

Changeover Support

MOVITRAC[®] 31C to MOVIDRIVE[®] 60/61 B

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This document has been prepared on the basis of the current status of knowledge. Consequently, subsequent discoveries may lead to different statements. As a result, the possibility of misinterpretations or mistakes in the technical data cannot be ruled out.

Preface

This document is intended to support sales activities by dealing with current and general questions relating to technology and the project planning of products.

Please do not hesitate to contact the authors if you have any questions or suggestions.

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1 Comparison of Technical Data

The technical data of MOVITRAC® 31C and MOVIDRIVE® B are almost the same. Line cross sections and fusing therefore remain the same. Power losses are lower with the MOVIDRIVE® B unit. The two tables show the most important data of the two units:

	MC31	MDX60/61B
GENERAL		
Supply voltage V_{mains}	3 x 380 $V_{\text{AC}}-10\%$... 3 x 500 $V_{\text{AC}}+10\%$	
Mains frequency f_{mains}	50 Hz ... 60 Hz $\pm 5\%$	
Interference emission with EMC-compliant installation		Sizes 0, 1 and 2 according to
Internal current limitation	$I_{\text{max}} = 20...150\%$ can be set in menu (P320 / P340)	$I_{\text{max}} = 0...200\%$ (size 0) 0...150% (sizes 1-5) can be set in menu (P303 / P313)
PWM frequency f_{PWM}	Adjustable: 4/8/12/16 kHz (P325/P345)	Adjustable: 4/8/12/16 kHz (P860/P861)
Speed range	-400 Hz...0...400 Hz $f_{\text{min}} = 0...40$ Hz, $f_{\text{max}} = 5...400$ Hz	-6000 ... 0 ... +6000 min^{-1} 4-pin corresponds to about 400Hz
Resolution $n_A / \Delta n_A$	0.05 Hz	0.2 min^{-1} over the entire range corresponds to 0.0067Hz
Ambient temperature J_U	0 °...+45 °C (PN reduction: 3.0 % IN per K to max. 60 °C) (EN 50178, class 3K3)	0°C...+50°C at $I_D = 100\%$ IN 0°C...+40°C at $I_D = 125\%$ IN at $f_{\text{PWM}} = 4$ kHz (VFC operating mode) (PN reduction: 3.0% IN per K to max. 60°C EN 60721-3-3, class 3K3)
Storage temperature J_L	-25 °C – +70 °C (EN 60721-3-3, class 3K3) DBG keypad: -20°C – +60 °C	-25 °C – +70 °C (EN 60721-3-3, class 3K3) DBG keypad: -20°C – +60 °C
Enclosure	IP 20 (EN 60529/NEMA1)	Sizes 0 to 3 IP 20 (EN 60529/NEMA1) Sizes 4 to 6 IP00 (power connections); IP10 with Plexiglas cover mounted (supplied as standard)
Installation altitude	$h = 1000$ m (3300 ft) I_N reduction: 1 % per 100 m (330 ft) from 1000 m (3300 ft) to max. 2.000 m (6600 ft)	$h = 1000$ m (3300 ft) • I_N reduction – 1 % per 100 m (330 ft) – From 1000 m to max. 4000 m (3300 ft to max. 13200 ft) • V_N reduction –3 V per 100 m (330 ft) From 2000 m to max. 4000 m (6600 ft to max. 13 200 ft): Above 2000 m (6600 ft) only overvoltage class 2 . For overvoltage class 3, external measures are required. Overvoltage classes to DIN VDE 0110-1.

	MC31C005 -503-4-00	MDX60B00 05-5A3-4-0	MC31C007 -503-4-00	MDX60B 0008-5A3- 4-0	MC31C011 -503-4-00	MDX60B 0011-5A3- 4-0	MC31C014 -503-4-00	MDX60B 0014-5A3- 4-0
INPUT								
Rated system current I_{mains} 100% (with $V_{\text{mains}} = 3 \times 400 \text{ V}_{\text{AC}}$)	1.6 A _{AC}	1.8 A _{AC}	1.9 A _{AC}	2.2 A _{AC}	2.4 A _{AC}	2.8 A _{AC}	3.5 A _{AC}	3.6 A _{AC}
Rated system current I_{mains} 125% (with $V_{\text{mains}} = 3 \times 400 \text{ V}_{\text{AC}}$)	1.9 A _{AC}	2.3 A _{AC}	2.4 A _{AC}	2.7 A _{AC}	2.9 A _{AC}	3.5 A _{AC}	4.4 A _{AC}	4.5 A _{AC}
OUTPUT								
Rated output power P_{R} (bei $U_{\text{Netz}} = 3 \times 380 \dots 500 \text{ V}_{\text{AC}}$)	1.4 kVA	1.4 kVA	1.8 kVA	1.6 kVA	2.2 kVA	2.1 kVA	2.8 kVA	2.8 kVA
Rated output current I_{R} (bei $U_{\text{Netz}} = 3 \times 400 \text{ V}_{\text{AC}}$)	2.0 A _{AC}	2.0 A _{AC}	2.5 A _{AC}	2.4 A _{AC}	3.2 A _{AC}	3.1 A _{AC}	4.0 A _{AC}	4.0 A _{AC}
Continuous output current = 125% I_{N} I_{D} (bei $U_{\text{Netz}} = 3 \times 400 \text{ V}_{\text{AC}}$ und $f_{\text{PWM}} = 4 \text{ kHz}$)	2.5 A _{AC}	2.5 A _{AC}	3.1 A _{AC}	3.0 A _{AC}	4.0 A _{AC}	3.8 A _{AC}	5.0 A _{AC}	5.0 A _{AC}
Constant load P_{Mot} Recommended motor power	0.55 kW (0.75 HP)	0.55 kW (0.75 HP)	0.75 kW (1.0 HP)	0.75 kW (1.0 HP)	1.1 kW (1.5 HP)	1.1 kW (1.5 HP)	1.5 kW (2.0 HP)	1.5 kW (2.0 HP)
Variable torque load P_{Mot} and constant load without overload Recommended motor power	0.75 kW (1.0 HP)	0.75 kW (1.0 HP)	1.1 kW (1.5 HP)	1.1 kW (1.5 HP)	1.5 kW (2.0 HP)	1.5 kW (2.0 HP)	2.2 kW (3.0 HP)	2.2 kW (3.0 HP)
Minimum permitted braking resistor RBW in 4Q_mode	200 Ω - 10%	68 Ω	200 Ω - 10%	68 Ω	200 Ω - 10%	68 Ω	200 Ω - 10%	68 Ω
GENERAL								
Power loss at P_{N} P_{Vmax}	46 W	42 W	54 W	48 W	68 W	58 W	75 W	85 W
Cooling air consumption	•	3 m ³ /h (1.8 ft ³ /min)	•	3 m ³ /h (1.8 ft ³ /min)	40 m ³ /h (15 ft ³ /min)	9 m ³ /h (5.4 ft ³ /min)	20 m ³ /h (12 ft ³ /min)	40 m ³ /h (24 ft ³ /min)
Weight	2.5 kg (5.5 lb)	2.0 kg (4.4 lb)	2.5 kg (5.5 lb)	2.0 kg (4.4 lb)	2.5 kg (5.5 lb)	2.5 kg (5.5 lb)	2.5 kg (5.5 lb)	2.5 kg (5.5 lb)
Size	0	0S	0	0S	0	0M	0	0M

	MC31C008- 503-4-00	MDX60B 0008- 5A3-4-0	MDX61B 0008- 5A3-4-0	MC31C015- 503-4-00	MDX60B 0014- 5A3-4-0	MDX61B 0014- 5A3-4-0
INPUT						
Rated system current I_{mains} 100% (with $V_{\text{mains}} = 3 \times 400 \text{ V}_{\text{AC}}$)	2.0 A _{AC}	2.2 A _{AC}	2.2 A _{AC}	3.5 A _{AC}	3.6 A _{AC}	3.6 A _{AC}
Rated system current I_{mains} 125% (with $V_{\text{mains}} = 3 \times 400 \text{ V}_{\text{AC}}$)	2.5 A _{AC}	2.7 A _{AC}	2.7 A _{AC}	4.4 A _{AC}	4.5 A _{AC}	4.5 A _{AC}
OUTPUT						
Rated output power P_{N} (with $V_{\text{mains}} = 3 \times 380 \dots 500 \text{ V}_{\text{AC}}$)	1.8 kVA	1.6 kVA	1.6 kVA	2.8 kVA	2.8 kVA	2.8 kVA
Rated output current I_{N} (with $V_{\text{mains}} = 3 \times 400 \text{ V}_{\text{AC}}$)	2.5 A _{AC}	2.4 A _{AC}	2.4 A _{AC}	4.0 A _{AC}	4.0 A _{AC}	4.0 A _{AC}
Continuous output current = 125% I_{N} I_{D} (with $V_{\text{mains}} = 3 \times 400 \text{ V}_{\text{AC}}$ and $f_{\text{PWM}} = 4 \text{ kHz}$)	3.1 A _{AC}	3.0 A _{AC}	2.4 A _{AC}	5.0 A _{AC}	5.0 A _{AC}	4.0 A _{AC}
Constant load P_{Mot} Recommended motor power	0.75 kW (1.0 HP)	0.75 kW (1.0 HP)	0.75 kW (1.0 HP)	1.5 kW (2.0 HP)	1.5 kW (4.0 HP)	1.5 kW (4.0 HP)
Variable torque load P_{Mot} and constant load w/o overload Recommended motor power	1.1 kW (1.5 HP)	1.1 kW (1.5 HP)	1.1 kW (1.5 HP)	2.2 kW (3.0 HP)	2.2 kW (3.0 HP)	2.2 kW (3.0 HP)
Minimum permitted braking resistance RBW in 4Q operation	47 Ω -10%	68 Ω	68 Ω	47 Ω -10%	68 Ω	68 Ω
GENERAL						
Power loss at P_{N} P_{Vmax}	65 W	105 W	105 W	85 W	130 W	130 W
Cooling air consumption	•	40 m ³ /h (24 ft ³ /min)	40 m ³ /h (24 ft ³ /min)	•	40 m ³ /h (24 ft ³ /min)	40 m ³ /h (24 ft ³ /min)
Weight	4.5 kg (9.9 lb)	2.5 kg (5.5 lb)	2.8 kg (5.5 lb)	4.5 kg (9.9 lb)	2.5 kg (5.5 lb)	2.8 kg (5.5 lb)
Size	1	0S	0S	1	0H	0H

