

M-Max Series

Adjustable Frequency Drives

FS1–FS5

Instruction Leaflet
Montageanweisung
Notice d'installation
Instrucciones de montaje
Istruzioni per il montaggio
安装说明

Инструкция по монтажу
Montagehandleiding
Montagevejledning
Οδηγίες εγκατάστασης
Instruções de montagem
Monteringsanvisning

Asennusohje
Návod k montáži
Paigaldusjuhend
Szerelési utasítás
Montážas instrukcija
Montavimo instrukcija

Instrukcja montażu
Navodila za montažo
Návod na montáž
Μονταžни инструкции
Instruções de montaj



(en) **Electric Current! Danger to Life!**

Only skilled or instructed persons may carry out the following operations.

(de) **Lebensgefahr durch elektrischen Strom!**

Nur Elektrofachkräfte und elektrotechnisch unterwiesene Personen dürfen die im Folgenden beschriebenen Arbeiten ausführen.

(fr) **Tension électrique dangereuse !**

Seules les personnes qualifiées et averties doivent exécuter les travaux ci-après.

(es) **¡Corriente eléctrica! ¡Peligro de muerte!**

El trabajo a continuación descrito debe ser realizado por personas cualificadas y advertidas.

(it) **Tensione elettrica: Pericolo di morte!**

Solo persone abilitate e qualificate possono eseguire le operazioni di seguito riportate.

(zh) **触电危险!**

只允许专业人员和受过专业训练的人员进行下列工作。

(ru) **Электрический ток! Опасно для жизни!**

Только специалисты или проинструктированные лица могут выполнять следующие операции.

(nl) **Levensgevaar door elektrische stroom!**

Uitsluitend deskundigen in elektriciteit en elektrotechnisch geïnstrueerde personen is het toegestaan, de navolgend beschrevene werkzaamheden uit te voeren.

(da) **Livsfare på grund af elektrisk strøm!**

Kun uddannede el-installatører og personer der er instruerede i elektrotekniske arbejdsopgaver, må udføre de nedenfor anførte arbejder.

(el) **Προσοχή, κίνδυνος ηλεκτροπληξίας!**

Οι εργασίες που αναφέρονται στη συνέχεια θα πρέπει να εκτελούνται μόνο από ηλεκτρολόγους και ηλεκροτεχνίτες.

(pt) **Perigo de vida devido a corrente eléctrica!**

Apenas electricistas e pessoas com formação electrotécnica podem executar os trabalhos que a seguir se descrevem.

(sv) **Livsfara genom elektrisk ström!**

Endast utbildade elektriker och personer som undervisats i elektroteknik får utföra de arbeten som beskrivs nedan.

(fi) **Hengenvaarallinen jännite!**

Vain pätevät sähköasentajat ja opastusta saaneet henkilöt saavat suorittaa seuraavat työt.

EATON

Powering Business Worldwide

CS Nebezpečí úrazu elektrickým proudem!
Níže uvedené práce směřjí provádět pouze osoby s elektrotechnickým vzděláním.

et Eluohhtlik! Elektrilöögioht!
Järgnevalt kirjeldatud töid tohib teostada ainult elektriala spetsialist või elektrotehnilise instrueerimise läbinud personal.

hu Életveszély az elektromos áram révén!
Csak elektromos szakemberek és elektrotechnikában képzett személyek végezhetik el a következőkben leírt munkákat.

lv Elektriskā strāva apdraud dzīvību!
Tālāk aprakstītos darbus drīkst veikt tikaielektrospeciālisti un darbam ar elektrotehniskām ekārtām instruetās personas!

lt Pavojus gyvybei dėl elektros srovės!
Tik elektrikai ir elektrotechnikos specialistai gali atlikti žemiau aprašytus darbus.

pl Porażenie prądem elektrycznym stanowi zagrożenie dla życia!
Opisane poniżej prace mogą przeprowadzać tylko wykwalifikowani elektrycy oraz osoby odpowiednio poinstruowane w zakresie elektrotechniki.

sl Življenjska nevarnost zaradi električnega toka!
Spodaj opisana dela smejo izvajati samo elektrostrokovnjaki in elektrotehnično poučene osebe.

sk Nebezpečenstvo ohrozenia života elektrickým prúdom!
Práce, ktoré sú nižšie opísané, smú vykonávať iba elektroodborníci a osoby s elektrotechnickým vzdelaním.

bg Опасност за живота от електрически ток!
Операциите, описани в следващите раздели, могат да се извършват само от специалисти-електротехници и инструктиран електротехнически персонал.

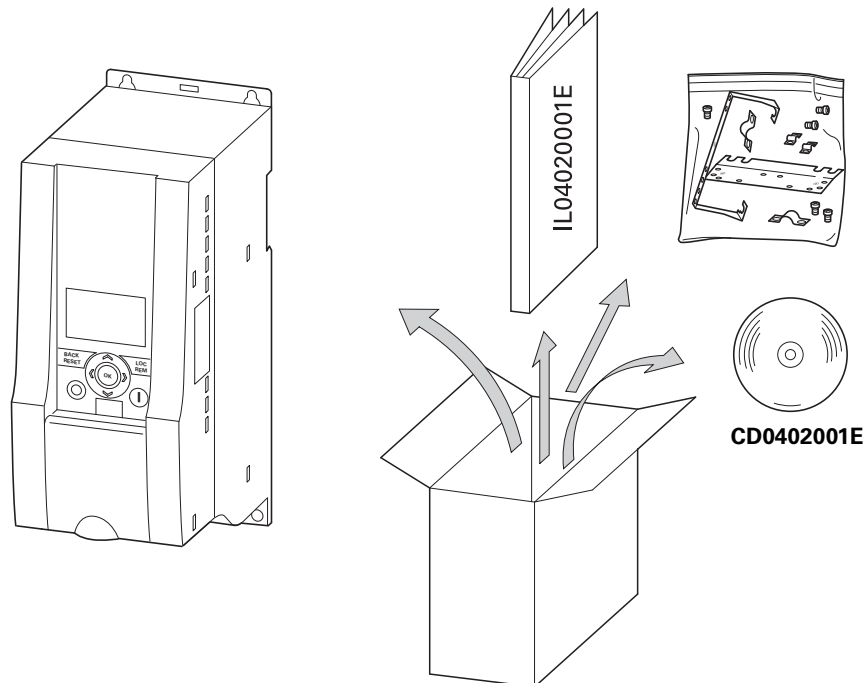
ro Atenție! Pericol electric!
Toate lucrările descrise trebuie efectuate numai de personal de specialitate calificat și de persoane cu cunoștințe profunde în electrotehnică.

M-Max Series Adjustable Frequency Drives for Machinery Applications (FS1–FS5)

