EC20H 系列可编程控制器速查手册

感谢您购买艾默生网络能源有限公司开发生产的可编程控制器（PLC）。在使用 PLC 产品前，请您仔细阅读本手册，以便更清楚地掌握产品特性，更安全地应用，充分利用本产品丰富的功能。

本手册简述了 EC20H 系列 PLC 的硬件规格、特性及使用方法，可用于 EC20H 系列 PLC 的设计、安装、连接和维护的快速指引，便于用户现场对所需信息的查阅。若需要更详细的产品资料，可参考我公司的《EC20H 系列可编程控制器用户手册》、《ControlStar 编程软件用户手册》和《EC 系列小型可编程控制器编程手册》。如需要，可向供货商咨询。您也可以登录 http://www.emersonnetworkpower.com.cn 网站下载 PLC 相关技术资料或反馈 PLC 相关问题。

尊敬的用户：

您好！谢谢您选用了艾默生网络能源有限公司产品。为了解产品在使用中的质量情况，更好地为您服务，请您在设备运行 1 个月时详细填写此表并邮寄或传真给我公司客户服务中心，当我们收到您填写完整的《产品质量反馈单》后，我们将给您寄去一份精美的纪念品，以表示我们的衷心谢意。如您能对我们提高产品和服务质量提出建议，便有机会获得特别奖励。

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产品性能			
产品包装			
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1 产品介绍

1.1 型号说明

产品型号说明如图 1-1 所示。

图 1-1　产品型号说明

1.2 外形结构
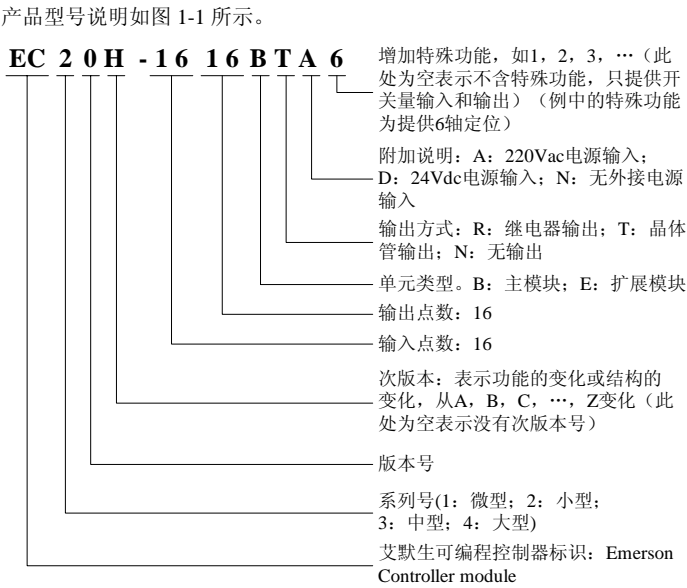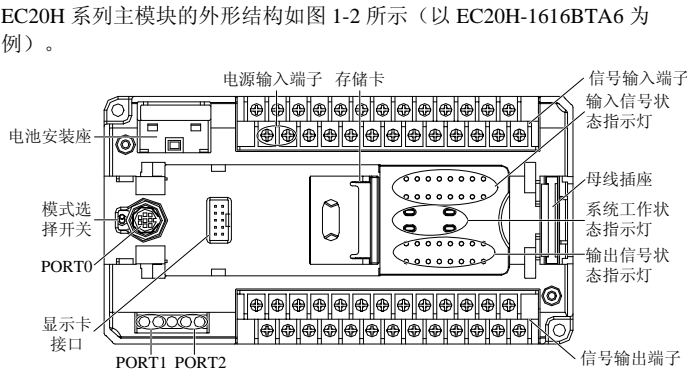
EC20H 系列主模块的外形结构如图 1-2 所示（以 EC20H-1616BTA6 为例）。

图 1-2　外形结构

母线插座用于连接扩展模块。模式选择开关有 ON、TM、OFF 三个档位。

1.3 端子介绍

EC20H-1616BTA6、EC20H-1616BTA4 端子排列如下所示。

输入端子：

⊕	•	COM	COM	S/S	X0	X2	X4	X6	X10	X12	X14	X16
L	N	•	+24V	+24V	X1	X3	X5	X7	X11	X13	X15	X17

输出端子：

Y0	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y10	Y12	•	Y14	Y16
COM0	•	COM1	•	COM2	•	COM3	COM4	Y11	Y13	COM5	Y15	Y17

2 电源规格

主模块内置电源电气规格和主模块可提供给扩展模块的电源规格如表 2-1 所示。

表 2-1　电源规格

项目		单位	最小值	典型值	最大值	备注
输入电压范围		Vac	85	220	264	正常启机和工作范围
输入电流		A	/	/	1.5	90Vac 输入，满载输出
额定输出电流	5V/GND	mA	/	1000	/	该容量为主模块内部消耗和扩展模块负载之和。最大输出功率即为各路满载之和：35W。模块采用自然冷
	24V/GND	mA	/	650	/	
	24V/COM	mA	/	600	/	

