

PACMotion™ Servos Accessories Guide



Warnings and Caution Notes as Used in this Publication

WARNING

Warning notices are used in this publication to emphasize that hazardous voltages, currents, temperatures, or other conditions that could cause personal injury exist in this equipment or may be associated with its use.

In situations where inattention could cause either personal injury or damage to equipment, a Warning notice is used.

CAUTION

Caution notices are used where equipment might be damaged if care is not taken.

Note: Notes merely call attention to information that is especially significant to understanding and operating the equipment.

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Section 1: Introduction

1.1 Revisions in this Manual

Revision	Date	Description
B	October 2020	Technical corrections to part numbers, descriptions, and general ordering information.
A	Sep 2020	Initial Release

1.2 About this Manual

This manual describes accessories for the PACMotion Servos Drives (PSD) and contains essential technical data. This manual is only valid in conjunction with the manuals for PSD drive and applicable motor in your application.

1.3 Related Documentation

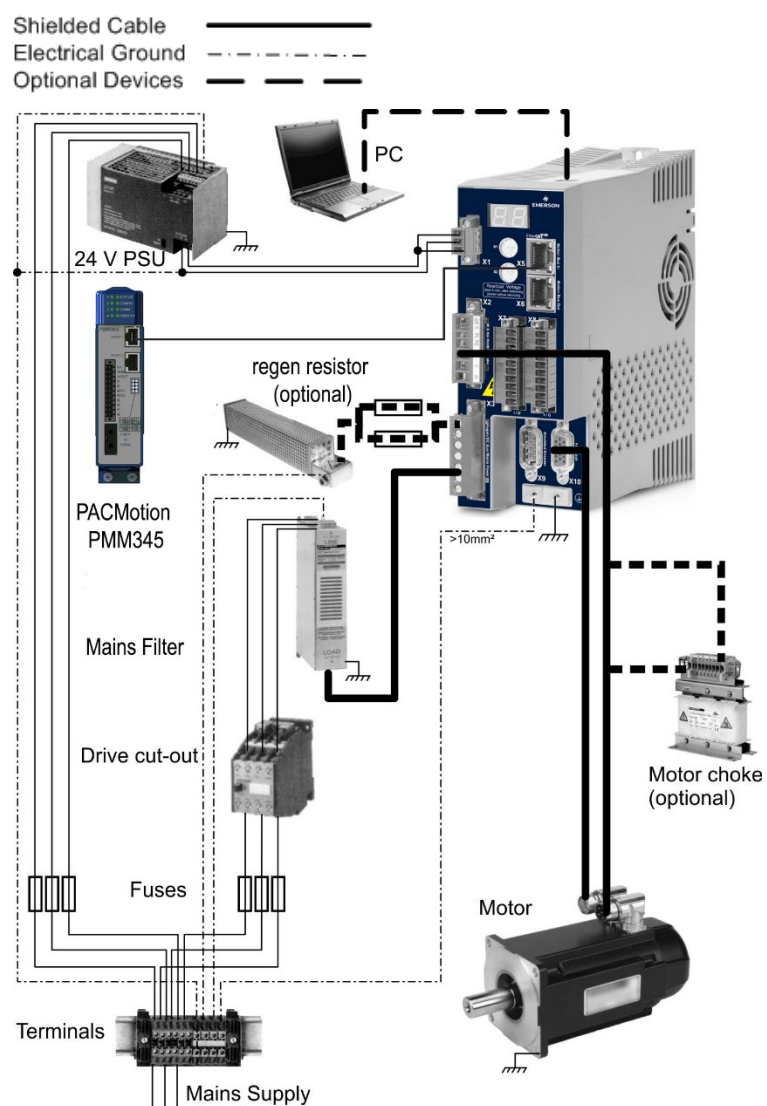
Description of Manual	GFK Number
PACMotion Servo Drives Installation and User Manual	GFK-3168
PACMotion Rotary Servo Motors Installation and User Manual	GFK-3169
PACMotion Servos Accessories Guide	GFK-3173
PACMotion Servos Secure Deployment Guide	GFK-3177

Section 2: Digital Drive Systems

The systems shown are possible scenarios for setting up a digital drive system with relevant components.

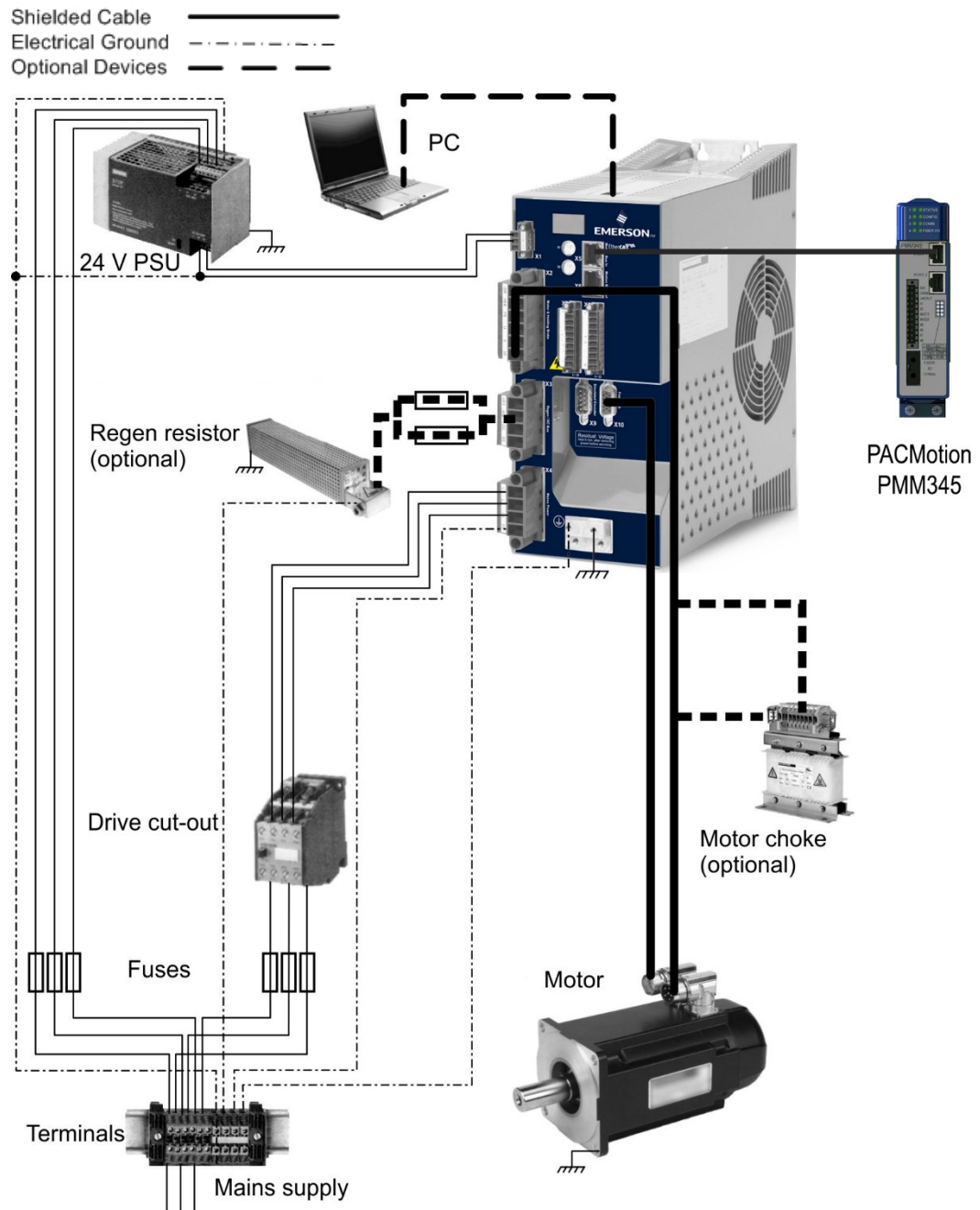
2.1 Drive System with PSD Drives IC830DP00306 to 01206

Figure 1: Drive System with IC830D00306 to 01206 (no Mains Filter required)



2.2 Drive System with PSD Drives IC830DP00307 to 02406

Figure 2: Drive System with IC830DP00307 to 02406 (with Mains Filter)



Section 3: Shielding Accessories

3.1 Safety Instructions

CAUTION

You must read the instructions manual for the drive/motor you are using in your application and observe the safety instructions they contain before beginning mounting/installation work.

