PLC Product

FRECON

ABOUT US

FRECON Electric (Shenzhen) Co., Ltd. is a national key high-tech enterprise, a dual-soft enterprise in Shenzhen, and a professional company in the fields of industrial automation, high efficiency and energy saving, and green new energy which was founded in 2013. We have more than 16 years of experience in the development and application of frequency converters, servo drives, energy-saving control cabinets, solar inverter systems etc.

Product feature

▶▶ Multiple modes of communication
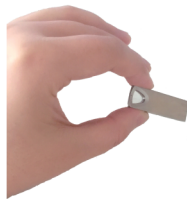
■ RS232　　　　　　■ RS485　　　　　　■ BUS　　　　　　■ USB　　　　　　■ Ethernet

Communication protocol: support MODBUS RTU, MODBUS ASCII, custom protocol RS, MODBUS TCP/IP, EtherCAT, RTX, etc.

USB interface communication

Function 1: Use USB to upgrade PLC firmware

● Insert the USB flash drive into the PLC and the program will automatically update in about 1s

● Programs can be downloaded to PLC in batches via USB flash drive

● The files in the USB flash drive have been encrypted and cannot be opened directly by the programming software to protect the user's intellectual property rights
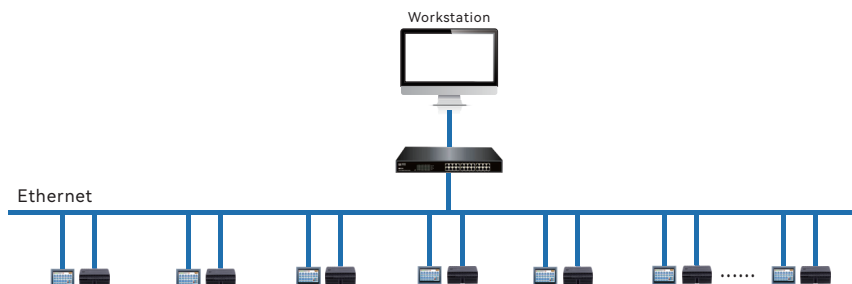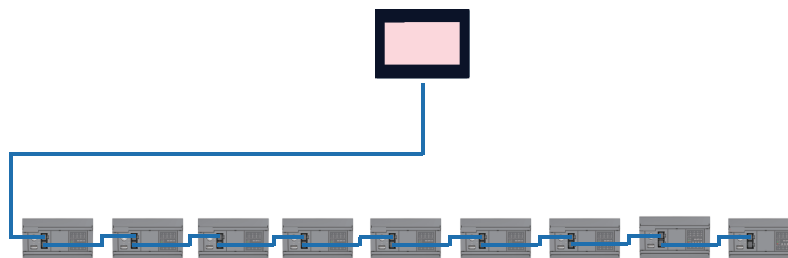
Function 2　PLC online monitoring
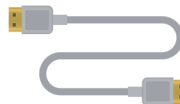
Ethernet communication

Through Ethernet communication, one PC can monitor multiple PLC online and download programs.

■ Ethernet implements multi-machine and multi-screen data exchange

Workstation

Ethernet

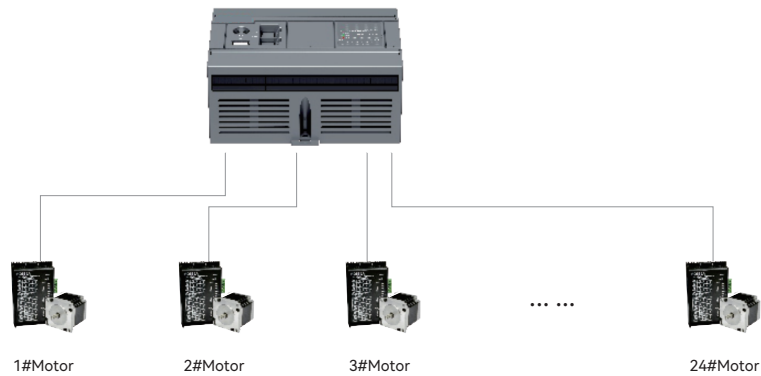■ Dual Ethernet ports implement switch functions

PLC

Product feature

≫ Motion control function

High speed output

Pulse + Direction: A single board can drive up to 24 stepper/servo motors with a maximum frequency of 200khz high-speed output.

| 1#Motor | 2#Motor | 3#Motor | ... ... | 24#Motor |

High speed input

Supports single-phase high-speed counting up to 12 channels, the hardware single-phase maximum frequency is 100Khz, and the software single-phase maximum frequency is 10Khz. AB phase high-speed counting up to 6 channels: the maximum frequency is 200khz. AB phase counting 4 times frequency mode.

Up count

A

B

+1 +1 +1 +1 +1 +1 +1 +1 +1 +1 +1 +1

Up count

A

B

-1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1
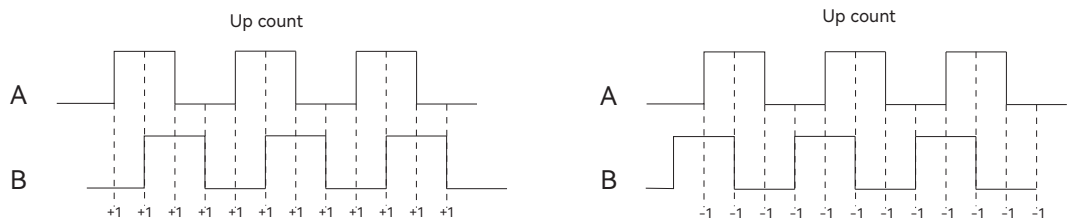
Interpolation function

Supports two-axis linkage (linear interpolation/circular interpolation/elliptical interpolation).

