



禾川科技官方网站

HPPD1490021-00A
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CN 安装说明
EN Instruction Sheet

1. 安全注意事项 (Safety precautions)

安全图标 (Safety symbols)

在接收检验、安装、配线、操作、维护及检查时，应随时注意以下安全注意事项。	Please always pay attention to the following safety precautions during acceptance, inspection, installation, wiring, operation, and maintenance.
对于忽视说明书记载内容，错误的使用本产品，而可能带来的危害和损害的程度按下列标识加以区分和说明。	The safety instruction levels, which may be caused by the neglect of the instruction or incorrect use of this product, are classified and described in the following table.

⚠ DANGER	该标志表示「可能会发生导致死亡或重伤事故的危險」的内容 Indicates that incorrect handling may result in death or severe injury.
⚠ CAUTION	该标志表示「可能会导致伤害或财产损失事故发生」的内容 Indicates that incorrect handling may result in personal injury or property damage.

对应当遵守的事项用以下的图形标志进行说明。
The matters to be observed are indicated by the following diagrammatic symbols.

	该图形表示禁止实施的「禁止实施」事项内容。 Indicates "Prohibited" (what must not be done).
	该图形表示必须实行的「强制实行」内容。 Indicates "Forced" (what must be done).

⚠ DANGER

关于安装和配线 (Installation and wiring)

	切勿将电机直接连接到商用电源。 Do not connect the motor directly to a commercial power.	否则，会引发火灾、故障。 Otherwise, it may cause fire or malfunction.
	请勿在电机、驱动器的周围放置可燃物。 Do not place any combustibles near the servo motor and drive.	否则，会引发火灾事故。 Otherwise, it may cause a fire.
	驱动器必须要用外箱保护，设置保护外箱时，外箱壁、其他机器和驱动器之间要保持使用说明书规定的距离。 Please place the drive within a protective case, and leave specified clearances between the drive and control enclosure walls or other equipment.	否则，会引发触电、火灾、故障。 Otherwise, it may cause an electric shock, fire, or malfunction.
	应安装在尘埃较少、不会接触到水、油等的地方。 Please install the drive in a place that frees from excessive dust, water, and oil.	否则，会引发触电、火灾、故障、破损。 Otherwise, it may cause an electric shock, fire, malfunction, or damage.
	电机、驱动器安装在金属等非可燃物上。 Please install the drive to incombustible, such as metal.	否则，会引发火灾事故。 Otherwise, it may cause a fire.
	务必由专业电工进行接线作业。 The wiring must be done by a professional electrician.	否则，会引发触电。 Otherwise, it may cause an electric shock.
	电机、驱动器的FG端子必须接地。 The FG terminal of the motor or the drive must be grounded.	否则，会引发触电。 Otherwise, it may cause an electric shock.
	必须先切断上位断路器，进行正确的接线。 Please cut off the upper circuit breaker before wiring.	否则，可能会引发触电、受伤、故障、破损。 Otherwise, it may cause an electric shock, injury, malfunction.
	电缆应确保连接好、通电部位须用绝缘物切实地做到绝缘。 Otherwise, it may cause an electric shock, injury, malfunction, or damage.	否则，会引发触电、火灾、故障。 Otherwise, it may cause an electric shock, fire, or malfunction.

关于操作运行 (Operation and running)