This manual is only valid in conjunction with the instruction manuals for the drive and motor you are using in your application.

3.2 Shield Plates

Shield plates can be attached to drives to assist in grounding and routing cabling.

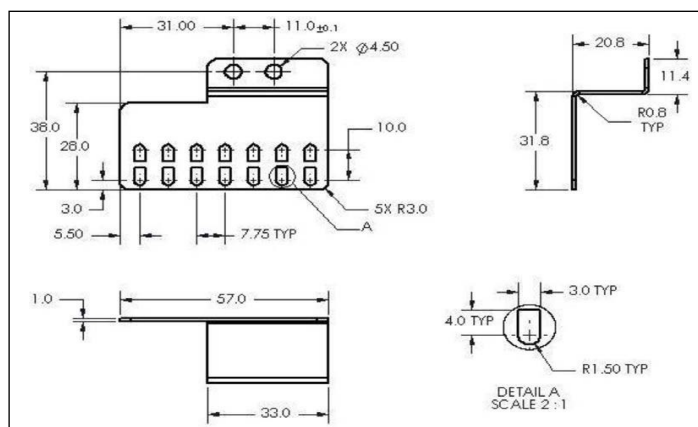
Figure 3: Shield Plates



3.3 PSD Shield Plates

3.3.1 IC830DPzzz06 Shield Plate

Figure 4: IC830DPzzz06 Shield Plate

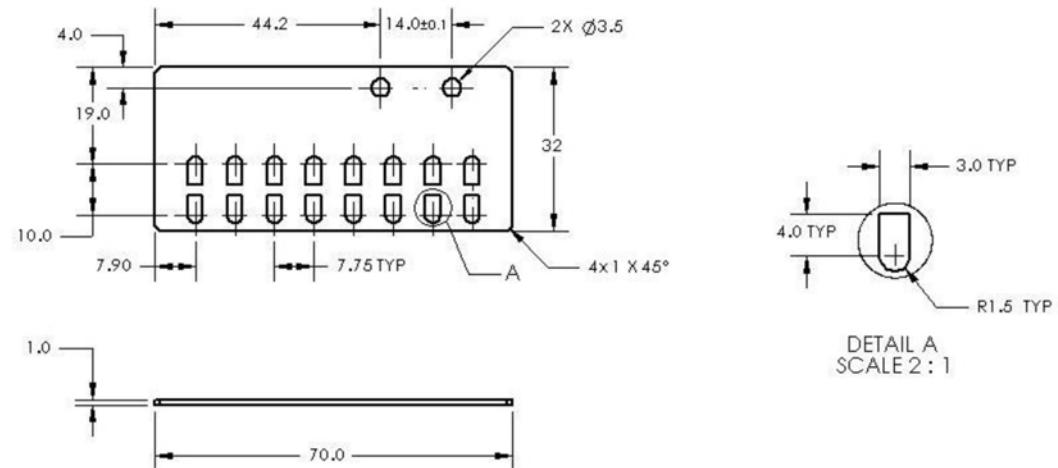


This shield plate is not included with IC830DPzzz06, but can be ordered separately (Item 153-230000-01).

3.3.2 IC830DP00307, IC830DP00607, IC830DP 01207 Shield Plate

This shield plate (Item number 153-254001-00) is included for use with IC830DP 00307, IC830DP 00607, and IC830DP 01207 drives.

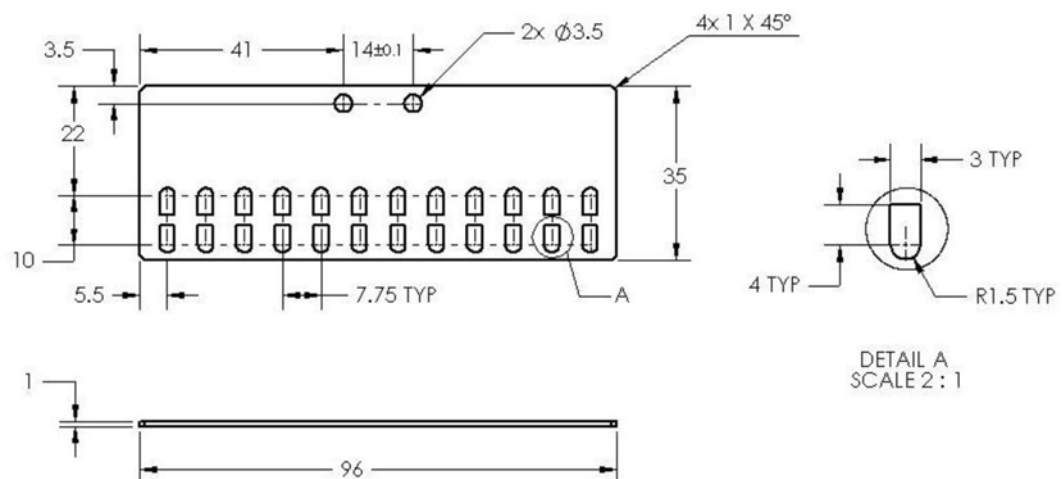
Figure 5: IC830DP00307, IC830DP00607, IC830DP01207 Shield Plate



3.3.3 IC830DP02407 Shield Plate

This shield plate (Item 153-255000-02) is included for use with the IC830DP02407 drive.

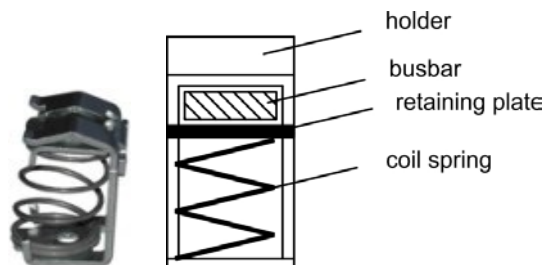
Figure 6: IC830DP02407 Shield Plate



3.4 External Shielding Busbar (purchased separately)

In special cases, the cable shields can be routed to an additional busbar via shield clamps. The following shield clamp is recommended:

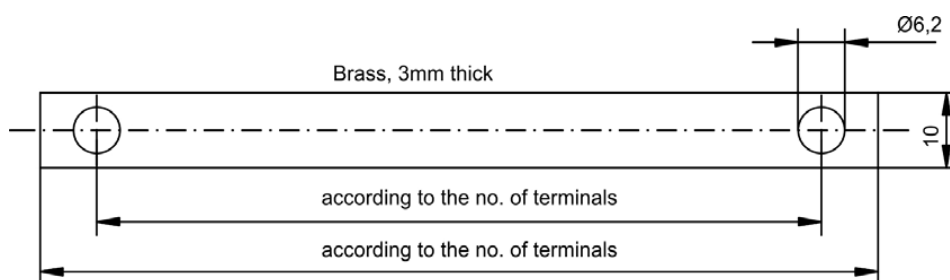
Figure 7: External Shield Busbar



A possible scenario for setting up a busbar for the above shield clamps is described below.

1. Cut a busbar of the required length from a brass rail (cross-section 10 x 3 mm) and drill holes in it as indicated. All shield clamps required must fit between the drill holes.

