

ELESY  
伊莱斯



# ES1-ES2 系列交流伺服系統

AC SERVO SYSTEMS

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# COMPANY

## >> INTRODUCTION

### 企业简介

广东伊莱斯电机有限公司专注于工业自动化控制领域，是一家集研发、生产和销售于一体的国家级高新技术企业。主要产品有数控系统、伺服驱动系统、伺服电机等；产品广泛应用于数控机床、塑胶机械、纺织机械、机器人等智能自动化设备，其性能、功能和可靠性等在国内同行业中达到领先水平。

公司产品种类、规格齐全，以客户需求为导向，为客户提供个性化的整套解决方案，秉承企业与客户互利共赢的经营理念，做客户信赖的企业。伊莱斯本着：“崇尚实干、持续改进、精耕细作、客户信赖”的企业精神，致力于打造百年企业，成为运动控制领域的专家。

让我们共同努力，实现中国工业自动化技术与世界同步！

Guangdong ELESY Electric CO.,LTD. is a national high-tech enterprise which focuses on R&D, production and sales of industrial automation control products. We offer customers full range of ELESY series numerical control systems, servo drive systems and servo motors that have been widely used in numerical control machine tool, plastic machinery, textile machine, robot, etc. With powerful functions and outstanding performance, we have established a leading position among all domestic companies in the industry.

We are now providing not only general but also customized products and solutions for customers. Guided by enterprise spirit of "Advocate hard work, continuous improvement, intensive cultivation, customer trust", ELESY is devoted to casting century enterprise and experting motion control field.

Let's jointly strive to realize Chinese industry automation technology keeps up with the world.



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## ★交流伺服系统特性

Characteristics of AC Servo System

### ▶高过载性能

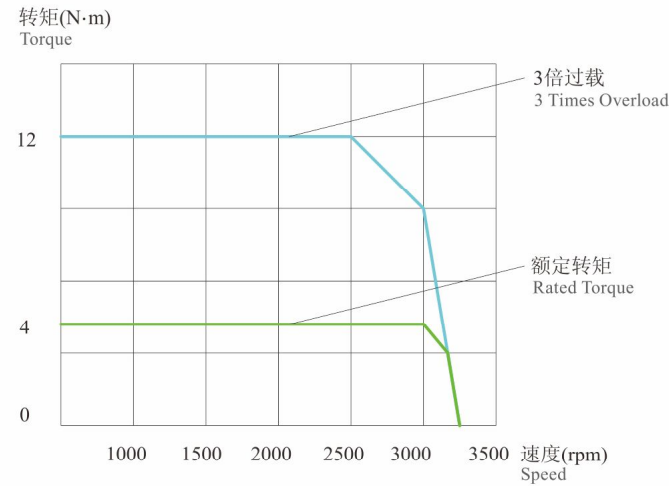
High Overload Performance

采用工业级功率模块，具有过载能力强、启动转矩大等特点。能保证5.5KW以下大部分机型达到3倍过载能力，7.5KW以上机型可以达到2.5倍过载。优化的电机控制算法，实现对转矩、速度、位置精确的全数字控制。

With the industrial grade power module, it has the characteristics of strong overload capability and large starting torque, thus ensuring that most of less than 5.5 KW models can generally achieve 2.5 times overload and the 7.5 KW or more can achieve 2.5 times overload. The optimized motor control algorithm has realized the full-digital control over torque, speed and position accuracy.

(图示力矩曲线图：测试规格：110机座，1.3kw，4N·m，3000rpm 电机额定工况及过载工况下。)

(The torque curve shown in the figure: Test specifications: Base 110, 1.3kw, 4N·m, operating conditions of 3000 rpm rated motor conditions and its overload conditions.)

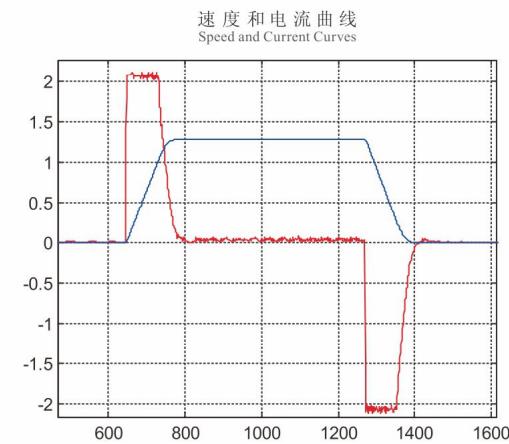


### ▶高速高性能

High Speed and High Performance

采用高性能DSP+FPGA体系结构，数据处理运算速度快，集成度高、可靠性好。采用优化的PID控制算法和指令平滑功能，提高动态跟踪和稳定性能。速度响应带宽达1.2kHz，提升命令响应速度，位置整定时间最优可达1ms，转速波动范围0.03%。

The high-performance DSP + FDGA architecture is adopted to obtain fast data processing and computing speed as well as high integration and good reliability. The optimized PID control algorithm and the command smoothing function have improved the dynamic tracking and stability. The speed response bandwidth is up to 1.2kHz, which improves the command response speed. The position setting time is optimally up to 1ms, and the speed fluctuation range is 0.03%.

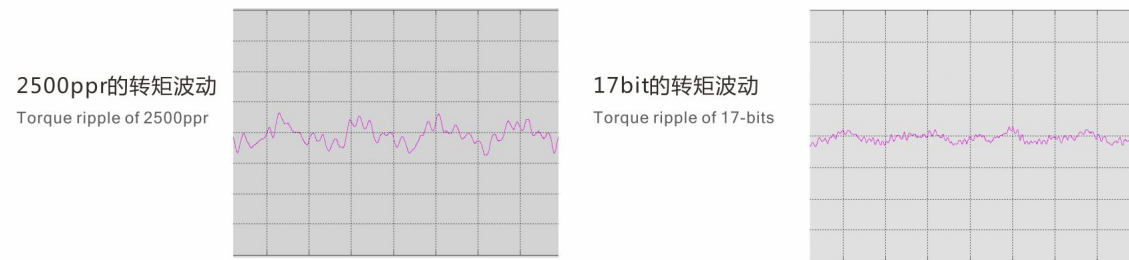


### ▶高分辨率的反馈单元

High Resolution Feedback Unit

伺服电机内含131072ppr高分辨率的编码器，精度高、低速性能好，并能兼容省线式、绝对值编码器、旋转变压器等多种反馈单元，提升定位精度与低速运转稳定性。

The servo motor contains 131072 ppr high-resolution encoder with high precision, low speed and good performance. It can be compatible with various feedback units such as reduced-line absolute encoder and rotary transformer to improve positioning accuracy and the stability operating at a low speed.



### ▶高速通信功能

High Speed Communication Function

伺服驱动器支持多种高速工业现场总线，可灵活配套对应的CNC数控系统、PLC、控制器等。伺服驱动器标配RS485接口，内部集成MODBUS通讯协议，能够与PLC、触摸屏等组网通信。ES2系列伺服驱动器标配USB接口，配合ELESY Soft软件，可以便捷的对伺服进行配置与监控。

Servo driver can support many high-speed industrial field buses, which can flexibly match with the corresponding CNC numerical control system, PLC and controller. The servo driver is equipped with RS485 interface as standard, and integrated with MODBUS communication protocol, which can communicate with the networks including PLC and touch screen. Equipped with USB interfaces as standard and ELESY Soft software, ES2 series servo driver can easily configure and monitor the servo.

## ★交流伺服系统功能

AC Servo System Functions

### ▶满足多样化的命令控制模式

To meet diversified command and control mode

位置/速度/转矩控制模式。

混合控制模式：位置/速度、速度/转矩、位置/转矩控制模式。  
指令来源选择：内部/外部位置指令；内部/模拟量速度指令；内部/模拟量转矩指令。

模拟转矩限制/模拟速度限制。

多组电子齿轮比切换。

应用实例：送料机、薄膜分切机、卷绕机、包装机械、印刷机械、绣花机机械、绕线机械、激光切割机械。

Position / speed / torque control mode;

Mixed control mode: position / speed, speed / torque, position / torque control mode;

Command source selection: internal / external position command, internal / analog speed command; internal/analog torque command.

Analog torque limit / analog speed limit

Multiple sets of electronic gear ratios are switched.

Examples of application: feeder, film splitter, coiler, packaging machinery, printing machinery, embroidery machinery, winding machine and laser cutting machinery.

### ▶全闭环控制功能

Full-closed Control Functions

支持外部编码器、光栅尺(A、B、Z格式)等

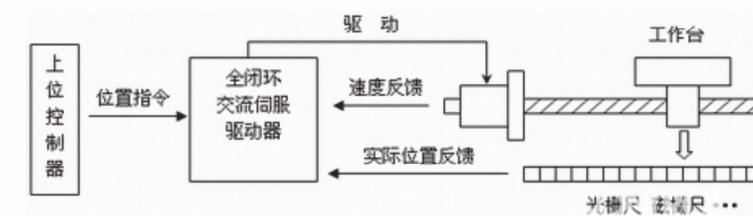
降低机械打滑和传动背隙的影响，保证机械终端定位精度

应用实例：数控机床、送料类型设备等

To support external encoder and grating scale (A, B, Z format)

To reduce the impact of mechanical slipping and transmission back clearance and ensure the positioning accuracy of mechanical terminals

Examples of application: CNC machine tools, feeding machine, etc.



### ▶增益调整与振动抑制

Gain Adjustment and Vibration Suppression

多组增益选择以及增益切换功能。

位置前馈、速度前馈功能，可显著减小追随误差。

负载惯量比设置，在线辨识功能，简化增益调整。

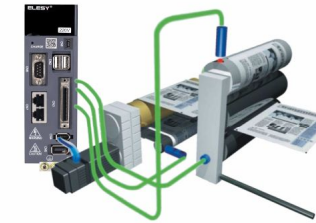
陷波器功能，消除机械共振引起的振动与异响。

Multiple sets of gain selection and gain switching function

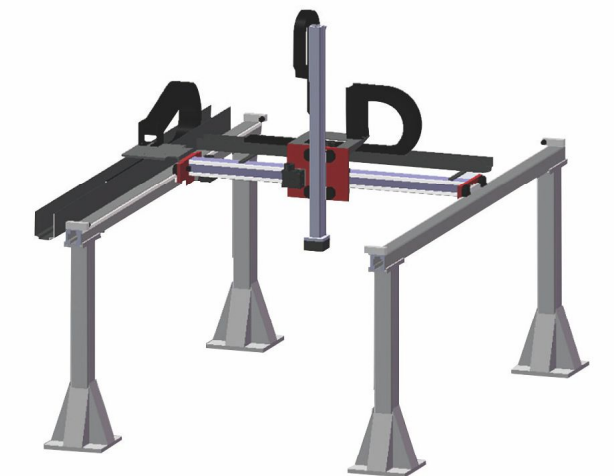
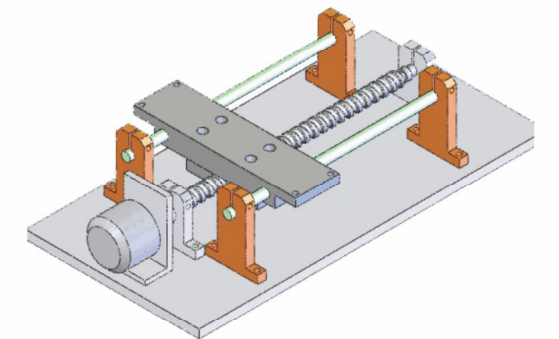
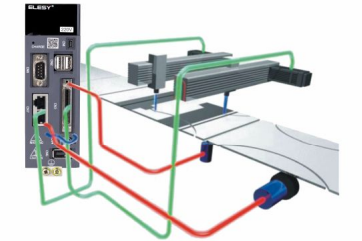
Position feed forward and speed feed forward function can significantly reduce tracking error. Load inertia ratio setting, online identification function and simplified gain adjustment.

The wave trap function eliminates vibration and abnormal noise caused by mechanical resonance.

印刷机械应用原理  
Application theory of printing machinery



激光切割应用原理  
Application theory of laser cutting



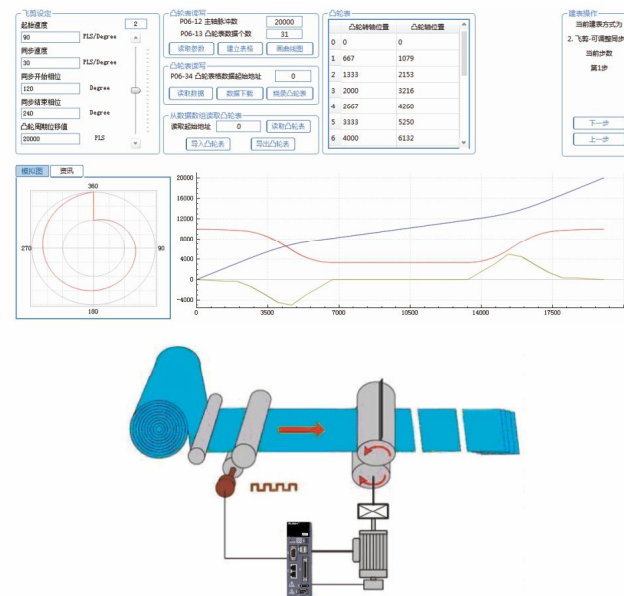


### ▶ 电子凸轮

#### Electronic Cam

凸轮曲线数据可达720点。  
相邻两点之间由软件插补三次曲线，点数多寡不影响运行平滑性。  
支持飞剪、追剪以及自定义曲线规划，  
可方便的使用ELESY Soft软件进行规划与设置。  
驱动器内置飞剪、追剪宏指令，可直接对曲线进行调整与重新规划。

The cam curve data can reach 720 points.  
The cubic curve is interpolated by software between two adjacent points, and the number of points does not affect the smoothness of the operation.  
To support flying shear, chasing shear and customize curve planning  
Easy to use ELESY Soft software to make planning and setting  
The driver has the macros for built-in flying shear and chasing shear to directly adjust and re-plan the curve.

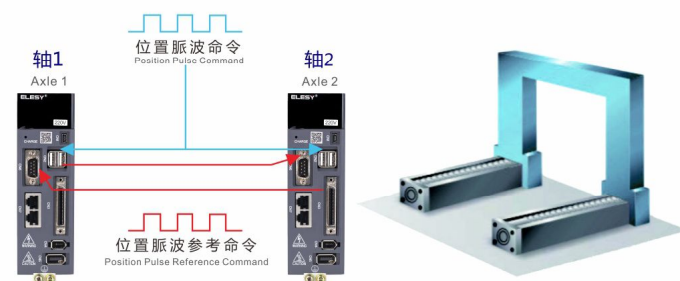


### ▶ 龙门同步

#### Gantry Synchronization

龙门式机械机构可以使用双轴驱动，驱动器自动进行位置同步。  
当同步位置偏差超过设定值后，驱动器会发出报警并停止运行。  
上位机同时给两台驱动器发脉冲指令，  
通过将两台驱动器位置反馈脉冲信号交叉连接，  
实时调节电机运行速度，使两轴位置同步。

The gantry-type mechanism can be driven by double shaft and the driver can synchronize its position automatically.  
When the deviation of synchronized position exceeds the set value, the driver will give an alarm and stop running.  
The servo system computer sends pulse commands to two drivers simultaneously.  
Via cross connection of position feedback pulse signals from two drivers, the motor running speed is adjusted in real time to synchronize the positions of two shafts.



### ▶ 内置运动控制功能

#### Built-in motion control function

提供32段路径可供使用者灵活规划。  
路径类型包括：原点回归、定速控制、定位控制、  
修改参数、跳转路径等。  
位置控制支持：绝对定位、相对定位、增量定位、  
CAP抓取定位。

多段加减速时间、延时时间、目标速度可选。

位置控制采用PUU用户单位，方便使用。

多种触发方式：软件触发、CNTR信号触发、  
EV1/2/3/4事件触发（跳沿可选）。

ELESY Soft软件采用图形化设置操作，设定简便。

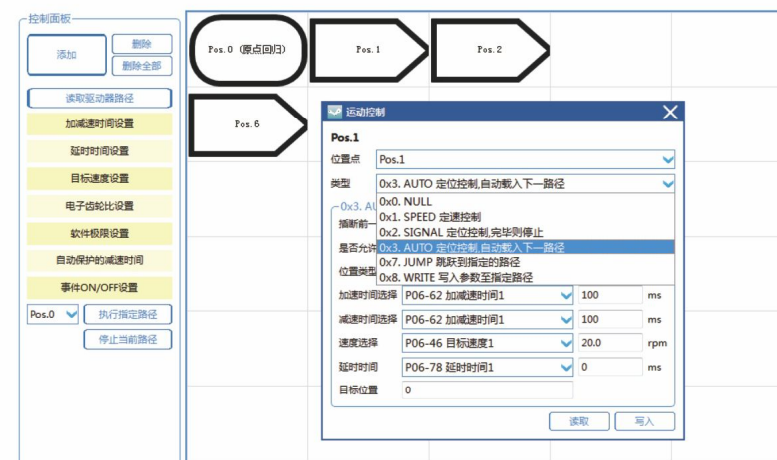
To provide a 32-segment path for the user to make the planning flexible.  
Route types include: zero return, constant speed control, positioning control, modification parameters, and jump path.

Position control support: absolute positioning, relative positioning, incremental positioning, CAP capture positioning.

Multi-stage acceleration /deceleration time, delay time and target speed are optional.

It is convenient to use with the adoption of position control  
Multiple trigger modes: software trigger, CNTR signal trigger, EV1/2/3/4 event trigger (jump edge optional).

The graphical setting operation is made via ELESY Soft software and easy for setup.



