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SEW EURODRIVE

MOVIDRIVE® MD_60A, Size 6

Edition

12/2002

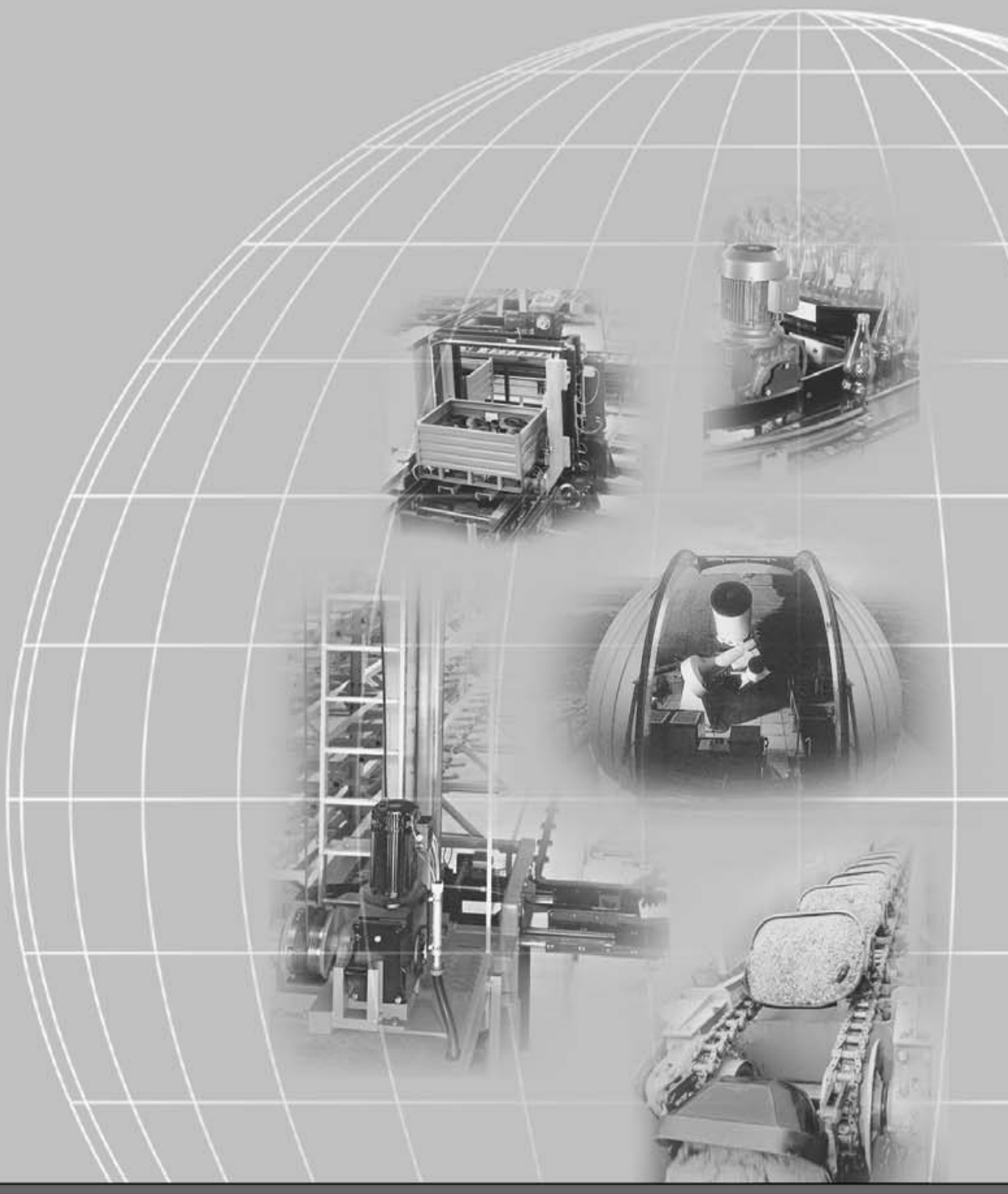


Addendum to the System Manual

1056 9510 / EN

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1 Important Notes



- **This addendum to the system manual does not replace the detailed operating instructions!**
- **Installation and startup only by trained personnel observing applicable accident prevention regulations and operating instructions!**

Safety and warning instructions

Always follow the safety and warning instructions contained in this publication!



Electrical hazard
Possible consequences: Severe or fatal injuries.



Hazard
Possible consequences: Severe or fatal injuries.



Hazardous situation
Possible consequences: Slight or minor injuries.



Harmful situation
Possible consequences: Damage to the unit and the environment.



Tips and useful information.



A requirement of fault-free operation and fulfillment of any rights to claim under guarantee is that the information in the **operating instructions** is adhered to. Consequently, **read the operating instructions** before you start working with the unit!

The **operating instructions** contain **important information about servicing**; as a result, they should be kept **in the vicinity of the unit**.

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Designated use



MOVIDRIVE® MD_60A drive inverters are intended for industrial and commercial use for the operation of AC asynchronous motors or permanent-field AC synchronous motors. These motors must be suitable for operation with frequency inverters. No other loads may be connected to the units.

MOVIDRIVE® MD_60A drive inverters are units intended for stationary installation in switch cabinets. All instructions referring to the technical data and the permissible conditions where the unit is operated must be followed.

Do not start up the unit (take it into operation in the designated fashion) until you have established that the machine complies with the EMC Directive 89/336/EEC and that the conformity of the end product has been determined in accordance with the Machinery Directive 89/392/EEC (with reference to EN 60204).

Application environment



The following uses are forbidden unless measures are expressly taken to make them possible:

- Use in explosion-proof areas
- Use in areas exposed to harmful oils, acids, gases, vapors, dust, radiation, etc.
- Use in non-stationary applications which are subject to mechanical vibration and shock loads in excess of the requirements in EN 50178.

Safety functions



MOVIDRIVE® *compact* drive inverters may not perform safety functions without higher-level safety systems.

Use superordinate safety systems to guarantee the protection of machinery and people.

Waste disposal



Please follow the current instructions: Disposal must be carried out in accordance with the material structure and the regulations in force, for instance as:

- Electronics scrap (printed-circuit boards)
- Plastic (housing)
- Sheet metal
- Copper

etc.

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2 Technical Data and Dimensions

2.1 CE-marking, UL approval and unit designation

CE-marking

- Low-voltage Directive

  MOVIDRIVE® MD_60A drive inverters comply with the regulations of the Low-voltage Directive 73/23/EEC.

- Electromagnetic compatibility (EMC)

  The designated use of MOVIDRIVE® regenerative power supply units and drive inverters is as components for installation in machinery and systems. They comply with the EMC product standard EN 61800-3 "Variable-speed electrical drives". Provided the installation instructions are complied with, they satisfy the appropriate requirements for CE-marking of the entire machine/system in which they are fitted, on the basis of the EMC Directive 89/336/EEC.

  MOVIDRIVE® MD_60A drive inverters of size 1 and 2 are fitted with an input filter as standard. These units comply with limit value class A to EN 55011 and EN 55014 on the line side without further measures.

CE

The CE-mark on the nameplate indicates conformity with the Low-voltage Directive 73/23/EEC and the EMC Directive 89/336/EEC. We can issue a declaration of conformity to this effect on request.

UL approval

c UL us

UL and cUL approval procedures for MOVIDRIVE® inverters of size 6 (0900...1320) are pending. cUL is equivalent to CSA approval.

Unit designation

The following example illustrates the unit designation of MOVIDRIVE®:

MOVIDRIVE® MDV 60 A 0055-5A3-4-00

Version	00 = Standard / 0T = Technology
Quadrants	4 = 4Q (with brake chopper)
Type of supply	3 = 3-phase
Input filter	A = installed / 0 = not installed
Rated supply voltage	5 = 380...500 V_{AC} / 2 = 200...240 V_{AC}
Recommended motor power	0055 = 5.5 kW
Version A	
Type series and generation	
Type: MDF	= flux control mode without encoder for asynchronous motors VFC operating modes (VFC = Voltage Flux Control) only
MDV	= field oriented control mode without and with encoder for asynchronous motors VFC and CFC operating modes (CFC = Current Flux Control)
MDS	= flux control mode with resolver for synchronous motors SERVO operating modes
MDR	= regenerative power supply unit

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2.2 General technical data

The following table lists the technical data applicable to all MOVIDRIVE® MD_60A drive inverters, irrespective of their type, version, size and performance.

MOVIDRIVE® MD_60A	All sizes
Interference immunity	To EN 61800-3
Interference emission with EMC-compliant installation	According to class A limit to EN 55011 and EN 55014 To EN 61800-3
Ambient temperature[1] ϑ_{amb} **Derating ambient temperature** **Climate class**	0°C - +50°C at I_D = 100% I_N and f_{PWM} = 4 kHz (VFC mode) 0°C - +40°C at I_D = 125% I_N and f_{PWM} = 4 kHz (VFC mode) 0°C - +50°C at I_D = 100% I_N and f_{PWM} = 8 kHz (CFC mode) P_N reduction: 3.0% I_N per K to max. 60°C EN 60721-3-3, class 3K3
Storage temperature[2] ϑ_S	-25°C - +70°C (EN 60721-3-3, class 3K3) DBG keypad: -20°C - +60°C
Type of cooling (DIN 51751)	Forced cooling
Enclosure **Sizes 4 to 6** **EN 60529** **(NEMA1)**	IP00 (power connections); IP10 with Plexiglas cover mounted (supplied as standard)
Operating mode	DB (EN 60149-1-1 and 1-3)
Installation altitude	h ≤ 1000 m (3300 ft) I_N reduction: 1% per 100 m (330 ft) from 1000 m (3300 ft) to max. 2000 m (6600 ft)

1) Exception for the unit MD_60A1320-503-4-0_ : 0° - +50°C at I_D = 85% I_N (P_N reduction: 4.0% I_N per K to max. 60°C)

2) Connect to supply voltage for at least 5 minutes every 2 years if stored for long periods, otherwise the unit's service life may be reduced.

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2.3 MOVIDRIVE® MD_60A...-5_3 (400/500 V units)

Size 6



50915AXX

Fig. 1: Size 6

MOVIDRIVE® MD_60A		0900-503-4-0_	1100-503-4-0_	1320-503-4-0_
INPUT				
Supply voltage	V_{in}	3 × 380 V_{AC}-10% - 3 × 500 V_{AC}+10%		
Supply frequency	f_{in}	50 Hz ... 60 Hz ± 5%		
Rated system current[1] I_{in} (at V_{in} = 3 × 400 V_{AC})	**100%** **125%**	153 A_{AC} 191 A_{AC}	180 A_{AC} 225 A_{AC}	225 A_{AC} 281 A_{AC}
OUTPUT				
Rated output power[2] (at V_{in} = 3 × 380...500 V_{AC})	P_N	118 kVA	139 kVA	174 kVA
Rated output current[1] (at V_{in} = 3 × 400 V_{AC})	I_N	170 A_{AC}	200 A_{AC}	250 A_{AC}
Current limitation	I_{max}	Motor and regenerative 150% I_N, duration depending on the capacity utilization		
Internal current limitation		I_{max} = 0 - 150% can be set in menu (P303 / P313)		
Minimum permitted brake resistance value (4Q operation)	R_{BRmin}	2.7 Ω		
Output voltage	V_{out}	max. V_{in}		
PWM frequency	f_{PWM}	Adjustable with VFC: 4 or 8 kHz (P860 / P861); with CFC/SERVO fixed at 8 kHz		
Speed range / resolution	n_A / Δn_A	-5000 - 0 - +5000 min^{-1} / 0.2 rpm^{-1} across the entire range		
GENERAL				
Power loss at P_N	P_{Vmax}	2300 W	2500 W	2700 W
Cooling air consumption		600 m^3/h (360 ft^3/min)		
Weight		60 kg (132 lb)		
Dimensions	**W × H × D**	280 × 1000 × 400 mm (11.02 × 39.37 × 15.75 in)		

1) The system and output currents must be reduced by 20% from the nominal values for V_{in} = 3 x 500 V_{in}.
2) MDF and MDV units in VFC operating modes: The performance data apply to f_{PWM} = 4 kHz (factory setting).

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MDF60A standard type (VFC)	0900-503-4-00	1100-503-4-00	1320-503-4-00
Part number	827 709 5	827 710 9	827 711 7
MDF60A application version (VFC)	0900-503-4-0T	1100-503-4-0T	1320-503-4-0T
Part number	827 715 X	827 716 8	827 717 6
Constant load Rec. motor power P_{Mot}	90 kW (120 HP)	110 kW (147 HP)	132 kW (177 HP)
Variable torque load or constant load without overload Rec. motor power P_{Mot}	110 kW (147 HP)	132 kW (177 HP)	160 kW (215 HP)
Continuous output current = 125% I_N I_D (at V_{in} = 3 × 400 V_{AC} and f_{PWM} = 4 kHz)	212 A_{AC}	250 A_{AC}	312 A_{AC}

MDV60A standard type (VFC/CFC)	0900-503-4-00	1100-503-4-00	1320-503-4-00
Part number	827 712 5	827 713 3	827 714 1
MDV60A application version (VFC/CFC)	0900-503-4-0T	1100-503-4-0T	1320-503-4-0T
Part number	827 718 4	827 719 2	827 720 6
VFC operating mode	Recommended motor power → MDF60A		
CFC operating mode Continuous output current = 100% I_N I_D	170 A_{AC}	200 A_{AC}	250 A_{AC}
Recommended motor power	→ Sec. Project Planning, CFC motor selection		

Dimensions

Provide at least 100 mm (4 in) clearance above and below the unit. No clearance is required at the sides; the units can be lined up in rows.

Do not install any components which are sensitive to high temperatures within 300 mm (11.81 in) of the top of the unit (e.g. contactors or fuses).

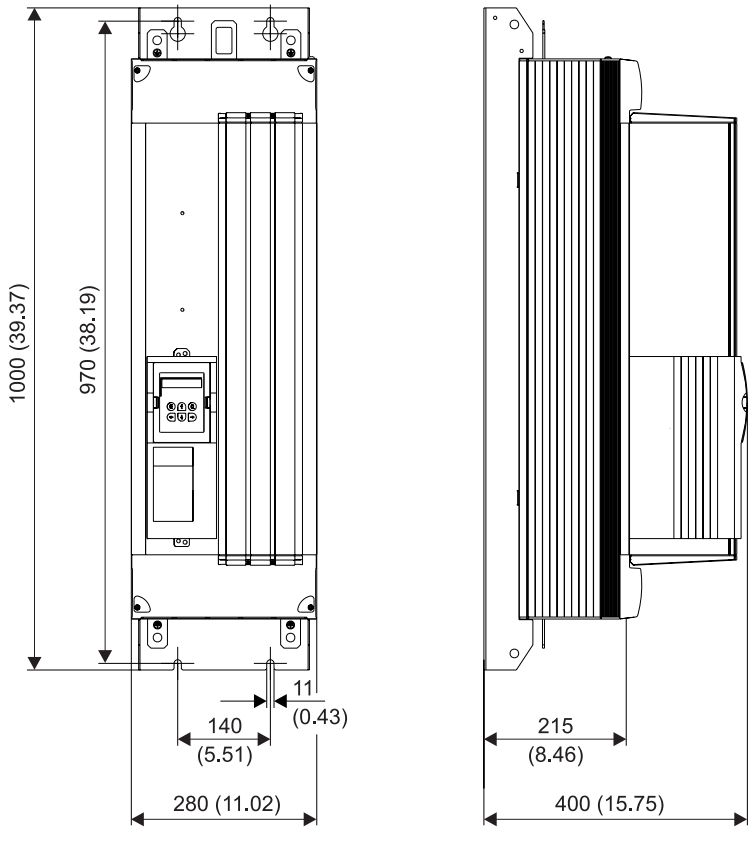


Fig. 2: Dimensions, size 6, in mm (in)

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2.4 DBG11B keypad option

Description

The keypad is used for startup and for service. The basic version of MOVIDRIVE® does not have a keypad and can be upgraded as an option.

Keypad	Language	Part number
DBG11B-08	DE/EN/FR/ES/PT (German/English/French/Spanish/Portuguese)	824 154 6
DBG11B-09	EN/IT/SV/DA/FI (English/Italian/Swedish/Danish/Finnish)	824 155 4
DBG11B-11	ES/DE/EN/FR/PT (Spanish/German/English/French/Portuguese)	824 156 2
DBG11B-12	SV/EN/IT/DA/FI (Swedish/English/Italian/Danish/Finnish)	824 157 0
DBG11B-13	EN/ES/DE/FR/PT (English/Spanish/German/French/Portuguese)	824 158 9
DBG11B-14	FR/IT/ES/PT/EN (French/Italian/Spanish/Portuguese/English)	824 248 8
DBG11B-15	DE/EN/IT/ES/PT (German/English/Italian/Spanish/Portuguese)	824 423 5

Equipment

- Illuminated plain text display, five languages can be set.
- Membrane keypad with 6 keys.
- Selection between quick menu, detailed parameter menu and startup menu in VFC mode (CFC and SERVO startup is not possible with the DBG11B).
- Can be plugged onto the inverter (TERMINAL option slot).
- Connection possible via FKG11A extension cable (part number 822 101 4).
- Enclosure IP40 (EN 60529)

Note

The DBG11B keypad option and the USS21A serial interface option are connected to the same inverter slot (TERMINAL) and therefore cannot be used at the same time.