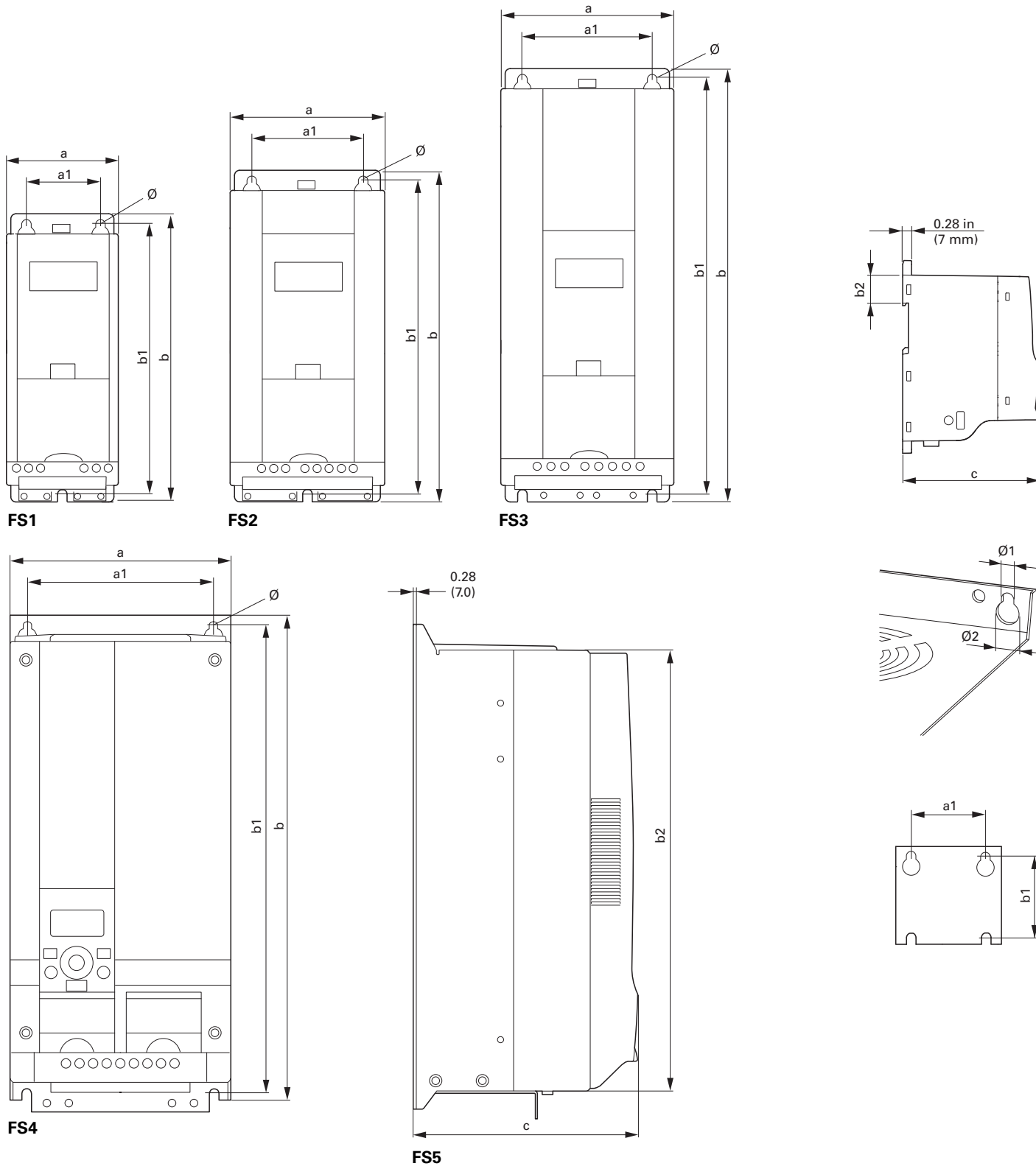
MMX11, MMX12, MMX32, MMX34, MMX35



MN0402001E Manual
MN04020021 Quick Start Guide



Dimensions and Weights – Dimensões e pesos – Encombremets et poids – Abmessungen und Gewichte – Dimensioni e pesi – Afmetingen en gewichten – Dimensioner og vægt – Διαστάσεις και βάρη – Dimensiones y pesos – Mått och vikter – Mitat ja painot – Rozměry a hmotnosti – Mõõdud ja kaalud – Méretek és tömeg – Izmēri un svārs – Matmenys ir masė – Wymiary i ciężary – Mere in teže – Rozměry a hmotnosti – Размеры и тегло – Dimensiuni și greutateți – Размеры и вес – 尺寸和重量



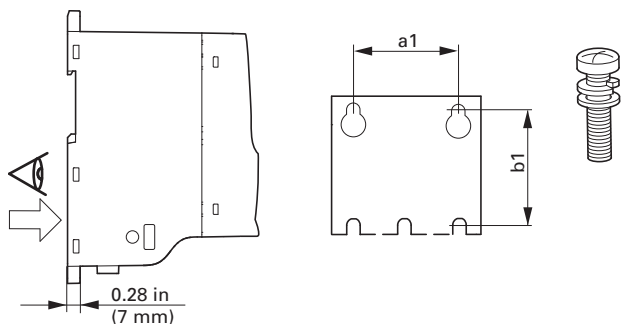
Dimensions and Frame Sizes

Part Number	Approximate Dimensions in inches (mm)								Installation Size
	a	a1	b	b1	b2	c	Ø, Ø1	Ø2	
MMX12AA1D7_ MMX12AA2D4_ MMX12AA2D8_	2.60 (66)	1.50 (38)	6.30 (160)	5.79 (147)	1.26 (32)	4.02 (102)	0.18 (4.5)	—	FS1
MMX32AA1D7_ MMX32AA2D4_ MMX32AA2D8_									
MMX34AA1D3_ MMX34AA1D9_ MMX34AA2D4_									
MMX11AA1D7_ MMX11AA2D4_ MMX11AA2D8_ MMX11AA3D7_	3.54 (90)	2.46 (62.5)	7.68 (195)	7.17 (182)	1.26 (32)	4.14 (105)	2.17 (5.5)	—	FS2
MMX12AA3D7_ MMX12AA4D8_ MMX12AA7D0_									
MMX32AA3D7_ MMX32AA4D8_ MMX32AA7D0_									
MMX34AA3D3_ MMX34AA4D3_ MMX34AA5D6_									
MMX11AA4D8_ MMX12AA9D6_ MMX32AA011_ MMX34AA7D6_ MMX34AA9D0_ MMX34AA012_ MMX34AA014_	3.94 (100)	2.95 (75)	9.96 (253)	9.53 (242)	1.34 (34)	4.41 (112)	2.17 (5.5)	—	FS3
MMX35AA1D7_ MMX35AA2D7_ MMX35AA3D9_ MMX35AA6D1_ MMX35AA9D0_									
MMX32AA012_ MMX32AA017_ MMX32AA025_ MMX34AA016_ MMX34AA023_	6.50 (165.0)	5.51 (140.0)	14.57 (370.0)	13.82 (351.0)	13.27 (337.0)	6.61 (168.0)	0.28 (7.0)	0.55 (14.0)	FS4
MMX32AA031_ MMX32AA038_ MMX34AA031_ MMX34AA038_	6.50 (165.0)	5.51 (140.0)	14.57 (414.0)	13.82 (398.0)	15.08 (383.0)	8.07 (205.0)	0.28 (7.0)	0.55 (14.0)	FS5

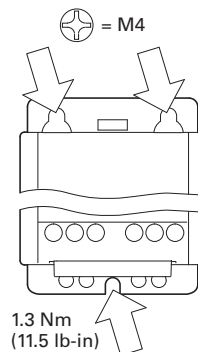
Note

1 in = 25.4 mm, 1 mm = 0.0394 in

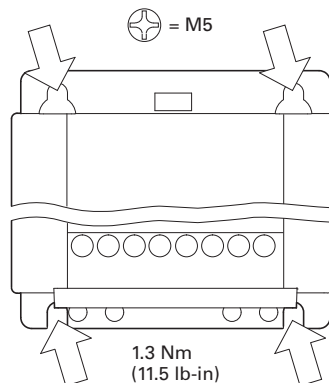
**Mounting – Montaje – Montage – Montaggio – Montering – Τοποθέτηση – Montagem – Asennus –
Montáž – Paigaldamine – Felszerelés – Montáža – Montavimas – Montaž – Montaža – Монтаж –
Montarea – Монтаж – 安裝**



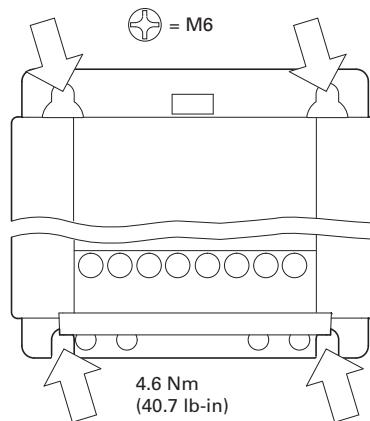
	a1 mm [in]	b1 mm [in]	Mass kg [lb]	Torque Nm [ft-lb]	Mounting Screw
FS1	38 [1.5]	147 [5.79]	0.55 [1.2]	1.3 [0.95]	M4
FS2	62.5 [2.46]	182 [7.17]	0.7 [1.5]	1.3 [0.95]	M5
FS3	75 [2.95]	242 [9.53]	0.99 [2.2]	1.3 [0.95]	M5
FS4	140 [5.51]	351 [13.82]	8 [18.0]	4.6 [3.4]	M6
FS5	140 [5.51]	398 [13.82]	10 [22.0]	4.6 [3.4]	M6



FS1

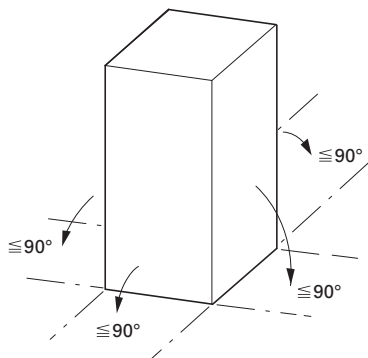


FS2, FS3

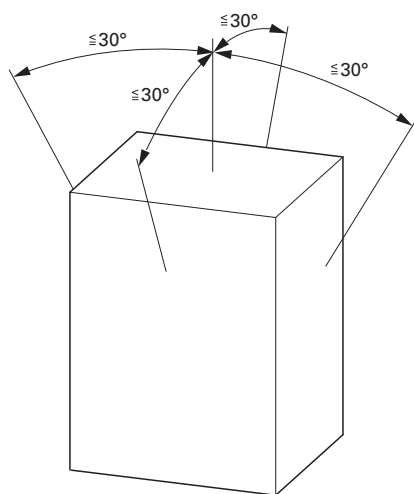


FS4, FS5

Mounting Positions

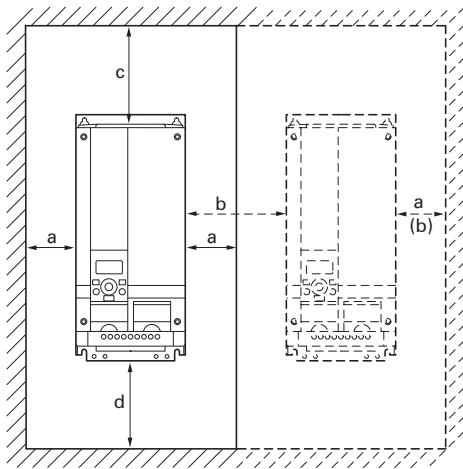


FS1-FS3

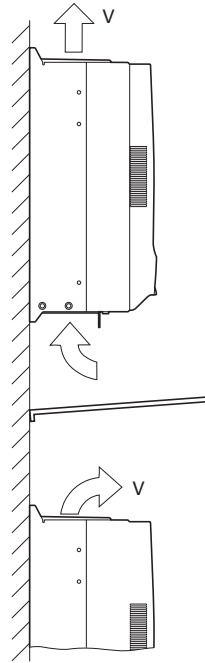
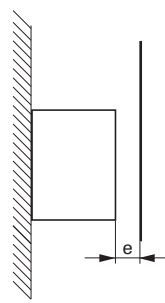


