

! (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 elektotechnisch geïnstrueerde personen is het toegestaan, de navolgend beschreven 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 ηλεκτροτεχνίτες.

(pt) Perigo de vida devido a corrente eléctrica!
Apenas electricistas e pessoas com formação electroécnica 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.

(cs) Nebezpečí úrazu elektrickým proudem!
Níže uvedené práce smějí provádět pouze osoby s elektrotechnickým vzděláním.

(et) Eluohhtlik! Elektrilöögiolt!
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 tikai elektrospēcialisti un darbam ar elektrotehnikām iekārtām instruētās 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.

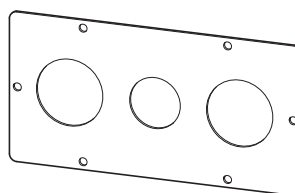
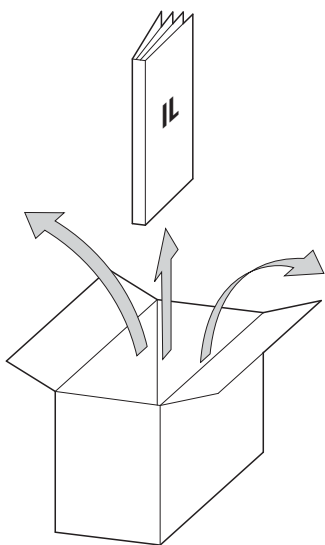
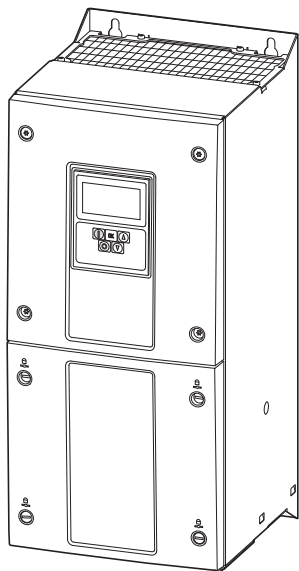
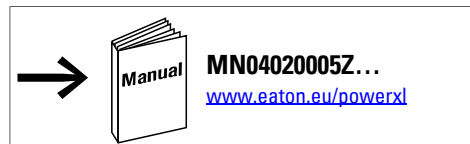
(bg) Опасност за живота от електрически ток!
Операциите, описани в следващите раздели, могат да се извършват само от специалисти-електротехници и инструктиран електротехнически персонал.

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

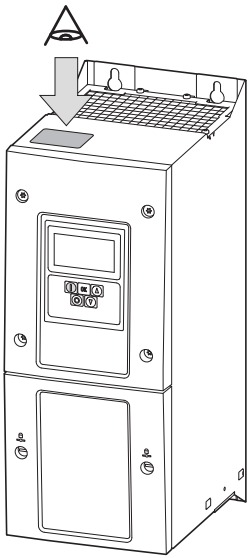
(hr) Opasnost po život uslijed električne struje!
Radove opisane u nastavku smiju obavljati samo stručni električari i osobe koje su prošle elektrotehničku obuku.

DA1-32...
DA1-34...
DA1-35...
DL1-34...

IP55, NEMA3



(FS4, FS5)



DL1- 34 zzz FB - ...55...

DA1- 3y zzz FN - ...55...

55 = IP55, NEMA 3

B = Brake chopper (DC+, BR)

N = No Brake chopper

F = EMC Filter (RFI)

N = No EMC Filter (RFI)

I_e

024 = 24 A

302 = 302 A

U_{LN} (Mains), 50/60 Hz

2 = 230 V (200 - 240 V $\pm 10\%$)

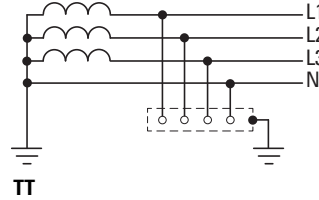
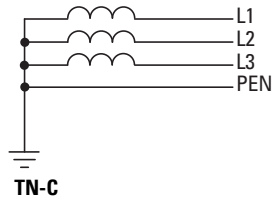
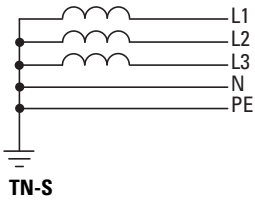
4 = 400 V (380 - 480 V $\pm 10\%$)

5 = 575 V (500 - 600 V $\pm 10\%$)

Mains \rightarrow Motor

3 = 3 AC \rightarrow 3 AC

Mains (TN, TT)



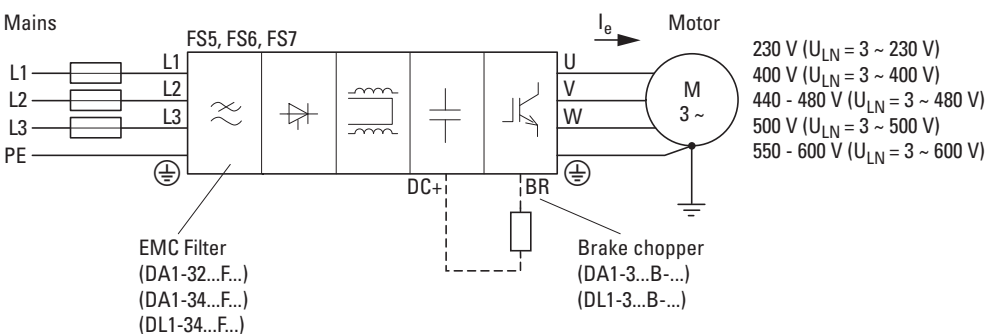
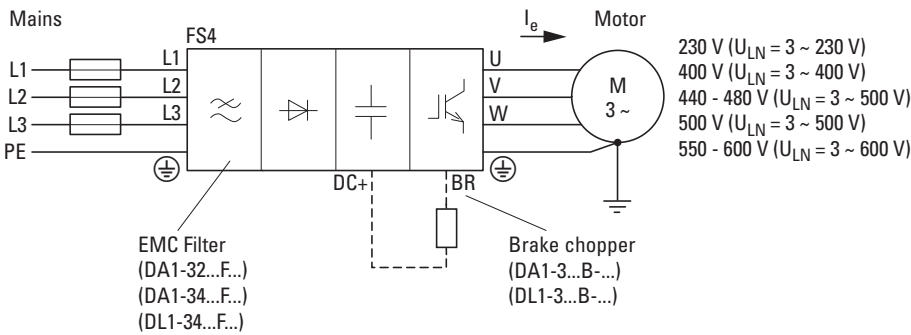
DA1-32..., DA1-34..., DA1-35..., DL1-34...

DA1-32...: $U_{LN} = 3 \sim 200 - 240 \text{ V} \pm 10\%$, 50/60 Hz

DA1-34...: $U_{LN} = 3 \sim 380 - 480 \text{ V} \pm 10\%$, 50/60 Hz

DA1-35...: $U_{LN} = 3 \sim 500 - 600 \text{ V} \pm 10\%$, 50/60 Hz

DL1-34...: $U_{LN} = 3 \sim 380 - 480 \text{ V} \pm 10\%$, 50/60 Hz

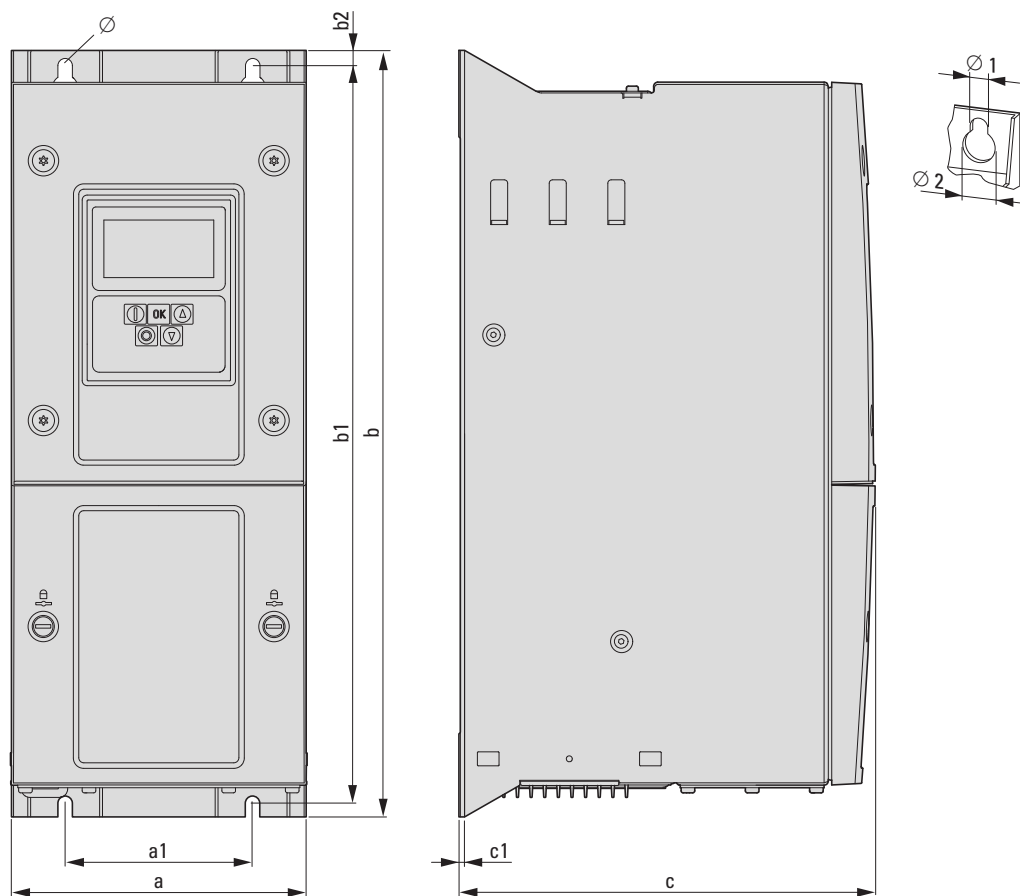


(en) Dimensions and weights
 (de) Abmessungen und Gewichte
 (fr) Encombremets et poids
 (es) Dimensiones y pesos
 (it) Dimensioni e pesi
 (zh) 尺寸和重量

(ru) Размеры и вес
 (nl) Afmetingen en gewichten
 (da) Mål og vægt
 (el) Διαστάσεις και βάρη
 (pt) Medições e pesos
 (sv) Dimensioner och vikter


(fi) Mitat ja painot
 (cs) Rozměry a hmotnosti
 (et) Mõõtmed ja kaalud
 (hu) Méretek és Súly
 (lv) Izmēri un svars
 (lt) Matmenys ir svoriai

(pl) Wymiary i masy
 (sl) Dimenzije in teže
 (sk) Rozmery a hmotnosti
 (bg) Размери и тегло
 (ro) Dimensiuni și greutateți
 (hr) Dimenzije i težina

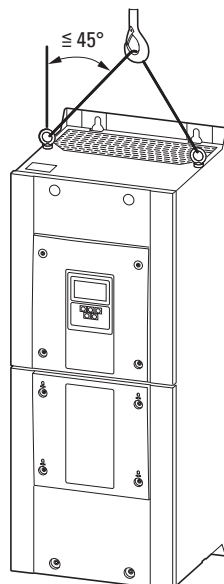
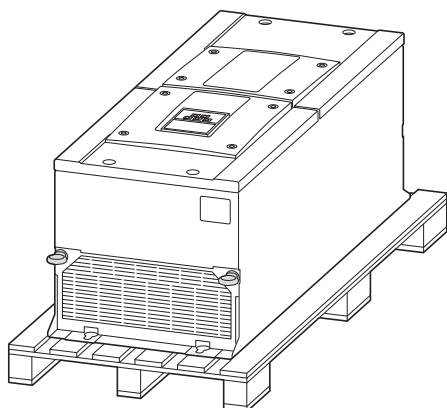


