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SD100P Series

Servo Drive

FRECON ELECTRIC (SHENZHEN) CO.,LTD.

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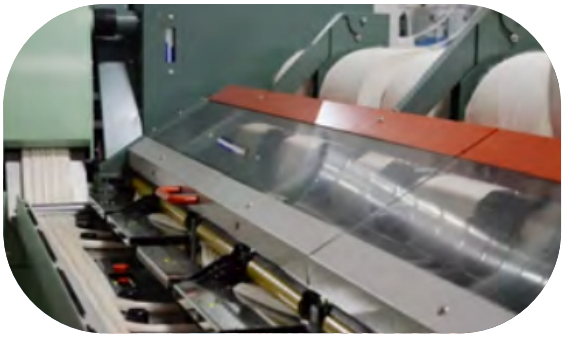
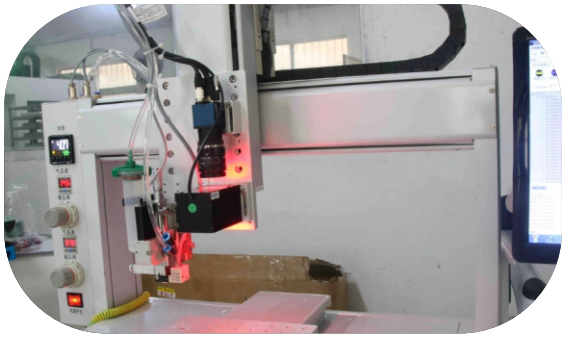
Servo drive system

SD100P series economical servo driver adopts a thin and light appearance design, superior performance, and rich interfaces. It can be widely used in CNC machine tools, woodworking, laser, packaging, robots, 3C and other industries.

Application



Features

- **High accuracy encoder**
  With 17bit magnetic encoders, significantly improve the repeatable positioning accuracy and absolute positioning accuracy of the equipment

- **High response bandwidth**
  The response bandwidth can reach 2kHz, which improves the servo performance greatly.

- **Inertia identification**
  The load inertia ratio is important parameter of the servo system, and the correct setting of the load inertia ratio helps to quickly complete the debugging.

- **Friction compensation**
  The friction compensation function reduces the influenceof the friction force in the mechanical transmission on the operation effect, and performs different positive and negative compensation values according to the positive and negative directions of the operation.

- **Switch freely through the threeloop of external input signal**
  Can be switched between speed/position, speed/current, position/current.

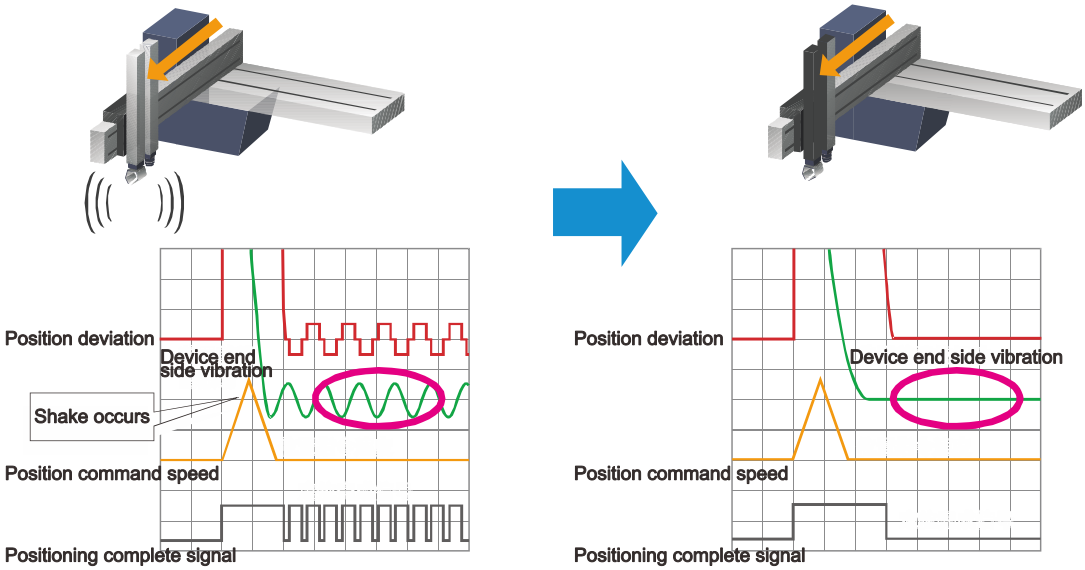
- **Support three types of pulse input**
  Pulse + direction, pulse + pulse, quadrature input

- **Vibration suppression function**
  1:Mechanical resonance suppression:
  The mechanical system has a certain resonance frequency. When the servo gain is increased, resonance may occur near the mechanical resonance frequency, so that the gain cannot continue to be increased. It can be suppressed by torque command filtering and notch filter.