FS4, FS5

Air-Cooling Space



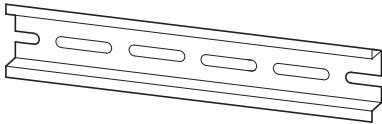
Minimum Clearance at the Front



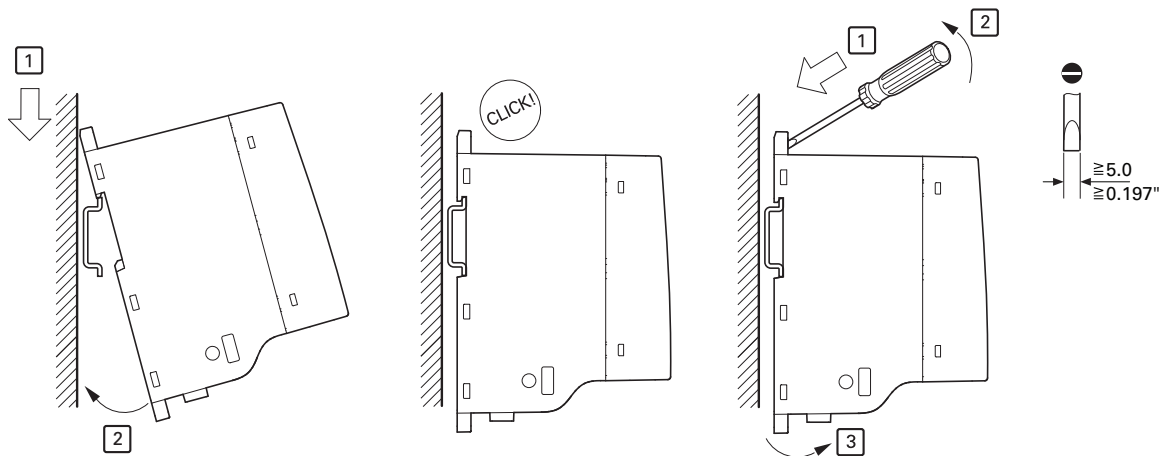
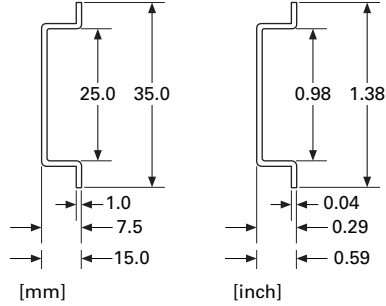
Minimum Clearance and Required Cooling Air

	a mm	b mm	c mm	d mm	e mm	V m ³ /h
FS1	20	50	100	50	15	10
FS2	20	50	100	50	15	10
FS3	20	50	100	50	15	30
FS4	20	50	100	100	20	45
FS5	20	50	120	100	20	75

Mounting Positions



IEC/EN 60715





(en)

Warning!

Connect only in voltage-free state!

(es)

¡Advertencia!

¡Conectar únicamente en estado sin tensión!

(fr)

Avertissement !

Raccordez l'appareil uniquement hors tension !

(de)

Warnung!

Nur im spannungsfreien Zustand anschließen!

(it)

Avvertimento!

Collegare solo in assenza di tensione!

(nl)

Waarschuwing!

Alleen in spanningsloze toestand aansluiten!

(da)

Advarsel!

Må kun tilsluttes i spændingsfri tilstand!

(el)

Προειδοποίηση!

Συνδέστε μόνο όταν δεν επικρατεί τάση!

(pt)

Atenção!

Ligar apenas com a tensão desligada!

(sv)

Varning!

Får endast anslutas i spänningsfritt tillstånd!

(fi)

Varoitus!

Kytke vain jännitteettömässä tilassa!

(cs)

Varování!

Připojujte jen při zcela odpojeném napájení!

(et)

Hoiatus!

Ühendada ainult pingevabas olekus!

(hu)

Figyelmeztetés!

Csak feszültségmentes állapotban csatlakoztassa!

(lv)

Brīdinājums!

Pieslēgt tikai tad, kad nenotiek sprieguma padeve!

(lt)

Perspėjimas!

Prijungti tik tada, kai išjungta įtampa!

(pl)

Ostrzeżenie!

Podłączając zawsze po uprzednim odłączeniu od zasilania elektrycznego!

(sl)

Opozorilo!

Napravo priključite le, ko ni pod napetostjo!

(sk)

Varovanie!

Napájať len v stave bez napätia!

(bg)

Предупреждение!

Свързвайте само, когато уреда не е под напрежение!

(ro)

Atenție!

Conectați doar când aparatul nu se află sub tensiune!

(ru)

Предупреждение!

Подключать только в обесточенном состоянии!

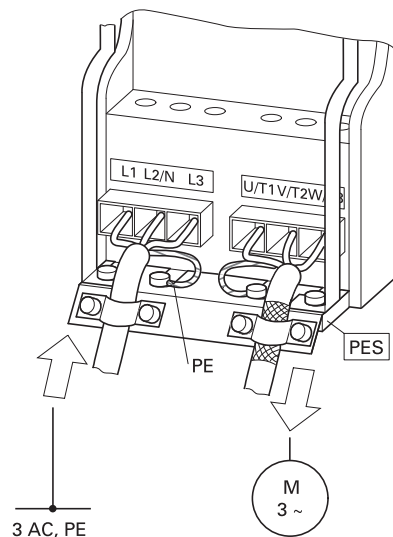
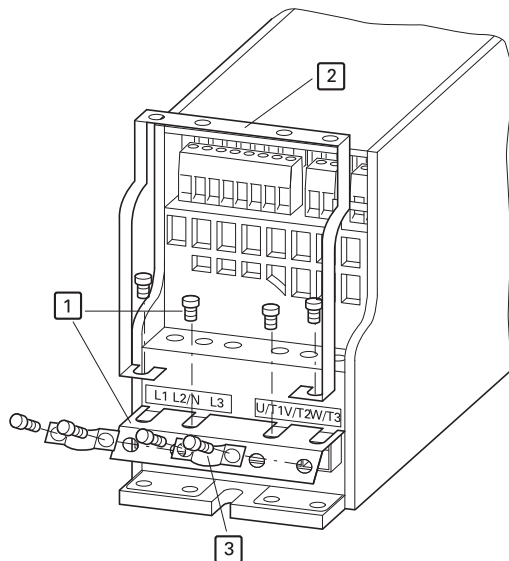
(zh)

警告!

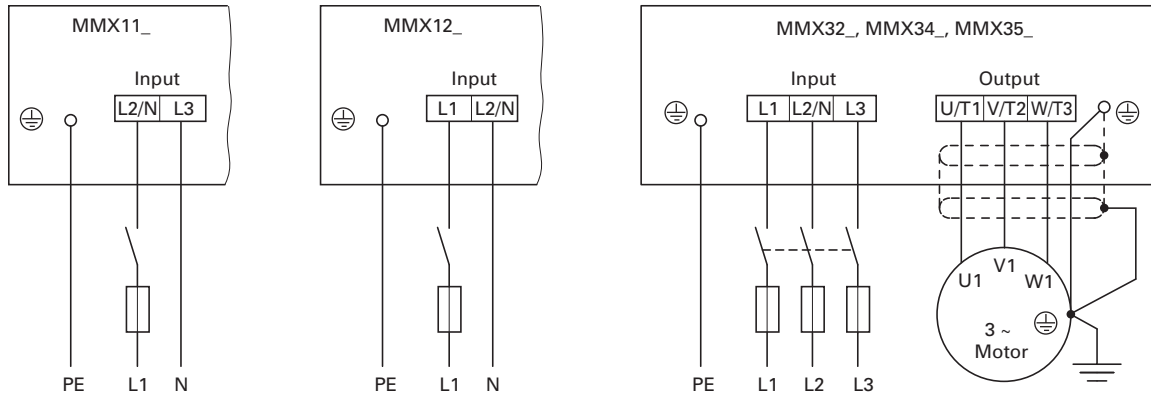
必须在断电状态下进行连接!



