The voltage of the frequency converter is dangerous whenever the equipment is connected to mains. Incorrect installation of the motor or the frequency converter may cause damage to the equipment, serious personal injury or death.
Consequently, the instructions in this manual, as well as national and local rules and safety regulations, must be complied with.

■ Safety regulations

1. The frequency converter must be disconnected from mains if repair work is to be carried out. Check that the mains supply has been disconnected and that the necessary time has passed before removing motor and mains plugs.
2. The [STOP/RESET] key on the control panel of the frequency converter does not disconnect the equipment from mains and is thus not to be used as a safety switch.
3. Correct protective earthing of the equipment must be established, the user must be protected against supply voltage, and the motor must be protected against overload in accordance with applicable national and local regulations.
4. The earth leakage currents are higher than 3.5 mA.
5. Protection against motor overload is not included in the factory setting. If this function is desired, set parameter 128 to data value *ETR trip* or data value *ETR warning*.
   Note: The function is initialised at 1.16 x rated motor current and rated motor frequency. For the North American market: The ETR functions provide class 20 motor overload protection in accordance with NEC.
6. Do not remove the plugs for the motor and main supply while the frequency converter is connected to mains. Check that the mains supply has been disconnected and that the necessary time has expired before removing motor and mains plugs.
7. Please note that the frequency converter has more voltage inputs than L1, L2 and L3, when loadsharing (linking of DC intermediate circuit) and external 24 V DC have been installed. Check that all voltage inputs have been disconnected and that the necessary time has passed before repair work is commenced.

■ Warning against unintended start

1. The motor can be brought to a stop by means of digital commands, bus commands, references or a local stop, while the frequency converter is connected to mains.
   If personal safety considerations make it necessary to ensure that no unintended start occurs, these stop functions are not sufficient.
2. While parameters are being changed, the motor may start. Consequently, the stop key [STOP/RESET] must always be activated, following which data can be modified.
3. A motor that has been stopped may start if faults occur in the electronics of the frequency converter, or if a temporary overload or a fault in the supply mains or the motor connection ceases.

■ Quick Setup

■ Introduction to Quick Setup

This Quick Setup will guide you through EMC correct installation of the frequency converter by connecting power, motor and control wiring (fig. 1). Start/stop of motor is to be done with the switch.

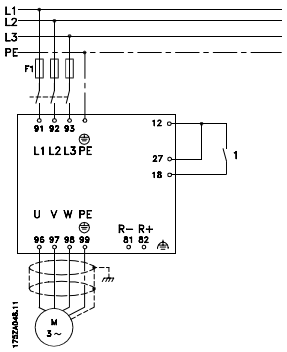


Fig. 1

■ 1. Mechanical Installation

AKD 5000 frequency converters allow side-by-side mounting. The necessary cooling demands a free air passage of 10 cm above and below the frequency converter (5016-5062 380-500 V and 5008-5027 200-240 V must have 20 cm).
Drill all holes by using the measurements stated in the table. Please note the difference in unit voltage.
Place the frequency converter on the wall. Tighten up all four screws.
All the below listed measurements are in mm

AKD type	A	B	C	a	b
Compact IP 20, 200–240 V (Fig. 4)					
5001 - 5003	395	220	160	384	200
5004 - 5006	395	220	200	384	200
5008	560	242	260	540	200
5011 - 5016	700	242	260	680	200
5022 - 5027	800	308	296	780	270
Compact IP 20, 380–500 V (Fig. 4)					
5001 - 5005	395	220	160	384	200
5006 - 5011	395	220	200	384	200
5016 - 5022	560	242	260	540	200
5027 - 5032	700	242	260	680	200
Compact IP 54, 200–240 V (Fig. 3)					
5001 - 5003	460	282	195	260	258
5004 - 5006	530	282	195	330	258
5008 - 5011	810	350	280	560	326
5016 - 5027	940	400	280	690	375
Compact IP 54, 380–500 V (Fig. 3)					
5001 - 5005	460	282	195	260	258
5006 - 5011	530	282	195	330	258
5016 - 5027	810	350	280	560	326
5032 - 5062	940	400	280	690	375
5042 - 5062	800	308	296	780	270

