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|-----------------|-------------------|
| HPPP2080000-00D | |
| 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风险和财产损失。

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
-
ID
16
-
D
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-
xxxx

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| | | | | | | | |
|----------|--|----------|---------------------------------|----------|--|----------|---------------------------------|
| 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) | ID | 数字量输入 (Digital input (DI)) | 16 | 16通道 (16 channels) | 4 | 第4代 (The 4th generation) |
| | | OD | 数字量输出 (Digital output (DO)) | | | | |
| | | MD | 数字量混合 (Mixed DI/DO) | | | | |
| 2 | 产品系列 | 5 | 电源类型 (Power supply type) | 7 | 软件/固件定制代码 (Customized code/firmware code) | | |
| QX | Q系列通用扩展 (Q-series general-purpose expansion) | 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 |
|--|------------------|---|---|
| 数字量输入模块 Digital input module | HCQX-ID16-D4 | 16通道数字量输入，支持NPN和PNP | 16-channel digital input, supports NPN and PNP |
| | HCQX-ID32-D4 | 32通道数字量输入，支持NPN和PNP | 32-channel digital input, supports NPN and PNP |
| | HCQX-OD16-D4 | 16通道数字量输出，芯片输出，支持NPN | 16-channel digital output, supports NPN |
| 数字量输出模块 Digital output module | HCQX-OD16-D4-PNP | 16通道数字量输出，芯片输出，支持PNP | 16-channel digital output, supports PNP |
| | HCQX-OD32-D4 | 32通道数字量输出，芯片输出，支持NPN | 32-channel digital output, supports NPN |
| | HCQX-OD32-D4-PNP | 32通道数字量输出，芯片输出，支持PNP | 32-channel digital output, supports PNP |
| | HCQX-OC08-D4 | 8通道数字量输出，继电器类型 | 8-channel digital output, relay type |
| 数字量混合模块 Mixed digital input/digital output module | HCQX-MD16-D4 | 8通道数字量输入8通道数字量输出，芯片输出，支持NPN和PNP型输入方式和NPN型输出方式 | 8-channel digital input & 8-channel digital output, supports NPN and PNP input and NPN output |
| | HCQX-MD16-D4-PNP | 8通道数字量输入8通道数字量输出，芯片输出，支持NPN和PNP型输入方式和PNP型输出方式 | 8-channel digital input & 8-channel digital output, supports NPN and PNP input and PNP output |
| | HCQX-MD32-D4 | 16通道数字量输入16通道数字量输出，芯片输出，支持NPN和PNP型输入方式和NPN型输出方式 | 16-channel digital input & 16-channel digital output, supports NPN and PNP input and NPN output |
| | HCQX-MD32-D4-PNP | 16通道数字量输入16通道数字量输出，芯片输出，支持NPN和PNP型输入方式和PNP型输出方式 | 16-channel digital input & 16-channel digital output, supports NPN and PNP input and PNP output |

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) ¹ | 额定电压 / 功率 ² | Rated voltage/power ² | 数字量输入 / 输出类型 | Digital input/output type |
|-------------------------|------------------------|----------------------------------|--------------------------------------|--|
| HCQX-ID16-D4 | DC12V, 1W | DC12V, 1W | 数字量输入: DC24V(DC20.4~28.8V), 4.1mA/Ch | Digital input: DC24V(DC20.4~28.8V), 4.1mA/Ch |
| HCQX-ID32-D4 | | | 数字量输入: DC24V(DC20.4~28.8V), 4.1mA/Ch | Digital input: DC24V(DC20.4~28.8V), 4.1mA/Ch |
| HCQX-MD16-D4 | | | 数字量输入: DC24V, 500mA/Ch, 4A/8Ch | Digital output: DC24V, 500mA/Ch, 4A/8Ch |
| HCQX-MD16-D4-PNP | | | 负载类型: 阻性/电磁负载 | Load type: Resistive/Pilot duty |
| HCQX-MD32-D4 | DC12V, 1.2W | DC12V, 1.2W | 数字量输入: DC24V(DC20.4~28.8V), 4.1mA/Ch | Digital input: DC24V(DC20.4~28.8V), 4.1mA/Ch |
| HCQX-MD32-D4-PNP | | | 数字量输出: DC24V, 500mA/Ch, 4A/16Ch | Digital output: DC24V, 500mA/Ch, 4A/16Ch |
| HCQX-OD16-D4 | DC12V, 1.3W | DC12V, 1.3W | 负载类型: 阻性/电磁负载 | Load type: Resistive/Pilot duty |
| HCQX-OD16-D4-PNP | | | 数字量输出: DC24V, 500mA/Ch, 8A/32Ch | Digital output: DC24V, 500mA/Ch, 8A/32Ch |
| HCQX-OD32-D4 | | | 负载类型: 阻性/电磁负载 | Load type: Resistive/Pilot duty |
| HCQX-OD32-D4-PNP | DC12V, 1.2W | DC12V, 1.2W | 继电器输出: DC24V(DC20.4~28.8V), 16A/8Ch | Relay output: DC24V(DC20.4~28.8V), 16A/8Ch |
| HCQX-OC08-D4 | | | 负载类型: 阻性/电磁/钨丝灯负载 | Load type: Resistive/Pilot duty/Tungsten |