Functions

- Displays of process values and status displays.
- Status displays of the binary inputs/outputs.
- Fault memory inquiry and fault reset.
- Displaying and setting the operating parameters and service parameters.
- Saving data and transferring parameter sets to other MOVIDRIVE® units.
- User-friendly startup menu for VFC mode.
- Saving curve data when the electronic cam function is used.

Dimensions

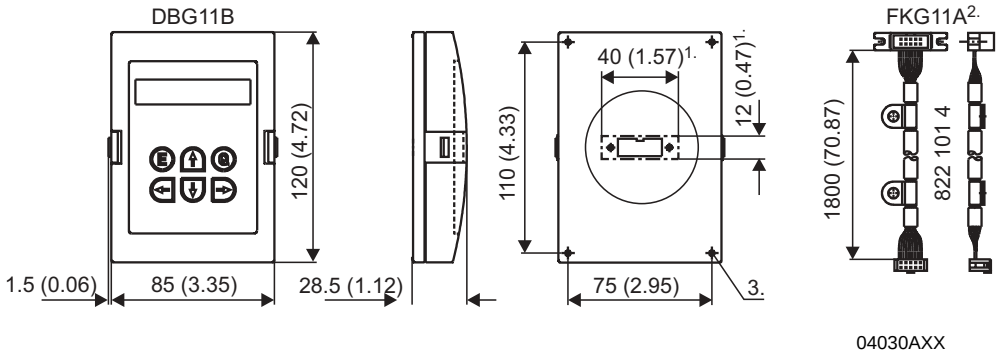


Fig. 3: Dimensions, DBG11B and FKG11A, in mm (in)

1. Cut-out for the plug in the mounting plate
2. DBG11B - MOVIDRIVE® communications cable
3. Holes for tapping screws 3.5 × 9.5 mm (0.14 × 0.37 in)

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2.5 Braking resistor option type BW...

General information

The braking resistors in the BW... series are adapted to the technical characteristics of MOVIDRIVE® drive inverters.

Wire and grid resistors

- Perforated sheet cover (IP20) open towards the mounting surface.
- The short-time load capacity of the wire and grid resistors is greater than in the flat-type braking resistors (→ power diagrams).

SEW recommends also protecting the wire and grid resistors against overload using a bimetallic relay. Set the trip current to the value I_F in the table. Do not use any electronic or electromagnetic fuses since even the brief excess currents which are still permitted may cause them to trip.

The surfaces of the resistors get very hot if loaded with P_N. Bear this aspect in mind when selecting the installation location. As a rule, therefore, braking resistors are mounted on the switch cabinet roof.

The performance data listed in the tables below show the load capacity of the braking resistors according to their cyclic duration factor (cyclic duration factor = cdf of the braking resistor in % in relation to a cycle duration ≤ 120 s).

Parallel connection

Two braking resistors must be connected in parallel in the case of some inverter/resistor combinations. In this case, the trip current must be set on the bimetallic relay to twice the value of I_F entered in the table.

Assignment to 400/500 V units (MD_60A...-5_3)

Braking resistor type		**BW106**	**BW206**
Part number		821 050 0	821 051 9
Load capacity at	**100% cdf** **50% cdf**[1] **25% cdf** **12% cdf** **6% cdf**	13 kW 24 kW 40 kW 66 kW 102 kW	18 kW 32 kW 54 kW 88 kW 112 kW[2]
		Note the **regenerative power limit** of the inverter! (= 150% of the recommended motor power → Technical Data)	
Resistance value	R_{BR}	6 Ω ±10 %	
Trip current (of F16)	I_F	38 A_{RMS}	42 A_{RMS}
Type		Grid resistor	
Connections		M8 stud	
Enclosure		IP20 (when mounted)	
Ambient temperature	ϑ_V	-20 - +45 °C	
Type of cooling		KS = Self-cooling	
for MOVIDRIVE®		2 × parallel with 0900/1100/1320	

1) cdf = cyclic duration factor of the braking resistor in relation to a cycle duration T_D ≤ 120 s.

2) Physical power limit due to the DC link voltage and the resistance value.

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Dimensions BW106 and BW206

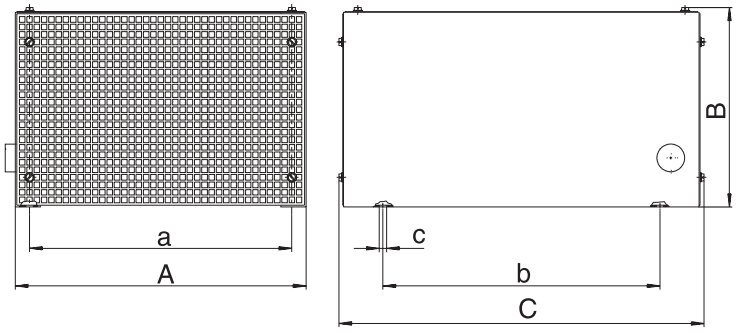


Fig. 4: Dimensions BW106 and BW206 braking resistors

Mounting position as required

All dimensions in mm (in):

BW...	Main dimensions			Fixing dimensions		Hole dimension	Weight
Type	A	B	C	a	b	c	kg (lb)
BW106	795 (31.30)	260 (10.24)	490 (19.29)	770 (30.31)	380 (14.96)	10.5 (0.41)	32 (70.5)
BW206	995 (39.17)			970 (38.18)			43 (94.8)

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2.6 Line chokes option type ND...

- To increase the overvoltage protection
- To limit the charging current when several inverters are connected together in parallel on the input end with a shared supply system contactor (rated current of line choke = total of inverter rated currents)

Line choke type		ND020-013	ND045-013	ND085-013	ND1503	ND200-0033	ND300-005
Part number		826 012 5	826 013 3	826 014 1	825 548 2	826 579 8	827 721 4
Rated voltage	V_N	$3 \times 380\ V_{AC}$ -10% - $3 \times 500\ V_{AC}$ +10%, 50/60 Hz					
Rated current[1]	I_N	20 A_{AC}	45 A_{AC}	85 A_{AC}	150 A_{AC}	200 A_{AC}	300 A_{AC}
Power loss at I_N	P_V	10 W	15 W	25 W	65 W	100 W	280 W
Inductance	L_N	0.1 mH				0.03 mH	0.05 mH
Ambient temperature	ϑ_{amb}	-25 - +45 °C					
Enclosure		IP 00 (EN 60529)					
Connections		Modular terminal blocks 4 mm^2 (AWG10)	Modular terminal blocks 10 mm^2 (AWG8)	Modular terminal blocks 35 mm^2 (AWG2)	M10 stud PE: M8 stud		M12 stud PE: $2 \times$ M10
Assignment to 400/500 V units (MD_60A...-5_3)							
Rated operation (100%)		0015 - 0075	0110 - 0220	0300 0450 and MDR60A0370	0550/0750	MDR60A0750	0900 - 1320
With increased power (VFC, 125%)		0015 - 0075	0110/0150	0220 - 0370	0450 - 0750		
Assignment to 230 V units (MD_60A...-2_3)							
Rated operation (100%)		0015 - 0055	0075/0110	0150/0220	0300	-	-
With increased power (VFC, 125%)		0015 - 0037	0055/0075	0110/0150	0220/0300	-	-

1) If more than one MOVIDRIVE® is connected to a line choke, the **total value of the rated currents** of the connected units **must not exceed the rated current of the line choke**!

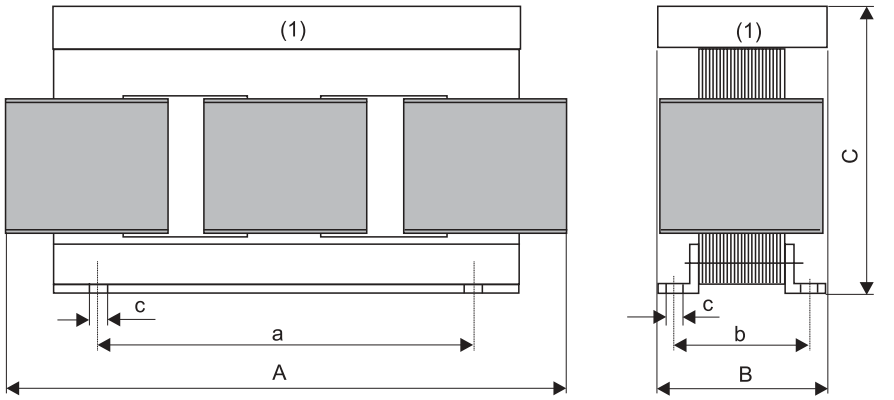


Fig. 5: Dimensions, ND... line chokes

(1) Space for terminals (safe to touch)
Mounting position as required

All dimensions in mm (in):

Line choke type	Main dimensions			Fixing dimensions		Hole dimension	Weight
	A	B	C	a	b	c	kg (lb)
ND020-013	85 (3.35)	60 (2.36)	120 (4.72)	50 (1.97)	31 (1.22)	5-10 (0.20-0.39)	0.5 (1.1)
ND045-013	125 (4.92)	95 (3.74)	170 (6.69)	84 (3.31)	55-75 (2.17-2.95)	6 (0.24)	2.5 (5.5)
ND085-013	185 (7.28)	115 (4.53)	235 (9.25)	136 (5.35)	56 (2.20)	7 (0.28)	8 (17.6)
ND1503	255 (10.04)	140 (5.51)	230 (9.06)	170 (6.69)	77 (3.03)	8 (0.31)	17 (37.5)
ND200-0033	250 (9.84)	160 (6.30)	230 (9.06)	180 (7.09)	98 (3.86)	8 (0.31)	15 (33.1)
ND300-005	300 (11.81)	190 (7.48)	295 (11.61)	255 (10.04)	145 (5.71)	11 (0.43)	35 (77.1)

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2.7 NF...-... input filter option

- To suppress interference emissions on the line side of inverters

Input filter type	NF009-503	NF014-503	NF018-503	NF035-503	NF048-503
Part number	827 412 6	827 116 X	827 413 4	827 128 3	827 117 8
Rated voltage V_{rated}	$3 \times 500\ V_{AC}$ +10%, 50/60 Hz				
Rated current I_N	9 A_{AC}	14 A_{AC}	18 A_{AC}	35 A_{AC}	48 A_{AC}
Power loss at I_N P_V	6 W	9 W	12 W	15 W	22 W
Earth-leakage current at V_N	< 25 mA	< 25 mA	< 25 mA	< 25 mA	< 40 mA
Ambient temperature ϑ_{amb}					
Enclosure	IP 20 (EN 60529)				
Connections L1-L3/L1'-L3'	4 mm^2 (AWG 10) M5 stud			10 mm^2 (AWG 8) M5/M6 stud	
PE					
Assignment to 400/500 V units (MD_60A...-5_3)					
Rated operation (100%)	0015 - 0040	0055/0075	-	0110/0150	0220
With increased power (VFC, 125%)	0015. - 0030	0040/0055	0075	0110	0150
Assignment to 230 V units (MD_60A...-2_3)					
Rated operation (100%)	0015/0022	0037	-	0055/0075	0110
With increased power (VFC, 125%)	0015	0022	0037	0055/0075	-

Input filter type	NF063-503	NF085-503	NF115-503	NF150-503	NF210-503	NF300-503
Part number	827 414 2	827 415 0	827 416 9	827 417 7	827 418 5	827 419 3
Rated voltage V_{rated}	$3 \times 500\ V_{AC}$ +10 %, 50/60 Hz					
Rated current I_N	63 A_{AC}	85 A_{AC}	115 A_{AC}	150 A_{AC}	210 A_{AC}	300 A_{AC}
Power loss at I_N P_V	30 W	35 W	60 W	90 W	150 W	180 W
Earth-leakage current at V_N	< 30 mA	< 30 mA	< 30 mA	< 30 mA	< 40 mA	< 45 mA
Ambient temperature ϑ_{amb}	-25 - +40°C					
Enclosure	IP 20 (EN 60529)					
Connections L1-L3/L1'-L3'	16 mm^2 (AWG 6) M6	35 mm^2 (AWG 2) M8	50 mm^2 (AWG1/0) M10	95 mm^2 (AWG4/0) M10	95 mm^2 (AWG4/0) M10	150 mm^2 (AWG300-2) M12
PE						
Assignment to 400/500 V units (MD_60A...-5_3)						
Rated operation (100%)	0300	0370/0450	0550	0750	0900/1100	1320
With increased power (VFC, 125%)	0220	0300/0370	0450	0550/0750	0900	1100/1320
Assignment to 230 V units (MD_60A...-2_3)						
Rated operation (100%)	0150	0220	0300	-	-	-
With increased power (VFC, 125%)	0110/0150	-	0220/0300	-	-	-

The effectiveness of input filters is restricted in IT systems.

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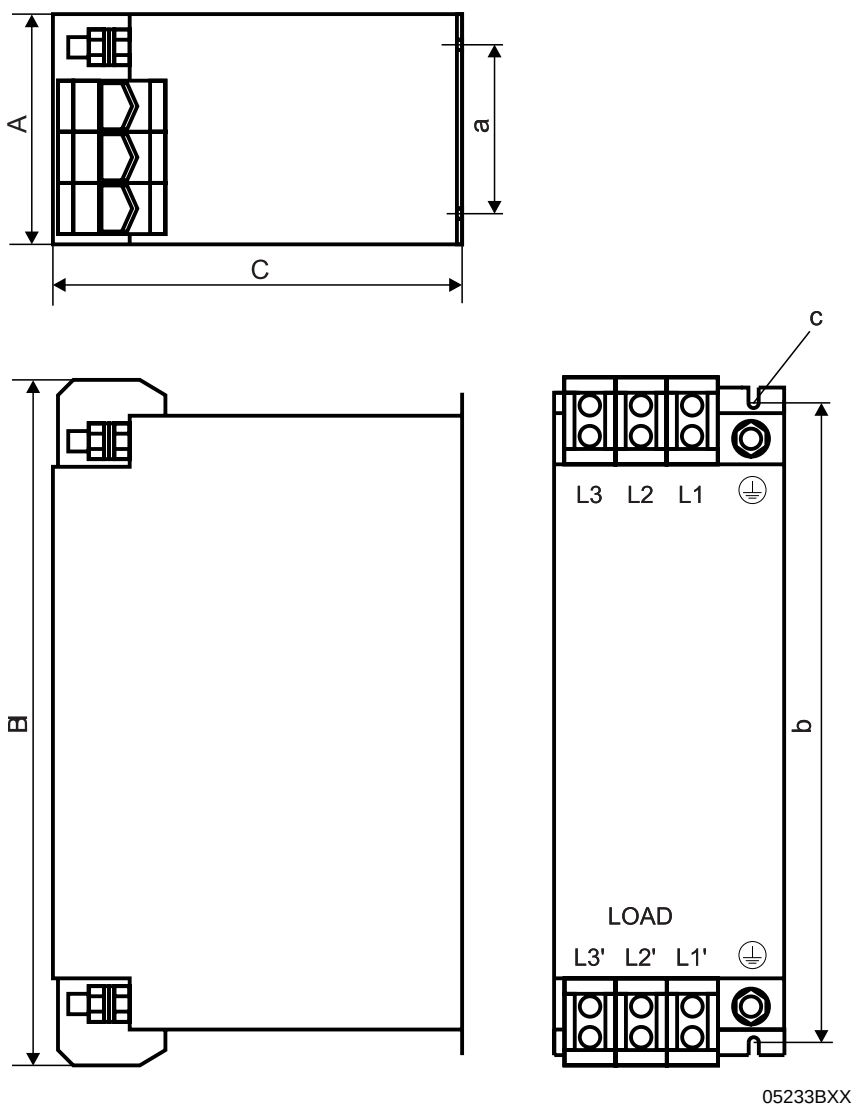


Fig. 6: Dimensions, NF input filters

Mounting position as required

All dimensions in mm (in):

Input filter type	Main dimensions			Fixing dimensions		Hole dim.	PE connection	Weight
	A	B	C	a	b	c		kg (lb)
NF009-503	55 (2.16)	195 (7.67)	80 (3.15)	20 (0.79)	180 (7.09)	5.5 (0.22)	M5	0.8 (1.8)
NF014-503		225 (8.85)			210 (8.27)			0.9 (2.0)
NF018-503	50 (1.96)	255 (10.04)			240 (9.45)			1.1 (2.4)
NF035-503	60 (2.36)	275 (10.83)	100 (3.93)	30 (1.18)	255 (10.04)			1.7 (3.7)
NF048-503		315 (12.40)			295 (11.61)		M6	2.1 (4.6)
NF063-503	90 (3.54)	260 (10.24)		60 (2.36)	235 (9.25)	6.5 (0.26)		2.4 (5.3)
NF085-503		320 (12.60)	140 (5.51)		255 (10.04)		M8	3.5 (7.7)
NF115-503	100 (3.93)	330 (13.00)	155 (6.10)	65 (2.56)			M10	4.8 (10.6)
NF150-503								5.6 (12.3)
NF210-503	140 (5.51)	450 (17.72)	190 (7.48)	102 (4.02)	365 (14.37)			8.9 (19.6)
NF300-503	170 (6.69)	540 (21.26)	230 (9.06)	125 (4.92)	435 (17.13)		M12	12.2 (26.9)

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2.8 Output choke option type HD...