### ▶ 通讯与现场总线功能

#### Communication and field bus functions

内置RS-485接口，支持MODBUS通讯协议。  
支持MECHATROLINK-II/III总线通讯协议。  
支持CANopen总线通讯协议，支持CiA-301、DSP-402子协议。  
支持EtherCAT总线通讯，应用层采用IEC61800-7  
CiA 402 - CANopen运动控制子协议。  
配合相应上位控制器，如CNC数控系统、PLC、控制器等，  
可实现多台伺服驱动器组网运行。

With the built-in RS-485 interface, support MODBUS communication protocol.  
To support MECHATROLINK - II / III bus communication protocol.  
To support CANopen bus communication protocol, support CiA-301, DSP-402 sub-protocol.  
To support EtherCAT bus communication and IEC61800-7 (CZA402)-CANopen motion control sub-protocol is adopted for the application layer.  
With the corresponding servo system controller, such as CNC numerical control system, PLC, controller, etc., multiple servo drivers can be networked.

### ▶ ELESY Soft伺服控制PC软件

#### ELESY Soft servo control PC software

支持通过RS-485或USB与驱动器通讯，即插即用，连接简便。  
参数编辑器允许用户实时查看修改伺服参数，并提供参数说明、  
设定范围等信息。支持导入、导出用户参数表，  
能方便的批量配置伺服驱动器。

示波器支持4通道数据采集，刷新速度1kHz。

用户可以监测伺服运行波形，

对波形数据可进行缩放、测量、导入、导出等操作。

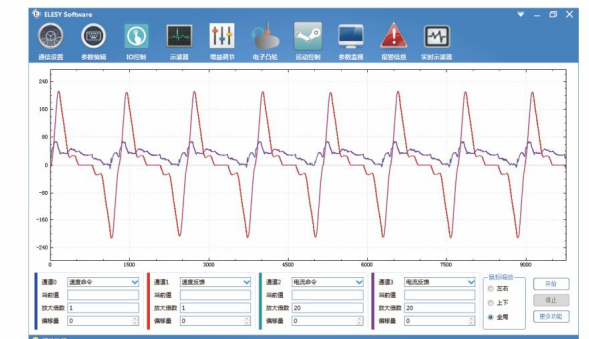
IO控制器可直接选择端子逻辑和功能，并实时查看端子状态。

运动控制与电子凸轮功能，采用图形化设置，

可以方便的对相关功能进行配置与调试。

此外还提供增益调节、参数监视、报警信息等功能。

To support communications with the driver through RS-485 or USB; plug and play, easy to connect.  
The parameter editor allows the user to view the modified servo parameters in real time and provide and provide information such as parameter description and setting range; import support and export the user parameter tables, which can conveniently configure servo drivers in batches.  
The oscilloscope supports 4-channel data acquisition with a refresh rate of 1 kHz. The user can monitor the servo running waveform, to scale, measure, import, and export the waveform data.  
The IO controller can directly select terminal logic and the function to look at the status of the terminals in real time.  
Graphical settings is used for motion control and electronic cam function. Easy to configure and debug related functions.  
In addition, it also provides functions such as gain adjustment, parameter monitoring and alarm information.



### ▶ 节能功能 (ES2-021T及以上规格)

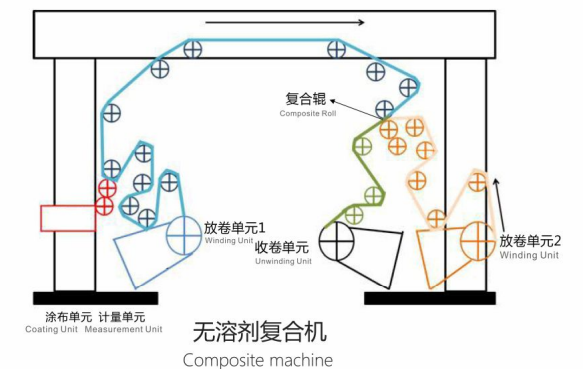
#### Energy-saving function (specifications for ES2-021 and above)

驱动器可共直流母线，能量充分利用，设备更节能；  
减小制动电阻数量及功率要求，降低配件成本。

应用案例：印刷设备、纺织设备、收放卷设备等。

The driver can share the DC bus and the energy is fully utilized so that the device is more energy-efficient;  
To reduce the quantity of braking resistors, power requirements and the cost of accessories.

Cases of Application: printing equipment, textile equipment and unwinder / rewinder





## ★ ES1/ES2系列全数字交流伺服驱动器

ES1 / ES2 Series Full-digital AC Servo Driver

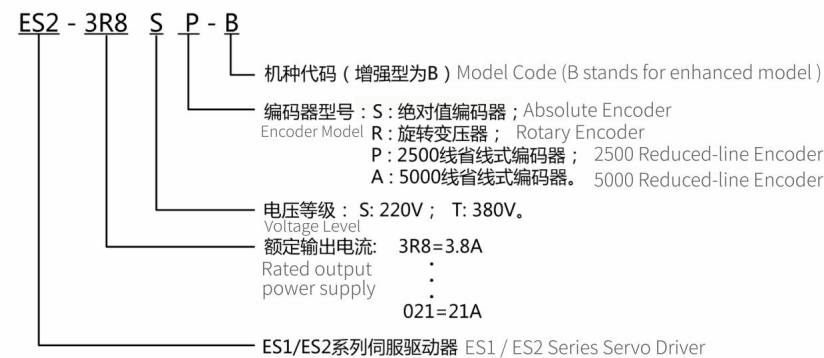


采用 DSP+FPGA 体系结构，加快了数据的采集和处理速度，集成度高、可靠性好。优化的 PID 控制算法，实现转矩、速度、位置精确的全数字控制，精度高、响应快。丰富的数字量与模拟量接口、位置反馈脉冲分频和零位脉冲扩宽输出，能与多种上位控制装置配套。

DSP+FPGA architecture is adopted to obtain fast data collection and processing, as well as high integration density and reliability. The optimized PID control algorithm realizes the fully digital control of torque, speed and position with high precision and fast response. With abundant digital & analog interfaces, and position feedback pulse frequency division and zero pulse broadening output, it can be matched with multiple upper control devices.

### 》伺服驱动器型号说明

Model of servo drive



注: ES1系列无机种代码 Note: ES1 Series Non-model Code

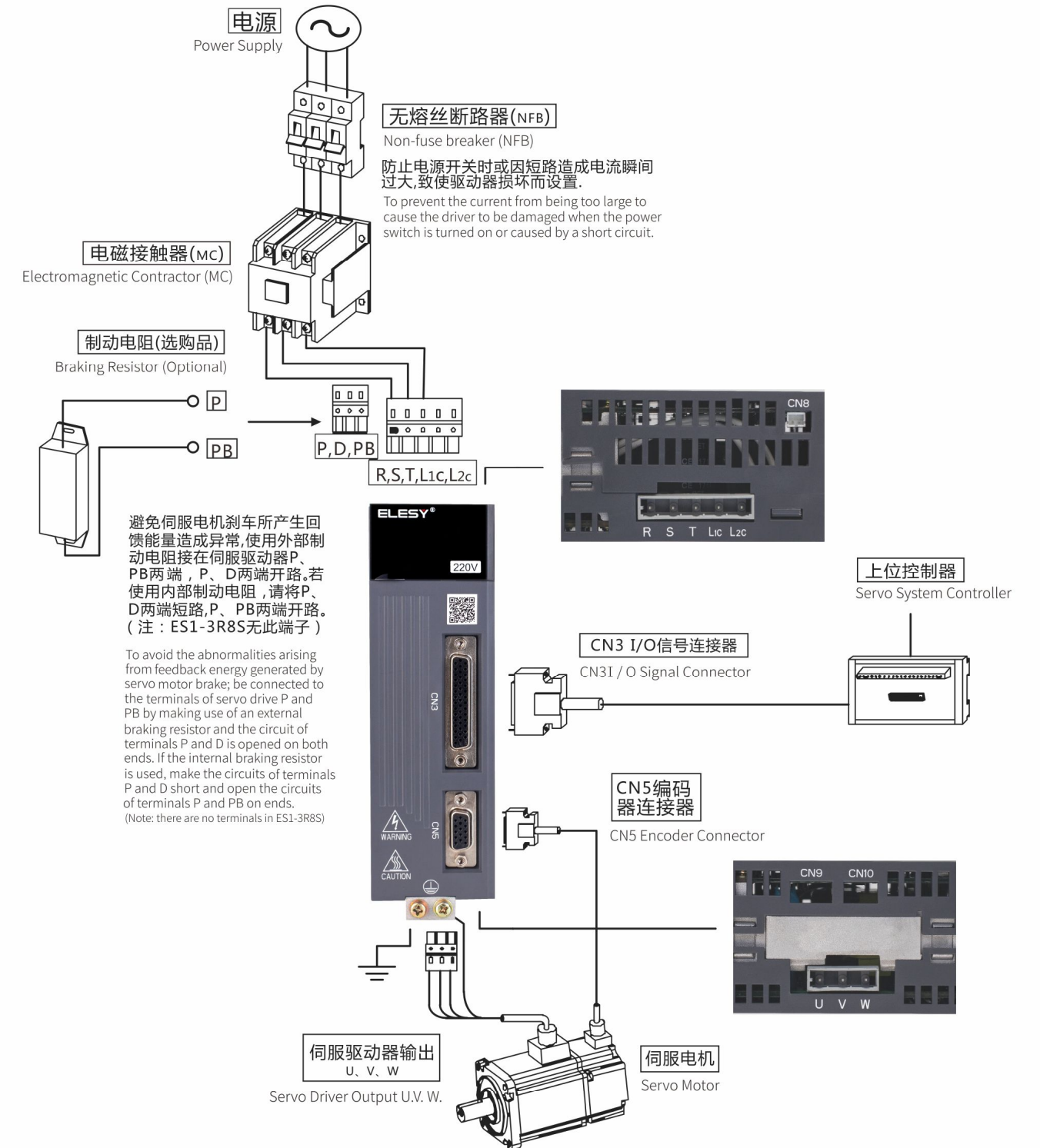
机种代码 Model Code	全闭环 Full-closed	电子凸轮 Electronic Cam	USB 接口 USB Interface	I/O 扩展 I/O expansion	CANopen	EtherCAT	M-II	M-III
B: 增强型 Enhanced Model	○	×	○	×	×	×	×	×
M: MII总线 MII Bus	○	×	○	×	×	×	○	×
M3: MIII总线 MIII Bus	○	×	○	×	×	×	×	○
F: 功能型 Functional Model	○	○	○	○	×	×	×	×
C: CANopen 总线 CANopen Bus	○	○	○	○	○	×	×	×
E: EtherCAT 总线 EtherCAT bus	○	○	○	○	×	○	×	×

### 》伺服驱动器接口

Drive Interface

### ▶ ES1-3R8S/7R6S/012S/8R4T/012T系列驱动器

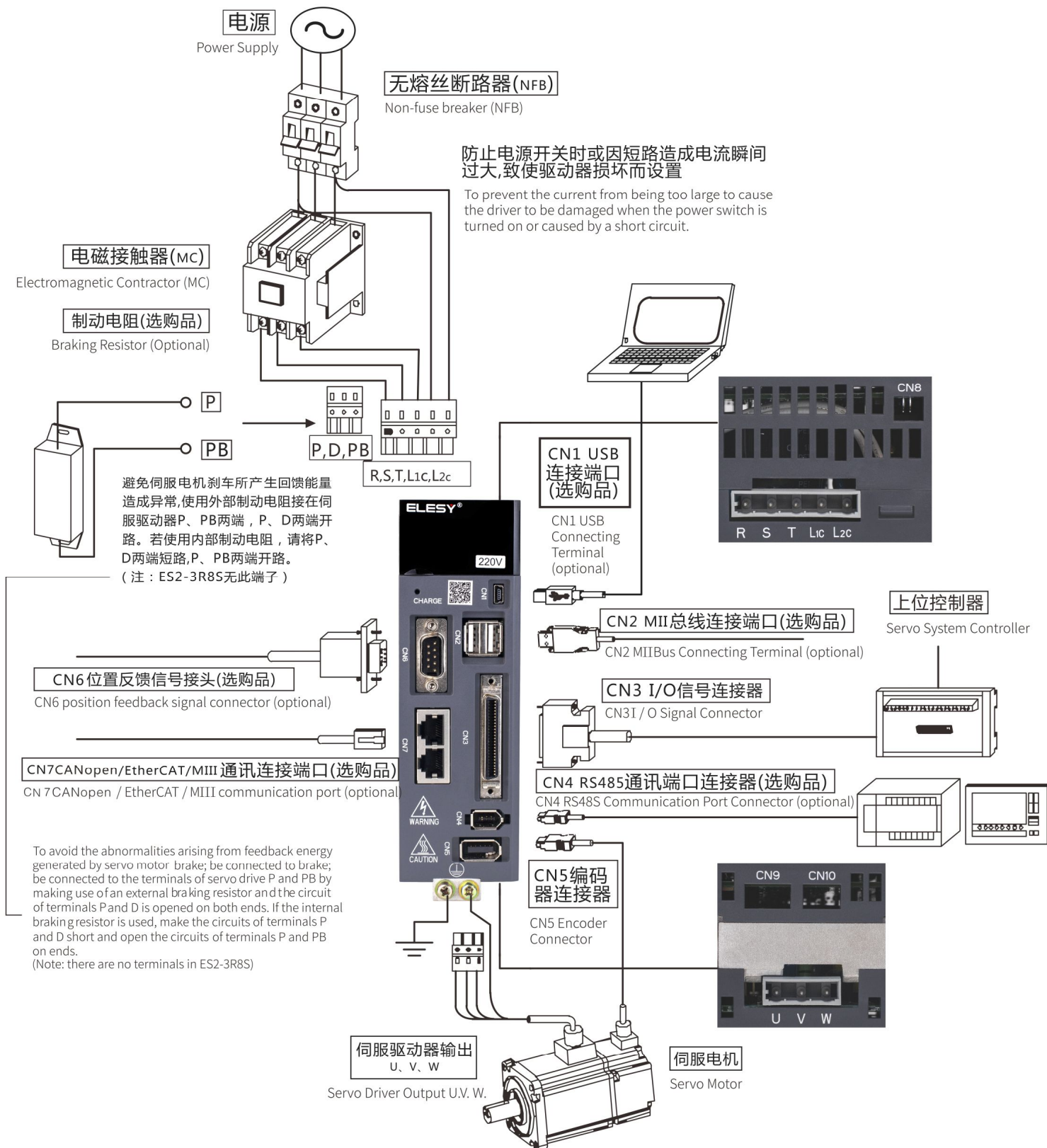
ES1 -3R8S / 7R6S / 012S / 8R4T / 012T Series Driver