	请勿触摸驱动器内部。 Do not touch the internal parts of the drive.	否则，会引发烧伤、触电事故。 Otherwise, it may cause burns or an electric shock.
	请勿让电缆线受到损伤、承受过大的外力、重压、受夹。 The cables must not be excessively damaged, stressed, loaded, or pinched.	否则，会引发触电、故障。 Otherwise, it may cause an electric shock, malfunction, or damage.
	切勿接触运转中的电机旋转部。 Do not touch the rotating parts of the servo motor during operation.	否则，会引发受伤事故。 Otherwise, it may cause injury.
	请勿将电缆线浸在油和水中使用。 Do not immerse the cables in oil or water during operation.	否则，会引发触电、受伤、火灾事故。 Otherwise, it may cause an electric shock, injury, or fire.
	请勿用湿手进行接线和操作。 Do not conduct wiring or perform operations with wet hands.	否则，会引发触电、受伤、火灾事故。 Otherwise, it may cause an electric shock, injury, or fire.
	使用轴端带键槽的电机时，请勿裸手接触键槽。 Do not touch the keyway of the motor shaft with bare hands.	否则，会引发受伤事故。 Otherwise, it may cause injury.
	电机、驱动器、散热器的温度会升高，请勿触摸。 Do not touch the motor, drive, and heat spreaders since they will heat up during operation.	否则，会引发烧伤或部件损伤事故。 Otherwise, it may cause burns or component damage.
	请勿用外部动力驱动电机。 Do not connect the motor to an external power.	否则，会引发火灾事故。 Otherwise, it may cause a fire.

关于其他使用上的注意事项 (Other safety precautions)

	在地震发生后务必进行相关安全确认。 Please ensure equipment safety after earthquakes.	否则，会引发触电、受伤、火灾事故。 Otherwise, it may cause an electric shock, injury, or fire.
	为防止发生地震时造成火灾及人身事故，应切实地进行设置和安装。 Ensure a correct installation and setting to prevent fire or personal injury during earthquakes.	否则，会引发受伤、触电、火灾、故障、破损。 Otherwise, it may cause injury, electric shock, fire, malfunction, or damage.
	务必在外部设置紧急停止电路，以确保紧急时可以及时地停止运转、切断电源。 Please provide an external emergency stop circuit to ensure that operation can be stopped and power switched off immediately.	否则，会引发受伤、触电、火灾、故障、破损。 Otherwise, it may cause injury, electric shock, fire, malfunction, or damage.

关于维护和点检 (Maintenance and inspection)

	驱动器有危险高压部分。进行配线和点检工作时，必须切断电源放置使其放电后（5分钟以上）进行。并且，绝对不允许对其进行分解。 As there's dangerous and high-voltage inside the drive, before wiring or inspection, turn off the power and wait for 5 minutes or more until the charge lamp turns off. Do not disassemble the drive.	会引发触电事故。 Otherwise, it may cause an electric shock.
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⚠ CAUTION

关于安装和配线 (Installation and wiring)

	电机和驱动器要按指定的匹配组合。 Please install the servo motor and drive following the combinations specified in this instruction.	否则，会引发火灾、故障。 Otherwise, it may cause fire or malfunction.
	不可直接触碰连接器端子。 Do not touch the connector terminals directly.	否则，会引发触电、故障。 Otherwise, it may cause an electric shock or malfunction.
	注意通风口不可堵塞，或异物进入。 Do not block the intake and let any foreign materials enter into the equipment.	否则，会引发触电、火灾。 Otherwise, it may cause an electric shock or fire.
	试运转须在电机固定，并与其他机械系统分离状态下实施。动作确认后在安装到机械系统上。 Only after confirming the operation can the motor be installed to the mechanical system.	否则，会引发受伤事故。 Otherwise, it may cause injury.
	遵守指定的安装方法、安装方向。 The servo motor must be installed following the specified directions and methods.	否则，会引发受伤、故障。 Otherwise, it may cause injury or malfunction.