3 开关量输入输出特性

3.1 输入特性与信号规格

输入特性与信号规格如表 3-1 所示。

表 3-1 输入特性与信号规格

项目		高速输入端 X0~X7	普通输入端
信号输入方式		源型/漏型方式，用户可通过"S/S"端子进行选择	
电气参数	检测电压	24Vdc	
	输入阻抗	3.3kΩ	4.3kΩ
	输入 ON	外部回路电阻小于 400Ω	外部回路电阻小于 400Ω
	输入 OFF	外部回路电阻大于 24kΩ	外部回路电阻大于 24kΩ
滤波功能	数字滤波	X0~X7：滤波时间可在 0~60ms 之间由用户编程设定	
	硬件滤波	除 X0~X7 以外的其余端口为硬件滤波，滤波时间约 10ms	
高速功能		X0~X7 可实现高速计数、中断、脉冲捕捉等功能 X0~X7 端口计数最高频率达 100kHz	

高速输入端口有相应的最高频率限制。当输入频率超过该限制后，可能导致计数不准，或系统无法正常运行，请选用合适的外部传感器。

PLC 提供一个端口"S/S"用来选择信号的输入方式，可以设置为源型输入方式或漏型输入方式。将"S/S"与"+24V"相连，即设置为漏型输入方式，可以连接 NPN 型传感器。否则为源型输入方式。分别请参见图 3-1 和图 3-2。

图 3-1 源型输入接线图

图 3-2 漏型输入接线图

3.2 输出特性与信号规格

输出电气规范如表 3-2 所示。

表 3-2 输出电气规范

项目		输出规格
输出方式		晶体管。输出状态为 ON 时导通；OFF 时断开
电路绝缘		光耦绝缘
动作指示		光耦被驱动时指示灯点亮
回路电源电压		5~24Vdc，有极性要求
开路时漏电流		小于 0.1mA/30Vdc
最小负载		5mA（5~24Vdc）
最大输出电流	电阻负载	0.3A/1 点。 公共端合计负载： 0.3A/1 点组公共端 0.6A/2 点组公共端 0.8A/4 点组公共端 1.6A/8 点组公共端
	感性负载	7.2W/24Vdc
	电灯负载	0.9W/24Vdc
响应时间	OFF→ON	Y0~Y3：≤5μs/10mA 以上 Y4~Y7：≤10μs/10mA 以上 其他：≤0.5ms/100mA 以上
	ON→OFF	
最高输出频率		Y0~Y3：200kHz；Y4~Y7：100kHz
输出公共端		至多每 8 个端口使用 1 个公共端，每个公共端之间彼此隔离，不同型号公共端的详细内容，参考端子排列
熔断器保护		无

3.3 输入输出连接示例

输入连接示例

图 3-3 为 EC20H-1616BTA6 加一个 EC20-0808ERN 的连接，实现简单定位控制的示例。由编码器得到的位置信号通过 X0、X1 高速计数端子检测，需要快速反应的行程开关信号可接入 X2~X7 的高速端子，其余的用户信号则可分布于输入端口。

图 3-3 输入连接示例

输出连接示例

图 3-4 为 EC20H-1616BTA6 加一只 EC20-0808ERN 的连接方式，不同的输出组可接入不同的信号电压回路。不同的输出组可工作于不同电压等级的回路，且仅可接入直流回路，并需要注意电流方向。

图 3-4 输出连接示例

4 通讯口

EC20H 系列主模块提供了三个串行异步通讯端口，分别为 PORT0、PORT1 和 PORT2，支持的波特率：115200、57600、38400、19200、9600、4800、2400、1200bps。PORT0 为 RS232 电平，插座为 Mini DIN8。PORT0 的管脚定义请参见下图。

针脚号	名称	描述
3	GND	接地引脚
4	RXD	串行数据接收引脚（RS232 到可编程控制器）
5	TXD	串行数据发送引脚（可编程控制器到 RS232）
1、2、6、7、8	保留	未作定义的引脚，禁止用户连接

图 4-1 模式选择开关位置与 PORT0 管脚定义

PORT0 作为用户编程的专用接口，可通过模式选择开关强制切换为编程协议。PLC 运行状态及 PORT0 使用协议关系如表 4-1 所示。

表 4-1 PLC 运行状态及 PORT0 使用协议关系

模式选择开关位置	状态	PORT0 运行协议
ON	运行	由用户程序及其系统配置决定。可为编程协议、Modbus 协议、自由端口协议、N:N 网络协议（ECbus）
TM（ON→TM）	运行	强制切换为编程协议
TM（OFF→TM）	停止	
OFF	停止	若用户程序的系统设置为自由端口协议，则停止后自动切换为编程协议，否则保持系统设置的协议不变

PORT1、PORT2 均为 RS485 端口，可以与具有通讯功能的设备连接使用，如变频器或 HMI 等，采用 Modbus 协议、ECbus 协议或自由端口协议，对多台设备进行组网控制。其端口为螺丝固定的端子，通讯信号电缆可由用户自行制作，建议使用双绞屏蔽线作为通信端口的连接电缆。

5 安装

本 PLC 设计用于安装环境 II 标准、污染等级 2 的应用场合。

5.1 尺寸规格

EC20H 系列主模块尺寸规格如表 5-1 所示。

表 5-1 尺寸规格

型号	长	宽	高	净重
EC20H-1616BTA6 EC20H-1616BTA4	170mm	90mm	85mm	740g

5.2 安装方法

采用 DIN 槽安装固定

一般情况采用 35mm 宽度的 DIN 槽进行安装，如图 5-1 所示。
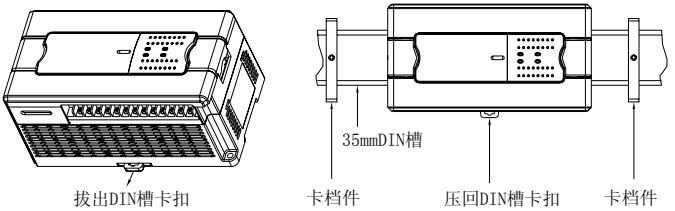
图 5-1 DIN 槽安装示意图