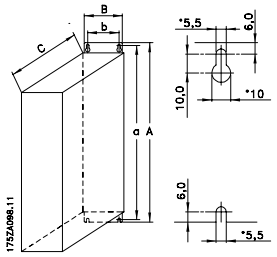


Fig. 2

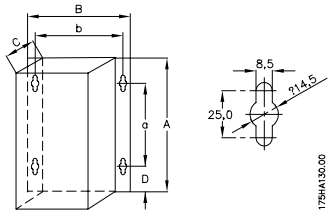


Fig. 3

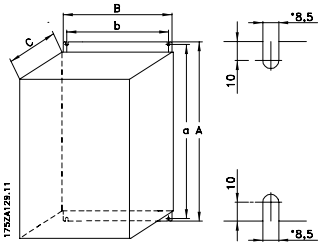


Fig. 4

■ 2. Electrical Installation, power

NOTE: The terminals are detachable on AKD 5001-5006, 200-240 V and AKD 5001-5011, 380-500 V Connect the mains supply to the mains terminals L1, L2, L3 of the frequency converter and to the earth connection (fig. 5-8). Cable relief fitting is placed on the wall for Bookstyle units. Mount screened motor cable to the motor terminals U, V, W, PE of the frequency converter. Make sure, the screen is connected electrically to the drive.

