



Persist in our goals, energy technology

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**Servo drive and servo motor selection brochure**

**AC Servo Driver & Servo Motor**

**ESS200P series synchronous servo drive**

V18.07

# About us

## Company introduction

Shenzhen Encom Electric Technologies CO., LTD is a state-level high-tech enterprise with independent intellectual property rights, focusing on industrial automation products' development, production and sales. The main products include frequency inverter/ac drive, servo controller, PLC, new energy systems.

ENC company was established in 2004, has passed ISO9001: 2008 quality management system certification and the European Union CE certification, won the National Innovation Fund, the Shenzhen strategic emerging industries fund, product innovation award, the most investment value award and repeatedly won "China top ten low-voltage inverter domestic brands" title.



1. Won National Innovation Fund enterprise, China's high-tech enterprise
2. Repeatedly won "China top ten domestic brands" title
3. With more than 13 years of rich experience R&D team
4. With completely independent intellectual property rights, has dozens of patents
5. Master the world's leading asynchronous, synchronous vector control technology and torque control technology
6. ISO9001:2008 system certification unit, strict and standard information quality control system
7. Has more than 30 offices in China
8. ENC provide quality products and services for more than 30 countries' industrial user

## ENC Servo ESS200P series products Overview

### Application Fields



Medical equipment, rubber tires, food machinery, textile machinery, printing & packaging, semiconductor production, fine engraving machine, 3D printing, lithium electrical manufacturing, precision welding, paper making, printing and painting equipment, industrial robot and various testing equipments.

### performance

- 1KHZ: Response Frequency 1KHZ
- Low cogging torque of motor
- The resolution of motor encoder can reach 2<sup>23</sup> Pulse each cycle
- Max. Input pulses frequency 4MHZ
- Max. overload capability of the motor: 3 times
- The resolution of analog command: 12bit

### Intelligent

- Motor parameters self-learning
- Load inertia self-learning
- Manual/Automatic notch filter
- Encoder self-learning
- PI parameters auto-tuning via one key
- Manual/Automatic Low frequency vibration suppression
- Excellent position feed-forward algorithm

### Safety

- Protection level of servo motor is IP65/67
- Perfect hardware and software protection and fault detection
- Conform to the requirements of CE certification

### Utility

- Gain switch
- Origin return function
- Torque limit switchover function
- Brake energy processing function
- Allocation function of input and output signal
- Abundant encoder type
- Compensation function for gravity load
- Abundant motor type for selecting
- Powerful upper device debugging software
- Parameters copy and download function

### functions

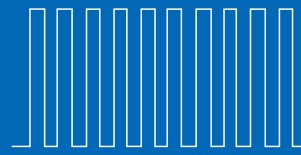
- Double PG full closed loop application
- Interrupted type position control
- The resolution of motor encoder can reach 2<sup>23</sup> Pulse each cycle
- Max. Input pulses frequency 4MHZ
- Encoder adopts two-in-one design which supports 2500 lines incremental and 23 bit bus type encoder



# ENC Servo ESS200P series products features

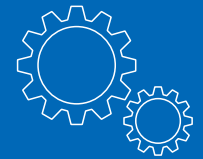
## Performance

It has very quick action, fast response and high precision locating advantages. With proprietary intellectual property rights excellent algorithms matching high performance motors, it can meet the high requirements of various industrial sites.



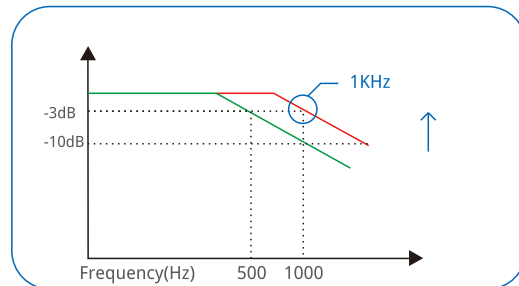
## Powerful application PC software

Background monitoring and debugging software has continuous sampling mode oscilloscope and can monitor DI/DO. It makes problems determination and products adjusting more convenient and intelligent. (Please explore [www.encyfd.com](http://www.encyfd.com) and download the software)

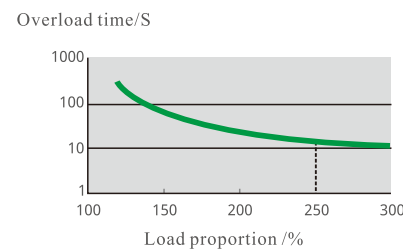


### Response Frequency 1KHZ

Bandwidth response frequency of velocity loop can reach 1KHZ

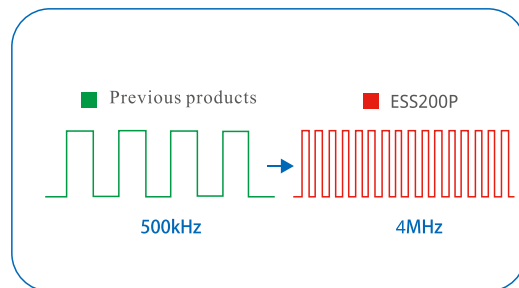


### Max. overload capability of the motor: 3 times

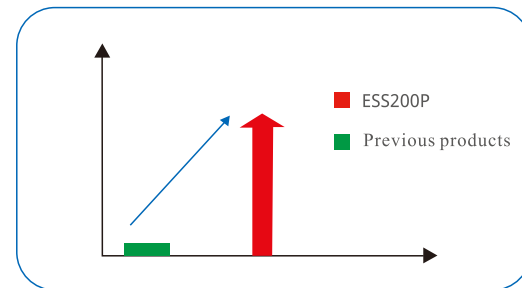


### Max. input command pulses 4MHZ

Max. input command pulses can reach 4MHZ

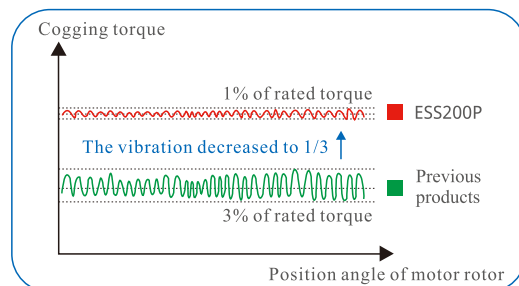


### The resolution of motor encoder can reach 2^23 Pulses each cycle

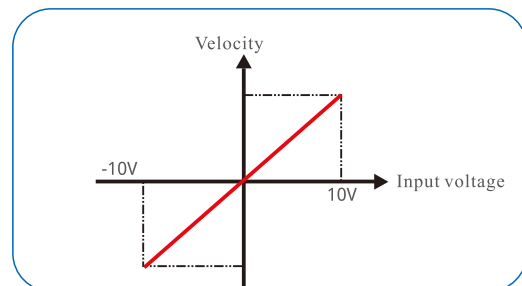


### Low cogging torque of servo motor

Best collaboration of motor poles and slot



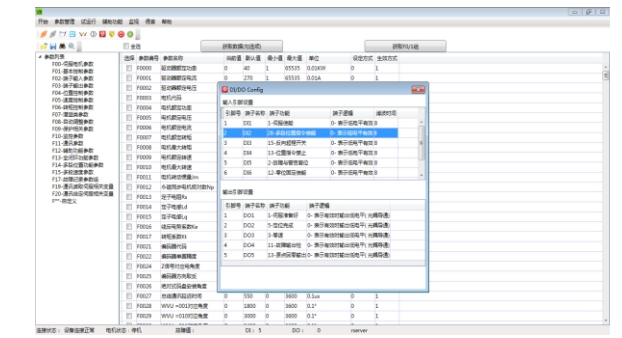
### The resolution of analog command: 12bit



### Convenient to read/write motor parameters

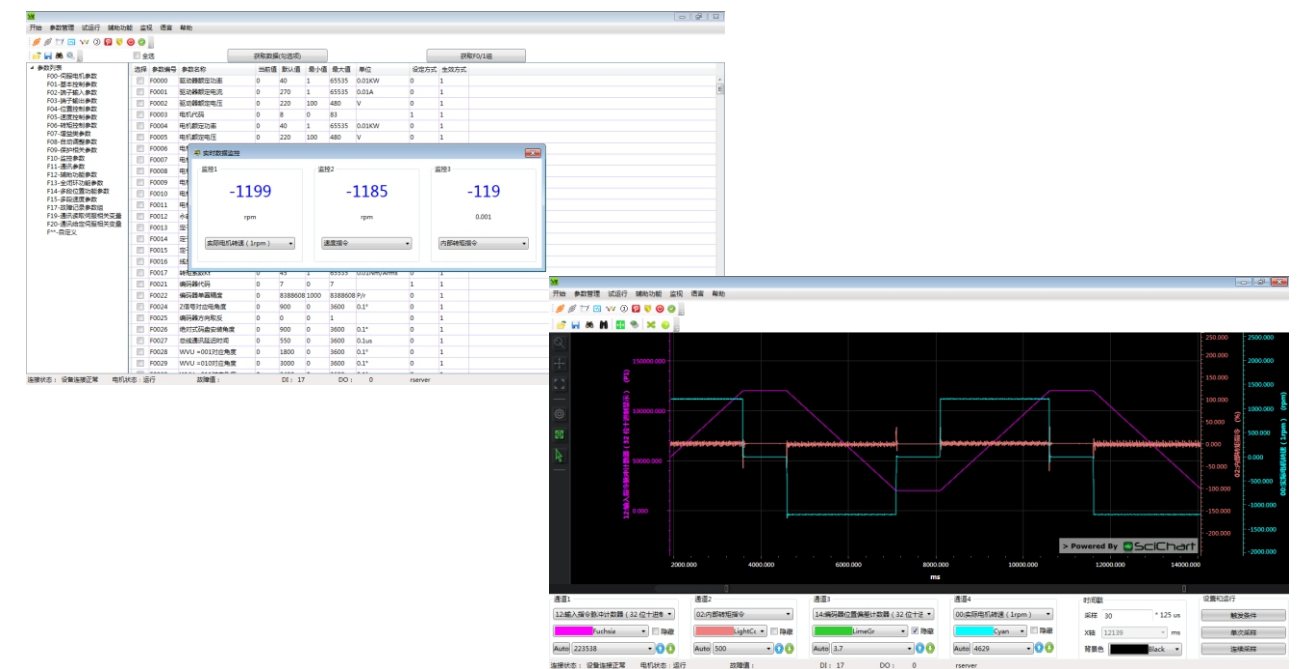


### Convenient parameters setup



### Multitask real-time oscilloscope

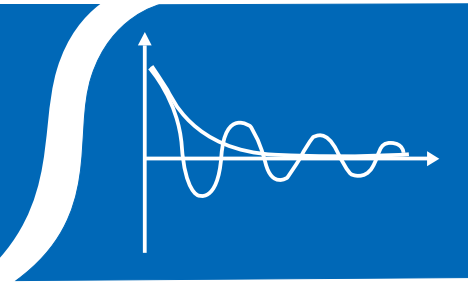
Multitask real-time oscilloscope makes adjusting more convenient



# ENC Servo ESS200P series products features

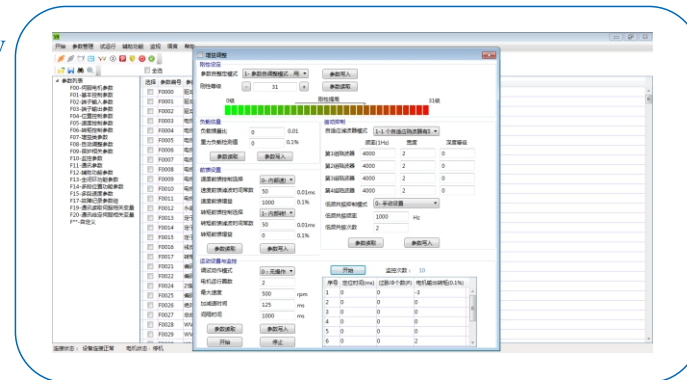
## Intelligent

It avoids the complex parameter debugging of traditional products. Self-calculation and identification according to different loads used by users, and adjusting the system inertia, notch filter, rigidity and other parameters via one key so that the equipment always operate in the optimal state.



