

CREATE A BETTER LIFE THROUGH OUR WORK 

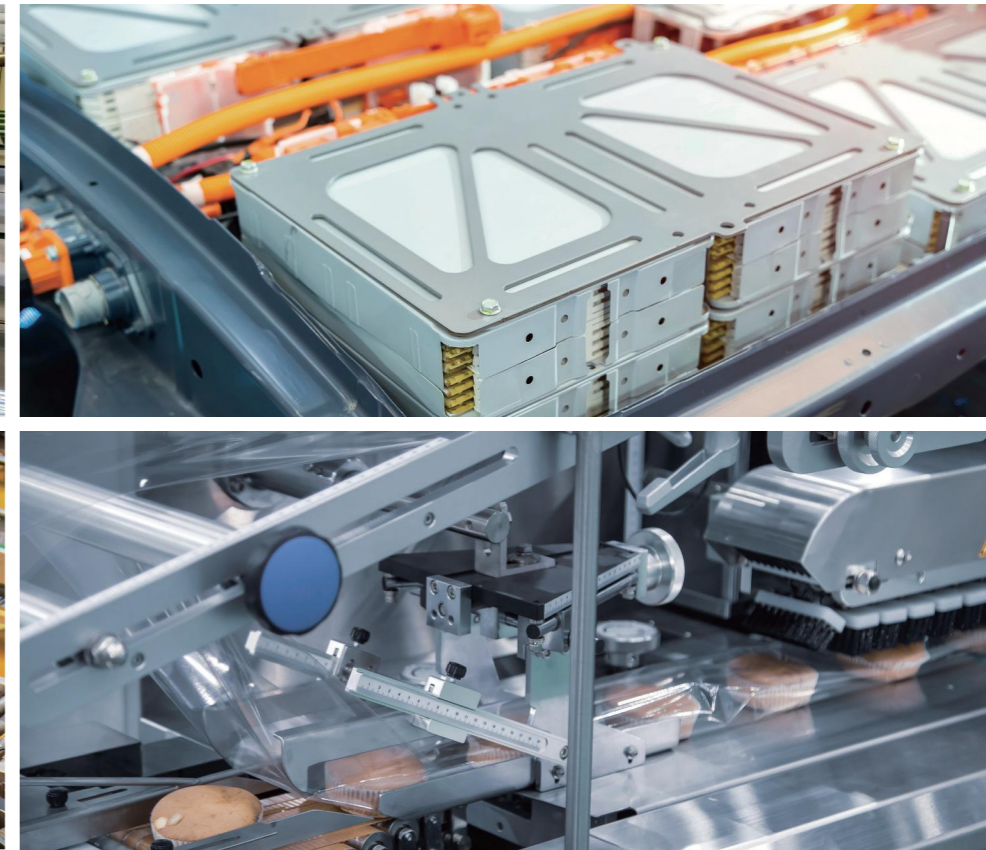
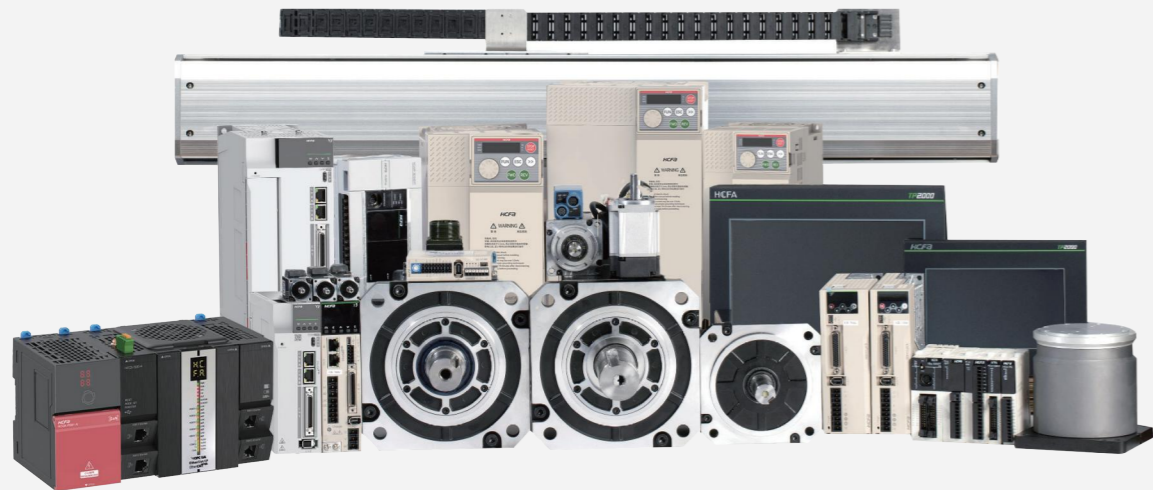
# Selection Guide for Control Products

CREATE A BETTER LIFE THROUGH OUR WORK

Control Products Catalog



To be the most valuable industrial automation core components and solution provider



Stock code: 688320.SH

R&D Centers

5

Set up nationally

Sales Office

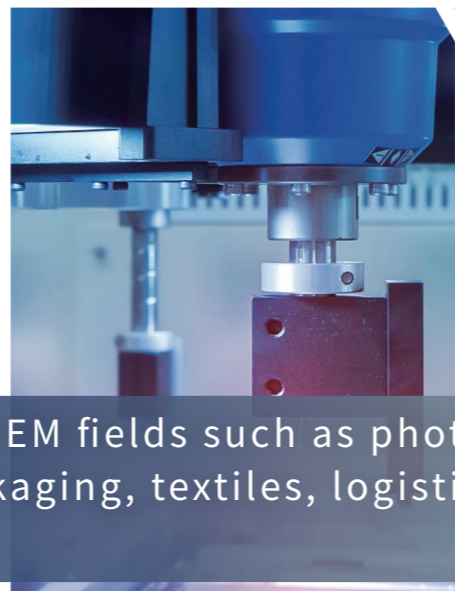
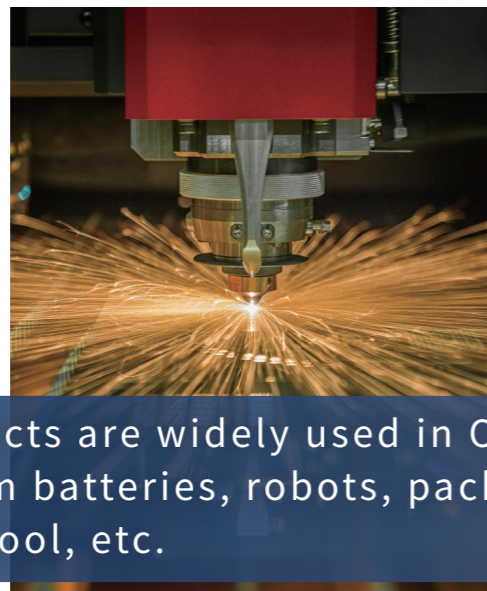
40+