- To suppress radiated interference from the unshielded motor cable. For HD001 to HD003, we recommend routing the motor cable through the output choke with 5 loops. Less than 5 loops are possible if the cable has a large diameter. To make up for this, 2 or 3 output chokes should be connected in series. Two output chokes should be connected in series if there are 4 loops, and three output chokes in series if there are 3 loops. For HD004, the number of loops is fixed.
- Output chokes HD001 to HD003 are allocated on the basis of the cable cross sections of the motor feeders. Consequently, there is no separate allocation table for the 230 V units.
- The HD004 output choke is allocated to size 6 units (0900...1320).

Output choke type	HD001	HD002	HD003	HD004
Part number	813 325 5	813 557 6	813 558 4	816 885 7
Max. power loss P_{Vmax}	15 W	8 W	30 W	100 W
For cable cross sections/ connections	1.5 ... 16 mm^2 (AWG 16 ... 6)	≤ 1.5 mm^2 (AWG 16)	≥ 16 mm^2 (AWG 6)	M12 connection studs

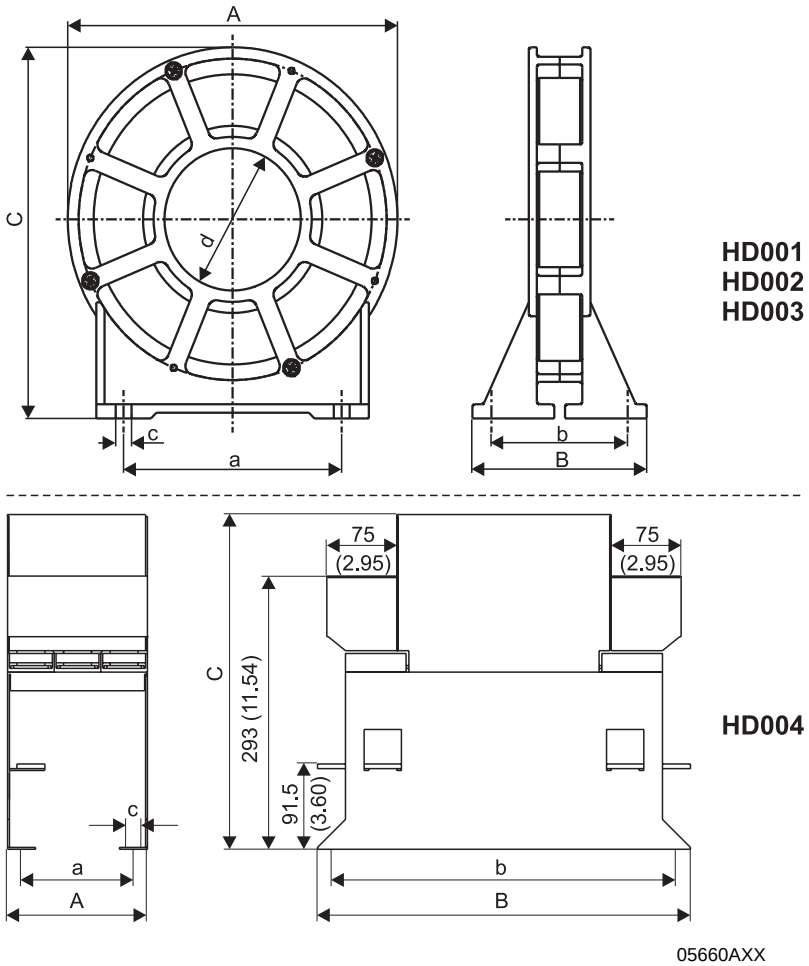


Fig. 7: Dimensions, HD001...HD003 and HD004 output chokes

Mounting position as required

All dimensions in mm (in):

Output choke type	Main dimensions			Fixing dimensions		Inside ∅	Hole dimension	Weight
	A	B	C	a	b	d	c	kg (lb)
HD001	121 (4.76)	64 (2.52)	131 (5.16)	80 (3.15)	50 (1.97)	50 (1.97)	5.8 (0.23)	0.5 (1.1)
HD002	66 (2.60)	49 (1.93)	73 (2.87)	44 (1.73)	38 (1.50)	23 (0.91)		0.2 (0.44)
HD003	170 (6.69)	64 (2.52)	185 (7.28)	120 (4.72)	50 (1.97)	88 (3.46)	7.0 (0.28)	1.1 (2.42)
HD004	150 (5.91)	400 (15.75)	360 (14.17)	120 (4.72)	370 (14.57)	-	9.0 (0.35)	12.5 (27.5)

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3 Project Planning

3.1 Motor selection for asynchronous AC motors (VFC)

Motor selection in delta/star circuit type (230/400 V_{AC} / 50 Hz)

Motors for 380 V_{AC} / 60 Hz can also be allocated on the basis of this selection table.

P_{max} [kW (HP)] for operation on MOVIDRIVE® MDF/MDV 60A...-5_3 (400/500 V units)												
Connection			⅄ / 400 V_{AC} [1]						Δ / 230 V_{AC} [2]			
Cooling			Self-cooling			Forced			Self-cooling		Forced	
f_{min} - f_{max} [Hz]			10 - 50 / 6 - 60 5 - 70 / 5.5 - 80			≤ 2.5 - 50 / ≤ 3 - 60 [3]			9 - 87		≤ 2.5 - 87 [3]	
n_{min} - n_{max} [rpm]			300 - 1500 / 180 - 1800 150 - 2100 / 165 - 2400			≤ 75 - 1500 / ≤ 90 - 1800			270 - 2610		≤ 75 - 2610	
Setting range			1:5 / 1:10 / 1:15			≥ 1:20			1:10		≥ 1:20	
Motor type [4]	**Rated power P_n [kW (HP)]**		**$P = P_{reduced}$ [kW (HP)]**		**MDF/MDV** [6] **60A...-5_3**	**$P = P_n$ [kW (HP)]**		**MDF/MDV** [6] **60A...-5_3**	**$P = P_{increased}$** [5] **[kW (HP)]**		**MDF/MDV** [6] **60A...-5_3**	
DT71D4	**0.37**	**(0.5)**	0.25	(0.33)	**0015**	0.37	(0.5)	**0015**	0.55	(0.75)	**0015**	
DT80K4	**0.55**	**(0.75)**	0.37	(0.5)		0.55	(0.75)		0.75	(1.0)		
DT80N4	**0.75**	**(1.0)**	0.55	(0.75)		0.75	(1.0)		1.1	(1.5)		
DT90S4	**1.1**	**(1.5)**	0.75	(1.0)		1.1	(1.5)		1.5	(2.0)		
DT90L4	**1.5**	**(2.0)**	1.1	(1.5)		1.5	(2.0)		2.2	(3.0)	**0022**	
DV100M4	**2.2**	**(3.0)**	1.5	(2.0)		2.2	(3.0)	**0022**	3.0	(4.0)	**0030**	
DV100L4	**3.0**	**(4.0)**	2.2	(3.0)	**0022**	3.0	(4.0)	**0030**	4.0	(5.4)	**0040**	
DV112M4	**4.0**	**(5.4)**	3.0	(4.0)	**0030**	4.0	(5.4)	**0040**	5.5	(7.5)	**0055**	
DV132S4	**5.5**	**(7.5)**	4.0	(5.4)	**0040**	5.5	(7.5)	**0055**	7.5	(10)	**0075**	
DV132M4	**7.5**	**(10)**	5.5	(7.5)	**0055**	7.5	(10)	**0075**	9.2	(12.5)	**0110**	
DV132ML4	**9.2**	**(12.5)**	7.5	(10)	**0075**	9.2	(12.5)	**0110**	11	(15)		
DV160M4	**11**	**(15)**	9.2	(12.5)	**0110**	11	(15)		15	(20)	**0150**	
DV160L4	**15**	**(20)**	11	(15)		15	(20)	**0150**	18.5	(25)	**0220**	
DV180M4	**18.5**	**(25)**	15	(20)	**0150**	18.5	(25)	**0220**	22	(30)	**0300**	
DV180L4	**22**	**(30)**	18.5	(25)	**0220**	22	(30)		30	(40)	**0370**	
DV200L4	**30**	**(40)**	22	(30)		30	(40)	**0300**	37	(50)		
DV225S4	**37**	**(50)**	30	(40)	**0300**	37	(50)	**0370**	45	(60)	**0450**	
DV225M4	**45**	**(60)**	37	(50)	**0370**	45	(60)	**0450**	55	(75)	**0550**	
DV250M4	**55**	**(75)**	45	(60)	**0450**	55	(75)	**0550**	75	(100)	**0750**	
DV280S4	**75**	**(100)**	55	(75)	**0550**	75	(100)	**0750**	90	(120)	**0900**	
D280M4	**90**	**(120)**	75	(100)	**0750**	90	(120)	**0900**	110	(150)	**1100**	
D315S4	**110**	**(150)**	90	(120)	**0900**	110	(150)	**1100**	132	(180)	**1320**	
D315M4	**132**	**(180)**	110	(150)	**1100**	132	(180)	**1320**				
D315M4a	**160**	**(220)**	132	(180)	**1320**							

1) Also applies to motors with rated voltage 460 V or 500 V and to 400/690 V motors with Δ connection.

2) Also applies to motors with rated voltage 266 V or 290 V.

3) The following applies to MDF and MDV without speed control: f_{min} = 0.5 Hz

4) In load type S3 (40% cdf), the motor can be operated at its listed power (P = P_n) even without forced-cooling. Example: P_{stat} = 2 kW, P_{dyn} = 2.5 kW → selected motor DV100M4 (P_n = 2.2 kW).

5) $P_{increased}$ means that the motor is operated at the power of the next larger motor (1 frame size), rather than with the $\sqrt{3}$–fold power.

6) The devices listed here permit intermittent loads of up to 1.5 times the nominal load in the specific application. With variable torque load and constant load without overload, each inverter can also be operated with an increased continuous output power (→ Sec. Technical Data). The continuous output current of 125% of the unit rated current is only available at f_{PWM} = 4 kHz in the VFC operating modes.

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Motor selection in double-star/star circuit type (230/460 V_{AC} / 60 Hz)

P_{max} [kW (HP)] for operation on MOVIDRIVE® MDF/MDV 60A...-5_3 (400/500 V units)											
Connection			Y / 460 V_{AC}						YY / 230 V_{AC}		
Cooling			Self-cooling			Self-cooling		Forced	Self-cooling		Forced
f_{min} - f_{max} [Hz]			6 - 90			10 - 60		0 - 60[1]	10 - 120		0 - 120[1]
n_{min} - n_{max} [rpm]			180 - 2700			200 - 1800		0 - 1800	200 - 3600		0 - 3600
Setting range			1:15			1:6		≥ 1:15	1:12		≥ 1:20
Motor type	**Rated power P_n [kW (HP)]**		**$P = P_{reduced}$**			**$P = P_n$**			**$P = P_{increased}$[2]**		
			[kW (HP)]		**With MDF/MDV[3] 60A...-5_3**	**[kW (HP)]**		**With MDF/MDV[3] 60A...-5_3**	**[kW (HP)]**		**With MDF/MDV[3] 60A...-5_3**
DT71D4	**0.37**	**(0.5)**	0.25	(0.33)	**0015**	0.37	(0.5)	**0015**	0.75	(1.0)	**0015**
DT80K4	**0.55**	**(0.75)**	0.37	(0.5)		0.55	(0.75)		1.1	(1.5)	
DT80N4	**0.75**	**(1.0)**	0.55	(0.75)		0.75	(1.0)		1.5	(2.0)	
DT90S4	**1.1**	**(1.5)**	0.75	(1.0)		1.1	(1.5)		2.2	(3.0)	**0022**
DT90L4	**1.5**	**(2.0)**	1.1	(1.5)		1.5	(2.0)		3.0	(4.0)	**0030**
DV100M4	**2.2**	**(3.0)**	1.5	(2.0)		2.2	(3.0)	**0022**	4.0	(5.4)	**0040**
DV100L4	**3.7**	**(5.0)**	2.2	(3.0)	**0022**	3.0	(4.0)	**0030**	5.5	(7.5)	**0055**
DV112M4	**4.0**	**(5.4)**	3.0	(4.0)	**0030**	4.0	(5.4)	**0040**	7.5	(10)	**0075**
DV132S4	**5.5**	**(7.5)**	4.0	(5.4)	**0040**	5.5	(7.5)	**0055**	9.2	(12.5)	**0110**
DV132M4	**7.5**	**(10)**	5.5	(7.5)	**0055**	7.5	(10)	**0075**	11	(15)	
DV132ML4	**9.2**	**(12.5)**	7.5	(10)	**0075**	9.2	(12.5)	**0110**	15	(20)	**0150**
DV160M4	**11**	**(15)**	9.2	(12.5)	**0110**	11	(15)		18.5	(25)	**0220**
DV160L4	**15**	**(20)**	11	(15)		15	(20)	**0150**	22	(30)	
DV180M4	**18.5**	**(25)**	15	(20)	**0150**	18.5	(25)	**0220**	30	(40)	**0300**
DV180L4	**22**	**(30)**	18.5	(25)	**0220**	22	(30)		37	(50)	**0370**
DV200L4	**30**	**(40)**	22	(30)		30	(40)	**0300**	45	(60)	**0450**
DV225S4	**37**	**(50)**	30	(40)	**0300**	37	(50)	**0370**	55	(75)	**0550**
DV225M4	**45**	**(60)**	37	(50)	**0370**	45	(60)	**0450**	75	(100)	**0750**
DV250M4	**55**	**(75)**	45	(60)	**0450**	55	(75)	**0550**	90	(120)	**0900**
DV280S4	**75**	**(100)**	55	(75)	**0550**	75	(100)	**0750**	110	(150)	**1100**
D280M4	**90**	**(120)**	75	(100)	**0750**	90	(120)	**0900**	132	(180)	**1320**
D315S4	**110**	**(150)**	90	(120)	**0900**	110	(150)	**1100**			
D315M4	**132**	**(180)**	110	(150)	**1100**	132	(180)	**1320**			
D315M4a	**160**	**(220)**	132	(180)	**1320**						

1) The following applies to MDF and MDV without speed control: f_{min} = 0.5 Hz

2) $P_{increased}$ means that the motor is operated at the power of the next larger motor (1 frame size), rather than with the $\sqrt{3}$–fold power.

3) The devices listed here permit intermittent loads of up to 1.5 times the nominal load in the specific application. With variable torque load and constant load without overload, each inverter can also be operated with an increased continuous output power (→ Sec. Technical Data). The continuous output current of 125% of the unit rated current is only available at f_{PWM} = 4 kHz in the VFC operating modes.

