

Quick installation guide MicroFlex e190 servo drive



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List of related manuals in English

Drive hardware manuals and guides

Code (English)

MicroFlex e190 User's manual

[3AXD50000037326](#)

MicroFlex e190 Wall chart

[3AXD50000037323](#)

Certificates

MicroFlex e190 & OPT-SIO-1 EU Single Declaration of Conformity

[3AXD10000540159](#)

MicroFlex e190 STO (TÜV) Certificate

[3AXD10000540318](#)

MicroFlex e190 UL Certificate

[3AXD10000540319](#)

Option manuals and guides

OPT-MF-200 Encoder Breakout Quick installation guide

[3AXD10000692233](#)

OPT-MF-201 Resolver Adapter Quick installation guide

[3AXD10000688314](#)

OPT-SIO-1 Option Card User's manual*

[3AXD50000351336](#)

OPT-SIO-1 Option Card Quick installation guide

[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.

* MicroFlex e190 firmware build version that supports the option card: Build 5900.4.0 and later.

3AXD50000037325 Rev D

MUL

EFFECTIVE: 2020-03-06

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Quick installation guide - MicroFlex e190

Introduction

This guide contains the very basic 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 [English]).

Safety instructions



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



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. A hard copy of this information may be ordered at +358 10 22 11 or your local ABB sales office.

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.

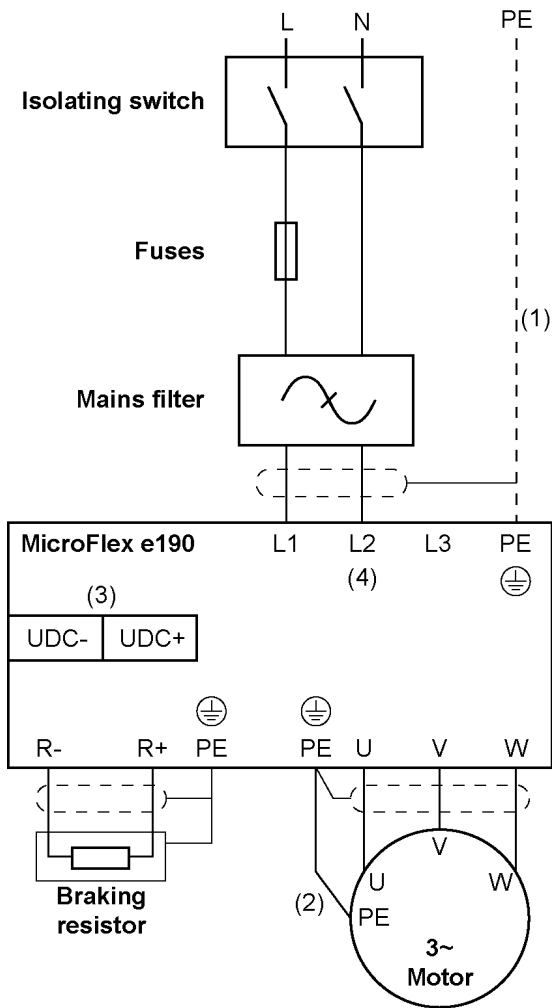
- A rotating permanent magnet motor can generate a dangerous voltage. Lock the motor shaft mechanically before connecting a permanent magnet motor to the drive, and before doing any work on a drive system connected to a permanent magnet motor.
- The MicroFlex e190 is an IP20 (UL open type) drive to be 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:
1.6 A model: 45 °C (113 °F) at rated current. The current is derated for 45 to 50 °C (113 to 122 °F). See user's manual.
3 A - 9 A models: 55 °C (131 °F) at rated current. No current derating is required.
- Motor overtemperature sensing is not provided by the drive.
- The drive is suitable for use in a circuit capable of delivering not more than 5,000 rms symmetrical amperes, 240 V maximum, when protected by CC class 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 75 °C copper wiring only.
- The input cable must be protected with fuses. Suitable IEC (class gG) and UL (class CC) 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 manual.

Mechanical installation

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

Electrical installation



Notes:

(1) If shielded supply (input) 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) For motor cabling, use a separate ground cable if the conductivity of the motor cable shield is less than 50% of that of a phase conductor and the cable has no symmetrical ground conductors.

(3) MicroFlex e190 can be powered from a DC supply. See user's manual.