→ 1 inch = 25.4 mm
 1 mm = 0.0394 inch
 1 inch = 1"

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[mm (in)]		a	a1	b	b1	b2	c	c1	Ø 1	Ø 2	 kg (lbs)
FS4	DA1-32... DA1-34... DL1-34...	173 (6.81)	110 (4.33)	450 (17.72)	433 (17.05)	9 (0.35)	240 (9.45)	2 (0.08)	8 (0.31)	15 (0.59)	11.5 (25.35)
FS5	DA1-32... DA1-34... DL1-34...	235 (9.25)	175 (6.89)	540 (20.28)	520 (20.47)	12 (0.47)	270 (10.63)	2 (0.08)	8 (0.31)	15 (0.59)	22.5 (49.60)
FS6	DA1-32... DA1-34...	330 (12.99)	200 (7.87)	865 (34.06)	840 (33.07)	15 (0.59)	322 (12.68)	2 (0.08)	11 (0.43)	22 (0.87)	50 (110.23)
FS7	DA1-32... DA1-34...	330 (12.99)	200 (7.87)	1280 (50.39)	1255 (49.41)	15 (0.59)	348 (13.7)	2 (0.08)	11 (0.43)	22 (0.87)	80 (176.37)

FS6, FS7

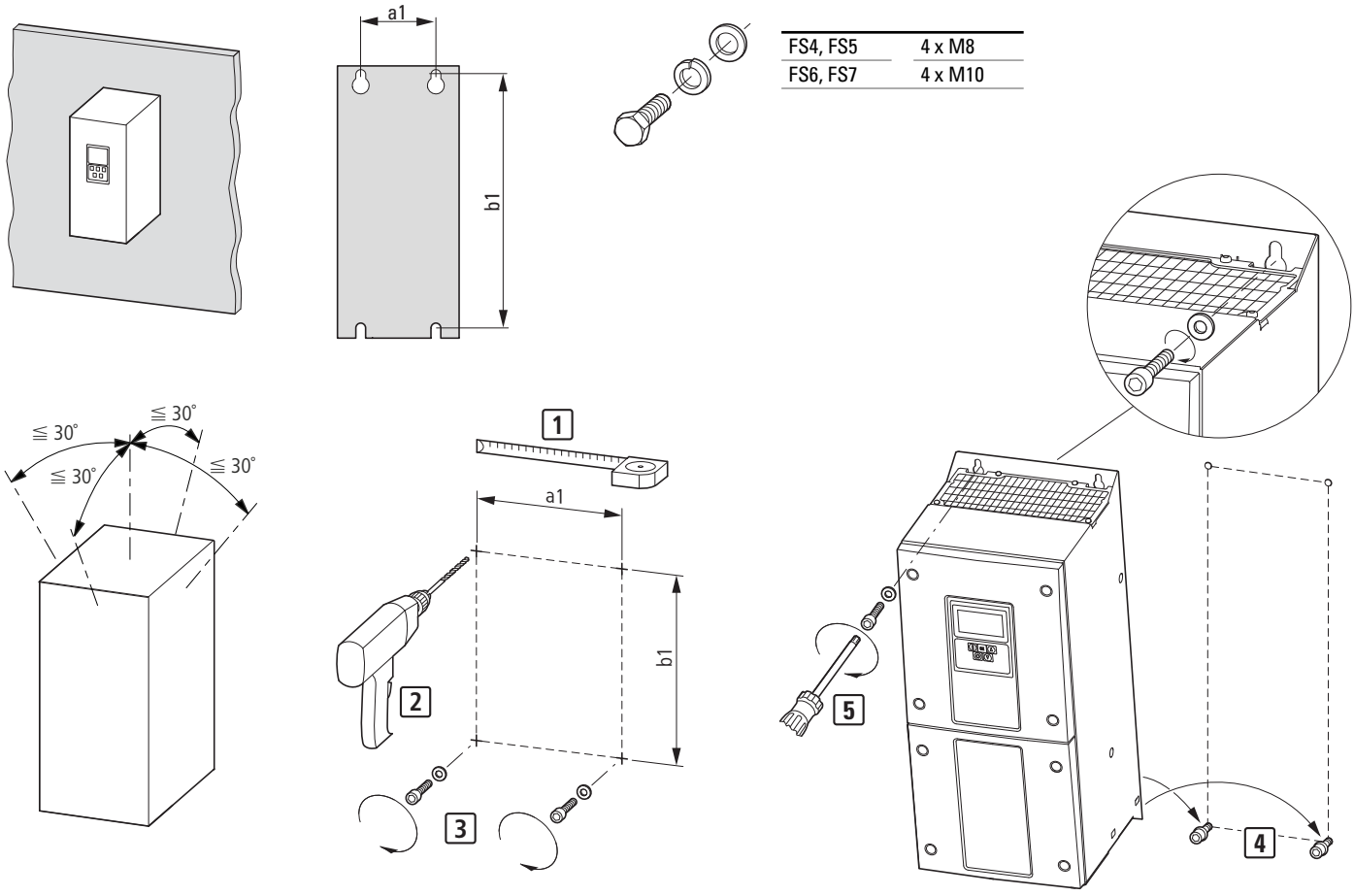


(en) Mounting on metal plate
 (de) Montage auf Metallplatte
 (fr) Montage sur platine métallique
 (es) Montaje sobre una placa de metal
 (it) Montaggio su piastra metallica
 (zh) 安裝到金屬板上

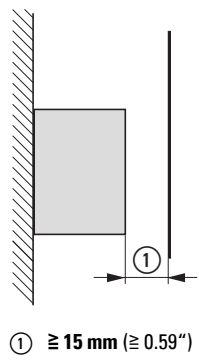
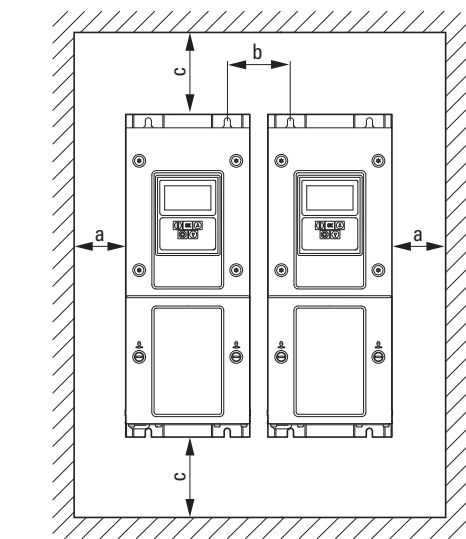
(ru) Монтаж на металлической пластине
 (nl) Montage op metalen plaat
 (da) Montering på metalplade
 (el) Εγκατάσταση σε μεταλλικό έλασμα
 (pt) Montagem na placa de metal
 (sv) Montering på metallplatta

(fi) Asennus metallilevyllä
 (cs) Montáž na kovovou desku
 (et) Montáž na kovonú dosku
 (hu) Szerelés fémlemezre
 (lv) Montāža uz metāla plāksnes
 (lt) Montavimas ant metalinės plokštės

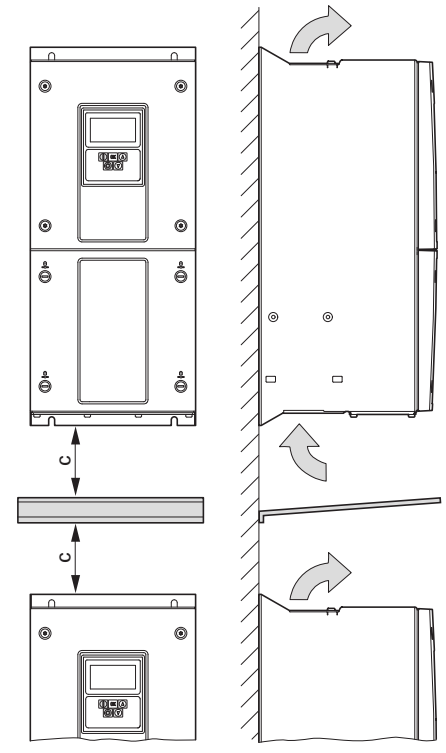
(pl) Montaż na metalowej płytce
 (sl) Montaža na kovinsko ploščo
 (sk) Montáž na kovonú dosku
 (bg) Монтаж върху метална планка
 (ro) Montare pe placă metalică
 (hr) Montaža na metalnu ploču



FS4, FS5	4 x M8
FS6, FS7	4 x M10

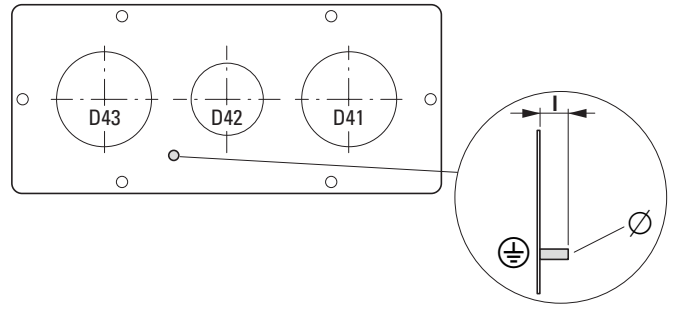
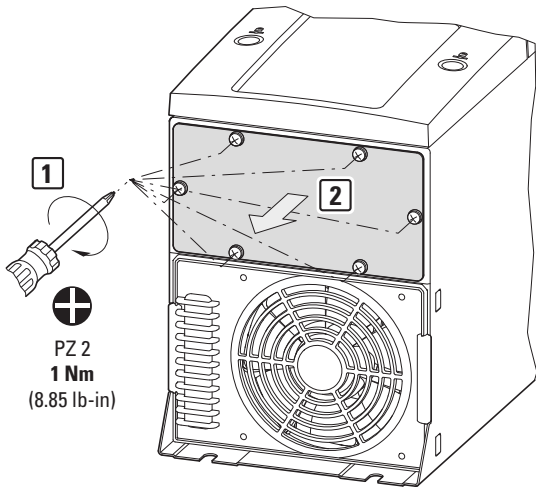


mm (in)	a	b	c
FS4	10 (0.39)	70 (2.76)	200 (7.87)
FS5	10 (0.39)	70 (2.76)	200 (7.87)
FS6	10 (0.39)	140 (5.51)	200 (7.87)
FS7	10 (0.39)	140 (5.51)	200 (7.87)



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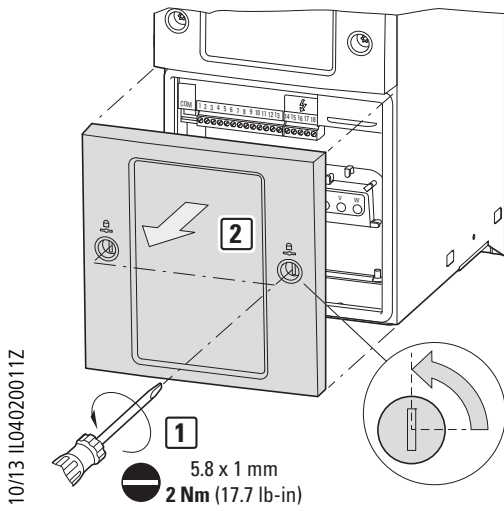
FS4, FS5