具体的安装步骤如下：

1．将 DIN 槽水平固定于安装背板上；
2．将模块底部下方的 DIN 槽卡扣拔出；
3．把模块挂到 DIN 上；
4．将卡扣压回原位，锁住模块；
5．最后用 DIN 槽卡档件将模块的两端固定，避免左右滑动。

其他 EC20H 系列可编程控制器均可按上述步骤进行 DIN 槽安装。

采用螺钉安装固定

对于可能存在较大冲击的场合，则可采用螺孔安装方式。将固定螺钉经 PLC 外壳的两个螺孔固定在电气柜的背板上，螺钉尺寸 M3。如图 5-2 所示。
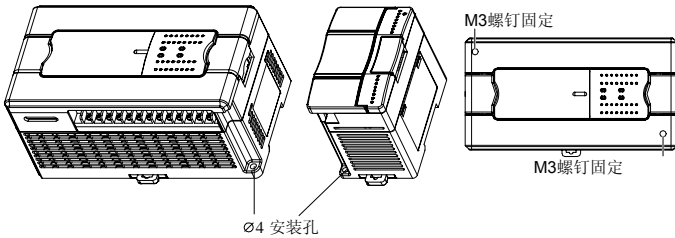
图 5-2 螺钉安装示意图

5.3 电缆连接及规格

连接电源线及接地线

交流电源及辅助电源连接示例如图 5-3 所示。
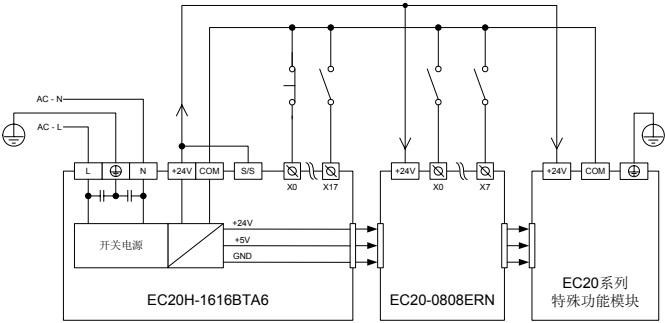
图 5-3 交流电源及辅助电源连接示意图

设置可靠的接地线可加强设备安全，提高 PLC 的电磁抗扰能力，安装时将 PLC 的电源⏚端连接到接地体上，建议采用 AWG12～16 型连接导线，并尽可能减小导线长度。建议设置独立的接地装置，布线中尽量避免与其他设备（尤其是干扰较强的设备）的接地线有公共路径，如图 5-4 所示。
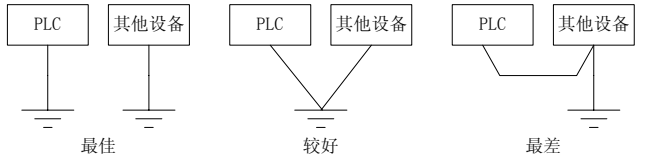
图 5-4 接地示意图

电缆规格

在进行 PLC 应用的配线时，建议使用多股铜导线，并预制绝缘端头，这样可保证接线质量。推荐的导线的截面积和型号如表 5-2 所示。

表 5-2 推荐的导线截面积和型号

线缆	导线截面	推荐导线号	配合使用的接线端子及热缩管
交流电源线（L、N）	1.0～2.0mm²	AWG12、18	H1.5/14 预绝缘管状端头，或线头烫锡处理
接地线（⏚）	2.0mm²	AWG12	H2.0/14 预绝缘管状端头，或线头烫锡处理
输入信号线（X）	0.8～1.0mm²	AWG18、20	UT1-3 或 OT1-3 冷压端头，Φ3 或 Φ4 热缩管
输出信号线（Y）	0.8～1.0mm²	AWG18、20	

用螺丝将加工好的电缆头固定在 PLC 的接线端子上，注意螺钉位置正确，螺钉的旋紧力矩在 0.5～0.8Nm，保证可靠连接，又不致损坏螺丝。
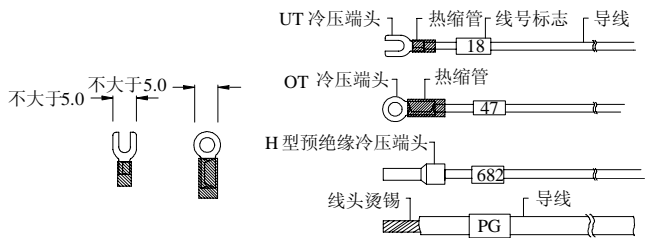
推荐的电缆制备方式如图 5-5 所示。

