

S-SERVO[®] II

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)



CE

FASTECH

Fast, Accurate, Smooth Motion

Features

S-SERVO II 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 drive resolution can be heated easily because of constant current goes into the motor regardless of loads magnitude. However S-SERVO II 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%)

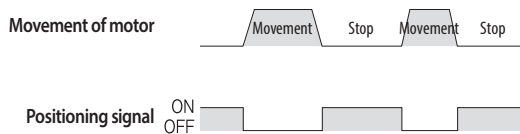
1. Completely Free from the Concern of Loss of Position (Alarm will be generated when step out)

Because of mounted encoder constantly monitor the current position, step out cannot be occurred. If step out occurred by external force or 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 resolve the problem of unclear positioning of current Open Loop System.

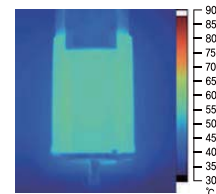


3. Position Precision is Only Related to Encoder

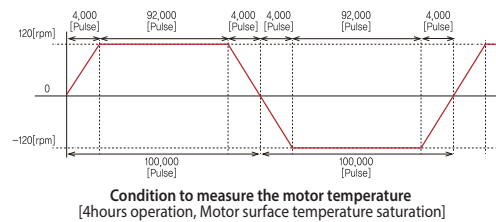
S-SERVO II controls position by using high precision of encoder. Regardless of motor type(2 Phase or 5 Phase), S-SERVO II position precision is only related to mounted encoder resolution so high precision of positioning is possible unlike open loop micro step motor and drive which adapts 2 Phase or 5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

4. Reduce the Motor Temperature and Energy Usage. (Current control according to load)

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



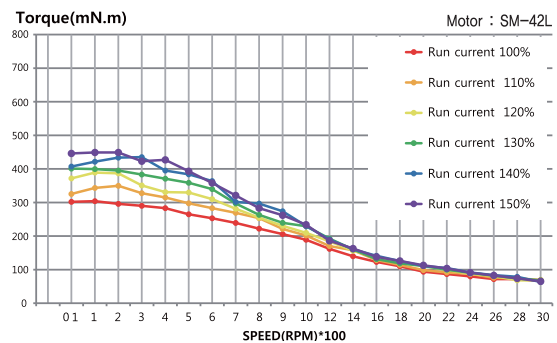
Motor temperature [measured by thermograph]



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

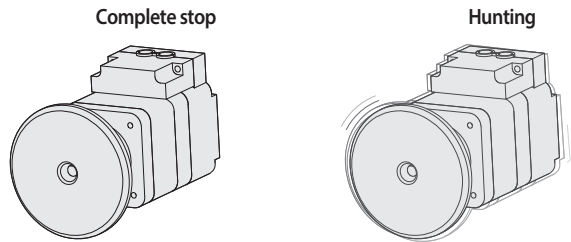
5. Improved acceleration and deceleration characteristics by Boost Current.

by Boost Current Setting of Parameter setting. It enables acceleration and deceleration characteristics to be improved.



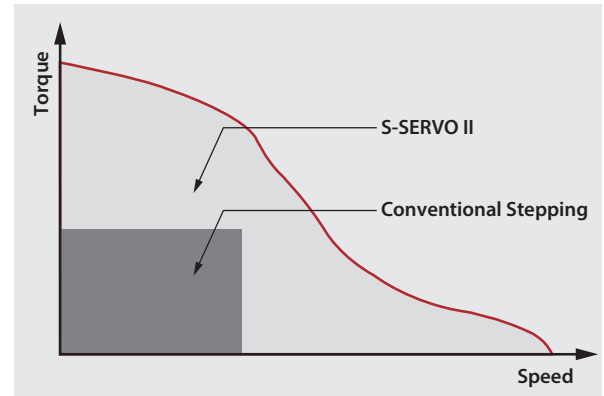
6. Complete Stop

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



8. High Torque and High Speed

S-SERVO II 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.



7. 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.

9. Variety of Position Command Unit

According to the purpose of usage, S-SERVO II offer 16 stage(500 ~50,000[ppr]) of position command unit.



Part Numbering Method

S-SERVO II-ST-56L-A-BK-PN05-□



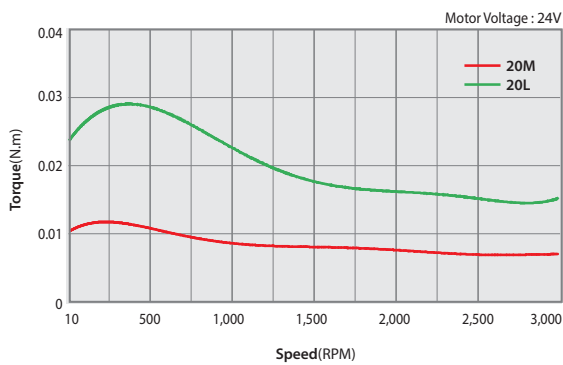
Motor, Drive Combination

	UNIT No.	MOTOR No.	DRIVE No.
	S-SERVO II-ST-20M	SM-20M	SV2-PD-20M
	S-SERVO II-ST-20L	SM-20L	SV2-PD-20L
	S-SERVO II-ST-28S	SM-28S	SV2-PD-28S
	S-SERVO II-ST-28M	SM-28M	SV2-PD-28M
	S-SERVO II-ST-28L	SM-28L	SV2-PD-28L
	S-SERVO II-ST-35M	SM-35M	SV2-PD-35M
	S-SERVO II-ST-35L	SM-35L	SV2-PD-35L
	S-SERVO II-ST-42S	SM-42S	SV2-PD-42S
	S-SERVO II-ST-42M	SM-42M	SV2-PD-42M
	S-SERVO II-ST-42L	SM-42L	SV2-PD-42L
	S-SERVO II-ST-42XL	SM-42XL	SV2-PD-42XL
	S-SERVO II-ST-56S	SM-56S	SV2-PD-56S
	S-SERVO II-ST-56M	SM-56M	SV2-PD-56M
	S-SERVO II-ST-56L	SM-56L	SV2-PD-56L
	S-SERVO II-ST-60S	SM-60S	SV2-PD-60S
	S-SERVO II-ST-60M	SM-60M	SV2-PD-60M
	S-SERVO II-ST-60L	SM-60L	SV2-PD-60L

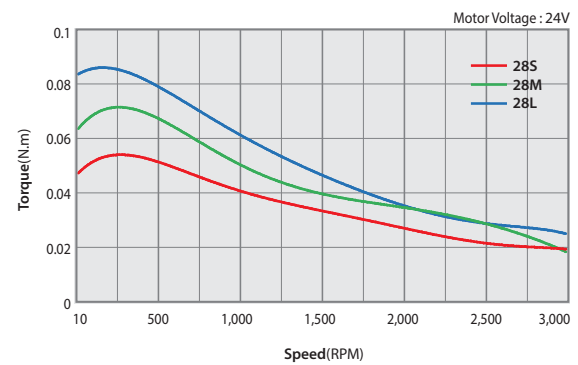
Motor Specification Table

Model	Unit	20		28			35	
		20M	20L	28S	28M	28L	35M	35L
DRIVE METHOD	-	BI-POLAR						
Number OF PHASES	-	2	2	2	2	2	2	2
VOLTAGE	VDC	3.9	6	3.75	4.55	6.2	3.8	2.7
CURRENT per PHASE	A	0.6	0.6	0.67	0.67	0.67	0.8	1
RESISTANCE per PHASE	Ohm	6.5	10	5.6	6.8	9.2	4.8	2.7
INDUCTANCE per PHASE	mH	2.2	5.5	4.2	4.9	5.7	4	4.3
HOLDING TORQUE	N·m	0.018	0.037	0.069	0.098	0.118	0.078	0.137
ROTOR INERTIA	g·cm ²	3	3.3	9	13	18	10	14
WEIGHTS	g	70	80	110	140	200	120	180
LENGTH(L)	mm	33	38	32	45	50	26	36
ALLOWABLE OVERHUNG LOAD (DISTANCE FROM END OF SHAFT)	3mm	18	18	30	30	30	22	22
	8mm	30	30	38	38	38	26	26
	13mm	-	-	53	53	53	33	33
	18mm	-	-	-	-	-	46	46
ALLOWABLE THRUST LOAD	N	Lower than motor weight						
INSULATION RESISTANCE	Mohm	100 MΩ MIN.(at 500VDC)						
INSULATION CLASS	-	CLASS B(130°C)						
OPERATING TEMPERATURE	°C	0 to 55						

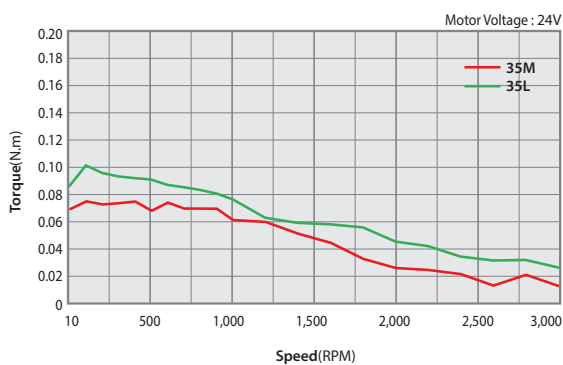
S-SERVO II ST_20 Series



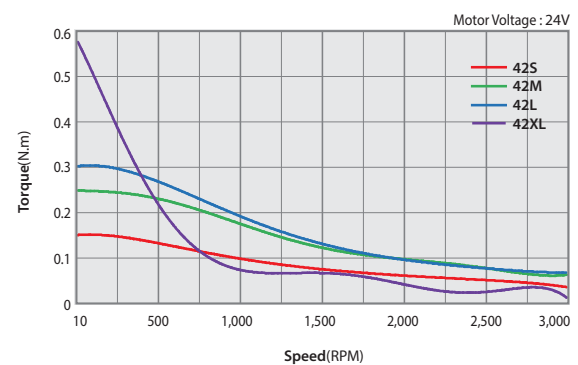
S-SERVO II ST_28 Series



S-SERVO II ST_35 Series



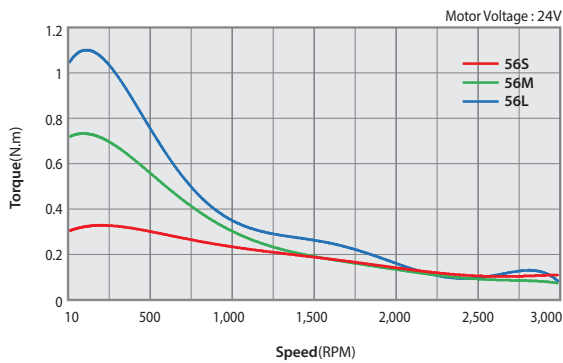
S-SERVO II ST_42 Series



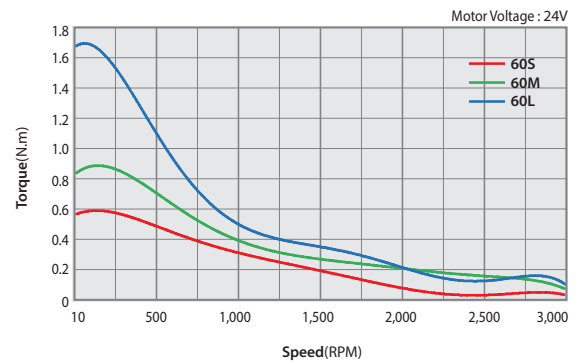
42				56			60		
42S	42M	42L	42XL	56S	56M	56L	60S	60M	60L
BI-POLAR									
2	2	2	2	2	2	2	2	2	2
2.8	2.8	2.8	7.2	1.96	2.52	3.16	1.32	1.48	2.2
1.3	1.68	1.68	1.2	2.8	2.8	2.8	4.0	4.0	4.0
2.1	1.65	1.65	6	0.7	0.9	1.13	0.33	0.37	0.55
2.5	3.2	2.8	15.6	1.4	2.5	3.6	0.75	1.1	2.7
0.216	0.353	0.431	0.650	0.539	1.00	1.72	0.88	1.28	2.40
35	54	68	114	120	300	480	240	490	690
220	280	350	500	470	700	1000	600	1000	1300
33	39	47	60	41	56	76	47	56	85
22	22	22	22	52	52	52	70	70	70
26	26	26	26	65	65	65	87	87	87
33	33	33	33	85	85	85	114	114	114
46	46	46	46	123	123	123	165	165	165

