Control

Drive

Sensor

M&E

Info.

**HCFa**

Create a better life through our work

# Selection Guide for Control Products

# CONTROL SYSTEM TOPOLOGY

## SERVO LEVEL — Drive layer

PC

PC

**Ethernet**

TP2000 series

SCADA

## DEVICE LEVEL — Device layer

**Ethernet**

HCQ1

HCQ5

HCQ0

Other PLC

- EtherNet/IP
- Modbus TCP
- EtherCAT (Technology Group)
- CANopen
- Modbus
- PROFINET
- OPC UA

HCR2

HCR8C

HCR8A

HCR8P

- CANopen
- Modbus

**Serial**

## CONTROLLER LEVEL — Control layer

EtherCAT coupler

Q-series extension I/O

Distributed I/O

PD01

Visual system

Sensors

**TCP/IP**

A-series extension I/O
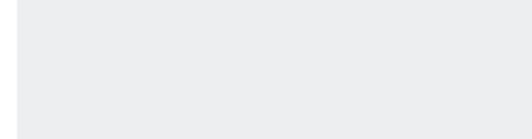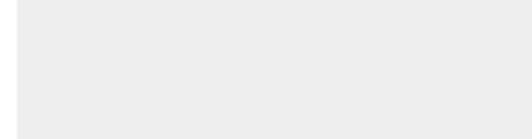
Terminal converter

Third-party device

## COMPUTER LEVEL — Host controller

EtherCAT (Technology Group)

HN-Y7EB
X3EB
X5EB
X6EB
X6FB

Robot arm

MECHATROLINK  PROFINET  Modbus

HN-Y7E
X2E
X3E
X5E
X6E

CANopen

X2EN
X3EN
X5EN
X6EN

**Low-voltage servo**

D3E-A
D3E-BN

Inverter

---
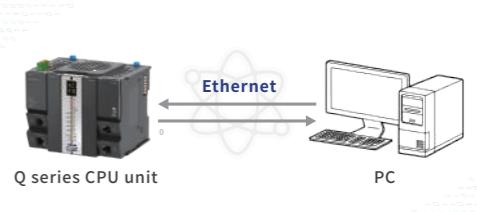
### COMPUTER LEVEL

**Ethernet cable / USB to achieve program download**
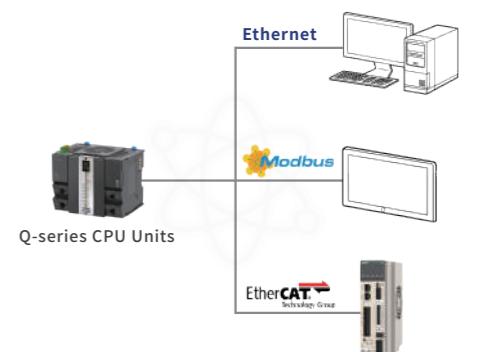
The upper controller transmits the internal data of the program through the Ethernet cable, and the user can also upload and download the program through the USB port.

Ethernet

Q series CPU unit            PC

### COMPUTER LEVEL

**Multiple communication protocol supported:**
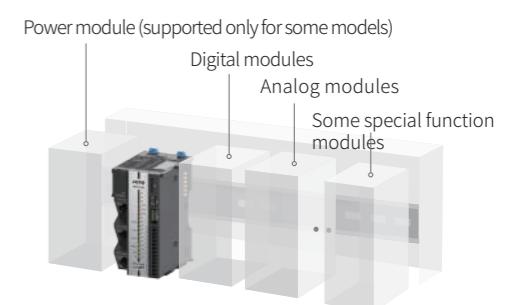
Various communication protocol: Modbus TCP
Modbus RTU EtherNet/IP OPC UA
EtherCAT CANopen RS232/RS485

Ethernet

Modbus

Q-series CPU Units

EtherCAT (Technology Group)

### COMPUTER LEVEL

**Up to 16 local extension modules**

Q series CPU unit supports power modules on the left side, and supports digital, analog, temperature measurement, high-speed counting extension modules, etc. on the right side.

Power module (supported only for some models)
Digital modules
Analog modules
Some special function modules

*The number of local extension modules needs to be calculated based on the current consumption of the module

# Overall solutions

Q1 standard PACs are the solution to a control device that integrates logical operations, motion control, visualized interfaces, and multiple communications in a single control device.

## Up to 128 axes in 4ms

Help improve production accuracy and efficiency

## Customer-centric

The brain of the control system, rich communication interfaces make information interaction more easier, software motion control enrich the hardware options, and graphical data collection makes the variable monitoring more intuitive.

# Q-SERIES LINEUP

## Naming rule for Q-series PACs

$$HCQ1\square-1300-D2$$

**Product name**

**HC**

HC: HCFA controller

**Series name**

**Q1**

Q0: Basic bus motion controller
Q1: Standard bus motion controller
Q3: High-end bus motion controller
Q5: Basic intelligent mechanical controller
Q7: Standard intelligent mechanical controller
Q9: High-end intelligent mechanical controller

**Series models**

□

N/A: Standard type
S: Basic type
J: Modular type

**Operating system**

**1**

1: Linux
2: Windows10
3: Windows7
4: QNX

**Number of motion control axis**

**3**

n (0~8): $2^{n+2}$
Note: Number of axes recommended by the controller.

**Control software module**

**0**

0: CODESYS
1: HCPACS
2: ROBOT
3: CNC
4: MC
9: N/A

**Additional function software module**

**0**

0: Standard software
1: Machine vision
2: Edge computing

**Power type**

**D**

D: DC power
A: AC power

**Product iteration serial number**

**2**

## Recommended number of axes

| Series name | Classification | Recommended number of axes | Max. number of axes |
|---|---|---|---|
| HCQ0S* | 1200 | CANOpen:16 axes | Unlimited |
| HCQ0 | 1100 | EtherCAT:8 axes | Up to 8 axes |
| | 1200 | EtherCAT:16 axes | Unlimited |
| HCQ1 | 1200 | EtherCAT:16 axes | Up to 16 axes |
| | 1300 | EtherCAT:32 axes | Unlimited |
| HCQ5 | 1400 | EtherCAT:64 axes | Up to 64 axes |
| | 1500 | EtherCAT:128 axes | Unlimited |
| HCQ7* | 1500 | EtherCAT:128 axes | Up to 128 axes |
| | 1600 | EtherCAT:256 axes | Unlimited |
| HCQ9* | 1600 | EtherCAT:256 axes | Up to 256 axes |
| | 1700 | EtherCAT:256*2 axes | Unlimited |

* Under development

## HCQ0-1□00-D
Basic bus motion controller

**Basic performance**
- Program capacity 16MB
- Recommend number of axes: 16[*1]
- Output power 16W
- 16 local extension modules supported

**Functions**
- Number of IO points for main unit
- Single-axis positioning and fixed-speed
- Electric cam/flying shear/rotary shear
- Electronic gear
- CNC G-code control/Robot control
- Linear interpolation/circular interpolation/helical interpolation

**Supported protocol**
- EtherCAT
- CANOpen
- Modbus TCP
- Modbus RTU

## HCQ1-1□00-D2
Standard bus motion controller

**Basic performance**
- Program capacity 16MB
- Recommend number of axes: 32[*1]
- Output power 16W
- 16 local extension modules supported

**Functions**
- Number of IO points for main unit
- Single-axis positioning and fixed-speed
- High-speed pulse input/output
- Electric cam/flying shear/rotary shear
- Electronic gear
- CNC G-code control/Robot control
- Linear interpolation/circular interpolation/helical interpolation

**Supported protocol**
- EtherCAT
- CANOpen
- OPC/UA
- EtherNet / IP
- Modbus TCP
- Modbus RTU

## HCQ5-1□00-A
Basic intelligent mechanical controller

**Basic performance**
- Program capacity 16MB
- Recommend number of axes: 128[*1]
- Output power 16W
- 16 local extension modules supported

**Functions**
- Single-axis positioning and fixed-speed
- Electronic gear
- Electric cam/flying shear/rotary shear
- Linear interpolation/circular interpolation/helical interpolation
- CNC G-code control/Robot control

**Supported protocol**
- EtherCAT
- CANOpen*2
- OPC/UA
- EtherNet / IP
- Modbus TCP
- Modbus RTU

[*1]Recommended axis number for high-configuration models 4ms. For specific models, please refer to product naming rules.
[*2]Will be supported.

**PAC**

Basic bus motion controller

# HCQ0-I☐00-D

Control topology
Q-series PAC
IQ8000-series IPC
Q-series I/O
Distributed I/O
A-series PLC
R-series PLC
A-series/I/O
Product list



## > Electrical specifications

| Items | Technical specifications | | | |
|---|---|---|---|---|
| Dielectric withstand voltage | AC1000V for 1 min, between power terminal and I/O terminal, between external terminal and shell | | | |
| Noise resistance | 1500Vp-p or more，Noise width 1μs，50ns (based on noise simulator) , comply with (IEC61000-4-2/3/4/6) | | | |
| Vibration resistance | **Installation** | **Frequency (Hz)** | **Acceleration (m/s²)** | **Single amplitude (mm)** |
| | DIN rail mounting | 10-57 | - | 0.035 |
| | | 57-150 | 4.9 | - |
| Insulation resistance | 50 MΩ or more using 500 V DC insulation resistance meter (Between all terminals and ground terminal) | | | |
| IP protection level | IP20 | | | |
| Working atmosphere | Max. 50℃，free from excessive dust and corrosive gas | | | |
| Working altitude | 2000m (80kPa) | | | |
| Degree of pollution | 2，Normally there is only non-conductive pollution, but temporary conductivity caused by condensation should also be expected | | | |

Vibration resistance note: 10 times of testing in each direction (X-, Y-, and Z-axis directions) (Total: 80 min, each)

## > Environment specifications

| Classifications | Items | Working environment | Transport environment | Storage environment |
|---|---|---|---|---|
| Environment parameter (IEC60721-3) | Temperature | 0~50℃ (No freezing) | -40~75℃ | -25~75℃ |
| | Humidity | 5-95%RH (No condensation) | | |
| | Impact (collision) | Acceleration 150m2, action time 11ms, twice in each direction (X-, Y-, and Z-axis directions) | | |
| | Altitude/Atmosphere | Max.2000m | Max.3000m (>70kPa) | |

## > Input specifications*

| Items | Specifications |
|---|---|
| Signal name | Transistor input (I0-I2) |
| Rated input voltage | DC 24V (+20%~-15%, pulse ripple within 10%) |
| Input type | NPN |
| Rated input current | 3.65mA |
| ON current | >4.14mA |
| OFF current | <3.88mA |
| Input impedance | 1.5KΩ |
| Max. input frequency | 1kHz |
| Common method | Shared with power supply 0V, short-circuited internally |

## > Output specifications*

| Items | Specifications |
|---|---|
| Signal name | Transistor output (Q0-Q1) |
| Output polarity | NPN |
| Control circuit voltage | DC 5~24V |
| Rated load current | 50mA |
| Max. voltage drop at power-ON | 0.05V |
| Leakage current at power-OFF | <0.1mA |
| Output frequency | Max. 1kHz |
| Common method | Shared with power supply 0V, short-circuited internally |

*Will be supported.

## > Power specifications

| Items | Power voltage | Voltage fluctuation range | Input power | Undervoltage level | Output voltage | Voltage fluctuation | Output power |
|---|---|---|---|---|---|---|---|
| Specifications | DC 24V | -15%~20% | 36W | 19V | 12V | ±5% | 16W |

## > Performance specifications

| Items | Specifications | |
|---|---|---|
| Programming | Program capacity | 16MBytes |
| | I-area (%I) | 128KBytes |
| | Q-area (%Q) | 128KBytes |
| | M-area (%M) | 512KBytes |
| | Power-failure retention area | 800KBytes |
| | Other variables | Not defined |
| Configuration | Number of extension modules | Digital module | Calculated based on current consumption |
| | | Analog module | |
| | | External power supply | 12V/16W |
| EtherCAT | Communication standard | IEC 61158 Type12 |
| | Physical layer | 100BASE-TX |
| | Transmission speed | 100Mbps (100Base-TX) |
| | Duplex mode | Full duplex |
| | Topology | Linear, bus and star-type |
| | Transmission medium | Cat.5E twisted pair cables |
| | Maximum transmission distance between nodes | 100m |
| | Max. process data | Input: 5,736 bytes Output: 5,736 bytes (but the max. number of frames of process data is 4) |
| | Communication cycle | Mini.1ms |
| CANOpen master | Link layer | CAN2.0A |
| | Terminal resistor | Built-in 120Ω. Do not support disconnection |
| | Support baud rate bps | 20K,50K,100K,125K,250K,500K,800K和1M |
| | Transmission medium | Cat.5E twisted pair cables |
| | Max. communication distance | 2500 m  (20Kbit/s) |
| | Maximum number of the slaves | 32 |
| | Communication cycle | Mini.1ms |
| Serial ports | Physical layer | COM1 | RS485 |
| | | COM2 | RS485 only support master station |
| | | COM3 | RS232 |
| | Terminal resistor | COM1 | Built-in 120Ω, support DIP switch |
| | | COM2 | Built-in 120Ω. Do not support disconnection |
| | Baud rate bps | 4800~115200 |
| | Max. communication distance | COM1, COM2 | 500m |
| | | COM3 | 15m |
| | Maximum number of the slaves | COM1, COM2 | 32 |
| | | COM3 | 1 |
| | Transmission medium | Cat.5E twisted pair cables |

**Standard bus motion controller**

# HCQ1-1□00-D2

## > Electrical specifications

| Items | Technical specifications |
|---|---|
| Dielectric withstand voltage | AC1000V for 1 min, between power terminal and I/O terminal, between external terminal and shell |
| Noise resistance | 1500Vp-p or more, Noise width 1μs, 50ns (based on noise simulator), comply with (IEC61000-4-2/3/4/6) |

| Vibration resistance | Installation | Frequency (Hz) | Acceleration (m/s²) | Single amplitude (mm) | |
|---|---|---|---|---|---|
| | DIN rail mounting | 10-57 | - | 0.035 | 10 times of testing in each direction (X-, Y-, and Z-axis directions) (Total: 80 min, each) |
| | | 57-150 | 4.9 | - | |

| Insulation resistance | 50 MΩ or more using 500 V DC insulation resistance meter (Between all terminals and ground terminal) |
|---|---|
| IP protection level | IP20 |
| Working atmosphere | Max. 50℃, free from excessive dust and corrosive gas |
| Working altitude | 2000m (80kPa) |
| Degree of pollution | 2, Normally there is only non-conductive pollution, but temporary conductivity caused by condensation should also be expected |

## > Environment specifications

| Classifications | Items | Working environment | Transport environment | Storage environment |
|---|---|---|---|---|
| Environment parameter (IEC60721-3) | Temperature | 0~50℃ (No freezing) | -40~75℃ | -25~75℃ |
| | Humidity | 5-95%RH (No condensation) | | |
| | Impact (collision) | Acceleration 150m2, action time 11ms, twice in each direction (X-, Y-, and Z-axis directions) | | |
| | Altitude/Atmosphere | Max.2000m | Max.3000m (>70kPa) | |

## > High-speed input specifications

| Items | Specifications |
|---|---|
| Signal name | High-speed input (DI0-DI15) |
| Rated input voltage | DC 24V (+20%~-15%, pulse ripple within 10%) |
| Input type | NPN、PNP |
| Rated input current | 3.65mA |
| ON current | >4.14mA |
| OFF current | <3.88mA |
| Input impedance | 1.5KΩ |
| Max. input frequency | 100kHz(Version 2.XX.XX) 200kHz (Version 3.XX.XX or more) |
| 2-phase input worst duty ratio | （40%：60%）~（60%：40%） |
| Common method | Every 8 points share a common terminal. |

## > High-speed output specifications

| Items | Specification |
|---|---|
| Signal name | Output (DO0-DO15) |
| Output polarity | NPN |
| Control circuit voltage | DC 5~24V |
| Rated load current | 250mA |
| Max. voltage drop at power-ON | 0.05V |
| Leakage current at power-OFF | <0.1mA |
| Output frequency | 100KHZ (Version 2.XX.XX) 200KHz (Version 3.XX.XXor more) |
| Common method | Every 8 points share a common terminal. |

## > Power specifications

| Items | Power voltage | Voltage fluctuation range | Input power | Undervoltage level | Output voltage | Voltage fluctuation | Output power |
|---|---|---|---|---|---|---|---|
| Specifications | DC 24V | -15%~20% | 36W | 19V | 12V | ±5% | 16W |

## > Performance specifications

| Items | | Specifications |
|---|---|---|
| Programming | Program capacity | 16MBytes |
| | I-area (%I) | 128KBytes |
| | Q-area (%Q) | 128KBytes |
| | M-area (%M) | 512KBytes |
| | Power-failure retention area | 800KBytes |
| | Other variables | Not defined |
| Configuration | Number of extension modules — Digital module | Calculated based on current consumption |
| | Analog module | |
| | External power supply | 12V/16W |
| EtherCAT | Communication standard | IEC 61158 Type12 |
| | Physical layer | 100BASE-TX |
| | Transmission speed | 100Mbps (100Base-TX) |
| | Duplex mode | Full duplex |
| | Topology | Linear, bus and star-type |
| | Transmission medium | Cat.5E twisted pair cables |
| | Maximum transmission distance between nodes | 100m |
| | Max. process data | Input: 5,736 bytes Output: 5,736 bytes (but the max. number of frames of process data is 4) |
| | Communication cycle | Mini.1ms |
| CANOpen master | Link layer | CAN2.0A |
| | Terminal resistor | Built-in 120Ω. Do not support disconnection |
| | Support baud rate bps | 20K,50K,100K,125K,250K,500K,800K和1M |
| | Transmission medium | Cat.5E twisted pair cables |
| | Max. communication distance | 2500 m（20Kbit/s) |
| | Maximum number of the slaves | 32 |
| | Communication cycle | Mini.1ms |
| Serial ports | Physical layer — COM1, COM2 | RS485 |
| | COM3 | RS232 |
| | Terminal resistor — COM1, COM2 | Built-in 120Ω, support DIP switch |
| | Baud rate bps | 4800~115200 |
| | Max. communication distance — COM1, COM2 | 500m |
| | COM3 | 15m |
| | Maximum number of the slaves — COM1, COM2 | 32 |
| | COM3 | 1 |
| | Transmission medium | Cat.5E twisted pair cables |

## PAC

**Basic intelligent mechanical controller**

# HCQ5-I☐OO-A

## > Electrical specifications

| Items | Technical specifications | | | |
|---|---|---|---|---|
| Dielectric withstand voltage | AC1000V for 1 min, between power terminal and I/O terminal, between external terminal and shell | | | |
| Noise resistance | 1500Vp-p or more，Noise width 1μs，50ns（based on noise simulator），comply with (IEC61000-4-2/3/4/6) | | | |
| | Installation | Frequency (Hz) | Acceleration (m/s²) | Single amplitude (mm) |
| Vibration resistance | DIN rail mounting | 10-57 | - | 0.035 |
| | | 57-150 | 4.9 | - |
| Insulation resistance | 50 MΩ or more using 500 V DC insulation resistance meter (Between all terminals and ground terminal) | | | |
| IP protection level | IP20 | | | |
| Working atmosphere | Max. 50℃，free from excessive dust and corrosive gas | | | |
| Working altitude | 2000m (80kPa) | | | |
| Degree of pollution | 2，Normally there is only non-conductive pollution, but temporary conductivity caused by condensation should also be expected | | | |

Vibration resistance note: 10 times of testing in each direction (X-, Y-, and Z-axis directions) (Total: 80 min, each)

## > Environment specifications

| Classifications | Items | Working environment | Transport environment | Storage environment |
|---|---|---|---|---|
| Environment parameter （IEC60721-3） | Temperature | 0~50℃ (No freezing) | -40~75℃ | -25~75℃ |
| | Humidity | 5-95%RH (No condensation) | | |
| | Impact (collision) | Acceleration 150m2, action time 11ms, twice in each direction (X-, Y-, and Z-axis directions) | | |
| | Altitude/Atmosphere | Max.2000m | Max.3000m (>70kPa) | |

