



Addendum to the Operating Instructions



Application Inverter
MOVIDRIVE® modular
MOVILINK® DDI



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1 General information

INFORMATION



The present addendum describes amendments to the content of the operating instructions regarding the MDA90A and MDD91A axis modules.

The present document is an addendum to the "MOVIDRIVE® modular Application Inverter" operating instructions.

The additional information in this addendum describes the MOVILINK® DDI interface that is available with the MDA90A and MDD91A axis modules.

INFORMATION



The connection at the MOVILINK® DDI interface X16 is only permitted in combination with the coaxial cable that is available from SEW-EURODRIVE.

2 Device structure

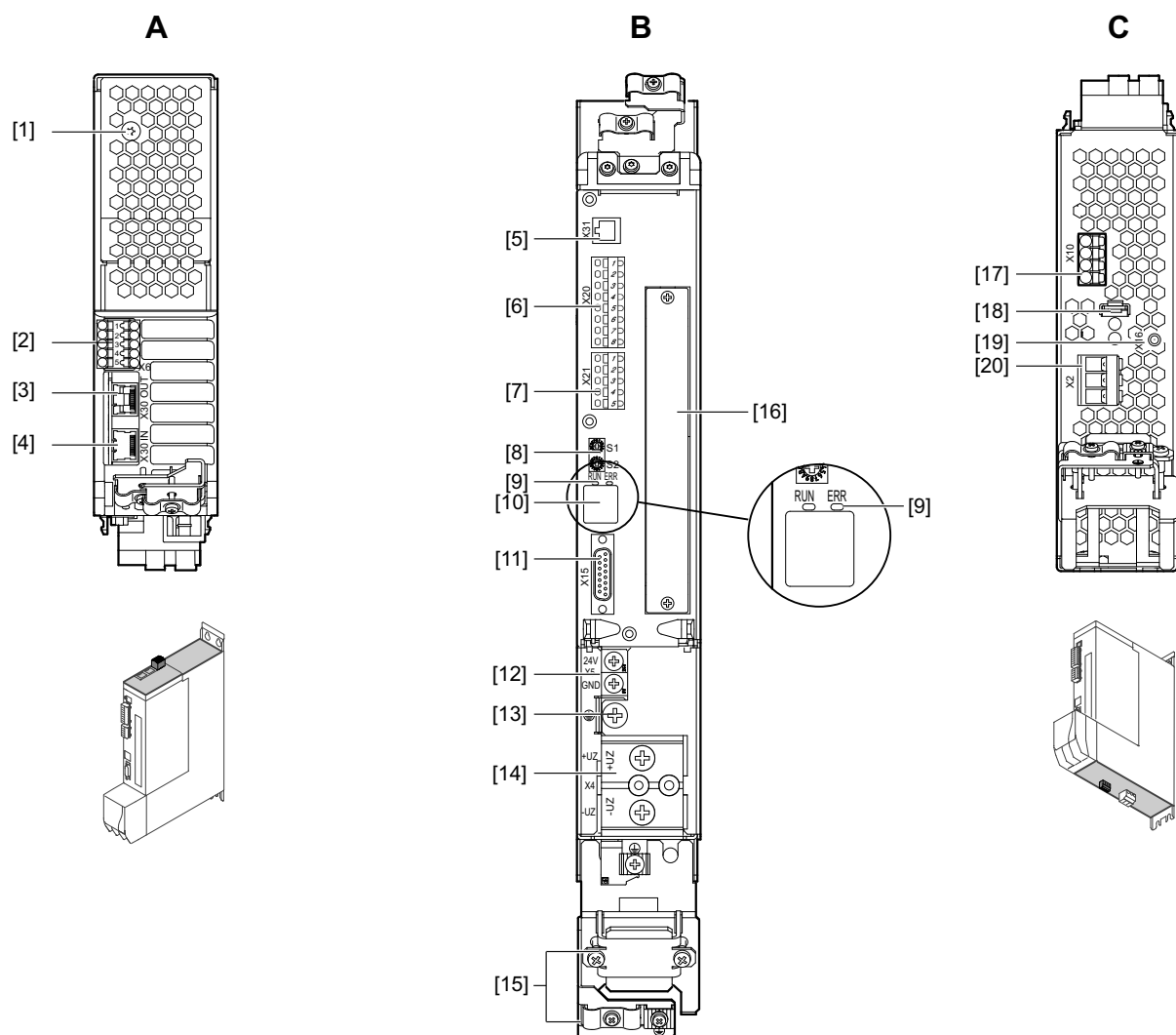
2.1 MOVIDRIVE® modular type code

The following type code applies to MOVIDRIVE® modular.

Example: MDA90A-0080-503-X-S00		
Product family	MD	MD = MOVIDRIVE®
Device type	A	- A = Single-axis module - C = Capacitor module - D = Double-axis module - P = Power supply module with brake chopper - S = Switched-mode power supply module with AC and DC supply - M = Master module UHX45A/MDM90A
Series	90	90 = Standard design 91 = Double-axis module with MOVILINK® DDI
Version	A	A = Version status A
Performance class	0080	- MDA: Nominal output current – e.g. 0080 = 8 A - MDD: Nominal output current – e.g. 0020 = 2 × 2 A - MDP: Nominal power – e.g. 0100 = 10 kW
Connection voltage	5	5 = AC 380 – 500 V
EMC variants of the power section	0	0 = Basic interference suppression integrated
Connection type	3	3 = 3-phase connection type
Operating mode	X	4 = 4-quadrant operation (with brake chopper) - X = Not relevant
Device variant	0	0 = Not relevant - S = Control MOVI-C® CONTROLLER - C = Power supply module with integrated braking resistor and capacitor - E = Inverter with device profile CiA402
Designs	00	00 = Standard design
Options		01 = Axis module MDA90A-0640-.. in size 5 /X = MOVIDRIVE® modular without card slots /L = Design with coated printed circuit boards The following list serves as an example: /CES11A = Multi-encoder card /CID21A, /CIO21A = I/O expansion card /CS..A = Safety card

2.2 Device structure of the MDA axis modules

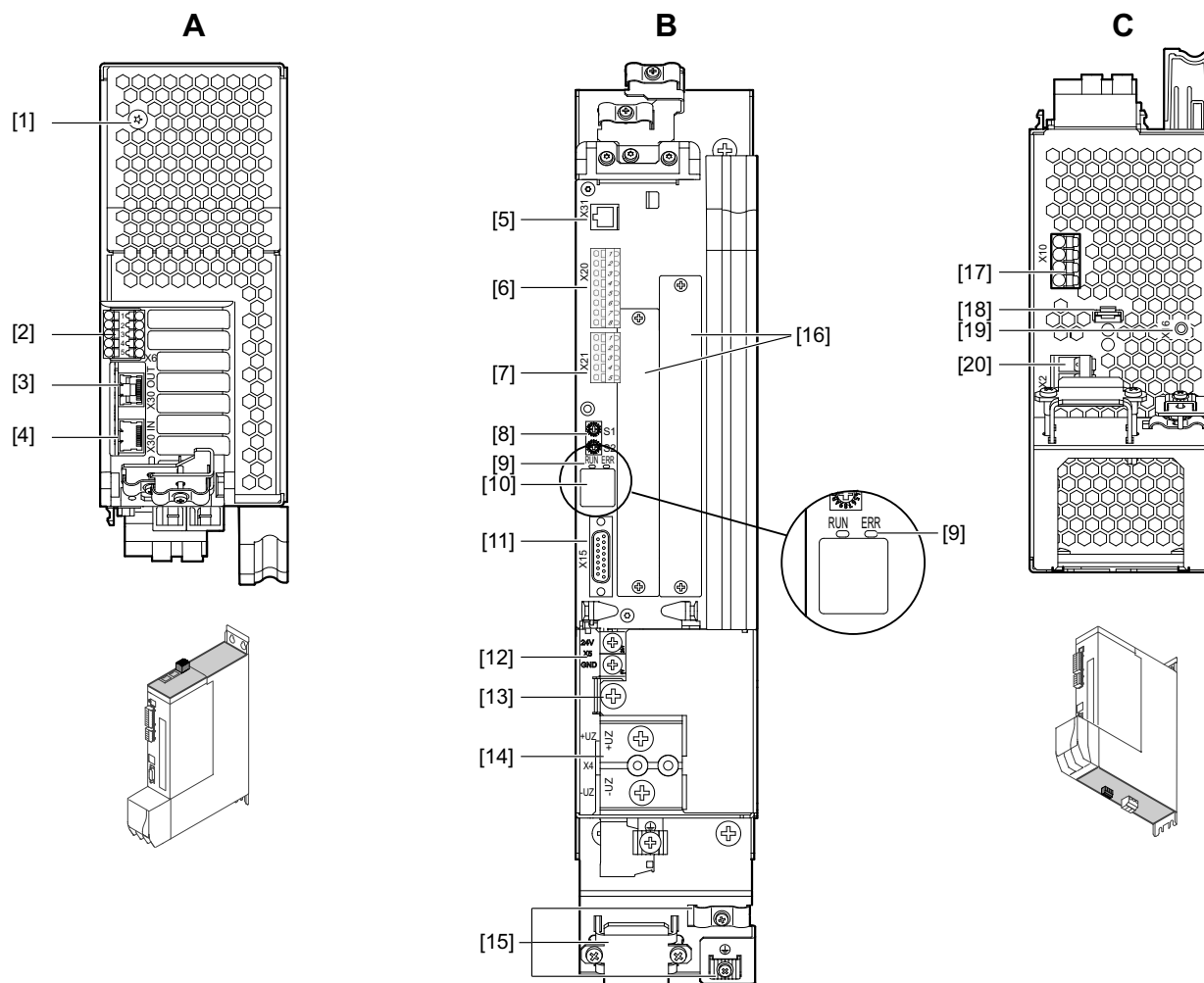
2.2.1 MDA90A-0020, 0040, 0080, 0120 (size 1) – Single-axis module



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A: View from top		B: View from front		C: View from bottom	
[1]	EMC: Terminal screw for TN/TT systems	[5]	X31: SEW-EURODRIVE Service interface	[17]	X10: Brake control and motor temperature monitoring
[2]	X6: Connection for Safe Torque Off (STO)	[6]	X20: Digital inputs	[18]	PE connection housing
[3]	X30 OUT: System bus	[7]	X21: Digital outputs	[19]	X16: MOVILINK® DDI connection
[4]	X30 IN: System bus	[8]	EtherCAT® ID switch	[20]	X2: Motor connection
		[9]	Status LEDs EtherCAT®/SBus ^{PLUS} "RUN", "ERR"		
		[10]	7-segment display		
		[11]	X15: Motor encoder connection		
		[12]	X5: Connection +24 V supply voltage		
		[13]	PE connection		
		[14]	X4: DC link busbar		
		[15]	Shield plate		
		[16]	Card slot		

2.2.2 MDA90A-0160, 0240 (size 2) – Single-axis module



36028809932028555

A: View from top

- [1] EMC: Terminal screw for TN/TT systems
- [2] X6: Connection for Safe Torque Off (STO)
- [3] X30 OUT: System bus
- [4] X30 IN: System bus