图 5-5 电缆制备示意图

⚠ 警告

晶体管输出严禁接交流回路，如 220VAC。请严格参照电气参数要求设计输出回路，不可过压或过流。

6 存储卡介绍

ECA20-MB40 存储卡为 EC20H 系列主模块的选配件，可通过存储卡连接端子直接插入 PLC 的存储卡接口。存储卡接口在 PLC 上的位置请参见图 1-2。用户可以从控制器复制用户文件到存储卡或从存储卡下载用户文件到控制器。用户文件包含用户程序、系统块、数据块。存储卡不支持热插拔。
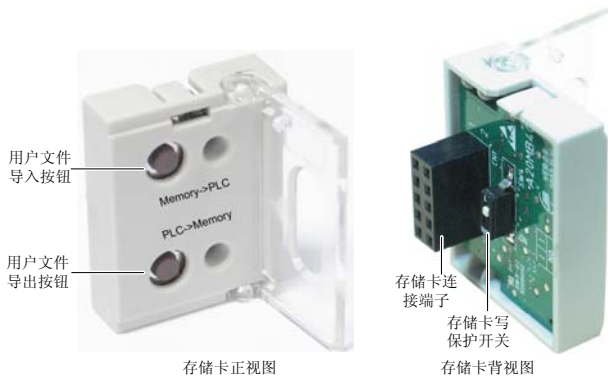
6.1 外形结构

存储卡外形结构如图 6-1 所示。

存储卡正视图   存储卡背视图
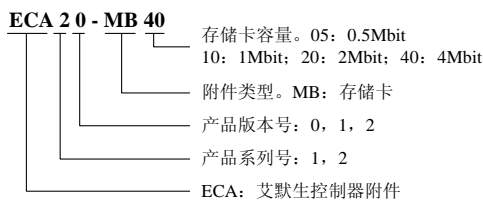
图 6-1 存储卡外形结构

6.2 型号说明

存储卡型号说明如图 6-2 所示。

图 6-2 存储卡型号说明

6.3 存储卡操作说明

存储卡上提供了两个按钮及一个存储卡写保护开关。具体说明请参见下表。

表 6-1 存储卡操作说明

部件名称	丝印	功能说明
用户文件导入按钮	Memory->PLC	将用户文件从存储卡导入控制器
用户文件导出按钮	PLC->Memory	将用户文件从控制器导出到存储卡
存储卡写保护开关	WR/Lock	Lock：存储卡写保护；WR：存储卡可写

6.4 存储卡密码功能

为保护 EC20H 系列主模块内部用户程序的知识产权，同时防止恶意破坏，存储卡需要通过 ControlStar 编程软件设置上下载密码。只有存储卡的上下载密码与 PLC 主模块内部的密码相同的情况下，存储卡才能与 PLC 主模块交换用户文件。

7 上电运行与例行保养

7.1 上电运行

接线完毕后逐项检查连接情况，确保无异物掉入机壳内，散热通畅。

1. 接通 PLC 电源，PLC 的 POWER 灯应点亮。

2. 启动 PC 上的 ControlStar 软件，将编制好的用户程序下载到 PLC。

3. 下载程序校验完毕，把模式选择开关拨到 ON 位，RUN 灯应点亮。若 ERR 灯点亮，表明用户程序或系统有错误，请按《EC 系列小型可编程控制器编程手册》的说明排除错误，直到正确为止。

4. 把 PLC 外部系统的电源合上，进行系统调试。

7.2 例行保养

例行保养检查应注意如下方面：

1. 保证 PLC 控制器工作环境的整洁，避免异物、灰尘落入机内。

2. 保持可编程控制器良好的通风散热。

3. 所有接线连接及接线端子固定牢固，状态良好。

用户须知

1. 保修范围指可编程控制器本体。

2. **保修期为十八个月**，保修期内正常使用情况下，产品发生故障或损坏，我公司免费维修。

3. **保修期起始时间为产品制造出厂日期**，机器编码是判断保修期的唯一依据，无机器编码的设备按过保处理。

4. 即使在保修期内，如发生以下情况，将收取一定的维修费用：

   ● 不按用户手册操作导致的机器故障；

   ● 由于火灾、水灾、电压异常等造成的机器损坏；

   ● 将可编程控制器用于非正常功能时造成的损坏。

5. 服务费按实际费用计算，如另有合同，以合同优先的原则处理。

6. 请您务必保留此卡，并在保修时出示给维修单位。

7. 如您有问题可与代理商联系，也可直接与我公司联系。

EC20H Series PLC Quick Start Manual

Thank you for using Emerson programmable logic controller (PLC). Before using the PLC product, please carefully read this booklet so as to better understand it, fully use it, and ensure safety.

Briefly introduced in this booklet are the hardware specification, features, and usage of EC20H series PLC. This quick start manual offers you a quick guide to the design, installation, connection and maintenance of EC20H series PLC, convenient for on-site reference. For detailed product information, please refer to our *EC20H Series PLC User Manual, ControlStar Programming Software User Manual*, and *EC Series Micro-PLC Programming Manual*. For ordering the above user manuals, contact your Emerson distributor. You can also log on to http://www.emersonnetworkpower.com.cn to download the related technical documentation or feedback PLC-related problems.

To Customers:

Thank you for choosing our products. To improve the product and provide better service for you, could you please fill in the form after the product has been operated for 1 month, and mail or fax it to our Customer Service Center? We will send you an exquisite souvenir upon receiving the complete Product Quality Feedback Form. Furthermore, if you can give us some advices on improving the product and service quality, you will be awarded a special gift. Thank you very much!

