

ABB SERVO PRODUCTS

MicroFlex e190 servo drive

Quick installation guide

English 3

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List of related manuals

Drive hardware manuals and guides

MicroFlex e190 User's manual

MicroFlex e190 Wall chart

Code (English)

[3AXD50000037326](#)

[3AXD50000037323](#)

Certificates

MicroFlex e190 EU Single Declaration of Conformity

MicroFlex e190 STO (TÜV) Certificate

MicroFlex e190 UL Certificate

[3AXD10001229164](#)

[3AXD10001229165](#)

[3AXD10001251067](#)

Option manuals and guides

OPT-MF-200 Encoder Breakout Quick installation guide

OPT-MF-201 Resolver Adapter Quick installation guide

OPT-SIO-1 Option Card User's manual

OPT-SIO-1 Option Card Quick installation guide

[3AXD10000692233](#)

[3AXD10000688314](#)

[3AXD50000351336](#)

[3AXD50000296361](#)

You can find manuals and other product documents in PDF format on the Internet. See section [Document library on the Internet](#) on the inside of the back cover. For manuals not available in the Document library, contact your local ABB representative.

Quick installation guide - MicroFlex e190

Introduction

This guide contains the information about the mechanical and electrical installation of the MicroFlex e190 drive module. For complete documentation see the MicroFlex e190 User's Manual (code: 3AXD50000037326).

Safety instructions



WARNING! All electrical installation and maintenance work on the drive should be carried out by qualified electricians only.



WARNING! Obey the safety instructions. If you ignore them, injury or death, or damage to the equipment can occur.



WARNING! Operation of this equipment requires detailed installation and operation instructions provided in the Installation/Operation manual intended for use with this product. It should be retained with this device at all times.

Never work on the drive, the braking chopper circuit, the motor cable or the motor when input power is applied to the drive. After disconnecting input power, always wait for 5 minutes to let the intermediate circuit capacitors discharge before you start working on the drive, control cabling, motor or motor cable. Even when input power is not applied to the drive, externally supplied control circuits may carry dangerous voltages. Always

ensure by measuring that no voltage is actually present.

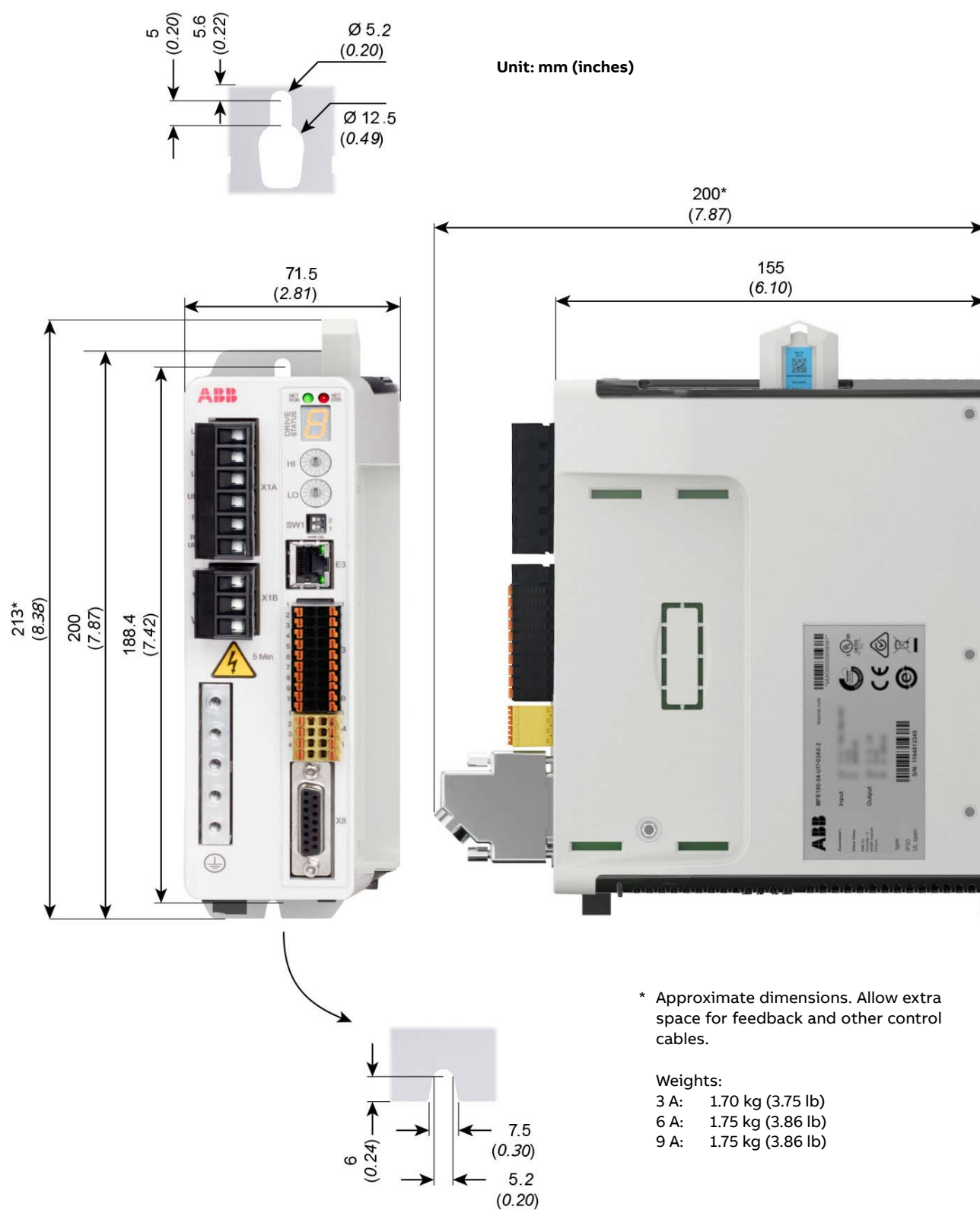
- A rotating permanent magnet motor can generate a dangerous voltage. Lock the motor shaft mechanically before connecting a permanent magnet motor to the drive, and before doing any work on a drive system connected to a permanent magnet motor.
- The MicroFlex e190 is an IP20 (open type) drive to be used in a heated, indoor controlled environment. The drive must be installed in clean air according to enclosure classification. Cooling air must be clean, free from corrosive materials and electrically conductive dust. See the User's Manual for detailed specifications.
- The MicroFlex e190 must be installed where the pollution degree according to UL and EN 61800-5-1 shall not exceed 2.
- The maximum ambient air temperature is 55 °C (131 °F) at rated current. No current derating is required.
- The drive is suitable for use in a circuit capable of delivering not more than 5,000A (rms) symmetrical amperes, 240 V maximum, when protected by fuses rated max. 20 A.
- The cables located within the motor circuit must be rated for at least 75 °C (167 °F) in UL-compliant installations.
- Use copper wiring only.
- The input cable must be protected with fuses. Suitable gG (IEC) and CC (UL) fuses are listed in the Technical data section of the MicroFlex e190 User's Manual.
- Integral solid state short circuit protection does not provide branch circuit protection. For installation in the United States, branch circuit protection must be provided in accordance with the National Electrical Code (NEC) and any applicable local codes. To fulfill this requirement, use the UL classified fuses.