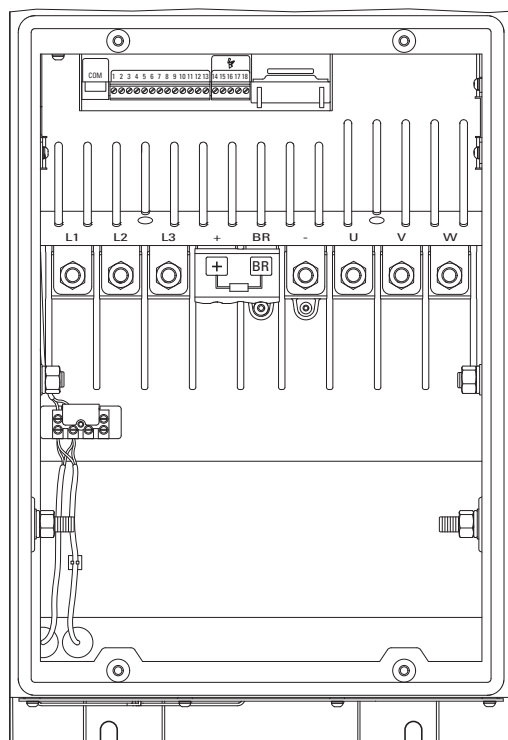
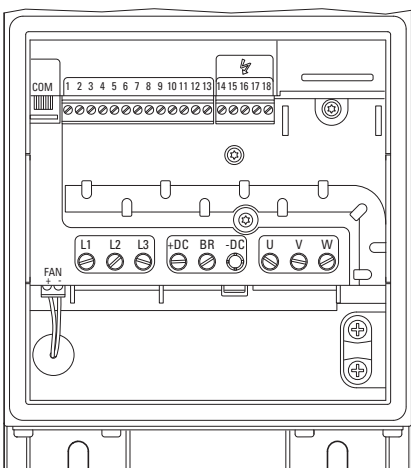
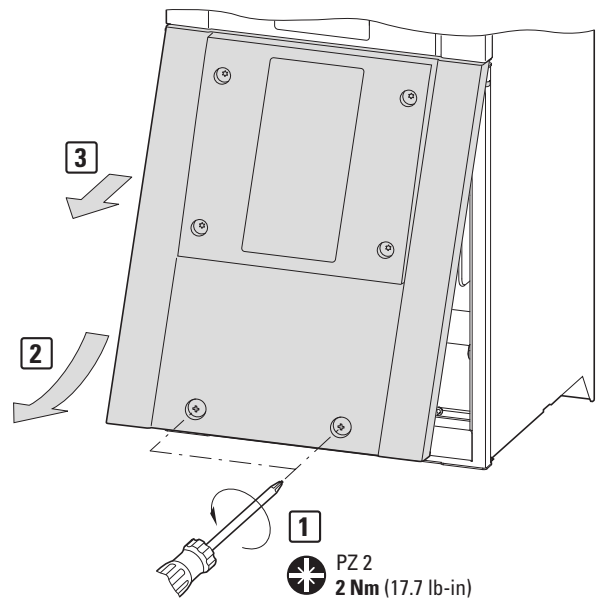
mm (in)

	D41 Mains	D42 Control	D43 Motor	l	Ø
FS4	40.5 (1.59) M40	25.5 (1) M25	40.5 (1.59) M40	10 (0.39)	M4
FS5	50.5 (1.99) M50	25.5 (1) M25	50.5 (1.99) M50	18 (0.71)	M6

FS4, FS5



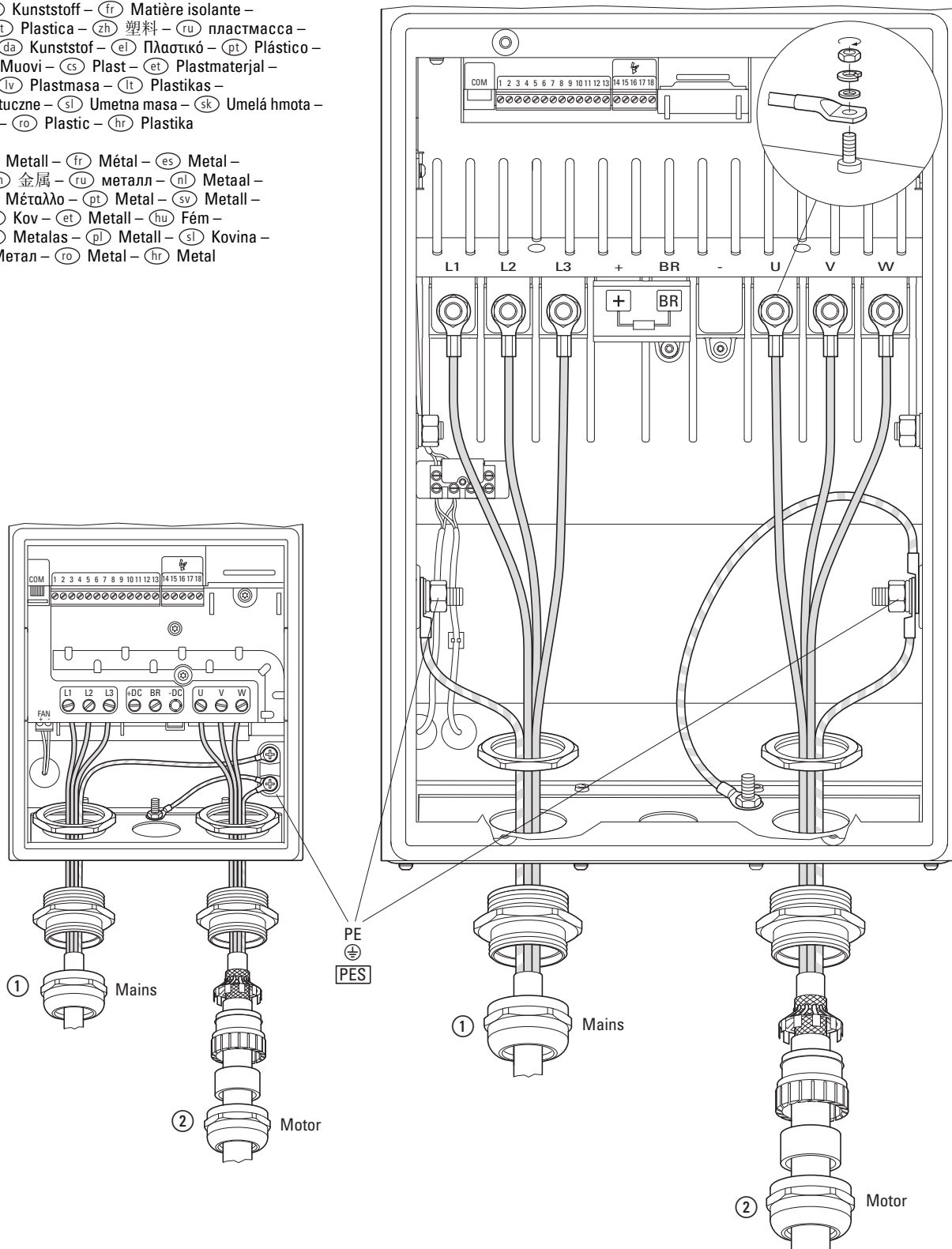
FS6, FS7



en NOTICE Connect only in voltage-free state!	da VIGTIGT Må kun tilsluttes i spændingsfri tilstand!	lv UZMANĪBU Pieslēgt tikai tad, kad nenotiek sprieguma padeve!
de ACHTUNG Nur im spannungsfreien Zustand anschließen!	el ΕΠΙΓΡΥΠΝΗΣΗ Συνδέστε μόνο όταν δεν επικρατεί τάση!	it DĒMESIO Prijungti tik tada, kai išjungta įtampa!
fr ATTENTION Raccordez l'appareil uniquement hors tension !	pt ADVERTÊNCIA Ligar apenas com a tensão desligada!	pl UWAGA Podłączać zawsze po uprzednim odłączeniu od zasilania elektrycznego!
es CAUIDADO ¡Conectar únicamente en estado sin tensión!	sv OBSERVERA Får endast anslutas i spänningsfritt tillstånd!	sl POZOR Napravo priključite le, ko ni pod napetostjo!
it AVVISO Collegare solo in assenza di tensione!	fi ILMOITUS Kytke vain jännitteettömässä tilassa!	sk UPOZORNENIE Narájat' len v stave bez napätia!
zh 注意 必须在断电状态下进行连接!	cs UPOZORNĚNÍ Připojíte jen při zcela odpojeném napájení!	bg ПРЕДУПРЕЖДЕНИЕ Свързвайте само, когато уреда не е под напрежение!
ru ВНИМАНИЕ Подключать только в обесточенном состоянии!	et TÄHELEPANU Ühendada ainult pingevabas olekus!	ro ATENȚIE Conectați doar când aparatul nu se află sub tensiune!
nl OPGELET Alleen in spanningsloze toestand aansluiten!	hu FIGYELEM Csak feszültségmentes állapotban csatlakoztassa!	hr POZOR Priključujte samo u beznaponskom stanju!

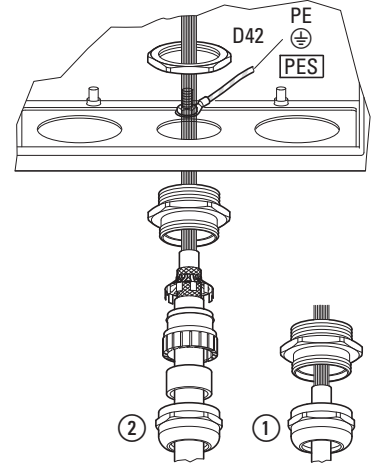
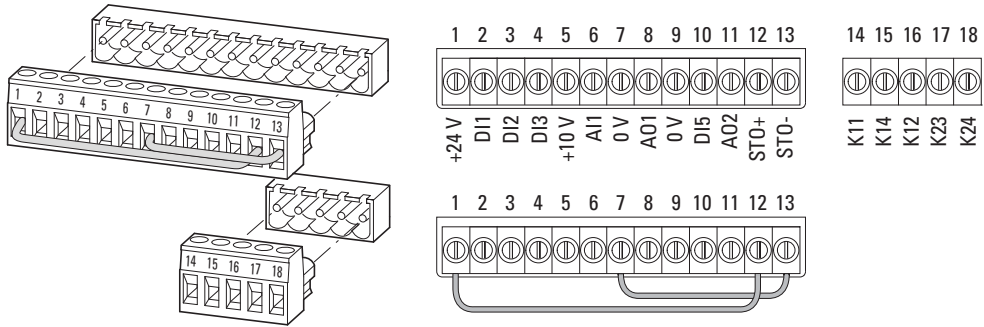
- ② **en** Plastic – **de** Kunststoff – **fr** Matière isolante –
es Plástico – **it** Plastica – **zh** 塑料 – **ru** пластмасса –
nl Kunststof – **da** Kunststof – **el** Πλαστικό – **pt** Plástico –
sv Plast – **fi** Muovi – **cs** Plast – **et** Plastmaterjal –
hu Műanyag – **lv** Plastmasa – **lt** Plastikasis –
pl Tworzywo sztuczne – **sl** Umetna masa – **sk** Umelá hmota –
bg Пластмаса – **ro** Plastic – **hr** Plastika

- ③ **en** Metal – **de** Metall – **fr** Métal – **es** Metal –
it Metallo – **zh** 金属 – **ru** металл – **nl** Metaal –
da Metal – **el** Μέταλλο – **pt** Metal – **sv** Metall –
fi Metall – **cs** Kov – **et** Metall – **hu** Fém –
lv Metāls – **lt** Metalas – **pl** Metal – **sl** Kovina –
sk Kov – **bg** Метал – **ro** Metal – **hr** Metal