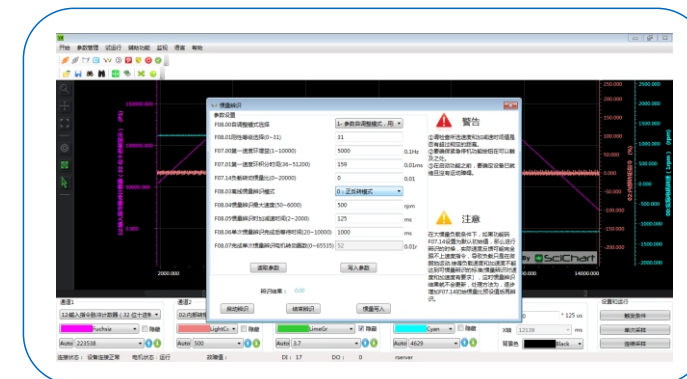
### Parameters auto-tuning via one key

The gain of velocity loop and position loop can be adjusted automatically by adjusting the single rigidity level parameter. For different mechanical equipment, the difficulty of gain debugging greatly reduced by setup corresponding rigidity level in advance.



### Load inertia self-learning

With inertial identification function, most of the system gain parameters can reach optimal state. It greatly reduces the system debugging time.



### Motor parameters self-learning

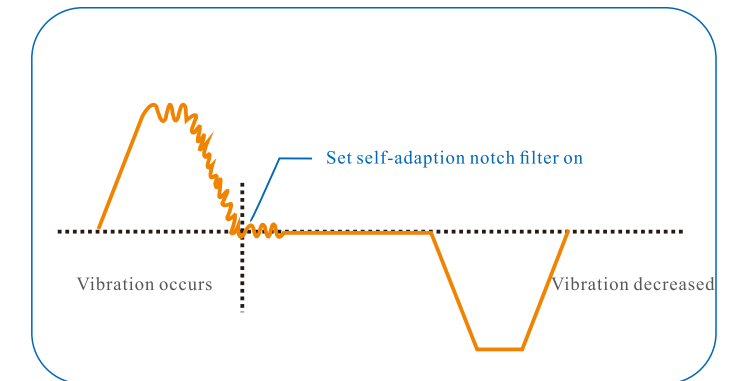
The optimal current loop response can be guaranteed by self-learning of motor resistance, inductance, torque coefficient and so on. At the same time, it is also convenient for Servo Drive to adapt to other brands motor.

### Encoder self-learning

The self-learning of encoder installation information greatly alleviates the user's installation and maintenance work of encoder. It is also convenient for the Servo Drive to adapt to encoder of other brands motor.

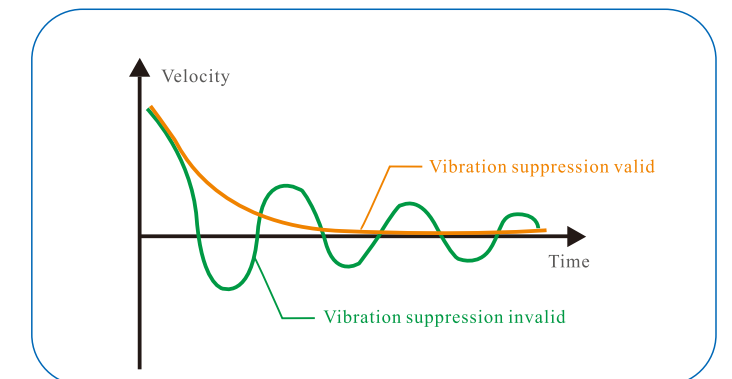
### Manual/Automatic notch filter

4 notch filters are provided with 100 ~ 4000Hz range setup frequency for each filter and the depth and width can be adjusted. 2 of them can automatically detect and set the vibration frequency and depth. It greatly reduces the vibration and noise which caused by the mechanical resonance of devices to realize rapid response actions.



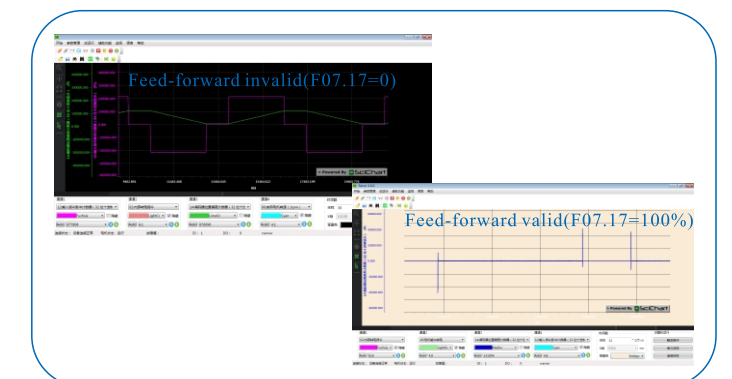
### Manual/Automatic vibration suppression at low frequency

The low frequency vibration suppression algorithm can effectively overcome the mechanical resonance at low frequency and the shimmy phenomenon of end for long swinging arm mechanism, so as to shorten the finish time of mechanical positioning significantly and reduce the defective rate during product processing which caused by vibration. The vibration frequency and the number of vibration times can be obtained automatically to restrain the vibration at low frequency. This method reduces the difficulty of debugging by user.



### Excellent position feed-forward algorithm

Excellent position feed-forward trajectory tracking algorithm ensures the minimum position deviation in the process of localization so as to meets the harsh application areas.





## ENC Servo ESS200P series products features

### ▼ Safety & Utility

Servo Drive has perfect protection function. Conforming to national safety standards, it's safe and reliable to use. Combined with the actual requirements of users, it has simple parameters setup, abundant application functions and more considerate debugging.



### Servo motor protection level is IP65/67

Standard oil seal design, up to IP67 protection level can meet harsh application areas

### Perfect hardware and software protection and fault detection

Overcurrent, overvoltage, undervoltage, short circuit to ground, input loss phase, overheating, Servo Drive overload, motor overload, speeding, encoder fault, too large position deviation, etc

### Gain switchover

The two sets of gains can be switched according to different conditions, which can shorten the positioning time and reduce the vibration for better results.

### Torque limit switchover function

Torque limit switching via I/O for simple pressure, tension control applications, etc.

### Allocation function of input and output signal

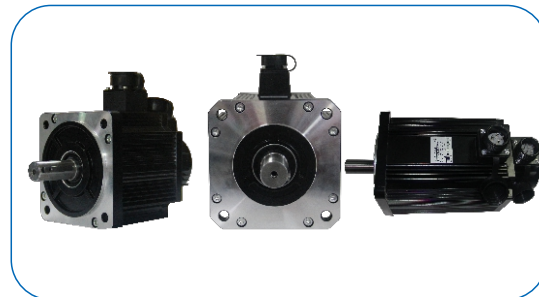
Allocating general 8-channel input and 5-channel output through setting parameters. The background software has a dedicated interface, making setting easier and faster.

### Compensation function for gravity load

Gravity load one-button self-learning, more stably control Z-axis.

### Parameter copy and download function

copying and downloading parameters through optional parameter copy keyboard, quickly realize parameter setting of multiple servo drives.



### Conform to the requirements of CE certification

### Origin return method

A variety of origin return methods, including zero return and electrical zero return, to meet different applications.

### Brake energy processing function

When the large load inertia is stopped, the braking energy generated by the servo motor can be consumed by the built-in or external braking resistor.

### Abundant encoder type

Photovoltaic incremental 2500 lines, photoelectric incremental (line-saving) 2500 lines, absolute value communication type 17 bits, 20 bits, 23 bits. Encoder interface all-in-one design, which is convenient for inventory management.

### Abundant motor type for selecting

37 kinds of servo motors, mid-high and low inertia configuration flexibly, meet different industry requirements.

## Abundant application features of ENC servo product

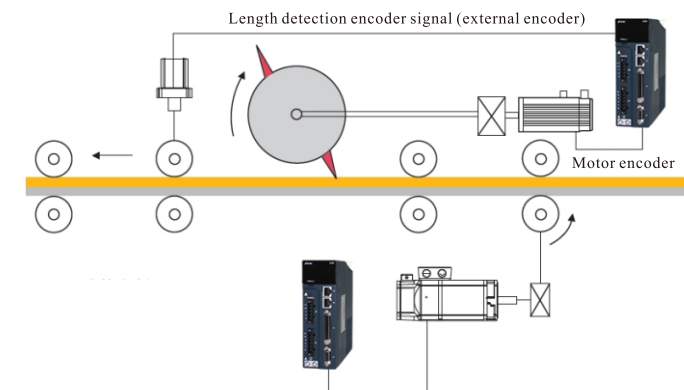
### Dual PG full closed loop control

#### Function description:

In simple terms, in practical application, the servo drive can be equipped with two encoders, one for speed closed loop control on the motor shaft, and the other encoder mounted on the speed detector to feed back the actual position of the material, and the servo drive performs position closed-loop control according to the pulse signal sent to it to ensure that the material is accurately and smoothly sent to the preset position. It effectively prevents the belt from slipping and various problems caused by the mechanical transmission gap. The dual PG full-closed control function of the ESS200P is implemented by an internal algorithm. The speed and position control smoothness during material transfer are adjusted by the built-in filter of the drive, and there is a speeding protection function when the position difference between the inner and outer loop is large, so as to ensure the feeding process smooth and accurate, and meet the needs of various production processes. In addition, the mechanical deviation value can also be detected.

#### For example:

Steel plate shearing machine, pipe bending machine, wire stripping machine



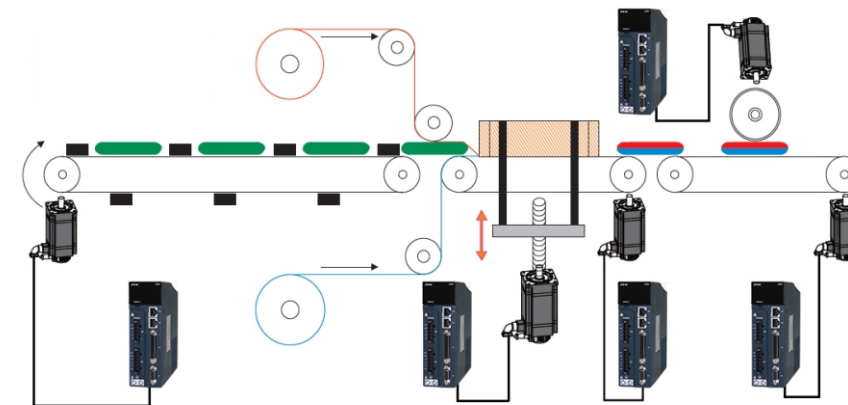
### Internal multi-segment position control

#### Function description:

If without upper computer sending pulse signals, the ESS200P can control the position by the number of pulses set in the servo drive. In the application, different built-in position commands, relative positions or absolute positions can be selected by different combinations of input terminals. It is also possible to preset multiple sets of position signals for the internal function code of the drive via upper computer communication or manual input, and can select up to 16 segments of position control at one time. It can simplify the design of the upper computer. During the execution of the multi-segment position, each segment is executed with a position arrival signal output, which is convenient for the upper computer to judge.