*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。

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°C | -10~55°C |
| 储存温度 | Storage temperature | -40~75°C | -40~75°C |
| 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。

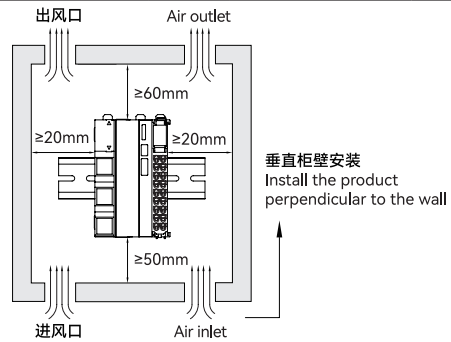
*Note: If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

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；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。

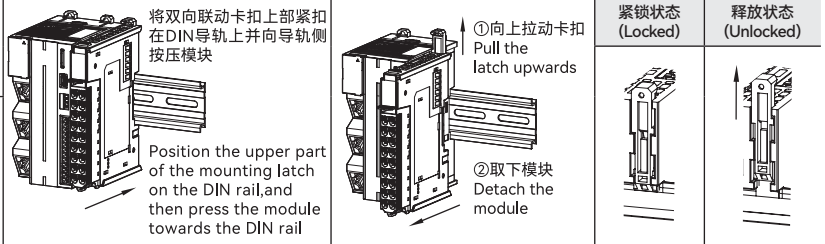
EN Please install the product perpendicular to the wall and ensure a sufficient cooling effect via natural air or a cooling fan. Please leave enough clearance around the product as shown in the right figure. During a side-by-side installation, please leave a horizontal clearance of more than 20 mm on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

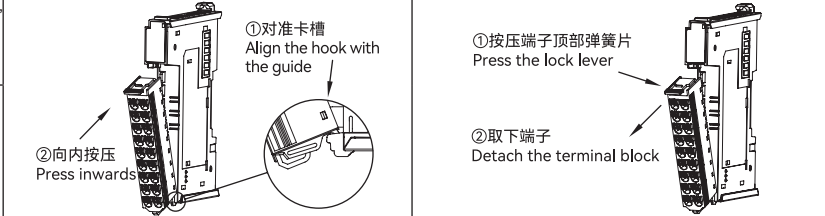
EN Before installation, check that the DIN rail mounting latch is in a locked state. During mounting, align the groove of the module to that of the Q series controller to engage them together, and then press the module towards the DIN rail until a clear click is heard (which indicates the latch is momentarily 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.



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形斜向下施力，将端子取下。

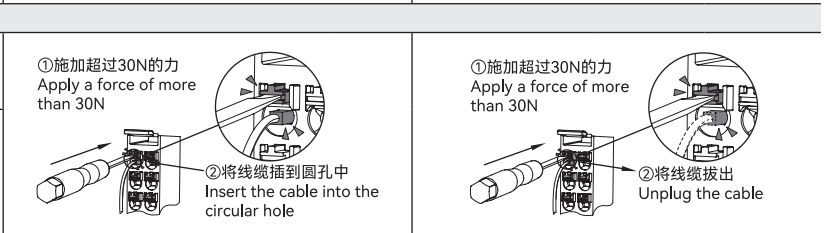
EN During mounting, align the mounting hook at the bottom of the terminal block to the guide of the module and press inwards on the terminal block until a clear click is heard (which indicates the terminal block has been locked to the module). During dismounting, press the lock lever on the terminal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



5.4 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，拨出一字螺丝刀，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) | 线径范围 (Wire width) |
|-----------------|------------------------|----------------------------------|-------------------|------------------------------|
| 18Pin | 24~17 | 8~10 | 30 | 剥线长度 (Wire stripping length) |

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.