Figure 8: Cutting the Busbar



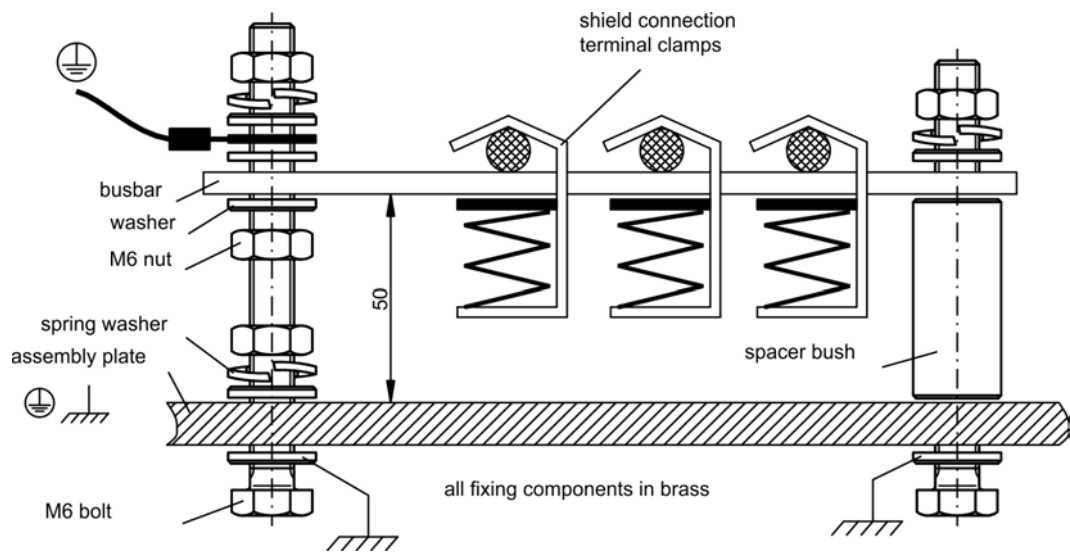
2. Squeeze together the coil spring and the supporting plate and push the busbar through the opening in the holder.

CAUTION

Risk of injury is present due to the spring force of the coil spring. Use pincers.

3. Mount the busbar with the shield clamps fitted on the assembly plate. Use either metal spacer bushes or screws with nuts and accessories to maintain a spacing of 50 mm. Earth the busbar using a single conductor with a cross-section of at least 2.5 mm².

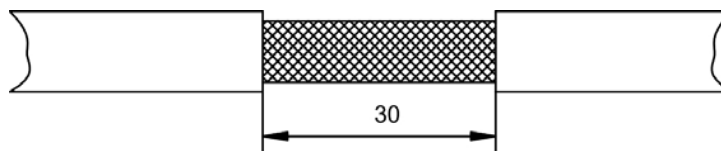
Figure 9: Mounting the Busbar



3. Strip the external cable sheath to a length of approximately 30 mm, taking care not to damage the braided shield. Push the shield clamp up and route the cable to it via the busbar.

Note: Make sure good contact exists between the shield clamp and the braided shield.

Figure 10: Cable Sheath



Section 4: Mating Connectors and Adapter

4.1 Connectors for PSD

Mating connectors are part of delivery (except SubD and RJ types). For spare parts, see tables below.

Drive Connectors

Description	Order Code
Mating connector X2, motor, with shield clamp SK14, Drive 240 V 3/6 A, Power Plug Pitch 5,08 6 Positions	AKD-X2+SK14-KIT
Mating connector X2, motor, with shield plate, Drive P01206/P02406/P0xx07, Power Plug Pitch 7.62 6 Positions	AKD-X2+SHIELD-KIT
Mating connector X3, mains, DC-Bus, Regen Resistor, 7 POSITION, Drive 3-6 A, 240 V, Screw Lock	CON-AKDX3A-SL
Mating connector X3, mains, DC-Bus, Regen Resistor, 8 POSITION, 5.08 SPACING, 12 A, 240 V, Screw Lock	CON-AKDX3B-SL-J
Mating connector X4, mains, 4 POSITION, 24 A, 3-24, 7,62 Spacing Screw Lock	CON-AKDX3C-SL-J
Mating connector X4, Mains, 24A 240V, 3-24 A 480 V	CON-AKDX3C-SL-Y

Digital I/O

Description	Order Code
Screw lock mating connector kit for IC830DP00306-NBEC and IC830DP00606-NBEC (includes X1, X2, X3, X7 and X8 connectors)	AKD-CONKIT-MV3-6-SL
Screw lock mating connector kit for IC830DP01206-NBEC (includes X1, X2, X3, X7 and X8 connectors)	AKD-CONKIT-MV12-SL
Screw lock mating connector kit IC830DP02406-NBEC (includes X1, X2, X3, X4, X7 and X8 connectors)	AKD-CONKIT-MV24-SL
Screw lock mating connector kit for IC830DP00307-NBEC, -DP00607, & -DP01207 (includes X1, X2, X3, X4, X7 and X8 connectors)	AKD-CONKIT-HV3-12-SL
Screw lock mating connector kit for IC830P0D2407-NBEC (includes X1, X2, X3, X4, X7 and X8 connectors)	AKD-CONKIT-HV24-SL
3 Position Mating connector X1, 24Vdc and STO, Screw Lock	CON-AKDX1-SL
Screw lock X2 connector for IC830DP00306-NBEC and DP00606	CON-AKDX2A-SL
Screw lock X2 connector for IC830DP01206-NBEC, DP02406 & DPxxx07	CON-AKDX2B-SL
Mating connector X7, Digital I/O, 10 Position, Drive, keyed option 1, Screw Lock	CON-AKDX7-SL

Description	Order Code
Mating connector X8, Digital I/O, 10 Position, Drive keyed option 2, ScrewLock	CON-AKDX8-SL
Mating connector X21, I/O option, 8 Position, keyed	CON-AKDX21-SL
Mating connector X22, I/O option, 8 Position, keyed	CON-AKDX22-SL
Mating connector X23, I/O option, 14 Position, keyed	CON-AKDX23-SL
Mating connector X24, I/O option, 14 Position, keyed	CON-AKDX24-SL
Connector kit with X10 male 15 pin high density, X9 female 9 pin, 2 housings, Screws	AKD-X9-X10-KIT

Section 5: Mains Filters

PSD drives IC830DP00306 through 02406 require an external mains filter. All other drives feature built-in mains filters (see the relevant instruction manual). The filtering effect of the mains filters can only be assured if the permissible throughput rating of the mains filters is not exceeded even on peak loading of the drives with I_{peak} .

The max. available throughput rating of the mains filter must be higher than the max. power consumption of the drives and higher than the maximum power consumption of the motors.

5.1 Safety Instructions

CAUTION

You must read the instructions manual for the drive/motor you are using in your application and observe the safety instructions they contain before commencing mounting/installation work. This manual is only valid in conjunction with the instructions manual for the drive and motor you are using in your application.

WARNING

Power terminals are capable of conducting hazardous voltage up to 10 minutes after the mains voltage has been disconnected. Before starting work on power terminals, check that the phase-to-earth and phase-to-phase voltages have de-energized.

WARNING

Due to the high earth leakage currents induced by the system, you should observe the requirements of EN 61800-5-1 (e.g. fixed installation, $\geq 10 \text{ mm}^2$ or double protective earth) when carrying out mounting and installation work. A connection diagram appears in the drive installation manual.