Lower than motor weight
100 MΩ MIN.(at 500VDC)
CLASS B(130°C)
0 to 55

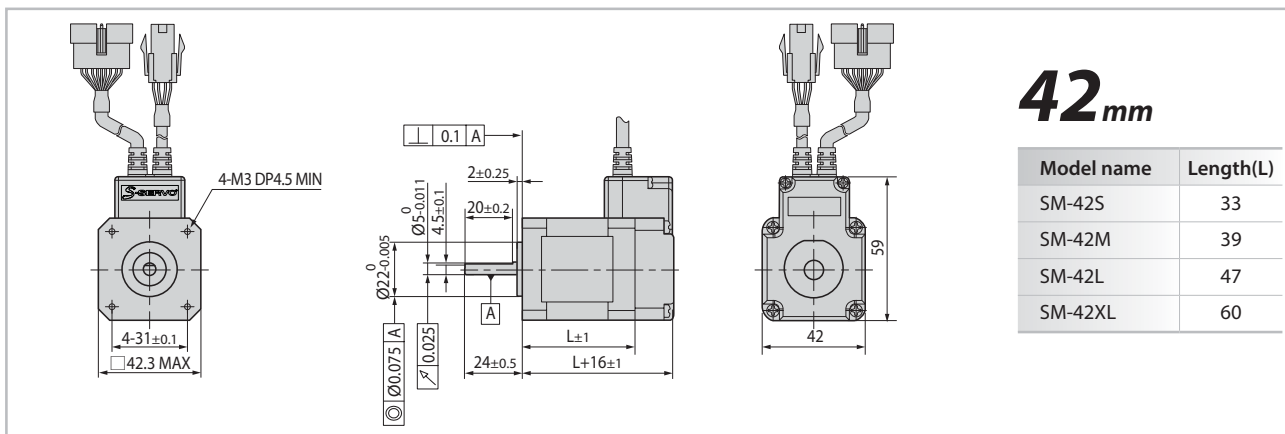
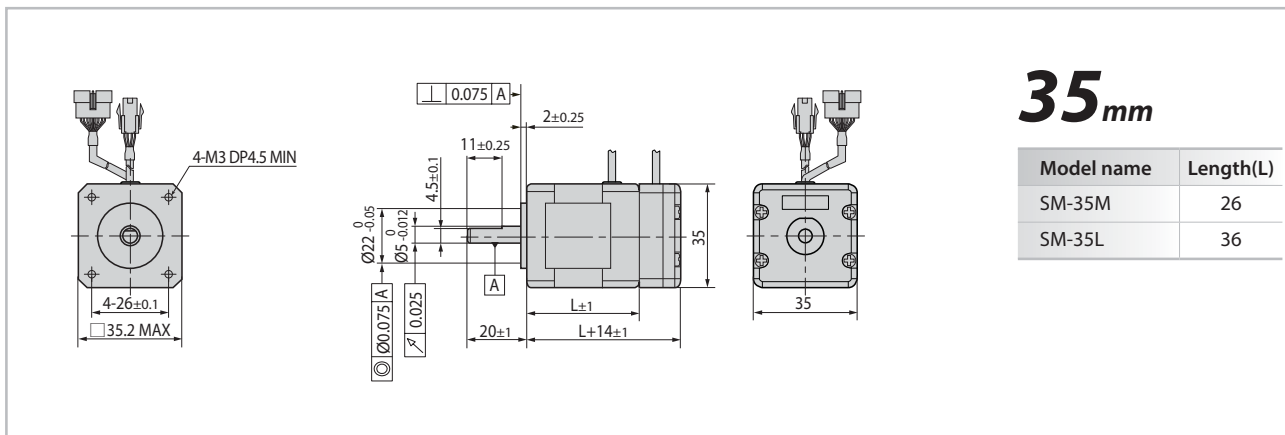
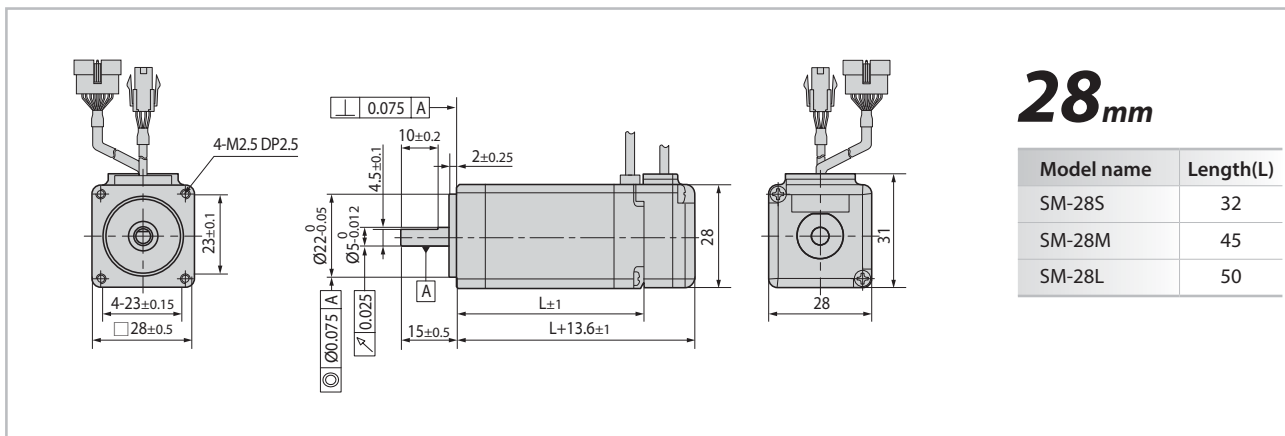
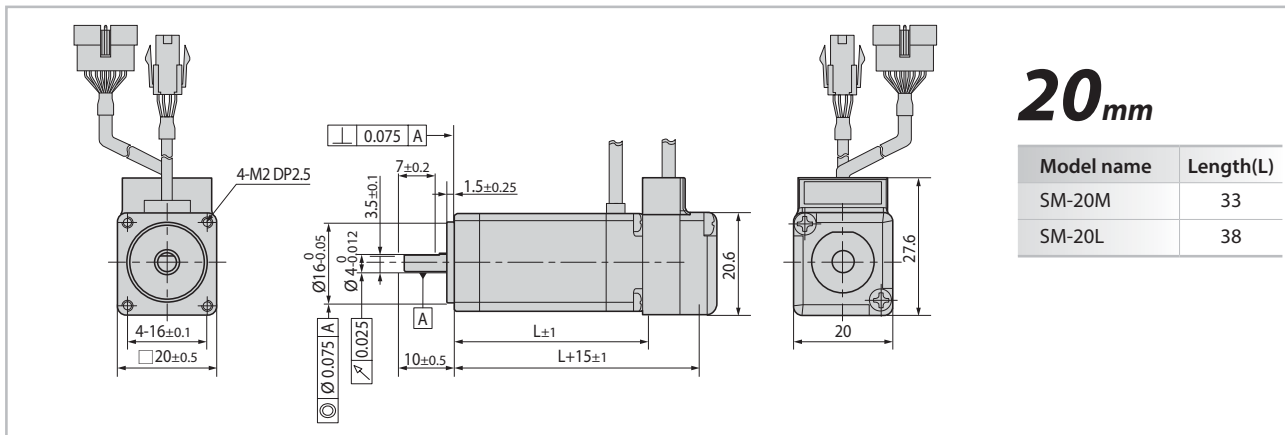
S-SERVO II ST_ 56 Series

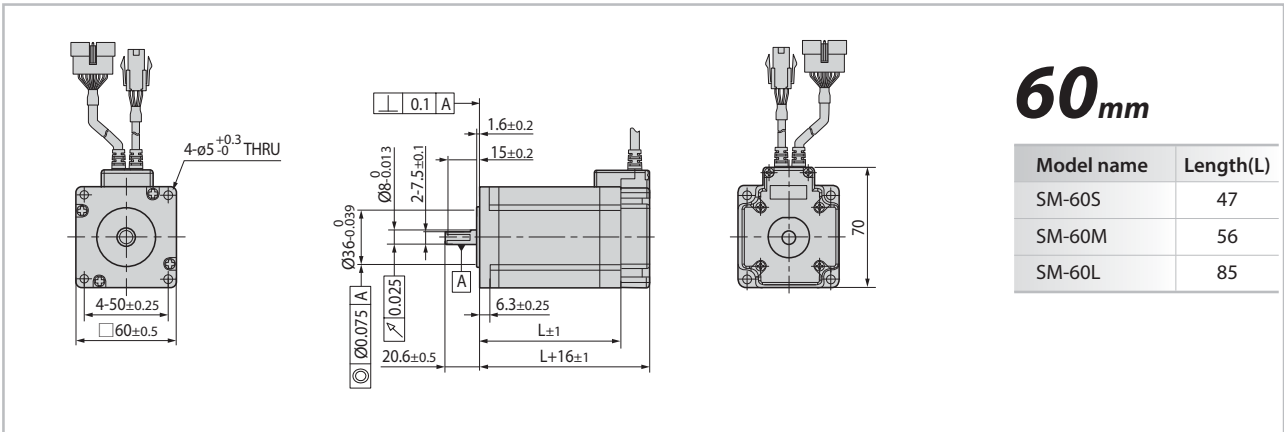
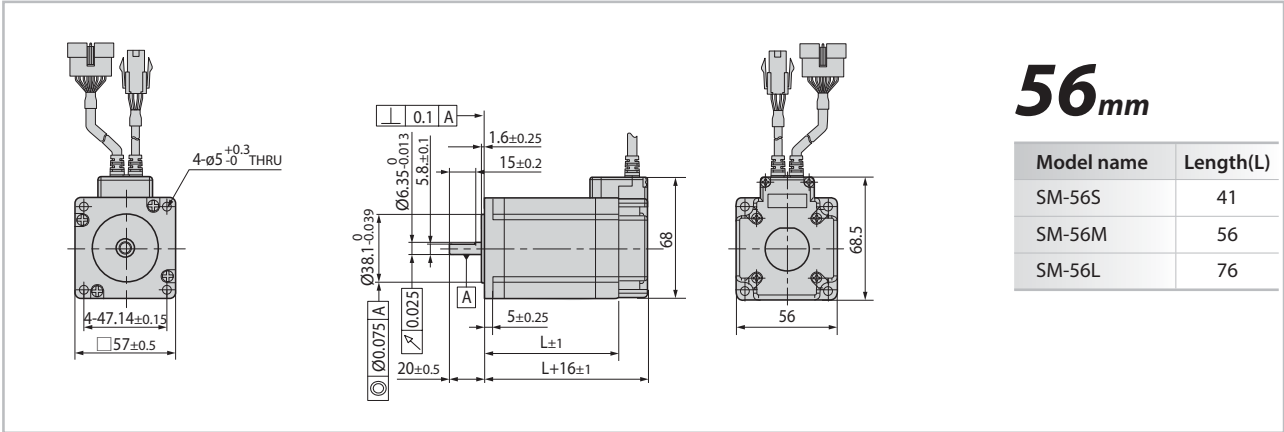


S-SERVO II ST_ 60 Series



Motor Drawing





Drive Specification

Specifications

Motor Model	SM-20 Series	SM-28 Series	SM-35 Series	SM-42 Series	SM-56 Series	SM-60 Series
Drive 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 ±10%					
Control Method	Closed Loop Control by ARM-based 32-bit MCU					
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				
Function *2	Rotation Speed	0~3,000[rpm] *1				
	Resolution[ppr] *4	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 with DIP Switch) ※ Default : 4,000				
	Max. Input	500KHz(Duty 50%)				
	Protection	Over Current Error, Over Speed Error, Position Tracking Error Error, Over Load Error, Over Temperature Error, Over Regenerated Voltage Error, 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				
	Run Current *5	50%~150%(Setting by using GUI) 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 GUI) 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 with DIP Switch) ※ Default : 2-Pulse				
	Rotational Direction	CW / CCW(Selectable with DIP Switch) ※ Default : CW				
	Speed / Position Control Command	Pulse Train Input				
I/O Signal *3	Input Signal Functions	Position command pulse, Enable, Alarm reset(Photocoupler Input)				
	Output Signal Functions	In-Position, Alarm(Photocoupler output)				

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

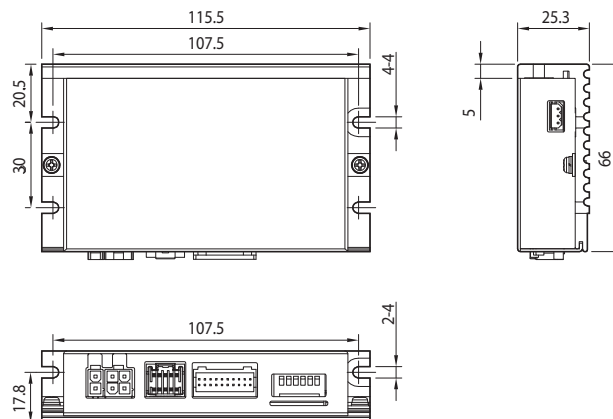
*2 : Please refer to 「Setting and Operation(Catalogue 239page)」 to obtain detailed function information.

*3 : Please refer to 「Control Input / Output explanation(Catalogue 280page)」 to obtain detailed Input / Output signal information.

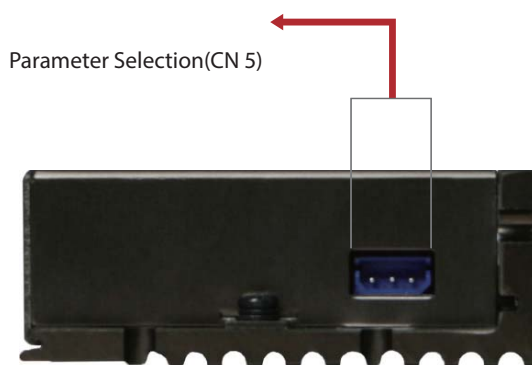
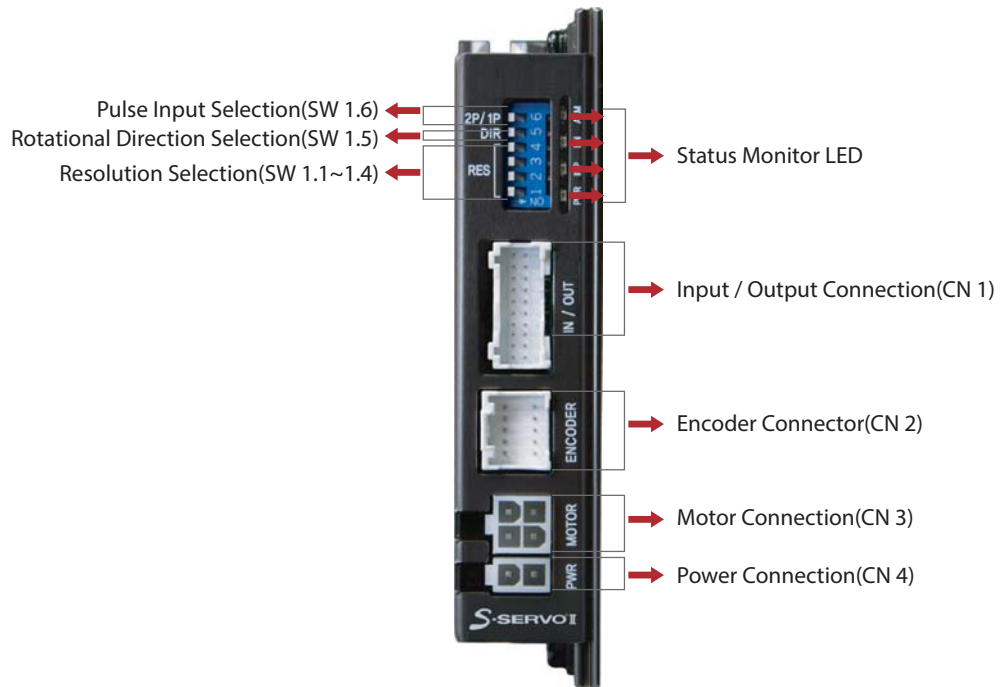
*4 : Maximum encoder resolution of S-SERVO II is 4,000[ppr]. If set resolution is above 4,000[ppr], it is microstepping operation between encoder pulse.

*5 : For more detail information of Run Current, please refer to the 「Parameter Setting GUI(Catalogue 281page)」

Drive Dimension(mm)



Setting and Operation



System Operation Manual

Status Monitor LED

1. Status Monitor LED

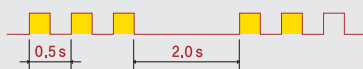
Indication	Color	Function	ON/OFF Condition
PWR	Green	Power input indication	LED is turned ON when power is applied
INP	Yellow	Complete Positioning Motion	Light on when Position Deviation located within preset value*1 from target position, after Position Commando Pulse Input is completed
EN	Orange	Motor 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

2. 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 3,000[rpm]
3	Position Tracking Error	Position error value is higher than 90° 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 with Encoder Connector in drive
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

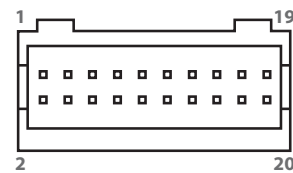
Alarm LED Flash(ex : Position Tracking Error)



Connector

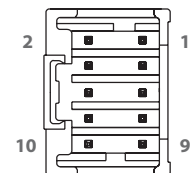
1. Input / Output Signal(CN 1)

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



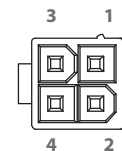
2. Encoder Connector(CN 2)

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



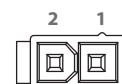
3. Motor Connection(CN 3)

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



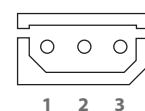
4. Power Connection(CN 4)

NO.	Function
1	24VDC ±10%
2	GND



5. Parameter Selection(CN 5)

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



Switch

1. Resolution Selection Switch(SW 1.1 ~ SW 1.4)

The Number of pulse per revolution.

