



禾川科技官方网站

|                 |                   |
|-----------------|-------------------|
| HPPP2030000-00C |                   |
| Date            | 2024-12-20        |
| 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 QX 系列硬件手册。  
Please refer to the QX series hardware manual for more detailed information.

2. 命名规则 (Model identification)

HC QX - AD 16 - D 4 - xxxx  
1 2 3 4 5 6 7

|    |                                              |    |                                |    |                           |   |                                               |
|----|----------------------------------------------|----|--------------------------------|----|---------------------------|---|-----------------------------------------------|
| 1  | 产品名称 (Product name)                          | 3  | 功能模块 (Function module)         | 4  | 通道数量 (Number of channels) | 6 | 迭代版本 (Iteration version)                      |
| HC | 禾川 (Hechuan Technology)                      | AD | 模拟量输入 (Analog input)           | 16 | 16通道 (16 channels)        | 4 | 第4代 (The 4th generation)                      |
| 2  | 产品系列 (Product series)                        | DA | 模拟量输出 (Analog output)          | 5  | 电源类型 (Power supply type)  | 7 | 软件/固件定制代码 (Customized software/firmware Code) |
| QX | Q系列通用扩展 (Q-series general-purpose expansion) | TS | 温度测量 (Temperature measurement) | D  | 直流电源 (DC power supply)    | x | 0~9/A~Z/空(N/A)                                |

3. 适用型号 (Applicable model)

| 名称 (Name)                                | 型号 (Model)     | 模块简要说明                                  | Brief description                                                                     |
|------------------------------------------|----------------|-----------------------------------------|---------------------------------------------------------------------------------------|
| 模拟量输入模块<br>Analog input (AI) module      | HCQX-AD04-D4   | 4通道模拟量差分输入, ±10V, 0~20mA, 16bit         | 4-channel analog differential input, ±10V, 0~20mA, 16bit                              |
|                                          | HCQX-AD04-D4-C | 4通道模拟量差分输入, ±10V, 0~20mA, 16bit, 兼容D2版本 | 4-channel analog differential input, ±10V, 0~20mA, 16bit, compatible with D2 version  |
| 模拟量输出模块<br>Analog output (AO) module     | HCQX-DA04-D4   | 4通道模拟量单端输出, ±10V, 0~20mA, 16bit         | 4-channel analog single-ended output, ±10V, 0~20mA, 16bit                             |
|                                          | HCQX-DA04-D4-C | 4通道模拟量单端输出, ±10V, 0~20mA, 16bit, 兼容D2版本 | 4-channel analog single-ended output, ±10V, 0~20mA, 16bit, compatible with D2 version |
| 温度测量模块<br>Temperature measurement module | HCQX-TS04-D4   | 4通道温度传感器信号输入, 支持PT&TC, 24bit            | 4-channel temperature sensor signal input, supports PT&TC, 24bit                      |

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

4.1 通用电气规格 (General electrical specifications)

| 型号 (Model) <sup>1</sup> | 额定电压 / 功率 <sup>2</sup> | Rated voltage/power <sup>2</sup> | 模拟量输入输出类型           | Analog input/output type                 |
|-------------------------|------------------------|----------------------------------|---------------------|------------------------------------------|
| HCQX-AD04-D4            | DC12V, 1.2W            | DC12V, 1.2W                      | 模拟量输入: ±10V, 0~20mA | Analog input: ±10V, 0~20mA               |
| HCQX-AD04-D4-C          |                        |                                  |                     |                                          |
| HCQX-DA04-D4            |                        |                                  | 模拟量输出: ±10V, 0~20mA | Analog output: ±10V, 0~20mA              |
| HCQX-DA04-D4-C          |                        |                                  |                     |                                          |
| HCQX-TS04-D4            |                        |                                  | 温度传感器输入: 支持PT&TC    | Temperature sensor input: Supports PT&TC |

\* 注: 1. 所有型号仅能在由限功率电源 (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时的最大功率。  
\*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.

