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07060201-0784-001
Date 2025-03-13
CN 安装说明
EN Instruction Sheet

⚠ 1. 安全注意事项（Safety precautions）

本说明书涉及产品为工业产品，并且均为开放型外壳设计。要求用户使用产品时，务必将产品安装于具有防尘、防潮以及免于电击 / 冲击等意外的控制柜内，并且需要设置保护措施以防止非维护人员不当操作或意外导致设备故障或损坏，造成不可避免的人员危险和财产损失。

The products in this manual are industrial products and are all open-type housing designs. It is essential to install these products within a control cabinet that is safeguarded against dust, moisture, and accidents such as electric shocks or physical impacts. Additionally, protective measures must be taken to prevent malfunctions or damage caused by improper operation or accidents involving non-maintenance personnel. Failure to do so may lead to serious risks to personnel safety and potential loss of property.

更详细的信息请参考 QP 系列硬件手册。

Please refer to the QP series hardware operation manual for more detailed information.

2. 命名规则（Model identification）

HC	Q0	P	-	1	2	0	0	-	D	4	-	XXXX
1	2	3		4	5	6	7		8	9		10

1	产品名称（Product name）
HC	禾川（Hechuan Technology）

2	产品系列（Product series）
Q0	基本总线型运动控制器 (Basic Bus-based motion controller)
Q1	标准总线型运动控制器 (Standard Bus-based motion controller)

3	系列型号（Series type）
空（N/A）	标准型（Standard type）
P	增强型（Enhanced type）

4	操作系统（Operating system）
1	Linux

5	内部编号（Internal number）
2	预留（Reserved）

6	控制软件模块（Control software module）
0	CODESYS

7	控制软件（Control software）
0	标准软件（Standard software）

8	电源类型（Power supply type）
D	直流电源（DC power supply）

9	迭代版本（Iteration version）
4	第4代（The 4th generation）

10	软件/固件定制代码（Customized software/firmware code）
X	0~9/A~Z/空 (N/A)

3. 适用型号（Applicable model）

名称 (Name)	型号（Model）	适配的 IO 型号 * (Applicable IO model)	简要说明（Brief description）
CPU单元 CPU unit	HCQ0P-1200-D4	HCQX-EC01-D4 HCQX-EC02-D4 HCQX-EC03-D4 HCQX-ES06-D4 HCQX-ID16-D4 HCQX-OD16-D4 HCQX-OD16-D4-PNP HCQX-MD16-D4 HCQX-MD16-D4-PNP HCQX-ID32-D4 HCQX-OD32-D4 HCQX-OD32-D4-PNP HCQX-MD32-D4 HCQX-MD32-D4-PNP HCQX-AD04-D4 HCQX-DA04-D4 HCQX-TS04-D4 HCQX-RS02-D4 HCQX-RS02-D4-M HCQX-OC08-D4	Cortex-A35双核处理器、硬盘8G 、运存512M、掉电保持区1M、16点输入16点输出、8轴EtherCAT总线、8轴脉冲、3路以太网口（EtherNet*2、EtherCAT*1）、RS485*2、Type-C*1、SD卡*1 Cortex-A35 dual-core processor, 8G hard drive, 512M RAM, 1M persistent data memory, 16-channel input and 16-channel output, 8-axis EtherCAT bus, 8-axis pulse, 3-channel Ethernet port(EtherNet*2, EtherCAT*1), RS485*2, Type-C*1, SD card*1
	HCQ1P-1300-D4		Cortex-A35双核处理器、硬盘8G 、运存512M、掉电保持区1M、16点输入16点输出、16轴EtherCAT总线、8轴脉冲、3路以太网口（EtherNet*2、EtherCAT*1）、RS485*2、Type-C*1、SD卡*1 Cortex-A35 dual-core processor, 8G hard drive, 512M RAM, 1M persistent data memory, 16-channel input and 16-channel output, 16-axis EtherCAT bus, 8-axis pulse, 3-channel Ethernet port(EtherNet*2, EtherCAT*1), RS485*2, Type-C*1, SD card*1

* 注： CPU 单元本体右侧最多可以挂载 16 个 IO 模块。

*Note: Up to 16 IO modules can be mounted to the right side of a CPU unit.

