

⚠ 1. 安全注意事项 (Safety precautions)

本说明书涉及产品均为开放式外壳设计。要求用户使用产品时，务必将产品安装于具有防尘、防潮以及免于电击 / 冲击等意外的控制柜内，并且需要设置保护措施以防止非维护人员不当操作或意外导致设备故障或损坏，造成不可避免的人员危险和财产损失。

The products involved are all open-type housing designs. Therefore, they should be installed in a control cabinet that is free of airborne dust, humidity, electric shock, and vibration. The cabinet should prevent non-maintenance staff from operating the products or accidents from happening in case danger and damage may occur on the products.

更详细的信息请参考 M 系列硬件手册。
Please refer to the M series hardware operation manual for more detailed information.

⚠ Battery	M300/M500S 系列 CPU 内置 CR-2032L/BN 的电池，更换的电池仅可从禾川购买。 The M300/M500S series CPU is equipped with a built-in CR-2032L/BN battery, and the replacement battery can only be purchased from HCFA. Le CPU de la série M300/M500S est équipé d'une batterie CR-2032L/BN intégrée, et la batterie de remplacement ne peut être achetée qu'auprès de HCFA.
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2. 通用电气及环境规格 (General electrical and environmental specifications)

2.1 通用电气规格 (General electrical specifications)

型号 (Model)	额定功率: W	Rated power: W	额定电压	Rated voltage
HCM301-16MT4-D	5	5	DC24V, 电压范围: DC20.4~28.8V	DC24V, voltage range: DC20.4~28.8V
HCM302-16MT4-D	5	5		
HCM310-16MT4-D	5	5		
HCM311-16MT4-D	5	5		
HCM501S-16MT4-D	5	5		

* 注: 所有型号均为安全特低电压输入产品。

*Note: All models are featured by the SELV input type.

2.2 环境规格 (Environmental specifications)

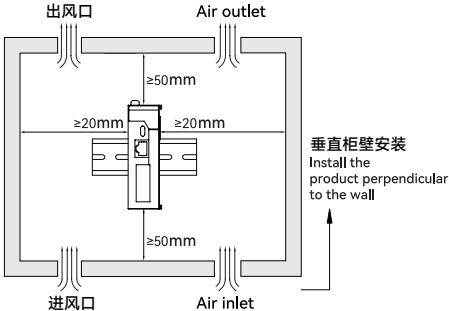
项目	Item	规格	Specifications
海拔高度	Altitude	≤2000m	≤2000m
使用环境	Operating environment	控制柜内安装，开放式及室内使用	Installation within a control cabinet, open-type and indoor use
工作温度	Operating temperature	0~55°C	-0~55°C
储存温度	Storage temperature	-25~70°C	-25~70°C
环境湿度	Ambient humidity	10~95%RH (无结露)	10~95%RH (non-condensation)
振动耐受	Vibration resistance	5~150Hz (X/Y/Z方向, 1g/3.5mm位移)	5~150Hz (X/Y/Z direction, 1g /3.5mm displacement)
污染等级	Pollution degree	污染度II	Level 2
冷却方式	Cooling method	自然冷却	Natural air cooling
防护等级	IP rating	IP20	IP20
外壳材质	Enclosure material	阻燃材料	Self-extinguishable

* 注: 如果以制造商未规定的方式使用设备，可能会损坏设备。

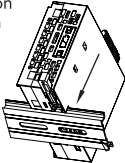
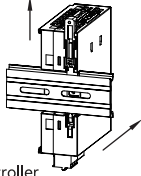
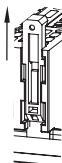
*NOTE: If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

3. 安装说明 (Installation instructions)

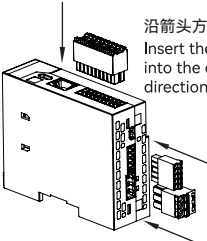
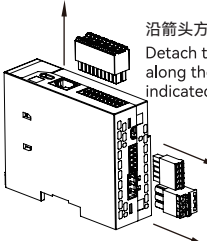
3.1 控制柜安装 (Installation within a control cabinet)

CN	设备冷却方式为自然冷却或通过加装风扇进行冷却，请保证安装方向与柜壁垂直； 请参考右侧示意图，在设备的周围留有足够的空间。并排安装时，建议横向两侧预留 20mm 以上间距。	
EN	Please install the product perpendicular to the wall and ensure a sufficient cooling effect via natural air or a cooling fan. Please leave enough clearance around the product as shown in the right figure. During a side-by-side installation, please leave a horizontal clearance of more than 20 mm on both sides.	