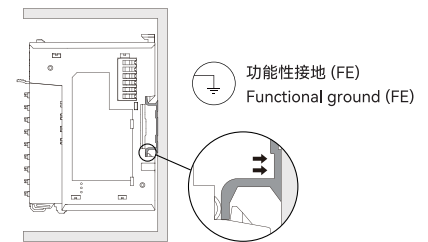
5.5 接地 (Functional ground)

CN QX 系列模块通过背部金属弹片接地，如右图所示。

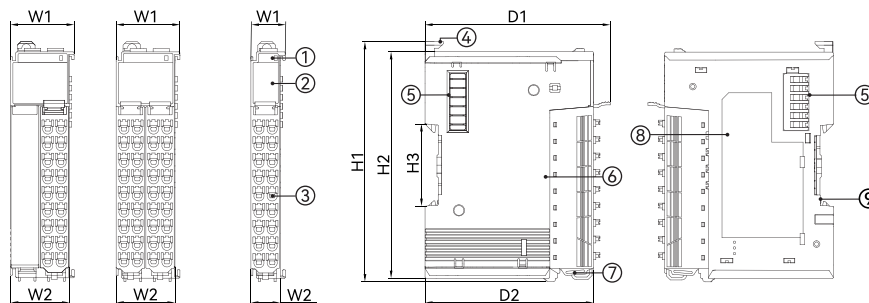
EN The QX series module is grounded through a metal spring on the back side, as shown in the diagram on the right.

产品型号 (Product model)

HCQX-OC08-D4



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



R 双排模块 **T** 单排模块
Dual-row module Single-row module

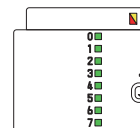
R 继电器类型 **T** 晶体管类型
Relay type Transistor type

| 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) |

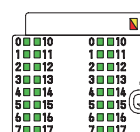
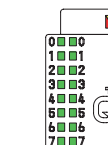
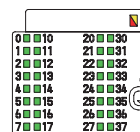
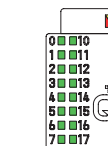
| 型号 (Model) | | 外形尺寸 (Dimension) : mm | | | | | | | 重量 (Weight) : g |
|-----------------------------|------------------|-----------------------|-------|--------|--------|-------|-------|-------|-----------------|
| | | W1 | W2 | H1 | H2 | H3 | D1 | D2 | |
| 单排模块 (Single-row module) | HCQX-ID16-D4 | 15.20 | 13.00 | 106.00 | 100.00 | 35.40 | 81.90 | 74.50 | 70 approx. |
| | HCQX-OD16-D4 | | | | | | | | |
| | HCQX-MD16-D4 | | | | | | | | |
| | HCQX-OD16-D4-PNP | | | | | | | | |
| | HCQX-MD16-D4-PNP | | | | | | | | |
| 双排模块 (Dual-row module) | HCQX-ID32-D4 | 28.20 | 26.00 | 106.00 | 100.00 | 35.40 | 81.90 | 74.50 | |
| | HCQX-OD32-D4 | | | | | | | | |
| | HCQX-MD32-D4 | | | | | | | | |
| | HCQX-OD32-D4-PNP | | | | | | | | |
| | HCQX-MD32-D4-PNP | | | | | | | | |
| | HCQX-OC08-D4 | | | | | | | | |

7. 指示灯说明 (Indicator description)

| 指示灯含义 (Indicator meaning) | 颜色 (Color) | 状态 | Status | 说明 | Description | |
|------------------------------|----------------|-------------|--------|--------------------|-----------------|------------------------------------|
| 模块状态 (Module status) | 黄色 (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 (Red) | 慢闪 | Slow blinking | 总线信号输入状态异常 | The module is in an abnormal state |