  2:End low frequency suppression:
  if the end of the mechanical load is long and heavy, the end vibration is prone to occur during the emergency stop, and the vibration can be effectively reduced through the low-frequency resonance suppression function.

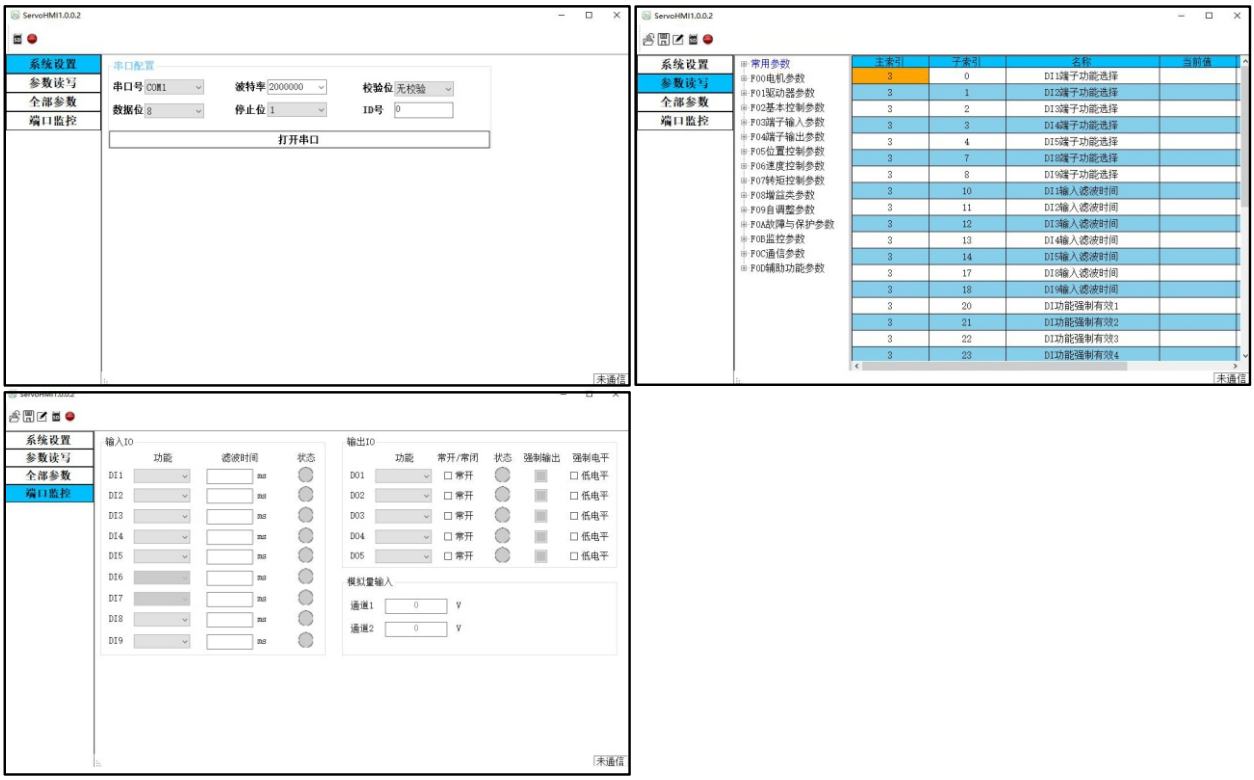
Suppress device vibration

There are two vibration components at the end of the device. SD300 series servo drive can simultaneously suppress the two vibrations at the end of the device, which can bring higher mechanical response.



PC debug software

Support parameter read/write, parameter upload/download, and terminal state monitor, makes parameter debugging more easy.



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SD100 Series Size Model Description

Model Description

SD100 P-2S-3R0

SD100P
SD100P series servo drive

Product Type:
P: Pulse type (product type)

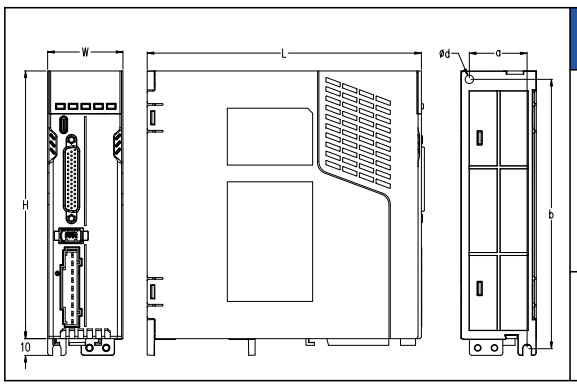
Rated Output Current
220V:1R8:1.8A
3R0:3.0A
5R5:5.5A
7R6:7.6A