## > Power specifications（PD01）
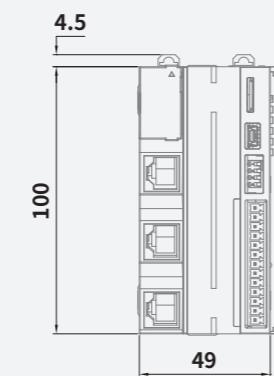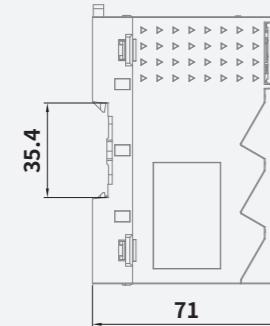
| Items | Power voltage | Voltage fluctuation range | Input power | Undervoltage level | Output voltage | Voltage fluctuation | Output power |
|---|---|---|---|---|---|---|---|
| Specifications | AC 100~240V | -15%~20% | 100W | 80V | 12V | ±5% | 60W |

## > Performance specifications

| Items | Specifications | | |
|---|---|---|---|
| Programming | Program capacity | | 16MBytes |
| | I-area (%I) | | 128KBytes |
| | Q-area (%Q) | | 128KBytes |
| | M-area (%M) | | 512KBytes |
| | Power-failure retention area | | 800KBytes |
| | Other variables | | Not defined |
| Configuration | Number of extension modules | Digital module | Calculated based on current consumption |
| | | Analog module | |
| | | External power supply | 12V/16W |
| EtherCAT | Communication standard | | IEC 61158 Type12 |
| | Physical layer | | 100BASE-TX |
| | Transmission speed | | 100Mbps (100Base-TX) |
| | Duplex mode | | Full duplex |
| | Topology | | Linear, bus and star-type |
| | Transmission medium | | Cat.5E twisted pair cables |
| | Maximum transmission distance between nodes | | 100m |
| | Max. process data | | Input: 5,736 bytes Output: 5,736 bytes (but the max. number of frames of process data is 4) |
| | Communication cycle | | Mini.1ms |
| Serial ports | Physical layer | COM1, COM2 | RS485 |
| | | COM3 | RS232 |
| | Terminal resistor | COM1, COM2 | Built-in 120Ω, support DIP switch |
| | Baud rate bps | | 4800~115200 |
| | Max. communication distance | COM1, COM2 | 500m |
| | | COM3 | 15m |
| | Maximum number of the slaves | COM1, COM2 | 32 |
| | | COM3 | 1 |
| | Transmission medium | | Cat.5E twisted pair cables |

Control topology

Q-series PAC

IQ8000-series IPC

Q-series I/O

Distributed I/O

A-series PLC

R-series PLC

A-seriesI/O

Product list

**HCQ0-1☐00-D**

Unit:mm



35.4
100
4.5
71
49

**HCQ1-1☐00-D**

Unit:mm



35.4
100.4
4.3
100
132

**HCQ5-1☐00-A**

Unit:mm



35.4
100
4.5
100
187

**Naming rule for IQ8000 series**

# H C – I Q 8 5 6 0 – 1 0 5 0 – D

**Product name**

**HC**

**HC:** HCFA controller

**Series name**

**IQ8**

**IQ8:** Industrial PC: 8000 series

**Processor**

**5**

**5:** X86-J1900
**6:** X86-8145
**7:** X86-I3
**8:** X86-I5
**9:** X86-I7

**Storage specifications**

**6**

**5:** 2G+64G
**6:** 4G+128G
**7:** 8G+256G
**8:** 16G+512G

**Display specifications**

**0**

**0:** No display screen

**Operating system**

**1**

**1:** Linux(Ubuntu)
**2:** Windows10
**3:** Windows7
**4:** QNX

**Reserved**

**0**

**0:** Reserved

**Control software module**

**5**

**0:** CODESYS
**1:** HCPACS
**2:** ROBOT
**3:** CNC
**4:** MC
**5:** N/A

**Additional function software module**

**0**

**0:** Standard software
**1:** Machine vision
**2:** Edge computing

**Power type**

**D**

**D:** DC power
**A:** AC power

# IPC

Industrial PC

# HC-IQ8560-I050-D

## > Main units

| Model name | Description |
|---|---|
| HC-IQ8560-1050-D | 2G, 64G SSD, Linux system |

## > Environment specifications

| Items | Specifications |
|---|---|
| Working temperature | 0 ~ 55℃ |
| Storage temperature | -25 ~ 70℃ (No condensation) |
| Relative humidity | 10% ~ 95% (No condensation) |
| Working altitude | 2km or less |
| Electromagnetic interference | EFT 2KV (Power cable, signal cable) |
| Vibration | 5~8.4Hz, amplitude 3.5mm, 8.4~150Hz, Acceleration 9.8m/s², scan at a rate of one multiplication frequency per minute, ten times in each direction (X-, Y-, and Z-axis directions). |
| Impact (collision) | 147m/s², three times in each direction (X-, Y-, and Z-axis directions) |
| Pollution level | Pollution degree 2 |
| Protection level | IP20 |
| Cooling method | Forced air cooling |
| Installation method | Screw-fixed installation |

## > Power specifications

| Items | Specifications |
|---|---|
| Input voltage | DC 24V±20% |
| Allowable instantaneous power-failure time | Depend on the UPS |
| Power consumption | 48W Max. |

## > Performance Specifications

| Items | | | Specifications |
|---|---|---|---|
| Host system | CPU | CPU type | J1900 |
| | | No. of cores /threads | 4 cores/4 threads |
| | | Main/Turbo frequency | 2GHz/2.42 GHz |
| | | Buffer | 2 MB L2 |
| | Memory | Internal memory | 2G DDR3L |
| Operating system | Window OS | | Window7-32bit Window7-64bit |
| | Linux OS | | Ubuntu16.04 64bit |
| Storage device | Hard disk | SSD | mSATA×1 64GB |
| | SD-card storage | | miniSD×1 |
| Interfaces | USB | Type A | USB2.0 A-type×2, USB3.0 A-type×2 |
| | LAN | | 100/1000M×4 |
| | CAN | | Isolated CAN 2.0 (not supported now) |
| | Serial ports | | Isolated RS232×1, RS485×2 |
| | VGA | | VGA DSUB15×1 |
| | HDMI | | HDMI×1 |
| | I/O | | DI×3, DO×2 |
| | Power buttons | | Power buttons with light×1 |
| | Power interfaces | | DC 24V/2A |
| Extension interfaces | PCIe extension | | Gen2x1 ×1, motion control module can be extended |
| | IOT extension | | 2G/4G/5G |

## > Input specifications

| Items | | Specifications |
|---|---|---|
| Input points | | 2points |
| Input form | | NPN/PNP |
| Input voltage | | DC 24V±10% |
| Input impedance | | 4.3kΩ |
| Input current | | 5.3mA/DC24V |
| Input sensitivity current | ON-current | 2.13mA or more |
| | OFF-current | 1.8mA or less |
| Input response frequency | | 5kHz |
| Input signal form | | NPN/PNP open-collector transistor |
| Circuit isolation | | Optocoupler isolation |
| Input operation display | | N/A |

Control topology
Q-series PAC
IQ8000-series IPC
Q-series I/O
Distributed I/O
A-series PLC
R-series PLC
A-seriesI/O
Product list

## > Output Specifications

| Items | | Specifications |
|---|---|---|
| Output points | | 2points |
| Output type | | Transistor/NPN |
| External voltage | | DC 5～30V |
| Max. load | Resistive load | 0.5A/1 point |
| | Inductive load | 12W/DC 24V |
| Open-circuit leakage current | | 0.1mA or less/DC 30V |
| Turn-on voltage drop | | 1.5V or less |
| Response tiem | OFF→ON | 0.2ms or less/200mA or more(at 24V DC) |
| | ON→OFF | 0.2ms or less/200mA or more(at 24V DC) |
| Circuit isolation | | Optocoupler isolation |
| Output operation display | | N/A |

## > Ethernet specifications

| Items | Specifications |
|---|---|
| Interface type | RJ45 connector |
| Data transmission speed | 100/1000Mbps |
| Communication mode | Full duplex/Half duplex |
| Interfaces | RJ45 connector |
| Max. transmission distance between stations | 100m |
| Supported protocol | Self-defined |
| Transmission medium | Cat.5E twisted pair cables |
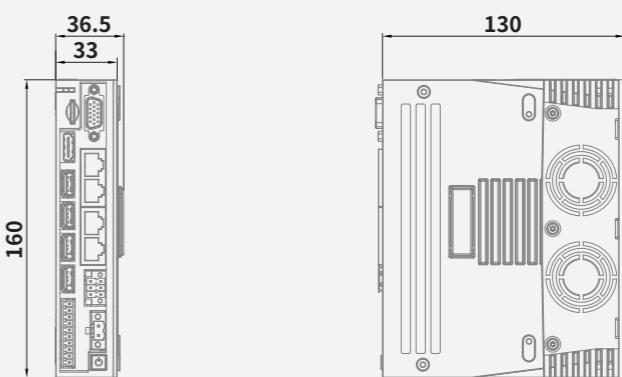
## > RS485 specifications

| Items | Specifications |
|---|---|
| Interface type | RS485 |
| Data transmission speed | Max.115200bps |
| Communication mode | Half duplex |
| Max. transmission distance | 100m (At a specific baud rate) |
| Supported protocol | Self-defined |
| Isolation status | Digital isolation |
| Terminal resistor | Not built-in |

## > RS232 specifications

| Items | Specifications |
|---|---|
| Interface type | RS232 |
| Data transmission speed | Max.115200bps |
| Communication mode | Half duplex |
| Max. transmission distance | 5m |
| Supported protocol | Self-defined |
| Isolation status | Digital isolation |

## IQ8000-SERIES IPC DIMENSION DRAWING

### HC-IQ8560-1050-D

Unit:mm

36.5
33
130
160

Control topology
Q-series PAC
IQ8000-series IPC
Q-series I/O
Distributed I/O
A-series PLC
R-series PLC
A-seriesI/O
Product list

# Modular Compact Easy-to-use

**Digital module**

High-density compact design, up to 16 I/O points on the module with a thickness of only 12mm

**Analog module**

Support a variety of voltage and current input and output

**Temperature measurement module**

Support a variety of thermocouples, thermal resistance etc., and can get the temperature data through the host controller easily

**High-speed pulse I/O module**

Support encoder input and high-speed pulse output, up to 200kHz pulse I/O



**Coupler module**

· Support EtherCAT input/output

**Coupler module**

· Support EtherCAT input/output

**Digital input module**

· 16/32- point digital input module

**Digital output module**

· 16/32-point digital output module

**Digital I/O module**

· 8-point input/8-point output
· 16-point input/16-point output

**Analog input module**

· 4-ch analog input
· Voltage input：
　0~10V
　-10~10V
　-5~5V
　0~5V
　1~5V
· Current input：
　0~20mA
　4~20mA

**Analog output module**

· 4-ch analog input
· Voltage input：
　0~10V
　-10~10V
　-5~5V
　0~5V
　1~5V
· Current input：
　0~20mA
　4~20mA

**Temperature measurement module**

· Support thermocouple: K, J, E, T, N, B, R, S (Default: K-type)
· Support thermal resistance：PT100, PT1000, Ni100, Ni1000 (Default: PT100) three-wire system

**High-speed counter**

· 4-ch high-speed counter (encoder) module, input signal supports pulse + direction, up to 200kHz

**Pulse output**
**Step drive module**

· 20-50V DC single-axis, support PP PV CSP and other motor control modules

**Terminal module**

Note: The -D2 models are the upgraded version of the corresponding -D, and there is no difference in their functions. It is recommended to purchase the D2 models.

# HCQX-SERIES UNIT LINEUP

## Naming rule for HCQX-series extension modules

# H C Q X - I D 1 6 - D 2

**Product name**

| HC | **HC:** HCFA controller |

**Series name**

| QX | **QX:** Q-series modules |

**Function modules**

| ID |

**EC:** Coupler    **DA:** Analog output
**ID:** Digital input    **PD:** Power extension
**OD:** Digital output    **TS:** Temperature measurement
**MD:** Digital I/O    **HC:** High-speed counter
**AD:** Analog input

**Number of channels**

| 16 | **16:** Number of channels |

**Power type**

| D | **D:** DC power
**A:** AC power |

**Product iteration serial number**

| 2 |

# H C Q X - S T 1 5 0 5 - D 2

**Product name**

| HC | **HC:** HCFA controller |

**Series name**

| QX | **QX:** Q-series modules |

**Function modules**

| ST | **ST:** Step drive |

**Number of channels**

| 1 | **1:** Single-axis
**2:** Two-axis |

**Working voltage**

| 5 | **5:** 50V (×10) |

**Peak current**

| 05 | **05:** 5A |

**Power type**

| D | **D:** DC power
**A:** AC power |

**Product iteration serial number**

| 2 |

## Coupler module

| Models | | Output power | Max. distance between stations | Max. number of local extension modules | External dimension WxDxH(mm) |
|---|---|---|---|---|---|
| | HCQX-EC01-D | 16W | 100m* | 16 | 49x71.2x100 |
| | HCQX-EC02-D | 16W | 100m* | 16 | 49x71.2x100 |

## Power module

| Models | | Output power | Max. distance between stations | Max. number of local extension modules | External dimension WxDxH(mm) |
|---|---|---|---|---|---|
| | HCQX-PD01-A | AC100~240V 50/60Hz | 12V 60W | 5 years, Based on working20 hoursa day at an ambient temperature of 30°C | 50x100x100 |

## Digital input module

| Models | | Number of channels | Input/output type | | External dimension WxDxH(mm) |
|---|---|---|---|---|---|
| | | | Input | Output | |
| | HCQX-ID16-D2 | 16 | 16 | DC24V (NPN/PNP) | - | - | 15.2x71.2x100 |
| | HCQX-ID16-D | 16 | 16 | DC24V (NPN/PNP) | - | - | 14.7x100x100 |
| | HCQX-ID32-D2 | 32 | 32 | DC24V (NPN/PNP) | - | - | 28.2x71.2x100 |

*The transmission medium between the two stations is Ethernet cable;

## Digital output module

| Models | | Number of channels | Input/output type | | | | External dimension WxDxH(mm) |
|---|---|---|---|---|---|---|---|
| | | | Input | | Output | | |
| | HCQX-OD16-D2* | 16 | - | - | 16 | NPN | 15.2x71.2x100 |
| | HCQX-OD16-D | 16 | - | - | 16 | NPN | 14.7x100x100 |
| | HCQX-OD32-D2* | 32 | - | - | 32 | NPN | 28.2x71.2x100 |

## Digital I/O module

| Models | | Number of channels | Input/output type | | | | External dimension WxDxH(mm) |
|---|---|---|---|---|---|---|---|
| | | | Input | | Output | | |
| | HCQX-MD16-D2* | 16 | 8 | DC 24V (NPN/PNP) | 8 | NPN | 15.2x71.2x100 |
| | HCQX-MD16-D | 16 | 8 | DC 24V (NPN/PNP) | 8 | NPN | 14.7x100x100 |
| | HCQX-MD32-D2* | 32 | 16 | DC 24V (NPN/PNP) | 16 | NPN | 28.2x71.2x100 |

## Analog input module

| Models | | Number of channels | Input type | | Channel data update time | External dimension WxDxH(mm) |
|---|---|---|---|---|---|---|
| | | | Voltage | Current | | |
| | HCQX-AD04-D | 4 | 0~10V -10~10V -5~5V 0~5V 1~5V | 0~20mA 4~20mA | 1ms | 14.7x100x100 |

## Analog output module

| Models | | Number of channel | Output type | | Channel data update time | External dimension WxDxH(mm) |
|---|---|---|---|---|---|---|
| | | | Voltage | Current | | |
| | HCQX-DA04-D | 4 | 0~10V -10~10V -5~5V 0~5V 1~5V | 0~20mA 4~20mA | 1ms | 14.7x100x100 |

## Temperature measurement module

| Models | | Number of channels | Corresponding sensor | Intput type | | External dimension WxDxH(mm) |
|---|---|---|---|---|---|---|
| | | | | Items | Input temperature* | |
| | HCQX-TS04-D | 4 | Thermocouple：K, J, E, T, N, B, R, S (Default: K-type) | Input range | -200~1370°C | 14.7x100x100 |
| | | | | Resolution | <±0.3%(For full scale) | |
| | | | Thermal resistance：PT100, PT1000, Ni100, Ni1000(Default: PT100) 3-wire | Input range | -200~850°C | |
| | | | | Resolution | <±0.5°C | |

## High-speed counter module

| Models | | Number of channel | Pulse input method | Max. response frequency (A/B-phase) | External dimension WxDxH(mm) |
|---|---|---|---|---|---|
| | HCQX-HC04-D2 | 4 | Phase difference pulse(x1/2/4) , Pulse + direction input, up/down pulse input | Single-phase 200kHz | 15.2x71.2x100 |

## Step drive module

| Models | | Number of channel | Motor control mode | Max. output current | Input voltage | External dimension WxDxH(mm) |
|---|---|---|---|---|---|---|
| | HCQX-ST1505-D2 | Single-axis | PP、PV、CSP、Homing | Max.5A (peak current) | 20/50V | 15.2x71.2x100 |

## End unit

| Models | | Functions | External dimension WxDxH(mm) |
|---|---|---|---|
| | End unit | Attached to the end of the CPU units or extension modules | 1x90x100 |

*PNP output needs to be customized, the model name is：HCQX-□□□□，If needed, please contact HCFA sales or distributors.

*The specific temperature range may vary depending on the sensor type。

Control topology
Q-series PAC
IQ8000-series IPC
Q-series I/O
Distributed I/O
A-series PLC
R-series PLC
A-seriesI/O
Product list

## General Specifications for HCQX-series Extension Modules

### Electrical specifications

| Items | | Specifications |
|---|---|---|
| Insulation voltage | Electrostatic | AC 500V60s |
| Insulation resistance | Electrostatic | 1MΩ |
| EMC requirements | Discharge | Contact ±4kV, air ±8kV |
| | EFT | ±2kV |
| | Surge | DC500V |

### Environment specifications

| Items | Specifications |
|---|---|
| Working temperature | 0~55℃ |
| Storage temperature | -25~75℃ |
| Relative numidity | 95%no condensation |
| Altitude | 2km or less |
| Atmosphere | 108kPa~66kPa |
| Noise resistance | ±2kV  5~100kHz |
| Sinusoidal vibration | 9Hz<f<100Hz, 1.0 acceleration, constant amplitude |
| Drop | 1m, 10 times, for packaging transportation |

### Power specification for IO special modules

| Items | Specifications |
|---|---|
| Rated power for control end | DC 12V |
| Input voltage range | DC 10.8~13.2V |
| Max. current consumption | 100mA/12V |
| Rated power for signal end | DC 24V |
| Input voltage range | DC 20.4~28.8V |

ETHERCAT COUPLER



HCQX-EC01-D

EtherCAT

Fast Ethernet

ETHERCAT COUPLER



HCQX-EC02-D

EtherCAT

Fast Ethernet

Support SLOT nodes

AC POWER



HCQX-PD01-A

AC 110V~220V

END UNIT



HCQX-END

Attached to the end of the modules

### Coupler module— Performance specifications

| Items | Specifications | |
|---|---|---|
| Models | HCQX-EC01-D | HCQX-EC02-D |
| Functions | Connect the terminal module and the 100BASE-TX EtherCAT network | Connect terminal module and 100BASE-TX EtherCAT network, support SLOT node |
| Number of local extension | Up to 16 | Up to 16 |
| Data transmission medium | EtherNet/EtherCAT (Cat.5E twisted pair cables at least) Shielded | EtherNet/EtherCAT (Cat.5E twisted pair cables at least) Shielded |
| Distance between station | Ethernet transmission, max.100m | Ethernet transmission, max.100m |
| Transmission protocol / transmission rate | EtherCAT/100Mbaud | EtherCAT/100Mbaud |
| Delay | about 1μs | About 1μs |
| Bus interface | 2 × RJ45 | 2 × RJ45 |
| Power supply | DC 24V (-15%~+20%) | DC 24V (-15%~+20%) |
| Current consumption | 70mA+（Σ QBUS current/4 ) | 70mA+（Σ QBUS current/4 ) |
| QBUS Load power | Max.1750mA（21W）(-25°C~+55°C) Max.1333mA（16W）(>+55°C) | Max.1750mA（21W）(-25°C~+55°C) Max.1333mA（16W）(>+55°C) |
| Electrical isolation | Isolated power supply | Isolated power supply |

### AC power module - Power specifications

| Items | Specifications |
|---|---|
| Models | HCQX-PD01-A |
| Input voltage | AC 100~240V   50/60Hz |
| Output voltage | 12V |
| Load power | 60W |

PAC
Extension
Modules

Control topology
Q-series PAC
IQ8000-series IPC
Q-series I/O
Distributed I/O
A-series PLC
R-series PLC
A-series I/O
Product list

Digital I/O Module

# HCQX SERIES

## DIGITAL INPUT

| HCQX-ID16-D2 |
| 16-point digital input |
| Support NPN/PNP input |

| HCQX-ID16-D |
| 16-point digital input |
| Support NPN/PNP input |

| HCQX-ID32-D2 |
| 32-point digital input |
| Support NPN/PNP input |

## DIGITAL OUTPUT

| HCQX-OD16-D2* |
| 16-point digital output |
| Support NPN output |

| HCQX-OD16-D |
| 16-point digital output |
| Support NPN output |

| HCQX-OD32-D2* |
| 32-point digital output |
| Support NPN output |

## DIGITAL IN/OUT

| HCQX-MD16-D2* |
| 16-point digital I/O |
| Support NPN/PNP input |
| Support NPN output |

| HCQX-MD16-D |
| 16-point digital I/O |
| Support NPN/PNP input |
| Support NPN output |

| HCQX-MD32-D2* |
| 32-point digital I/O |
| Support NPN/PNP input |
| Support NPN output |

*PNP output needs to be customized, the model name is：HCQX-□□□□，If needed, please contact HCFA sales or distributors.

