



HPPD1490016-00A
Date 2024-07-30
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，再安装到机械系统上。 The test operation must be done with the motor being fixed but separated from the mechanical system. 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. 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. 请勿在受日光直接照射的地方使用。 Keep it away from the direct sunlight.	否则, 会引发触电、受伤、故障、破损。 Otherwise, it may cause an electric shock, injury, malfunction, or damage. 否则, 会引发故障、破损。 Otherwise, it may cause malfunction or damage.
⊘	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. 请确认电源规格是否正常。 Please confirm that the power supply specification is normal.	否则, 会引发触电、火灾、受伤。 Otherwise, it may cause an electronic shock, fire, or injury. 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继电器需串联。 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. 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.	否则, 会引发受伤、故障。 Otherwise, it may cause injury or malfunction. 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. 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. 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. 长时间不使用请务必切断主电源。 If the equipment is to be stored for a long time, please switch off the main power.	否则, 会引发故障。 Otherwise, it may cause malfunction. 否则, 会引发故障。 Otherwise, it may cause malfunction. 否则, 会引发火灾事故。 Otherwise, it may cause a fire. 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 X4 系列用户手册。	Please refer to the X4 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)
100W	SV-X4EA010A-AE-00	1kW	SV-X4EA100A-AE-00
200W	SV-X4EA020A-AE-00	1.5kW	SV-X4EA150A-AE-00
400W	SV-X4EA040A-AE-00	2kW	SV-X4EA200A-AE-00
750W	SV-X4EA075A-AE-00	2.5kW	SV-X4EA250A-AE-00

3. 环境规格 (Environmental specifications)

3.1 环境要求 (Environmental requirements)

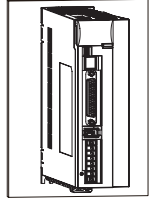
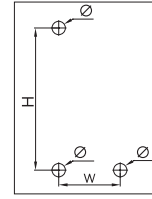
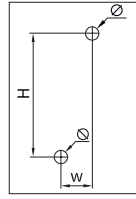
项目 (Item)	规格 (Specifications)	项目 (Item)	规格 (Specifications)
环境要求 (Environmental requirements)	控制柜内安装, 开放式及室内使用 (Installation within a control cabinet, open-type and indoor use)	耐热等级 (Heat resistance class)	Class B
环境空气 (Ambient air)	无腐蚀性气体、易燃性气体、潮气、油雾、粉尘 (Free from corrosive gas, flammable gas, moisture, 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)	-20~65°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, 安装输出功率 1kW 及以下的驱动器时, 使用 2 个 M4 螺丝固定, 锁紧扭矩为 3.5 N.m; 安装输出功率 1.5kW 及以上的驱动器时, 使用 3 个 M5 螺丝固定, 锁紧扭矩为 3.5 N.m。

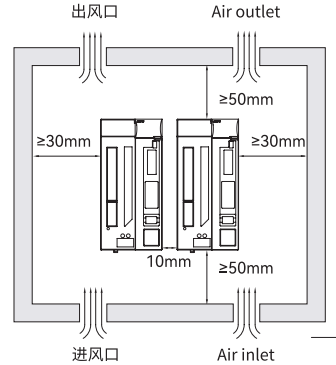
EN Drill holes on the back panel of the cabinet according to the hole map. When installing a drive with an output power of 1kW or less, please use two M4 screws with the tightening torque of 3.5 N.m to secure it. When installing a drive with an output power of 1.5kW or above, please use three M5 screws with the tightening torque of 3.5 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 30mm 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 30 mm on both sides.

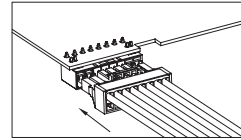


垂直柜壁安装
Install the product perpendicular to the wall

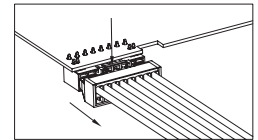
4.3 端子拆装 (Terminal block mounting and dismounting)

CN 拆装带有主电源输入接口, 控制电源接口, 再生电阻接口, 母线电压负极, 电机动力输出接口的端子如右图所示。

EN The mounting and dismounting of terminals with main power supply input interface, control power supply interface, regenerative resistor interface, negative polarity of busbar voltage, and motor power output interface are shown in the right figures.