- For installation in Canada, branch circuit protection must be provided in accordance with Canadian Electrical Code and any applicable provincial codes. To fulfill this requirement, use the UL classified fuses.
- For use in Canada: Transient surge suppression shall be installed on the line side of this equipment and shall be rated 240 V (phase to ground), 240 V (phase to phase), suitable for overvoltage category III, and shall provide protection for a rated impulse withstand voltage peak of 2.5 kV.
- The drive provides overload protection in accordance with the National Electrical Code (NEC). See the User's Manual for overload protection settings.
- The drive can provide an overload current of 300% of rated current for a maximum of 3 s. See User's Manual.
- The drive must be installed within an area which does not allow unauthorized access, such as a cabinet with a lock or that is accessible only by a special tool.
- The communication cables between the drive and other devices must be connected within an area which does not allow unauthorized access, such as a cabinet with a lock or that is accessible only by a special tool.
- It is recommended to use ABB specified communication cables in accordance with CE and UL safety requirements.
- The memory unit can be fixed on the drive securely with the supplied screw for safety. It is not allowed to remove and insert the memory unit while the drive is running.
- The memory unit's installation slot is designed for the memory unit matching the same drives type only, other modules cannot be inserted.

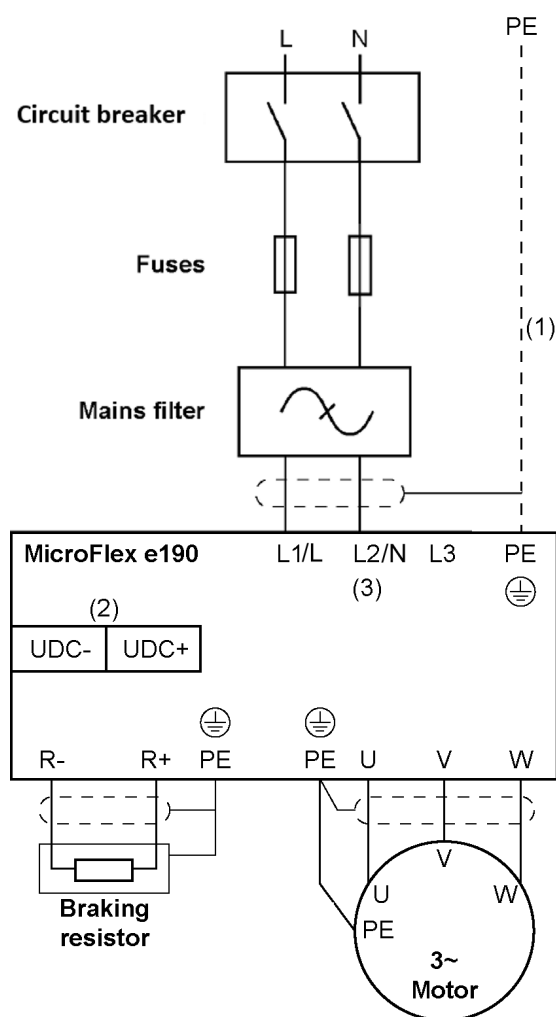
Mechanical installation

Fasten the drive module to the mounting surface using screws through the two mounting holes.

Dimensions



Electrical installation



Notes:

(1) If shielded supply cable is used, and the conductivity of the shield is less than 50% of the conductivity of a phase conductor, use a cable with a ground conductor or a separate PE cable.

(2) MicroFlex e190 can be powered from a DC supply. See User's Manual.