Input Voltage
2S: Single phase 220VInput
2T: Three phase 220V input

Drive Model List

Structure	Model	Input Voltage(V)	Rated Current(A)	Maximum Current(A)
SIZEA	SD100□-2S-1R8	Single phase 220V	1.8	5.4
	SD100□-2S-3R0		3	9
	SD100□-2S-5R5		5.5	14
SIZEB	SD100□-2T-7R6	Three phase 220V	7.6	18

Drive size



Structure	Model	Product size (mm)					
		L	W	H	a	b	d
SIZEA	SD100□-2S-1R8	166	45	160	34.5	161	5
	SD100□-2S-3R0						
	SD100□-2S-5R5						
SIZEB	SD100□-2T-7R6	172	66	167	54.5	157.2	5

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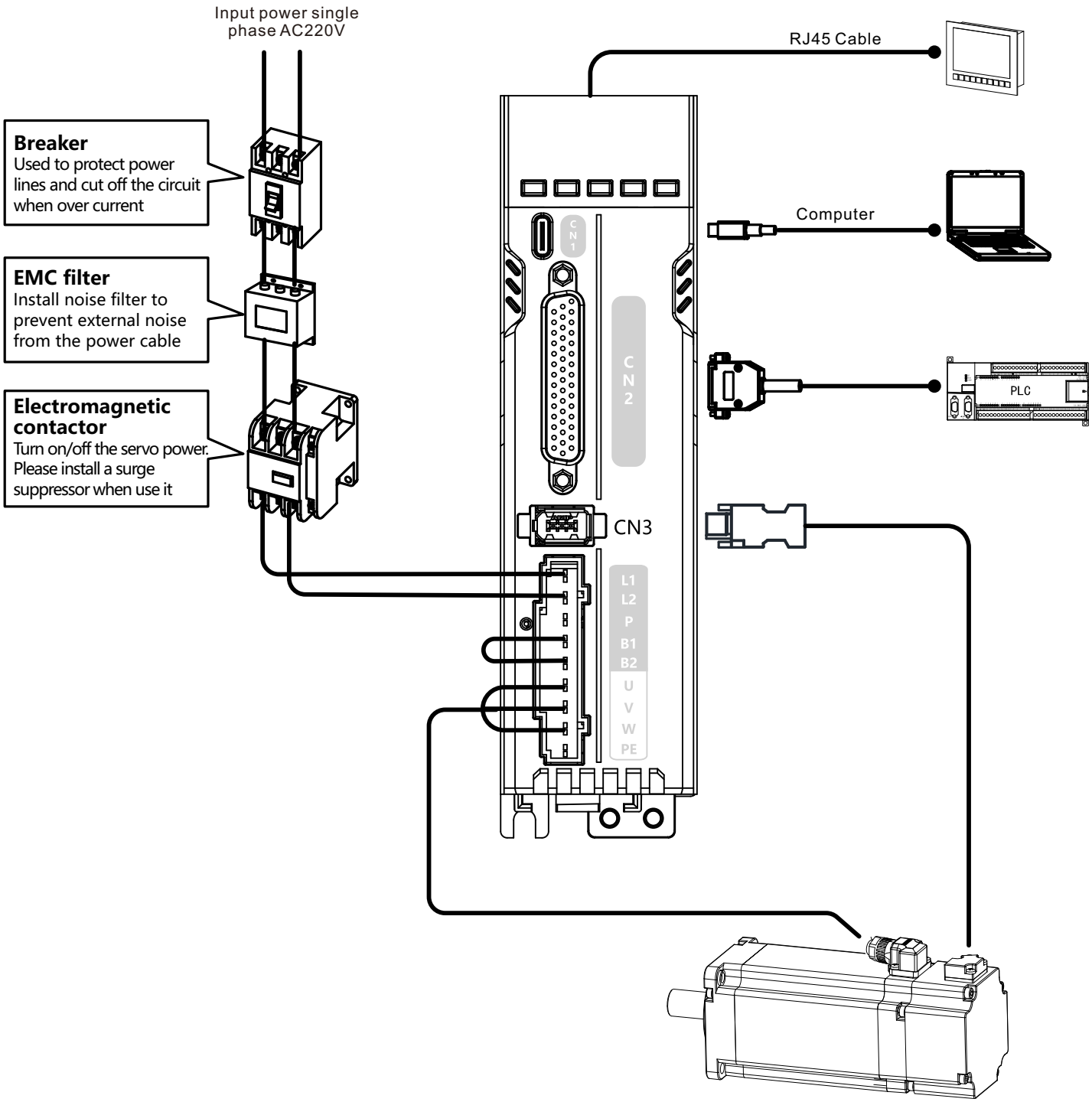
Drive Technical Parameters