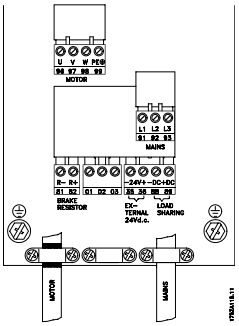


Fig. 6
Compact IP 20 and IP 54
5001 - 5011 380 - 500 V
5001 - 5006 200 - 240 V

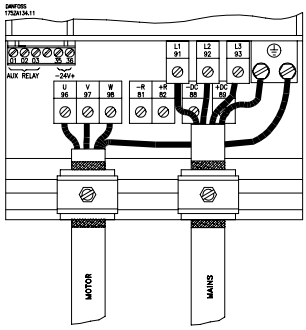
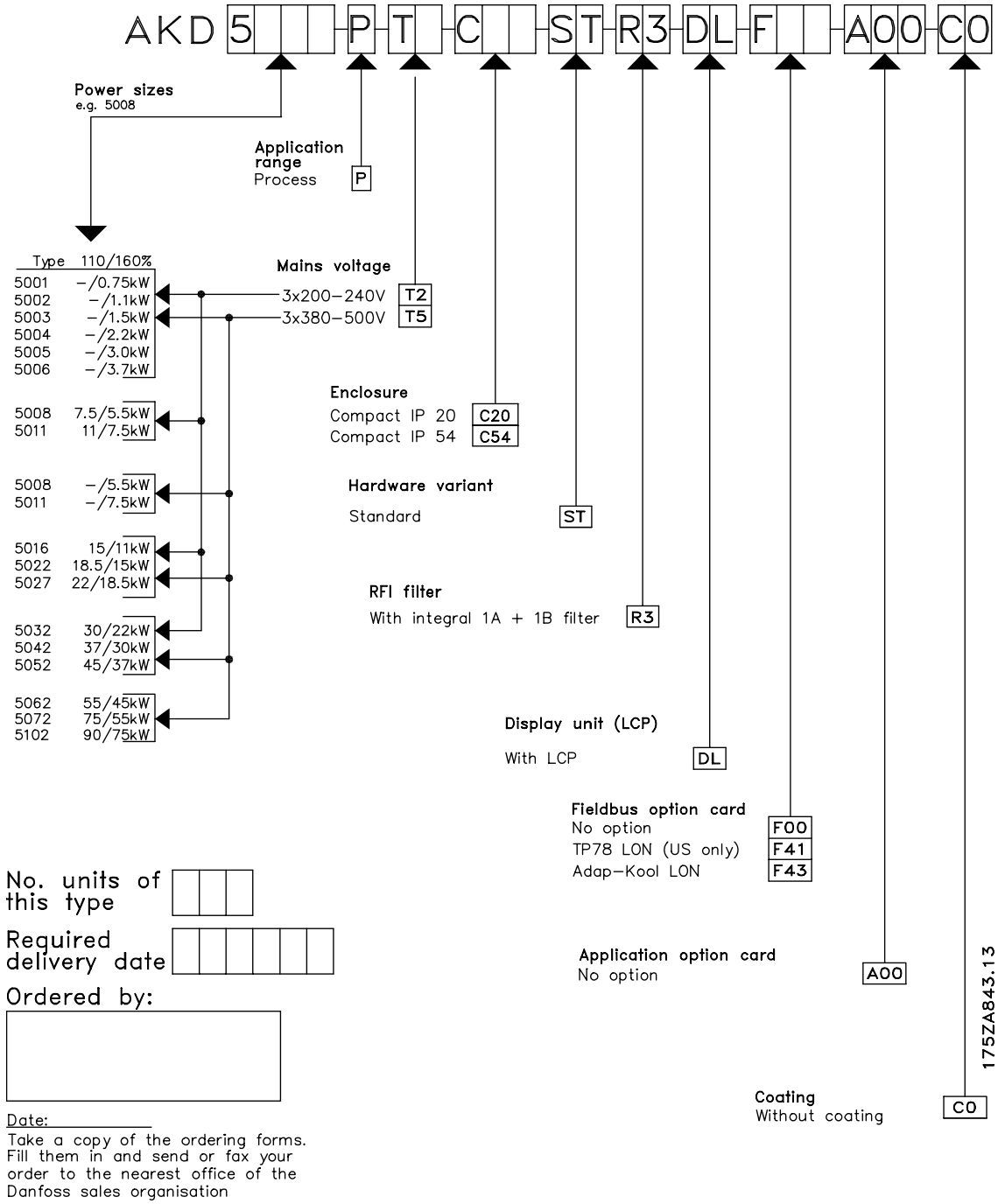


Fig. 7
Compact IP 20
5016 - 5062 380 - 500 V
5008 - 5027 200 - 240 V

■ Ordering form AKD 5000 Series - Typecode



■ Compact, netvoeding 3 x 380-500 V

Overeenkomstig internationale voorschriften	AKD-type		5016	5022	5027
	Normaal overbelastingskoppel (110 %):				
Uitgangsstroom	I_N [A] (380-440 V)		32	37.5	44
	I_{MAX} (60 s) [A] (380-440 V)		35.2	41.3	48.4
	I_N [A] (441-500 V)		27.9	34	41.4
	I_{MAX} (60 s) [A] (441-500 V)		30.7	37.4	45.5
Vermogen	S_N [kVA] (380-440 V)		24.4	28.6	33.5
	S_N [kVA] (441-500 V)		24.2	29.4	35.8
Typisch asvermogen	P_N [kW]		15	18.5	22
Typisch asvermogen	P_N [HP]		20	25	30
	Hoog overbelastingskoppel (160 %):				
Uitgangsstroom	I_N [A] (380-440 V)		24	32	37.5
	I_{MAX} (60 s) [A] (380-440 V)		38.4	51.2	60
	I_N [A] (441-500 V)		21.7	27.9	34
	I_{MAX} (60 s) [A] (441-500 V)		34.7	44.6	54.4
Vermogen	S_N [kVA] (380-440 V)		18.3	24.4	28.6
	S_N [kVA] (441-500 V)		18.8	24.2	29.4
Typisch asvermogen	P_N [kW]		11	15	18.5
Typisch asvermogen	P_N [HP]		15	20	25
Max. dwarsdoorsnede van kabel naar motor, rem en loadsharing [mm^2]/[AWG][2) 4)]		IP 54	16/6	16/6	16/6
		IP 20	16/6	16/6	35/2
Min. dwarsdoorsnede van kabel naar motor, rem en loadsharing [mm2]/[AWG]			10/8	10/8	10/8
Nominale ingangsstroom	$I_{L,N}$ [A] (380 V)		32	37.5	44
	$I_{L,N}$ [A] (460 V)		27.6	34	41
Max. kabeldoorsnede, vermogen [mm^2]/[AWG]		IP 54	16/6	16/6	16/6
		IP 20	16/6	16/6	35/2
Max. voorzekeringen	[-]/UL[1)] [A]		63/40	63/50	63/60
Voorzekering SMPS	[-]/UL[5)] [A]		4.0/4.0	4.0/4.0	4.0/4.0
Rendement			0.96	0.96	0.96
Gewicht IP 20 EB	[kg]		21	22	27
Gewicht IP 54	[kg]		41	41	42
Vermogensverlies bij max. belasting. - hoog overbelast-ingskoppel (160 %)	[W]		419	559	655
- normaal overbelastingskoppel (110 %)	[W]		559	655	768
Behuizing			IP 20/IP54	IP 20/IP54	IP 20/IP54