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

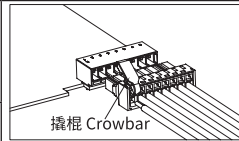


按压锁扣并拔出端子
Press the latch and detach the terminal block

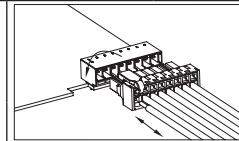
4.4 线缆拆装 (Cable connecting and disconnecting)

CN 拆装主电源输入接口, 控制电源接口, 再生电阻接口, 母线电压负极, 电机动力输出接口的线缆需要使用撬棍, 拆装步骤如右图所示。

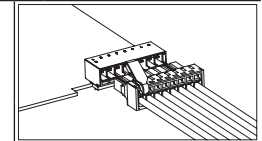
EN The scenarios using the crowbar include mounting and dismounting the cables of the main power supply input interface the control power interface, the regenerative resistor interface, the negative polarity of the busbar voltage, and the motor power output interface. The specific steps are shown in the figure on the right.



安装撬棍
Install the crowbar



按压撬棍, 将线缆插入/拔出端口
Press the crowbar and then insert or unplug a cable into or out of the port where the crowbar is installed

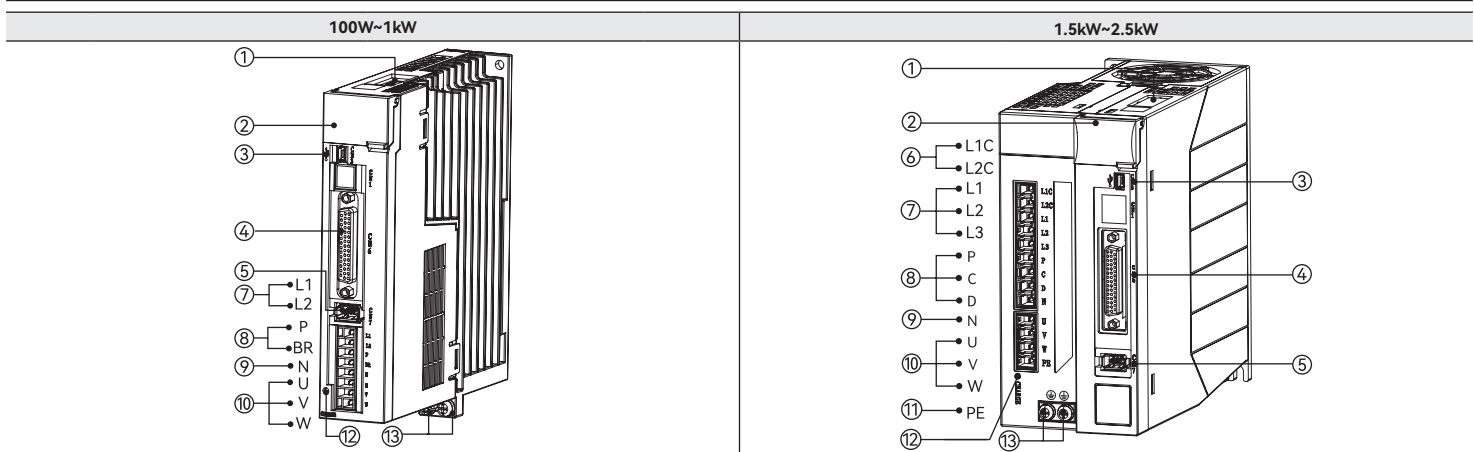


移除撬棍
Remove the crowbar

4.5 配线选择 (Wiring options)

功率 (Power)	线缆 (Cable)	线径 (Wire width): AWG	耐热 (Heat resistance)	线缆 (Cable)	线径 (Wire width): AWG	耐热 (Heat resistance)
750W以下 (750W or less)	主电源输入线缆 (Main circuit power supply cable)	18	105°C	再生电阻线缆 (Regenerative resistor cable)	18	105°C
	电机动力输出线缆 (Motor power output cable)			通讯线缆 (Communication cable)		
1kW以上 (1kW or more)	主电源输入线缆 (Main circuit power supply cable)	14		编码器线缆 (Encoder cable)	电源 (Power) : 22	-
	控制回路电源输入线缆 (Control circuit power supply cable)			信号 (Signal) : 24		
	电机动力输出线缆 (Motor power output cable)		-			

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



显示面板 (LED display)	说明	Description	显示面板 (LED display)	说明	Description	
	接通电源	Power on	1级面板 Level 1 panel		显示参数组号	Parameter group number
	显示警告	Warning	2级面板 Level 2 panel		显示参数组号和组内偏移量	Parameter group number and in-group offset
	显示故障	Fault	3级面板 Level 3 panel		显示偏移量的参数值	Parameter value of the offset
	显示无故障	No fault			显示参数修改情况	Parameter modifications
0级面板 Level 0 panel		位置模式下正在运行				
		速度模式下正在运行				
		转矩模式下正在运行				

*注: 面板显示的详细内容请参考 X4 系列硬件手册。

*Note: For detailed information of the LED display, please refer to the X4 series hardware manual.