3.2 导轨拆装 (DIN rail mounting and dismounting)

CN	安装控制器时，将控制器后方双向联动卡扣上部紧扣在 DIN 导轨上，并用力按压控制器下部，听到“咔哒”声，控制器即成功安装于 DIN 导轨上（安装前应保证双向联动卡扣处于紧锁状态，否则可能导致安装故障）；拆卸控制器时，将双向联动卡扣向上拉动一定距离，听到“咔哒”声后，取下控制器即可。	将双向联动卡扣上部紧扣在DIN导轨上，并向导轨侧按压控制器 Position the upper part of the mounting Latch on the DIN rail, and then press the controller towards the DIN rail 	①向上拉动双向联动卡扣 Pull up to unlock the DIN rail mounting latch 	紧锁状态 (Locked) 	释放状态 (Unlocked) 
EN	Before installation, check that the DIN rail mounting latch is in a locked state. During mounting, position the upper part of the mounting latch of the module on the DIN rail, and then press the controller against the DIN rail until a clear click is heard (which indicates the latch is momentarily opened and locked onto the rail). During dismounting, pull the latch upwards until a clear click is heard (which indicates the latch is unlocked), and then directly remove the controller.				

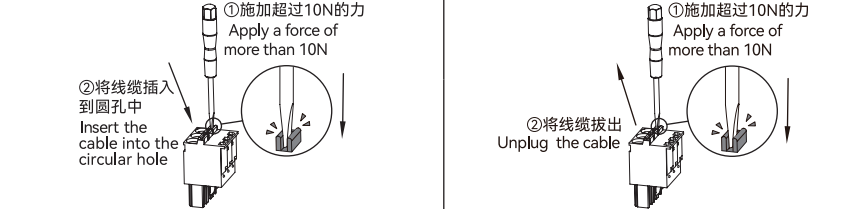
3.3 可拆卸端子拆装 (Removable terminal block mounting and dismounting)

CN	可拆卸端子拆装如右图所示。	沿箭头方向插入端子 Insert the terminal block into the device along the direction indicated by the arrow 	沿箭头方向拔出端子 Detach the terminal block along the direction indicated by the arrow 
EN	The mounting and dismounting of the removable terminal block are shown in the figures on the right side.		

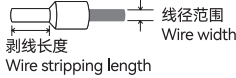
3.4 线缆拆装 (Cable connecting and disconnecting)

CN 安装线缆时, 将赠送的一字螺丝刀垂直插入可拆卸端子压块内, 施加超过 10N 的力, 此时圆孔打开, 将准备好的线缆插入到圆孔中, 拔出一字螺丝刀, 轻拽线缆, 线缆不松动即成功完成配线, 反之即可取出线缆。端子规格及配线示意图如右图所示。

EN During connecting, insert the flat-blade screwdriver into the unlocking tab with a force of more than 10 N. Then insert a cable into the circular hole. Gently tug the cable after pulling out the screwdriver. If the cable is secured firmly, then the connection is finished. The reverse is the procedure for unplugging the cable. The terminal specifications and wiring diagram are shown in the right figure.



控制器端子 (Terminal)	线径范围: AWG (Wire width)	剥线长度: mm (Wire stripping length)	按压力: N (Pressure)	拔线力: N (Wire pulling force)
20Pin IO端子 (20Pin IO terminal)	24~16	9~10	25	40
5Pin 串行通讯端子 (5Pin serial communication terminal)	24~16	8~10	16	40
DC24V 电源端子 (DC24V power supply terminal)	26~12	10~11	25	60

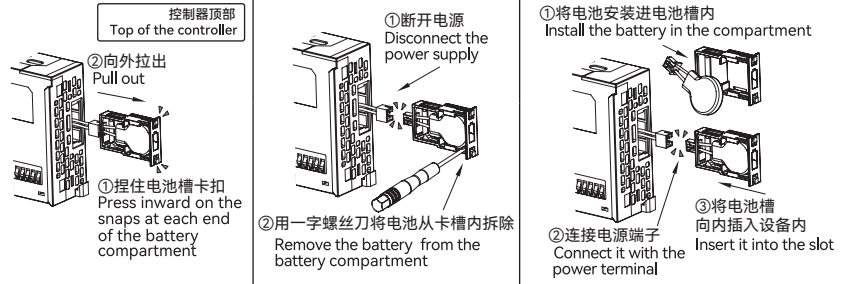


警告: 仅使用铜导线。
Warning: Use copper conductors only.
Attention: Utilisez uniquement des conducteurs en cuivre.