Position(SW 1)				Pulse/Revolution
1	2	3	4	
ON	ON	ON	ON	500
ON	ON	ON	OFF	1,000
ON	ON	OFF	ON	1,600
ON	ON	OFF	OFF	2,000
ON	OFF	ON	ON	3,200
ON	OFF	ON	OFF	3,600
ON	OFF	OFF	ON	4,000*1
ON	OFF	OFF	OFF	5,000

*1 : Default = 4,000

Position(SW 1)				Pulse/Revolution
1	2	3	4	
OFF	ON	ON	ON	6,400
OFF	ON	ON	OFF	8,000
OFF	ON	OFF	ON	10,000
OFF	ON	OFF	OFF	20,000
OFF	OFF	ON	ON	25,000
OFF	OFF	ON	OFF	36,000
OFF	OFF	OFF	ON	40,000
OFF	OFF	OFF	OFF	50,000

2. Rotational Direction Selection Switch(SW 1.5)

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



CCW Dir.
Direction Selection Switch : ON



CW Dir.
Direction Selection Switch : OFF

3. Pulse Input Selection Switch(SW 1.6)

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

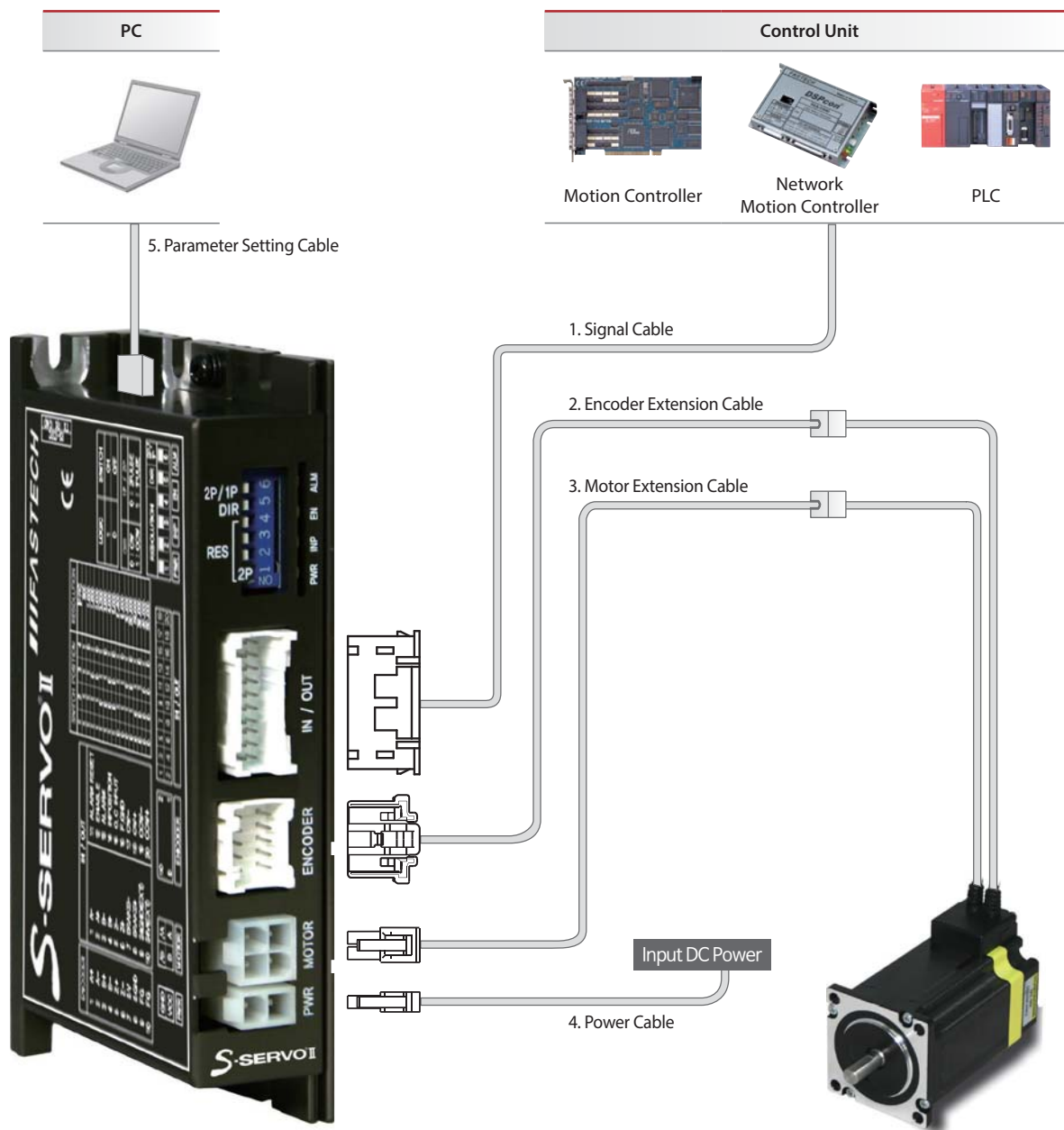
2-Pulse Mode



1-Pulse Mode



System Configuration



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

Accessories

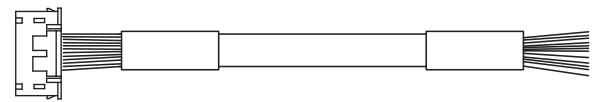
Purpose	ITEM	Standard	Quantity	Manufacturer	
I/O Connections(CN 1)	Housing	PADP-20V-1-S	1	JST	
	Terminal	SPH-002T-P0.5L	20		
Encoder Connection	Drive Side(CN 2)	Housing	51353-1000	1	MOLEX
		Terminal	56134-9000	10	
	Encoder Side	Housing	SMP-09V-NC	1	JST
		Terminal	SHF-001T-0.8BS	10	
Motor Connection	Drive Side(CN 3)	Housing	5557-04R	1	MOLEX
		Terminal	5556T	4	
	Motor Side	Housing	5557-04R	1	
		Terminal	5556T	4	
Power Connection(CN 4)	Housing	5557-02R	1		
	Terminal	5556T	2		

Option Cable

1. Signal Cable

Model Name	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.

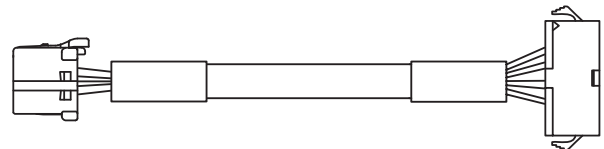


Manufacturer : JST
Housing : PADP-20V-1-S
Terminal : SPH-002T-P0.5L

2. Encoder Extension Cable

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.



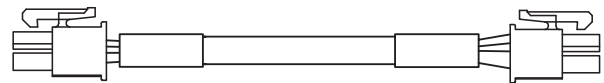
Manufacturer : MOLEX
Housing : 51353-1000
Terminal : 56134-9000

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

3. Motor 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.



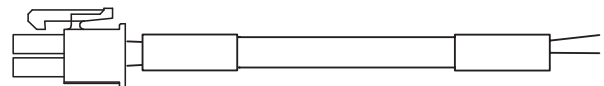
Manufacturer : MOLEX
Housing : 5557-04R
Terminal : 5556T

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

4. 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.

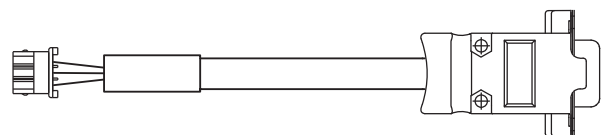


Manufacturer : MOLEX
Housing : 5557-02R
Terminal : 5556T

5. Parameter Setting Cable

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

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

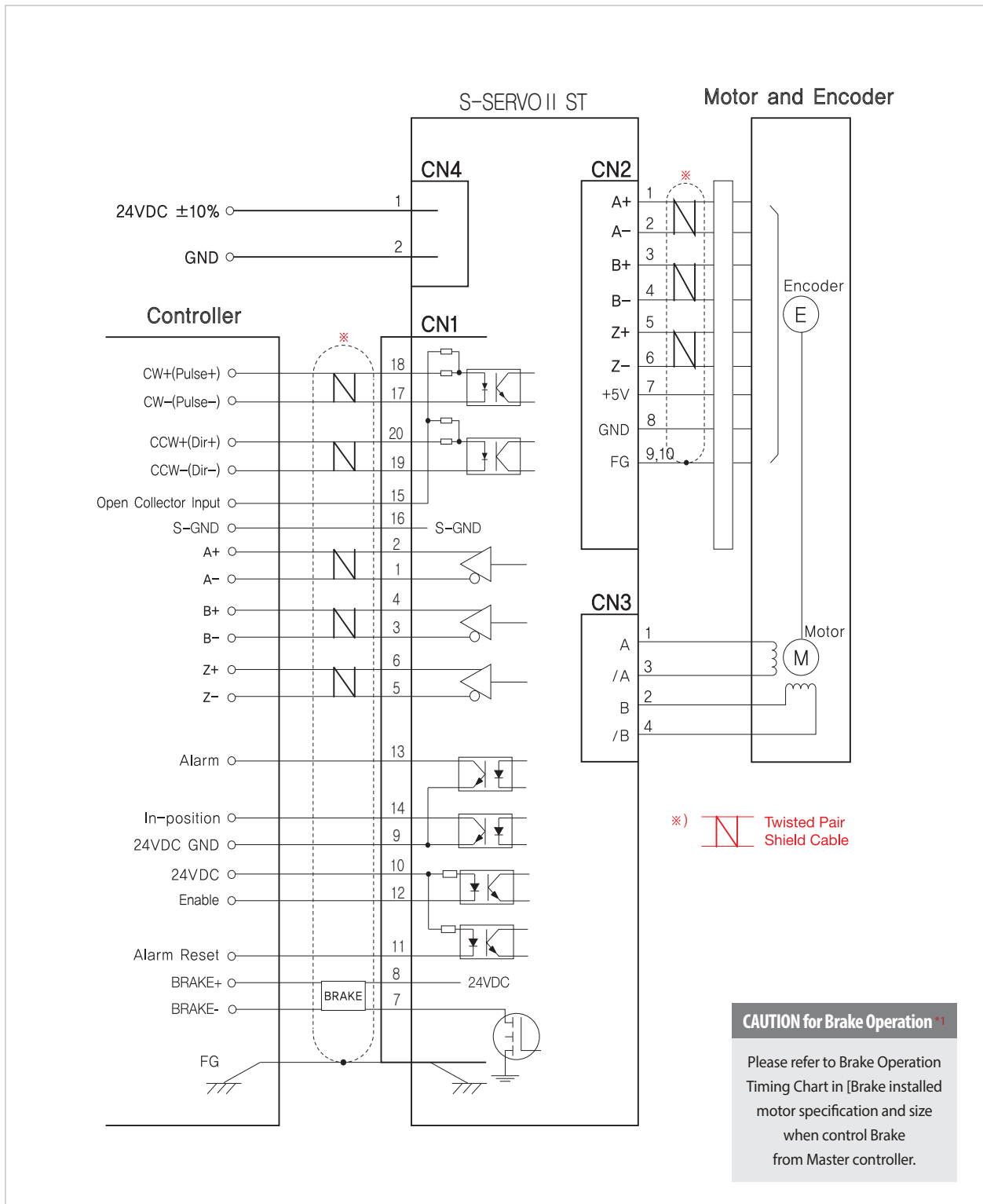


Manufacturer : MOLEX
Housing : 5264-03
Terminal : 5263

AMPHENOL : Manufacturer
L177SDE09S : Housing
17E-1657-09 : Terminal

External Wiring Diagram

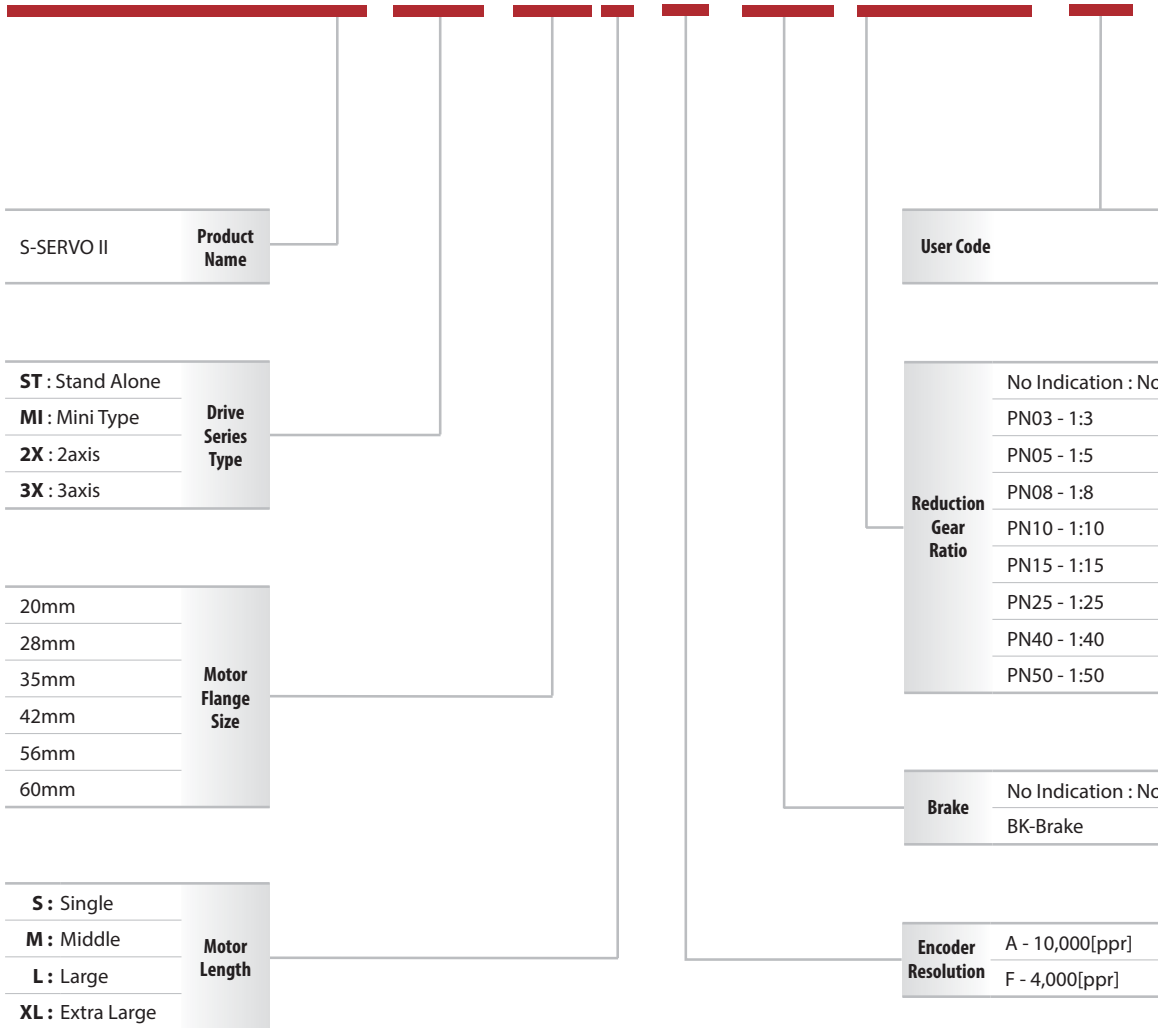
S-SERVO II ST



※ Turn power off of S-SERVO II drive and master controller when connect I/O cable between drive and master controller to avoid any damage.

