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CN 安装说明
EN Instruction Sheet

1. 安全注意事项 (Safety precautions)

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

The products in this manual are industrial products and are all open-type housing designs. It is essential to install these products within a control cabinet that is safeguarded against dust, moisture, and accidents such as electric shocks or physical impacts. Additionally, protective measures must be taken to prevent malfunctions or damage caused by improper operation or accidents involving non-maintenance personnel. Failure to do so may lead to serious risks to personnel safety and potential loss of property.

更详细的信息请参考 MX 系列温度测量模块硬件手册。

Please refer to the MX series temperature measurement module hardware manual for more detailed information.

2. 命名规则 (Model identification)

HC MX - TC 04 □ - D - XXXX
1 2 3 4 5 6 7

1	产品名称 (Product name)
HC	禾川 (Hechuan Technology)
2	产品系列 (Product series)
MX	M系列通用扩展 (M-series general-purpose expansion)
3	功能模块 (Function module)
TC	温度测量 (热电偶) (Temperature measurement (Thermocouple))
PT	温度测量 (热电阻) (Temperature measurement (Resistance Temperature Detector))

4	通道数量 (Number of channels)
04	4通道 (4 channels)
5	端子类型 (Terminal type)
空 (N/A)	标准端子 (Standard terminal)

6	电源类型 (Power supply type)
D	直流电源 (DC power supply)
7	软件/固件定制代码 (Customized software/firmware Code)
X	0~9/A~Z/空 (N/A)

3. 适用型号 (Applicable model)

名称 (Name)	型号 (Model)*	模块简要说明	Brief description
温度测量模块 Temperature measurement module	HCMX-TC04-D	4通道温度测量模块，支持K、B、R、N、J、T、E、S等多种热电偶传感器	4-channel temperature measurement module, supporting a variety of thermocouple sensors, including K, J, E, T, N, B, R, and S
	HCMX-PT04-D	4通道温度测量模块，支持Pt100、Pt500、Pt1000、Cu100、KTY84、NTC5K_B:2000、NTC5K_B:3950、NTC5K_B:6000、NTC10K_B:2000、NTC10K_B:3950、和NTC10K_B:6000等多种热电阻传感器	4-channel temperature measurement module, supporting a variety of resistance temperature detector sensors, including Pt100, Pt500, Pt1000, Cu100, KTY84, NTC5K_B:2000, NTC5K_B:3950, NTC5K_B:6000, NTC10K_B:2000, NTC10K_B:3950, and NTC10K_B:6000

* 注：仅能在由有限功率电源 (LPS) 提供的安全特低电压 (SELV) 下运行。

*Note: Only operate under the safety extra low voltage (SELV) provided by a limited power source (LPS).

4. 通用电气及环境规格 (General electrical and environmental specifications)

4.1 通用电气规格 (General electrical specifications)

项目 (Item)	规格 (Specifications)	
	HCMX-TC04-D	HCMX-PT04-D
电压 (Voltage)	DC24V (DC20.4~28.8V)	
功率 (Power)*	1W	
输入类型 (Input type)	热电偶 (Thermocouple)	热电阻 (2线/3线) (Resistance Temperature Detector (RTD) (2-wire/3-wire))
传感器类型及测量范围 (Sensor type & Measurement range)	K:-270.0°C ~ 1370.0°C , -454.0°F~2498.0°F B:200.0°C ~ 1800.0°C , 392.0°F ~ 3272.0°F R:-50.0°C ~ 1765.0°C , -58.0°F~3209.0°F N:-200.0°C ~ 1300.0°C , -328.0°F ~ 2372.0°F J:-210.0°C ~ 1200.0°C , -346.0°F~2192.0°F T:-270.0°C ~ 400.0°C , -454.0°F~752.0°F E:-270.0°C ~ 1000.0°C , -454.0°F ~ 1832.0°F S:-50.0°C ~ 1765.0°C , -58.0°F~3209.0°F	Pt100: -200.0°C ~ 850.0°C , -328.0°F ~ 1562.0°F Pt500: -200.0°C ~ 850.0°C , -328.0°F ~ 1562.0°F Pt1000: -200.0°C ~ 850.0°C , -328.0°F ~ 1562.0°F Cu100: -50.0°C ~ 150.0°C , -58.0°F ~ 302.0°F KTY84: 0.0°C ~ 200.0°C , 32.0°F ~ 392.0°F NTC5K_B:2000: -30.0°C ~ 200.0°C , -22.0°F ~ 392.0°F NTC5K_B:3950: -15.0°C ~ 100.0°C , 5.0°F ~ 212.0°F NTC5K_B:6000: 0.0°C ~ 100.0°C , 32.0°F ~ 212.0°F NTC10K_B:2000: -25.0°C ~ 200.0°C , -13.0°F ~ 392.0°F NTC10K_B:3950: 0.0°C ~ 150.0°C , 32.0°F ~ 302.0°F NTC10K_B:6000: 6.0°C ~ 100.0°C , 42.8°F ~ 212.0°F
温度单位 (Temperature unit)	摄氏°C/华氏°F (°C/°F (Celsius/Fahrenheit))	
补偿方式 (Compensation method)	内部冷端补偿 (Internal cold junction compensation)	
转换时间 (Conversion time)	120ms/通道 (120ms/channel)	90ms/通道 (90ms/channel)
精度 (25°C) (Accuracy (25°C))	±0.1% (全量程) +冷端补偿误差 (±0.1% (full scale) + cold junction compensation error)	±0.1% (全量程) (±0.1% (full scale))
精度 (0~55°C) (Accuracy (0~55°C))	±0.3% (全量程) +冷端补偿误差 (±0.3% (full scale) + cold junction compensation error)	±0.3% (全量程) (±0.3% (full scale))
分辨率 (Resolution)	24bit	
灵敏度 (Sensitivity)	0.1°C / 0.1°F	
通道开启与关闭 (Channel on/off)	支持 (Supported)	
滤波功能 (Filtering function)	均值滤波 (mean filter)	
输入断线检测 (Input open circuit detection)	支持 (Supported)	
超限检查 (Overlimit check)	支持 (Supported)	
隔离方式 (Isolation method)	I/O端子与电源之间隔离，通道之间不隔离 (I/O terminals isolated from power supply; no isolation between channels)	