Sales elites gathering

Global Distributor

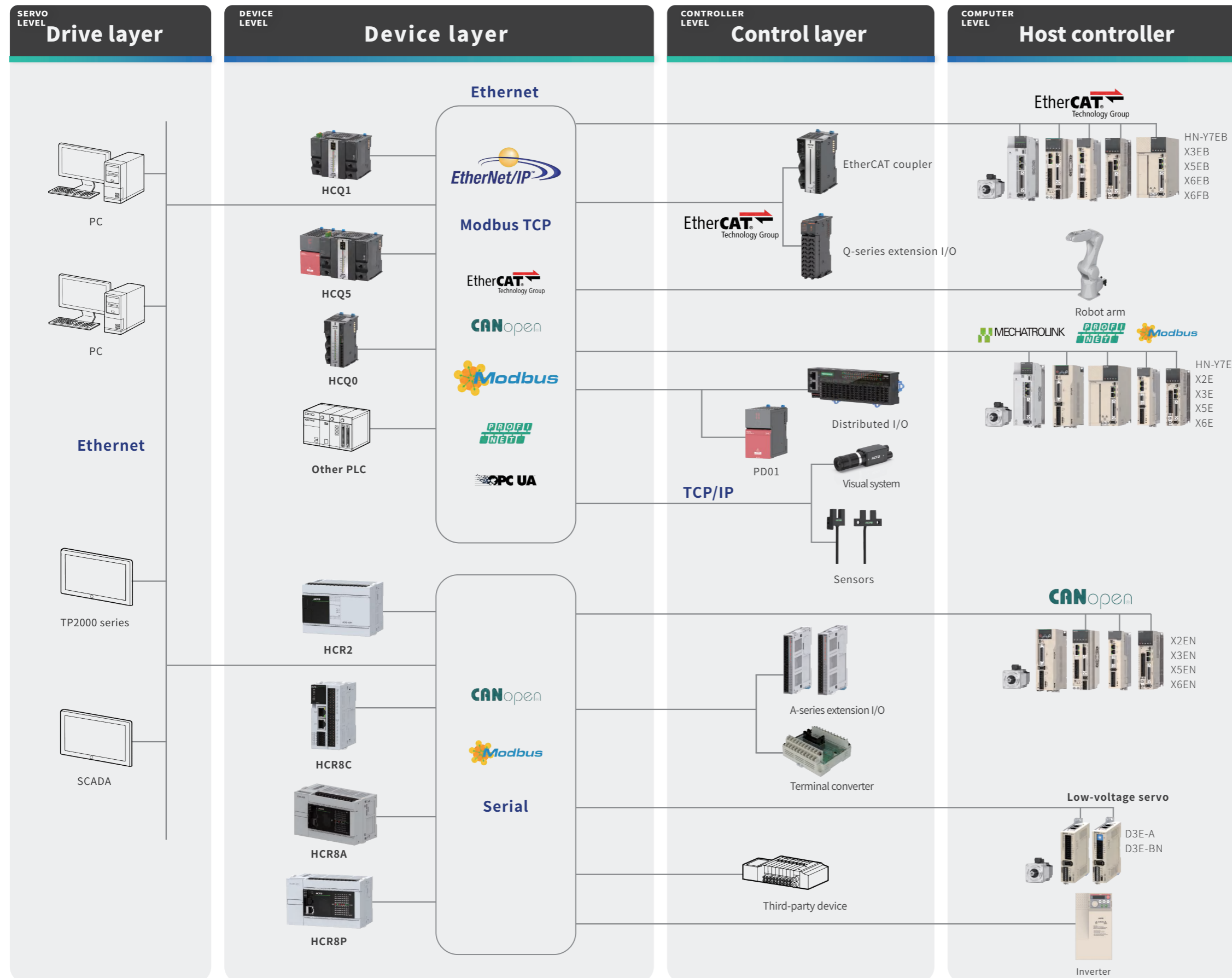
400+

Products sold worldwide



The products are widely used in OEM fields such as photovoltaic, 3C, lithium batteries, robots, packaging, textiles, logistics, lasers, machine tool, etc.

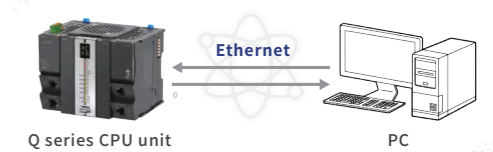
# CONTROL SYSTEM TOPOLOGY



## COMPUTER LEVEL

Ethernet cable / USB to achieve program download

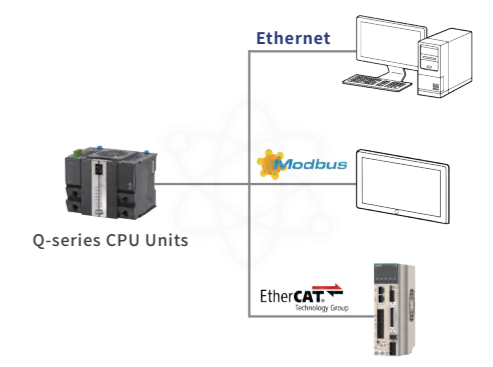
The upper controller transmits the internal data of the program through the Ethernet cable, and the user can also upload and download the program through the USB port.



## COMPUTER LEVEL

Multiple communication protocol supported:

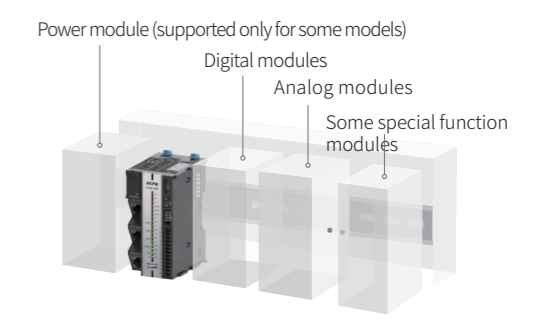
Various communication protocol: Modbus TCP  
Modbus RTU EtherNet/IP OPC UA  
EtherCAT CANopen RS232/RS485



## 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.



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

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  
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A-series PLC  
R-series PLC  
A-series I/O  
Product list

# 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□-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<sup>n+2</sup>**  
**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<sup>\*1</sup>
- 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<sup>\*1</sup>
- 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<sup>\*1</sup>
- 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<sup>\*2</sup>
- 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.



> Electrical specifications

Items	Technical specifications			
<b>Dielectric withstand voltage</b>	AC1000V for 1 min, between power terminal and I/O terminal, between external terminal and shell			
<b>Noise resistance</b>	1500Vp-p or more, Noise width 1μs, 50ns (based on noise simulator), comply with (IEC61000-4-2/3/4/6)			
<b>Vibration resistance</b>	Installation	Frequency (Hz)	Acceleration (m/s <sup>2</sup> )	Single amplitude (mm)
		10-57	-	0.035
	DIN rail mounting	57-150	4.9	-
	10 times of testing in each direction (X-, Y-, and Z-axis directions) (Total: 80 min, each)			
<b>Insulation resistance</b>	50 MΩ or more using 500 V DC insulation resistance meter (Between all terminals and ground terminal)			
<b>IP protection level</b>	IP20			
<b>Working atmosphere</b>	Max. 50°C, free from excessive dust and corrosive gas			
<b>Working altitude</b>	2000m (80kPa)			
<b>Degree of pollution</b>	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
<b>Environment parameter (IEC60721-3)</b>	Temperature	0~50°C (No freezing)	-40~75°C	-25~75°C
	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
<b>Signal name</b>	Transistor input (I0-I2)
<b>Rated input voltage</b>	DC 24V (+20%~-15%, pulse ripple within 10%)
<b>Input type</b>	NPN
<b>Rated input current</b>	3.65mA
<b>ON current</b>	>4.14mA
<b>OFF current</b>	<3.88mA
<b>Input impedance</b>	1.5KΩ
<b>Max. input frequency</b>	1kHz
<b>Common method</b>	Shared with power supply 0V, short-circuited internally

> Output specifications\*

Items	Specifications
<b>Signal name</b>	Transistor output (Q0-Q1)
<b>Output polarity</b>	NPN
<b>Control circuit voltage</b>	DC 5~24V
<b>Rated load current</b>	50mA
<b>Max. voltage drop at power-ON</b>	0.05V
<b>Leakage current at power-OFF</b>	<0.1mA
<b>Output frequency</b>	Max. 1kHz
<b>Common method</b>	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		
<b>Programming</b>	<b>Program capacity</b>	16MBytes	
	<b>I-area (%I)</b>	128KBytes	
	<b>Q-area (%Q)</b>	128KBytes	
	<b>M-area (%M)</b>	512KBytes	
	<b>Power-failure retention area</b>	800KBytes	
	<b>Other variables</b>	Not defined	
<b>Configuration</b>	<b>Number of extension modules</b>	<b>Digital module</b>	
		<b>Analog module</b>	
		Calculated based on current consumption	
		<b>External power supply</b>	
		12V/16W	
<b>EtherCAT</b>	<b>Communication standard</b>	IEC 61158 Type12	
	<b>Physical layer</b>	100BASE-TX	
	<b>Transmission speed</b>	100Mbps (100Base-TX)	
	<b>Duplex mode</b>	Full duplex	
	<b>Topology</b>	Linear, bus and star-type	
	<b>Transmission medium</b>	Cat.5E twisted pair cables	
	<b>Maximum transmission distance between nodes</b>	100m	
	<b>Max. process data</b>	Input: 5,736 bytes Output: 5,736 bytes (but the max. number of frames of process data is 4)	
	<b>Communication cycle</b>	Mini.1ms	
	<b>CANOpen master</b>	<b>Link layer</b>	CAN2.0A
<b>Terminal resistor</b>		Built-in 120Ω. Do not support disconnection	
<b>Support baud rate bps</b>		20K,50K,100K,125K,250K,500K,800K和1M	
<b>Transmission medium</b>		Cat.5E twisted pair cables	
<b>Max. communication distance</b>		2500 m (20Kbit/s)	
<b>Maximum number of the slaves</b>		32	
<b>Communication cycle</b>		Mini.1ms	
<b>Serial ports</b>	<b>Physical layer</b>	<b>COM1</b>	RS485
		<b>COM2</b>	RS485 only support master station
		<b>COM3</b>	RS232
	<b>Terminal resistor</b>	<b>COM1</b>	Built-in 120Ω, support DIP switch
		<b>COM2</b>	Built-in 120Ω. Do not support disconnection
	<b>Baud rate bps</b>	4800~115200	
	<b>Max. communication distance</b>	<b>COM1, COM2</b>	500m
		<b>COM3</b>	15m
<b>Maximum number of the slaves</b>	<b>COM1, COM2</b>	32	
	<b>COM3</b>	1	
<b>Transmission medium</b>	Cat.5E twisted pair cables		