4. 通用电气及环境规格（General electrical and environmental specifications）

4.1 通用电气规格（Electrical specifications）

型号（Model）*1	额定电压 / 功率（Rated voltage, power）*2	输出电压 / 功率（Output voltage/power）	数字量输入 / 输出类型（Digital input/Output type）
HCQ0P-1200-D4	DC 24V(DC 20.4V~28.8V)/21W	DC12V/16W	数字量输入（Digital input）：DC24V, 6.81mA/Ch 芯片输出（Digital output）：DC24V, 500mA/Ch*3 负载类型：阻性/电磁负载（Load type: Resistive/Pilot duty）
HCQ1P-1300-D4			

* 注：1. 所有型号仅能在由有限功率电源（LPS）提供的安全特低电压（SELV）下运行。
2. 此处标识的额定功率为满负载运行的最大功率。
3. 考虑温升影响，降额使用。

*Note: 1. All models can only operate under the safety extra low voltage (SELV) provided by a limited power source (LPS).
2. The power rating indicated here is the maximum power under full-load operation.
3. Consider the effect of temperature rise and derate during using.

4.2 环境规格（Environmental requirements）

项目	Item	规格	Specifications
海拔高度	Altitude	≤2000m	≤2000m
使用环境	Operating environment	控制柜内安装，开放式及室内使用	Installation within a control cabinet, open-type and indoor use
工作温度	Operating temperature	-10~55℃	-10~55℃
储存温度	Storage temperature	-40~75℃	-40~75℃
环境湿度	Ambient humidity	10~95%RH（无结露）	10~95%RH (non-condensing)
振动耐受	Vibration resistance	5~150Hz（X/Y/Z方向，1g/3.5mm位移）	5~150Hz (X/Y/Z direction, 1g /3.5mm displacement)
污染等级	Pollution degree	污染度2	Level 2
冷却方式	Cooling method	自然冷却	Natural air cooling
防护等级	IP rating	IP20	IP20
外壳材质	Enclosure material	阻燃材料	Self-extinguishable

* 注：若设备未依制造商指定方式使用，设备所提供的保护可能会被减弱。

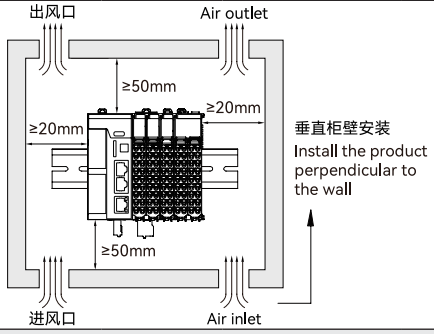
*Note: If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

5. 安装说明（Installation instructions）

5.1 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。 并排安装时，建议横向两侧预留 20mm 以上间距。

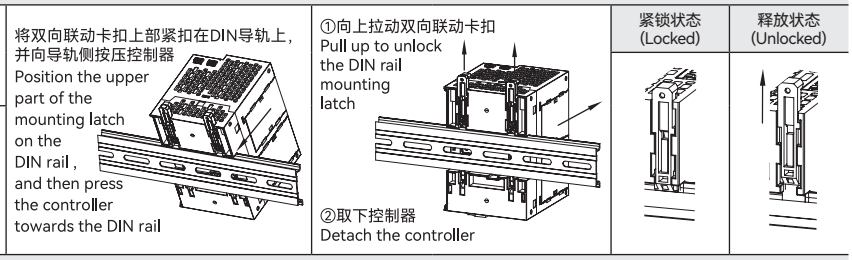
EN Please install the product perpendicular to the wall and ensure a sufficient cooling effect via natural air or a cooling fan. Please leave enough clearance around the product as shown in the right figure. During a side-by-side installation, please leave a horizontal clearance of more than 20 mm on both sides.