Emerson Network Power Co., Ltd.

Product Quality Feedback Form

Customer name		Tele	
Address		Zip code	
Model		Date of use	
Machine SN			
Appearance or structure			
Performance			
Package			
Material			
Quality problem during usage			
Suggestion about improvement			

Address: No.1 Kefa Rd., Science & Industry Park, Nanshan District, 518057, Shenzhen, PRC.   Tel: +86 755 86010581

1   Introduction

1.1   Model Designation

The model designation is shown in the following figure.
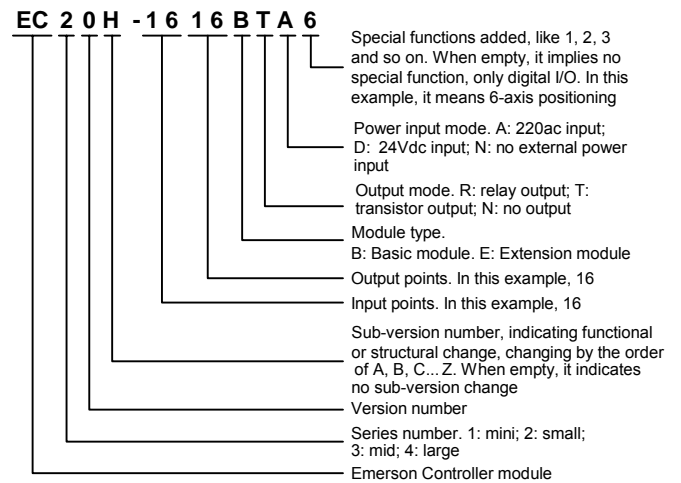
Figure 1-1   Model designation

1.2   Outline

The outline of the basic module is shown in the following figure by taking EC20H-1616BTA6 as an example.
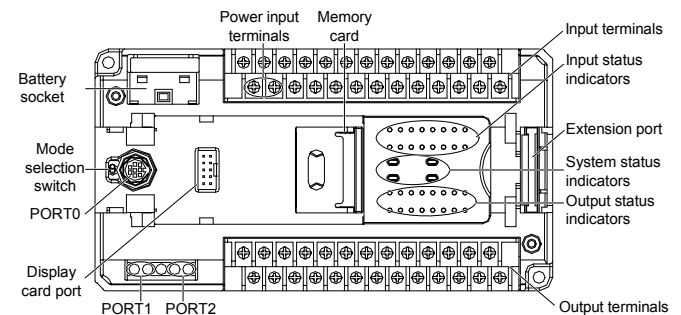
Figure 1-2   Outline

The extension port is for connecting extension modules, while the mode selection switch has three positions: ON, TM and OFF.

1.3   Terminal Introduction

The terminal layout of EC20H-1616BTA6 and EC20H-1616BTA4 are shown below.

Input terminal:

⏚	•	COM	COM	S/S	X0	X2	X4	X6	X10	X12	X14	X16
L	N	•	+24V	+24V	X1	X3	X5	X7	X11	X13	X15	X17

Output terminal:

Y0	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y10	Y12	•	Y14	Y16
COM0	•	COM1	•	COM2	•	COM3	COM4	Y11	Y13	COM5	Y15	Y17

2   Power Supply

The specifications of PLC built-in power supply and the power supply for extension modules are listed in the following table.

Table 2-1   Power supply specifications

Item		Unit	Min.	Rated	Max.	Note
Power supply voltage		Vac	85	220	264	Normal startup and operation
Input current		A	/	/	1.5	Input: 90Vac, 100% output
Rated output current	5V/GND	mA	/	1000	/	This capacity is the sum of module power consumption and extension modules. Max. output power is the sum of all outputs fully loaded: 35W. The module uses natural cooling
	24V/GND	mA	/	650	/	
	24V/COM	mA	/	600	/	

3 Digital Input & Output

3.1 Input Characteristic And Specification

The input characteristic and specification are listed in the following table.

Table 3-1 Input characteristic and specification

Item		High-speed input terminals X0~X7	General input terminal
Input mode		Source mode or sink mode, set through s/s terminal	
Electric parameters	Input voltage	24Vdc	
	Input impedance	3.3kΩ	4.3kΩ
	Input ON	External circuit resistance < 400Ω	
	Input OFF	External circuit resistance > 24kΩ	
Filtering function	Digital filter	For X0 ~ X7, the filtering time is 0 ~ 60ms, as determined by user program	
	Hardware filter	Input terminals other than X0 ~ X7 are of hardware filtering. Filtering time: about 10ms	
High-speed function		X0 ~ X7: high-speed counting, interrupt, and pulse catching The counting frequency of X0 ~ X7 is up to 100kHz	

The high-speed input terminal has a limit over the maximum frequency. Any frequency higher than that may result in incorrect counting or abnormal system operation. Make sure that proper external sensors are used.