> Electrical specifications

Items	Technical specifications			
<b>Dielectric withstand voltage</b>	AC1000V for 1 min, between power terminal and I/O terminal, between external terminal and shell			
<b>Noise resistance</b>	1500Vp-p or more, Noise width 1μs, 50ns (based on noise simulator), comply with (IEC61000-4-2/3/4/6)			
<b>Vibration resistance</b>	<b>Installation</b>	<b>Frequency (Hz)</b>	<b>Acceleration (m/s<sup>2</sup>)</b>	<b>Single amplitude (mm)</b>
	DIN rail mounting	10-57 57-150	- 4.9	0.035 -
10 times of testing in each direction (X-, Y-, and Z-axis directions) (Total: 80 min, each)				
<b>Insulation resistance</b>	50 MΩ or more using 500 V DC insulation resistance meter (Between all terminals and ground terminal)			
<b>IP protection level</b>	IP20			
<b>Working atmosphere</b>	Max. 50°C, free from excessive dust and corrosive gas			
<b>Working altitude</b>	2000m (80kPa)			
<b>Degree of pollution</b>	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
<b>Environment parameter (IEC60721-3)</b>	<b>Temperature</b>	0~50°C (No freezing)	-40~75°C	-25~75°C
	<b>Humidity</b>	5-95%RH (No condensation)		
	<b>Impact (collision)</b>	Acceleration 150m2, action time 11ms, twice in each direction (X-, Y-, and Z-axis directions)		
	<b>Altitude/Atmosphere</b>	Max.2000m	Max.3000m (>70kPa)	

> High-speed input specifications

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

> High-speed output specifications

Items	Specification
<b>Signal name</b>	Output (DO0-DO15)
<b>Output polarity</b>	NPN
<b>Control circuit voltage</b>	DC 5~24V
<b>Rated load current</b>	250mA
<b>Max. voltage drop at power-ON</b>	0.05V
<b>Leakage current at power-OFF</b>	<0.1mA
<b>Output frequency</b>	100KHZ (Version 2.XX.XX) 200KHz (Version 3.XX.XX or more)
<b>Common method</b>	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
<b>Specifications</b>	DC 24V	-15%~20%	36W	19V	12V	±5%	16W

> Performance specifications

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



> Electrical specifications

Items	Technical specifications			
<b>Dielectric withstand voltage</b>	AC1000V for 1 min, between power terminal and I/O terminal, between external terminal and shell			
<b>Noise resistance</b>	1500Vp-p or more, Noise width 1μs, 50ns (based on noise simulator) , comply with (IEC61000-4-2/3/4/6)			
<b>Vibration resistance</b>	<b>Installation</b>	<b>Frequency (Hz)</b>	<b>Acceleration (m/s<sup>2</sup>)</b>	<b>Single amplitude (mm)</b>
	DIN rail mounting	10-57 57-150	- 4.9	0.035 -
10 times of testing in each direction (X-, Y-, and Z-axis directions) (Total: 80 min, each)				
<b>Insulation resistance</b>	50 MΩ or more using 500 V DC insulation resistance meter (Between all terminals and ground terminal)			
<b>IP protection level</b>	IP20			
<b>Working atmosphere</b>	Max. 50°C, free from excessive dust and corrosive gas			
<b>Working altitude</b>	2000m (80kPa)			
<b>Degree of pollution</b>	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
<b>Environment parameter (IEC60721-3)</b>	<b>Temperature</b>	0~50°C (No freezing)	-40~75°C	-25~75°C
	<b>Humidity</b>	5-95%RH (No condensation)		
	<b>Impact (collision)</b>	Acceleration 150m2, action time 11ms, twice in each direction (X-, Y-, and Z-axis directions)		
	<b>Altitude/Atmosphere</b>	Max.2000m	Max.3000m (>70kPa)	

> Power specifications (PD01)

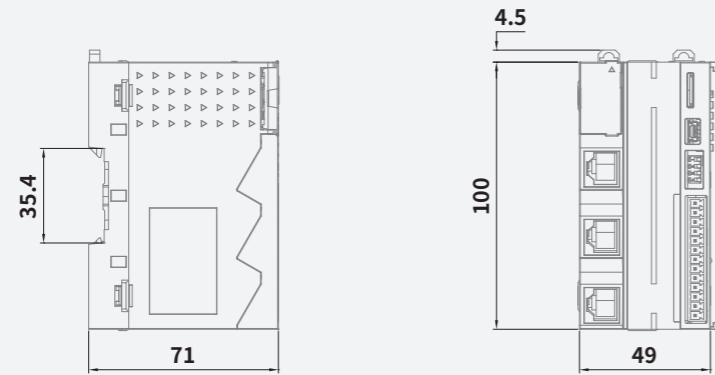
Items	Power voltage	Voltage fluctuation range	Input power	Undervoltage level	Output voltage	Voltage fluctuation	Output power
<b>Specifications</b>	AC 100~240V	-15%~20%	100W	80V	12V	±5%	60W

> Performance specifications

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

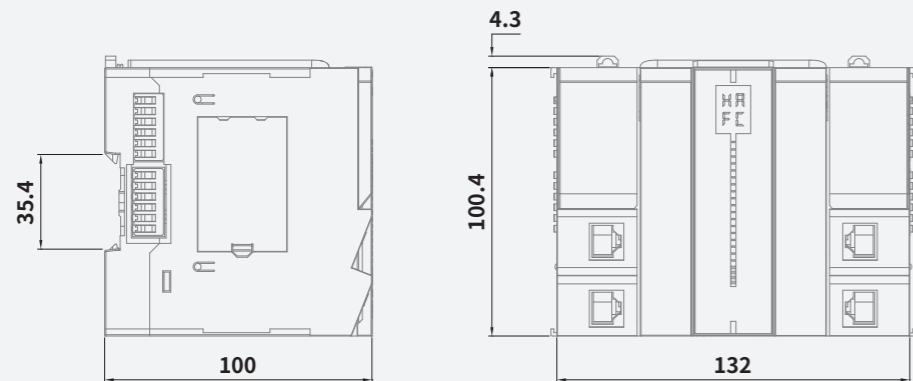
**HCQ0-1□00-D**

Unit: mm



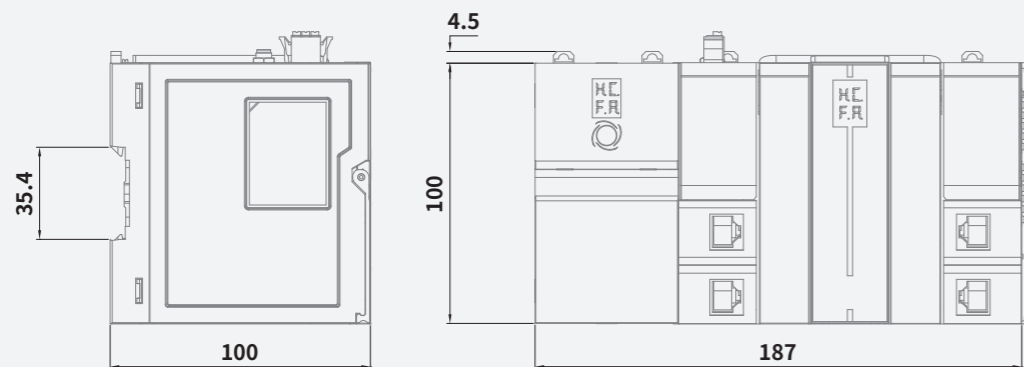
**HCQ1-1□00-D**

Unit: mm



**HCQ5-1□00-A**

Unit: mm



**Naming rule for IQ8000 series**

**HC-IQ8560-1050-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



> Main units

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

> Environment specifications

Items	Specifications
Working temperature	0 ~ 55°C
Storage temperature	-25 ~ 70°C (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/s <sup>2</sup> , scan at a rate of one multiplication frequency per minute, ten times in each direction (X-, Y-, and Z-axis directions).
Impact (collision)	147m/s <sup>2</sup> , 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		
Interfaces	SD-card storage		miniSD×1
	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	

