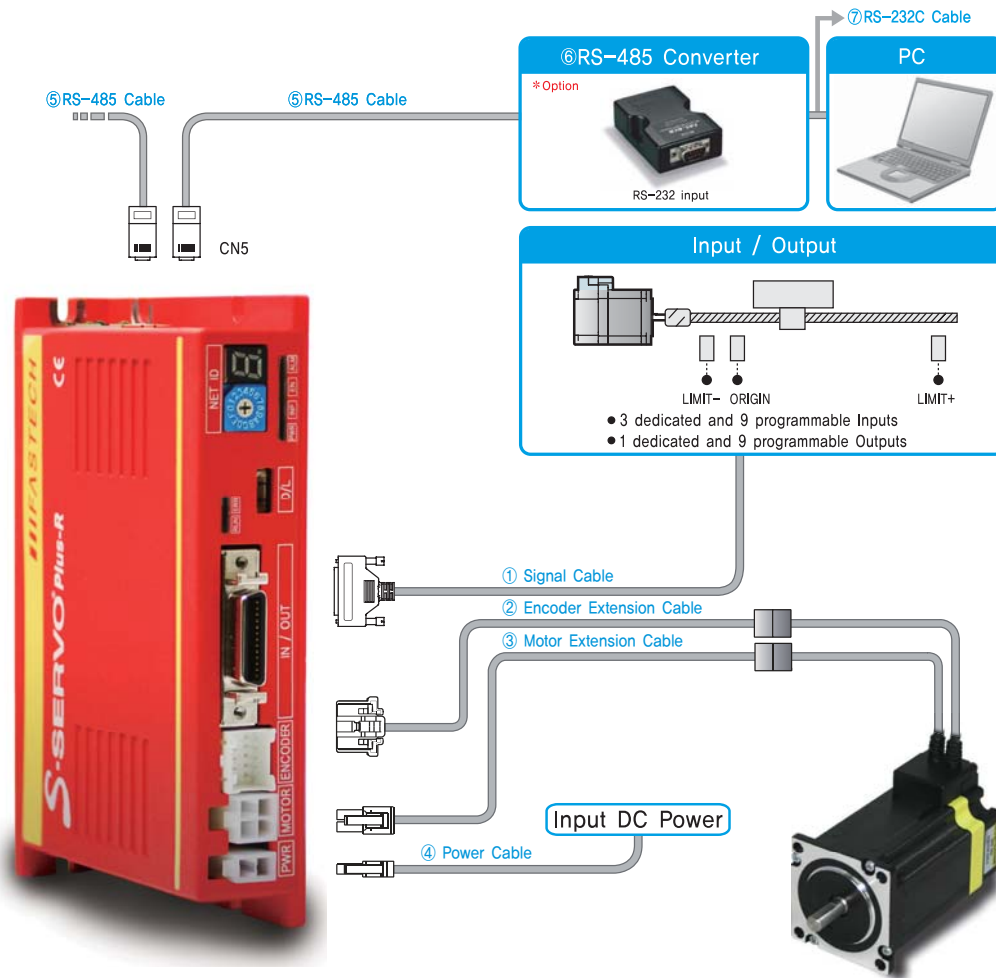
NO.	Function	NO.	Function
1	GND	5	GND
2	GND	6	Data-
3	Data+	7	GND
4	GND	8	GND



9. Communicaton Status Indicator LED

Indication	Color	Function	Blinking Condition
RUN	Green	Indicate communication status	Lighting : Waiting Communication, Blink : Under Communication
ERR	Red	Indicate Alarm	Blinks when communication ERROR and protection function executes

System Configuration [S-SERVO Plus-R]



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

Accessories [S-SERVO Plus-R]

Purpose		ITEM	Standard	Quantity	Quantity
I/O Connections(CN1)		Connector	10126-3000PE	1	3M
		Shell	10326-52FO-008	1	
Encoder Connection	Drive Side(CN2)	Housing	51353-1000	1	MOLEX
		Terminal	56134-9000	12	
	Encoder Side	Housing	SMP-09V-NC	1	JST
		Terminal	SHF-001T-0.8BS	10	
Motor Connection	Drive Side(CN3)	Housing	5557-04R	1	MOLEX
		Terminal	5556T	5	
	Motor Side	Housing	5557-04R	1	
		Terminal	5556T	5	
Power Connection(CN4)		Housing	5557-02R	1	
		Terminal	5556T	3	

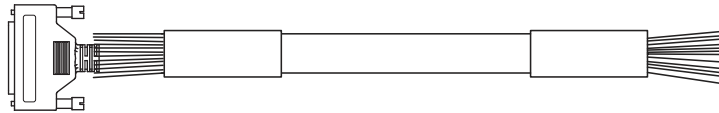
[S-SERVO Plus-R] Cable Option

①Signal Cable

Model Name	Length(m)	Remark
CSVR-S-□□□F	□□□	Normal Cable
CSVR-S-□□□M	□□□	Robot Cable