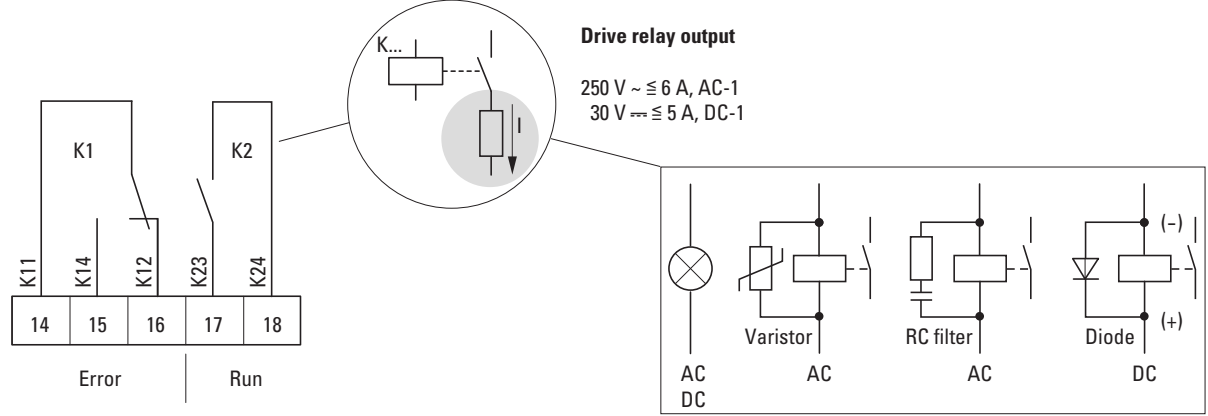
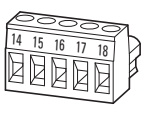
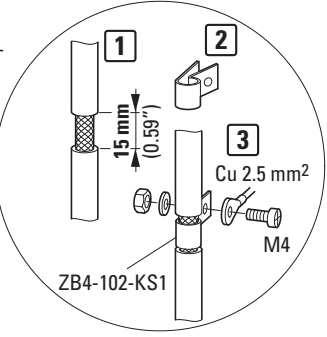
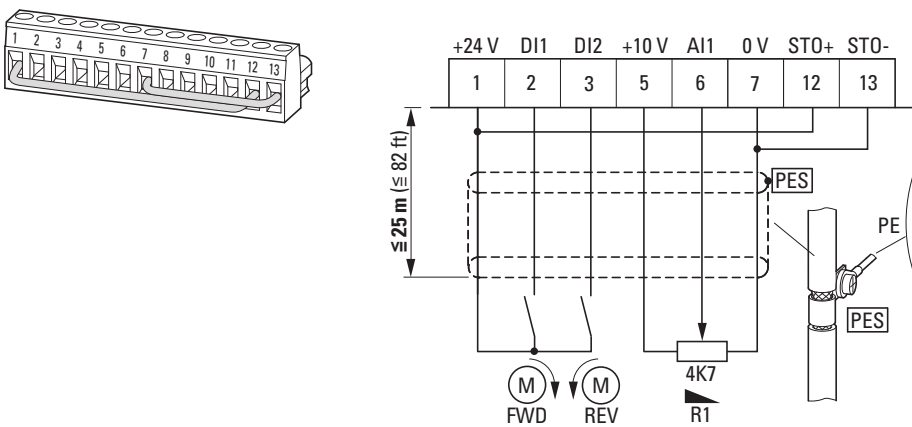
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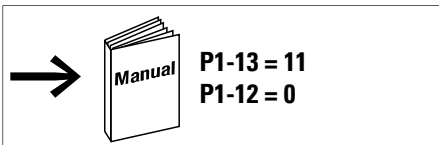
	L1, L2, L3, +DC, BR, -DC, U, V, W			PZ2 PE		M8			M10			Torx 20 [+ , BR], [-]	
	mm	Nm	lb-in	Nm	lb-in	mm	Nm	lb-in	mm	Nm	lb-in	Nm	lb-in
FS4	1.0 × 5.8	4	35	2.5	22								
FS5	1.0 × 5.8	15	133	2.5	22								
FS6						13	10	88	17	20	177	2.5	22
FS7						13	10	88	17	20	177	2.5	22



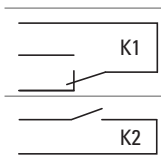
mm ²	mm ²	AWG	mm	in	M3 Nm	lb-in	mm
0.14 - 2.5	0.14 - 2.5	30 - 12	6	0.24	0.8	7	0.4 x 2.5

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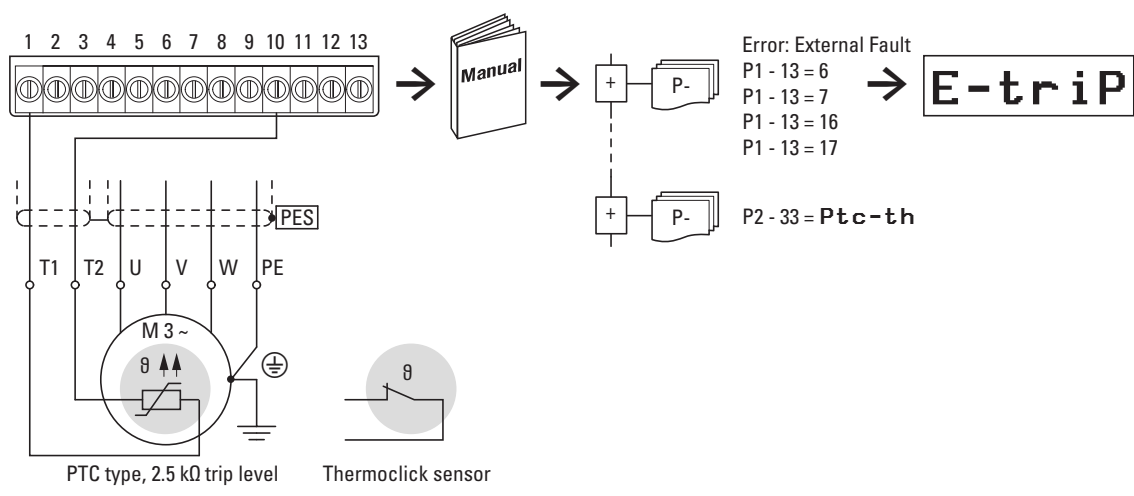




Input	L: 0 - 4 V DC	H: 8 - 30 V DC	Output
External Supply +24 V DC (100 mA)			1 +24 V DC, < 100 mA
Digital Input 1 (DI1)	Stop	Enable, Run Forward Rotation	2
Digital Input 2 (DI2)	Stop	Enable, Run Reverse Rotation	3
Digital Input 3 (DI3)	AI1	FF1/FF2	4
			5 +10 V DC, < 10 mA
Analog Input 1 (AI1): 0 - 10 V DC, < 20 mA, Frequency Setpoint value [Digital Input 4 (DI4)] → P1-13			6
0 V			7 0 V
0 V			8 Analog Output 1 (AO1): 0 - 10 V DC, < 20 mA, Output Frequency [Digital Output 1 (DO1)] → P2-11, P2-12
Digital Input 5 (DI5) [Analog Input 2 (AI2)] → P1-13	FF1, Fixed Frequency (P2-01 = 5 Hz)	FF2, Fixed Frequency (P2-02 = 10 Hz)	9 0 V
			10
Safe Torque Off	Stop	STO+ (18 - 30 V DC)	11 Analog Output 2 (AO2): 0 - 10 V DC, < 20 mA, Output Current [Digital Output 2 (DO2)] → P2-13, P2-14
Safe Torque Off	Stop	STO- (0 V)	12
			13
			14 Relay (K11 = COM)
			15 Relay (K14 = NO), Healthy
			16 Relay (K12 = NC), Error
			17 Relay (K23 = COM)
			18 Relay (K24 = NO), RUN

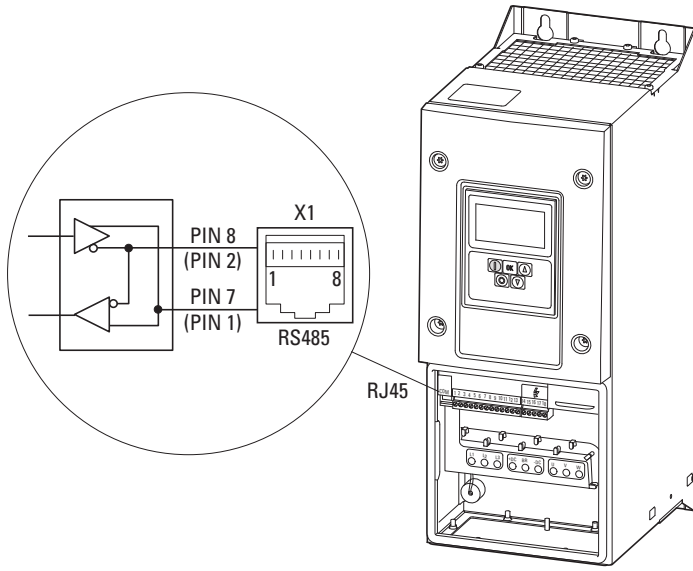


- (en) Thermistor
- (it) Termistore
- (da) Thermistor
- (fi) Termistori
- (lv) Termistors
- (sk) Termistor
- (de) Thermistor
- (zh) 热敏电阻
- (el) Θερμίστορ
- (cs) Termistor
- (lt) Termistorius
- (bg) Термистор
- (fr) Thermistance
- (ru) Термистор
- (pt) Thermistance
- (et) Termistor
- (pl) Termistor
- (ro) Termistor
- (es) Termistor
- (nl) Thermistor
- (sv) Termistor
- (hu) Termisztor
- (sl) Termistor
- (hr) Termistor

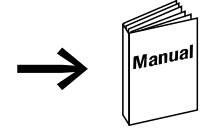


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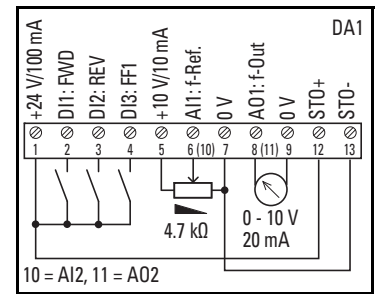
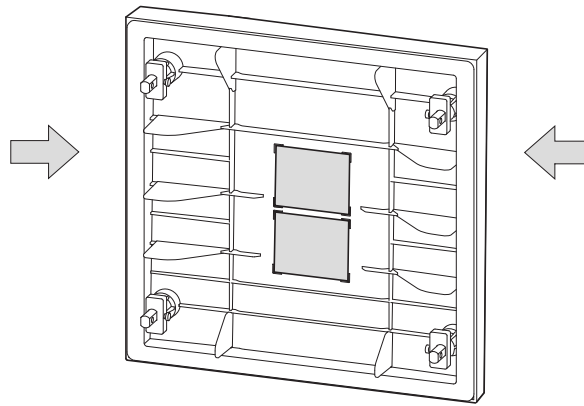
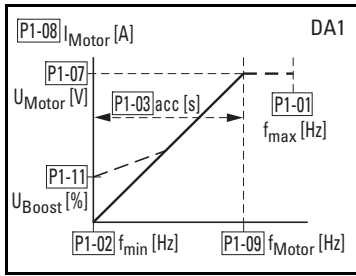
COM