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-condensation)                                     |
| 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                                             |

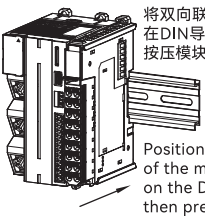
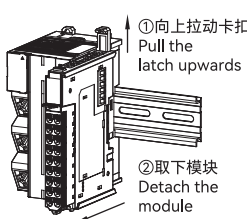
\* 注: 若设备未依制造商指定方式使用, 设备所提供的保护可能会被减弱。  
\*Note: If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

5. 安装说明 (Installation instructions)

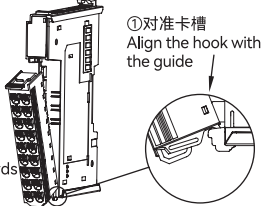
5.1 控制柜安装 (Installation within a control cabinet)

|    |                                                                                                                                                                                                                                                                                                                        |  |
|----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| 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;<br>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. |  |

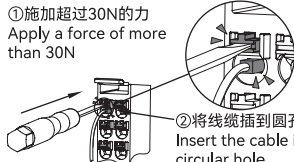
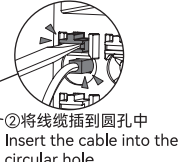
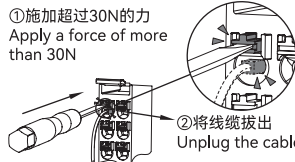
5.2 导轨拆装 (DIN rail mounting and dismounting)

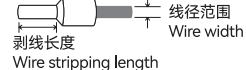
|    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                               |                                                                                     |               |                 |
|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------|-----------------|
| CN | 安装模块时，将模块侧面导槽对准 Q 系列控制器导槽后，向内按压模块，听到“咔哒”声，模块成功安装于 DIN 导轨上（安装前保证双向联动卡扣处于紧锁状态，否则可能导致安装故障）；拆卸模块时，将卡扣向上拉动一定距离，听到“咔哒”声后，取下模块即可。                                                                                                                                                                                                                                                                                                                                                                                  |                              |  | 紧锁状态 (Locked) | 释放状态 (Unlocked) |
| EN | Before installation, check that the DIN rail mounting latch is in a locked state. During mounting, align the groove of the module to that of the Q series controller to engage them together, and then press the module towards 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 module. | Position the upper part of the mounting latch on the DIN rail, and then press the module towards the DIN rail | ②取下模块 Detach the module (2) Detach the module                                       |               |                 |

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

|    |                                                                                                                                                                                                                                                                                                                                                     |                                                                                    |                                                                                   |                                                          |                                                                                     |
|----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|----------------------------------------------------------|-------------------------------------------------------------------------------------|
| 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。                                                                                                                                                                                                                                                  |  |  | ①按压端子顶部弹簧片 Press the lock lever (1) Press the lock lever |  |
| 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. |                                                                                    |                                                                                   |                                                          |                                                                                     |

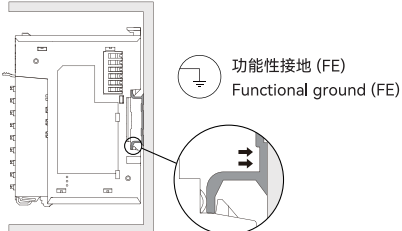
5.4 线缆拆装 (Cable connecting and disconnecting)

|    |                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                    |                                                                                    |                                                                                     |                                                                                     |
|----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| 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，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. |                                                                                    |                                                                                    |                                                                                     |                                                                                     |