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

Manufacturer : 3M
 Connector : 10126-3000PE
 Shell : 10326-52FO-008

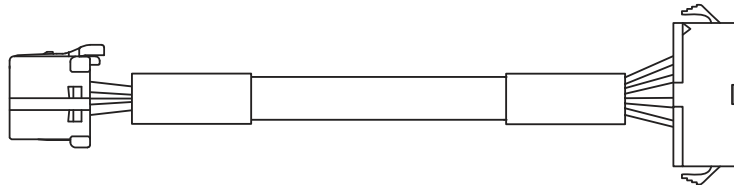


②Encoder Extension Cable

Model Name	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



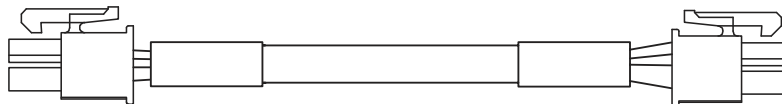
Manufacturer : JST
 Housing : SMP-09V-NC
 Terminal : SHF-001T-0,8BS

③Motor Extension Cable

Model Name	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



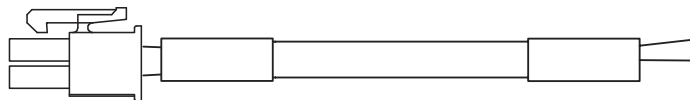
Manufacturer : MOLEX
 Housing : 5557-04R
 Terminal : 5556T

④Drive Power Cable

Model Name	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



⑥RS-485 Cable

Item	Length[m]	Remark
CGNR-R-0R6F	0,6	Normal Cable
CGNR-R-001F	1	
CGNR-R-1R5F	1,5	
CGNR-R-002F	2	
CGNR-R-003F	3	
CGNR-R-005F	5	

⑦FAS-RCR(RS-232C to RS-485 Converter)

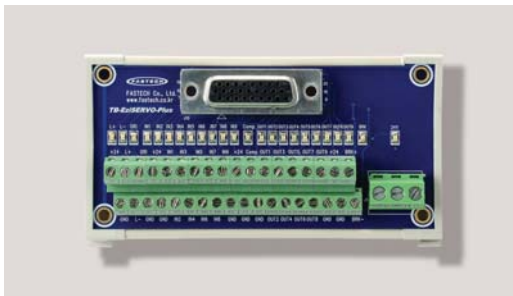
Item	Specification
Comm, Speed	Max, 115,2Kbps
Comm, Distance	RS-232C : Max, 15m RS-485 : Max, 1,2km
Connector Type	RS-232C : DB9 Female RS-485 : RJ-45
Dimension	50X75X23mm
Weight	38g
Power	Powered from PC (Usable for external DC5~24V)

⑧RS-232C Cable

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

⑨TB-Plus(Interface Board)

Available to connect more conveniently between Input/Output signal and S-SERVO Plus-R.