Y-axis   Y-axis   Y-axis

X-axis   X-axis   X-axis

Linear interpolation   Circular interpolation   Ellipse interpolation
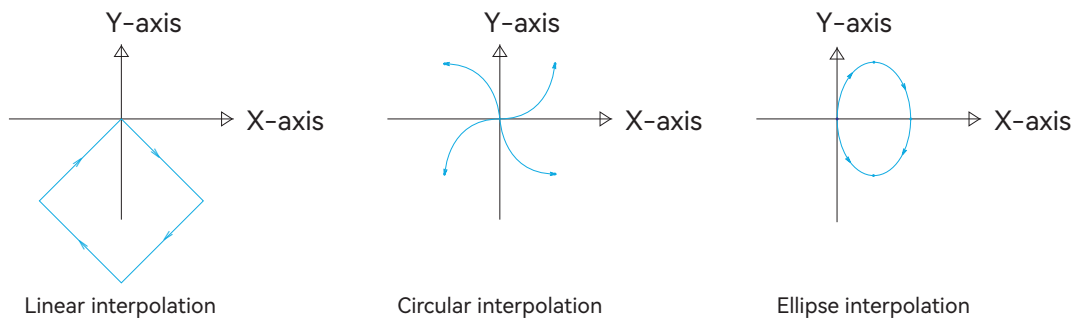
Product feature

Electronic cam: wheel cutting, rolling cutting, chasing shearing, pillow packaging, custom cam

- ■ Support calibration of multiple sections with variable length chasing shear
- ■ It has the function of fixed length and fixed calibration, and is suitable for a variety of occasions.
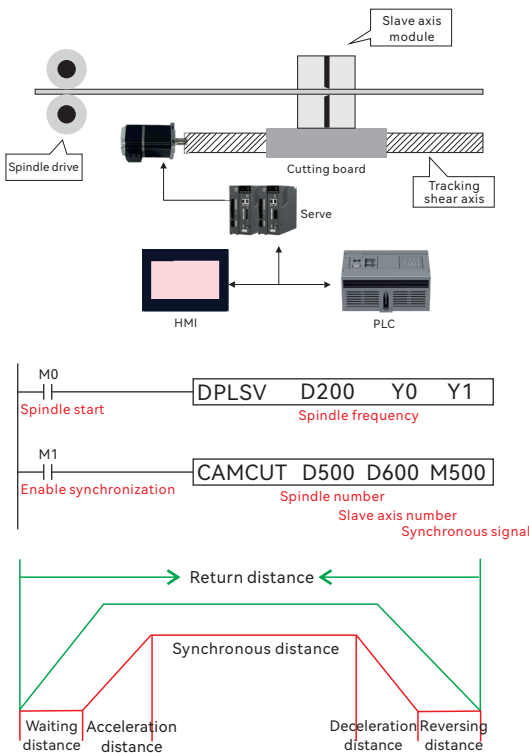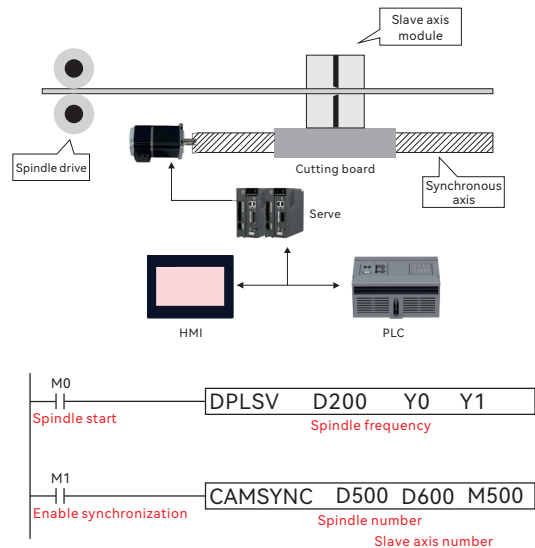- ■ The acceleration zone, deceleration zone and return zone have optimized curves, and the system runs smoothly without any abruptness.
- ■ The electronic cam speed curve is adopted, and the positioning is highly accurate without any cumulative deviation.。

Chasing shearing solution


```
   M0
   ┤├          DPLSV    D200    Y0    Y1
Spindle start                Spindle frequency

   M1
   ┤├          CAMCUT   D500   D600   M500
Enable synchronization       Spindle number
                             Slave axis number
                             Synchronous signal
```


- ■ Return distance = cutting length – waiting distance – acceleration distance – synchronization distance – deceleration distance – reversing distance
- ■ The shearing system only needs to set the required waiting, acceleration, synchronization, deceleration, and reversing distance parameters to meet the customer's cam adjustment and alignment functions.

Synchronous solution


```
   M0
   ┤├          DPLSV    D200    Y0    Y1
Spindle start                Spindle frequency

   M1
   ┤├          CAMSYNC  D500   D600   M500
Enable synchronization       Spindle number
                             Slave axis number
```

- ■ The electronic cam synchronization programming is simple, and the CAMSYNC instruction can be used to achieve synchronous movement of the slave axis and the main axis.