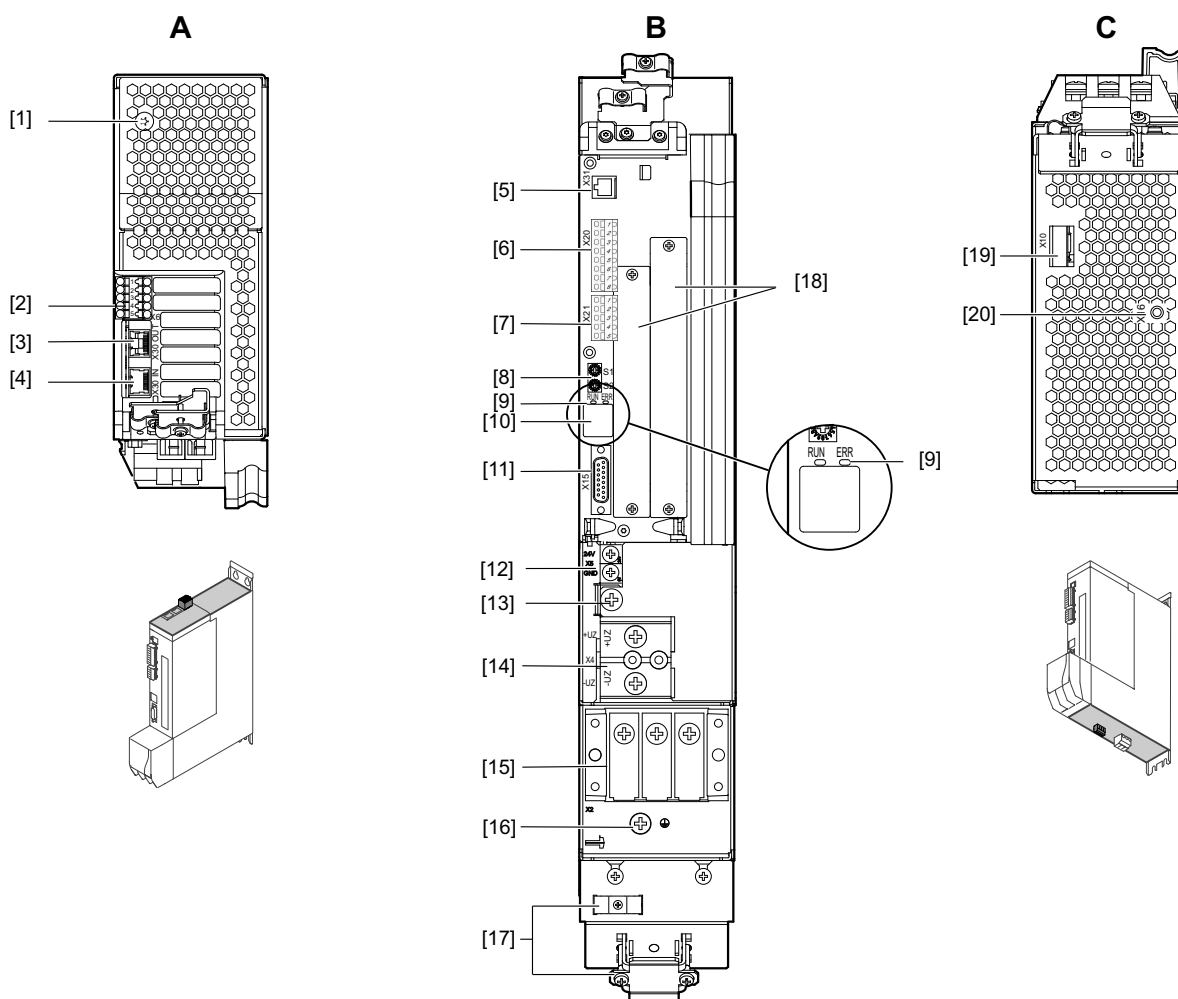
B: View from front

- [5] X31: SEW-EURODRIVE Service interface
- [6] X20: Digital inputs
- [7] X21: Digital outputs
- [8] EtherCAT® ID switch
- [9] Status LEDs EtherCAT®/SBus^{PLUS} "RUN", "ERR"
- [10] 7-segment display
- [11] X15: Motor encoder connection
- [12] X5: Connection +24 V supply voltage
- [13] PE connection
- [14] X4: DC link busbar
- [15] Shield plate
- [16] Card slots

C: View from bottom

- [17] X10: Brake control and motor temperature monitoring
- [18] PE connection housing
- [19] X16: MOVILINK® DDI connection
- [20] X2: Motor connection

2.2.3 MDA90A0-320, 0480 (size 3) – Single-axis module



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A: View from top

- [1] EMC: Terminal screw for TN/TT systems
- [2] X6: Connection for Safe Torque Off (STO)
- [3] X30 OUT: System bus
- [4] X30 IN: System bus

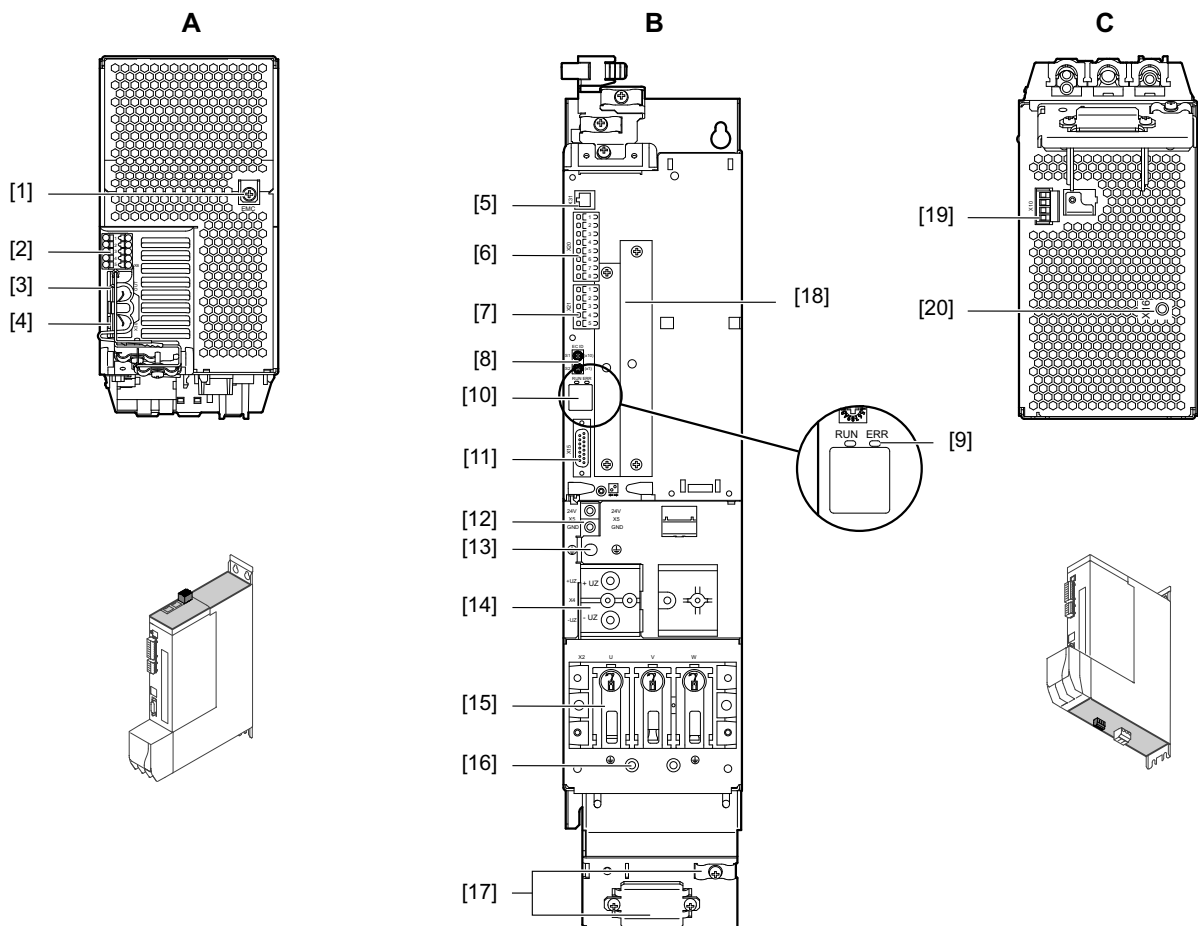
B: View from front

- [5] X31: SEW-EURODRIVE Service interface
- [6] X20: Digital inputs
- [7] X21: Digital outputs
- [8] EtherCAT® ID switch
- [9] Status LEDs EtherCAT®/SBus^{PLUS} "RUN", "ERR"
- [10] 7-segment display
- [11] X15: Motor encoder connection
- [12] X5: Connection +24 V supply voltage
- [13] PE connection
- [14] X4: DC link busbar
- [15] X2: Motor connection
- [16] PE connection housing
- [17] Shield plate
- [18] Card slots

C: View from bottom

- [19] X10: Brake control and motor temperature monitoring
- [20] X16: MOVILINK® DDI connection

2.2.4 MDA90A0-0640 (size 4) – Single-axis module



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A: View from top

- [1] EMC: Terminal screw for TN/TT systems
- [2] X6: Connection for Safe Torque Off (STO)
- [3] X30 OUT: System bus
- [4] X30 IN: System bus

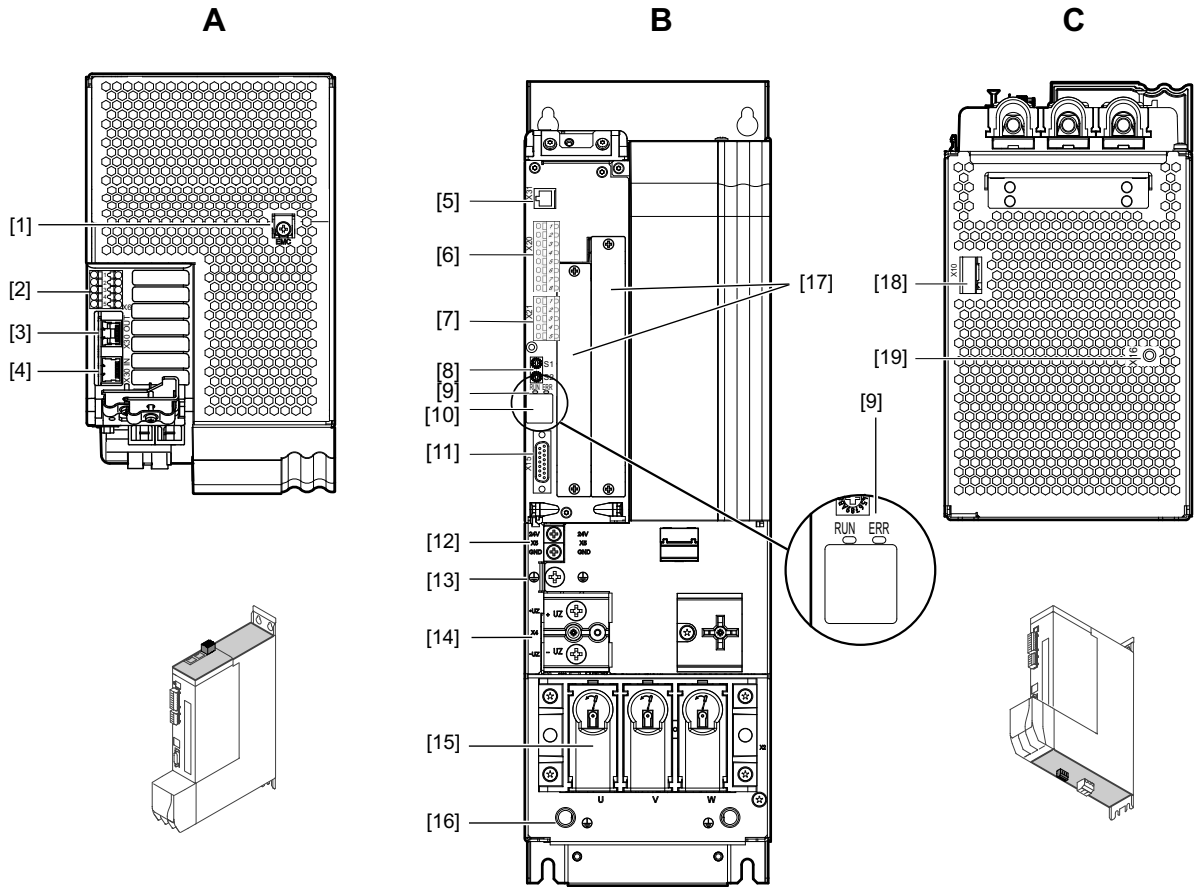
B: View from front

- [5] X31: SEW-EURODRIVE Service interface
- [6] X20: Digital inputs
- [7] X21: Digital outputs
- [8] EtherCAT® ID switch
- [9] Status LEDs EtherCAT®/SBus^{PLUS} "RUN", "ERR"
- [10] 7-segment display
- [11] X15: Motor encoder connection
- [12] X5: Connection +24 V supply voltage
- [13] PE connection
- [14] X4: DC link busbar
- [15] X2: Motor connection
- [16] PE connection housing
- [17] Shield plate
- [18] Card slots

C: View from bottom

- [19] X10: Brake control and motor temperature monitoring
- [20] X16: MOVILINK® DDI connection

2.2.5 MDA90A-0640, 1000 (size 5) – Single-axis module



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A: View from top

- [1] EMC: Terminal screw for TN/TT systems
- [2] X6: Connection for Safe Torque Off (STO)
- [3] X30 OUT: System bus
- [4] X30 IN: System bus