5.2 导轨拆装（DIN rail mounting and dismounting）

CN 安装控制器时，将控制器后方双向联动卡扣上部紧扣在 DIN 导轨上，并用力按压控制器下部，听到“咔哒”声，控制器即成功安装于 DIN 导轨上（安装前应保证双向联动卡扣处于紧锁状态，否则可能导致安装故障）；拆卸控制器时，将双向联动卡扣向上拉动一定距离，听到“咔哒”声后，取下控制器即可。

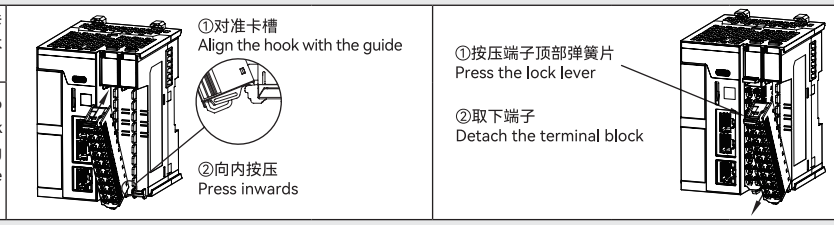
EN Before installation, check that the DIN rail mounting latch is in a locked state. During mounting, position the upper part of the mounting latch of the module on the DIN rail, and then press the controller against the DIN rail until a clear click is heard (which indicates the latch is momentarily opened and locked onto the rail). During dismounting, pull the latch upwards until a clear click is heard (which indicates the latch is unlocked), and then directly remove the controller.



5.3 可拆卸端子拆装 1（Removable terminal block mounting and dismounting I）

CN 安装可拆卸端子时，将端子底部对准模块底部凹槽并紧扣，上部对齐模块，当听到“咔哒”声即完成了端子的组装；拆卸端子时，向下按压端子顶部卡扣，使其脱离模块本体并以底部卡扣呈圆弧状斜向下施力，将端子取下。

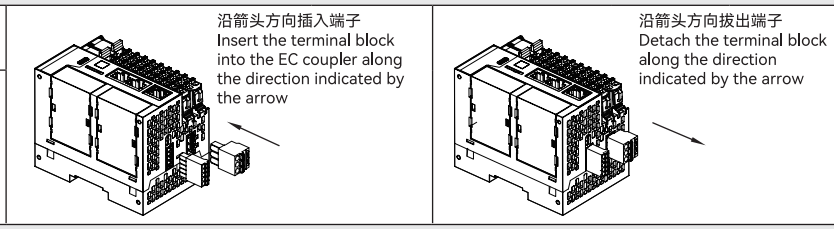
EN During mounting, align the mounting hook at the bottom of the terminal block to the guide of the module and press inwards on the terminal block until a clear click is heard (which indicates the terminal block has been locked to the module). During dismounting, press the lock lever on the terminal block and then detach it from the module.



5.4 可拆卸端子拆装 2（Removable terminal block mounting and dismounting II）

CN 可拆卸端子拆装如右图所示。

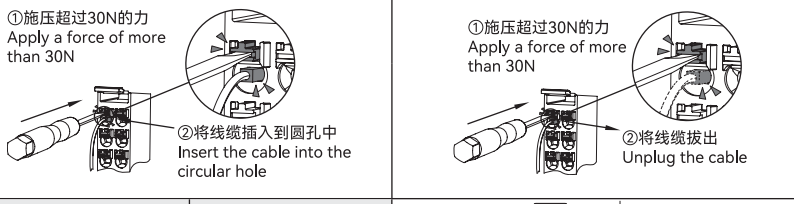
EN The mounting and dismounting of the removable terminal block are shown in the figures on the right side.



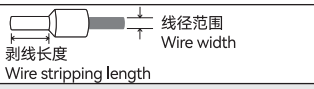
⚠ 5.5 线缆拆装 1（Cable connecting and disconnecting I）

CN 安装线缆时，将一字螺丝刀垂直插入可拆卸端子压块内，施加超过 30N 的力，此时圆孔打开，将准备好的线缆插入到圆孔中，拔出一字螺丝刀，轻拽线缆，线缆不松动即成功完成配线；反之即可取出线缆。端子规格及配线示意图如右图所示。

EN During connecting, insert the flat-blade screwdriver into the unlocking tab with a force of more than 30 N. Then insert a cable into the circular hole. Gently tug the cable after pulling out the screwdriver. If the cable is secured firmly, then the connection is finished. The reverse is the procedure for unplugging the cable. The terminal specifications and wiring diagram are shown in the right figure.