	MC31C015-503-4-00	MDX60B 0015-5A3-4-0	MC31C022-503-4-00	MDX60B 0022-5A3-4-0	MC31C030-503-4-00	MDX60B 0030-5A3-4-0	MC31C040-503-4-00	MDX60B 0040-5A3-4-0
INPUT								
Rated system current I_{mains} 100% (with $V_{\text{mains}} = 3 \times 400 \text{ V}_{\text{AC}}$)	3.5 A _{AC}	3.6 A _{AC}	5.0 A _{AC}	5.0 A _{AC}	6.7 A _{AC}	6.3 A _{AC}	8.8 A _{AC}	8.6 A _{AC}
Rated system current I_{mains} 125% (with $V_{\text{mains}} = 3 \times 400 \text{ V}_{\text{AC}}$)	4.4 A _{AC}	4.5 A _{AC}	6.3 A _{AC}	6.2 A _{AC}	8.4 A _{AC}	7.9 A _{AC}	11 A _{AC}	10.7 A _{AC}
OUTPUT								
Rated output power P_{N} (with $V_{\text{mains}} = 3 \times 380 \dots 500 \text{ V}_{\text{AC}}$)	2.8 kVA	2.8 kVA	3.8 kVA	3.8 kVA	5.1 kVA	4.9 kVA	6.6 kVA	6.6 kVA
Rated output current with $V_{\text{mains}} = 3 \times 400 \text{ V}_{\text{AC}}$	4.0 A _{AC}	4.0 A _{AC}	5.5 A _{AC}	5.5 A _{AC}	7.3 A _{AC}	7.0 A _{AC}	9.6 A _{AC}	9.5 A _{AC}
Continuous output current = 125% I_{N} I_{D} (with $V_{\text{mains}} = 3 \times 400 \text{ V}_{\text{AC}}$ and $f_{\text{PWM}} = 4 \text{ kHz}$)	5.0 A _{AC}	5.0 A _{AC}	6.9 A _{AC}	6.9 A _{AC}	9.1 A _{AC}	8.8 A _{AC}	12 A _{AC}	11.9 A _{AC}
Constant load P_{Mot} Recommended motor power	1.5 kW (2.0 HP)	1.5 kW (2.0 HP)	2.2 kW (3.0 HP)	2.2 kW (3.0 HP)	3.0 kW (4.0 HP)	3.0 kW (4.0 HP)	4.0 kW (5.0 HP)	4.0 kW (5.0 HP)
Variable torque load P_{Mot} and constant load without overload Recommended motor power	2.2 kW (3.0 HP)	2.2 kW (3.0 HP)	3.0 kW (4.0 HP)	3.0 kW (4.0 HP)	4.0 kW (5.0 HP)	4.0 kW (5.0 HP)	5.5 kW (7.5 HP)	5.5 kW (7.5 HP)
Min. permitted braking resistance RBW in 4Q operation	47 Ω -10%	68 Ω	47 Ω -10%	68 Ω	47 Ω -10%	68 Ω	47 Ω -10%	68 Ω
GENERAL								
Power loss at P_{N} P_{Vmax}	85 W	85 W	105 W	105 W	130 W	130 W	190 W	180 W
Cooling air consumption	•	40 m ³ /h (24 ft ³ /min)	25 m ³ /h (15 ft ³ /min)	40 m ³ /h (24 ft ³ /min)	25 m ³ /h (15 ft ³ /min)	40 m ³ /h (24 ft ³ /min)	50 m ³ /h (30 ft ³ /min)	40 m ³ /h (24 ft ³ /min)
Weight	4.5 kg (9.9 lb)		4.5 kg (9.9 lb)		4.5 kg (9.9 lb)		5.9 kg (13 lb)	
Size	1	1	1	1	1	1	2	1

	MC31C055-503-4-00	MDX60B 0055-5A3-4-0	MC31C075-503-4-00	MDX60B 0075-5A3-4-0	MC31C110-503-4-00	MDX60B 0110-5A3-4-0	MC31C150-503-4-00	MDX60B 0150-503-4-0
INPUT								
Rated system current I_{mains} 100% (bei $U_{\text{Netz}} = 3 \times 400 \text{ V}_{\text{AC}}$)	10.7 A _{AC}	11.3 A _{AC}	13.8 A _{AC}	14.4 A _{AC}	20 A _{AC}	21.6 A _{AC}	27 A _{AC}	28.8 A _{AC}
Rated system current I_{mains} 125% (with $V_{\text{mains}} = 3 \times 400 \text{ V}_{\text{AC}}$)	13.4 A _{AC}	14.1 A _{AC}	17.3 A _{AC}	18.0 A _{AC}	24 A _{AC}	27.0 A _{AC}	33 A _{AC}	36.0 A _{AC}
OUTPUT								
Rated output power P_{N} (with $V_{\text{mains}} = 3 \times 380 \dots 500 \text{ V}_{\text{AC}}$)	8.3 kVA	8.7 kVA	11 kVA	11.2 kVA	17 kVA	16.8 kVA	23 kVA	22.2 kVA
Rated output current with $V_{\text{mains}} = 3 \times 400 \text{ V}_{\text{AC}}$	12 A _{AC}	12.5 A _{AC}	16 A _{AC}	16 A _{AC}	24 A _{AC}	24 A _{AC}	33 A _{AC}	32 A _{AC}
Continuous output current = 125% I_{N} I_{D} (with $V_{\text{mains}} = 3 \times 400 \text{ V}_{\text{AC}}$ and $f_{\text{PWM}} = 4 \text{ kHz}$)	15 A _{AC}	15.6 A _{AC}	20 A _{AC}	20.0 A _{AC}	30 A _{AC}	30.0 A _{AC}	41 A _{AC}	40.0 A _{AC}
Constant load P_{Mot} Recommended motor power	5.5 kW (7.5 HP)	5.5 kW (7.5 HP)	7.5 kW (10 HP)	7.5 kW (10 HP)	11 kW (15 HP)	11 kW (15 HP)	15 kW (20 HP)	15 kW (20 HP)
Variable torque load P_{Mot} and constant load without overload Recommended motor power	7.5 kW (10 HP)	7.5 kW (10 HP)	11 kW (15 HP)	11 kW (15 HP)	15 kW (20 HP)	15 kW (20 HP)	22 kW (30 HP)	22 kW (30 HP)
Minimum permitted braking resistance RBW in 4Q operation	47 Ω -10%	47 Ω	47 Ω -10%	47 Ω	18 Ω -10%	15 Ω	18 Ω -10%	15 Ω
GENERAL								
Power loss at P_{N} P_{Vmax}	230 W	220 W	310 W	290 W	430 W	400 W	580 W	550 W

Cooling air consumption	50 m ³ /h (30 ft ³ /min)	80 m ³ /h (48 ft ³ /min)	50 m ³ /h (30 ft ³ /min)	80 m ³ /h (48 ft ³ /min)	100 m ³ /h (60 ft ³ /min)	80 m ³ /h (48 ft ³ /min)	230 m ³ /h (135 ft ³ /min)	180 m ³ /h (108 ft ³ /min)
Weight	5.9 kg (13 lb)		5.9 kg (13 lb)		13 kg (28.7 lb)		13 kg (28.7 lb)	
Size	2	2S	2	2S	3	2	3	3

	MC31C220 -503-4-0_	MDX60B 0220-503- 4-0_	MC31C300 -503-4-00	MDX60B 0300-503- 4-0_	MC31C370 -503-4-00	MDX60B 0370-503- 4-0_	MC31C450 -503-4-00	MDX60B 0450-503- 4-0_
INPUT								
Rated system current I _{mains} 100% (with V _{mains} = 3x400 V _{AC})	39 A _{AC}	41.4 A _{AC}	56 A _{AC}	54.0 A _{AC}	69 A _{AC}	65.7 A _{AC}	84 A _{AC}	80.1 A _{AC}
Rated system current I _{mains} 125% (with V _{mains} = 3x400 V _{AC})	49 A _{AC}	51.7 A _{AC}	70 A _{AC}	67.5 A _{AC}	86 A _{AC}	81.9 A _{AC}	105 A _{AC}	100.1 A _{AC}
OUTPUT								
Rated output power P _N (with V _{mains} = 3x380...500 V _{AC})	33 kVA	31.9 kVA	42 kVA	41.6 kVA	52 kVA	51.1 kVA	64 kVA	62.3 kVA
Rated output current I _N With V _{mains} = 3x400 V _{AC})	47 A _{AC}	46 A _{AC}	61 A _{AC}	60 A _{AC}	75 A _{AC}	73 A _{AC}	92 A _{AC}	89 A _{AC}
Continuous output current = 125% I _N I _D (with V _{mains} = 3x400 V _{AC} and f _{PWM} = 4 kHz)	58 A _{AC}	57.5 A _{AC}	76 A _{AC}	75.0 A _{AC}	93 A _{AC}	91 A _{AC}	115 A _{AC}	111 A _{AC}
Constant load Recommended motor power P _{Mot}	22 kW (30 HP)	22 kW (30 HP)	30 kW (40 HP)	30 kW (40 HP)	37 kW (50 HP)	37 kW (50 HP)	45 kW (60 HP)	45 kW (60 HP)
Variable torque load or constant load without overload Recommended motor power P _{Mot}	30 kW (40 HP)	30 kW (40 HP)	37 kW (50 HP)	37 kW (50 HP)	45 kW (60 HP)	45 kW (60 HP)	55 kW (75 HP)	55 kW (75 HP)
Min. permitted braking resistance RBW in 4Q operation	15 O -10%	15 O	12 O -10%	12 O	10 O -10%	6 O	8.2 O -10%	6 O
GENERAL								
Power loss at P _N P _{Vmax}	800 W	750 W	1000 W	950 W	1200 W	1200 W	1500 W	1450 W
Cooling air consumption	230 m ³ /h (135 ft ³ /min)	180 m ³ /h (108 ft ³ /min)	230 m ³ /h (135 ft ³ /min)	180 m ³ /h (108 ft ³ /min)	230 m ³ /h (135 ft ³ /min)	180 m ³ /h (108 ft ³ /min)	230 m ³ /h (135 ft ³ /min)	180 m ³ /h (108 ft ³ /min)
Weight	13 kg (28.7 lb)		19 kg (41.9 lb)		19 kg (41.9 lb)		20 kg (44.1 lb)	
Size	3	3	4	3	4	4	4	4