## Digital input modules — Performance Specifications

| Items | Specifications | |
| --- | --- | --- |
| Models | HCQX-ID16-D / HCQX-ID16-D2 | HCQX-ID32-D2 |
| Input points | 16 | 32 |
| Input form | NPN/PNP | NPN/PNP |
| Input voltage range | DC 24V (+20%~-15%) | DC 24V (+20%~-15%) |
| Input signal current | 7mA / DC 24V | 7mA / DC 24V |
| Input resistance | 4.86kΩ | 4.86kΩ |
| Input sensitivity ON-current | 5.35mA or more | 5.35mA or more |
| Input sensitivity OFF-current | 2.1mA or less | 2.1mA or less |
| Input voltage threshold | VIH_Min：15V    VIL_Max：5V | VIH_Min：15V    VIL_Max：5V |
| Input frequency response | 5kHz | 5kHz |
| Input response time | 0.1ms or less | 0.1ms or less |
| Pulse shape | Pulse width：100us or more  Rising/falling edge：50us or less | Pulse width：100us or more  Rising/falling edge：50us or less |
| Wiring method | 2-wire，Shared by common terminal | 2-wire，Shared by common terminal |
| Common method | Every 8 points share a common terminal | Every 8 points share a common terminal |
| Isolation voltage level | 1.5kVrms | 1.5kVrms |

## Digital output modules — Performance Specifications

| Items | Specifications | |
| --- | --- | --- |
| Models | HCQX-OD16-D / HCQX-OD16-D2 | HCQX-OD32-D2 |
| Output points | 16 | 32 |
| External power range | DC 5V~30V | DC 5V~30V |
| Output form | The standard models support NPN; PNP needs to be customized | The standard models support NPN; PNP needs to be customized |
| Max. load current | 0.25A/point    2A/8point | 0.25A/point    2A/8point |
| Voltage drop at power-ON | 1V or less | 1V以下 |
| Leakage current at -OFF | 0.1mA/DC 24V | 0.1mA/DC 24V |
| Output response | 5kHz | 5kHz |
| Output response time | 0.1ms point | 0.1ms or less |
| Wiring method | 2-wire，Shared by common terminal | 2-wire，Shared by common terminal |
| Common method | Every 8 points share a common terminal | Every 8 points share a common terminal |
| Isolation voltage level | 1.5kVrms | 1.5kVrms |

## Digital I/O module — Performance Specifications

| Items | Specifications | |
| --- | --- | --- |
| Models | HCQX-MD16-D / HCQX-MD16-D2 | HCQX-MD32-D2 |
| I/O points | 8，8 | 16，16 |
| Input form | NPN/PNP | NPN/PNP |
| Output form | The standard models support NPN; PNP needs to be customized | The standard models support NPN; PNP needs to be customized |
| Input voltage range | DC 24V (+20%~-15%) | DC 24V (+20%~-15%) |
| Input signal current | 7mA / DC 24V | 7mA / DC 24V |
| Input resistance | 4.86kΩ | 4.86kΩ |
| Input sensitivity ON-current | 5.35mA or more | 5.35mA or more |
| Input sensitivity OFF-current | 2.1mA or less | 2.1mA or less |
| Input voltage threshold | VIH_Min：15V    VIL_Max：5V | VIH_Min：15V    VIL_Max：5V |
| Input frequency response | 5kHz | 5kHz |
| Input response time | 0.1ms or less | 0.1ms or less |
| Input pulse waveform | Pulse width：100us or more  Rising/falling edge：50us or less | Pulse width：100us or more  Rising/falling edge：50us or less |
| External power range | DC 5V~30V | DC 5V~30V |
| Max. load current | 0.25A/point    2A/8point | 0.25A/point    2A/8point |
| Voltage drop at power-ON | 1V or less | 1V or less |
| Leakage current at power-OFF | 0.1mA/DC 24V | 0.1mA/DC 24V |
| Output response frequency | 5kHz | 5kHz |
| Output response time | 0.1ms or less | 0.1ms or less |
| Wiring method | 2-wire，Shared by common terminal | 2-wire，Shared by common terminal |
| Common method | Every 8 points share a common terminal | Every 8 points share a common terminal |
| Isolation voltage level | 1.5kVrms | 1.5kVrms |

Control topology
Q-series PAC
IQ8000-series IPC
Q-series I/O
Distributed I/O
A-series PLC
R-series PLC
A-series I/O
Product list

## ANALOG INPUT

| HCQX-AD04-D | |
| --- | --- |
| 4-ch analog input | Input voltage range：0~10V、-10~10V、-5~5V、0~5V、1~5V |
| Differential/ single-ended input | Input current range：0~20mA、4~20mA |

## ANALOG OUTPUT

| HCQX-DA04-D | |
| --- | --- |
| 4-ch analog output | Input voltage range：0~10V、-10~10V、-5~5V、0~5V、1~5V |
| Single-ended output | Input current range：0~20mA、4~20mA |

## TEMPERATURE MEASURMENT

| HCQX-TS04-D | |
| --- | --- |
| 4-ch temperature measurement | |
| Thermocouple type：K，J，E，T，N，B，R，S | |
| Thermal resistance：PT100，PT1000，Ni100，Ni1000 | |

### Analog input module — Performance Specifications

| Items | Specifications |
| --- | --- |
| Models | HCQX-AD04-D |
| Analog current consumption | Type：80mA |
| Voltage sampling input | 0~10V、-10~10V、-5~5V、0~5V、1~5V |
| Max. voltage input | -50V~+50V |
| Current sampling input | 0~20mA、4~20mA |
| Max. current sampling input | -50mA~+50mA |
| Voltage input type | Differential input/single-ended input |
| Current input type | Single-ended input |
| Sampling rate | 4ksps |
| Accuracy | ±0.3%FSR(Full scale range) |
| Voltage channel temperature drift | ±7uV/℃ (0.003%FSR) |
| Current channel temperature drift | ±3nA/℃ |

### Analog output module — Performance Specifications

| Items | Specifications |
| --- | --- |
| Models | HCQX-DA04-D |
| Analog current consumption | Type：160mA |
| Voltage conversion output | 0~10V、-10~10V、-5~5V、0~5V、1~5V |
| Current conversion output | 0~20mA、4~20mA |
| Voltage output type | Single-ended output |
| Current output type | Single-ended output |
| Conversion rate | 4ksps |
| Accuracy | ±0.3%FSR |
| Voltage channel temperature drift | ±0.03%FSR |
| Current channel temperature drift | ±0.05%FSR |
| Voltage output load | Min：1kΩ |
| Current output load | Max：0.625 kΩ |

### Temperature measurement module — Performance Specifications

| Items | Specifications |
| --- | --- |
| Models | HCQX-TS04-D |
| Signal voltage | Thermocouple：K，J，E，T，N，B，R，S（Default K-type） |
| | Thermal resistance：PT100，PT1000，Ni100，Ni1000（Default PT100）3-wire system |
| Settings | No need to set the address in the software, codesys will make the configuration automatically; Functions include overrun detection / disconnection detection / sampling cycle setting / sensor-type setting /Input filter setting and temperature unit conversion setting Typical 1Khz; Depends on sensor-type, conversion time and length |
| Input filter limit frequency | Typical 1Khz；Depends on sensor type, conversion time and length |
| Resolution | 0.1 ℃ per digit ，0.1℉ per digit |
| Warm-up time during TC test | 30 mins |
| Absolute max. ratings | ±150mV |
| Conversion time | About 100ms~1.3s, according to the configuration and filter settings and provide disconnection detection. (Turned on by default) and takes 460ms. TC time: 100ms* number of open channels*filtering times of this channel PT time: 200ms* number of open channels*filtering times of this channel |
| Temperature range | Determined by the corresponding sensor type； For TC, default setting K: -200~1370 ℃, -7~55mV; For PT, default setting PT100: -200~850℃, 18~391Ω. |
| Measurement error (total error range) | TC：<±0.3% (For full scale) PT：<±0.5℃ |

Control topology
Q-series PAC
IQ8000-series IPC
Q-series I/O
Distributed I/O
A-series PLC
R-series PLC
A-seriesI/O
Product list

Control topology
Q-series PAC
IQ8000-series IPC
Q-series I/O
Distributed I/O
A-series PLC
R-series PLC
A-seriesI/O
Product list

**High-speed counter/step drive modules**

# HCQX SERIES

## ○ HIGH SPEED COUNTER

HCQX-HC04-D2

4-ch high-speed counting

Single-ended input

Single-phase / dual-phase pulse input

## ○ STEP DRIVER

HCQX-ST1505-D2

Single-axis control

Supported mode：PP PV CSP HM

## High-speed counter module —Line drive specifications

| Items | specifications |
|---|---|
| Models | HCQX-HC04-D2 |
| Collector input | DC 24V/8.4mA |
| ON-voltage/ON-current | DC 15V or more/5mA or more |
| Single-phase max. response frequency (A/B-phase) | 200kHz |
| ON/OFF response time | Less than 2μs |

## High-speed counter module — Input specifications

| Items | specifications |
|---|---|
| Models | HCQX-HC04-D2 |
| Number of channel | 4 |
| Number of input points per channel | 4 |
| Rated input voltage | DC 24V (DC 20.4~28.8V) |
| Input resistance | 3kΩ |
| Input type | NPN /PNP |
| Wiring method | Three-wire encoder |
| Pulse input method | Orthogonal phase pulse(x2/4)/Pulse + direction/Up/down pulse |
| Counting unit | Pulse |
| Counting range | – 2,147,483,648～2,147,483,647 |

## High-speed counter module — Counting functions

| Items | specifications |
|---|---|
| Models | HCQX-HC04-D2 |
| Counter type | Ring counter or linear counter |
| Counter control | Gate control, counter reset and counter preset |
| Lock function | 1 external input lock and 1 internal lock |
| Measurement method | Pulse rate measurement and pulse period measurement |

## Step drive module — Power Specifications

| Items | Specifications |
|---|---|
| Models | HCQX-ST1505-D2 |
| QBUS rated voltage | DC 12V |
| QBUS current consumption | Type：100mA (without encoder) Max：300mA (with encoder) |
| Input voltage range | DC 20~50V |
| Max. input current | 5A |

## Step drive module — Control Specifications

| Items | Specifications |
|---|---|
| Models | HCQX-ST1505-D2 |
| Control protocol | CiA402 |
| Communication scan cycle | 250μs、500μs、1ms、2ms、4ms、8ms |
| Subdivision level | 32~256 step |
| Power supply to the encoder | 4.5~5V、200mA (Max) |
| Encoder input type | Differential input |
| Encoder max. response frequency | 200kHz |
| Motor control mode | PP、PV、CSP、Homing |
| Digital input | I0~I4, single-ended DC 24V, max. pulse frequency 5kHz |
| Digital output | Q0~Q1, open-drain collector, max. 30V/250mA, max. pulse frequency 2kHz |
| Motor parameters | The motor parameters can be detected by servo drive automatically |

## Step drive module — Drive Specifications

| Items | Specifications |
|---|---|
| Models | HCQX-ST1505-D2 |
| Power output type | Dual H-bridge |
| Current control | PWM frequency 25kHz |
| Output current | Continuous max. peak current 5A |
| Protection functions | Overcurrent protection, undervoltage protection, overvoltage protection, over-temperature protection |

Control topology
Q-series PAC
IQ8000-series IPC
Q-series I/O
Distributed I/O
A-series PLC
R-series PLC
A-seriesI/O
Product list

# HCQX-SERIES UNIT DIMENSION DRAWING
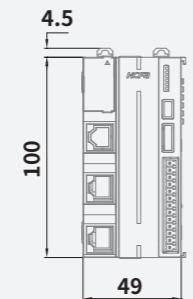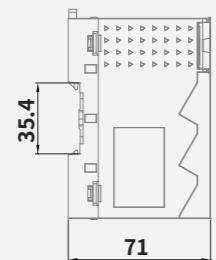
## Coupler modules
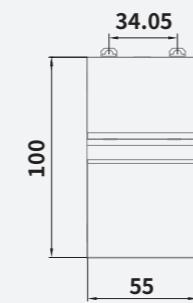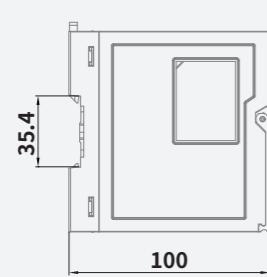
Unit：mm



| Model | |
|---|---|
| HCQX-EC01-D | HCQX-EC02-D |

## Power modules
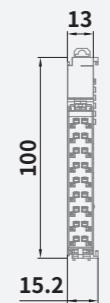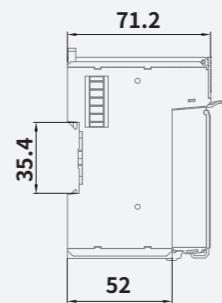
Unit：mm



| Model |
|---|
| HCQX-PD01-A |
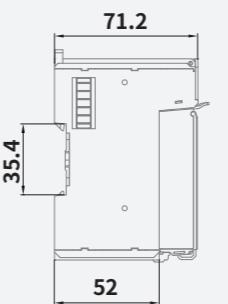
## Extension modules
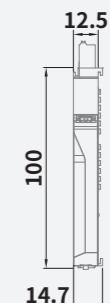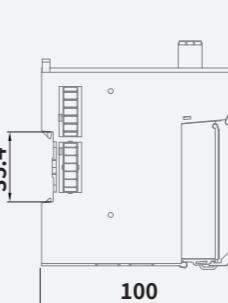
Unit：mm



| Model | | | |
|---|---|---|---|
| HCQX-ID16-D2 | HCQX-OD16-D2 | HCQX-MD16-D2 | HCQX-HC04-D2 |

Unit：mm
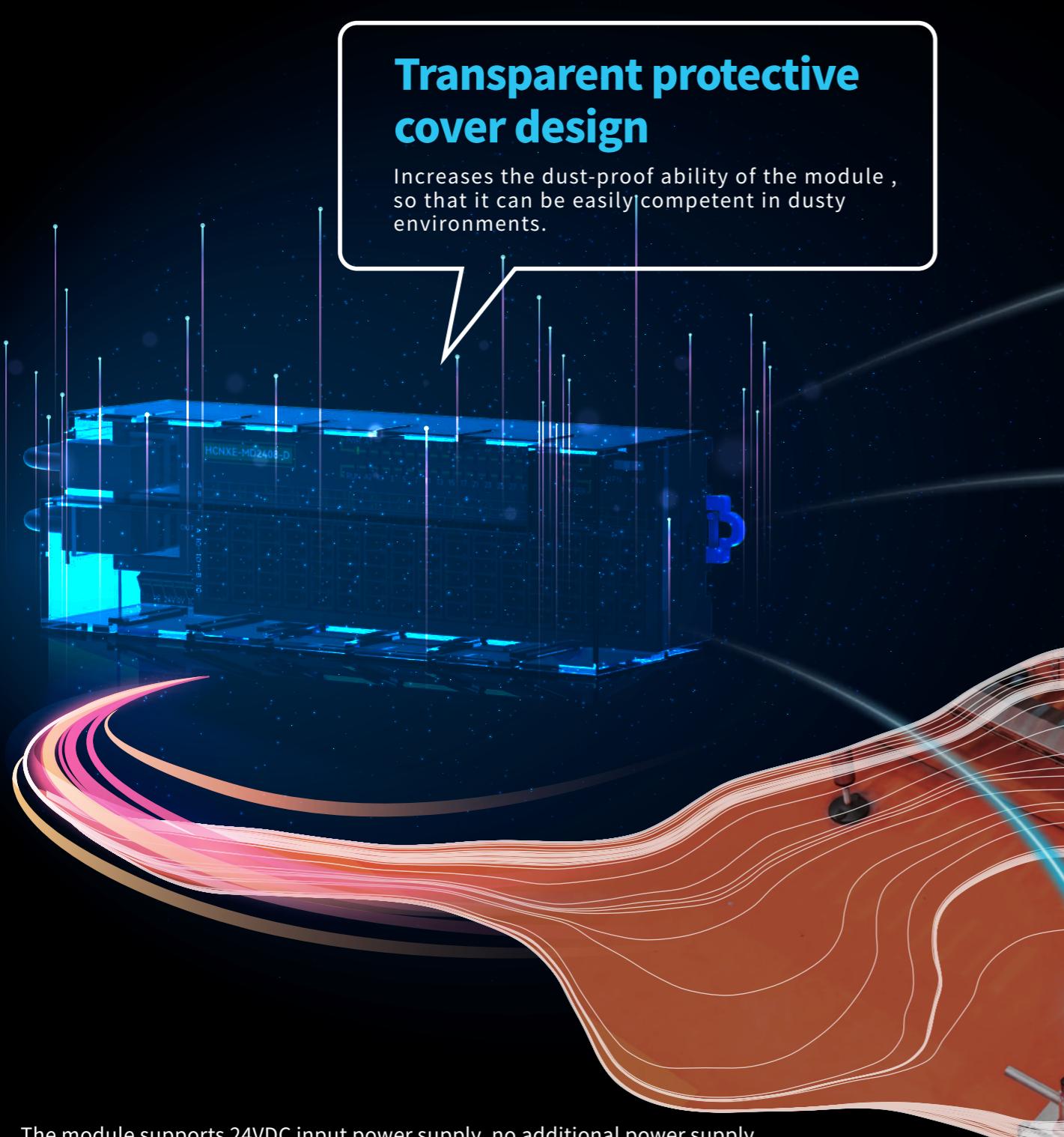


| Model | | | |
|---|---|---|---|
| HCQX-ID32-D2 | HCQX-OD32-D2 | HCQX-MD32-D2 | HCQX-ST1505-D2 |

Unit：mm



| Model | | | |
|---|---|---|---|
| HCQX-ID16-D | HCQX-OD16-D | HCQX-MD16-D | HCQX-AD04-D |
| HCQX-DA04-D | HCQX-TS04-D | | |