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3.2 Motor selection for asynchronous servomotors (CFC)

Motor table CT/CV

n_N [rpm]	Motor	M_N [Nm]	I_N [A]	I_{q_n} [A]	I_{d_n} [A]	k_T [A]	V_N [V]	J_{Mot} [10^{-4} kgm^2]	J_{BMot} [10^{-4} kgm^2]
1200	CT80N4	5	2.0	1.52	1.30	2.50	350	8.7	9.6
	CT90L4	10	3.5	2.95	1.89	2.86	345	34	39.5
	CV100M4	15	4.7	4.13	2.25	3.19	345	53	59
	CV100L4	26	8.9	8.30	3.21	2.92	310	65	71
	CV132S4	37	11.1	9.99	4.83	3.33	340	146	158
	CV132M4	50	15.5	14.2	6.18	3.23	340	280	324
	CV132ML4	61	17.6	16.0	7.43	3.47	345	330	374
	CV160M4	73	22.5	20.3	9.73	3.24	335	400	440
	CV160L4	95	29	25.3	14.2	3.28	330	925	1030
	CV180M4	110	34	27.7	19.7	3.24	330	1120	1226
	CV180L4	125	35	28.4	20.5	3.57	345	1290	1396
	CV200L4	200	58	52.9	23.7	3.45	330	2340	2475
1700	CT80N4	5	2.8	2.15	1.79	2.33	350	8.7	9.6
	CT90L4	10	4.8	4.03	2.61	2.48	345	34	39.5
	CV100M4	15	6.5	5.71	3.10	2.63	345	53	59
	CV100L4	26	13.6	12.9	4.41	2.02	315	65	71
	CV132S4	37	15.2	13.7	6.67	2.70	340	146	158
	CV132M4	48	20.8	18.9	8.70	2.54	335	280	324
	CV132ML4	58	24.4	21.7	11.2	2.67	320	330	374
	CV160M4	71	29.8	26.6	13.4	2.67	340	400	440
	CV160L4	89	37.5	32.0	19.5	2.78	330	925	1030
	CV180M4	105	44.5	35.2	27.2	2.98	335	1120	1226
	CV180L4	115	48.5	37.5	30.7	3.07	325	1290	1396
	CV200L4	190	77	69.4	33.4	2.74	330	2340	2475
2100	CT71D4	2.5	2.0	1.60	1.20	1.56	340	4.6	5.5
	CT80N4	5	3.5	2.67	2.26	1.87	340	8.7	9.6
	CT90L4	10	6.1	5.14	3.29	1.95	335	34	39.5
	CV100M4	15	8.1	7.09	3.91	2.12	335	53	59
	CV100L4	25	14.8	13.7	5.56	1.82	305	65	71
	CV132S4	37	19.2	17.3	8.41	2.14	335	146	158
	CV132M4	48	26	23.7	10.7	2.03	335	280	324
	CV132ML4	58	29	26.0	12.9	2.23	340	330	374
	CV160M4	70	37	33.9	16.9	2.13	330	400	440
	CV160L4	88	46	38.9	24.6	2.26	330	925	1030
	CV180M4	100	53	40.5	34.2	2.47	330	1120	1226
	CV180L4	115	56	43.4	35.4	2.65	345	1290	1396
	CV200L4	175	88	77.8	41.2	2.25	325	2340	2475
3000	CT71D4	2.4	2.6	2.01	1.65	1.19	345	4.6	5.5
	CT80N4	4.5	4.3	2.97	3.11	1.52	350	8.7	9.6
	CT90L4	9.5	7.9	6.47	4.54	1.47	345	34	39.5
	CV100M4	15	11.3	9.93	5.39	1.51	345	53	59
	CV100L4	21	17.0	15.2	7.65	1.38	310	65	71
	CV132S4	35	25.0	22.1	11.6	1.58	340	146	158
	CV132M4	45	34	30.5	15.1	1.48	335	280	324
	CV132ML4	52	38	32.7	19.3	1.59	320	330	374
	CV160M4	64	47	40.8	23.3	1.57	345	400	440
	CV160L4	85	62	51.9	33.9	1.64	335	925	1030
	CV180M4	93	68	49.0	47.2	1.90	340	1120	1226
	CV180L4	110	81	61.2	53.1	1.80	325	1290	1396
	CV200L4	145	102	84.0	57.8	1.73	330	2340	2475

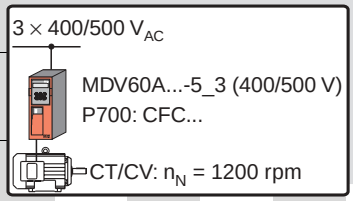
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CT/CV motor selection

CT/CV motors in the 4 speed classes are designed for the operation with 400/500 V units. For operation with 230 V units, please contact SEW.

1. Rated speed n_N = 1200 rpm:

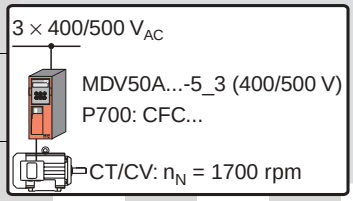
Motor		MOVIDRIVE® MDV60A...-5_3 (400/500 V units) in the CFC operating modes (P700)												
		0015	0022	0030	0040	0055	0075	0110	0150	0220	0300	0370	0450	0550	0750
CT80N4	M_{max} [Nm] ([lb.in])	15.6 (138)													
	$n_{transition}$[rpm]	540													
CT90L4	M_{max} [Nm] ([lb.in])	18.2 (160)	25.7 (227)	30.5 (270)											
	$n_{transition}$[rpm]	928	781	685											
CV100M4	M_{max} [Nm] ([lb.in])		29.0 (256)	37.0 (327)	45.0 (398)										
	$n_{transition}$[rpm]		883	781	680										
CV100L4	M_{max} [Nm] ([lb.in])			32.6 (288)	45.3 (400)	60.0 (530)	75.0 (663)								
	$n_{transition}$[rpm]			1062	947	813	675								
CV132S4	M_{max} [Nm] ([lb.in])					64.0 (565)	84.0 (743)	110 (972)							
	$n_{transition}$[rpm]					992	915	825							
CV132M4	M_{max} [Nm] ([lb.in])						82.0 (725)	125 (1105)	150 (1326)						
	$n_{transition}$[rpm]						1011	877	806						
CV132ML4	M_{max} [Nm] ([lb.in])							126 (1114)	169 (1495)	183 (1617)					
	$n_{transition}$[rpm]							922	819	725					
CV160M4	M_{max} [Nm] ([lb.in])							125 (1105)	169 (1495)	219 (1935)					
	$n_{transition}$[rpm]							986	909	840					
CV160L4	M_{max} [Nm] ([lb.in])								163 (1440)	240 (2121)	294 (2600)				
	$n_{transition}$[rpm]								1043	954	921				
CV180M4	M_{max} [Nm] ([lb.in])									241 (2130)	320 (2828)	360 (3183)			
	$n_{transition}$[rpm]									1050	986	1005			
CV180L4	M_{max} [Nm] ([lb.in])									244 (2156)	324 (2863)	360 (3183)			
	$n_{transition}$[rpm]									960	959	947			
CV200L4	M_{max} [Nm] ([lb.in])										326 (2882)	402 (3554)	494 (4367)	567 (5013)	
	$n_{transition}$[rpm]										1011	986	947	940	



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2. Rated speed n_N = 1700 rpm:

Motor		MOVIDRIVE® MDV60A...-5_3 (400/500 V units) in the CFC operating modes (P700)														
		0015	0022	0030	0040	0055	0075	0110	0150	0220	0300	0370	0450	0550	0750	0900
CT80N4	M_{max} [Nm] ([lb.in])	12.6 (110)	15.6 (137)													
	$n_{transition}$ [rpm]	1150	992													
CT90L4	M_{max} [Nm] ([lb.in])		18.1 (160)	23.6 (208)	30.5 (270)											
	$n_{transition}$ [rpm]		1400	1280	1150											
CV100M4	M_{max} [Nm] ([lb.in])			26.3 (230)	36.4 (320)	45.0 (397)										
	$n_{transition}$ [rpm]			1363	1229	1145										
CV100L4	M_{max} [Nm] ([lb.in])				32.4 (285)	43.6 (385)	56.5 (500)	75.0 (663)								
	$n_{transition}$ [rpm]				1536	1427	1299	1113								
CV132S4	M_{max} [Nm] ([lb.in])						59.0 (520)	91.0 (805)	110 (970)							
	$n_{transition}$ [rpm]						1470	1330	1280							
CV132M4	M_{max} [Nm] ([lb.in])							87.4 (770)	118 (1045)	150 (1325)						
	$n_{transition}$ [rpm]							1484	1369	1292						
CV132ML4	M_{max} [Nm] ([lb.in])								114 (1007)	166 (1467)	183 (1618)					
	$n_{transition}$ [rpm]								1485	1331	1345					
CV160M4	M_{max} [Nm] ([lb.in])								120 (1060)	176 (1555)	219 (1935)					
	$n_{transition}$ [rpm]								1420	1312	1254					
CV160L4	M_{max} [Nm] ([lb.in])									170 (1503)	226 (2000)	278 (2457)	294 (2600)			
	$n_{transition}$ [rpm]									1470	1400	1330	1395			
CV180M4	M_{max} [Nm] ([lb.in])										226 (2000)	280 (2475)	345 (3050)	360 (3182)		
	$n_{transition}$ [rpm]										1510	1460	1400	1504		
CV180L4	M_{max} [Nm] ([lb.in])											259 (2290)	321 (2838)	360 (3182)	360 (3182)	
	$n_{transition}$ [rpm]											1480	1434	1472	1664	
CV200L4	M_{max} [Nm] ([lb.in])												345 (3050)	411 (3633)	513 (4535)	567 (5013)
	$n_{transition}$ [rpm]												1460	1428	1382	1446

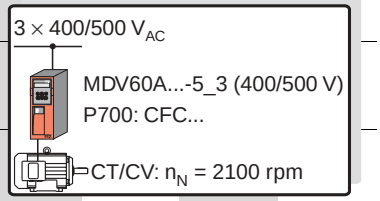


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3. Rated speed n_N = 2100 rpm:

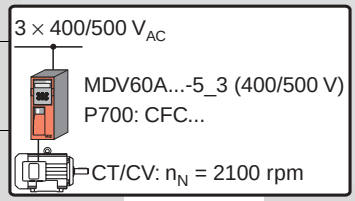
Assignment to MOVIDRIVE® MDV60A0015-5A3 ... MDV60A0300-503 (sizes 1 ... 3):

Motor		MOVIDRIVE® MDV60A...-5_3 (400/500 V units) in the CFC operating modes (P700)									
		0015	0022	0030	0040	0055	0075	0110	0150	0220	0300
CT71D4	M_{max} [Nm] ([lb.in])	7.7 (68)									
	$n_{transition}$[rpm]	1318									
CT80N4	M_{max} [Nm] ([lb.in])	9.7 (85)	13.5 (120)	15.6 (137)							
	$n_{transition}$[rpm]	1754	1510	1420							
CT90L4	M_{max} [Nm] ([lb.in])			18.3 (160)	25.5 (225)	30.5 (270)					
	$n_{transition}$[rpm]			1843	1676	1619					
CV100M4	M_{max} [Nm] ([lb.in])				28.4 (250)	38.1 (335)	45.0 (397)				
	$n_{transition}$[rpm]				1760	1626	1580				
CV100L4	M_{max} [Nm] ([lb.in])					34.0 (300)	44.4 (392)	67.6 (597)	75.0 (663)		
	$n_{transition}$[rpm]					1978	1869	1613	1555		
CV132S4	M_{max} [Nm] ([lb.in])							71.6 (633)	96.7 (855)	110 (970)	
	$n_{transition}$[rpm]							1850	1722	1786	
CV132M4	M_{max} [Nm] ([lb.in])								94.8 (838)	138 (1220)	150 (1325)
	$n_{transition}$[rpm]								1850	1670	1696
CV132ML4	M_{max} [Nm] ([lb.in])									143 (1264)	183 (1618)
	$n_{transition}$[rpm]									1658	1549
CV160M4	M_{max} [Nm] ([lb.in])									138 (1220)	183 (1618)
	$n_{transition}$[rpm]									1792	1690
CV160L4	M_{max} [Nm] ([lb.in])										177 (1565)
	$n_{transition}$[rpm]										1882



Assignment to MOVIDRIVE® MDV60A0370-503 ... MDV60A1320-503 (sizes 4 ... 6):

Motor		MOVIDRIVE® MDV60A...-5_3 (400/500 V units) in the CFC operating modes (P700)						
		0370	0450	0550	0750	0900	1100	1320
CV160M4	M_{max} [Nm] ([lb.in])	219 (1935)						
	$n_{transition}$[rpm]	1625						
CV160L4	M_{max} [Nm] ([lb.in])	218 (1927)	268 (2370)	294 (2600)				
	$n_{transition}$[rpm]	1824	1740	1779				
CV180M4	M_{max} [Nm] ([lb.in])	218 (1927)	270 (2387)	322 (2847)	360 (3182)			
	$n_{transition}$[rpm]	1939	1894	1836	1932			
CV180L4	M_{max} [Nm] ([lb.in])		275 (2430)	328 (2900)	360 (3182)			
	$n_{transition}$[rpm]		1709	1670	1805			
CV200L4	M_{max} [Nm] ([lb.in])			329 (2910)	412 (3640)	498 (4400)	567 (5013)	
	$n_{transition}$[rpm]			1830	1792	1747	1869	

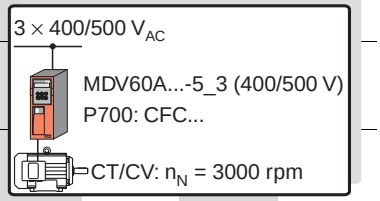


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4. Rated speed n_N = 3000 rpm:

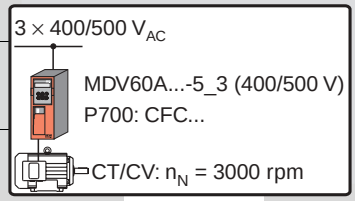
Assignment to MOVIDRIVE® MDV60A0015-5A3 ... MDV60A0300-503 (sizes 1 ... 3):

Motor		MOVIDRIVE® MDV60A...-5_3 (400/500 V units) in the CFC operating modes (P700)									
		0015	0022	0030	0040	0055	0075	0110	0150	0220	0300
CT71D4	M_{max} [Nm] ([lb.in])	6.0 (53)	7.7 (68)								
	$n_{transition}$[rpm]	2380	2092								
CT80N4	M_{max} [Nm] ([lb.in])		9.7 (85)	12.7 (112)	15.6 (137)						
	$n_{transition}$[rpm]		2566	2362	2200						
CT90L4	M_{max} [Nm] ([lb.in])				18.0 (159)	24.3 (214)	30.5 (270)				
	$n_{transition}$[rpm]				2662	2496	2368				
CV100M4	M_{max} [Nm] ([lb.in])					27.1 (240)	35.2 (310)	45.0 (397)			
	$n_{transition}$[rpm]					2554	2432	2458			
CV100L4	M_{max} [Nm] ([lb.in])						31.4 (277)	48.5 (428)	65.4 (578)	75.0 (663)	
	$n_{transition}$[rpm]						2848	2643	2425	2368	
CV132S4	M_{max} [Nm] ([lb.in])							51.0 (450)	69.2 (610)	101 (893)	110 (970)
	$n_{transition}$[rpm]							2740	2650	2458	2611
CV132M4	M_{max} [Nm] ([lb.in])								65.8 (580)	97.3 (860)	128 (1130)
	$n_{transition}$[rpm]								2809	2669	2512
CV132ML4	M_{max} [Nm] ([lb.in])									93.5 (825)	124 (1095)
	$n_{transition}$[rpm]									2765	2656
CV160M4	M_{max} [Nm] ([lb.in])										131 (1158)
	$n_{transition}$[rpm]										2550



Assignment to MOVIDRIVE® MDV60A0370-503 ... MDV60A1320-503 (sizes 4 ... 6):

Motor		MOVIDRIVE® MDV60A...-5_3 (400/500 V units) in the CFC operating modes (P700)						
		0370	0450	0550	0750	0900	1100	1320
CV132M4	M_{max} [Nm] ([lb.in])	150 (1325)						
	$n_{transition}$[rpm]	2451						
CV132ML4	M_{max} [Nm] ([lb.in])	152 (1343)	183 (1618)					
	$n_{transition}$[rpm]	2547	2444					
CV160M4	M_{max} [Nm] ([lb.in])	161 (1423)	198 (1750)	219 (1935)				
	$n_{transition}$[rpm]	2470	2368	2387				
CV160L4	M_{max} [Nm] ([lb.in])	155 (1370)	192 (1697)	228 (2015)	285 (2520)	294 (2600)		
	$n_{transition}$[rpm]	2682	2618	2554	2438	2630		
CV180M4	M_{max} [Nm] ([lb.in])		191 (1688)	228 (2015)	288 (2545)	348 (3075)	360 (3182)	
	$n_{transition}$[rpm]		2752	2707	2637	2560	2914	
CV180L4	M_{max} [Nm] ([lb.in])			212 (1875)	268 (2370)	325 (2873)	360 (3182)	360 (3182)
	$n_{transition}$[rpmn]			2682	2630	2572	2854	3168
CV200L4	M_{max} [Nm] ([lb.in])				293 (2590)	350 (3095)	454 (4015)	567 (5013)
	$n_{transition}$[rpm]				2573	2592	2534	2477