	请根据设备本身的重量和产品的额定输出进行妥当安装。 Ensure a proper installation in accordance with the weight and rated output of the equipment.	否则，会引发受伤、故障。 Otherwise, it may cause injury or malfunction.
关于操作和运转 (Operation and running)		
⊘	请勿站在产品上、或在产品上放置重物。 Do not stand or put any heavy objects on the equipment.	否则，会引发触电、受伤、故障、破损。 Otherwise, it may cause an electric shock, injury, malfunction, or damage.
	禁止极端的增益调整及变更，会导致运作不稳定。 Do not make extreme gain adjustments or changes, which will result in unstable running.	否则，会引发故障、破损。 Otherwise, it may cause malfunction or damage.
	请勿在受日光直接照射的地方使用。 Keep it away from the direct sunlight.	否则，会引发故障。 Otherwise, it may cause malfunction.
	请勿使电机及电机轴部受到较强的冲击。 Do not subject the motor and its axis to heavy impact.	否则，会引发故障。 Otherwise, it may cause malfunction.
	电机内置制动器的作用是保持用制动，禁止用在通常的制动场合。 The electromagnetic brake on the motor is designed to hold its shaft and should not be used for ordinary braking.	否则，会引发受伤、故障。 Otherwise, it may cause injury or malfunction.
	停电后恢复供电时，有可能出现突然启动的情况，故请勿靠近机器。务必做好机器设定，以确保即使重启也可确保人身安全。 When power is restored after an instantaneous power outage, keep away from the machine because it may be restarted suddenly. Set the machine so that it is secured against personal injury if restarted.	否则，会引发受伤事故。 Otherwise, it may cause injury.
⚠	不要使用有故障、破损的电机和驱动器。 Do not use any malfunctioning or damaged motor or drive.	否则，会引发触电、火灾、受伤。 Otherwise, it may cause an electronic shock, fire, or injury.
	请确认电源规格是否正常。 Please confirm that the power supply specification is normal.	引发故障发生原因。 Otherwise, it may cause malfunction.
	保持制动器不是确保机械安全的停止装置。请在机械侧设置确保安全用的停止装置。 Holding brake is not a safety stopper used for ensuring machine safety. To ensure safety, install a stopper on the machine side.	否则，会引发受伤事故。 Otherwise, it may cause injury.
	报警时，排除故障原因，确保安全后，解除报警，重启。 When any alarm has occurred, eliminate its cause, ensure safety, and deactivate the alarm before restarting operation.	否则，会引发受伤事故。 Otherwise, it may cause injury.
	制动器用继电器与紧急停止用断路器需串联。 The brake relay and the emergency stop relay must be connected in series.	否则，会引发受伤、故障。 Otherwise, it may cause injury or malfunction.
关于搬运和保管 (Transportation and storage)		
⊘	不能保存在雨水及水滴溅到的场所、有毒性气体及液体的地方。 Do not subject the equipment to rain, droplets, toxic gas, or fluid.	否则，会引发故障的。 Otherwise, it may cause malfunction.
	搬运时，切勿抓持电缆或电机轴部。 Do not carry the motor by the cables or shaft during transportation.	否则，会引发受伤、故障。 Otherwise, it may cause injury or malfunction.
⚠	进行搬运时或安装作业时要以防落下或翻倒。 Do not drop or overturn the motor during transportation and installation.	否则，会引发受伤、故障。 Otherwise, it may cause injury or malfunction.
	需长期保存时，请按本说明书记载的联系方法进行咨询。 For long-term storage, please contact HCFA via the contact information listed in this instruction sheet.	引发故障的原因。 Otherwise, it may cause malfunction.
	请保管在符合本说明书中规定保管环境的保管场所。 Please store in a storage place that complies with the storage environment specified in this manual.	否则，会引发故障。 Otherwise, it may cause malfunction.
关于其他使用上的注意事项 (Other safety precautions)		
⊘	废弃电池时，请将电池用胶带等进行绝缘处理，并根据有关部门的规定废弃处理。 Please insulate the battery with adhesive tape and dispose of it following the law of each country (area).	
	废弃时请作为工业废弃物处理。 When disposing of the equipment, treat it as an industrial waste.	
关于维护和点检 (Maintenance and inspection)		
⚠	除本公司外请勿进行拆卸修理工作。 Do not carry out disassembly and repair work without consulting our company.	否则，会引发故障。 Otherwise, it may cause malfunction.
	主电源开关不要频繁的打开和关闭。 Do not turn on and off the main circuit power switch too frequently.	否则，会引发故障。 Otherwise, it may cause malfunction.
	驱动器发生故障时，请切断控制电源和主电源。 When the drive becomes faulty, switch off the control circuit and main power.	否则，会引发火灾事故。 Otherwise, it may cause a fire.
	长时间不使用时务必切断主电源。 If the equipment is to be stored for a long time, please switch off the main power.	因误动作等引发受伤事故。 Otherwise, it may result in injury caused by the malfunction of the equipment.
关于维护和点检 (Maintenance and inspection)		
< 保证期限 > • 产品的保证期间为本公司制造月起 18 个月。但是，对应制动器的电机，轴的加速、减速次数不超出使用寿命为前提。	< Warranty period > • The term of warranty for the product is eighteen months from the date of manufacture. However, for the motor with a brake, the warranty period does not exceed the maximum period that the shaft can accelerate or decelerate.	
< 保证内容 > • 按照本说明书的正常使用状态下，在保证期间内，发生故障时为无偿修理。但是，即使在保证期间内有如下的故障发生时为有偿修理。 ① 错误的使用方法，以及不适当的修理以及改造时。 ② 收货之后的掉落，以及不是公司品质原因的损伤。 ③ 超出产品规格使用该产品。 ④ 火灾、地震、落雷、风灾与水灾、盐害、电压异常等其他灾害。 ⑤ 水、油、金属片、其他异物侵入。 • 保证范围为交付品本体，如由交付品的故障诱发的损害，判定为补偿范围外。	< Warranty coverage > • This warranty applies only when the condition, method, environment, etc. of use are in compliance with the terms and conditions and instructions that are stated in the instruction. However, even during the warranty period, the repair cost will be charged to customers in the following cases. ① A failure caused by improper storing or handling, repair, and modification. ② A failure caused by drops or damages during transportation. ③ A failure caused by using without following the product specifications. ④ A failure caused by external factors such as inevitable accidents, including without limitation fire, earthquake, thunder and lightning, wind hazard and flooding, salty damage, and abnormal fluctuation of voltage. ⑤ A failure caused by the intrusion of water, oil, metal sheet, and other foreign materials. • The warranty coverage is only for the product itself. HCFA bears no joint responsibility and makes no compensation for any further damages caused by product malfunction.	
更详细的信息请参考 D5EB 系列用户手册。	Please refer to the D5EB series user's manual for more detailed information.	