> 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

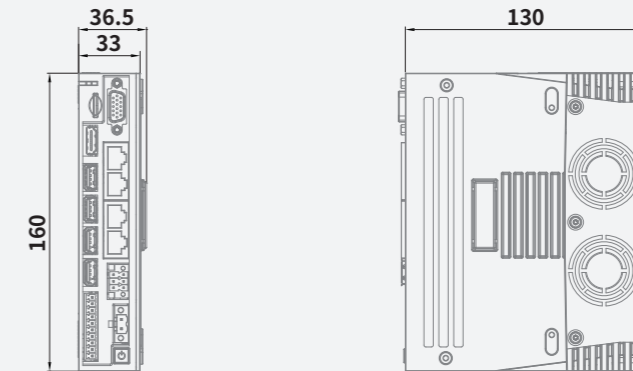
Items	Specifications
Interface type	RS485
Data transmission speed	Max.115200bps
Communication mode	Half duplex
Max. transmission distance	100m (At a specific baud rate)
Supported protocol	Self-defined
Isolation status	Digital isolation
Terminal resistor	Not built-in

> 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

HC-IQ8560-1050-D

Unit:mm



## 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 PPV 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

# HCQX-ID16-D2

**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**

# HCQX-ST1505-D2

**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 working 20 hours a 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

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


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	Input 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)	
			Input range	-200~850°C	
		Thermal resistance: PT100, PT1000, Ni100, Ni1000(Default: PT100) 3-wire	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

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

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°C
Storage temperature	-25~75°C
Relative humidity	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

Coupler/power/terminal modules  
**HCQX SERIES**

ETHERCAT COUPLER



ETHERCAT COUPLER



AC POWER



END UNIT



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

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

**Digital output modules — Performance Specifications**

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

**Digital I/O module — Performance Specifications**

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

**ANALOG INPUT**



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

**ANALOG OUTPUT**



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

**TEMPERATURE MEASUREMENT**



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

**Analog output module — Performance Specifications**

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

**Temperature measurement module — Performance Specifications**

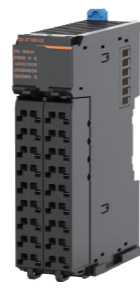
Items	Specifications
<b>Models</b>	HCQX-TS04-D
<b>Signal voltage</b>	Thermocouple: K, J, E, T, N, B, R, S (Default K-type) Thermal resistance: PT100, PT1000, Ni100, Ni1000 (Default PT100) 3-wire system
<b>Settings</b>	No need to set the address in the software, codesys will make the configuration automatically; 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
<b>Input filter limit frequency</b>	Typical 1Khz; Depends on sensor type, conversion time and length
<b>Resolution</b>	0.1 °C per digit , 0.1°F per digit
<b>Warm-up time during TC test</b>	30 mins
<b>Absolute max. ratings</b>	±150mV
<b>Conversion time</b>	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
<b>Temperature range</b>	Determined by the corresponding sensor type; For TC, default setting K: -200~1370 °C, -7~55mV; For PT, default setting PT100: -200~850°C, 18~391Ω.
<b>Measurement error (total error range)</b>	TC: <±0.3% (For full scale) PT: <±0.5°C

○ HIGH SPEED COUNTER

○ STEP DRIVER



- HCQX-HC04-D2
- 4-ch high-speed counting
- Single-ended input
- Single-phase / dual-phase pulse input



- HCQX-ST1505-D2
- Single-axis control
- Supported mode: PP PV CSP HM

**High-speed counter module — Line drive specifications**

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

**High-speed counter module — Input specifications**

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

**High-speed counter module — Counting functions**

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

**Step drive module — Power Specifications**

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

**Step drive module — Control Specifications**

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

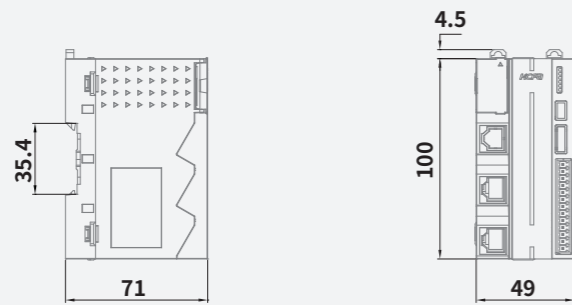
**Step drive module — Drive Specifications**

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

# HCQX-SERIES UNIT DIMENSION DRAWING

## Coupler modules

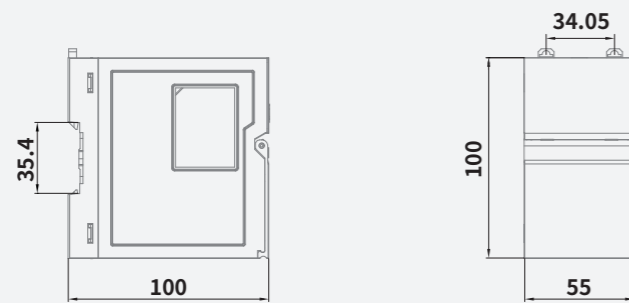
Unit:mm



Model	
HCQX-EC01-D	HCQX-EC02-D

## Power modules

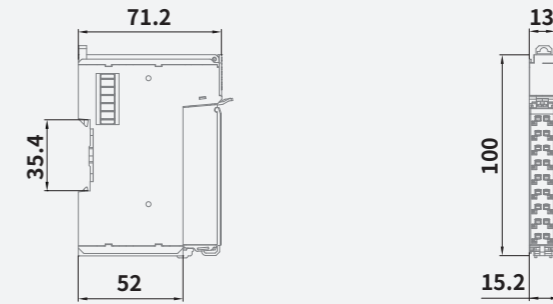
Unit:mm



Model	
HCQX-PD01-A	

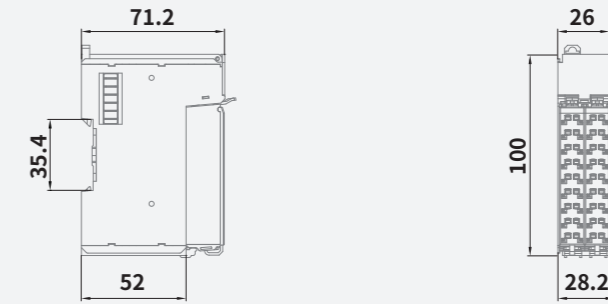
## Extension modules

Unit:mm



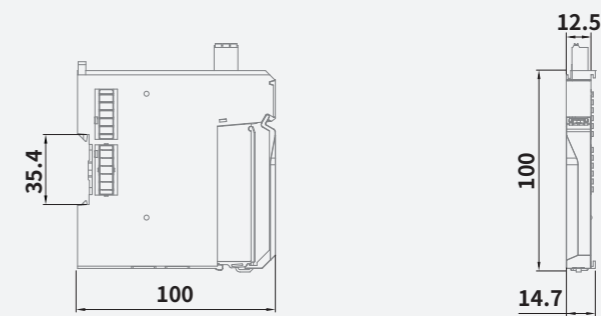
Model			
HCQX-ID16-D2	HCQX-OD16-D2	HCQX-MD16-D2	HCQX-HC04-D2