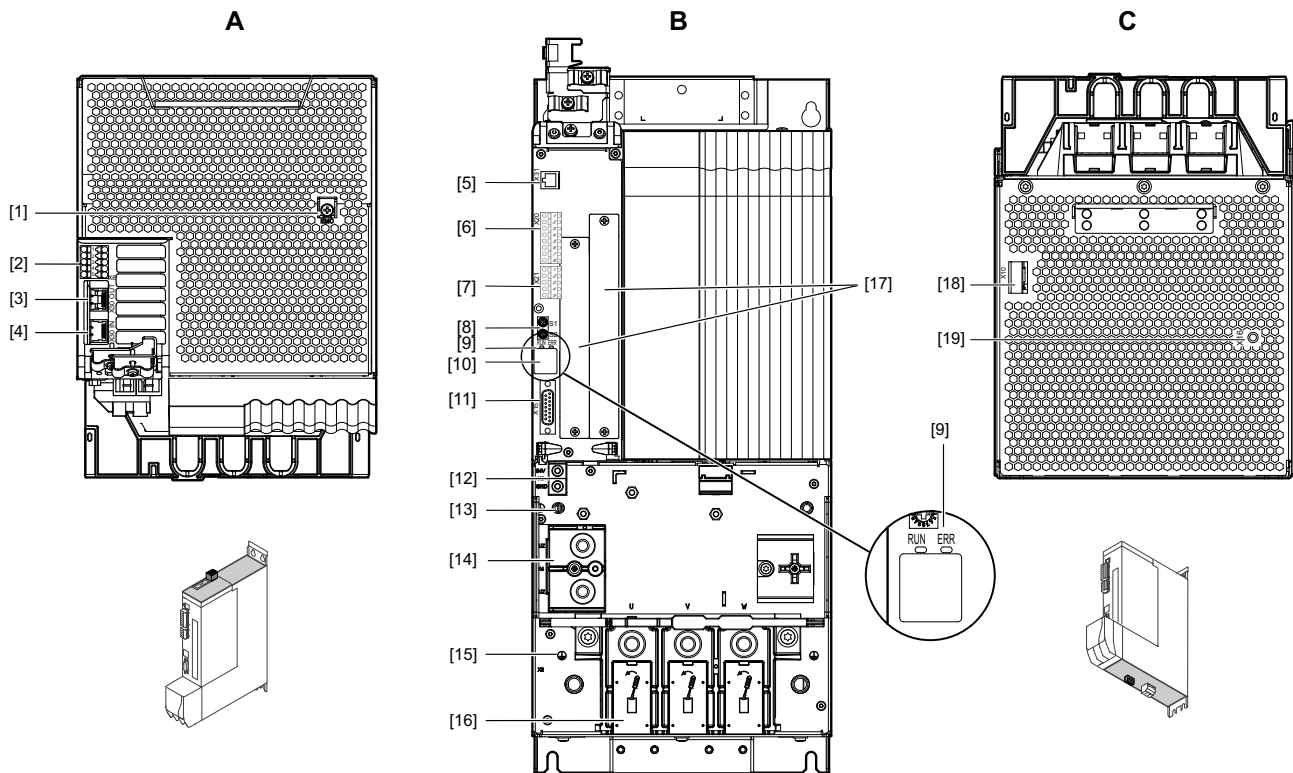
B: View from front

- [5] X31: SEW-EURODRIVE Service interface
- [6] X20: Digital inputs
- [7] X21: Digital outputs
- [8] EtherCAT® ID switch
- [9] Status LEDs EtherCAT®/SBus^{PLUS} "RUN", "ERR"
- [10] 7-segment display
- [11] X15: Motor encoder connection
- [12] X5: Connection +24 V supply voltage
- [13] PE connection
- [14] X4: DC link busbar
- [15] X2: Motor connection
- [16] PE connection housing
- [17] Card slots

C: View from bottom

- [18] X10: Brake control and motor temperature monitoring
- [19] X16: MOVILINK® DDI connection

2.2.6 MDA90A-1400, 1800 (size 6) – Single-axis module



18014418615506059

A: View from top

- [1] EMC: Terminal screw for TN/TT systems
- [2] X6: Connection for Safe Torque Off (STO)
- [3] X30 OUT: System bus
- [4] X30 IN: System bus

B: View from front

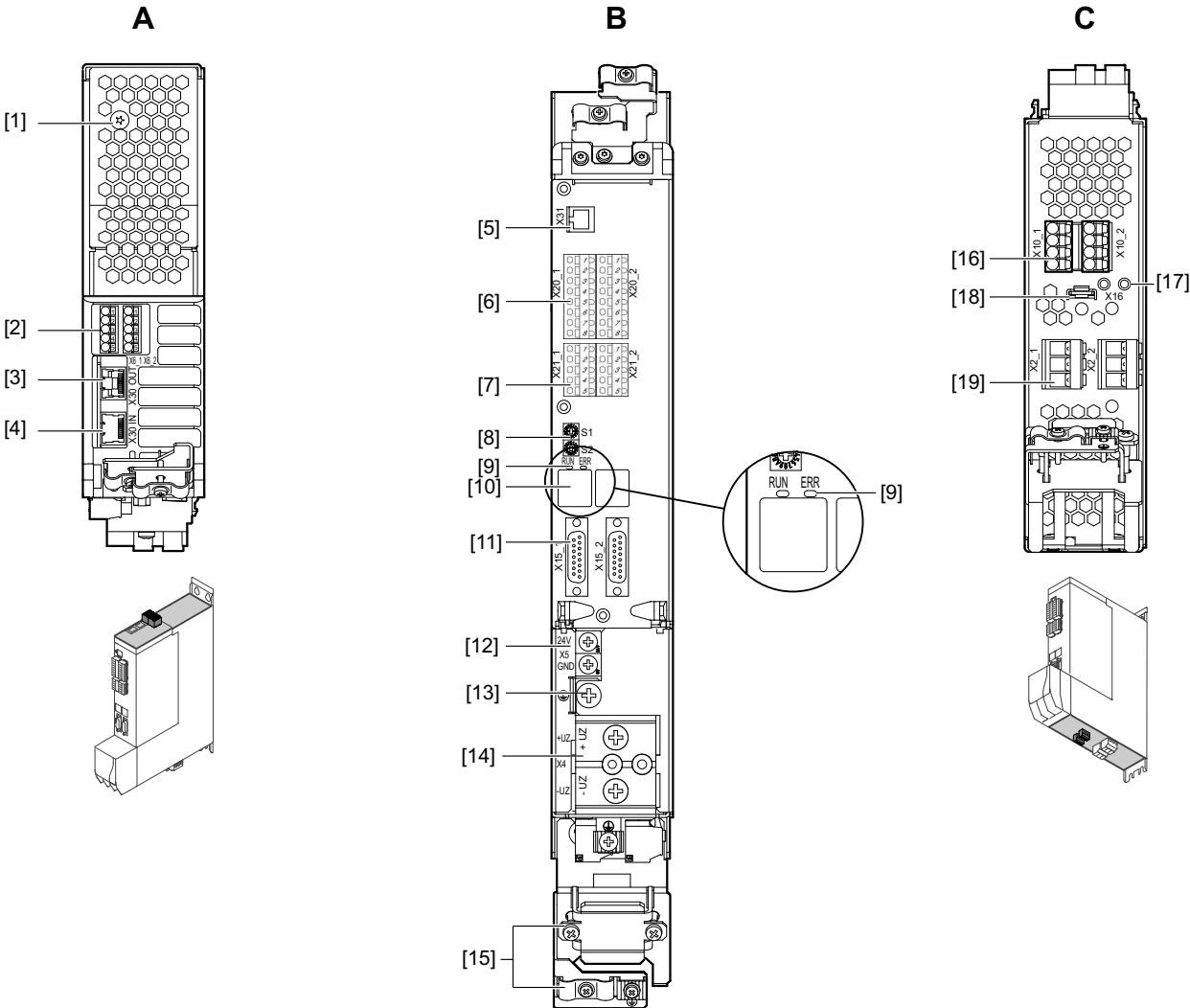
- [5] X31: SEW-EURODRIVE Service interface
- [6] X20: Digital inputs
- [7] X21: Digital outputs
- [8] EtherCAT® ID switch
- [9] Status LEDs EtherCAT®/SBus^{PLUS} "RUN", "ERR"
- [10] 7-segment display
- [11] X15: Motor encoder connection
- [12] X5: Connection +24 V supply voltage
- [13] PE connection
- [14] X4: DC link busbar
- [15] PE connection housing
- [16] X2: Motor connection
- [17] Card slots

C: View from bottom

- [18] X10: Brake control and motor temperature monitoring
- [19] X16: MOVILINK® DDI connection

2.3 Device structure of the MDD9.A double-axis modules

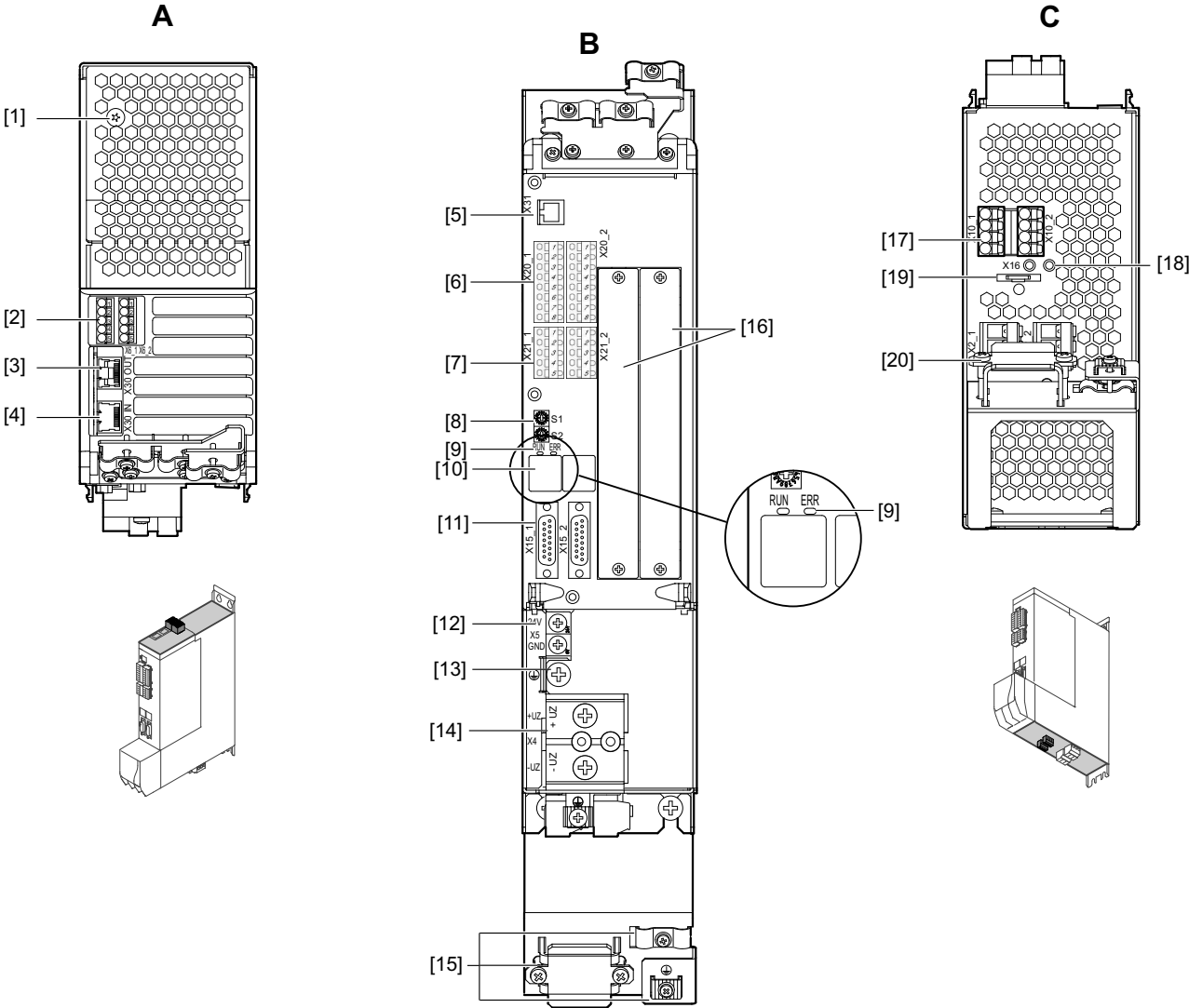
2.3.1 MDD9.A-0020, 0040 (size 1) – Double-axis module



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A: View from top		B: View from front	C: View from bottom
[1]	EMC: Terminal screw for TN/TT systems	[5] X31: SEW-EURODRIVE Service interface	[16] X10: 2 × brake control and temperature monitoring motor
[2]	X6: 2 × connection for safe disconnection (STO)	[6] X20: 2 × digital inputs	[17] X16: Connection MOVILINK [®] DDI with MDD91A
[3]	X30 OUT: System bus	[7] X21: 2 × digital outputs	[18] PE connection housing
[4]	X30 IN: System bus	[8] EtherCAT [®] ID switch	[19] X2: 2 × motor connection
		[9] Status LEDs EtherCAT [®] /SBus ^{PLUS} "RUN", "ERR"	
		[10] 2 × 7-segment display	
		[11] X15: 2 × motor encoder connection with MDD90A	
		[12] X5: Connection +24 V supply voltage	
		[13] PE connection	
		[14] X4: DC link busbar	
		[15] Shield plate	

2.3.2 MDD9.A-0020, 0040, 0080 (size 2) – Double-axis module



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A: View from top		B: View from front	C: View from bottom
[1]	EMC: Terminal screw for TN/TT systems	[5] X31: SEW-EURODRIVE Service interface	[17] X10: 2 × brake control and temperature monitoring motor
[2]	X6: 2 × connection for safe disconnection (STO)	[6] X20: 2 × digital inputs	[18] X16: Connection MOVILINK [®] DDI with MDD91A
[3]	X30 OUT: System bus	[7] X21: 2 × digital outputs	[19] PE connection housing
[4]	X30 IN: System bus	[8] EtherCAT [®] ID switch	[20] X2: 2 × motor connection
		[9] Status LEDs EtherCAT [®] /SBus ^{PLUS} "RUN", "ERR"	
		[10] 2 × 7-segment display	
		[11] X15: 2 × motor encoder connection with MDD90A	
		[12] X5: Connection +24 V supply voltage	
		[13] PE connection	
		[14] X4: DC link busbar	
		[15] Shield plate	
		[16] Card slots	

3 Technical data

3.1 Marks

3.1.1 Basic device

The MOVIDRIVE® modular application inverter complies with the following regulations and guidelines:

Mark	Definition
	The CE mark states the compliance with the following European guidelines: • Low Voltage Directive 2014/35/EU • EMC Directive 2014/30/EU • Machinery Directive 2006/42/EC • Directive 2011/65/EU for limiting the use of hazardous substances in electric and electronic equipment
	Waste disposal of this product must be in compliance with the WEEE directive 2012/19/EU.
	The EAC mark states compliance with the requirements of the technical regulations of the Customs Union of Russia, Kazakhstan, and Belarus.
	The RCM mark states compliance with the technical regulations of the Australian Communications and Media Authority ACMA.
	The China RoHS mark states compliance with directive SJ/T 11364-2014 for limiting the use of hazardous substances in electric and electronic equipment and their packaging.
	The UL and cUL mark states the UL approval. cUL is equivalent to CSA approval.