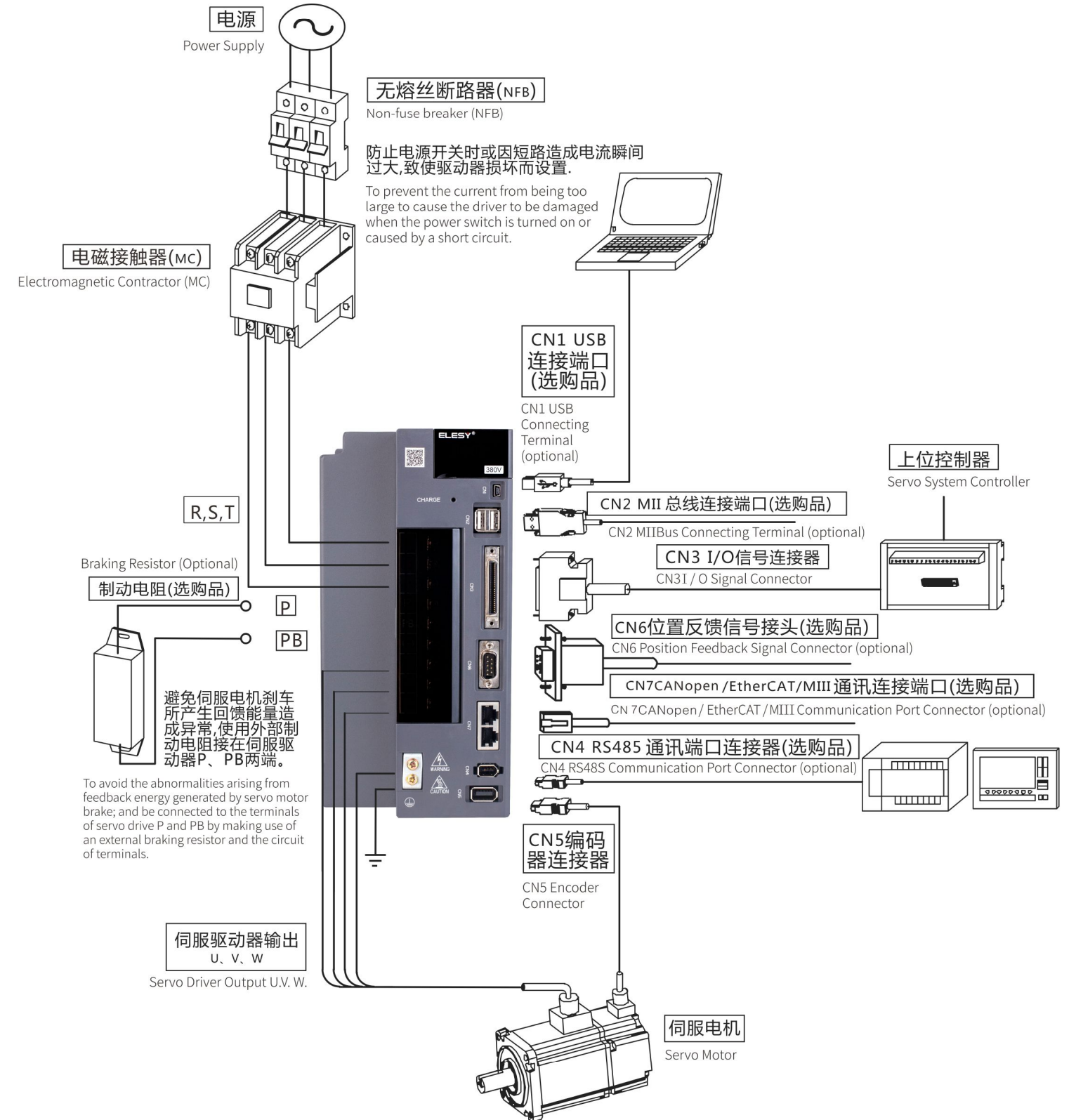
▶ ES2-3R8S/7R6RS/012S/8R4T/012T系列驱动器

ES2-3R8S / 7R6S / 012S / 8R4T / 012T Series Driver



▶ ES2-021T/026T系列驱动器

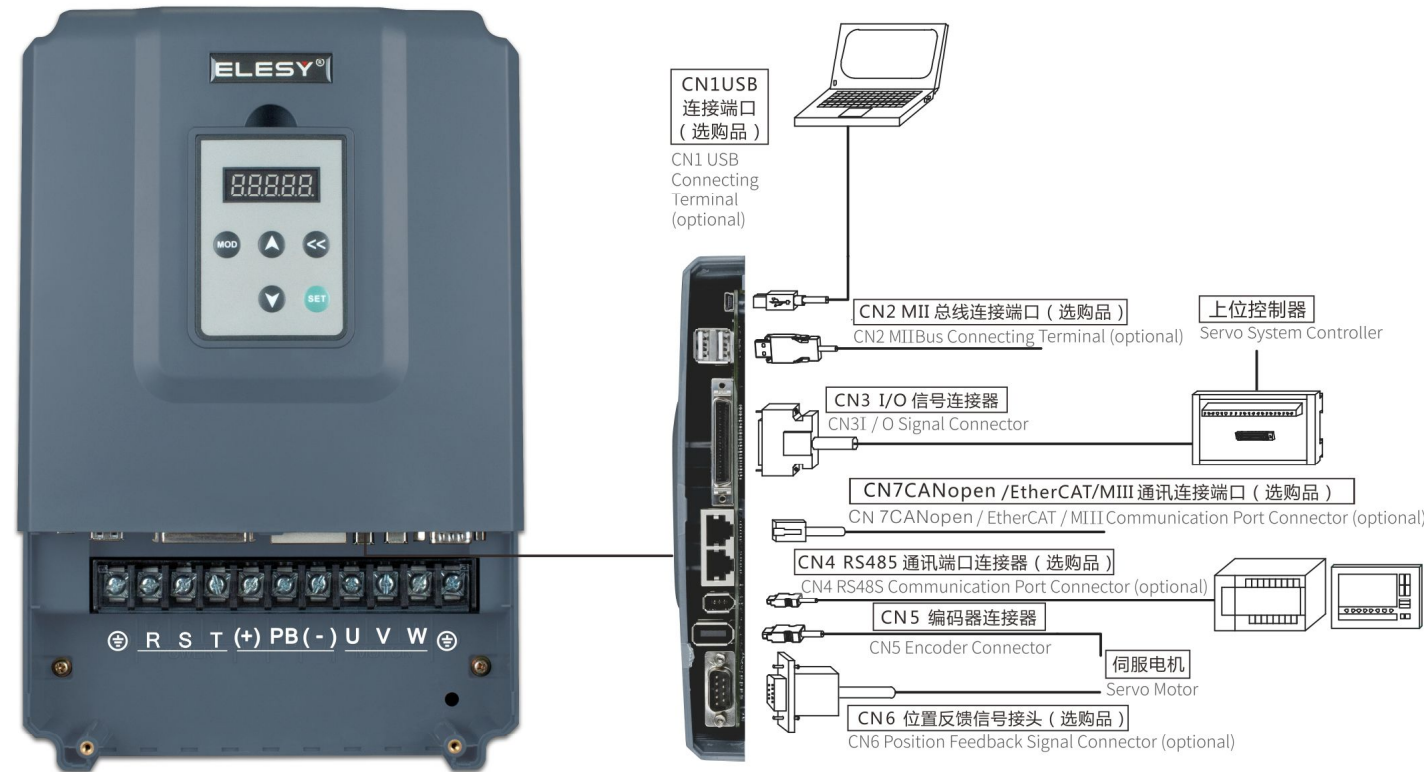
ES2-021T/026T Series Driver





▶ ES2-033T / 045T系列驱动

ES2 -033T / 045T S Series Driver



ES2-033T/045T 主回路端子定义及接线说明  
ES2 -033T / 045T Series Driver

端子符号 Terminal Symbol	名称 Name	说明 Description
R, S, T	三相电源输入端子 Three-phase Power Input Terminal	三相交流电源连接点。 Three-phase AC Output Connecting Terminal
(+), (-)	直流母线正负端子 DC Bus +/- Terminal	共直流母线输入点。 Common DC Bus Input Terminal
(+), PB	制动电阻连接端子 Braking Resistor Connecting Terminal	制动电阻连接点。 Braking Resistor Connecting Terminal
U, V, W	伺服驱动器输出端子 Serve Drive Output Terminal	连接电机 Connecting Motor
⊕	接地端子 Ground Terminal	接地端子 Ground Terminal

ES2-033T/045T 制动回路接线说明  
ES2 -003T / 045T Brake Circuit Wiring Instructions

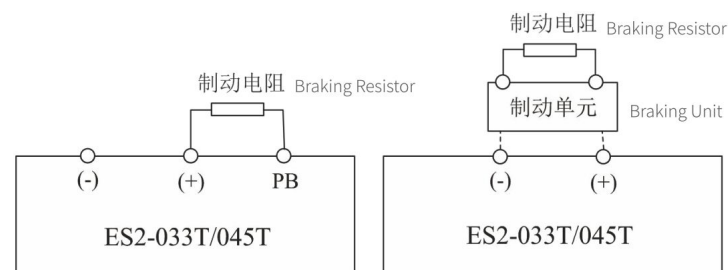
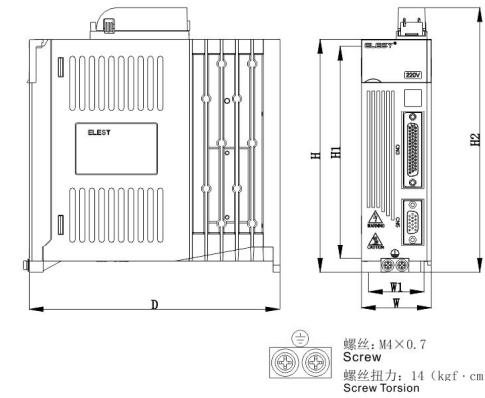


图 3.3 ES2-033T/045T 制动回路接线示意图  
Figure3.3 ES2-003T / 045T Brake Circuit Wiring Diagram

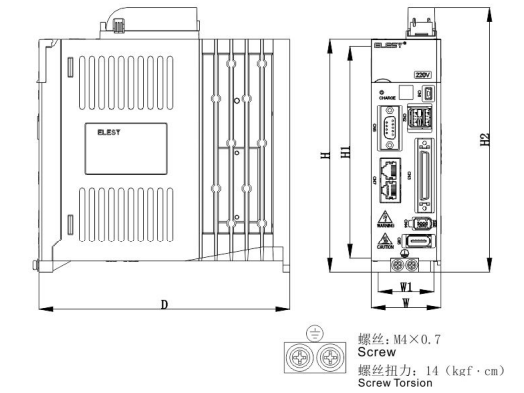
》 伺服驱动器外形尺寸和规格

Outline dimension and specs of servo drive

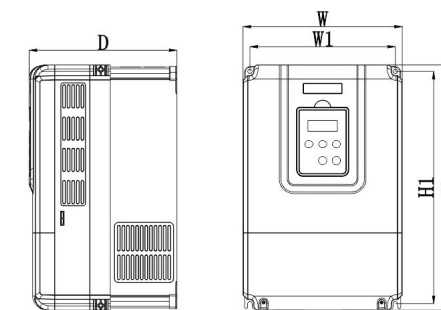
• ES1-3R8S/7R6S/012S/8R4T/012T系列驱动器尺寸  
Dimension of ES1 -3R8S / 7R6S / 012S / 8R4T / 012T Series Driver



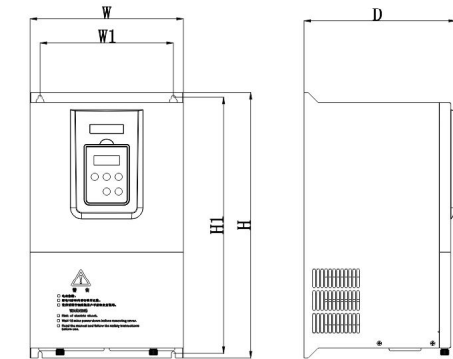
• ES2-3R8S/7R6S/012S/8R4T/012T/021T/026T系列驱动器尺寸  
Dimension of ES2 - 3R8S / 7R6S / 012S / 8R4T / 012T / 021T / 026T Series Driver



• ES2-033T系列驱动器尺寸  
Dimension of ES2-033T Series Driver



• ES2-045T/060T/090T系列驱动器尺寸  
Dimension of ES2 -045T / 060T / 090T Series Driver



• ES1/ES2-3R8S~090T 系列驱动器安装尺寸 Installation Dimension of ES1 / ES2-3R8S-090T Series Driver

尺寸 Dimension	单位 Unit	W	H	D	W1	H1	H2	SCREW
驱动器型号 Driver Model								
ES1/ES2-3R8S	mm	50	168	180	40	153	191	2-M4
ES1/ES2-7R6S	mm	70	168	180	60	153	191	3-M4
ES1/ES2-012S /8R4T/012T	mm	90	208	200	80	193	231	3-M4
ES2-021T/026T	mm	123	250	210	108	238	273	4-M5
ES2-033T	mm	208	322	193	190	305	-	4-M5
ES2-045T	mm	230	400	228	200	386	-	4-M5
ES2-060T	mm	285	463	233	235	447	-	4-M6
ES2-090T	mm	385	600	272	260	580	-	4-M8



★ 伺服驱动器参数

Parameters of Servo Driver

ES2 系列型号 ES2 Series Model	3R8S	7R6S	012S	8R4T	012T	021T	026T	033T	045T	090T
ES1 系列型号 ES1 Series Model	3R8S	7R6S	012S	8R4T	012T	--	--	--	--	--
额定电流输出 Rated Current Output	3.8A	7.6A	12A	8.4A	12A	21A	26A	33A	45A	90A
电源 Power Supply	三相或单相 220VAC Three-phase or single phase 220 V / AC			三相 380VAC Three-phase 380V / AC						
冷却方式 Type of Cooling	自然风冷、强制风冷 Natural air cooling, forced air cooling									
主回路控制方式 Mode of Main Loop Control	SVPWM 控制 SVPWM control									
反馈电阻 Feedback Resistor	内置 Built-in					外置 External				
使用环境 Operating Environment	温度 Temperature	工作环境温度: -10°C~40°C (环境温度在 40°C~50°C, 请降额使用) (不冻结) Working environment temperature: - 10 °C ~ 40 °C (If ambient temperature ranges from 40 °C~50 °C, please de-rate for use) (no freezing) 储存温度: -20°C~+85°C (不冻结) Storage temperature: - 20 °C~85°C (no freezing)								
	湿度 Humidity	小于 90%, 无结露 Less than 90%, no condensation								
	防护等级 Level of Protection	IP20								
	海拔高度 Altitude	< 1000m (海拔 1000m 以上, 请降额使用。) <1000m(if the altitude is over 1000m, please de-rate for use)								
	振动 Vibration	≤0.6G ( 5.9 m / s <sup>2</sup> ) 10-60Hz 非连续运行 ≤ 0.6G (5.9 m / s <sup>2</sup> ) 10- 60Hz discontinuous operation								
位置控制模式 Position Control Mode	脉冲指令模式 Pulse Command Mode	脉冲+符号; Pulse + symbol; A相+B相; Phase A + phase B; CCW 脉冲+CW 脉冲。 CCW pulse + CW pulse								
	最大输入脉冲频率 Max. Output Pulse Frequency	脉冲+符号: 500 Kpps ; Pulse + symbol : 500Kpps; CCW 脉冲+CW 脉冲 : 500 Kpps ; CCW pulse + CW pulse: 500Kpps; A相+B相: 单相 500 Kpps ; Phase A + phase B: single phase 500Kpps; 开集电极传输方式: 200 Kpps。 Open collector transmission : 200 Kpps								
	指令控制方式 Command Control Mode	外部脉冲控制/ 内部寄存器控制 (PR mode) External pulse control / internal position control (PR mode)								
	指令平滑方式 Command Smoothing Mode	低通及曲线平滑滤波 Low pass and curve smoothing filtering								
	电子齿轮比 Electronic Gear Ratio	电子齿轮比: N / M ( N : 1~2147483647 / M : 1~ 2147483647 ) Electronic gear ratio: N / M (N: 1~2147483647 / M: 1~21474836470								
	转矩限制 Torque-speed Limit	参数设定方式 Parameter setting mode								
速度控制模式 Speed Control Mode	模拟指令输入 Analog Command Input	电压范围 Voltage Scope	-10V ~ +10V							
		分辨率 Resolution	12-bit							
		输入阻抗 Input Resistance	1MΩ							
		时间常数 Time Constant	25μs							
	速度控制范围 Scope of Speed Control	1 : 6000								
	指令平滑方式 Command Smoothing Mode	低通平滑滤波; S 曲线平滑滤波 Low pass and smoothing filtering; S curve smoothing filtering								
转矩限制 Torque-speed Limit	参数设定方式或模拟输入 Parameter setting mode or analog input									

	带宽 Bandwidth	最大 1.2kHz ( 闭环 ) Max.1.2k Hz(closed loop)	
扭矩控制模式 Torque Control Mode	模拟指令输入 Analog Command Input	电压范围 Voltage Scope	-10V ~ +10V
		分辨率 Resolution	12-bit
		输入阻抗 Input Resistance	1MΩ
		时间常数 Time Constant	25μs
	指令控制方式 Command Control Mode	外部模拟指令控制/内部寄存器控制 External analog command control/internal register control	
指令平滑方式 Command Smoothing Mode	低通平滑滤波 Low pass and smoothing filtering		
速度限制 Speed Limit	参数设定方式或模拟输入 Parameter setting mode/analog input		
数字 Digital	输入 Input	1. 伺服使能 Servo Enabled	
		2. 报警清除 Alarm Reset	
3. 正向极限限制 Forward Limit Restrictions			
4. 反向极限限制 Reverse Limit Restrictions			
5. 脉冲指令禁止 Pulse Command Suppression			
6. 零速钳位 Zero Speed			
7. 偏差清零 Deviation Reset			
8. 外部力矩限制 External Torque-speed Limit			
9. 控制模式切换 Control Mode Switch			
10. 增益切换选择 1 Gain Switching 1			
11. 增益切换选择 2 Gain Switching 2			
14. 内部速度选择 1 Internal Speed Select 1			
15. 内部速度选择 2 Internal Speed Select 2			
17. 电子凸轮啮合 Electronic Cam Tothing			
20. 内部转矩选择 1 Internal Torque-speed Select			
21. 内部转矩选择 2 Internal Torque-speed Select 2			
24. 电子齿轮比选择 1 Electronic Gear Ratio Select 1			
25. 电子齿轮比选择 2 Electronic Gear Ratio Select 2			
26. 速度指令方向选择 1 Speed Command Direction Select 1			
27. 速度指令方向选择 2 Speed Command Direction Select 2			
28. 速度力矩指令方向取反 Speed Command Direction Reverse			
29. 紧急停车 Emergency Stop			
32. 启动原点回归 Original-point Regression Initiate			
33. 原点回归参考点 Original-point Regression Reference Point			
36. 内部位置运行启动信号 Start Signal for Internal Position Running			
37. 电机暂停 Motor Pause			
38. 内部位置选择 0 Internal Position Select 0			
39. 内部位置选择 1 Internal Position Select 1			
40. 内部位置选择 2 Internal Position Select 2			
41. 内部位置选择 3 Internal Position Select 3			
42. 内部位置选择 4 Internal Position Select 4			
44. 全闭环内外部编码器切换 Full-closed Internal / External Encoder Switching			
45. 全闭环内外部编码器误差清零 Full-closed Internal / External Encoder Error Reset			
53. 正向点动 Forward Limit Restrictions			
54. 反向点动 Reverse Limit Restrictions			
55. EV 事件 EV Event-triggered Command			
输出 Output	1. 伺服准备好 Servo Ready		
	2. 报警输出 Alarm Output		
	3. 定位完成 Positioning Finish		
	4. 电磁制动 Electromagnetic Braking		
	5. 速度达到 Speed Achieve		
	6. 力矩达到 Torque Achieve		
	7. 零速达到 Zero-speed Signal		
	8. 原点回归完成 Original-point Regression Finish		
	9. 转矩限制 Torque-speed		
	10. 速度限制 Speed Limit		
	11. 警告输出 Alarm Output		
12. 凸轮角度输出 Cam Speed Output			
13. 内部位置命令完成 Internal Position Command Finish			
14. 内部位置命令输出异常 Internal Position Command Output Abnormal			
15. 正软件极限 Forward Software Limit			
16. 反软件极限 Reverse Software Limit			
17. 定位附近信号范围 Scope of Positioning Surrounding Signals			
18. 原点信号范围 Scope of Original-point Signals			
19. 栓锁信号有效 Bolt-Lock Signal Valid			
20. 捕获完成 Capture Finish			
21. 绝对型系统坐标设定完成 Completion Of Absolute System Coordinate setting			
保护功能 Protection Function	输入输出缺相保护、超速、过流、过压、欠压、过热、制动异常、过载、位置超差、编码器异常等 Input/output phase loss protection, over-speed, over-current, over-voltage, under-voltage, over-heating, abnormal braking, over-load, position ultra-error, abnormal encoder, etc.		
通讯功能 Communication Function	RS-485 / USB		

注: Note:

1. TN 系统: 电力系统的中性点直接和大地相连, 暴露在外之金属元件经由保护性的接地导体连接到大地。  
TN System: the neutral point is directly connected to the earth in the electric power system and the exposed metal parts will be connected to the earth via the protective grounding conductor .
2. 单相电源电机使用单相三线电力系统。  
Single-phase three-wire electric power system is used for the single-phase power supply models.