Motion control function

Chasing Shear CAMCUT

Flying Shears CAM
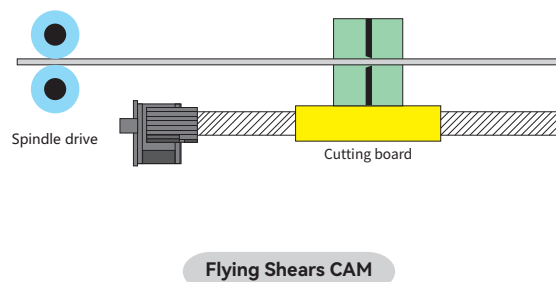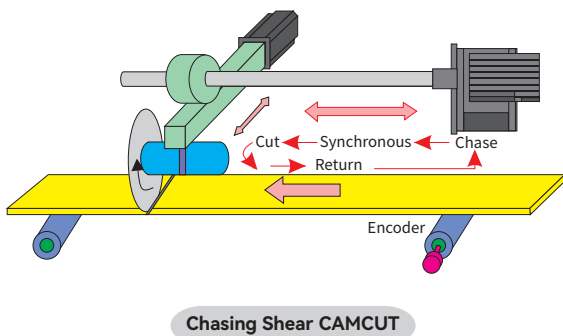
Product feature

Fixed length cam CAM

Color mark sensor

Encoder

Variable length cam CAM

Spindle drive   Optical fiber
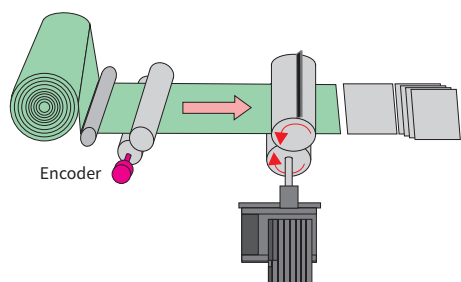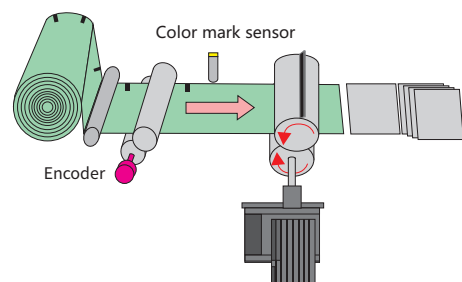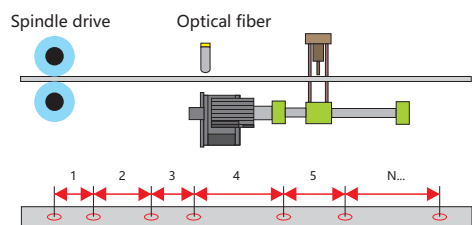
Variable length shear CAM

Y

X

Z
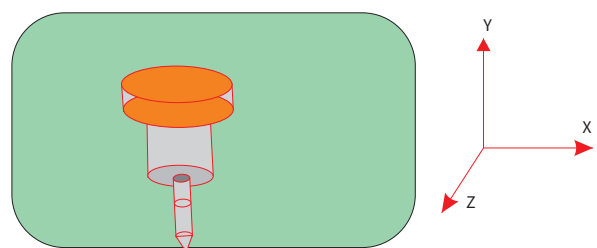
Multi-axis linkage interpolation TRACK

Acceleration after superposition

Trigger overlay command

Trigger overlay command

Trigger overlay command

Trigger overlay command

Motion Overlay CAMADD

Frequency

Acceleration

Custom CAM

PLC
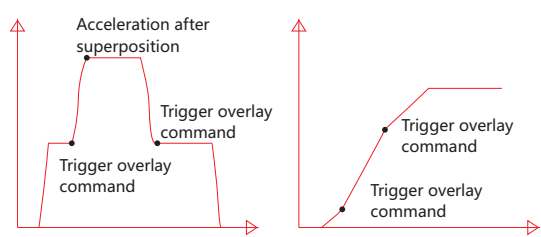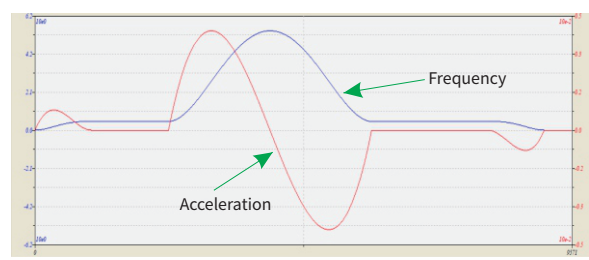
PLC series introduction

►► System chart

40 point block diagram

EtherNET*2
Implement switch function

High speed input
4 groups of AB phase 200K high-speed counting input

RS232
New communication convenience
Easier command programming

Expansion interface
Up to 16 local expansion modules
can be connected.
Digital, analog, temperature/weighing
expansion.

USB
The program can be downloaded
via USB or USB cable

RS485
2 groups of RS485 support free protocol,
MODBUS Indicates the master/slave protocol

BD expansion board
Can be expanded to RS485, RS232
module, analog input/output module

High speed output
4 channels 200Khz,
can drive 4-axis servo or stepper

►► HC series PLC controller

■ Non-bus type PLC series, providing 16-60 points of digital input, and the input and output can be expanded to 256/256 at most.

■ High-speed input/output: supports up to 4 AB phase high-speed inputs and 12-axis high-speed outputs

►► HCM series PLC controller

■ Based on the HC series, motion control function is added.

■ Rich functions: chasing shear, flying shear, synchronization, following, motion superposition, virtual axis, custom cam, etc.