3.2 Electronics data – Signal terminals

	Terminal designation		Specifications
	Single-axis module	Double-axis module	
General			
Design			In accordance with IEC 61131-2
Supply voltage			
Connection	X5		External power supply 24 V in accordance with IEC 61131 ¹⁾
Connection	X5		CU busbars
Digital inputs			
Cycle time I/O			1 ms
Number			6
Response time			100 µs plus cycle time
Assignment	X20: 1 – 6	X20_1: 1 – 6 X20_2: 1 – 6	DI00: "Output stage enable" permanently assigned. DI01 – DI05: For the selection option, see the parameter menu. All 6 inputs are suitable for Touchprobe function. Latency period < 100 µs, max. 2 simultaneously. DI04, DI05: Connection HTL low-resolution encoder (only MDA).
	X20: 7	X20_1: 7 X20_2: 7	GND
	X20: 8	X20_1: 8 X20_2: 8	+24 V supply voltage Maximum output current = 50 mA
Connection			Plug connector – 1 core: 0.25 – 2.5 mm ² – 2 cores: 0.5 – 1.5 mm ² (twin AEH) ²⁾ Shield terminals for control cables available.
Digital outputs			
Cycle time I/O			1 ms
Number			• MDA: 1 × 4 • MDD: 2 × 4
Response time			175 µs plus cycle time
Output current			I _{max} = 50 mA
Short-circuit protection			Yes
Assignment	X21: 1 – 4	X21_1: 1 – 4 X21_2: 1 – 4	DO00 – DO03: For the selection option, see the parameter menu.
	X21: 5	X21_1: 5 X21_2: 5	GND
Connection			Plug connector – 1 core: 0.25 – 2.5 mm ² – 2 cores: 0.5 – 1.5 mm ² (twin AEH) ¹⁾ Shield terminals for control cables available.
Brake control/temperature sensor motor			
Assignment	X10:DB0	X10_1:DB0 X10_2:DB0	DB00: Direct control is possible with selected brakes from SEW-EURODRIVE. See chapter "Project Planning" for more information.
	X10:GND	X10_1:GND X10_2:GND	GND
	X10:TF1	X10_1:TF1 X10_2:TF1	Sensor input for temperature monitoring of the motor
	X10:GND	X10_1:GND X10_2:GND	GND
Connection			Plug connector – One core: 0.25 – 2.5 mm ² – Two cores: 0.5 – 1 mm ² (twin AEH) ¹⁾ Shield terminals for control cables available.
Encoder supply			
	X15:13	X15:13_1 X15:13_2	X15:13 DC 24 V, I _{max} = 500 mA

	Terminal designation		Specifications
	Single-axis module	Double-axis module	
	X15:15	X15:15_1 X15:15_2	X15:15 DC 12 V, $I_{\max} = 500 \text{ mA}$

- 1) For directly supplied DC 24 V brakes, observe the restricted tolerance range of -0% to +10%
2) AEH: Conductor end sleeve

MOVILINK® DDI connection		
MDA90A-..	X16	DC 24 V, $I_{\max} = 500 \text{ mA}$
MDD91A-..	X16_1 X16_2	

NOTICE

Connection of inductive loads to digital outputs

Destruction of digital outputs.

If you connect inductive loads to digital outputs, you must install an external protective element (freewheeling diode).

4 Installation

4.1 Notes on MOVILINK® DDI

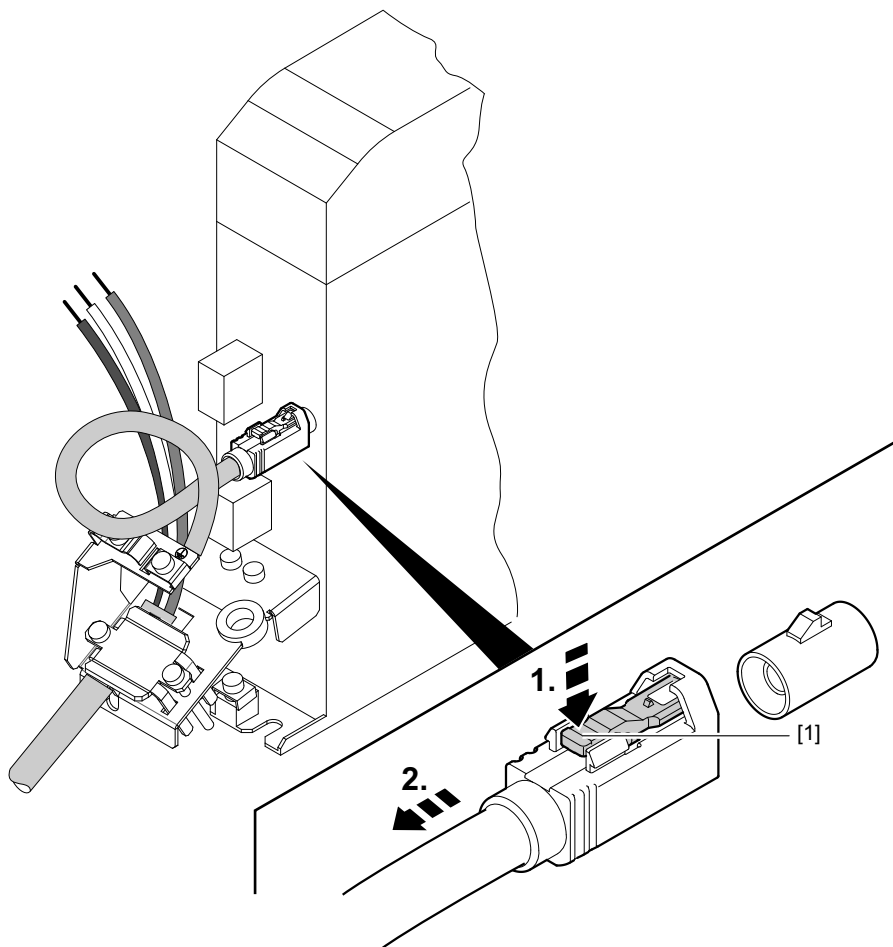
INFORMATION



You must only remove the MOVILINK® DDI connector if the 24 V voltage supply is switched off or if standby operation is active.

Removing the connector

When removing the MOVILINK® DDI connector X16, note that the latch [1] at the connector must be pushed before removing the connector, see figure.

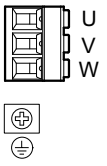
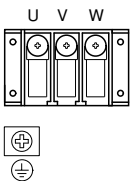
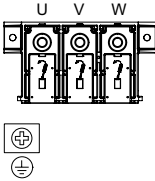
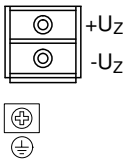
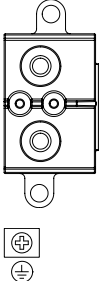
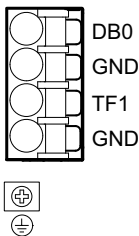
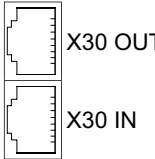


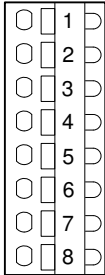
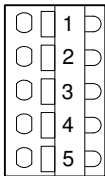
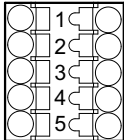
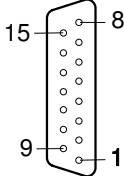
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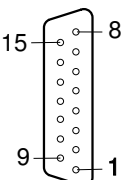
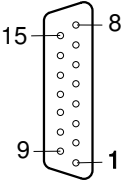
Maximum line length

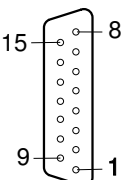
The maximum cable length for the coaxial cable is 200 m.

4.2 Terminal assignment at MDA single-axis module

Representation	Terminal	Connection	Brief description
	X2:U	U	Motor connection MDA90A-0020 – 0160-.. (size 1, 2)
	X2:V	V	
	X2:W	W	
	⊕	PE	PE connection
	X2:U	U	Motor connection MDA90A-0240 – 1000-.. (Sizes 3 – 5)
	X2:V	V	
	X2:W	W	
	⊕	PE	PE connection
	X2:U	U	Motor connection MDA90A-1400 – 1800 (size 6)
	X2:V	V	
	X2:W	W	
	⊕	PE	PE connection
	X4:+U _z	+U _z	DC link connection
	X4:-U _z	-U _z	
	⊕	PE	PE connection
	X4:+U _z	+U _z	DC link connection MDA90A-1400 – 1800-.. (size 6)
	X4:-U _z	-U _z	
	⊕	PE	PE connection
	X5:24 V	V _{24 V}	DC 24 V supply voltage
	X5:GND	GND	Reference potential
	X10:DB0	DB00	Brake control
	X10:GND	GND	Reference potential
	X10:TF1	TF1	Sensor input for temperature monitoring of the motor
	X10:GND	GND	Reference potential
	⊕	PE	PE connection
	X30 OUT		System bus
	X30 IN		

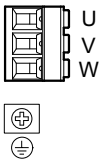
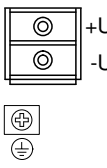
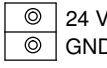
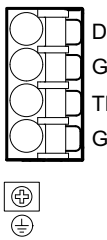
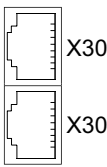
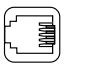
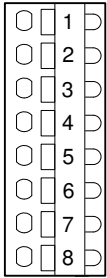
Representa- tion	Terminal	Connection	Brief description
	X31		SEW-EURODRIVE Service interface
	X20:1	DI00	Digital input 1, "Output stage enable" permanently assigned ¹⁾
	X20:2	DI01	Digital input 2, fixed setpoints – positive direction of rotation
	X20:3	DI02	Digital input 3, fixed setpoints – negative direction of rotation
	X20:4	DI03	Digital input 4, fixed speed setpoint bit 0
	X20:5	DI04	Digital input 5, fixed speed setpoint bit 1
	X20:6	DI05	Digital input 6, fault reset
	X20:7	GND	Reference potential
	X20:8	+24 V	DC 24 V voltage output
	X21:1	DB00	Digital output 1, brake output
	X21:2	DO00	Digital output 2, ready for operation ²⁾
	X21:3	DO01	Digital output 3, output stage enable
	X21:4	DO02	Digital output 4, error
	X21:5	DO03	STO active
	X6:1	F_STO_P1	DC +24 V input F_STO_P1
	X6:2	F_STO_M	DC 0 V input F_STO_M
	X6:3	F_STO_P2	DC +24 V input F_STO_P2
	X6:4	GND	Reference potential
	X6:5	24 V STO_OUT	U _{out} = DC 24 V supply of F_STO_P1 and F_STO_P2
	X15:1	S2 (sin+)	Signal track
	X15:2	S1 (cos+)	Signal track
	X15:3	Reserved	–
	X15:4	Reserved	–
	X15:5	R1 (REF+)	Supply voltage resolver
	X15:6	-TEMP_M	Motor temperature evaluation
	X15:7	Reserved	–
	X15:8	Reserved	–
	X15:9	S4 (sin-)	Signal track
	X15:10	S3 (cos-)	Signal track
	X15:11	Reserved	–
	X15:12	Reserved	–
	X15:13	R2 (REF-)	Supply voltage resolver
	X15:14	+TEMP_M	Motor temperature evaluation
	X15:15	Reserved	–