#### For example:

longitudinal cutting machine, multi-station switching mechanism, servo tool holder



# ENC Servo ESS200P series products features

## Servo drive specifications

Item		Terminal function and specification		
Basic specification	Control method	Vector control		
	Control mode	①position control ②speed control ③torque control ④position/speed control ⑤position/torque control ⑥speed/torque control.		
	Gain adjustment mode	Manual mode, one-button parameter auto-tuning mode		
	Filter function	1 · Command pulse inertial filter, FIR filter 2 · Self adaptive low frequency resonance filter 3 · 4 sets of notch filters, 2 of which are self adaptive notch filters		
	Inertia self-learning function	Offline inertia self-learning		
	Motor parameter self-learning function	Motor parameter self-learning, encoder information self-learning		
	Supported encoder	2500 line incremental encoder (9 lines, 15 lines); 17bit, 20bit, 23bit absolute encoder; Note: The bus protocol is the Tamagawa protocol or the Fre_Dat-B protocol of Changchun Yuheng.		
	Parameters batch upload and download	Support parameter batch upload and download of external lead accessories		
Position control mode	Performance	Speed feedforward compensation	0 ~ 100.0%( Set resolution 0.1%)	
		Torque feedforward compensation	0 ~ 200.0%( Set resolution 0.1%)	
		Positioning accuracy	±1 motor encoder pulse	
	Input signal	Input pulse form	Input pulse form	Contains "direction + pulse", "A, B phase orthogonal pulse", "CW/CCW pulse" command forms.
			Input form	Differential input Open collector
		Input pulse frequency	Input pulse frequency	Differential input: High speed up to 4Mpps, pulse width not less than 0.125us. The low speed is up to 500Kpps and the pulse width cannot be lower than 1us. Open collector: Maximum 200Kpps and the pulse width cannot be lower than 2.5us.
			Built-in collector open circuit power supply	+24V( built-in 2.4kΩresistance)
	Multi-segment position command selection	Configure 4 DI to achieve the 1st to 16th position selection.		
	Speed/torque control mode	Performance	Speed control range	1: 5000
			Speed calibration rate	Load rating change (0 ~ 100%),Maximum±0.01%
Power supply ±10%,Maximum±0.01%				
Ambient temperature (0 ~ 50°C),Maximum±0.01%				

Item		Terminal function and specification		
Speed/torque control mode	Performance	Speed loop bandwidth	5%	
		Torque control accuracy	1000HZ	
	Input signal	Speed command input	Command voltage	DC±10V,12 bits Input voltage : ±12V
			Input resistance	About 9kΩ
		Torque command input	Circuit time parameter	About 47μs
			Command voltage	DC±10V , 12 bits Input voltage:Max±12V
	Muti-speed command	Input impedance	About 9kΩ	
		Circuit time parameter	About 47μs	
	Input output signal	Analog input	(AI1 , AI2)2 channels analog input	DC±10V,12-bit resolution,Input impedance about 9kΩ
		Analog output	(AO1 , AO2)2 channels analog output	DC±10V
Digit input signal		Signal allocation can be changed	8-channel DI (where DI8 is high-speed DI input) Multiple DI functions:Servo enable, alarm reset, gain switching, forward overtravel switch, reverse overtravel switch, forward external torque limit, reverse external torque limit, Origin switch, Origin return enable, interrupt fixed length disable, position deviation clear , internal pulse command prohibition and other functions	
Digital output signal		Signal allocation can be changed	5-channel DO Multiple DO features:Servo ready, motor rotation, zero speed signal, consistent speed, positioning completed,Positioning proximity, torque limit, speed limit, brake output, warning output,Fault output, interrupt fixed length completion, origin return to zero completion, electrical return to zero completion, torque arrival, speed arrival, etc.	
Position output function		Output form	A phase,B phase:differential output Z phase:differential output or open-collector output	
		Frequency dividing ratio	Arbitrary frequency dividing(Max 500Khz)	
Other function	Overtravel protect function		Forward/reverse overtravel switch stop immediately once moving	
	Electronic gear ratio		0.1048576 ≤ B/A ≤ 419430.4	
	LED display function		Main power CFARGE,5 digits LED display	
	Communication function	MODBUS	up to 247 stations	
		RS232	Support PC upper computer commissioning、 monitoring、 parameter setting, etc.	
Other	Origin return, full closed loop, gain adjustment, alarm recording, JOG operation, 16-segment position control, 16-segment multi-speed control			
Protection function	Over current, over voltage, undervoltage, short to ground, input phase loss, overheating, drive overload, motor overload, speeding, encoder failure, too large position deviation, etc.			
Environment	Work/storage temperature	0 ~ +45 °C ( should derating use when environment temperature higher than 45°C , Average load rate cannot be higher than 80%) / 40 ~ +70 °C °		
	Work/storage humidity	Lower than 90%RF ( no drop condensates)		
	Vibration resistance/ impact strength	4.9m/s2 / 19.6m/s2		
	Pollution grade	Grade 2		
	Altitude	Under 1000 meters		
Structure	Protection grade	Ip20		
	Cooling mode	Forced air cooling or natural cooling		
	Installation form	Wall hanging		



# ESS200P servo drive product overview

## Naming rules

ESS200   P   -   2S   101   -   C ①   ②   ③   ④   ⑤	① Product series Servo drive	④ Power grade 101--10×10 <sup>1</sup> 201--20×10 <sup>1</sup> ...
	② Product Type P: Pulse Type N:EtherCAT	⑤ non-standard specification C:CANOPEN
	③ Voltage level 2S: single phase 220V 2T: three phase 220V 4T: three phase 380V	

## Servo drive model and Figure number

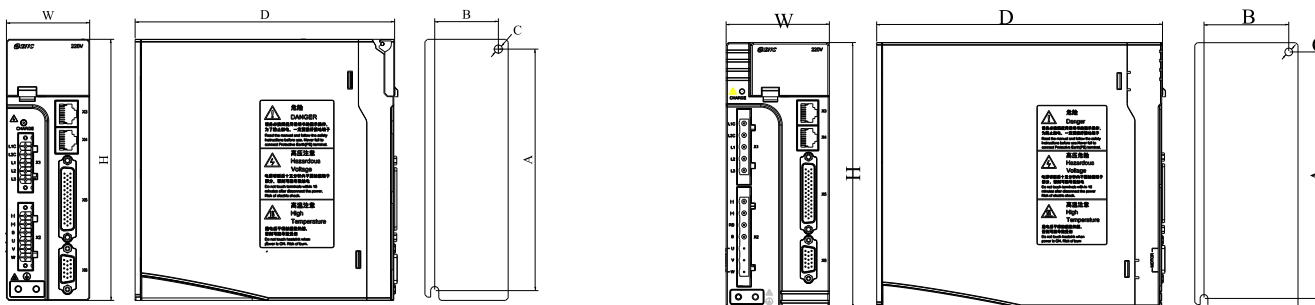


Figure A

Figure B

Servo drive model	A (mm)	B (mm)	W (mm)	H (mm)	D (mm)	C (mm)	Figure
ESS200P-2S101	36	148	51	160	159	5	Figure A
ESS200P-2S201							
ESS200P-2S401							
ESS200P-2S751							
ESS200P-2T102	55	160	67	172	185	5	Figure B
ESS200P-2T152							
ESS200P-4T102							
ESS200P-4T152							
ESS200P-4T202							

# ESS200P Matching Servo Motor Product Overview

## Naming rules

EMS- 06   401   L - 30   S - 7   C   1   A ①   ②   ③   ④   ⑤   ⑥   ⑦   ⑧   ⑨   ⑩	① Product Name ESS200 Series Universal Servo Motor	④ Inertia grade L: lower inertia M: Middle inertia H:High inertia	⑥ Voltage level S: 220V T: 380V	⑨ Options 1: Oil seal without brake (standard) 2: No oil seal without brake 3: Oil seal with electromagnetic brake 4: No oil seal with electromagnetic brake 5: Oil seal with permanent magnet brake 6: No oil seal with permanent magnet brake
	② Base No. 04:40mm 06:60mm 08:80mm 09:90mm 11:110mm 13:130mm 15:150mm 18:180mm	⑤ Rated speed 01:100 10:1000 15:1500 20:2000 25:2500 30:3000	⑦ Encoder type (requires F00.21 parameters input) 0: 2500 line incremental encoder 1: 2500 line incremental encoder 5: 17-bit bus absolute value 6: 20-bit bus absolute value 7: 23-bit bus absolute value	⑩ Alternative A: General B: Non-standard
	③ Power grade 101--10×10 <sup>1</sup> 201--20×10 <sup>1</sup> ... 552--55×10 <sup>2</sup> 752--75×10 <sup>2</sup>	⑧ Axis connection method A: Optical axis B: Solid core with tool C: Solid core with tool and screw hole (standard) D: Solid core with screw hole		

## Motor specifications

Model	Motor No. (Required parameter F00.03 input)	Rated output (KW)	Rated torque (N.m)	Maximum torque (N.m)	Rated current (Arms)	Maximum current (Arms)	Rated speed (rpm)	Maximum speed (rpm)	Torque parameter (N.m/Arms)	Rotor moment of inertia (10 <sup>-4</sup> kg.m <sup>2</sup> )
Voltage 220V										
EMS-04101L-30S-xxxA	15	0.1	0.32	0.96	0.6	1.81	3000	6000	0.53	0.05
EMS-06201L-30S-xxxA	16	0.2	0.64	1.91	1.20	3.60	3000	6000	0.53	0.17
EMS-06201M-30S-xxxA	00	0.2	0.64	1.92	1.30	3.92	3000	6000	0.49	0.26
EMS-06401L-30S-xxxA	17	0.4	1.27	3.90	2.80	8.67	3000	6000	0.45	0.29
EMS-06401M-30S-xxxA	01	0.4	1.27	3.81	2.60	7.94	3000	6000	0.48	0.40
EMS-08401H-30S-xxxA	02	0.4	1.27	3.81	2.00	5.95	3000	5000	0.64	1.05
EMS-08731H-20S-xxxA	03	0.73	3.50	10.50	3.00	8.97	2000	2500	1.17	2.63
EMS-08751L-30S-xxxA	04	0.75	2.40	7.17	3.00	8.96	3000	4000	0.80	1.82
EMS-09751H-30S-xxxA	21	0.75	2.40	7.10	3.00	8.88	3000	4000	0.80	2.45
EMS-08102L-25S-xxxA	06	1.0	4.00	12.00	4.40	13.33	2500	3500	0.90	2.97
EMS-13102M-25S-xxxA	07	1.0	4.00	12.00	4.00	12.00	2500	3000	1.00	8.50
EMS-13102H-10S-xxxA	23	1.0	10.00	20.00	4.50	9.01	1000	1500	2.22	19.40

Model	Motor No. (Required parameter F00.03 input)	Rated output (KW)	Rated torque (N.m)	Maximum torque (N.m)	Rated current (Arms)	Maximum current (Arms)	Rated speed (rpm)	Maximum speed (rpm)	Torque parameter (N.m/Arms)	Rotor moment of inertia (10 <sup>-4</sup> kg.m <sup>2</sup> )
Voltage 220V										
EMS-08122L-30S-xxxA	08	1.2	4.00	12.00	5.00	13.64	3000	4000	0.88	2.97
EMS-11152M-30S-xxxA	24	1.5	5.0	15.00	6.00	18.07	3000	3200	0.83	6.30
EMS-13152M-25S-xxxA	25	1.5	6.00	18.00	6.00	18.00	2500	3000	1.00	12.60
EMS-13152H-15S-xxxA	26	1.5	10.00	25.00	6.00	14.97	1500	2000	1.67	19.40
EMS-11182L-30S-xxxA	27	1.8	6.00	18.00	6.00	18.00	3000	3500	1.00	7.60
EMS-13202M-25S-xxxA	28	2.0	7.70	22.00	7.50	21.36	2500	3000	1.03	15.30
EMS-13262M-25S-xxxA	29	2.6	10.00	25.00	10.00	25.00	2500	3000	1.00	19.40
EMS-18292H-10S-xxxA	31	2.9	27.00	67.00	12.00	29.78	1000	1500	2.25	96.40
EMS-15302M-20S-xxxA	30	3.0	15.00	30.00	14.00	28.04	2000	3000	1.07	38.80
EMS-18302H-15S-xxxA	14	3.0	19.00	47.50	12.00	30.06	1500	2000	1.58	70.00
Voltage 380V										
EMS-13102M-25T-xxxA	44	1.0	4.00	12.00	2.60	7.79	2500	3000	1.54	8.50
EMS-13102H-10T-xxxA	32	1.0	10.00	25.00	3.00	7.51	1000	1500	3.33	19.40
EMS-13122L-30T-xxxA	33	1.2	4.00	10.00	3.00	11.24	3000	4000	0.89	8.50
EMS-13152M-25T-xxxA	46	1.5	6.00	18.00	3.70	11.11	2500	3200	1.62	12.6
EMS-13152M-15T-xxxA	34	1.5	10.00	25.00	4.20	8.77	1500	2000	2.85	19.40
EMS-13202M-25T-xxxA	47	2.0	7.70	22.00	4.70	13.41	2500	3000	1.64	15.3
EMS-13232H-15T-xxxA	35	2.3	15.00	37.50	5.00	12.50	1500	2000	3.00	27.70
EMS-13262M-25T-xxxA	36	2.6	10.00	25.00	6.00	14.97	2500	3000	1.67	19.40
EMS-18272H-15T-xxxA	48	2.7	17.20	43.00	6.50	16.23	1500	2000	2.65	65
EMS-18302H-15T-xxxA	49	3.0	19.00	47.00	7.50	18.80	1500	2000	2.50	70.00
EMS-13382L-25T-xxxA	38	3.8	15.00	37.50	8.80	22.06	2500	3000	1.70	27.70
EMS-18432M-15T-xxxA	39	4.3	27.00	67.50	10.00	25.00	1500	2000	2.70	96.40
EMS-18452M-20T-xxxA	50	4.5	21.00	53.00	9.50	23.98	2000	2500	2.21	79.6
EMS-18552M-15T-xxxA	51	5.5	35.00	70.00	12.00	23.97	1500	2000	2.92	122.50
EMS-18752M-15T-xxxA	52	7.5	48.00	96.00	20.00	40	1500	2000	2.40	167.20