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DT/DV/D motor tables

Characteristic values for delta/star 230/400 V / 50 Hz

Motor	M_N	Mass moment of inertia J_M		Star ⅄ 400 V)				Delta Δ (230 V)			
		Without brake	With brake	I_n	I_{q_n} [1)]	I_{d_n} [1)]	k_T [1)]	I_n	I_{q_n} [1)]	I_{d_n} [1)]	k_T [1)]
	[Nm (lb.in)]	[10^{-4} kgm^2 (10^{-3} lb.ft^2)]		[A]	[A]	[A]	[Nm/A]	[A]	[A]	[A]	[Nm/A]
DT71D4	2.6 (23)	4.6 (10.4)	5.5 (12.5)	-	-	-	-	2.15	1.82	1.14	1.43
DT80K4	3.9 (34)	6.6 (15.6)	7.5 (17.7)	-	-	-	-	3.03	2.53	1.67	1.54
DT80N4	5.2 (46)	8.7 (20.7)	9.6 (22.8)	2.15	1.72	1.29	3.02	3.72	2.99	2.21	1.74
DT90S4	7.5 (66)	25 (59.4)	31 (72.2)	2.80	2.39	1.46	3.13	4.85	4.17	2.48	1.80
DT90L4	10.2 (90)	34 (78.9)	40 (93.6)	3.7	3.18	1.89	3.21	6.41	5.51	3.28	1.85
DV100M4	15.0 (133)	42 (101)	48 (114)	4.95	4.37	2.32	3.43	8.57	7.57	4.02	1.98
DV100L4	20.5 (181)	53 (126)	59 (139)	6.7	5.89	3.19	3.48	11.6	10.2	5.52	2.01
DV112M4	26.9 (238)	98 (233)	110 (262)	8.7	7.85	3.75	3.43	15.2	13.6	6.79	1.98
DV132S4	36.7 (324)	146 (416)	158 (445)	11.4	10.3	4.89	3.56	19.8	17.9	8.46	2.05
DV132M4	50.1 (443)	280 (655)	330 (769)	15.5	14.2	6.21	3.53	27.0	24.6	11.1	2.04
DV132ML4	61.0 (539)	330 (769)	380 (887)	18.7	17.1	7.57	3.57	32.5	29.6	13.4	2.06
DV160M4	72.9 (644)	398 (945)	448 (1049)	22.5	20.3	9.70	3.59	39.0	35.1	17.0	2.08
DV160L4	98.1 (867)	925 (2197)	1060 (2449)	31.0	27.6	14.1	3.55	54.0	47.8	25.1	2.05
DV180M4	121 (1070)	1120 (2660)	1255/1520 [2)] (2912/3164 [2)])	38.5	33.1	19.7	3.66	67.0	57.3	34.7	2.11
DV180L4	143 (1264)	1290 (3064)	1425/1520 [2)] (3316/3567 [2)])	46.0	40.7	21.4	3.51	80.0	70.4	38.0	2.03
DV200L4	195 (1724)	2340 (5558)	2475/2570 [2)] (5809/6061 [2)])	57.0	51.8	23.8	3.76	99.0	89.8	41.7	2.17
DV225S4	240 (2122)	3010 (7149)	3145/3240 [2)] (7400/7652 [2)])	70.0	64.5	27.2	3.72	122	112	48.4	2.14
DV225M4	292 (2581)	3570 (8479)	3705/3800 [2)] (8730/8982 [2)])	86.0	77.6	37.1	3.76	149	134	65.2	2.18
DV250M4	356 (3147)	6300 (14950)	6600/6730 [2)] (15550/15908 [2)])	102	91.7	44.7	3.88	172	159	77.7	2.24
DV280S4	483 (4270)	8925 (21180)	9225/9355 [2)] (21737/22112 [2)])	142	124	68.9	3.90	226	216	120	2.24
D280M4	580 (5127)	14500 (34409)	[3)]	155	147	49.2	3.95	270	255	86.1	2.27
D315S4	707 (6249)	20000 (47460)	[3)]	192	180	67.0	3.93	-	-	-	-
D315M4	849 (7505)	24000 (56952)	[3)]	235	209	106	4.06	-	-	-	-
D315M4a	1028 (9087)	31000 (73564)	[3)]	295	259	140	3.97	-	-	-	-

1) Applies in the basic speed range up to $n_{transition}$.

2) Double disk brake

3) On request

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Characteristic values for double-star/star 230/460 V / 60 Hz

(according to MG1, NEMA design B up to DT80K4, NEMA design C up to DT80N4)

Motor	Mass moment of inertia J_M		Star ⅄ 460 V)					Double-star ⅄⅄ (230 V)				
	Without brake	With brake	M_N at 1000 rpm	I_n	I_{q_n} [1)]	I_{d_n} [1)]	k_T [1)]	M_N at 2400 rpm	I_n	I_{q_n} [1)]	I_{d_n} [1)]	k_T [1)]
	[10^{-4} kgm^2 (10^{-3} lb.ft^2)]		[Nm (lb.in)]	[A]	[A]	[A]	[Nm/A (lb.in/A)]	[Nm (lb.in)]	[A]	[A]	[A]	[Nm/A (lb.in/A)]
DT71D4	4.6 (10.4)	5.5 (12.5)	2.60 (23.0)	1.15	0.95	0.65	2.74 (24.2)	2.60 (23.0)	2.30	1.90	1.30	1.37 (12.1)
DT80K4	6.6 (15.6)	7.5 (17.7)	3.90 (34.5)	1.67	1.35	0.98	2.89 (27.3)	3.90 (34.5)	3.34	2.70	1.96	1.44 (12.8)
DT80N4	8.7 (20.7)	9.6 (22.8)	5.20 (46.0)	2.11	1.72	1.22	3.03 (26.8)	5.20 (46.0)	4.21	3.44	2.44	1.51 (13.4)
DT90S4	25 (59.4)	31 (72.2)	7.50 (66.3)	2.94	2.33	1.80	3.21 (28.4)	7.50 (66.3)	5.89	4.66	3.60	1.61 (14.2)
DT90L4	34 (78.9)	40 (93.6)	10.2 (90.2)	3.57	3.06	1.84	3.35 (29.6)	10.2 (90.2)	7.13	6.11	3.68	1.67 (14.8)
DT100LS4	42 (101)	48 (114)	15.0 (133)	5.00	4.47	2.25	3.34 (29.5)	15.0 (133)	10.1	9.00	4.50	1.66 (14.7)
DT100L4	53 (126)	59 (139)	20.5 (181)	7.92	7.32	3.02	3.45 (30.5)	20.5 (181)	15.8	14.6	6.05	1.72 (15.2)
DV112M4	98 (233)	110 (262)	26.9 (238)	8.20	7.47	3.37	3.60 (31.8)	26.9 (238)	16.4	14.9	6.74	1.80 (15.9)
DV132S4	146 (416)	158 (375)	36.7 (324)	11.0	10.3	3.77	3.55 (31.4)	36.7 (324)	22.0	20.7	7.54	1.78 (15.7)
DV132M4	280 (655)	330 (769)	50.0 (442)	15.9	14.3	6.87	3.46 (30.5)	50.1 (443)	31.8	28.7	13.7	1.77 (15.3)
DV132ML4	330 (769)	380 (887)	61.0 (539)	18.6	16.9	7.69	3.61 (31.7)	61.0 (539)	37.2	33.9	15.4	1.80 (15.8)
DV160M4	398 (945)	448 (1049)	71.0 (628)	22.7	20.4	9.93	3.47 (30.7)	71.0 (628)	45.4	40.8	19.9	1.74 (15.4)
DV160L4	925 (2197)	1060 (2449)	96.0 (849)	30.7	27.4	13.7	3.51 (31.0)	96.0 (849)	61.3	54.8	27.5	1.75 (15.5)
DV180M4	1120 (2660)	1255/1520 [2)] (2912/3164 [2)])	120 (1060)	36.5	33.6	14.3	3.57 (31.6)	120 (1060)	72.9	67.1	28.6	1.79 (15.8)
DV180L4	1290 (3064)	1425/1520 [2)] (3316/3567 [2)])	130 (1150)	42.7	37.6	20.2	3.46 (30.6)	130 (1150)	85.4	75.1	40.5	1.73 (15.3)
DV200L4	2340 (5558)	2475/2570 [2)] (5809/6061 [2)])	190 (1680)	54.6	52.1	16.2	3.65 (32.3)	190 (1680)	109	104	32.5	1.82 (16.2)
DV225S4	3010 (7149)	3145/3240 [2)] (7400/7652 [2)])	235 (2078)	67.9	64.5	21.0	3.64 (32.3)	235 (2078)	136	129	42.0	1.83 (16.2)
DV225M4	3570 (8479)	3705/3800 [2)] (8730/8982 [2)])	280 (2475)	78.8	74.1	27.0	3.78 (33.5)	260 (2300)	148	138	54.0	1.89 (16.8)
D250M4	7300 (17323)	[3)]	356 (3147)	102	95.6	36.4	3.73 (33.0)	356 (3150)	204	191	72.8	1.86 (16.5)
D280S4	12000 (28476)	[3)]	483 (4270)	135	128	45.2	3.77 (33.3)	483 (4270)	270	256	90.4	1.89 (16.8)
D280M4	14500 (34409)	[3)]	580 (5128)	162	153	51.7	3.79 (33.5)	580 (5130)	324	306	103.4	1.89 (16.8)
D315S4	20000 (47460)	[3)]	702 (6249)	201	188	69.8	3.76 (33.2)	-	-	-	-	-
D315M4	24000 (56952)	[3)]	849 (7505)	246	219	111	3.87 (34.2)	-	-	-	-	-
D315M4a	31000 (73564)	[3)]	1028 (9087)	308	271	147	3.79 (33.5)	-	-	-	-	-

1) Applies in the basic speed range up to $n_{transition}$.

2) Double disk brake

3) On request

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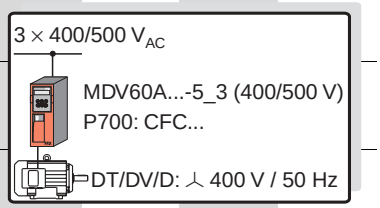
DT/DV/D motor selection with delta/star connection type (230/400 V_{AC} / 50 Hz)

1.) Star connection ⅄ 400 V / 50 Hz or 400/690 V / 50 Hz motors in Δ connection

Assignment to MOVIDRIVE® MDV60A0015-5A3 ... MDV60A0300-503 (sizes 1 to 3):

Motor		MOVIDRIVE® MDV60A...-5_3 (400/500 V units) in the CFC operating modes (P700)									
⅄ 400 V / 50 Hz		0015	0022	0030	0040	0055	0075	0110	0150	0220	0300
DT80N4	M_{max} [Nm] ([lb.in])	9.3 (82)									
	$n_{transition}$ [rpm]	908									
DT90S4	M_{max} [Nm] ([lb.in])	13.5 (120)	13.5 (120)								
	$n_{transition}$ [rpm]	1011	1011								
DT90L4	M_{max} [Nm] ([lb.in])	18.2 (161)	18.3 (162)	18.3 (162)							
	$n_{transition}$ [rpm]	928	1049	1056							
DV100M4	M_{max} [Nm] ([lb.in])		26.8 (236)	26.8 (236)	26.8 (236)						
	$n_{transition}$ [rpm]		940	1043	1056						
DV100L4	M_{max} [Nm] ([lb.in])			36.8 (325)	36.8 (325)	36.8 (325)					
	$n_{transition}$ [rpm]			889	1004	1011					
DV112M4	M_{max} [Nm] ([lb.in])				47.1 (416)	48.4 (427)	48.4 (427)				
	$n_{transition}$ [rpm]				915	1030	1062				
DV132S4	M_{max} [Nm] ([lb.in])					64.4 (569)	66.1 (584)	66.1 (584)			
	$n_{transition}$ [rpm]					992	1132	1196			
DV132M4	M_{max} [Nm] ([lb.in])						81.7 (722)	90.2 (797)	90.2 (797)		
	$n_{transition}$ [rpm]						1011	1145	1152		
DV132ML4	M_{max} [Nm] ([lb.in])							110 (972)	110 (972)		
	$n_{transition}$ [rpm]							1043	1132		
DV160M4	M_{max} [Nm] ([lb.in])							124 (1096)	131 (1157)	131 (1157)	
	$n_{transition}$ [rpm]							986	1132	1196	
DV160L4	M_{max} [Nm] ([lb.in])								163 (1440)	177 (1565)	177 (1565)
	$n_{transition}$ [rpm]								1043	1248	1312
DV180M4	M_{max} [Nm] ([lb.in])									217 (1917)	217 (1917)
	$n_{transition}$ [rpm]									1164	1395
DV180L4	M_{max} [Nm] ([lb.in])									230 (2033)	258 (2280)
	$n_{transition}$ [rpm]									1017	1152
DV200L4	M_{max} [Nm] ([lb.in])										325 (2873)
	$n_{transition}$ [rpm]										1011

Please note: The maximum torque M_{max} is limited to 180% of the rated motor torque M_N.

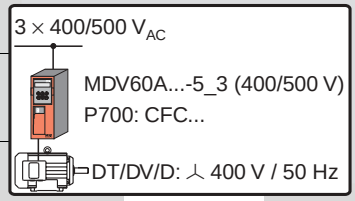


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Assignment to MOVIDRIVE® MDV60A0370-503 ... MDV60A1320-503 (sizes 4 to 6):

Motor		MOVIDRIVE® MDV60A...-5_3 (400/500 V units) in the CFC operating modes (P700)						
⅄ 400 V / 50 Hz		0370	0450	0550	0750	0900	1100	1320
DV180M4	M_{max} [Nm] ([lb.in])	217 (1917)						
	$n_{transition}$ [rpm]	1465						
DV180L4	M_{max} [Nm] ([lb.in])	258 (2280)	258 (2280)					
	$n_{transition}$ [rpm]	1299	1369					
DV200L4	M_{max} [Nm] ([lb.in])	351 (3100)	351 (3100)	351 (3100)				
	$n_{transition}$ [rpm]	1126	1299	1420				
DV225S4	M_{max} [Nm] ([lb.in])	395 (3490)	433 (3826)	433 (3826)	433 (3826)			
	$n_{transition}$ [rpm]	947	1030	1164	1312			
DV225M4	M_{max} [Nm] ([lb.in])		482 (4260)	526 (4648)	526 (4648)			
	$n_{transition}$ [rpm]		1030	1100	1299			
DV250M4	M_{max} [Nm] ([lb.in])			587 (5188)	641 (5665)	641 (5665)		
	$n_{transition}$ [rpm]			1017	1133	1133		
DV280S4	M_{max} [Nm] ([lb.in])				711 (6283)	871 (7698)	871 (7698)	
	$n_{transition}$ [rpm]				1075	1056	1306	
D280M4	M_{max} [Nm] ([lb.in])				745 (6583)	904 (7990)	1045 (9235)	1045 (9235)
	$n_{transition}$ [rpm]				1107	1094	1184	1382
D315S4	M_{max} [Nm] ([lb.in])						1150 (10163)	1273 (11250)
	$n_{transition}$ [rpm]						1088	1203
D315M4	M_{max} [Nm] ([lb.in])							1453 (12840)
	$n_{transition}$ [rpm]							1024
D315M4a	M_{max} [Nm] ([lb.in])							1374 (12143)
	$n_{transition}$ [rpm]							1107

Please note: The max. torque M_{max} is limited to 180% of the rated motor torque M_N.



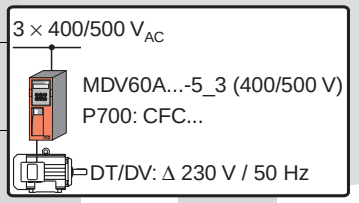
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2. Delta connection Δ 230 V / 50 Hz:

Assignment to MOVIDRIVE® MDV60A0015-5A3 ... MDV60A0300-503 (sizes 1 to 3):

Motor		MOVIDRIVE® MDV60A...-5_3 (400/500 V units) in the CFC operating modes (P700)									
Δ 230 V / 50 Hz		**0015**	**0022**	**0030**	**0040**	**0055**	**0075**	**0110**	**0150**	**0220**	**0300**
DT71D4	M_{max} [Nm] ([lb.in])	4.6 (40.5)									
	$n_{transition}$ [rpm]	1958									
DT80K4	M_{max} [Nm] ([lb.in])	6.9 (61)	6.9 (61)								
	$n_{transition}$ [rpm]	1849	1868								
DT80N4	M_{max} [Nm] ([lb.in])	9.3 (82)	9.3 (82)	9.3 (82)							
	$n_{transition}$ [rpm]	1817	2054	2054							
DT90S4	M_{max} [Nm] ([lb.in])		13.5 (120)	13.5 (120)	13.5 (120)						
	$n_{transition}$ [rpm]		1971	2246	2304						
DT90L4	M_{max} [Nm] ([lb.in])			18.3 (162)	18.3 (162)	18.3 (162)					
	$n_{transition}$ [rpm]			1843	2240	2329					
DV100M4	M_{max} [Nm] ([lb.in])				26.8 (236)	26.8 (236)	26.8 (236)				
	$n_{transition}$ [rpm]				1862	2214	2297				
DV100L4	M_{max} [Nm] ([lb.in])					36.8 (325)	36.8 (325)	36.8 (325)			
	$n_{transition}$ [rpm]					1779	2080	2188			
DV112M4	M_{max} [Nm] ([lb.in])						45.5 (402)	48.4 (427)	48.4 (427)		
	$n_{transition}$ [rpm]						1779	2163	2195		
DV132S4	M_{max} [Nm] ([lb.in])							66.1 (584)	66.1 (584)	66.1 (584)	
	$n_{transition}$ [rpm]							1996	2374	2444	
DV132M4	M_{max} [Nm] ([lb.in])								90.2 (797)	90.2 (797)	
	$n_{transition}$ [rpm]								1939	2310	
DV132ML4	M_{max} [Nm] ([lb.in])									110 (972)	110 (972)
	$n_{transition}$ [rpm]									2105	2246
DV160M4	M_{max} [Nm] ([lb.in])									131 (1157)	131 (1157)
	$n_{transition}$ [rpm]									1894	2246
DV160L4	M_{max} [Nm] ([lb.in])										177 (1565)
	$n_{transition}$ [rpm]										1881

Please note: The maximum torque M_{max} is limited to 180% of the rasted motor torque M_N.