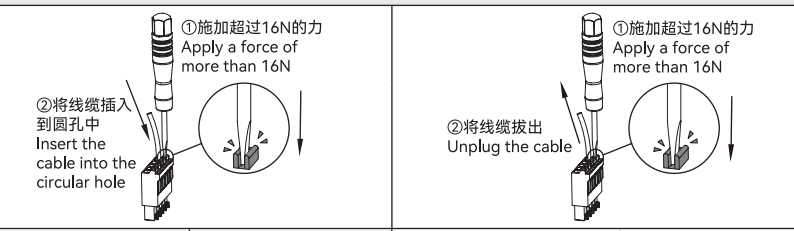
控制器端子（Terminal）	线径范围：AWG (Wire width)	剥线长度：mm (Wire stripping length)	按压力：N (Pressure)
18Pin IO端子（18Pin IO terminal）	24~17	8~10	30



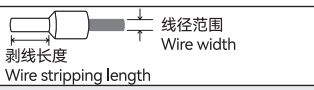
⚠ 5.6 线缆拆装 2（Cable connecting and disconnecting II）

CN 安装线缆时，将一字螺丝刀垂直插入可拆卸端子压块内，施加超过 16N 的力，此时圆孔打开，将准备好的线缆插入到圆孔中，拔出一字螺丝刀，轻拽线缆，线缆不松动即成功完成配线；反之即可取出线缆。端子规格及配线示意图如右图所示。

EN During connecting, insert the flat-blade screwdriver into the unlocking tab with a force of more than 16 N. Then insert a cable into the circular hole. Gently tug the cable after pulling out the screwdriver. If the cable is secured firmly, then the connection is finished. The reverse is the procedure for unplugging the cable. The terminal specifications and wiring diagram are shown in the right figure.



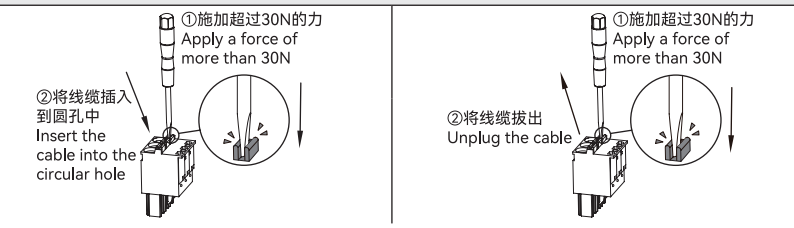
控制器端子（Terminal）	线径范围：AWG (Wire width)	剥线长度：mm (Wire stripping length)	按压力：N (Pressure)
5Pin 串行通讯端子（5Pin serial communication terminal）	24~16	8~10	16

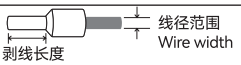


⚠ 5.7 线缆拆装 3（Cable connecting and disconnecting III）

CN 安装线缆时，将一字螺丝刀垂直插入可拆卸端子压块内，施加超过 30N 的力，此时圆孔打开，将准备好的线缆插入到圆孔中，拔出一字螺丝刀，轻拽线缆，线缆不松动即成功完成配线；反之即可取出线缆。端子规格及配线示意图如右图所示。

EN During connecting, insert the flat-blade screwdriver into the unlocking tab with a force of more than 30 N. Then insert a cable into the circular hole. Gently tug the cable after pulling out the screwdriver. If the cable is secured firmly, then the connection is finished. The reverse is the procedure for unplugging the cable. The terminal specifications and wiring diagram are shown in the right figure.



控制器端子（Terminal）	线径范围：AWG (Wire width)	剥线长度：mm (Wire stripping length)	按压力：N (Pressure)	
DC24V 电源端子（DC24V power supply terminal）	26~12	9~10	30	

警告：只能使用 75℃铜导线。

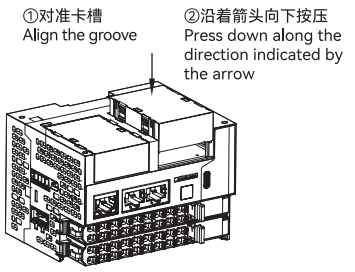
⚠ Warning: Use only a copper conductor that is 75° C.

