

产品规格书

Product Datasheet

FL8-E8-D

FL8-E16-D

FL8-E32-D

晶体管、以太网、EtherCAT、NPN、EtherNet



主要信息 Main

产品系列 Range Of Product	FL8
产品类型 Product Or Component Type	可编程控制器 Logic controller
额定电源电压[Us] Rated Supply Voltage	24VDC
离散量输入数量 Discrete Input Number	8
离散量输出类型 Discrete Output Type	晶体管 NPN Transistor
离散量输出数量 Discrete Output Number	8
离散量输出电压 Discrete Output Voltage	DC 5V~30V;
离散量输出电流/点 Discrete Output	最大 2A, Max 2A
离散量输出电流 /Group Discrete Output	最大 4A, Max 4A

补充信息 Complementary

系列 Series	FL8		
型号 Reference	FL8-E8-D	FL8-E16-D	FL8-E32-D
CPU	4 核 1GHz		
内存 Memory	1GB	2GB	2GB
硬盘 HD	4GB	8GB	8GB
带轴能力 Motion Axis	8 轴 EtherCAT+脉冲轴 8 Axis of EtherCAT+Pulse Axis	16 轴 EtherCAT+脉冲轴 16 Axis of EtherCAT+Pulse Axis	32 轴 EtherCAT+脉冲轴 32Axis of EtherCAT+Pulse Axis
脉冲轴 Pulse Axis	6 轴 200KHz		
左侧扩展卡 Left Expansion	支持左扩展 (4G Cat1 或 WiFi 无线, 串口) Support left expansion (4G Cat1 or WiFi wireless, serial port)		
以太网 Ethernet	百兆*2		
Ethercat	支持 (Ethercat 主站*1, 支持最大 72 从站) Support (EtherCAT master station * 1, support up to 72 slave stations)		
串口通信 Serial port	2 通道 RS485		
CAN 通信 CAN communication	1 通道 CANOPEN		
程序容量 Program Storage	32M		
用户数据空间 User Data Storage	128M		
数据容量 Data Storage	I 区 128KBytes、Q 区 128KBytes、M 区 512KBytes、掉电保持区 800KBytes, 其它变量: 无限制 128KBytes in area I, 128KBytes in area Q, 512KBytes in area M, 800KBytes in retain area, other variables: unlimited		
其他接口 Other connector	U 盘 (TYPE-C) 程序上下下载, 数据存储 USB flash disk (TYPE-C) program download, data storage		
运控功能 Motion Function	支持电子凸轮、电子齿轮、直线插补、圆弧插补 CAM, Gear, linear interpolation, circle interpolation		
编码器轴 HSC	7 点 200KHz		
本体 IO Build in IO	8 点输入(源型/漏型), 8 点输出(NPN) 8-point input (source/sink), 8-point output (NPN)		
右侧扩展 Right Expansion	最大 31 个 IO 模块 Max 31		
编程语言 Program language	Codesys 3.5.19.0(IL、LD、ST、SFC、CFC、FBD)		
电源输入 Power	DC24V±20%		
总线协议 Bus Protocol	EtherCAT、Modbus-TCP、Canopen、Modbus-RTU、OPC UA		
时钟 Real-time- clock	内置 RTC integrated		

晶体管输入 Transistor Input

特性 Characteristics		参数 Parameter
额定电压 Rated Voltage		DC 24V
输入范围 Input Range		DC 0V~28.8V
额定电流 Rated Current		7mA
峰值 Peak	电压 Voltage	30V
	电流 Current	9mA
状态 State	电压 (状态 1) Voltage in state 1	>15V
	电压 (状态 0) Voltage in state 0	<5V
	电流 (状态 1) Current in state 1	>2.5mA
	电流 (状态 0) Current in state 0	<1.0mA
隔离 Isolation	-	光耦 Optocoupler
输入阻抗 Input impedance		3.3kΩ
滤波时间 Filter time		默认 1ms, 无滤波到 100ms 平分 16 等级可选 Default 1ms, 16 equally divided levels selectable from unfiltered to 100ms
兼容性 Compatibility		兼容 2 线制/3 线制传感器 Compatible with 2/3 wire sensors
输入类型 Input type		源型/漏型 Source/Sink
线缆长度与类型 Cable length and type		最长 100m 屏蔽电缆或 50m 非屏蔽电缆 Max 100m shielded cable, 50m unshielded cable
保护 (过电压) Protection (overvoltage)		最大 30V, 限制每天 1 小时发生频率 Maximum 30V, limited to 1 hour per day frequency
接线端子 Wiring terminal		可拆卸端子台 Removable terminal block