2 Design and Connection

MOVITRAC® 31C and MOVIDRIVE® B differ greatly in the design. The units can therefore not just be exchanged.

With MOVIDRIVE® B, the voltage is supplied from above. With the B unit, the control terminals are arranged vertically, with MOVITRAC® 31C they are arranged horizontally.

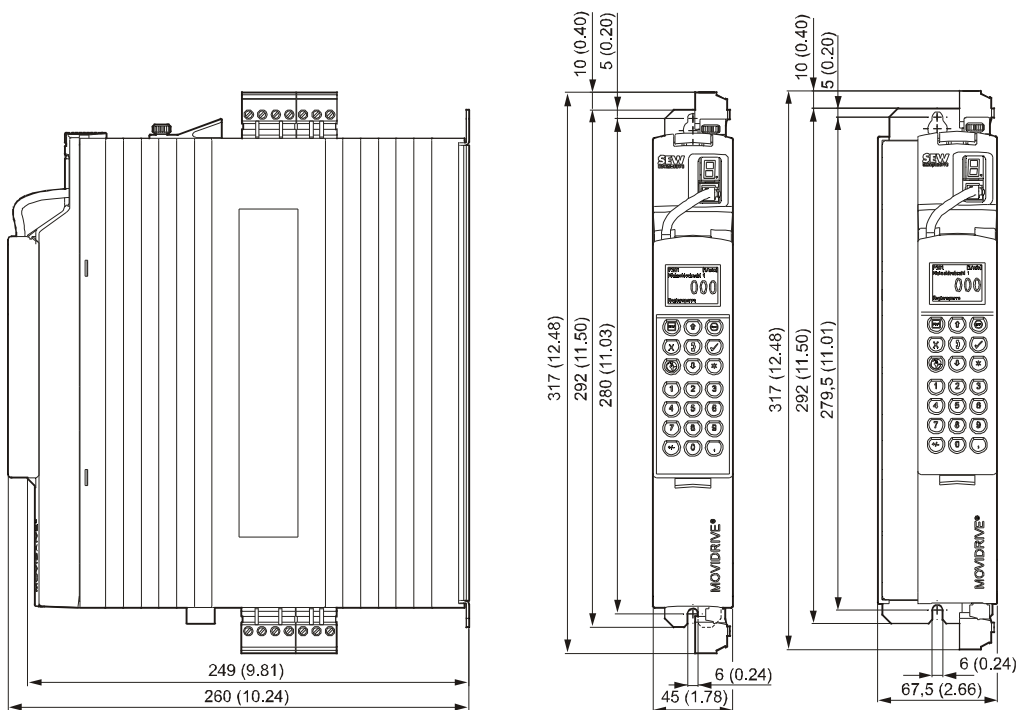
This means that new power cables and control cables are required depending on the control cabinet wiring.

MDX60B

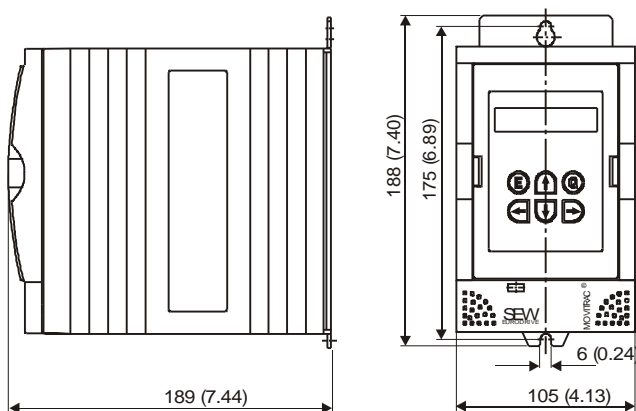
BG0

BG0S

BG0M

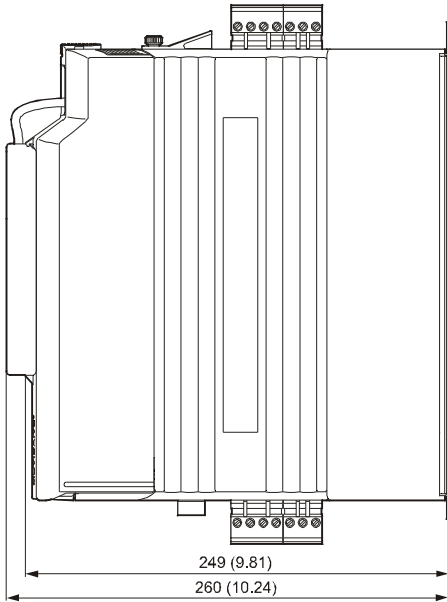


MOVITRAC^â 31C size 0

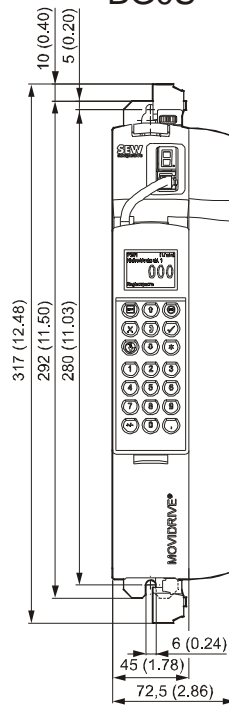


MDX61B

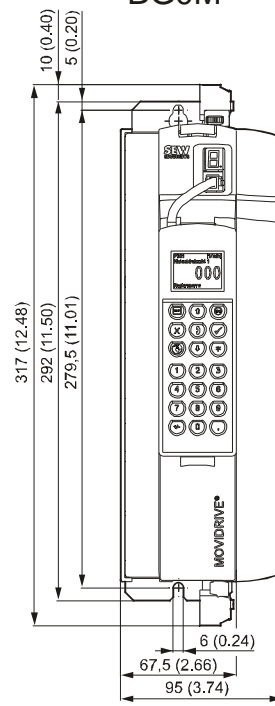
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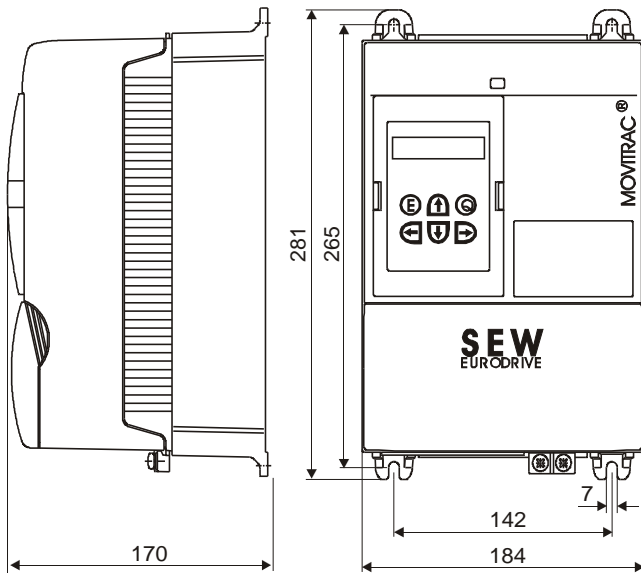
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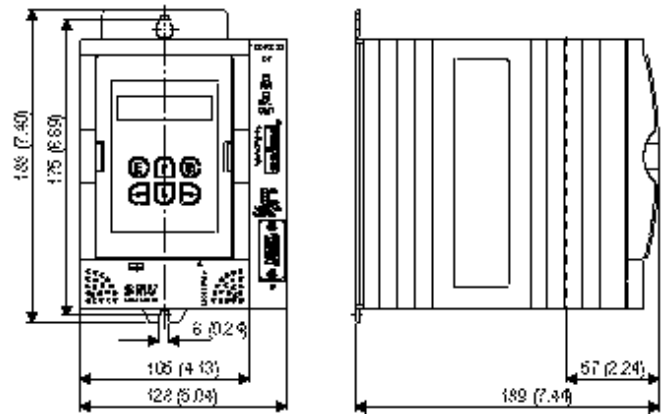
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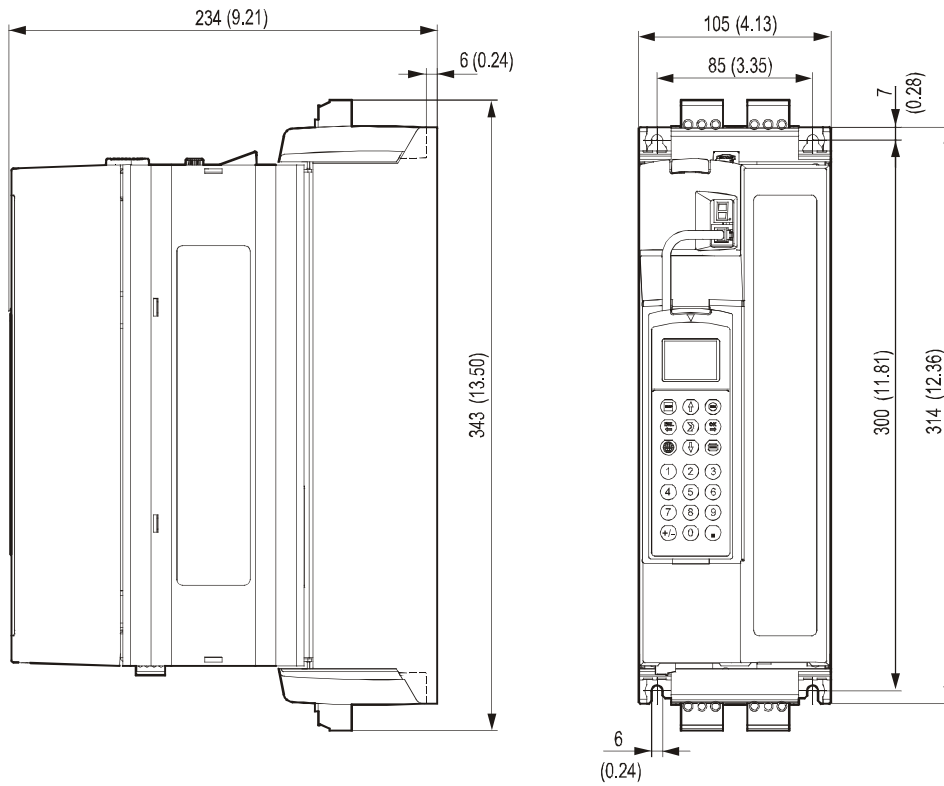
MOVITRAC^â 31C size 1