Part Numbering Method

S-SERVO II-MI-42L-A-BK-PN05-□



Motor, Drive Combination	UNIT No.	MOTOR No.	DRIVE No.
	S-SERVO II-MI-20M	SM-20M	SV2-PD-MI-20M
	S-SERVO II-MI-20L	SM-20L	SV2-PD-MI-20L
	S-SERVO II-MI-28S	SM-28S	SV2-PD-MI-28S
	S-SERVO II-MI-28M	SM-28M	SV2-PD-MI-28M
	S-SERVO II-MI-28L	SM-28L	SV2-PD-MI-28L
	S-SERVO II-MI-35M	SM-35M	SV2-PD-MI-35M
	S-SERVO II-MI-35L	SM-35L	SV2-PD-MI-35L
	S-SERVO II-MI-42S	SM-42S	SV2-PD-MI-42S
	S-SERVO II-MI-42M	SM-42M	SV2-PD-MI-42M
	S-SERVO II-MI-42L	SM-42L	SV2-PD-MI-42L
	S-SERVO II-MI-42XL	SM-42XL	SV2-PD-MI-42XL

Drive Specification

Specifications

Motor Model	SM-20 Series	SM-28 Series	SM-35 Series	SM-42 Series
Drive Model	SV2-PD-MI-20 Series	SV2-PD-MI-28 Series	SV2-PD-MI-35 Series	SV2-PD-MI-42 Series
Input Voltage	24VDC ±10%			
Control Method	Closed Loop Control by ARM-based 32-bit MCU			
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		
Function ^{*2}	Rotation Speed	0~3,000[rpm] ^{*1}		
	Resolution[ppr] ^{*4}	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 with DIP Switch) ※ Default : 4,000		
	Max. Input Pulse Frequency	500KHz(Duty 50%)		
	Protection	Over Current Error, Over Speed Error, Position Tracking Error Error, Over Load Error, Over Temperature Error, Over Regenerated Voltage Error, 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		
	Run Current ^{*5}	50%~150%(Setting by using GUI) ※ Default : 100% 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.		
	Stop Current	20%~100%(Setting by using GUI) ※ Default : 50% 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		
	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 ^{*3}	Input Signal	Position command pulse, Enable, Alarm reset(Photocoupler Input)		
	Output Signal	In-Position, Alarm(Photocoupler Output)		

^{*1} : Maximum speed is variable according to resolution. Maximum speed is 3,000[rpm] until resolution 10,000. Over the 10,000 resolution, maximum rotation speed will be reduced.

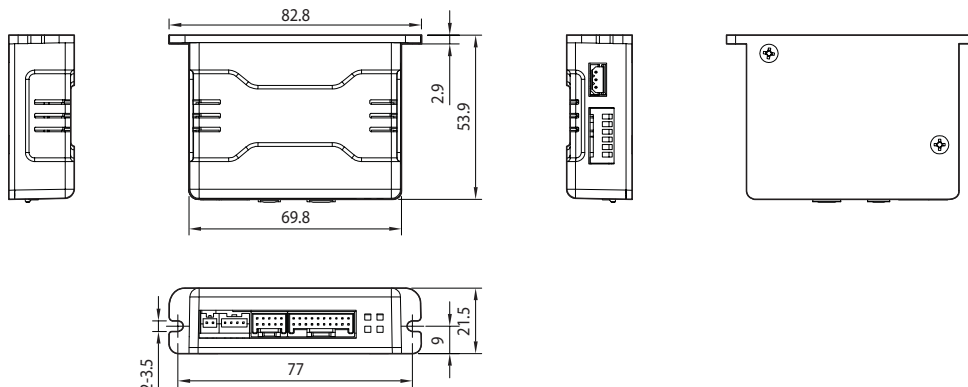
^{*2} : Please refer to 「Setting and Operation(Catalogue 252page)」 to obtain detailed function information

^{*3} : Please refer to 「Control Input / Output explanation(Catalogue 280page)」 to obtain detailed Input / Output signal information

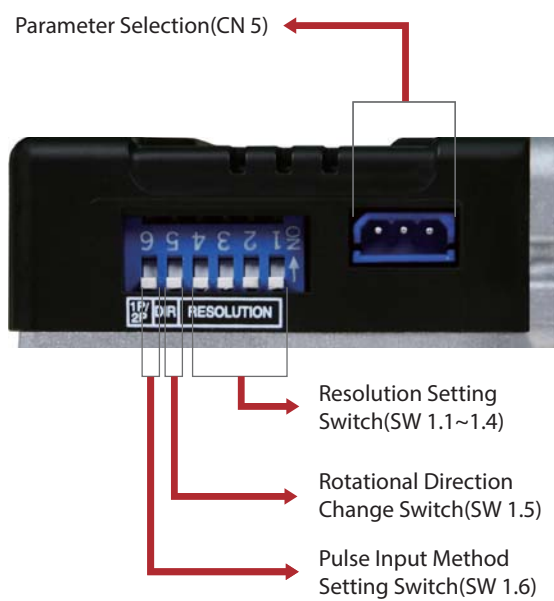
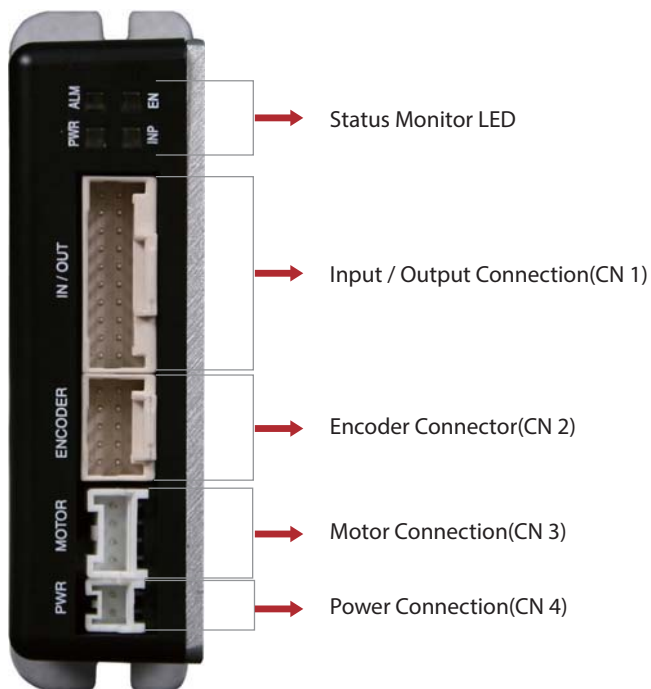
^{*4} : Maximum encoder resolution of S-SERVO II is 4,000[ppr]. If set resolution is above 4,000[ppr], it is microstepping operation between encoder pulse.

^{*5} : For more detail information of Run Current, please refer to the 「Parameter Setting GUI(Catalogue 281page)」

Drive Dimension(mm)



Setting and Operation



System Operation Manual

Status Monitor LED

1. Status Monitor LED

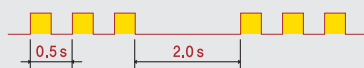
Indication	Color	Function	ON/OFF Condition
PWR	Green	Power Input Indication	LED is turned ON when power is applied
INP	Yellow	Complete Positioning Motion	Light on when Position Deviation located within preset value*1 from target position, after Position Commando Pulse Input is completed
EN	Orange	Motor 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

2. Protection functions and LED flash times

Time	Protection	Conditions
1	Over Current Error	The current through power devices in inverter exceeds the limit value
2	Over Speed Error	Motor speed exceed 3,000[rpm]
3	Position Tracking Error	Position error value is higher than 90° 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 with Encoder Connector in drive
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

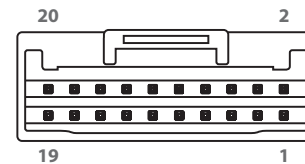
Alarm LED Flash(ex: Position Tracking Error)



Connector

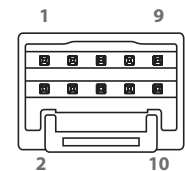
1. Input / Output Connection(CN 1)

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



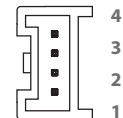
2. Encoder Connector(CN 2)

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	5GND	Output
9	F. GND	----
10	F. GND	----



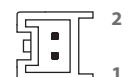
3. Motor Connection(CN 3)

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



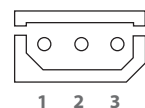
4. Power Connection(CN 4)

No.	Function
1	24VDC ±10%
2	GND



5. Parameter Selection(CN 5)

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



Switch

1. Resolution Selection Switch(SW 1.1 ~ SW 1.4)

The Number of pulse per revolution.

Position(SW 1)				Pulse/Revolution
1	2	3	4	
ON	ON	ON	ON	500
ON	ON	ON	OFF	1,000
ON	ON	OFF	ON	1,600
ON	ON	OFF	OFF	2,000
ON	OFF	ON	ON	3,200
ON	OFF	ON	OFF	3,600
ON	OFF	OFF	ON	4,000*1
ON	OFF	OFF	OFF	5,000

* 1 : Default 4,000

Position(SW 1)				Pulse/Revolution
1	2	3	4	
OFF	ON	ON	ON	6,400
OFF	ON	ON	OFF	8,000
OFF	ON	OFF	ON	10,000
OFF	ON	OFF	OFF	20,000
OFF	OFF	ON	ON	25,000
OFF	OFF	ON	OFF	36,000
OFF	OFF	OFF	ON	40,000
OFF	OFF	OFF	OFF	50,000

2. Rotational Direction Selection Switch(SW 1.5)

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



CCW Dir.
Direction Selection Switch : ON



CW Dir.
Direction Selection Switch : OFF

3. Pulse Input Selection Switch(SW 1.6)

Indication	Switch Name	Function
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

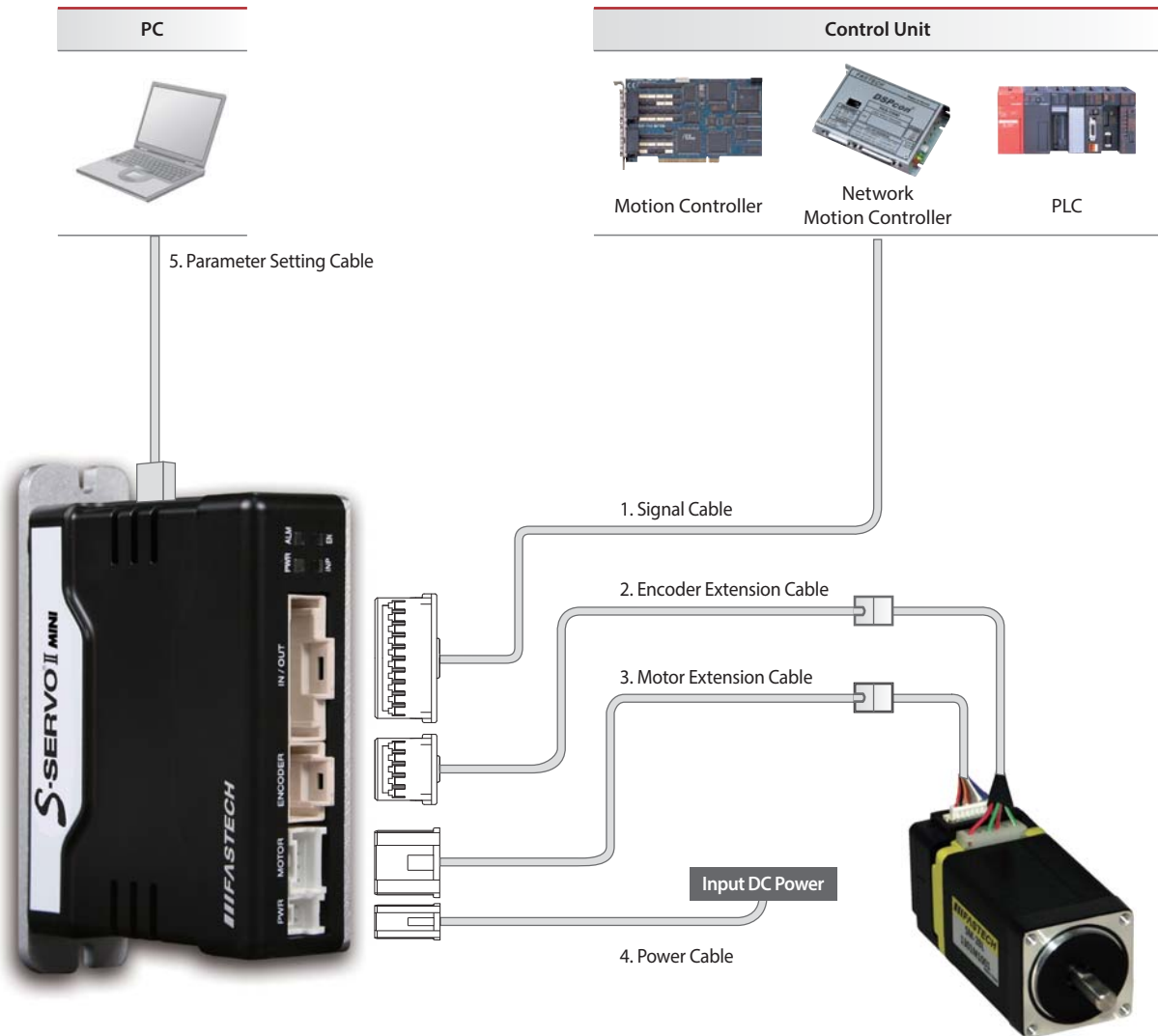
2-Pulse Mode



1-Pulse Mode



System Configuration



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

Accessories

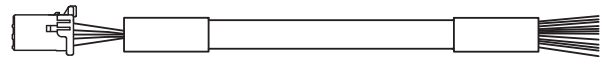
Purpose		ITEM	Standard	Quantity	Manufacturer
Input / Output Signal(CN 1)		Housing	501646-2000	1	MOLEX
		Terminal	501648-1000	20	
Encoder connection	Drive(CN 2)	Housing	501646-1000	1	MOLEX
		Terminal	501648-1000	10	
	Encoder	Housing	SMP-09V-NC	1	JST
		Terminal	SHF-001T-0.8BS	10	
Motor connection	Drive(CN 3)	Housing	PAP-04V-S	1	JST
		Terminal	SPHD-001T-P0.5	4	
	Motor	Housing	5557-04R	1	MOLEX
		Terminal	5556T	4	
Power Connection(CN 4)		Housing	PAP-02V-S	1	JST
		Terminal	SPHD-001T-P0.5	2	

Option Cable

1. Signal Cable

Model Name	Length[m]	Remark
CSSM-S-□□□F	□□□	Normal Cable
CSSM-S-□□□M	□□□	Robot Cable

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

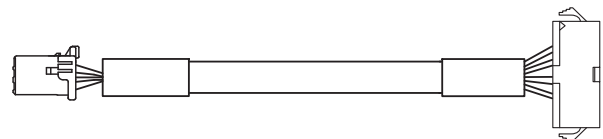


Manufacturer : MOLEX
Housing : 501646-2000
Terminal : 501648-1000

2. Encoder Extension Cable

Model Name	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.