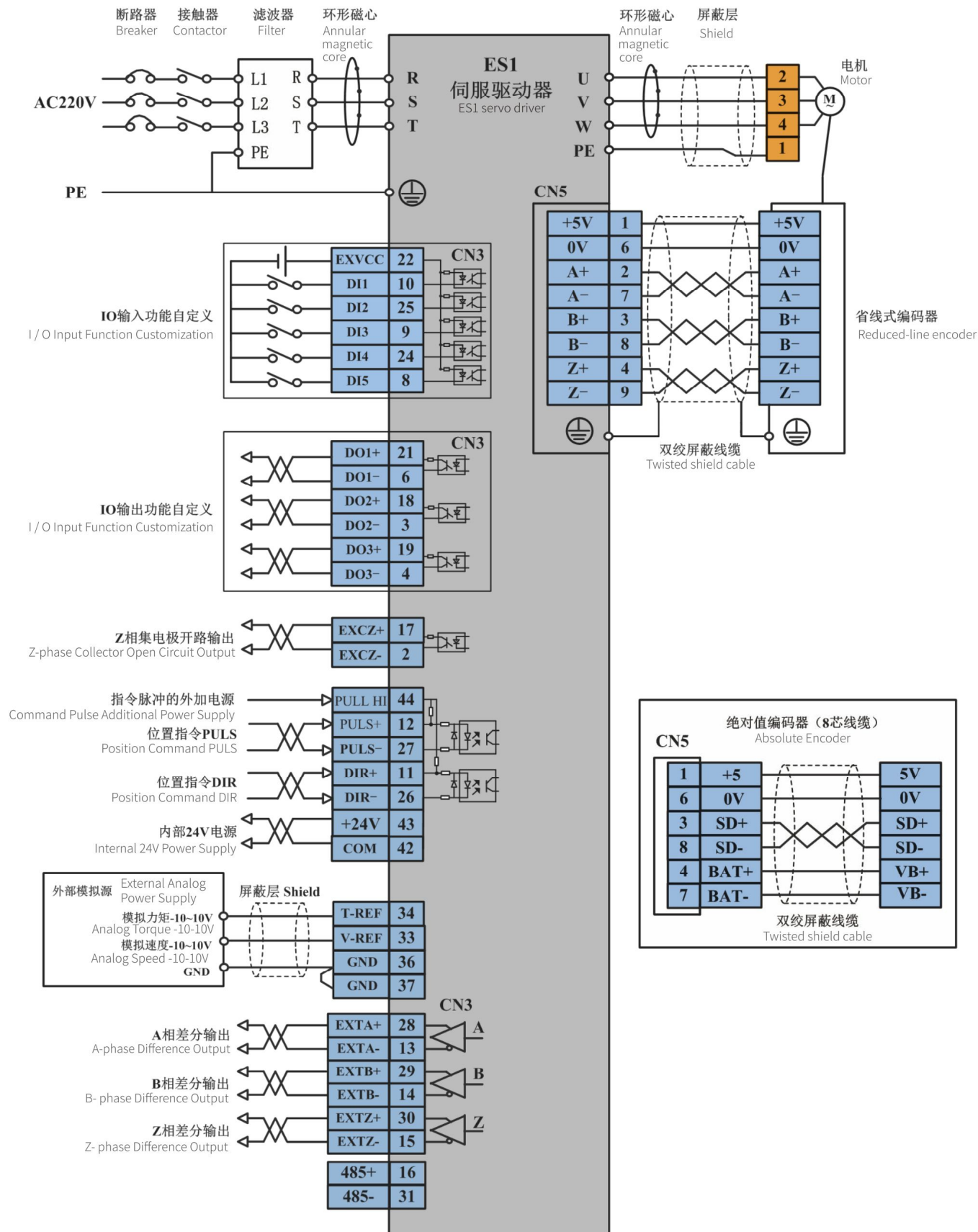


★ 控制模式标准接线介绍

Standard connection of control mode

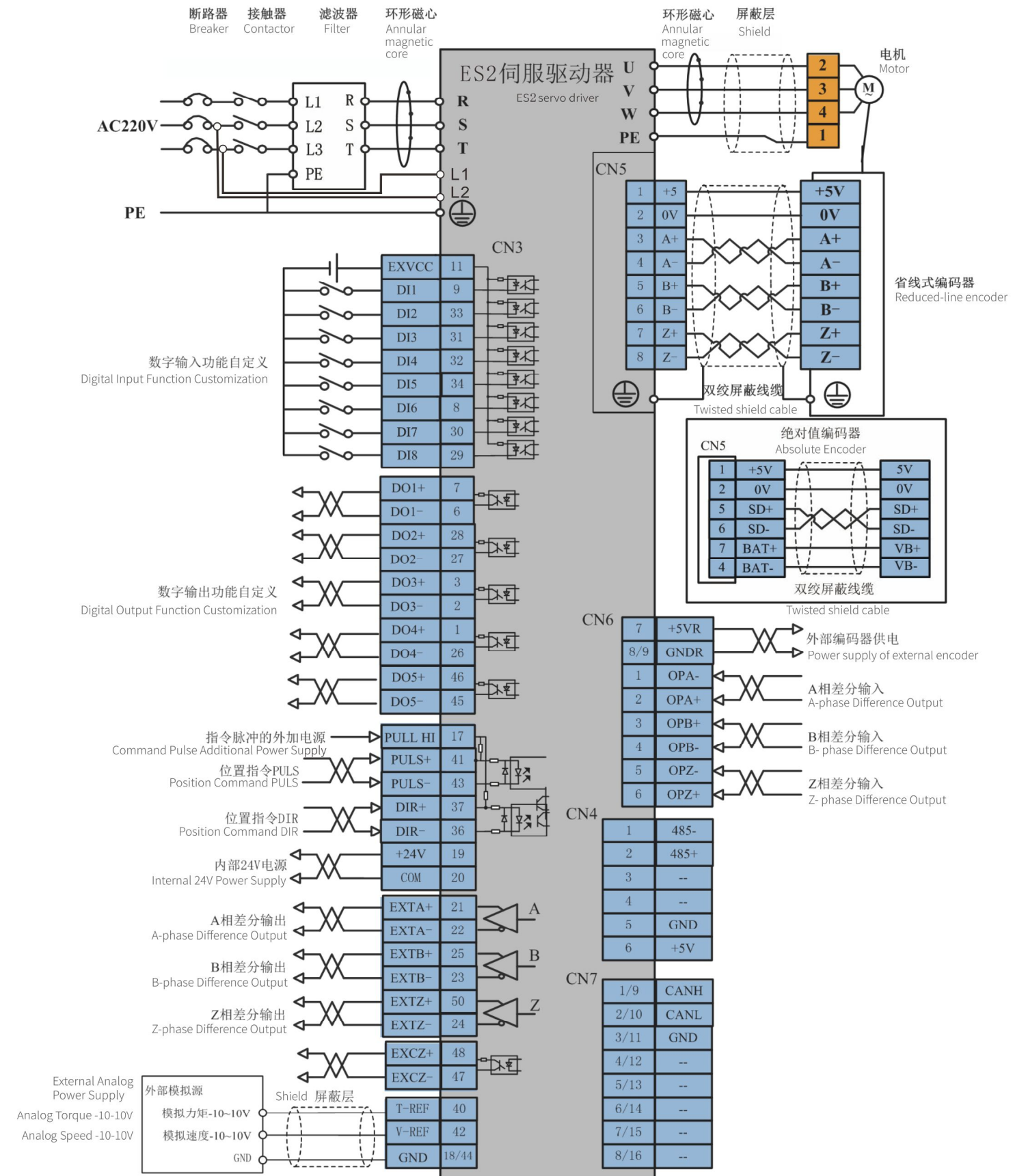
》 ES1伺服驱动器标准接线

Standard connection of ES1 servo driver



》 ES2伺服驱动器标准接线

Standard connection of ES2 servo driver





## ★ 伺服电机

Servo motor

EMA电机为永磁交流伺服电机，配套220V交流伺服驱动器，其额定功率范围为200w ~ 7.5kw。电机法兰有60 mm、80 mm、110 mm、130 mm、150 mm、180 mm共六种尺寸，电机额定转速范围从1000r/min到3000r/min，额定转矩范围为0.64Nm到47.8Nm。

EMD电机为永磁交流伺服电机，配套380V交流伺服驱动器，其额定功率范围为3kw~106.8kw。电机法兰有180mm、200 mm、220mm、260mm共四种尺寸，电机额定转速范围从1000r/min到2000r/min，额定转矩范围为14.3Nm到510Nm。

电机的配件可选配制动器、油封等，或根据客户要求提供个性化配置。

EMA motors are the permanent magnet AC servo motor, matched with 200V ~ 230V AC servo drive whose rated power range is 200w to 7.5kw. The motor flanges include 6 sizes: 60 mm, 80 mm, 110 mm, 130 mm, 150mm and 180 mm. The rated speed range of the motor is from 1000r / min to 3000r / min and the rated torque range is from 0.64Nm to 47.8Nm.

EMD motors are the permanent magnet AC servo motor, matched with 380V ~ 400V AC servo drive whose rated power range is 3kw to 106.8kw. The motor flanges include four sizes: 180 mm, 200 mm, 220mm and 260 mm. The rated speed range of the motor is from 1000r / min to 2000r / min and the rated torque range is from 14.3Nm to 510Nm.

The brake and oil seal are optional parts of the motor. The personalized configuration can also be provided according to the customer request.



## 》 伺服电机型号说明

Model of servo motor

130 - EM A - 050 B P 2 2

- 轴伸规格：1：直轴不带键；Straight Shaft without Button  
Shaft Extension 2：带键、带螺纹孔。With Button and Threaded Hole
- 选配件：1：不带选配件；2：带油封；1.No Optional Accessories 2.With Oil Seal  
Optional Accessories 3：带制动器；4：带油封，带制动器。3.With Brake 4.With Oil Seal and Brake
- 编码器型号：S：17位绝对值编码器；17-digital Absolute Encoder  
Encoder Model B：23位绝对值编码器；23-digital Absolute Encoder  
R：旋转变压器；Rotary Transformer  
P：2500线省线式编码器；2500 Reduced-line Encoder  
A：5000线省线式编码器。5000 Reduced-line Encoder
- 转速：A：3000rpm；B：2500rpm；C：2000rpm；  
Torque Speed D：1500rpm；E：1000rpm；F：1700rpm。
- 转矩：若三位均为数字，则数值乘以0.1代表转矩，  
Torque 如050代表50\*0.1=5Nm；若第三位为字母，  
则以A、B、C、D、E、F、G、H、J、K  
分别对应1、2、3、4、5、6、7、8、9、0。  
转换成数值后乘以1代表转矩，  
如10E代表105\*1=105Nm。
- 电压等级：A：220V；D：380V。  
Voltage Level
- EM：伊莱斯伺服电机  
Motor ELESY Servo Motor
- 电机 60：60\*60；80：80\*80；110：110\*110；130：130\*130；  
法兰：180：180\*180；200：200\*200；220：220\*220；260：260\*260。  
Flange

## 》 伺服电机

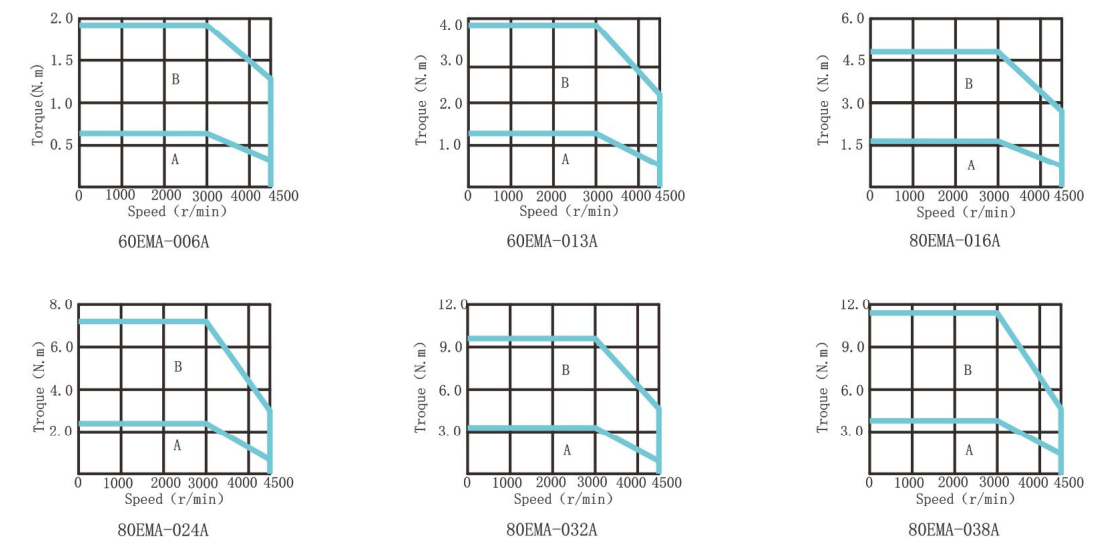
Servo motor

### • 60-80系列电机规格 60、80 Sever Motor Specs

伺服电机型号 Sever Motor Model			60EMA-		80EMA-			
			006A	013A	016A	024A	032A	038A
电源电压	Power Supply Voltage	V	220					
额定输出功率	Rated Output Power	W	200	400	500	750	1000	1200
额定转矩	Rated Torque	N.m	0.64	1.27	1.6	2.4	3.2	3.8
最大转矩	Maximum Torque	N.m	1.92	3.81	4.8	7.2	9.6	11.4
额定电流	Rated Current	Arms	1.5	2.5	3.0	4.0	5.2	5
最大电流	Maximum Current	Arms	4.5	7.5	9.0	12.0	15.6	15
额定转速	Rated Speed	r/min	3000					
最高转速	Maximum Speed	r/min	4500					
转动惯量	Moment of Inertia	$\times 10^{-4} \text{kg.m}^2$	0.19 (0.26)	0.33 (0.40)	1.09 (1.29)	1.24 (1.44)	1.59 (1.79)	1.98 (2.18)
重量-不带制动器	Weight-without Brake	kg	1.1	1.7	2.4	2.9	3.5	4.1
重量-带制动器	Weight-with Brake	kg	1.5	2.1	3	3.5	4.1	4.7
轴向最大荷重	Maxinum Axial Load	N	45		98			
径向最大荷重	Maxinum Radial Load	N	209		249			
制动器额定电压	Brake Rated Voltage	V	DC24					
制动器额定功率	Brake Rated Power	W	7.2		11.5			
制动器保持转矩	Brake Holding Torque	N·m	1.3		4			
编码器	Encoder	标准	省线式编码器2500P/R Wire-saving Encoder 2500P/R					
		选项	绝对值编码器131072P/R,旋转变压器 Absolute Encoder 131072P/R,Resolver					
绝缘等级	Insulation Class		F					
环境温度	Ambient Temperature		0 ~ +40°C (不结冰) 0 to +40°C(No Freezing)					
环境湿度	Ambient Humidity		20 ~ 80%RH (不结露) 20 to 80%RH(Non-condensing)					
防护等级	Protection Grade		IP65 (除输出轴伸和电连接器) IP65(Except output shaft extension and Connectors)					

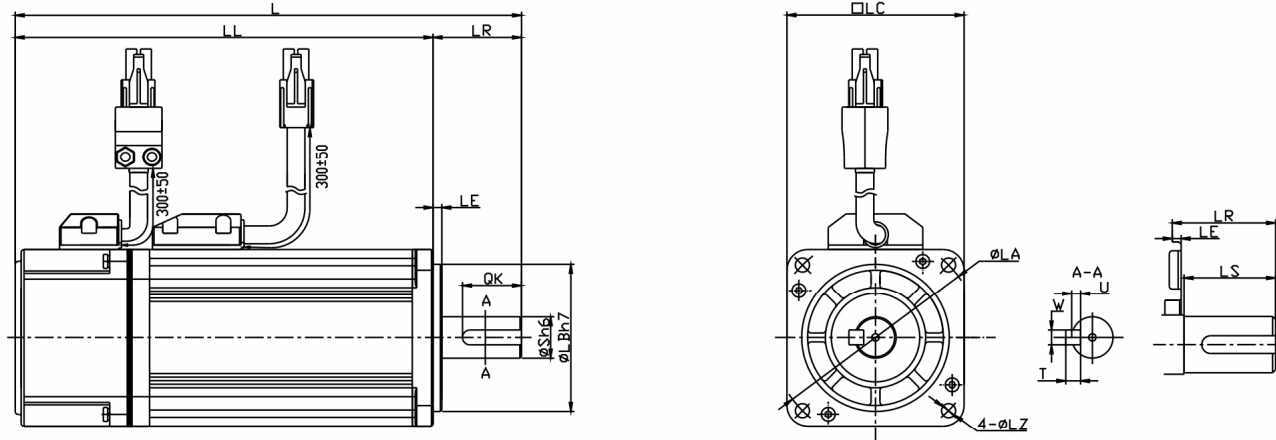
注：括号内的数值表示带制动器电机的值 (Note) The Values in parentheses are for servo motors with brake.

### • 转矩特性 Torque-Speed Characteristics





• 外形尺寸图 Dimension



伺服电机型号 Sever Motor Model	L	LL	法兰 Flange						S	LS	螺纹孔X深度 Threaded Hole x Depth	键 Button			
			LR	LE	LC	LA	LB	LZ				QK	W	T	U
60EMA-006A	146(186)	116(156)	30	3	60	70	50	5	14	27	M4×12	20	5	5	3
60EMA-013A	171(211)	141(181)	30	3	60	70	50	5	14	27	M4×12	20	5	5	3
80EMA-016A	164(207)	129(172)	35	3	80	90	70	6.4	19	31	M6×15	25	6	6	3.5
80EMA-024A	179(222)	144(187)	35	3	80	90	70	6.4	19	31	M6×15	25	6	6	3.5
80EMA-032A	199(242)	164(207)	35	3	80	90	70	6.4	19	31	M6×15	25	6	6	3.5
80EMA-038A	214(257)	179(222)	35	3	80	90	70	6.4	19	31	M6×15	25	6	6	3.5

注：( ) 中为带制动器电机的尺寸。(Note) The Dimensions in parentheses are for servo motors with brake.