SD100P Drive general technical specifications				
Control method				IGBT PWM Control, sine wave current drive method, 220V, 380V: single-phase or three-phase full-wave rectification
Environment	Temperature			Working/Storage: 0°C ~ 55°C (the ambient temperature is above 45°C, derate by 10% for every 5°C increase)/-20°C ~ 70°C
	Humidity			Working/Storage: Below 90%RH (no condensation)
	Vibration			4.9m/s2 / 19.6m/s2
	Atmospheric pressure			86kPa ~ 106kPa
IP grade				IP20
Altitude				Maximum altitude is up to 2000m. No derating is required for use at 1000m and below. Derating by 1% for every 100m above 1000m
Feedback method				Single-turn/multi-turn absolute encoder (Tamagawa protocol)
Position Mode	Input signal	Pulse command	Input pulse type	Three command formats:Direction + Pulse; A, B Phase Quadrature Pulse; Forward/Reverse Pulse
			Input Mode	Differential Input, Collector Open Circuit
			Input Frequency	Low Speed: ≤500kHz (Differential Input); ≤200kHz (Single-Ended Input). High Speed: ≤4MHz (Differential Input)
	Position output	Output mode		A phase, B phase: differential output Z phase: differential output or open collector output
		Frequency division ratio		Any frequency division ratio
Speed torque control mode	Speed mode	Command source		Parameter set
		Command acceleration and deceleration		Parameter set
	Torque mode	Source of command		Parameter set
		Speed limit		Parameter set
Input and output signals	Digital input signal	Input signal function selection		7DI DI1 ~ DI5 Digital signal inputs with a maximum frequency of 1kHz (frequency may decrease when the current-limiting resistance is greater than 2.4kΩ). DI8 ~ DI9 Digital signal inputs with hardware delay less than 1ms (current-limiting resistance is 2.4kΩ). DI functions are as follows: Servo enable,Alarm reset/clear,Forward drive disable,Reverse drive disable,Forward torque limit,Reverse torque limit,Emergency stop,Electronic gear selection 1,Electronic gear selection 2,Clear position deviation,Disable pulse input
	Digital output signal	Output signal function selection		5DO, programmable output terminal (photoelectric isolation) DO functions are as follows: Servo ready, alarm, positioning completed, speed reached, electromagnetic brake, torque limit, etc.
Built-in function	Overtravel (OT) prevention function			P-OT、N-OT stop immediately when moving
	Electronic gear ratio			Numerator and denominator：1-32767/1-32767
	LED display function			5 digit LED display
	Monitoring function			Speed, current position, position deviation, motor torque, motor current, command pulse frequency, bus voltage, module internal temperature, etc.
	Protective function			Overspeed, overvoltage, overcurrent, overload, abnormal braking, abnormal encoder, abnormal position, etc.
	Communication			Modbus RTU
	Host computer interface			USB, support parameter reading and writing, online upgrade

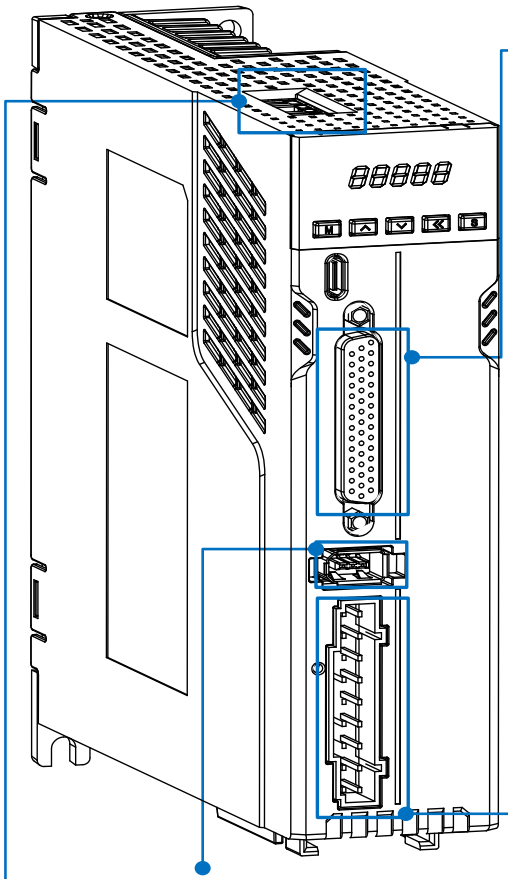
Servo drive wiring

SD100P Drive and peripheral device connection



Note: For three-phase input, the power input terminals are L1, L2, and L3.
The control power supply needs to select any two lines as the control power input L1C, L2C.