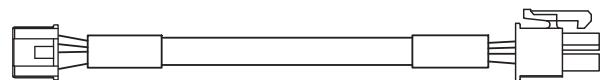
Manufacturer : MOLEX
Housing : 501646-1000
Terminal : 501648-1000

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

3. Motor Extension Cable

Model Name	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

Model Name	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.

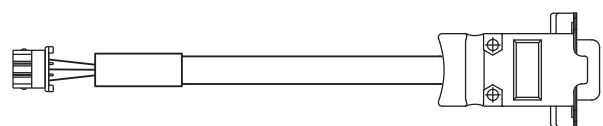


Manufacturer : JST
Housing : PAP-02V-S
Terminal : SPHD-001T-P0.5

5. Parameter Setting Cable

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

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

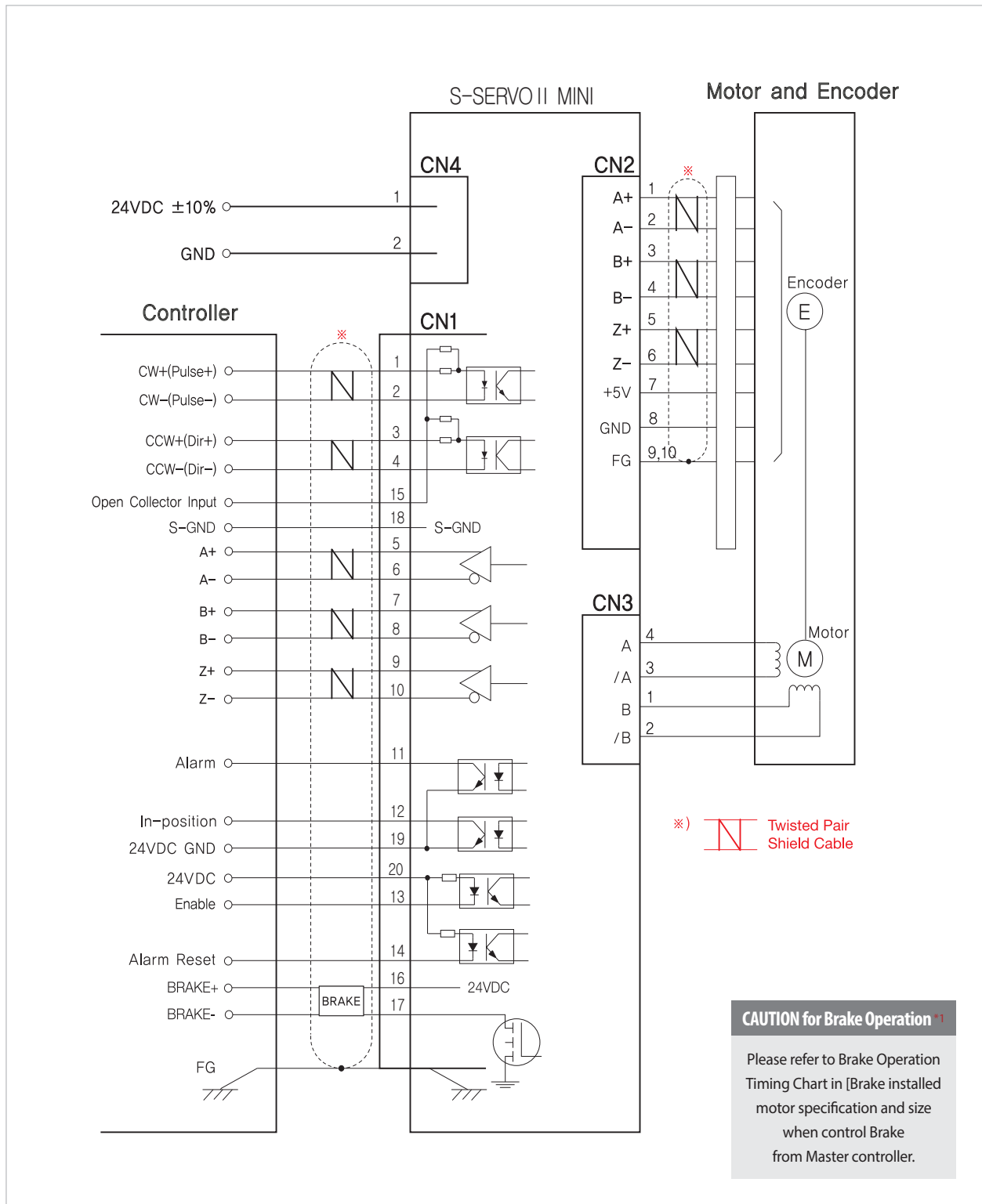


Manufacturer : MOLEX
Housing : 5264-03
Terminal : 5263

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

External Wiring Diagram

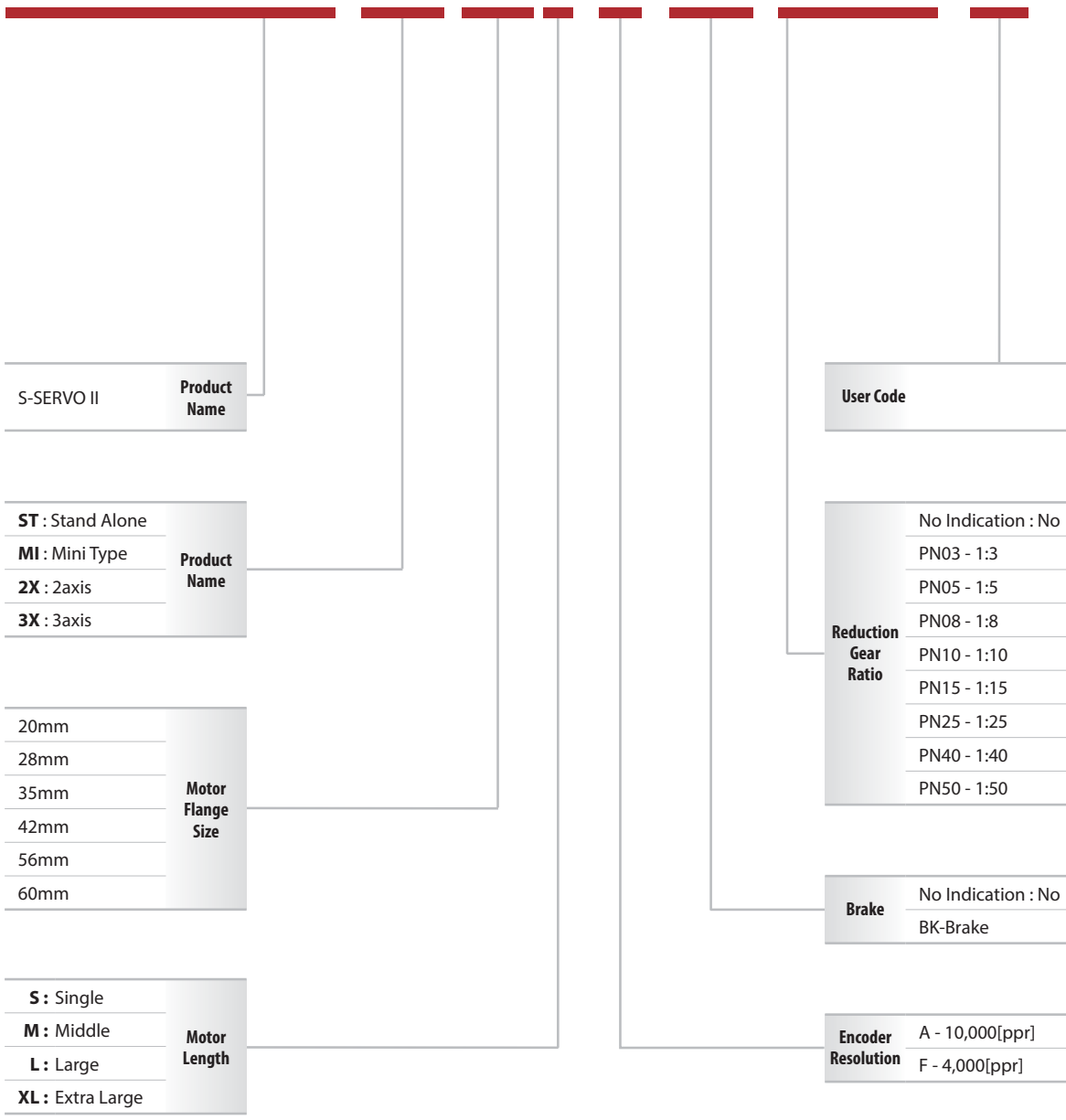
S-SERVO II MINI



※ Turn power off of S-SERVO II drive and master controller when connect I/O cable between drive and master controller to avoid any damage.

Part Numbering Method

S-SERVO II-2X-56L-A-BK-PN05-□



Motor, Drive Combination	UNIT No.	MOTOR No.	DRIVE No.
		S-SERVO II-2X-□□	

※ □ indicates the size of motor in the diagram of UNIT No.
 ex) In case of 20M, 42XL size of motors, it is expressed as S-SERVO II-2X-20M / 42XL

Drive Specification

Specifications

Item	S-SERVO II 2X	
Input Voltage	24VDC ±10%	
Control Method	Closed Loop Control by ARM-based 32-bit MCU	
Current Consumption	Max. 1A(Except Motor Current)	
Operating Condition	Temperature	0 ~ 50°C(Non-condensing)
	Humidity	35 ~ 85% RH(Non-condensing)
	Vib. Resist.	0.5G
Function ^{*2}	Rotation Speed	0 ~ 3,000[rpm] ^{*1}
	Resolution[ppr] ^{*4}	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 with Rotary Switch) ※ Default : 4,000
	Max. Input Pulse Frequency	500KHz(Duty 50%)
	Protection	Over Current Error, Over Speed Error, Position Tracking Error Error, Over Load Error, Over Temperature Error, Over Regenerated Voltage Error, Motor Connection Error, Encoder Connection Error, Motor Voltage Error, In-Position Error, System Error ROM Error, Position Overflow Error
	LED Display	Power status(Green), In-Position status(Yellow), Enable status(Orange), Alarm status(Red)
	Run Current ^{*5}	50%~150%(Setting by using GUI) 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 GUI) 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 Input
I/O Signal ^{*3}	Input Signal	Position command pulse, Enable, Alarm Reset(Photocoupler Input)
	Output Signal	In-Position, Alarm(Photocoupler Output)
Dimension(mm)	190(W)×80(D)×40(H)	
Weight(Except attachments)	270g	

^{*1} : Maximum speed is variable according to resolution. Maximum speed is 3,000[rpm] until resolution 10,000. Over the 10,000 resolution, maximum rotation speed will be reduced.

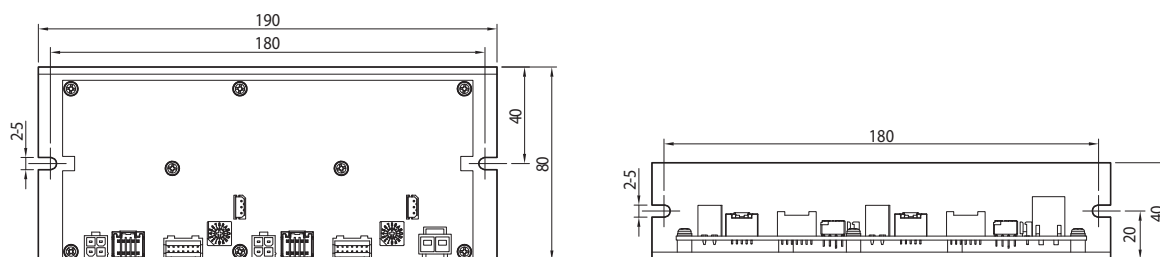
^{*2} : Please refer to 「Setting and Operation(Catalogue 264page)」 to obtain detailed function information

^{*3} : Please refer to 「Control Input / Output explanation(Catalogue 280page)」 to obtain detailed Input / Output signal information

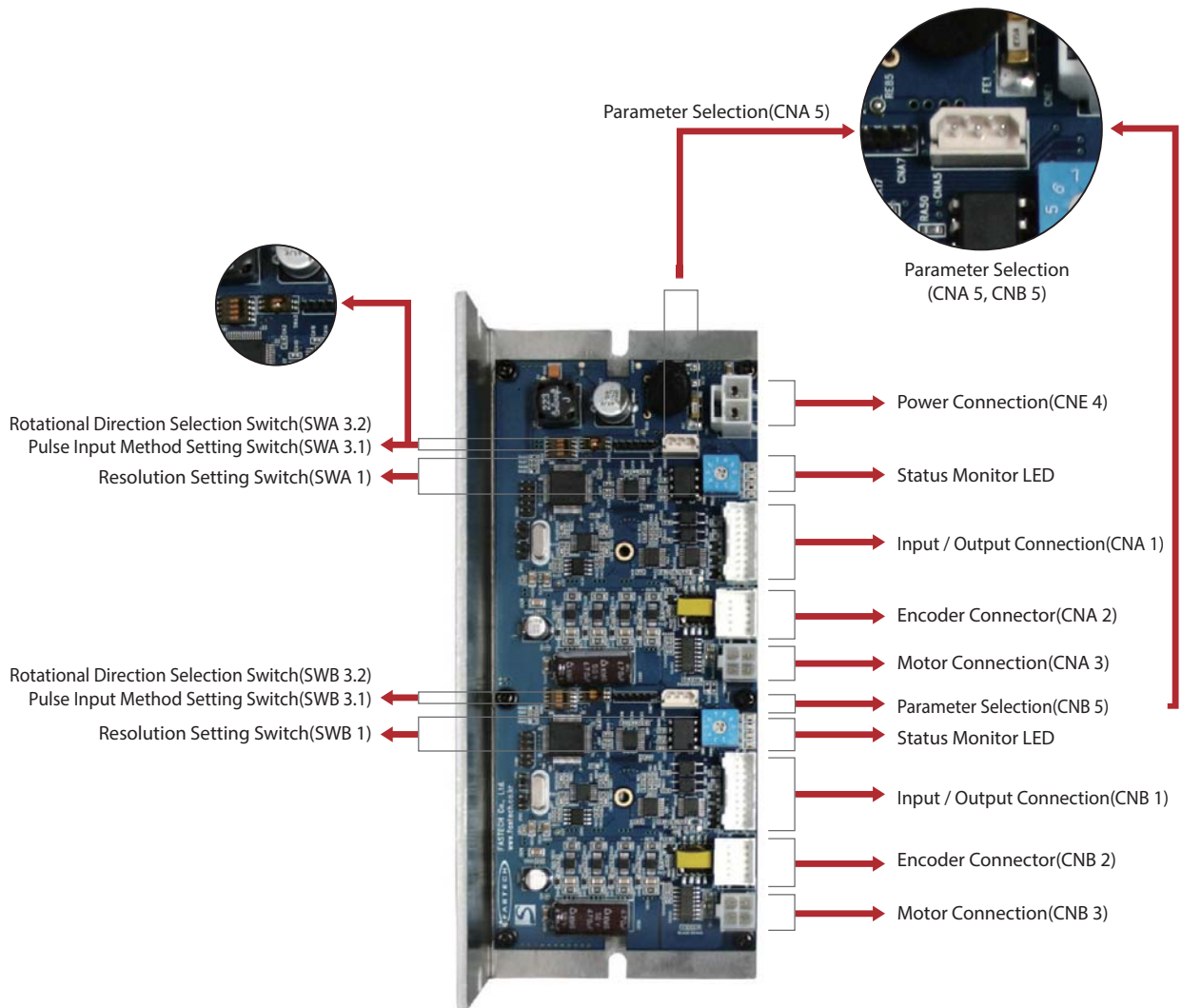
^{*4} : Maximum encoder resolution of S-SERVO II is 4,000[ppr]. If set resolution is above 4,000[ppr], it is microstepping operation between encoder pulse.

