MicroFlex e190
Wall chart

ABB motion control products

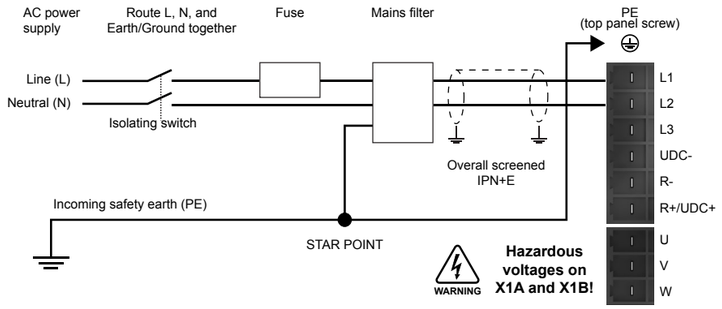
Part numbers

MFE190 - 04UP - 03A0 - 2 + N8020

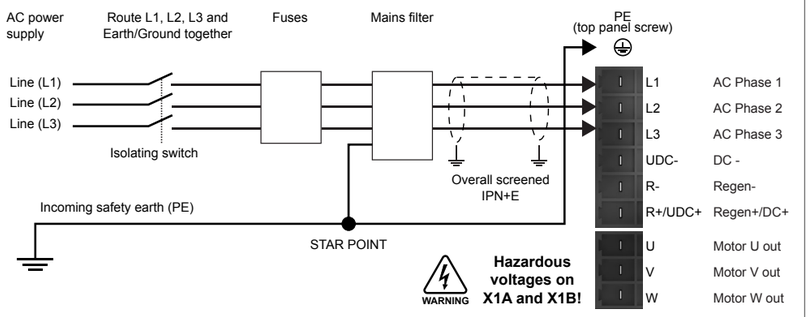
MFE190	E190 = MicroFlex e190
04	04 = Construction / frame size
UP	UP = Universal encoder, slave / CN, Programmable*
03A0	Rated amps: 01A6 = 1.6 A, 03A0 = 3 A, 06A0 = 6 A, 09A0 = 9 A
2	Input voltage rating: 2 = 200...240 VAC ±10%

* Motion programming is enabled by fitting memory unit MFE190-MU-OCU+N8020 (order code: 3AXD50000048603).

X1A - Single phase 200...240 V AC ±10% input / X1B - Motor power out



X1A - Three phase 200...240 V AC ±10% input / X1B - Motor power out



Drive status LED

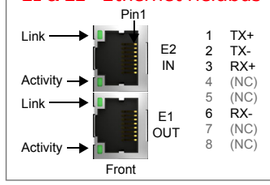


The drive status display indicates general MicroFlex e190 status information. When an error occurs, the drive displays a sequence starting with the symbol **E**, followed by the five digit error code. If the initial symbol is **b**, call technical support.

The decimal point to the right of the number illuminates to indicate that STO is activated (no torque). For a complete list of error codes open Mint WorkBench, press F1, and locate the error handling topics.

-.	Drive disabled, and one or both STO inputs are not powered
-	Drive disabled
1	Initialization error (check memory unit insertion) or recovery mode.
=	Suspend active
=.	Firmware loading
A	Hold To Analog (HTA) mode
8	Drive enabled, but idle
C	Cam move
d	Dwell
F	Flying shear
H	Follow move
h	Homing
I	Incremental move
J	Jog move
o	Offset move
P	Position move
9	Torque move
S	Stop input active
U	Velocity reference move
2	Spline move

E1 & E2 - Ethernet fieldbus



1	TX+	
2	TX-	
3	RX+	
4	(NC)	
5	(NC)	
6	RX-	
7	(NC)	
8	(NC)	

Memory unit



Stores firmware, parameters and Mint programs, and defines drive features:

3AXD50000048603: MFE190-MU-OCU+N8020

CAUTION!
Do not insert or remove the memory unit while the drive is powered.