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

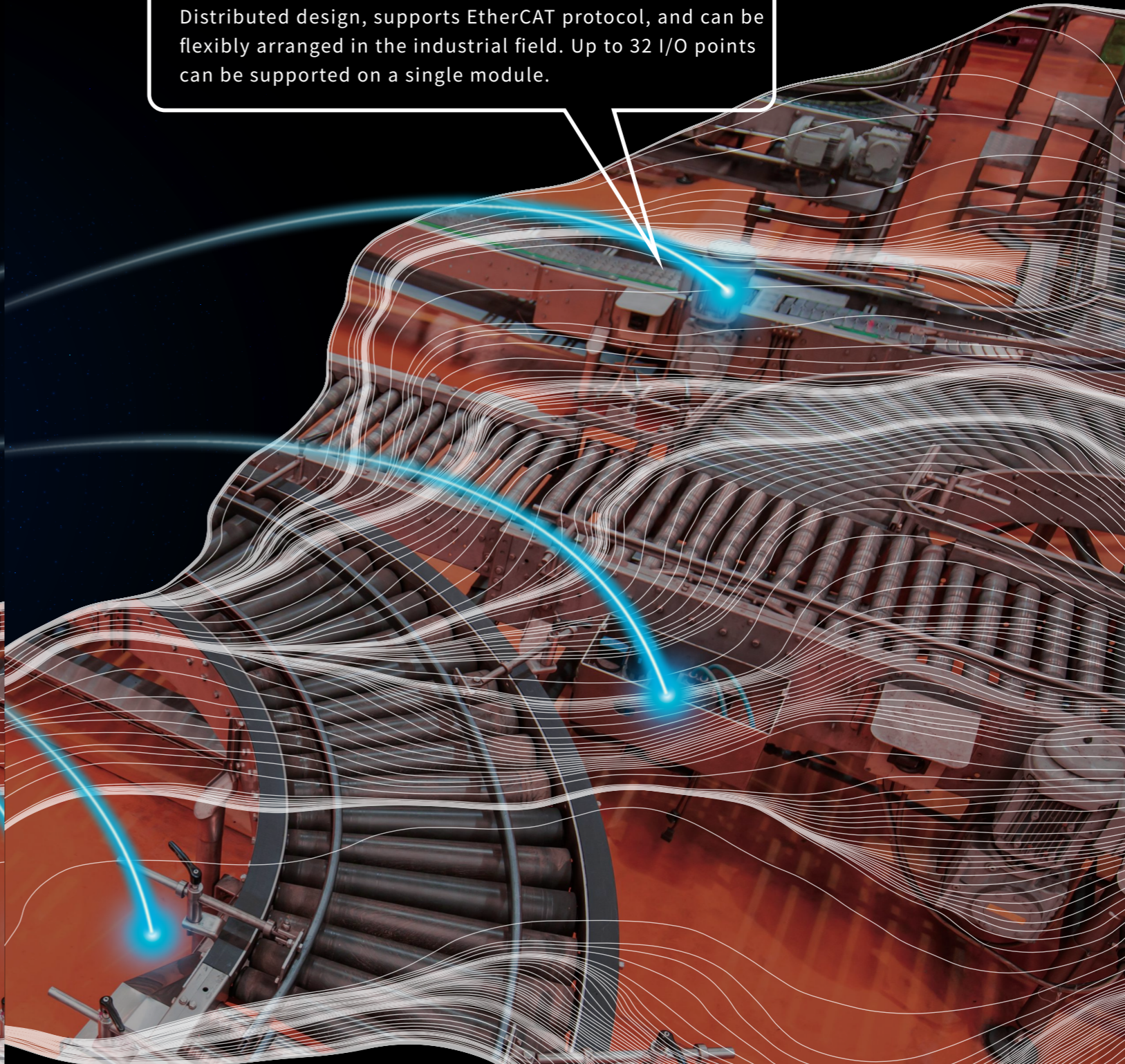
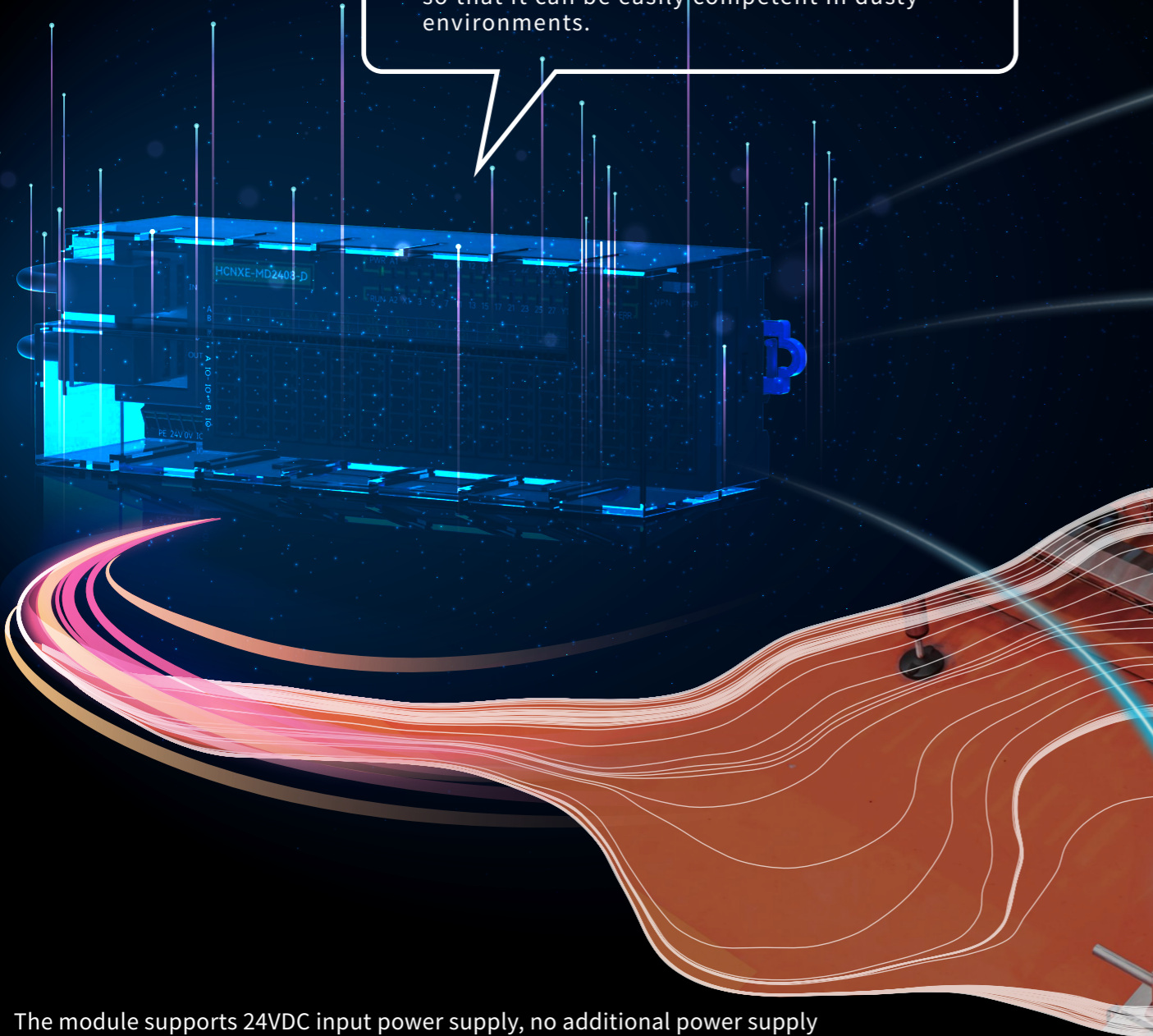
## Transparent protective cover design

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

## 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.

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

# HCNxE-ID32-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 specifications

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	<b>Installation</b>	
	When installed on DIN rail	Frequency (Hz)   Frequency (m/s <sup>2</sup> )   Half amplitude (mm)
	When installed directly	10-57   -   0.035
	57-150   4.9   -	
Shock resistance	147m/s <sup>2</sup> , 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	
Insulation resistance	5MΩ or more by 500V DC megger	
Grounding	Class D grounding (grounding resistance: 100Ω or 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

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 type	NPN, built-in common terminal
Wiring method	2-wire
Protection functions	Overcurrent protection, overvoltage protection, over-temperature protection

Digital I/O module

Items	Specifications	
	HCNxE-MD1616-D	HCNxE-MD2408-D
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



# 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.



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

**Make upgrading much easier!**  
The extension modules are compatible with the upgrade version of most CPU units, making system

2023



# A/R-SERIES LINEUP

## Naming rule for A-series PLC

# HCA8C-16X16YT-A

<b>Product name</b> <b>HC</b> HC: HCFA controller	<b>Series name</b> <b>A8</b> A1: Simple-type controller A2: General-purpose controller A8: High-performance controller	<b>Series models</b> <b>C</b> N/A: Standard-type P: Upgraded-type C: Compact type	<b>Input points</b> <b>16</b> 16: 16 points
<b>Input type</b> <b>X</b> 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	<b>Output points</b> <b>16</b> 16: 16 points	<b>Output type</b> <b>Y</b> Y: Digital output for main units EY: Digital output for extension modules DA: Analog output PG: Pulse output GM: Motion control	<b>Output method</b> <b>T</b> R: Relay output T: Transistor output
<b>Power type</b> <b>A</b> D: DC power A: AC power N/A: For modules			

## Naming rule for R-series PLC

# HCR8C-32MT-D

<b>Product name</b> <b>HC</b> HC: HCFA controller	<b>Series name</b> <b>R8</b> R1: Simple-type controller R2: General-purpose R8: High-performance controller	<b>Series models</b> <b>C</b> N/A: Standard-type A: A-series P: Upgraded-type C: Compact-type	
<b>Total points</b> <b>32</b> 10: 10 points 14: 14 points ...: ... 80: 80 points 128: 128 points	<b>Function module</b> <b>M</b> M: Standard control	<b>Output type</b> <b>T</b> R: Relay output T: Transistor output	<b>Power type</b> <b>D</b> 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 x1



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 x2, RS232 x2, Ethernet x1



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 x2, RS232 x2, Ethernet x1



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 x2, RS232 x2, Ethernet x1

\*Will be supported.