^{*5} : For more detail information of Run Current, please refer to the 「Parameter Setting GUI(Catalogue 281page)」

Drive Dimension(mm)



Setting and Operation



System Operation Manual

Status Monitor LED

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*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

2. Protection functions and LED flash times

Time	Protection	Conditions
1	Over Current	The current through power devices in inverter exceeds the limit value
2	Over Speed	Motor speed exceed 3,000[rpm]
3	Position Tracking Error	Position error value is higher than 90° in motor run state
4	Over Load	The motor is continuously operated more than 5 second under a load exceeding the Max. torque
5	Over Temperature	Inside temperature of drive exceeds 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 with Encoder Connector in drive
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

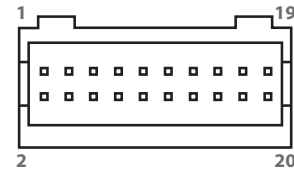
Alarm LED Flash(ex: Position Tracking Error)



Connector

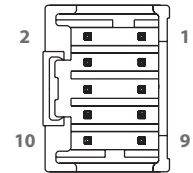
1. Input / Output Connection(CNA 1, CNB 1)

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



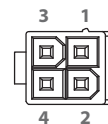
2. Encoder Connector(CNA 2, CNB 2)

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



3. Motor Connection(CNA 3, CNB 3)

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



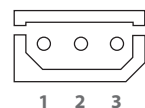
4. Power Connection(CNE 4)

No.	Function
1	24VDC ±10%
2	GND



5. Parameter Selection(CNA 5, CNB 5)

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

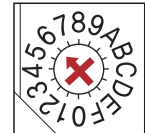


Switch

1. Resolution Setting Switch(SWA 1, SWB 1)

The Number of pulse per revolution.

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



* 1 : Default 4,000

2. Rotational Direction Selection Switch(SWA 3.2, SWB 3.2)

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



CCW Dir
Direction Selection Switch : ON

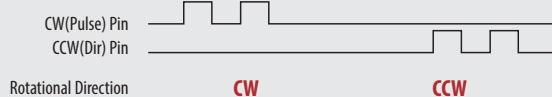


CW Dir
Direction Selection Switch : OFF

3. Pulse Input Method Setting Switch(SWA 3.1, SWB 3.1)

Indication	Switch Name	Function
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

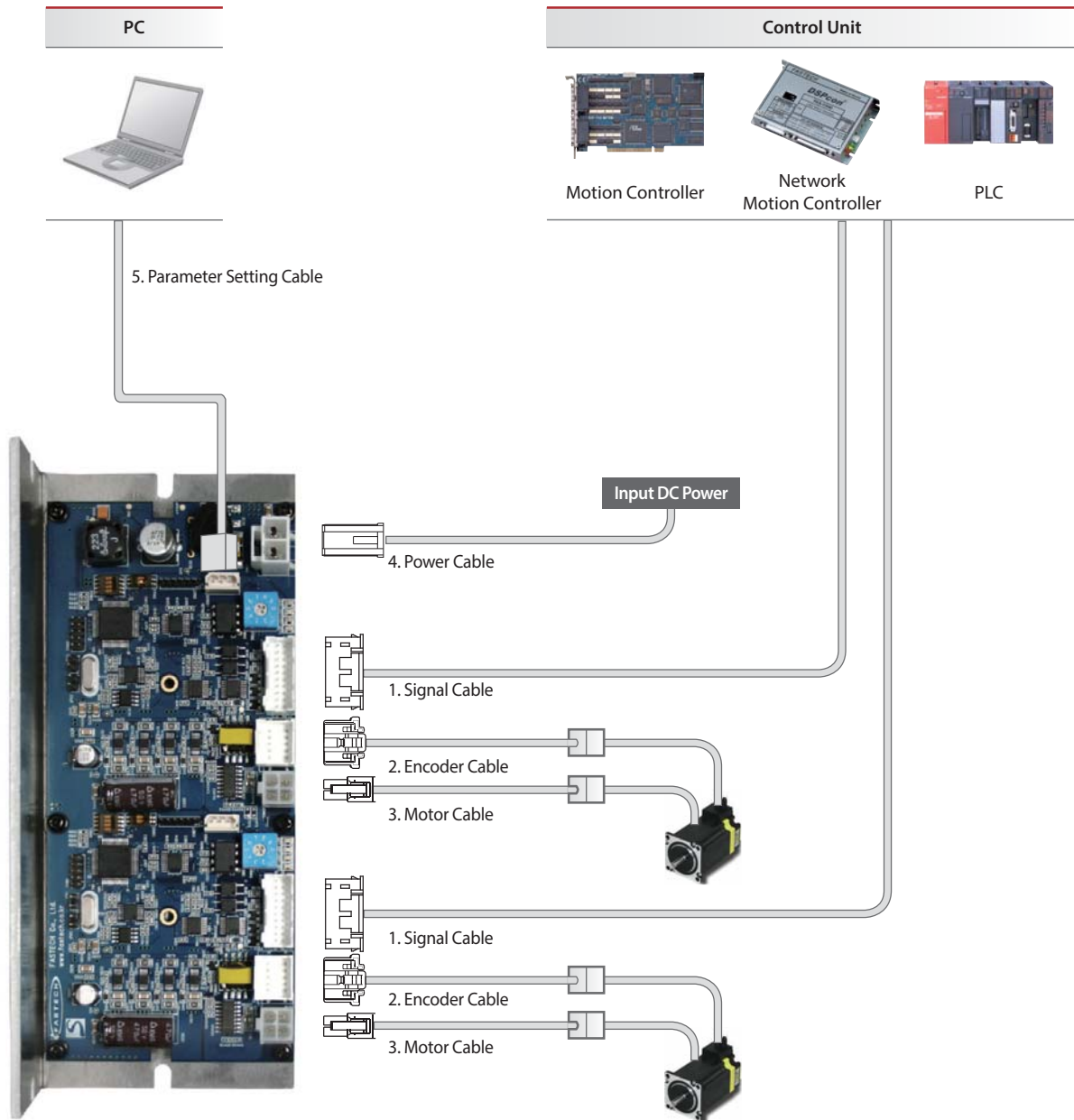
2-Pulse Mode



1-Pulse Mode



System Configuration



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

Accessories

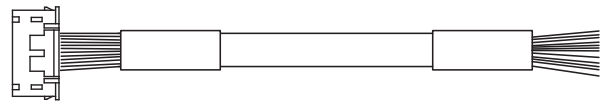
Purpose		ITEM	Standard	Quantity	Manufacturer
I/O Connections(CNA 1, CNB 1)		Housing	PADP-20V-1-S	2	JST
		Terminal	SPH-002T-P0.5L	40	
Encoder Connection	Drive Side (CNA 2, CNB 2)	Housing	510646-1000	2	MOLEX
		Terminal	510648-9000	20	
	Encoder Side	Housing	SMP-09V-NC	2	JST
		Terminal	SHF-001T-0.8BS	20	
Motor Connection	Drive Side (CNA 3, CNB 3)	Housing	PAP-04V-S	2	MOLEX
		Terminal	SPHD-001T-P0.5	8	
	Motor Side	Housing	5557-04R	2	
		Terminal	5556T	8	
Power Connection(CNE 4)		Housing	VLP-02V	1	JST
		Terminal	SVF-61T-P2.0	2	

Option Cable

1. Signal Cable

Model Name	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.

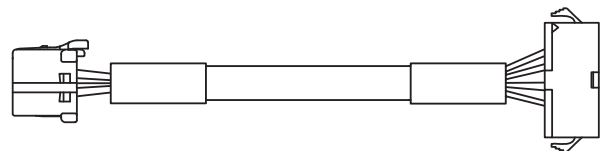


Manufacturer : JST
Housing : PADP-20V-1-S
Terminal : SPH-002T-P0.5L

2. Encoder Extension Cable

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.



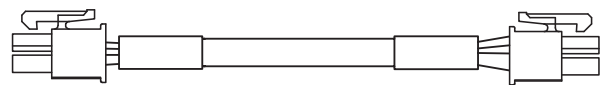
Manufacturer : MOLEX
Housing : 51353-1000
Terminal : 56134-9000

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

3. Motor 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.



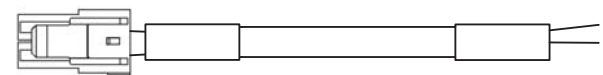
Manufacturer : MOLEX
Housing : 5557-04R
Terminal : 5556T

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

4. Power Cable

Model Name	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.

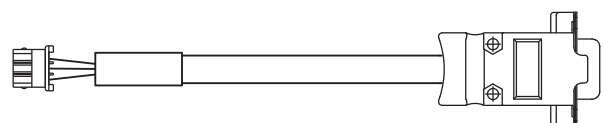


Manufacturer : MOLEX
Housing : VLP-02V
Terminal : SVF-61T-P2.0

5. Parameter Setting Cable

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

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

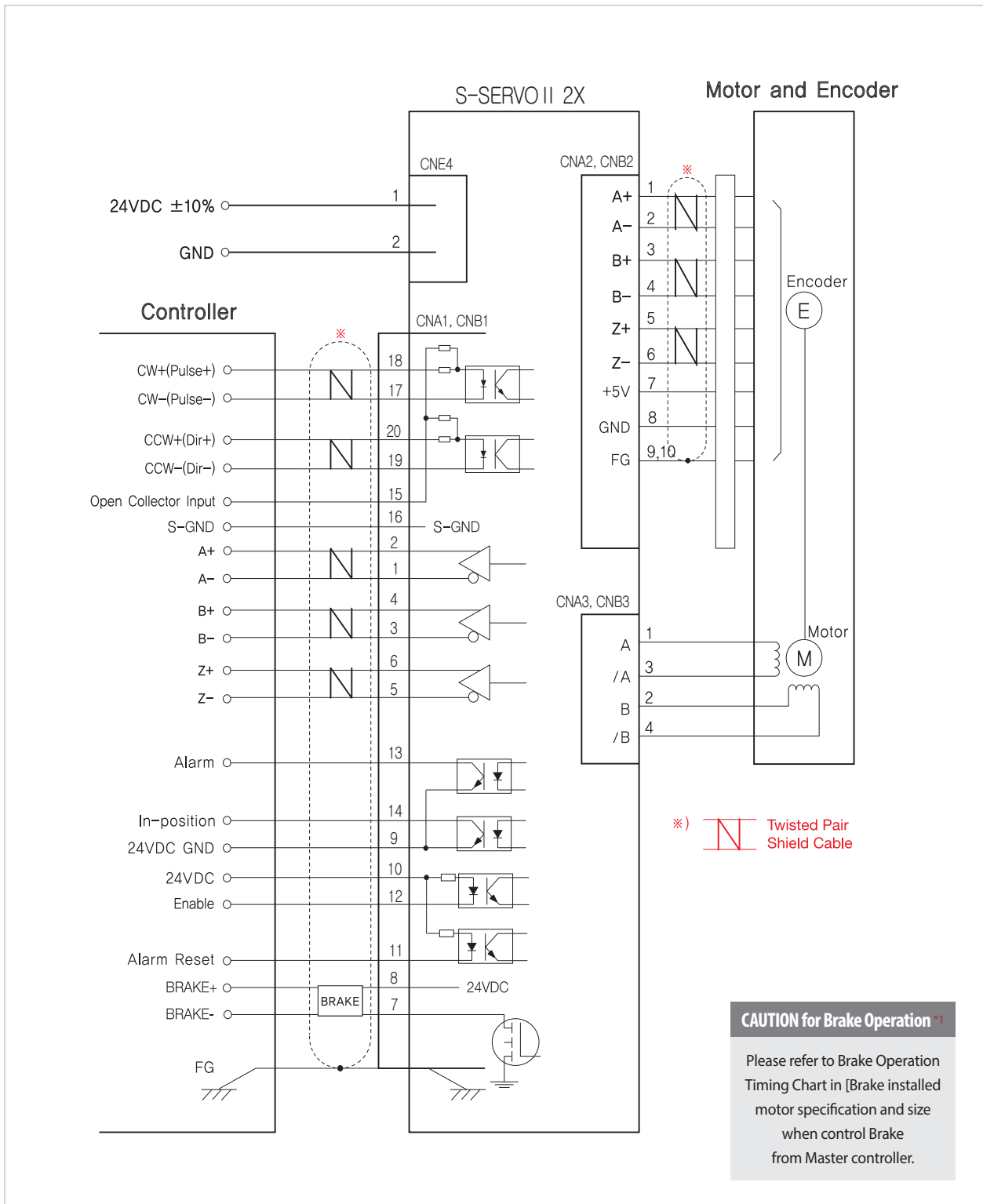


Manufacturer : MOLEX
Housing : 5264-03
Terminal : 5263

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

External Wiring Diagram

S-SERVO II 2X

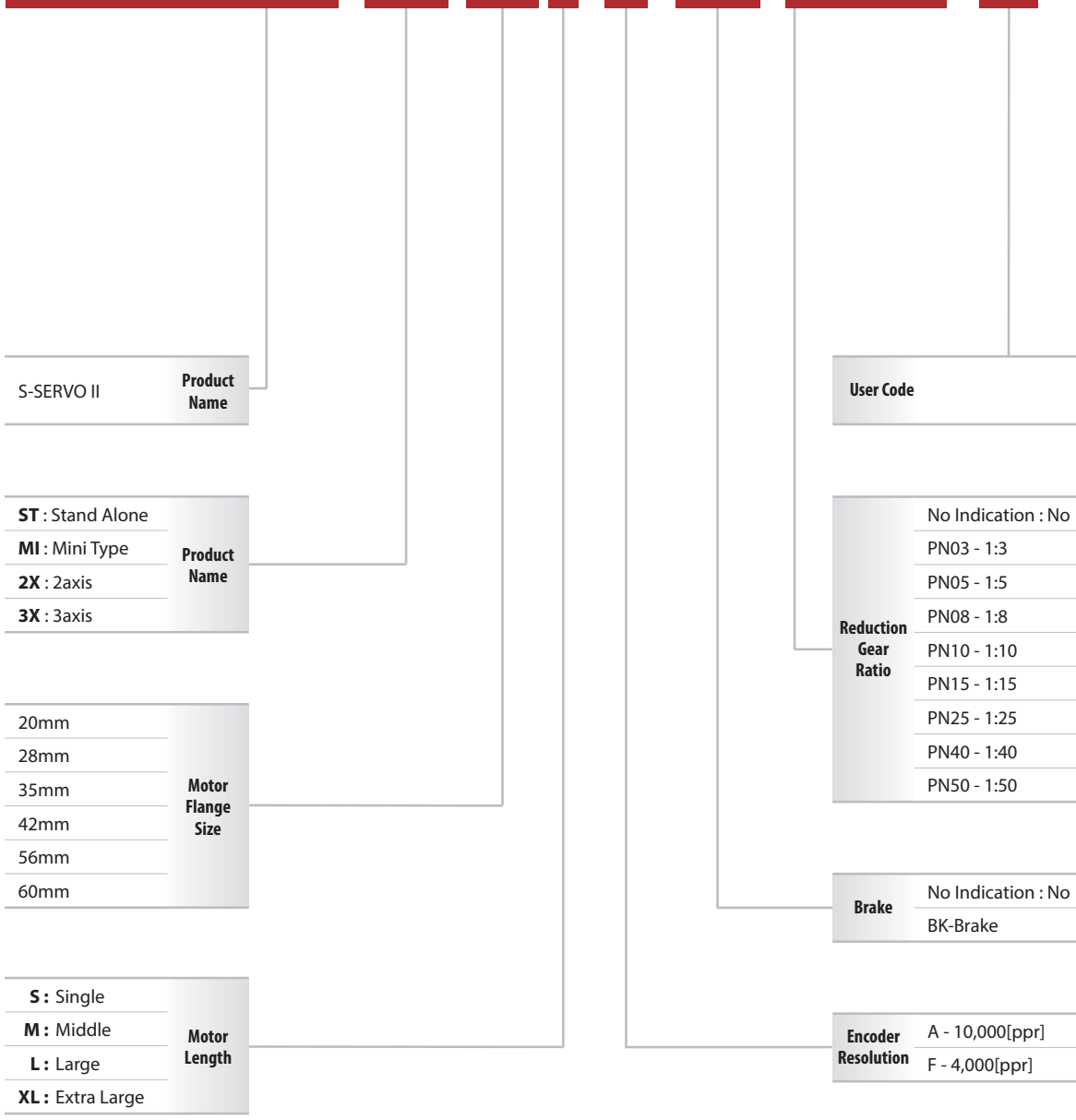


※ Except common usage of Power for S-SERVO II 2X,3X, external wiring diagram for each drive of motor, encoder and I/O are all same.