## Servo system specifications

Motor capacity	Rated speed	Maximum speed	Rated torque	Servo motor model	Base No.	Classification	Motor No.	Adapted Servo Drive Model		
								Single Phase 220V	Three Phase 220V	SIZE
100W	3000	6000	0.32	EMS-04101L-30S-xxxA	40	Small capacity, small inertia	15	2S101	/	A
200W	3000	6000	0.64	EMS-06201L-30S-xxxA	60	Small capacity, small inertia	16	2S101	/	A
	3000	6000	0.64	EMS-06201M-30S-xxxA	60	Small capacity, medium inertia	0			
400W	3000	6000	1.27	EMS-06401L-30S-xxxA	60	Small capacity, small inertia	17	2S401	/	A
	3000	6000	1.27	EMS-06401M-30S-xxxA	60	Small capacity, medium inertia	1			
	3000	5000	1.27	EMS-08401H-30S-xxxA	80	Small capacity, large inertia	2			
730W	2000	2500	3.50	EMS-08731H-20S-xxxA	80	Small capacity, large inertia	3	2S751	/	B
750W	3000	4000	2.40	EMS-08751L-30S-xxxA	80	Small capacity, small inertia	4			
		3000	4000	2.40	EMS-09751H-30S-xxxA	90	Small capacity, large inertia	21		
1000W	2500	3500	4.00	EMS-08102L-25S-xxxA	80	Small capacity, small inertia	6	/	2T102	B
	2500	3000	4.00	EMS-13102M-25S-xxxA	130	Small capacity, medium inertia	7			
	1000	1500	10.00	EMS-13102H-10S-xxxA	130	Small capacity, large inertia	23			
1200W	3000	4000	4.00	EMS-08122L-30S-xxxA	80	Medium capacity, small inertia	8	/	2T202	C
1500W	3000	3200	5.00	EMS-11152M-30S-xxxA	110	Medium capacity, medium inertia	24			
	2500	3000	6.00	EMS-13152M-25S-xxxA	130	Medium capacity, medium inertia	25	/	2T152	B
	1500	2000	10.00	EMS-13152H-15S-xxxA	130	Medium capacity, large inertia	26			
1800W	3000	3500	6.00	EMS-11182L-30S-xxxA	110	Medium capacity, small inertia	27	/	2T202	C
2000W	2500	3000	7.70	EMS-13202M-25S-xxxA	130	Medium capacity, medium inertia	28			
2600W	2500	3000	10.00	EMS-13262M-25S-xxxA	130	Medium capacity, medium inertia	29	/	2T302	C
2900W	1000	1500	27.00	EMS-18292H-10S-xxxA	180	Medium capacity, large inertia	31			
3000W	2000	3000	15.00	EMS-15302M-20S-xxxA	150	Medium capacity, medium inertia	30			
	1500	2000	19.00	EMS-18302H-15S-xxxA	180	Medium capacity, large inertia	14			

Motor capacity	Rated speed	Maximum speed	Rated torque	Servo motor model	Base No.	Classification	Motor No.	Adapted Servo Drive Model	
								Three Phase 380V	SIZE
1000W	2500	3000	4.00	EMS-13102M-25T-xxxA	130	Medium capacity, medium inertia	44	4T102	B
	1000	1500	10.00	EMS-13102H-10T-xxxA	130	Medium capacity, large inertia	32		
1200W	3000	4000	4.00	EMS-13122L-30T-xxxA	130	Medium capacity, small inertia	33	4T152	B
1500W	2500	3000	6.00	EMS-13152M-25T-xxxA	130	Medium capacity, medium inertia	46		
		1500	2000	10.00	EMS-13152M-15T-xxxA	130	Medium capacity, medium inertia	34	
2000W	2500	3000	7.70	EMS-13202M-25T-xxxA	130	Medium capacity, medium inertia	47	4T202	B
2300W	1500	2000	15.00	EMS-13232H-15T-xxxA	130	Medium capacity, large inertia	35		
2600W	2500	3000	10.00	EMS-13262M-25T-xxxA	130	Medium capacity, medium inertia	36	4T302	C
2700W	1500	2000	17.20	EMS-18272H-15T-xxxA	180	Medium capacity, large inertia	48		
3000W	1500	2000	19.00	EMS-18302H-15T-xxxA	180	Medium capacity, large inertia	49		
3800W	2500	3000	15.00	EMS-13382L-25T-xxxA	130	Medium capacity, small inertia	38	4T442	C
4300W	1500	2000	27.00	EMS-18432M-15T-xxxA	180	Medium capacity, medium inertia	39		
4500W	2000	2500	21.00	EMS-18452M-20T-xxxA	180	Medium capacity, medium inertia	50		
5500W	1500	2000	35.00	EMS-18552M-15T-xxxA	180	Medium capacity, medium inertia	51	4T552	C
7500W	1500	2000	48.00	EMS-18752M-15T-xxxA	180	Medium capacity, medium inertia	52	4T752	D

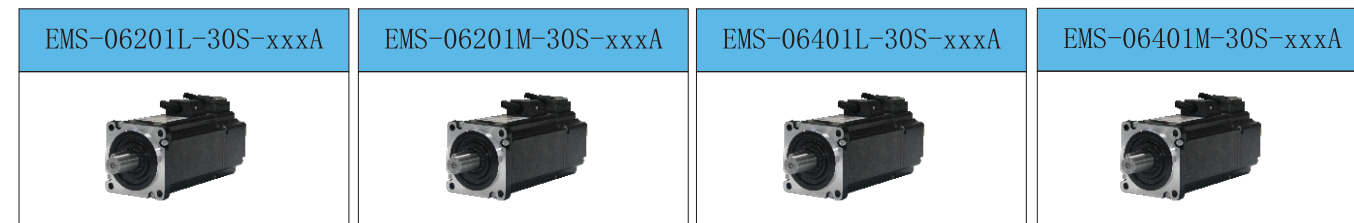


# ESS200P Matching Servo Motor Product Overview

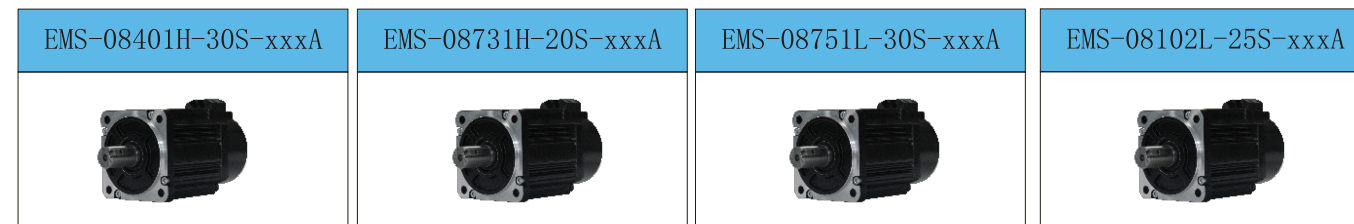
## 40 base servo motor



## 60 base servo motor



## 80 base servo motor



## 90 base servo motor



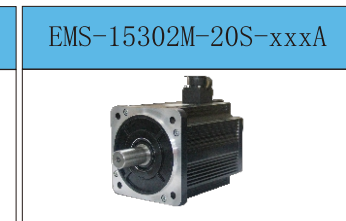
## 110 base servo motor



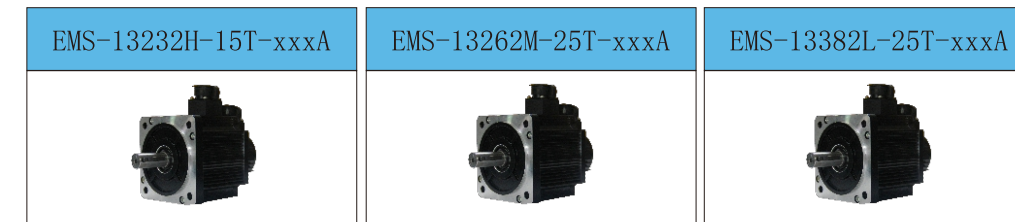
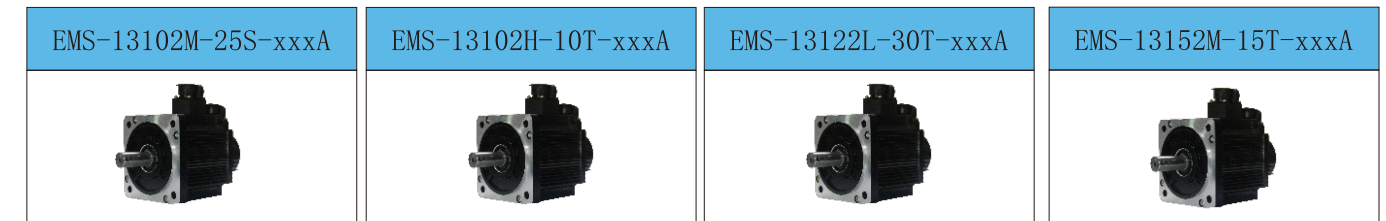
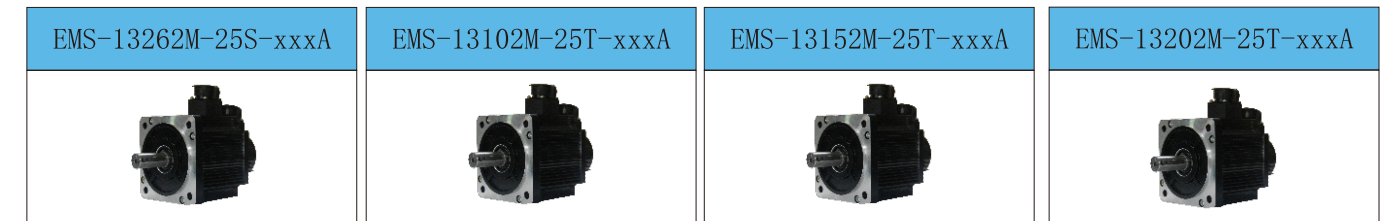
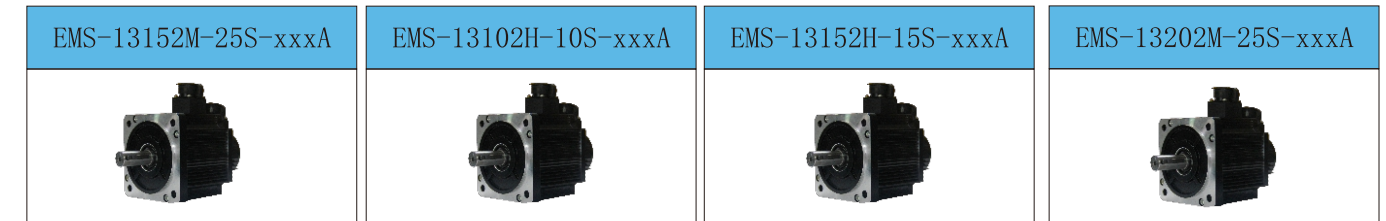
## 110 base servo motor



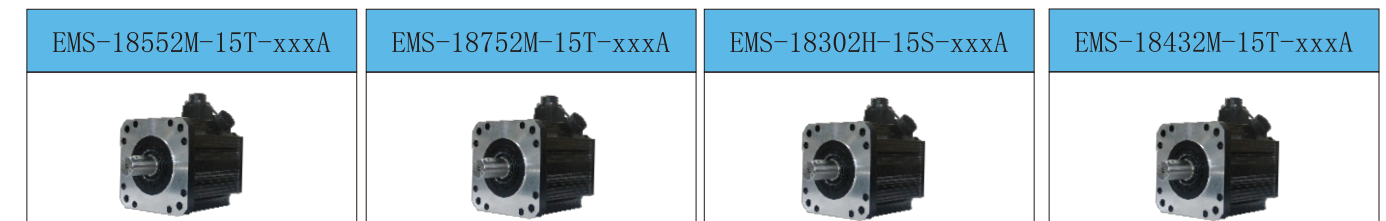
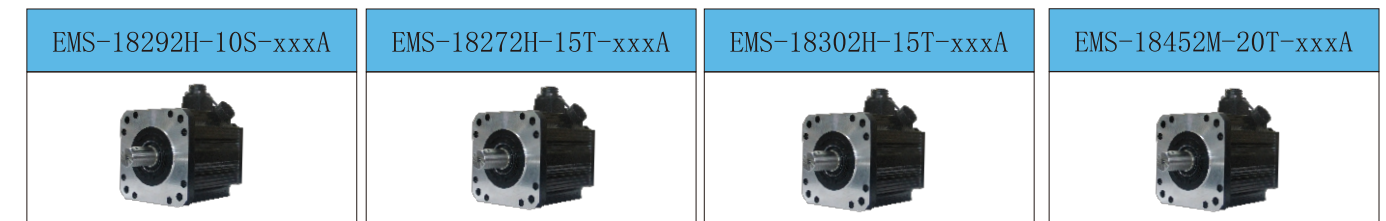
## 150 base servo motor