# Q SERIES DISTRIBUTED I/O SYSTEM

## Provide solutions for discrete control sites

Distributed design, supports EtherCAT protocol, and can be flexibly arranged in the industrial field. Up to 32 I/O points can be supported on a single module.
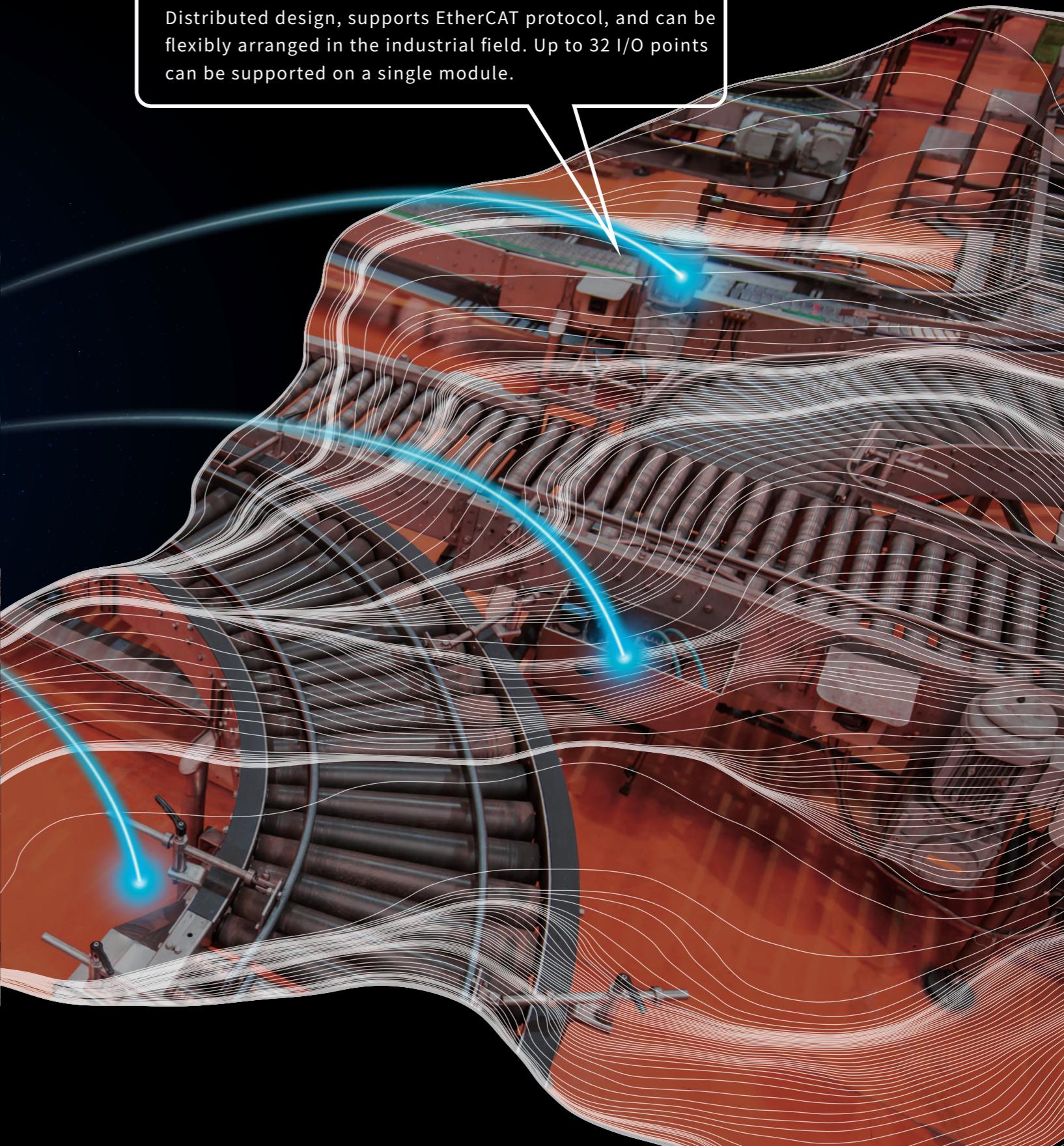
## Transparent protective cover design

Increases the dust-proof ability of the module , so that it can be easily competent in dusty environments.

The module supports 24VDC input power supply, no additional power supply module  needed, and 24VDC 0V port is provided for easy wiring.

# HCNXE-SERIES UNIT LINEUP

## Naming rule for HCNXE-series extension modules

# H C N X E – I D 3 2 – D

**Product name**

**HC**

**HC:** HCFA controller

**Distributed modules**

**NXE**

**NXE:** EtherCAT module
**NXP:** ProfiNet module
**NXM:** Modbus TCP module
**NXC:** CANOpen module

**Function modules**

**ID**

**ID:** Digital input
**OD:** Digital output
**MD:** Digital I/O

**Number of channels**

**32**

**32:** Number of channels
**Note:** For digital I/O, represented by 4-digit, for example: 2408, indicating 24 input points and 8 output points

**Power type**

**D**

**D:** DC power
**A:** AC power

## Distributed digital input modules

| Models | | Number of channel | Input/output type | | | External dimension  WxDxH(mm) |
|---|---|---|---|---|---|---|
| | | | Input | | Output | |
| | HCNXE-ID32-D | 32 | 32 | DC 24V (NPN/PNP) | - | - | 160x28x50 |

## Distributed digital output modules

| Models | | Number of channel | Input/output type | | | External dimension  WxDxH(mm) |
|---|---|---|---|---|---|---|
| | | | Input | | Output | |
| | HCNXE-OD32-D | 32 | - | - | 32 | NPN | 160x28x50 |

## Distributed digital I/O modules

| Models | | Number of channel | Input/output type | | | External dimension  WxDxH(mm) |
|---|---|---|---|---|---|---|
| | | | Input | | Output | |
| | HCNXE-MD1616-D | 32 | 16 | DC 24V (NPN/PNP) | 16 | NPN | 160x28x50 |
| | HCNXE-MD2408-D | 32 | 24 | DC 24V (NPN/PNP) | 8 | NPN | 160x28x50 |

## Environment specificaions

| Items | Specifications | | | | |
|---|---|---|---|---|---|
| Ambient temperature | For operation：0~55°C (32~131°F)      For storage：-25~75°C (-13~167°F) | | | | |
| Relative humidity | For operation：5~95%RH (No condensation) | | | | |
| Vibration resistance | Installation | Frequency (Hz) | Frequency (m/s²) | Half amplitude (mm) | |
| | When installed on DIN rail | 10-57 | - | 0.035 | 10 times of testing in each direction (X-, Y-, and Z-axis directions) (Total: 80 min, each) |
| | | 57-150 | 4.9 | - | |
| | When installed directly | 10-57 | - | 0.075 | |
| | | 57-150 | 9.8 | - | |
| Shock resistance | 147m/s² , Action time: 11ms，3 times by half-sine pulse in each direction X, Y, and Z | | | | |
| Noise resistance | By noise simulator at noise voltage of 10,000Vp-p, noise width of 1μs, rise time of 1ns and period of 30 to 100Hz | | | | |
| Dielectric withstand voltage | AC 500V  one minute | Between all the terminals and grounding terminals | | | |
| Insulation resistance | 5MΩor more by 500V DC megger | | | | |
| Grounding | Class D grounding (grounding resistance: 100Ωor less) <Common grounding with a heavy electrical system is not allowed. | | | | |
| Working atmosphere | Free from corrosive or flammable gas and excessive conductive dusts | | | | |
| Working altitude | 2000m or less | | | | |

## Power specifications

| Items | Rated power of control side | Input voltage range of control side | Max. current consumption of control side | Rated power of IO side | Input voltage range of IO side | Max. current of IO side |
|---|---|---|---|---|---|---|
| Specifications | DC 24V | DC 20.4~28.8V | 50mA/24V | DC 24V | DC 20.4~28.8V | 5A |

Digital I/O modules

# HCNXE SERIES

Control topology

Q-series PAC

IQ8000-series IPC

Q-series I/O

Distributed I/O

A-series PLC

R-series PLC

A-seriesI/O

Product list

○ REMOTE DIGITAL INPUT

HCNXE-ID32-D

32-point digital input

Support NPN/PNP input

○ REMOTE DIGITAL OUTPUT

HCNXE-OD32-D

32-point digital output

Support NPN output

○ REMOTE DIGITAL IN/OUT

HCNXE-MD1616-D

32-point digital I/O

Support NPN/PNP input

Support NPN output

HCNXE-MD2408-D

32-point digital I/O

Support NPN/PNP input

Support NPN output

## Digital input module

| Items | Specifications |
|---|---|
| Models | HCNXE-ID32-D |
| Input points | 32 |
| Rated input voltage | DC 24V (DC 20.4~28.8V) |
| Rated input current | 8.4mA/24V |
| ON-voltage/ON-current | DC 15V or more/5mA or more |
| ON/OFF response time | 125μs or more |
| Input resistance | 3kΩ |
| Input type | Compatible with NPN and PNP (switched by the Switch) |
| Wiring method | 2-wire sensor, 3-wire sensor |

## Digital output module

| Items | Specifications |
|---|---|
| Models | HCNXE-OD32-D |
| Output points | 32 |
| Rated load voltage | DC 24V (DC 20.4~28.8V) |
| Rated load current | 0.5A/ch, 2A/8ch |
| Leakage current at power-OFF | 0.1mA or less |
| Residual voltage at power-ON | 0.3V or less |
| ON/OFF response time | 125μs or more |
| Output typle | NPN，built-in common terminal |
| Wiring method | 2-wire |
| Protection functions | Overcurrent protection, overvoltage protection, over-temperature protection |

## Digital I/O module
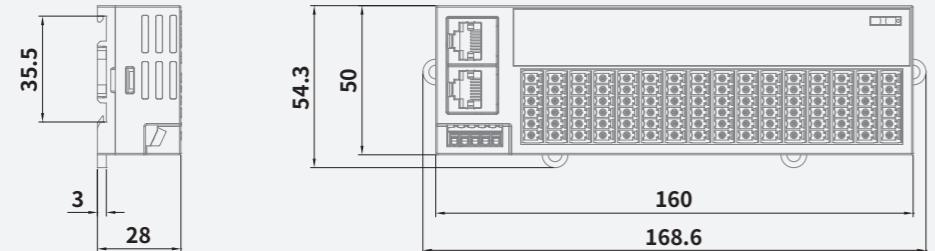
| Items | Specifications | |
|---|---|---|
| Models | HCNXE-MD1616-D | HCNXE-MD2408-D |
| Input points | 16 | 24 |
| Output points | 16 | 8 |
| Rated input voltage | DC 24V (DC 20.4~28.8V) | DC 24V (DC 20.4~28.8V) |
| Rated input current | 8.4mA/24V | 8.4mA/24V |
| ON-voltage/ON-current | DC 15V or more/5mA or more | DC 15V or more/5mA or more |
| ON/OFF response time | 125μs or more | 125μs or more |
| Input resistance | 3kΩ | 3kΩ |
| Input type | Compatible with NPN and PNP(switched by the Switch) | Compatible with NPN and PNP(switched by the Switch) |
| Wiring method | 2-wire sensor, 3-wire sensor | 2-wire sensor, 3-wire sensor |
| Rated load voltage | DC 24V (DC 20.4~28.8V) | DC 24V (DC 20.4~28.8V) |
| Rated load current | 0.5A/ch, 2A/8ch | 0.5A/ch, 2A/8ch |
| Leakage current at power-OFF | 0.1mA or less | 0.1mA or less |
| Residual voltage at power-ON | 0.3V or less | 0.3V or less |
| Output type | NPN，built-in common terminal | NPN，built-in common terminal |
| Wiring method | 2-wire | 2-wire |
| Protection functions | Overcurrent protection, overvoltage protection, over-temperature protection | Overcurrent protection, overvoltage protection, over-temperature protection |

## HCNXE-series

Unit：mm
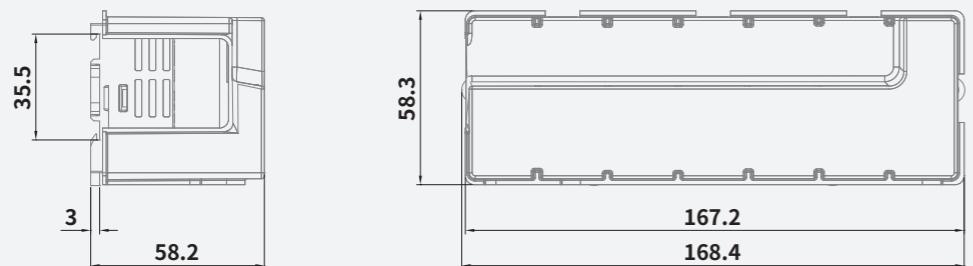
| Models | | | |
|---|---|---|---|
| HCNXE-ID32-D | HCNXE-OD32-D | HCNXE-MD1616-D | HCNXE-MD2408-D |

## HCNXE-series(with protective cover)

Unit：mm

| Models | | | |
|---|---|---|---|
| HCNXE-ID32-D | HCNXE-OD32-D | HCNXE-MD1616-D | HCNXE-MD2408-D |

# Rich PLC products

From the early A1P / A2P- series to the newly-launched R8P-series, HCFA has accumulated many years of PLC research and development experience, and constantly improves various PLC product lines according to customer needs.

**Make upgrading much easier!**

The extension modules are compatible with the upgrade version of most CPU units, making system

2021

The same setup programming software HCPWORK2, allows customers to use only one software for project development, reducing learning costs and improving production efficiency.

R8P

R8C

HCR8P-32MR

R2

2013

R8A

A1P   A2P

HCR2-40M

# A/R-SERIES LINEUP

## Naming rule for A-series PLC

# H C A 8 C – 1 6 X 1 6 Y T – A

**Product name**

**HC**
HC: HCFA controller

**Series name**

**A8**
A1: Simple-type controller
A2: General-purpose controller
A8: High-performance controller

**Series models**

**C**
N/A: Standard-type
P : Upgraded-type
C : Compact type

**Input points**

**16**
16: 16 points

**Input type**

**X**
X : Digital input for main units
EX: Digital input for extension modules
AD: Analog input
PT: Thermal resistance input
TC: Thermocouple input
HC: High-speed input
LC : Load cell

**Output points**

**16**
16: 16points

**Output type**

**Y**
Y : Digital output for main units
EY : Digital output for extension modules
DA: Analog output
PG: Pulse output
GM: Motion control

**Output method**

**T**
R: Relay output
T: Transistor output

**Power type**

**A**
D: DC power
A: AC power
N/A: For modules

## Naming rule for R-seires PLC

# H C R 8 C – 3 2 M T – D

**Product name**

**HC**
HC: HCFA controller

**Series name**

**R8**
R1: Simple-type controller
R2: General-purpose
R8: High-performance controller

**Series models**

**C**
N/A: Standard-type
A : A-series
P : Upgraded-type
C : Compact-type

**Total points**

**32**
10: 10 points
14: 14 points
...: ...
80: 80 points
128: 128 points

**Function module**

**M**
M: Standard control

**Output type**

**T**
R: Relay output
T: Transistor output

**Power type**

**D**
D: DC power
A: AC power

---

### HCA1P
**A-series simple-type PLC**

| Basic function | Up to 2 axes | 30 control points | Program capacity 2k steps |
| Function | Positioning function | Clock function | Board extension | High-speed input/output |
| Interfaces | RS422 | RS485 |

### HCA2P
**A-series general-purpose PLC**

| Basic function | Up to 2 axes | 256 control points | Program capacity 8k steps |
| Function | Positioning function | Clock function | Board extension | High-speed input/output | Support right-extension modules |
| Interfaces | RS422 | RS485 |

### HCR2
**R-series general-purpose PLC**

| Basic function | Up to 4 axes | 256 control points | Program capacity 64k steps |
| Function | Positioning function | Clock function | Board extension | High-speed input/output | Support right-extension modules |
| Protocol | Modbus RTU | Modbus TCP |
| Interfaces | RS422 | RS485 | RS232 | Ethernet×1 |

### HCR8A
**R-series high-performance PLC**

| Basic function | Up to 4 axes | 256 control points | Program capacity 64k steps |
| Function | Positioning function | SD memory card | Board extension | High-speed input/output | Support right-extension modules |
| Protocol | Modbus RTU | Modbus TCP |
| Interfaces | RS485×2 | RS232×2 | Ethernet×1 |

### HCR8C
**R-series high-performance PLC**

| Basic function | Up to 8 axes | 256 control points | Program capacity 64k steps |
| Function | Positioning function | SD memory card | High-speed input/output | Support right-extension modules |
| Protocol | Modbus RTU | Modbus TCP | CANOpen* |
| Interfaces | RS485×2 | RS232×2 | Ethernet×1 |

### HCR8P
**R-series high-performance PLC**

| Basic function | Up to 8 axes | 256 control points | Program capacity 64k steps |
| Function | Positioning function | SD memory card | Board extension | High-speed input/output | Support right-extension modules |
| Protocol | Modbus RTU | Modbus TCP | CANOpen* |
| Interfaces | RS485×2 | RS232×2 | Ethernet×1 |

*Will be supported.