The PLC provides terminal S/S to set the signal input mode to either source or sink. Connecting the S/S terminal with terminal +24V will set the input mode to sink, enabling the connection of NPN type sensor.
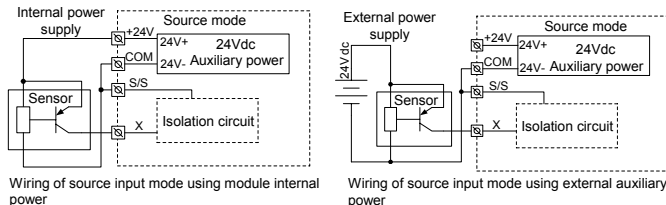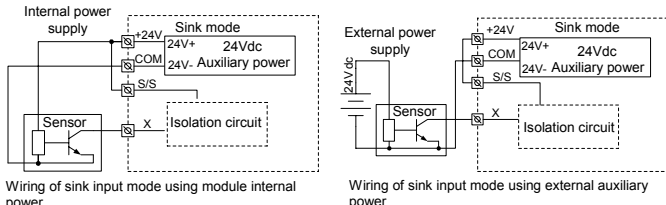

Figure 3-1 Source input mode

Figure 3-2 Sink input mode

Input connection example

The following diagram shows an example of EC20H-1616BTA6 in connection with an EC20-0808ERN, which realizes simple positioning control. The positioning signals from the PG are input through high speed counting terminals X0 and X1, the limit switch signals that require high-speed response can be input through high-speed terminals X2 ~ X7. Other user signals can be input through any other input terminals.
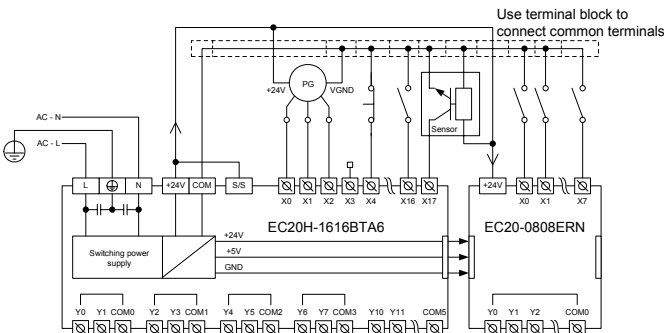

Figure 3-3 Input connection example

3.2 Output Characteristic And Specification

The output specification is shown in the following table.

Table 3-2 Output electric specification

Item		Specification
Output mode		Transistor output. When output state is ON, the circuit is closed; OFF, open
Circuit isolation		PhotoCoupler
Operation indication		LED is on when optical coupler is driven
Power supply voltage		5 ~ 24Vdc, correct polarity is required
Leakage current of open circuit		< 0.1mA/30Vdc
Minimum load		5mA (5 ~ 24Vdc)
Max. output current	Resistive load	0.3A/1 point Total load at the common terminal: 0.3A/1 point group common terminal 0.6A/2 point group common terminal 0.8A/4 point group common terminal 1.6A/8 point group common terminal
	Inductive load	7.2W/24Vdc
	Illumination load	0.9W/24Vdc
Response time	OFF→ON	Y0 ~ Y3: ≤ 5μs/10mA or more Y4 ~ Y7: ≤ 10μs/10mA or more
	ON→OFF	Others: ≤ 0.5ms/100mA or more
Max. output frequency		Y0 ~ Y3: 200kHz; Y4 ~ Y7: 100kHz
Output common terminal		At most every 8 terminals use 1 isolated common terminal. For the common terminals of different PLC models, see the terminal layout
Fuse protection		None

Output connection example

The following diagram shows an example of EC20H-1616BTA6 in connection with an EC20-0808ERN. Different output groups can be connected to different signal circuits with different voltages. Different output groups can only be connected to DC circuits with different voltages, in which case the direction of current flow should be considered.
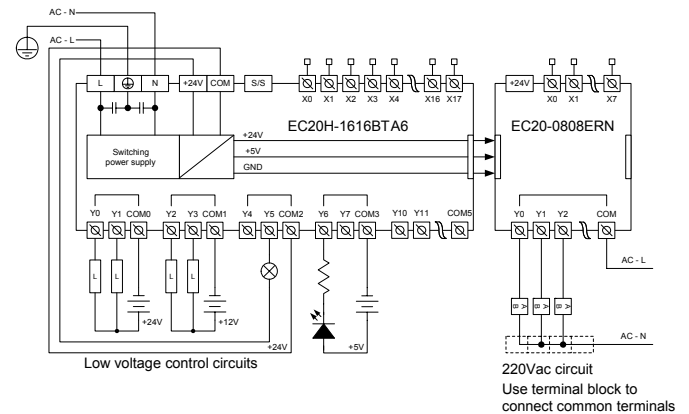

Figure 3-4 Output connection example

4 Communication Port

The EC20H series PLC basic module provides three serial asynchronous communication ports: PORT0, PORT1 and PORT2. Supported baud rates include:

115200 bps	57600 bps	38400 bps	19200 bps
9600 bps	4800 bps	2400 bps	1200 bps

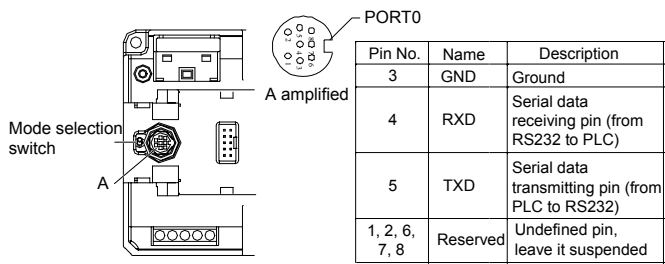PORT0 is of RS232 level with Mini DIN8 socket. See the following figure for the pin definition of PORT0.