5.2 Type Assignment

Drive	Mains filter
IC830DP00306 to 02406 (120 to 240V)	1NF, 3NF
IC830DP00307 to 02407 (240 to 480V)	Not required

5.3 Order Codes

Description	Order Code	Remarks
Mains filter 1NF-10 (230 VAC, 10A)	DE-201565	1~, 230 VAC, CE, UL
Mains filter 1NF-12 (230 VAC, 12A)	DE-201566	1~, 230 VAC, CE, UL
Mains filter 1NF-20B (125V/230V, 20A)	DE-201865	1~, IEC 230 VAC, UL 125 VAC, CE
Mains filter 1NF-25 (230 VAC, 25A)	DE-201568	1~, 230 VAC, CE, UL

Description	Order Code	Remarks
Mains filter 3NF-07 (480 VAC, 07A)	DE-201569	3~, 480 VAC, CE, UL
Mains filter 3NF-16 (480 VAC, 16A)	DE-201570	3~, 480 VAC, CE, UL
Mains filter 3NF-30 (480 VAC, 30A)	DE-201571	3~, 480 VAC, CE, UL

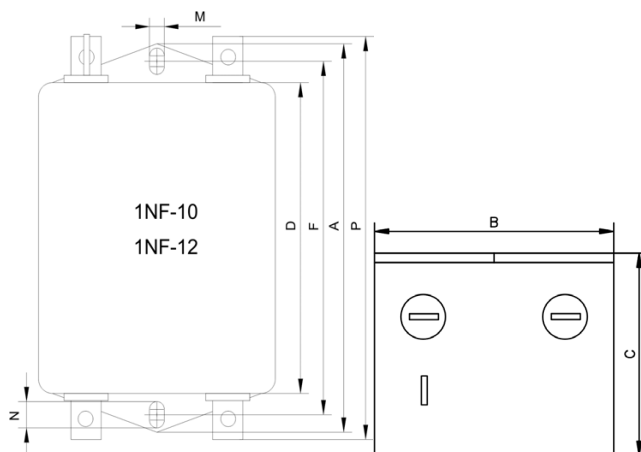
5.4 Mains filters 1NF-10...12

Observe the safety instructions. For single-phase operation only.

Figure 11: Mains filters 1NF-10...12



Figure 12: 1NF-10...12



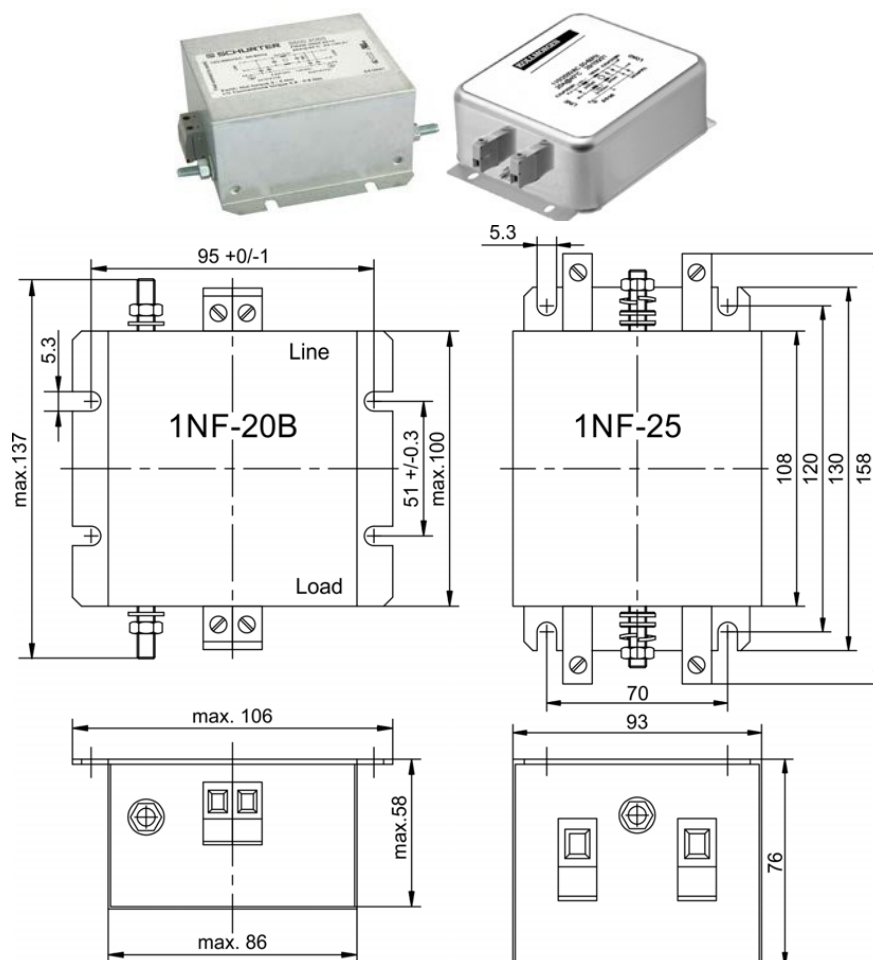
Technical Data

Type	Nominal Current A*	Nominal Voltage V	A mm	B mm	C mm	D mm	F mm	M mm	N mm	P mm	Weight kg	Connection
1NF-10	10	230	85	49	40.3	54	75	5.3	6.3	87	0.29	Fast-on
1NF-12	12	230	156	57.5	45.4	130.5	143	5.3	6	156	0.73	Fast-on

* at 40°C environment temperature

5.5 Mains filters 1NF-20B, 1NF-25

Figure 13: Mains filters 1NF-20B, 1NF-25



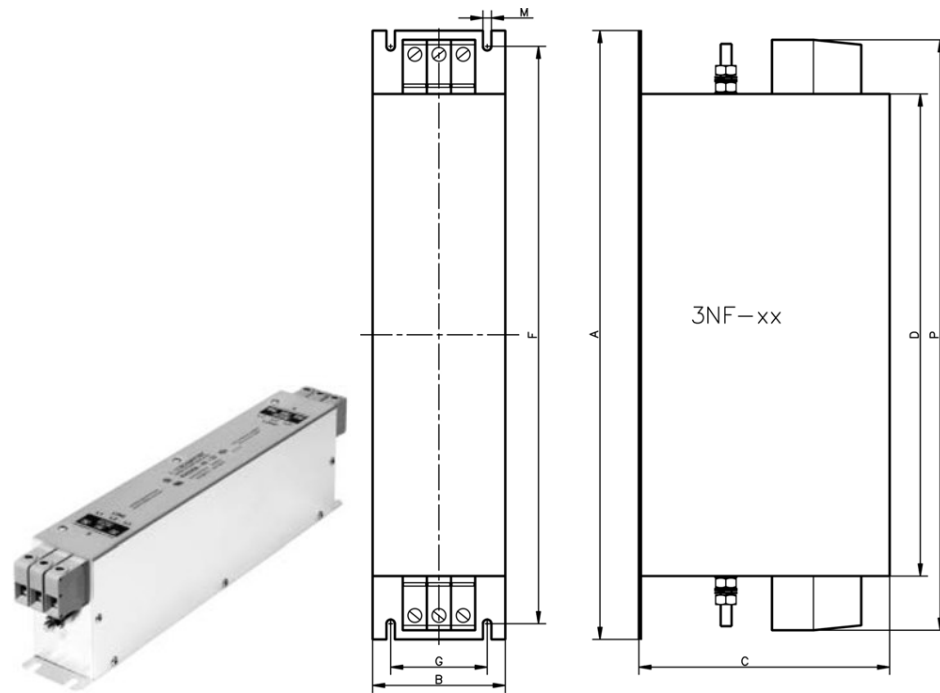
Technical Data

Type	Nominal Current [A]*	Nominal Voltage		Weight [kg]	Connection Phase Terminals	Connection PE
		IEC	UL/CSA			
1NF-20B	20	230V	125V	0.93	Wires up to 4mm ² Torque 0.6 to 0.8 Nm	Bolt M 6 Torque 3.5 to 4 Nm
1NF-25	25	230V	230V	0.7	Wires up to 10mm ² Torque 1.5 to 1.8 Nm	

*at 50°C environment temperature

5.6 Mains Filters 3NF-07...30

Figure 14: Mains Filters 3NF-07...30



Technical Data

Type	Nominal Current*	A [mm]	B [mm]	C [mm]	D [mm]	F [mm]	G [mm]	M [mm]	P [mm]	Weight [kg]	Terminals	PE Bolt
3NF-07	7 A	190	40	70	160	180	20	4.5	180	0.5	4 mm², 0.7 to 0.8 Nm 10 mm², 1.9 to 2.2 Nm	M5, 2.2Nm
3NF-16	16 A	250	45	70	220	235	25	5.4	240	0.8		
3NF-30	30 A	270	50	85	240	255	30	5.4	260	1.2		

* at 50°C environment temperature

Section 6: Capacitor Modules

KCM (Emerson Capacitor Modules) absorb energy generated by the motor when it is operating in generator mode. Normally, this energy is dissipated as waste through brake resistors. KCM feeds the energy stored back into the DC Bus link as and when it is required.