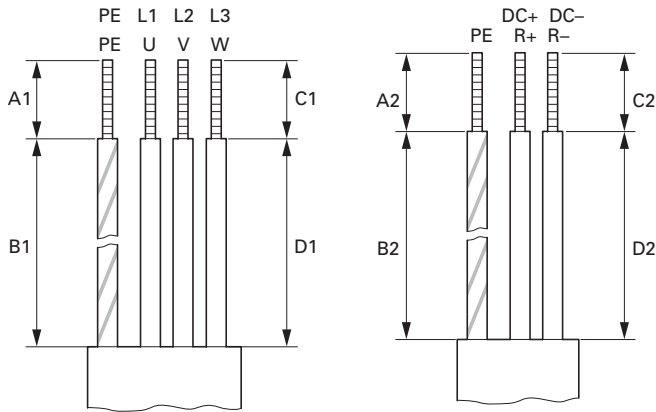
PZ2
1.3 Nm
(11.5 lb-in)



Connection to Power Section



Connection in Power Section

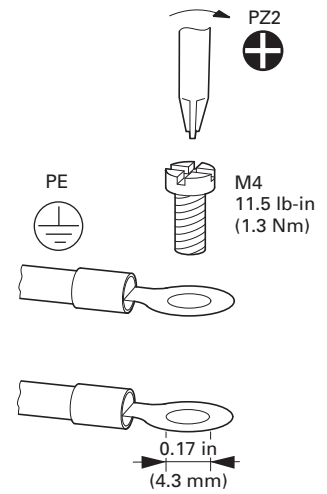


Stripping Lengths in the Power Section in inches (mm)

	Supply Voltage (Input)				Motor (Output)				DC-Link, Brake Resistor			
	L1, L2, L3		PE		U/T1, V/T2, W/T3		PE		DC+/R+, R-, DC-		PE	
	C1	D1	A1	B1	C1	D1	A1	B1	C2	D2	A2	B2
FS1	0.30 (8.0)	0.80 (20.0)	0.30 (8.0)	1.40 (35.0)	0.30 (8.0)	0.80 (20.0)	0.30 (8.0)	1.40 (35.0)	0.30 (8.0)	0.80 (20.0)	0.30 (8.0)	1.40 (35.0)
FS2	0.30 (8.0)	0.80 (20.0)	0.30 (8.0)	1.40 (35.0)	0.30 (8.0)	0.80 (20.0)	0.30 (8.0)	1.40 (35.0)	0.30 (8.0)	0.80 (20.0)	0.30 (8.0)	1.40 (35.0)
FS3	0.30 (8.0)	0.80 (20.0)	0.30 (8.0)	1.40 (35.0)	0.30 (8.0)	0.80 (20.0)	0.30 (8.0)	1.40 (35.0)	0.30 (8.0)	0.80 (20.0)	0.30 (8.0)	1.40 (35.0)
FS4	0.30 (8.0)	1.60 (40.0)	0.30 (8.0)	1.20 (30.0)	0.30 (8.0)	2.00 (50.0)	0.30 (8.0)	1.20 (30.0)	0.30 (8.0)	1.60 (40.0)	0.30 (8.0)	1.60 (40.0)
FS5	0.30 (8.0)	1.60 (40.0)	0.30 (8.0)	1.20 (30.0)	0.30 (8.0)	2.00 (50.0)	0.30 (8.0)	1.20 (30.0)	0.30 (8.0)	2.00 (50.0)	0.30 (8.0)	2.00 (50.0)

Arrangement and Size of the Connection Terminals

Part Numbers	M3 Nm	ft-lbs	mm	Terminal Configuration	
FS1	MMX12AA1D7_ MMX12AA2D4_ MMX12AA2D8_	0.5–0.6	0.37–0.44	0.6 x 3.5	
	MMX32AA1D7_ MMX32AA2D4_ MMX32AA2D8_	0.5–0.6	0.37–0.44	0.6 x 3.5	
	MMX34AA1D3_ MMX34AA1D9_ MMX34AA2D4_	0.5–0.6	0.37–0.44	0.6 x 3.5	
FS2	MMX11AA1D7_ MMX11AA2D4_ MMX11AA2D8_ MMX11AA3D7_	0.5–0.6	0.37–0.44	0.6 x 3.5	
	MMX12AA3D7_ MMX12AA4D8_ MMX12AA7D0_	0.5–0.6	0.37–0.44	0.6 x 3.5	
	MMX32AA3D7_ MMX32AA4D8_ MMX32AA7D0_	0.5–0.6	0.37–0.44	0.6 x 3.5	
	MMX34AA3D3_ MMX34AA4D3_ MMX34AA5D6_	0.5–0.6	0.37–0.44	0.6 x 3.5	
FS3	MMX11AA4D8_	0.5–0.6	0.37–0.44	0.6 x 3.5	
	MMX12AA9D6_	0.5–0.6	0.37–0.44	0.6 x 3.5	
	MMX32AA011_	0.5–0.6	0.37–0.44	0.6 x 3.5	
	MMX34AA7D6_ MMX34AA9D0_ MMX34AA012_ MMX34AA014_	0.5–0.6	0.37–0.44	0.6 x 3.5	
	MMX35AA1D7_ MMX35AA2D7_ MMX35AA3D9_ MMX35AA6D1_ MMX35AA9D0_	0.5–0.6	0.37–0.44	0.6 x 3.5	
FS4	MMX32AA017_ MMX32AA025_	1.2–1.5	0.88–1.11	0.6 x 3.5	
	MMX34AA016_ MMX34AA023_	1.2–1.5	0.88–1.11	0.6 x 3.5	
FS5	MMX32AA031_ MMX32AA038_	1.2–1.5	0.88–1.11	0.6 x 3.5	
	MMX34AA031_ MMX34AA038_	1.2–1.5	0.88–1.11	0.6 x 3.5	



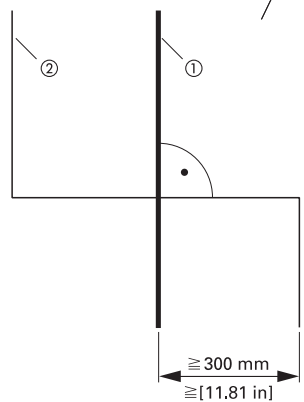
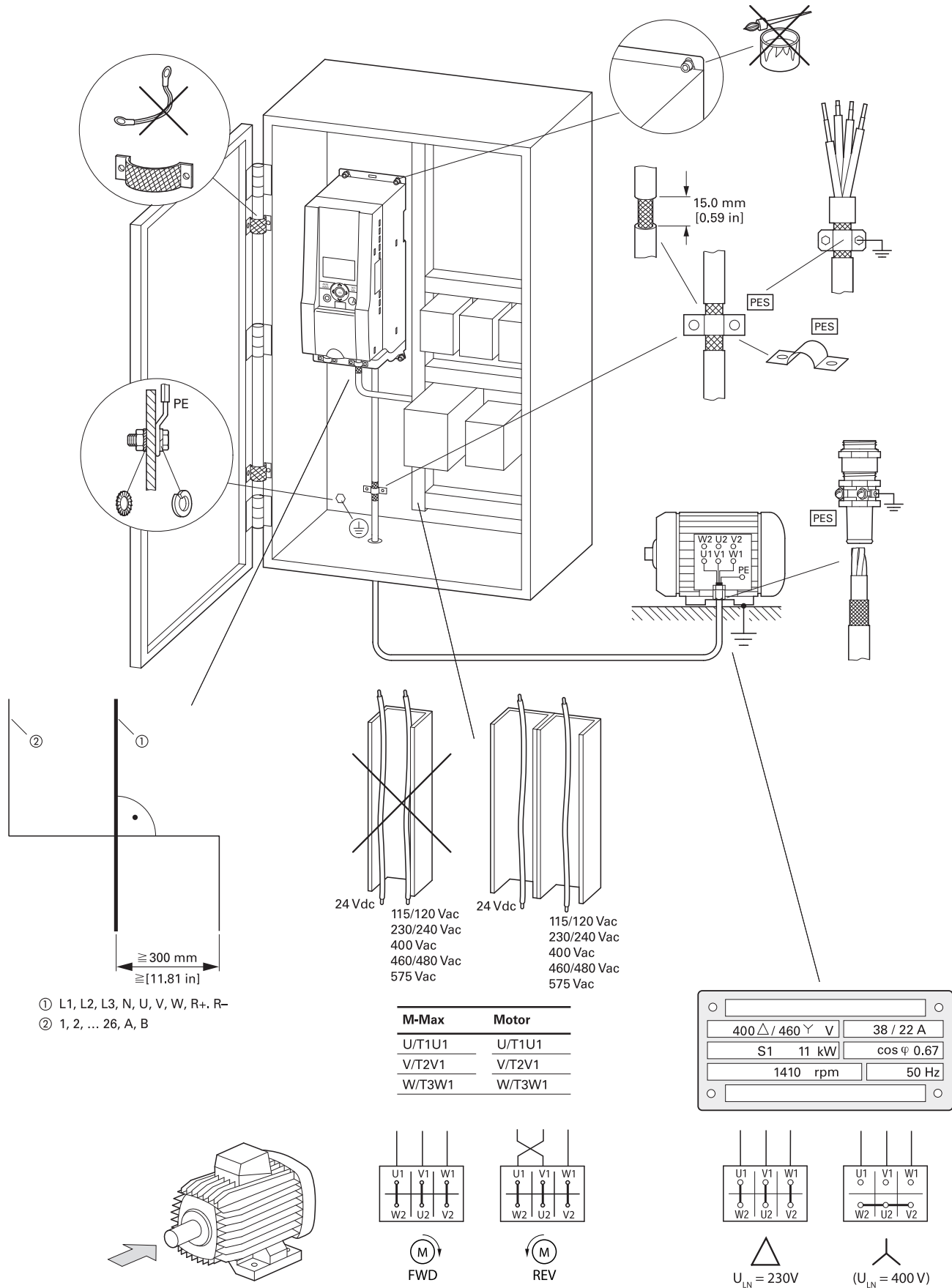
Maximum Cross-Sections