1. Zie hoofdstuk *Zekeringen* voor de benodigde zekeringen.
2. American Wire Gauge (Amerikaanse kabeldiktemaat).
3. Gemeten met een afgeschermde motorkabel van 30 m bij nominale belasting en nominale frequentie.
4. De min. kabeldoorsnede is de kleinste kabeldoorsnede die op de klemmen aangesloten mag worden om te voldoen aan IP 20. Houd u altijd aan de nationale en lokale voorschriften met betrekking tot de min. kabeldoorsnede.
5. Gebruik voor UL/cUL-toepassingen Ferraz Shawmut type FA Y85443, Danfoss-bestelnr. 612Z1182.

■ Fuses

UL compliance

To comply with UL/cUL approvals, pre-fuses according to the table below must be used.

200-240 V

AKD	Bussmann	SIBA	Littel fuse	Ferraz-Shawmut
5001	KTN-R10	5017906-010	KLN-R10	ATM-R10 or A2K-10R
5002	KTN-R10	5017906-010	KLN-R10	ATM-R10 or A2K-10R
5003	KTN-R25	5017906-016	KLN-R15	ATM-R15 or A2K-15R
5004	KTN-R20	5017906-020	KLN-R20	ATM-R20 or A2K-20R
5005	KTN-R25	5017906-025	KLN-R25	ATM-R25 or A2K-25R
5006	KTN-R30	5012406-032	KLN-R30	ATM-R30 or A2K-30R
5008	KTN-R50	5014006-050	KLN-R50	A2K-50R
5011	KTN-R60	5014006-063	KLN-R60	A2K-60R
5016	KTN-R85	5014006-080	KLN-R80	A2K-80R
5022	KTN-R125	2028220-125	KLN-R125	A2K-125R
5027	KTN-R125	2028220-125	KLN-R125	A2K-125R
5032	KTN-R150	2028220-160	L25S-150	A25X-150
5042	KTN-R200	2028220-200	L25S-200	A25X-200
5052	KTN-R250	2028220-250	L25S-250	A25X-250