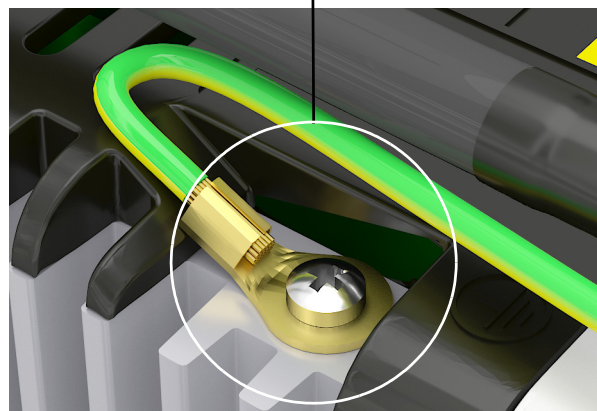
(4) AC supply, 1-phase **200...240 V** or 3-phase **200...240 V** phase-to-phase ($\pm 10\%$).

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.



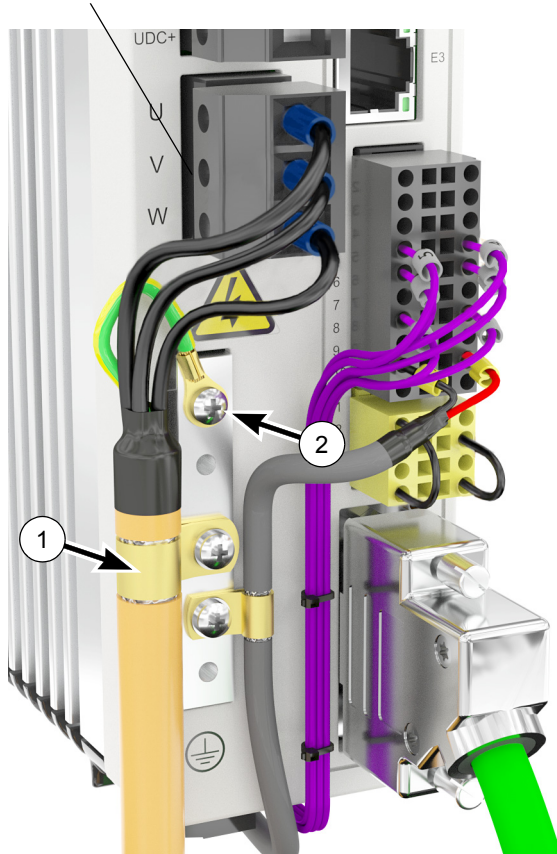
0.5...0.6 N·m
(4.4...5.3 lbf·in)



Power cabling: motor output

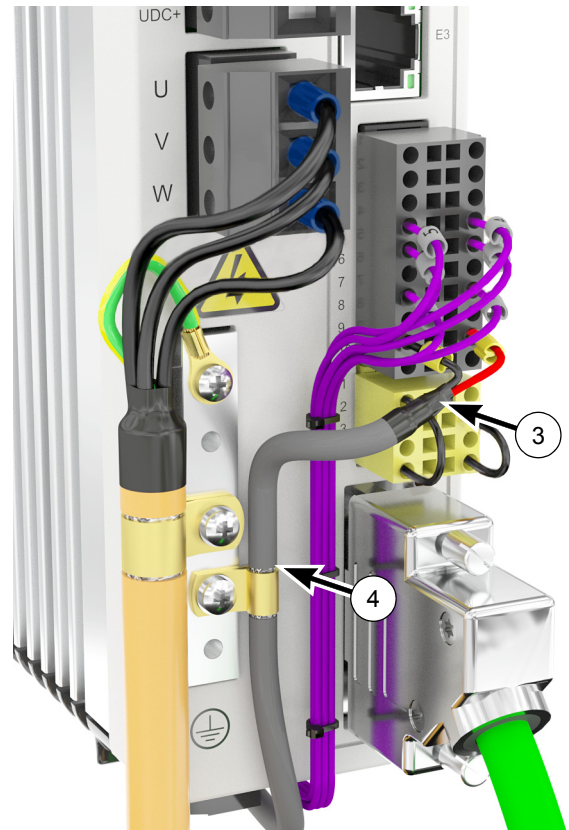
Ground the motor cable shield.