KCM-S	Saves energy: The energy stored in the capacitor module during regenerative braking is available the next time acceleration happens. The module's inception voltage is calculated automatically during the first load cycles.
KCM-P	Power in spite of power failure: If the power supply fails, the module provides the drive with the stored energy that is required to bring the drive to a standstill in a controlled manner (this only applies to the power supply voltage; battery-back the 24 V supply separately).
KCM-E	Expansion module for both applications. Expansion modules are available in two capacitance classes.

6.1 Important Notes

DANGER

DC Bus link terminals in servo systems carry high DC voltage of up to 900 V. Touching the terminals while they are carrying voltage is extremely dangerous. Switch off (disconnect) the line voltage. You must only work on the connections when the system is disconnected.

It can take over an hour for the modules to self-discharge. Check the state of charge with a measuring device that is suitable for a DC voltage of up to 1,000 V. When measuring a voltage of over 60 V between the DC+/DC- terminals or to ground, discharge the modules as described in the KCM Instructions Manual.

NOTE: You must read the instructions manual for the drive / servomotor you are using in your application and observe the safety instructions they contain before commencing mounting/installation work.

Wiring diagram and more important notes concerning wiring can be found in the KCM instructions manual and in the instructions manual of the used drive.

6.2 Order Codes

The KCM modules may only be connected to drives with 400/480 V rated voltage.

Type/Order Code	Remarks
KCM-S200-0000	Energy Saving Module, 1.6 kW
KCM-P200-0000	Power Module, 2 kW
KCM-E200-0000	Expansion Module 2 kW
KCM-E400-0000	Expansion Module 4 kW

6.3 KCM Module

Observe the safety instructions and in the instruction manual of the drive.

Permissible assembly type: Vertical, ground connections at the bottom. Other assembly positions are not permitted. Observe the required free space to next device. Ensure there is unobstructed convection for cooling purposes.

6.3.1 Technical Data

Type	Storage Capacity [Ws]	Rated supply voltage[V=]	Peak supply voltage [V=]	Power [kW]	Protection Class	Inception voltage [V=]	Weight [kg]
KCM-S200	1600	max 850 VDC	max 950VDC (30s in 6min)	18	IP20	calculated	6.9
KCM-P200	2000					470 VDC	6.9
KCM-E200	2000					-	4.1
KCM-E400	4000					-	6.2

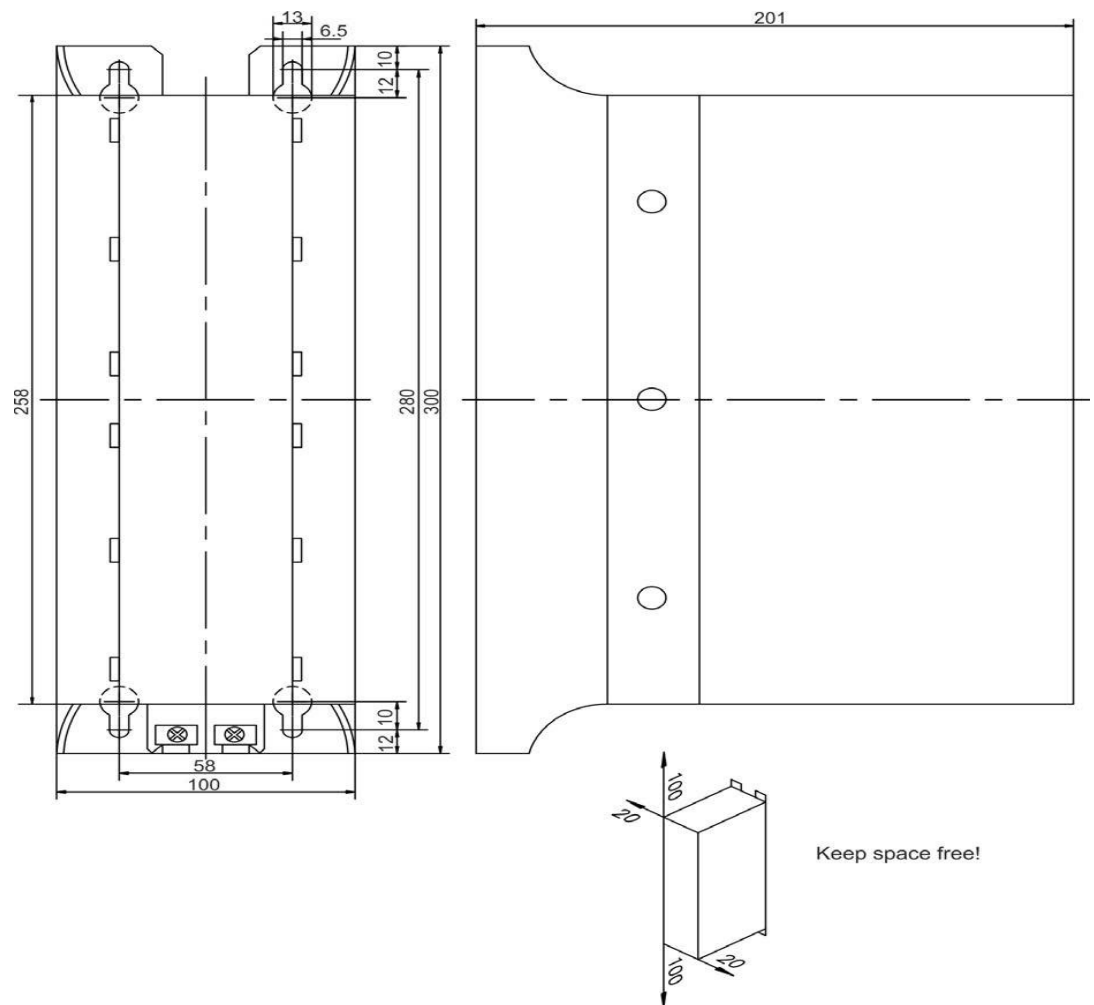
6.4 External Regen Resistor BAFP(U)

Observe the instructions in Important Notes and in the instruction manual of the drive.

Permissible assembly type: Vertical, ground connections at the bottom. Other assembly positions are not permitted.

Observe the required free space to next device. Ensure there is unobstructed convection for cooling purposes.

Figure 15: External Regen Resistor



Section 7: Regeneration Resistors

During braking with the aid of the motor, energy is fed back into the drive. This energy is dissipated as heat in the regeneration resistor. The regen resistor is switched on by the brake circuit. Different resistance values must be used depending on the drive. All regen resistors meet the requirements of CE directives and are UL-registered.

7.1 Safety Instructions

CAUTION

You must read the instruction manuals for the drive and motor that you are using in your application and observe the safety instructions they contain before starting mounting/installation work.

This manual is only valid in conjunction with the instruction manuals for the drive and motor you are using in your application.

Danger of burn. Mount only in switchgear cabinets, observe installation clearances, provide the requisite conditions for unobstructed convection for cooling. As Regen resistors can heat up to temperatures in excess of 250 °C, use temperature-resistant components in the vicinity of the resistor.

Observe allowed mounting positions (see dimension drawings). The connection terminals must never be in the exhaust area of hot air.