	L1, L2/N, L3 mm ²	AWG ①	U, V, W mm ²	AWG ①	PE mm ²	AWG ①	R+, R— mm ²	AWG ①
MMX11AA1D7... MMX11AA2D4... MMX11AA2D8... MMX11AA3D7...	2 x 2.5	2 x 14	3 x 2.5	3 x 14	2.5	14	—	—
MMX11AA4D8...	2 x 6	2 x 10	3 x 6	3 x 10	—	—	—	—
MMX12AA1D7... MMX12AA2D4... MMX12AA2D8... MMX12AA3D7...	2 x 1.5	2 x 16	3 x 1.5	3 x 16	1.5	16	—	—
MMX12AA4D8... MMX12AA7D0...	2 x 2.5	2 x 14	3 x 2.5	3 x 14	2.5	14	—	—
MMX12AA9D6...	2 x 6	2 x 10	3 x 6	3 x 10	6	10	—	—
MMX32AA1D7... MMX32AA2D4... MMX32AA2D8... MMX32AA3D7...	3 x 1.5	3 x 16	3 x 1.5	3 x 16	1.5	16	—	—
MMX32AA4D8... MMX32AA7D0...	3 x 1.5	3 x 16	3 x 1.5	3 x 16	1.5	16	—	—
MMX32AA011...	3 x 2.5	3 x 14	3 x 2.5	3 x 14	2.5	14	2 x 2.5	2 x 14
MMX32AA012...	3 x 6	3 x 10	3 x 6	3 x 10	6	10	2 x 6	2 x 10
MMX32AA017... MMX32AA025...	3 x 6	3 x 10	3 x 6	3 x 10	6	10	2 x 6	2 x 10
MMX32AA031... MMX32AA038...	3 x 10	3 x 8	3 x 8	3 x 8	10	8	2 x 10	2 x 8
MMX34AA1D3... MMX34AA1D9... MMX34AA2D4... MMX34AA3D3...	3 x 1.5	3 x 16	3 x 1.5	3 x 16	1.5	16	—	—
MMX34AA4D3... MMX34AA5D6...	3 x 1.5	3 x 16	3 x 1.5	3 x 16	1.5	16	2 x 1.5	2 x 16
MMX34AA7D6... MMX34AA9D0... MMX34AA012	3 x 2.5	3 x 14	3 x 2.5	3 x 14	2.5	14	2 x 2.5	2 x 14
MMX34AA014...	3 x 4	3 x 12	3 x 12	3 x 12	4	12	3 x 4	2 x 12
MMX34AA016... MMX34AA023...	3 x 6	3 x 10	3 x 6	3 x 10	6	10	2 x 6	2 x 10
MMX34AA031...	3 x 10	3 x 8	3 x 8	3 x 8	10	8	2 x 10	2 x 8
MMX34AA038...	3 x 10	3 x 6	3 x 8	3 x 6	10	6	2 x 10	2 x 6
MMX35AA1D7... MMX35AA2D7...	3 x 1.5	3 x 16	3 x 1.5	3 x 16	1.5	16	2 x 1.5	2 x 16
MMX35AA3D9... MMX35AA6D1... MMX35AA9D0...	3 x 2.5	3 x 14	3 x 2.5	3 x 14	2.5	14	2 x 2.5	2 x 14

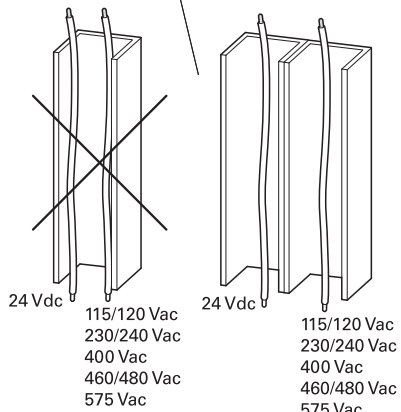
Notes

① AWG = American Wire Gauge.

② UL fuse with AWG.

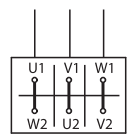
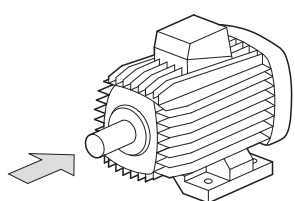


- ① L1, L2, L3, N, U, V, W, R+, R-
- ② 1, 2, ... 26, A, B

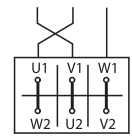


M-Max	Motor
U/T1U1	U/T1U1
V/T2V1	V/T2V1
W/T3W1	W/T3W1

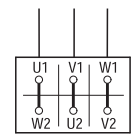
400 Δ / 460 Y V	38 / 22 A
S1 11 kW	cos φ 0.67
1410 rpm	50 Hz



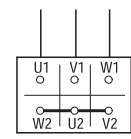
(M)
FWD



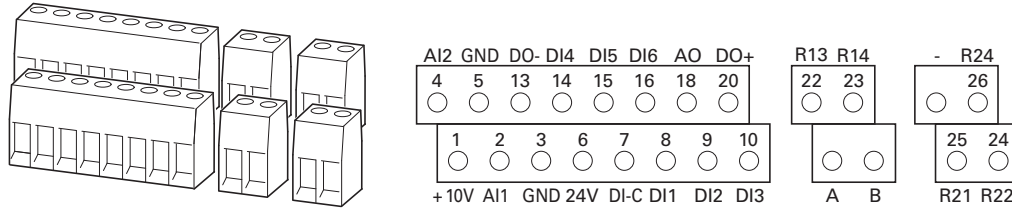
(M)
REV



Δ
 $U_{LN} = 230V$

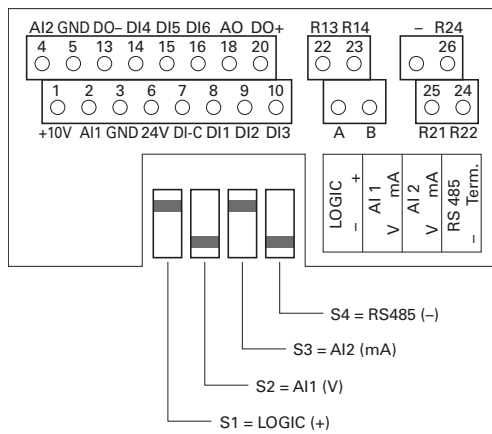


Y
 $(U_{LN} = 400V)$



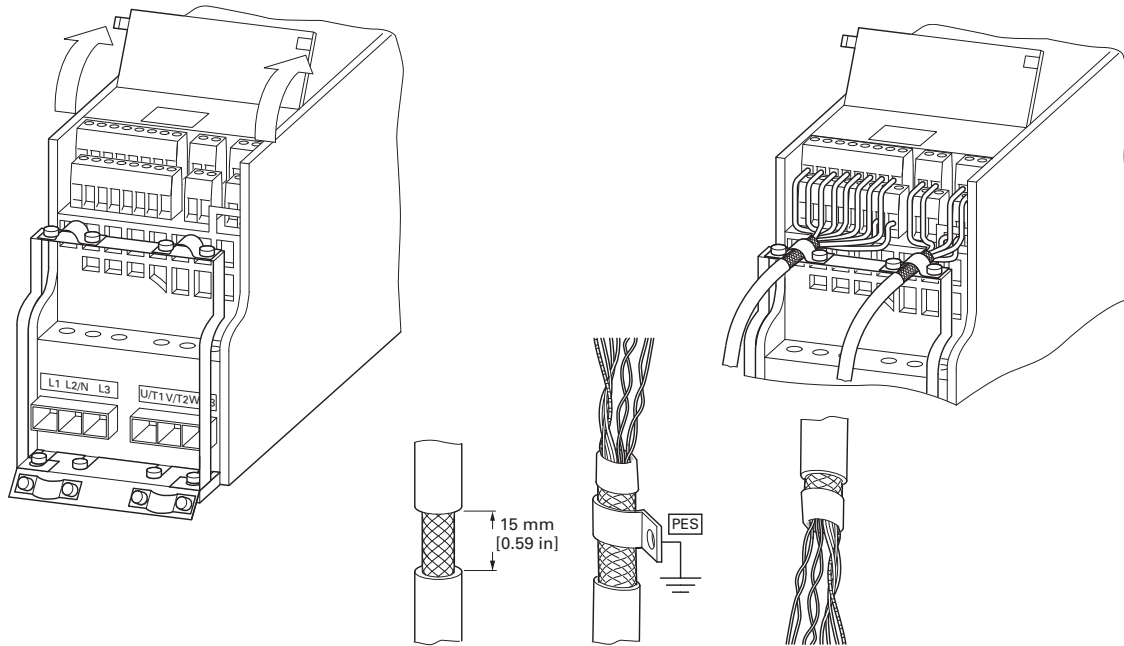
mm ²	mm ²	AWG	mm	M3	ft-lbs	mm
0.25–0.5	0.14–1.5	26–16	5	0.22–0.25	0.16–0.18	0.4 x 2.5