380-500 V

	Bussmann	SIBA	Littel fuse	Ferraz-Shawmut
5001	KTS-R6	5017906-006	KLS-R6	ATM-R6 or A6K-6R
5002	KTS-R6	5017906-006	KLS-R6	ATM-R6 or A6K-6R
5003	KTS-R10	5017906-010	KLS-R10	ATM-R10 or A6K-10R
5004	KTS-R10	5017906-010	KLS-R10	ATM-R10 or A6K-10R
5005	KTS-R15	5017906-016	KLS-R16	ATM-R16 or A6K-16R
5006	KTS-R20	5017906-020	KLS-R20	ATM-R20 or A6K-20R
5008	KTS-R25	5017906-025	KLS-R25	ATM-R25 or A6K-25R
5011	KTS-R30	5012406-032	KLS-R30	A6K-30R
5016	KTS-R40	5012406-040	KLS-R40	A6K-40R
5022	KTS-R50	5014006-050	KLS-R50	A6K-50R
5027	KTS-R60	5014006-063	KLS-R60	A6K-60R
5032	KTS-R80	2028220-100	KLS-R80	A6K-180R
5042	KTS-R100	2028220-125	KLS-R100	A6K-100R
5052	KTS-R125	2028220-125	KLS-R125	A6K-125R
5062	KTS-R150	2028220-160	KLS-R150	A6K-150R
5072	FWH-220	2028220-200	L50S-225	A50-P225
5102	FWH-250	2028220-250	L50S-250	A50-P250

KTS-fuses from Bussmann may substitute KTN for 240 V drives.
FWH-fuses from Bussmann may substitute FWX for 240 V drives.

KLSR fuses from LITTEL FUSE may substitute KLNR fuses for 240 V drives.
L50S fuses from LITTEL FUSE may substitute L50S fuses for 240 V drives.

A6KR fuses from FERRAZ SHAWMUT may substitute A2KR for 240 V drives.
A50X fuses from FERRAZ SHAWMUT may substitute A25X for 240 V drives.

Non UL compliance

If UL/cUL is not to be complied with, we recommend the above mentioned fuses or:

■ Mechanical dimensions

All the below listed measurements are in mm.

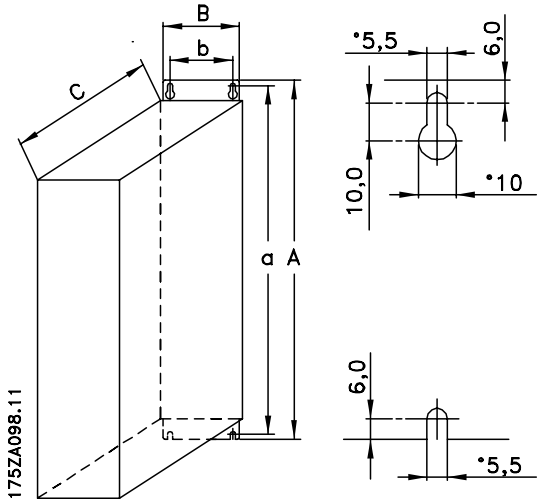
	A	B	C	D	a	b	ab/be	Type
Compact IP 20								
5001 - 5003 200 - 240 V 5001 - 5005 380 - 500 V	395	220	160		384	200	100	C
5004 - 5006 200 - 240 V 5006 - 5011 380 - 500 V	395	220	200		384	200	100	C
5008 200 - 240 V 5016 - 5022 380 - 500 V	560	242	260		540	200	200	D
5011 - 5016 200 - 240 V 5027 - 5032 380 - 500 V	700	242	260		680	200	200	D
5022 - 5027 200 - 240 V 5042 - 5062 380 - 500 V	800	308	296		780	270	200	D
Compact IP 54								
5001 - 5003 200 - 240 V 5001 - 5005 380 - 500 V	460	282	195	85	260	258	100	F
5004 - 5006 200 - 240 V 5006 - 5011 380 - 500 V	530	282	195	85	330	258	100	F
5008 - 5011 200 - 240 V 5016 - 5027 380 - 500 V	810	350	280	70	560	326	200	F
5016 - 5027 200 - 240 V 5032 - 5062 380 - 500 V	940	400	280	70	690	375	200	F
5072 - 5102 380 - 500 V	800	370	335		780	330	225	D