0.5...0.6 N·m
(4.4...5.3 lbf·in)



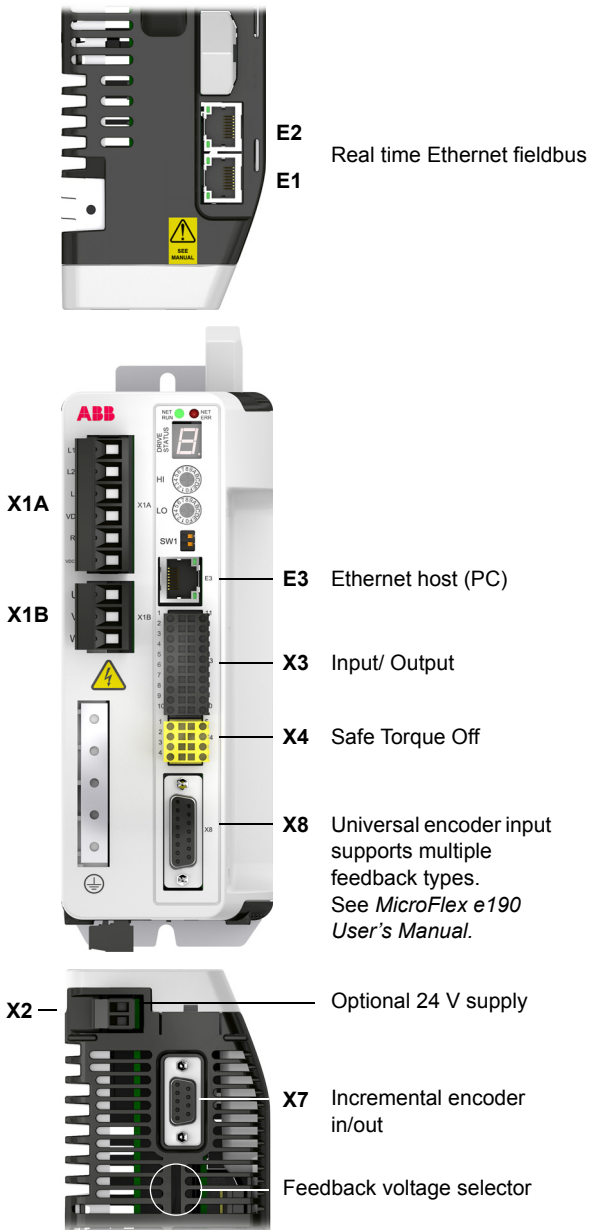
- ① Cable clamp on bare shield.
- ② PE/Ground connection.

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)

Notes:

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* (code: 3AXD500000373236).

E1/E2		
EtherCAT or Ethernet POWERLINK	IN	E2
	OUT	E1
X1A		
200...240 V AC ±10% input	L1	1
	L2	2
	L3	3
DC bus-	UDC-	4
Brake resistor	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

X4		X4	
1	STO1	STO1	5
2	STO2	STO2	6
3	SGND	SGND	7
4	24 V out	24 V out	8

Example: STO input using external 24 V supply

Example: STO input using internal 24 V supply

Safe Torque Off: Both circuits must be closed for the drive to start.

All connections are duplicated for easy wiring.

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-FF	Reserved

X8: Motor feedback in

The primary incremental encoder input connection provides A/B/Z channels and Hall signals.

Pin 1	1	CHA+	9	CHA-
	2	CHB+	10	CHB-
	3	CHZ+	11	CHZ-
	4	(NC)	12	+5.5V
	5	Hall U-	13	GND
	6	Hall U+	14	Hall W-
	7	Hall V-	15	Hall W+
	8	Hall V+		

More connections for serial interfaces and extra incremental encoder, see *MicroFlex e190 User's Manual*.

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	Fixed IP address 192.168.0.1

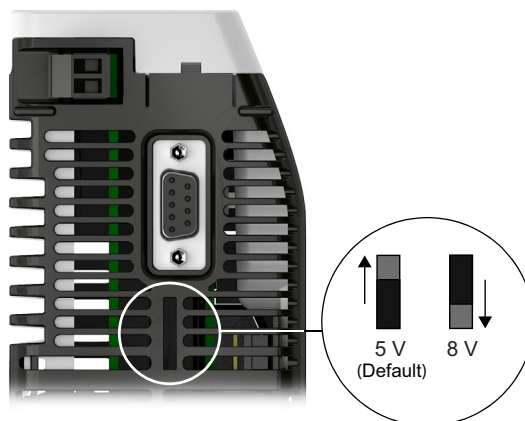
Feedback supply voltage

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.