Microswitch Factory Settings



Microswitch Description

Switch	Function	Description
S1	LOGIC	Control logic: + = Positive logic (FS) Source type - = Negative logic Sink type
S2	AI1	Analog input 1 (P2.1): V = 0–10V (FS) mA = 4–20 mA
S3	AI2	Analog input 2 (P2.5): mA = 4–20 mA (FS) V = 0–10V
S4	RS485	Bus terminating resistor (control signal terminal A/B): - = Disconnected Term. = Switched on (terminator)

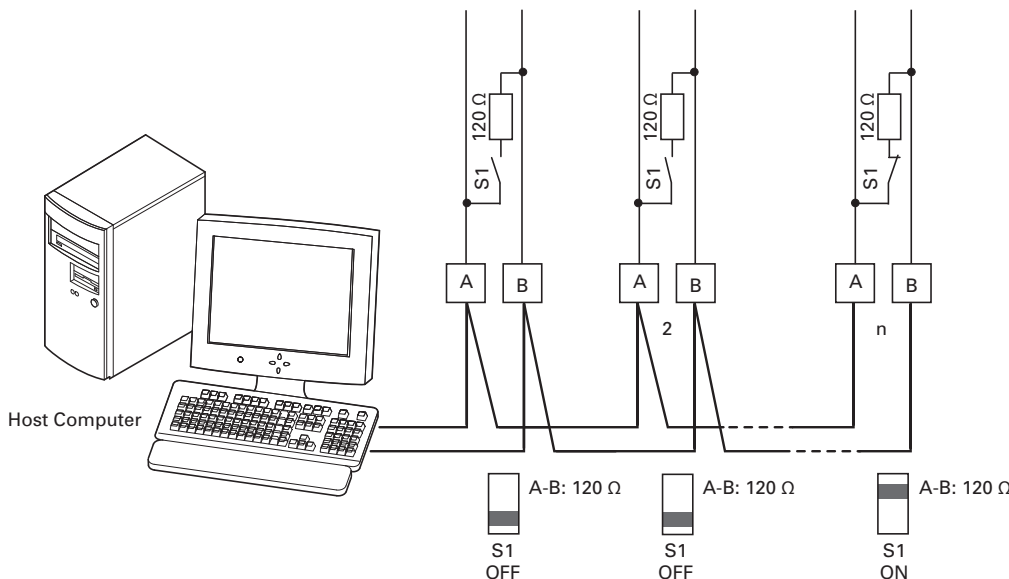


Factory-Set Control Terminal Functions

Terminal	Signal	Factory setting	Description
1	+10V	Output nominal voltage	— Maximum load 10 mA, reference potential GND
2	A11	Analog signal input 1	Frequency reference value ^① 0–10V ($R_i > 200k$ ohms) 0/4–20 mA ($R_B = 200$ ohms) Selectable through microswitch S2
3	GND	Reference potential	— 0V
4	A12	Analog input 2	PID controller, actual value ^① 0–10V ($R_i > 200k$ ohms) 0/4–20 mA ($R_B = 200$ ohms) Selectable through microswitch S3
5	GND	Reference potential	— 0V
6	24V	Control voltage for DI1–DI6, output (+24V)	— Maximum load 50 mA, reference potential GND
7	DI-C	Reference potential of the digital inputs DI1–DI6	LOGIC- (GND) Selectable through microswitch LOGIC –/+
8	DI1	Digital input 1	FWD start enable, forward ^① 0–30V ($R_i > 12k$ ohms)
9	DI2	Digital input 2	REV start enable, reverse ^① 0–30V ($R_i > 12k$ ohms)
10	DI3	Digital input 3	Fixed frequency B0 ^① 0–30V ($R_i > 12k$ ohms)
13	DO–	Digital output	Active = READY ^① Transistor, max. 50 mA, supply voltage control signal terminal 20
14	DI4	Digital input 4	Fixed frequency B1 ^① 0–30V ($R_i = 12k$ ohms)
15	DI5	Digital input 5	Error acknowledgment ^① 0–30V ($R_i = 12k$ ohms)
16	DI6	Digital input 6	PI controller deactivated ^① 0–30V ($R_i = 12k$ ohms)
18	A0	Analog output	Output frequency ^① 0–10V, max. 10 mA
20	DO+	Digital output	Supply voltage, see control signal terminal 13 Supply voltage for digital output DO max. 48 Vdc, max. 50 mA
22	R13	Relay 1, normally open contact	Active = RUN ^① Maximum switching load: 250 Vac/2A or 250 Vdc/0.4A
23	R14	Relay 1, normally open contact	Active = RUN ^① Maximum switching load: 250 Vac/2A or 250 Vdc/0.4A
24	R22	Relay 2, changeover contact (N/C)	Active = FAULT ^① Maximum switching load: 250 Vac/2A or 250 Vdc/0.4A
25	R21	Relay 2, changeover contact	Active = FAULT ^① Maximum switching load: 250 Vac/2A or 250 Vdc/0.4A
26	R24	Relay 2, changeover contact (N/O)	Active = FAULT ^① Maximum switching load: 250 Vac/2A or 250 Vdc/0.4A
A	A	RS485 signal A	BUS-communication Modbus RTU
B	B	RS485 signal B	BUS-communication Modbus RTU

Note

^① Programmable function, see User Manual MN04020003E.





(en)

Caution!

In the territory of the EU Directive, the frequency-controlled devices and their accessories must be taken into operation only when the machine has been determined to fulfill the protection requirements of Machinery Safety Directive 89/392/EEC.

Ensure EMC-compliant installation. Lay control and communication cables spatially separated from the motor cable. Ensure a large contact area connection between [PES] cable screen and PE.

(es)

¡Atención!

En el campo de aplicación de la normativa CE, los dispositivos controlados por frecuencia y sus correspondientes accesorios sólo deberán ponerse en marcha cuando se asegure que la máquina cumple con las exigencias de seguridad de la normativa de máquinas 89/392/CEE.

El montaje debe cumplir CEM. Los cables de mando y de conexión a red se deben instalar independientemente del cable de conexión al motor. El cable apantallado [PES] se debe conectar a masa utilizando una amplia superficie de contacto.

(fr)

Attention !

En application des directives européennes, les convertisseurs de fréquence et leurs accessoires ne doivent être mis en service que s'il a été vérifié que la machine répond aux exigences de la directive machines 89/392/CEE.

Montage conforme aux règles de la CEM. Eloigner les câbles de commande et de réseau des câbles puissance. Relier le blindage au PE en assurant de grandes surfaces de contact.

(de)

Vorsicht!

Im Geltungsbereich der EG-Richtlinien dürfen die frequenzgesteuerten Geräte und deren Zubehör nur dann in Betrieb genommen werden, wenn festgestellt wird, dass die Maschine die Schutzanforderungen der Maschinenrichtlinie 89/392/EWG erfüllt.

EMV-gerechter Aufbau. Steuer- und Netzleitungen räumlich getrennt von der Motorleitung verlegen. [PES] Leitungsschirm großflächig mit PE verbinden.

(it)

Attenzione!

Nel campo di validità delle direttive CE, gli apparecchi a controllo di frequenza e i loro accessori possono essere messi in esercizio soltanto se si verifica che la macchina soddisfa i requisiti di sicurezza della direttiva macchine 89/392/CEE.

Montaggio secondo CEM. Disporre i cavi comandi e di alimentazione separati dal cavo del motore. Collegare lo schermo del cavo [PES] con PE con un'ampia superficie.

(nl)

Voorzichtig!

Binnen het geldigheidsgebied van de EC-richtlijnen mogen de frequentiegeregelde apparaten en de toebehoren daarvan alleen in bedrijf worden genomen, wanneer wordt vastgesteld, dat de machine aan de veiligheidsvoorschriften van de machinerichtlijn 89/392/EWG voldoet.

EMC-conforme constructie. Besturings- en netkabels ruimtelijk gescheiden van de motorkabel leggen. [PES] Kabelafscherming over groot oppervlak met PE verbinden.

(da)

Forsigtig!