In case of insufficient cooling or false mounting the resistor or the surrounding devices could be overheated or damaged.

A connection diagram appears in the drive's instructions manual.

Note: For best results, the following conditions must be provided for regen resistors:

- Unobstructed cooling air
- Unobstructed exhaust of warmed air
- Rated data with maximum ambient temperature 40°C, in case of ambient temperature higher than 40°C, power must be reduced by 4% per 10K temperature rise.

7.2 Type Assignment

Drive	Regen resistor	Resistance/Ohm
IC830DP00306	BAFP(U)/BAR(U)/BAS(U)	33
IC830DP00606	BAFP(U)/BAR(U)/BAS(U)	33
IC830DP01206	BAFP(U)/BAR(U)/BAS(U)	15
IC830DP02406	BAR(U)/BAS(U)	15
IC830DP00307	BAR(U)/BAS(U)	33
IC830DP00607	BAR(U)/BAS(U)	33
IC830DP01207	BAR(U)/BAS(U)	33
IC830DP02407	BAR(U)/BAS(U)	23

Order Codes

Description	Drive	Resistance [Ω]	Rated Power [W]	Max. Power [W]	Order code
Regen resistor BAR(U) 1000-15	IC830DP01206, IC830DP02406	15	1000	1600	BAR-1000-15
Regen resistor BAS(U) 2000-15		15	2000	3200	BAS-2000-15
Regen resistor BAS(U) 3000-15		15	3000	4800	BAS-3000-15
Regen resistor BAS(U) 6000-15		15	6000	9600	BAS-6000-15
Regen resistor BAR(U) 600-23	IC830DP02407	23	600	960	BAR-600-23
Regen resistor BAR(U) 1000-23		23	1000	1600	BAR-1000-23
Regen resistor BAS(U) 2000-23		23	2000	3200	BAS-2000-23
Regen resistor BAS(U) 3000-23		23	3000	4800	BAS-3000-23
Regen resistor BAS(U) 4000-23		23	4000	6400	BAS-4000-23
Regen resistor BAFP(U) 100-33	IC830DP 00306 to IC830DP00606 IC830DP00307 IC830DP01207	33	100	160	BAFP-100-33
Regen resistor BAFP(U) 200-33		33	200	320	BAFP-200-33
Regen resistor BAR(U) 250-33		33	250	400	BAR-250-33
Regen resistor BAR(U) 500-33		33	500	800	BAR-500-33
Regen resistor BAR(U) 1500-33		33	1500	2400	BAR-1500-33
Regen resistor BAS(U) 3000-33		33	3000	4800	BAS-3000-33

7.3 External Regen Resistor BAFP(U)

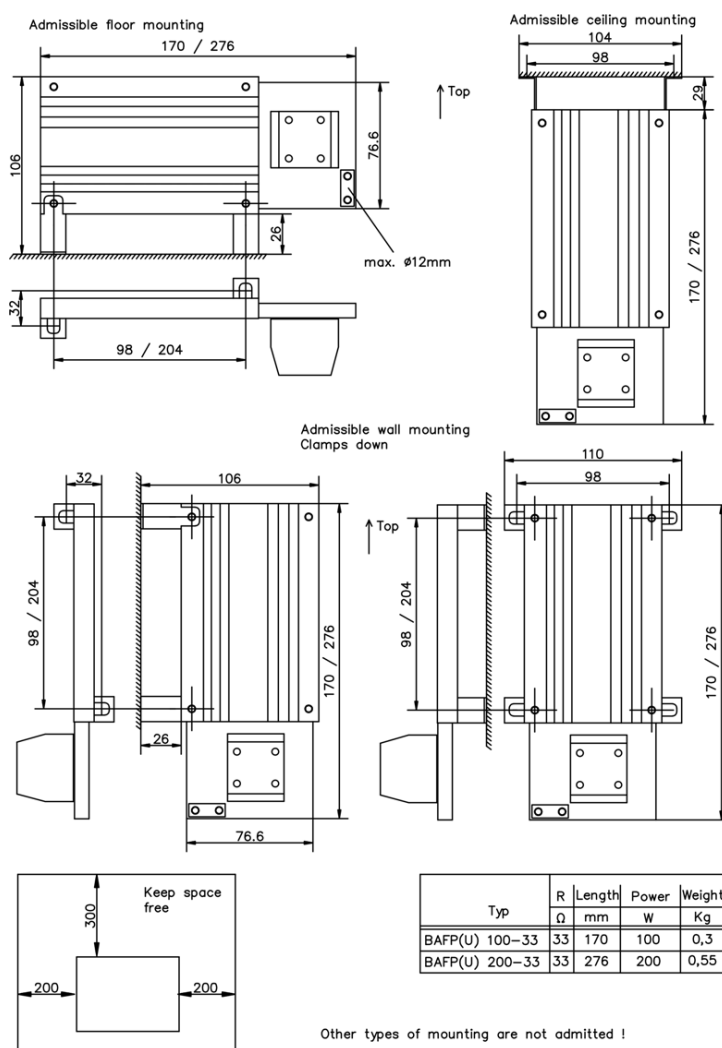


Protection class: IP40

CAUTION

- Surface temperature can exceed 250 °C.
- Make sure that the necessary space is kept clear.
- Do not mount on combustible surfaces.

Figure 16: Drawings of External Regen Resistor



7.4 External Regen Resistor BAR(U)

Figure 17: External Regen Resistor BAR(U) *

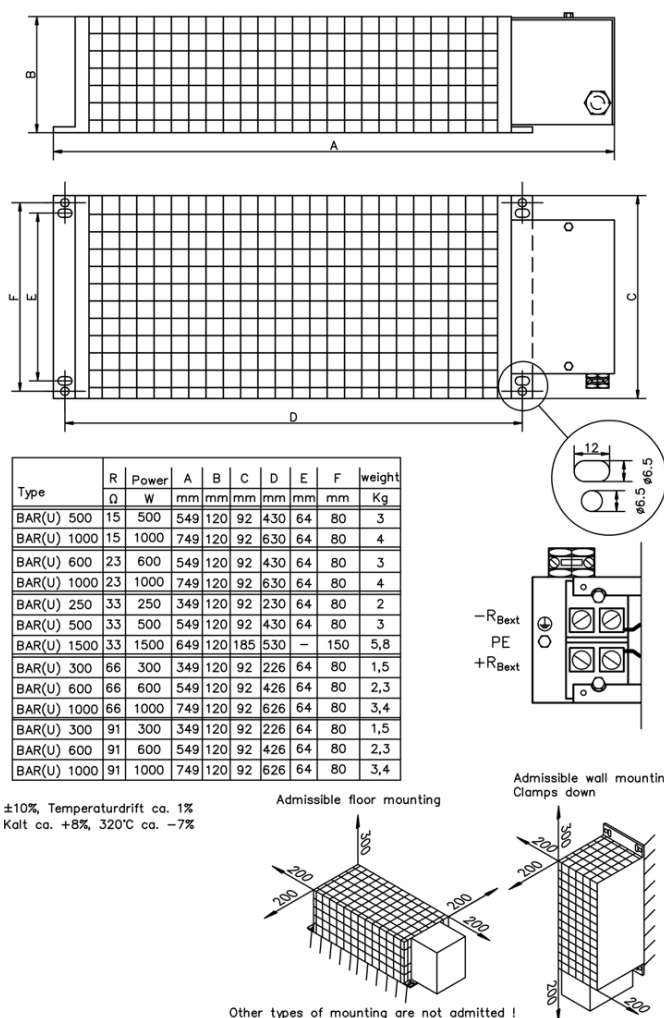


*Protection class: IP20

CAUTION

- Surface temperature can exceed 250 °C.
- Make sure that the necessary space is kept clear.
- Do not mount on combustible surfaces.