3.5 电池拆装 (Battery mounting and dismounting)

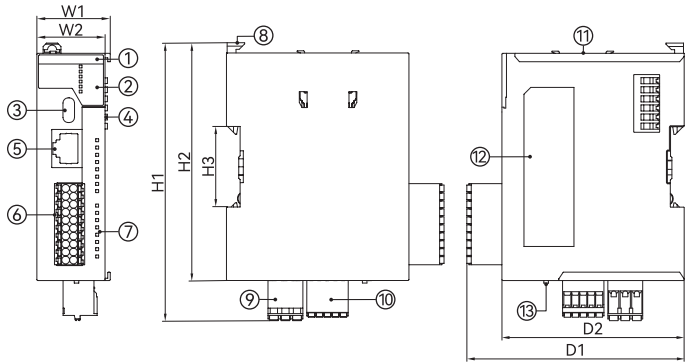
CN 拆卸电池时, 捏住电池槽上下卡扣向外拉出电池槽, 再将电池槽的电源断开, 最后用一字螺丝刀将电池从卡槽内拆除即可; 安装电池时, 先将电池安装进电池槽内, 再将电源端子公母端连接上, 最后将电池槽向内插入控制器内。

EN During dismounting, press inwards on the snaps of the battery and pull out the battery compartment. After disconnecting the power supply, remove the battery from the compartment with a flat-blade screwdriver. During mounting, install the battery into the compartment first, and then connect the compartment with the power terminal. Finally, insert the compartment into the slot of the controller.



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

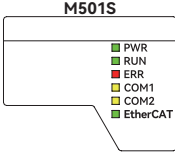
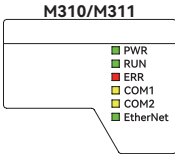
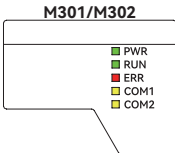
序号(No.)	项目	Item
1	产品型号	Product model
2	系统状态指示灯	System status indicator
3	Type-C 接口	Type-C interface
4	扩展模块通讯接口	Expansion terminal communication interface
5	M301/M302/ M310/M311 M501S EtherNet	RJ45 interface M301/M302/ M310/M311 M501S EtherCAT
6	20Pin IO 端子	20Pin IO terminal
7	通道状态指示灯	Channel status indicator
8	双向联动卡扣	DIN rail mounting latch
9	DC24V 电源端子	DC24V power supply terminal
10	5Pin 串行通讯端子	5Pin serial communication terminal
11	RTC 电池槽	RTC battery compartment
12	标签	Label
13	RUN/STOP 开关	RUN/STOP DIP switch



型号 (Model)	外形尺寸 (Dimension) :mm							重量 (Weight) :g
	W1	W2	H1	H2	H3	D1	D2	
HCM301-16MT4-D	32.30	30.00	122.15	104.50	35.40	95.64	80.20	56 approx.
HCM302-16MT4-D								
HCM310-16MT4-D								
HCM311-16MT4-D								
HCM501S-16MT4-D								

5. 指示灯说明 (Indicator description)

丝印 (Screen printing)	指示灯含义 (Indicator meaning)	颜色 (Color)	状态	Status	说明	Description
PWR	电源 (Power)	绿色 (Green)		熄灭 Not lit	电源未接通	Power off
				常亮 Lit	电源接通	Power on
RUN	运行 (Run)	绿色 (Green)		熄灭 Not lit	停止状态	Stop
				常亮 Lit	正常运行	Run
ERR	系统故障 (System error)	红色 (Red)		熄灭 Not lit	无故障发生	No error
				常亮 Lit	发生故障	Error
COM1	RS232通讯 (RS232 communication)	黄色 (Yellow)		熄灭 Not lit	未发送数据	No data is being sent to other devices
				闪烁 Blinking	正在发送数据给其他设备	Data is being sent to other devices
COM2	RS485通讯 (RS485 communication)	黄色 (Yellow)		熄灭 Not lit	未发送数据	No data is being sent to other devices
				闪烁 Blinking	正在发送数据给其他设备	Data is being sent to other devices
M310/M311						
EtherNet	通讯 (Communication)	绿色 (Green)		熄灭 Not lit	未建立物理连接	No physical connection
				闪烁 Blinking	建立物理连接且有通讯数据	Physical connection with communication data
				常亮 Lit	建立物理连接但无通讯数据	Physical connection without communication data