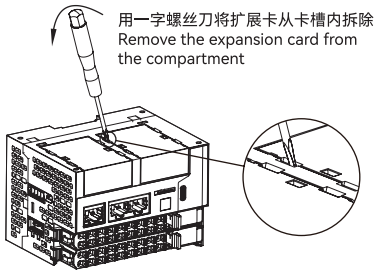
Attention: Utilisez uniquement un conducteur en cuivre à 75° C.

5.8 扩展卡拆装（Expansion card mounting and dismounting）

CN 安装扩展卡时，水平放置控制器，将扩展卡沿着卡扣垂直放入控制器的卡槽中，并向下按压扩展卡。当听到明显声音后，检查表面是否平齐，若平齐，则扩展卡安装完成；拆卸扩展卡时，将一字螺丝刀插入卡扣，按箭头方向撬动扩展卡。当听到明显声音时，扩展卡与控制器脱离，此时将扩展卡垂直拿出，扩展卡拆卸完成。

EN During dismounting, place the controller horizontally, put the expansion card into the slot of the controller along the card slot, and press the expansion card downwards. When a distinct sound is heard, check whether the surface is flush, if flush, the expansion card installation is complete; when removing the expansion card, insert a screwdriver into the card slot and pry the expansion card in the direction of the arrow. When you hear the obvious sound, the expansion card is detached from the controller, at this time, the expansion card will be taken out vertically, the expansion card disassembly is complete.





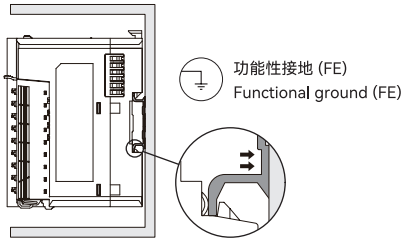
5.9 接地（Functional ground）

CN QP 系列控制器通过背部金属弹片接地，示意图如右图所示。

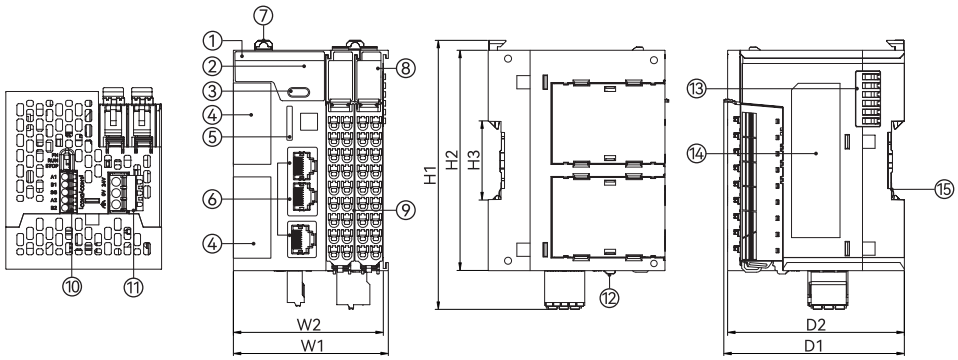
EN The QP series controller is grounded through a metal spring on the back side, as shown in the diagram on the right.