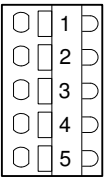
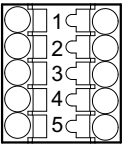
Representa- tion	Terminal	Connection	Brief description
	X15:1	A (cos+) (K1)	Signal track A (cos+) (K1)
	X15:2	B (sin+) (K2)	Signal track B (sin+) (K2)
	X15:3	C (K0)	Signal track C (K0)
	X15:4	DATA+ ³⁾	Data cable for electronic nameplate
	X15:5	Reserved	–
	X15:6	-TEMP_M	Motor temperature evaluation
	X15:7	Reserved	–
	X15:8	GND	Reference potential
	X15:9	$\bar{A}$ (cos -) ($\bar{K1}$)	Negated signal track $\bar{A}$ (cos-) ($\bar{K1}$)
	X15:10	$\bar{B}$ (sin-) ($\bar{K2}$)	Negated signal track $\bar{B}$ (sin-) ($\bar{K2}$)
	X15:11	$\bar{C}$ ($\bar{K0}$)	Negated signal track $\bar{C}$ ($\bar{K0}$)
	X15:12	DATA- ²⁾	Data cable for electronic nameplate
	X15:13	U _{S24VG}	Encoder supply 24 V
	X15:14	+TEMP_M	Motor temperature evaluation
	X15:15	U _{S12VG}	Encoder supply 12 V
	X15:1	A (K1)	Signal track A (K1)
	X15:2	B (K2)	Signal track B (K2)
	X15:3	C (K0)	Signal track C (K0)
	X15:4	Reserved	–
	X15:5	Reserved	–
	X15:6	-TEMP_M	Motor temperature evaluation
	X15:7	Reserved	–
	X15:8	GND	Reference potential
	X15:9	$\bar{A}$ ($\bar{K1}$)	Negated signal track $\bar{A}$ ($\bar{K1}$)
	X15:10	$\bar{B}$ ($\bar{K2}$)	Negated signal track $\bar{B}$ ($\bar{K2}$)
	X15:11	$\bar{C}$ ($\bar{K0}$)	Negated signal track $\bar{C}$ ($\bar{K0}$)
	X15:12	Reserved	–
	X15:13	U _{S24VG}	Encoder supply 24 V
	X15:14	+TEMP_M	Motor temperature evaluation
	X15:15	U _{S12VG}	Encoder supply 12 V

Representation	Terminal	Connection	Brief description
	X15:1	A (cos+) (K1)	Signal track A (cos+) (K1)
	X15:2	B (sin+) (K2)	Signal track B (sin+) (K2)
	X15:3	Reserved	–
	X15:4	DATA+	Data line RS485
	X15:5	Reserved	–
	X15:6	-TEMP_M	Motor temperature evaluation
	X15:7	Reserved	–
	X15:8	GND	Reference potential
	X15:9	$\bar{A}$ (cos -) ($\bar{K1}$)	Negated signal track $\bar{A}$ (cos-) ($\bar{K1}$)
	X15:10	$\bar{B}$ (sin-) ($\bar{K2}$)	Negated signal track $\bar{B}$ (sin-) ($\bar{K2}$)
	X15:11	Reserved	–
	X15:12	DATA-	Data line
	X15:13	U _{S24VG}	Encoder supply 24 V
	X15:14	+TEMP_M	Motor temperature evaluation
	X15:15	U _{S12VG}	Encoder supply 12 V
	X16	Coaxial connection	MOVILINK® DDI

- 1) The assignment of DI00 – DI05 specified here is the factory setting. The inputs are parameterizable.
- 2) The assignment of DOI00 – DO02 specified here is the factory setting. The outputs are parameterizable.
- 3) For encoders from SEW-EURODRIVE with electronic nameplate of type E.7S

4.3 Terminal assignment at MDD double-axis module

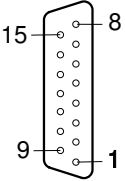
Representation	Terminals		Connection	Brief description
	X2_1:U	X2_2:U	U	Motor connection MDD9.A-0020 – 0080-.. (size 1, 2)
	X2_1:V	X2_2:V	V	
	X2_1:W	X2_2:W	W	
			PE	PE connection
	X4:+U _z		+U _z	DC link connection
	X4:-U _z		-U _z	
			PE	PE connection
	X5:24 V		V _I 24	DC 24 V supply voltage
	X5:GND		GND	Reference potential
	X10_1:DB0	X10_2:DB0	DB00	Brake control
	X10_1:GND	X10_2:GND	GND	Reference potential
	X10_1:TF1	X10_2:TF1	TF1	Sensor input for temperature monitoring of the motor
	X10_1:GND	X10_2:GND	GND	Reference potential
			PE	PE connection
	X30 OUT			System bus
	X30 IN			
	X31			SEW-EURODRIVE Service interface
	X20_1:1	X20_2:1	DI00	Digital input 1, "Output stage enable" permanently assigned ¹⁾
	X20_1:2	X20_2:2	DI01	Digital input 2, fixed setpoints – positive direction of rotation
	X20_1:3	X20_2:3	DI02	Digital input 3, fixed setpoints – negative direction of rotation
	X20_1:4	X20_2:4	DI03	Digital input 4, fixed speed setpoint bit 0
	X20_1:5	X20_2:5	DI04	Digital input 5, fixed speed setpoint bit 1
	X20_1:6	X20_2:6	DI05	Digital input 6, fault reset
	X20_1:7	X20_2:7	GND	Reference potential
	X20_1:8	X20_2:8	+24 V	DC 24 V voltage output

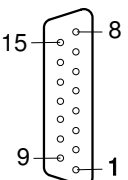
Representa- tion	Terminals		Connection	Brief description
	X21_1:1	X21_2:1	DB00	Digital output 1, brake output
	X21_1:2	X21_2:2	DO00	Digital output 2, ready for operation ²⁾
	X21_1:3	X21_2:3	DO01	Digital output 3, output stage enable
	X21_1:4	X21_2:4	DO02	Digital output 4, error
	X21_1:5	X21_2:5	DO03	STO active
	X6_1:1	X6_2:1	F_STO_P1	DC +24 V input F_STO_P1
	X6_1:2	X6_2:2	F_STO_M	DC 0 V input F_STO_M
	X6_1:3	X6_2:3	F_STO_P2	DC +24 V input F_STO_P2
	X6_1:4	X6_2:4	GND	Reference potential
	X6_1:5	X6_2:5	24 V STO_OUT	U _{out} = DC 24 V supply of F_STO_P1 and F_STO_P2

1) The assignment of DI00 – DI05 specified here is the factory setting. The inputs are parameterizable.

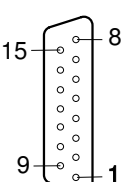
2) The assignment of DO100 – DO02 specified here is the factory setting. The outputs are parameterizable.

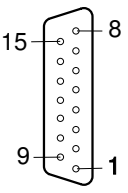
The X15_.. terminals are available for the MDD90A double-axis module.

Representa- tion	Terminals		Connection	Brief description, motor encoder resolver
	X15_1:1	X15_2:1	S2 (sin+)	Signal track
	X15_1:2	X15_2:2	S1 (cos+)	Signal track
	X15_1:3	X15_2:3	Reserved	-
	X15_1:4	X15_2:4	Reserved	-
	X15_1:5	X15_2:5	R1 (REF+)	Supply voltage resolver
	X15_1:6	X15_2:6	-TEMP_M	Motor temperature evaluation
	X15_1:7	X15_2:7	Reserved	-
	X15_1:8	X15_2:8	Reserved	-
	X15_1:9	X15_2:9	S4 (sin-)	Signal track
	X15_1:10	X15_2:10	S3 (cos-)	Signal track
	X15_1:11	X15_2:11	Reserved	-
	X15_1:12	X15_2:12	Reserved	-
	X15_1:13	X15_2:13	R2 (REF-)	Supply voltage resolver
	X15_1:14	X15_2:14	+TEMP_M	Motor temperature evaluation
	X15_1:15	X15_2:15	Reserved	-

Representa- tion	Terminals		Connection	Brief description, motor encoder sin/cos encoder, TTL encoder
	X15_1:1	X15_2:1	A (cos+) (K1)	Signal track A (cos+) (K1)
	X15_1:2	X15_2:2	B (sin+) (K2)	Signal track B (sin+) (K2)
	X15_1:3	X15_2:3	C (K0)	Signal track C (K0)
	X15_1:4	X15_2:4	DATA+ ¹⁾	Data cable for electronic nameplate
	X15_1:5	X15_2:5	Reserved	–
	X15_1:6	X15_2:6	-TEMP_M	Motor temperature evaluation
	X15_1:7	X15_2:7	Reserved	–
	X15_1:8	X15_2:8	GND	Reference potential
	X15_1:9	X15_2:9	$\bar{A}$ (cos -) ($\bar{K}1$)	Negated signal track $\bar{A}$ (cos-) ($\bar{K}1$)
	X15_1:10	X15_2:10	$\bar{B}$ (sin-) ($\bar{K}2$)	Negated signal track $\bar{B}$ (sin-) ($\bar{K}2$)
	X15_1:11	X15_2:11	$\bar{C}$ ($\bar{K}0$)	Negated signal track $\bar{C}$ ($\bar{K}0$)
	X15_1:12	X15_2:12	DATA- ¹⁾	Data cable for electronic nameplate
	X15_1:13	X15_2:13	U _{S24VG}	Encoder supply 24 V
	X15_1:14	X15_2:14	+TEMP_M	Motor temperature evaluation
	X15_1:15	X15_2:15	U _{S12VG}	Encoder supply 12 V

1) For encoders from SEW-EURODRIVE with electronic nameplate of type E.7S

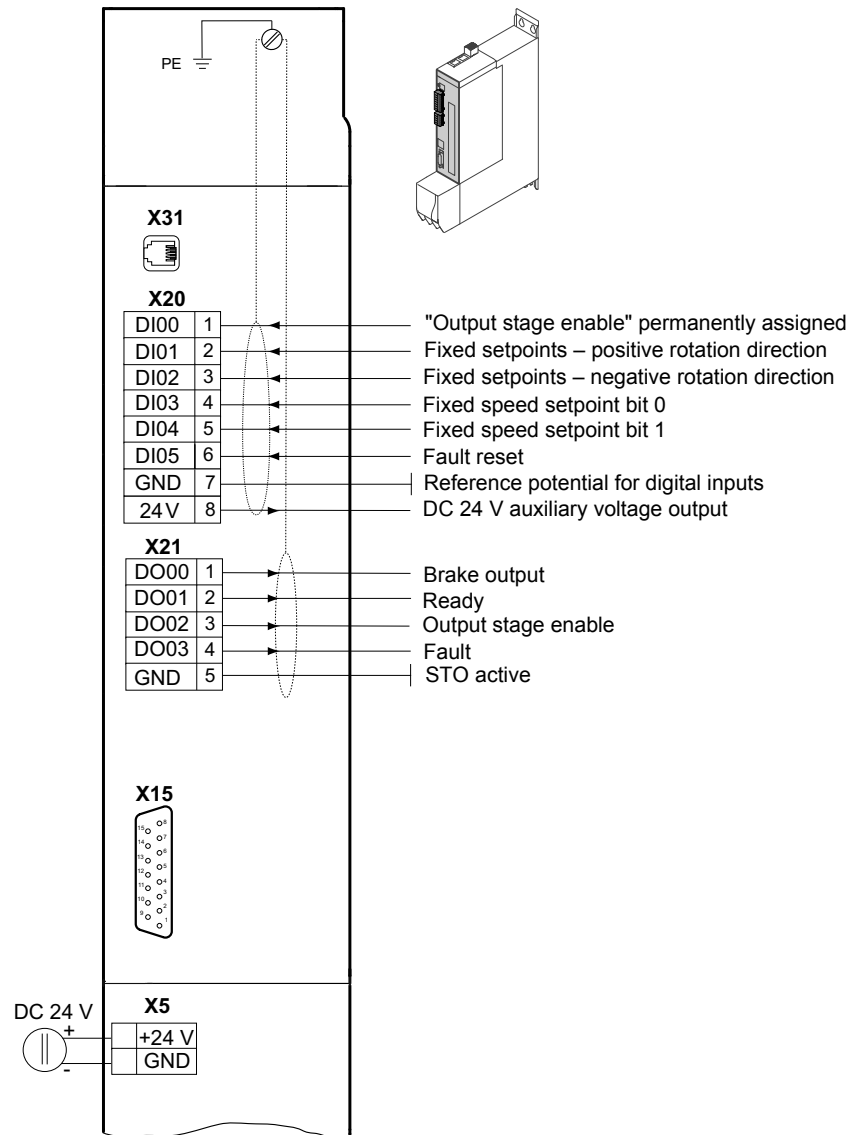
Representa- tion	Terminals		Connection	Brief description motor encoder HTL en- coder
	X15_1:1	X15_2:1	A (K1)	Signal track A (K1)
	X15_1:2	X15_2:2	B (K2)	Signal track B (K2)
	X15_1:3	X15_2:3	C (K0)	Signal track C (K0)
	X15_1:4	X15_2:4	Reserved	–
	X15_1:5	X15_2:5	Reserved	–
	X15_1:6	X15_2:6	-TEMP_M	Motor temperature evaluation
	X15_1:7	X15_2:7	Reserved	–
	X15_1:8	X15_2:8	GND	Reference potential
	X15_1:9	X15_2:9	$\bar{A}$ ($\bar{K}1$)	Negated signal track $\bar{A}$ ($\bar{K}1$)
	X15_1:10	X15_2:10	$\bar{B}$ ($\bar{K}2$)	Negated signal track $\bar{B}$ ($\bar{K}2$)
	X15_1:11	X15_2:11	$\bar{C}$ ($\bar{K}0$)	Negated signal track $\bar{C}$ ($\bar{K}0$)
	X15_1:12	X15_2:12	Reserved	–
	X15_1:13	X15_2:13	U _{S24VG}	Encoder supply 24 V
	X15_1:14	X15_2:14	+TEMP_M	Motor temperature evaluation
	X15_1:15	X15_2:15	U _{S12VG}	Encoder supply 12 V