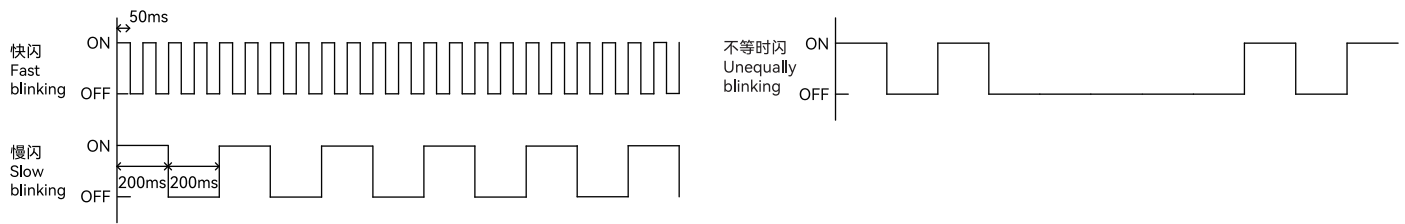


| 丝印 (Screen printing) | 指示灯含义 (Indicator meaning) | 颜色 (Color) | 状态 | Status | 说明 | Description | |
|---------------------------------|------------------------------|---------------|----|--------|---------|-----------------|--|
| ID16/OD16/OD16-PNP | | | | | | | |
| I N (0~7,10~17) | 输入 (Input) | 绿色 (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 |
| Q 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 for this channel |
| | | | | 常亮 | Lit | 输出通道 N 有信号输出 | There are output signals for this channel |
| ID32/OD32/OD32-PNP | | | | | | | |
| I N (0~7,10~17, 20~27,30~37) | 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 |
| Q N (0~7,10~17, 20~27,30~37) | 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 for this channel |
| | | | | 常亮 | Lit | 输出通道 N 有信号输出 | There are output signals for this channel |
| OC08 | | | | | | | |
| Q N (0~7) | 输出 (Output) | 绿色 (Green) | | 熄灭 | Not lit | 继电器断开 | Relay is open |
| | | | | 常亮 | Lit | 继电器闭合 | Relay is closed |
| MD16/MD16-PNP | | | | | | | |
| I N (0~7) | 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 |
| Q N (0~7) | 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 for this channel |
| | | | | 常亮 | Lit | 输出通道 N 有信号输出 | There are output signals for this channel |
| MD32/MD32-PNP | | | | | | | |
| I 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 |
| Q 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 for this channel |
| | | | | 常亮 | Lit | 输出通道 N 有信号输出 | There are output signals for this channel |



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)

| 型号(Model) | | ID16 | ID32 | OD16 | OD16-PNP | OD32 | OD32-PNP | MD16 | MD16-PNP | MD32 | MD32-PNP |
|----------------|-----|------|------|------|----------|------|----------|------|----------|------|----------|
| 输入 (Input) | NPN | ○ | ○ | - | - | - | - | ○ | ○ | ○ | ○ |
| | PNP | ○ | ○ | - | - | - | - | ○ | ○ | ○ | ○ |
| 输出 (Output) | NPN | - | - | ○ | - | ○ | - | ○ | - | ○ | - |
| | PNP | - | - | - | ○ | - | ○ | - | ○ | - | ○ |

*注: ○: 代表支持该类型; -: 代表不支持该类型。

*Note: The symbol "○" indicates that the type is supported. The symbol "-" indicates that the type is not supported.

| 端子说明 (Terminal description) | | ID16 | ID32 | | | | 接线 (Wiring) | | | | | |
|--------------------------------|--|------|------|-----|----|-----|-------------|-----|--|--|--|--|
| 0 | | 10 | I0 | I10 | I0 | I10 | I20 | I30 | | | | |
| 1 | | 11 | I1 | I11 | I1 | I11 | I21 | I31 | | | | |
| 2 | | 12 | I2 | I12 | I2 | I12 | I22 | I32 | | | | |
| 3 | | 13 | I3 | I13 | I3 | I13 | I23 | I33 | | | | |
| 4 | | 14 | I4 | I14 | I4 | I14 | I24 | I34 | | | | |
| 5 | | 15 | I5 | I15 | I5 | I15 | I25 | I35 | | | | |
| 6 | | 16 | I6 | I16 | I6 | I16 | I26 | I36 | | | | |
| 7 | | 17 | I7 | I17 | I7 | I17 | I27 | I37 | | | | |
| 8 | | 18 | SS | SS | SS | SS | SS | SS | | | | |