Pin No.	Name	Description
3	GND	Ground
4	RXD	Serial data receiving pin (from RS232 to PLC)
5	TXD	Serial data transmitting pin (from PLC to RS232)
1, 2, 6, 7, 8	Reserved	Undefined pin, leave it suspended

Figure 4-1　PORT0 pin definition

As a terminal dedicated to user programming, PORT0 can be converted to programming protocol through the mode selection switch. The relationship between PLC operation status and the protocol used by PORT0 is shown in the following table.

Table 4-1　Setting of mode selection switch

Mode selection switch position	Status	PORT0 operation protocol
ON	Running	Programming protocol, or Modbus protocol, or free-port protocol, or N:N network protocol (ECbus), as determined by user program and system configuration
TM (ON→TM)	Running	Converted to programming protocol
TM (OFF→TM)	Stop	
OFF	Stop	If the system configuration of user program is free-port protocol, the protocol converts to programming protocol automatically after stop; otherwise the system protocol keeps unchanged

PORT1 and PORT2 are both RS485 port that can be connected to equipment capable of communication, such as inverters or HMIs. With Modbus protocol, ECbus protocol or free-port protocol, PORT1 and PORT2 can control multiple devices through the network. The terminals are fixed with screws. You can use a shielded twisted-pair as the signal cable to connect communication ports by yourself.

5　Installation

PLC is applicable to Installation Category II, Pollution Degree 2.

5.1　Installation Dimensions

The installation dimensions of EC20H series PLC are shown in the following table.

Table 5-1　Installation dimensions

Model	Length	Width	Height	Weight
EC20H-1616BTA6 EC20H-1616BTA4	170mm	90mm	85mm	740g

5.2　Installation Method

DIN rail mounting

Generally you can mount the PLC onto a 35mm-wide rail (DIN), as shown in the following figure.
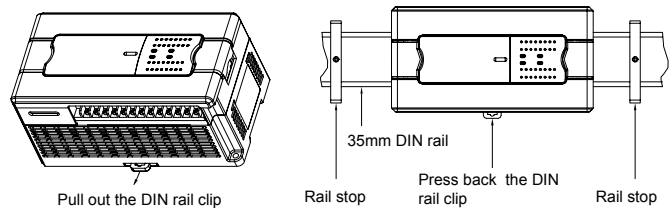

Figure 5-1　DIN rail mounting

Follow the procedures below.

1. Secure the DIN rail horizontally to the installation backboard.
2. Pull out the DIN rail clip at the bottom of the module.
3. Hang the module onto the DIN rail.
4. Press back the rail clip to fasten the module to the rail.
5. Use two rail stops at both sides of the module to avoid sliding.

All EC20H series PLC modules can be mounted with the procedures above.

Screw fixing

Fixing the PLC with screws can stand greater shock than DIN rail mounting. Use M3 screws through the mounting holes on PLC enclosure to fix the PLC onto the backboard of the electric cabinet, as shown in the following figure.
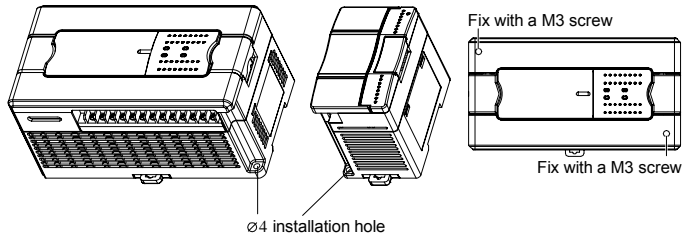

Figure 5-2　Screw fixing

5.3　Cable Connection And Specification

Connecting power cable and grounding cable

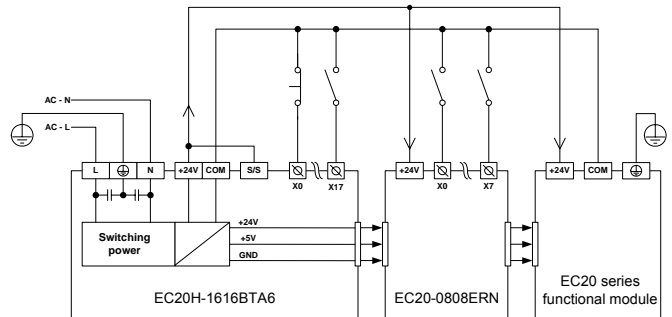The connection of AC power and auxiliary power is demonstrated in the following figure.

Figure 5-3　Connection of AC power and auxiliary power

Connect the PLC ⏚ terminal to the grounding electrode. To ensure reliable grounding cable connection, which makes the equipment safer and protects it from EMI, use AWG12~16 cable and make the cable as short as possible. Use independent grounding. Avoid sharing route with the grounding cable of other equipment (particularly those with strong EMI). See the following figure.
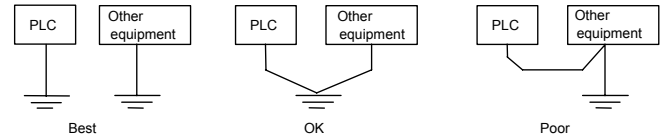

Figure 5-4　Grounding

Cable specification

When wiring a PLC, use multi-strand copper wire and ready-made insulated terminals to ensure the quality. The recommended model and the cross-sectional area of the cable are shown in the following table.