Figure 18: External Regen Resistor BAR (U)



7.5 External Regen Resistor BAS(U)

Figure 19: External Regen Resistor BAS(U)



Protection class: IP20

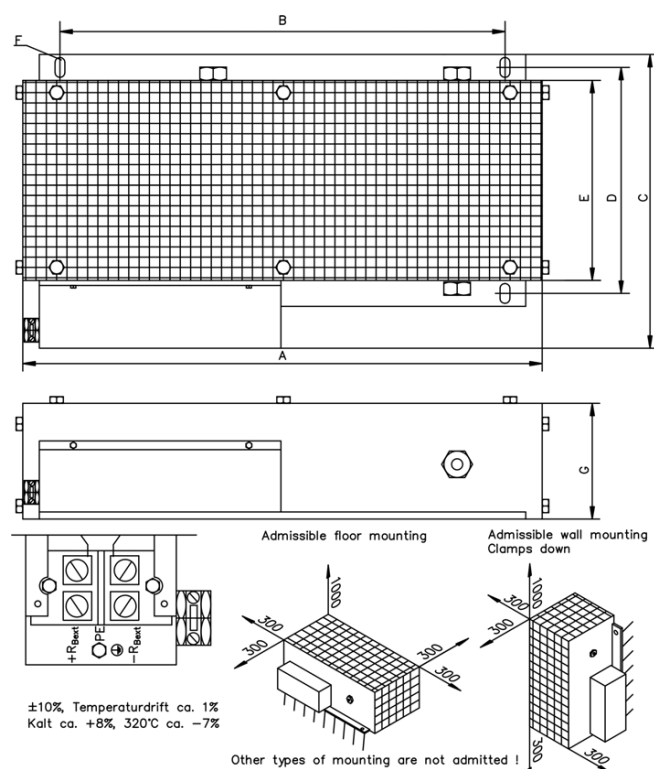
CAUTION

Surface temperature can exceed 250 °C.

Make sure that the necessary space is kept clear.

Do not mount on combustible surfaces.

Figure 20: Drawing of External Regen Resistor BAS(U)



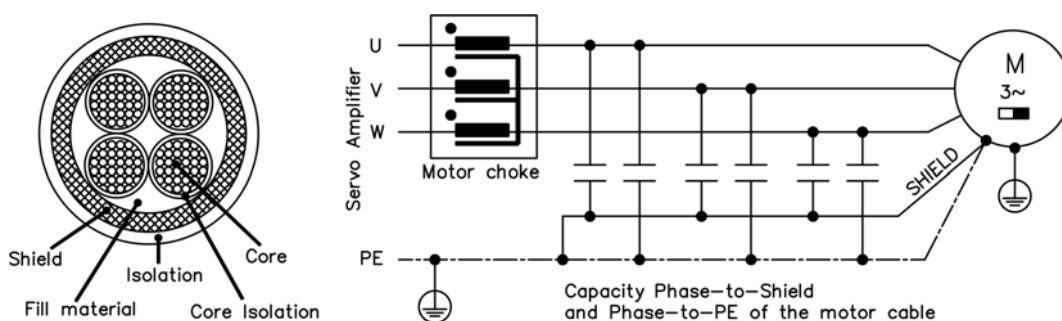
	R	Rated power	A	B	C	D	E	F	G	weight
	Ω	W	mm	mm	mm	mm	mm	mm	mm	Kg
BAS(U)2000-10	10	2000	490	380	255	170	150	#10,5	260	7
BAS(U)3000-10	10	3000	490	380	355	270	250	#10,5	260	8
BAS(U)6000-10	10	6000	490	380	455	370	350	#10,5	260	11
BAS(U)2000-15	15	2000	490	380	255	170	150	#10,5	260	7
BAS(U)3000-15	15	3000	490	380	355	270	250	#10,5	260	8
BAS(U)6000-15	15	6000	490	380	455	370	350	#10,5	260	11
BAS(U)2000-23	23	2000	490	380	255	170	150	#10,5	260	7
BAS(U)3000-23	23	3000	490	380	355	270	250	#10,5	260	8
BAS(U)4000-23	23	4000	490	380	355	270	250	#10,5	260	9
BAS(U)3000-33	33	3000	490	380	355	270	250	#10,5	260	8

Section 8: Motor Chokes

8.1 Shielded Motor Cables

For electromagnetic compatibility, the motor must be supplied with power using a shielded cable. The structure of a cable with 100% shielding and the capacity equivalent circuit diagram (to earth) are shown below.

Figure 21: Shielded Motor Chokes



8.1.1 Why use motor chokes?

- To compensate for high capacitive charge/discharge currents typical of shielded motor cables approximately 25 m and longer.
- To reduce current alternation noise in the motor.
- To reduce current ripple in the motor.

The digital drives' high switching frequencies and steep switching edges give rise to the transfer of capacitive currents to the shield by the three phases (U, V, W). These currents flow from the shield to earth. Depending on the cable length and cable capacity, this can lead to the generation of shield currents with peak values of up to 20 A. These shield currents place a load on the drives and motor and, on large systems, lead to shifts in potential which can damage other components. This effect is evident in particular on systems with multiple drives operating in parallel on the same mains filter. The motor chokes slow down the rate of rise of the motor current, thereby reducing the current transferred to the shield.

8.1.2 Why is the cross-section of the motor cable important?

Motor cables longer than 50 m with a small cross-section (such as 4x1.0mm²) and therefore a higher equivalent resistance are able to reduce the oscillation tendency of the LCR oscillating circuit (drive/choke/cable/motor). This cross-section can also be advantageous for cable lengths shorter than 50 m if the cable capacity and motor inductance are very high. However, the current loading of the cable must always be within the limits specified by industry standards.

8.2 Safety Instructions

CAUTION

- Before starting mounting/installation work, you must read and observe the instruction manuals and the safety instructions that they contain for the drive and motor that you are using in your application.
- This manual is only valid in conjunction with the instruction manuals for the drive and motor you are using in your application.
- Mount the motor choke on a conductive earthed plate in the switchgear cabinet.
- The choke can become hot during operation (rising to temperatures in excess of 80 °C). Therefore, you should make sure that the choke is mounted a sufficient distance away from neighboring components.
- Provide the requisite conditions for unobstructed convection to cool the choke.
- A connection diagram appears in the drive instructions manual.
- If the motor cable is longer than 25 m, then the motor choke is wired into the cable close to the amplifier. When laying the motor cable, allow about 400 mm for the connection to the choke.

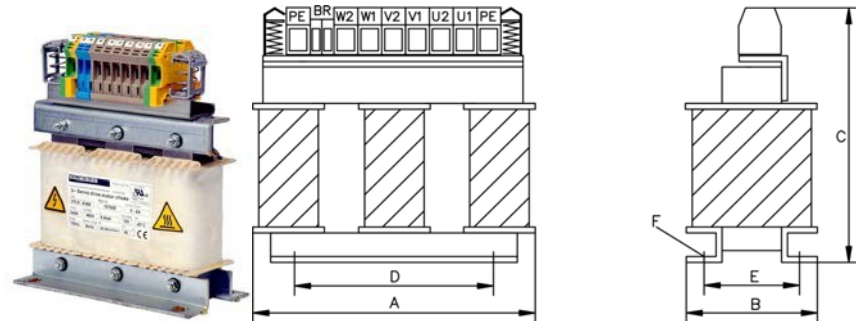
8.3 Type Assignment

Drive*	Motor choke	Approvals	Condition
IC830DP003x to IC830DP006x	3YLN-06	CE, UL	Motor cable > 25m
IC830DP012x	3YLN-14	CE, UL	Motor cable > 25m
IC830DP024x	3YLN-24	CE, UL	Motor cable > 25m

*IC830DP part numbers indicate continuous current rating (-003 is 3 A, -012 is 12 A, etc).