Representation	Terminals		Connection	Brief description motor encoder HIPERFACE® and SEW-EURODRIVE encoder (RS485)
	X15_1:1	X15_2:1	A (cos+) (K1)	Signal track A (cos+) (K1)
	X15_1:2	X15_2:2	B (sin+) (K2)	Signal track B (sin+) (K2)
	X15_1:3	X15_2:3	Reserved	–
	X15_1:4	X15_2:4	DATA+	Data line RS485
	X15_1:5	X15_2:5	Reserved	–
	X15_1:6	X15_2:6	-TEMP_M	Motor temperature evaluation
	X15_1:7	X15_2:7	Reserved	–
	X15_1:8	X15_2:8	GND	Reference potential
	X15_1:9	X15_2:9	$\bar{A}$ (cos -) ($\bar{K1}$)	Negated signal track $\bar{A}$ (cos-) ($\bar{K1}$)
	X15_1:10	X15_2:10	$\bar{B}$ (sin-) ($\bar{K2}$)	Negated signal track $\bar{B}$ (sin-) ($\bar{K2}$)
	X15_1:11	X15_2:11	Reserved	–
	X15_1:12	X15_2:12	DATA-	Data line
	X15_1:13	X15_2:13	U _{S24VG}	Encoder supply 24 V
	X15_1:14	X15_2:14	+TEMP_M	Motor temperature evaluation
	X15_1:15	X15_2:15	U _{S12VG}	Encoder supply 12 V
	X16_1	X16_2	Coaxial connection	MOVILINK® DDI for MDD91A

4.4 Electronics connection MDA90A.. single-axis module

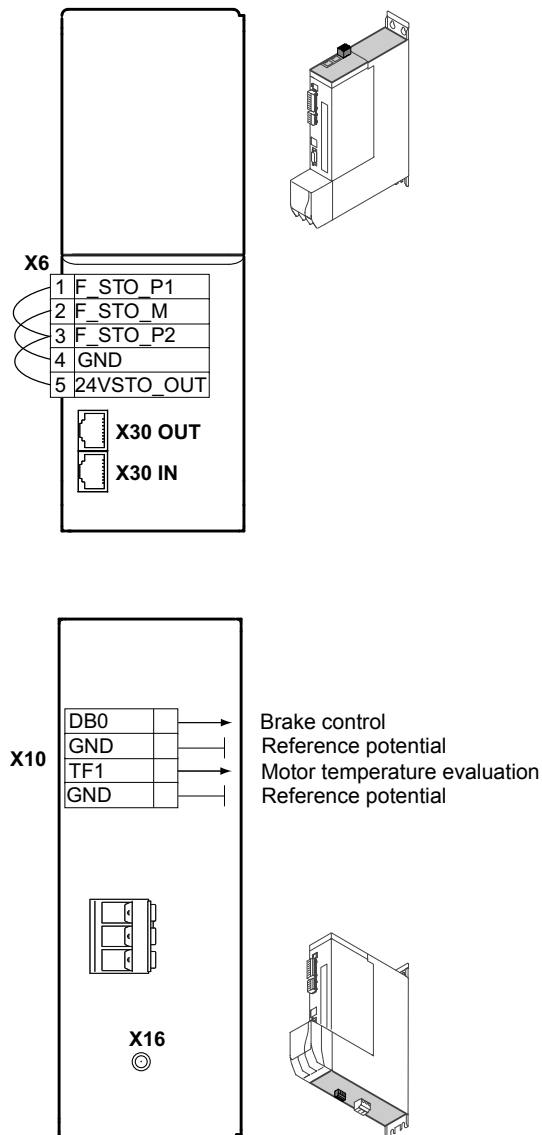
4.4.1 Wiring the control electronics

For the terminal assignment and connections, refer to the chapter Terminal assignment.



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- X5 Connection +24 V supply voltage
- X20 Digital inputs
- X21 Digital outputs
- X30 System bus
- X31 SEW-EURODRIVE Service interface



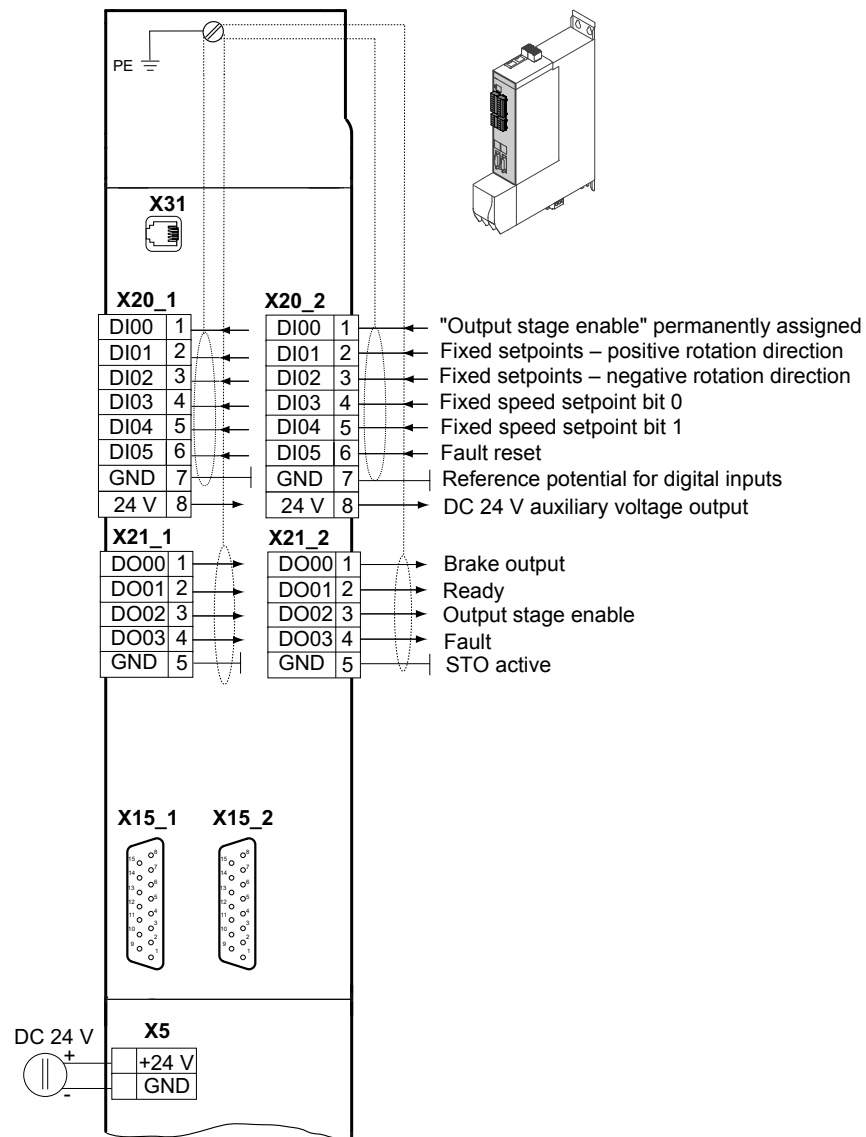
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- X6** Connection for Safe Torque Off (STO)
With installed CS.A card, the cable bridges are removed at the factory.
If no CS.A card is installed upon delivery, the cable bridges are installed at the factory
- X10** Brake control and motor temperature monitoring
- X16** MOVILINK® DDI connection
- X30** System bus

4.5 MDD9.A.. double-axis module electrical connection

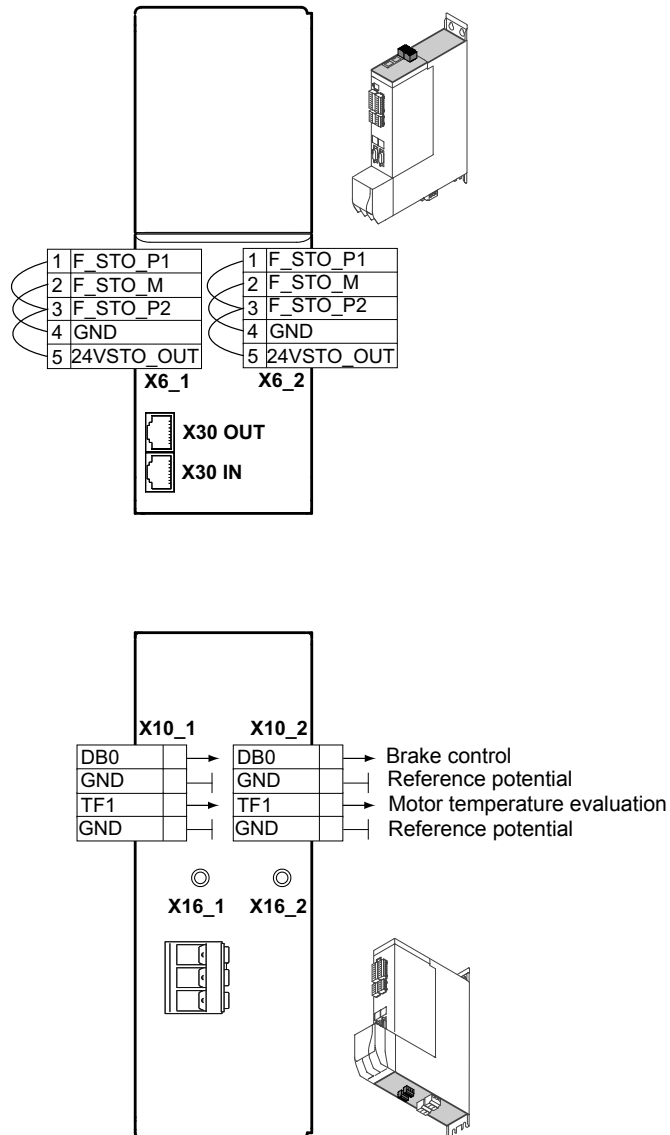
4.5.1 Wiring the control electronics

For the terminal assignment and connections, refer to the chapter Terminal assignment.



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- X5 Connection +24 V supply voltage
- X15 Motor encoder connection with MDD90A-..
- X20 Digital inputs
- X21 Digital outputs
- X30 System bus
- X31 SEW-EURODRIVE Service interface



25607711883

- X6** Connection for Safe Torque Off (STO)
 With installed CS.A card, the cable bridges are removed at the factory.
 If no CS.A card is installed upon delivery, the cable bridges are installed at the factory.
- X10** Brake control and motor temperature monitoring
- X16** MOVILINK® DDI connection with MDD91A-..
- X30** System bus

5 Operation

5.1 MOVILINK® DDI error

5.1.1 Fault 12 brake

Subfault: 12.1		
Description: Brake output		
Response: Application stop + output stage inhibit		
	Cause	Measure
	No brake connected.	Check the connection of the brake.
	Brake cable disconnected in switched-on state.	Check the connection of the brake.
	Overload due to overcurrent > 2 A	Check the sequential profile of brake control.
	Overload due to excessive connection (> 0.5 Hz)	Check the sequential profile of brake control.
	Monitoring works only with parameter setting "Brake installed" and "Brake applied".	Make sure that the connected brake is permitted.
Subfault: 12.2		
Description: DC 24 V brake voltage		
Response: Application stop + output stage inhibit		
	Cause	Measure
	DC 24 V supply voltage not within permitted tolerance of ± 10%.	Check the DC 24 V supply voltage.
	Monitoring is only active with parameter settings "Brake installed" and "Brake applied".	Check the parameter setting.
Subfault: 12.20		
Description: Digital motor integration fault – critical		
Response: Output stage inhibit with self-reset		
	Cause	Measure
	The intelligent brake rectifier of "digital motor integration" signaled a critical component fault.	See subcomponent fault.
Subfault: 12.21		
Description: Digital motor integration fault		
Response: Emergency stop + output stage inhibit with self-reset		
	Cause	Measure
	The intelligent brake rectifier of "digital motor integration" signaled a component fault.	See subcomponent fault.
Subfault: 12.22		
Description: Digital motor integration warning		
Response: Warning with self-reset		
	Cause	Measure
	The intelligent brake rectifier of "digital motor integration" signaled a warning.	See subcomponent fault.

5.1.2 Fault 13 encoder 1

Subfault: 13.1		
Description: Position comparison check		
Response: Encoder 1 – latest critical fault		
	Cause	Measure
	Faulty comparison between raw position and track counter of absolute encoders.	– Check the track signal wiring. – Check interference sources (e.g. from the area of EMC). – Replace encoder. – Replace the card. Information: In "Emergency mode" manual mode, you can move the drive using the motor encoder even if the external position encoder is faulty.