A-series Simple-type PLC

# HCAIP

Control topology

Q-series PAC

IQ8000-series IPC

Q-series I/O

Distributed I/O

A-series PLC

R-series PLC

A-seriesI/O

Product list

## > Main units

| Models | Description |
| --- | --- |
| HCA1P-8X6YT/R-A/D | 8 input points、6 output points、transistor/relay output |
| HCA1P-12X8YT/R-A/D | 12 input points、8 output points、transistor/relay output |
| HCA1P-16X14YT/R-A/D | 16 input points、14 output points、transistor/relay output |

## > Environment specifications

| Items | Specifications |
| --- | --- |
| Working temperature | 0~55℃ |
| Storage temperature | -25~70℃ (No condensation) |
| Relative humidity | 10%~95% (No condensation) |
| Working altitude | 2000m Max. |
| Electromagnetic interference | EFT 2KV (Power cable, signal cable) |
| Vibration | 5～8.4Hz,　amplitude 3.5mm, 8.4～150Hz, Acceleration 9.8m/s², scan at a rate of one multiplication frequency per minute, ten times in each direction (X-, Y-, and Z-axis directions) |
| Impact (collision) | 147m/s², three times in each direction (X-, Y-, and Z-axis directions) |
| Pollution level | Pollution degree2 |
| Protection level | IP20 |
| Cooling method | Natural air cooling |
| Installation method | DIN rail mounting 35mm |

## > Power specifications

| Items | Speficications |
| --- | --- |
| Power specifications | AC power：AC　100~240V　DC power：DC 24V±20% |
| Power consumption | AC  power：19W (6X4Y、8X6Y)，20W (12X8Y)，21W (16X14Y) |
| | DC power：6W (6X4Y)，6.5W (8X6Y)，7W (12X8Y)，8W (16X14Y) |
| Rush current | AC power：Max.15A 5ms or less/AC 100V、max.25A 5ms or less/AC 200V DC power：Max.10A 100µs/DC 24V |
| Input specifications | DC 24V 7mA/5mA No voltage contact or NPN open-collector transistor input |
| Output specifications | Relay output：2A/1 point、8A/4 points COM　AC 250V、DC 30V or less |
| | Transistor output：0.5A/1 point、0.8A/4 points COM DC 5~30V |
| I/O extension, special extension | Some inputs/outputs and analog inputs/outputs  can be extended by installing function extension boards |

## > Performance specifications

| Items | | Specifications |
| --- | --- | --- |
| Performance | Program  capacity | Built-in 2,000 steps,(EEPROM without battery)，comment input, write  during RUN |
| | | Memory Box with program transfer function can be installed (max. 2,000 steps) |
| | Clock function | Built-in real-time clcok (with time setting  and time comparison instructions) |
| | Instructions | Basic instruction: 27, Step ladder instruction: 2, Applied instruction: 85 |
| | Operation processing time | Basic instruction：0.5~0.7µs/instruction，Applied instruction：3.7~100µs/instruction |
| | High-speed processing | I/O refresh instruction, input filter adjustment command, input interrupt function, pulse catch function |
| | Max. I/O points | 30 points(4 input points and 2 output points can be extended by function extension boards) |
| | Auxiliary relay, timer | Auxiliary relay：512 points, Timer：64 points |
| | Counter | For general use, 16-bit up counter：32 points |
| | | For high-speed use, 32-bit up/down counter：[1-phase]60kHZ/2points, 10kHZ/4 poitns [2-phase]30kHZ/1 point, 5kHZ/1 point |
| | Data registers | For general use: 256 points, for index use:16 points, for file use: Up to 1,500 points |
| Others | COM port | Built-in communication port，RS422/RS485 |
| | Corresponding data communication | N:N network, parallel link, PC link, programming communication |

## > Input specifications

| Items | | Specifications |
| --- | --- | --- |
| Input points | HCA1P-8X6Y□ | 8 points |
| | HCA1P-12X8Y□ | 12 points |
| | HCA1P-16X14Y□ | 16 points |
| Input form | | NPN/PNP |
| Input voltage | | DC 24V±10% |
| Input resistance | X000～X007 | 3.3kΩ |
| | X010 or more | 4.3kΩ |
| Input current | X000～X007 | 7mA/DC 24V |
| | X010 or more | 5mA/DC 24V |
| Input sensitivity current at power-ON | X000～X007 | 4.5mA or more |
| | X010 or more | 3.5mA or more |
| Input sensitivity current at power-OFF | All inputs | 1.5mA or less |
| Input response time | X000～X001 | About 10µs |
| | X002~X007 | About 50µs |
| | X010 or more | About 10µs |
| Input circuit isolation | | Optocoupler isolation |
| Input operation display | | LED lit when driving |

Control topology

Q-series PAC

IQ8000-series IPC

Q-series I/O

Distributed I/O

A-series PLC

R-series PLC

A-seriesI/O

Product list

## > Output specifications

| Items | | Transistor output specifications |
|---|---|---|
| External voltage | | DC 5～30V |
| Max. load | Resistive load | Make sure that the total load current of resistance load per common terminal not exceed the following value:<br>1 output point: 0.5A<br>4 output points: 0.8A<br>8 output points: 1.6A |
| | Inductive load | 12W/DC 24V |
| Mini. load | | - |
| Open circuit leakage current | | 0.1mA or less/DC 30V |
| ON voltage | | 1.5V or less |

| Items | | | Relay output specifications |
|---|---|---|---|
| External voltage | | | DC 30V or less |
| | | | AC 240V or less (AC 250V or less when not compatible with CE, UL, cUL standards) |
| Max. load | Resistive load | 2A/1 point | Make sure that the total load current of resistance load per common terminal not exceed the following value:<br>1 output point: 2A<br>4 output points: 8A<br>8 output points: 8A |
| | Inductive load | 80VA | - |
| Mini. load | | | DC 5V 2mA (Reference) |
| Open circuit leakage current | | | - |
| Response time | OFF→ON | | About 10ms |
| | ON→OFF | | About 10ms |
| Circuit insulation | | | Mechanical insulation |
| Operation display | | | LED lit when the relay coil is energized |

## > RS485 specifications

| Items | Specifications |
|---|---|
| Interface type | RS485 |
| Data transmission speed | Max.115200bps |
| Communication mode | Half-duplex |
| Max. transmission distance | 50m (At a specific baud rate) |
| Supported protocol | N:N network, parallel link, PC link |
| Isolation status | Non-isolated |
| Terminating resistor | Not built-in |

## > RS422 specifications

| Items | Specifications |
|---|---|
| Interface type | RS422 |
| Data transmission speed | Max.115200bps |
| Communication mode | Full-duplex |
| Max. transmission distance | 50m (At a specific baud rate) |
| Supported protocol | Programming port protocol |
| Isolation status | Non-isolated |

Control topology

Q-series PAC

IQ8000-series IPC

Q-series I/O

Distributed I/O

A-series PLC

R-series PLC

A-series I/O

Product list

Control topology

Q-series PAC

IQ8000-series IPC

Q-series I/O

Distributed I/O

A-series PLC

R-series PLC

A-series I/O

Product list

Control topology

Q-series PAC

IQ8000-series IPC

Q-series I/O

Distributed I/O

A-series PLC

R-series PLC

A-seriesI/O

Product list

## > Main units

| Models | Description |
|---|---|
| HCA2P-14X10YT/R-A/D | 14 input points，10 output points，transistor/relay output |
| HCA2P-24X16YT/R-A/D | 24 input points，16 output points，transistor/relay output |
| HCA2P-36X24YT/R-A/D | 36 input points，24 output points，transistor/relay output |

## > Environment specifications

| Items | Specifications |
|---|---|
| Working temperature | 0~55℃ |
| Storage temperature | -25~70℃ (No condensation) |
| Relative humidity | 10%~95% (No condensation) |
| Working altitude | 2000m Max. |
| Electromagnetic interference | EFT 2KV (Power cable, signal cable) |
| Vibration | 5～8.4Hz，amplitude 3.5mm, 8.4～150Hz, Acceleration 9.8m/s², scan at a rate of one multiplication frequency per minute, ten times in each direction (X-, Y-, and Z-axis directions) |
| Impact (collision) | 147m/s², three times in each direction (X-, Y-, and Z-axis directions) |
| Pollution level | Pollution degree2 |
| Protection level | IP20 |
| Cooling method | Natural air cooling |
| Installation method | DIN rail mounting 35mm |

## > Power specifications

| Items | Spefications |
|---|---|
| Power specifications | AC power：AC 100~240V DC power：DC 24V±20% |
| Power consumption | AC power：30W (14X10Y)，32W (24X16Y)，35W (36X24Y) |
| | DC power：15W (14X10Y)，18W (24X16Y)，20W (36X24Y) |
| Rush current | AC power：Max.30A 5ms or less/AC 100V，max.50A 5ms or less/AC 200V |
| | DC power：Max.25A 1ms or less/DC 24V，max.22A 0.3ms or less/DC 12V |
| Input specifications | DC 24V 7mA/5mA, No voltage contact or NPN open-collector transistor input |
| Output specifications | Relay output：2A/1 point,8A/4 points COM AC 250V，DC 30V or less |
| | Transistor output：0.5A/1 point, 0.8A/4 points COM DC 5~30V |
| I/O extension, special extension | Can be connected to HCA8C series I/O extension modules; |
| | Some inputs/outputs and analog inputs/outputs can be extended by installing function extension boards |

## > Performance specifications

| Items | | Specifications |
|---|---|---|
| Performance | Program capacity | Built-in 8,000 steps,(EEPROM without battery)，comment input, write during RUN |
| | | Memory Box with program transfer function can be installed (max. 8,000 steps) |
| | Clock function | Built-in real-time clcok (with time setting, time comparison instructions,with correction for leap year) |
| | Instructions | Basic instruction: 27, Step ladder instruction: 2, Applied instruction: 89 |
| | Operation processing time | Basic instruction：0.5~0.7μs/instruction，Applied instruction：3.7~100μs/instruction |
| | High-speed processing | I/O refresh instruction, input filter adjustment command, input interrupt function, pulse catch function |
| | Max. I/O points | 256 points |
| | Auxiliary relay, timer | Auxiliary relay：1,536 points, Timer：256 points |
| | Counter | For general use, 16-bit up counter：200 points; For general use, 32-bit up/down counter: 35 points |
| | | For high-speed use, 32-bit up/down counter：[1-phase]60kHz/2 points, 10kHz/4 points[2-phase]30kHz/1 point, 5kHz/1 point |
| | Data registers | For general use: 8000 points, for index use:16 points, for file use: Up to 7,000 points |
| Others | COM port | Built-in communication port，RS422/RS485 |
| | Special extension | Analog,positioning modules |
| | Corresponding data communication | N:N network, parallel link, PC link, programming communication |

## > Input Specifications

| Items | | Specifications |
|---|---|---|
| Input points | HCA2P-14X10Y□ | 14points |
| | HCA2P-24X16Y□ | 24points |
| | HCA2P-36X24Y□ | 36points |
| Input form | | NPN/PNP |
| Input voltage | | DC 24V±10% |
| Input resistance | X000～X007 | 3.3kΩ |
| | X010 or more | 4.3kΩ |
| Input current | X000～X007 | 7mA/DC 24V |
| | X010 or more | 5mA/DC 24V |
| Input sensitivity current at power-ON | X000～X007 | 4.5mA or more |
| | X010 or more | 3.5mA or more |
| Input sensitivity current at power-OFF | All inputs | 1.5mA or less |
| Input response time | X000～X001 | About 10μs |
| | X002~X007 | About 50μs |
| | X010 or more | About 10μs |
| Input circuit isolation | | Optocoupler isolation |
| Input operation display | | LED lit when driving |

Control topology

Q-series PAC

IQ8000-series IPC

Q-series I/O

Distributed I/O

A-series PLC

R-series PLC

A-seriesI/O

Product list

## > Output specifications

| Items | | Transistor output specifications |
|---|---|---|
| External voltage | | DC 5～30V |
| Max. load | Resistive load | Make sure that the total load current of resistance load per common terminal not exceed the following value:<br>1 output point: 0.5A<br>4 output points: 0.8A<br>8 output points: 1.6A |
| | Inductive load | 12W/DC 24V |
| Mini. load | | - |
| Open circuit leakage current | | 0.1mA or less /DC 30V |
| ON voltage | | 1.5V or less |

| Items | | | Relay output specifications |
|---|---|---|---|
| External voltage | | | DC 30V or less |
| | | | AC 240V or less (AC 250V or less when not compatible with CE, UL, cUL standards) |
| Max. load | Resistive load | 2A/1 point | Make sure that the total load current of resistance load per common terminal not exceed the following value:<br>1 output point: 2A<br>4 output points: 8A<br>8 output points: 8A |
| | Inductive load | 80VA | - |
| Mini. load | | | DC 5V 2mA (Reference) |
| Open circuit leakage current | | | - |
| Response time | OFF→ON | | About 10ms |
| | ON→OFF | | About 10ms |
| Circuit insulation | | | Mechanical insulation |
| Operation display | | | LED lit when the relay coil is energized |

## > RS485 Specifications

| Items | Specifications |
|---|---|
| Interface type | RS485 |
| Data transmission speed | Max.115200bps |
| Communication mode | Half-duplex |
| Max. transmission distance | 50m (At a specific baud rate) |
| Supported protocol | N:N network, parallel link, PC link |
| Isolation status | Non-isolated |
| Terminating resistor | Not built-in |

## > RS422 Specifications

| Items | Specifications |
|---|---|
| Interface type | RS422 |
| Data transmission speed | Max.115200bps |
| Communication mode | Full-duplex |
| Max. transmission distance | 50m (At a specific baud rate) |
| Supported protocol | Programming port protocol |
| Isolation status | Non-isolated |

**HCR2**

Control topology

Q-series PAC

IQ8000-series IPC

Q-series I/O

Distributed I/O

A-series PLC

R-series PLC

A-series/IO

Product list

## > Main units

| Models | Description |
|---|---|
| HCR2-24MT/R-A | 14 input points，10 output points，transistor/relay output |
| HCR2-40MT/R-A | 24 input points，16 output points，transistor/relay output |
| HCR2-60MT/R-A | 36 input points，24 output points，transistor/relay output |

## > Environment Specifications

| Items | Specifications |
|---|---|
| Working temperature | 0~55℃ |
| Storage temperature | -25~70℃ (No condensation) |
| Relative humidity | 10%~95% (No condensation) |
| Working altitude | 2000m Max. |
| Electromagnetic interference | EFT 2KV (Power cable, signal cable) |
| Vibration | 5～8.4Hz, amplitude 3.5mm, 8.4～150Hz, Acceleration 9.8m/s², scan at a rate of one multiplication frequency per minute, ten times in each direction (X-, Y-, and Z-axis directions) |
| Impact (collision) | 147m/s², three times in each direction (X-, Y-, and Z-axis directions) |
| Pollution level | Pollution degree 2 |
| Protection level | IP20 |
| Cooling method | Natural air cooling |
| Installation method | DIN rail mounting 35mm |

## > Power Specifications

| Items | Speficications |
|---|---|
| Input voltage | AC 100~240V 50/60Hz |
| Max. input current | 220V/320mA |
| Power efficiency | 80% |
| Allowable instantaneous power-failure time | Continue to operate for instantaneous power failures below 10ms<br>When the power supply voltage is 200VAC, it can be changed to 10～100ms by user program |
| Protection functions | Overload protection (110%-150% of rated output power)；<br>Protection mode: hiccup mode, Can restore automatically  after the abnormal load condition is removed |
| Output voltage | External 24VDC power：24V/0.8A |
| Power consumption | 45W Max. |
| Output power right-extension modules | 5V/2A<br>24V/0.8A |
| Number of right extension modules | Up to 8  (without extension power supply) |

## > Performance specifications

| Items | | | Specifications |
|---|---|---|---|
| Number of control axes | | | 4 axes |
| Pulse output form | | | Transistor |
| Max. frequency | | | Pulse 200kHz |
| Positioning | Pulse output mode | | PULSE/SIGN mode |
| | Positioning range | Control unit | Motor Unit System |
| | | Positioning range | -2147483648～+2147483647 |
| | Speed instruction | Speed instruction unit | pps |
| | | Base speed | 0～200Kpps |
| | | Max. speed | 1pps～200Kpps |
| | | Homing return speed | 1pps～200Kpps |
| | | Creeping speed | 1pps～200Kpps |
| | | Acceleration time | 0～32767ms |
| | | Deceleration time | 0～32767ms |
| | Acceleration/deceleration processing | | Trapezoidal acceleration/deceleration |
| | Interpolation function | | N/A |

## > Input specifications

| high-speed input | | Specifications |
|---|---|---|
| Input points | | 8点 (X000~X007) |
| Input form | | NPN/PNP |
| Input voltage | All inputs | DC 24V±10% |
| Input resistance | All inputs | 2.7kΩ |
| Input current | All inputs | 8.5mA/DC 24V |
| Input sensitivity current | On-current | All inputs | 5.3mA以上 |
| | OFF-current | All inputs | 1mA以下 |
| Input response frequency | All inputs | 200kHz |
| Input signal form | All inputs | NPN/PNP Open collector transistor |
| Circuit isolation | All inputs | Digital isolation |
| Input operation display | - | LED lit at power-ON |

| Low-speed input | | Specifications |
|---|---|---|
| Input points | | X010 or more |
| Input form | | NPN/PNP |
| Input voltage | All inputs | DC 24V±10% |
| Input resistance | All inputs | 4.3kΩ |
| Input current | All inputs | 5.3mA/DC 24V |
| Input sensitivity current | On-current | All inputs | 2.13mA or more |
| | OFF-current | All inputs | 1.8mA or less |
| Input response frequency | All inputs | 5kHz |
| Input signal form | All inputs | NPN/PNP Open collector transistor |
| Circuit isolation | All inputs | Optocoupler isolation |
| Input operation display | - | LED lit at power-ON |

## > Output specifications

| Items | | Transistor output specifications |
|---|---|---|
| Output points | | 10 points/16 points/24 points |
| Output type | | Transistor/NPN (PNP needs to be customized) |
| External voltage | All outputs | DC 5～30V |
| Max. load | Resistive load | All outputs | 0.5A/1点<br>Make sure that the total load current per common terminal should be the following:<br>- 1 output point:0.5A<br>- 4 output points:0.8A<br>- 8 output points:1.6A |
| | Inductive load | All outputs | 12W/DC 24V |
| Open circuit leakage current | All outputs | 0.1mA or less /DC 30V |
| ON-voltage drop | All outputs | 1.5V or less |
| Response time | OFF→ON | Y000～Y007 | 2.5μs or less/10mA or more(DC 5～24V) |
| | | Y010 or more | 0.2ms or less/200mA or more(DC 24V时) |
| | ON→OFF | Y000～Y007 | 2.5μs or less/10mA or more(DC 5～24V) |
| | | Y010 or more | 0.2ms or less/200mA or more(DC 24V时) |
| Circuit isolation | All outputs | Optocoupler isolation |
| Output operation display | - | LED lit when driving |

| Items | | Relay output specifications |
|---|---|---|
| Output points | | 10 points/16 points/24 points |
| Output type | | Relay |
| External voltage | | DC 30V or less     AC 240V or less |
| Max. load | | 2A/1 point<br>Make sure that the total load current per common terminal should be the following:<br>·4 output points/common terminal：8A or less<br>·8 output points/common terminal：8A or less |
| Open circuit leakage current | | - |
| Response time | OFF→ON | About 10ms |
| | ON→OFF | About 10ms |
| Circuit isolation | All outputs | Mechanical isolation |
| Output operation display | | LED lit when output is ON |

## > Ethernet specifications

| Items | Specifications |
|---|---|
| Interface type | RJ45 connector |
| Data transmission speed | 100/10Mbps |
| Communication mode | Full/half-duplex |
| Max. transmission distance | 100m |
| Supported protocol | Download monitoring protocol<br>Modbus TCP/IP slave |
| Transmission medium | Cat.5E twisted pair cables |

## > RS485 specifications

| Items | Specifications |
|---|---|
| Interface type | RS485 |
| Data transmission speed | Max.115200bps |
| Communication mode | Half-duplex |
| Max. transmission distance | 100m (At a specific baud rate) |
| Supported protocol | Modbus RTU master/slave station<br>Download monitoring protocol<br>Free communication protocol |
| Isolation status | Non-isolated |
| Terminating resistor | Not built-in |

## > RS232 specifications

| Items | Specifications |
|---|---|
| Interface type | RS232 |
| Data transmission speed | Max.115200bps |
| Communication mode | Full-duplex |
| Max. transmission distance | 5m |
| Supported protocol | Download monitoring protocol<br>Free communication protocol |
| Isolation status | Non-isolated |

## > RS422 specifications

| Items | Specifications |
|---|---|
| Interface type | RS422 |
| Data transmission speed | Max.115200bps |
| Communication mode | Full-duplex |
| Max. transmission distance | 100m (At a specific baud rate) |
| Supported protocol | Download monitoring protocol<br>Free communication protocol |
| Isolation status | Non-isolated |

# PLC

**R-series PLC**

# HCR8A

## > Main units

| Models | Description |
|---|---|
| HCR8A-32MT/R-A | 16 input points，16 output points，transistor/relay output |
| HCR8A-48MT/R-A | 24 input points，24 output points，transistor/relay output |
| HCR8A-64MT/R-A | 32 input points，32 output points，transistor/relay output |
| HCR8A-80MT/R-A | 40 input points，40 output points，transistor/relay output |
| HCR8A-128MT/R-A | 64 input points，64 output points，transistor/relay output |

## > Environment specifications

| Items | Specifications |
|---|---|
| Working temperature | 0~55℃ |
| Storage temperature | -25~70℃ (No condensation) |
| Relative humidity | 10%~95% (No condensation) |
| Working altitude | 2000m Max. |
| Electromagnetic interference | EFT 2KV (No condensation) |
| Vibration | 5～8.4Hz， amplitude 3.5mm, 8.4～150Hz, Acceleration 9.8m/s², scan at a rate of one multiplication frequency per minute, ten times in each direction (X-, Y-, and Z-axis directions) |
| Impact (collision) | 147m/s², three times in each direction (X-, Y-, and Z-axis directions) |
| Pollution level | Pollution degree 2 |
| Protection level | IP20 |
| Cooling method | Natural air cooling |
| Installation method | DIN rail mounting 35mm |

## > Power specifications

| Items | | AC power specifications |
|---|---|---|
| Power voltage | | AC 100~240V |
| Freeze frequency | | 50/60Hz |
| Instantaneous power-failure range | | The operation of the main units will not be affected When the instantaneous power failure occurs within 10ms. |
| Power fuse | | 250V 3.15A |
| Inrush current | Main units | Max.30A 5ms or less/AC 100V<br>Max.65A 5ms or less/AC 200V |

| Power | HCR8A-32M□-A | 60W |
|---|---|---|
| | HCR8A-48M□-A | 60W |
| | HCR8A-64M□-A | 60W |
| | HCR8A-80M□-A | 60W |
| | HCR8A-128M□-A | 60W |
| 24VDC power supply | HCR8A-48MT~80MT | 600mA or less |