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



> 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°C
Storage temperature	-25~70°C (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/s <sup>2</sup> , scan at a rate of one multiplication frequency per minute, ten times in each direction (X-, Y-, and Z-axis directions)
Impact (collision)	147m/s <sup>2</sup> , 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
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 clock (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
Others	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 points [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
	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	

## &gt; 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: 1 output point: 0.5A 4 output points: 0.8A 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: 1 output point: 2A 4 output points: 8A 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

## &gt; 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

## &gt; 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



> 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°C
Storage temperature	-25~70°C (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/s <sup>2</sup> , scan at a rate of one multiplication frequency per minute, ten times in each direction (X-, Y-, and Z-axis directions)
Impact (collision)	147m/s <sup>2</sup> , 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
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 clock (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
Others	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
	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	

## &gt; 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: 1 output point: 0.5A 4 output points: 0.8A 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: 1 output point: 2A 4 output points: 8A 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

## &gt; 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

## &gt; 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



> 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°C
Storage temperature	-25~70°C (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/s <sup>2</sup> , scan at a rate of one multiplication frequency per minute, ten times in each direction (X-, Y-, and Z-axis directions)
Impact (collision)	147m/s <sup>2</sup> , 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
Max. input current	220V/320mA
Power efficiency	80%
Allowable instantaneous power-failure time	Continue to operate for instantaneous power failures below 10ms 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); 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 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	

## &gt; 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 Make sure that the total load current per common terminal should be the following: - 1 output point:0.5A - 4 output points:0.8A - 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 Make sure that the total load current per common terminal should be the following: · 4 output points/common terminal:8A or less · 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	

## &gt; 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 Modbus TCP/IP slave
Transmission medium	Cat.5E twisted pair cables

## &gt; 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 Download monitoring protocol Free communication protocol
Isolation status	Non-isolated
Terminating resistor	Not built-in

## &gt; 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 Free communication protocol
Isolation status	Non-isolated

## &gt; 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 Free communication protocol
Isolation status	Non-isolated



> 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°C
Storage temperature	-25~70°C (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/s <sup>2</sup> , scan at a rate of one multiplication frequency per minute, ten times in each direction (X-, Y-, and Z-axis directions)
Impact (collision)	147m/s <sup>2</sup> , 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 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 (HCP Woks2)	Ethernet	Supported
	USB(Mini-B)	Supported
	RS485	-
	RS232	Supported
Positioning (Transistor output)	200kpps×4 axes	
High-speed counter (1-phase 1-input)	200kHz×3 ch 10kHz×1 ch	
SD memory card slot	Supported	
Network (Ethernet)	Simple communication	Will be supported
	Modbus/TCP master	Will be supported
	Modbus/TCP slave	Supported
	Socket communication	Will be supported
	FTP server function	Will be supported
Hold during power-failure	Data size 64KB	
Extension	Board extension	Supported
	Left extension modules	Will be supported
	Right extension modules	Supported
Serial communication (protocol or instruction)	Modbus RTU	32 slave stations supported
	Modbus RTU slave	Supported
	Free communication protocol	Supported

## &gt; 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	

## &gt; 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	5μs or 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 specifications	
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 4 output points: 8A 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	

## &gt; 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

## &gt; 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 Download monitoring protocol Free communication protocol
Isolation status	Digital isolation
Terminating resistor	Not built-in

## &gt; 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 Free communication protocol
Isolation status	Non-isolated



> Main units

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

> Environment specifications

Items	Specifications
Working temperature	0~55°C
Storage temperature	-25~70°C (No condensation)
Relative humidity	10%~95% (No condensation) or less
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/s <sup>2</sup> , scan at a rate of one multiplication frequency per minute, ten times in each direction (X-, Y-, and Z-axis directions)
Impact (collision)	147m/s <sup>2</sup> , 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 modules	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	

## &gt; 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 The total load current of resistance load per common terminal should be the following: - 1 output point:0.5A - 4 output points:0.8A - 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

## &gt; 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 Modbus TCP/IP slave
Transmission medium	Cat.5E twisted pair cables

## &gt; 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 Download monitoring protocol Free communication protocol
Isolation status	Digital isolation
Terminating resistor	Not built-in

## &gt; 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 Free communication protocol
Isolation status	Digital isolation

## &gt; 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



### > 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°C
Storage temperature	-25~70°C (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/s <sup>2</sup> , scan at a rate of one multiplication frequency per minute, ten times in each direction (X-, Y-, and Z-axis directions)
Impact (collision)	147m/s <sup>2</sup> , 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

## &gt; 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		<b>All outputs</b>	DC 5~30V
Max. load	Resistive load	<b>All outputs</b>	0.5A/1 point The total load current of resistance load per common terminal should be the following: - 1 output point:0.5A - 4 output points:0.8A - 8 output points:1.6A
	Inductive load	<b>All outputs</b>	12W/DC 24V
Open-circuit leakage current		<b>All outputs</b>	0.1mA or less/DC 30V
ON-voltage drop		<b>All outputs</b>	1.5V or less
Response time	OFF→ON	<b>Y000~Y007</b>	2.5μs or less/10mA or more(DC 5~24V)
		<b>Y0010 or more</b>	0.2ms or less/200mA or more(at 24VDC)
	ON→OFF	<b>Y000~Y007</b>	2.5μs or less/10mA or more(DC 5~24V)
		<b>Y010 or more</b>	0.2ms or less/200mA or more(at 24VDC)
Circuit isolation		<b>All outputs</b>	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 The total load current of resistance load per common terminal should be the following: ·4 output points/common terminal:8A or less ·8 output points/common terminal:8A or less	
Open-circuit leakage current		-	
Response time	OFF→ON	About 10ms	
	ON→OFF	About 10ms	
Circuit isolation		<b>All outputs</b>	Mechanical isolation
Output operation display		The corresponding LED dots are on when the output is ON	

## &gt; 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 Modbus TCP/IP slave
Transmission medium	Cat.5E twisted pair cables

## &gt; 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 Download monitoring protocol Free communication protocol
Isolation status	Digital isolation
Terminating resistor	Not built-in

## &gt; RS232 Specifications

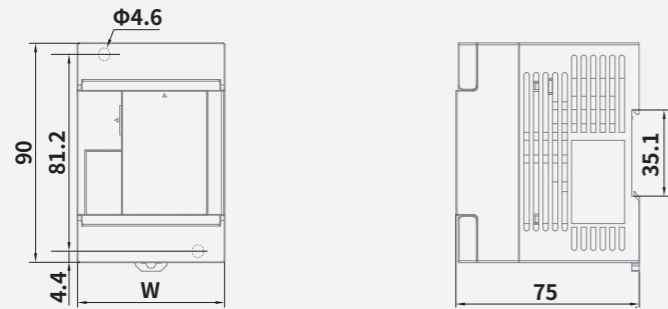
Items	Specifications
Interface type	RS232
Data transmission speed	Max.115200bps
Communication mode	Full-duplex
Max. transmission distance	5m
Supported protocol	Download monitoring protocol Free communication protocol
Isolation status	Digital isolation