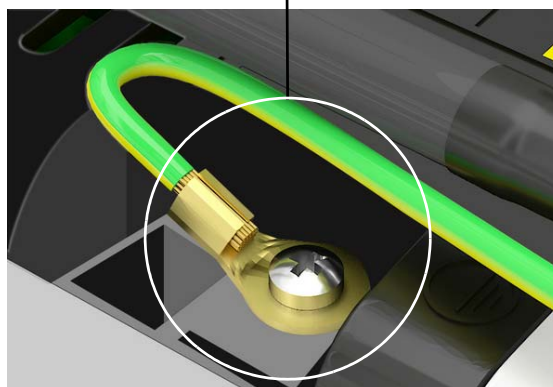
(3) AC supply, 1-phase **200...240 V** or 3-phase **200...240 V** phase-to-phase ($\pm 10\%$).

Power cabling: input

- Attach the included terminal blocks to the drive.
- Connect the supply, resistor (if present) and motor cables to the appropriate terminals of the drive.
- Strip the power cables so that the shields are bare at the cable clamps.



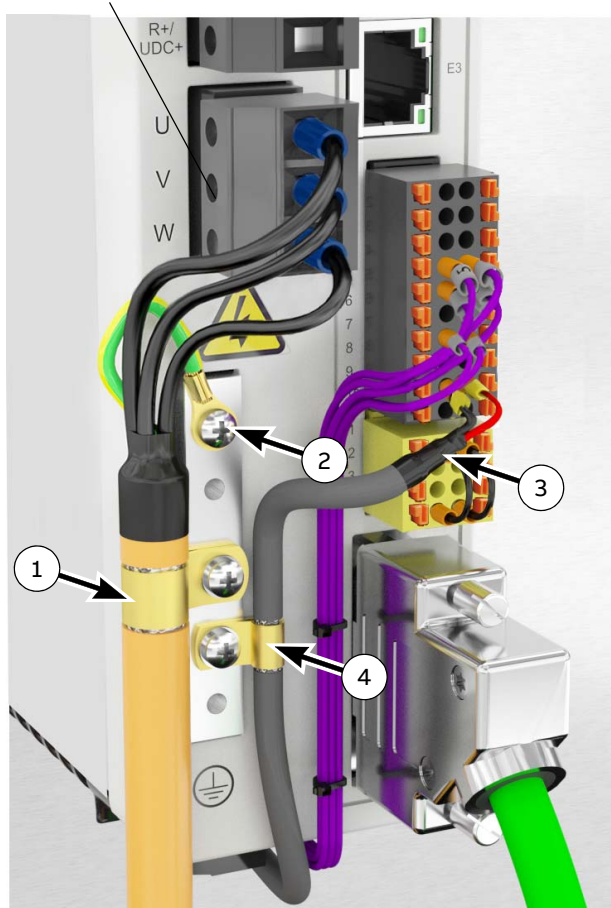
0.5...0.6 N·m
(4.4...5.3 lbf·in)



Power cabling: motor output

Ground the motor cable shield.

0.5...0.6 N·m
(4.4...5.3 lbf·in)

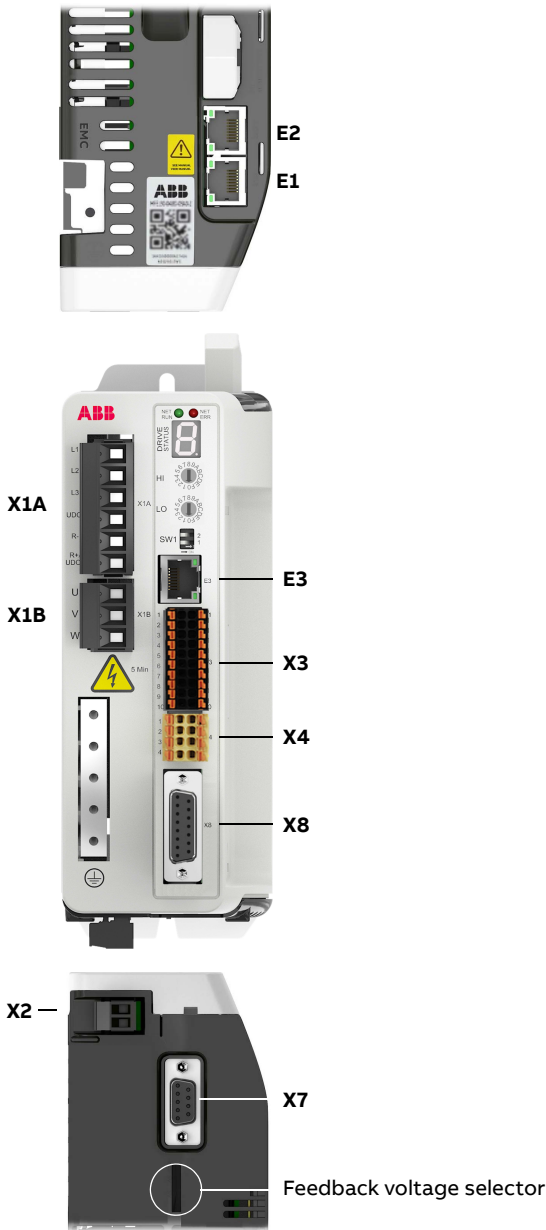


- ① Cable clamp on bare shield.
- ② PE/Ground connection.

Control cabling

- ③ Use shrink tubing or tape to contain strands.
- ④ Remove outer jacket of cable at clamp to expose cable screen.