## > Performance specifications

| Items | | Specifications |
|---|---|---|
| Control points | | 256 points in total |
| Operation speed | | LD:20ns |
| Program capacity | | 64k steps |
| Number of subprogram (tasks) | | Unlimited |
| Programming port<br>(HCP Woks2) | Ethernet | Suported |
| | USB(Mini-B) | Suported |
| | RS485 | - |
| | RS232 | Suported |
| Positioning (Transistor output) | | 200kpps×4 axes |
| High-speed counter (1-phase 1-input) | | 200kHz×3 ch    10kHz×1 ch |
| SD memory card slot | | Suported |
| Network (Ethernet) | Simple communication | Will be supported |
| | Modbus/TCP master | Will be supported |
| | Modbus/TCP slave | Suported |
| | Socket communication | Will be supported |
| | FTP server function | Will be supported |
| Hold during power-failure | Data size | 64KB |
| Extension | Board extension | Suported |
| | Left extension modules | Will be supported |
| | Right extension modules | Suported |
| Serial communication<br>(protocol or instruction) | Modbus RTU | 32 slave stations supported |
| | Modbus RTU slave | Suported |
| | Free communication protocol | Suported |

> ## Input specifications

| Items | | | Specifications |
|---|---|---|---|
| Input points | | | 16/24/32/40/64 points |
| Input resistance | Main units | X000～X005 | 3.9kΩ |
| | | X006,X007 | 3.3kΩ |
| | | X010 or more | 4.3kΩ |
| | I/O extension units/modules | | 4.3kΩ |
| Input current | Main units | X000～X005 | 6mA/DC 24V |
| | | X006,X007 | 7mA/DC 24V |
| | | X010 or more | 5mA/DC 24V |
| | I/O extension units/modules | | 5mA/DC 24V |
| Input sensitivity ON-current | Main units | X000～X005 | 3.5mA or more |
| | | X006,X007 | 4.5mA or more |
| | | X010 or more | 3.5mA or more |
| | I/O extension units/modules | | 3.5mA or more/DC 24V |
| Input sensitivity OFF-current | | | 1.5mA or less |
| Input response frequency | X000～X005 | | 200kHz |
| | X005 or more | | 10kHz |
| Input signal form | | | No-voltage contact input |
| | | | Sink NPN open-collector transistor |
| | | | Source PNP open-collector transistor |
| Input circuit isolation | | | Optocoupler isolation |
| Operation display | | | LCD dot matrix lit when input is ON |

> ## Output specifications

| Items | | | Transistor output specifications |
|---|---|---|---|
| Output points | | | 16/24/32/40/64 points |
| Output type | | | NPN by default(PNP needs to be customized) |
| External voltage | | | DC 5～30V |
| Max. load | | | 1 output point: 0.5A |
| | | | 4 output points: 0.8A |
| | | | 8 output points: 1.6A |
| Open-circuit leakage current | | | 0.1mA or less/DC 30V |
| ON-voltage drop | Y0～Y3 | | 1.0V or less |
| | Y3 or more | | 1.5V or less |
| Response time | Main units | Y0～Y3 | 5μor less/10mA or more(DC 5～24V) |
| | | Y3 or more | 0.2ms or less/200mA or more(DC 24V) |
| | I/O extension units/modules | | 0.2ms or less/200mA or more(DC 24V) |
| Input circuit isolation | | | Optocoupler isolation |
| Input operation display | | | LCD dot matrix lit when output is ON |

| Items | | Relay output sepcifications |
|---|---|---|
| Output points | | 16/24/32/40/64 points |
| Output type | | Relay |
| External voltage | | DC 30V or less  240VAC or less( 250VAC or less when not compatible with CE, UL, CUL standards) |
| Max. load | Resistive load | 1 output point : 2A<br>4 output points: 8A<br>8 output points: 8A |
| | Inductive load | 80VA |
| Mini. load | | DC 5V  2mA(Reference) |
| Open-circuit leakage current | | - |
| Response time | OFF→ON | About10ms |
| | ON→OFF | About10ms |
| Circuit isolation | | Mechanical isolation |
| Operation display | | LCD dot matrix lit when output is ON |

> ## Ethernet specifications

| Items | Specifications |
|---|---|
| Interface type | RJ45 connector |
| Data transmission speed | 100Mbps |
| Communication mode | Full/half-duplex |
| Max. transmission distance | 100m |
| Supported protocol | HCP Works 2 connection, Socket communication, simple communication, FTP server |
| Transmission medium | Cat.5E twisted pair cables |

> ## RS485 specifications

| Items | Specifications |
|---|---|
| Interface type | RS485 |
| Data transmission speed | Max.115200bps |
| Communication mode | Half-duplex |
| Max. transmission distance | 100m (At a specific baud rate) |
| Supported protocol | Modbus RTU master/slave<br>Download monitoring protocol<br>Free communication protocol |
| Isolation status | Digital isolation |
| Terminating resistor | Not built-in |

> ## RS232 specifications

| Items | Specifications |
|---|---|
| Interface type | RS232 |
| Data transmission speed | Max.115200bps |
| Communication mode | Full-duplex |
| Max. transmission distance | 5m |
| Supported protocol | Download monitoring protocol<br>Free communication protocol |
| Isolation status | Non-isolated |

Control topology

Q-series PAC

IQ8000-series IPC

Q-series I/O

Distributed I/O

A-series PLC

R-series PLC

A-seriesI/O

Product list

**R-series PLC**

# HCR8C-32MT-D



## > Main units

| Models | Description |
|---|---|
| HCR8C-32MT-D | 16 input points，16 output points，transistor output |

## > Environment specifications

| Items | Specifications |
|---|---|
| Working temperature | 0~55℃ |
| Storage temperature | -25~70℃ (No condensation) |
| Relative humidity | 10%~95% (No condensation) |
| Working altitude | 2000m Max. |
| Electromagnetic interference | EFT 2KV (Power cable, signal cable) |
| Vibration | 5～8.4Hz， amplitude 3.5mm, 8.4～150Hz, Acceleration 9.8m/s², scan at a rate of one multiplication frequency per minute, ten times in each direction (X-, Y-, and Z-axis directions) |
| Impact (collision) | 147m/s², three times in each direction (X-, Y-, and Z-axis directions) |
| Pollution level | Pollution degree 2 |
| Protection level | IP20 |
| Cooling method | Natural air cooling |
| Installation method | DIN rail mounting 35mm |

## > Power specifications

| Items | Specifications |
|---|---|
| Rated voltage | DC 24V |
| Voltage fluctuation range | -15%, +20% |
| Allowable instantaneous power-failure time | The operation of the main units will not be affected When the instantaneous power failure occurs within 5ms. |
| Output power for right extension moduels | 5V/2A |
| Number of right extension modules | Up to 8 (Extension power supply not connected) |

## > Performance specifications

| Items | | | Specifications |
|---|---|---|---|
| Number of control axes | | | 8 axes |
| Pulse output form | | | Transistor |
| Max. frequency | | | Pulse 200kHz |
| Positioning | Pulse output mode | | PULSE/SIGN mode |
| | Positioning range | Control unit | Pulse |
| | | Positioning range | -2147483648～+2147483647 |
| | Speed instruction | Speed instruction unit | pps |
| | | Base speed | 0～200Kpps |
| | | Max. speed | 1pps～200Kpps |
| | | Homing return speed | 1pps～200Kpps |
| | | Creeping speed | 1pps～200Kpps |
| | | Acceleration time | 0～32767ms |
| | | Deceleration time | 0～32767ms |
| | Acceleration/ deceleration processing | | Trapezoidal acceleration /deceleration |
| | Interpolation function | | N/A |

## > Input specifications

| Items | | Specifications |
|---|---|---|
| Input points | | 16 points (X000~X017) |
| Input form | | NPN/PNP |
| Input voltage | All inputs | DC 24V±10% |
| Input resistance | All inputs | 2.7kΩ |
| Input current | All inputs | 8.5mA/DC 24V |
| Input sensitivity current | On-current | All inputs | 4.03mA or more |
| | OFF-current | All inputs | 3.06mA or less |
| Input response time | At ON | All inputs | 2.5μs or less |
| | At OFF | All inputs | 2.5μs or less |
| Input signal form | All inputs | No voltage contact input, NPN/PNP open collector transistor |
| Circuit isolation | All inputs | Optocoupler isolation |
| Input operation display | - | LED lit when input is ON |

Control topology

Q-series PAC

IQ8000-series IPC

Q-series I/O

Distributed I/O

A-series PLC

R-series PLC

A-seriesI/O

Product list

## > Output specifications

| Items | | | Specifications |
|---|---|---|---|
| Output points | | | 16 points |
| Output type | | | Transistor/NPN (PNP type needs to be customized) |
| External voltage | | All outputs | DC 5～30V |
| Max. load | Resistive load | All outputs | 0.5A/1 point<br>The total load current of resistance load per common terminal should be the following:<br>- 1 output point:0.5A<br>- 4 output points:0.8A<br>- 8 output points:1.6A |
| | Inductive load | All outputs | 12W/DC 24V |
| Open-circuit leakage current | | All outputs | 0.1mA or less/DC 30V |
| On-voltage drop | | All outputs | 1.5V or less |
| Response time | OFF→ON | Y000～Y007 | 2.5μs or less/10mA or less(DC 5～24V) |
| | | Y010 or more | 0.2ms or less/200mA or less(at 24VDC) |
| | ON→OFF | Y000～Y007 | 2.5μs or less/10mA or less(DC 5～24V) |
| | | Y010 or more | 0.2ms or less/200mA or less(at 24VDC) |
| Circuit isolation | | All outputs | Optocoupler isolation |
| Output operation display | | - | LED lit when optocoupler is driven |

## > Ethernet specifications

| Items | specifications |
|---|---|
| Interface type | connector |
| Data transmission speed | 100/10Mbps |
| Communication mode | Full/Half-duplex |
| Max. transmission distance | 100m |
| Supported protocol | Download monitoring protocol<br>Modbus TCP/IP slave |
| Transmission medium | Cat.5E twisted pair cables |

## > RS485 specifications

| Items | specifications |
|---|---|
| Interface type | RS485 |
| Data transmission speed | Max.115200bps |
| Communication mode | Half-duplex |
| Max. transmission distance | 100m (At a specific baud rate) |
| Supported protocol | Modbus RTU master/slave<br>Download monitoring protocol<br>Free communication protocol |
| Isolation status | Digital isolation |
| Terminating resistor | Not built-in |

## > RS232 specifications

| Items | Specifications |
|---|---|
| Interface type | RS232 |
| Data transmission speed | Max.115200bps |
| Communication mode | Full-duplex |
| Max. transmission distance | 5m |
| Supported protocol | Download monitoring protocol<br>Free communication protocol |
| Isolation status | Digital isolation |

## > CAN specifications

| Items | Specifications |
|---|---|
| Data transmission speed | Max.1Mbps |
| Communication mode | Half-duplex |
| Max. transmission distance | 2.5km (The actual transmission distance is related to the baud rate) |
| Supported protocol | CANOpen |
| Isolation status | Digital isolation |

# PLC

**R-series PLC**

# HCR8P

Control topology
Q-series PAC
IQ8000-series IPC
Q-series I/O
Distributed I/O
A-series PLC
R-series PLC
A-series I/O
Product list

## > Main units

| Models | Description |
| --- | --- |
| HCR8P-32MT/R-A | 16 input points、16 output points、transistor/relay output |
| HCR8P-48MT/R-A | 24 input points、24 output points、transistor/relay output |
| HCR8P-64MT/R-A | 32 input points、32 output points、transistor/relay output |
| HCR8P-80MT/R-A | 40 input points、40 output points、transistor/relay output |
| HCR8P-128MT/R-A | 60 input points、60 output points、transistor/relay output |

## > Environment specifications

| Items | Specifications |
| --- | --- |
| Working temperature | 0~55℃ |
| Storage temperature | -25~70℃ (No condensation) |
| Relative humidity | 10%~95% (No condensation) |
| Working altitude | 2000m Max. |
| Electromagnetic interference | EFT 2KV (Power cable, signal cable) |
| Vibration | 5～8.4Hz，amplitude 3.5mm, 8.4～150Hz, Acceleration 9.8m/s², scan at a rate of one multiplication frequency per minute, ten times in each direction (X-, Y-, and Z-axis directions) |
| Impact (collision) | 147m/s², three times in each direction (X-, Y-, and Z-axis directions) |
| Pollution level | Pollution degree 2 |
| Protection level | IP20 |
| Cooling method | Natural air cooling |
| Installation method | DIN rail mounting 35mm |

## > Power specifications

| Items | Specifications |
| --- | --- |
| Input voltage | AC 100~240V 50/60Hz |
| Power fuse | 250V 3.15A time-delay fuse |
| Power efficiency | 80% |
| Allowable instantaneous power-failure time | The operation of the main units will continue when the instantaneous power failure occurs within 10ms. When the voltage is 200VAC, it can be changed to 10-100ms by user program |
| Output voltage | External 24VDC power：24V/0.8A |
| Output power for right extension modules | 5V/2A 24V/0.8A |
| Number of right extension modules | Up to 8 (Extension power supply not connected) |

## > Performance specifications

| Items | | | Specifications |
| --- | --- | --- | --- |
| Number of control axes | | | 8 axes |
| Pulse output form | | | Transistor |
| Max. frequency | | | Pulse 200kHz |
| Positioning | Pulse output mode | | PULSE/SIGN mode |
| | Positioning range | Control unit | Motor unit system |
| | | Positioning range | -2147483648～+2147483647 |
| | Speed instruction | Speed instruction unit | pps |
| | | Base speed | 0～200Kpps |
| | | Max. speed | 1pps～200Kpps |
| | | Homing return speed | 1pps～200Kpps |
| | | Creeping speed | 1pps～200Kpps |
| | | Acceleration time | 0～32767ms |
| | | Deceleration time | 0～32767ms |
| | Acceleration/ deceleration processing | | Trapezoidal acceleration /deceleration |
| | Interpolation function | | N/A |

## > Input specifications

| High-speed input | | Specifications |
| --- | --- | --- |
| Input points | | 16 points (X000~X017) |
| Input form | | NPN/PNP |
| Input voltage | All inputs | DC 24V±10% |
| Input resistance | All inputs | 2.7kΩ |
| Input current | All inputs | 8.5mA/DC 24V |
| Input sensitivity current | ON-current | All inputs | 4.03mA or more |
| | OFF-current | All inputs | 3.06mA or less |
| Input response frequency | All inputs | 200kHz |
| Input signal form | All inputs | NPN/PNP Open collector transistor |
| Circuit isolation | All inputs | Optocoupler isolation |
| Input operation display | - | LEDlit when input is ON |

| Low-speed input | | Specifications |
| --- | --- | --- |
| Input points | | X020 or more |
| Input form | | NPN/PNP |
| Input voltage | All inputs | DC 24V±10% |
| Input resistance | All inputs | 4.3kΩ |
| Input current | All inputs | 5.3mA/DC 24V |
| Input sensitivity current | ON-current | All inputs | 2.13mA or more |
| | OFF-current | All inputs | 1.8mA or less |
| Input response frequency | All inputs | 5kHz |
| Input signal form | All inputs | NPN/PNP Open collector transistor |
| Circuit isolation | All inputs | Optocoupler isolation |
| Input operation display | - | LEDlit when input is ON |

Control topology
Q-series PAC
IQ8000-series IPC
Q-series I/O
Distributed I/O
A-series PLC
R-series PLC
A-series I/O
Product list

## > Output specifications

| Items | | | Transistor output specifications |
|---|---|---|---|
| Output points | | | 16/24/32/40/64 points |
| Output form | | | Transistor/NPN (PNP type needs to be customized) |
| External voltage | | All outputs | DC 5～30V |
| Max. load | Resistive load | All outputs | 0.5A/1 point<br>The total load current of resistance load per common terminal should be the following:<br>- 1 output point:0.5A<br>- 4 output points:0.8A<br>- 8 output points:1.6A |
| | Inductive load | All outputs | 12W/DC 24V |
| Open-circuit leakage current | | All outputs | 0.1mA or less/DC 30V |
| ON-voltage drop | | All outputs | 1.5V or less |
| Response time | OFF→ON | Y000～Y007 | 2.5μs or less/10mA or more(DC 5～24V) |
| | | Y0010 or more | 0.2ms or less/200mA or more(at 24VDC) |
| | ON→OFF | Y000～Y007 | 2.5μs or less/10mA or more(DC 5～24V) |
| | | Y010 or more | 0.2ms or less/200mA or more(at 24VDC) |
| Circuit isolation | | All outputs | Optocoupler isolation |
| Output operation display | | - | LED lit whdn optocoupler is driven |

| Items | | Relay output specifications |
|---|---|---|
| Output points | | 16/24/32/40/64 points |
| Output type | | Relay |
| External voltage | | DC 30V or less    AC 240V or less |
| Max. load | | 2A/1 point<br>The total load current of resistance load per common terminal should be the following:<br>·4 output points/common terminal：8A or less<br>·8 output points/common terminal：8A or less |
| Open-circuit leakage current | | - |
| Response time | OFF→ON | About 10ms |
| | ON→OFF | About 10ms |
| Circuit isolation | All outputs | Mechanical isolation |
| Output operation display | | The corresponding LED dots are on when the output is ON |

## > Ethernet specifications

| Items | Specifications |
|---|---|
| Interface type | RJ45 connector |
| Data transmission speed | 100/10Mbps |
| Communication mode | Full/Half-duplex |
| Max. transmission distance | 100m |
| Supported protocol | Download monitoring protocol<br>Modbus TCP/IP slave |
| Transmission medium | Cat.5E twisted pair cables |

## > RS485 Specifications

| Items | Specifications |
|---|---|
| Interface type | RS485 |
| Data transmission speed | Max.115200bps |
| Communication mode | Half-duplex |
| Max. transmission distance | 100m (At a specific baud rate) |
| Supported protocol | Modbus RTU master/slave<br>Download monitoring protocol<br>Free communication protocol |
| Isolation status | Digital isolation |
| Terminating resistor | Not built-in |

## > RS232 Specifications

| Items | Specifications |
|---|---|
| Interface type | RS232 |
| Data transmission speed | Max.115200bps |
| Communication mode | Full-duplex |
| Max. transmission distance | 5m |
| Supported protocol | Download monitoring protocol<br>Free communication protocol |
| Isolation status | Digital isolation |

## > CAN Specifications

| Items | Specifications |
|---|---|
| Data transmission speed | Max.1Mbps |
| Communication mode | Half-duplex |
| Max. transmission distance | 2.5km (The actual transmission distance is related to the baud rate) |
| Supported protocol | CANOpen |
| Isolation status | Digital isolation |

# A/R-SERIES PLC DIMENSION DRAWING
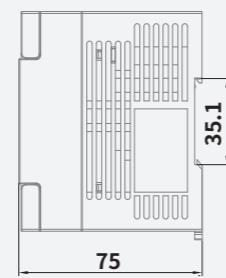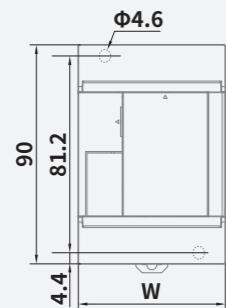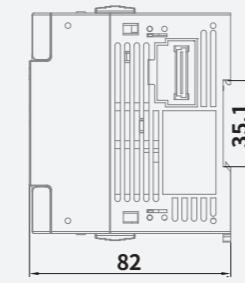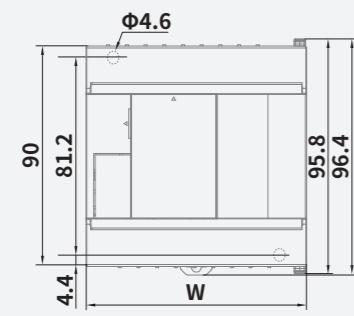
## HCA1P-series