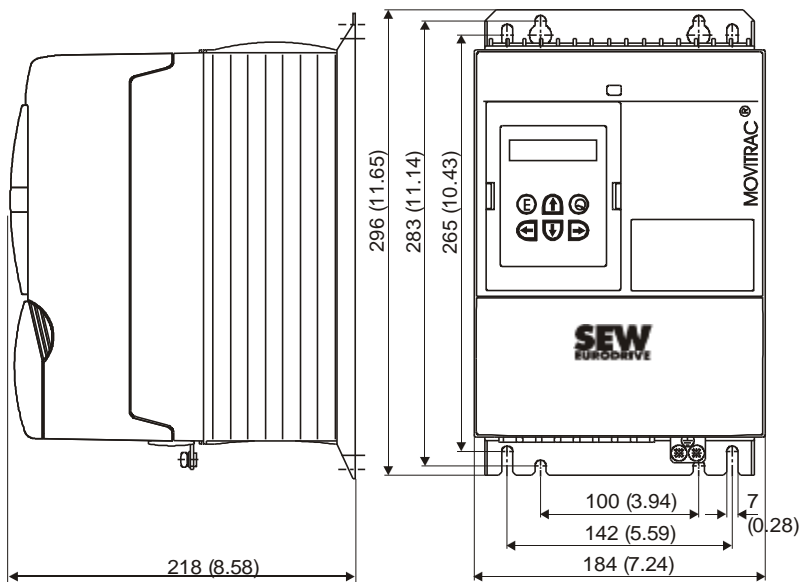
MOVITRAC^â 31C size 0 with bus



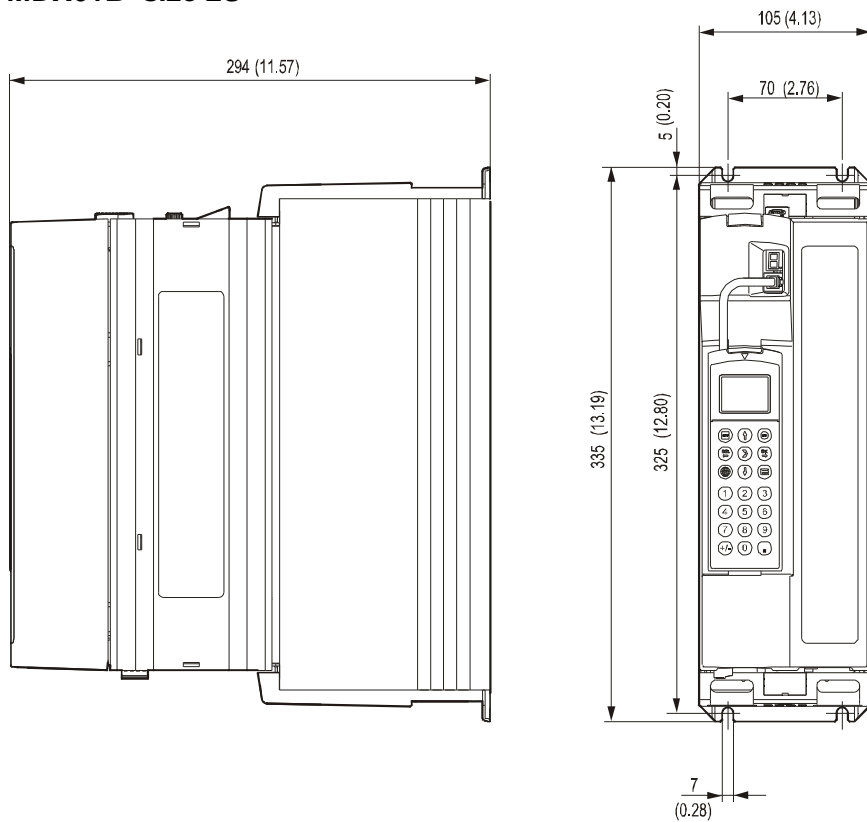
MDX61B size 1



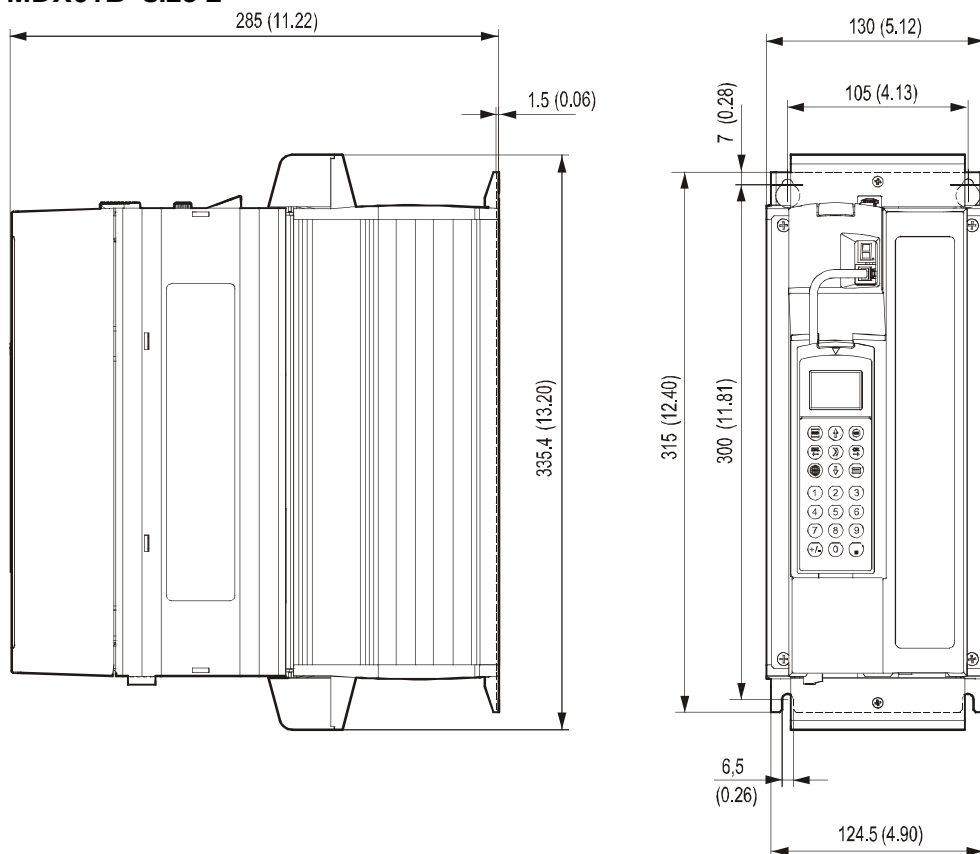
MOVITRAC[®] 31C size 2



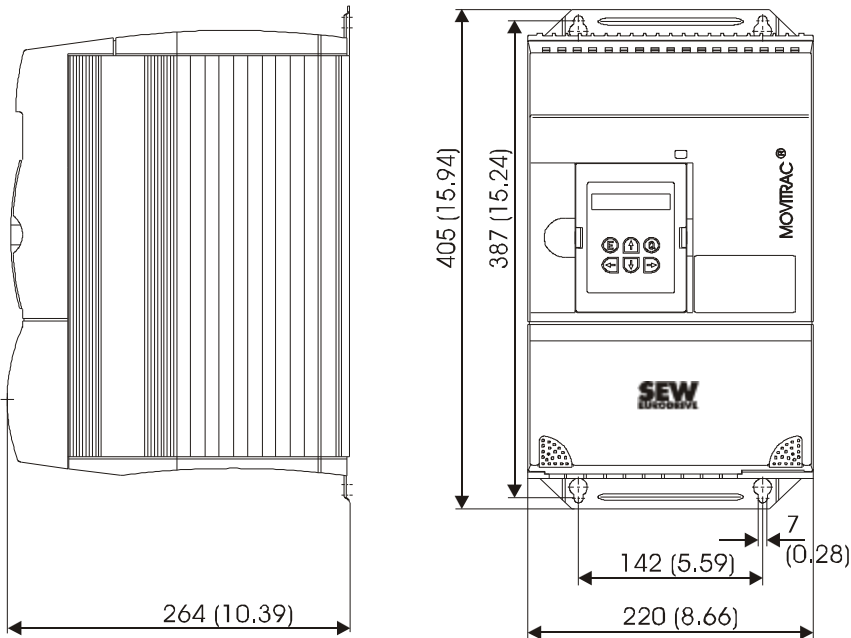
MDX61B size 2S



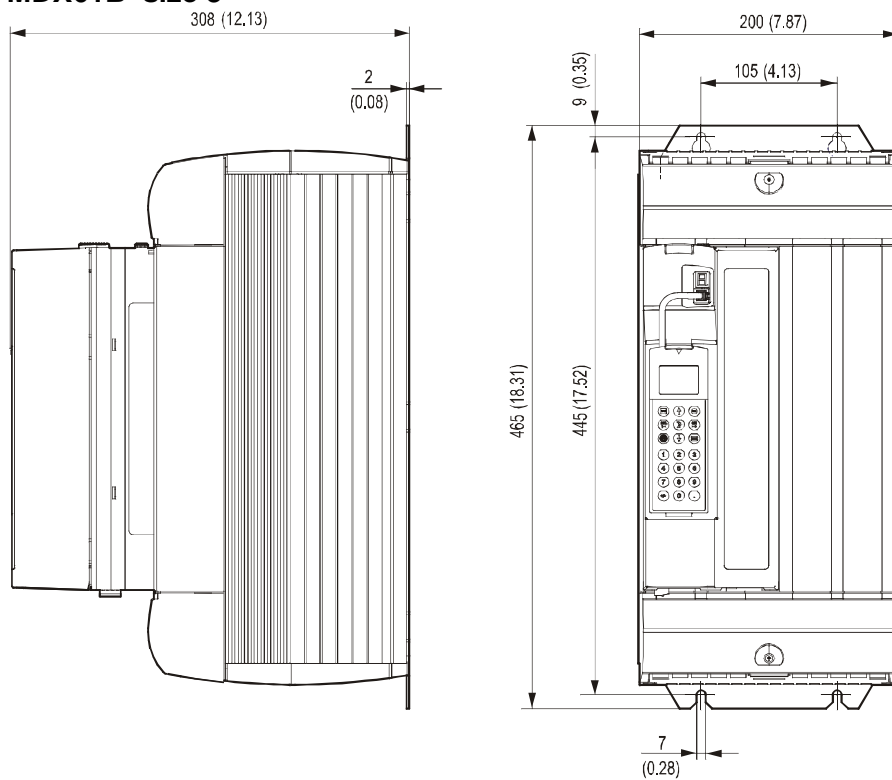
MDX61B size 2



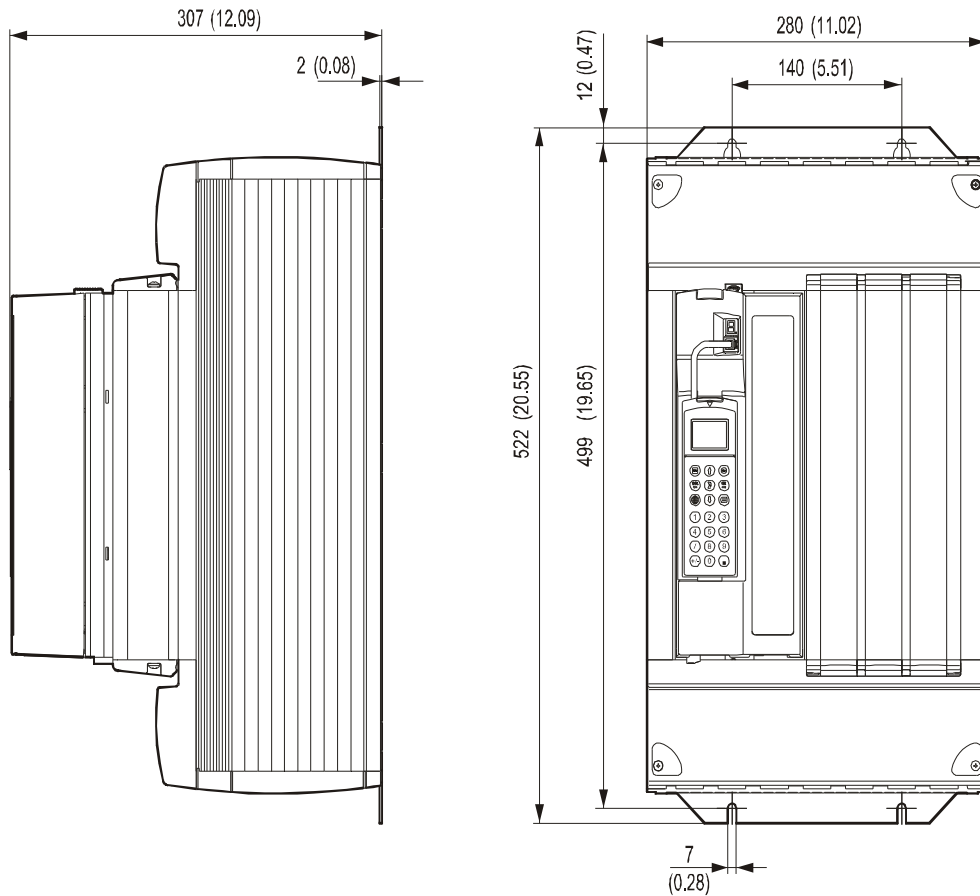
MOVITRAC[®] 31C size 3



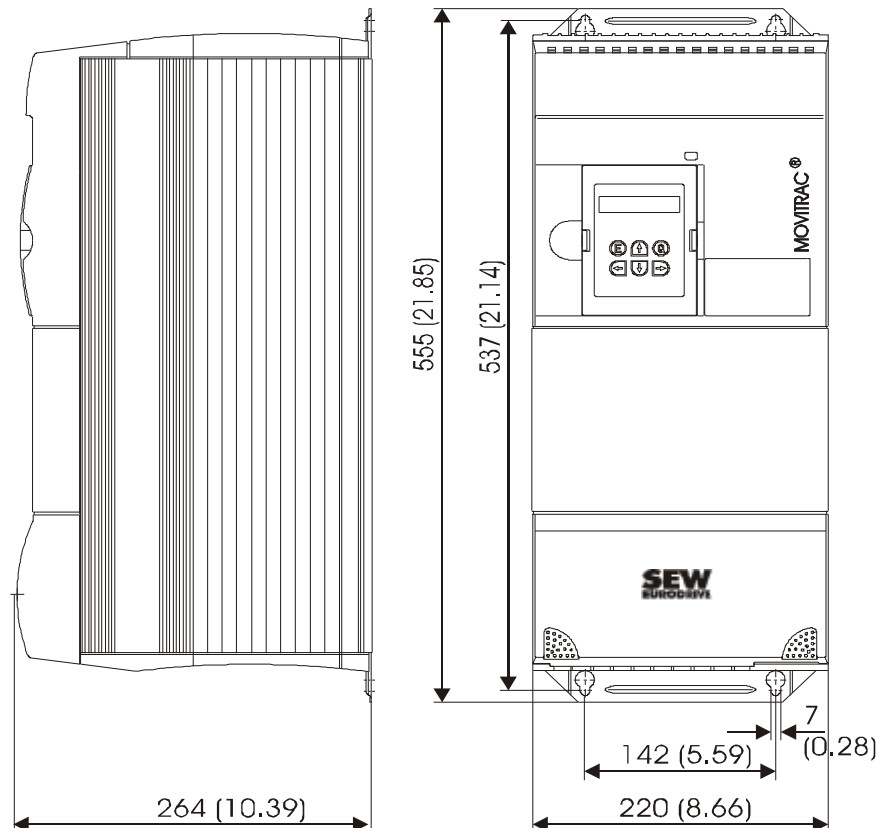
MDX61B size 3



MDX61B size 4

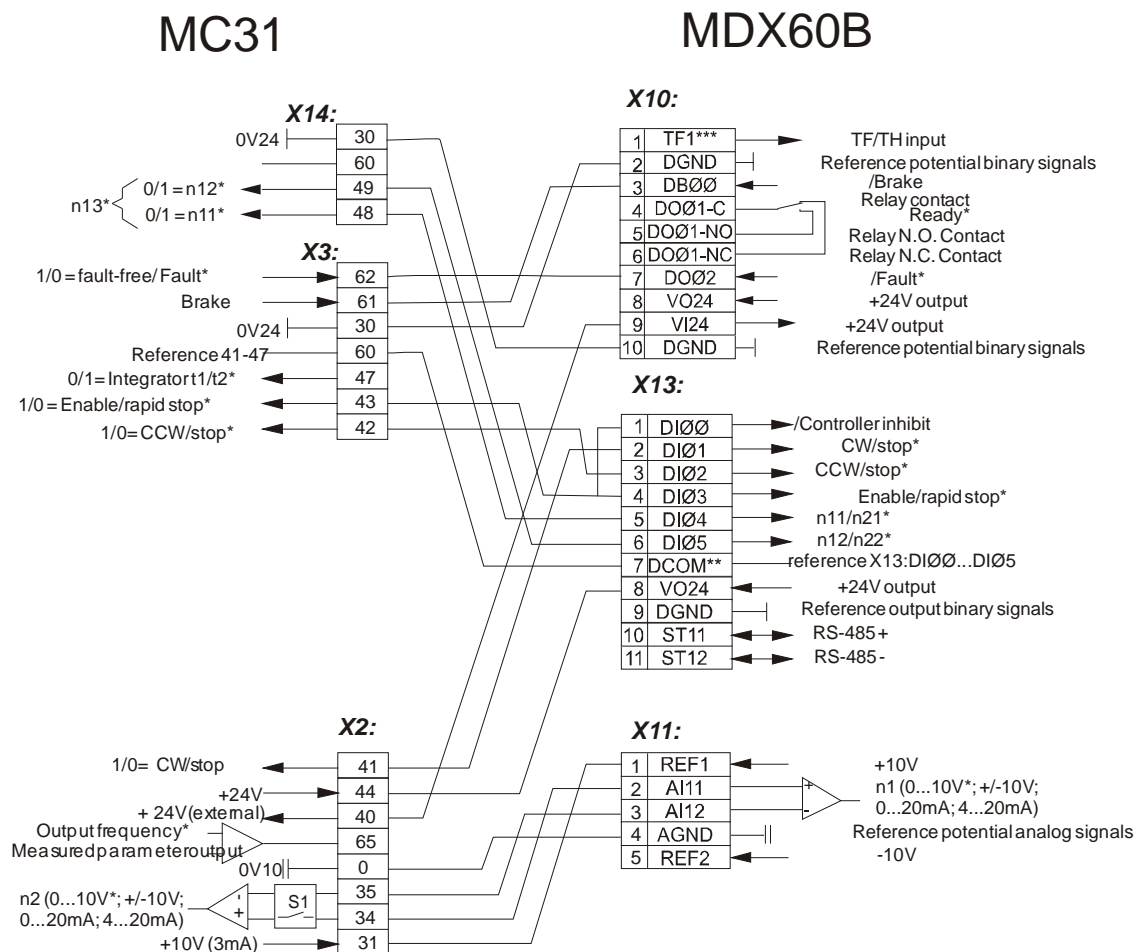


MOVITRAC[®] 31C size 4



3 Terminal Assignment of Standard Unit

The basic unit can be exchanged without any problems in terms of terminal functionality. An exception is the PWM output. This