M501S						
EtherCAT	通讯 (Communication)	绿色 (Green)		熄灭 Not lit	未建立物理连接	No physical connection
				闪烁 Blinking	建立物理连接且有通讯数据	Physical connection with communication data
				常亮 Lit	建立物理连接但无通讯数据	Physical connection without communication data
丝印 (Screen printing)	指示灯含义 (Indicator meaning)	颜色 (Color)	状态	Status	说明	Description
IN N(0~7)	输入 (Input)	绿色 (Green)		熄灭 Not lit	输入通道 N 未检测到输入信号	The input channel N has not detected input signals
				常亮 Lit	输入通道 N 检测到输入信号	The input channel N has detected input signals
OUT N(0~7)	输出 (Output)	绿色 (Green)		熄灭 Not lit	输出通道 N 无输出信号	There is no output signal for this channel
				常亮 Lit	输出通道 N 有信号输出	There are output signals in this channel

IN
0
1
2
3
4
5
6
7
OUT
0
1
2
3
4
5
6
7

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

端口说明 (Terminal description)	IN	OUT	类型(Type)	通用IO接线(General IO wiring)	高速IO接线(High speed IO wiring)
IN OUT 0 0 1 1 2 2 3 3 4 4 5 5 6 6 7 7 S0 24V S0 COM	I0	Q0	漏型输入 NPN Input		
	I1	Q1			
	I2	Q2			
	I3	Q3	源型输入 PNP Input		
	I4	Q4			
	I5	Q5			
	I6	Q6	漏型输出 NPN Output		
	I7	Q7			
	S0	24V			
	S0	COM			

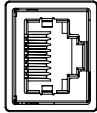
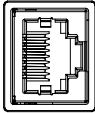
* 注 1: 外部负载电流较小时, 建议在输出点和 24V 之间接入约 500Ω 的电阻。
*Note 1: Connect a resistor of about 500 Ω between the output terminal and the 24V terminal when the external load current is small.

端子配置 (I/O configuration)											
输入端子名称 (General input name)		I0	I1	I2	I3	I4	I5	I6	I7	S0 ^{*2}	S0 ^{*2}
M301/ M302/ M310/M311/M501S高速输入通道 (High-speed input channels)		通道1 (Channel1)		通道2 (Channel2)		-					
高速输入定义 (High-speed input definition)	脉冲+方向 (Pulse + Direction)	脉冲 (Pulse)	方向 (Direction)	脉冲 (Pulse)	方向 (Direction)	-					
	AB相(AB Phase)	A	B	A	B	-					
	单脉冲 (Single pulse)	脉冲 (Pulse)	-	脉冲 (Pulse)	-	-					
输出端子名称 (General output name)		Q0	Q1	Q2	Q3	Q4	Q5	Q6	Q7	24V	COM
M301/ M302/ M310/M311/M501S高速输出通道 (High-speed output channels)		通道1 (Channel1)		通道2 (Channel2)		通道3 (Channel3)		通道4 (Channel4)		DC24V	公共端 (Common terminal)
高速输出定义 (high-speed output definition)	脉冲+方向 (Pulse + Direction)	脉冲 (Pulse)	方向 (Direction)	脉冲 (Pulse)	方向 (Direction)	脉冲 (Pulse)	方向 (Direction)	脉冲 (Pulse)	方向 (Direction)		

* 注 2: 输入公共端 S0 内部导通。
*Note 2: Input terminal S0 is internally conductive.

5Pin串行通讯端子说明 (5Pin serial communication terminal description)			RS232接线 (RS232 Wiring)		RS485接线 (RS485 Wiring)	
COM1 RS232 数据发送 COM1 RS232 data sending	Tx					
COM1 RS232 数据接收 COM1 RS232 data receiving	Rx					
信号参考地 Signal reference ground	SG					
COM2 RS485通讯信号 + COM2 RS485 communication signal +	D+					
COM2 RS485通讯信号 - COM2 RS485 communication signal -	D-					

DC24V电源端子说明 (DC24V power supply terminal description)		接线 (Wiring)	
24V			
0V			

RJ45 接口说明 (RJ45 interface description)					
型号 (Model)	接口说明 (Interface description)		型号 (Model)	接口说明 (Interface description)	
HCM501S-16MT4-D	EtherCAT	EtherCAT	HCM310-16MT4-D HCM311-16MT4-D	EtherNet ^{*3}	EtherNet

* 注 3: EtherNet 通讯网口可用于以太网通信, 支持 Modbus TCP、自定义通讯协议。默认 IP:192.168.1.8。

*Note3: EtherNet communication port supports EtherNet communication, Modbus TCP, customized communication protocols, and default IP :192.168.1.8.