Unit:mm



| Models | Width (W) |
| --- | --- |
| HCA1P-8X6YT/R-A/D | 60.5 |
| HCA1P-12X8YT/R-A/D | 75.5 |
| HCA1P-16X14YT/R-A/D | 100 |

## HCA2P/R2-series
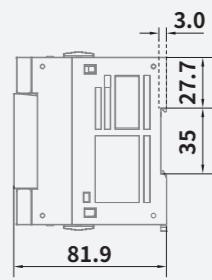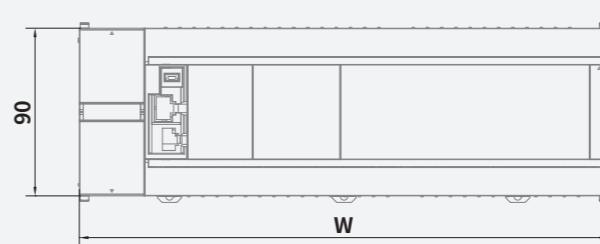
Unit:mm



| Models | Width (W) | Models | Width (W) |
| --- | --- | --- | --- |
| HCA2P-14X10YT/R-A/D | 90 | HCR2-40MT/R-A | 130 |
| HCA2P-24X16YT/R-A/D | 130 | HCR2-60MT/R-A | 175 |
| HCA2P-36X24YT/R-A/D | 175 | | |

## HCR8A/R8P- series
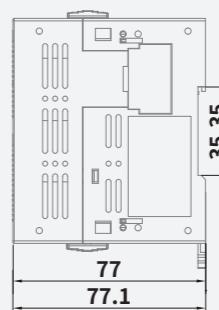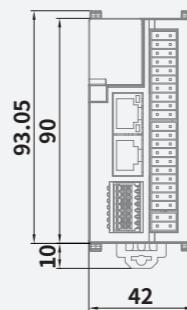
Unit:mm



| Models Dimensions | HCR8P-32MT/R-A HCR8A-32MT/R-A | HCR8P-48MT/R-A HCR8A-48MT/R-A | HCR8P-64MT/R-A HCR8A-64MT/R-A | HCR8P-80MT/R-A HCR8A-80MT/R-A | HCR8P-128MT/R-A HCR8A-128MT/R-A |
| --- | --- | --- | --- | --- | --- |
| W | 151.2 | 180.7 | 218.9 | 284.1 | 352.7 |

## HCR8C - series

Unit:mm



| Models |
| --- |
| HCR8C-32MT-D |

# A-SERIES UNIT LINEUP

## Naming rule for HCA8C-series extension modules

### H C A 8 C – 1 6 X 1 6 Y T – A

**Product name**

**HC**   **HC:** HCFA controller

**Series name**

**A8**   **A1:** Simple-type controller
**A2:** General0purpose
**A8:** High-performance controller

**Series models**

**C**   **N/A:** Standard-type
**P :** Upgraded-type
**C :** Compact-type

**Input points**

**16**   **16:** 16 points

**Input type**

**X**
**X :** Digital input for main units
**EX :** Digital input for extension modules
**AD :** Analog input
**PT :** Thermal resistance input
**TC :** Thermocouple input
**HC :** High-speed input
**LC :** Load cell

**Output points**

**16**   **16:** 16 points

**Output type**

**Y**
**Y :** Digital output for main units
**EY :** Digital output for extension modules
**DA:** Analog output
**PG:** Pulse output
**GM:** Motion control

**Output method**

**T**
**R :** Relay output
**T :** Transistor output

**Power type**

**A**
**D :** DC power
**A :** AC power
**N/A:** None for modules

## Naming rule for HCA8P-series extension modules

### H C A 8 P – A D x x – D

**Product name**

**HC**   **HC:** HCFA controller

**Extension series name**

**A8P**   **M :** Standard control

**Series models**

**AD**
**AD:** Analog input   **PG:** Pulse output
**DA:** Analog output

**Number of channel**

**xx**   **xx:** Number of channels

**Power type**

**D**
**D :** DC power
**A :** AC power

## Right-extension input modules

| Models | | Number of channels | Input/output type | | | | Connector type | External dimension WxDxH(mm) |
|---|---|---|---|---|---|---|---|---|
| | | | Input | | Output | | | |
| | HCA8C-8EX | 8 | 8 | DC 24V | - | - | Screw terminal type | 29x74.5x94.6 |
| | HCA8C-16EX | 16 | 16 | DC 24V | - | - | Screw terminal type | 28.9x74.5x94.6 |
| | HCA8C-16EX-C | 16 | 16 | DC 24V | - | - | Screw terminal type | 19.4x86.8x94.6 |

## Right-extension output modules

| Models | | Number of channels | Input/output type | | | | Connector type | External dimension WxDxH(mm) |
|---|---|---|---|---|---|---|---|---|
| | | | Input | | Output | | | |
| | HCA8C-8EYR | 8 | - | - | 8 | Relay | Screw terminal type | 29x74.5x94.6 |
| | HCA8C-8EYT | 8 | - | - | 8 | Transistor | Screw terminal type | 29x74.5x94.6 |
| | HCA8C-16EYR | 16 | - | - | 16 | Relay | Screw terminal type | 28.9x74.5x94.6 |
| | HCA8C-16EYT | 16 | - | - | 16 | Transistor | Screw terminal type | 28.9x74.5x94.6 |
| | HCA8C-16EYT-C | 16 | - | - | 16 | Transistor | Horn connector | 19.4x86.8x94.6 |

Control topology | Q-series PAC | IQ8000-series IPC | Q-series I/O | Distributed I/O | A-series PLC | R-series PLC | A-series I/O | Product list

## Right-extension I/O modules

| Models | | Total points | Input/output type | | | | Connector type | External dimension WxDxH(mm) |
|---|---|---|---|---|---|---|---|---|
| | | | Input | | Output | | | |
|  | HCA8C-4EX4EYR | 8 | 4 | DC 24V | 4 | Relay | Screw terminal type | 29x74.5x94.6 |
|  | HCA8C-4EX4EYT | 8 | 4 | DC 24V | 4 | Transistor | Screw terminal type | 29x74.5x94.6 |
|  | HCA8C-8EX8EYR | 16 | 8 | DC 24V | 8 | Relay | Screw terminal type | 28.9x74.5x94.6 |
|  | HCA8C-8EX8EYT | 16 | 8 | DC 24V | 8 | Transistor | Screw terminal type | 28.9x74.5x94.6 |
|  | HCA8C-8EX8EYT-C | 16 | 8 | DC 24V | 8 | Transistor | Horn connector | 19.4x86.8x94.6 |

## Analog modules

| Models | | Number of channels | Input specifications | | Channel data update time | External dimension WxDxH(mm) |
|---|---|---|---|---|---|---|
| | | | Signal voltage | Signal current | | |
|  | HCA8P-AD04-D | 4 | -10V~10V | 0~20mA 4~20mA | 500μs×Number of channels used ×Average times | 19.4x74.8x97.8 |
|  | HCA8P-DA04-D | 4 | -10V~10V | 0~20mA 4~20mA | 1ms (Regardless of the number of channels used) | 19.4x74.8x97.8 |

## Pulse positioning modules

| Models | | Number of channels | Input signal | Output signal | External dimension WxDxH(mm) |
|---|---|---|---|---|---|
| | | | | Pulse output | |
|  | HCA8P-1PG | 1 | DC 24V±10% | DC 5~24V | 19.4x74.9x95.7 |

## Terminal conversion modules

| Models | | Type | Functions | External dimensionWxDxH(mm) |
|---|---|---|---|---|
|  | HCA8C-CBR | Relay output | Realize the conversion between Ihorn terminal and conventional terminalfor IO modules, which is convenient for users to make wiring | 100x90x40.7 |
|  | HCA8C-CBT | Transistor output | | 100x90x40.7 |

## Extension conversion modules

| Models | | Functions | Power signal | | External dimension |
|---|---|---|---|---|---|
| | | | Input | Output | |
|  | HCA8C-CNV5V-TX2N | Interface conversion and power extension | DC 24V | DC 5V | 19.5x74.9x96 |

**PLC**
**Extension**
**Modules**

Digital I/O modules

# HCA8 SERIES UNIT

HCA8-series Modules | Specifications

## DIGITAL INPUT

**HCA8C-8EX**
8 points digital input

**HCA8C-16EX**
16 points digital input

**HCA8C-16EX-C**
8 points digital input

## DIGITAL OUTPUT

**HCA8C-8EYR**
8 points digital output
Relay output

**HCA8C-8EYT**
8 points digital output
Transistor output

**HCA8C-16EYR**
16 points digital output
Relay output

**HCA8C-16EYT**
16 points digital output
Transistor output

**HCA8C-16EYT-C**
16 points digital output
Transistor output

## DIGITAL IN/OUT

**HCA8C-4EX4EYR**
4 points digital input/output
Transistor output

**HCA8C-4EX4EYT**
4 points digital input/output
Transistor output

**HCA8C-8EX8EYR**
8 points digital input/output
Transistor output

**HCA8C-8EX8EYT**
8 points digital input/output
Transistor output

**HCA8C-8EX8EYT-C**
8 points digital input/output
Transistor output

## > HCA8-series Modules ｜ Specifications

| Models | Input points | Type | Output points | Type | Connector type | I/O occupied points | DC5Vpower supply capacity(mA) |
|---|---|---|---|---|---|---|---|
| HCA8C-4EX4EYR | 4 | DC 24V | 4 | Relay | Horn connector | 16* | 40 |
| HCA8C-4EX4EYT | 4 | DC 24V | 4 | Transistor | Horn connector | 16* | 40 |
| HCA8C-8EX | 8 | DC 24V | - | - | Horn connector | 8 | 25 |
| HCA8C-8EYR | - | - | 8 | Relay | Horn connector | 8 | 30 |
| HCA8C-8EYT | - | - | 8 | Transistor | Horn connector | 8 | 30 |
| HCA8C-8EX8EYR | 8 | DC 24V | 8 | Relay | Horn connector | 16 | 60 |
| HCA8C-8EX8EYT | 8 | DC 24V | 8 | Transistor | Horn connector | 16 | 60 |
| HCA8C-8EX8EYT-C | 8 | DC 24V | 8 | Transistor | Screw terminal type | 16 | 60 |
| HCA8C-16EX | 16 | DC 24V | - | - | Horn connector | 16 | 30 |
| HCA8C-16EYR | - | - | 16 | Relay | Horn connector | 16 | 50 |
| HCA8C-16EYT | - | - | 16 | Transistor | Horn connector | 16 | 50 |
| HCA8C-16EX-C | 16 | DC 24V | - | - | Screw terminal type | 16 | 30 |
| HCA8C-16EYT-C | - | - | 16 | Transistor | Screw terminal type | 16 | 50 |

*Note：HCA8C-4EX4EYT；HCA8C-4EX4EYR has four input points and four output points, but it occupies eight input points and eight output points in the PLC; So pay attention to the use of input and output points when needs to connect other extension modules.

## > Input specifications

| Items | | Specifications |
|---|---|---|
| Signal voltage | | DC 24V+20%-15% ,fluctuation (P-P) within 5% |
| Input resistance | | 4.3kΩ |
| Signal current | | 5mA / DC 24V |
| Input sensitivity current | NO | 3.5mA or more |
| | OFF | 1.5mA  or less |
| Response time | | About 10ms |
| Signal type | | NPN/ PNP input |
| Circuit isolation | | Optocoupler isolation |
| Operation display | | LED lit when the input is ON |

## > Transistor output specifications

| Items | | | Transistor output specifications | |
|---|---|---|---|---|
| External power supply | | | DC 5~30V | |
| Max. load | Resistance load | HCA8C-16EYT | 0.1A/1 point | |
| | | HCA8C-16EYT-C | 0.3A/ 1 point | Make sure that the total load current of resistance load per common terminal (16 points) is 1.6A or less |
| | | HCA8C-8EYT、HCA8C-16EYT、HCA8C-16EYR | 0.5A/1 point | The total load current of resistance load per common terminal (16 points) should be the following:4 points/common: 0.8A; 8 points: 1.6A |
| | | HCA8C-8EYR | 1A/1 point | Make sure that the total load current of resistance load per common terminal (4 points) is 2A or less |
| | Inductive load | HCA8C-16EYT | 2.4W/1 point (DC 24V) | |
| | | HCA8C-16EYT-C | 7.2W/1 point (DC 24V) | |
| | | HCA8C-8EYT、HCA8C-16EYT、HCA8C-16EYR | 12W/1 point (DC 24V) | |
| | Lamp load | HCA8C-16EYT | 0.3W/1 point (DC 24V) | |
| | | HCA8C-16EYT-C | 1W/1 point (DC 24V) | |
| | | HCA8C-8EYT、HCA8C-16EYT、HCA8C-16EYR | 1.5W/1 point (DC 24V) | |
| | | HCA8C-8EYR | 3W/1 point (DC 24V) | |
| Open-circuit leakage current | | | 0.1WmA or less/DC 30V | |
| ON-voltage | | | 1.5V | |
| Response time | OFF-ON | Extension modules | 0.2ms or less/100mA(DC 24V) | |
| | ON-OFF | Extension modules | 0.2ms or less/100mA(DC 24V) | |
| Circuit isolation | | | Optocoupler isolation | |
| Operation display | | Extension modules | LED lit when the optocoupler is driven | |

## > Relay output specifications

| Items | | | Specifications |
|---|---|---|---|
| External power supply | | | DC 30V or less, AC 250V or less |
| Max. load | Resistance load | HCA8C-16EYT | Make sure that the total load current of resistance load per common terminal (16 points) is 8A or less |
| | | HCA8C-16EYR | 2A/1 point  The total load current of resistance load per common terminal should be the following: 4 points/common: 8A; 8 points: 8A |
| | Inductive load | HCA8C-16EYT | Please refer to the user manual (item 622) for the life-expectancy standard |
| | | HCA8C-16EYR | 80VA  when inductive load is connected  In addition, please refer to the user manual (item 624) for theprecaution on external wiring |
| Mini. load | | | DC 5V  2mA  (Reference) |
| Open-circuit leakage current | | | - |
| Response time | OFF-ON | | About10ms |
| | ON-OFF | | About10ms |
| Circuit isolation | | | Mechanical isolation |
| Operation display | | | LED lit when the relay is energized |

Analog/Special Modules

# HCA8 SERIES UNIT

## ANALOG INPUT

HCA8P-AD04-D

- 4-ch analog input
- Differential/single-ended input
- Input voltage range：-10~10V
- Input current range：0~20mA、4~20mA

## ANALOG OUTPUT

HCA8P-DA04-D

- 4-ch analog output
- Single-ended output
- Output voltage range：-10~10V
- Output current range：0~20mA、4~20mA

## PULSE POSITIONING MODULE

HCA8P-1PG

- Single channel pulse output
- Built-in T-shaped acceleration and deceleration function
- Multiple positioning control methods

## TERMINAL CONVERSION

HCA8C-CBR/CBT

- Transistor/relay output
- Conversion of horn and conventional terminal

## EXTENSION CONVERSION

HCA8C-CNV5V-TX2N

- Extension for IO module connector
- 24VDC power supply extension

## Power specifications

| Items | Specifications |
|---|---|
| A/D conversion circuit driving power | DC 24V±10% 100mA (24VDC needs to be supplied from the terminal block) |
| CPU driving power | DC 5V 100mA (Supplied from the main unit) |

## Analog input module — Performance specifications

| Items | Voltage input | Current input |
|---|---|---|
| Analog input range | DC -10V~+10V | DC 0~20mA,4~20mA |
| Max. absolute input | ±15V | 0~30mA |
| Digital output | Decimal | Decimal |
| Resolution | 0.32mV (20Vx1/64000) 2.5mV (20Vx1/8000) | 1.25μA (40mAx1/32000) 5.00μA (40mAx1/8000) |
| Overall accuracy | Ambient temperature 25℃±5℃ Full scale 20V±0.3% (±60mV) Ambient temperature 0℃~55℃ Full scale 20V±0.3% (±100mV) | Ambient temperature 25℃±5℃ Full scale 20mA±0.3% (±100uA) Ambient temperature 0℃~55℃ Full scale 20mA±0.3% (±200uA) |
| AD conversion time | 500μs×Number of channels used×Average times | |

## Analog output module — Performance specifications

| Items | Voltage output | Current output |
|---|---|---|
| Analog output range | DC -10~+10V | DC 0~20mA,4~20mA |
| Offset value | -10~+9V | 0~17mA |
| Gain value | -9~+10V | 3~30mA |
| Digital input | 16 bits, binary, with sign | 15 bits, binary |
| Resolution | 0.32mV (20Vx1/64000) | 0.63μA (20mA/32000) |
| Overall accuracy | Ambient temperature 25℃±5℃ Full scale 20V±0.3% (±60mV) Ambient temperature0℃~55℃ Full scale 20V±0.3% (±100mV) | Ambient temperature 25℃±5℃ Full scale 20mA±0.3% (±100uA) Ambient temperature 0℃~55℃ Full scale 20mA±0.3% (±200uA) |
| D/A conversion time | 1ms (Not related to the number of selected channels) | |
| Insulation method | The photocoupler is used to insulate the analog input area from the PLC. • The DC/DC converter is used to insulate the power supply line from the analog input area. • Channels are not insulated from each other. | |
| Occupied points | 8 points (can be either inputs or outputs) | |

## Pulse positioning module — Performance Specifications

| Items | | Specifications |
|---|---|---|
| Power supply | Input signal | DC 24V±10%,Current consumption 40mA or less |
| | Output signal | Pulse output: DC 5~24V, current consumption 35mA or less CLR output: DC 5~24V, current consumption 20mA or less |
| Number of control axes | | 1 |
| Positioning operation | Method | Incremental/absolute value |
| | Unit | PLS,um,10⁻⁴ inch,mdeg |
| | Unit magnification | 1x,10x,100x,300x |
| | Range | -2,147,483,648,to2,147,483,647 PLS |
| | Opeation speed unit | Hz,cm/min,inch/min,10deg/min |
| | Output frequency | 1Hz~200kHz |
| | Acceleration and deceleration settings | Trapezoidal acceleration/ deceleration: 1~32767 ms |
| Occupied points | | 8 points (can be either inputs or outputs) |