►► H2 series PLC controller

■ EtherCAT bus type PLC series host provides 16-60 points of digital input and output, and the input and output can be expanded to 256/256 at most.

■ Supports up to 4 AB phase high-speed inputs, 8 pulse axis high-speed outputs, and 32 bus axis outputs.

►► H2M series PLC controller

■ Based on the H2 series PLC, motion control function is added.

■ Rich functions: chasing shear, flying shear, synchronization, following, motion superposition, virtual axis, custom cam, etc.

PLC

PLC series introduction

≫ Controller naming instructions

$$H \quad C \quad - \quad 4 \quad 0 \quad T \quad 4 \quad - \quad E \quad - \quad D$$
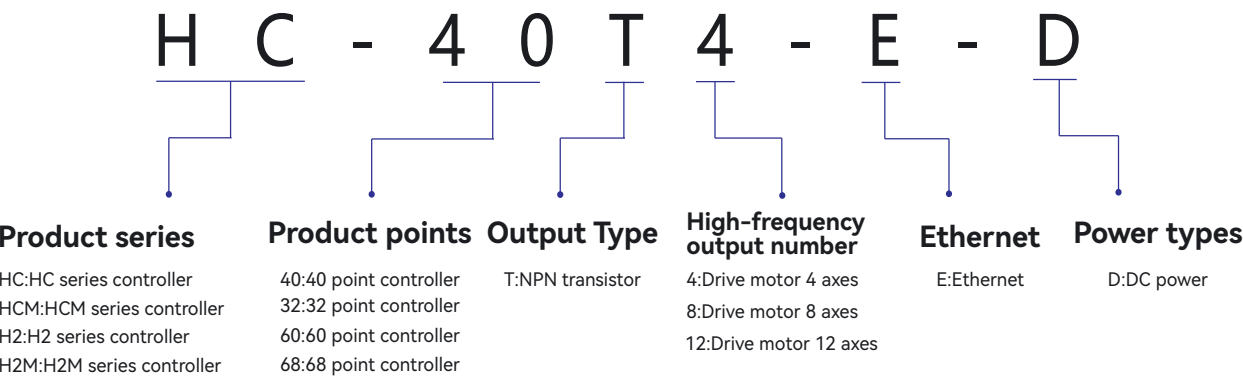
Product series	Product points	Output Type	High-frequency output number	Ethernet	Power types
HC:HC series controller	40:40 point controller	T:NPN transistor	4:Drive motor 4 axes	E:Ethernet	D:DC power
HCM:HCM series controller	32:32 point controller		8:Drive motor 8 axes		
H2:H2 series controller	60:60 point controller		12:Drive motor 12 axes		
H2M:H2M series controller	68:68 point controller				

≫ Expansion module naming instructions

$$H \quad E \quad - \quad 1 \quad 6 \quad T \quad - \quad S$$

Product series	Count	Types	Input types
HE:HE expansion module	8:8 Points	X:Pure input type	With S:input is NPN/PNP type
	16:16 Points	YT:Pure output NPN transistor type	Without S:Input is NPN type
	32:32 Points	YP:Pure output PNP transistor type	
		YR:Pure output relay type	
		T:With Input and Output (NPN) Type	
		P:With input and output (PNP) type	
		R:With input and output (relay) type	