SD100P Drive port definition



Cn2 Control terminal definition				
Signal name		Default function	Pin number	Terminal function
Universal terminal signal	DI1	S-ON	9	Servo enable
	DI2	ALM-RST	10	Alarm fault reset
	DI3	P-OT	24	Forward overtravel
	DI4	N-OT	8	Reverse overtravel
	DI5	ClrPosErr	33	Clear position deviation
	DI8	Reserve	30	-
	DI9	Reserve	12	-
	COM+		11	DI input terminal common end
	DO1+	S-RDY+	7	Servo ready
	DO1-	S-RDY-	6	
	DO2+	COIN+	5	Positioning completed
	DO2-	COIN-	4	
	DO3+	ZERO+	3	Zero speed signal
	DO3-	ZERO-	2	
	DO4+	ALM+	1	Fault output
	DO4-	ALM-	26	
	DO5+	HomeAttain+	28	Home return completion
	DO5-	HomeAttain-	27	

Signal name		Pin number	Terminal function
Position command	PULSE+	41	Input pulse command mode: Differential drive input, collector PULSE- 43 open circuit Input pulse form: Direction + pulse, A, B phase orthogonal pulse, SIGN- 39 CW/CCW pulse
	PULSE−	43	
	SIGN+	37	
	SIGN−	39	
	HPULSE+	38	High-speed input pulse command
	HPULSE−	36	
	HSIGN+	42	
	HSIGN−	40	
	PULLHI	35	External power input interface for command pulse
	GND	29	Signal ground

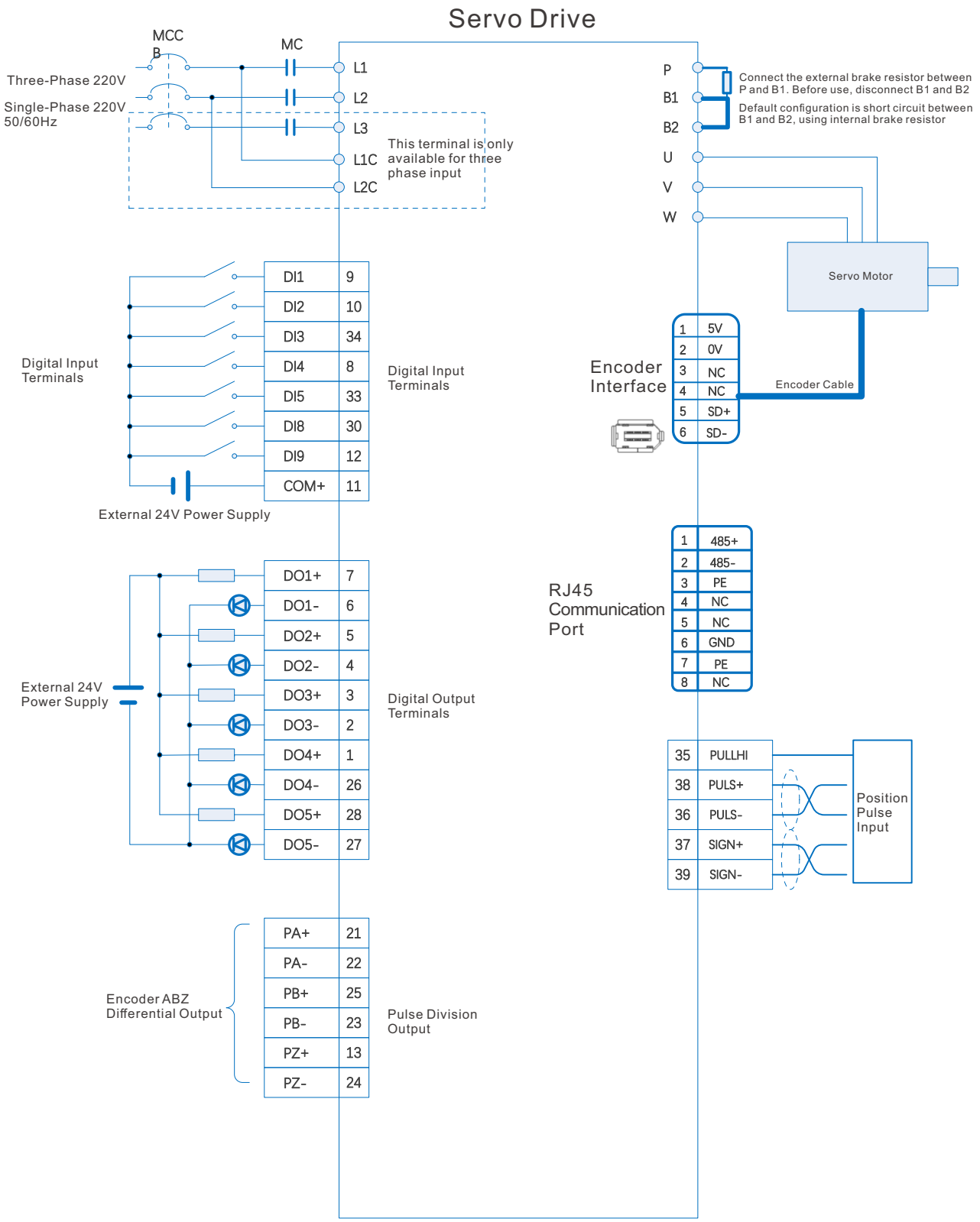
Cn3 encoder connection terminal		
Pin number	Definition	Describe
1	+5V	5V power
2	GND	
3	Reserve	-
4	Reserve	-
5	SD+	Encoder signal
6	SD−	