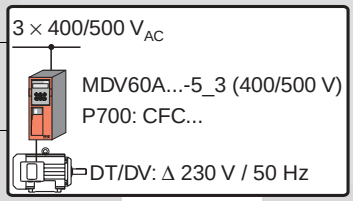


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Assignment to MOVIDRIVE® MDV60A0370-503 ... MDV60A1320-503 (sizes 4 to 6):

Motor		MOVIDRIVE® MDV60A...-5_3 (400/500 V units) in the CFC operating modes (P700)						
Δ 230 V / 50 Hz		0370	0450	0550	0750	0900	1100	1320
DV160M4	M_{max} [Nm] ([lb.in])	131 (1157)						
	$n_{transition}$ [rpm]	2348						
DV160L4	M_{max} [Nm] ([lb.in])	177 (1565)	177 (1565)					
	$n_{transition}$ [rpm]	2208	2451					
DV180M4	M_{max} [Nm] ([lb.in])	217 (1917)	217 (1917)	217 (1917)				
	$n_{transition}$ [rpm]	1952	2336	2611				
DV180L4	M_{max} [Nm] ([lb.in])		258 (2280)	258 (2280)	258 (2280)			
	$n_{transition}$ [rpm]		1836	2131	2457			
DV200L4	M_{max} [Nm] ([lb.in])			329 (2908)	351 (3100)	351 (3100)		
	$n_{transition}$ [rpm]			1830	2092	2413		
DV225S4	M_{max} [Nm] ([lb.in])				405 (3580)	433 (3827)	433 (3827)	
	$n_{transition}$ [rpm]				1708	1895	2290	
DV225M4	M_{max} [Nm] ([lb.in])					487 (4304)	526 (4649)	526 (4649)
	$n_{transition}$ [rpm]					1856	2163	2541
DV250M4	M_{max} [Nm] ([lb.in])					492 (4348)	641 (5665)	641 (5665)
	$n_{transition}$ [rpm]					1856	1837	2227
DV280S4	M_{max} [Nm] ([lb.in])						616 (5444)	796 (7035)
	$n_{transition}$ [rpm]						1933	1907

Please note: The max. torque M_{max} is limited to 180% of the rated motor torque M_N.



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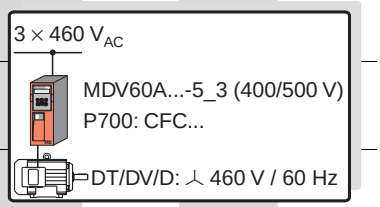
DT/DV/D motor selection with double-star/star connection type (230/460 V_{AC} / 60 Hz)

1. Star connection ⅄ 460 V / 60 Hz:

Assignment to MOVIDRIVE® MDV60A0015-5A3 ... MDV60A0300-503 (sizes 1 to 3):

Motor		MOVIDRIVE® MDV60A...-5_3 (400/500 V units) in the CFC operating modes (P700)									
⅄ 460 V / 60 Hz		0015	0022	0030	0040	0055	0075	0110	0150	0220	0300
DT80N4	M_{max} [Nm] ([lb.in])	9.3 (82)									
	$n_{transition}$ [rpm]	1145									
DT90S4	M_{max} [Nm] ([lb.in])	13.5 (120)									
	$n_{transition}$ [rpm]	1312									
DT90L4	M_{max} [Nm] ([lb.in])	18.3 (162)	18.3 (162)								
	$n_{transition}$ [rpm]	1152	1318								
DT100LS4	M_{max} [Nm] ([lb.in])		26.5 (234)	27.0 (238)							
	$n_{transition}$ [rpm]		1100	1222							
DT100L4	M_{max} [Nm] ([lb.in])			28.2 (250)	36.8 (325)	36.8 (325)					
	$n_{transition}$ [rpm]			1171	1075	1120					
DV112M4	M_{max} [Nm] ([lb.in])			35.8 (316)	48.4 (427)	48.4 (427)					
	$n_{transition}$ [rpm]			1196	1139	1312					
DV132S4	M_{max} [Nm] ([lb.in])				48.7 (430)	65.1 (575)	66.1 (584)				
	$n_{transition}$ [rpm]				1068	992	1100				
DV132M4	M_{max} [Nm] ([lb.in])						80.0 (705)	90.2 (797)			
	$n_{transition}$ [rpm]						1088	1222			
DV132ML4	M_{max} [Nm] ([lb.in])							110 (972)	110 (972)		
	$n_{transition}$ [rpm]							1196	1299		
DV160M4	M_{max} [Nm] ([lb.in])							120.3 (1062)	131 (1157)	131 (1157)	
	$n_{transition}$ [rpm]							1132	1260	1318	
DV160L4	M_{max} [Nm] ([lb.in])								161 (1422)	177 (1565)	
	$n_{transition}$ [rpm]								1158	1370	
DV180M4	M_{max} [Nm] ([lb.in])								164 (1448)	217 (1917)	217 (1917)
	$n_{transition}$ [rpm]								1140	1177	1350
DV180L4	M_{max} [Nm] ([lb.in])									228 (2015)	258 (2280)
	$n_{transition}$ [rpm]									1081	1196
DV200L4	M_{max} [Nm] ([lb.in])										323 (2845)
	$n_{transition}$ [rpm]										1024
DV225S4	M_{max} [Nm] ([lb.in])										318 (2815)
	$n_{transition}$ [rpm]										1100

Please note: The max. torque M_{max} is limited to 180% of the rated motor torque M_N.

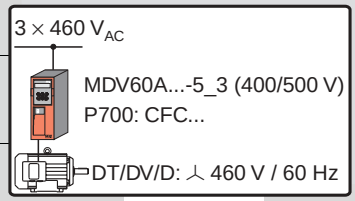


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Assignment to MOVIDRIVE® MDV60A0370-503 ... MDV60A1320-503 (sizes 4 to 6):

Motor		MOVIDRIVE® MDV60A...-5_3 (400/500 V units) in the CFC operating modes (P700)						
⅄ 460 V / 60 Hz		0370	0450	0550	0750	0900	1100	1320
DV180L4	M_{max} [Nm] ([lb.in])	258 (2280)						
	$n_{transition}$ [rpm]	1324						
DV200L4	M_{max} [Nm] ([lb.in])	351 (3100)	351 (3100)					
	$n_{transition}$ [rpm]	1107	1248					
DV225S4	M_{max} [Nm] ([lb.in])	391 (3456)	433 (3826)	433 (3826)				
	$n_{transition}$ [rpm]	1075	1145	1286				
DV225M4	M_{max} [Nm] ([lb.in])	401 (3542)	494 (4364)	526 (4648)	526 (4648)			
	$n_{transition}$ [rpm]	1081	1056	1139	1324			
D250M4	M_{max} [Nm] ([lb.in])			570 (5040)	640 (5656)			
	$n_{transition}$ [rpm]			1300	1395			
D280S4	M_{max} [Nm] ([lb.in])				717 (6335)	869 (7678)	871 (7695)	
	$n_{transition}$ [rpm]				1345	1318	1594	
D280M4	M_{max} [Nm] ([lb.in])				712 (6290)	864 (7634)	1045 (9233)	
	$n_{transition}$ [rpm]				1337	1325	1382	
D315S4	M_{max} [Nm] ([lb.in])						1099 (9710)	1273 (11247)
	$n_{transition}$ [rpm]						1325	1408
D315M4	M_{max} [Nm] ([lb.in])							1387 (12255)
	$n_{transition}$ [rpm]							1242
D315M4a	M_{max} [Nm] ([lb.in])							1307 (11548)
	$n_{transition}$ [rpm]							1344

Please note: The max. torque M_{max} is limited to 180% of the rated motor torque M_N.



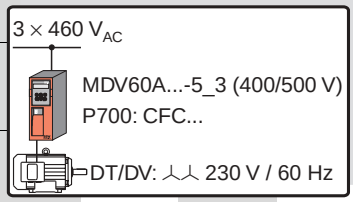
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2. Double-star connection ⅄⅄ 230 V / 60 Hz:

Assignment to MOVIDRIVE® MDV60A0015-5A3 ... MDV60A0300-503 (sizes 1 to 3):

Motor		MOVIDRIVE® MDV60A...-5_3 (400/500 V units) in the CFC operating modes (P700)									
⅄⅄ 230 V / 60 Hz		0015	0022	0030	0040	0055	0075	0110	0150	0220	0300
DT71D4	M_{max} [Nm] ([lb.in])	4.6 (40.5)									
	$n_{transition}$ [rpm]	2988									
DT80K4	M_{max} [Nm] ([lb.in])	7.0 (62)	7.0 (62)								
	$n_{transition}$ [rpm]	2688	2822								
DT80N4	M_{max} [Nm] ([lb.in])	8.3 (73)	9.3 (82)	9.3 (82)							
	$n_{transition}$ [rpm]	2585	2873	2969							
DT90S4	M_{max} [Nm] ([lb.in])		11.9 (105)	13.5 (120)	13.5 (120)						
	$n_{transition}$ [rpm]		2636	2931	3462						
DT90L4	M_{max} [Nm] ([lb.in])			16.4 (145)	18.3 (162)	18.3 (162)					
	$n_{transition}$ [rpm]			2604	3014	3353					
DT100LS4	M_{max} [Nm] ([lb.in])				22.5 (200)	27.0 (238)	27.0 (238)				
	$n_{transition}$ [rpm]				2592	2732	3104				
DT100L4	M_{max} [Nm] ([lb.in])						32.5 (287)	36.8 (325)			
	$n_{transition}$ [rpm]						2592	2912			
DV112M4	M_{max} [Nm] ([lb.in])						41.4 (365)	48.4 (427)			
	$n_{transition}$ [rpm]						2534	2988			
DV132S4	M_{max} [Nm] ([lb.in])							62.4 (550)	66.1 (585)		
	$n_{transition}$ [rpm]							2233	2572		
DV132M4	M_{max} [Nm] ([lb.in])								80.0 (705)	90.2 (797)	
	$n_{transition}$ [rpm]								2348	2707	
DV132ML4	M_{max} [Nm] ([lb.in])									110 (972)	110 (972)
	$n_{transition}$ [rpm]									2566	2944
DV160M4	M_{max} [Nm] ([lb.in])									115 (1015)	131 (1157)
	$n_{transition}$ [rpm]									2451	2688
DV160L4	M_{max} [Nm] ([lb.in])										150 (1325)
	$n_{transition}$ [rpm]										2457

Please note: The max. torque M_{max} is limited to 180% of the rated motor torque M_N.

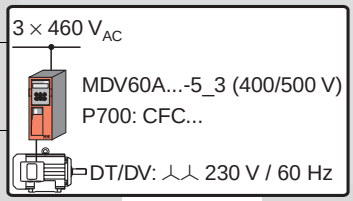


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Assignment to MOVIDRIVE® MDV60A0370-503 ... MDV60A1320-503 (sizes 4 to 6):

Motor		MOVIDRIVE® MDV60A...-5_3 (400/500 V units) in the CFC operating modes (P700)						
人人 230 V / 60 Hz		0370	0450	0550	0750	0900	1100	1320
DV160M4	M_{max} [Nm] ([lb.in])	131 (1157)						
	$n_{transition}$ [rpm]	2963						
DV160L4	M_{max} [Nm] ([lb.in])	177 (1565)	177 (1565)					
	$n_{transition}$ [rpm]	2512	2918					
DV180M4	M_{max} [Nm] ([lb.in])	189 (1670)	217 (1917)	217 (1917)				
	$n_{transition}$ [rpm]	2355	2457	2771				
DV180L4	M_{max} [Nm] ([lb.in])		220 (1943)	258 (2280)	258 (2280)			
	$n_{transition}$ [rpm]		2284	2291	2720			
DV200L4	M_{max} [Nm] ([lb.in])			281 (2482)	350 (3092)	351 (3100)		
	$n_{transition}$ [rpm]			2208	2163	2509		
DV225S4	M_{max} [Nm] ([lb.in])				346 (3056)	419 (3700)	433 (3825)	
	$n_{transition}$ [rpm]				2291	2253	2694	
DV225M4	M_{max} [Nm] ([lb.in])				354 (3127)	430 (3798)	526 (4646)	526 (4646)
	$n_{transition}$ [rpm]				2278	2252	2336	2803

Please note: The max. torque M_{max} is limited to 180% of the rated motor torque M_N.



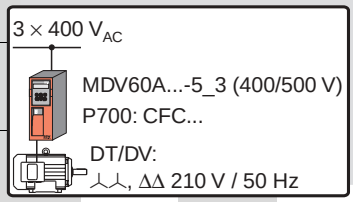
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DT/DV/D motor selection with double-star or double-delta connection type (220 V_{AC} / 50 Hz)

Assignment to MOVIDRIVE® MDV60A0015-5A3 ... MDV60A0300-503 (sizes 1 to 3):

Motor		MOVIDRIVE® MDV60A...-5_3 (400/500 V units) in the CFC operating modes (P700)									
⅄⅄, ΔΔ 200 V / 50 Hz[1]		0015	0022	0030	0040	0055	0075	0110	0150	0220	0300
DT80K4	M_{max} [Nm] ([lb.in])	6.9 (61)	6.9 (61)								
	$n_{transition}$ [rpm]	2035	2112								
DT80N4	M_{max} [Nm] ([lb.in])		9.3 (82)	9.3 (82)	9.3 (82)						
	$n_{transition}$ [rpm]		2483	2624	2624						
DT90L4	M_{max} [Nm] ([lb.in])				18.3 (162)	18.3 (162)	18.3 (162)				
	$n_{transition}$ [rpm]				2521	2924	2963				
DV100M4	M_{max} [Nm] ([lb.in])				24.4 (215)	26.8 (236)	26.8 (236)				
	$n_{transition}$ [rpm]				2124	2419	2732				
DV112M4	M_{max} [Nm] ([lb.in])							48.4 (427)	48.4 (427)		
	$n_{transition}$ [rpm]							2457	2796		
DV132S4	M_{max} [Nm] ([lb.in])							58.3 (515)	66.1 (585)	66.1 (585)	
	$n_{transition}$ [rpm]							2355	2656	3052	
DV132M4	M_{max} [Nm] ([lb.in])								77.3 (683)	90.2 (797)	90.2 (797)
	$n_{transition}$ [rpm]								2361	2688	2886
DV160M4	M_{max} [Nm] ([lb.in])									112 (995)	131 (1157)
	$n_{transition}$ [rpm]									2265	2470

Please note: The max. torque M_{max} is limited to 180% of the rated motor torque M_N.

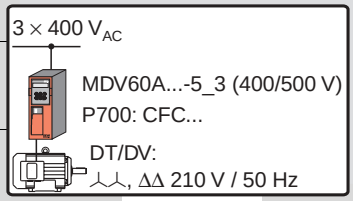


1) The values also apply to 200 V / 60 Hz and 220 V / 60 Hz.

Assignment to MOVIDRIVE® MDV60A0370-503 ... MDV60A1320-503 (sizes 4 to 6):

Motor		MOVIDRIVE® MDV60A...-5_3 (400/500 V units) in the CFC operating modes (P700)						
⅄⅄, ΔΔ 200 V / 50 Hz[1]		0370	0450	0550	0750	0900	1100	1320
DV160M4	M_{max} [Nm] ([lb.in])	131 (1157)	131 (1157)					
	$n_{transition}$ [rpm]	2784	2918					
DV160L4	M_{max} [Nm] ([lb.in])	177 (1565)	177 (1565)	177 (1565)	177 (1565)			
	$n_{transition}$ [rpm]	2316	2726	2995	3084			
DV180M4	M_{max} [Nm] ([lb.in])		217 (1917)	217 (1917)	217 (1917)			
	$n_{transition}$ [rpm]		2406	2803	3251			
DV180L4	M_{max} [Nm] ([lb.in])			252 (2233)	258 (2280)	258 (2280)		
	$n_{transition}$ [rpm]			2240	2662	3008		
DV200L4	M_{max} [Nm] ([lb.in])				336 (2975)	351 (3110)	351 (3110)	
	$n_{transition}$ [rpm]				2233	2541	3072	
DV225S4	M_{max} [Nm] ([lb.in])				330 (2917)	401 (3553)	433 (3836)	433 (3836)
	$n_{transition}$ [rpm]				2112	2086	2438	2867
DV225M4	M_{max} [Nm] ([lb.in])					395 (3500)	518 (4590)	526 (4660)
	$n_{transition}$ [rpm]					2291	2253	2720

Please note: The max. torque M_{max} is limited to 180% of the rated motor torque M_N.