Subfault: 13.2		
Description: Unknown encoder type		
Response: Encoder 1 – latest critical fault		
	Cause	Measure
	Encoder type not known and not supported by inverter.	– Check the encoder type. – Contact SEW-EURODRIVE Service. Information: In "Emergency mode" manual mode, you can move the drive using the motor encoder even if the external position encoder is faulty.
Subfault: 13.3		
Description: Invalid data		
Response: Encoder 1 – latest critical fault		
	Cause	Measure
	Invalid encoder nameplate data (measuring steps/pulses per revolution/multi-turn).	– Check the startup parameters. – Replace encoder. Information: In "Emergency mode" manual mode, you can move the drive using the motor encoder even if the external position encoder is faulty.
Subfault: 13.4		
Description: Track measurement error		
Response: Encoder 1 – latest critical fault		
	Cause	Measure
	Error during track measurement.	– Switch the device off and on again. – Check the wiring. – Check interference sources (e.g. from EMC). – Check the encoder. Replace if necessary. Information: In "Emergency mode" manual mode, you can move the drive using the motor encoder even if the external position encoder is faulty.
Subfault: 13.5		
Description: Internal warning		
Response: Encoder – warning		
	Cause	Measure
	Encoder signaled warning.	– Check the wiring. – Check interference sources (light beam interrupted, reflector, data cables, etc.). – Clean the sensor.
Subfault: 13.6		
Description: Signal level too low		
Response: Encoder 1 – latest critical fault		
	Cause	Measure
	Vector below permitted limit during signal level monitoring.	– Check the wiring. – Check interference sources (e.g. from the area of EMC). – Check the encoder. Information: In "Emergency mode" manual mode, you can move the drive using the motor encoder even if the external position encoder is faulty.
Subfault: 13.7		
Description: Signal level too high		
Response: Encoder 1 – latest critical fault		
	Cause	Measure
	Vector exceeds permitted limit during signal level monitoring.	Check the gear ratio of the resolver in use. Information: In "Emergency mode" manual mode, you can move the drive using the motor encoder even if the external position encoder is faulty.
Subfault: 13.8		
Description: Signal level monitoring		
Response: Encoder 1 – latest critical fault		
	Cause	Measure
	Vector exceeds permitted limit during signal level monitoring.	Check the resolver mounting position. Information: In "Emergency mode" manual mode, you can move the drive using the motor encoder even if the external position encoder is faulty.

Subfault: 13.9		
Description: Quadrant check		
	Response: Encoder 1 – latest critical fault	
	Cause	Measure
	Error checking quadrants (sine encoder).	– Switch the device off and on again. – Check the wiring. – Check interference sources (e.g. from the area of EMC). – Check the encoder. Replace if necessary. Information: In "Emergency mode" manual mode, you can move the drive using the motor encoder even if the external position encoder is faulty.
Subfault: 13.10		
Description: Position tolerance range monitoring		
	Response: Encoder 1 – latest critical fault	
	Cause	Measure
	Position outside tolerance range.	– Check the startup parameters. – Check the wiring. – Check interference sources (light beam interrupted, reflector, data cables, etc.). – Replace encoder. Information: In "Emergency mode" manual mode, you can move the drive using the motor encoder even if the external position encoder is faulty.
Subfault: 13.11		
Description: Data timeout		
	Response: Encoder 1 – latest critical fault	
	Cause	Measure
	Encoder process data timeout.	– Check interference sources (e.g. from the area of EMC). – Check the startup parameters. Information: In "Emergency mode" manual mode, you can move the drive using the motor encoder even if the external position encoder is faulty.
Subfault: 13.12		
Description: Emergency		
	Response: Encoder 1 – latest critical fault	
	Cause	Measure
	Encoder signaled emergency.	– Check interference sources (e.g. from the area of EMC). – Check the startup parameters. Information: In "Emergency mode" manual mode, you can move the drive using the motor encoder even if the external position encoder is faulty.
Subfault: 13.13		
Description: Error during initialization		
	Response: Encoder 1 – latest fault	
	Cause	Measure
	Communication error during initialization.	– Check parameterization. – Check baud rate. – Ensure that the CANopen interface on the encoder (Node ID) is correctly adjusted. – Check the wiring. Information: In "Emergency mode" manual mode, you can move the drive using the motor encoder even if the external position encoder is faulty.
Subfault: 13.14		
Description: Communication		
	Response: Encoder 1 – latest fault	
	Cause	Measure
	Faulty communication with encoder.	– Check the voltage supply. – Check interference sources (e.g. from the area of EMC). – Check the wiring. Information: In "Emergency mode" manual mode, you can move the drive using the motor encoder even if the external position encoder is faulty.

Subfault: 13.15		
Description: System error		
	Response: Encoder 1 – latest critical fault	
	Cause	Measure
	System error while evaluating encoder.	– Ensure that the multi-turn encoder is within the configured path range. – Check the limits. – Check for correct settings of encoder numerator/denominator factors. – Check interference sources (e.g. from the area of EMC). – Check the startup parameters. – Switch the device off and on again. – If the fault occurs repeatedly, contact SEW-EURODRIVE Service. Information: In "Emergency mode" manual mode, you can move the drive using the motor encoder even if the external position encoder is faulty.
Subfault: 13.16		
Description: Permanent high level in data line – critical		
	Response: Encoder 1 – latest critical fault	
	Cause	Measure
	Permanent high level of data signal.	– Check the wiring. – Check the encoder. Information: In "Emergency mode" manual mode, you can move the drive using the motor encoder even if the external position encoder is faulty.
Subfault: 13.17		
Description: Permanent high level in data line		
	Response: Encoder 1 – latest fault	
	Cause	Measure
	Permanent high level of data signal.	– Check the wiring. – Check the encoder. Information: In "Emergency mode" manual mode, you can move the drive using the motor encoder even if the external position encoder is faulty.
Subfault: 13.18		
Description: Permanent low level in data line – critical		
	Response: Encoder 1 – latest critical fault	
	Cause	Measure
	Permanent low level of data signal.	– Check the wiring. – Check the encoder. Information: In "Emergency mode" manual mode, you can move the drive using the motor encoder even if the external position encoder is faulty.
Subfault: 13.19		
Description: Permanent low level in data line		
	Response: Encoder 1 – latest fault	
	Cause	Measure
	Permanent low level of data signal.	– Check the wiring. – Check the encoder. Information: In "Emergency mode" manual mode, you can move the drive using the motor encoder even if the external position encoder is faulty.
Subfault: 13.20		
Description: SSI error bit – critical		
	Response: Encoder 1 – latest critical fault	
	Cause	Measure
	Error bit set in SSI protocol.	– Check the startup parameters. – Check the settings at the SSI encoder (fault bit). – Check the wiring. – Check interference sources (light beam interrupted, reflector, data cables, etc.). – Replace encoder. Information: In "Emergency mode" manual mode, you can move the drive even with a fault in an external position encoder.

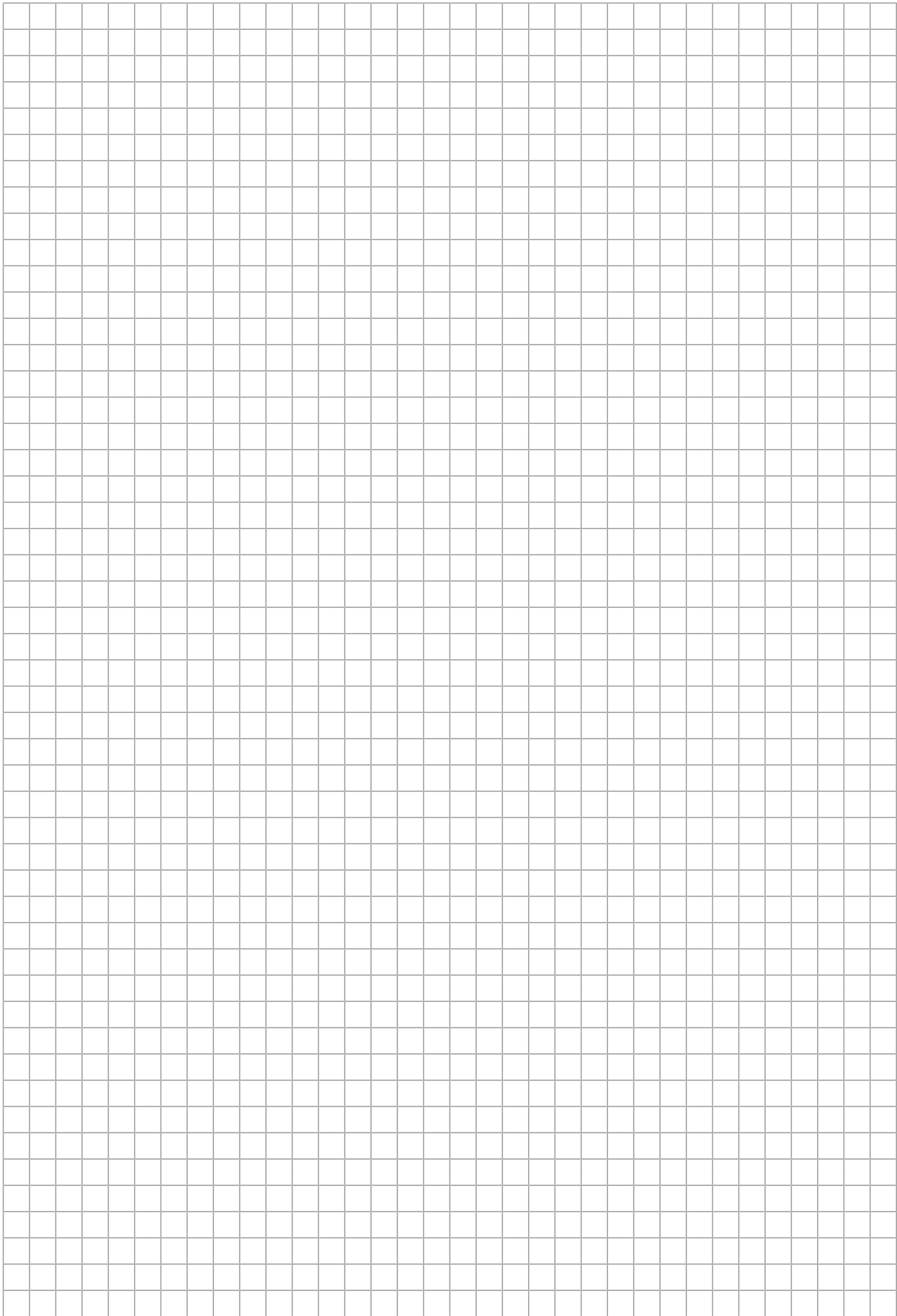
Subfault: 13.21		
Description: SSI error bit		
	Response: Encoder 1 – latest fault	
	Cause	Measure
	Error bit set in SSI protocol.	– Check the startup parameters. – Check the settings at the SSI encoder (fault bit). – Check the wiring. – Check interference sources (light beam interrupted, reflector, data cables, etc.). – Replace encoder. Information: In "Emergency mode" manual mode, you can move the drive even with a fault in an external position encoder.
Subfault: 13.22		
Description: Internal fault – critical		
	Response: Encoder 1 – latest critical fault	
	Cause	Measure
	Encoder signaled internal fault.	– Check the wiring. – Check interference sources (light beam interrupted, reflector, data cables, etc.). – Replace encoder. Information: In "Emergency mode" manual mode, you can move the drive using the motor encoder even if the external position encoder is faulty.
Subfault: 13.23		
Description: Internal fault		
	Response: Encoder 1 – latest fault	
	Cause	Measure
	Encoder signaled internal fault.	– Check the wiring. – Check interference sources (light beam interrupted, reflector, data cables, etc.). – Replace encoder. Information: In "Emergency mode" manual mode, you can move the drive using the motor encoder even if the external position encoder is faulty.
Subfault: 13.24		
Description: Travel range exceeded		
	Response: Encoder 1 – latest fault	
	Cause	Measure
	Current position mode (index 8381.10) does not allow for larger travel range.	Check travel range. Information: In "Emergency mode" manual mode, you can move the drive using the motor encoder even if the external position encoder is faulty.
Subfault: 13.25		
Description: Error during encoder startup		
	Response: Output stage inhibit	
	Cause	Measure
	Fatal error during encoder startup.	Switch the device off and on again. Information: In "Emergency mode" manual mode, you can move the drive using the motor encoder even if the external position encoder is faulty.
Subfault: 13.26		
Description: Digital motor integration fault – critical		
	Response: Encoder 1 – latest critical fault	
	Cause	Measure
	Encoder of "digital motor integration" signaled component fault.	– Check interference sources. – Replace encoder.
Subfault: 13.27		
Description: Digital motor integration fault		
	Response: Encoder 1 – latest fault	
	Cause	Measure
	Encoder of "digital motor integration" signaled component fault.	– Check interference sources. – Replace encoder.