X7: Incremental encoder in / out

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

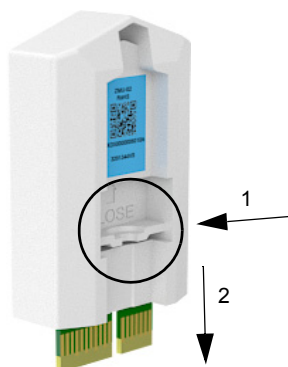
Pin 1	1	CHA+	6	CHA-
	2	CHB+	7	CHB-
	3	CHZ+	8	CHZ-
	4	(NC)	9	(NC)
	5	GND		



Memory unit

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

- Open the memory unit:



- Insert the memory unit:



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 伺服驱动器模块的机械和电气安装的基本信息。完整文档请参见 *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! 操作该设备时需严格遵守安装和操作说明。需始终将该手册与设备保存在一起。如需相关信息的纸面文档，可通过拨打 +358 10 22 11 订购，也可从您当地的 ABB 营业部获取。

不能对带电的伺服驱动器、制动斩波电路、电机电缆或电机进行任何操作。断开电源之后，对伺服驱动器、控制电缆连接、电机或电机电缆进行操作之前，必须至少等待 5 分钟使中间电路电容器放电完毕。即使伺服驱动器的输入电源已经切断，外部控制电路仍然可能将危险电压引入伺服驱动器。在开始工作之前，始终用电压表确认伺服驱动器已经放电完毕。

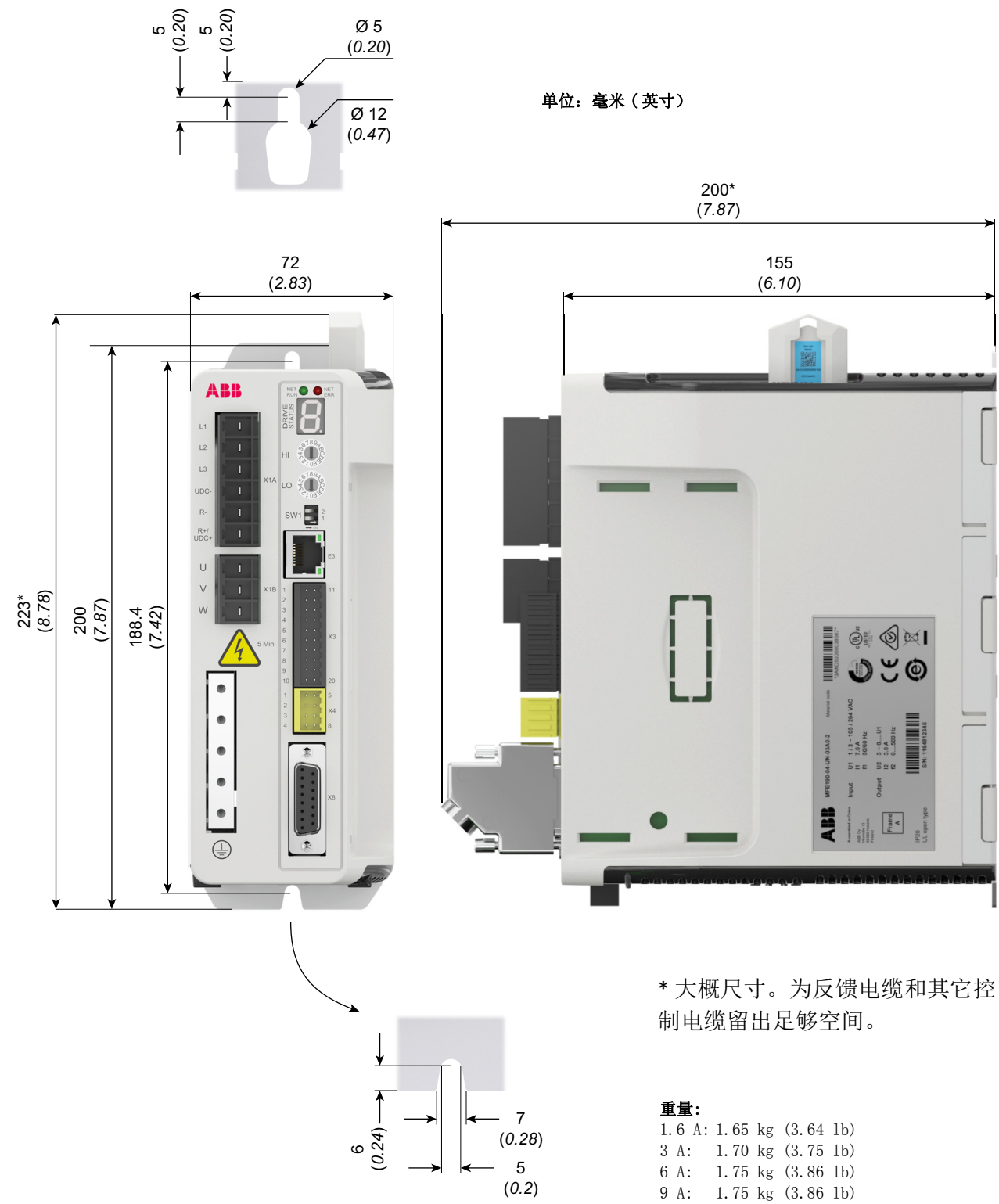
- 旋转的永磁电机可以产生危险的电压。在永磁电机与伺服驱动器连接之前，以及在伺服驱动器系统连接到永磁电机时，对其进行任何操作之前，将电机轴机械锁死。
- MicroFlex e190 是 IP20（UL 开放式）防护等级的伺服驱动器，用于加热的环境可控的室内。变频器必须安装在符合要求的清洁环境中。冷却空气必须干净，并且没有腐蚀性气体和导电灰尘。详细说明请参见 *用户手册*。
- MicroFlex e190 安装地点的污染等级必须符合 UL 和 EN 61800-5-1 标准，不能超过 2。