PLC
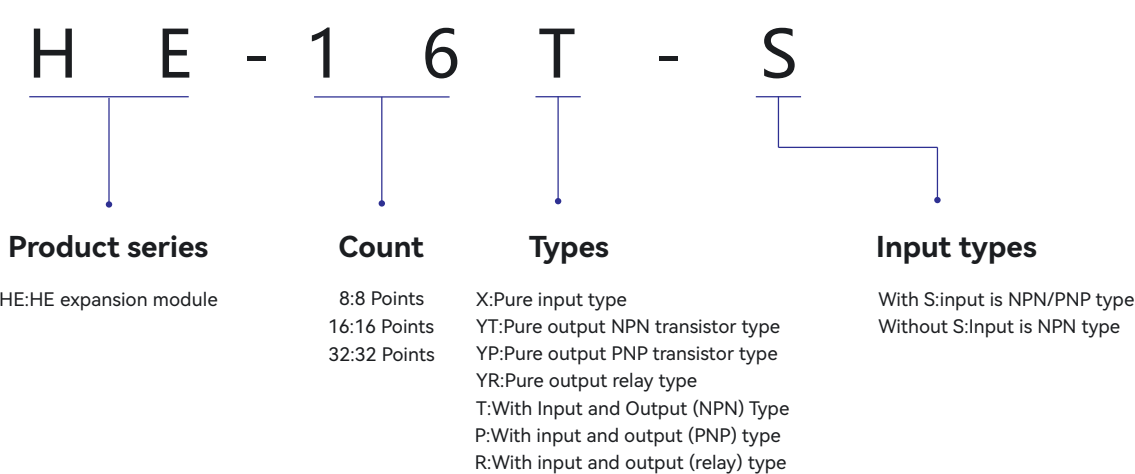
PLC Technical parameters

▶▶ HC non-bus type PLC model and technical parameters

Series model HC-	16T4-D	24T4-D	32T4[/8]-D	40T4[/8]-D	48T4[/12]-D	60T4[/12]-D
Output method	T: Transistor NPN output;					
Total points	16 Points	24 Points	32 Points	40 Points	48 Points	60 Points
Number of digital input points	8	14	16	24	24	36
Number of digital output points	8	10	16	16	24	24
High-speed input counter	3 way AB phase	3 way AB phases	4 way AB phases	4 way AB phases	4 way AB phases	4 way AB phases
High-speed input maximum	200kHz					
Right module	16					
Left module	Support for communication expansion					
BD board	Support 1				Support 2	
Serial communication port	RS232/RS485*2					
USB communication port	No		Programme download/firmware upgrade			
Ethernet port	No					
Number of pulse axes	4 axes		4/8 axes		4/12 axes	
Maximum frequency	200kHz					
Bus function	No					
Number of bus axes	No					
Programme volume	30k					
Perpetual calendar	Support					
Size（mm）	114*100*73		155*100*73		218*100*73	
Whether to support C language	Support					
Protection class	IP20					
Working environment temperature	5~55℃（41~131℉）frost-free					
Relative humidity	5~95%					
Ambient temperature for transport	-25~70℃（-13~158℉）					
Vibration Resistance	10M/S²					

Note: 1. The above is the technical parameters of PLC with network port, and other PLC models without network port have the same technical parameters.
      2. C language function, only HC-16T/R/P does not support, other models are supported

Input point electrical specifications

Series model HC-	16T、24T		32T、40T、48T、60T	
Input point	X0~X5	X6~	X0~X7	X10~
Input point type	Digital input			
Input form	DC (NPN type)			
Input current	5mA			
Input impedance	4.5KΩ			
Max frequency	200kHz	10kHz	200kHz	10kHz
Response time — Off→On	<2.5μs	<20μs	<2.5μs	<20μs
Response time — On→Off	<5μs	<50μs	<5μs	<50μs

Electrical specifications for output points

Series model HC-	16T、24T、32T、40T、48T、60T		32T8、40T8	48T12、60T12
Output point	Y0、Y2、Y4、Y6	Y1、Y3、Y5、Y7~Y17	Y0、Y2.3..Y16 (8 even output outlets)	Y0、Y2.3..Y26 (8 even output outlets))
Max frequency	200Khz	10Khz	200Khz	200Khz
Max load — Resistive	0.3A/1点(2.4A/COM)			
Max load — Inductive	15W			
Response time — Off→On	<2μs	<20μs	<2μs	<2μs
Response time — On→Off	<3μs	<30μs	<3μs	<3μs

PLC Technical parameters

» H2 EtherCAT bus PLC model and technical parameters

Series model HC-	16T8[/16]-D	24T8[16/32]-D	32T8[16/32]-E-D	40T8[16/32]-E-D	48T12[/32]-E-D	60T12[/32]-E-D
Output method	T: Transistor NPN output;					
Total points	16 points	24 points	32 points	40 points	48 points	60 points
Number of digital input points	8	14	16	24	24	36
Number of digital output points	8	10	16	16	24	24
High-speed input counter	3 way AB phase(X0~X5)		4 way AB phase(X0~X7)			
High-speed input maximum frequency	200kHz					
Right module	16					
Left module	Support for communication expansion					
BD board	Support 1				Support 2	
Serial communication port	RS232/RS485*2					
USB communication port	No		Programme download/firmware upgrade			
Ethernet port	No					
Number of pulse axes	4 axes	5 axes	8 axes			
Maximum frequency for high speed output	200kHz					
Bus function	EtherCAT bus					
Number of bus axes	8/16 axes		8/16/32 axes		12/32 axes	
Programme volume	60k					
Perpetual calendar	Support					
Size（mm）	114*100*73		155*100*73		218*100*73	
Whether to support C language	Support					
Protection class	IP20					
Working environment temperature	5~55℃（41~131℉）frost-free					
Relative humidity	5~95%					
Ambient temperature for transport	–25~70℃（–13~158℉）					
Vibration Resistance	10M/S^2					

Note: If the bus PLC model is H2-32T16-E-D, it means that the pulse and bus axes total 16 axes, and the number of axes can be customised by the PLC program.If the number of pulse axes is defined as 2 axes, the bus axes will be 14 axes.

Input point electrical specifications

Series model H2-	16~24		32~60	
Input point	X0~X5	X6~	X0~X7	X10~
Input point type	Digital input			
Input current	5mA			
Input impedance	4.5KΩ			
Max frequency	200kHz	10kHz	200kHz	10kHz
Response time — Off→On	<2.5μs	<20μs	<2.5μs	<20μs
Response time — On→Off	<5μs	<50μs	<5μs	<50μs

Electrical specifications for output points

Series model H2-	16T、24T、32T、40T、48T、60T	
Output point	Y0、Y2、Y4、Y6	Y1、Y3、Y5、Y7~Y17
Max frequency	200Khz	10Khz
Max load — Resistive	0.3A/1points(2.4A/COM)	
Max load — Inductive	15W	
Response time — Off→On	<2μs	<20μs
Response time — On→Off	<3μs	<30μs

PLC

PLC technical parameters

▶▶ HCM Non-Bus Motion Control PLC Model List

Series model HCM-	32T4-D	40T4-D	48T12-D	60T4[/12]-D
Output mode	T: Transistor NPN output;			
Total points	32 points	40 points	48 points	60 points
Number of digital input points	16	24	24	36
Number of digital output points	16	16	24	24
Ethernet port	No			
Number of pulse axes	4 axes	4 axes	12 axes	4/12 axes

Note: HCM is a pulse type PLC with electronic cam function, other functions are the same as those of the corresponding HC model, please refer to the previous section for the series description.