## 130 base servo motor



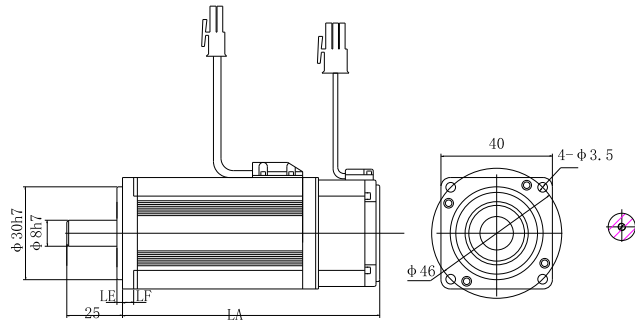
## 180 base servo motor



# ESS200P Matching Servo Motor Product Overview

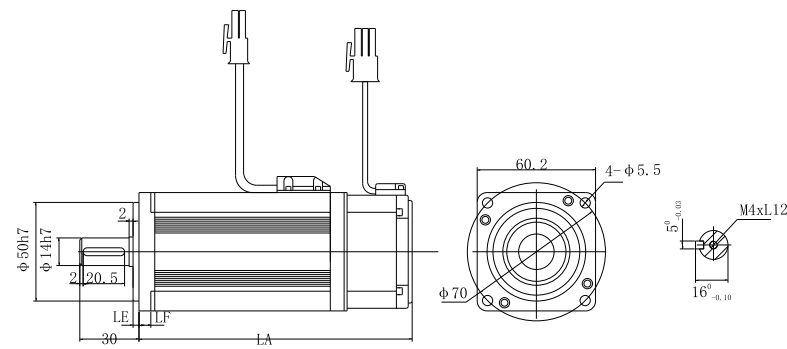
## 40 base servo motor parameters and installation dimensions

Model			
LE(mm)	LF(mm)	LA(mm)	LA (mm) with brake
EMS-04101L-30S-xxxA			
3	6	90	124



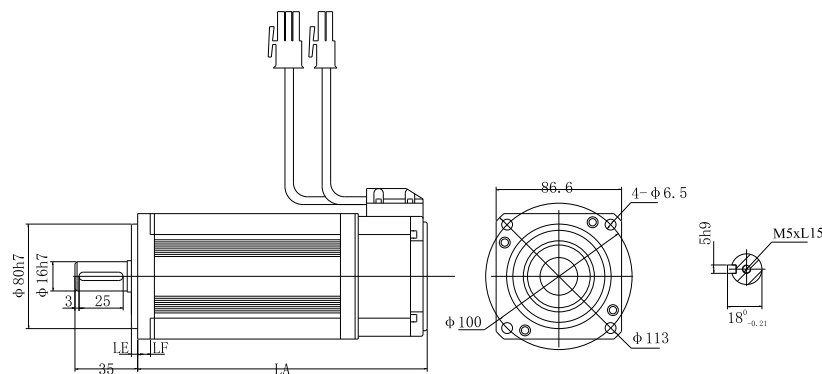
## 60 base servo motor parameters and installation dimensions

Model			
LE(mm)	LF(mm)	LA(mm)	LA (mm) with brake
EMS-06201L-30S-xxxA			
3	7.5	116	164
EMS-06201M-30S-xxxA			
3	7	109	157
EMS-06401L-30S-xxxA			
3	7.5	141	189
EMS-06401M-30S-xxxA			
3	7	133	181



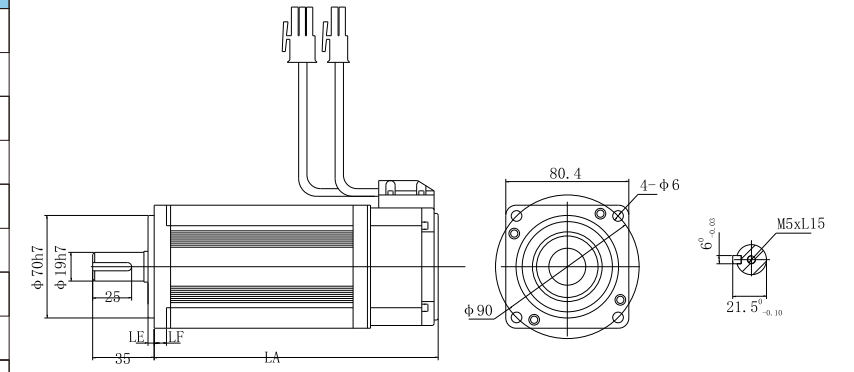
## 90 base servo motor parameters and installation dimensions

Model			
LE(mm)	LF(mm)	LA(mm)	LA (mm) with brake
EMS-09751H-30S-xxxA			
3	10	150	198



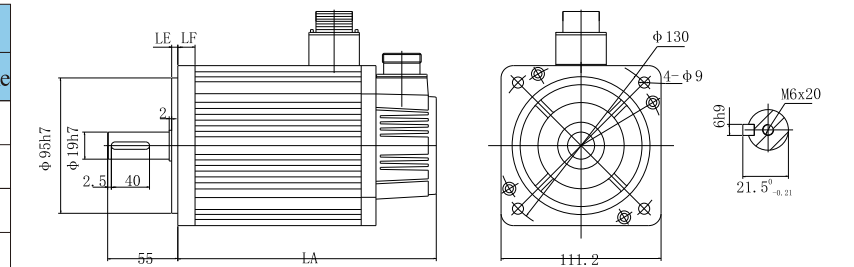
## 80 base servo motor parameters and installation dimensions

Model			
LE(mm)	LF(mm)	LA(mm)	LA (mm) with brake
EMS-08401H-30S-xxxA			
3	8	124	166
EMS-08731H-20S-xxxA			
3	8	179	221
EMS-08751L-30S-xxxA			
3	8	151	193
EMS-08102L-25S-xxxA			
3	8	191	233
EMS-08122L-30S-xxxA			
3	8	191	233



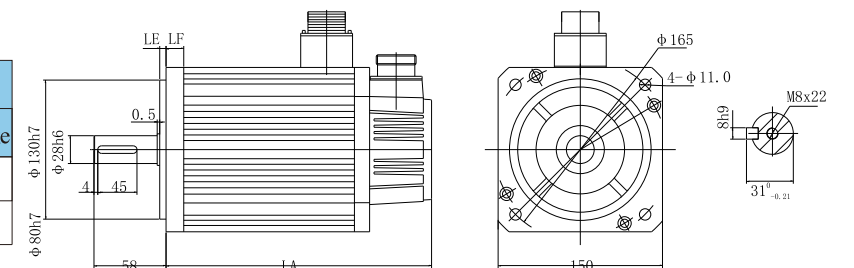
## 110 base servo motor parameters and installation dimensions

Model			
LE(mm)	LF(mm)	LA(mm)	LA (mm) with brake
EMS-11152M-30S-xxxA			
5	12	204	278
EMS-11182L-30S-xxxA			
5	12	219	293



## 150 base servo motor parameters and installation dimensions

Model			
LE(mm)	LF(mm)	LA(mm)	LA (mm) with brake
EMS-15302M-20S-xxxA			
5	14	230	303

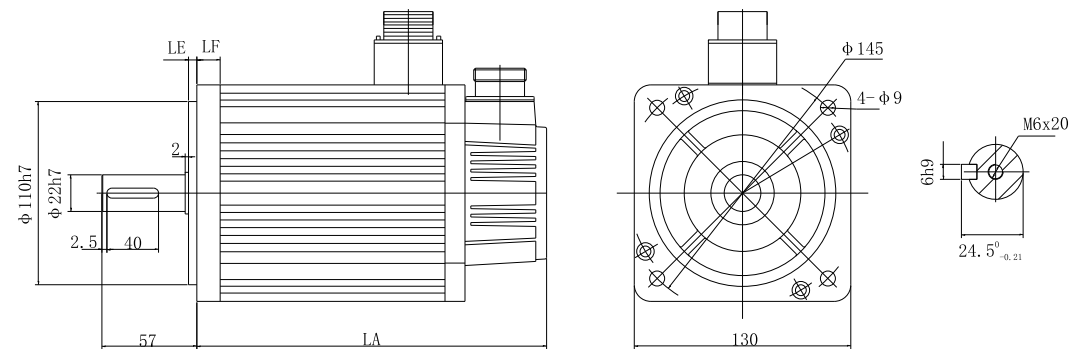




# ESS200P Matching Servo Motor Product Overview

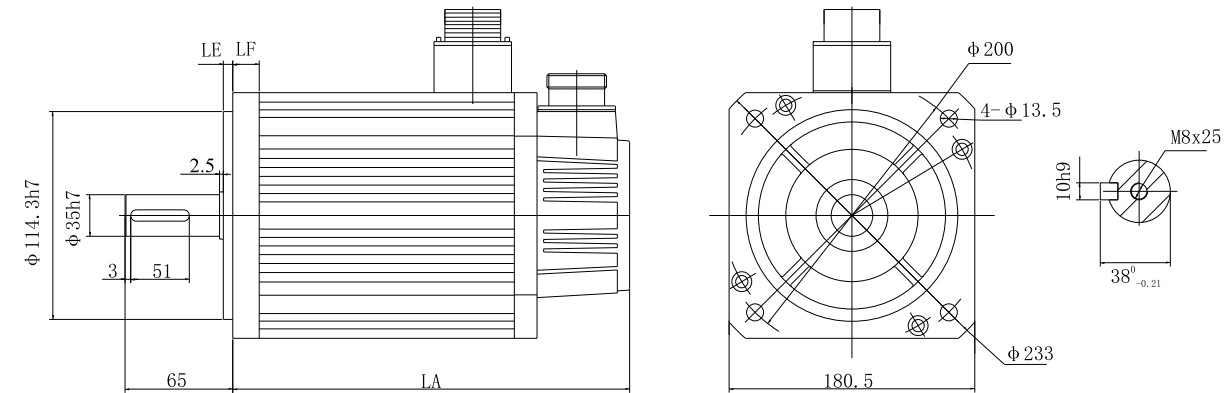
## 130 base servo motor parameters and installation dimensions

Model							
LE(mm)	LF(mm)	LA(mm)	LA (mm) with brake	LE(mm)	LF(mm)	LA(mm)	LA (mm) with brake
EMS-13152M-25S-xxxA				EMS-13102M-25S-xxxA			
5	14	179	236	5	14	166	229
EMS-13102H-10S-xxxA				EMS-13102H-10T-xxxA			
5	14	213	294	5	14	213	294
EMS-13152H-15S-xxxA				EMS-13122L-30T-xxxA			
5	14	213	294	5	14	166	229
EMS-13202M-25S-xxxA				EMS-13152M-15T-xxxA			
5	14	192	249	5	14	213	294
EMS-13262M-25S-xxxA				EMS-13232H-15T-xxxA			
5	14	209	290	5	14	241	322
EMS-13102M-25T-xxxA				EMS-13262M-25T-xxxA			
5	14	166	223	5	14	209	290
EMS-13152M-25T-xxxA				EMS-13382L-25T-xxxA			
5	14	179	236	5	14	231	312
EMS-13202M-25T-xxxA							
5	14	192	249				