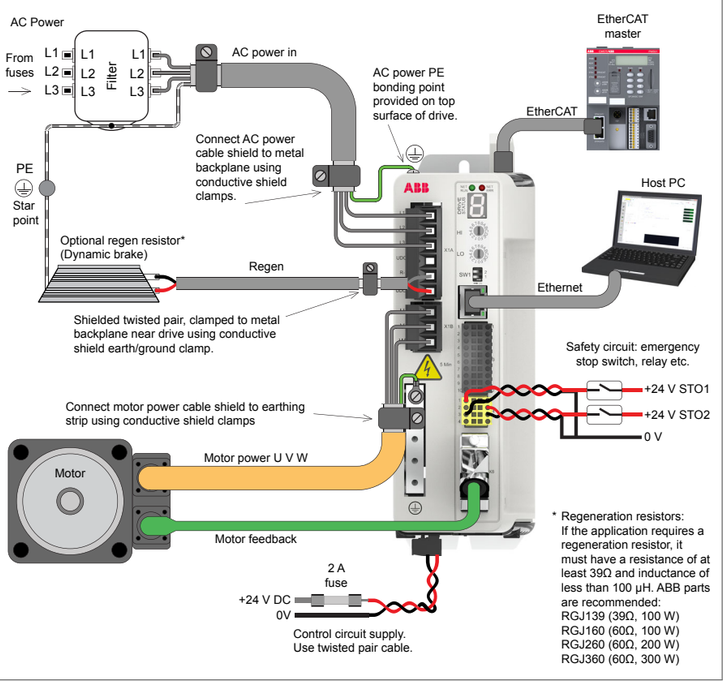
Recommended power filters

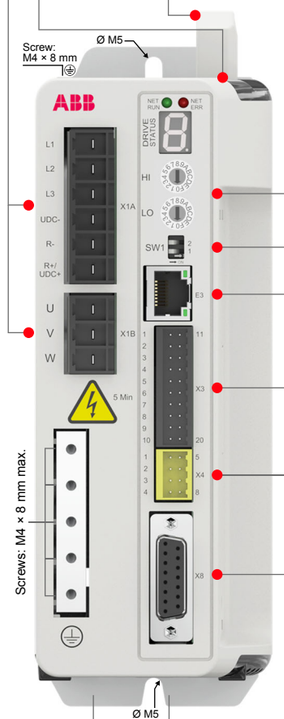
Drive continuous current rating	1Ø AC power ABB catalog number	3Ø AC power ABB catalog number
1.6 A	OFI-01 / OFI-02	OFI-03
3 A	OFI-01 / OFI-02	OFI-03
6 A	OFI-01	JFI-02
9 A	OFI-01	JFI-02

IMPORTANT!
Compliant with EN61000-6-3 (Class B).

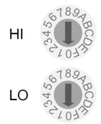
Foot-mount filter OFI-01 is designed for use with any single-phase MicroFlex e190.

Recommended system wiring





Ethernet fieldbus port configuration



Value	Mode
00	EtherCAT slave mode
01-EF	POWERLINK CN mode: selected value is node ID
F0-FF	Reserved

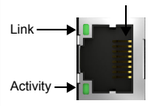
Example: 0 0 = EtherCAT slave mode selected

Mating connectors

		mm² / AWG	N·m / lbf·in
X1A	Dinkle EC762V-B3253206P-BK	0.2-6.0 / 30*-10	0.7 / 6.2
X1B	Dinkle EC762V-B3253203P-BK	0.2-6.0 / 30*-10	0.7 / 6.2
X2	Phoenix MVSTBR 2,5HC/ 2-ST-5,08	0.2-2.5 / 24-12	0.6 / 5.3
X3	Weidmüller B2L 3.50/20/180	0.2-1.0 / 28-16	-/-
X3	Weidmüller B2L 3.50/8/180	0.2-1.0 / 28-16	-/-

* Minimum size for UL installations is 14 AWG.

E3 - Ethernet: host PC



1	TX+	
2	TX-	
3	RX+	
4	(NC)	
5	(NC)	
6	RX-	
7	(NC)	
8	(NC)	

SW1 - DIP switches



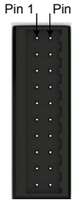
Switch	Purpose	OFF	ON
2	Firmware recovery mode	Normal operation	Recovery mode
1	Fix IP address for host port	Normal IP configuration	Fixed IP address 192.168.0.1

Fieldbus status LEDs

NET RUN	EtherCAT®	POWERLINK®
Off:	INITIALISATION state (or not powered)	NOT ACTIVE state (or not powered)
Blinking:	PRE-OPERATIONAL state	STOPPED state
1 flash:	SAFE-OPERATIONAL state	PRE-OP1 state
2 flashes:	-	PRE-OP2 state
3 flashes:	Device identification	READY TO OPERATE state
Flickering:	-	BASIC ETHERNET state
Continuous:	OPERATIONAL state.	OPERATIONAL state

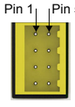
NET ERR	EtherCAT®	POWERLINK®
Off:	No errors or not powered.	No errors or not powered.
Blinking:	Invalid configuration	-
1 flash:	Unhandled error. See manual 3AXD50000037326 for details.	-
2 flashes:	Sync manager watchdog.	-
Continuous:	OPERATIONAL state.	An error has occurred.

X3 - Input / output



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

X4 - Safe Torque Off (STO)



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

The 24 V output is for powering the STO inputs only. See user manual for wiring.