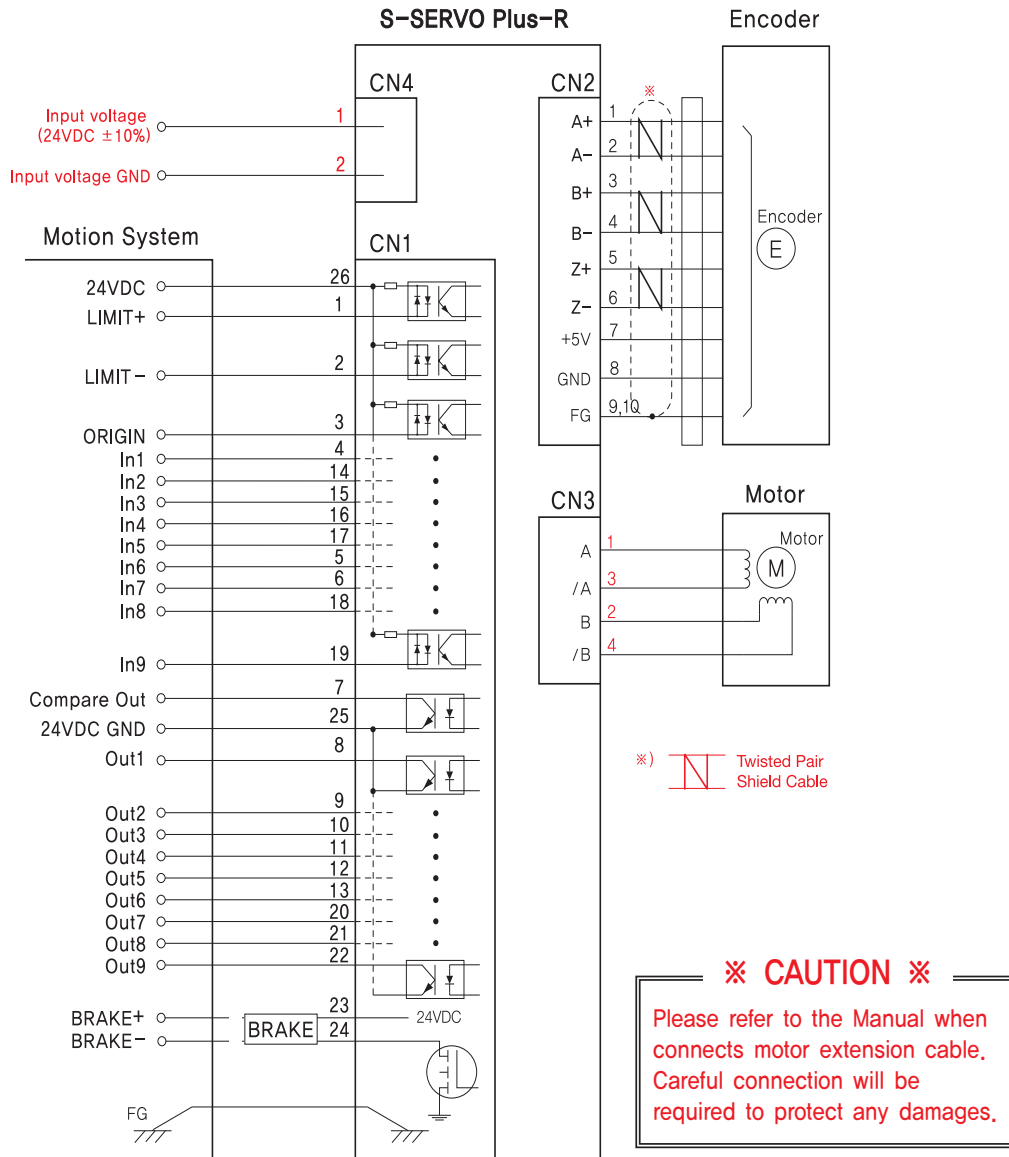
Interface Cable

Available to Connect between TB-Plus Interface Board and S-SERVO Plus-R.

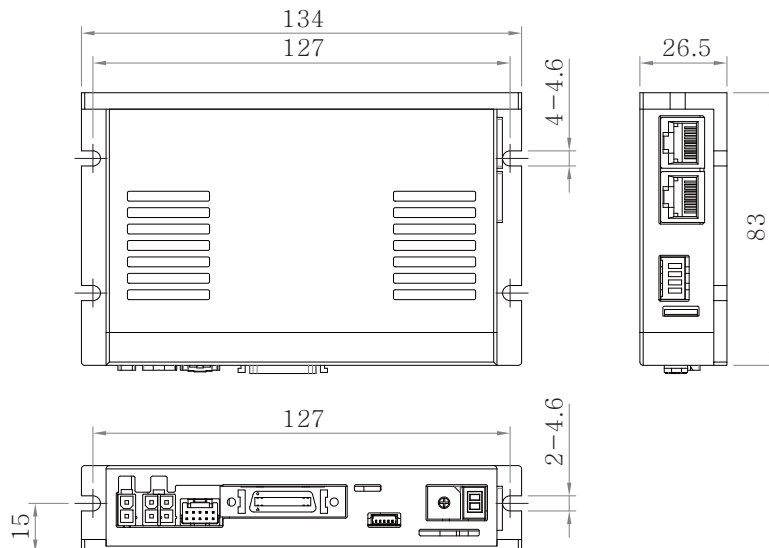
Item	Length[m]	Remark
CIFD-S-□□□F	□□□	Normal Cable
CIFD-S-□□□M	□□□	Robot Cable

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

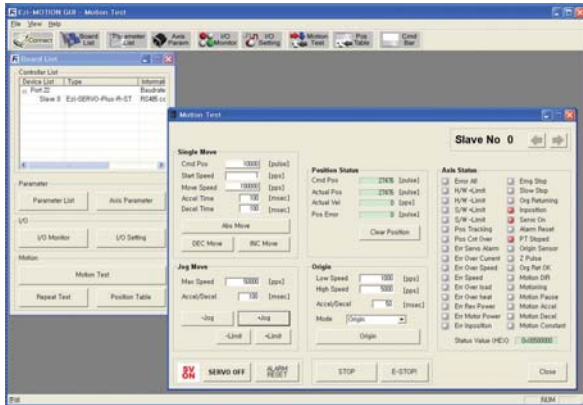
External Wiring Diagram [S-SERVO Plus-R]