## &gt; 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

## HCA1P-series

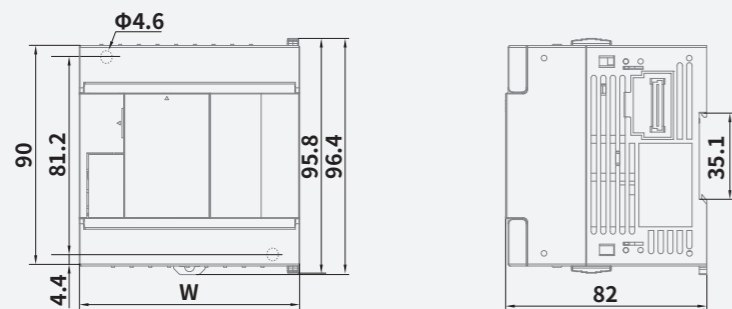
Unit: mm



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

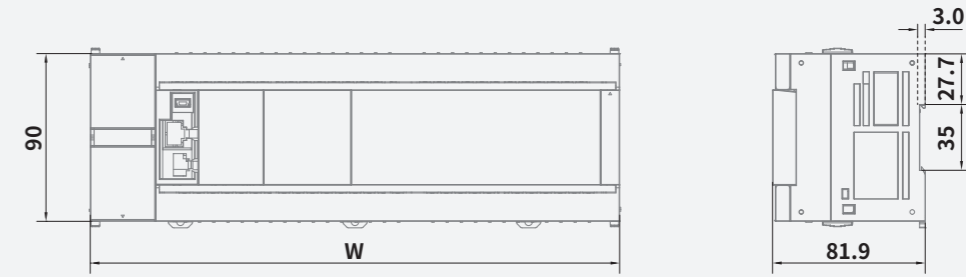
Unit: mm



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

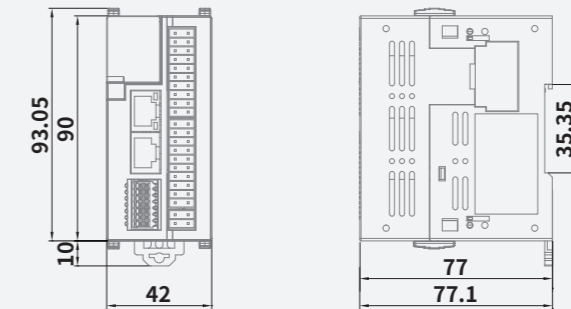
Unit: mm



Models	HCR8P-32MT/R-A	HCR8P-48MT/R-A	HCR8P-64MT/R-A	HCR8P-80MT/R-A	HCR8P-128MT/R-A
Dimensions	HCR8A-32MT/R-A	HCR8A-48MT/R-A	HCR8A-64MT/R-A	HCR8A-80MT/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

# HCA8C-16X16YT-A

### Product name

**HC** HC: HCFA controller

### Series name

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

### Series models

**C** 空: 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

# HCA8P-ADxx-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


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 dimension WxDxH(mm)
 HCA8C-CBR	Relay output	Realize the conversion between Ihorn terminal and conventional terminal for 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

# HCA8 SERIES UNIT

## 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/Occupied points	DC5Vpower supply capacity(mA)
HCA8C-4EX4EYR	4	DC 24V	4	Relay	Homconnector	16*	40
HCA8C-4EX4EYT	4	DC 24V	4	Transistor	Homconnector	16*	40
HCA8C-8EX	8	DC 24V	-	-	Homconnector	8	25
HCA8C-8EYR	-	-	8	Relay	Homconnector	8	30
HCA8C-8EYT	-	-	8	Transistor	Homconnector	8	30
HCA8C-8EX8EYR	8	DC 24V	8	Relay	Homconnector	16	60
HCA8C-8EX8EYT	8	DC 24V	8	Transistor	Homconnector	16	60
HCA8C-8EX8EYT-C	8	DC 24V	8	Transistor	Screw terminal type	16	60
HCA8C-16EX	16	DC 24V	-	-	Homconnector	16	30
HCA8C-16EYR	-	-	16	Relay	Homconnector	16	50
HCA8C-16EYT	-	-	16	Transistor	Homconnector	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	2A/1 point Make sure that the total load current of resistance load per common terminal (16 points) is 8A or less The total load current of resistance load per common terminal should be the following: 4 points/common: 8A; 8 points: 8A
		HCA8C-16EYR	
	Inductive load	HCA8C-16EYT	80VA Please refer to the user manual (item 622) for the life-expectancy standard when inductive load is connected In addition, please refer to the user manual (item 624) for theprecaution on external wiring
		HCA8C-16EYR	
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 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°C±5°C Full scale 20V±0.3% (±60mV) Ambient temperature 0°C~55°C Full scale 20V±0.3% (±100mV)	Ambient temperature 25°C±5°C Full scale 20mA±0.3% (±100µA) Ambient temperature 0°C~55°C Full scale 20mA±0.3% (±200µA)
AD conversion time	500µs×Number of channels used×Average times	

Analog output module — Performance specifications

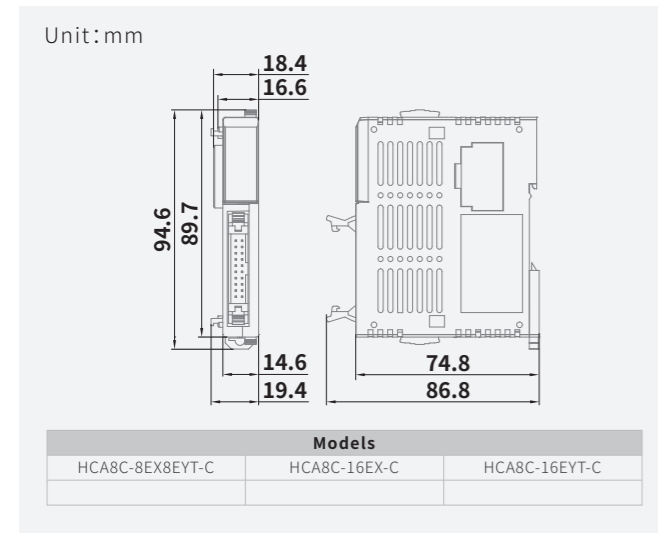
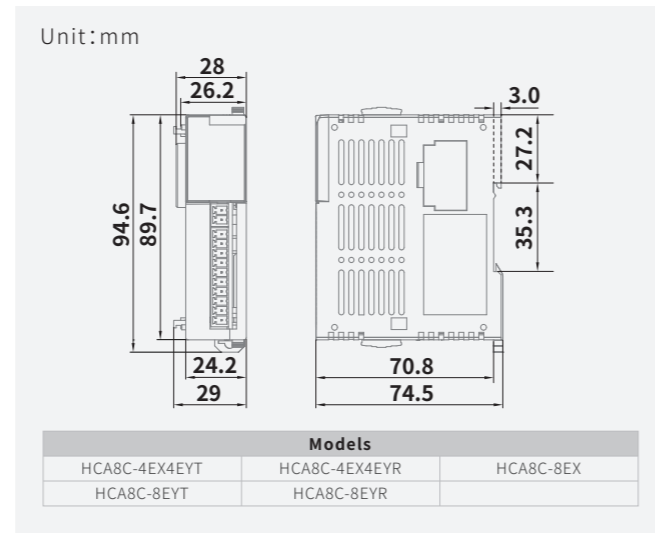
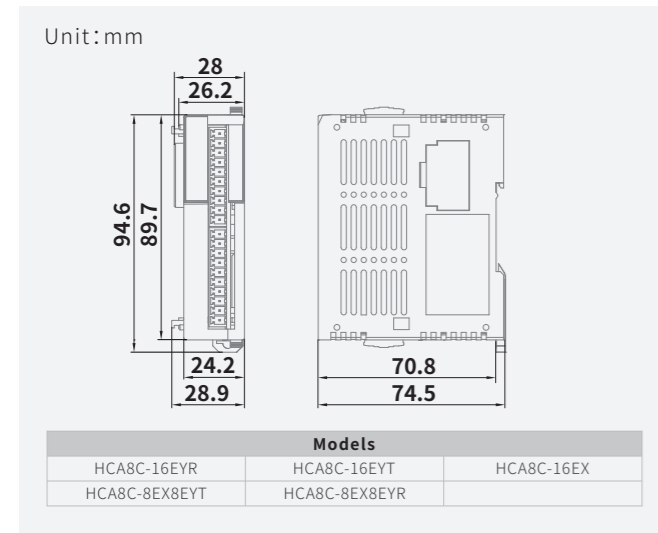
Items	Voltage output	Current output
Analog output range	DC -10~+10V	DC 0~20mA, 4~20mA
Offset value	-10~+9V	0~17mA
Gain value	-9~+10V	3~30mA
Digital input	16 bits, binary, with sign	15 bits, binary
Resolution	0.32mV (20Vx1/64000)	0.63µA (20mA/32000)
Overall accuracy	Ambient temperature 25°C±5°C Full scale 20V±0.3% (±60mV) Ambient temperature 0°C~55°C Full scale 20V±0.3% (±100mV)	Ambient temperature 25°C±5°C Full scale 20mA±0.3% (±100µA) Ambient temperature 0°C~55°C Full scale 20mA±0.3% (±200µA)
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