- 最高环境温度为：
1.6 A 型：额定电流时为 45°C (113°F)。在 45 至 50°C (113 至 122°F) 温度下，电流降容。参见用户手册。
3 A-9 A 型：额定电流时为 55 °C (131 °F)。不需要电流降额。
- 该驱动器未配备电机过温传感装置。
- 在有额定最大电流为 20A 的 CC 级保险丝保护的情况下，该驱动器适用于能够提供对称电流不超过 5000rms、最大电压不超过 240V 的电路。
- 遵照 UL 认证的安装要求，位于电机电路内部的电缆在至少 75°C (167°F) 时降容。
- 只可使用 75°C (167°F) 的铜线。
- 输入电缆必须有熔断器保护。符合 IEC（等级 gG）和 UL（CC 级）的熔断器在 *MicroFlex e190 用户手册的技术数据* 一章列出。
- 集成式固态短路保护装置不具备支路保护功能。对于美国用户，按照国家电气法规（NEC）和地方法规的要求，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的要求，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：应在设备的线路端安装瞬态电压浪涌抑制器，额定电压应为 240V（对地），240V（相间），适用于过电压类别 III，且能够为峰值为 2.5kV 的额定冲击耐受电压提供保护。
- 伺服驱动器提供符合国家电气法规（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*。
- 该驱动器能够提供额定电流 3 倍的过载电流的时间不超过 3 秒。参见 *用户手册*。