CN4/CN5 Communication terminal		
Pin number	Signal name	Terminal function
1	MBS−	Modubus Communication data negative terminal
2	MBS+	Modubus Communication data positive terminal
3	PE	Ground terminal
4	NC	Reserve
5	NC	Reserve
6	GND	Internal power ground
7	PE	The drive is grounded and connected to the power supply and motor ground terminals
8	NC	Reserve

Main circuit terminal definition (SIZE A)	
Terminal identification	Terminal function
L1、L2	Control circuit power input terminal
P、B1、B2	When use external brake resistor, disconnect between B1 and B2, and connect the external brake resistor across P and B1, not connected to B2
U、V、W	Output to motor U V W power
PE	PE motor ground terminal

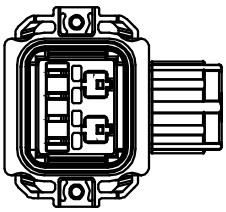
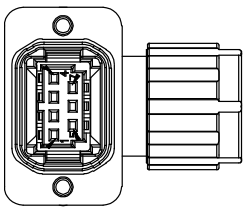
Main circuit terminal definition(SIZEB)	
Terminal identification	Terminal function
L1C、L2C	Control circuit power input terminal
L1、L2、L3	Main circuit power input terminal
P+、N−	Servo bus terminal
P、B1、B2	When use external brake resistor, disconnect between B1 and B2, and connect the external brake resistor across P and B1, not connected to B2
U、V、W	Output to motor U V W power
PE	PE motor ground terminal

SD100P Control Wiring Diagram



Note:
1.Use twisted pair cable with shielding for pulse input.

SD100 servo drive and peripheral equipment connection

60/80flange motor side terminal definition	Power side cable 6P connector		Power Side Encoder 7-pin connector	
				
	Pin number	Signal name	Pin number	Signal name
	1	W	1	5V
	2	V	2	0
	3	U	3	SD+
	4	PE	4	SD−
	A	BK+	5	PE
	B	BK−	6	BAT+
			7	BAT−

Cable Selection for Matching

Cable Model Naming

LPG - 0 075 0 - 3.0 - G
① ② ③ ④ ⑤ ⑥

①Motor Power Cable
LPG: General 4-core power
LPB: Power cable with brake

②Drive Side Plug Type
0: U-shaped type terminal
1:Needle type terminal

③Wire diameter(mm²)
050:0.5
075:0.75
100:1.0
150:1.5
250:2.5
...

④Motor Side Plug Type
0:4-core Amp head
1: SC-MC6S (Gecko Head)
2:6P-core aviation head

⑤Cable length
3.0:3m
5.0:5m
10.0:10m
...