* 注：此处标识的额定功率为满负载运行时的最大功率。

*Note: The power rating indicated here is the maximum power under full-load operation.

4.2 环境规格 (Environmental requirements)

项目	Item	规格	Specifications
海拔高度	Altitude	≤2000m	≤2000m
使用环境	Operating environment	控制柜内安装，开放式及室内使用	Installation within a control cabinet, open-type and indoor use
工作温度	Operating temperature	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-condensing)
振动耐受	Vibration resistance	5~150Hz (X/Y/Z方向, 1g/3.5mm位移)	5~150Hz (X/Y/Z direction, 1g /3.5mm displacement)
污染等级	Pollution degree	污染度2	Level 2

冷却方式	Cooling method	自然冷却	Natural air cooling
防护等级	IP rating	IP20	IP20
外壳材质	Enclosure material	阻燃材料	Self-extinguishable

* 注：若设备未依制造商指定方式使用，设备所提供的保护可能会被减弱。
*Note: If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

5. 安装说明 (Installation instructions)

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

CN

设备冷却方式为自然冷却，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. Please leave enough clearance around the product as shown in the right figure. During a side-by-side installation, please leave a horizontal clearance of more than 20 mm on both sides.

5.2 导轨拆装 (DIN rail mounting and dismounting)

CN

安装模块时，将模块侧面导轨对准左侧模块的导槽后，沿导槽向内摺压，听到“咔哒”声，模块成功安装于 DIN 导轨上（安装前保证双向联动卡扣处于紧锁状态，否则可能导致安装故障）；拆卸模块时，将卡扣向上拉动一定距离，听到“咔哒”声后，取下模块即可。

EN

Before installation, check that the DIN rail mounting latch is in a locked state. During mounting, align the groove of the module to that of the module on the left side to engage them together, and then press the module inwards until a clear click is heard (which indicates the latch is momentarily opened and locked onto the rail). During dismounting, pull the latch upwards until a clear click is heard (which indicates the latch is unlocked), and then directly remove the module.

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

CN

安装可拆卸端子时，将端子底部对准模块底部凹槽并紧扣，上部对齐模块，当听到“咔哒”声即完成了端子的组装；拆卸端子时，向下按压端子顶部卡扣，使其脱离模块本体并以底部卡扣呈圆弧状斜向下施力，将端子取下。

EN

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

5.4 线缆拆装 (Cable connecting and disconnecting)

CN

安装线缆时，将一字螺丝刀垂直插入可拆卸端子压块内，施加超过 30N 的力，将准备好的线缆插入到圆孔中，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 30N. Then insert a cable into the circular hole. Gently tug the cable after pulling out the screwdriver. If the cable is secured firmly, then the connection is finished. The reverse is the procedure for unplugging the cable. The terminal specifications and wiring diagram are shown in the right figure.

模块端子 (Terminal)	线径范围: AWG (Wire width)	剥线长度: mm (Wire stripping length)	按压力: N (Pressure)	剥线长度 Wire stripping length
18Pin IO端子 (18Pin IO terminal)	24~18	8~10	30	线径范围 Wire width

警告：只能使用 75℃铜导线。
Warning: Use only a copper conductor that is 75° C.
Attention: Utilisez uniquement un conducteur en cuivre à 75° C.