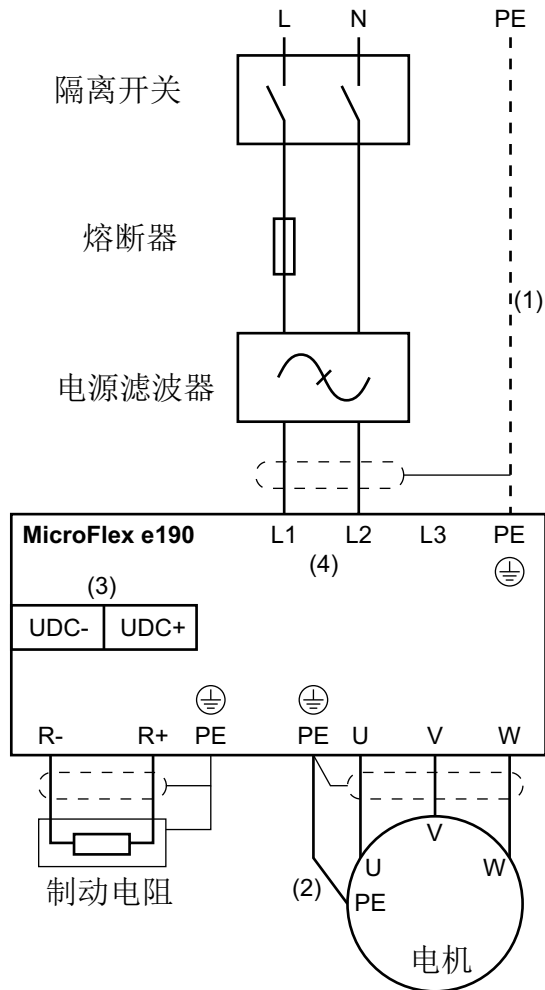
机械安装

用螺丝通过两个安装点将伺服驱动器模块固定到安装座上。

尺寸



电气安装

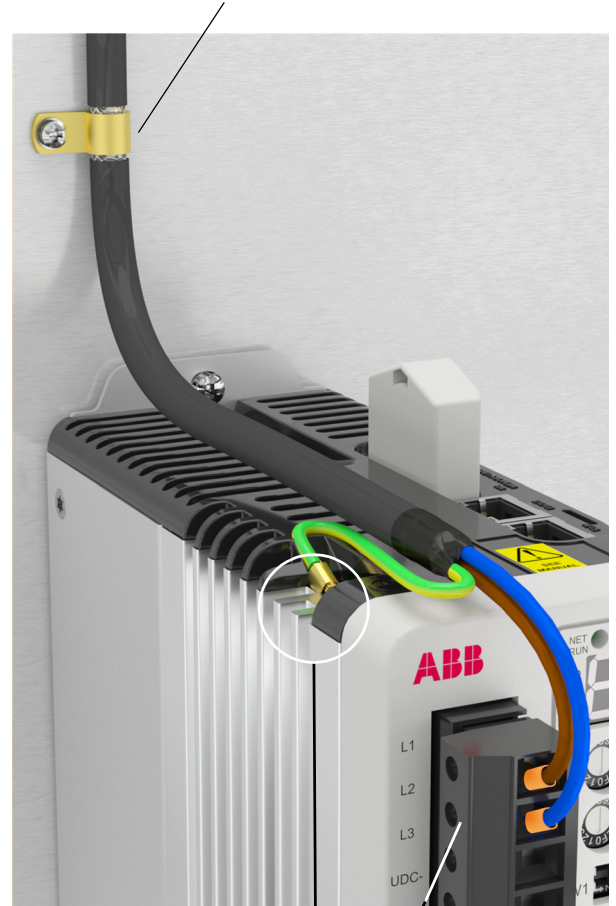


注意:

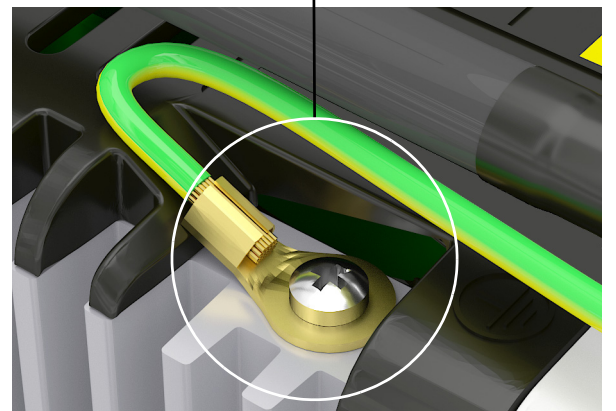
- (1) 如果使用了输入屏蔽电缆，并且屏蔽层的导电率低于相导体导电率的 50%，那么请使用带有接地导体或者单独 PE 导体的电缆。
- (2) 对于电机电缆，如果电缆屏蔽层的导电率低于相导体导电率的 50% 并且没有对称的接地导体，那么必须使用单独的地线电缆。
- (3) MicroFlex e190 可通过直流电源供电。参见用户手册。
- (4) 交流供电，单相或三相 200... 240V (±10%)。

动力电缆：输入

- 将随附的端子块连接到伺服驱动器。
- 将电源电缆、电阻电缆（如有）和电机电缆连接到伺服驱动器相应的端子上。
- 剥开动力电缆，使其屏蔽层裸露在电缆固定夹上。

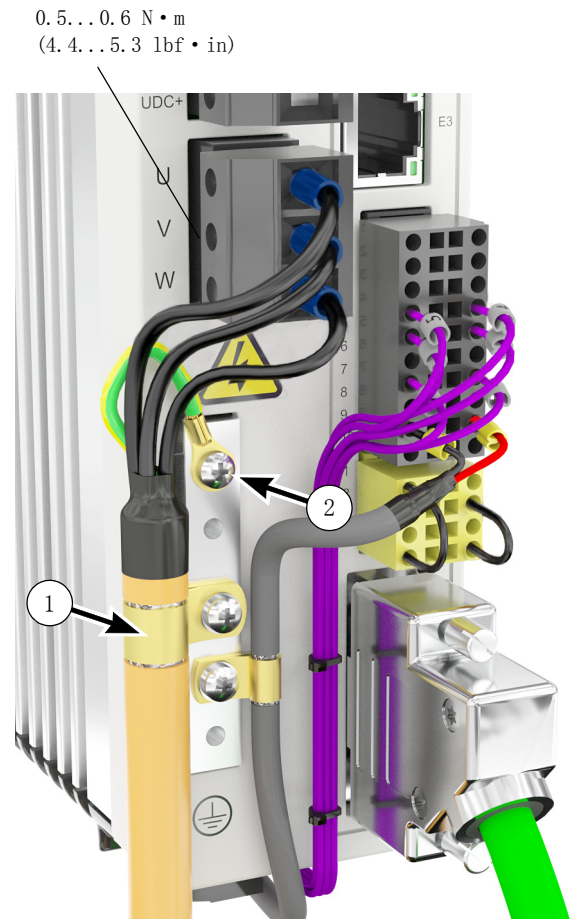


0.5 ... 0.6 N · m
(4.4 ... 5.3 lbf · in)