※ Turn power off of S-SERVO II drive and master controller when connect I/O cable between drive and master controller to avoid any damage.

Part Numbering Method

S-SERVO II-3X-56L-A-BK-PN05-□



Motor, Drive Combination	UNIT No.	MOTOR No.	DRIVE No.
		S-SERVO II-3X-□□□	

※ □ indicates the size of motor in the diagram of UNIT No.
ex) In case of 20M, 42XL, 60M size of motors, it is expressed as S-SERVO II-3X-20M / 42XL / 60M

Drive Specification

Specifications

Item	S-SERVO II 3X	
Input Voltage	24VDC ±10%	
Control Method	Closed Loop Control by ARM-based 32-bit MCU	
Current Consumption	Max. 1.5A(Except Motor Current)	
Operating Condition	Temperature	0 ~ 50°C(Non-condensing)
	Humidity	35 ~ 85% RH(Non-condensing)
	Vib. Resist.	0.5G
Function ^{*2}	Rotation Speed	0 ~ 3,000[rpm] ^{*1}
	Resolution[ppr] ^{*4}	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 with Rotary Switch) ※ Default : 4,000
	Max. Input Pulse Frequency	500KHz(Duty 50%)
	Protection	Over Current Error, Over Speed Error, Position Tracking Error Error, Over Load Error, Over Temperature Error, Over Regenerated Voltage Error, Motor Connection Error, Encoder Connection Error, Motor Voltage Error, In-Position Error, System Error ROM Error, Position Overflow Error
	LED Display	Power status(Green), In-Position status(Yellow), Enable 상태(Orange), Alarm status(Red)
	Run Current ^{*5}	50%~150%(Setting by using GUI) 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 GUI) 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 Input
I/O Signal ^{*3}	Input Signal	Position command pulse, Enable, Alarm Reset(Photocoupler Input)
	Output Signal	In-Position, Alarm(Photocoupler Output)
Dimension(mm)	260(W)×80(D)×40(H)	
Weight(Except attachments)	410g	

^{*1} : Maximum speed is variable according to resolution. Maximum speed is 3,000[rpm] until resolution 10,000. Over the 10,000 resolution, maximum rotation speed will be reduced.

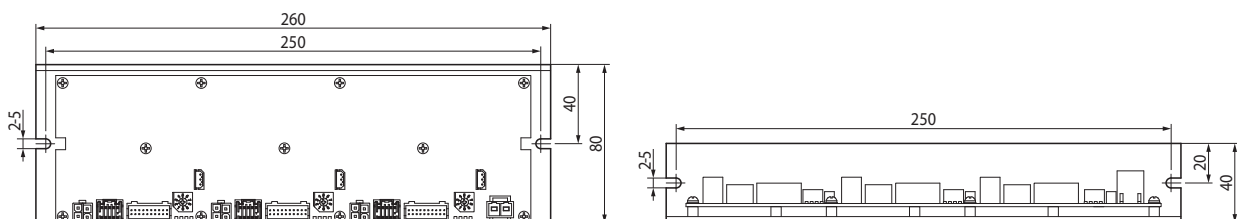
^{*2} : Please refer to 「Setting and Operation(Catalogue 274page)」 to obtain detailed function information

^{*3} : Please refer to 「Control Input / Output explanation(Catalogue 280page)」 to obtain detailed Input / Output signal information

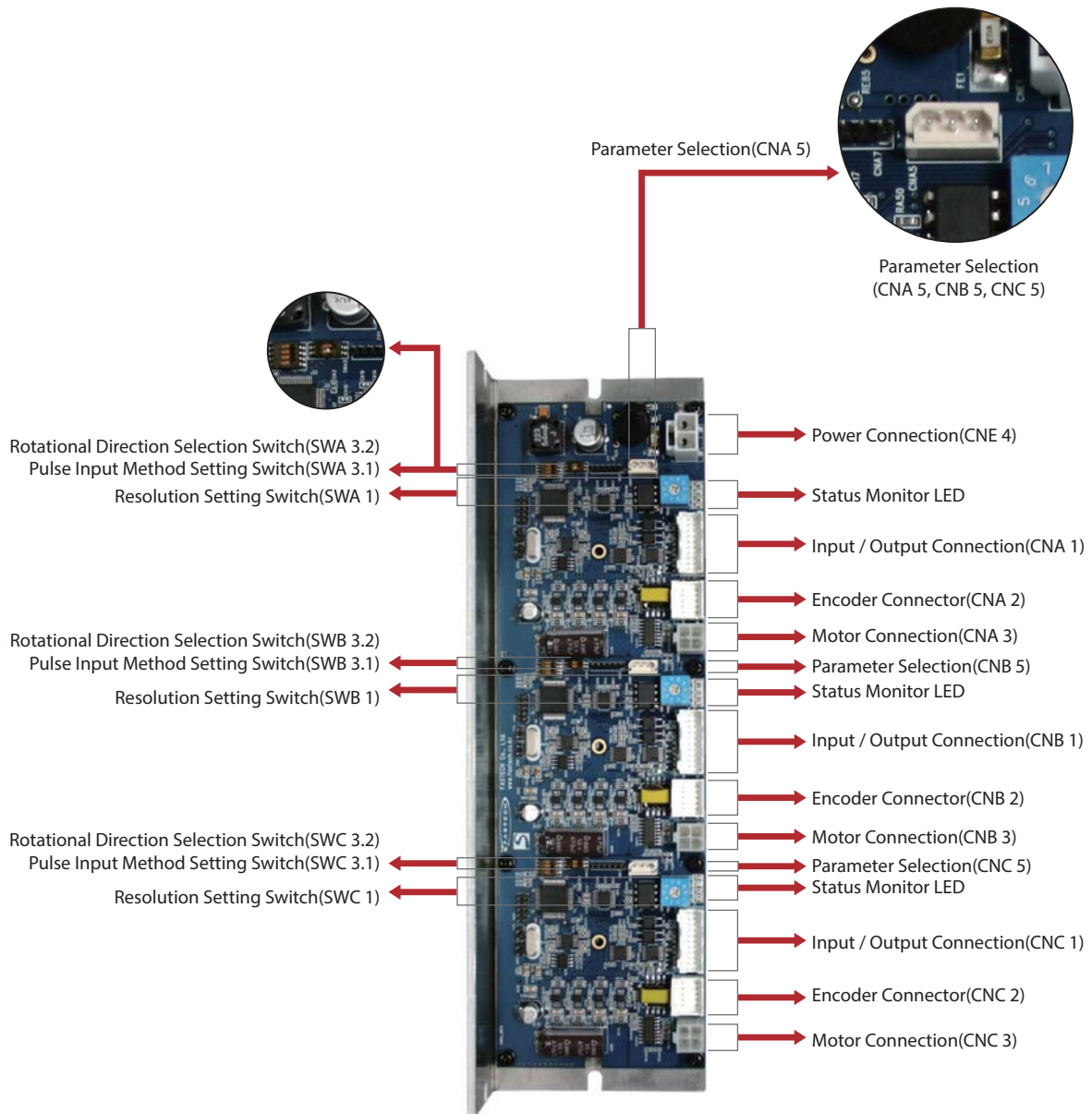
^{*4} : Maximum encoder resolution of S-SERVO II is 4,000[ppr]. If set resolution is above 4,000[ppr], it is microstepping operation between encoder pulse.

^{*5} : For more detail information of Run Current, please refer to the 「Parameter Setting GUI(Catalogue 281page)」

Drive Dimension(mm)



Setting and Operation



System Operation Manual

Status Monitor LED

1. Status Monitor LED

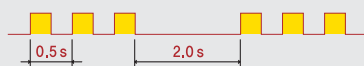
Indication	Color	Function	ON/OFF Condition
PWR	Green	Power Input Indication	LED is turned ON when power is applied
INP	Yellow	Complete Positioning Motion	Light on when Position Deviation located within preset value*1 from target position, after Position Commando Pulse Input is completed
EN	Orange	Motor 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

2. Protection functions and LED flash times

Time	Protection	Conditions
1	Over Current	The current through power devices in inverter exceeds the limit value
2	Over Speed	Motor speed exceed 3,000[rpm]
3	Position Tracking Error	Position error value is higher than 90° in motor run state
4	Over Load	The motor is continuously operated more than 5 second under a load exceeding the Max. torque
5	Over Temperature	Inside temperature of drive exceeds 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 with Encoder Connector in drive
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

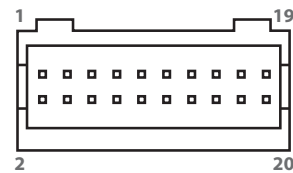
Alarm LED Flash(ex: Position Tracking Error)



Connector

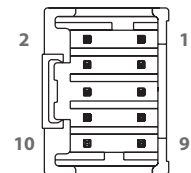
1. Input / Output Connection(CNA 1, CNB 1, CNC 1)

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



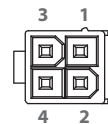
2. Encoder Connector(CNA 2, CNB 2, CNC 2)

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



3. Motor Connection(CNA 3, CNB 3, CNC 3)

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



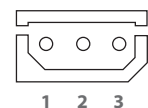
4. Power Connection(CNE 4)

No.	Function
1	24VDC ±10%
2	GND



5. Parameter Selection(CNA 5, CNB 5, CNC5)

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

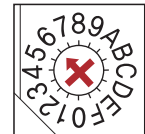


Switch

1. Resolution Setting Switch(SWA 1, SWB 1, SWC 1)

The Number of pulse per revolution.

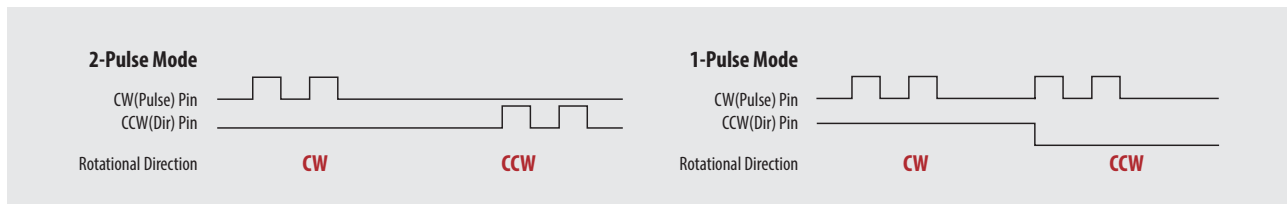
Position	Pulse/Revolution	Position	Pulse/Revolution	Position	Pulse/Revolution	Position	Pulse/Revolution
0	500	4	3,200	8	6,400	C	25,000
1	1,000	5	3,600	9	8,000	D	36,000
2	1,600	6	4,000 *1	A	10,000	E	40,000
3	2,000	7	5,000	B	20,000	F	50,000