Table 5-1　Recommended cable model and CSA

Wire	Cross-sectional area	Recommended model	Cable lug and heat shrinkable tube
AC power cable (L, N)	$1.0 \sim 2.0 mm^2$	AWG12, 18	H1.5/14 round insulated lug, or tinned cable lug
Earth cable (⏚)	$2.0 mm^2$	AWG12	H2.0/14 round insulated lug, or tinned cable end
Input signal cable (X)	$0.8 \sim 1.0 mm^2$	AWG18, 20	UT1-3 or OT1-3 solderless lug
Output signal cable (Y)	$0.8 \sim 1.0 mm^2$	AWG18, 20	Φ3 or Φ4 heat shrinkable tube

Fix the prepared cable head onto the PLC terminals with screws. Fastening torque: 0.5~0.8Nm.
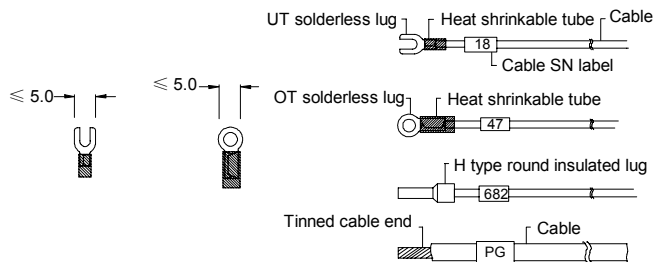
The recommended cable processing-method is shown below.

Figure 5-5   Cable processing method

6   Memory Card Introduction

As an option of EC20H series PLC, ECA20-MB40 memory card can be connected to the PLC by inserting the connecting terminal on the memory card to the memory card port on the PLC. See *Figure 1-2* for the location of the memory card port on the PLC. You can copy user files from PLC to the memory card or vice versa. The user file contains user program, system block and data block. The memory card is not hot-pluggable.

6.1   Appearance & Structure

The memory card appearance and structure is shown below.
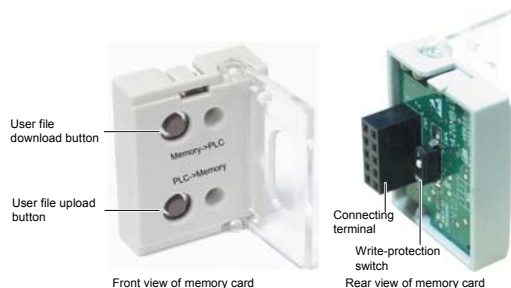
Figure 6-1   Memory card appearance & structure

6.2   Model Description

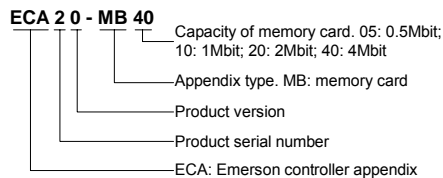The memory card model is described in the following figure.

Figure 6-2   Memory card model description

6.3   Operation Description

The memory card provides two buttons and a write-protection switch. See the following table for details.

Table 6-1   Memory card operation instruction

Part name	Silk print	Function description
User file download button	Memory -> PLC	Download user files from memory card to controller
User file upload button	PLC -> Memory	Upload user files from controller to memory card
Write-protection switch	WR/Lock	Lock: write disabled; WR: writable

6.4   Password Protection

To protect the intellectual property of the internal program of EC20H series PLC, and to protect the PLC, you need to set upload/download password for the memory card through ControlStar. The memory card can exchange user files with the PLC only when the memory card password coincides with the internal password of the PLC.

7   Power-on O&M

7.1   Power-on Operation

Check the cable connection carefully. Make sure that the PLC is clear of alien objects and the heat dissipation channel is clear.

1. Power on the PLC, the PLC POWER indicator should be on.

2. Start the Controlstar software on the host and download the compiled user program to the PLC.

3. After checking the download program, switch the mode selection switch to the ON position, the RUN indicator should be on. If the ERR indicator is on, the user program or the system is faulty. Look up in the EC Series Micro-PLC Programming Manual and remove the fault.

4. Power on the PLC external system to start system debugging.

7.2   Routine Maintenance

Do the following:

1. Ensure the PLC a clean environment. Protect it from aliens and dust.

2. Keep the ventilation and heat dissipation of PLC in good condition.

3. Ensure that the cable connections are reliable and in good condition.

 Warning

Never connect the transistor output to an AC circuit (like 220Vac). The design of the output circuit must abide by the requirements of electric parameters, and no over-voltage or over-current is allowed.

Notice

1. The warranty range is confined to the PLC only.

2. **Warranty period is 18 months**, within which period Emerson Network Power conducts free maintenance and repairing to the PLC that has any fault or damage under the normal operation conditions.

3. **The start time of warranty period is the delivery date of the product**, of which the product SN is the sole basis of judgment. PLC without a product SN shall be regarded as out of warranty.

4. Even within 18 months, maintenance will also be charged in the following situations:

■   Damages incurred to the PLC due to mis-operations, which are not in compliance with the User Manual;

■   Damages incurred to the PLC due to fire, flood, abnormal voltage, etc;

■   Damages incurred to the PLC due to the improper use of PLC functions.

5. The service fee will be charged according to the actual costs. If there is any contract, the contract prevails.

6. Please keep this paper and show this paper to the maintenance unit when the product needs to be repaired.

7. If you have any question, please contact the distributor or our company directly.