PIN 1	CANopen -
PIN 2	CANopen +
PIN 3	0V
PIN 4	OP-Bus -
PIN 5	OP-Bus +
PIN 6	+ 24 V
PIN 7	Modbus RTU -
PIN 8	Modbus RTU +

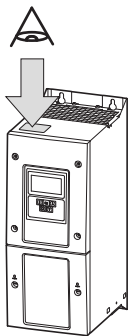


Help Card

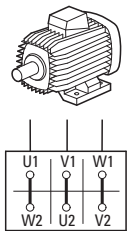


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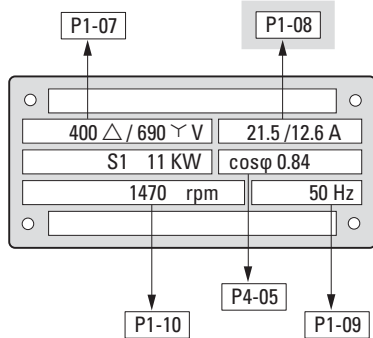
Motor Protection



$U_{LN} = 3 \sim 400 \text{ V}, 50 \text{ Hz}$
DA1-34024...
 $I_e = 24 \text{ A}$

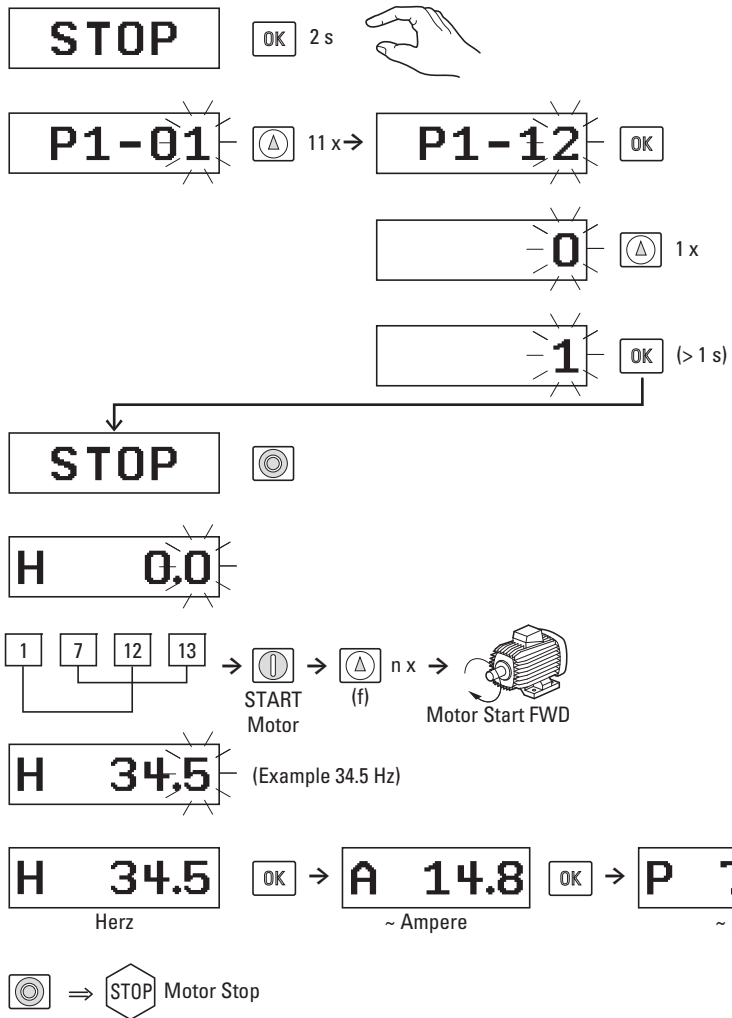
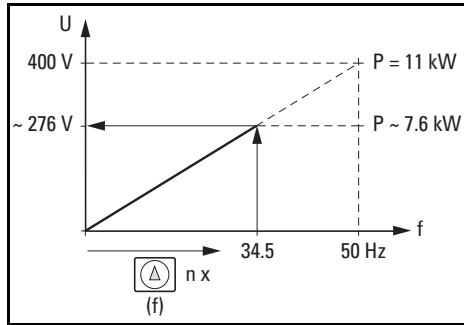
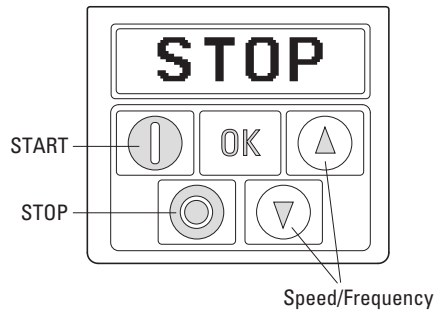


400 V



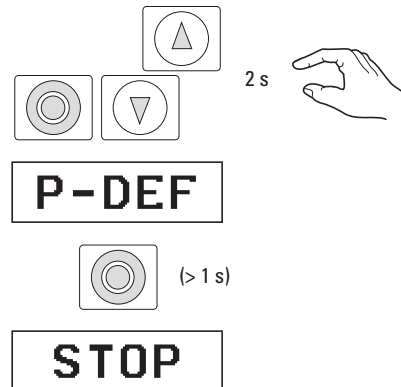
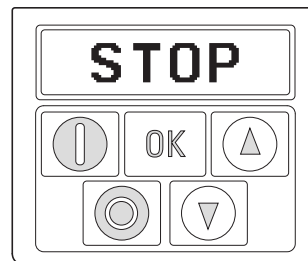
- STOP** [OK] 2 s
- P1-01** [Δ] 7 x
- P1-08** [OK]
- A 24.0** [▽] ... x
- A 21.5** [OK] (> 1 s)
- STOP**

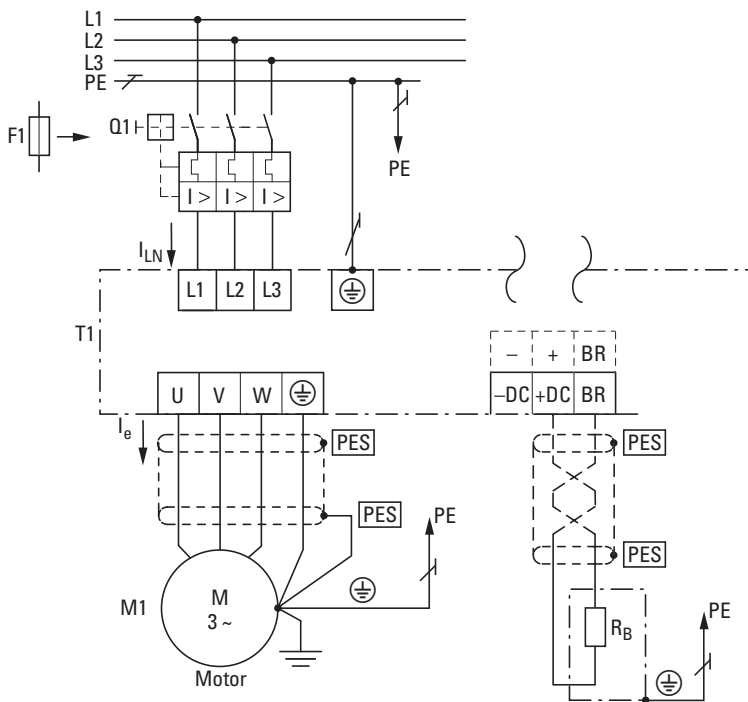
Hand Modus (Keypad)



Reset

- en Resetting the parameters to their default settings
- de Rücksetzen der Parameter in die Werkseinstellung
- fr Réinitialisation des paramètres sur réglage usine
- es Restauración de los parámetros al ajuste de fábrica
- it Ripristino delle impostazioni di fabbrica
- zh 复位机器设置参数
- ru Сброс параметров на заводские установки
- nl Resetten van de parameters naar de fabrieksinstelling
- da Tilbagestilling af parametrene til fabriksindstillingen
- el Επαναφορά των παραμέτρων στις εργοστασιακές ρυθμίσεις
- pt Redefinição dos parâmetros na regulagem de fábrica
- sv Återställa parametrerna fabriksinställning
- fi Parametrien palauttaminen tehdasasetukseen
- cs Navrácení parametrů na nastavení z výroby
- et Parameetrite lähtestamine algseadistusele
- hu Paraméterek visszaállítása gyári beállításkorra
- lv Rūpnīcas parametru atiestatīšana
- lt Parametų gamyklinių nuostatų atstata
- pl Resetowanie ustawień do parametrów fabrycznych
- sl Povrnitev parametrov na tovarniško nastavitvev
- sk Obnovenie parametra do továrenského nastavenia
- bg Нулиране на параметър в заводска настройка
- ro Resetarea parametrilor la setarea din fabrică
- hr Vraćanje parametara na tvorničke postavke





Mains

- DA1-32...: 3 ~ 200 V - 240 V ±10 %, 50/60 Hz
- DA1-34..., DL1-34...: 3 ~ 380 V - 480 V ±10 %, 50/60 Hz
- DA1-35...: 3 ~ 500 V - 600 V ±10 %, 50/60 Hz

Motor (M1)

- DA1-32...: kW (230 V, 50 Hz)
HP (220 - 240 V, 60 Hz)
- DA1-34..., DL1-34...: kW (400 V, 50 Hz)
HP (440 - 480 V, 60 Hz)
- DA1-35...: kW (500 V, 50 Hz)
kW (525 V, 50 Hz)
HP (550 - 600 V, 60 Hz)