I det område, hvor EF-direktiverne er gældende, må det frekvensstyrede udstyr og dets tilbehør kun tages i anvendelse, hvis det konstateres, at maskinen opfylder beskyttelseskravene i maskindirektivet 89/392/EØF.

EMC-korrekt installation. Træk styre- og netledninger rumligt adskilt fra motorledningen. [PES] Sørg for en stor kontakflade mellem PES ledningsafskærmning og PE.

(el)

Προσοχή!

Στο πεδίο εφαρμογής των οδηγιών της ΕΚ, οι ελεγχόμενες μέσω συχνότητας συσκευές και τα παρελκόμενά τους επιτρέπεται να τίθενται σε λειτουργία μόνο εφόσον διαπιστωθεί ότι το μηχάνημα πληροί τις απαιτήσεις προστασίας της οδηγίας της ΕΚ για τα μηχανήματα 89/392/ΕΟΚ.

Κατασκευή σύμφωνα με τις απαιτήσεις ΗΜΣ. Εγκαθιστάτε τους αγωγούς ελέγχου και δικτύου ανεξάρτητα από τον αγωγό του κινητήρα. [PES] Συνδέετε τη θωράκιση των αγωγών σε μεγάλη επιφάνεια με τη γείωση.

(pt)

Cuidado!

No âmbito das diretivas da CE, os aparelhos comandados por frequência e os respectivos acessórios só podem ser postos em operação se for comprovado que a máquina atende às exigências de proteção da diretiva de máquinas 89/392/CE.

Estrutura com compatibilidade eletromagnética. Dispor os fios de comando e de rede separados do fio do motor. [PES] Ligar uma área grande da blindagem do cabo (PES) com o PE.

(sv)

Se upp!

I giltighetsområdet för EG-direktiven får de frekvensstyrda apparaterna och deras tillbehör endast tagas i drift när man fastställt att maskinen uppfyller skyddskraven i maskindirektiv 89/392/EEC.

EMC-anpassad uppbyggnad. Styr- och nätledningar dras avskilda från motorledningarna. [PES] Förbind ledningsskärm över ett brett område med PE.

(fi)

Varo!

EU-direktiivien voimassaoloalueella taajuusohjatut laitteet ja niiden varusteet saa ottaa käyttöön vain silloin, kun todetaan, että kone täyttää konedirektiivin 89/392/ETY suojausvaatimukset.

EMC-mukainen rakenne. Ohjaus- ja verkkojohdot on asennettava tilalotteisesti erotettuina. Johdonsuoja on liitettävä laajasti maadoitukseen [PES].

(cs)

Pozor!

V rozsahu platnosti směrnice ES smí být frekvenčně řízené přístroje a jejich příslušenství uvedeny do provozu jedině tehdy, pokud je zjištěno, že stroj splňuje požadavky ochrany stanovené směrnicí 89/392/EHS o strojních zařízeních.

Nástavba odpovídající směrnici EMC. Řídící a síťová vedení pokládejte prostorově oddělená od vedení motoru. [PES] Stínění vedení spojte velkoplošně s PE.

(et)

Ettevaatust!

EÜ-direktiivi kehtivuspiirkonnas võib sagedusjuhitavaid seadmeid ja nende lisaseadmeid kasutusele võtta ainult siis, kui on kindlaks tehtud, et masin vastab masinadirektiivi 89/392/EMÜ kaitsenõuetele.

Elektromagnetilisele ühilduvusele vastav ehitus. Juhtimis- ja võrgukaablid paigaldada mootori toitekaablist ruumiliselt eraldatuna. [PES] Kaabli kaitseekraan ühendada ulatuslikult talitusmaandusega.

(hu)

Vigyázat!

Az EK irányelvek hatályossági területén a frekvenciavezérelt készülékeket és azok tartozékait csak akkor szabad üzembe helyezni, ha megállapítást nyert, hogy a gép megfelel a gépek biztonságáról szóló, 89/392/EGK számú irányelv biztonsági követelményeinek.

Elektromágnesesen összeférhető kivitelű biztosítson. A motorvezetékektől térben elkülönítve vezesse vezérlő és hálózati vezetékeket. [PES] Nagy felületen csatlakoztassa a védőföldeléshez a vezetékkáryékolást.

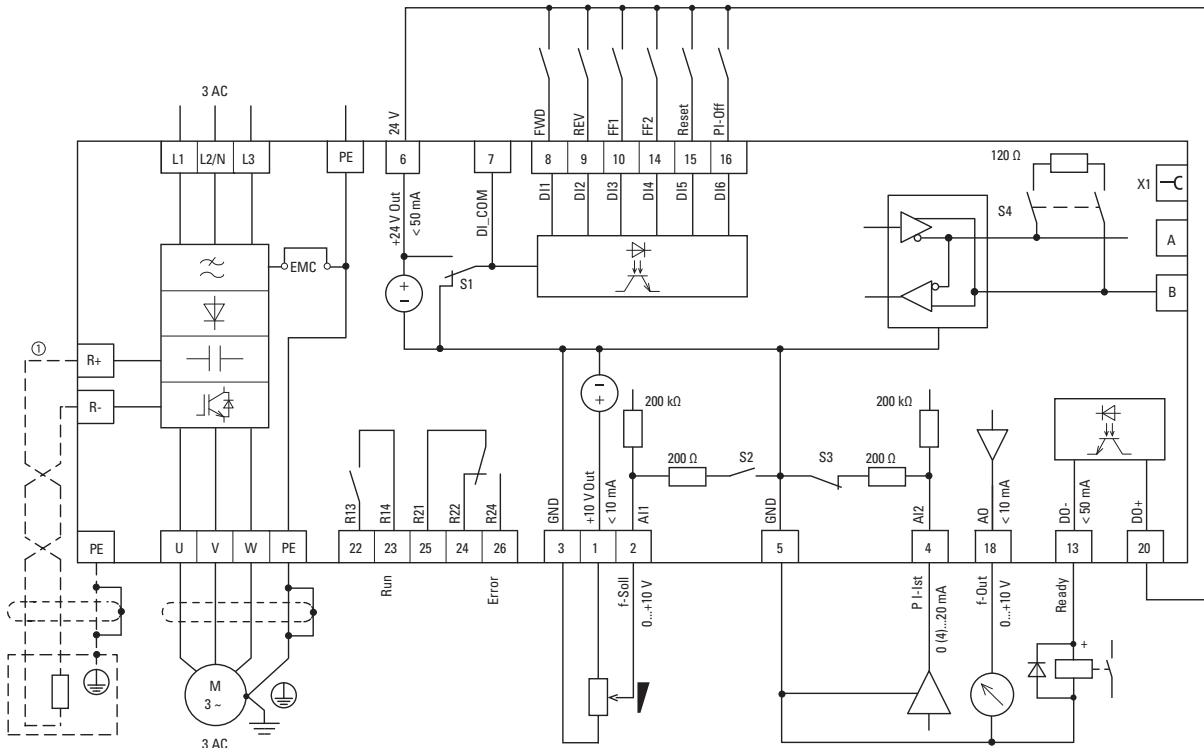
(lv)

levērot piesardzību!

Valstīs, kurās ir spēkā EK direktīvas, ierīču ar frekvenčvadību un to piederumu ekspluatāciju drīkst sākt tikai tad, ja ir konstatēta iekārtas atbilstība Mašīnu direktīvā 89/392/EEK ietvertajām aizsardzības prasībām.

EMS atbilstoša uzbūve. Vadības un tīkla kabelus izvietot atsevišķi no motora kabeļa [PES] Vada ekrānu plašā virsmā savienot ar PE.

MMX32..., MMX34..., MMX35...




① MMX34...4D3..., MMX34...5D6..., MMX34...7D6..., MMX34...9D0..., MMX34...012..., MMX34...014...


UL® Cautions, Warnings, and Instructions

Wiring Warnings for Electrical Practices and Wire Sizes

The Cautions, Warnings, and instructions in this section summarize the procedures necessary to ensure an inverter installation complies with Underwriters Laboratories® guidelines.

 (en) **Warning!**
Use 60/75°C Cu wire only or equivalent.

 (en) **Warning!**
Open Type Equipment.

 (en) **Warning!**
Suitable for use on a circuit capable of delivering not more than 5,000 rms symmetrical amperes:

- 120V maximum for MMX11 models.
- 240V maximum for MMX12 and MMX32 models.
- 480V maximum for MMX34 models.
- 575V maximum for MMX35 models.


Circuit Breaker and Fuse Sizes

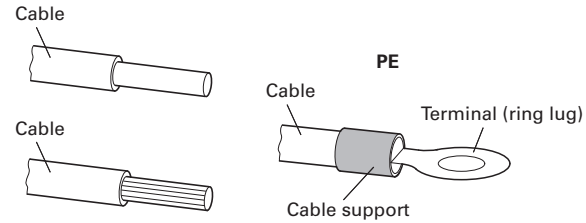
The adjustable frequency drive's connections to input power must include UL Listed inverse time circuit breakers with 600V rating, or UL Listed fuses.

Terminal Tightening Torque and Wire Size

The wire size range and tightening torque for field wiring terminals are presented.