电机连接器规格  
Motor Connector Specs



插头 Plug  
172167-1 (Amp)

针号 Pin No.	信号 Signal
1	GND
2	U
3	V
4	W

制动器连接器规格  
Brake Connector Specs



插头 Plug  
172165-1 (Amp)

针号 Pin No.	信号 Signal
1	+24V
2	0V

编码器连接器规格  
Encoder Connector Specs



插头 Plug  
172169-1 (Amp)

针号 Pin No.	信号 Signal		
	省线式编码器 Wire-saving Encoder	绝对值编码器 Absolute Encoder	旋转变压器 Rotary transformer
1	FG	FG	FG
2	+5V	VCC	
3	0V	0V	
4	A		R1
5	B	SD+	R2
6	Z	VB+	SIN+
7	A-	VB-	SIN-
8	B-	SD-	COS+
9	Z-		COS-

• 110-130系列电机规格 110、130 Series Servo Moto

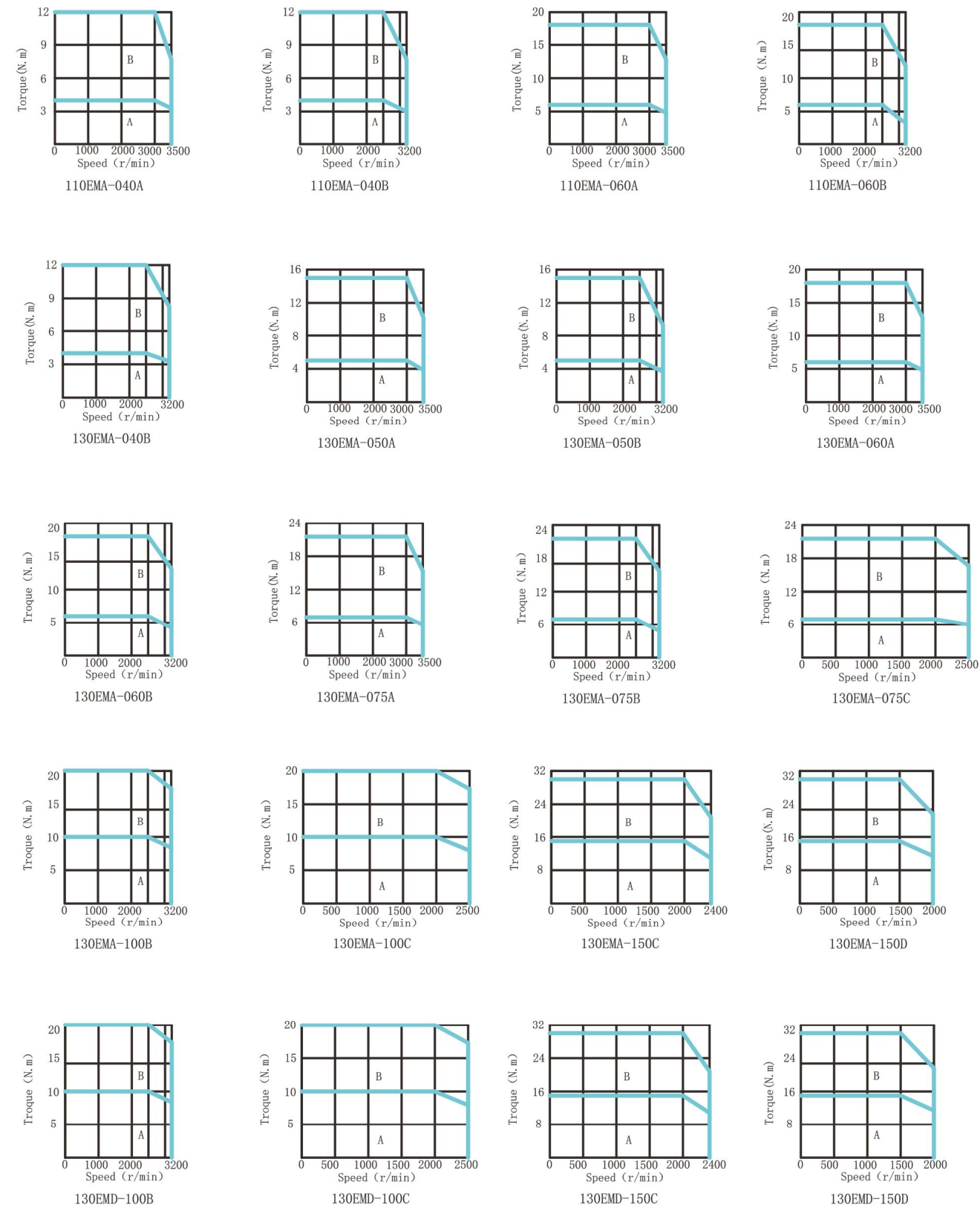
伺服电机型号 Sever Motor Model			110EMA-				130EMA-					
			040A	040B	060A	060B	040B	050A	050B	060A	060B	075A
电源电压	Power Supply Voltage	V	220									
额定输出功率	Rated Output Power	kW	1.26	1.05	1.88	1.57	1.05	1.57	1.31	1.88	1.57	2.36
额定转矩	Rated Torque	N·m	4.0	4.0	6.0	6.0	4.0	5.0	5.0	6.0	6.0	7.5
最大转矩	Maximum Torque	N·m	12	12	18	18	12	15	15	18	18	22.5
额定电流	Rated Current	Arms	4.6	4.2	7.5	6.4	4.2	6.8	5.0	7.3	6.2	8.8
最大电流	Maximum Current	Arms	13.8	12.6	22.5	19.2	12.6	20.4	15	21.9	18.6	26.4
额定转速	Rated Speed	r/min	3000	2500	3000	2500	2500	3000	2500	3000	2500	3000
最高转速	Maximum Speed	r/min	3500	3200	3500	3200	3200	3500	3200	3500	3200	3500
转动惯量	Moment of Inertia	× 10 <sup>-4</sup> kg.m <sup>2</sup>	5.4(6.0)	5.4(6.0)	7.5(8.1)	7.5(8.1)	8.9(9.5)	9.7(10.3)	9.7(10.3)	12.4(13.0)	12.4(13.0)	17.2(17.8)
重量-不带制动器	Weight-without Brake	kg	6	5.9	7.7	7.8	6	6.2		7.1		8.7
重量-带制动器	Weight-with Brake	kg	7.7	7.6	9.4	9.8	8.6	8.8		9.7		11.3
轴向最大荷重	Maxinum Axial Load	N	98									
径向最大荷重	Maxinum Radial Load	N	490									
制动器额定电压	Brake Rated Voltage	V	DC24									
制动器额定功率	Brake Rated Power	W	18			20						
制动器保持转矩	Brake Holding Torque	N·m	6			8						
编码器	Encoder	标准 Standard	省线式编码器2500P/R Reduced-Line Encoder 2500P/R									
		选项 Opitions	绝对值编码器131072P/R,旋转变压器 Absolute Encoder 131072P/R,Resolver									
绝缘等级	Insulation Class	F										
环境温度	Ambient Temperature	0~+40°C (不结冰) 0 to +40°C(No Freezing)										
环境湿度	Ambient Humidity	20~80%RH (不结露) 20 to 80%RH(Non-condensing)										
防护等级	Enclosure	IP65 (除输出轴伸和电连接器) IP65(Except for Shaft Opening and Connectors)										

伺服电机型号 Sever Motor Model			130EMA-					130EMD-				
			075B	075C	100B	100C	150C	150D	100B	100C	150C	150D
电源电压	Power Supply Voltage	V	220					380				
额定输出功率	Rated Output Power	kW	1.96	1.57	2.62	2.09	3.14	2.36	2.62	2.09	3.14	2.36
额定转矩	Rated Torque	N·m	7.5	7.5	10	10	15	15	10	10	15	15
最大转矩	Maximum Torque	N·m	22.5	22.5	20	20	30	30	20	20	30	30
额定电流	Rated Current	Arms	7.8	6.5	10.5	9.0	11.5	9.0	6.0	4.8	7.5	5.8
最大电流	Maximum Current	Arms	23.4	19.5	21	18	23	18	12.0	9.6	15	11.6
额定转速	Rated Speed	r/min	2500	2000	2500	2000	2000	1500	2500	2000	2000	1500
最高转速	Maximum Speed	r/min	3200	2500	3200	2500	2500	2000	3200	2500	2500	2000
转动惯量	Moment of Inertia	× 10 <sup>-4</sup> kg.m <sup>2</sup>	17.2(17.8)	17.2(17.8)	21.9(22.5)	21.9(22.5)	28.9(29.5)	28.9(29.5)	21.9(22.5)	21.9(22.5)	28.9(29.5)	28.9(29.5)
重量-不带制动器	Weight-without Brake	kg	8.7	10.1	12.7	10.1	12.7	10.1	12.7	10.1	12.7	12.7
重量-带制动器	Weight-with Brake	kg	11.3	12.7	15.3	12.7	15.3	12.7	15.3	12.7	15.3	15.3
轴向最大荷重	Maxinum Axial Load	N	98									
径向最大荷重	Maxinum Radial Load	N	490									
制动器额定电压	Brake Rated Voltage	V	DC24									
制动器额定功率	Brake Rated Power	W	20			19.5						
制动器保持转矩	Brake Holding Torque	N·m	8			20						
编码器	Encoder	标准 Standard	省线式编码器2500P/R Reduced-Line Encoder 2500P/R									
		选项 Opitions	绝对值编码器131072P/R,旋转变压器 Absolute Encoder 131072P/R,Resolver									
绝缘等级	Insulation Class	F										
环境温度	Ambient Temperature	0~+40°C (不结冰) 0 to +40°C(No Freezing)										
环境湿度	Ambient Humidity	20~80%RH (不结露) 20 to 80%RH(Non-condensing)										
防护等级	Protection Grade	Ip65 (除输出轴伸和电连接器) IP65(Except output shaft extension and Connectors)										

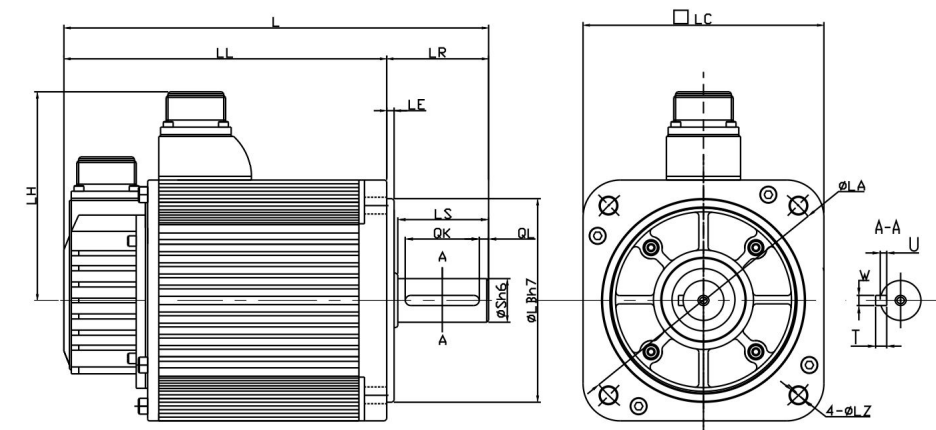
注：括号内的数值表示带制动器电机的值 (Note) The Values in parentheses are for servo motors with brake.



• 转矩特性 Torque-Speed Characteristics



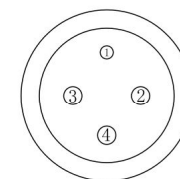
• 外形尺寸图 Dimension



伺服电机型号 Servo Motor Model	L	LL	LH	法兰 Flange						S	LS	螺纹孔X深度 Threaded Hole x Depth	键 Button				
				LR	LE	LC	LA	LB	LZ				QL	QK	W	T	U
110EMA-040A/B	239(283)	186(230)	99	53	5	110	130	95	9	19	46	M6 x 15	0	35	6	6	3.5
110EMA-060A/B	274(318)	221(265)	99	53	5	110	130	95	9	19	46	M6 x 15	0	35	6	6	3.5
130EMA-040B	215(267)	159(211)	113	56	4	130	145	110	9	22	50	M6 x 20	7.5	35	6	6	3.5
130EMA-050A/B	221(273)	165(217)	113	56	4	130	145	110	9	22	50	M6 x 20	7.5	35	6	6	3.5
130EMA-060A/B	231(283)	175(227)	113	56	4	130	145	110	9	22	50	M6 x 20	7.5	35	6	6	3.5
130EMA-075A/B/C	251(303)	195(247)	113	56	4	130	145	110	9	22	50	M6 x 20	7.5	35	6	6	3.5
130EMA/D-100B/C/D	271(323)	215(267)	113	56	4	130	145	110	9	22	50	M6 x 20	7.5	35	6	6	3.5
130EMA/D-150C/D	301(353)	245(297)	113	56	4	130	145	110	9	22	50	M6 x 20	7.5	35	6	6	3.5

注：( ) 中为带制动器电机的尺寸。(Note) The Dimensions in parentheses are for servo motors with brake.

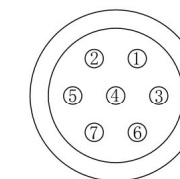
电机连接器规格  
Motor Connector Specs



插座  
Receptacle YD28J4Z

针号 Pin No.	信号 Signal
1	GND
2	U
3	V
4	W

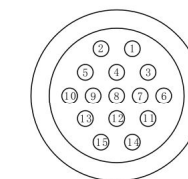
制动器连接器规格  
Brake Connector Specs



插座  
Receptacle WF28J7Z

针号 Pin No.	信号 Signal
1	GND
2	U
3	V
4	W
5	+24V
6	0V

编码器连接器规格  
Encoder Connector Specs



插座  
Receptacle YD28J15Z

针号 Pin No.	信号 Signal		
	省线式编码器 Incremental Encoder	绝对值编码器 Absolute Encoder	旋转变压器 Rotary transformer
1	FG	FG	FG
2	+5V	VCC	
3	0V	0V	
4	A		R1
5	B	SD+	R2
6	Z	VB+	SIN+
7	A-	VB-	SIN-
8	B-	SD-	COS+
9	Z-		COS-