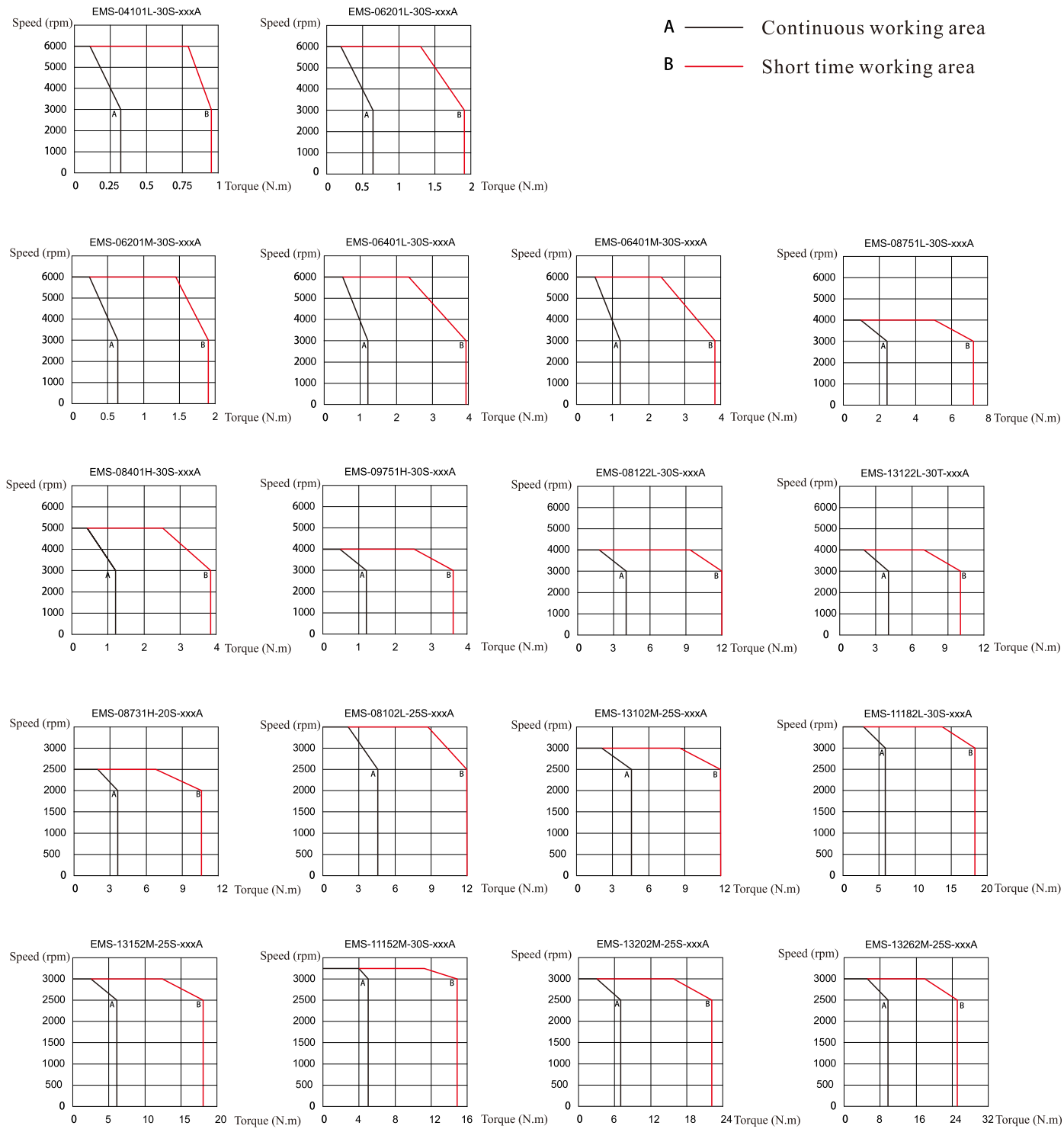
## 180 base servo motor parameters and installation dimensions

Model							
LE(mm)	LF(mm)	LA(mm)	LA (mm) with brake	LE (mm)	LF (mm)	LA (mm)	LA (mm) with brake
EMS-18292H-10S-xxxA				EMS-18552M-15T-xxxA			
3.2	18	262	334	3.2	18	292	364
EMS-18272H-15T-xxxA				EMS-18752M-15T-xxxA			
3.2	18	226	298	3.2	18	346	418
EMS-18302H-15T-xxxA				EMS-18302H-15S-xxxA			
3.2	18	232	304	3.5	18	232	304
EMS-18452M-20T-xxxA				EMS-18432M-15T-xxxA			
3.2	18	243	315	3.5	18	262	334

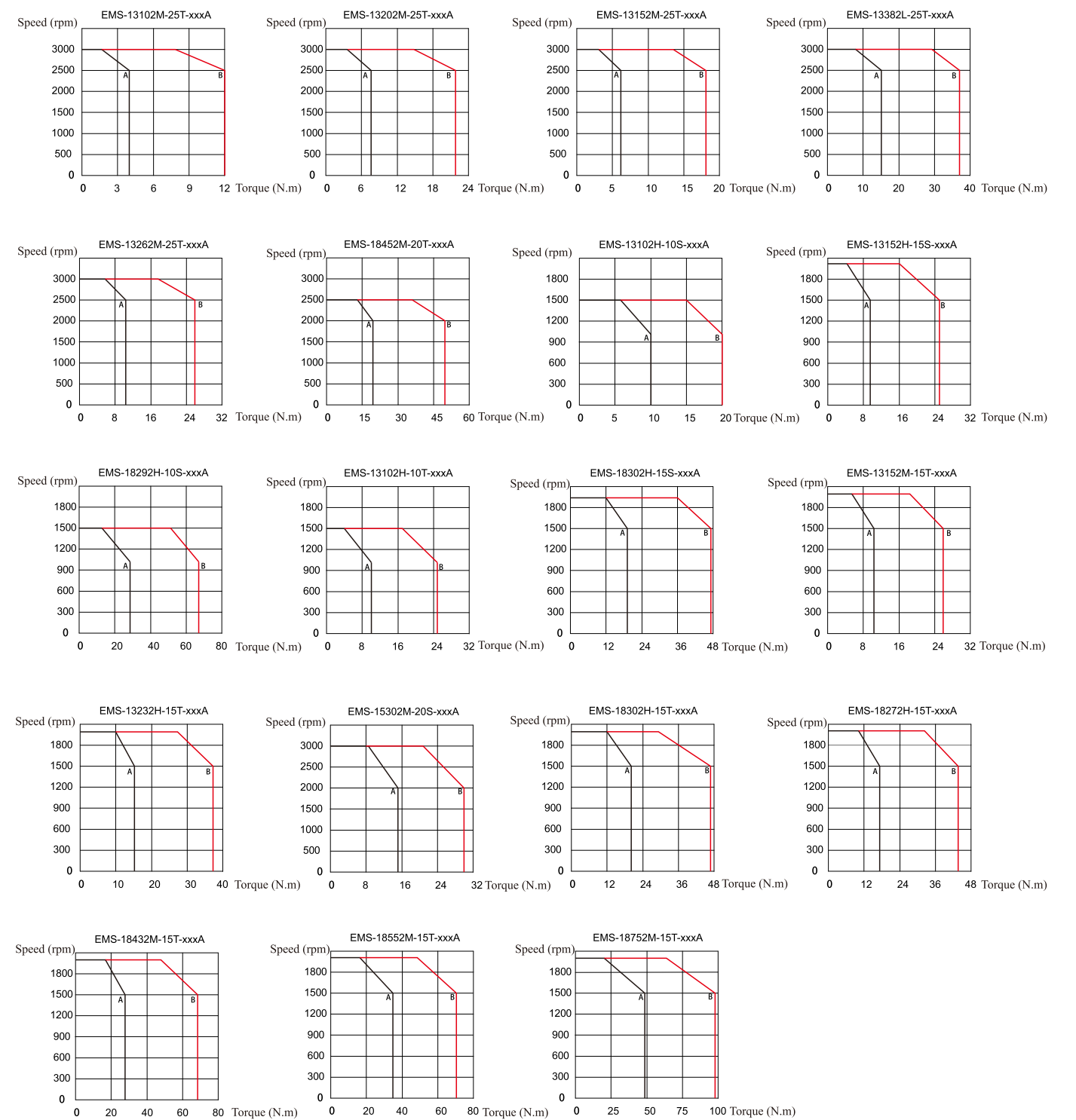


# ESS200P Matching Servo Motor Product Overview

## Torque-speed characteristics of servo motors



## Torque-speed characteristics of servo motors





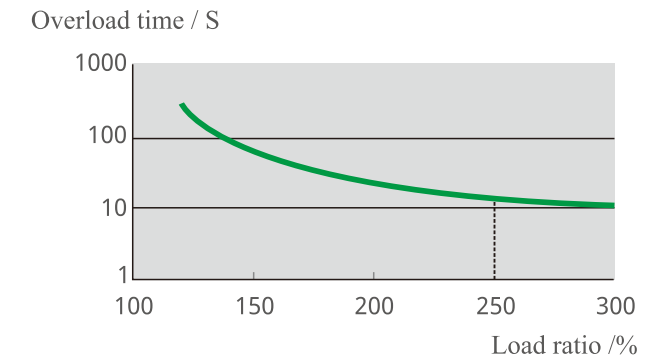
# ESS200P Matching Servo Motor Product Overview

## Servo motor axial, radial allowable load

Motor model	Radial Allowable Load (N)	Axial Allowable Load (N)
EMS-04101L-30S-xxxA	78	54
EMS-06201L-30S-xxxA	245	74
EMS-06201M-30S-xxxA	245	74
EMS-06401L-30S-xxxA	245	74
EMS-06401M-30S-xxxA	245	74
EMS-08401H-30S-xxxA	245	74
EMS-08731H-20S-xxxA	392	74
EMS-08750L-30S-xxxA	392	74
EMS-09750H-30S-xxxA	392	74
EMS-08102L-25S-xxxA	686	196
EMS-13102M-25S-xxxA	686	196
EMS-13102H-10S-xxxA	686	196
EMS-13102M-25T-xxxA	686	196
EMS-13102H-10T-xxxA	686	196
EMS-08122L-30S-xxxA	686	343
EMS-13122L-30T-xxxA	686	343
EMS-11152M-30S-xxxA	686	196
EMS-13152M-25S-xxxA	686	196
EMS-13152H-15S-xxxA	686	196
EMS-13152M-25T-xxxA	686	196
EMS-13152M-15T-xxxA	686	196
EMS-11182L-30S-xxxA	686	196
EMS-13202M-25S-xxxA	686	196
EMS-13202M-25T-xxxA	686	196
EMS-13232H-15T-xxxA	686	196
EMS-13262M-25S-xxxA	686	196
EMS-13262M-25T-xxxA	686	196
EMS-18272H-15T-xxxA	686	196
EMS-18292H-10S-xxxA	980	392
EMS-15302M-20S-xxxA	980	392
EMS-18302H-15S-xxxA	980	392
EMS-18302H-15T-xxxA	1470	490
EMS-13382L-25T-xxxA	392	147
EMS-18432M-15T-xxxA	1470	490
EMS-18452M-20T-xxxA	1470	490
EMS-18552M-15T-xxxA	1764	588
EMS-18752M-15T-xxxA	1764	588