ab: Minimum space above enclosure

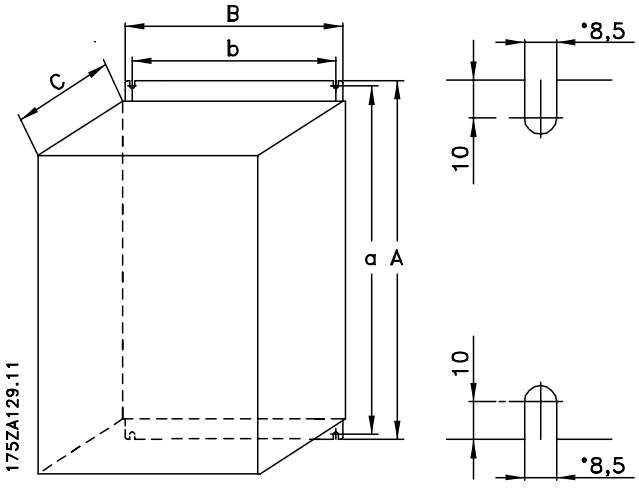
be: Minimum space below enclosure

1: Only above enclosure (ab) IP 00 when built in a Rittal cabinet.

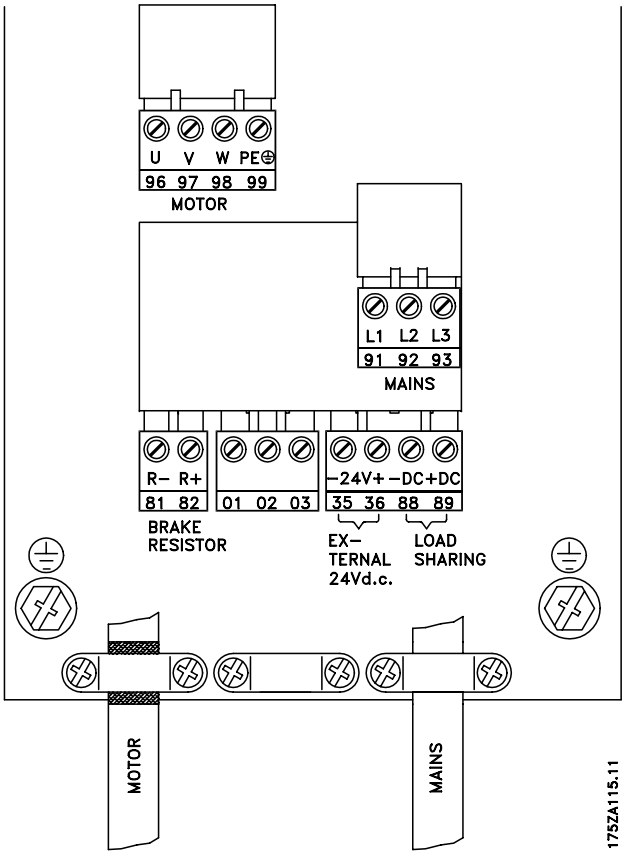
■ Mechanical dimensions, cont.