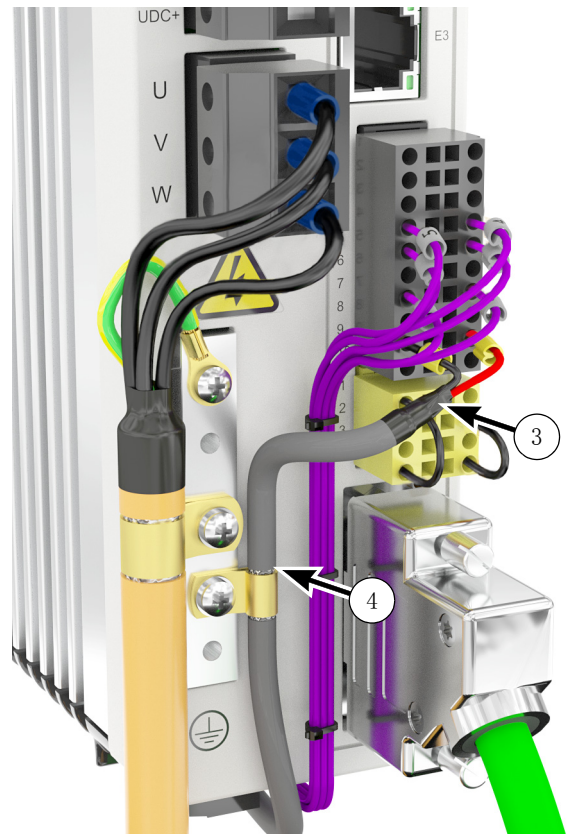
动力电缆：电机输出

将电机电缆屏蔽层接地。



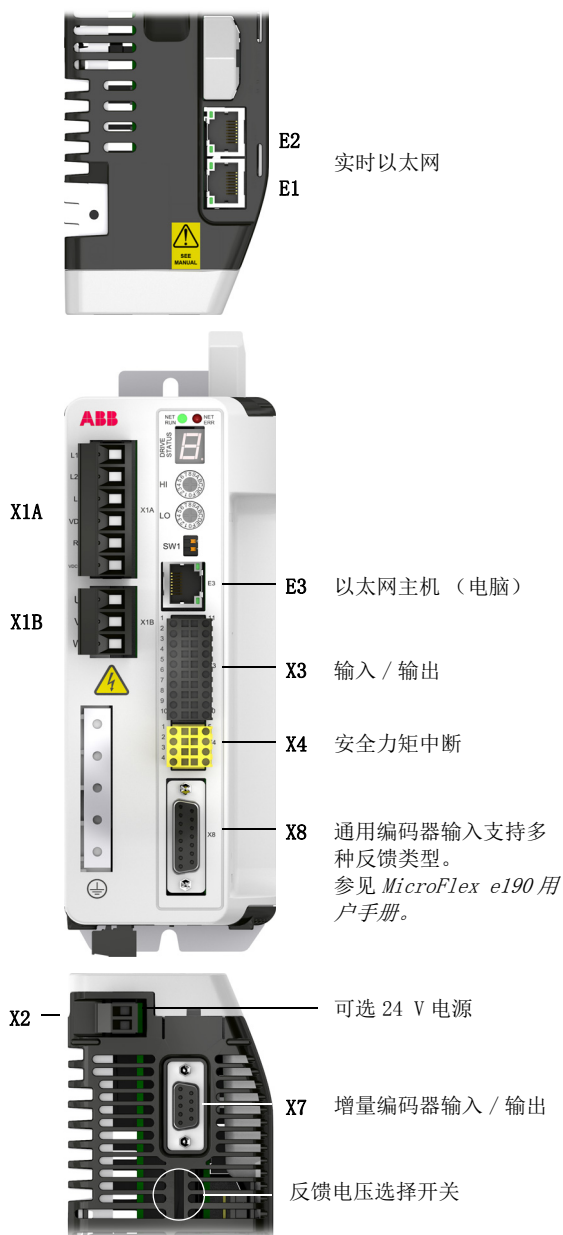
- ① 在裸露屏蔽层上的电缆固定夹。
- ② PE/ 接地连接。

控制电缆连接



- ③ 使用热缩管或绝缘套管包住屏蔽层。
- ④ 剥开电缆固定夹处的电缆外皮，将屏蔽层裸露出来。

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 设备的最小尺寸为 14 AWG。

力矩: 0.7 N·m (6.2 lbf·in)