2. 适用型号 (Applicable model)

功率(Power)	型号* (Model)	功率(Power)	型号 (Model)
10W	SV-D5E(F)B001LU-A-00/SV-D5E(F)B001LY-A-00	400W	SV-D5E(F)B040LU-A-00/SV-D5E(F)B040LY-A-00
100W	SV-D5E(F)B010LU-A-00/SV-D5E(F)B010LY-A-00	750W	SV-D5E(F)B075LU-A-00/SV-D5E(F)B075LY-A-00
200W	SV-D5E(F)B020LU-A-00/SV-D5E(F)B020LY-A-00	-	-

*注：型号 SV-D5EB □ LU 中“U”表示端子侧出带外壳，型号 SV-D5EB □ LY 中“Y”表示端子侧出不带外壳。

*Note: The “U” in model SV-D5EB □ LU means terminal side interface with housing, and the “Y” in model SV-D5EB □ LY means terminal side interface without housing.

3. 环境规格 (Environmental specifications)

3.1 环境要求 (Environmental requirements)

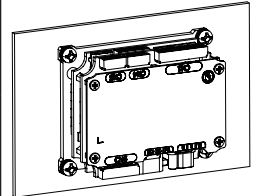
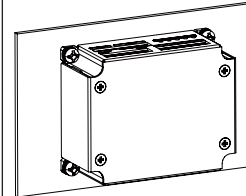
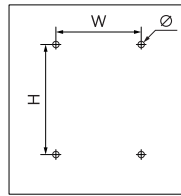
项目 (Item)	规格 (Specifications)	项目 (Item)	规格 (Specifications)
环境要求 (Environmental requirements)	控制柜内安装，开放式及室内使用 (Installation within a control cabinet, open-type and indoor use)	耐热等级 (Heat resistance class)	Class B
环境空气 (Ambient air)	无腐蚀性气体、易燃性气体、潮气、油雾、粉尘 (Free from corrosive gas, flammable gas, moisture, oil mist, and dust)	海拔 (Altitude)	1000m以下 (Below 1000m)
使用环境温度 (Ambient operating temperature)	0~55°C	耐振动 (Vibration resistance)	49m/s ² (5G)
保存环境温度 (Ambient storage temperature)	-20~60°C	耐冲击 (Impact resistance)	98m/s ² (10G)
环境湿度 (Ambient humidity)	20~80%RH 以下 (无结露) (Less than 20~80%RH (with no condensation))	保护等级 (Protection class)	IP 65