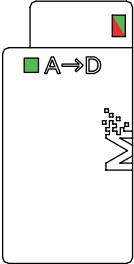
6. 接口和尺寸说明 (Interface and dimension description)

序号(No.)	名称	Name	功能	Function
1	产品型号	Product model	模块型号	Module model numbers
2	模块状态指示灯	Module status indicator	显示模块与通道状态	Display module and channel status
3	18Pin IO端子	18Pin IO terminal	输入信号接口	Input signal interface
4	双向联动卡扣	DIN rail mounting latch	固定模块在DIN导轨上	Mount the module onto a DIN rail
5	扩展模块通讯接口	Expansion module communication interface	主机和IO模块或IO模块间通讯及供电接口，不支持热插拔	The interface for the communication and power supply between the host and the IO module or between IO modules, does not support hot-swapping
6	集线结构	Cable collector	收纳IO线缆	Organize IO cables
7	标签	Label	显示模块型号、规格参数、内部序列号等基本信息	Display the basic information including module model, specification parameters, and internal serial number
8	侧边丝印	Side silk screen printing	模块端子说明	Module terminal description

型号 (Model)	外形尺寸 (Dimension) : mm							重量 (Weight) : g
	W1	W2	H1	H2	H3	D1	D2	
HCMX-TC04-D	15.20	13.00	106.00	100.00	35.40	81.90	74.50	70 approx.
HCMX-PT04-D								

7. 指示灯说明 (Indicator description)

指示灯含义 (Indicator meaning)	颜色 (Color)	状态	Status	说明	Description		
模块状态 (Module status)	绿色 (Green)		熄灭	Not lit	未供电 / 损坏	Not powered on / Damaged	
			闪烁	Blinking	初始化 / 停止状态	Initialization / Stop	
			常亮	Lit	运行状态	Run	
	红色 (Red)		熄灭	Not lit	无错误	No error	
			闪烁	Blinking	模块外部电源异常	The external power supply of the module is abnormal	
			常亮	Lit	模块发生错误	The module has errors	
丝印 (Screen printing)	指示灯含义 (Indicator meaning)	颜色 (Color)	状态	Status	说明	Description	
A → D	模数转换 (Analog-to-Digital Conversion (ADC))	绿色 (Green)		熄灭	Not lit	模块有错误 / 配置异常 / 未供电	The module has errors / Configuration abnormalities / unpowered
				常亮	Lit	配置正常, 数据正在转换	Configuration normal, data conversion in progress



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

HCMX-TC04-D端子说明 (Terminal description)					接线 (Wiring)
0		10	L1+	L2+	屏蔽层*2 Shield*2 热电偶*1 Thermocouple*1 冷端传感器: 请勿触摸或拆下 Cold junction sensor: Do not touch or remove DC24V 24V COM
1		11	L1-	L2-	
2		12	C+	C-	
3		13	L3+	L4+	
4		14	L3-	L4-	
5		15	NC	NC	
6		16	NC	NC	
7		17	PE	PE	
8		18	24V	COM	

*注: 1. 热电偶的信号线应使用带屏蔽层的线缆, 且信号线应与电源线或其他可能引起噪声的线缆分开。若信号线需要延长, 应使用带屏蔽层的补偿线缆, 否则可能会导致温度测量值异常;
2. 热电偶信号线的屏蔽层需要接地。

*Note: 1. The signal cables of thermocouples should use shielded cables, and the signal cables should be separated from power supply cables or other cables that may cause noise. If the signal cables need to be extended, compensation cables with shielded layers must be used; otherwise, abnormal temperature measurements may occur.
2. The shielding layer of the thermocouple signal cable must be grounded.

HCMX-PT04-D端子说明 (Terminal description)					接线 (Wiring)
0		10	I1A	I2A	屏蔽层*1 Shield*1 两线热电阻*2 2-wire RTD*2 三线热电阻*2 3-wire RTD*2 DC24V 24V COM
1		11	I1B	I2B	
2		12	I1b	I2b	
3		13	I3A	I4A	
4		14	I3B	I4B	
5		15	I3b	I4b	
6		16	NC	NC	
7		17	PE	PE	
8		18	24V	COM	

*注: 1. 热电阻的信号线应使用带屏蔽层的线缆, 且信号线应与电源线或其他可能引起噪声的线缆分开。若信号线需要延长, 应使用带屏蔽层的补偿线缆, 否则可能会导致温度测量值异常。
2. 热电阻信号线的屏蔽层需要接地。

*Note: 1. The signal cables of resistance temperature detector should use shielded cables, and the signal cables should be separated from power supply cables or other cables that may cause noise. If the signal cables need to be extended, compensation cables with shielded layers must be used; otherwise, abnormal temperature measurements may occur.
2. The shielding layer of the resistance temperature detector signal cable must be grounded.