▶▶ H2M Bus Motion Control PLC Model List

Series model HCM-	16T8[16/32]-D	24T8[16/32]-D	32T8[16/32]-D	40T8[/32]-D	48T12[/32]-D	60T12[/32]-D
Output mode	T: : Transistor NPN output;					
Total points	16 points	24 points	32 points	40 points	48 points	60 points
Number of digital input	8	14	16	24	24	36
Number of digital output	8	10	16	16	24	24
Ethernet port	No	No	1			
Number of pulse axes	4 axes	5 axes	8 axes			
Number of bus axes	8/16/32 axes			8/32 axes	12/32 axes	

Note: H2M is a bus type PLC with electronic cam function, other functions are the same as those of the corresponding H2 model, please refer to the previous section for the series description.
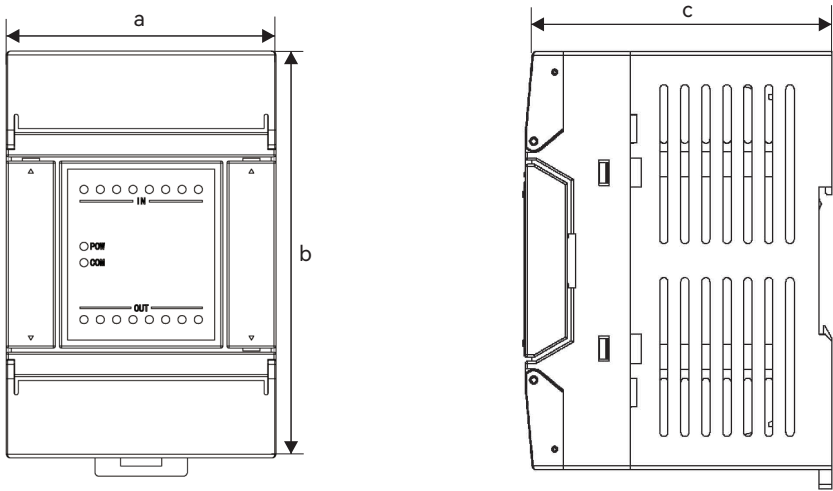
PLC sizes

▌ HC/H2/HCM/H2M series mainframe mounting dimensions
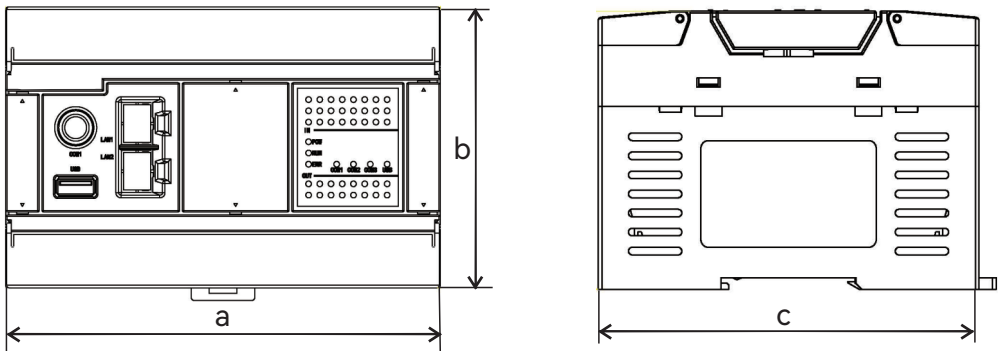
Controller	Size(mm)		
	a	b	c
14-24 points	114	100	73
32-40 points	155	100	73
48-60 points	218	100	73

▌ HE Series extended product dimensions

Expansion module	Size(mm)		
	a	b	c
Digital volume expansion: 8-16 points Analogue expansion: HE-4AI2AO、HE-4AO、HE-8AO、HE-8AI、HE-2L、HE-4L、HE-2TCY、HE-2TCY2、HE-4TCY、HE-4TCY2、HE-8PT、HE-4PT、HE-4PT2	66	100	73
Digital volume expansion: 24-32 points、HE-8AI4AOS2、HE-8AI8AOS2、HE-8PT2	114	100	73

PLC

HE-series - Standard Expansion

In order to meet the application needs of more occasions, the controller can be equipped with a variety of expansion modules. The expansion modules are mainly divided into digital input and output expansion modules, analog input and output expansion modules, temperature expansion modules, weighing expansion modules and other categories. Each type of module has a variety of points, which can flexibly configure the company's various I/O scales to achieve a higher cost performance.

Performance characteristics

■ Each input and output channel adopts photoelectric isolation, which has high reliability and strong anti-interference ability.

■ The power supply has reverse connection protection and surge absorption function, which can be applied to a variety of working environments.

■ The maximum number of digital I/O points is: 256DI/256DO.