⑥Cable type
G: General Cable
H: Super High-flex Cable (Bend endurance over 10 million cycles)

LEG - 0 0 - 3.0 - G
① ② ③ ④ ⑤

①Encoder Cables
LEG: Universal Absolute Encoder Cables
LEB: Battery-Powered Absolute Encoder Cables

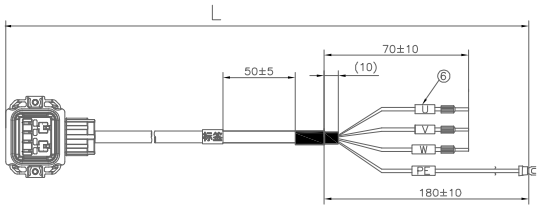
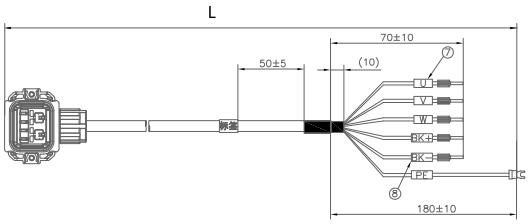
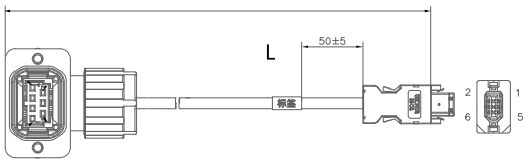
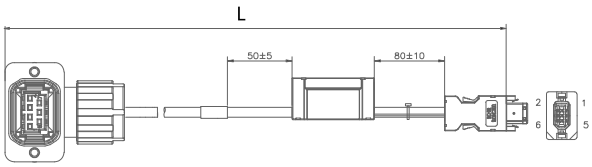
②Drive side plug type
O:1394 plug
1:DB15 plug
2:DB9 plug

③Motor side plug type
1:SC-MC7S (Gecko Head)
2:10P-core aviation plug

④Cable length
3.0:3m
5.0:5m
10.0:10m
...

⑤Cable type
G: General Cable
H: Super High-flex Cable (Bend endurance over 10 million cycles)

Cable Selection Table

Motor model	Cable name	Cable model	Length(m)	Cable appearance diagram
F1M Terminal Type Motor (40/60/80 Flange Motor)	Power Cable without Brake	LPG-10501-3.0-G	3	
		LPG-10501-5.0-G	5	
		LPG-10501-10.0-G	10	
	Power Cable with Brake	LPB-10501-3.0-G	3	
		LPB-10501-5.0-G	5	
		LPB-10501-10.0-G	10	
	Single-turn Absolute Encoder Cable	LEG-01-3.0-G	3	
		LEG-01-5.0-G	5	
		LEG-01-10.0-G	10	
	Multi-turn Absolute Encoder Cable	LEB-01-3.0-G	3	
		LEB-01-5.0-G	5	
		LEB-01-10.0-G	10	

Servo motor information

Motor model description

F1 M - 40A 30 L 1 - A1 60

① ② ③ ④ ⑤ ⑥ ⑦ ⑧

①Product Series

F1:F1 series motor

②Rotor inertia

M:medium inertia

③Rated power(W)

A:×10
B:×100
For example:40A=400W
. . .

④Rated speed(Rpm)

15=1500rpm
20=2000rpm
25=2500rpm
30=3000rpm

⑤Input voltage

L:AC220V

⑥Brake

1:Without brake
2:With brake

⑦Encoder type

A: Magnetic Encoder

1: 17-bit Absolute Value Single-turn
2: 17-bit Absolute Value Multi-turn

⑧Motor flange

60:60 flange
80:80 flange

Motor Selection Table

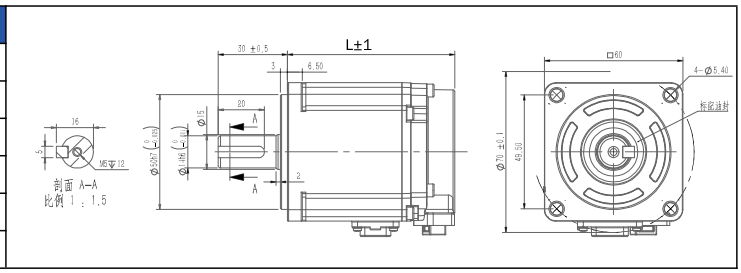
Motor model	Rated output (kW)	Voltage (V)	Rated torque (N.m)	Rated current (A)	Rotor inertia (x10-4kg.m²)	Rated speed/ Maximum speed(rpm)
F1M-20A30L□-A160	200W	220V	0.64	1.7	0.28	3000/6000
F1M-40A30L□-A160	400W	220V	1.27	2.5	0.52	3000/6000
F1M-60A30L□-A160	600W	220V	1.91	3.6	0.76	3000/6000
F1M-75A30L□-A180	750W	220V	2.39	4.4	1.48	3000/6000
F1M-10B30L□-A180	1000W	220V	3.18	5.8	1.97	3000/6000