## Servo motor overload characteristics

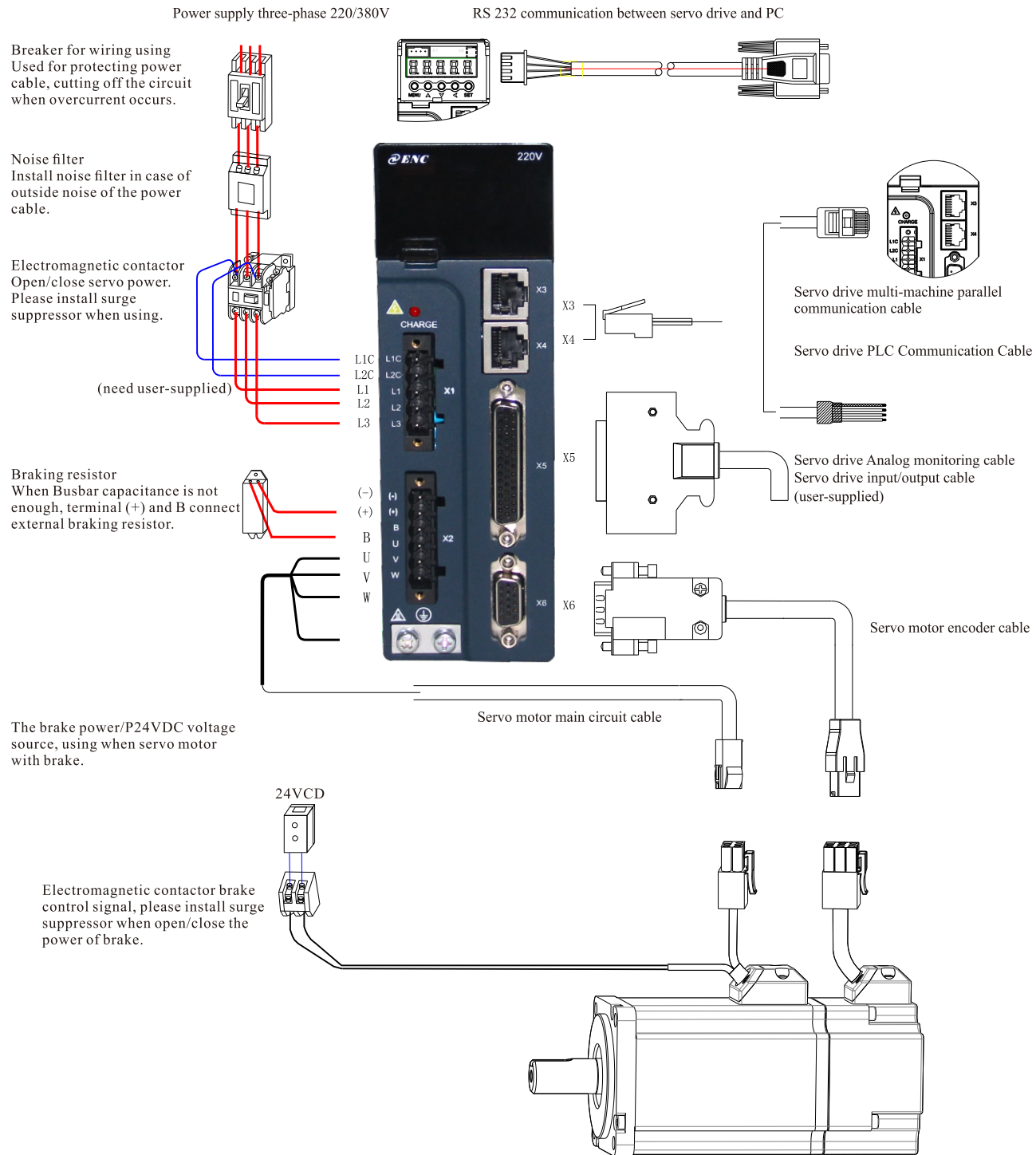
Load ratio (%)	Running time (S)
120	223
130	162
140	103
150	81
160	63
170	50
180	43
190	38
200	33
210	30
220	26
230	24
240	19
250	18
300	11



## Motor Safety Brake Electrical Specifications

Motor base model	Rated torque (Nm)	Supply voltage (V) ±10%	Supply current range (A)	Disengagement time (ms)	Pull-in time (ms)
40 base	1	24	0.23~0.27	20	8
60 base	2	24	0.40~0.50	30	10
80, 90 base	4	24	0.52~0.86	55	63
110 and 130-10N below motor	8	24	0.68~0.85	72	87
130-10N (inclusive) and above motor	16	24	0.85~1.33	95	110
180-35N below motor	30	24	0.85~1.80	115	130
180-35N (inclusive) and above motor	50	24	1.47~1.70	120	135

# ESS200P servo drive wiring



# ESS200P Servo drive auxiliary cable selection

## Power cable servo motor side connector

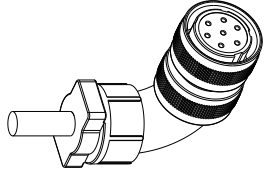
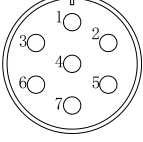
Connection outline diagram	Terminal pin distribution	Base number										
	<table border="1"> <thead> <tr> <th>Pin number</th> <th>Signal name</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>U</td> </tr> <tr> <td>2</td> <td>V</td> </tr> <tr> <td>3</td> <td>W</td> </tr> <tr> <td>4</td> <td>PE</td> </tr> </tbody> </table> <p>Molded case: AMP 1-172159-9; Terminal: 170362-1</p>	Pin number	Signal name	1	U	2	V	3	W	4	PE	40 60 80 90
Pin number	Signal name											
1	U											
2	V											
3	W											
4	PE											
	<p>aviation plug</p> <table border="1"> <thead> <tr> <th>Pin number</th> <th>Signal name</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>PE</td> </tr> <tr> <td>2</td> <td>U</td> </tr> <tr> <td>3</td> <td>V</td> </tr> <tr> <td>4</td> <td>W</td> </tr> </tbody> </table> <p>Model: YD28K4TSJ</p>	Pin number	Signal name	1	PE	2	U	3	V	4	W	110 130 150
Pin number	Signal name											
1	PE											
2	U											
3	V											
4	W											
	<p>aviation plug</p> <table border="1"> <thead> <tr> <th>Pin number</th> <th>Signal name</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>PE</td> </tr> <tr> <td>2</td> <td>U</td> </tr> <tr> <td>3</td> <td>V</td> </tr> <tr> <td>4</td> <td>W</td> </tr> </tbody> </table> <p>Model: YD28K4TSJ</p>	Pin number	Signal name	1	PE	2	U	3	V	4	W	180
Pin number	Signal name											
1	PE											
2	U											
3	V											
4	W											

## Bus absolute value encoder cable connector

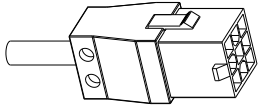
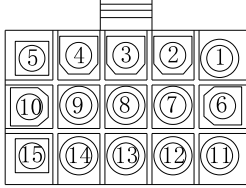
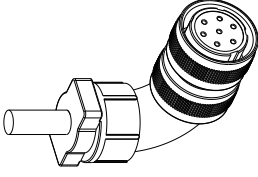
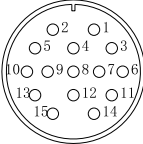
Connection outline diagram	Terminal pin distribution	Base number																
	<table border="1"> <thead> <tr> <th>Pin number</th> <th>Signal name</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>PE</td> </tr> <tr> <td>2</td> <td>E-</td> </tr> <tr> <td>3</td> <td>E+</td> </tr> <tr> <td>4</td> <td>SD-</td> </tr> <tr> <td>5</td> <td>OV</td> </tr> <tr> <td>6</td> <td>SD+</td> </tr> <tr> <td>7</td> <td>5V</td> </tr> </tbody> </table> <p>Molded case: AMP 1-172161-9; Terminal: 170361-1</p>	Pin number	Signal name	1	PE	2	E-	3	E+	4	SD-	5	OV	6	SD+	7	5V	40 60 80 90
Pin number	Signal name																	
1	PE																	
2	E-																	
3	E+																	
4	SD-																	
5	OV																	
6	SD+																	
7	5V																	

## ESS200P Servo drive auxiliary cable selection

### Bus absolute value encoder cable connector

Connection outline diagram	Terminal pin distribution	Base number																
	 <p>aviation plug</p> <p>Model: YD28K7TSJ</p>	<table border="1"> <thead> <tr> <th>Pin number</th> <th>Signal name</th> </tr> </thead> <tbody> <tr><td>1</td><td>PE</td></tr> <tr><td>2</td><td>E-</td></tr> <tr><td>3</td><td>E+</td></tr> <tr><td>4</td><td>SD-</td></tr> <tr><td>5</td><td>OV</td></tr> <tr><td>6</td><td>SD+</td></tr> <tr><td>7</td><td>5V</td></tr> </tbody> </table>	Pin number	Signal name	1	PE	2	E-	3	E+	4	SD-	5	OV	6	SD+	7	5V
	Pin number		Signal name															
1	PE																	
2	E-																	
3	E+																	
4	SD-																	
5	OV																	
6	SD+																	
7	5V																	
		110 130 150 180																

### Incremental photoelectric encoder cable connector

Connection outline diagram	Terminal pin distribution	Base number																																				
	 <p>Molded case: AMP 1-172163-9; Terminal: 17D361-1</p>	<table border="1"> <thead> <tr> <th>Pin number</th> <th>Signal name</th> <th>Pin number</th> <th>Signal name</th> </tr> </thead> <tbody> <tr><td>1</td><td>PE</td><td>9</td><td>A+</td></tr> <tr><td>2</td><td>5V</td><td>10</td><td>V+</td></tr> <tr><td>3</td><td>0V</td><td>11</td><td>W+</td></tr> <tr><td>4</td><td>B+</td><td>12</td><td>V-</td></tr> <tr><td>5</td><td>C-</td><td>13</td><td>A-</td></tr> <tr><td>6</td><td>U+</td><td>14</td><td>B-</td></tr> <tr><td>7</td><td>Z+</td><td>15</td><td>W-</td></tr> <tr><td>8</td><td>U-</td><td></td><td></td></tr> </tbody> </table>	Pin number	Signal name	Pin number	Signal name	1	PE	9	A+	2	5V	10	V+	3	0V	11	W+	4	B+	12	V-	5	C-	13	A-	6	U+	14	B-	7	Z+	15	W-	8	U-		
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7	Z+	15	W-																																			
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	 <p>aviation plug</p> <p>Model: YD28K15TSJ</p>	<table border="1"> <thead> <tr> <th>Pin number</th> <th>Signal name</th> <th>Pin number</th> <th>Signal name</th> </tr> </thead> <tbody> <tr><td>1</td><td>PE</td><td>9</td><td>Z-</td></tr> <tr><td>2</td><td>5V</td><td>10</td><td>U+</td></tr> <tr><td>3</td><td>0V</td><td>11</td><td>V+</td></tr> <tr><td>4</td><td>A+</td><td>12</td><td>W+</td></tr> <tr><td>5</td><td>B+</td><td>13</td><td>U-</td></tr> <tr><td>6</td><td>Z+</td><td>14</td><td>V-</td></tr> <tr><td>7</td><td>A-</td><td>15</td><td>W-</td></tr> <tr><td>8</td><td>B-</td><td></td><td></td></tr> </tbody> </table>	Pin number	Signal name	Pin number	Signal name	1	PE	9	Z-	2	5V	10	U+	3	0V	11	V+	4	A+	12	W+	5	B+	13	U-	6	Z+	14	V-	7	A-	15	W-	8	B-		
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		110 130 150 180																																				

## ESS200P servo driver wiring

### Drive terminal definition

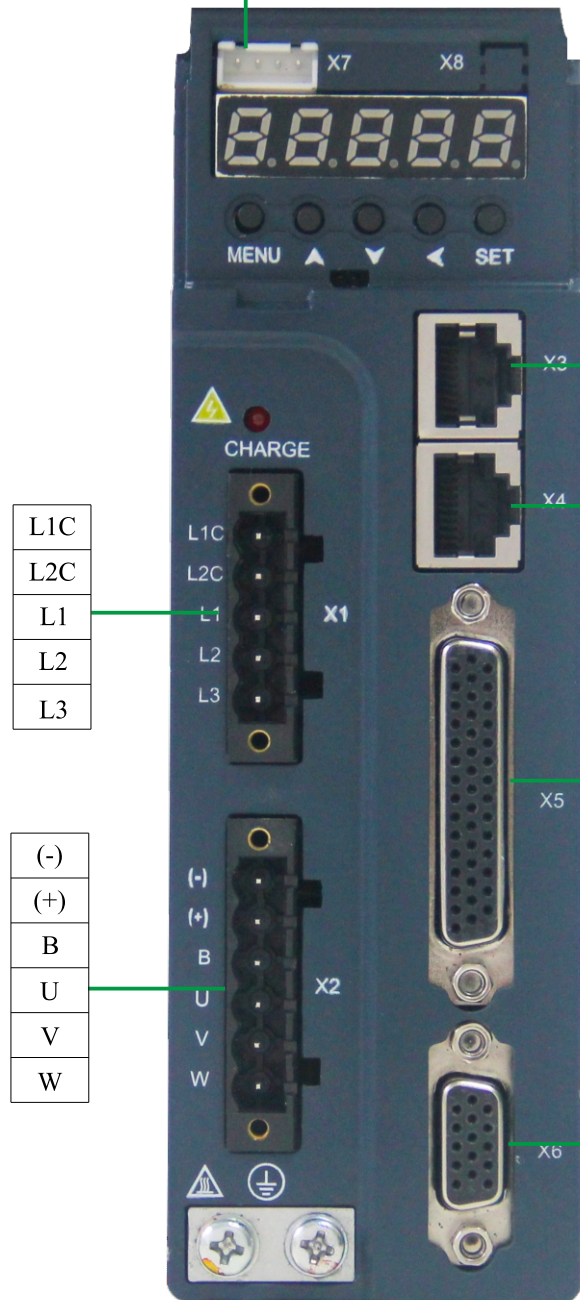
Terminal mark	Terminal name	Terminal functions	
L1□L2、L3	Main circuit power input terminal	ESS200P : 2S101□2S201、2S401、2S751	Main circuit single phase power input, could connect any two terminals (L1,L2,L3). Three phase 220V power supply connect L1,L2,L3. Connect AC220V power between L1 and L2.
		ESS200P : 2T102、2T152、2T202、2T302	Main circuit three phase 220V power input
		ESS200P : 4T102□4T152、4T202、4T302、4T442、4T552、4T752	Circuit three phase 380V power input
L1C□L2C	Control power input terminal	Circuit power input, need to refer the rated voltage grade of nameplate	
RB□B、(+)	External brake resistor connecting terminal	ESS200P : 2S101□2S201、2S401	When braking capacity is lacked, connect external brake resistor among (+) and B. Please purchase external brake resistor separately.
		ESS200P : 2S751□2T102、2T152、2T202、2T302、4T102、4T152、4T202、4T302、4T442、4T552、4T752	By default, use short wires between RB and B. When braking capacity is lacked, please make an open circuit between RB and B(remove short wiring). And connect external brake resistor between RB and B. Please purchase external brake resistor separately.
(+)□(-)	Common DC bus terminal	Servo's DC bus terminal could realize common bus connection under multi-machine parallel running	
U、V、W	Servo motor connecting terminals	Servo motor connecting terminals is connected to U, V, W of motor.	
⊕	Ground	Two ground terminals are connected with power ground terminal and motor ground terminal.	