■ One main unit can carry 16 expansion modules

HE Series Digital Expansion

Digital Input Expansion

Model	Function	Specification
HE-8X	8 channel digital NPN input	DC24V power supply, no external power supply needed Maximum frequency of input points 10Khz
HE-8X-S	8 channel digital NPN input /PNP input	
HE-16X	16 channel digital NPN input	
HE-16X-S	16 channel digital NPN input /PNP input	
HE-16X2	16 channel digital NPN input ,1 way RS485 communication	

Digital Output Expansion

Model	Function	Specification
HE-8YT	8 channel transistor NPN output	DC24V power supply, no external power supply required R: relay output T: NPN transistor output P: PNP transistor output R response time: about 10ms T/P response time: about 50μs R maximum output current: maximum 2A T/P maximum output current: 0.3A per point
HE-16YT	16 channel transistor NPN output	
HE-8YR	8 channel relay output	
HE-16YR	16 channel relay output	
HE-32YT	32 channel transistor NPN output	
HE-32YR	32 channel relay output	

Digital Input/Output Expansion

Model	Function	Specification
HE-8T	4 channel digital input, 4 channel transistor output	DC24V power supply, no external power supply required R: relay output T: NPN transistor output P: PNP transistor output R response time: about 10ms T/P response time: about 50μs R maximum output current: maximum 2A T/P maximum output current: 0.3A per point
HE-8T(/P)-S	4 channel digital input, 4 channel transistor output	
HE-16T	8 channel digital input, 8 channel transistor output	
HE-16T2	8 channel digital input, 8 channel transistor output, 1 RS485 communication	
HE-16T(/P)-S	8 channel digital input, 8 channel transistor output	
HE-16R	8 channel digital input, 8 channel relay output	
HE-16R-S	8 channel digital input, 8 channel relay output	
HE-32T	16 channel digital input, 16 channel transistor output	
HE-32T(/P)-S	16 channel digital input, 16 channel transistor output	
HE-32R	16 channel digital input, 16 channel relay output	
HE-32R-S	16 channel digital input, 16 channel relay output	
HE-40T	24 channel digital input, 16 channel transistor output	
HE-40T(/P)-S	24 channel digital input, 16 channel transistor output	

HE series HBD board

Model	Function	Specification
HBD-1AI 1AOS	1 channel analog input, 1 channel analog output	Voltage range:0V~10V; Current range:0-20mA
HBD-2AI	2 channel analog input	
HBD-2AOS	2 channel analog output	
HBD-2RS485	2 channel RS485	With Isolation
HBD-2TC	2 temperature acquisition inputs	2-way K-type thermocouple temperature acquisition input
HBD-CAN	1 CAN bus	With 16 slave stations: such as servo, stepper, valve island, etc.

PLC

HE series - Standard expansion

HE series analog expansion

Performance feature

■ High reliability and anti-interference capability.

■ Power supply with reverse connection protection, surge absorption function,
can be applied to a variety of working environments

Analogue input expansion

Model	Function	Specification
HE-4AI	4 channel analog input	Voltage range: 0V~10V Current range: 0~20mA Resolution: 12bit
HE-4AI2	4 channel analog input，1 RS485 communication	
HE-8AI	8 channel analog input	
HE-8AI2	8 channel analog input，1 RS485 communication	

Analogue output expansion

Model	Function	Specification
HE-4AO	4 channel analog input	Voltage range: -10V~10V Current range: 0~20mA; 4~20mA Resolution: 12bit
HE-8AO	8 channel analog input	

Analogue input/output expansion

| Model	Function	Specification
HE-4AI2AO	4 channel analog input，2 channel analog input	Voltage range: (input: 0V~5V, 0V~10V)(output: -10V~10V) Current range: (input/output: 0~20mA; 4~20mA) Resolution: 12bit
HE-4AI2AO2	4 channel analog input，2 channel analog input，1 RS485 communication	
HE-8AI4AO2	8 channel analog input，4 channel analog input，1 RS485 communication	Voltage range: (input/output: 0V~10V) Current range: (input/output: 0~20mA; 4~20mA) Resolution: 12bit
HE-8AI8AO2	8 channel analog input，8 channel analog input，1 RS485 communication	

Temperature expansion

Model	Function	Specification
HE-2TCY	2 channel temperature input，2 channel transistor NPN output	Supports K-type thermocouple, measuring range 0~900℃, accuracy 1℃
HE-2TCY2	2 channel temperature input，2 channel transistor NPN output，with RS485	
HE-4TCY	4 channel temperature input，4 channel transistor NPN output	
HE-4TCY2	4 channel temperature input，4 channel transistor NPN output，with RS485	
HE-8TC	8 channel temperature input	
HE-8TCY	8 channel temperature input，8 channel transistor NPN output	
HE-8TCY2	8 channel temperature input，8 channel transistor NPN output，withRS485	
HE-4PT	4 channel temperature input	Supports PT100 thermocouple, measurement range -50~300℃, accuracy 1℃
HE-4PT2	4 channel temperature input，with RS485	
HE-8PT	8 channel temperature input	
HE-8PT2	8 channel temperature input，with RS485	

Weight expansion

Model	Function	Specification
HE-2L	2 channels weighing input	DC24V power supply, no external power supply required Resolution 24 bits, accuracy ±1%
HE-4L	4 channels weighing input	

PLC

Application
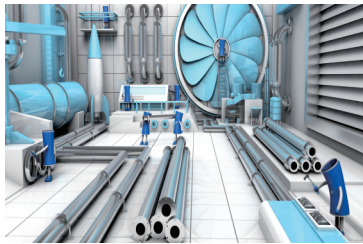
Electronic cam

Pillow Packaging

Data acquisition

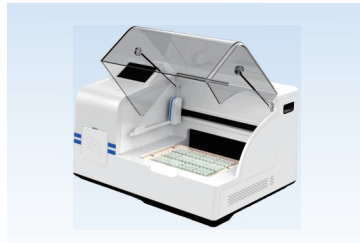**Automatic dispensing**

Control cabinet system

Automatic sewing

Automatic printing

Medical Devices

Automatic weaving

Case show

Pillow packaging machine

It can realize fixed length, variable length, labeling, anti-cutting, anti-empty packaging, anti-scalding film and other functions. The fastest production capacity is 1200 .bags/min.