Wire Connectors


 (en) **Warning!**
Field wiring connections must be made by a UL Listed and CSA Certified ring lug terminal connector sized for the wire gauge being used. The connector must be fixed using the crimping tool specified by the connector manufacturer.







Motor Overload Protection

MMX adjustable frequency drives provide solid-state motor overload protection, which depends on the proper setting of the following parameter: P7.2 "current limit".

Set the rated current [Amperes] of the motor(s) with the above parameters. The setting range is 0.2 * rated current to 2 * rated current, → manual MN04020001.

 (en) **Warning!**
When two or more motors are connected to the inverter, they cannot be protected by the electronic overload protection. Install an external thermal relay on each motor.

Specified Fuses and Disconnect Devices

Part No. M-Max	Maximum Permitted Line Supply Voltage U_{LN} [V]	 VDE [A]	 UL [A] ^①	 ^② Type Designation	 ^② Type Designation/Catalog No.
MMX11AA1D7...	1 AC 120V +10%	20	20	FAZ-B20/1N	—
MMX11AA2D4...	1 AC 120V +10%	20	20	FAZ-B20/1N	—
MMX11AA2D8...	1 AC 120V +10%	20	20	FAZ-B20/1N	—
MMX11AA3D7...	1 AC 120V +10%	20	20	FAZ-B20/1N	—
MMX11AA4D8...	1 AC 120V +10%	32	30	FAZ-B32/1N	—
MMX12AA1D7...	1 AC 240V +10%	10	10	FAZ-B10/1N	—
MMX12AA2D4...	1 AC 240V +10%	10	10	FAZ-B10/1N	—
MMX12AA2D8...	1 AC 240V +10%	10	10	FAZ-B10/1N	—
MMX12AA3D7...	1 AC 240V +10%	10	10	FAZ-B10/1N	—
MMX12AA4D8...	1 AC 240V +10%	20	20	FAZ-B20/1N	—
MMX12AA7D0...	1 AC 240V +10%	20	20	FAZ-B20/1N	—
MMX12AA9D6...	1 AC 240V +10%	32	30	FAZ-B32/1N	—
MMX32AA1D7...	3 AC 240V +10%	6	6	FAZ-B6/3	PKM0-6.3/XTPM6P3BNL
MMX32AA2D4...	3 AC 240V +10%	6	6	FAZ-B6/3	PKM0-6.3/XTPM6P3BNL
MMX32AA2D8...	3 AC 240V +10%	6	6	FAZ-B6/3	PKM0-6.3/XTPM6P3BNL
MMX32AA3D7...	3 AC 240V +10%	6	6	FAZ-B6/3	PKM0-6.3/XTPM6P3BNL
MMX32AA4D8...	3 AC 240V +10%	10	10	FAZ-B10/3	PKM0-10/XTPM010BNL
MMX32AA7D0...	3 AC 240V +10%	10	10	FAZ-B10/3	PKM0-10/XTPM010BNL
MMX32AA011...	3 AC 240V +10%	20	20	FAZ-B20/3	PKM0-20/XTPM020BNL
MMX32AA012...	3 AC 240V +10%	20	20	FAZ-B20/3	PKM0-20/XTPM020BNL
MMX32AA017...	3 AC 240V +10%	25	25	FAZ-B25/3	PKM0-25/XTPM025BNL
MMX32AA025...	3 AC 240V +10%	32	40	FAZ-B32/3	PKM0-32/XTPM032BNL
MMX32AA031...	3 AC 240V +10%	40	40	FAZ-B40/3	PKM4-40/XTPM040BNL
MMX32AA038...	3 AC 240V +10%	50	50	FAZ-B50/3	PKM4-50/XTPM050BNL
MMX34AA1D3...	3 AC 480V +10%	6	6	FAZ-B6/3	PKM0-6.3/XTPM6P3BNL
MMX34AA1D9...	3 AC 480V +10%	6	6	FAZ-B6/3	PKM0-6.3/XTPM6P3BNL
MMX34AA2D4...	3 AC 480V +10%	6	6	FAZ-B6/3	PKM0-6.3/XTPM6P3BNL
MMX34AA3D3...	3 AC 480V +10%	6	6	FAZ-B6/3	PKM0-6.3/XTPM6P3BNL
MMX34AA4D3...	3 AC 480V +10%	10	10	FAZ-B10/3	PKM0-10/XTPM010BNL
MMX34AA5D6...	3 AC 480V +10%	10	10	FAZ-B10/3	PKM0-10/XTPM010BNL
MMX34AA7D6...	3 AC 480V +10%	20	20	FAZ-B20/3	PKM0-20/XTPM020BNL
MMX34AA9D0...	3 AC 480V +10%	20	20	FAZ-B20/3	PKM0-20/XTPM020BNL
MMX34AA012...	3 AC 480V +10%	20	20	FAZ-B20/3	PKM0-20/XTPM020BNL
MMX34AA014...	3 AC 480V +10%	25	25	FAZ-B25/3	PKM0-25/XTPM025BNL
MMX34AA016...	3 AC 480V +10%	25	25	FAZ-B25/3	PKM0-25/XTPM025BNL
MMX34AA023...	3 AC 480V +10%	32	40	FAZ-B32/3	PKM0-32/XTPM032BNL
MMX34AA031...	3 AC 480V +10%	40	40	FAZ-B40/3	PKM4-40/XTPM040BNL
MMX34AA038...	3 AC 480V +10%	50	50	FAZ-B50/3	PKM4-50/XTPM050BNL
MMX35AA1D7...	3 AC 575V +10%	6	6	FAZ-B6/3	PKM0-6.3/XTPM6P3BNL
MMX35AA2D7...	3 AC 575V +10%	6	6	FAZ-B6/3	PKM0-6.3/XTPM6P3BNL
MMX35AA3D9...	3 AC 575V +10%	6	6	FAZ-B6/3	PKM0-6.3/XTPM6P3BNL
MMX35AA6D1...	3 AC 575V +10%	10	10	FAZ-B10/3	PKM0-10/XTPM010BNL
MMX35AA9D0...	3 AC 575V +10%	20	20	FAZ-B20/3	PKM0-20/XTPM020BNL

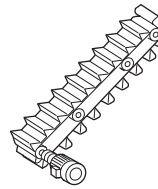
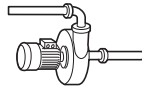
Notes

① Fuse UL-rated, Class J, 600V.

② I_{cn} 10 kA.

Quick Start Parameter Guide

Predefined Application Parameters from Parameter P1.2



Parameter (PNU)	Basic (Standard Drive)	Pump Drive	Fan Drive	High Load	Designation
P1.1	1 = Only quick configuration parameters	1 = Only quick configuration parameters	1 = Only quick configuration parameters	1 = Only quick configuration parameters	Quick start parameters
P1.2	0 = Basic	1 = Pump drive	2 = Fan drive	3 = Hoisting device (high load)	Application
P1.3	1 = N/A	1 = N/A	1 = N/A	1 = N/A	Country specific default settings
P6.1	1 = Control signal terminals (I/O) (I/O)	1 = Control signal terminals (I/O) (I/O)	1 = Control signal terminals (I/O) (I/O)	1 = Control signal terminals (I/O) (I/O)	Primary remote control source
P6.2	3 = AI1 (analog setpoint 1)	3 = AI1 (analog setpoint 1)	3 = AI1 (analog setpoint 1)	3 = AI1 (analog setpoint 1)	Primary remote speed reference
P6.3	00.00 Hz	20.00 Hz	20.00 Hz	00.00 Hz	Minimum frequency
P6.4	60.00 Hz	60.00 Hz	60.00 Hz	60.00 Hz	Maximum frequency
P6.5	3.0s	5.0s	20.0s	1.0s	Acceleration time (acc1)
P6.6	3.0s	5.0s	20.0s	1.0s	Deceleration time (dec1)
P6.7	0 = Ramp (acceleration)	0 = Ramp (acceleration)	0 = Ramp (acceleration)	0 = Ramp (acceleration)	Start function
P6.8	0 = Free coasting	1 = Deceleration time (ramp)	0 = Free coasting	0 = Free coasting	Stop function
P7.1	I_e	I_e	I_e	I_e	Motor, rated current
P7.3	1720 RPM	1720 RPM	1720 RPM	1720 RPM	Motor, rated speed (RPM)
P7.4	0.85	0.85	0.85	0.85	Motor, power factor (cos φ)
P7.5	230/460/575V ^①	230/460/575V ^①	230/460/575V ^①	230/460/575V ^①	Motor, rated operating voltage
P7.6	60 Hz	60 Hz	60 Hz	60 Hz	Motor, rated frequency
P11.7	0 = Deactivated	0 = Deactivated	0 = Deactivated	1 = Enabled	Torque increase
M1.1	0.00 Hz	0.00 Hz	0.00 Hz	0.00 Hz	Output frequency (display only)

Note

^① 230V = MMX11_, MMX12_, MMX32_
400V = MMX34_, 575V = MMX35_
This parameter will default based on style of unit.

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