晶体管输出特性 Transistor Output

特性 Characteristic	参数 Parameter
输出类型 Output type	NPN

额定电压 Rated voltage	DC 24V
电压范围 Voltage range	DC 19.2V~28.8V
额定电流 Rated current	2A
电流/组 Current/group	4A* 每组的输出点数 4A* Output point of each group
压降 Voltage drop	最大 DC 1V Maximum 1V DC
关闭时漏电流 Leakage current when turned off	<5 μ A
纯电阻负载最大功率 Maximum power of incandescent lamp	2.4W
降容 Derating	无 None
开启时间 Start time	最大 34 μ s Maximum 34 μ s
关闭时间 Turn-off time	最大 250 μ s Maximum 250 μ s
最高输出频率 Maximum output frequency	1kHz
短路保护 Short circuit protection	有 Yes
短路输出峰值电流 Peak short-circuit output current	1.3A
短路或过载后自恢复 Self-recovery after short circuit or overload	每 10ms Per 10ms
钳制电压 Clamping voltage	最大 DC 39V \pm 1V Maximum 39V \pm 1V DC
隔离 Isolation	输出与内部逻辑间 AC 500V 500V AC between output and internal logic
电缆类型 Type of Cable	非屏蔽 Unshielded
电缆长度 Cable length	50m 非屏蔽线缆 Unshielded 50m
接线端子 Wiring terminal	可拆卸端子台 Removable terminal block

环境特性 Environmental Characteristics

类别 Category	特性 Characteristic
运行环境温度 Operating ambient temperature	-10°C~60°C
存储温度 Storage temperature	-20°C~70°C

相对湿度 Relative humidity	5%~95%，无凝露 without condensation
污染等级 Class of pollution	2 (IEC60664)
防护等级 Class of protection	IP20
涂层 Coating	涂层防护，干膜厚度≥20μm；加强版干膜厚度≥40μm Coated protection, dry film thickness ≥ 20μm; reinforced dry film thickness ≥ 40μm
海拔高度 Altitude	运行：0m~3,000m Operation: 0m~3,000m 运输：≤6,000m Transportation: ≤6,000m
抗震性能 Seismic performance	5Hz~13.2Hz, 振幅 7mm; 13Hz~100Hz, 加速度 2G, X、Y、Z 三轴方向各 20 次 5~13.2Hz Amplitude 7mm, 13Hz~100Hz Acceleration 2G, 20 times each in X, Y and Z axes
抗冲击性能 Impact performance	半正弦波，加速度 15G, 持续 11ms, X、Y、Z 三轴方向各 6 次 Semi-positive sine wave, acceleration 15G, duration 11ms, 6 times in each of the X, Y and Z directions

电磁敏感性 Electromagnetic Susceptibility

Standard	Method	Item
EN IEC 61000-6-4:2019	CISPR 16-2-1	Conducted Emissions at AC Mains Power Port (150kHz-30MHz)
	CISPR 32	Conducted Emissions at Wired Network Port(150kHz-30MHz)
	CISPR 16-2-3	Radiated Emissions(30MHZ-1GHz)
	CISPR 16-2-3	Radiated Emissions(Above 1GHz)
EN IEC 61000-6-22019	EN 61000-4-6:2014	Conducted Immunity at AC Mains Power Port(150kHz-80MHz)
	EN 61000-4-6:2014	Conducted Immunity at Signal Port150kHz-80MHz
	EN 61000-4-4:2012	Electrical Fast Transients Burst at AC Mains Power Port
	EN 61000-4-4:2012	Electrical Fast Transients Burst at Signal Port
	EN 61000-4-2:2009	Electro static Discharge