Automatic tea packaging machine

Simultaneous packaging of inner and outer bags. Automatically complete bag making, measuring, filling, sealing, slitting, counting and other processes. Packaging speed 18-20 bags/minute.Weighing accuracy can reach ±0.1g.

Steel bar adjustment machine
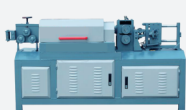
Automatically calculates the distance of the flight, the fastest speed of automatic calculation of the line, and the product speed can reach 100m/min. The cut length is within 40 cm, and the system is fast.

Visual dispensing machine
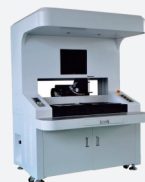
Communication instruction and PC model introduction method, high performance inset type movement control equipment core, integrated industrial droplet plastic processing process control function. Introducing multiple types of calculations, route path calculations, and supporting multiple sentence case forms.

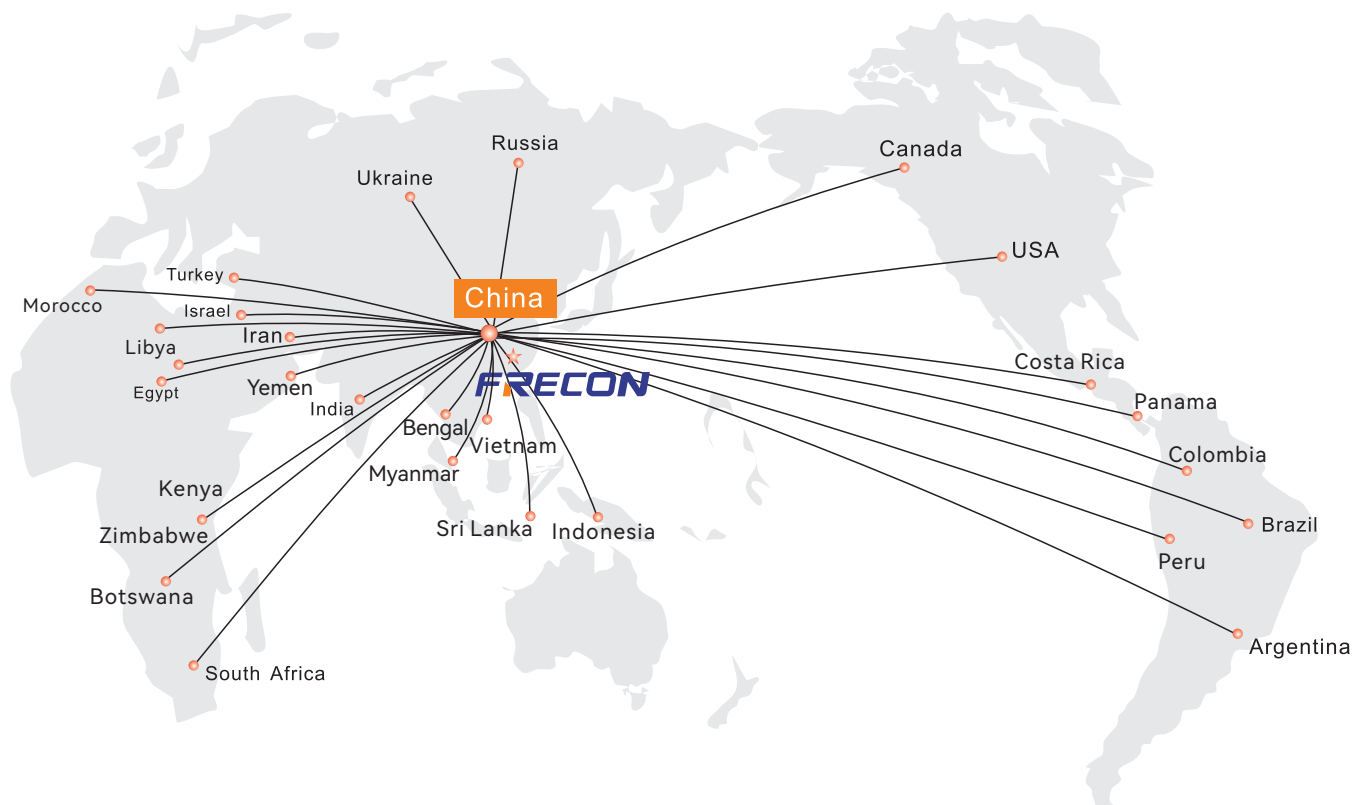### Fully automatic granule packaging machine

Actually, 4 scales, 8 scales, and 12 scales are constructed in a symmetrical heavy system. Automatic bag completion system, counting, filling, sealing, dividing, counting, etc. functions. Weight accuracy is ±0.1g.

Bag-type vacuum packaging machine

Really high-speed shipping, packaging, and packaging speed of 100 packages/min. Liquid packaging, lozenge packaging, granular packaging, and powder packaging.

PLC

FRECON

World map showing China connected to: Russia, Ukraine, Canada, USA, Turkey, Morocco, Israel, Iran, Libya, Yemen, Egypt, India, Bengal, Vietnam, Costa Rica, Panama, Colombia, Kenya, Myanmar, Brazil, Zimbabwe, Sri Lanka, Indonesia, Peru, Botswana, South Africa, Argentina

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