output is not available in the new B unit. The load on the auxiliary supply output may be 200 mA only (formerly 250 mA). The resolution of the setpoint input has improved. The terminal /Controller inhibit (DI01; X13:1) must be connected (e.g. to the enable terminal DI02; X13:4).



4 MOVITRAC^â 31C with Option Cards

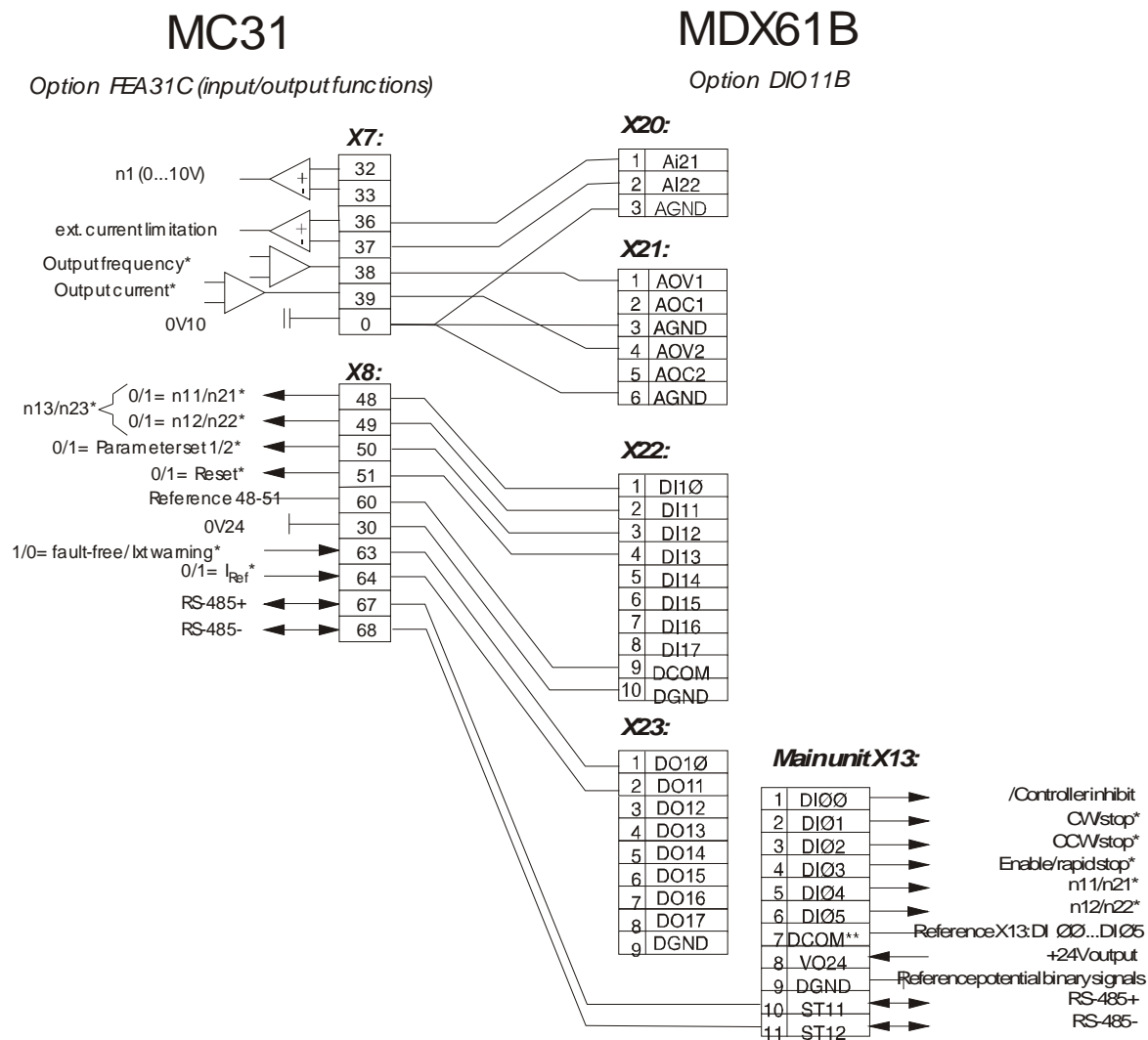
Important: When option cards are used, the MDX61B inverter must be used because the MDX60B cannot be expanded with option cards.

4.1 FEA31C

The B unit comes with RS485 interface as standard. With the option card DIO11B, only one analog input is available. The max. output current of the analog output is now $I_{max}=10mA$ (FEA31C $I_{max}=3mA$).