1) The values also apply to 200 V / 60 Hz and 220 V / 60 Hz.

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3.3 Selecting the braking resistor

High voltage



The connection leads to the braking resistor carry a **high DC voltage (approx. 900 V)**. The braking resistor lines must be suitable for this high DC voltage.

Line length



The **maximum permitted line length** between MOVIDRIVE® and the braking resistor is **100 m (330 ft)**.

Parallel connection

Two braking resistors must be connected in parallel in the case of some inverter/ resistor combinations. In this case, the **trip current** must be set on the bimetallic relay to twice the value of I_F entered in the table.

Peak braking power

The DC link voltage and the resistance value mean the peak braking power may be less than the load capacity of the braking resistor. This peak braking power is calculated as follows:

$$P_{max} = \frac{U_{DC}^2}{R}$$

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V_{DC} is the switch-in threshold of the brake chopper. Its value is

– with MOVIDRIVE® MD_60A...-5_3 (400/500 V units) V_{DC} = 822 V_{DC}

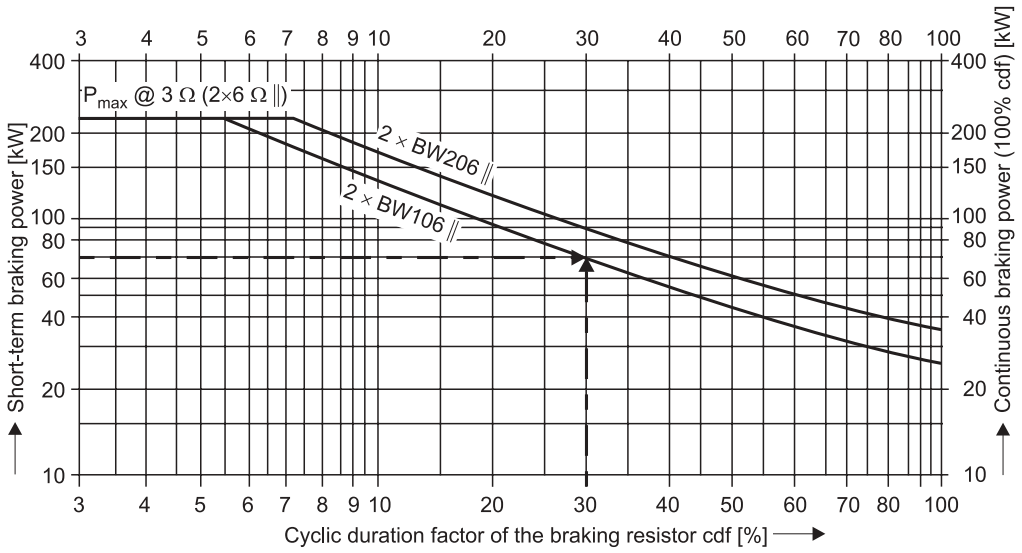
The following table lists the peak braking power levels which are possible for the different resistance values.

Resistance value	Peak braking power MD_60A...-5_3 (400/500 V units)
3 Ω (2 × BW106/206 parallel)	225 kW

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Power diagram

In the case of braking operations within the cycle duration T_D (standard: $T_D \leq 120$ s), the cdf braking power can be used to ascertain the resulting continuous resistor dissipation (100% cdf power) with reference to the power diagrams. The right-hand y axis shows the 100 % cdf power.



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Fig. 8: Power diagram for BW106 and BW206 steel-grid resistors

Example

When an intermittent braking power of 70 kW is needed with a cyclic duration factor of 30%, this requires a braking resistor with a continuous power of 26 kW, for example 2 × BW106 connected in parallel.

Braking resistor type		**BW106**	**BW206**
Load capacity	**100% cdf**	13 kW (26 kW when connected in parallel)	18 kW (36 kW when connected in parallel)
Resistance value	**R_{BR}**	6 Ω ± 10%	
Trip current of F16	**I_F**	38 A_{RMS} (76 A_{RMS} when connected in parallel)	42 A_{RMS} (84 A_{RMS} when connected in parallel)
Enclosure		IP20 (when mounted)	
For MOVIDRIVE® MD_60A...-5_3		2 × parallel with 0900 ... 1320	

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3.4 Supply system leads and motor cables

Special regulations

Comply with the **regulations issued by specific countries and for specific machines** regarding fusing and the selection of line cross sections. Also comply with the instructions for **UL-compliant installation** if necessary.

Line cross sections and fusing

SEW proposes the following line cross sections and fusing, assuming the use of single-core copper cables with PVC insulation laid in cable ducts, an ambient temperature of 25°C and rated system currents of 100% of the rated inverter current:

400/500 V units metric, V_{in} = 3 × 400 V_{AC}:

MOVIDRIVE® MD_60A...-5A3	0015	0022	0030	0040	0055	0075	0110
Size	1				2		
Fuses F11/F12/F13 I_N	16 A				16 A		25 A
Supply system lead L1/L2/L3	1.5 mm²				1.5 mm²		4 mm²
PE conductor	2 × 1.5 mm² 1 × 10 mm²				2 × 1.5 mm² 1 × 10 mm²		2 × 4 mm² 1 × 10 mm²
Motor cable U/V/W	1.5 mm²				1.5 mm²	2.5 mm²	4 mm²
Unit terminal cross section of the power supply unit	Disconnectable terminal strip 4 mm² conductor end sleeve DIN 46228				Screw and washer assembly M4 with terminal clip 4 mm² conductor end sleeve DIN 46228 6 mm² crimp cable connector DIN 46234		

MOVIDRIVE® MD_60A...-503	0150	0220	0300	0370	0450	0550	0750
Size	3			4		5	
Fuses F11/F12/F13 I_N	35 A	50 A	63 A	80 A	100 A		125 A
Supply system lead L1/L2/L3	6 mm²	10 mm²	16 mm²	25 mm²	35 mm²		50 mm²
PE conductor	2 × 6 mm² 1 × 10 mm²	1 × 10 mm²	1 × 16 mm²	1 × 16 mm²			1 × 25 mm²
Motor cable U/V/W	6 mm²	10 mm²	16 mm²	25 mm²	35 mm²		50 mm²
Unit terminal cross section of the power supply unit	Screw and washer assembly M6 with washer max. 25 mm² Crimp cable connector DIN 46234			Bolt M10 with nut max. 70 mm² Crimp cable connector DIN 46235			

MOVIDRIVE® MD_60A...-503	0900	1100	1320
Size	6		
Fuses F11/F12/F13 I_N	160 A	200 A	250 A
Supply system lead L1/L2/L3	70 mm²	95 mm²	150 mm²
PE conductor	35 mm²	50 mm²	70 mm²
Motor cable U/V/W	70 mm²	95 mm²	150 mm²
Unit terminal cross section of the power supply unit	Bolt M12 with nut max. 185 mm² Crimp cable connector DIN 46235		

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400/500 V units to USA NEC, V_{in} = 3 × 460 V_{AC}:

MOVIDRIVE® MD_60A...-5A3	0015	0022	0030	0040	0055	0075	0110
Size	1				2		
Fuses F11/F12/F13 I_N	6 A	10A		15 A	20 A		30 A
Supply system lead L1/L2/L3	AWG14				AWG12		AWG10
PE conductor	AWG14				AWG12		AWG10
Motor cable U/V/W	AWG14				AWG12		AWG10
Unit terminal cross section of the power supply unit	Disconnectable terminal strip AWG10 conductor end sleeve				Screw and washer assembly M4 with terminal clip AWG10 conductor end sleeve AWG10 crimp cable connector		

MOVIDRIVE® MD_60A...-503	0150	0220	0300	0370	0450	0550	0750
Size	3			4		5	
Fuses F11/F12/F13 I_N	40 A	60 A	80 A	90 A	110 A	150 A	175 A
Supply system lead L1/L2/L3	AWG8	AWG6	AWG4	AWG4	AWG3	AWG1	AWG2/0
PE conductor	AWG10		AWG8	AWG8	AWG6	AWG6	
Motor cable U/V/W	AWG8	AWG6	AWG4	AWG4	AWG3	AWG1	AWG2/0
Unit terminal cross section of the power supply unit	Screw and washer assembly M6 with washer max. AWG4 crimp cable connector			Bolt M10 with nut max. AWG2/0 crimp cable connector			

MOVIDRIVE® MD_60A...-503	0900	1100	1320
Size	6		
Fuses F11/F12/F13 I_N	175 A	200 A	230 A
Supply system lead L1/L2/L3	AWG2/0	AWG3/0	AWG4/0
PE conductor	AWG6	AWG6	AWG4
Motor cable U/V/W	AWG2/0	AWG3/0	Kcmil 250
Unit terminal cross section of the power supply unit	Bolt M12 with nut Kcmil 350 crimp cable connector		

AWG = American Wire Gauge

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Permitted motor lead lengths

The **maximum motor lead length** depends on:

- cable type
- voltage drop in the cable
- only in VFC operating mode: Set PWM frequency P860/P861
- only in VFC operating mode: Connect an HF... output filter
- with an encoder connected: The maximum cable length for the encoder connection is 100 m (330 ft) with a capacitance per unit length of ≤ 120 nF/km (193 nF/mile).

The following information provides approximate values:

MOVIDRIVE® MD_60A...-5_3:

MOVIDRIVE® MD_60A...-5_3 at V_{in} = 3 × 400 V_{AC}		**0015**	**0022**	**0030**	**0040**	**0055**	**0075 ... 1320**
		Recommended maximum motor lead length [m (ft)]					
		Shielded cable					
VFC operating mode[1] PWM frequency (P860/P861)	**4 kHz**	120 (396)	200 (660)	250 (825)	300 (990)	300 (990)	400 (1320)
	8 kHz	80 (264)	120 (396)	150 (495)	250 (825)	250 (825)	300 (990)
	12 kHz	50 (165)	80 (264)	120 (396)	200 (660)	200 (660)	250 (825)
	16 kHz	40 (132)	60 (198)	100 (330)	150 (495)	150 (495)	200 (660)
CFC and SERVO mode PWM frequency fixed at 8 kHz		100 (330)					
		Unshielded cable					
VFC operating mode[1] PWM frequency (P860/P861)	**4 kHz**	360 (1188)	600 (1980)	750 (2475)	900 (2970)	900 (2970)	1200 (3960)
	8 kHz	240 (792)	360 (1188)	450 (1485)	750 (2475)	750 (2475)	900 (2970)
	12 kHz	150 (495)	240 (792)	360 (1188)	600 (1980)	600 (1980)	750 (2475)
	16 kHz	120 (396)	180 (594)	300 (990)	450 (1485)	450 (1485)	600 (1980)
CFC and SERVO mode PWM frequency fixed at 8 kHz		100 (330)					

1) An output filter is only permitted in VFC mode and with an unshielded motor feeder. If an HF... output filter is connected, the cable length is not restricted by these limiting values, but exclusively by the voltage drop along the motor feeder.

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Voltage drop

The line cross section of the motor lead should be selected so the **voltage drop is as small as possible**. An excessively high voltage drop means that the full motor torque is not achieved.

The expected voltage drop can be determined with reference to the following tables (the voltage drop can be calculated in proportion to the length if the cables are shorter).

Line cross section	Load with I [A] =																		
	4	6	8	10	13	16	20	25	30	40	50	63	80	100	125	150	200	250	300
Copper	Voltage drop ΔU [V] with length = 100 m (330 ft) and ϑ = 70°C																		
1.5 mm²	5.3	8	10.6	13.3	17.3	21.3	1)	1)	1)	1)	1)	1)	1)	1)	1)	1)	1)	1)	1)
2.5 mm²	3.2	4.8	6.4	8.1	10.4	12.8	16	1)	1)	1)	1)	1)	1)	1)	1)	1)	1)	1)	1)
4 mm²	1.9	2.8	3.8	4.7	6.5	8.0	10	12.5	1)	1)	1)	1)	1)	1)	1)	1)	1)	1)	1)
6 mm²					4.4	5.3	6.4	8.3	9.9	1)	1)	1)	1)	1)	1)	1)	1)	1)	1)
10 mm²						3.2	4.0	5.0	6.0	8.2	10.2	1)	1)	1)	1)	1)	1)	1)	1)
16 mm²								3.3	3.9	5.2	6.5	7.9	10.0	1)	1)	1)	1)	1)	1)
25 mm²									2.5	3.3	4.1	5.1	6.4	8.0	1)	1)	1)	1)	1)
35 mm²											2.9	3.6	4.6	5.7	7.2	8.6	1)	1)	1)
50 mm²														4.0	5.0	6.0	1)	1)	1)
70 mm²																	4.6	1)	1)
95 mm²																	3.4	4.2	1)
150 mm²																		2.7	3.3
185 mm²																			2.7

1) Loading not permitted, in accordance with VDE 0100 part 430

Line cross section	Load with I [A] =																		
	4	6	8	10	13	16	20	25	30	40	50	63	80	100	125	150	200	250	300
Copper	Voltage drop ΔU [V] with length = 100 m (330 ft) and ϑ = 70°C																		
AWG16	7.0	10.5	1)	1)	1)	1)	1)	1)	1)	1)	1)	1)	1)	1)	1)	1)	1)	1)	1)
AWG14	4.2	6.3	8.4	10.5	13.6	1)	1)	1)	1)	1)	1)	1)	1)	1)	1)	1)	1)	1)	1)
AWG12	2.6	3.9	5.2	6.4	8.4	10.3	12.9	1)	1)	1)	1)	1)	1)	1)	1)	1)	1)	1)	1)
AWG10					5.6	6.9	8.7	10.8	13.0	1)	1)	1)	1)	1)	1)	1)	1)	1)	1)
AWG8						4.5	5.6	7.0	8.4	11.2	1)	1)	1)	1)	1)	1)	1)	1)	1)
AWG6								4.3	5.1	6.9	8.6	10.8	13.7	1)	1)	1)	1)	1)	1)
AWG4									3.2	4.3	5.4	6.8	8.7	10.8	13.5	1)	1)	1)	1)
AWG3									2.6	3.4	4.3	5.1	6.9	8.6	10.7	12.8	13.7	1)	1)
AWG2											3.4	4.2	5.4	6.8	8.5	10.2	10.9	13.6	1)
AWG1												3.4	4.3	5.4	6.8	8.1	8.6	10.8	13.5
AWG1/0												2.6	3.4	4.3	5.4	6.4	6.7	8.6	10.7
AWG2/0													2.7	3.4	4.3	5.1	5.4	6.8	8.5
AWG3/0														2.6	3.3	4.0	4.1	5.2	6.5
AWG4/0															3.1	3.8	4.0	5.0	6.2
Kcmil 250																3.0	3.2	4.0	5.0

1) More than 3% voltage drop in relation to V_{in} = 460 V_{AC}.

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3.5 External 24 V_{DC} voltage supply

General information

The internal 24 V_{DC} supply of MOVIDRIVE® has a maximum power of 29 W. An external 24 V_{DC} power supply unit must be connected to terminal X10:9 (VI24) if a higher power level is needed due to options installed on the 24 V_{DC} level. This power supply unit then takes over the complete 24 V_{DC} power supply for MOVIDRIVE®.

The following tables show the power demand of the MOVIDRIVE® units without options and the power demand of the individual options. MOVIDRIVE® units without options do not need an external 24 V_{DC} power supply.

The following conditions apply to the information about the power demand without options:

- For MDV/MDS: The motor encoder/resolver is supplied from MOVIDRIVE®.
- For MDV/MDS: No external encoder is connected. An external encoder increases the power demand by about 5 W.
- The 24 V_{DC} outputs (VO24) are not loaded.
- Binary outputs DBØØ and DOØ2 are loaded with 100 mA in total.

The power values of the options are maximum values given full load on the inputs/outputs.

MDF

24 V_{DC} power demand of MOVIDRIVE® MDF60A:

Size	Without option	Additional 24 V_{DC} power demand with option					
		Fieldbus options[1]	DIO11A	DIP11A	DRS11A	DPA11A	DPI11A
1	20 W	3 W	17 W	25 W	-[2]	-[2]	-[2]
2	20 W						
3	26 W						
4	28 W						
5	28 W						
6	28 W						

1) Fieldbus options are: DFP21A, DFP11A, DFI11A, DFI21A, DFC11A, DFO11A, DFD11A

2) Not possible with type MDF.