8.4 Motor Choke 3YLN-xx

Figure 22: Motor Choke 3YLN-XX



8.4.1 Technical Data

Rated Data	Symbol	Units	3YLN-06	3YLN-14	3YLN-24
Rated current	I _{0rms}	A	6	14	24
Rated voltage	U _{nom}	V	480		
Rated frequency	f _{nom}	Hz	0 to 150		
Max. frequency	f _{max}	kHz	8		
Inductivity	L	μH	900	900	450
Power loss	P	W	12	19.4	23.2
Protection class	-	-	IP00		
Temperature class	-	-	F		
Operation class	-	-	S1		
Weight	G	kg	4.5	10	10
Cable diameter (Shield clamp)	-	mm	4 to 13.5		
Wiring cross section max. (Terminals)	-	mm ²	10	16	16
Width	A	mm	155	190	190
Depth	B	mm	90	125	125
Height	C	mm	195	230	230
Mounting hole distance	D	mm	130	170	170
Mounting hole distance	E	mm	56.5	78	78
Mounting screws	F	-	4xM6	4xM6	4xM6

Section 9: Cables

This chapter provides cable information for PSD servo drives.

9.1 PC Connection

The PSD drive is connected to a PC or to a switch/hub by a standard net cable with RJ45 connectors.

9.2 Emerson Ethernet Cables

PUR jacketed CAT5e cables, pre-terminated with RJ45 connectors.

Description	Order code
0.17 meter pre-terminated patch cable	ENCP-0017-000
0.26 meter pre-terminated patch cable	ENCP-0026-000
0.50 meter pre-terminated patch cable	ENCP-0050-000
1 meter pre-terminated patch cable	ENCP-0100-000
2 meter pre-terminated patch cable	ENCP-0200-000
3 meter pre-terminated patch cable	ENCP-0300-000
4 meter pre-terminated patch cable	ENCP-0400-000
5 meter pre-terminated patch cable	ENCP-0500-000
10 meter pre-terminated patch cable	ENCP-1000-000

9.2.1 Technical Data

ENCP-xxxx-xxx (Emerson Ethernet Cables)	
Cross-section	4 x 2 x AWG26/7 ... 4 x 2 x 0.128 mm ²
Cable sheath material	PUR
Color	Green (RAL 6018)
Line configuration	SF/UTP
Diameter	sheath: typ. 5.9 mm ± 0.2 mm
Bending radius	> 5 x diameter
Category/class	CAT5e, class D
Operating/installation temperature	-40 - +75 °C / -10 ... +60 °C
Insertion cycles	min. 750

9.3 PSD Performance Cables

9.3.1 Hybrid Cables

Hybrid cables offer a single connection point on the motor for both feedback and power. Feedback options for this connection type are:

- SFD GEN3 (Single-turn absolute, CA option)
- HIPERFACE DSL (Multi-turn option, GF option)

9.3.2 PSD Hybrid Cables by Motor Type

Motor	Hybrid Cable ¹ option for 240V drives (IC830DPxxx06xxxx)	Hybrid Cable ¹ option for 480V drives (IC830DPxxx07xxxx)
IC830M < 12 A	CCJ1A2-015	CCJ2A2-015
12 A ≤ IC830M < 20 A	CCJ2A2-025	CCJ2A2-025

¹Hybrid cables support SFD GEN 3, Single-turn and Multi-turn HIPERFACE DSL

9.3.3 Dual Cables

Dual cables are used to separate power and feedback. Options included in this catalog support:

- BiSS (Multi-turn absolute, AOption)

Motor	Power Cable	Power Cable with Brake	BiSS
IC830M < 12 A	CP-507CCAN	CP-507CDAN	CF-SB7374N
12 A ≤ IC830M < 20 A	-	-	CF-SB7374N
20 A ≤ IC830M < 24 A	-	-	CF-SB7374N

9.4 Motor Power and Feedback Cables

These cables differ in how they are connected to the drive due to the varying requirements for minimum code distances, different shielding concepts, depending on rated voltage, and current load. The following pre-assembled, ready-to-use cables meet the requirements of relevant CE and UL standards.



Flex Line Cables

9.4.1 Hybrid Cables (Power and Feedback)

Order Code	Description
CCJ1A2-015	Hybrid Cable, Power & Feedback with brake, 1.5 mm ² , SpeedTec 1.0 connector (6A, 240 VAC)
CCJ2A2-015	Hybrid Cable, Power & Feedback with brake, 1.5 mm ² , SpeedTec 1.0 connector (20A, 240 and 480 VAC)
CCJ2A2-025	Hybrid Cable, Power & Feedback with brake, 2.5 mm ² , SpeedTec 1.0 connector (20A, 240 and 480 VAC)

9.4.2 Power Cables

Order Code	Description
CP-507CCAN	Motor Power Cable, High Flex w/ Intercontec Style Connector, (12 A, 240 and 480 VAC)
CP-507CDAN	Motor Power Cable w/ Brake, High Flex w/ Intercontec Style Connector, (12 A, 240 and 480 VAC)
P1-12-040-A5	Motor Power Cable, High Flex, PUR, w/ Intercontec Style Connector, (27 A, 480 VAC)
P2-12-040-A5	Motor Power Cable w/ Brake, High Flex, PUR, w/ Intercontec Style Connector, (27 A, 480 VAC)
P5-12-015-A5	Motor Power Cable, High Flex, PVC, w/ Intercontec Style Connector, (15A, 480 VAC)

9.4.3 Feedback

Order Code	Description
CF-SB7374N	Motor Feedback Cable w/ Intercontec Style Connector, BiSS
F1-12-FB4-A3	Motor Feedback Cable, High Flex, w/ M23 Speedtec Connector, PUR, BiSS

9.5 Preparing Motor Cables (Motor End)

9.5.1 PSR motors IC830M2 through IC830M7

Please note that different conductor cross-sections are required for different motors, and for motors with a holding brake, the brake signals are also attached through this connector.

Connections: The view is as seen from the contact side of the connector:

Standard (size 1), wire max 4mm ²				
	Pin	Signal	Pin	Signal
	1	U2	A	+ Br
	4	V2	B	- Br
	3	W2	C	n.c.
	(2)	PE	D	n.c.

Option H (size 1.5), wire max. 10mm ²				
	Pin	Signal	Pin	Signal
	U	U2	+	+ Br
	V	V2	-	- Br
	W	W2	1	n.c.
		PE	2	n.c.

9.5.2 Motor Power Cable Specifications

All cables supplied with IC830D are RoHS compliant.

9.5.2.1 Cable Routing Standards

UL 508C and UL 508A indicate that wires, when routed together, shall be rated for the highest voltage involved in all of the circuits. This means that value line feedback cables which are 300V rated are not appropriate when routed directly next to motor power cables that carry more voltage than 300V. They should be physically separated. Performance line cables are recommended when this is a concern.

The NFPA 70 (NEC) article 300.3(C)(1) says that for circuits that are 600V or less, conductors of ac and dc circuits shall be permitted to occupy the same equipment wiring enclosure, cable, or raceway. All conductors shall have an insulation rating equal to at least the maximum circuit voltage applied to any conductor within the enclosure, cable, or raceway.

9.6 Motor Feedback Cable Specifications

All cables supplied with PSD servo drives are RoHS compliant.

9.6.1 Cable Routing Standards

UL 508C and UL 508A indicate that wires, when routed together, shall be rated for the highest voltage involved in all of the circuits. This means that value line feedback cables which are 300 V rated are not appropriate when routed directly next to motor power cables that carry more voltage than 300 V. They should be physically separated. Performance line cables are recommended when this is a concern.

The NFPA 70 (NEC) article 300.3(C)(1) says that for circuits that are 600 V or less, conductors of ac and dc circuits shall be permitted to occupy the same equipment wiring enclosure, cable, or raceway. All conductors shall have an insulation rating equal to at least the maximum circuit voltage applied to any conductor within the enclosure, cable, or raceway.

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Any escalation request should be sent to: mas.sfdcescalation@emerson.com

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