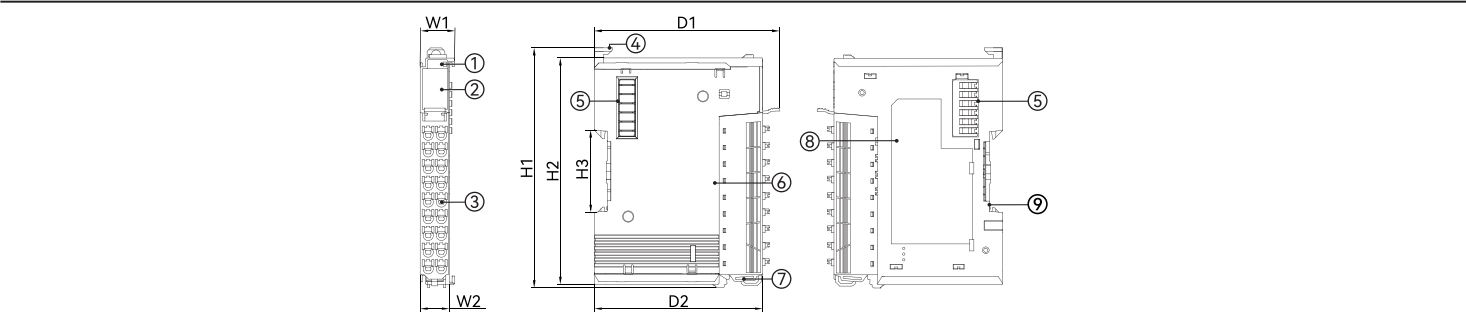
| 模块端子 (Terminal) | 线径范围: AWG (Wire width) | 剥线长度: mm (Wire stripping length) | 按压力: N (Pressure) |                                                                                     |
|-----------------|------------------------|----------------------------------|-------------------|-------------------------------------------------------------------------------------|
| 18Pin           | 24~17                  | 8~10                             | 30                |  |

警告：只能使用 75°C 铜导线。  
Warning: Use only a copper conductor that is 75° C.  
Attention: Utilisez uniquement un conducteur en cuivre à 75° C.

5.5 接地 (Functional ground)

| 产品型号 (Product model) |                                                                                                                 |                                                                                       |
|----------------------|-----------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| CN                   | QX 系列模块通过背部金属弹片接地，如右图所示。                                                                                        |  |
| EN                   | The QX series module is grounded through a metal spring on the back side, as shown in the diagram on the right. |                                                                                       |
|                      | HCQX-AD04-D4                                                                                                    |                                                                                       |
|                      | HCQX-AD04-D4-C                                                                                                  |                                                                                       |
|                      | HCQX-DA04-D4                                                                                                    |                                                                                       |
|                      | HCQX-DA04-D4-C                                                                                                  |                                                                                       |
|                      | HCQX-TS04-D4                                                                                                    |                                                                                       |

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

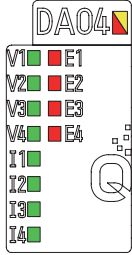
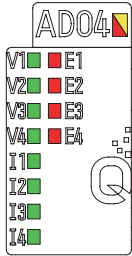


| 序号(No.) | 名称         | Name                                     | 功能                          | Function                                                                                                                                     |
|---------|------------|------------------------------------------|-----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|
| 1       | 产品型号       | Product model                            | 模块型号                        | Module model numbers                                                                                                                         |
| 2       | 模块状态指示灯    | Module status indicator                  | 显示模块与通道状态                   | Display module and channel status                                                                                                            |
| 3       | 18Pin IO端子 | 18Pin IO terminal                        | 输入输出信号接口                    | Input and output signal interface                                                                                                            |
| 4       | 双向联动卡扣     | DIN rail mounting latch                  | 固定模块在DIN导轨上                 | Mount the module onto a DIN rail                                                                                                             |
| 5       | 扩展模块通讯接口   | Expansion module communication interface | 主机和IO模块或IO模块间通讯及供电接口，不支持热插拔 | The interface for the communication and power supply between the host and the IO module or between IO modules, does not support hot-swapping |
| 6       | 侧边丝印       | Side silk screen printing                | 模块配线图                       | Channel wiring diagram                                                                                                                       |
| 7       | 集线结构       | Cable collector                          | 收纳IO线缆                      | Organize IO cables                                                                                                                           |
| 8       | 标签         | Label                                    | 显示模块型号、规格参数、内部序列号等基本信息      | Display the basic information including module model, specification parameters, and internal serial number                                   |
| 9       | 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    |                 |
| HCQX-AD04-D4   | 15.20                 | 13.00 | 106.00 | 100.00 | 35.40 | 81.90 | 74.50 | 70 approx.      |
| HCQX-DA04-D4   |                       |       |        |        |       |       |       |                 |
| HCQX-AD04-D4-C |                       |       |        |        |       |       |       |                 |
| HCQX-DA04-D4-C |                       |       |        |        |       |       |       |                 |
| HCQX-TS04-D4   |                       |       |        |        |       |       |       |                 |