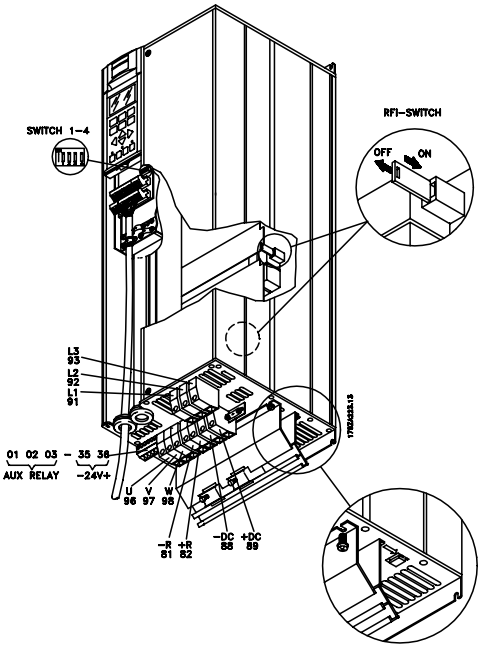
Type C, IP20



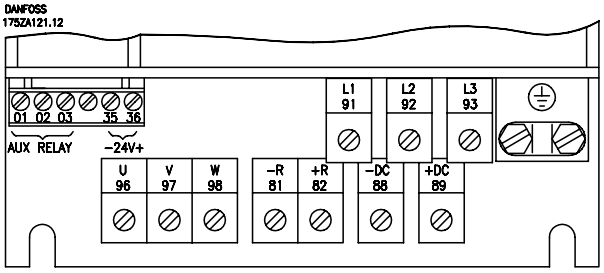
Type D, IP20



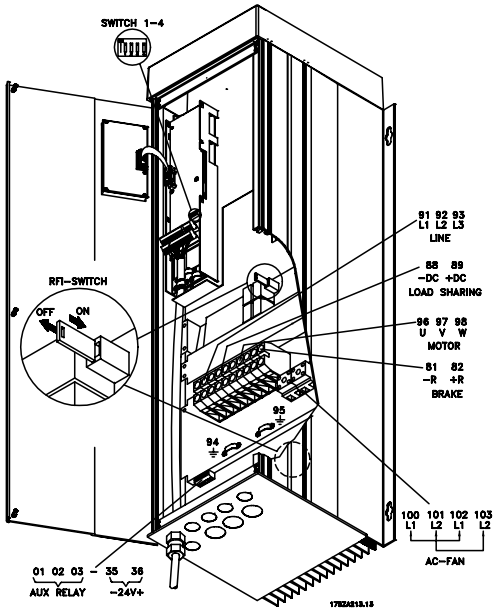
Compact IP 20 / IP 54
AKD 5001-5006 200-240 V
AKD 5001-5011 380-500 V



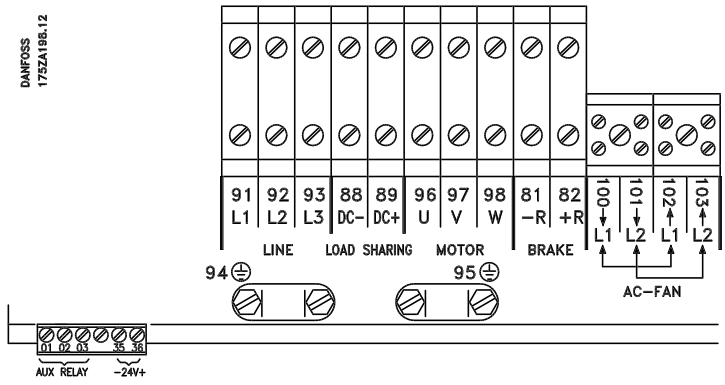
Compact IP 20
AKD 5008-5027 200-240 V
AKD 5016-5062 380-500 V