Standard	Method	Item
	EN 61000-4-8:2010	Power Frequency Magnetic Field
	EN IEC 61000-4-3:2020	Radiated Immunity(80MHZ-6GHZ)
	EN 61000-4-5:2014+A1:2017	Surge at AC Mains Power Port
	EN 61000-4-5:2014+A1:2017	Surge at Signal Port
	EN IEC 61000-4-11:2020	Voltage Dips and Interruptions

电源 Power

安全注意事项 Safety notes

- ◆ 如果不能保持在指定的电压范围内，则可能无法按预期切换输出。请使用合适的安全联锁和电压监控电路。If the specified voltage range cannot be maintained, the output may not switch as expected. Please use a proper safety interlock and voltage monitoring circuit.
- ◆ 根据 IEC61140，24V DC 电源必须是额定的安全超低电压（SELV）或保护性超低电压（PELV）。这些电源在电源的电气输入和输出电路之间隔离。Required for the PLCs and associated I/O extension modules. According to IEC 61140, the 24 V DC power supply must be rated for Safety Extra Low Voltage (SELV) or Protected Extra Low Voltage (PELV). These power supplies are isolated between the electrical input and output circuits of the power supply.
- ◆ PLC 必须由 24V 外部电源设备供应。按照 IEC 标准规定，断电期间，与适当电源相关联的 PLC 可继续正常运行至少 10ms。The PLCs must be supplied by a 24 V external power supply device. During a power failure, the PLC associated with a suitable power supply can continue to operate normally for at least 10 ms according to the IEC standard.

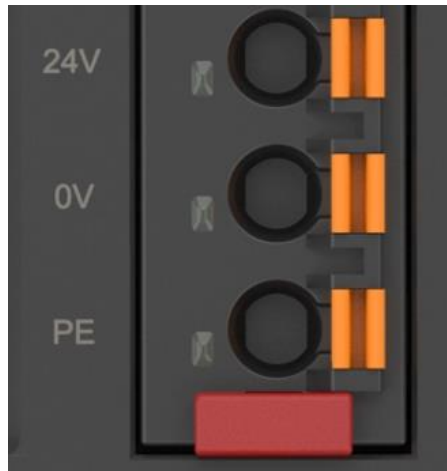
请确保外部提供的直流电源满足以下特性要求。Make sure the external DC power supply meets the following characteristic requirement.

特性 Characteristic	值 Value
额定电压 Rated voltage	24V DC
电压范围 Supply voltage range	19.2V~28.8V DC
电源中断时间 Power interruption time	10 ms at 24V DC
最高峰值电流 Maximum peak current	3A
最高电源消耗 Maximum power consumption	FL8-EXX-D 6.5W

连接直流电源线的操作方法如下：The method of connecting DC power cords is as follows：

步骤1. 将外部直流电源的正极连接至 PLC 直流电源输入的“24V”端子。Connect the positive pole of the external DC power supply to the "24V" terminal of the PLC DC power input.

步骤2. 将外部直流电源的负极连接到 PLC 直流电源输入的“0V”端子。Connect the negative pole of the external DC power supply to the "0V" terminal of the PLC DC power input.



连接 USB 接口 Connect to USB Port

用户可通过 USB 接口对 PLC 进行编程调试。连接 USB 端口的操作方法如下：You can program for the PLC via USB interface. The method of connecting USB ports is as follows:

步骤3. 将 USB 连接线缆的 Type-C 端连接至 PLC 的 USB 接口。Connect the Type-C end of the USB connection cable to the USB interface of the PLC.

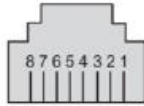
步骤4. 将 USB 连接线缆的 Type-A 端连接至 PC 的 USB 接口。Connect the Type-A end of the USB cable to the USB interface of the PC.



连接以太网接口 Connect to Ethernet Port

PLC 的以太网接口为 RJ45 接口，速率为 10M/100Mbit/s，自适应半双工/全双工。Ethernet interface is RJ45 type, 10Mbps/100Mbps, adaptive/half full duplex.

下图展示了以太网连接器引脚定义。The following diagram shows the Ethernet connector pin definitions:



引脚号	信号
1	TD+
2	TD-
3	RD+
4	-
5	-
6	RD-
7	-
8	-

使用 RJ45 标准以太网线缆连接 PLC 的以太网端口及对端设备（如 PC）的以太网端口。Using RJ45 standard Ethernet cable to connect Ethernet ports of PLC to Ethernet port of device such as PC.