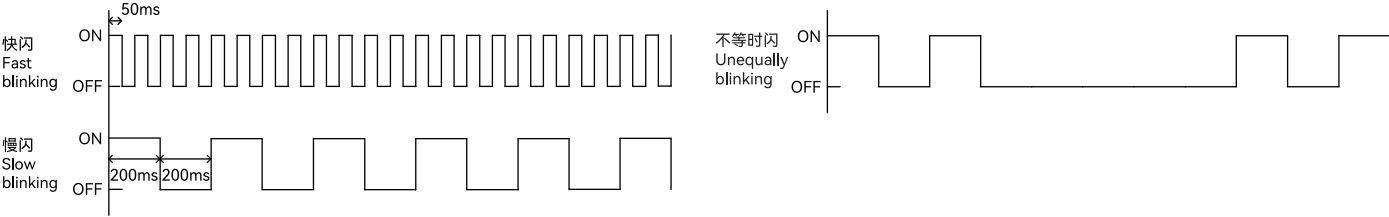
7. 指示灯说明 (Indicator description)

| 指示灯含义<br>(Indicator meaning) |                              | 颜色<br>(Color) | 状态   | Status             | 说明              | Description                        |                                                               |
|------------------------------|------------------------------|---------------|------|--------------------|-----------------|------------------------------------|---------------------------------------------------------------|
| 模块状态<br>(Module status)      | 黄色<br>(Yellow)               |               | 熄灭   | Not lit            | Init (初始化状态)    | Initialization                     |                                                               |
|                              |                              |               | 快闪   | Fast blinking      | Preop (预操作状态)   | Pre Operational                    |                                                               |
|                              |                              |               | 慢闪   | Slow blinking      | Safeop (安全操作状态) | Safe Operational                   |                                                               |
|                              |                              |               | 常亮   | Lit                | OP (可操作状态)      | Operational                        |                                                               |
|                              |                              |               | 不等时闪 | unequally blinking | Boot (引导程序状态)   | Bootstrap                          |                                                               |
|                              | 红色<br>(Red)                  |               | 慢闪   | Slow blinking      | 总线信号输入状态异常      | The module is in an abnormal state |                                                               |
| 丝印<br>(Screen printing)      | 指示灯含义<br>(Indicator meaning) | 颜色<br>(Color) | 状态   | Status             | 说明              | Description                        |                                                               |
| AD04-D4/AD04-D4-C            |                              |               |      |                    |                 |                                    |                                                               |
| V N<br>(1~4)                 | 通道状态<br>(Channel status)     | 绿色<br>(Green) |      | 熄灭                 | Not lit         | 通道 N 电压模式未启动                       | The voltage mode of channel N is not enabled                  |
|                              |                              |               |      | 常亮                 | Lit             | 通道 N 电压模式启动                        | The voltage mode of channel N is enabled                      |
| I N<br>(1~4)                 |                              | 绿色<br>(Green) |      | 熄灭                 | Not lit         | 通道 N 电流模式未启动                       | The current mode of channel N is not enabled                  |
|                              |                              |               |      | 常亮                 | Lit             | 通道 N 电流模式启动                        | The current mode of channel N is enabled                      |
| E N<br>(1~4)                 |                              | 红色<br>(Red)   |      | 熄灭                 | Not lit         | 通道 N 无错误发生                         | No error occurs in channel N                                  |