# HCA8-SERIES UNIT DIMENSION DRAWING

## HCA8C-series I/O extension modules

Unit：mm



28
26.2
94.6
89.7
24.2
28.9
70.8
74.5

| Models | | |
|---|---|---|
| HCA8C-16EYR | HCA8C-16EYT | HCA8C-16EX |
| HCA8C-8EX8EYT | HCA8C-8EX8EYR | |

Unit：mm



28
26.2
3.0
27.2
35.3
94.6
89.7
24.2
29
70.8
74.5

| Models | | |
|---|---|---|
| HCA8C-4EX4EYT | HCA8C-4EX4EYR | HCA8C-8EX |
| HCA8C-8EYT | HCA8C-8EYR | |

Unit：mm



18.4
16.6
94.6
89.7
14.6
19.4
74.8
86.8

| Models | | |
|---|---|---|
| HCA8C-8EX8EYT-C | HCA8C-16EX-C | HCA8C-16EYT-C |
| | | |

## HCA8P-1PG

Unit：mm



19.4
94.8
95.7
89.7
27.2
29.2
27.2
35.3
14.6
74.9

## HCA8P-AD/DA04-D

Unit：mm



19.4
97.8
89.7
35.4
14.6
74.9

## HCA8C-CBR/CBT

Unit：mm



4.2
4
Φ4
92
3.0
27.3
27.6
34.8
90
82
100.5
40.7

## HCA8C-CNV5V-TX2N

Unit：mm



19.5
95.5
90
35.4
14.7
74.9
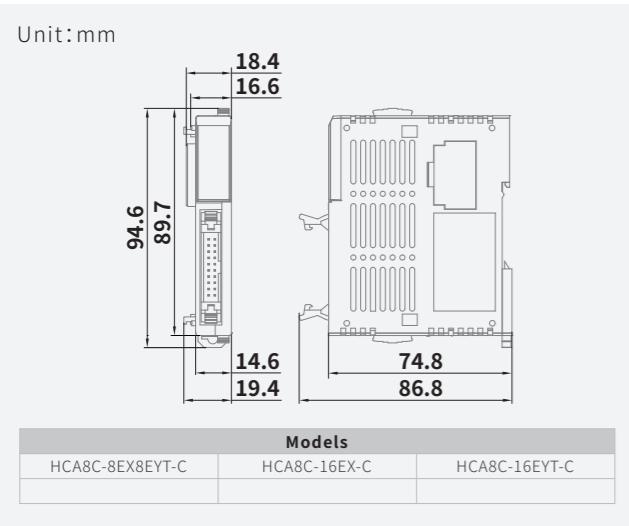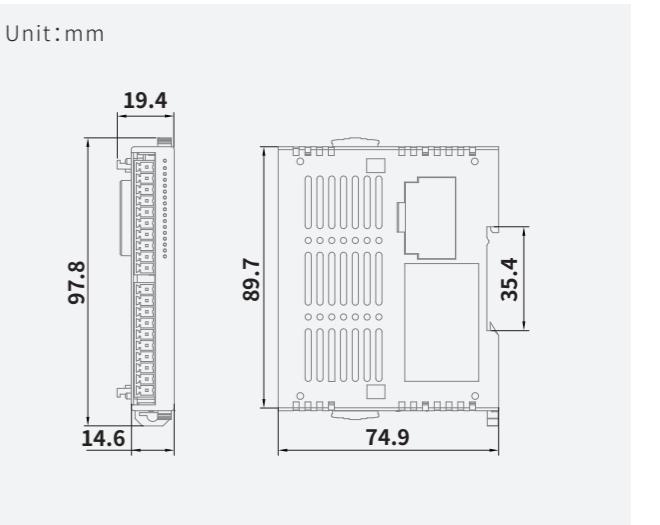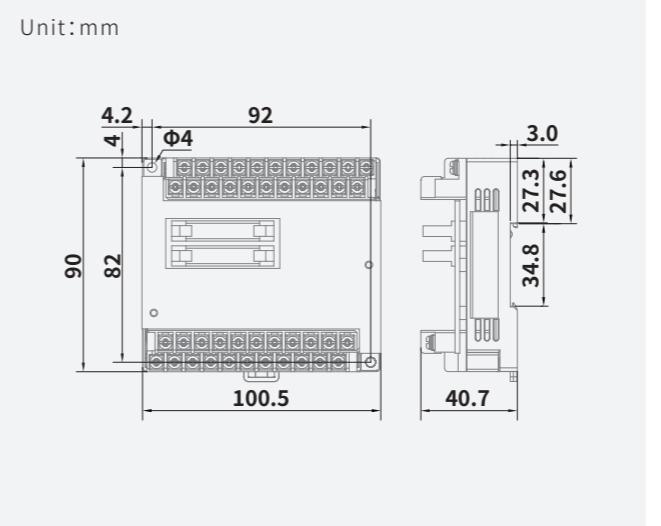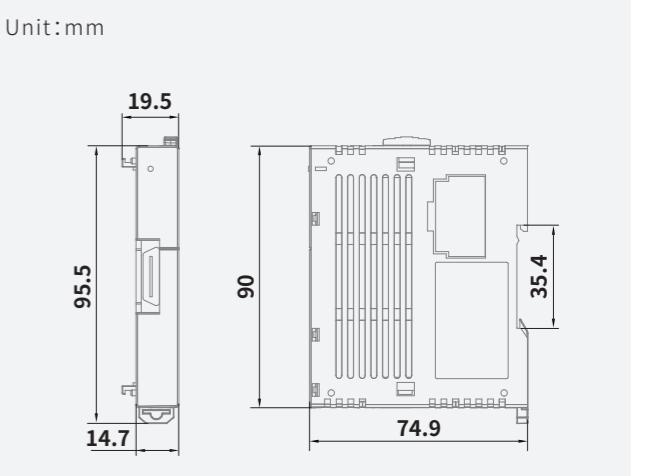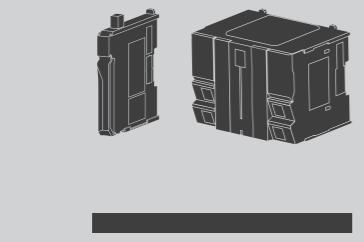
## CPU units

| Models | Recommended number of axes | Specifications | | High-speed input | High-speed output | Communicaton protocol | | | | | | Page |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Rated voltage | Input | Output | | | Modbus TCP | Modbus RTU | CANOpen | EtherCAT | OPC UA | EtherNetIP | |
| HCQ0-1100-D | 8 | DC 24V | - | - | - | - | ✓ | ✓ | ✓ | ✓ | | | 7 |
| HCQ0-1200-D | 16 | | - | - | - | - | ✓ | ✓ | ✓ | ✓ | | | 7 |
| HCQ1-1200-D | 16 | | 16 points | 16 points | 16 points | 16 points | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | 9 |
| HCQ1-1300-D | 32 | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | 9 |
| HCQ5-1400-A*¹ | 64 | AC 110~220V 50/60Hz | - | - | - | - | ✓ | ✓ | | ✓ | ✓ | ✓ | 11 |
| HCQ5-1500-A*¹ | 128 | | - | - | - | - | ✓ | ✓ | | ✓ | ✓ | ✓ | 11 |
| HC-IQ8560-1050-D | - | DC 24V | 2 points | 2 points | - | - | ✓ | ✓ | | | | | 15 |

## EtherCAT coupler module

| Models | Specifications | Page |
|---|---|---|
| HCQX-EC01-D | The coupler module connects the EtherCAT master/slave to the EtherCAT terminal | 26 |
| HCQX-EC02-D | The coupler module connects the EtherCAT master/slave to the EtherCAT terminal,support SLOT node | 26 |

## Power module

| Models | Specifications | Page |
|---|---|---|
| HCQX-PD01-A | AC 100~240V, AC power module, 50/60Hz，Can connect on the left side of Q5-series | 26 |

## I/Omodule*²

| Models | | Specifications | | | | Page |
|---|---|---|---|---|---|---|
| | | Rated voltage | Input | | Output | |
| Digital input module | HCQX-ID16-D2 | DC 24V | 16 points | NPN/PNP | - | NPN | 27 |
| | HCQX-ID16-D not recommended | | 16 points | | | | 27 |
| | HCQX-ID32-D2 | | 32 points | | | | 27 |
| Digital output module | HCQX-OD16-D2 | DC 24V | - | NPN/PNP | 16 points | NPN | 27 |
| | HCQX-OD16-D not recommended | | | | 16 points | | 27 |
| | HCQX-OD32-D2 | | | | 32 points | | 27 |
| Digital I/O module | HCQX-MD16-D2 | DC 24V | 8 points | NPN/PNP | 8 points | NPN | 27 |
| | HCQX-MD16-D not recommended | | 8 points | | 8 points | | 27 |
| | HCQX-MD32-D2 | | 16 points | | 16 points | | 27 |

## Special module

| Models | | Specifications | Page |
|---|---|---|---|
| Analog input module | HCQX-AD04-D | 4-channel analog input module, support 0~10V, -10~10V, -5~5V, 0~5V 1~5V 0~20mA, 4~20mA | 29 |
| Analog output module | HCQX-DA04-D | 4-channel analog output module, support 0~10V, -10~10V, -5~5V, 0~5V 1~5V 0~20mA, 4~20mA | 29 |
| Temperature measurement module | HCQX-TS04-D | 4-channel temperature acquisition, support common thermocouple and thermal resistance sensors on the market, temperature range Two-wire sensor*³: -200~1370°C Three-wire sensor*³: -200~850°C | 29 |
| High-speed counter module | HCQX-HC04-D2 | 4-channel high-speed counter module, support pulse + direction, up to 200kHz | 31 |
| Stepping drive module | HCQX-ST1505-D2 | 20-50VDC single-axis stepping drive module, supporting control modes such as PP, PV, CSP, HM, etc | 31 |

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**Seletion Guide for HCFA Control Products**

CPU module / I/O module / HCNXE-series digital module EtherCAT

coupler module / Matching table for CPU units and modules

Power module /special module / terminal conversion module / extension conversion module

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*¹The power supply module needs to be connected to the left-side of Q5-series main units, otherwise it will not work normally;
*²-D2 models is an upgraded version of the corresponding -D models, there is no difference in function, so it is recommended to buy the D2 models；
*³The specific temperature range may vary depending on the sensor type.

Control topology | Q-series PAC | IQ8000-series IPC | Q-series I/O | Distributed I/O | A-series PLC | R-series PLC | A-series I/O | Product list

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Q-series PAC
IQ8000-series IPC
Q-series I/O
Distributed I/O
A-series PLC
R-series PLC
A-seriesI/O
Product list

## HCNXE-series digital module

| Models | Specifications | | | Page |
|---|---|---|---|---|
| | Rated voltage | Input | Output | |
| HCNXE-ID32-D | DC 24V | 32 points | - | 39 |
| HCNXE-OD32-D | | - | 32 points | 39 |
| HCNXE-MD1616-D | | 16 points | 16 points | 39 |
| HCNXE-MD2408-D | | 24 points | 8 points | 39 |

Note: Input column shows NPN/PNP, Output column shows NPN/built-in common terminal

## Accessories

| Type | Model name | Specifications | Page |
|---|---|---|---|
| HCQ1 button battery | HCQ1-BAT | HCQ1/HCQ5 button battery，the life expectancy in normal use is 5 years | - |
| HCQ0 button battery | HCQ0-BAT | HCQ0 button battery，the life expectancy in normal use is 5 years | - |
| Terminal module | HCQX-END | Connected to the end of the modules | 26 |
| | HCQX-END02 | | 26 |
| 18PIN terminal block | HCQXT-18P | Removable terminal block | - |
| Cables | SV-ECAT-xxM | EtherCAT cables | - |

## CPU units

| Models | Specifications | | | | Page |
|---|---|---|---|---|---|
| | Rated voltage | Input | | Output | |
| **HCA1P  CPU units** | | | | | |
| HCA1P-8X6YT-A | AC 100~240V | 8 | 6 | Transistor (NPN) | 47 |
| HCA1P-8X6YR-A | | | | Relay | 47 |
| HCA1P-12X8YT-A | | 12 | 8 | Transistor (NPN) | 47 |
| HCA1P-12X8YR-A | | | | Relay | 47 |
| HCA1P-16X14YT-A | | 16 | 14 | Transistor (NPN) | 47 |
| HCA1P-16X14YR-A | | | | Relay | 47 |
| HCA1P-8X6YT-D | DC 24V | 8 | 6 | Transistor (NPN) | 47 |
| HCA1P-8X6YR-D | | | | Relay | 47 |
| HCA1P-12X8YT-D | | 12 | 8 | Transistor (NPN) | 47 |
| HCA1P-12X8YR-D | | | | Relay | 47 |
| HCA1P-16X14YT-D | | 16 | 14 | Transistor (NPN) | 47 |
| HCA1P-16X14YR-D | | | | Relay | 47 |
| **HCA2P  CPU Units** | | | | | |
| HCA2P-14X10YT-A | AC 100~240V | 14 | 10 | Transistor (NPN) | 51 |
| HCA2P-14X10YR-A | | | | Relay | 51 |
| HCA2P-24X16YT-A | | 24 | 16 | Transistor (NPN) | 51 |
| HCA2P-24X16YR-A | | | | Relay | 51 |
| HCA2P-36X24YT-A | | 36 | 24 | Transistor (NPN) | 51 |
| HCA2P-36X24YR-A | | | | Relay | 51 |
| HCA2P-14X10YT-D | DC 24V | 14 | 10 | Transistor (NPN) | 51 |
| HCA2P-14X10YR-D | | | | Relay | 51 |
| HCA2P-24X16YT-D | | 24 | 16 | Transistor (NPN) | 51 |
| HCA2P-24X16YR-D | | | | Relay | 51 |
| HCA2P-36X24YT-D | | 36 | 24 | Transistor (NPN) | 51 |
| HCA2P-36X24YR-D | | | | Relay | 51 |

Note: Input column for HCA1P and HCA2P shows "DC 24V  NPN/PNP"

*Will be supported.

Control topology
Q-series PAC
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# CPU units

| Models | Specifications | | | Communication protocol | | | Page |
|---|---|---|---|---|---|---|---|
| | Rated voltage | Input | Output | Modbus TCP | Modbus RTU | CANOpen | |
| **HCR2 CPU units** | | | | | | | |
| HCR2-40MT-A | AC 100~240V | 24 | DC 24V NPN/PNP — 16 | Transistor (NPN) | ✓ | ✓ | | 55 |
| HCR2-40MR-A | | 24 | 16 | Relay | ✓ | ✓ | | 55 |
| HCR2-60MT-A | | 36 | 24 | Transistor (NPN) | ✓ | ✓ | | 55 |
| HCR2-60MR-A | | 36 | 24 | Relay | ✓ | ✓ | | 55 |
| **HCR8A CPU units** | | | | | | | |
| HCR8A-32MT-A | AC 100~240V | 16 | DC 24V NPN/PNP — 16 | Transistor (NPN) | ✓ | ✓ | | 59 |
| HCR8A-32MR-A | | 16 | 16 | Relay | ✓ | ✓ | | 59 |
| HCR8A-48MT-A | | 24 | 24 | Transistor (NPN) | ✓ | ✓ | | 59 |
| HCR8A-48MR-A | | 24 | 24 | Relay | ✓ | ✓ | | 59 |
| HCR8A-64MT-A | | 32 | 32 | Transistor (NPN) | ✓ | ✓ | | 59 |
| HCR8A-64MR-A | | 32 | 32 | Relay | ✓ | ✓ | | 59 |
| HCR8A-80MT-A | | 40 | 40 | Transistor (NPN) | ✓ | ✓ | | 59 |
| HCR8A-80MR-A | | 40 | 40 | Relay | ✓ | ✓ | | 59 |
| HCR8A-128MT-A | | 64 | 64 | Transistor (NPN) | ✓ | ✓ | | 59 |
| HCR8A-128MR-A | | 64 | 64 | Relay | ✓ | ✓ | | 59 |
| **HCR8C CPU units** | | | | | | | |
| HCR8C-32MT-D | DC 24V | 16 | DC 24V NPN/PNP — 16 | Transistor (NPN) | ✓ | ✓ | ✓ * | 63 |
| **HCR8P CPU units** | | | | | | | |
| HCR8P-32MT-A | AC 100~240V | 16 | DC 24V NPN/PNP — 16 | Transistor (NPN) | ✓ | ✓ | ✓ * | 67 |
| HCR8P-32MR-A | | 16 | 16 | Relay | ✓ | ✓ | ✓ * | 67 |
| HCR8P-48MT-A | | 24 | 24 | Transistor (NPN) | ✓ | ✓ | ✓ * | 67 |
| HCR8P-48MR-A | | 24 | 24 | Relay | ✓ | ✓ | ✓ * | 67 |
| HCR8P-64MT-A | | 32 | 32 | Transistor (NPN) | ✓ | ✓ | ✓ * | 67 |
| HCR8P-64MR-A | | 32 | 32 | Relay | ✓ | ✓ | ✓ * | 67 |
| HCR8P-80MT-A | | 40 | 40 | Transistor (NPN) | ✓ | ✓ | ✓ * | 67 |
| HCR8P-80MR-A | | 40 | 40 | Relay | ✓ | ✓ | ✓ * | 67 |
| HCR8P-128MT-A | | 64 | 64 | Transistor (NPN) | ✓ | ✓ | ✓ * | 67 |
| HCR8P-128MR-A | | 64 | 64 | Relay | ✓ | ✓ | ✓ * | 67 |

# I/O modules

| Models | Specification | | | Connector type | Page |
|---|---|---|---|---|---|
| | Rated voltage | Input | Output | | |
| **Right-side extension input modules** | | | | | |
| HCA8C-8EX | DC 5~30V | 8 | DC 24V NPN/PNP — - | - | Screw terminal type | 77 |
| HCA8C-16EX | | 16 | - | - | Screw terminal type | 77 |
| HCA8C-16EX-C | | 16 | - | - | Horn connector | 77 |
| **Right-side extension output modules** | | | | | |
| HCA8C-8EYR | DC 5~30V | - | 8 | Relay | Screw terminal type | 77 |
| HCA8C-8EYT | | - | 8 | Transistor (NPN) | Screw terminal type | 77 |
| HCA8C-16EYR | | - | 16 | Relay | Screw terminal type | 77 |
| HCA8C-16EYT | | - | 16 | Transistor (NPN) | Screw terminal type | 77 |
| HCA8C-16EYT-C | | - | 16 | Transistor (NPN) | Horn connector | 77 |
| **Right-side extension I/O modules** | | | | | |
| HCA8C-4EX4EYR | DC 5~30V | 4 | DC 24V NPN/PNP — 4 | Relay | Screw terminal type | 78 |
| HCA8C-4EX4EYT | | 4 | 4 | Transistor (NPN) | Screw terminal type | 78 |
| HCA8C-8EX8EYR | | 8 | 8 | Relay | Screw terminal type | 78 |
| HCA8C-8EX8EYT | | 8 | 8 | Transistor (NPN) | Screw terminal type | 78 |
| HCA8C-8EX8EYT-C | | 8 | 8 | Transistor (NPN) | Horn connector | 78 |

# Special modules

| Models | Specifications | Page |
|---|---|---|
| HCA8P-AD04-D | 4-channel analog input module, 12-bit resolution | 81 |
| HCA8P-DA04-D | 4-channel analog output module, 12-bit resolution | 81 |
| HCA8P-1PG | Single-channel incremental/absolute pulse output module | 81 |

# Terminal conversion module/extension conversion module

| Models | Specifications | Page |
|---|---|---|
| HCA8C-CBR | Relay output type, realize the conversion of horn terminal and conventional terminal of IO modules | 81 |
| HCA8C-CBT | Transistor output type, realize the conversion of horn terminal and conventional terminal of IO modules | 81 |
| HCA8C-CNV5V-TX2N | Extension IO module connector and 24VDC extension power supply | 81 |

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## Matching table for CPU units and modules

| Models / CPU | HCA1P | HCA2P | HCR1 | HCR2 | HCR8A | HCR8C | HCR8P |
|---|---|---|---|---|---|---|---|
| HCA8P-AD04-D | | | | ✓ | ✓ | ✓ | ✓ |
| HCA8P-DA04-D | | | | ✓ | ✓ | ✓ | ✓ |
| HCA8C-4EX4EYR | | ✓ | | ✓ | ✓ | ✓ | ✓ |
| HCA8C-8EX8EYT-C | | ✓ | | ✓ | ✓ | ✓ | ✓ |
| HCA8C-8EX8EYR | | ✓ | | ✓ | ✓ | ✓ | ✓ |
| HCA8C-8EX8EYT | | ✓ | | ✓ | ✓ | ✓ | ✓ |
| HCA8C-16EX | | ✓ | | ✓ | ✓ | ✓ | ✓ |
| HCA8C-8EX | | ✓ | | ✓ | ✓ | ✓ | ✓ |
| HCA8C-4EX4EYT | | ✓ | | ✓ | ✓ | ✓ | ✓ |
| HCA8C-16EX-C | | ✓ | | ✓ | ✓ | ✓ | ✓ |
| HCA8C-16EYT-C | | ✓ | | ✓ | ✓ | ✓ | ✓ |
| HCA8C-16EYT | | ✓ | | ✓ | ✓ | ✓ | ✓ |
| HCA8C-8EYT | | ✓ | | ✓ | ✓ | ✓ | ✓ |
| HCA8C-16EYR | | ✓ | | ✓ | ✓ | ✓ | ✓ |
| HCA8C-POWER | Independent module, not the extension modules | | | | | | |
| HCA8C-CBR/CBT | | | | | | | |
| HCA8P-1PG | | | | ✓ | ✓ | ✓ | ✓ |

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