# ESS200P servo drive wiring

## Drive terminal definition

No.	1	2	3	4
Definition	5V	GND	TX	RX

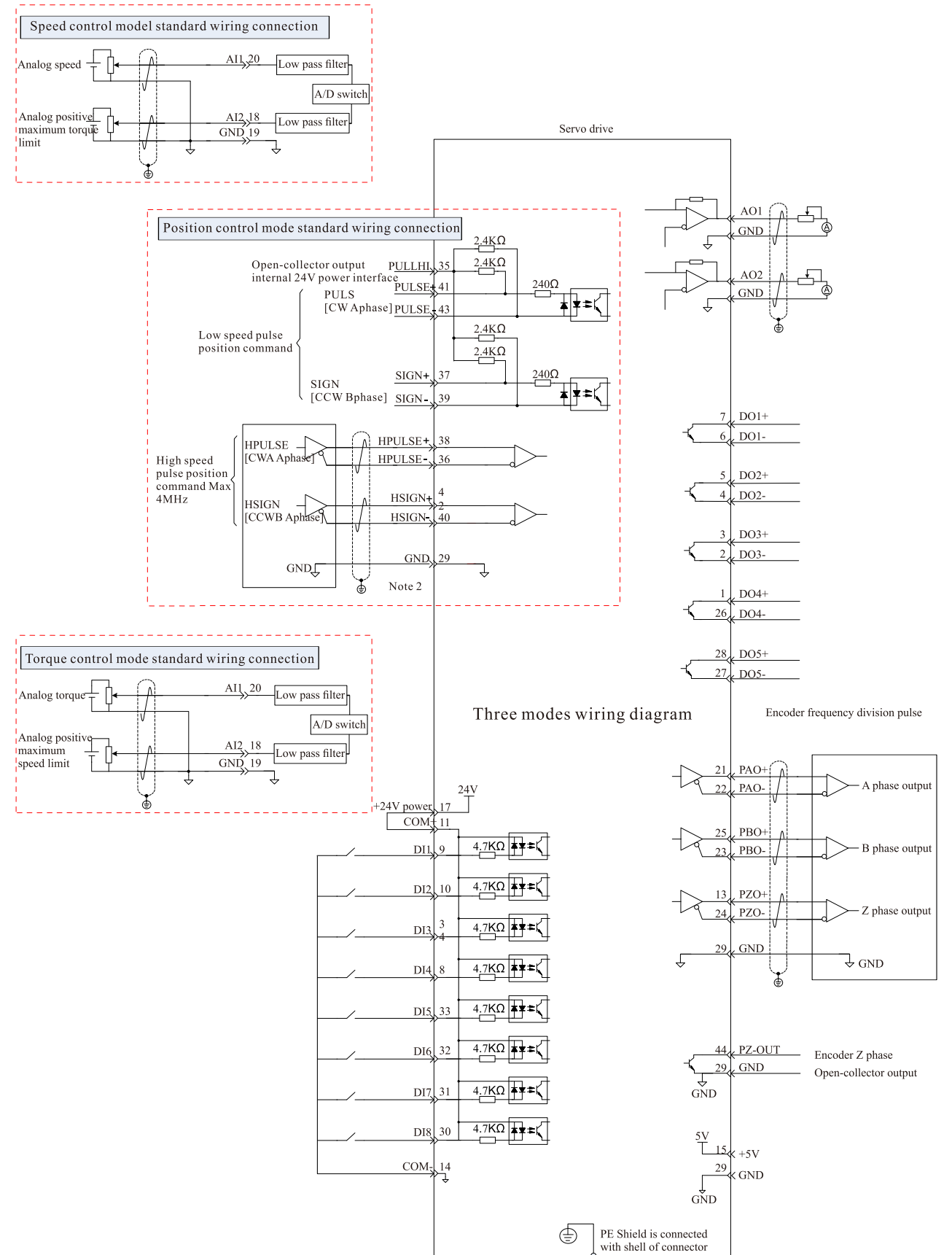


AGND
GND
Reserve
RS485+
RS485-
Reserve
CANL
CANH

1	16	31
HSIGN-	PBO+	PZO-
HSIGN+	PBO-	PZO+
HPULSE-	PAO+	AI1
HPULSE+	PAO-	AI2
GND	5V	AO1
PULSE-	AO2	DO4-
PULSE+	DO4+	DO2+
SIGN-	DO2-	DO3+
SIGN+	DO3-	DO5-
OPC	DO5+	COM-
DI8	DO1+	24V
COM+	DO1-	DI6
DI5	DI7	DI4
DI2	DI3	CZ
DI1	GND	44
15	30	

1	6	11
A+	Z+	V+/SD+
A-	Z-	V-/SD-
B+	U+	W+
B-	U-	W-
5V	GND	PE
5	10	⊕
		16

# ESS200P servo drive wiring



## Motor matching wiring selection

Motor model	Servo motor main circuit cable		
	L=3.0m	L=5.0m	L=10.0m
EMS-04101L-30S-xxxA EMS-06201L-30S-xxxA EMS-06201M-30S-xxxA EMS-06401L-30S-xxxA EMS-06401M-30S-xxxA EMS-08401H-30S-xxxA	EN-D201-3	EN-D201-5	EN-D201-10
EMS-08731H-20S-xxxA EMS-08751L-30S-xxxA EMS-09751H-30S-xxxA EMS-08102L-25S-xxxA EMS-08122L-30S-xxxA			
EMS-13102M-25S-xxxA EMS-13102H-10S-xxxA EMS-11152M-30S-xxxA EMS-13152M-25S-xxxA EMS-13152H-15S-xxxA EMS-11182L-30S-xxxA EMS-13202M-25S-xxxA EMS-13102M-25T-xxxA EMS-13102H-10T-xxxA EMS-13122L-30T-xxxA EMS-13152M-25T-xxxA EMS-13152M-15T-xxxA EMS-13202M-25T-xxxA EMS-13232H-15T-xxxA EMS-13262M-25T-xxxA			
EMS-13262M-25S-xxxA EMS-15302M-20S-xxxA EMS-13382L-25T-xxxA			
EMS-18272H-15T-xxxA EMS-18302H-15T-xxxA			
EMS-18292H-10S-xxxA EMS-18302H-15S-xxxA EMS-18432M-15T-xxxA EMS-18452M-20T-xxxA EMS-18552M-15T-xxxA			
EMS-18752M-15T-xxxA	EN-D222-3	EN-D222-5	EN-D222-10
	EN-D211-3	EN-D211-5	EN-D211-10
	EN-D212-3	EN-D212-5	EN-D212-10
	EN-D223-3	EN-D223-5	EN-D223-10
	EN-D221-3	EN-D221-5	EN-D221-10
	EN-D222-3	EN-D222-5	EN-D222-10

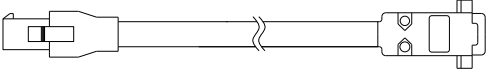
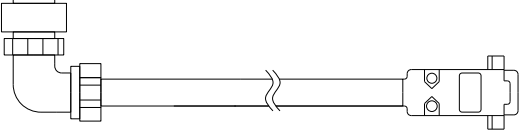
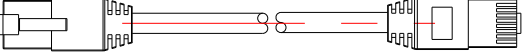
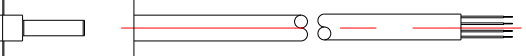
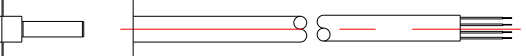

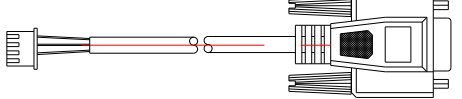
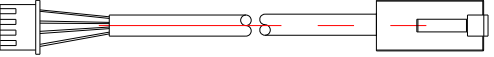
  

Motor base model	Servo motor main circuit cable		
	L=3.0m	L=5.0m	L=10.0m
90 and below models	EN-M601-3	EN-M601-5	EN-M601-10
110 and above models	EN-M611-3	EN-M611-5	EN-M611-10
90 and below models	EN-M602-3	EN-M602-5	EN-M602-10
110 and above models	EN-M612-3	EN-M612-5	EN-M612-10

## ESS200P cable patch cord specification

Cable name	Cable model	Cable length L (mm)	Cable appearance
Servo motor main circuit cable	EN-D201	3m	
		5m	
		10m	
	EN-D202	3m	
		5m	
		10m	
	EN-D211	3m	
		5m	
		10m	
	EN-D212	3m	
		5m	
		10m	
	EN-D221	3m	
		5m	
		10m	
	EN-D222	3m	
		5m	
		10m	
EN-D223	3m		
	5m		
	10m		
Servo motor encoder cable	EN-M601	3m	
		5m	
		10m	
	EN-M611	3m	
		5m	
		10m	

## ESS200P cable patch cord specification

Cable name	Cable model	Cable length L (mm)	Cable appearance
Servo motor encoder cable	EN-602	3m	
		5m	
		10m	
	EN-612	3m	
		5m	
		10m	
Servo drive multi-machine parallel cable	EN-M401	300mm	
Servo drive CAN communication cable	EN-M402	2000mm	
Servo drive 485 communication cable	EN-M403	2000mm	
Servo drive terminal matched resistor	EN-M404		
Servo drive PC 232 communication cable	EN-M701	3000mm	
Servo drive keyboard copy parameter communication cable	EN-M601	3000mm	

## ESS200P Cable patch cord specification

Be sure to make the side shielded mesh layer of drive and motor to ground reliably, otherwise it will cause the drive to false alarm.

- Please do not connect cable to “reserve” terminal
- The length of the encoder cable needs to fully consider the voltage drop caused by the cable resistance and the signal attenuation caused by the distributed capacitance. It is recommended to use the UL2464 standard 26AWG or higher twisted-pair shielded cable within 10m cable length; for longer cables demand needs to be increased appropriately Cable diameter, details see following table:

Cable size	$\Omega$ /km	Allowed cable length(m)
26AWG(0.13mm <sup>2</sup> )	143	10.0
25AWG(0.15mm <sup>2</sup> )	89.4	16.0
24AWG(0.21mm <sup>2</sup> )	79.6	18.0
23AWG(0.26mm <sup>2</sup> )	68.5	20.9
22AWG(0.32mm <sup>2</sup> )	54.3	26.4

## ESS200P resistor related specifications

Servo drive model	Built-in braking resistor specification		Minimum allowed resistance value ( $\Omega$ )	Capacitor absorbable maximum braking energy(J)
	Resistance value ( $\Omega$ )	Power (W)		
single phase 220 V	ESS200P2S101	-	60	5
	ESS200P2S201	-	60	10
	ESS200P2S401	-	60	18
	ESS200P2S751	30	60	25
Three phase 220V	ESS200P2T102	30	80	26
	ESS200P2T152	30	80	18
	ESS200P2T202	15	120	26
	ESS200P2T302	15	120	39
Three phase 380V	ESS200P4T102	60	60	26
	ESS200P4T152	60	60	39
	ESS200P4T202	60	80	53
	ESS200P4T302	60	80	79
	ESS200P4T442	30	120	116
	ESS200P4T552	30	120	145
	ESS200P4T752	-	-	30