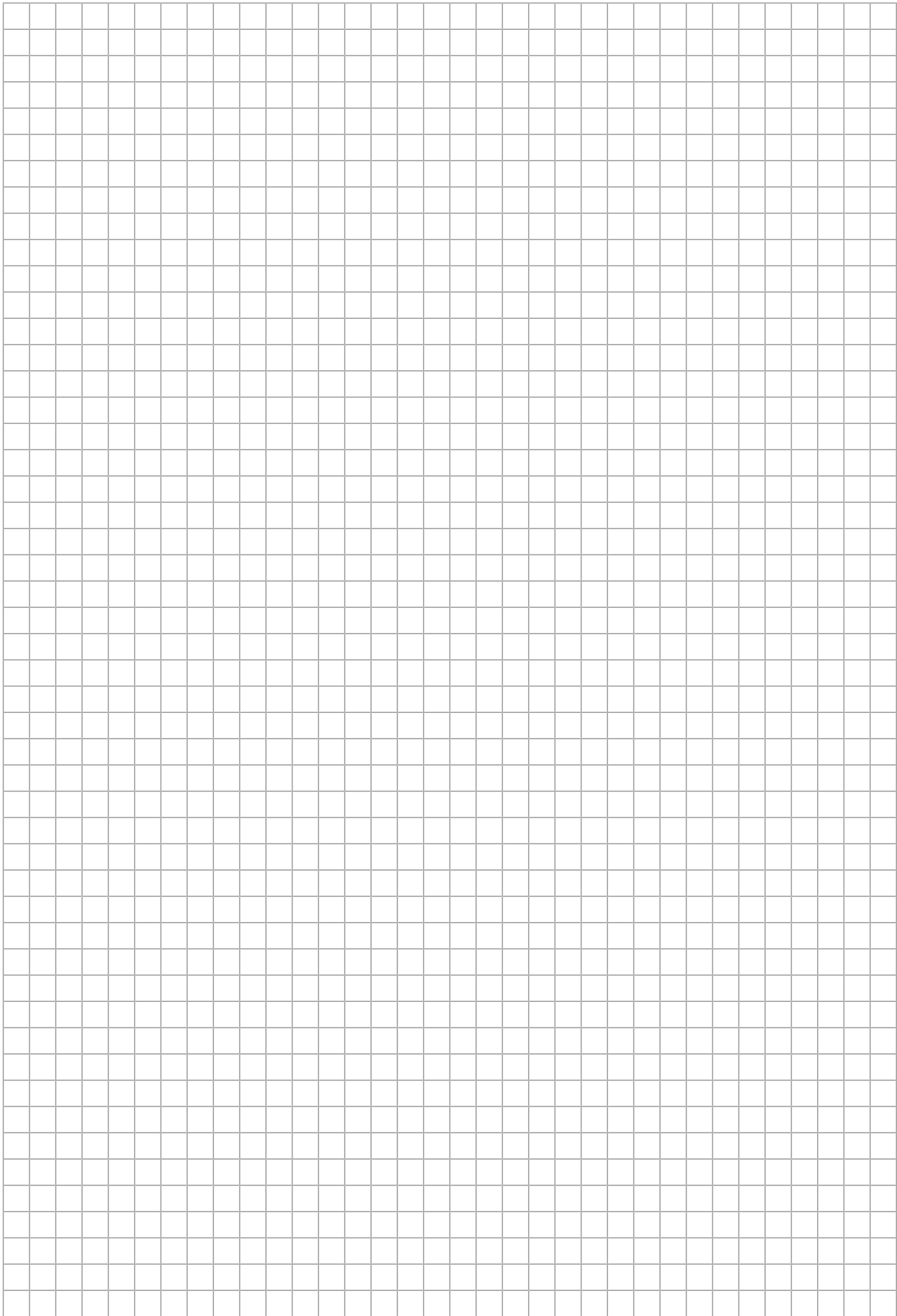
Subfault: 13.28		
Description: Digital motor integration warning		
Response: Encoder – warning		
	Cause	Measure
	Encoder of "digital motor integration" signaled a warning.	– Check interference sources.

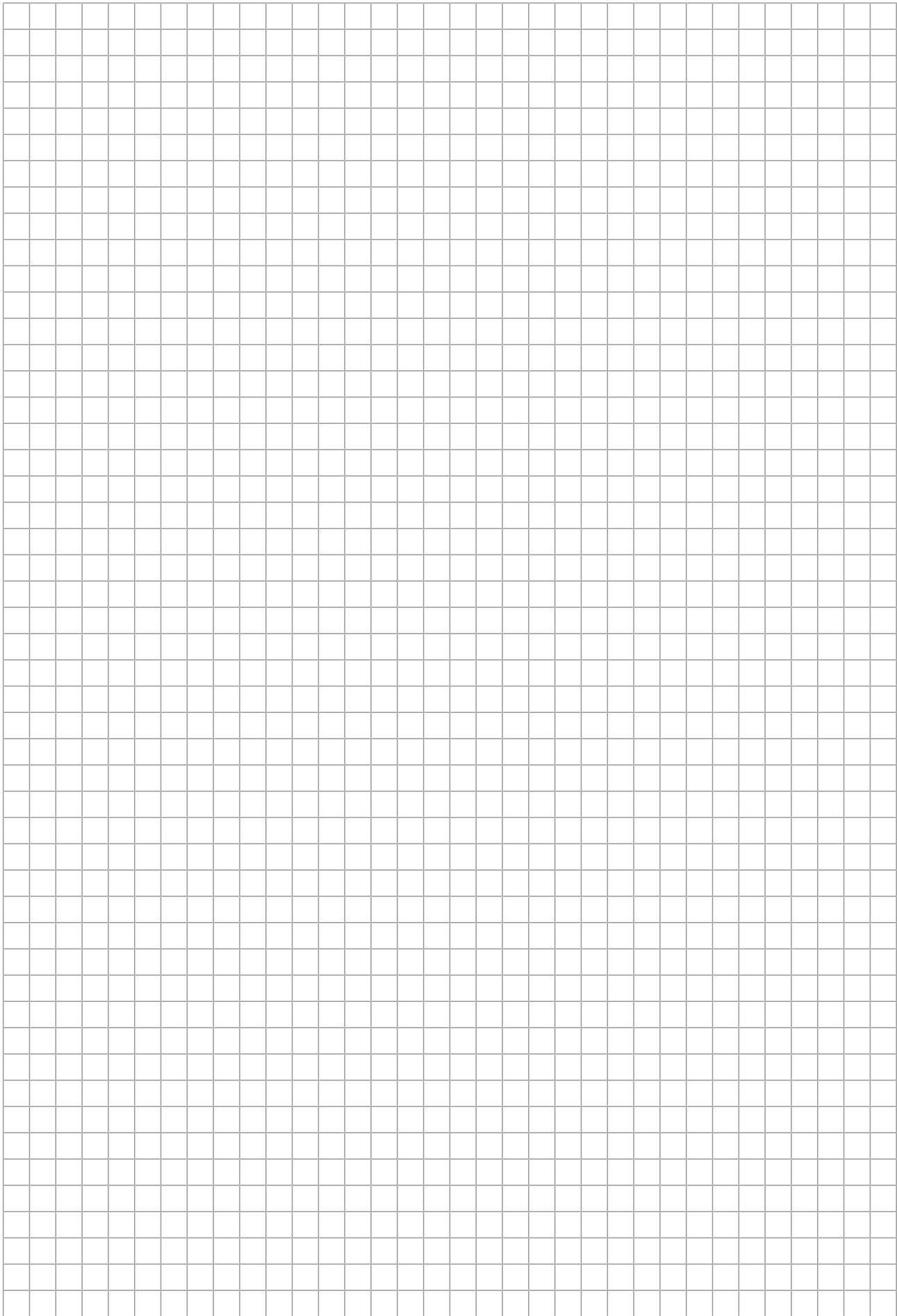
5.1.3 Fault 21 digital motor integration 1

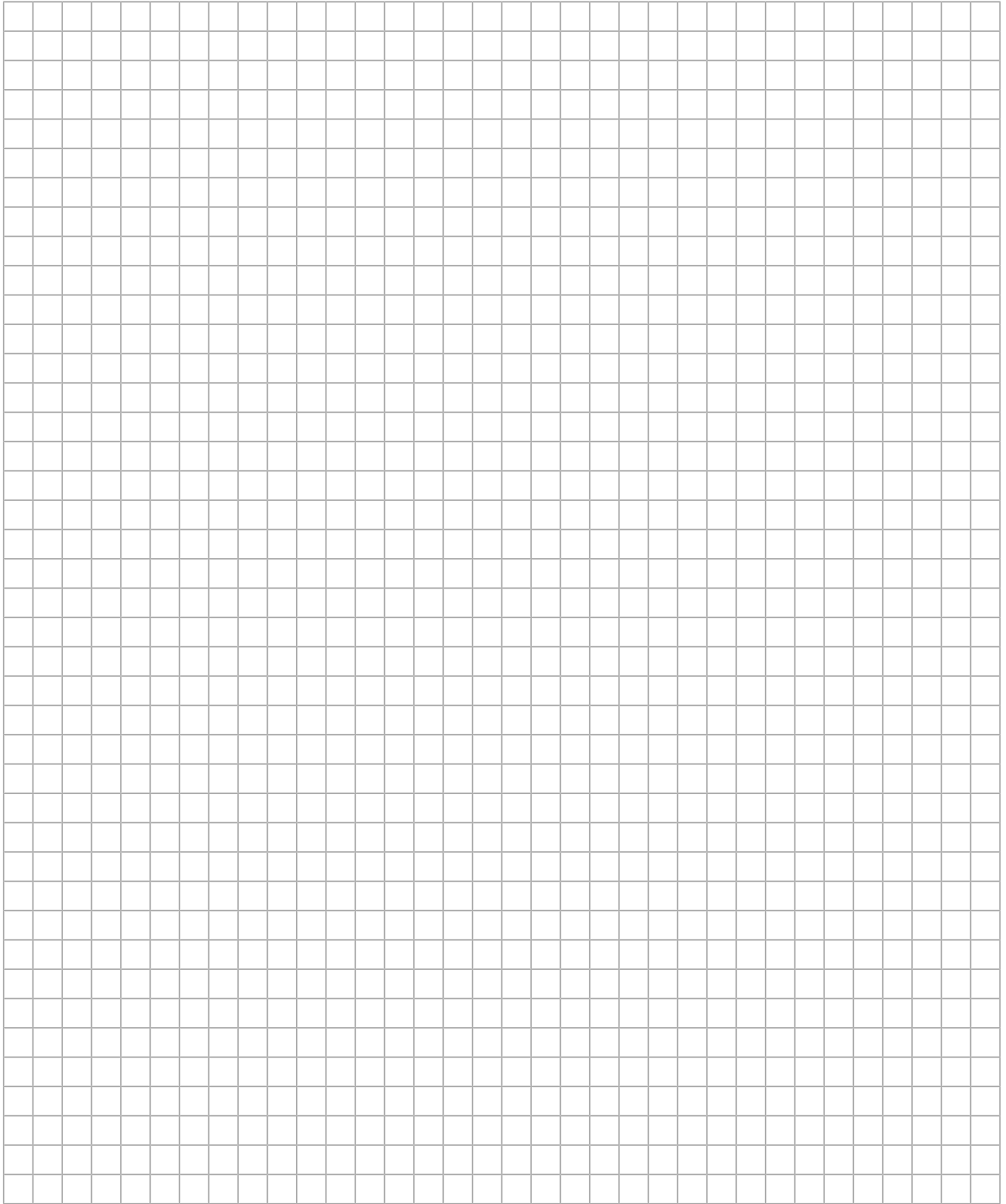
Subfault: 21.1		
Description: Communication fault		
Response: Output stage inhibit		
	Cause	Measure
	Communication error detected on the interface of the "digital motor integration".	Check the cabling.
Subfault: 21.2		
Description: Slave required		
Response: Output stage inhibit		
	Cause	Measure
	Device started up with a drive with "digital motor integration" but no drive with "Digital motor integration" is connected.	Connect a drive with "digital motor integration" matching start-up, or perform a new startup.
Subfault: 21.3		
Description: Incompatible drive motor		
Response: Output stage inhibit		
	Cause	Measure
	Connected drive not compatible with started-up drive.	Connect a drive that matches startup, or perform a new startup.
Subfault: 21.4		
Description: Invalid label		
Response: Output stage inhibit		
	Cause	Measure
	The connected drive contains invalid data.	Replace the drive.
Subfault: 21.5		
Description: Incompatible slave		
Response: Output stage inhibit		
	Cause	Measure
	The connected slave of "digital motor integration" cannot be used with this inverter firmware.	Update inverter or slave.
Subfault: 21.6		
Description: Overload/short circuit on the interface		
Response: Output stage inhibit		
	Cause	Measure
	Short circuit in the cabling of components of "Digital motor integration".	Check the cabling of the component of "digital motor integration".
	Voltage of "Digital motor integration" component too low.	Check the voltage supply of the component.
Subfault: 21.7		
Description: Slave permanent supply current too large		
Response: Output stage inhibit		
	Cause	Measure
	The permanent supply current of the slave is too large to be operated at this device.	Use slave with low supply current
Subfault: 21.20		
Description: Slave error – critical		
Response: Output stage inhibit		
	Cause	Measure
	A slave of "digital motor integration" signaled a critical component fault.	See subcomponent fault.

Subfault: 21.21		
Description: Slave error		
	Response: Emergency stop + output stage inhibit	
	Cause	Measure
	A slave of "digital motor integration" signaled a component fault.	See subcomponent fault.
Subfault: 21.22		
Description: Slave warning		
	Response: Warning	
	Cause	Measure
	A slave of "digital motor integration" signaled a warning.	See subcomponent fault.











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