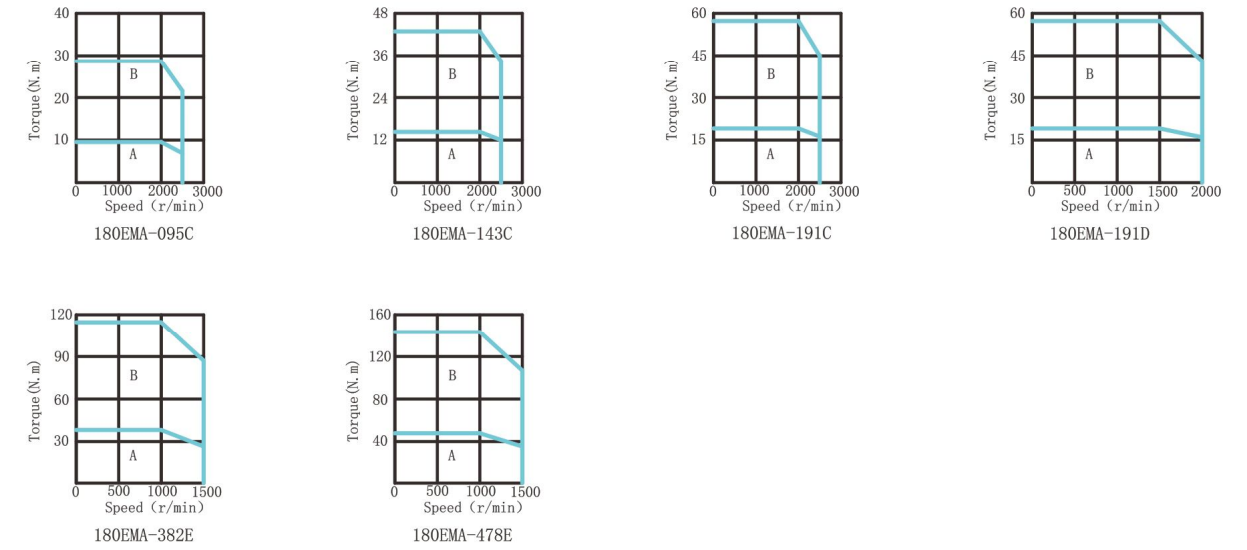


• 180系列电机规格 180 Series Servo Moto

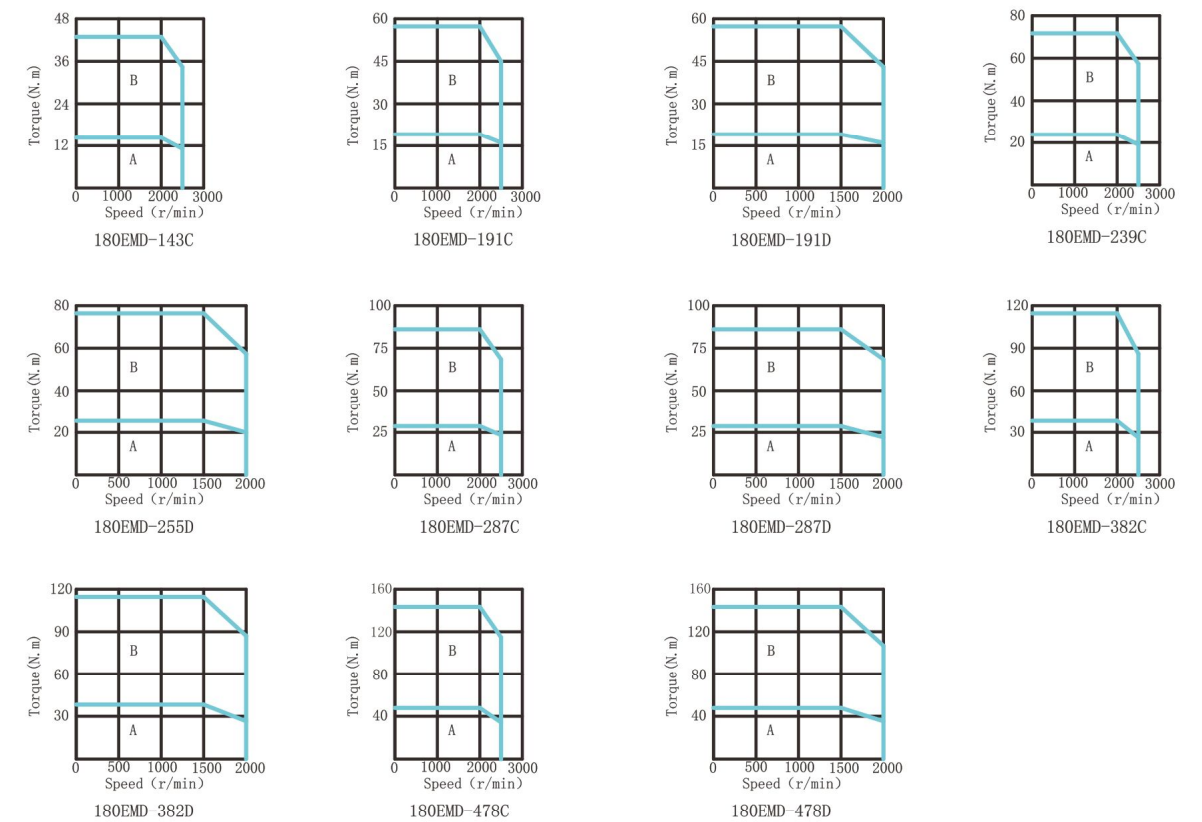
伺服电机型号 Sever Motor Model			180EMA-						180EMD-		
			095C	143C	191C	191D	382E	478D	143C	191C	191D
电源电压	Power Supply Voltage	V	220						380		
额定输出功率	Rated Output Power	kW	2.0	3.0	4.0	3.0	4.0	7.5	3.0	4.0	3.0
额定转矩	Rated Torque	N·m	9.55	14.3	19.1	19.1	38.2	47.8	14.3	19.1	19.1
最大转矩	Maximum Torque	N·m	28.7	42.9	57.3	57.3	114.6	143.4	42.9	57.3	57.3
额定电流	Rated Current	Arms	11.2	16.5	23.0	20.0	20.5	38.0	10.5	13.0	11.0
最大电流	Maximum Current	Arms	33.6	49.5	69.0	60.0	61.5	114	31.5	39.0	33.0
额定转速	Rated Speed	r/min	2000	2000	2000	1500	1000	1500	2000	2000	1500
最高转速	Maximum Speed	r/min	2500	2500	2500	2000	1500	2000	2500	2500	2000
转动惯量	Moment of Inertia	$\times 10^{-4} \text{kgm}^2$	31.5(34.7)	41.3(44.5)	52.5(55.8)	52.5(55.8)	102.2(105.5)	122.5(128.1)	41.3(44.5)	52.5(55.8)	52.5(55.8)
重量-不带制动器	Weight-without Brake	kg	13.9	16.9	19.1		29.6	33.6	16.9	19.1	
重量-带制动器	Weight-with Brake	kg	20.4	23.4	25.6		36.1	40.1	23.4	25.6	
轴向最大荷重	Maxinum Axial Load	N	490								
径向最大荷重	Maxinum Radial Load	N	1470								
制动器额定电压	Brake Rated Voltage	V	DC24V								
制动器额定功率	Brake Rated Power	W	35								
制动器保持转矩	Brake Holding Torque	N·m	50								
编码器	Encoder	标准	省线式编码器2500P/R Reduced-Line Encoder 2500P/R								
		选项	绝对值编码器131072P/R,旋转变压器 Absolute Encoder 131072P/R,Resolver								
绝缘等级	Insulation Class		F								
环境温度	Ambient Temperature		0 ~ +40°C (不结冰) 0 to +40°C(No Freezing)								
环境湿度	Ambient Humidity		20 ~ 80%RH (不结露) 20 to 80%RH(Non-condensing)								
防护等级	Enclosure		IP65 (除输出轴伸和电连接器) IP65(Except for Shaft Opening and Connectors)								
伺服电机型号 Sever Motor Model			180EMD-								
			239C	255D	287C	287D	382C	382D	478C	478D	
电源电压	Power Supply Voltage	V	380								
额定输出功率	Rated Output Power	kW	5.0	4.0	6.0	4.5	8.0	6.0	10.0	7.5	
额定转矩	Rated Torque	N·m	23.9	25.5	28.7	28.7	38.2	38.2	47.8	47.8	
最大转矩	Maximum Torque	N·m	71.7	76.5	86.1	86.1	114.6	114.6	143.4	143.4	
额定电流	Rated Current	Arms	17.5	13.5	17.0	15.0	20.0	15.5	25.5	16.5	
最大电流	Maximum Current	Arms	52.5	40.5	51.0	45.0	60.0	46.5	76.5	49.5	
额定转速	Rated Speed	r/min	2000	1500	2000	1500	1000	1500	1000	1500	
最高转速	Maximum Speed	r/min	2500	2000	2500	2000	1500	2000	1500	2000	
转动惯量	Moment of Inertia	$\times 10^{-4} \text{kgm}^2$	65.7(68.9)	65.7(68.9)	75.2(78.5)	75.2(78.5)	102.2(105.5)	102.2(105.5)	122.5(128.1)	122.5(128.1)	
重量-不带制动器	Weight-without Brake	kg	22		24.9		29.6		33.6		
重量-带制动器	Weight-with Brake	kg	28.5		31.4		36.1		40.1		
轴向最大荷重	Maxinum Axial Load	N	490								
径向最大荷重	Maxinum Radial Load	N	1470								
制动器额定电压	Brake Rated Voltage	V	DC24V								
制动器额定功率	Brake Rated Power	W	35								
制动器保持转矩	Brake Holding Torque	N·m	50								
编码器	Encoder	标准	省线式编码器2500P/R Reduced-Line Encoder 2500P/R								
		选项	绝对值编码器131072P/R,旋转变压器 Absolute Encoder 131072P/R,Resolver								
绝缘等级	Insulation Class		F								
环境温度	Ambient Temperature		0 ~ +40°C (不结冰) 0 to +40°C(No Freezing)								
环境湿度	Ambient Humidity		20 ~ 80%RH (不结露) 20 to 80%RH(Non-condensing)								
防护等级	Protection Grade		Ip65 (除输出轴伸和电连接器) IP65(Except output shaft extension and Connectors)								

• 转矩特性 Torque-Speed Characteristics

220V 系列 220V Series



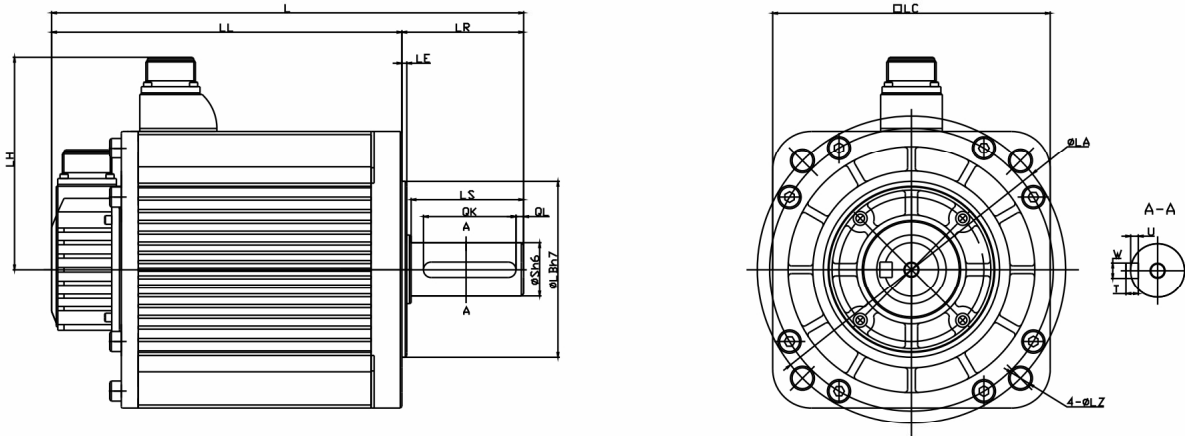
380V 系列 380V Series



注：括号内的数值表示带制动器电机的值 (Note) The Values in parentheses are for servo motors with brake.



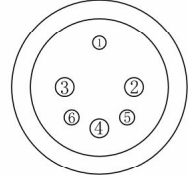
• 外形尺寸 Dimension



伺服电机型号 Sever Motor Model	L	LL	LH	法兰 Flange					S	LS	螺纹孔X深度 Threaded Hole x Depth	键 Button					
				LR	LE	LC	LA	LB				LZ	QL	QK	W	T	U
180EMA-095C	277(354)	198(275)	138	79	3.2	180	200	114.3	13.5	35	73	M12x25	5	65	10	8	5
180EMA/D-143C/D	307(384)	228(305)	138	79	3.2	180	200	114.3	13.5	35	73	M12x25	5	65	10	8	5
180EMA/D-191C/D	322(399)	243(320)	138	79	3.2	180	200	114.3	13.5	35	73	M12x25	5	65	10	8	5
180EMA/D-239C	342(419)	263(340)	138	79	3.2	180	200	114.3	13.5	35	73	M12x25	5	65	10	8	5
180EMA/D-255D	342(419)	263(340)	138	79	3.2	180	200	114.3	13.5	35	73	M12x25	5	65	10	8	5
180EMA/D-287C/D	362(439)	283(360)	138	79	3.2	180	200	114.3	13.5	35	73	M12x25	5	65	10	8	5
180EMA/D-382D/E	431(508)	318(395)	138	113	3.2	180	200	114.3	13.5	35/42	108	M12x25	5	90	12	8	5
180EMA/D-478D/E	451(528)	338(415)	138	113	3.2	180	200	114.3	13.5	35/42	108	M12x25	5	90	12	8	5

注：( ) 中为带制动器电机的尺寸。(Note) The Dimensions in parentheses are for servo motors with brake.

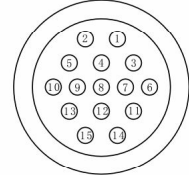
电机连接器规格  
Motor Connector Specs



插座 Receptacle WF32-6P

针号 Pin No.	信号 Signal
1	GND
2	U
3	V
4	W
5	+24V
6	0V

编码器连接器规格  
Encoder Connector Specs



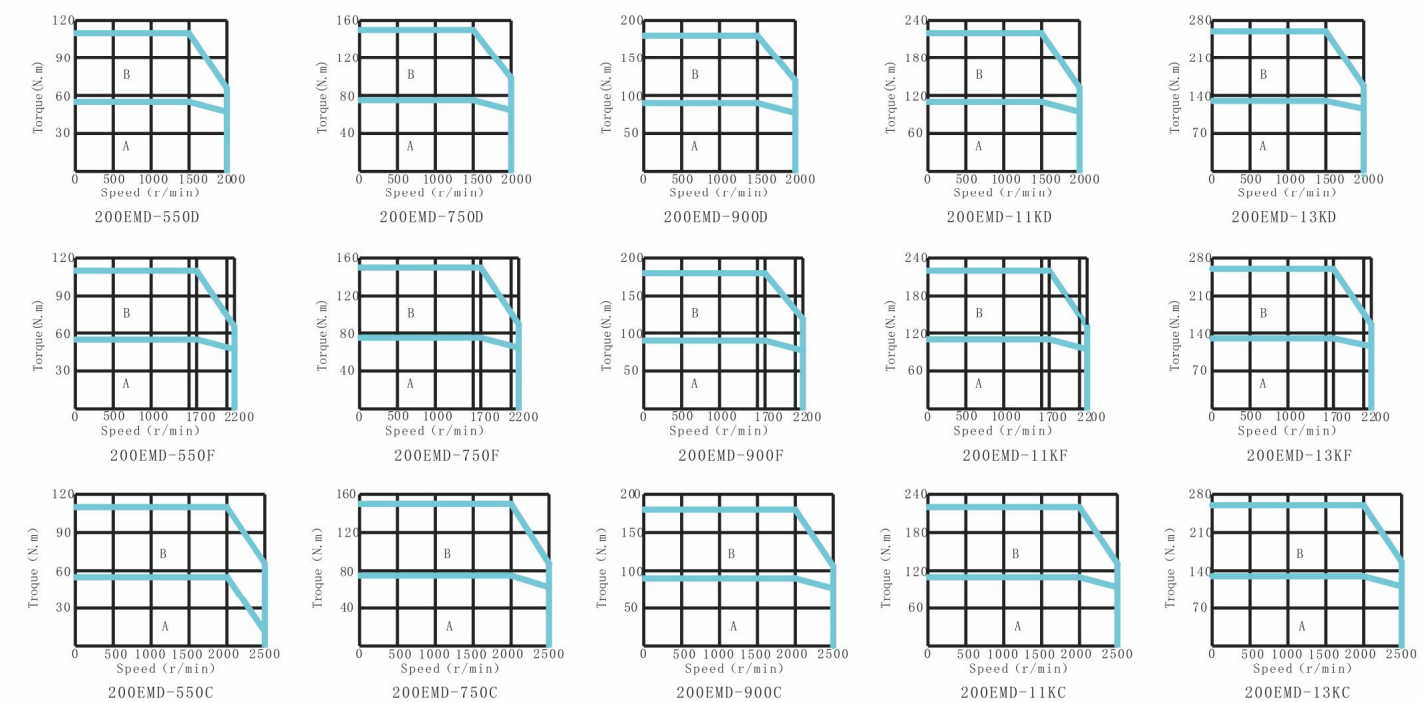
插座 Receptacle YD28J15Z

针号 Pin No.	信号 Signal		
	省线式编码器 Wire-saving Encoder	绝对值编码器 Absolute Encoder	旋转变压器 Rotary transformer
1	FG	FG	FG
2	+5V	VCC	
3	0V	0V	
4	A		R1
5	B	SD+	R2
6	Z	VB+	SIN+
7	A-	VB-	SIN-
8	B-	SD-	COS+
9	Z-		COS-

• 200系列电机规格 200 Series Servo Moto

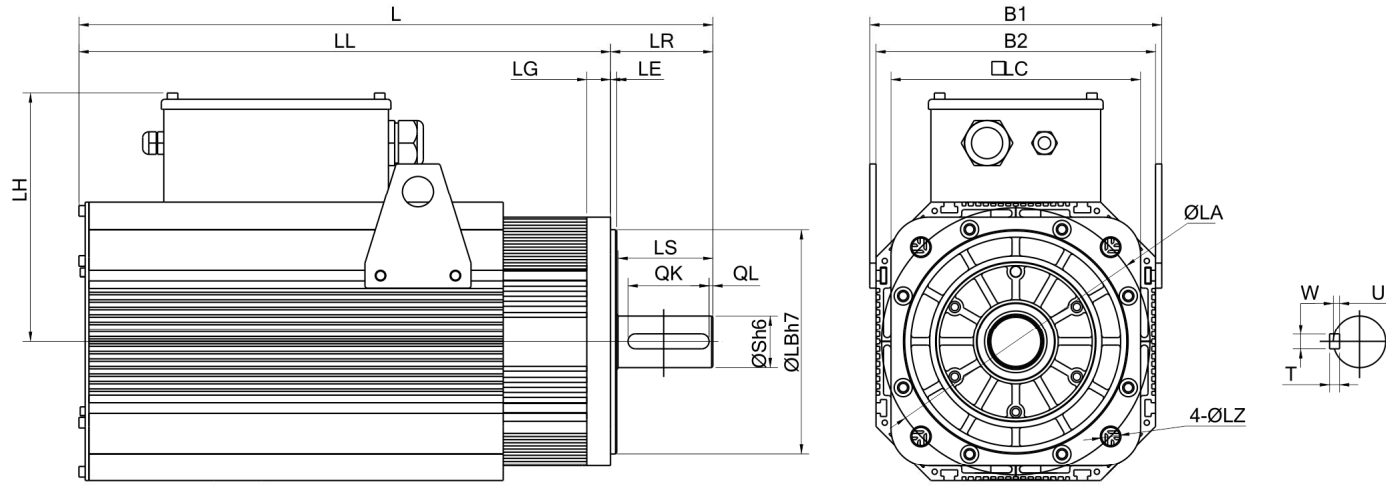
伺服电机型号 Sever Motor Model			200EMD-														
			550D	750D	900D	11KD	13KD	550F	750F	900F	11KF	13KF	550C	750C	900C	11KC	13KC
额定电压	Rated Voltage	V	380														
额定输出功率	Rated Output Power	kW	8.6	11.8	14.1	17.3	20.4	9.8	13.4	16.0	19.6	23.1	11.5	15.7	18.8	23.0	27.2
额定转矩	Rated Torque	N.m	55	75	90	110	130	55	75	90	110	130	55	75	90	110	130
最大转矩	Maximum Torque	N.m	110	150	180	220	260	110	150	180	220	260	110	150	180	220	260
额定电流	Rated Current	Arms	17.0	22.6	27.1	33.4	39.4	18.4	25.2	31.0	36.9	44.9	22.1	32.3	36.2	44.3	56.1
最大电流	Maximum	Arms	34.0	45.2	54.2	66.8	78.8	36.8	50.4	62.0	73.8	89.8	44.2	64.6	72.4	88.6	112.2
转矩常数	Torque Constant	N.m/A	3.24	3.32	3.32	3.29	3.30	2.99	2.98	2.90	2.98	2.90	2.49	2.32	2.49	2.48	2.32
额定转速	Rated Speed	r/min	1500					1700					2000				
最高转速	Moment of Inertia	r/min	2000					2200					2500				
转动惯量	Moment of inertia	$\times 10^{-3} \text{kg}\cdot\text{m}^2$	7	9	11	13	15	7	9	11	13	15	7	9	11	13	15
重量	Weight	kg	44	50.5	57	63.5	70	44	50.5	57	63.5	70	44	50.5	57	63.5	70
轴向最大荷重	Maxinum Axial Load	N	922														
径向最大荷重	Maxinum Radial Load	N	2780														
编码器	Encoder	标准 Standard	旋转变压器 Rotary Transformer														
		选项 Opitions	绝对值式编码器131072P/R, 省线式编码器2500P/R Absolute Encoder 131072P/R, Wire-saving Encoder 2500P/R														
绝缘等级	Insulation Class		F														
环境温度	Ambient Temperature		0 ~ +40°C (不结冰) 0 to +40°C (No freezing)														
环境湿度	Ambient Humidity		20 ~ 80%RH (不结露) 20 to 80% RH (Non-condensing)														
防护等级	Protection grade		Ip54 (除输出轴伸) IP54 (except output shaft extension)														

• 转矩特性 Torque-Speed Characteristics





• 外形尺寸 Dimension



伺服电机型号 Servo Motor Model	L	LL	LH	LG	B1	B2	法兰 Flange							S	LS	螺纹孔x深度 TapxDepth	键 Button								
							LR	LE	LC	LA	LB	LZ	QL				QK	W	T	U	K1	K2	K3	K4	K5
200EMD-550C/D/F	474(602)	392(520)	201	19	234	224	82	5	200	215	180	14.5	42	76	M12x25	3	65	12	8	5	225	39	278	254	12
200EMD-750C/D/F	509(637)	427(555)	201	19	234	224	82	5	200	215	180	14.5	42	76	M12x25	3	65	12	8	5	260	39	278	254	12
200EMD-900C/D/F	544(672)	462(590)	201	19	234	224	82	5	200	215	180	14.5	42	76	M12x25	3	65	12	8	5	295	39	278	254	12
200EMD-11KC/D/F	584(712)	502(630)	201	19	234	224	82	5	200	215	180	14.5	42	76	M12x25	3	65	12	8	5	335	39	278	254	12
200EMD-13KC/D/F	619(747)	537(665)	201	19	234	224	82	5	200	215	180	14.5	42	76	M12x25	3	65	12	8	5	370	39	278	254	12

注：( ) 中为带制动器电机的尺寸。(Note) The Dimensions in parentheses are for servo motors with brake.