产品型号（Product model）

HCQ0P-1200-D4
HCQ1P-1300-D4



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

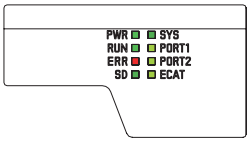


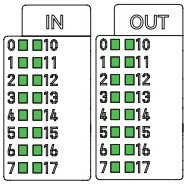
序号 (No.)	名称		Name		功能	Function
1	产品型号		Product model		显示CPU单元型号	Displays CPU unit model
2	指示灯		Indicator		显示控制器运行，SD卡/U盘连接与通讯接口状态	Displays the status of controller operation, SD card/U disk connection, and communication interface
3	Type-C接口		Type-C interface		预留，当前版本暂不支持任何功能	Reserved. No functions are supported in the current version
4	BD扩展接口	EXP-A：扩展卡槽A	BD expansion interface	EXP-A: Expansion slot A	扩展卡卡槽，可选配支持的扩展卡	Expansion card slot, which can be optionally equipped with supported expansion cards
		EXP-B：扩展卡槽B		EXP-B: Expansion slot B		
5	SD卡槽		SD card slot		装载SD 卡，支持FAT32/exFAT格式，最大支持128G(SD卡需要客户自行选购)	Loads the SD card. It supports FAT32/exFAT formats and can support up to 128G at most (the SD card needs to be purchased by the customer themselves)
6	RJ45通讯接口	PORT1：EtherNet通讯接口	RJ45 communication interface	PORT1: EtherNet communication interface	百兆以太网口，支持Modbus TCP、OPC UA、EtherNet/IP Scanner和Adapter 默认IPV4：192.168.188.100 子网掩码：255.255.255.0	100Mbps Ethernet port, supports Modbus TCP, OPC UA, EtherNet/IP Scanner and Adapter Default IPV4: 192.168.188.100 Subnet mask: 255.255.255.0
		PORT2：EtherNet通讯接口		PORT2: EtherNet communication interface		
		EtherCAT：EtherCAT通讯接口		EtherCAT: EtherCAT communication interface	百兆以太网口，支持EtherCAT主站	100Mbps Ethernet port, supports EtherCAT masters
7	双向联动卡扣		DIN rail mounting latch		固定模块在DIN导轨上	Mounts the module onto a DIN rail
8	模块状态指示灯		Module status indicator		显示模块与通道状态	Displays module and channel status
9	18Pin IO端子	左侧 输入	18Pin IO terminal	Left input	16通道数字量输入	16-channel digital input
		右侧 输出		Right output	16通道数字量输出	16-channel digital output
10	5Pin 串行通讯端子		5 Pin serial communication terminal		RS485通讯接口*2	RS485 communication interface*2
11	DC24V 电源端子		DC24V power supply terminal		DC24V供电接口	DC24V power supply interface
12	FN/RUN/STOP开关		FN/RUN/STOP switch		拨到FN为复位EtherNet通讯接口IP地址，拨到RUN为运行控制器程序，拨到STOP为停止控制器程序	When switched to FN, it resets the IP address of the EtherNet communication interface. When switched to RUN, it runs the controller program. When switched to STOP, it stops the controller program
13	扩展模块通讯接口		Expansion terminal communication interface		主机和IO模块通讯及供电接口，不支持热插拔	The interface for the communication and power supply of the host and IO modules, does not support hot-swapping
14	标签		Label		显示CPU单元型号，规格参数、内部序列号等基本信息	Displays the basic information including CPU unit model, specification parameters, and internal serial number
15	接地弹片		Grounding spring		功能性接地（FE）	Functional grounding (FE)

型号（Model）	外形尺寸（Dimension）：mm							重量（Weight）：g
	W1	W2	H1	H2	H3	D1	D2	
HCQ0P-1200-D4	70.30	67.99	122.05	100.00	35.40	81.92	80.20	278 approx.
HCQ1P-1300-D4								

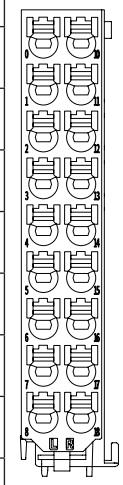
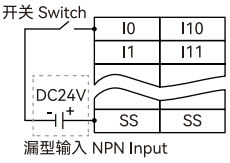
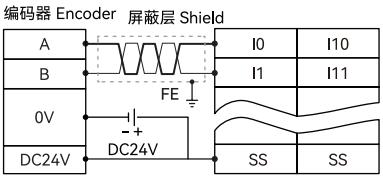
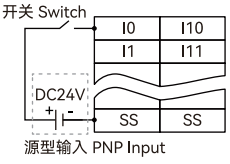
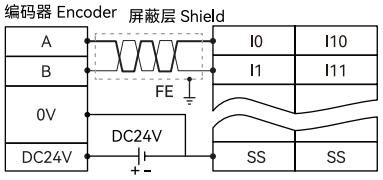
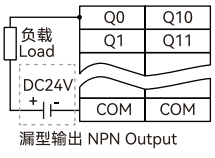
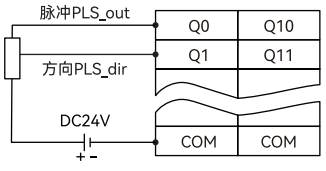
7. 指示灯说明（Indicator description）