* 1 : Default : 4,000

2. Pulse Input Method Setting Switch(SWA 3.1, SWB 3.1, SWC 3.1)

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



3. Rotational Direction Selection Switch(SWA 3.2, SWB 3.2, SWC 3.2)

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

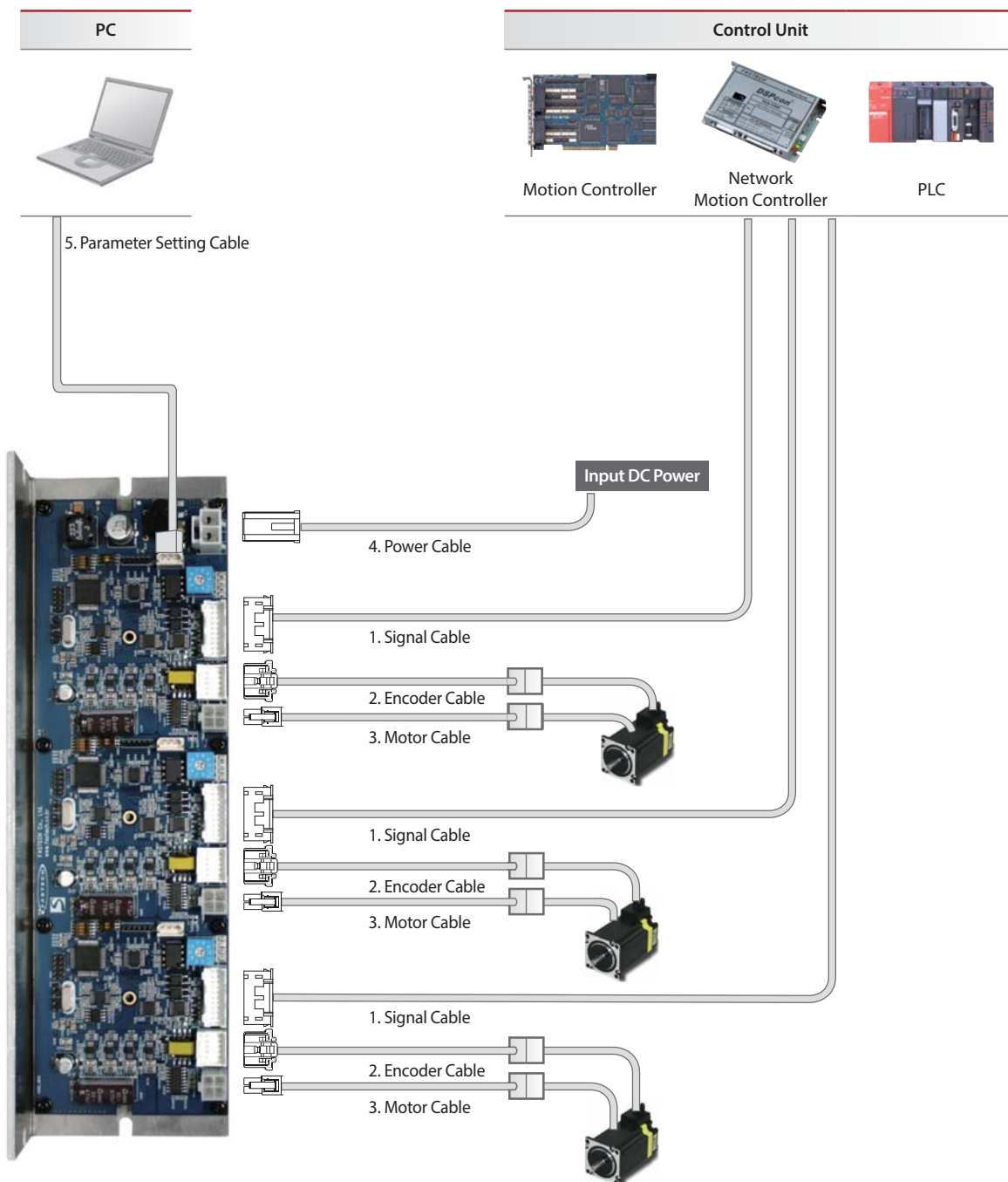


CCW Dir
Direction Selection Switch : ON



CW Dir
Direction Selection Switch : OFF

System Configuration



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

Accessories

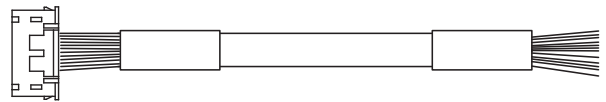
Purpose		ITEM	Standard	Quantity	Manufacturer
I/O Connections (CNA 1, CNB 1, CNC 1)		Housing	PADP-20V-1-S	2	JST
		Terminal	SPH-002T-P0.5L	60	
Encoder Connection	Drive Side (CNA 2, CNB 2, CNC 2)	Housing	51353-1000	2	MOLEX
		Terminal	56134-9000	20	
	Encoder Side	Housing	SMP-09V-NC	2	JST
		Terminal	SHF-001T-0.8BS	20	
Motor Connection	Drive Side (CNA 3, CNB 3, CNC 3)	Housing	5557-04R	2	MOLEX
		Terminal	5556T	8	
	Motor Side	Housing	5557-04R	2	
		Terminal	5556T	8	
Power Connection(CNE 4)		Housing	VLP-02V	1	JST
		Terminal	SVF-61T-P2.0	2	

Option Cable

1. Signal Cable

Model Name	Length[m]	Remark
CSSO-S-□□□ F	□□□	Normal Cable
CSSO-S-□□□ M	□□□	Robot Cable

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

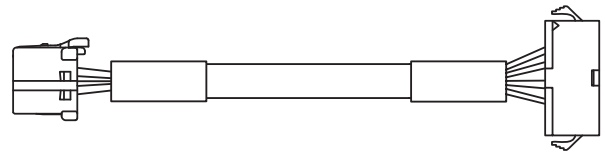


Manufacturer : JST
Housing : PADP-20V-1-S
Terminal : SPH-002T-P0.5L

2. Encoder Extension Cable

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.



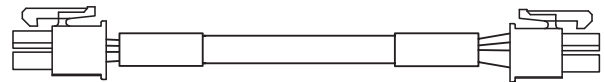
Manufacturer : MOLEX
Housing : 51353-1000
Terminal : 56134-9000

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

3. Motor 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.



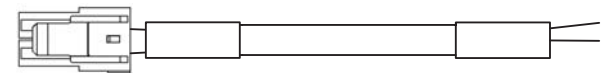
Manufacturer : MOLEX
Housing : 5557-04R
Terminal : 5556T

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

4. Power Cable

Model Name	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.

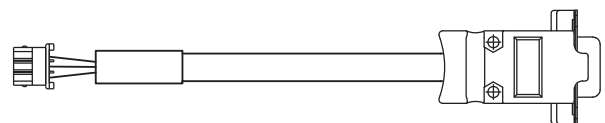


Manufacturer : JST
Housing : VLP-02V
Terminal : SVF-61T-P2.0

5. Parameter Setting Cable

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

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

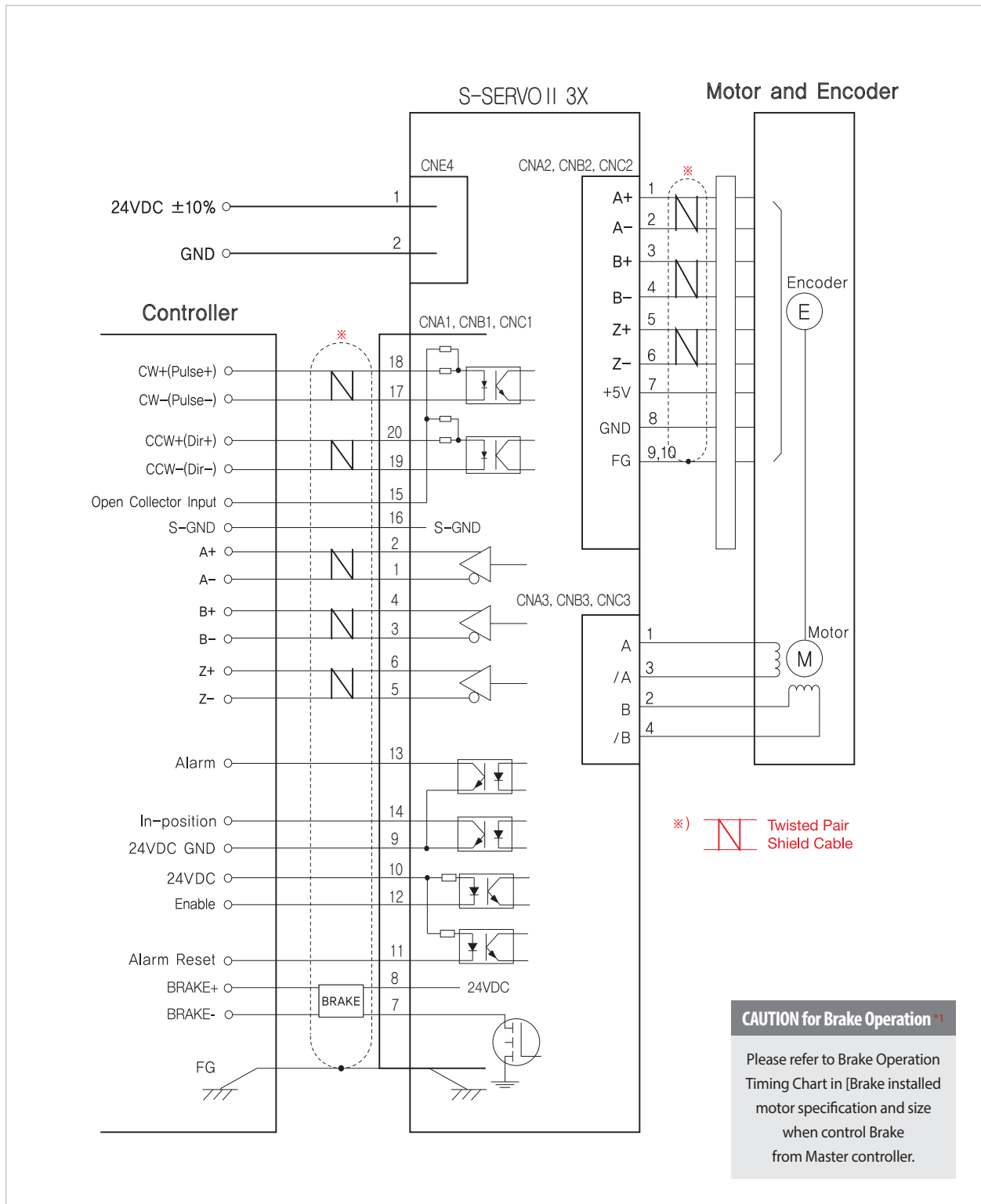


Manufacturer : MOLEX
Housing : 5264-03
Terminal : 5263

AMPHENOL : Manufacturer
L1775DE09S : Connector
17E-1657-09 : Backshell

External Wiring Diagram

S-SERVO II 3X



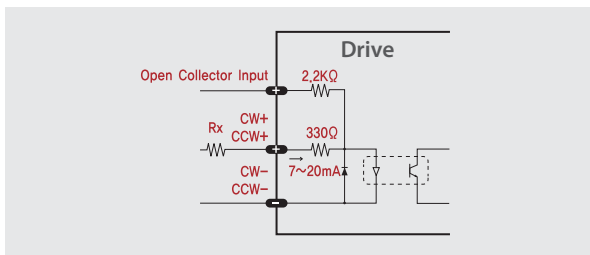
※ Except common usage of Power for S-SERVO II 2X,3X, external wiring diagram for each drive of motor, encoder and I/O are all same.

※ Turn power off of S-SERVO II drive and master controller when connect I/O cable between drive and master controller to avoid any damage.

Control Signal Input / Output Description

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.



Functions	Pin Number	
	S-SERVO II ST	S-SERVO II MINI
Open Collector Input	15	15
CW+	18	1
CW-	17	2
CCW+	20	3
CCW-	19	4

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

1. CW, CCW Input

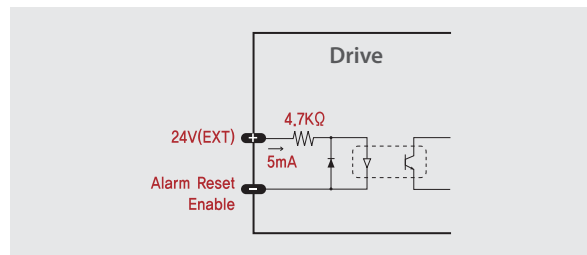
This signal can be used to receive a positioning pulse command from a user host motion controller. The user can select 1-Pulse Input mode or 2-Pulse Input mode (refer to switch No.1, SW 1).

The input schematic of CW, CCW is designed for 5V TTL level.

When using 5V level as an input signal, the resistor Rx is not used and connect to the drive directly. When the level of input signal is more than 5V, Rx resistor is required. If the resistor is absent, the drive will be damaged! If the input signal level is 12V, Rx value is 680ohm and 24V, Please use Open Collector Input.

2. 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 drive cuts off the power supply to the motor. Then, one can manually adjust output position. When setting the signal back to [OFF], the drive resumes the power to the motor and recovers the holding torque. When driving a motor, one needs to set the signal [OFF].

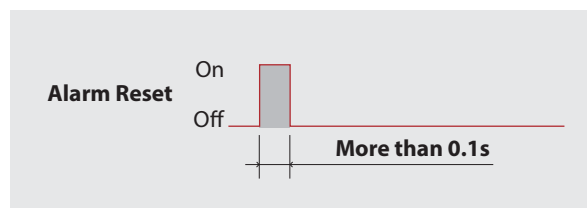


Functions	Pin Number	
	S-SERVO II ST	S-SERVO II MINI
24V(EXT)	10	20
Alarm Reset	11	14
Enable	12	13

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

3. Alarm Reset Input

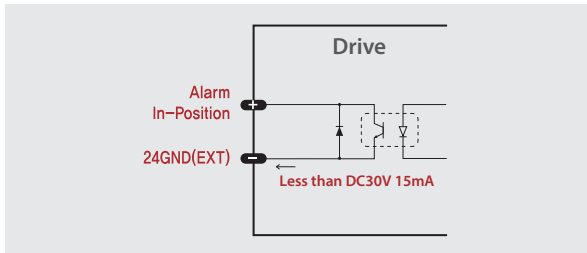
When a protection mode has been activated, a signal to this alarm reset input cancels the Alarm output.



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

Output Signal

Output signals from the drive 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.



Functions	Pin Number	
	S-SERVO II ST	S-SERVO II MINI
Alarm	13	11
In-Position	14	12
24GND(EXT)	9	19

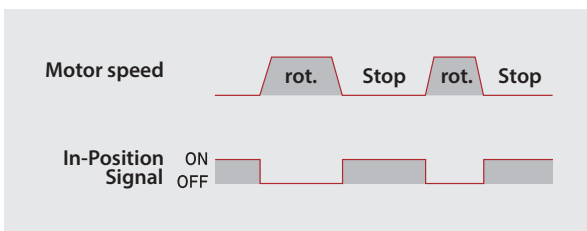
※ S-SERVO II 2X and 3X's pin number is the same as S-SERVO II ST.

1. Alarm Output

The Alarm output indicates [ON] when the drive 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 drive detects an abnormal operation such as overload or over current of the motor, it sets the Alarm output to [OFF], flashes the Alarm LED, disconnect the power to a motor and stops the motor simultaneously.

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

2. In-Position Output

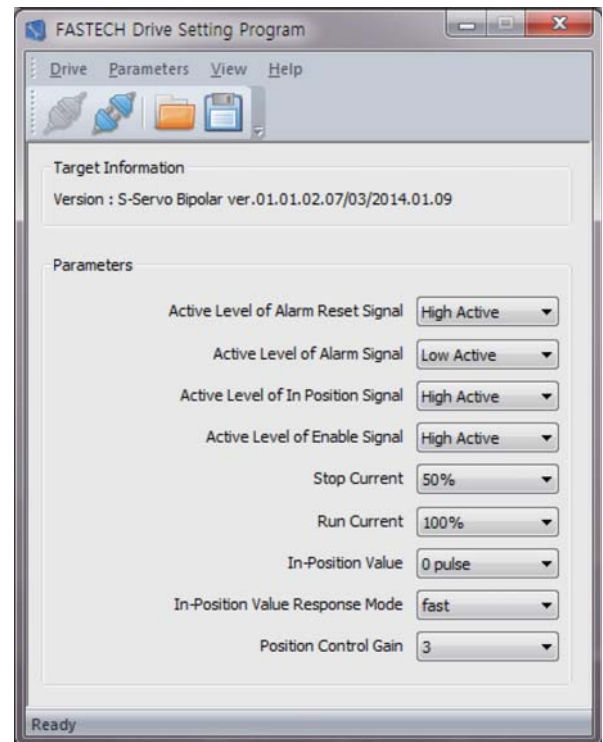


In-Position signal is [ON] when positioning is completed. This signal is [ON] when the motor position error is within the value set by the switch SW 4.

Parameter Setting GUI [User Interface]

S-SERVO II drive 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.



- Parameter setting program(GUI) can be downloaded from website (www.fastech.co.kr).
- Parameter setting program(GUI) support Windows XP / 7 / 8 / 10 / Vista (32, 64bit).
- Parameter setting program(GUI) can be updated without warning to increase performance and convenience of user.



Fast, Accurate, Smooth Motion

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