

4 Technical data

4.1 Markings

4.1.1 Basic device

Mark	Definition
	The CE marking indicates compliance with the following European directives: • Low Voltage Directive 2014/35/EU¹⁾ • EMC Directive 2014/30/EU • Machinery Directive 2006/42/EC • Directive 2011/65/EU for limiting the use of certain hazardous substances in electrical and electronic equipment • Ecodesign Regulation 2019/1781
	The waste disposal of this product is performed in compliance with the WEEE Directive 2012/19/EU.
	The EAC mark indicates compliance with the requirements of the technical regulations of the Customs Union (Eurasian Economic Union), Armenia, Belarus, Kazakhstan, Kyrgyzstan, and Russia.
	The RCM mark indicates compliance with the technical regulations of the Australian Communications and Media Authority (ACMA).
	The China RoHS mark indicates compliance with the directive SJ/T 11364-2014 regarding the restriction of use of certain hazardous substances in electrical and electronic equipment and its packaging.
	The NM mark states compliance with the following Moroccan directives ²⁾ : • Low Voltage Directive no. 2573-14 (July 16, 2015) • EMC Directive N° 2574-14 (July 16, 2015)
	The UA.TR mark declares conformity with the technical regulations of Ukraine.
	The KC mark declares compliance with §3 of Article 58-2 for the Korean Radio Wave Act.
	The UKCA mark indicates compliance with British directives (see UK declaration of conformity or UK declaration of incorporation).
	The UL and cUL mark indicates UL approval. cUL is equally eligible for approval by the CSA.

1) For products with functional safety, the requirements from the Low Voltage Directive are fulfilled by the Machinery Directive.

2) The selectable approvals UKCA (Great Britain) and NM (Morocco) are mutually exclusive.

4.1.2 Accessories

BW.. braking resistors

Mark	Definition
	The CE mark states compliance with the following European directives: • Low Voltage Directive 2014/35/EU • Directive 2011/65/EU for limiting the use of certain hazardous substances in electrical and electronic equipment
	The waste disposal of this product is performed in compliance with the WEEE Directive 2012/19/EU.
	The China RoHS mark declares compliance with the Directive SJ/T 11364-2014 regarding the restriction of use of certain hazardous substances in electrical and electronic equipment and its packaging.
	The UKCA mark states the compliance with the following British guidelines: • Low Voltage Directive S. I. 2016/1101 • Directive S. I. 2012/3032 for limiting the use of certain hazardous substances in electrical and electronic equipment
	The cUR mark states the UL approval for this component.

NF.. line filters

Mark	Definition
	The CE mark states compliance with the following European directives: • Low Voltage Directive 2014/35/EU • Directive 2011/65/EU for limiting the use of certain hazardous substances in electrical and electronic equipment
	The waste disposal of this product is performed in compliance with the WEEE Directive 2012/19/EU.
	The China RoHS mark declares compliance with the directive SJ/T 11364-2014 regarding the restriction of use of certain hazardous substances in electrical and electronic equipment and its packaging.
	The UKCA mark states the compliance with the following British guidelines: • Low Voltage Directive S. I. 2016/1101 • Directive S. I. 2012/3032 for limiting the use of certain hazardous substances in electrical and electronic equipment
	The UL and cUL mark indicates UL approval. cUL is equally eligible for approval by the CSA.

ND.. line chokes

Mark	Definition
	The CE mark states compliance with the following European directives: • Low Voltage Directive 2014/35/EU • Directive 2011/65/EU for limiting the use of certain hazardous substances in electrical and electronic equipment
	The waste disposal of this product is performed in compliance with the WEEE Directive 2012/19/EU.
	The China RoHS mark declares compliance with the directive SJ/T 11364-2014 regarding the restriction of use of certain hazardous substances in electrical and electronic equipment and its packaging.
	The UKCA mark states the compliance with the following British guidelines: • Low Voltage Directive S. I. 2016/1101 • Directive S. I. 2012/3032 for limiting the use of certain hazardous substances in electrical and electronic equipment
	The cUL mark states the UL approval for this component.

HF.. output filters

Mark	Definition
	The CE mark states compliance with the following European directives: • Low Voltage Directive 2014/35/EU • Directive 2011/65/EU for limiting the use of certain hazardous substances in electrical and electronic equipment
	The waste disposal of this product is performed in compliance with the WEEE Directive 2012/19/EU.
	The China RoHS mark declares compliance with the directive SJ/T 11364-2014 regarding the restriction of use of certain hazardous substances in electrical and electronic equipment and its packaging.
	The UKCA mark states the compliance with the following British guidelines: • Low Voltage Directive S. I. 2016/1101 • Directive S. I. 2012/3032 for limiting the use of certain hazardous substances in electrical and electronic equipment
	The UL and cUL mark indicates UL approval. cUL is equally eligible for approval by the CSA.

31986846/EN – 03/2025

HD.. output chokes

Mark	Definition
	The CE mark states compliance with the following European directives: • Low Voltage Directive 2014/35/EU • Directive 2011/65/EU for limiting the use of certain hazardous substances in electrical and electronic equipment
	The waste disposal of this product is performed in compliance with the WEEE Directive 2012/19/EU.
	The China RoHS mark declares compliance with the directive SJ/T 11364-2014 regarding the restriction of use of certain hazardous substances in electrical and electronic equipment and its packaging.
	The UKCA mark states the compliance with the following British guidelines: • Low Voltage Directive S. I. 2016/1101 • Directive S. I. 2012/3032 for limiting the use of certain hazardous substances in electrical and electronic equipment
	The UL and cUL mark indicates UL approval. cUL is equally eligible for approval by the CSA.