丝印 (Screen printing)	指示灯含义 (Indicator meaning)	颜色 (Color)	状态	Status	说明	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
RUN	运行 (Run)	绿色 (Green)	熄灭	Not lit	停止状态	Stop
			常亮	Lit	正常运行	Run
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
SD	SD 卡状态 (SD card status)	绿色 (Green)	熄灭	Not lit	SD 卡未插入或未运行	SD card is not inserted or not running
			常亮	Lit	SD 卡加载成功或读写数据中	SD card is successfully loaded or data is being read and written
SYS	系统状态 (System status)	绿色 (Green)	其它	Other	负载过高或发生故障	Load is too high or a fault occurs
			闪烁	Blinking	正常运行	Run
PORT1/PORT2	EtherNet 通讯 (EtherNet communication)	黄绿色 (Yellow-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
			常亮	Lit	建立物理连接但无通讯数据	Physical connection without communication data
ECAT	EtherCAT 通讯 (EtherCAT communication)	黄绿色 (Yellow-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
			常亮	Lit	建立物理连接但无通讯数据	Physical connection without communication data
IN N (0~7,10~17)	输入 (Input)	绿色 (Green)	熄灭	Not lit	输入通道 N 未检测到输入信号	The input channel N has not detected input signals
			常亮	Lit	输入通道 N 检测到输入信号	The input channel N has detected input signals
OUT N (0~7,10~17)	输出 (Output)	绿色 (Green)	熄灭	Not lit	输出通道 N 无信号输出	There is no output signal in this channel
			常亮	Lit	输出通道 N 有信号输出	There are output signals in this channel



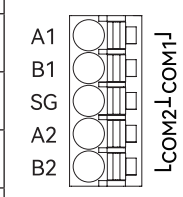
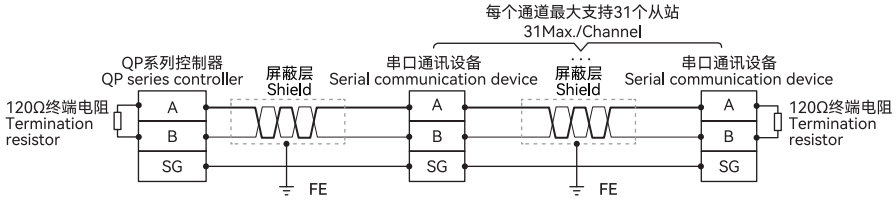


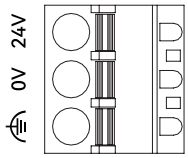
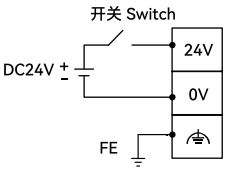
8. 端子及配线说明（Terminal and wiring description）

18Pin IO 端子说明 (18Pin IO terminal descirption)			IN		OUT		类型（Type）	通用IO接线（General IO wiring）	高速IO接线（High-speed IO wiring）
0		10	I0	I10	Q0	Q10	漏型输入 NPN input		
1		11	I1	I11	Q1	Q11			
2		12	I2	I12	Q2	Q12			
3		13	I3	I13	Q3	Q13	源型输入 PNP input		
4		14	I4	I14	Q4	Q14			
5		15	I5	I15	Q5	Q15			
6		16	I6	I16	Q6	Q16	漏型输出 NPN output		
7		17	I7	I17	Q7	Q17			
8		18	SS*	SS*	COM*	COM*			

* 注：输入公共端 SS 内部导通，输出公共端 COM 内部导通。

*Note: The input terminals SS are internally conductive, and so are the output terminals COM.

5Pin串行通讯端子说明（5Pin serial communication terminal description）			RS485接线（RS485 wiring）
COM1 RS485通讯信号 + COM1 RS485 communication signal +	A1		
COM1 RS485通讯信号 - COM1 RS485 communication signal -	B1		
信号参考地 Signal reference ground	SG		
COM2 RS485通讯信号 + COM2 RS485 communication signal +	A2		
COM2 RS485通讯信号 - COM2 RS485 communication signal -	B2		

DC24V电源端子说明（DC24V power supply terminal description）		接线（Wiring）
24V		
0V		