kW @ 230 V/400 V, 50 Hz, 1500 min⁻¹
HP @ 230 V/460 V 60 Hz, 1800 rpm

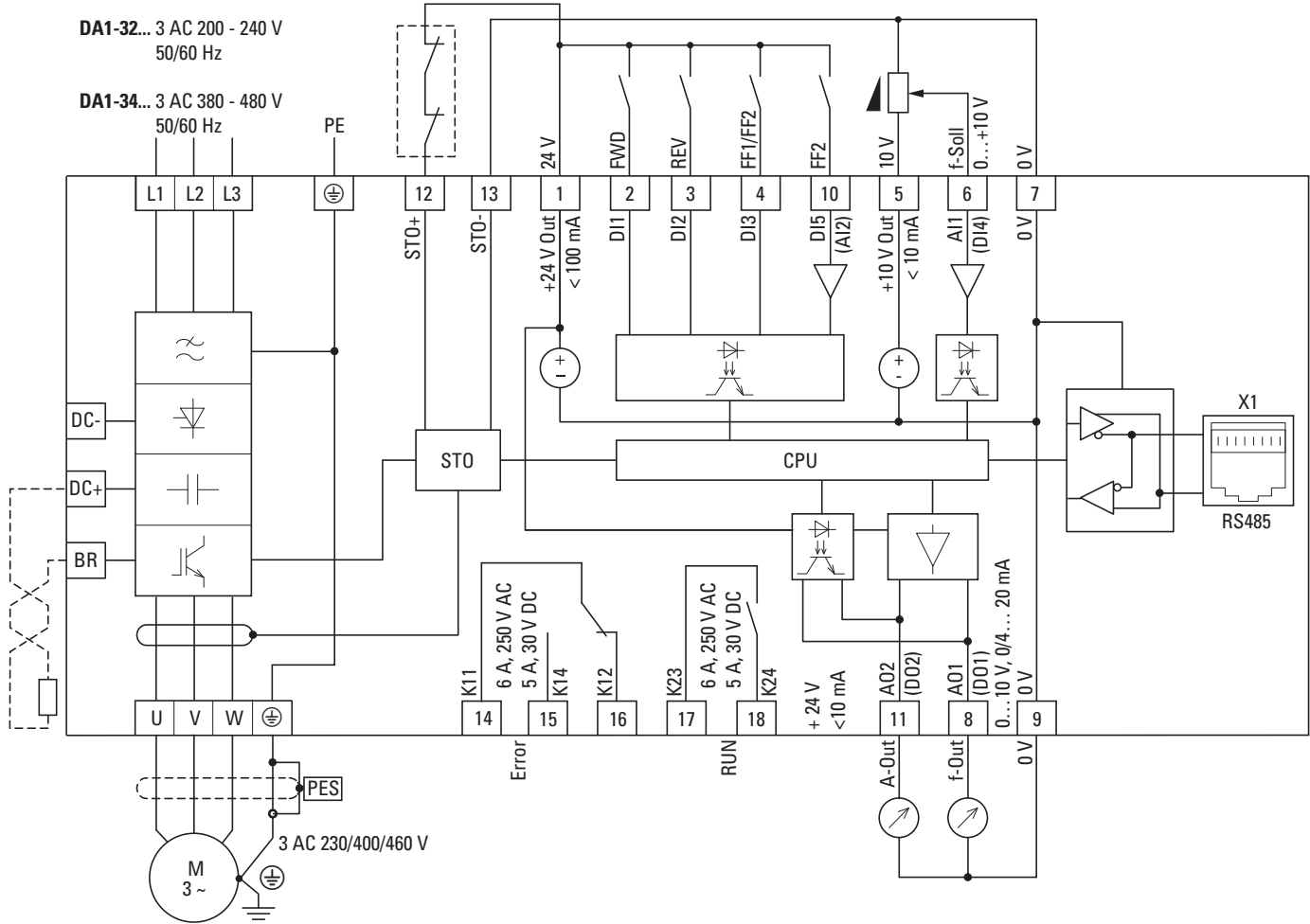


AWG = American Wire Gauge.
Smaller numbers represent increasing wire thickness.
kcmil = 1,000 circular mils, a measure of wire cross-sectional area

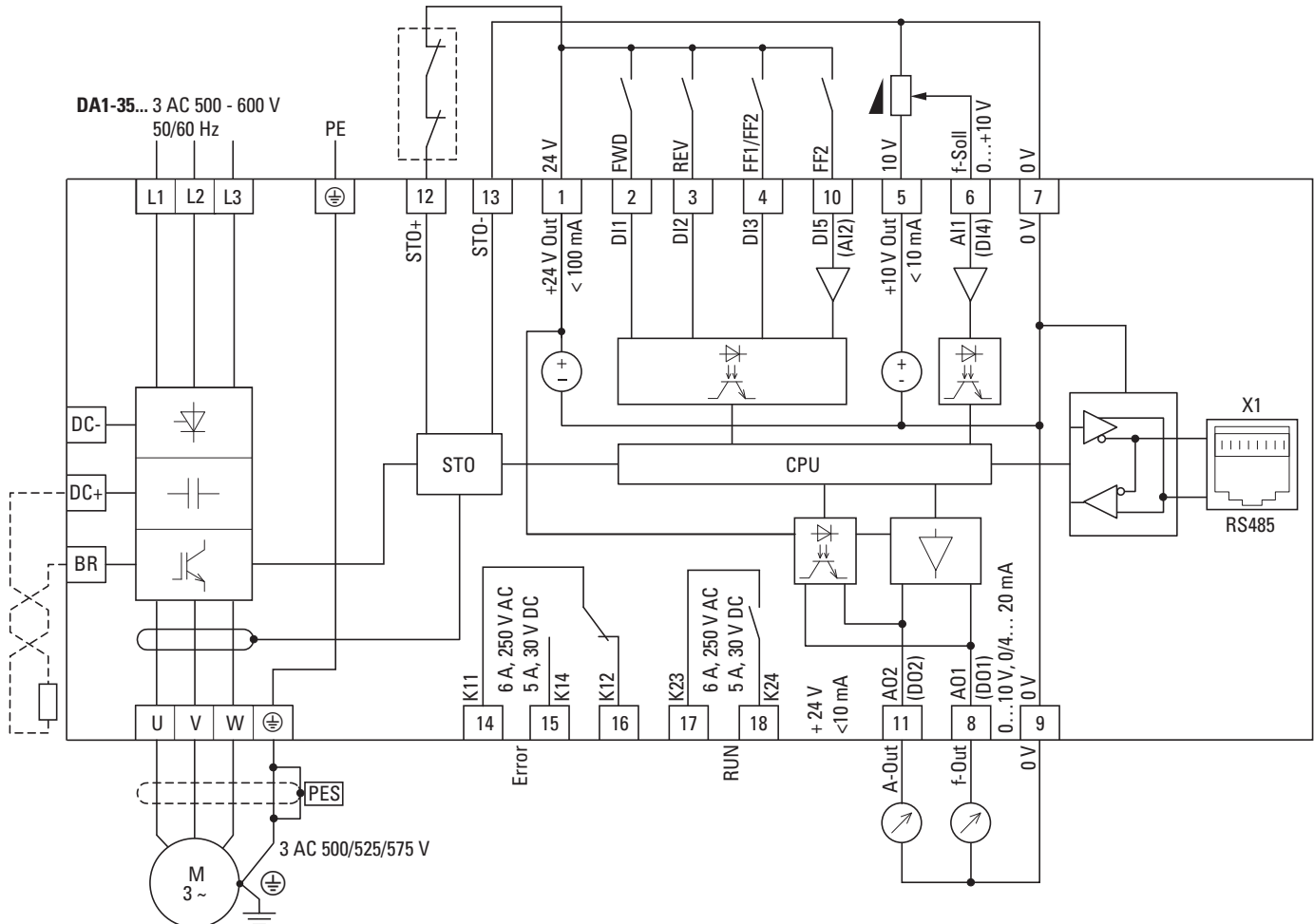
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Type	Mains				Rated Output Current		Motor			Brake Resistor (min.)	Screw Torque Power unit			
	T1	I _{LN} A	F1/Q1 Fuse or MCB (Type B) IEC UL	A mm ² AWG kcmil	I _e A	P kW	HP	A mm ² AWG kcmil	R _B Ω	Frame Size	lb-in	Nm		
DA1-32024...	29.1	40	40	10	8	24	5.5	7.5	4	10	20	FS4	35	4
DA1-32030...	36.4	50	50	16	8	30	7.5	10	6	8	22			
DA1-32046...	55.8	80	80	25	4	46	11	15	10	6	22			
DA1-32061...	70.2	100	100	35	3	61	15	20	16	4	12			
DA1-32072...	82.9	125	125	50	2	72	18.5	25	25	3	12	FS5	133	15
DA1-32090...	103.6	160	160	70	1	90	22	30	35	2	6	FS6	177	20
DA1-32110...	126.7	160	160	70	2/0	110	30	40	50	1/0	6			
DA1-32150...	172.7	250	250	120	4/0	150	37	50	70	3/0	6			
DA1-32180...	183.3	250	250	120	4/0	180	45	60	95	4/0	6			
DA1-32202...	205.7	300	300	185	300	202	55	75	120	250	6	FS7	177	20
DA1-32248...	255.5	400	400	2 x 95	400	248	75	100	150	350	6			
DA1-34024...	28.9	40	40	10	8	24	11	15	4	10	40	FS4	35	4
DL1-34024...	28.9	40	40	10	8	24	11	15	4	10	40			
DA1-34030...	37.2	50	50	16	8	30	15	20	6	8	22			
DL1-34030...	37.2	50	50	16	8	30	15	20	6	8	22			
DA1-34039...	47	60	60	16	6	39	18.5	25	10	8	22			
DL1-34039...	47	60	60	16	6	39	18.5	25	10	8	22			
DA1-34046...	52.4	70	70	25	4	46	22	30	10	6	22			
DL1-34046...	52.4	70	70	25	4	46	22	30	10	6	22			
DA1-34061...	63.8	80	80	25	4	61	30	40	16	4	12	FS5	133	15
DL1-34061...	63.8	80	80	25	4	61	30	40	16	4	12			
DA1-34072...	76.4	100	100	35	3	72	37	50	25	3	12			
DL1-34072...	76.4	100	100	35	3	72	37	50	25	3	12			
DA1-34090...	92.2	125	125	50	1	90	45	60	35	2	6	FS6	177	20
DA1-34110...	112.5	150	150	70	1/0	110	55	75	50	1/0	6			
DA1-34150...	153.2	200	200	95	3/0	150	75	100	70	3/0	6			
DA1-34180...	183.7	250	250	120	4/0	180	90	150	95	4/0	6			
DA1-34202...	205.9	300	300	185	300	202	110	175	120	250	6	FS7	177	20
DA1-34240...	244.5	350	350	185	350	240	132	200	150	350	6			
DA1-34302...	307.8	400	400	2 x 95	600	302	160	250	2 x 70	500	6			
DA1-35022...	26.7	40	35	10	8	22	11	15	4	10	33	FS4	35	4
DA1-35028...	34	50	45	16	8	28	15	18.5	6	8	33			
DA1-35034...	41.2	63	60	16	6	34	18.5	22	6	8	22			
DA1-35043...	49.5	63	70	16	6	43	22	30	10	6	16			
DA1-35054...	62.2	80	80	25	4	54	30	37	16	4	16	FS5	133	15
DA1-35065...	75.8	100	100	35	3	65	37	45	25	4	12			
DA1-35078...	90.9	125	125	50	2	78	45	55	25	3	12	FS6	177	20
DA1-35105...	108.2	160	150	70	1/0	105	75	75	50	1/0	8			
DA1-35130...	127.7	160	175	70	2/0	130	90	90	70	2/0	8			
DA1-35150...	134.8	200	175	95	2/0	150	90	110	70	3/0	8			

FS4: DA1-32..., DA1-34..., DL1-34...