Drive Size [S-SERVO Plus-R] (mm)

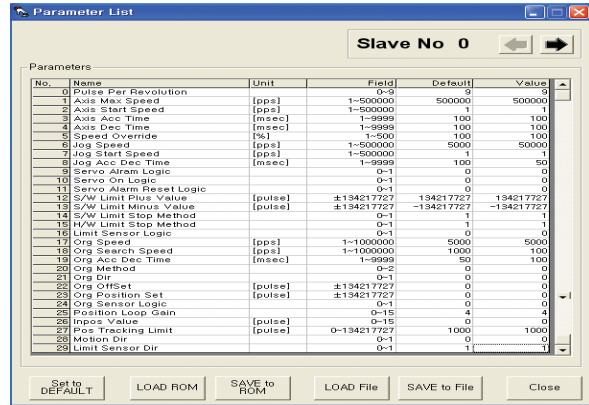


GUI(Graphic User Interface) Screenshot



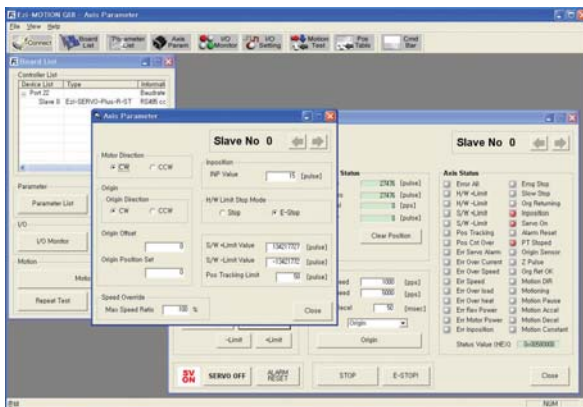
◆ Controller Lists and Motion Test

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



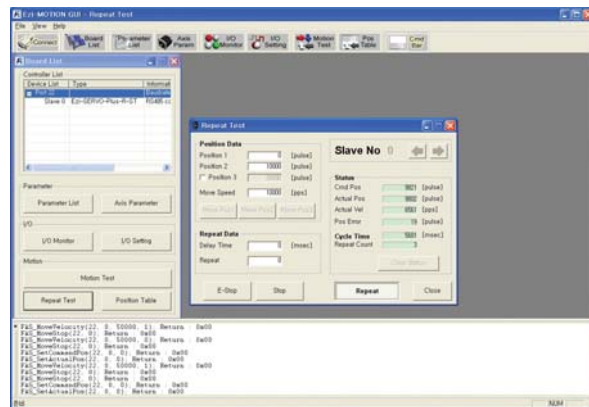
◆ Parameter List

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



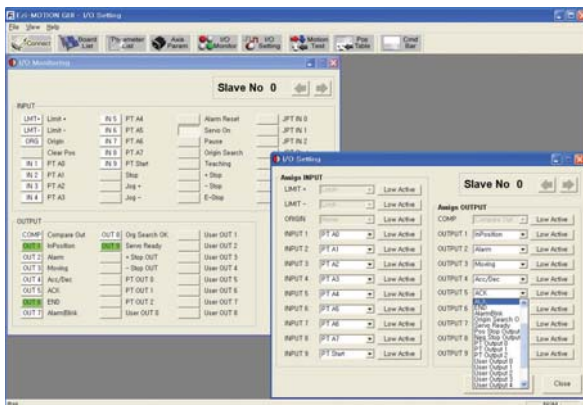
◆ Axis Parameter Setup

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



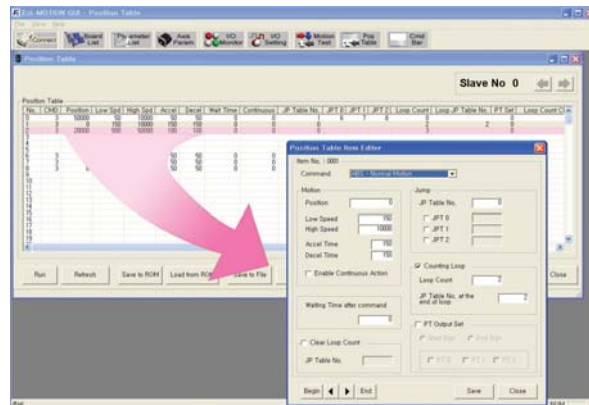
◆ Motion Repeat and Monitor Status

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



◆ I/O Monitoring and Setting

You can select various digital input and output signals of the controller.



◆ Position Table

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



Fast, Accurate, Smooth Motion

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