Example

MOVIDRIVE® MDF60A0022-503-4-00 (size 1) with the fieldbus interface option type DFI21A:

20 W + 3 W = 23 W

The power demand is less than 29 W, which means no external 24 V_{DC} power supply unit is needed.

MOVIDRIVE® MDF60A0110-503-4-00 (size 2) with the options fieldbus interface type DFP21A and input/output card type DIO11A:

20 W + 3 W + 17 W = 40 W

A 24 V_{DC} power supply unit with a power of at least 40 W must be connected to VI24.

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MDV

24 V_{DC} power demand of MOVIDRIVE® MDV60A:

Size	Without option	Additional 24 V_{DC} power demand with option					
		Fieldbus options[1]	DIO11A	DIP11A	DRS11A	DPA11A	DPI11A
1	26 W	3 W	17 W	25 W	22 W	120 W[2]	120 W[2]
2	26 W						
3	29 W						
4	29 W						
5	29 W						
6	29 W						

1) Fieldbus options are: DFP21A, DFP11A, DFI11A, DFI21A, DFC11A, DFO11A, DFD11A

2) Power demand when the binary outputs of the option are loaded with I = 500 mA. The 24 V_{DC} power supply unit must be connected to the VI24 input of the option (X50:30/X50:31).

Example

MOVIDRIVE® MDV60A0550-503-4-00 (size 5) with the synchronous operation card option type DRS11A:

29 W + 22 W = 51 W

A 24 V_{DC} power supply unit with a power of at least 51 W must be connected to VI24.

MDS

24 V_{DC} power demand MOVIDRIVE® MDS60A:

Size	Without option	Additional 24 V_{DC} power demand with option					
		Fieldbus options[1]	DIO11A	DIP11A	DRS11A	DPA11A	DPI11A
1	24 W	3 W	17 W	25 W	22 W	120 W[2]	120 W[2]
2	24 W						
3	29 W						
4	29 W						
5	29 W						

1) Fieldbus options are: DFP21A, DFP11A, DFI11A, DFI21A, DFC11A, DFO11A, DFD11A

2) Power demand when the binary outputs of the option are loaded with I = 500 mA. The 24 V_{DC} power supply unit must be connected to the VI24 input of the option (X50:30/X50:31).

Example

MOVIDRIVE® MDS60A0150-503-4-00 (size 3) with the absolute encoder interface option type DIP11A:

29 W + 25 W = 54 W

A 24 V_{DC} power supply unit with a power of at least 54 W must be connected to VI24.

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4 Safety Notes

Installation and startup

- **Never install damaged products or take them into operation.** Please submit a complaint to the transport company immediately in the event of damage.
- **Installation, startup and service work** only by **trained personnel** observing applicable accident prevention regulations and operating instructions! The regulations in force (e.g. EN 60204, VBG 4, DIN-VDE 0100/0113/0160) must also be complied with.
- Follow the **specific instructions** during **installation** and **startup** of the motor and the brake!



- Make sure that **preventive measures** and **protection devices** correspond to the **applicable regulations** (e.g. EN 60204 or EN 50178).

  Required preventive measures: Grounding the unit

  Required protection device: Overcurrent protection devices
- **The unit meets all requirements for reliable isolation** of power and electronics connections in accordance with EN 50178. **All connected circuits** must also **satisfy the requirements for reliable isolation** so as to guarantee reliable isolation.
- Take **suitable measures** (e.g. disconnecting the electronics terminal block) to ensure that the connected **motor does not start up automatically** when the inverter **is switched on**.

Operation and servicing

- **Disconnect the unit from the supply system** prior to **removing the protective cover. Dangerous voltages** may still be present for up to **10 minutes after mains disconnection**.



- The unit has **IP 00** enclosure with the **protective cover removed**. **Dangerous voltages** are present at all subassemblies except for the control electronics. The unit must be closed during operation.
- **Dangerous voltages** are present at the **output terminals** and the **cables and motor terminals connected to them when the unit is switched on**. This also applies even when the unit is inhibited and the motor at a standstill.
- Just because the **operation LED and other display elements** have gone out **does not mean** that the unit has been disconnected from the supply system and is **de-energized**.



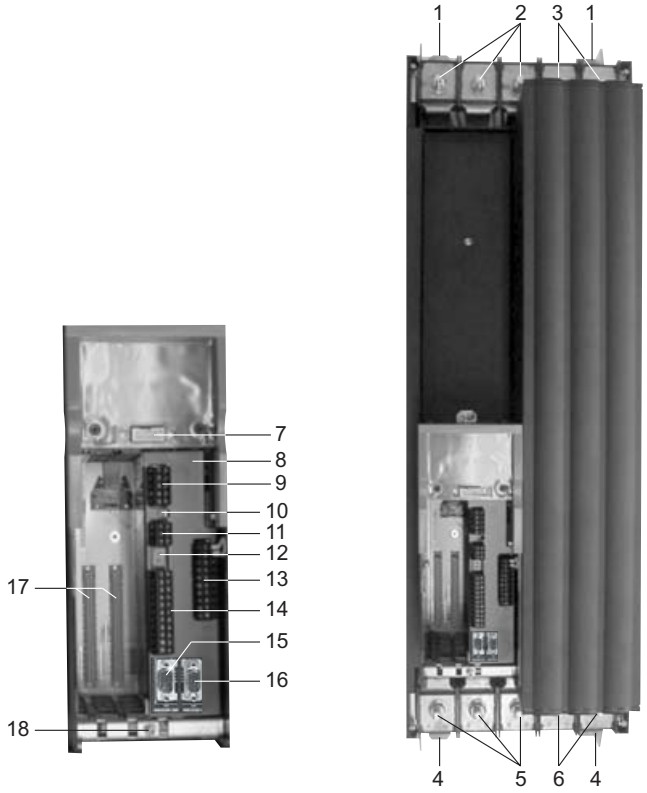
- **Safety functions inside the unit** or a **mechanical blockage** may cause the **motor to stop**. The **removal of the source of the malfunction** or a **reset** can result in an **automatic restart of the drive**. If, for safety reasons, this is **not permissible** for the driven machine, the **unit must be disconnected from the supply system** before correcting the fault. In such cases, it is also forbidden for the **"Auto-Reset" function (P841)** to be activated.
- The inverter output is only allowed to be **switched when the output stage is inhibited**.

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5 Unit Design

5.1 *Unit design, size 6*

MD_60A-503 (400/500 V units): 0900 ... 1320



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Fig. 9: Unit design MOVIDRIVE®, size 6

1. X2: PE connection
2. X1: Mains connection L1 (1) / L2 (2) / L3 (3)
3. X4: DC link connection $-U_Z$ / $+U_Z$
4. X2: PE connection
5. X2: Motor connection U (4) / V (5) / W (6)
6. X3: Braking resistor connection R+ (8) / R- (9)
7. TERMINAL: Option slot for DBG11B keypad or USS21A serial interface
8. Control pcb on CONTROL option slot
9. X11: Electronics terminal strip (setpoint input AI1 and 10 V reference voltage)
10. Switch S11 (signal type AI1) and switch S12 (system bus terminating resistor)
11. X12: Electronics terminal strip system bus (SBus)
12. 7-segment display
13. X10: Electronics terminal strip binary outputs and TF/TH input
14. X13: Electronics terminal strip binary inputs and RS-485 interface
15. Only MDV/MDS, X14: Incremental encoder simulation or external encoder input (9-pin sub D plug)
16. Only MDV/MDS, X15: Motor encoder input (9-pin sub D socket)
17. OPTION1 and OPTION2: Option slots 1 and 2
18. Connection for electronics shield clamps

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6 Installation

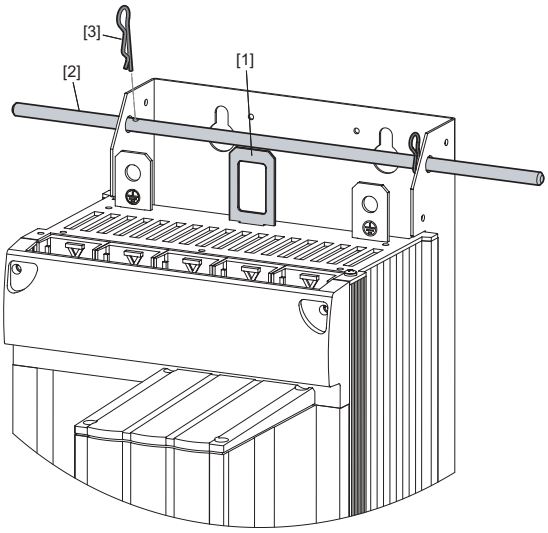
6.1 Installation instructions for basic unit

It is essential to comply with the safety notes during installation!

Installation notes for size 6 (0900...1320)

The MOVIDRIVE® units of size 6 (0900...1320) are fitted with an eyebolt. Use hoist and eyebolt for installation if possible.

If no hoist is available, you can insert a carrying bar (included in the scope of delivery of size 6) in the holes in the rear panel for easier installation. Secure the carrying bar against axial displacement using the split pin.



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Fig. 10: Eyebolt and carrying bar

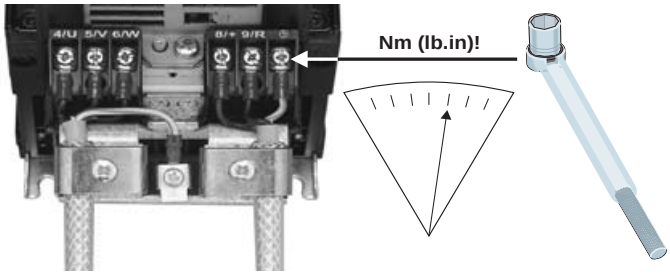
[1] Permanently mounted eyebolt

[2] Carrying bar (included in the scope of delivery of size 6)

[3] Split pin (included in the scope of delivery of size 6)

Tightening torques

- Only use **genuine connection elements**. Note the **permitted tightening torques** of MOVIDRIVE® power terminals.
  - Size 1 → 0.6 Nm (5.3 lb.in)
  - Size 2 → 1.5 Nm (13.3 lb.in)
  - Size 3 → 3.5 Nm (31 lb.in)
  - Sizes 4 and 5 → 14 Nm (124 lb.in)
  - Size 6 → 20 Nm (177 lb.in)



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Fig. 11: Note the tightening torques

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6.2 UL compliant installation

Please note the following points for UL compliant installation:

- Only use copper cables with the **following temperature ranges** as connection leads:
  - for MOVIDRIVE® MD_60A0015 ... 0300 temperature range 60/75°C
  - for MOVIDRIVE® MD_60A0370 ... 1320 temperature range 75/90°C
- The **permitted tightening torques** for MOVIDRIVE® power terminals are:
  - Size 1 → 0.6 Nm (5.3 lb.in)
  - Size 2 → 1.5 Nm (13.3 lb.in)
  - Size 3 → 3.5 Nm (31 lb.in)
  - Sizes 4 and 5 → 14 Nm (124 lb.in)
  - Size 6 → 20 Nm (177 lb.in)
- MOVIDRIVE drive inverters® are **suitable for operation in voltage power systems with an earthed start point** (TN and TT systems) which can supply a maximum supply current in accordance with the following table and which have a rated voltage of 500 V_{AC} for MOVIDRIVE® MD_60A...-5_3 (400/500 V units). The performance data of the fuses must not exceed the values in the tables.

400/500 V units

MOVIDRIVE® MD_60A...5_3	Max. supply current	Max. supply voltage	Fuses
0015/0022/0030/0040	10000 A_{AC}	500 V_{AC}	30 A / 600 V
0055/0075/0110	10000 A_{AC}	500 V_{AC}	30 A / 600 V
0150/0220	5000 A_{AC}	500 V_{AC}	175 A / 600 V
0300	5000 A_{AC}	500 V_{AC}	225 A / 600 V
0370/0450	10000 A_{AC}	500 V_{AC}	350 A / 600 V
0550/0750	10000 A_{AC}	500 V_{AC}	500 A / 600 V
0900/1100/1320	10000 A_{AC}	500 V_{AC}	500 A / 600 V

- Only use tested units with a **limited output voltage** (V_{max} = 30 V_{DC}) and **limited output current** (I ≤ 8 A) as an **external 24 V_{DC} voltage source**.

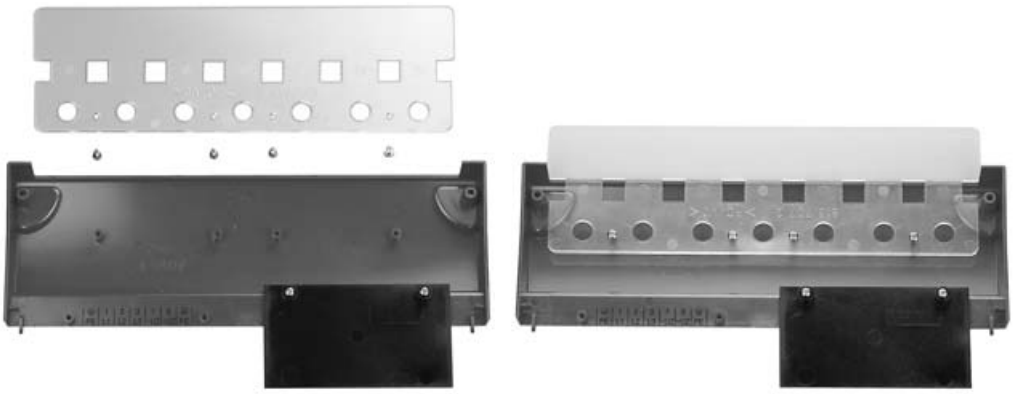


UL certification does not apply to operation in voltage supply systems with a non-earthed star point (IT systems).

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6.3 Touch guard

Two touch guards and eight retaining screws are supplied as standard with MOVIDRIVE® size 4 (500 V units: MD_60A0370/0450; 230 V units: MD_60A0220/0300), size 5 (MD_60A0550/0750) and size 6 (MD_60A0900/1100/1320). Install the touch guard on the two hood covers for the power section terminals.



01470BXX

Fig. 12: Touch guard for MOVIDRIVE® sizes 4 to 6

With installed touch guard, MOVIDRIVE® sizes 4 to 6 units achieve IP10 enclosure, IP00 without touch guard.

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6.4 Assignment of braking resistors, chokes and filters

400/500 V units, size 6

MOVIDRIVE® MD_60A...-503			0900	1100	1320
Size				6	
Braking resistors	Trip current	Part number			
BW106	I_F = 76 A_{RMS}	821 050 0	C	C	C
BW206	I_F = 84 A_{RMS}	821 051 9	C	C	C
Line chokes		Part number			
ND300-005	ΣI_{system} = 300 A_{AC}	827 721 4			
Input filters		Part number			
NF210-503	V_{max} = 550 V_{AC}	827 418 5		A	
NF300-503	V_{max} = 550 V_{AC}	827 419 3		B	
Output chokes	Connection	Part number			
HD004	M12 stud	816 885 7			

A In rated operation (100%)

B With variable torque load in VFC mode (125%)

C Connect two braking resistors in parallel and set twice the trip current ($2 \times I_F$) on F16

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7 Startup

7.1 General startup instructions



It is essential to comply with the safety notes during startup!

Requirements

Correct project planning of the drive is the pre-requisite for successful startup. Refer to the MOVIDRIVE® MD_60A system manual for detailed project planning instructions and an explanation of the parameters (chapters 4 and 5).

VFC operating modes without speed control

MOVIDRIVE® MD_60A drive inverters are factory set for operation with the SEW motor (MD_60A...-5_3: 4-pole and rated voltage 3 × 400 V_{AC} / 50 Hz or MD_60A...-2_3: 4-pole and rated voltage 3 × 230 V_{AC} / 60 Hz) which has been adjusted to the correct power level. The motor can be connected and the drive started immediately in accordance with Sec. "Starting the motor" (→ System Manual, page 277).

Inverter/motor combinations

The following tables indicate which inverter/motor combinations this applies to.

400/500 V units

MOVIDRIVE® MDF60A or MDV60A in VFC mode	SEW motor
0015-5A3-4	DT90L4
0022-5A3-4	DV100M4
0030-5A3-4	DV100L4
0040-5A3-4	DV112M4
0055-5A3-4	DV132S4
0075-5A3-4	DV132M4
0110-5A3-4	DV160M4
0150-503-4	DV160L4
0220-503-4	DV180L4
0300-503-4	DV200L4
0370-503-4	DV225S4
0450-503-4	DV225M4
0550-503-4	DV250M4
0750-503-4	DV280S4
0900-503-4	D280M4
1100-503-4	D315S4
1320-503-4	D315M4

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SEW-EURODRIVE GmbH & Co KG · P.O. Box 3023 · D-76642 Bruchsal/Germany
Phone +49 7251 75-0 · Fax +49 7251 75-1970
http://www.sew-eurodrive.com · sew@sew-eurodrive.com

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