Connectors



Wire sizes and tightening torques:

X1A: Dinkle EC762V-B3253206P-BK

X1B: Dinkle EC762V-B3253203P-BK

0.2...6.0 mm² (30*...10 AWG)

* Minimum size for UL installations is 14 AWG.

Torque: 0.7 N·m (6.2 lbf·in)

X2: Phoenix Contact MVSTBR 2,5HC/ 2-ST-5,08

0.2...2.5 mm² (24...12 AWG)

Torque: 0.6 N·m (5.3 lbf·in)

X3, X4: Weidmüller B2L 3.50/20/180,

Weidmüller B2L 3.50/8/180

0.2...1.0 mm² (28...16 AWG)

Note:

The wiring shown is for demonstrative purposes only. Complete information for all connectors, including X7 and X8, is provided in MicroFlex e190 User's Manual.

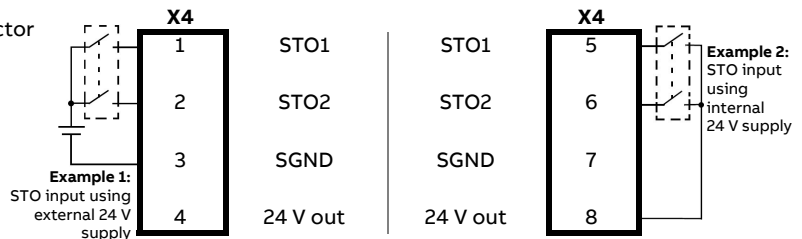
		E1/E2
EtherCAT, PROFINET or Ethernet POWERLINK	IN	E2
	OUT	E1

		X1A
AC input 200...240 V AC ±10%	L1	1
	L2	2
	L3	3
DC bus-	UDC-	4
Brake res.-	R-	5
DC bus+ / Brake res.+	R+/UDC+	6

		X1B
Motor output	U	1
	V	2
	W	3

		E3
Ethernet host (PC)		1

		X3	X3
1	DO0-	DO0+	11
2	DO2-	DO2+	12
3	DO1-	DO1+	13
4	DI2-	DI2+	14
5	DI3-	DI3+	15
6	DI1-	DI1+	16
7	DI0-	DI0+	17
8	AGND	AO0	18
9	AI0-	AI0+	19
10	Shield	Shield	20



STO1 inputs (Pin 1 and Pin 5) are inner-connected, and STO2 inputs (Pin 2 and Pin 6) are inner-connected, easy to cascade.

Note: The wiring above is an example only, see STO section of the User's Manual for detailed information.

		X2
(Optional) External power input: 24 V, 1 A	0 V	1
	+24 V IN	2

E1 / E2: Ethernet port configuration

The rotary switches are read once at start-up. The switches select the mode of operation for the E1 and E2 Ethernet fieldbus connectors on the top panel of the drive.

	Value	Mode
HI	00	EtherCAT slave mode
	01-EF	Ethernet POWERLINK CN mode: selected value is the node ID
LO	F0-F1	Reserved
	F2*	PROFINET slave mode
	F3-FF	Reserved

*Dual port PROFINET within E1/E2 only

SW1: Mode and IP address selection

The linear switches are read once at start-up. The switch 2 selects the mode of operation for the drive. The switch 1 selects IP address assignment for the E3 host port.

Switch	OFF	ON
2	Normal operation	Recovery mode
	1	Normal IP configuration
1	Normal IP configuration	Fixed IP address (192.168.0.1)

X7: Incremental encoder in / out

The secondary incremental encoder input/output connection provides A/B channels and a Z index channel.

Pin 1		
1	CHA+	6 CHA-
2	CHB+	7 CHB-
3	CHZ+	8 CHZ-
4	(NC)	9 +5 V out
5	GND	

X8: Motor feedback in

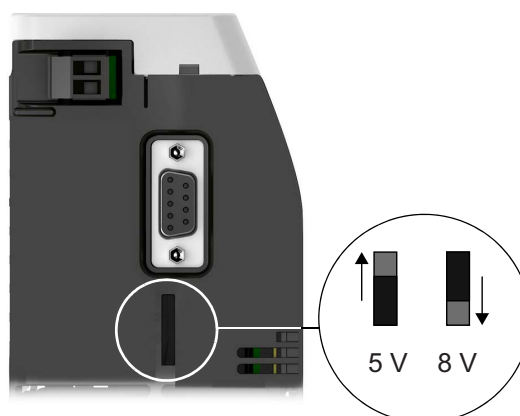
Universal encoder interface.

Pin 1	Smart Abs	
1	Data+	9 Data-
2	(NC)	10 (NC)
3	(NC)	11 (NC)
4	(NC)	12 +5.5 V out
5	(NC)	13 GND
6	(NC)	14 (NC)
7	(NC)	15 (NC)
8	(NC)	

More connections, see User's Manual.

Feedback supply voltage

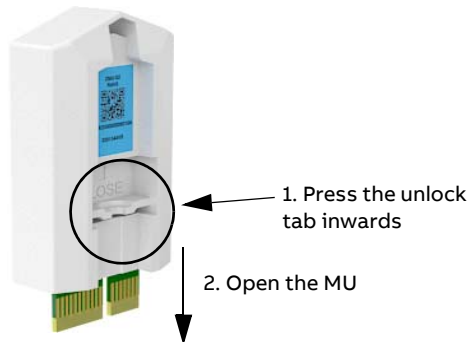
The selector sets the supply output voltage on feedback connector X8, Pin 12. Check that the correct output voltage is selected. Most feedback devices require 5 V (default), but some Hiperface devices require 8 V.