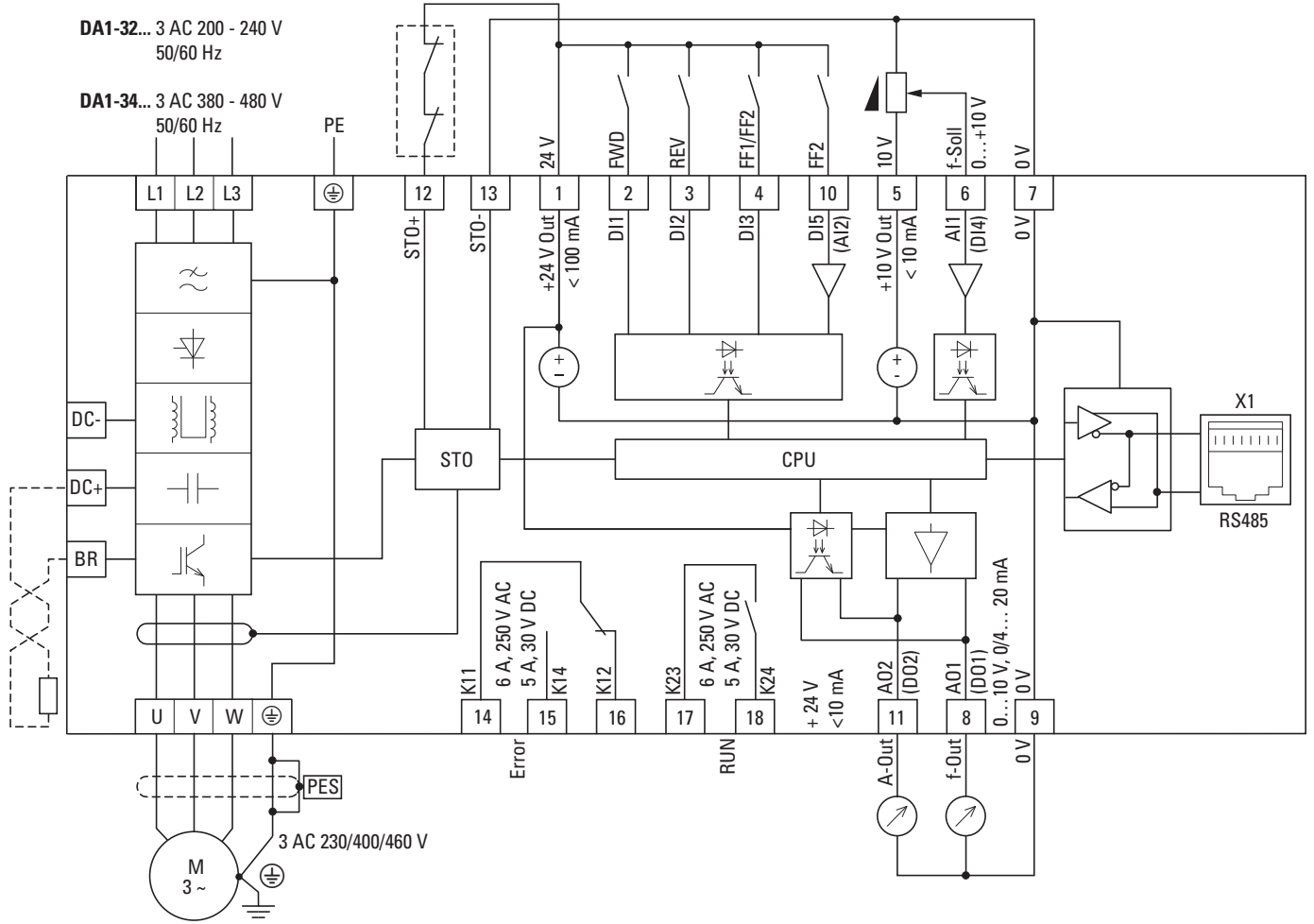


FS4: DA1-35...



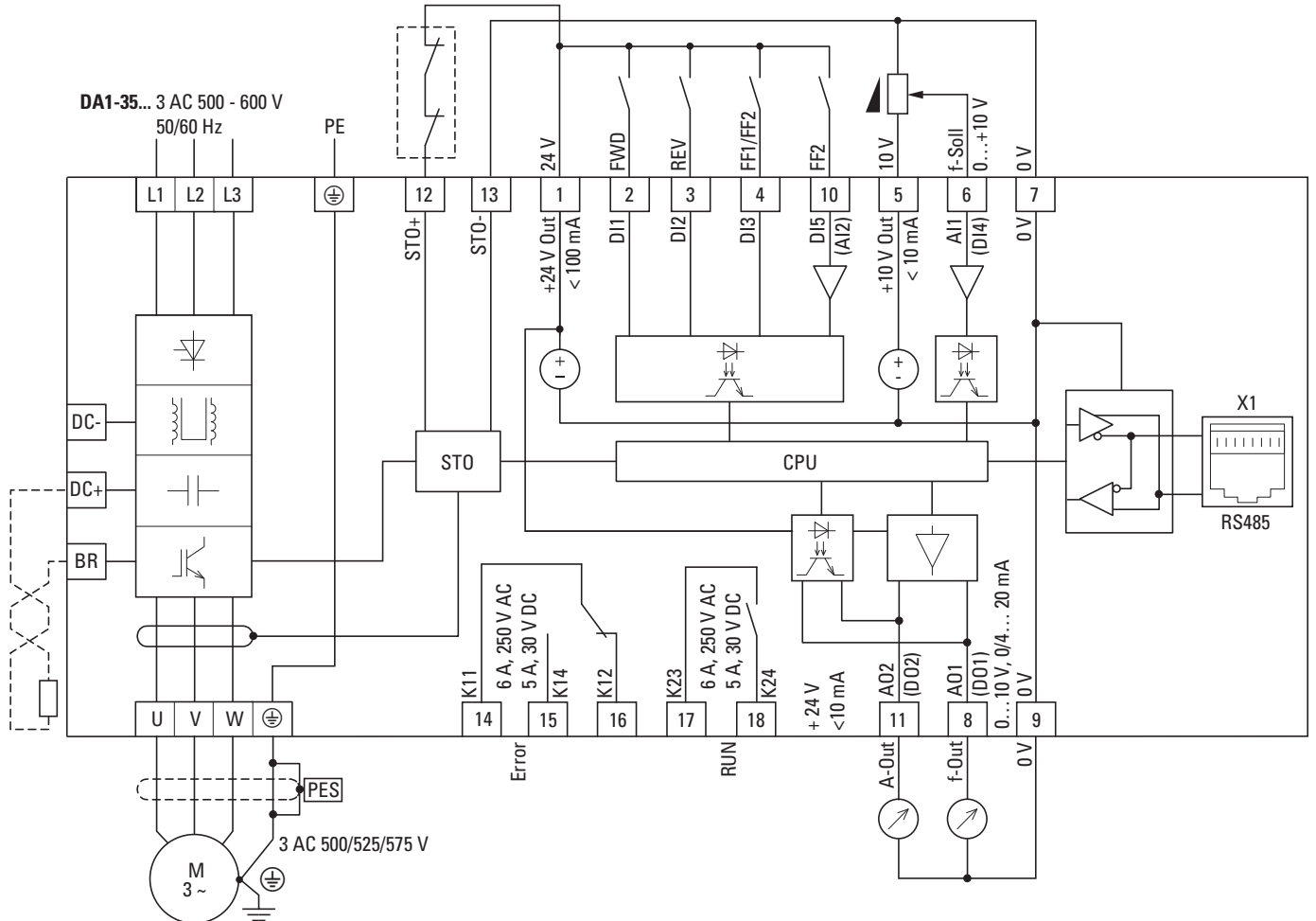
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FS5, FS6, FS7: DA1-32..., DA1-34..., DL1-34...



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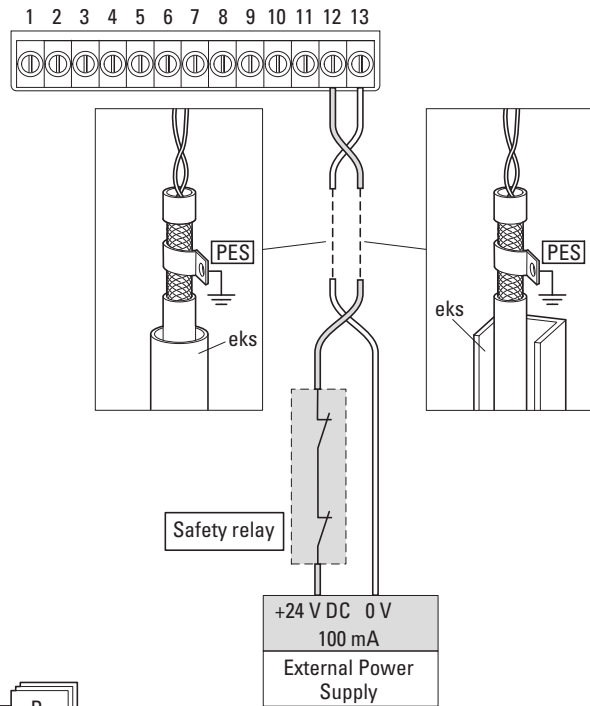
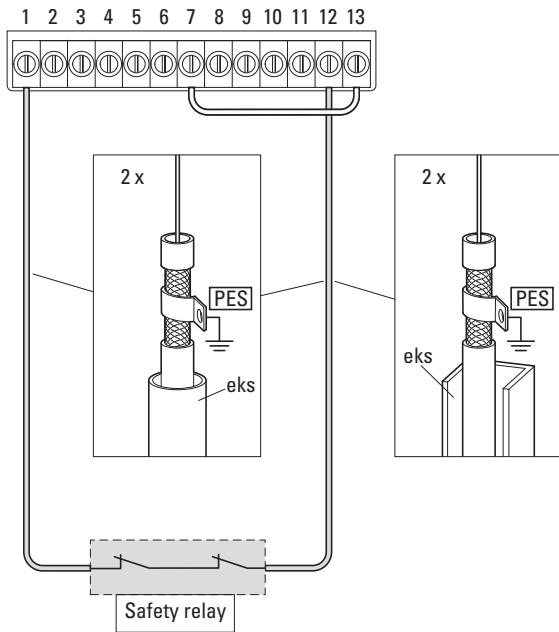
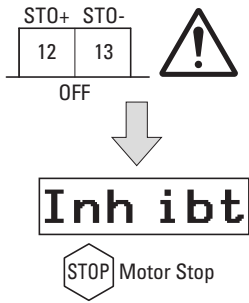
FS5, FS6, FS7: DA1-35...



STO (Safe Torque Off)

- (en) Shielded cable [PES] routed in an inherently short-circuit-proof and ground-fault-proof manner
- (de) Abgeschirmtes Kabel [PES] erd- und kurzschlussicher verlegen (eks)
- (fr) Câble blindé [PES] à poser avec protection contre courts-circuits/défauts à la terre
- (es) Tender el cable [PES] apantallado con seguridad de puesta a tierra y cortocircuito.
- (it) Posare il cavo [PES] schermato collegato a terra e protetto contro il cortocircuito
- (zh) 铺设接地防短路屏蔽电缆 [PES]
- (ru) Экранированный кабель [PES] прокладывается с защитой от замыкания на землю и коротких замыканий.
- (nl) Afgeschermde kabel [PES] geaard en kortsluitveilig installeren
- (da) Læg det afskærmede kabel [PES] jord- og kortslutningssikkert.
- (el) Τοποθετήστε το θωρακισμένο [PES] ο καλώδιο κατά τρόπον ώστε να είναι ασφαλές από βραχυκύκλωμα γείωσης και βραχυκύκλωμα.
- (pt) Dispor o cabo [PES] blindado com ligação à terra e protegido contra curto-circuito
- (sv) Dra den skärmade kabeln [PES] jordfels- och kortslutningssäkert.

- (fi) Sijoita suojattu kaapeli [PES] maa- ja oikosulkusuojaustusti (mos).
- (cs) Stíněný kabel [PES] položte tak, aby byl bezpečný proti uzemnění a zkratu (buz).
- (et) Paigaldage varjestatud kaabel [PES] maandus- ja lühiskaitstult (mlk).
- (hu) Árnyékolt kábelt [PES] földelvé és rövidzármntesen kell lefektetni.
- (lv) Izvilkt ekranētu kabeli [PES], kas ir aizsargāts pret zemslēgumiem un īsslēgumiem.
- (lt) Ekranuotą kabelį [PES] nutieskite apsaugotą nuo žemėjimo ir trumpojo jungimo.
- (pl) Kabel ekranowany [PES] ułożyć z zabezpieczeniem przed zwarciem i zwarciem doziemnym.
- (sl) Izoliran kabel [PES] speljite zavarovano pred zemeljskim in kratkim stikom.
- (sk) Uložte tiený kábel [PES], odolný voči skratu a náhodnému uzemneniu.
- (bg) Положете екраниран кабел [PES] и го заземете срещу късо съединение.
- (ro) Pozați cablul [PES] ecranat astfel încât să fie asigurată protecția la scurtcircuit și scurgeri la pământ.
- (hr) Zakrijljeni kabel [PES] postavite tako da bude zaštićen od uzemljenja i kratkog spoja.



Safety Relay Specification

The safety relay should be chosen so that at minimum it meets the safety standards in which the drive meets.