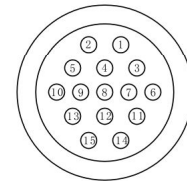
• 220系列电机规格 220 Series Servo Moto

伺服电机型号 servo motor model		220EMD-							
		478D	700D	955D	525C	716C	900C	10EC	
额定电压	Rated Voltage	V	380						
额定输出功率	Rated Output Power	KW	7.5	11.0	15.0	11.0	15.0	18.8	22.0
额定转矩	Rated Torque	N.m	47.8	70	95.5	52.5	71.6	90	105
最大转矩	Maximum Torque	N.m	143.4	175	210.1	157.5	179	198	231
额定电流	Rated Current	Arms	16.5	22.5	36	23.5	31.5	33.0	50.0
最大电流	Maximum	Arms	49.5	56.3	79.2	70.5	78.8	72.6	110.0
转矩常数	Torque Constant	N.m/A	2.90	3.11	2.65	2.23	2.27	2.73	2.10
额定转速	Rated Speed	r/min	1500			2000			
最高转速	Maximum Speed	r/min	2000			2500			
转动惯量	Moment of Inertia	$\times 10^{-3} \text{kg}\cdot\text{m}^2$	18.0(18.7)	22.8(23.5)	28.8(29.5)	18.0(18.7)	24.1(24.8)	26.8(27.5)	30.1(30.8)
重量-不带制动器	Weight-without Brake	kg	43.8	53.4	63.4	43.8	54.7	59.8	66
重量-带制动器	Weight-with Brake	kg	53.8	63.4	73.4	53.8	64.7	69.8	76
轴向最大荷重	Maximum Axial Load	N	1122						
径向最大荷重	Maximum Radial Load	N	2780						
制动器额定电压	Brake Rated Voltage	V	DC24V						
制动器额定功率	Brake Rated Power	W	50						
制动器保持转矩	Brake Holding Torque	N.m	100						
编码器	Encoder	标准Standard	旋转变压器 Rotary Transformer						
	选项Options		绝对值编码器131072P/R, 省线式编码器2500P/R Absolute Encoder 131072P/R, Wire-saving Encoder 2500P/R						
绝缘等级	Insulation Class		F						
环境温度	Ambient Temperature		0~+40°C (不结冰) 0 to +40°C (No freezing)						
环境湿度	Ambient Humidity		20~80%RH (不结露) 20 to 80% RH (Non-condensing)						
防护等级	Protection Grade		Ip54 (除输出轴伸) IP54 (Except output shaft extension)						

注：括号内的数值表示带制动器电机的值 (Note) The Values in parentheses are for servo motors with brake.

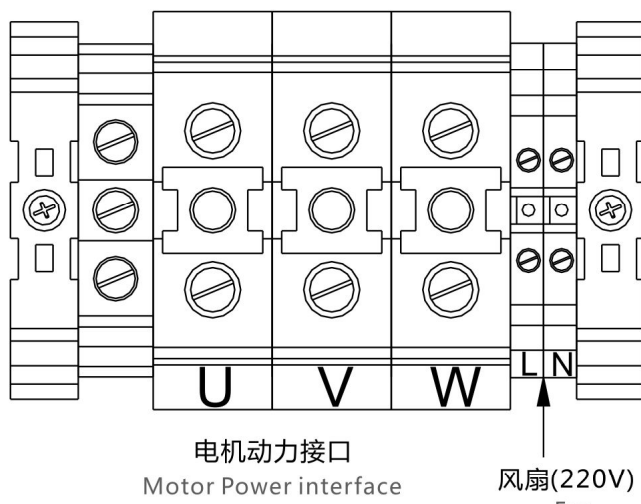
• 连接器规格 Connector Specs

编码器连接器规格  
Encoder Connector Specs

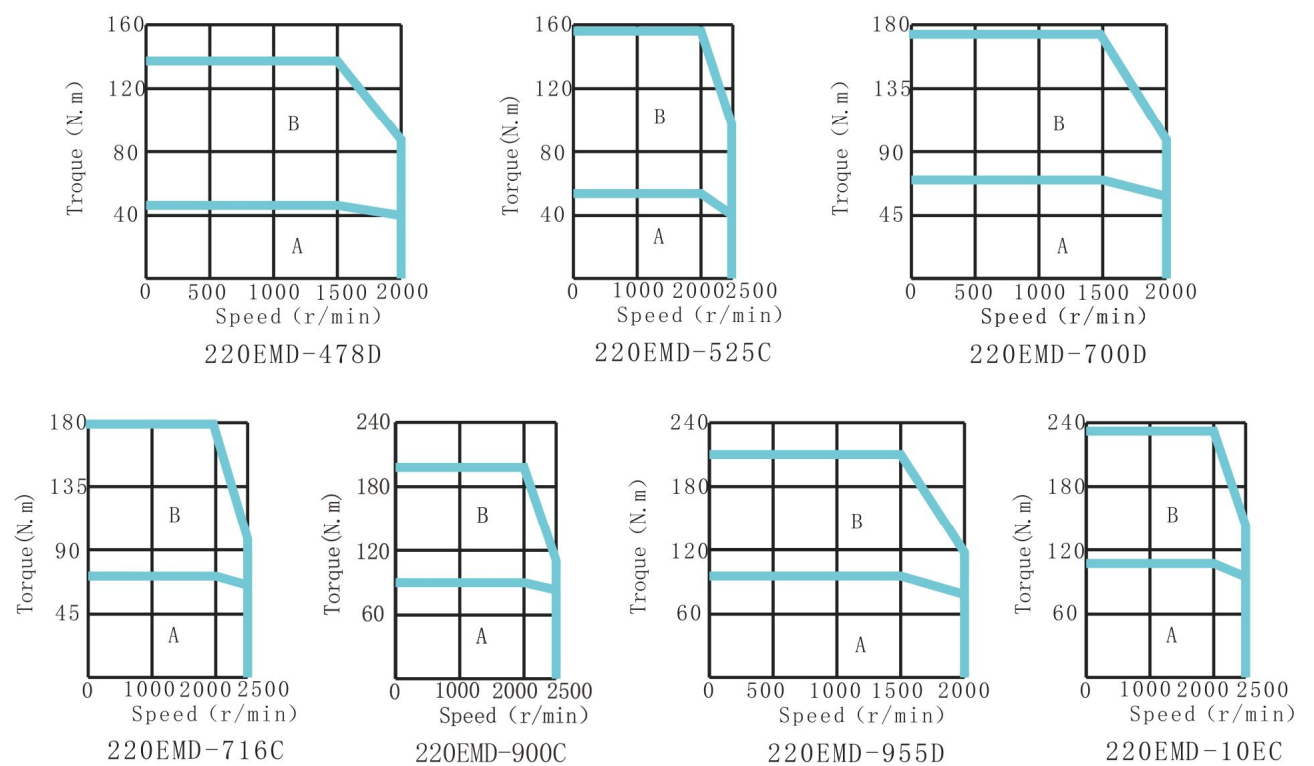


插座 Receptacle YD28J15Z

针号 Pin No.	信号 Signal		
	旋转变压器 Resolver	省线式编码器 Wire-saving Encoder	绝对值编码器 Absolute Encoder
1	FG	FG	FG
2		+5V	VCC
3		0V	0V
4	R1	A	
5	R2	B	SD+
6	SIN+	Z	VB+
7	SIN-	A-	VB-
8	COS+	B-	SD-
9	COS-	Z-	
10			
11	TH+	TH+	TH+
12			
13	PTC+	PTC+	PTC+
14	TH-	TH-	TH-
15	PTC-	PTC-	PTC-

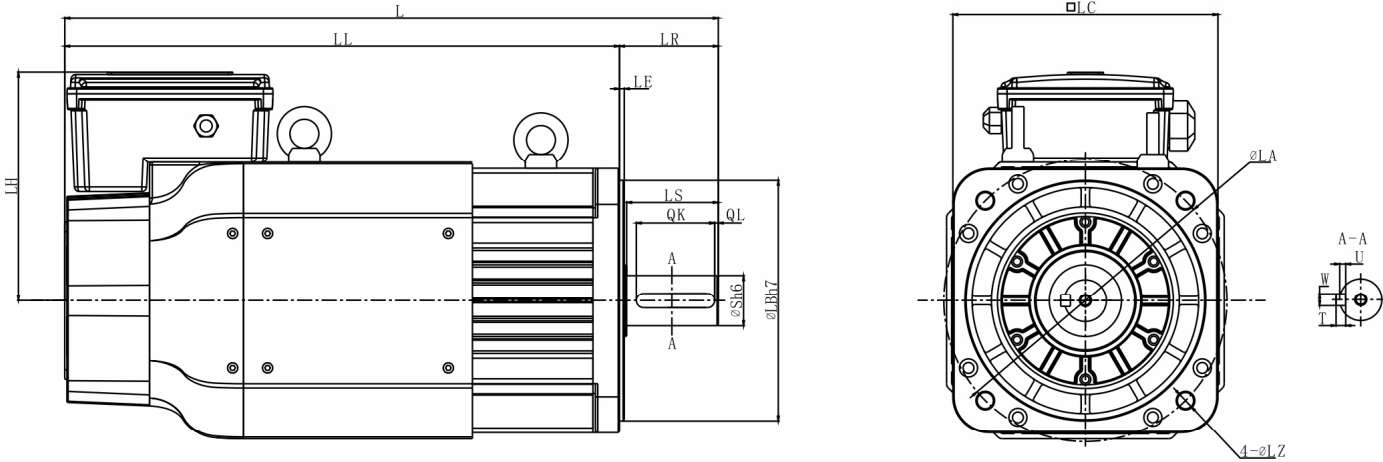


• 转矩特性 Torque-Speed Characteristics





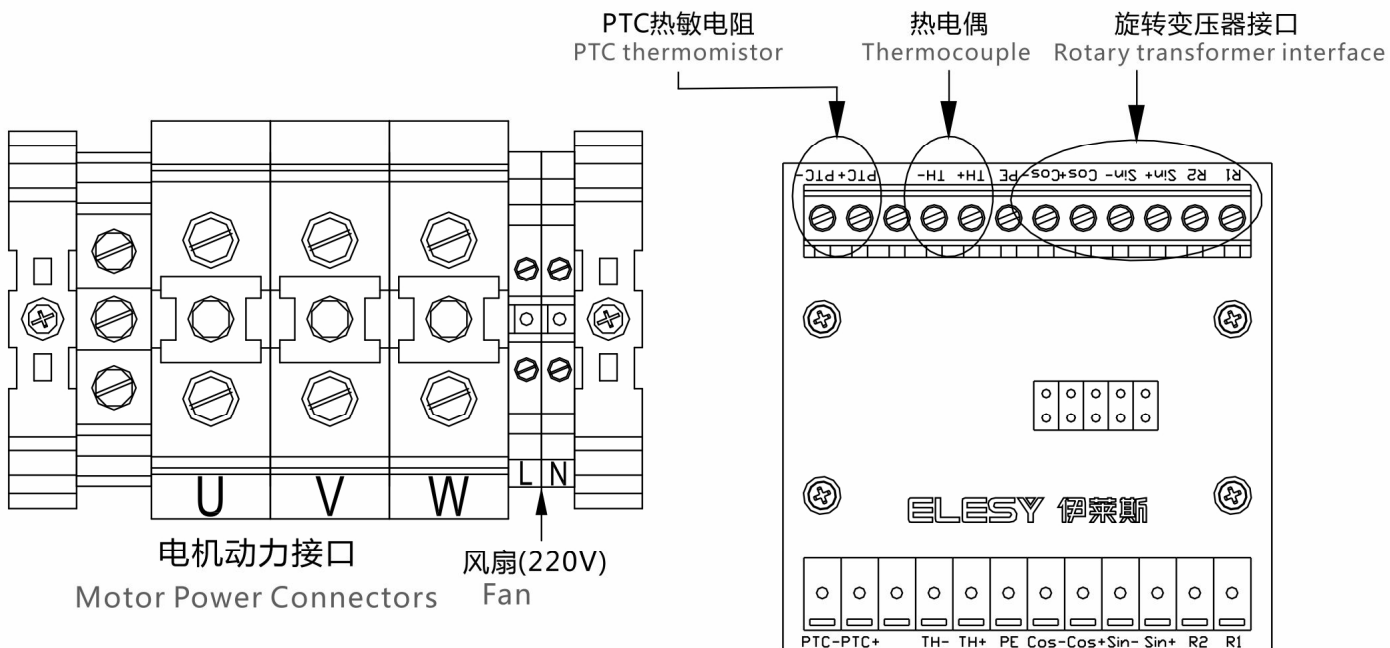
• 外形尺寸 Dimension



伺服电机型号 Servo Motor Model	L	LL	LH	法兰 Flange						S	LS	螺纹孔x深度 Threaded Hole x depth	键 Button				
				LR	LE	LC	LA	LB	LZ				QL	QK	W	T	U
220EMD-478D	465 (544)	383 (462)	190	82	4	220	235	200	13.5	42	76	M12x25	3	65	12	8	5
220EMD-525C	465 (544)	383 (462)	190	82	4	220	235	200	13.5	42	76	M12x25	3	65	12	8	5
220EMD-700D	520 (599)	438 (517)	190	82	4	220	235	200	13.5	42	76	M12x25	3	65	12	8	5
220EMD-716C	520 (599)	438 (517)	190	82	4	220	235	200	13.5	42	76	M12x25	3	65	12	8	5
220EMD-900C	535 (614)	453 (532)	190	82	4	220	235	200	13.5	42	76	M12x25	3	65	12	8	5
220EMD-955D	565 (644)	483 (562)	190	82	4	220	235	200	13.5	42	76	M12x25	3	65	12	8	5
220EMD-10EC	565 (644)	483 (562)	190	82	4	220	235	200	13.5	42	76	M12x25	3	65	12	8	5

注：( ) 中为带制动器电机的尺寸。(Note) The Dimensions in parentheses are for servo motors with brake.