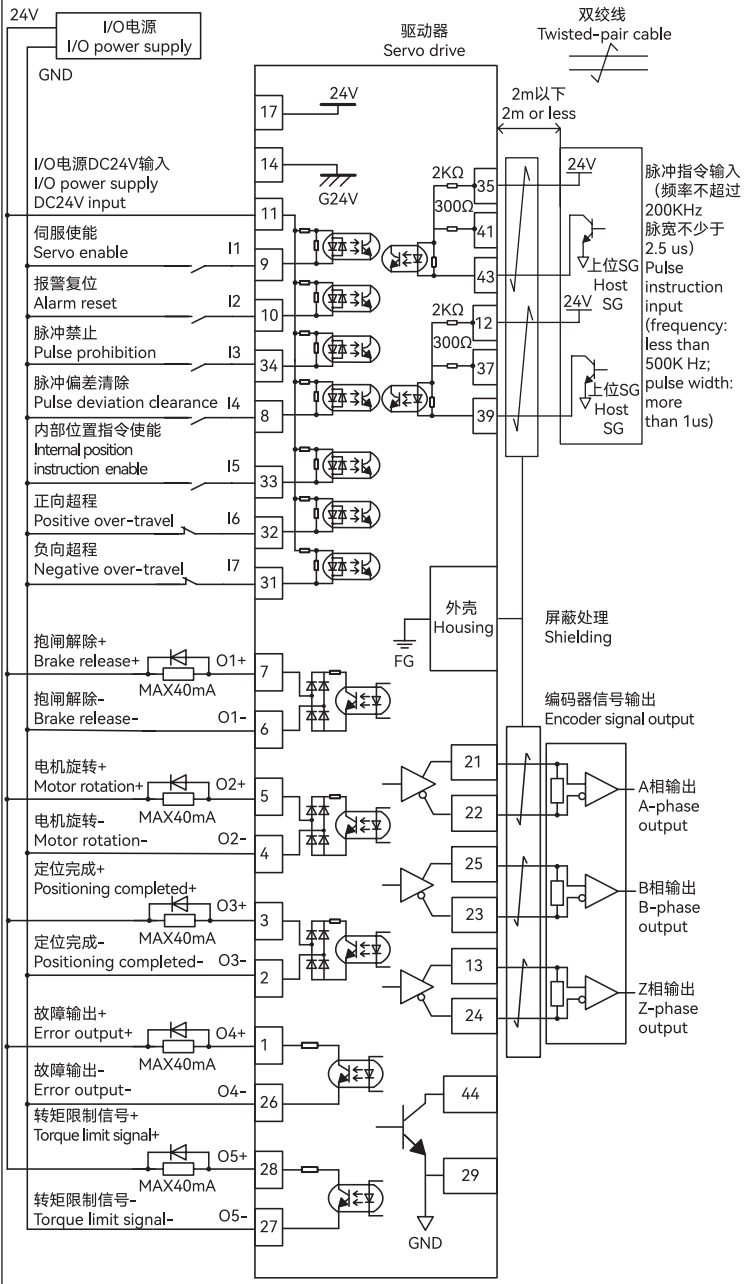
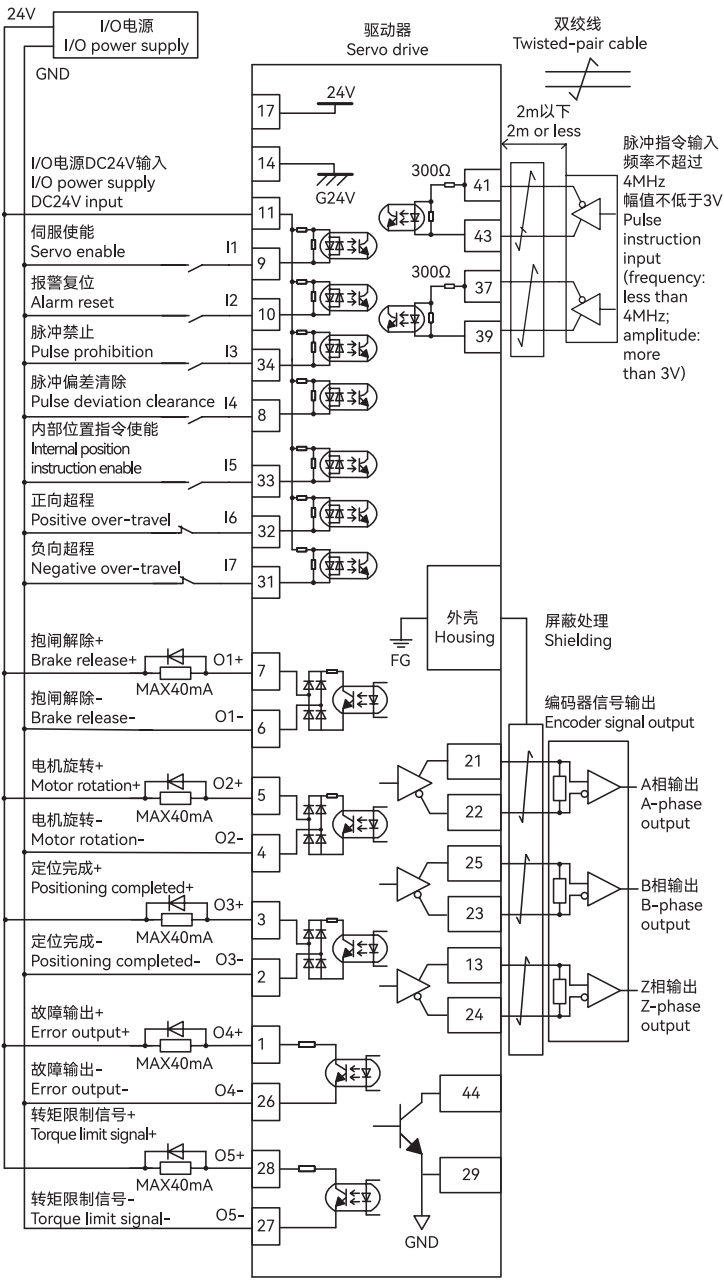
7. 端子及配线说明 (Terminal and wiring description)