Binary inputs and outputs remain the same. Additionally IOs are available on the main unit.

The RS485 can be rewired physically. Observe that another protocol is used in this case. The protocol must therefore be adjusted.



4.2 FIO31C

The RS485 interface comes as standard in the B unit. An additional input is available on the basic unit. If FEA31C is only used because of RS485 or a missing input, no additional hardware is now necessary anymore. DIO11B must be used if more inputs/outputs are required.

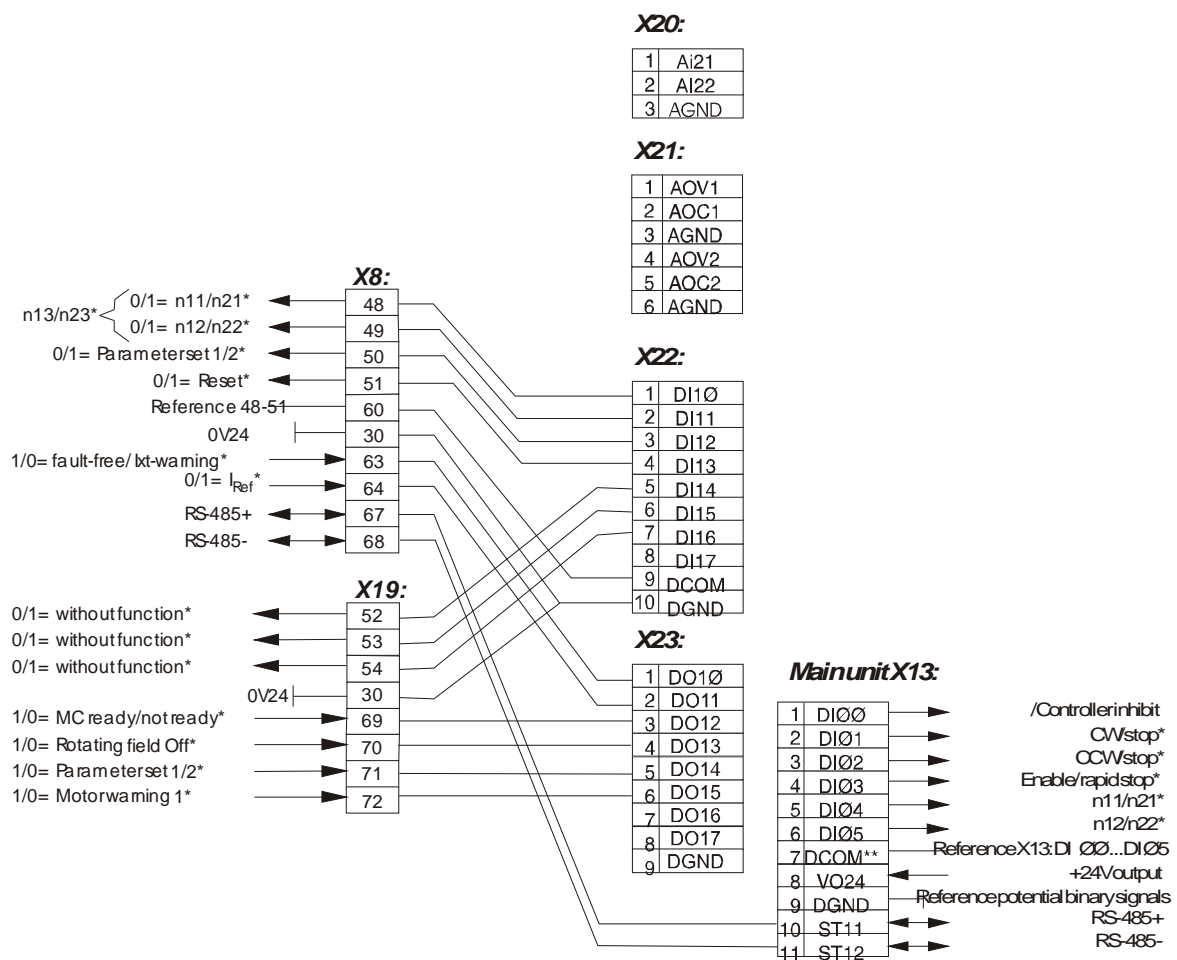
The RS485 can be rewired physically. Another protocol is used in this case. The protocol must therefore be adjusted.