Memory unit (MU)

The MU is an essential part of the drive and must always be fitted. It is not designed for frequent removal and insertion.

- Open the MU:

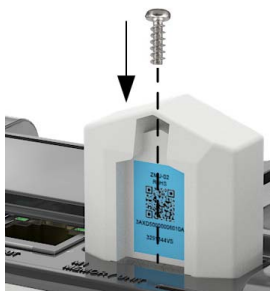


- Insert the MU:



It is recommended to tighten the screw in a vibration environment. The screw is supplied in the drive's installation pack.

Fasten the screw with a PH1 screwdriver. Max. torque: 0.1 N·m.



User's manual

Continue with drive start-up according to the instructions in MicroFlex e190 User's Manual.

快速安装指南 — MicroFlex e190

简介

本指南介绍了有关 MicroFlex e190 伺服驱动器的机械和电气安装的基本信息。更多信息请参见 MicroFlex e190 用户手册（代码：3AXD50000225217 [中文]）。

安全须知



警告! 只有具备资质的电气工程师才可以对伺服驱动器进行安装和维护。



警告! 遵守安全须知，否则可能会导致人身伤害或死亡，或设备损坏。



警告! 操作伺服驱动器时需严格遵守安装和操作说明。须始终将该手册与设备保存在一起。

不能对带电的伺服驱动器、制动电路、电机或电缆进行任何操作。断开电源之后，对伺服驱动器、电机或电缆进行操作之前，必须至少等待 5 分钟使电容器放电完毕。即使伺服驱动器的输入电源已经切断，仍然可能存在危险电压。在开始工作之前，用电压表确认伺服驱动器已经放电完毕。

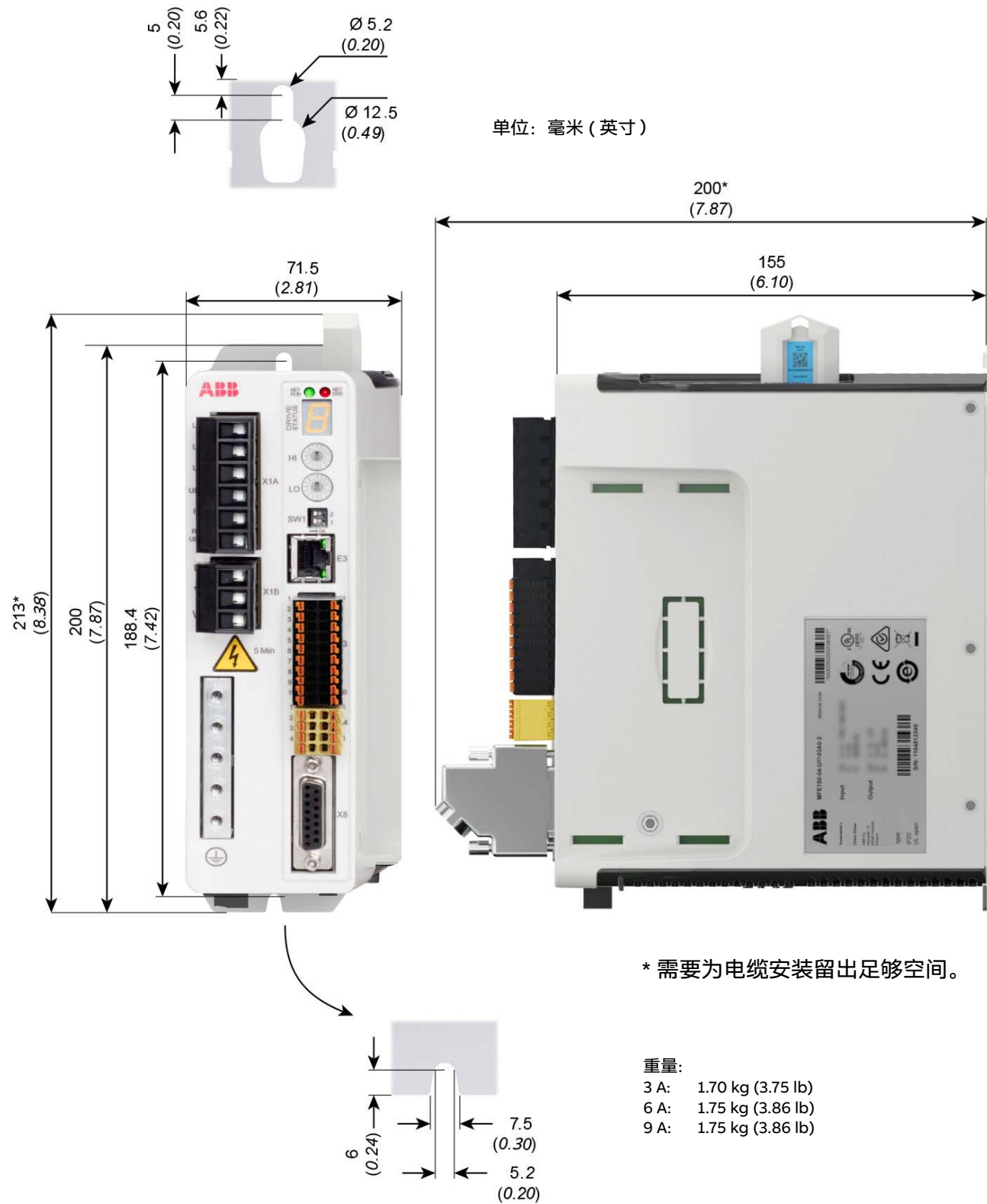
- 旋转的永磁电机可以产生危险的电压。在对永磁电机进行任何操作之前，需将电机轴机械锁死。
- MicroFlex e190 防护等级 IP20（开放式），用于室内，必须安装在符合要求的环境中。冷却空气必须干净，并且没有腐蚀性气体和导电灰尘。详细说明参见用户手册。
- MicroFlex e190 安装地点的污染等级不能高于 UL/EN 61800-5-1 等级 2 级。
- 最高环境温度：55 °C (131 °F) 额定电流。