连接串行通讯接口 1 Connect to Serial Communication Port 1

PLC 的串行通讯接口 1 如下图所示。The position of serial port 1 of the controller is shown below.



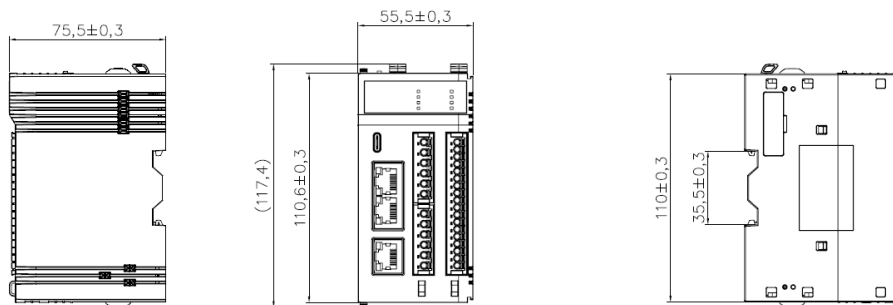
连接串行通讯接口 2 Connect to Serial Port2

PLC 的串行通讯接口 2 如下图所示。The position of serial port 2 of the controller is shown below.



使用双绞线连接至 A 端子和 B 端子，双绞线的另一端分别连接到对端设备串口的 RS485+和 RS485- 端子即可。Use twisted pair wire to connect to A and B terminals, and the other end of twisted pair to RS485 + and RS485- terminals to the serial port of the peer device, respectively.

CPU 尺寸 Dimension 单位 Unit mm



通风要求 Ventilation requirements

设备需要安装在通风条件良好的机柜中，并确保设备周围留有足够的空间便于设备散热。The equipment needs to be installed in a cabinet with good ventilation conditions and to ensure that there is enough space around the equipment to allow it to dissipate heat.



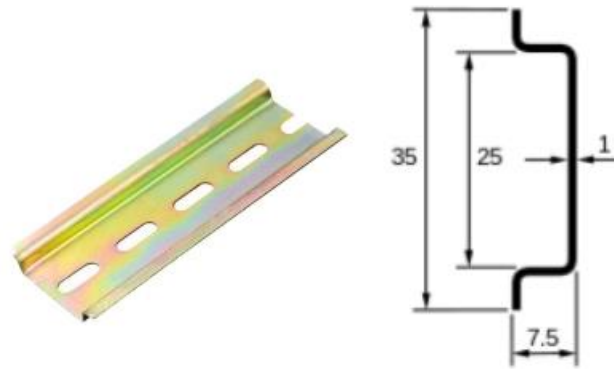
- 将散热量最多的设备安装在机柜顶部，以确保适当通风。Install the equipment that dissipates the most heat on top of the cabinet to ensure proper ventilation.
- 请勿将该设备安装在可能引起过热的设备旁边或上方。Do not install the equipment next to or above equipment that may cause overheating.
- 为保证设备良好运行，请确保设备的工作环境温度在 0°C~50°C。 To ensure that the equipment works well, please keep the ambient temperature between 0 °C and 50 °C.

在 DIN 导轨上安装设备 Installation of DIN Rail

可通过 DIN 导轨将设备安装至机柜。操作方法如下：The controller and its extension modules can be installed on DIN rails which can be fitted to a flat installation surface.

步骤1. 准备以下规格的 DIN 导轨，并将 DIN 导轨安装至机柜。Prepare DIN rails of the following specifications and install DIN rails into the cabinet.

推荐用于 PLC 安装的 DIN 导轨高 35 毫米，深 7.5 毫米。The recommended DIN rail for PLC installation is 35 mm high and 7.5 mm deep, as shown below.



步骤2. 将设备 DIN 安装槽的上端卡入 DIN 导轨的上端，用力按压设备，将设备 DIN 安装槽的下端卡入 DIN 导轨的下端。Insert the upper end of the DIN slot into the upper end of the DIN rail, press the equipment hardily, and insert the lower end of the DIN slot into the lower end of the DIN rail.