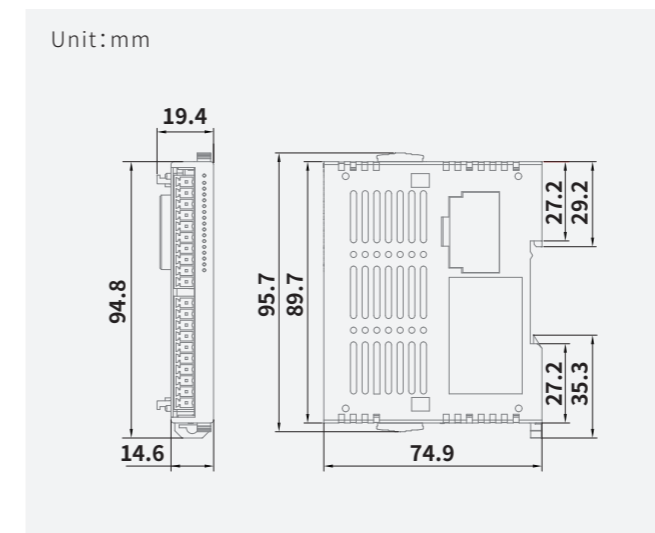
Items	Specifications	
Power supply	Input signal	DC 24V±10%, Current consumption 40mA or less
	Output signal	Pulse output: DC 5~24V, current consumption 35mA or less CLR output: DC 5~24V, current consumption 20mA or less
Number of control axes	1	
Positioning operation	Method	Incremental/absolute value
	Unit	PLS, µm, 10 <sup>-4</sup> inch, mdeg
	Unit magnification	1x, 10x, 100x, 300x
	Range	-2,147,483,648, to 2,147,483,647 PLS
	Operation speed unit	Hz, cm/min, inch/min, 10deg/min
Acceleration and deceleration settings	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

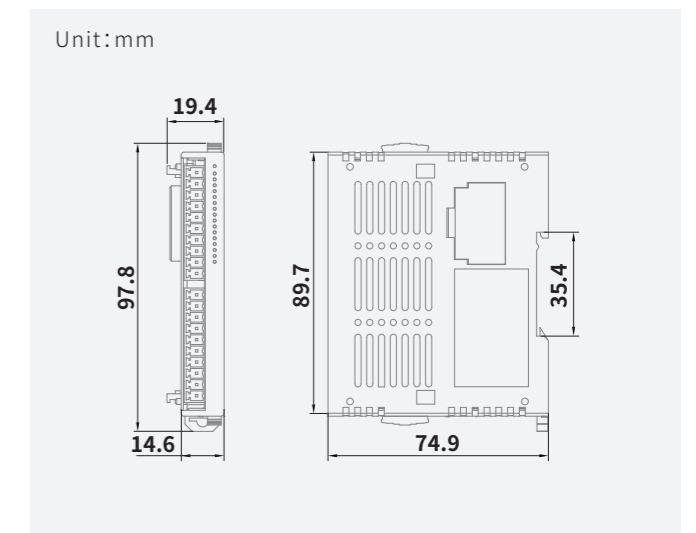
## HCA8C-series I/O extension modules



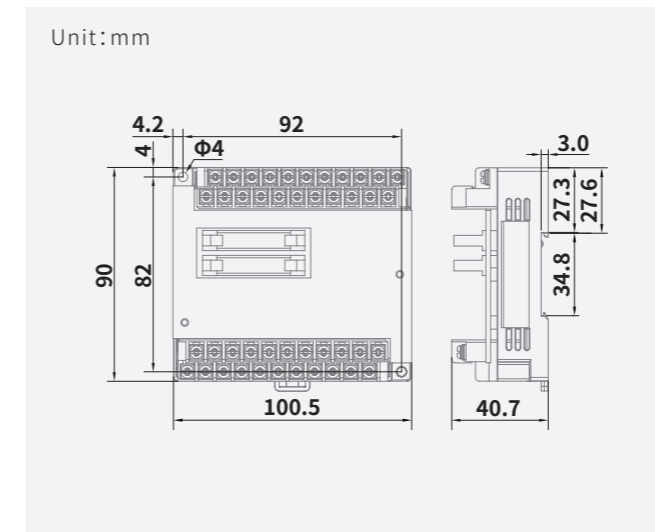
## HCA8P-1PG



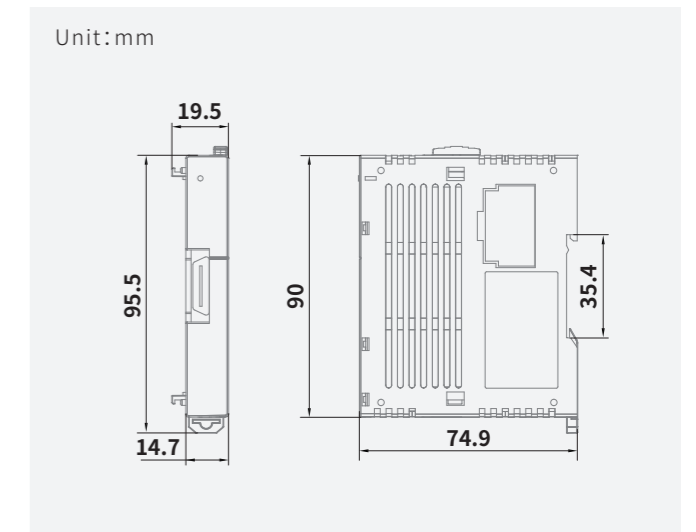
## HCA8P-AD/DA04-D



## HCA8C-CBR/CBT



## HCA8C-CNV5V-TX2N



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

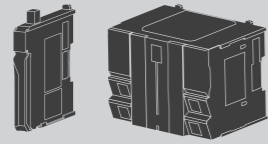
Distributed I/O

A-series PLC

R-series PLC

A-series I/O

Product list



## Selection 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



### CPU units

Models	Recommended number of axes	Specifications				Communication protocol						Page	
		Rated voltage	Input	Output	High-speed input	High-speed 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		16 points	16 points	16 points	16 points	✓	✓	✓	✓	✓	✓	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/O module\*2

Models	Specifications					Page
	Rated voltage	Input		Output		
Digital input module	DC 24V	16 points	NPN/PNP	-	NPN	27
		16 points				27
		32 points				27
Digital output module	DC 24V	-	NPN/PNP	16 points	NPN	27
		16 points		27		
		32 points		27		
Digital I/O module	DC 24V	8 points	NPN/PNP	8 points	NPN	27
		8 points		8 points		27
		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

\*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.

HCNXXE-series digital module

Models	Specifications				Page	
	Rated voltage	Input	Output			
HCNXXE-ID32-D	DC 24V	32 points	NPN/PNP	-	39	
HCNXXE-OD32-D		-		32 points	NPN/built-in common terminal	39
HCNXXE-MD1616-D		16 points		16 points		39
HCNXXE-MD2408-D		24 points		8 points		39

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				
<b>HCA1P CPU units</b>							
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
DC 24V NPN/PNP							
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
<b>HCA2P CPU Units</b>							
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
DC 24V NPN/PNP							
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

\*Will be supported.

CPU units

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

I/O modules

Models	Specification				Connector type	Page	
	Rated voltage	Input	Output				
<b>Right-side extension input modules</b>							
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
<b>Right-side extension output modules</b>							
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
<b>Right-side extension I/O modules</b>							
HCA8C-4EX4EYR	DC 5~30V	4	DC 24V NPN/PNP	4	Relay	Screw terminal type	78
HCA8C-4EX4EYT				4	Transistor (NPN)	Screw terminal type	78
HCA8C-8EX8EYR				8	Relay	Screw terminal type	78
HCA8C-8EX8EYT				8	Transistor (NPN)	Screw terminal type	78
HCA8C-8EX8EYT-C				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

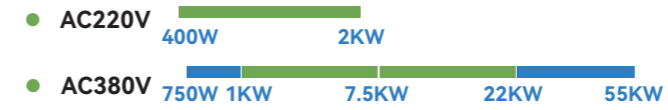
Models	Specifications	Page
HCA8C-CBR	Relay output type, realize the conversion of horn terminal and conventional terminal of IO modules	81
HCA8C-CBT	Transistor output type, realize the conversion of horn terminal and conventional terminal of IO modules	81
HCA8C-CNV5V-TX2N	Extension IO module connector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

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	Independent module, not the extension modules							
HCA8P-1PG					✓	✓	✓	✓

# Y7 Smart Advanced Servo System

## Abundant voltage levels and power specifications Note



Note: 0321 of the green part will be fully launched in 2023, and the blue part will be launched in Q2 of 2024

With **5S** as the design concept  
**Flexible response to market changes**

Faster response, higher precision, maximize system performance!

Higher speed, higher torque to achieve high-speed equipment!

Rich bus, All-in-one controlled by the "core"!

Meet the **high-performance** industry needs of general markets such as machine tools/laser/packaging/woodworking/photovoltaic/3C



<b>3.5Hz</b> Speed loop response	
<b>20BIT</b> Magnetic	<b>23/25BIT</b> light weave
<b>6500</b> Low power rpm	<b>4000</b> High Power rpm
<b>350</b> MAX %	<b>300</b> MAX %

- Digital quantity
- 1VPP
- BISS-C
- Safety shutdown (STO)
- Dynamic braking (DB)
- Brake control and detection (BD)
- Temperature check (TD)



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