X2 - 24 V control circuit backup supply



1	0 V
2	+24 V DC in

(Optional) A 24 V DC supply can be provided to maintain the controlling electronics if AC power is lost.

Continuous current - 1 A.

X7 Encoder in / out†

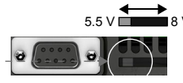


1	CHA+	6	CHA-
2	CHB+	7	CHB-
3	CHZ+	8	CHZ-
4	(NC)	9	+5 V out*
5	GND		

† X7 can be configured as an input (Enc 2) or output (Enc 0). If X7 is configured as an input, the extra incremental encoder input on X8 cannot be used.

X8 - Feedback in (Enc 0)





Incremental encoders

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

EnDat 2.1

1	Data+	9	Data-
2	Clock+	10	Clock-
3	(NC)	11	(NC)
4	(NC)	12	+5.5 V out*
5	Sin-	13	DGND
6	Sin+	14	(NC)
7	Cos-	15	(NC)
8	Cos+		

SinCos

1	(NC)	9	(NC)
2	(NC)	10	(NC)
3	(NC)	11	(NC)
4	(NC)	12	+5.5 V out*
5	Sin-	13	DGND
6	Sin+	14	(NC)
7	Cos-	15	(NC)
8	Cos+		

BiSS, SSI or EnDat 2.2

1	Data+	9	Data-
2	Clock+	10	Clock-
3	(NC)	11	(NC)
4	(NC)	12	+5.5 V out*
5	(NC)	13	DGND
6	(NC)	14	(NC)
7	(NC)	15	(NC)
8	(NC)		

* Max. combined current from X8 pin 12 and X7 pin 9 is 500 mA

Smart Abs

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

(Enc 2)†

Extra incremental encoder

1	(NC)	9	(NC)
2	(NC)	10	(NC)
3	(NC)	11	(NC)
4	(NC)	12	+5.5 V out*
5	CHA-	13	DGND
6	CHA+	14	CHZ-
7	CHB-	15	CHZ+
8	CHB+		

Hiperface

1	Data+	9	Data-
2	(NC)	10	(NC)
3	(NC)	11	(NC)
4	(NC)	12	+8 V out*
5	Sin-	13	DGND
6	Sin+	14	(NC)
7	Cos-	15	(NC)
8	Cos+		

* X8 pin 12 provides a 5.5 V or 8-12 V supply for feedback devices that require power. The maximum combined current from all encoder supplies (X8 pin 12 and X7 pin 9) is 500 mA.
WARNING! The 8-12 V supply is provided for devices on X8 that require this voltage. Move the switch towards the rear of the drive to select 8-12 V output. Selecting the wrong voltage could damage your feedback device.

An extra incremental encoder can be connected simultaneously with BiSS, SSI, EnDat 2.2, or Smart Abs. Use OPT-MF-200 Encoder Breakout for easy connection of both inputs.
Use OPT-MF-200 in conjunction with OPT-MF-201 Resolver Adapter to allow simultaneous connection of a resolver (Enc 0) and an incremental encoder (Enc 2). † See note for X7.

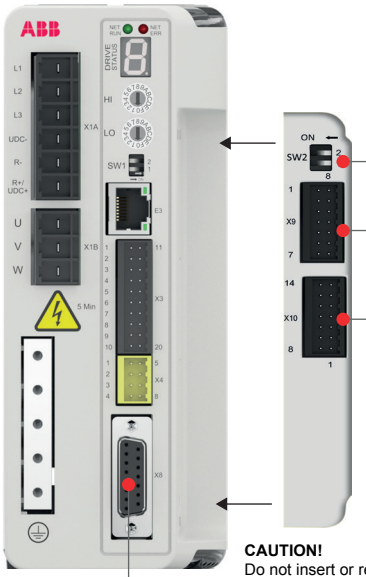
3AXD50000037323
REV C (EN)
1/2

new.abb.com

The information in this document is subject to change without notice. ABB assumes no responsibility for any errors that may appear in this document.

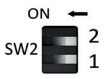
OPT-SIO-1 Option Card

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



CAUTION!
Do not insert or remove the option card while the drive is powered.