4. 安装说明 (Installation instructions)

4.1 机柜背板安装 (Cabinet backplane mounting)

CN 按孔位图在机柜背板上开孔，使用 4 个 M3 螺丝固定，锁紧扭矩为 0.9 N.m。

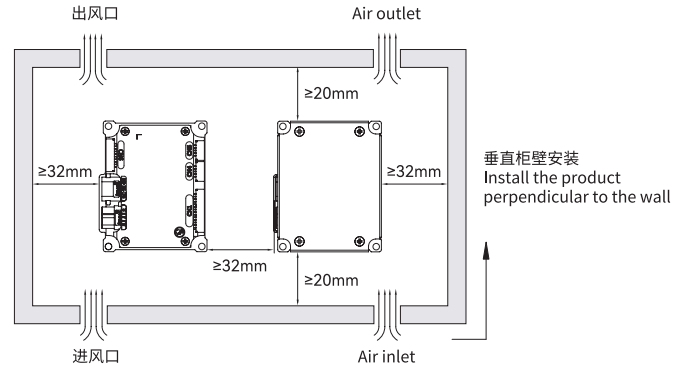
EN Drill holes on the back panel of the cabinet according to the hole map. Please use four M4 screws with the tightening torque of 0.9 N.m to secure it.



4.2 控制柜安装 (Installation within a control cabinet)

CN 设备冷却方式为自然冷却或通过加装风扇进行冷却，请保证安装方向与柜壁垂直。请参考右侧示意图，在设备的周围留有足够的空间，建议横向两侧预留 32mm 以上间距。

EN Please install the product perpendicular to the wall and ensure a sufficient cooling effect via natural air or a cooling fan. Please leave enough clearance around the product as shown in the right figure. It is recommended to leave a horizontal clearance of more than 32 mm on both sides.

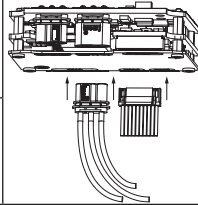


垂直柜壁安装
Install the product perpendicular to the wall

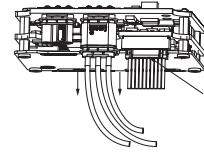
4.3 端子拆装 (Terminal block mounting and dismounting)

CN 拆装带有 EtherCAT 通讯接口，功能 I/O 接口，STO 接口，编码器接口，主电源输入与制动电阻接口，电机动力输出接口的端子如右图所示。

EN The terminals with the EtherCAT communication interface, function I/O interface, STO interface, encoder interface, main power input and braking resistor interface, and motor power output interface can be disconnected as shown in the right figure.



沿箭头所示方向插入端子
Insert the terminal block along the direction indicated by the arrow

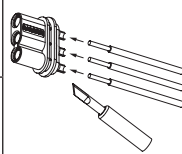


按压锁扣并拔出端子
Press the latch and detach the terminal block

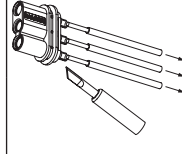
4.4 线缆拆装 (Cable connecting and disconnecting)

CN 拆装带有主电源输入接口和电机动力输出接口的线缆需要使用电烙铁，拆装步骤如右图所示。

EN The cable with the main power input interface and motor power output interface needs to be disconnected with a soldering iron, and the steps are shown in the right figure.



将线缆插入端子，预热电烙铁后融化焊锡丝，可完成线缆安装
Insert the cable into the terminal, then preheat the soldering iron and melt the solder wire to complete the cable connection.