| 端子说明 (Terminal description) | | OD16/OD16-PNP | OD32/OD32-PNP | | | | 接线 (Wiring) | | | | | |
|--------------------------------|--|---------------|---------------|-----|-----|-----|-------------|-----|--|--|--|--|
| 0 | | 10 | Q0 | Q10 | Q0 | Q10 | Q20 | Q30 | | | | |
| 1 | | 11 | Q1 | Q11 | Q1 | Q11 | Q21 | Q31 | | | | |
| 2 | | 12 | Q2 | Q12 | Q2 | Q12 | Q22 | Q32 | | | | |
| 3 | | 13 | Q3 | Q13 | Q3 | Q13 | Q23 | Q33 | | | | |
| 4 | | 14 | Q4 | Q14 | Q4 | Q14 | Q24 | Q34 | | | | |
| 5 | | 15 | Q5 | Q15 | Q5 | Q15 | Q25 | Q35 | | | | |
| 6 | | 16 | Q6 | Q16 | Q6 | Q16 | Q26 | Q36 | | | | |
| 7 | | 17 | Q7 | Q17 | Q7 | Q17 | Q27 | Q37 | | | | |
| 8 | | 18 | COM | COM | COM | COM | COM | COM | | | | |

| 端子说明 (Terminal description) | | MD16/ MD16-PNP | | 接线 (Wiring) | |
|--------------------------------|--|-------------------|----|-------------|--|
| 0 | | 10 | I0 | Q0 | <p>开关 Switch</p> <p>负载 Load</p> <p>源型输入 PNP Input</p> <p>漏型输入 NPN Input</p> <p>漏型输出 NPN Output</p> |
| 1 | | 11 | I1 | Q1 | |
| 2 | | 12 | I2 | Q2 | |
| 3 | | 13 | I3 | Q3 | |
| 4 | | 14 | I4 | Q4 | |
| 5 | | 15 | I5 | Q5 | |
| 6 | | 16 | I6 | Q6 | |
| 7 | | 17 | I7 | Q7 | |
| 8 | | 18 | SS | COM | |

| 端子说明 (Terminal description) | | MD32/MD32-PNP | | | | 接线 (Wiring) | |
|--------------------------------|--|---------------|----|-----|-----|-------------|---|
| 0 | | 10 | I0 | I10 | Q0 | Q10 | <p>开关 Switch</p> <p>负载 Load</p> <p>源型输入 PNP Input</p> <p>漏型输入 NPN Input</p> <p>漏型输出 NPN Output</p> <p>源型输出 PNP Output</p> |
| 1 | | 11 | I1 | I11 | Q1 | Q11 | |
| 2 | | 12 | I2 | I12 | Q2 | Q12 | |
| 3 | | 13 | I3 | I13 | Q3 | Q13 | |
| 4 | | 14 | I4 | I14 | Q4 | Q14 | |
| 5 | | 15 | I5 | I15 | Q5 | Q15 | |
| 6 | | 16 | I6 | I16 | Q6 | Q16 | |
| 7 | | 17 | I7 | I17 | Q7 | Q17 | |
| 8 | | 18 | SS | SS | COM | COM | |

| 端子说明 (Terminal description) | | OC08 | | 接线 (Wiring) | |
|--------------------------------|--|------|------|-------------|--|
| 0 | | 10 | Q0 | Q2 | <p>负载 Load</p> <p>漏型输出 NPN Output</p> <p>源型输出 PNP Output</p> <p>DC24V</p> <p>DC24V</p> |
| 1 | | 11 | Q1 | Q3 | |
| 2 | | 12 | COM0 | COM0 | |
| 3 | | 13 | NC | NC | |
| 4 | | 14 | Q4 | Q6 | |
| 5 | | 15 | Q5 | Q7 | |
| 6 | | 16 | COM1 | COM1 | |
| 7 | | 17 | NC | NC | |
| 8 | | 18 | 24V | 0V | |