|                              |                              |               |      | 常亮                 | Lit             | 通道 N 有错误发生                         | An error occurs in channel N                                  |
| DA04-D4/DA04-D4-C            |                              |               |      |                    |                 |                                    |                                                               |
| V N<br>(1~4)                 | 通道状态<br>(Channel status)     | 绿色<br>(Green) |      | 熄灭                 | Not lit         | 通道 N 电压模式未启动                       | The voltage mode of channel N is not enabled                  |
|                              |                              |               |      | 常亮                 | Lit             | 通道 N 电压模式启动                        | The voltage mode of channel N is enabled                      |
| I N<br>(1~4)                 |                              | 绿色<br>(Green) |      | 熄灭                 | Not lit         | 通道 N 电流模式未启动                       | The current mode of channel N is not enabled                  |
|                              |                              |               |      | 常亮                 | Lit             | 通道 N 电流模式启动                        | The current mode of channel N is enabled                      |
| E N<br>(1~4)                 |                              | 红色<br>(Red)   |      | 熄灭                 | Not lit         | 通道 N 无错误发生                         | No error occurs in channel N                                  |
|                              |                              |               |      | 常亮                 | Lit             | 通道 N 有错误发生                         | An error occurs in channel N                                  |
| TS04-D4                      |                              |               |      |                    |                 |                                    |                                                               |
| T N<br>(1~4)                 | 通道状态<br>(Channel status)     | 绿色<br>(Green) |      | 熄灭                 | Not lit         | 通道 N 当前未选用热电偶传感器                   | Channel N is not currently connected to a thermocouple sensor |
|                              |                              |               |      | 常亮                 | Lit             | 通道 N 当前选用的是热电偶传感器                  | Channel N is currently connected to a thermocouple sensor     |
| P N<br>(1~4)                 |                              | 绿色<br>(Green) |      | 熄灭                 | Not lit         | 通道 N 当前未选用热电阻传感器                   | Channel N is not currently connected to an RTD sensor         |
|                              |                              |               |      | 常亮                 | Lit             | 通道 N 当前选用的是热电阻传感器                  | Channel N is currently connected to an RTD sensor             |
| E N<br>(1~4)                 |                              | 红色<br>(Red)   |      | 熄灭                 | Not lit         | 通道 N 无错误发生                         | No error occurs in channel N                                  |
|                              |                              |               |      | 常亮                 | Lit             | 通道 N 有错误发生                         | An error occurs in channel N                                  |



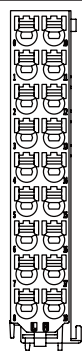
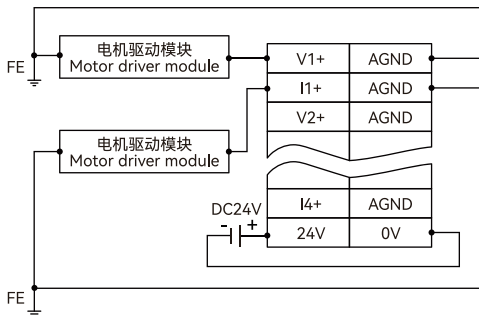
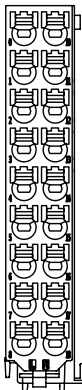
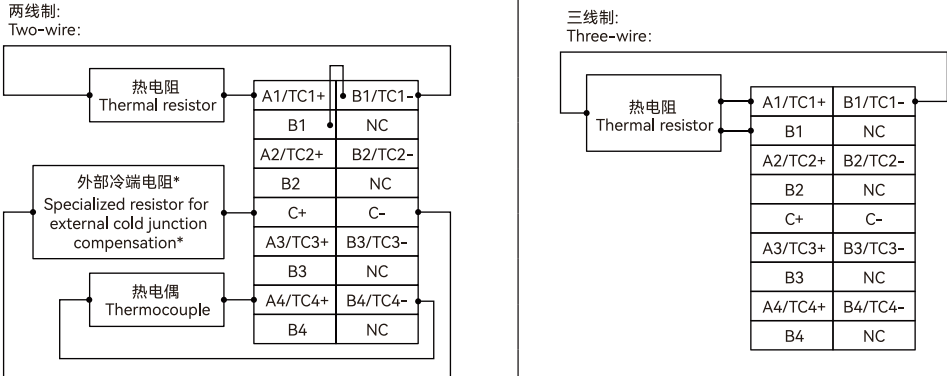
指示灯闪烁频率如下图所示:

The indicator blinking frequency is shown below.



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

| HCQX-AD04-D4/HCQX-AD04-D4-C |   |  |    | 接线 (Wiring) |  |
|-----------------------------|---|--|----|-------------|--|
| V1+                         | 0 |  | 10 | V1-         |  |
| I1+                         | 1 |  | 11 | I1-         |  |
| V2+                         | 2 |  | 12 | V2-         |  |
| I2+                         | 3 |  | 13 | I2-         |  |
| V3+                         | 4 |  | 14 | V3-         |  |
| I3+                         | 5 |  | 15 | I3-         |  |
| V4+                         | 6 |  | 16 | V4-         |  |
| I4+                         | 7 |  | 17 | I4-         |  |
| 24V                         | 8 |  | 18 | 0V          |  |

| HCQX-DA04-D4/HCQX-DA04-D4-C |   |                                                                                   |    | 接线 (Wiring)                  |                                                                                    |
|-----------------------------|---|-----------------------------------------------------------------------------------|----|------------------------------|------------------------------------------------------------------------------------|
| V1+                         | 0 |  | 10 | AGND                         |  |
| I1+                         | 1 |                                                                                   | 11 | AGND                         |                                                                                    |
| V2+                         | 2 |                                                                                   | 12 | AGND                         |                                                                                    |
| I2+                         | 3 |                                                                                   | 13 | AGND                         |                                                                                    |
| V3+                         | 4 |                                                                                   | 14 | AGND                         |                                                                                    |
| I3+                         | 5 |                                                                                   | 15 | AGND                         |                                                                                    |
| V4+                         | 6 |                                                                                   | 16 | AGND                         |                                                                                    |
| I4+                         | 7 |                                                                                   | 17 | AGND                         |                                                                                    |
| 24V                         | 8 |                                                                                   | 18 | 0V                           |                                                                                    |
|                             |   |                                                                                   |    | FE 功能性接地 (Functional ground) |                                                                                    |
| HCQX-TS04-D4                |   |                                                                                   |    | 接线 (Wiring)                  |                                                                                    |
| A1/TC1+                     | 0 |  | 10 | B1/TC1-                      |  |
| B1                          | 1 |                                                                                   | 11 | NC                           |                                                                                    |
| A2/TC2+                     | 2 |                                                                                   | 12 | B2/TC2-                      |                                                                                    |
| B2                          | 3 |                                                                                   | 13 | NC                           |                                                                                    |
| C+                          | 4 |                                                                                   | 14 | C-                           |                                                                                    |
| A3/TC3+                     | 5 |                                                                                   | 15 | B3/TC3-                      |                                                                                    |
| B3                          | 6 |                                                                                   | 16 | NC                           |                                                                                    |
| A4/TC4+                     | 7 |                                                                                   | 17 | B4/TC4-                      |                                                                                    |
| B4                          | 8 |                                                                                   | 18 | NC                           |                                                                                    |

\* 注：外部冷端电阻出厂默认安装。  
\*Note: External cold-junction compensation resistor (factory default installation).