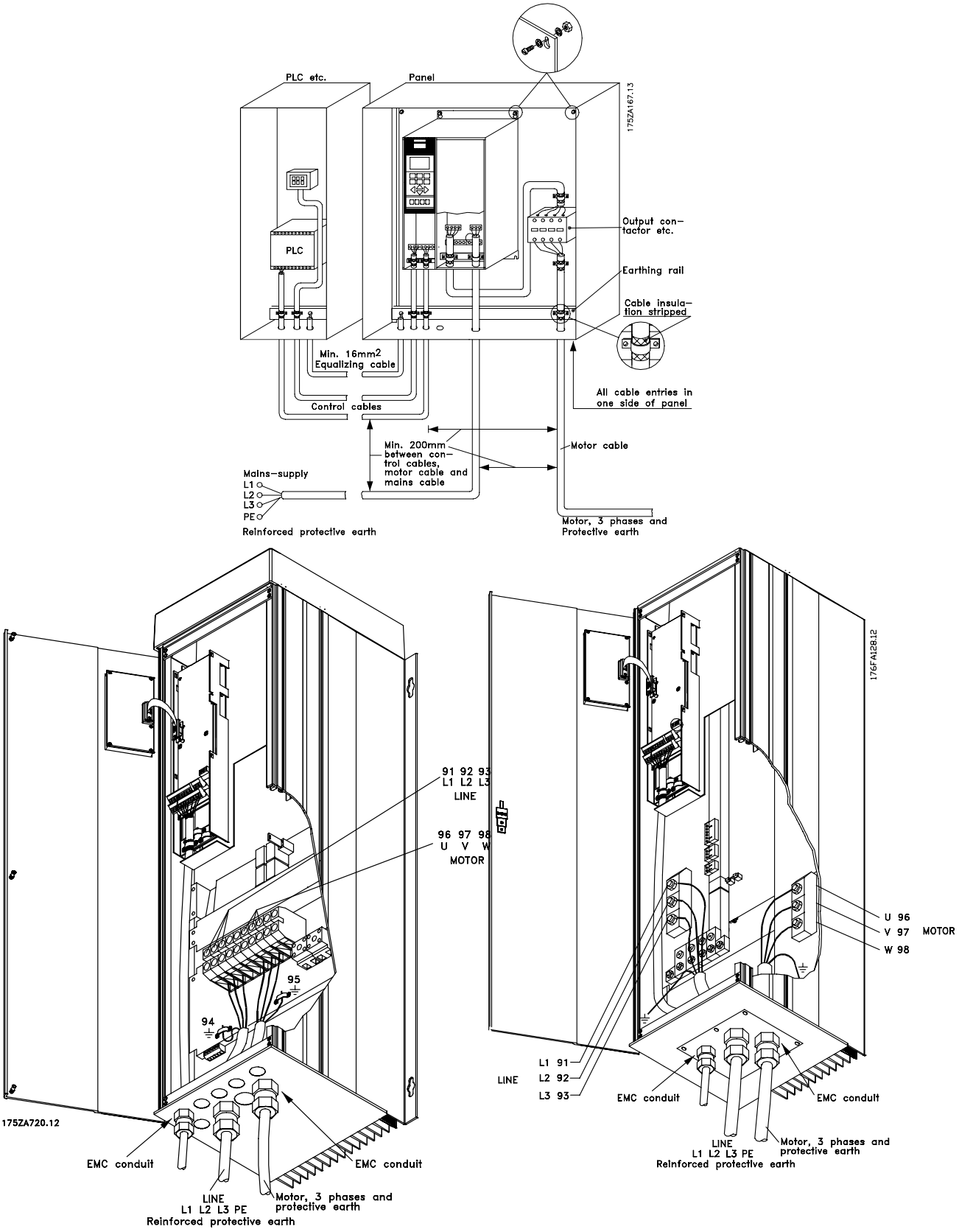
Compact IP 20
AKD 5008-5027 200-240 V
AKD 5016-5062 380-500 V



Compact IP 54
AKD 5008-5027 200-240 V
AKD 5016-5062 380-500 V



Compact IP 54
AKD 5008-5027 200-240 V
AKD 5016-5062 380-500 V


PLC etc.
Panel
175ZA167.13
PLC
Output con-
tactor etc.
Earthing rail
Cable insula-
tion stripped
Min. 16mm2
Equalizing cable
All cable entries in
one side of panel
Control cables
Min. 200mm
between con-
trol cables,
motor cable and
mains cable
Motor cable
Mains-supply
L1
L2
L3
PE
Reinforced protective earth
Motor, 3 phases and
Protective earth
91 92 93
L1 L2 L3
LINE
96 97 98
U V W
MOTOR
95
94
175ZA720.12
EMC conduit
EMC conduit
LINE
L1 L2 L3 PE
Reinforced protective earth
Motor, 3 phases and
protective earth
176FA128.12
U 96
V 97
W 98
MOTOR
LINE
L1 91
L2 92
L3 93
EMC conduit
EMC conduit
LINE
L1 L2 L3 PE
Reinforced protective earth
Motor, 3 phases and
protective earth