X2: Phoenix 触点 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)

注意:

所示接线图仅用于演示目的。所有连接器 (包括 X7 和 X8) 的全部信息请参见 *MicroFlex e190 用户手册* (代码: 3AXD50000225217)。

E1/E2		
EtherCAT 或 Ethernet POWERLINK	输入	E2
	输出	E1

X1A		
200...240 V AC ±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 (电脑)	1

X3		X3	
1	D00-	D00+	11
2	D02-	D02+	12
3	D01-	D01+	13
4	DI2-	DI2+	14
5	DI3-	DI3+	15
6	DI1-	DI1+	16
7	DI0-	DI0+	17
8	模拟接地	A00	18
9	AI0-	AI0+	19
10	屏蔽	屏蔽	20

X4		X4	
1	ST01	ST01	5
2	ST02	ST02	6
3	安全地	安全地	7
4	24 V 输出	24 V 输出	8

安全力矩中断: 伺服变频器要启动, 两个电路必须闭合。为便于接线, 所有连接器都为两套。

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


E1 / E2: 以太网端口配置

在启动时读取一次旋转开关。它们为驱动器顶面板上的以太网现场总线连接器 E1 和 E2 选择操作模式。

	值	模式
HI	00	EtherCAT 从机模式
	01-EF	以太网 POWERLINK CN 模式: 所选值为节点编号
LO	F0-FF	保留


SW1: 运行模式和 IP 地址选择开关

在启动时读取一次开关状态。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。

开关	OFF	ON
	2 正常运行	固件恢复模式
	1 正常 IP 配置	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 通道和一个 Z 索引通道。

引脚1	
	
1	CHA+
2	CHB+
3	CHZ+
4	(常闭)
5	接地
6	CHA-
7	CHB-
8	CHZ-
9	(常闭)

X8: 电机反馈输入

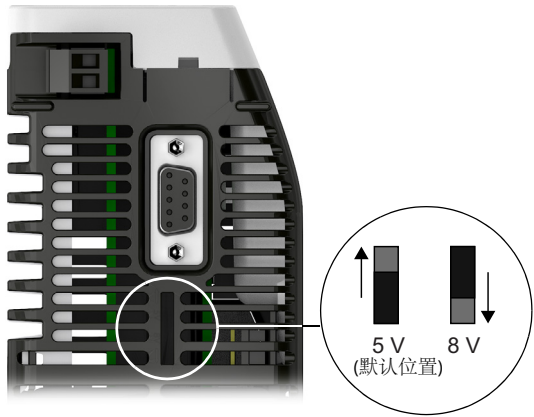
主增量编码器输入连接提供A/B/Z通道和霍尔信号通道。

引脚1	
	
1	CHA+
2	CHB+
3	CHZ+
4	(NC)
5	Hall U-
6	Hall U+
7	Hall V-
8	Hall V+
9	CHA-
10	CHB-
11	CHZ-
12	+5.5V
13	GND
14	Hall W-
15	Hall W+

更多串行接口和辅助增量编码器的连接，请参见 *MicroFlex e190 用户手册*。

反馈电源电压

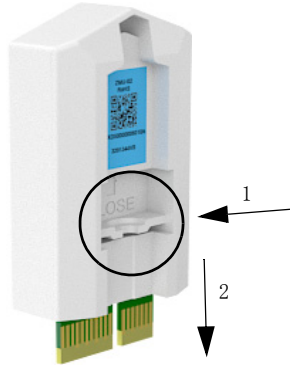
底部的选择开关用于设置反馈连接器 X8，引脚 12 上的电源输出电压。检查是否选择了正确的输出电压。多数反馈装置需要 5V，但是某些 Hiperface 装置要求使用 8V。



存储器单元

存储器单元为变频器的基本部件，必须始终配备。不宜频繁拔出和插入。

- 打开存储器单元：



- 插入存储器单元：



用户手册

根据 *MicroFlex e190 用户手册* 的说明继续启动驱动器。

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 and select *Training courses*.

Providing feedback on ABB Drives manuals

Your comments on our manuals are welcome, navigate to new.abb.com/drives/manuals-feedback-form.

Document library on the Internet

You can find manuals and other product documents in PDF format, navigate to new.abb.com/motion.

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