- 在有最大额定电流为 20 A 的熔断器保护的情况下，驱动器可用于对称电流不超过 5000 A (rms)、最大电压不超过 240 V 的电源电路。
- 为满足 UL，电机附近电缆的温度等级至少需要 75 °C (167 °F)。
- 只能使用铜线。
- 供电输入电缆必须有熔断器保护。符合 gG (IEC) 和 CC (UL) 的熔断器在用户手册的技术数据一章列出。
- 固态短路保护装置不具备支路保护功能。对于美国用户，按照美国国家电气法规 (NEC) 和地方法规，必须提供支路保护设备。为了满足这些要求，请使用 UL 认证的熔断器。
- 对于加拿大的用户，按照加拿大电气法规和各省法规，必须提供支路保护设备。为了满足这些要求，请使用 UL 认证的熔断器。
- 在加拿大使用，应在设备的进线侧安装过电压类别 III，且能够为峰值 2.5 kV 的额定冲击耐受电压提供保护的瞬态电压浪涌抑制器，额定电压 240 V（相对地 / 相间）。
- 伺服驱动器支持符合美国国家电气法规 (NEC) 的过载保护功能。关于过载保护设置的信息请参见用户手册。
- 伺服驱动器 300% 电流过载时间不能超过 3 秒。参见用户手册。
- 伺服驱动器必须安装在受控区域内，如带锁的机柜。
- 通信电缆的连接必须在受控区域内，如带锁的机柜。
- 推荐使用 ABB 指定的符合 CE 和 UL 安全要求的通信电缆。
- 安全起见，可用螺钉将存储单元固定在伺服驱动器上。禁止带电插拔存储单元。
- 伺服驱动器的存储单元安装槽专为存储单元设计，不得插入其他设备。

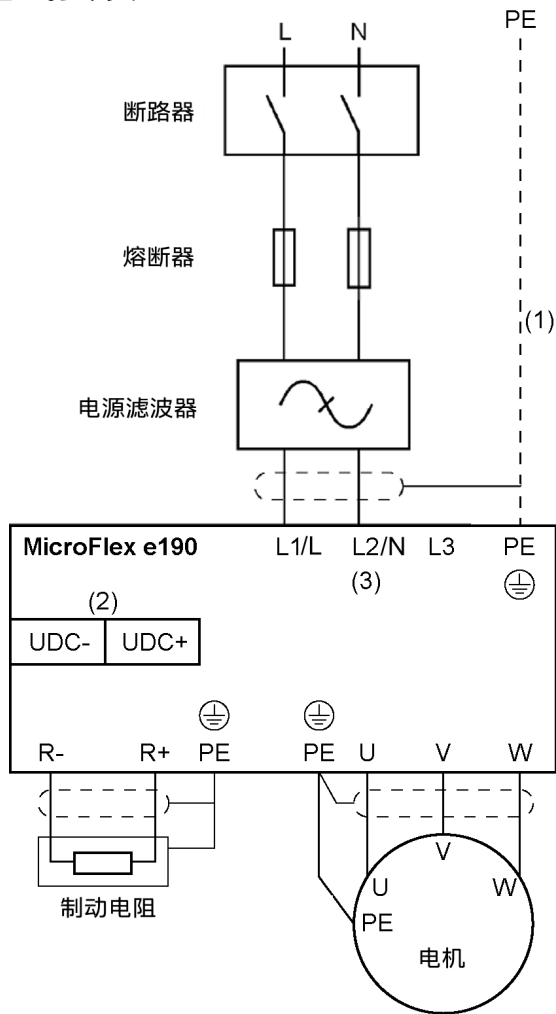
机械安装

用螺钉将伺服驱动器固定到安装背板上。

尺寸



电气安装



说明:

(1) 如果电缆屏蔽层的导电面积低于相线导电面积的 50%，请使用带有接地线的电缆或者单独的 PE 导线。

(2) MicroFlex e190 可通过直流电源供电，详情参见用户手册。

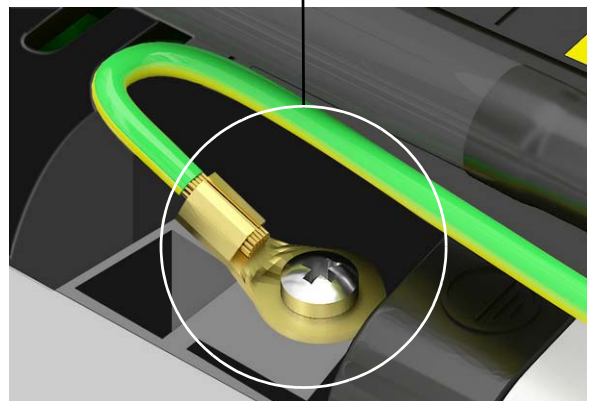
(3) 交流供电，单相或三相 200 ~ 240 V ($\pm 10\%$)。