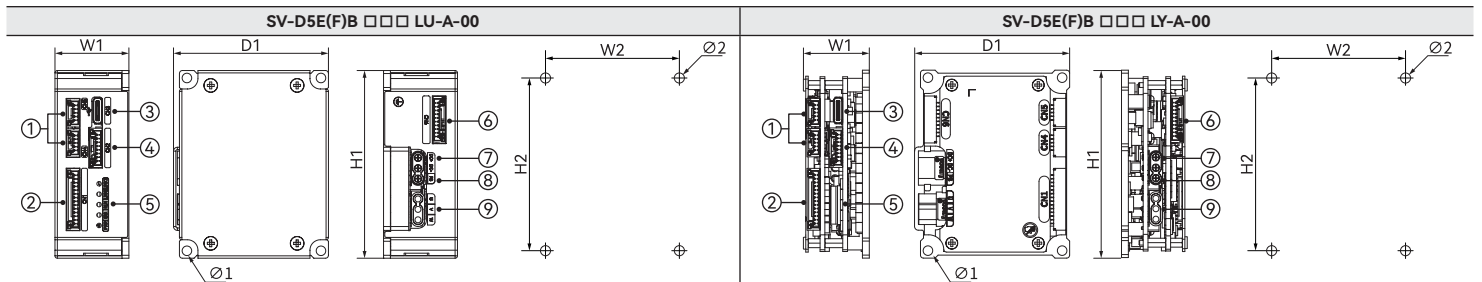


预热电烙铁后融化焊锡丝，将线缆从端子拔出，可完成线缆拆卸
Preheat the soldering iron and melt the solder wire, then pull out the cable from the terminal to complete the cable disconnection.

4.5 配线选择 (Wiring options)

线缆 (Cable)	线径 (Wire width): AWG		耐热 (Heat resistance)
	10W~200W	400W~750W	
主电源输入线缆 (Main circuit power supply cable)	16	12	105°C
电机动力输出线缆 (Motor power output cable)		18	
STO 线缆 (STO cable)		18	
制动电阻线缆 (Braking resistor cable)		18	
功能 I/O 线缆 (Function I/O cable)		28	
通讯线缆 (Communication cable)		28	120°C
编码器线缆 (Encoder cable)		28	

5. 接口和尺寸说明 (Interface and dimension description)



序号 (No.)	项目	Item
1	CN4/CN5: EtherCAT 通讯接口	CN4/CN5: EtherCAT communicate interface
2	CN1: 功能 I/O 接口	CN1: Function I/O interface
3	CN3: Type-C 接口	CN3: Type-C interface
4	CN2: STO 接口	CN2: STO interface
5	系统状态指示灯	System status indicator
6	CN6: 编码器接口	CN6: Encoder interface
7	DC+/DC-: 主电源输入接口	DC+/DC-: Main power supply input interface
8	PB: 制动电阻接口	PB: Power brake resistor interface
9	U/V/W: 电机动力输出接口	U/V/W: Motor power output interface

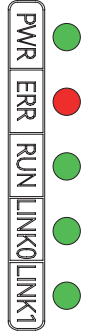
型号 (Model)	尺寸 (Dimension) :mm					孔径 $\Phi 1^*$ (Hole diameter $\Phi 1$):mm	孔径 $\Phi 2^*$ (Hole diameter $\Phi 2$):mm	重量 (Weight) :kg
	W1	W2	H1	H2	D1			
SV-D5E(F)B001LU-A-00	24.8	45.0	63	58.0	52	3.2	5	0.074
SV-D5E(F)B010LU-A-00								
SV-D5E(F)B020LU-A-00								
SV-D5E(F)B040LU-A-00								
SV-D5E(F)B075LU-A-00								
SV-D5E(F)B001LY-A-00	21.3	45.0	63	58.0	52	3.2	5	0.064
SV-D5E(F)B010LY-A-00								
SV-D5E(F)B020LY-A-00								
SV-D5E(F)B040LY-A-00								
SV-D5E(F)B075LY-A-00								

*注: 孔径 $\Phi 1$ 为驱动器孔径, 孔径 $\Phi 2$ 为背板打孔孔径。

*Note: The symbol $\Phi 1$ is the hole diameter of the servo drive, and $\Phi 2$ is that of the back panel.