SW2 - DIP switches



Switch	Purpose	ON	OFF
2	RS422 RX terminator	120Ω	No
1	RS422 TX terminator or RS485 terminator	120Ω	No

X9 - Communication and Analog Input



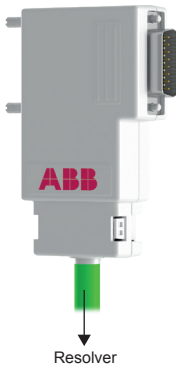
1	A/ TX+	8	A/ TX+
2	B/ TX-	9	B/ TX-
3	Shield	10	Shield
4	RX+	11	RX+
5	RX-	12	RX-
6	Shield	13	Shield
7	AIN1-	14	AIN1+

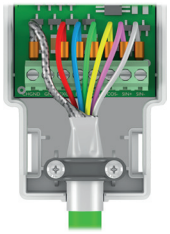
X10 - Digital Input and Output

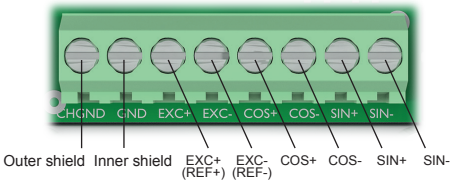


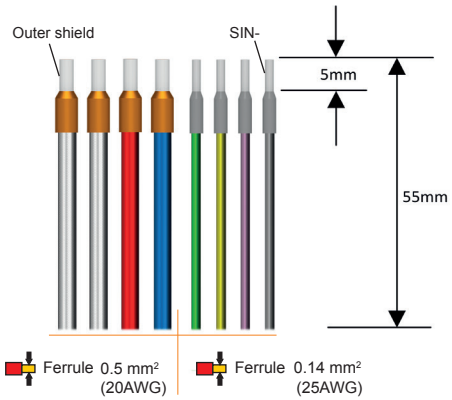
14	Shield	7	DIN4
13	CREF1	6	DIN5
12	DIN8	5	DIN6
11	DIN9	4	DIN7
10	USRV+	3	CREF0
9	DOUT5	2	DOUT3
8	DOUT6	1	DOUT4

X8 - OPT-MF-201 Resolver adapter

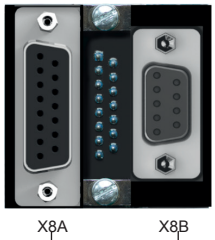


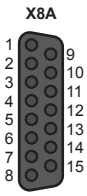




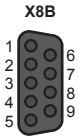


X8 - OPT-MF-200 Encoder breakout





	Incremental	BiSS-B/SSI/ EnDat 2.2	Smart Abs
1	CHA+	Data+	Data+
2	CHB+	Clock+	(NC)
3	CHZ+	(NC)	(NC)
4	(NC)	(NC)	(NC)
5	(NC)	(NC)	(NC)
6	(NC)	(NC)	(NC)
7	(NC)	(NC)	(NC)
8	(NC)	(NC)	(NC)
9	CHA-	Data-	Data-
10	CHB-	Clock-	(NC)
11	CHZ-	(NC)	(NC)
12	+5 V out	+5 V out	+5 V out
13	DGND	DGND	DGND
14	(NC)	(NC)	(NC)
15	(NC)	(NC)	(NC)
Shell	Shield	Shield	Shield



	Incremental	Halls
1	CHA+	Hall U+
2	CHB+	Hall V+
3	CHZ+	Hall W+
4	(NC)	(NC)
5	DGND	DGND
6	CHA-	Hall U-
7	CHB-	Hall V-
8	CHZ-	Hall W-
9	+5 V out	+5 V out
Shell	Shield	Shield

X8A and X8B can be used together to connect a single motor that has separate cables for encoder and Halls (e.g. a linear motor). Use X8A for the encoder and X8B for the Halls.

Mating connectors

		mm² / AWG
X9 X10	Weidmüller B2L 3.50/14/180	0.2-1.0 / 28-16
	ANYTEK vw-3.50mm 14p	0.2-1.0 / 28-16

* Minimum size for UL installations is 14 AWG.

Order Code

OPT-SIO-1 Option card	3AXD50000297450
OPT-MF-200 Encoder breakout	3AXD50000032891
OPT-MF-201 Resolver adapter	3AXD50000032892

Recommended power filters		Recommended regen resistors	
OFI-01	3AXD50000046328	RGJ139	3AXD50000032899
OFI-02	3AXD50000046327	RGJ160	3AXD50000032900
OFI-03	3AXD50000032910	RGJ260	3AXD50000032901
JFI-02	3ABD68711321	RGJ360	3AXD50000032902

3AXD50000037323
REV C (EN)
2/2

new.abb.com

The information in this document is subject to change without notice. ABB assumes no responsibility for any errors that may appear in this document.

CAUTION
Electrical components can be damaged by static electricity. Before touching the card, be sure to discharge static electricity from your body and clothing by touching a grounded metal surface. Alternatively, wear an earth strap while handling the card. Never work on the drive, motor cable or motor when input power is applied. To prevent equipment damage, be certain that input and output signals are powered and referenced correctly. Do not remove the screw locks while the device is powered. See manual MicroFlex e190 for details.