动力电缆：供电

- 将随附的端子安装到伺服驱动器。
- 将供电输入电缆、制动电阻电缆（如有）和电机输出电缆连接到伺服驱动器相应的端子上。
- 剥开动力电缆，露出屏蔽层，将屏蔽层固定在 P 型夹上。



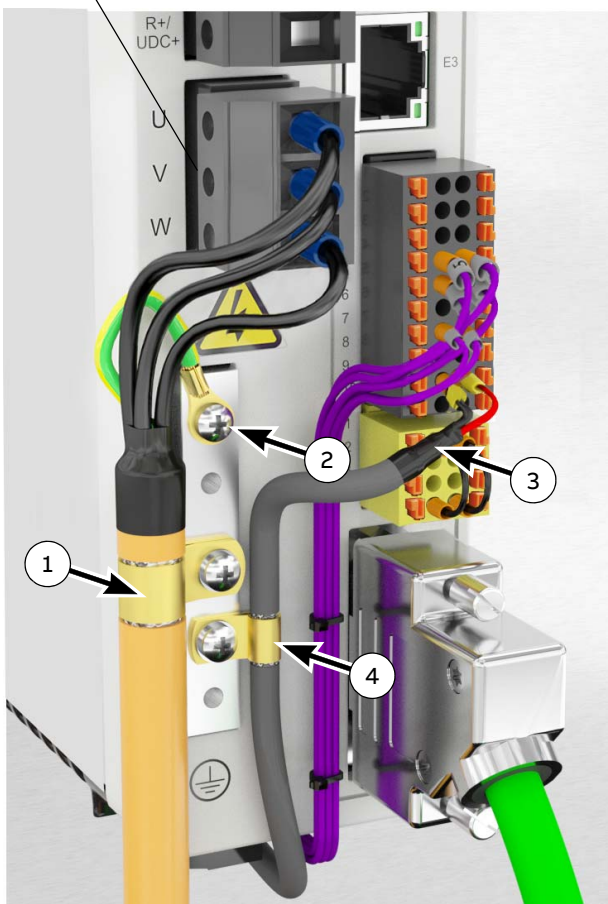
0.5 ~ 0.6 N·m
(4.4 ~ 5.3 lbf·in)



动力电缆：电机输出

将电机电缆屏蔽层接地。

0.5 ~ 0.6 N·m
(4.4 ~ 5.3 lbf·in)

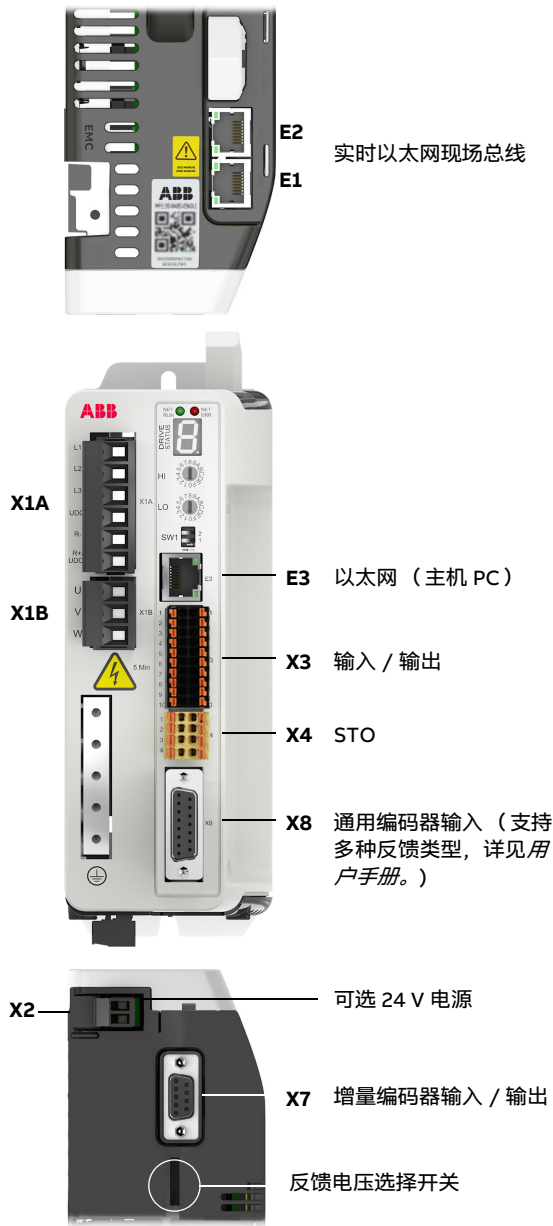


- ① 剥开电缆外皮，用 P 型夹将屏蔽层连接到接地排。
- ② PE 接地。

控制电缆连接

- ③ 使用热缩管或绝缘套管包住电缆末端。
- ④ 剥开电缆外皮，用 P 型夹将屏蔽层连接到接地排。

连接器



电缆规格和紧固力矩:

X1A: Dinkle EC762V-B3253206P-BK

X1B: Dinkle EC762V-B3253203P-BK

0.2 ~ 6.0 mm² (30* ~ 10 AWG)

* UL 要求最小为 14 AWG。

力矩: 0.7 N·m (6.2 lbf·in)

X2: Phoenix Contact MVSTBR 2,5HC/ 2-ST-5,08

0.2 ~ 2.5 mm² (24 ~ 12 AWG)