Standard Requirements	SIL2 or PLd SC3 or better (With Forcibly guided Contacts)
Number of Output Contacts	2 independent
Switching Voltage Rating	30 V DC
Switching Current	100 mA

External Power supply Specification

Voltage Rating (Nominal)	24 V DC
STO Logic High	18 - 30 V DC (Safe torque off in standby)
Current Consumption (Maximum)	100 mA

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Additional Information for UL[®] Approved Installations

→ Refer to Manual MN04020005Z-EN

DA1 is designed to meet the UL requirements. In order to ensure full compliance, the following must be fully observed.

Input Power Supply Requirements				
Supply Voltage	DA1-32...	200 - 240 RMS Volts for 230 Volt rated units, ±10 % variation allowed. 240 Volt RMS Maximum		
	DA1-34...	380 - 480 Volts for 400 Volt rated units, ±10 % variation allowed, Maximum 500 Volts RMS		
	DL1-34...			
	DA1-35...	500 - 600 Volts for 600 Volt rated units, ±10 % variation allowed, Maximum 600 Volts RMS		
Imbalance	Maximum 3 % voltage variation between phase – phase voltages allowed			
	All DA1 and DL1 units have phase imbalance monitoring. A phase imbalance of > 3 % will result in the drive tripping. For input supplies which have supply imbalance greater than 3 % Eaton Drives recommends the installation of input line reactors.			
Frequency	50 - 60 Hz ±5 % Variation			
Short Circuit Capacity	Voltage Rating	Min. kW (HP)	Max. kW (HP)	Maximum supply short-circuit current
	All	All	All	100 kA rms (AC)
All the drives in the above table are suitable for use on a circuit capable of delivering not more than the above specified maximum short-circuit Amperes symmetrical with the specified maximum supply voltage.				

Incoming power supply connection

- For 3 phase supplies, power should be connected to L1, L2, and L3. Phase sequence is not important.
- For compliance with CE and C Tick EMC requirements, a symmetrical shielded cable is recommended.
- For compliance with CSA requirements, transient surge suppression shall be installed on the line side of this equipment and shall be rated 600 V (phase to ground), 600 V (phase to phase), suitable for overvoltage category III, and shall provide protection for a rated impulse withstand voltage peak of 4 kV or equivalent.
- A fixed installation is required according to IEC61800-5-1 with a suitable disconnecting device installed between the DA1/DL1 and the AC Power Source. The disconnecting device must conform to the local safety code/regulations (e. g. within Europe, EN60204-1, Safety of machinery).
- The cables should be dimensioned according to any local codes or regulations. Guideline dimensions are given on page 11/16.
- Suitable fuses to provide wiring protection of the input power cable should be installed in the incoming supply line, according to the data on page 11/16. The fuses must comply with any local codes or regulations in place. In general, type gG (IEC 60269) or UL type T fuses are suitable; however in some cases type aR fuses may be required. The operating time of the fuses must be below 0.5 seconds.
- Where allowed by local regulations, suitably dimensioned type B MCB circuit breakers of equivalent rating may be utilised in place of fuses, providing that the clearing capacity is sufficient for the installation.
- When the power supply is removed from the drive, a minimum of 30 seconds should be allowed before re-applying the power. A minimum of 5 minutes should be allowed before removing the terminal covers or connection.
- The maximum permissible short circuit current at the DA1 and DL1 Power terminals as defined in IEC60439-1 is 100 kA.
- An optional Input Choke is recommended to be installed in the supply line for drives where any of the following conditions occur:
 - The incoming supply impedance is low or the fault level/short circuit current is high
 - The supply is prone to dips or brown outs
 - An imbalance exists on the supply (3 phase drives)
 - The power supply to the drive is via a busbar and brush gear system (typically overhead Cranes).
- In all other installations, an input choke is recommended to ensure protection of the drive against power supply faults.

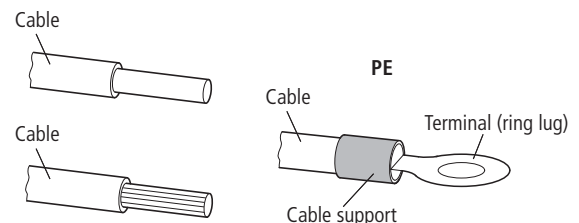
All DA1 and DL1 units are intended for indoor installation within controlled environments which meet the condition limits.

Ambient temperature range	Operational	-10 °C to 40 °C	IP55 Units (UL Approved)
		-10 °C to 50 °C	IP55 Units (Non UL Approved with derating)
	Storage and Transportation	-40 °C to 60 °C	
Max. altitude for rated operation	1000 m (Refer to Manual for Derating for Altitude Information). Installation above 2000 m is not UL approved.		
Relative Humidity	< 95 % (non condensing). Drive must be Frost and moisture free at all times.		

Branch circuit protection must be installed according to the relevant national codes. Fuse ratings and types are shown on page 11/16.

Suitable Power and motor cables should be selected according to the data.

Power cable connections and tightening torques are shown on page 6/16.



Motor Overload Protection

DA1 and DL1 provides motor overload protection in accordance with the National Electrical Code (US).

- Where a motor thermistor is not fitted, or not utilised, Thermal Overload Memory Retention must be enabled by setting P4-12 = 1. Set the parameters P1-08 „Current Limit“ on motor current.
- Where a motor thermistor is fitted and connected to the drive, connection must be carried out according to the information shown on page 8/16.

-
- Ratings shown above apply to 40 °C Ambient temperature. For derating information, refer to Manual MN04020005Z-EN.
 - The maximum motor cable length stated applies to using a shielded motor cable. When using an unshielded cable, the maximum cable length limit may be increased by 50 %. When using the Eaton Drives recommended output choke, the maximum cable length may be increased by 100 %
 - The PWM output switching from any inverter when used with a long motor cable length can cause an increase in the voltage at the motor terminals, depending on the motor cable length and inductance. The rise time and peak voltage can affect the service life of the motor. Eaton Drives recommend using an output choke for motor cable lengths of 50 m or more to ensure good motor service life
 - For UL compliant installation, use Copper wire with a minimum insulation temperature rating of 70 °C, UL Class CC or Class J Fuses



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 fulfil 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.

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.

fr AVERTISSEMENT

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.

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.

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.

zh 小心

根据欧盟设备一致性规范，安装频率控制设备及其配件时，应确保设备满足机器规范 89/392/EWG 中关于设备保护的要求。

[PES] 按照电磁兼容规范正确安装。应将控制电缆和电源电缆与机电电缆分开。大面积采用 PE 包裹电缆。

ru ОСТОРОЖНО

В сфере действия директив ЕС устройства с частотным управлением и их оснащение должны вводиться в эксплуатацию только в том случае, если установлено, что данное оборудование соответствует требованиям по защите Директивы о машинном оборудовании 89/392/EWG.

Сборка соответственно электромагнитной совместимости. Линии управления и электросети прокладывать в пространственном отношении отдельно от линии двигателя. [PES] силовой экран соединять с PE по большой площади.

nl VOORZICHTIG

Binnen het geldigheidsgebied van de EC-richtlijnen mogen de frequentieregelerde 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 ΠΡΟΣΟΧΗ

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 μηχανήμα 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 directivas 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 protecção da directiva de máquinas 89/392/CEE.

Estrutura com compatibilidade electromagnética. Dispon 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 FÖRSIKTIG

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

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

fi HUOMIO

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. Johdonsuojat on liitettävä laajasti maadoitukseen [PES].

cs POZOR

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

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

et ETTEVAATUST

EU-direktiivi kehtivuspiirkonnas võib sagedusjuhitavaid seadmeid ja nende liseseadmeid 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 talitlusmaandusega.

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 biztonságági követelményeinek.

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

lv IEVĒROT PIESARDŽĪBU

Valstīs, kurās ir spēkā EK direktīvas, ierīču ar frekvenču vadību 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 kabelju izvietot atsevišķi no motora kabēla. [PES] Vada ekrānu plašā virsmā savienot ar PE.

lt ATSARGIAI

EB direktyvų taikymo srityje dažniniu būdu valdomos įrenginius ir jų priedus leidžiama pradėti naudoti tik tada, kai nustatoma, kad įrenginys atitinka Mašinų direktyvos 89/392/EEB keliamus apsaugos reikalavimus.

Montažas turi atitikti EMS reikalavimus. Valdymo ir duomenų tinklo kabelius išdėstyti atokiai nuo variklio kabelio. [PES] Kabelio ekraną dideliu paviršiumi sujungti su žeminiu.

pl OSTROŻNIE

Na obszarze obowiązywania dyrektywy WE urządzenia sterowane częstotliwościowo wolno wprowadzać do eksploatacji tylko wtedy, gdy zostanie stwierdzone, że maszyna spełnia wymagania ochronne dyrektywy maszynowej 89/392/EWG.

Konstrukcja zgodna z dyrektywą w sprawie kompatybilności elektromagnetycznej (EMC). Przewody sterowania i zasilania elektrycznego należy układać oddzielnie od przewodu silnika. [PES] Ekranowanie połączyć z przewodem uziemiającym na większej powierzchni.

sl PREVIDNO

Na območju veljavnosti direktiv ES je zagon frekvenčno krmiljenih naprav in njihovega pribora dovoljen le tedaj, ko je bilo ugotovljeno, da stroj ustreza varnostnim zahtevam Direktive o strojih 89/392/EGS.

Montaža v skladu z EMZ. Krmilne in omrežne vodnike napeljuje ločeno od vodnikov motorja. [PES] Oklep vodnika na veliki površini povežite z zaščitnim vodnikom.

sk VÝSTRAHA

V krajinách, ktoré spadajú pod pôsobnosť smerníc ES smú byť rádiové ovládané zariadenia a ich príslušenstvo uvedené do prevádzky len ak je zabezpečené, že stroj spĺňa ochranné ustanovenia smernice č. 89/392/EHS o strojových zariadeniach.

Montáž v súlade s požiadavkami elektromagnetickej kompatibility. Ovládacie a sieťové vedenia uložte v priestore oddelene od vedenia motoru. [PES] Zabezpečte veľkú kontaktnú plochu medzi káblovým tienením a PE.

bg ВНИМАНИЕ

В сферата на действие на изискванията на ЕС устройствата с честотно управление и техните допълнителни устройства могат да бъдат приведени в употреба, само ако се установи, че оборудването съответства на изискванията за безопасност на машинно оборудване спрямо 89/392/EWG.

Монтаж с електромагнитна съвместимост. Полагане на контролните и мрежови проводници пространствено отделно от проводника на двигателя. [PES] Осигурете по-голяма контактна площ между силовия екран и PE.

ro PRECAUTIE

În cadrul sferei de aplicare a directivelor UE dispozitivele controlate prin frecvență și accesoriile acestora au voie să fie puse în funcțiune doar dacă se stabilește că aparatul îndeplinește cerințele Directivei 89/392/CEE privind mașinile.

Montajul trebuie să fie compatibil EMC. Poziționați cablurile de control și de rețea la distanță de cablul motorului. [PES] Asigurați o suprafață de contact mare între izolația cablului și PE.

hr OPREZ

U području valjanosti Direktiva EZ frekvencijski upravljani uređaji i njihov pribor smiju se puštati u rad samo ako se utvrdi da stroj ispunjava zahtjeve za zaštitom iz Direktive o strojevima 89/392/EEZ.

Konstrukcija u skladu s EMC-om. Upravljački i mrežni vodovi prostorno položeni odvojeno od voda motora. [PES] zaslon kabla povezan PE-om na velikoj površini.