MC31

Option FIO31C (Input/output functions)

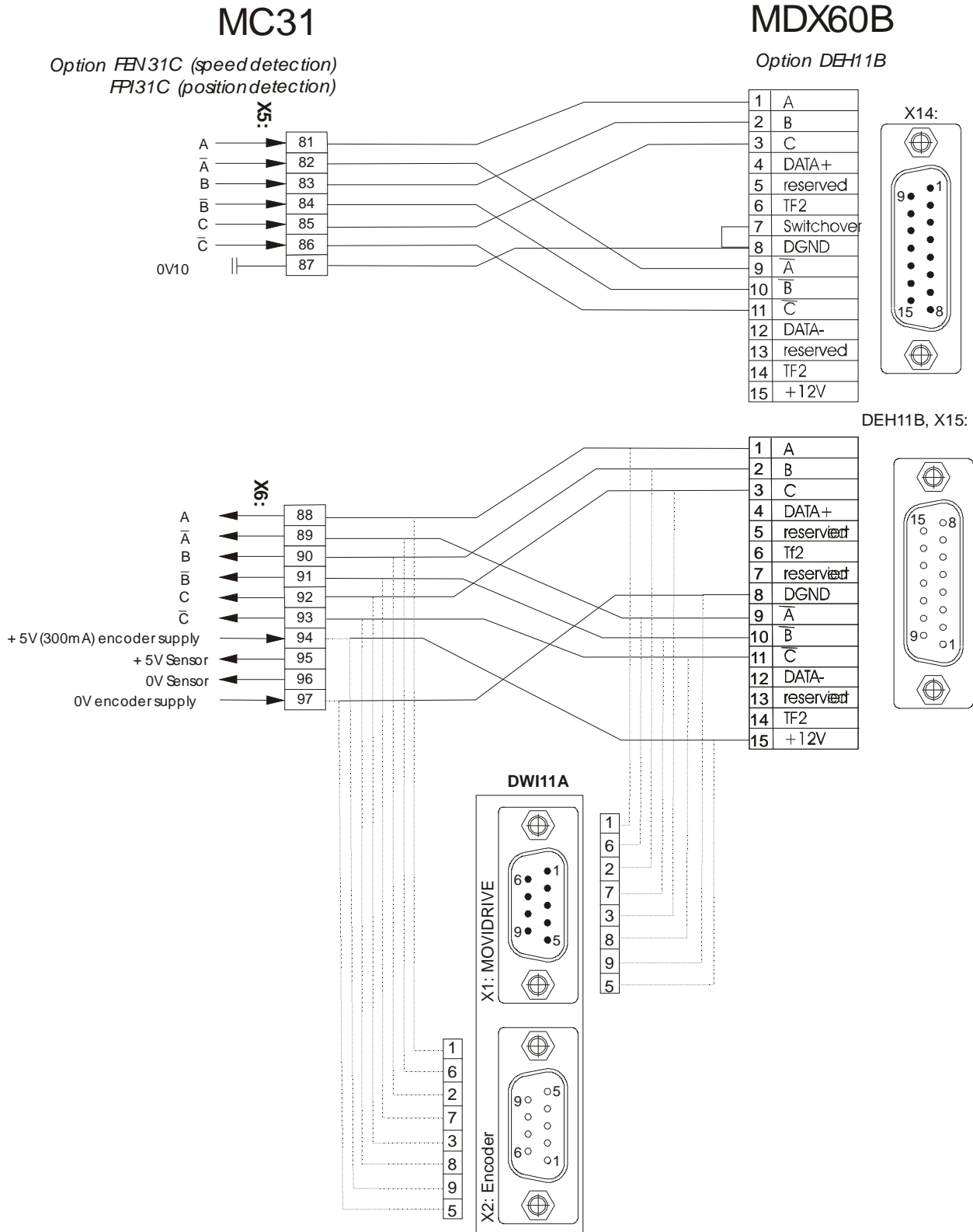
MDX61B

Option DIO11B



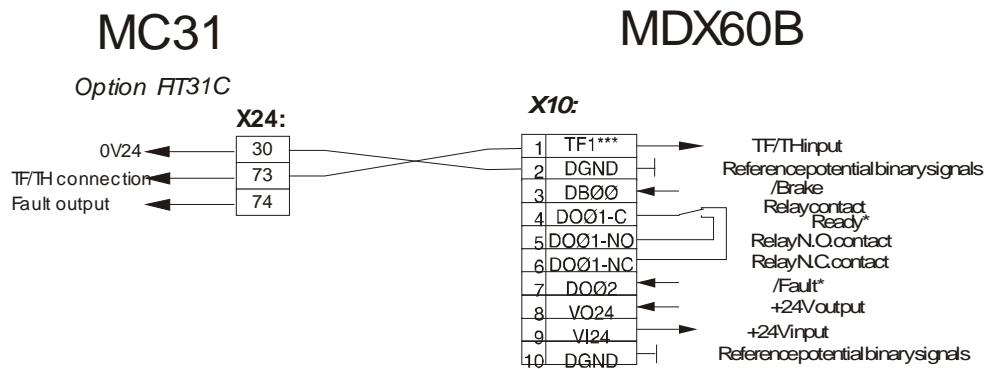
4.3 FEN31C / FPI31C

The DEH11B option card (or DER11B, for resolver input or synchronous servomotors) is required for encoder evaluation as replacement. If an encoder with 5V supply voltage (e.g. ES1T) must be connected, then the DWI11A option is required in addition.



4.4 FIT31C

With the B unit, no additional hardware is required as replacement for the option card FIT31C. The temperature is evaluated as standard in the B unit.



4.5 FRS31

The angular synchronous card is also available as option for the B unit under the name DRS11B. Control is compatible with FRS31 and can be rewired 1:1 without changing the control. For most applications, the internal synchronous operation can be used instead of the synchronous operation card. However, this involves programming and parameter setting effort.

4.6 FPI31 / Positioning with IPOS

IPOS positioning control is integrated in the B unit as standard. All functions known from FPI31, such as reference cam, are available. Instead of changing parameter P770 at the MC31C, the B unit allows for selecting "Positioning with IPOS" already at startup. If startup has already been completed, IPOS can be activated using parameter 700. When doing so, it is important that the operating mode is changed within the group only (VFC-n, CFC, Servo). Else, undesired control characteristics might occur.

5 Parameters

The parameters cannot be directly adopted when changing over to the B unit. As many parameters cannot be entered directly anymore (such as base frequency, rated motor current, motor voltage ...), a startup must be performed with the B unit in the case of changeover.

IPOS parameters that were located under the menu item Parameters with MOVITRAC® 31C, are now accommodated in parameter group 9__ .

Parameter group	MOVITRAC ^â 31C	Parameter group	MOVIDRIVE ^â B
0__	Display values Speed in Hz	0__	Display values Speed in rpm
1__	Setpoints/ramp generators	1__	Setpoints/ramp generators
2__	Characteristic frequency curves	2__	Controller parameters Parameters such as base frequency can now only be set via startup
3__	Motor parameters	3__	Motor parameters The parameters rated current, voltage, etc. can be set via startup only.
4__	Reference values	4__	Reference signals
5__	Monitoring functions	5__	Monitoring functions
6__	Terminal assignment	6__	Terminal assignment
7__	Control functions	7__	Control functions
8__	Special functions	8__	Unit functions
		9__	IPOS parameters

6 Accessories

6.1 Plain text keypad

Two versions are available for the FBG31C keypad for MOVITRAC® 31C with different languages (nine in total). On the DBG60B keypad for MOVIDRIVE® B, all languages are stored on one unit. Languages are selected by pressing a language key. Czech and Russian are in preparation. Both devices allow for saving and copying parameter sets.



6.2 EMC / filters / chokes

MC31C: Complies with interference suppression classes A and B only with EMC module or line filter.

B unit: Units of sizes 0, 1 and 2 come with a line filter as standard. This line filter ensures that class A limit is maintained on the supply side. Use an optional line filter to maintain the class B limit.

6.3 Braking resistors

Some braking resistors used with MOVITRAC® 31C can also be used with MOVIDRIVE® B. For more details, refer to the following table.

Apart from the external braking resistors, the **BW090-P52B** braking resistor can be directly mounted to the MOVIDRIVE® B size 0 unit. This braking resistor is designed for a continuous load with 100 W.