端子 (Terminal)	引脚 (Pin)	说明 (Description)	接线 (Wiring)
<p>100W~1kW</p>	L1	主电源输入 Main power supply input	
	L2		
	P	主回路母线正极 Positive polarity of the main circuit busbar	
	BR	再生电阻接口 Regenerative resistor interface	
	N	母线电压负极 Negative polarity of the busbar voltage	
	U	电机动力 U 相输出 Motor power U-phase output	
	V	电机动力 V 相输出 Motor power V-phase output	
	W	电机动力 W 相输出 Motor power W phase output	
<p>1.5kW~2.5kW</p>	L1C	单相220V控制电源输入 Single-phase 220V control power supply input	
	L2C		
	L3		
	L1	单相/三相 220V主电源输入 Single-phase/three-phase 220V main power supply input	
	L2		
	L3		
	P		
	C	P/C短接, 使用内部制动电阻 P/C断开, P/D接外部制动电阻 P/C short-circuited, use internal braking resistor P/C disconnected, connect P/D to external braking resistor	
	D		
	N	母线电压负极 Negative polarity of the busbar voltage	
U	电机动力 U 相输出 Motor power U-phase output		
V	电机动力 V 相输出 Motor power V-phase output		
W	电机动力 W 相输出 Motor power W-phase output		
PE	电机接地端子 Motor ground terminal		
<p>PE/电源接地端子 PE/Power supply ground terminal</p>	GND	接地 Grounding	
	GND		

端子 (Terminal)	序号 (No.)	引脚 (Pin)	说明 (Description)
	1	DO4+	数字信号输出+
	2	DO3-	数字信号输出-
	3	DO3+	数字信号输出+
	4	DO2-	数字信号输出-
	5	DO2+	数字信号输出+
	6	DO1-	数字信号输出-
	7	DO1+	数字信号输出+
	8/9/10	DI4/DI1/DI2	数字信号输入
	11	DI_COM	数字信号输入公共端
	12	CC-D	集电极脉冲指令输入SIGN电源 (24V)
	13	OUTZ+	脉冲输出Z信号+
	14	G24V	驱动器电源 GND
	15/16	-	-
	17	+24V	驱动器电源 24V 输出
	18	AI1	模拟量输入1
	19	AI2	模拟量输入2
	20	GND	模拟量参考GND
	21	OUTA+	脉冲输出A信号+
	22	OUTA-	脉冲输出A信号-
	23	OUTB-	脉冲输出B信号-
	24	OUTZ-	脉冲输出Z信号-
	25	OUTB+	脉冲输出B信号+
	26/27	DO4-/DO5-	数字信号输出-
	28	DO5+	数字信号输出+
	29	GND_OZ	集电极Z信号输出参考地
	30/31/32/33/34	DI8/DI7/DI6/DI5/DI3	数字信号输入
	35	CC-P	集电极脉冲指令输入PULS电源 (24V)
	36	-	-
	37	SIGN+	脉冲指令SIGN+
	38	-	-
	39	SIGN-	脉冲指令SIGN-
	40	-	-
	41	PULS+	脉冲指令PULS+
	42	-	-
	43	PULS-	脉冲指令PULS-
	44	OZOUT	集电极Z信号输出

脉冲指令差分输入 (Pulse instruction differential input)

脉冲指令24V集电极开路输入 (Pulse instruction 24V open collector output)



模拟量指令输入 (Analog instruction input)