力矩: 0.6 N·m (5.3 lbf·in)

X3, X4: Weidmüller B2L 3.50/20/180,
Weidmüller B2L 3.50/8/180

0.2 ~ 1.0 mm² (28 ~ 16 AWG)

说明: 接线图仅为示例。连接器 (包括 X7 和 X8) 的信息参见 *MicroFlex e190 用户手册*。

E1/E2		
EtherCAT, PROFINET 或 Ethernet POWERLINK	输入	E2
	输出	E1

X1A		
200 ~ 240 V AC $\pm 10\%$ 输入	L1	1
	L2	2
	L3	3
直流母线 -	UDC-	4
制动电阻 -	R-	5
直流母线 + / 制动电阻 +	R+ / UDC+	6

X1B		
电机输出	U	1
	V	2
	W	3

E3		
以太网 (主机 PC)		1

X3		X3	
1	DO0-	DO0+	11
2	DO2-	DO2+	12
3	DO1-	DO1+	13
4	DI2-	DI2+	14
5	DI3-	DI3+	15
6	DI1-	DI1+	16
7	DI0-	DI0+	17
8	模拟地	AO0	18
9	AI0-	AI0+	19
10	屏蔽	屏蔽	20



STO1 接口 (Pin 1 和 Pin 5) 内部短接, STO2 接口 (Pin 2 和 Pin 6) 内部短接, 便于级联。

说明: 接线图仅为示例, STO 的详细接线信息参见 *MicroFlex e190 用户手册*。

X2		
(可选) 外部电源输入: 24 V, 1 A	0 V	1
	+24 V 输入	2

E1 / E2: 以太网端口配置


仅在启动时读取地址开关状态。选择驱动器顶部的以太网现场总线接口 E1 和 E2 的操作模式。

	值	模式
HI	00	EtherCAT 从站模式
	01-EF	Ethernet POWERLINK CN 模式: 所选值为节点编号
LO	F0-F1	保留
	F2*	PROFINET 从站模式
	F3-FF	保留

*E1 / E2 端口 PROFINET 通信


SW1: 运行模式和 IP 地址选择开关

仅在启动时读取拨码开关状态。开关2选择伺服驱动器的运行模式。开关1选择以太网主机端口 E3的IP地址设置方式。

开关	OFF	ON
	2 正常运行模式	恢复模式
	1 配置 IP 地址	固定 IP 地址 (192.168.0.1)


X7: 增量编码器输入 / 输出

辅助增量编码器输入 / 输出连接提供 A/B/Z 通道。

引脚 1		
	1 CHA+	6 CHA-
	2 CHB+	7 CHB-
	3 CHZ+	8 CHZ-
	4 (NC)	9 +5 V out
	5 GND	

X8: 电机编码器输入

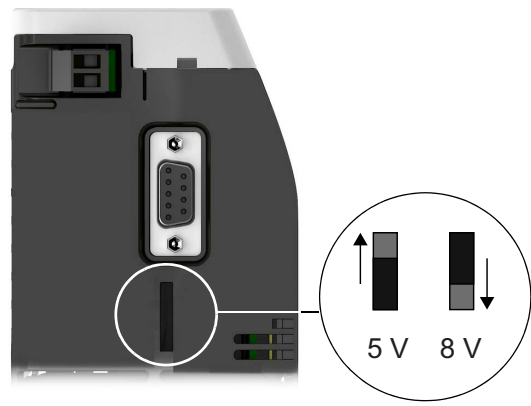
电机通用编码器反馈输入。

引脚 1	Smart Abs	
	1 Data+	9 Data-
	2 (NC)	10 (NC)
	3 (NC)	11 (NC)
	4 (NC)	12 +5.5 V out
	5 (NC)	13 GND
	6 (NC)	14 (NC)
	7 (NC)	15 (NC)
	8 (NC)	

更多连接，参见 *MicroFlex e190 用户手册*。

编码器电源电压

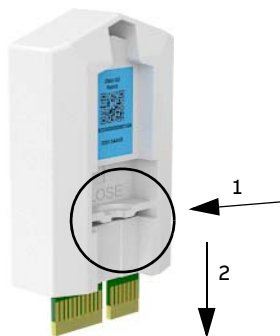
驱动器底部的选择开关用于设置连接器 X8 引脚 12 上的输出电压。多数反馈装置需要 5 V 供电，但是 Hiperface 装置需要 8 V。



存储单元

存储单元为驱动器的基本部件，必须始终配备。
禁止带电插拔。

- 打开存储单元：

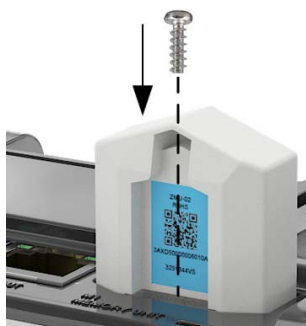


- 插入存储单元：



振动环境中，建议将存储单元用螺钉固定在驱动器上。螺钉在随附的安装包中。

使用 PH1 螺丝刀，最大扭矩 0.1 N·m。



用户手册

按照 *MicroFlex e190 用户手册* 的说明继续操作驱动器。

Note



Further information

Product and service inquiries

Address any inquiries about the product to your local ABB representative, quoting the type designation and serial number of the unit in question.

Product training

For information on ABB product training, navigate to new.abb.com/service/training.

Providing feedback on ABB Drives manuals

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