Note：□1 without brake, 2 with brake

Servo motor appearance and installation dimensions

60 Flange

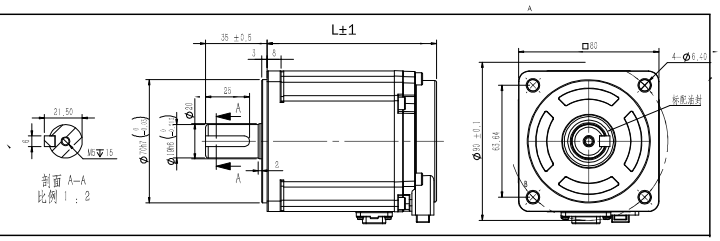
Mode l	L (mm)	Brake
F1M-20A30L1-A160	73	No brake
F1M-20A30L2-A160	102.5	Brake
F1M-40A30L1-A160	90	No brake
F1M-40A30L2-A160	119.5	Brake
F1M-60A30L1-A160	107	No brake
F1M-60A30L1-A160	136.5	Brake



Note: For other encoder types, please contact us for customization.

80 Flange

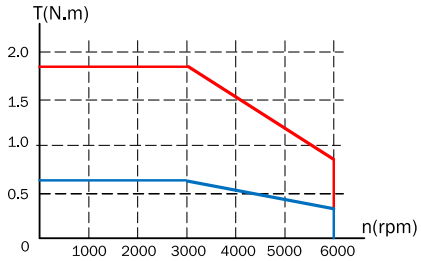
Model	L (mm)	Brake
F1M-75A30L1-A180	96.5	No brake
F1M-75A30L2-A180	130.5	Brake
F1M-10B30L1-A180	109.5	No brake
F1M-10B30L2-A180	143.5	Brake



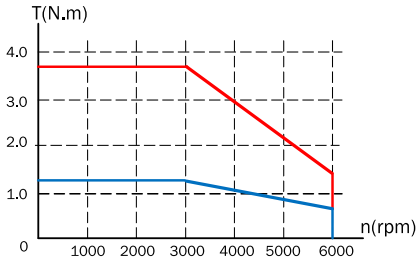
Note: For other encoder types, please contact us for customization.

Servo motor characteristic curve

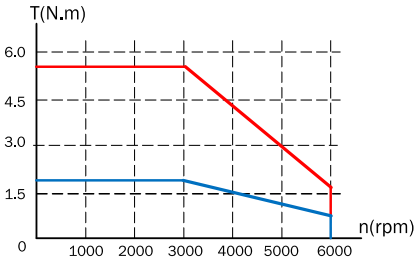
F1M-20A30L□-□60



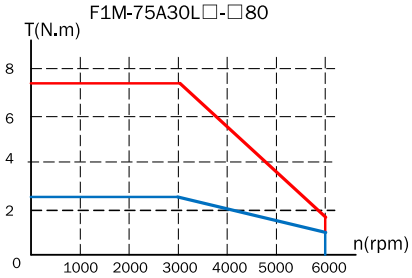
F1M-40A30L□-□60



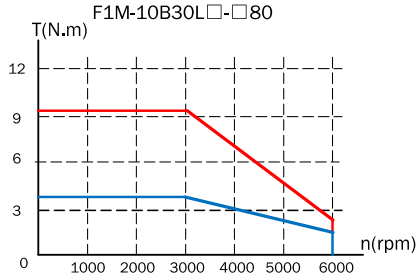
F1M-60A30L□-□60



F1M-75A30L□-□80



F1M-10B30L□-□80



Note: The blue line is the rated torque, the red line is the instantaneous torque.

SD100P Configuration table

Motor model	Flange	Rated Current (A)	Rated torque (N.m)	Voltage (V)	Adapter Drive	Encoder line	Power line
F1M-20A30L□-A160	60	1. 7	0. 64	220V	SD100□-2S-1R8	LEG-01-3.0-G (With battery) LEB-01-3.0-G (With battery)	LPG-10501-3.0-G LPB-10501-3.0-G (With brake)
F1M-40A30L□-A160	60	2. 5	1. 27		SD100□-2S-3R0		
F1M-60A30L□-A160	60	3. 6	1. 91		SD100□-2S-5R5		
F1M-75A30L□-A180	80	4. 4	2. 39				
F1M-10B30L□-A180	80	5. 8	3. 18		SD100□-2T-7R6		

FRECON

FRECON ELECTRIC (SHENZHEN) CO.,LTD

Add : 2nd, No.3 Zhenbao Industrial Zone, No.137 Shiyan Road, Shiyan Street, Bao'an, Shenzhen, China

Tel : 0755-88605930

Fax : 0755-88606072

E-Mail: overseas@frecon.com.cn

Web: www.frecon.com.cn

Frecon Website

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