• 连接器规格 Connector specs



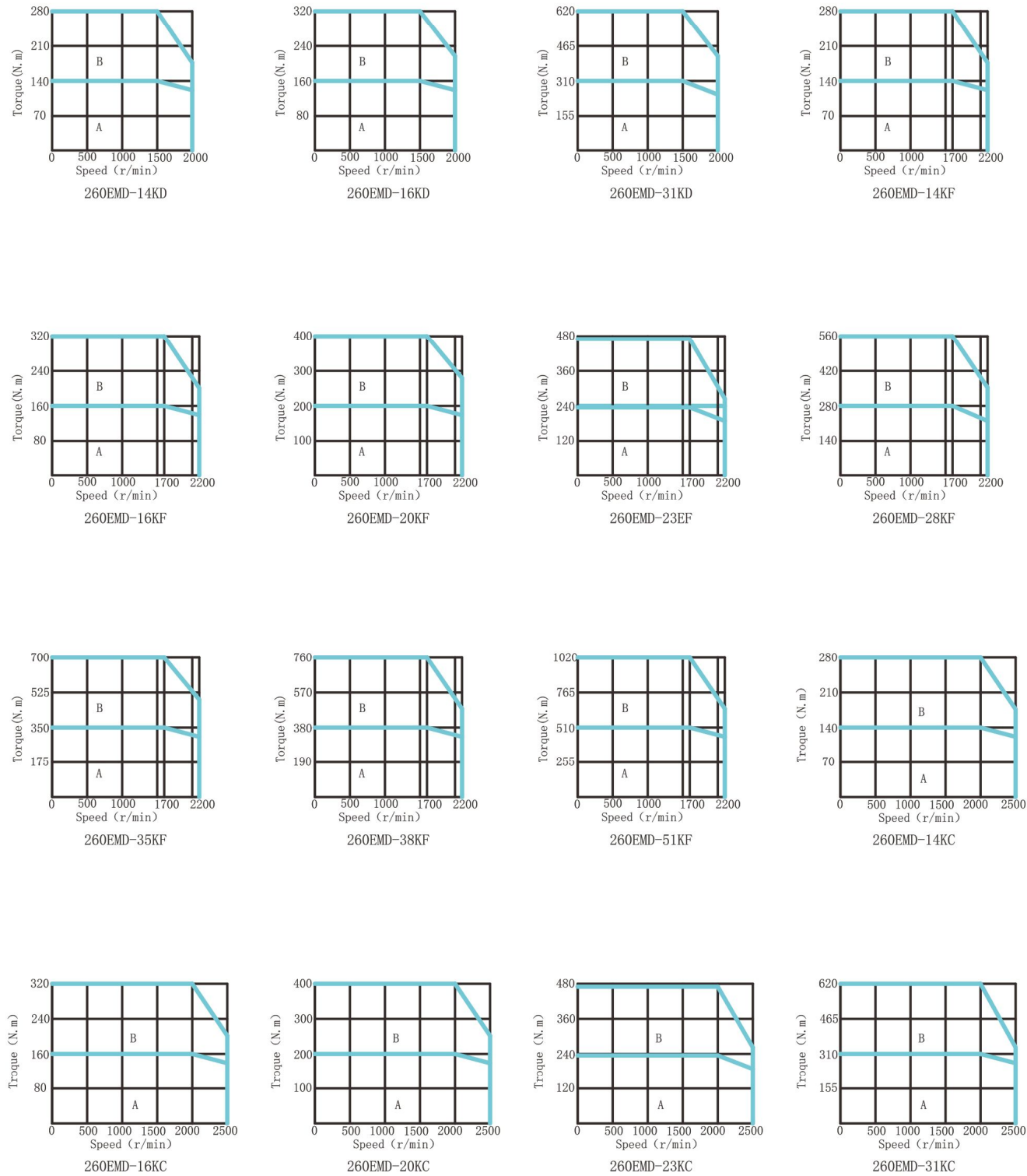
• 260系列电机规格 260 Series Servo Moto

伺服电机型号 Sever Motor Model			260EMD-						
			14KD	16KD	31KD	14KF	16KF	20KF	23EF
额定电压 Rated Voltage	V	380							
额定输出功率 Rated Output Power	kW	22.0	25.1	48.7	24.9	28.5	35.6	41.8	49.8
额定转矩 Rated Torque	N.m	140	160	310	140	160	200	235	280
最大转矩 Maximum torque	N.m	280	320	620	280	320	400	470	560
额定电流 Rated Current	Arms	43.5	51.9	100.0	48.9	59.3	70.3	78.0	98.5
最大电流 Maximum Current	Arms	87.0	103.8	200.0	97.8	118.6	140.6	156.0	197.0
转矩常数 Torque Constant	N.m/A	3.22	3.08	3.10	2.86	2.70	2.84	3.01	2.84
额定转速 Rated Speed	r/min	1500							
最高转速 Maximum Speed	r/min	2000							
转动惯量 Moment of inertia	$\times 10^{-3} \text{kg.m}^2$	28.5	30.2	36.0	42.8	50.3	54.3	61.2	65.2
重量 Weight	kg	105	109	120	133	148	155	169	176
轴向最大荷重 Maximum radial load	N	1454							
径向最大荷重 Maximum radial load	N	4700							
编码器 Encoder	标准Standard	旋转变压器 Rotary Transformer							
	选项Options	绝对值式编码器131072P/R, 省线式编码器2500P/R Absolute Encoder 131072P/R, Wire-saving Encoder 2500P/R							
绝缘等级 Insulation Class	F								
环境温度 Ambient temperature	0 ~ +40°C (不结冰) 0 to +40°C (No freezing)								
环境湿度 Ambient Humidity	20 ~ 80%RH (不结露) 20 to 80% RH (Non-condensing)								
防护等级 Enclosure	IP54 (除输出轴伸) IP54 (except for shaft opening)								

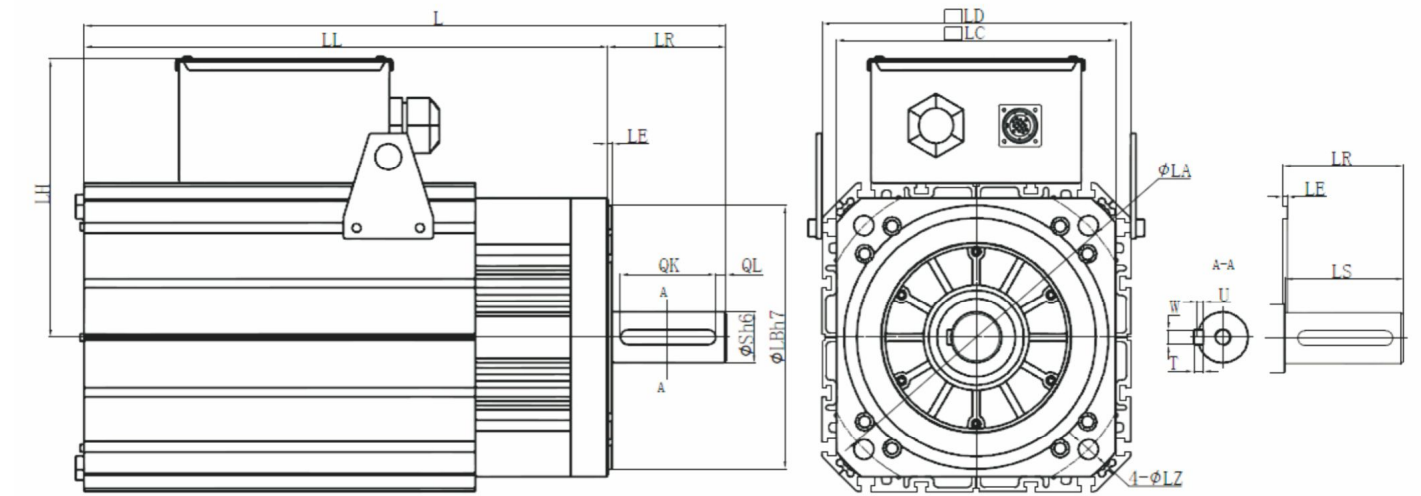
伺服电机型号 Sever Motor Model			260EMD-						
			35KF	38KF	51KF	14KC	16KC	20KC	23EC
额定电压 Rated Voltage	V	380							
额定输出功率 Rated Output Power	kW	62.3	67.6	90.8	29.3	33.5	41.9	49.2	64.9
额定转矩 Rated Torque	N.m	350	380	510	140	160	200	235	310
最大转矩 Maximum torque	N.m	700	760	1020	280	320	400	470	620
额定电流 Rated Current	Arms	130.7	132.4	193.2	56.0	69.2	84.4	98.3	133.4
最大电流 Maximum Current	Arms	261.4	264.8	386.4	112.0	138.4	168.8	196.6	266.8
转矩常数 Torque Constant	N.m/A	2.68	2.87	2.64	2.50	2.31	2.37	2.39	2.32
额定转速 Rated Speed	r/min	1700			2000				
最高转速 Maximum Speed	r/min	2200			2500				
转动惯量 Moment of inertia	$\times 10^{-3} \text{kg.m}^2$	61.2	65.2	86.9	28.5	30.2	36.0	42.8	54.3
重量 Weight	kg	169	176	218	105	109	120	133	155
轴向最大荷重 Maximum radial load	N	1454							
径向最大荷重 Maximum radial load	N	4700							
编码器 Encoder	标准Standard	旋转变压器 Rotary Transformer							
	选项Options	绝对值式编码器131072P/R, 省线式编码器2500P/R Absolute Encoder 131072P/R, Wire-saving Encoder 2500P/R							
绝缘等级 Insulation Class	F								
环境温度 Ambient temperature	0 ~ +40°C (不结冰) 0 to +40°C (No freezing)								
环境湿度 Ambient Humidity	20 ~ 80%RH (不结露) 20 to 80% RH (Non-condensing)								
防护等级 Enclosure	IP54 (除输出轴伸) IP54 (except for shaft opening)								



• 转矩特性 Torque-Speed Characteristics



• 外形尺寸 Dimension



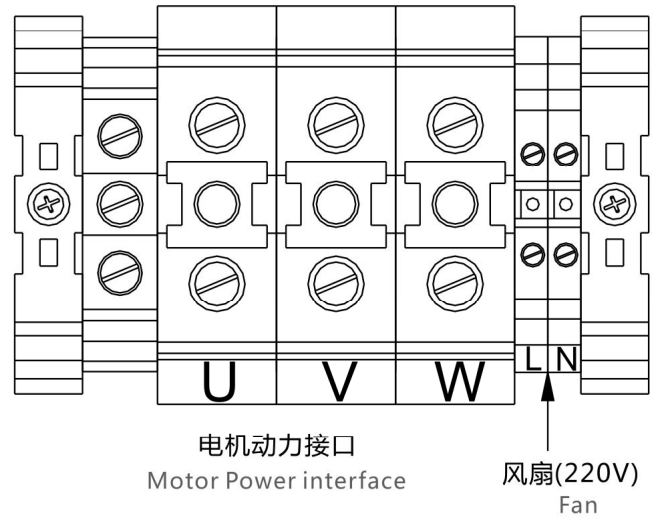
伺服电机型号 Sever Motor Model	L	LL	LH	LD	法兰 Flange						S	LS	螺纹孔深度 TapxDepth			键 Button		
					LR	LE	LC	LA	LB	LZ			QL	QK	W	T	U	
260EMD-14KD/F/C	590	478	264	292	112	4	264	300	250	19	48	110	M16x25	10	90	14	9	5.5
260EMD-16KD/F/C	600	488	264	292	112	4	264	300	250	19	48	110	M16x25	10	90	14	9	5.5
260EMD-20KF/C	631	519	264	292	112	4	264	300	250	19	48	110	M16x25	10	90	14	9	5.5
260EMD-23EF/C	671	559	264	292	112	4	264	300	250	19	48	110	M16x25	10	90	14	9	5.5
260EMD-28KF	712	600	264	292	112	4	264	300	250	19	48	110	M16x25	10	90	14	9	5.5
260EMD-31KD/C	733	621	264	292	112	4	264	300	250	19	48	110	M16x25	10	90	14	9	5.5
260EMD-35KF	773	661	264	292	112	4	264	300	250	19	48	110	M16x25	10	90	14	9	5.5
260EMD-38KF	794	682	264	292	112	4	264	300	250	19	48	110	M16x25	10	90	14	9	5.5
260EMD-51KF	916	804	264	292	112	4	264	300	250	19	48	110	M16x25	10	90	14	9	5.5

• 连接器规格 Connector Specs



编码器连接器规格  
Encoder Connector Specs

插座 Receptacle YD28J15Z



电机动力接口  
Motor Power interface  
风扇(220V)  
Fan

针号 Pin No.	信号 Signal		
	旋转变压器 Resolver	省线式编码器 Wire-saving Encoder	绝对值编码器 Absolute Encoder
1	FG	FG	FG
2		+5V	VCC
3		0V	0V
4	R1	A	
5	R2	B	SD+
6	SIN+	Z	VB+
7	SIN-	A-	VB-
8	COS+	B-	SD-
9	COS-	Z-	
10			
11	TH+	TH+	TH+
12			
13	PTC+	PTC+	PTC+
14	TH-	TH-	TH-
15	PTC-	PTC-	PTC-



★ 产品配置表

Combinations of servo drives and servo motors

伺服驱动器 servo drive					
	ES1-3R8S □ / ES2-3R8S □		ES1-7R6S □ / ES2-7R6S □		
伺服电机 servo motor					
	60EMA-006A(0.2KW) 60EMA-013A(0.4KW)	80EMA-016A(0.5KW) 80EMA-024A(0.75KW)	80EMA-032A(1.0KW) 80EMA-038A(1.2KW)	110EMA-040B(1.0KW) 110EMA-060B(1.6KW)	130EMA-040B(1.0KW) 130EMA-050B(1.3KW) 130EMA-060B(1.6KW) 130EMA-075B(2KW)
伺服驱动器 servo drive					
	ES1-8R4T □ / ES2-8R4T □		ES1-012S □ / ES2-012S □	ES1-012T □ / ES2-012T □	ES2-021T □
伺服电机 servo motor					
	130EMD-100B(2.6KW) 130EMD-100C(2.0KW) 130EMD-150C(3.1KW)	180EMD-143C(3KW)	130EMA-100B(2.6KW) 130EMA-150C(3.1KW)	180EMD-191C(4KW) 180EMD-191D(3KW)	180EMD-239C(5.0KW) 180EMD-287C(6.0KW) 180EMD-382C(6.0KW) 180EMD-255D(4.0KW) 180EMD-287D(4.5KW) 180EMD-382D(6.0KW) 180EMD-478D(7.5KW) 180EMD-382E(4.0KW) 180EMD-478E(5.0KW)
伺服驱动器 servo drives					
	ES2-021T □		ES2-026T □		
伺服电机 servo motor					
	200EMD-550D(8.6KW) 200EMA-550F(9.8KW)	220EMD-478D(7.5KW)	180EMD-478C(10KW)	200EMD-750D(11.8KW) 200EMD-900D(14.1KW) 200EMD-750F(13.4KW) 200EMD-550C(11.5KW)	220EMD-525C(11KW) 220EMD-700D(11KW) 220EMD-478D(7.5KW) 220EMD-478D(7.5KW)

★ 产品配置表

Combinations of servo drives and servo motors

伺服驱动器 servo drives				
	ES2-033T □		ES2-045T □	
伺服电机 servo motor				
	200EMD-750C(15.7KW) 200EMD-900F(16.0KW) 200EMD-11KD(17.3KW) 200EMD-13KD(20.4KW)	222EMD-716C(15KW) 222EMD-900C(18.8KW)	200EMD-900C(18.8KW) 200EMD-11KF(19.6KW) 200EMD-11KC(23.0KW) 200EMD-13KF(23.1KW) 200EMD-13KC(27.2KW)	220EMD-955D(15KW) 220EMD-10EC(22KW)
伺服驱动器 servo drives				
	ESDD-220D □		ESDD-370D □	
伺服电机 servo motor				
	220EMD-10EC(22.0KW)	260EMD-14KF(24.9KW) 260EMD-14KC(29.3KW) 260EMD-16KD(25.1KW) 260EMD-16KF(28.5KW)	260EMD-16KC(33.5KW) 260EMD-20KD(31.4KW) 260EMD-20KF(35.6KW) 260EMD-23ED(36.9KW)	260EMD-20KC(41.9KW) 260EMD-23EF(41.8KW) 260EMD-28KD(44.0KW)



### ★ 制动电阻推荐配置表

Recommended configuration table for braking resistor

伺服驱动器型号 Servo drive model	内置制动电阻 Built-in Brake Resistor		外置制动电阻 External Brake Resistor	
	阻值 Resistance	功率 Power	最小阻值 Min. Resistance	最小功率 Min. Power
ES1-3R8S	50Ω	40W		
ES1-7R6S	50Ω	100W	20Ω	200W
ES1-012S	50Ω	100W	15Ω	200W
ES1-8R4T	50Ω	100W	45Ω	200W
ES1-012T	50Ω	100W	45Ω	200W
ES2-3R8S	50Ω	40W		
ES2-7R6S	50Ω	100W	20Ω	200W
ES2-012S	50Ω	100W	15Ω	200W
ES2-8R4T	50Ω	100W	45Ω	200W
ES2-012T	50Ω	100W	45Ω	200W
ES2-017T			35Ω	1000W
ES2-021T			30Ω	1000W
ES2-026T			25Ω	1300W
ES2-033T			25Ω	1300W
ES2-045T			20Ω	2000W

### ★ 电机安全制动器电气规格

Electrical specifications of safety brake

伺服电机型号 Servo motor model	保持转矩 Torque/Nm	供电电压 Power supply/V (±10%)	接通 (释放) 时间 Drop away time/ms	断开 (制动) 时间 Braking time/ms
60EMA-006	1.3	DC24	50	20
60EMA-013				
80EMA-016				
80EMA-024	4			
80EMA-032				
80EMA-038				
110EMA-040	6			
110EMA-060				
130EMA-040				
130EMA-050	8			
130EMA-060				
130EMA-075				
130EMA-100	20			
130EMA-150				
180EMA-095				
180EMA-143				
180EMA-191				
180EMA-239				
180EMA-255				
180EMA-287				
180EMA-382				
180EMA-478				
180EMD-095				
180EMD-143				
180EMD-191				
180EMD-239				
180EMD-255				
180EMD-287				
180EMD-382				
180EMD-478				
200EMD-550	105			
200EMD-750				
200EMD-900				
200EMD-11K	130			
200EMD-13K				
220EMD-478				
220EMD-525	105			
220EMD-700				
220EMD-716				
220EMD-955				
220EMD-10E				
220EMD-10E				

### ★ 配件一览表

List of Accessorise

#### ▶ 1、电源、制动端子

Power supply and brake connector

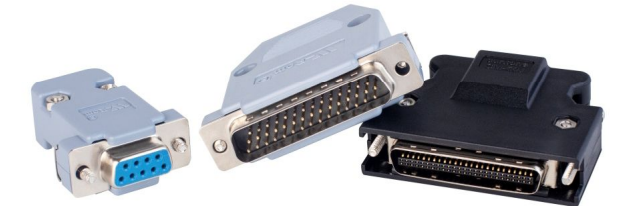
- 适用于ES1/ES2系列  
Applicable to ES1/ES2 series



#### ▶ 2、控制线接头端子

Cn2 I/O connector

- 连接上位机，提供线长选配  
Connect with servo system controller,  
Line length is optional



#### ▶ 3、通讯线、通讯接线端子

Connect with upper computer,  
Line length is optional

- 提供线长选配  
Line length is optional



#### ▶ 4、防水端子

Waterproof connectors

- 防水、防尘 可选配  
The waterproofing and dust  
prevention are optional





► 5、制动电阻

Braking resistor

- 选型表可参看P35页  
For braking resistor type selection, refer to the page P35.



► 6、电机电源连接线

Motor power cables

- 针对客户需求，另外提供独立接头配件或整条独立订做  
Based on customer demand, we provide independent connectors or the whole order



► 7、编码器连接线

Encoder cables

- 针对客户需求，另外提供独立接头配件或整条独立订做  
Based on customer demand, we provide independent connectors or the whole order



► 8、电池盒

Battery Case

- 绝对值编码器使用  
Use of Absolute Encoder



★ 公司销售网点

Company Sales Outlets

佛山（总公司）

Foshan Parent company : 0757-28392263