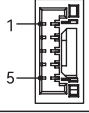

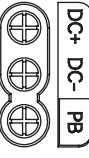
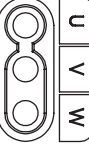
6. 指示灯和面板说明 (Indicator and LED panel description)

丝印 (Screen printing)	指示灯含义 (Indicator meaning)	颜色 (Color)	状态 (Status)	Status	说明 (Description)	Description
PWR	电源 (Power)	绿色 (Green)		熄灭 Not lit	电源未接通	Power off
				常亮 Lit	电源接通	Power on
ERR	系统故障 (System error)	红色 (Red)		熄灭 Not lit	无故障发生	No error
				常亮 Lit	发生故障	Error
RUN	运行 (Run)	绿色 (Green)		熄灭 Not lit	停止状态	Stop
				闪烁 Blinking	正常运行	Run
				常亮 Lit	待机状态	Standby
LINK0/LINK1	EtherCAT 通讯 (EtherCAT Communication)	绿色 (Green)		熄灭 Not lit	未建立物理连接	No physical connection
				闪烁 Blinking	建立物理连接且有通讯数据	Physical connection with communication data



7. 端子及配线说明 (Terminal and wiring description)

端子 (Terminal)	序号 (No.)	引脚 (Pin)	说明 (Description)	接线 (Wiring)
CN1				
	1	DI1	数字信号输入1	Digital signal input 1
	2	DI2	数字信号输入2	Digital signal input 2
	3	DI3	数字信号输入3	Digital signal input 3
	4	DI4	数字信号输入4	Digital signal input 4
	5	DI5	数字信号输入5	Digital signal input 5
	6	DI_COM	数字信号输入公共端	Digital signal input common terminal
	7	DO1+	数字信号输出1	Digital signal output 1
	8	DO1-		
	9	DO2+	数字信号输出2	Digital signal output 2
	10	DO2-		
	11	DO3+	数字信号输出3	Digital signal output 3
	12	DO3-		
	13	485-	RS485通讯接口	RS485 communication interface
	14	485+		
CN2				
	1	-	-	-
	2	-	-	-
	3	STO1+	2个独立电路, 驱动信号可切断电源	Two independent circuits Drive signal can cut off power
	4	STO1-		
	5	STO2+		
	6	STO2-		
	7	STO_OUT+	监视输出	Monitor output
	8	STO_OUT-		

CN4/CN5				
	1	ECAT_TX-	数据发送负	Data transmission-
	2	ECAT_TX+	数据发送正	Data transmission+
	3	PE	保护地	Protecting earthing
	4	ECAT_RX-	数据接收负	Data receiving-
	5	ECAT_RX+	数据接收正	Data receiving+
CN6				
	1	VCC	电源正	Power supply +
	2	GND	电源负	Power supply -
	3	DATA-	编码器信号: 数据输入输出	Encoder signal: Data input and output
	4	DATA+		
	5	A-	编码器A相输出	Encoder A-phase output
	6	A+	编码器A相输出	Encoder A-phase output
	7	B-	编码器B相输出	Encoder B-phase output
	8	B+	编码器B相输出	Encoder B-phase output
	9	Z-	编码器Z相输出	Encoder Z-phase output
	10	Z+	编码器Z相输出	Encoder Z-phase output
DC+/DC-/PB (DC+/DC-/PB)				
	1	DC+	电源输入正	Power supply input+
	2	DC-	电源输入负	Power supply input-
	3	PB	制动电阻接口	Power brake resistor interface
U/V/W (U/V/W)				
	1	U	电机动力 U 相输出	Motor power U-phase output
	2	V	电机动力 V 相输出	Motor power V-phase output
	3	W	电机动力 W 相输出	Motor power W phase output