MOVIDRIVE® MDX60/61B...-5A3	MC31C 005-503- 4-00	MC31C 007-503- 4-00	MC31C 011-503- 4-00	MC31C 014-503- 4-00	MC31C 008-503- 4-00	MC31C 015-503- 4-00	MDX60B 0005- 5A3-4-0	MDX60B 0008- 5A3-4-0	MDX60B 0011- 5A3-4-0	MDX60B 0014- 5A3-4-0
Braking resistors										
BW4										
BW072-003										
BW072-005										
BW168										
BW100-006										
BW200-3										
BW200-5										
Line chokes										
ND020-013										
Line filters										
NF009-503										
NF008-443										
NF008-503										
Output chokes										
HD001	für Kabelquerschnitte 1.5 ... 16 mm ² (AWG 16 ... 6)									
HD002	für Kabelquerschnitte = 1.5 mm ² (AWG 16)									
Output filters (only in VFC mode)										
HF008-503		A						A		
HF015-503		B		A		A		B		A
HF022-503				B		B				B
EMC modules										
EF014-503										
EF030-503										

A With rated operation (100 %)

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

	MC31C 015-503- 4-00	MC31C 022-503- 4-00	MC31C 030-503- 4-00	MC31C 040-503- 4-00	MDX60B 0015- 5A3-4-0	MDX60B 0022- 5A3-4-0	MDX60B 0030- 5A3-4-0	MDX60B 0040- 5A3-4-0
Braking resistors								
BW168								
BW268								
BW047-005								
BW147								
BW247								
BW347								
BW68-002								
BW68-004								
BW100-002								
BW100-003								
BW100-005								
BW100-006								
BW200-3								
BW200-5								
Line chokes								
ND020-013								
Line filters								
NF008-443/503								
NF016-443/503								
NF008-503								
NF009-503								A
NF014-503								B
Output chokes								
HD001	For cable cross sections 1.5 ... 16 mm ² (AWG 16 ... 6)							
HD002	for cable cross sections = 1.5 mm ² (AWG 16)							
HD003	for cable cross sections >16 mm ² (AWG 6)							
Output filters (only in VFC mode)								
HF015-503					A			
HF022-503					B	A		
HF030-503						B	A	
HF040-503							B	A
HF055-503								B
EMC modules								
EF014-503								
EF030-503								
EF075-503								

A With rated operation (100 %)

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

	MC31C 055-503- 4-00	MC31C 075-503- 4-00	MC31C 110-503- 4-00	MC31C 150-503- 4-00	MDX60B 0055- 5A3-4-0	MDX60B 0075- 5A3-4-0	MDX60B 0110- 5A3-4-0	MDX60B 0150- 5A3-4-0
Braking resistors								
BW039-012								
BW039-026								
BW039-050								
BW018-015								
BW018-035								
BW018-075								
BW915								
BW047-005								
BW147								
BW247								
BW347								
Line chokes								
ND020-013								
ND045-013								
Line filters								
NF016-443/503								
NF025-443/503								
NF036-443/503								
NF014-503						A		
NF018-503						B		
NF035-503								A
NF048-503								B
Output chokes								
HD001	For cable cross sections 1.5 ... 16 mm ² (AWG 16 ... 6)							
HD002	for cable cross sections = 1.5 mm ² (AWG 16)							
HD003	for cable cross sections >16 mm ² (AWG 6)							
Output filters (only in VFC mode)								
HF055-503					A			
HF075-503					B	A		
HF023-403						B	A	
HF033-403							B	A
HF047-403								B
EMC modules								
EF075-503								
EF220-503								

A With rated operation (100 %)

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

	MC31C 220-503- 4-00	MC31C 300-503- 4-00	MC31C 370-503- 4-00	MC31C 450-503- 4-00	MDX60B 0220- 5A3-4-0	MDX60B 0300- 5A3-4-0	MDX60B 0370- 5A3-4-0	MDX60B 0450- 5A3-4-0
Braking resistors								
BW012-025								
BW012-050								
BW012-100								
BW018-015				2x			C	C
BW018-035				2x			C	C
BW018-075				2x			C	C
BW915								
BW106								
BW206								
Line chokes								
ND045-013					A			
ND085-013					B			A
ND1503								B
Line filters								
NF050-443/503								
NF080-443/503								
NF110-443/503								
NF048-503					A			
NF063-503					B	A		
NF085-503						B		A
NF115-503								B
Output chokes								
HD001	For cable cross sections 1.5 ... 16 mm ² (AWG 16 ... 6)							
HD002	for cable cross sections = 1.5 mm ² (AWG 16)							
HD003	for cable cross sections >16 mm ² (AWG 6)							
Output filters (only in VFC mode)								
HF033-403					B/D	A/D		
HF047-403					A			
HF450-503						B		E
EMC modules								
EF220-503								
EF450-503								

A With 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 on F16

6.4 Motor cable lengths

The maximum permitted motor cable lengths are the same for MOVITRAC® 31C and MOVIDRIVE® B units of all sizes. The tables of MOVITRAC® 31C also apply to the MOVIDRIVE® B unit (MOVIDRIVE® B CFC operating mode and servo limited to 100m. Operating modes do not exist in MC31C).

6.5 Serial interface

For MOVITRAC® 31C, the USS21A was available as interface converter RS232/RS485. For MOVIDRIVE® B, the UWS21A interface converter is required. An additional interface exists for converting USB/RS485.

6.6 Programming interfaces (MCDTOOLS / MOVITOOLS / IPOS)

For MOVITRAC® 31C, the MCDTOOLS program package is available as user interface. In terms of functionality, this program package only differs slightly from the subsequent program package MOVITOOLS. All functions known from MCDTOOLS also exist in MOVITOOLS. The major novelty is the compiler which allows to create simple and complex programs in a programming structure that is similar to C.

Assembler programs generated with MCDTOOLS (IPOS) cannot be directly adopted in MOVITOOLS but must be re-programmed. The reason is that there are different instruction sets, which have increased in complexity in MOVITOOLS and are not compatible with MCDTOOLS. But many complex and frequently demanded requirements are included in the technology B unit as application and just require an adjusted parameter setting instead of lengthy programming. The parameters are easily set using the software wizard. Another advantage is that the B unit has another task apart from tasks 1 and 2, which offers new options for IPOS programming. It is important that task 3 does not have a fixed time sharing division but depends on the utilization of tasks 1 and 2.

Startup of the B unit is considerably easier for the user than startup of MC31C. With MC31C, the parameters must be set individually via the *Startup* selection menu. This window contains all important parameters for startup. Values in other parameter groups must only be set for special functions. With MOVIDRIVE® B, a startup wizard is selected via the *Startup* selection menu. The wizard makes startup easy for the user as the motor data is adopted from MOVITOOLS via a selection list from SEW motors. If non-SEW motors are used, the data can still be entered manually. When operating an SEW motor with HIPERFACE encoder, the electronic nameplate is read and is used automatically. Settings are then recommended by indicating application parameters. The user can directly accept these settings. Startup is complete when the parameters are downloaded to the inverter.

7 Useful Tips

7.1 Terminals /Controller inhibit and enable

With the B unit, /Controller inhibit is assigned to terminal DI00 in addition to the enable terminal (terminal 43 with MC31, and DI03 with MDx). The terminal function cannot be changed and must be set for the operation of the inverter. The enable terminal DI03 can be re-programmed using MOVITOOLS. The motor coasts to a halt without control if the /Controller inhibit terminal is set from HI to LO. Withdrawing the Enable terminal decelerates the motor at the rapid stop ramp to zero.

7.2 Hoist

For hoist applications it is important that this application is selected at startup. For the B unit, the smallest speed with activated hoist function is $n_{\min}=15 \text{ min}^{-1}$ even if the setting of P301 and P311 is different.

It is recommended for hoist applications to use an external braking resistor. BW4 should not be used in this application if possible.

7.3 Reference parameters for the respective inverters

- Ramps: With MOVITRAC[®], the reference parameter for ramps is 50 Hz, for MOVIDRIVE[®] 3000 min^{-1} . If other frequencies or rated speeds are used, they must be taken into account accordingly.
- Slip: With the MC31C, the name of the parameter P323 is not the slip itself as the name indicates but the slip frequency f_s . For MOVIDRIVE[®], the slip speed n_{slip} is entered.

MC31C		MDX60B/MDX61B	
P12_, P13_, P14_	$t_{\text{einzustellen}} = \frac{50\text{Hz}}{\Delta f} t_{\text{gefordert}}$	P13_, P14_	$t_{\text{einzustellen}} = \frac{3000 \text{ min}^{-1}}{\Delta n} t_{\text{gefordert}}$
P323, P343	$f_{\text{schlupf}} = \frac{n_{\text{synchron}} - n_{\text{nenn}}}{60} p$	P324, P334	$n_{\text{schlupf}} = n_{\text{synchron}} - n_{\text{nenn}}$

Legend:

Einzustellen = to be set

Gefordert = required

Nenn = rated

Schlupf = slip

This results in the following conversion of the ramps of MC31C to MDX6_B :

$$t_{\text{MDX_B}} = \frac{2}{p} t_{\text{MC31C}}$$

And for the conversion of the slip of MC31C to MDX6_B:

$$n_{\text{schlupfMDX6_B}} = \frac{60}{p} f_{\text{schlupfMC31C}}$$

7.4 IPOS terminals

If terminals are to be used for an IPOS program, it is important that the functions *IPOS* or *No function* are assigned to the terminals in parameters 6__ . Basically both is possible, but it is recommended to assign *IPOS* to terminals that are actually used with IPOS to allow that it is obvious in later modifications that this terminal has a program function.

7.5 Setting the correct baud rate

When using MOVITOOLS with the B unit, it is important that the baud rate set using DIP switches and the baud rate set in MOVITOOLS are identical.

8 Summary

It is basically possible to replace a MOVITRAC® 31C unit with a MOVIDRIVE® B unit. The control cabinet should be modified due to the different inverter designs and different terminal positions. The modified maximum motor cable lengths must be observed in any case.

Apart from the known functions of the MC31C, the MDX60/MDX61 B unit has new functions that can improve the performance of applications. Startup must be performed in any case because some parameters can only be set at startup.

A new interface converter (UWS21A) and the new MOVITOOLS software are required as basic equipment.