4.2 General technical data

Interference immunity	Meets EN 61800-3; 2nd environment
Interference emission	Limit value class C2 according to EN 61800-3. The interference suppression level can be improved using appropriate measures. Refer to chapter "EMC-compliant installation according to EN 61800-3" (→ 109) for further information.
Ambient temperature ϑ_{amb}	-10 – 40 °C without derating 40 – 55 °C with derating For further information, refer to chapter "Project planning" > "Selection of an inverter" > "Power reducing factors" (→ 100).
Type of cooling	Natural convection (device without fan): • MCC91A-0010 – 0032-5.3.. • MCC91A-0017 – 0034-2.1.. Forced convection through built-in temperature-dependent fan (ON – at heat sink temperature 44 °C / OFF – at heat sink temperature 40 °C): • MCC91A-0040-5.3.. – MCC91A-0240-5.3.. • MCC91A-0042-2.1.. – MCC91A-0093-2.1..
Short-circuit current	The uninfluenced short-circuit current according to EN 61800-5-1 is 65 kA.

31986846/EN – 03/2025

Degree of protection	IP20 in accordance with EN 60529, only with power connectors plugged in for grid and motor
Pollution class	2 in accordance with IEC 60664-1
Overvoltage category	III in accordance with IEC 60664-1
Installation altitude above sea level:	No restrictions apply to altitudes ≤ 1000 m. The following restrictions apply to altitudes > 1000 m: • From 1000 m to max. 3800 m: I_N reduction by 1% per 100 m • From 2000 m to max. 3800 m: To maintain protective separation and the air gaps and creepage distances according to EN 61800-5-1, an overvoltage protection device must be connected upstream to reduce the overvoltages from category III to category II.

4.3 Environmental conditions

4.3.1 Climatic conditions

Extended storage	Weatherproof IEC 60721-3-1; class 1K21, non-condensing, no condensation Deviating from the standard: Temperature -25 °C to +70 °C
Transport	Weatherproof IEC 60721-3-2; class 2K11, non-condensing, no condensation Deviating from the standard: Temperature -25 °C to +70 °C
Operation	Stationary use, weatherproof IEC 60721-3-3; class 3K22, non-condensing, no condensation Deviating from the standard: Temperature -10 to +40 °C

4.3.2 Special climatic conditions

Extended storage	Weatherproof IEC 60721-3-1 class 1Z1
Operation	Stationary use, weatherproof IEC 60721-3-3 class 3Z1

4.3.3 Biological conditions

Extended storage	Weatherproof IEC 60721-3-1 class 1B1
Transport	Weatherproof IEC 60721-3-2 class 2B1
Operation	Stationary use, weatherproof IEC 60721-3-3 class 3B1

4.3.4 Chemically active substances

Extended storage	Weatherproof IEC 60721-3-1 class 1C2 Deviating from the standard: no corrosive gases, no salt mist
Transport	Weatherproof IEC 60721-3-2 class 2C2, no sea water Deviating from the standard: no corrosive gases, no salt mist
Operation	Stationary use, weatherproof ISO 9223 class C3 Deviating from the standard: no corrosive gases, no salt mist

4.3.5 Mechanically active substances

Extended storage	Weatherproof IEC 60721-3-1 class 1S10, no conductive dust
Transport	Weatherproof IEC 60721-3-2 class 2S1, no conductive dust
Operation	Stationary use, weatherproof IEC 60721-3-3 class 3S5, no conductive dust

4.3.6 Mechanical requirements

The specifications are characteristic values for the device test. The specifications are based on the test characteristic values according to IEC 60721-3-3 and correspond to class 3M5 according to EN 60721-3-3:1995.

The tests carried out in this context are time-limited vibration cycles.

Vibration (sinusoidal)	2 – 200 Hz: 1 g
Vibration (noise)	10 – 200 Hz: 0.3 m ² /s ³ 200 – 500 Hz: 0.1 m ² /s ³ Corresponds to approx. 0.95 g _{rms} (g _{rms} = r.m.s. acceleration value)
Shocks (half sine)	10 g at 11 ms shock duration

4.4 Technical data of the MCC91A.. basic device 3 × AC 200 – 500 V

All technical data refers to a nominal line voltage of AC 400 V.

4.4.1 Size 0S

Input

	Unit	MCC91A-....-5E3-4..						
Size		0S						
Type		0010	0016	0020	0025	0032	0040	0055
Nominal line voltage (according to EN 50160) V _{line}	V	3 × AC 200 – 500						
Nominal current AC I _{line}	A	0.9	1.4	1.8	2.3	2.9	3.6	5
Line frequency f _{line}	Hz	50 – 60 ± 5%						
Controlled rectifier	–	No						
Connection contacts X1	–	"Cage clamp terminal" (→ 183)						

Output

	Unit	MCC91A-....-5E3-4..						
Size		0S						
Type		0010	0016	0020	0025	0032	0040	0055
Output voltage V _{out}	V	0 – V _{line} ¹⁾						
Motor power ASM P _{Mot}	kW	0.25	0.37	0.55	0.75	1.1	1.5	2.2
Nominal output current I _N at the smallest possible PWM frequency	A	1	1.6	2	2.5	3.2	4	5.5
Overload capacity	–	150% I _N : max. 30 s at f _{PWM} = 4 kHz						
Continuous output current at f = 0 Hz	–	75% × I _N at f _{PWM} = 4 kHz						

31986846/EN – 03/2025

	Unit	MCC91A-....-5E3-4..						
Size		0S						
Type		0010	0016	0020	0025	0032	0040	0055
Apparent output power S_N	kVA	0.7	1.1	1.4	1.7	2.2	2.8	3.8
Nominal DC link voltage V_{DCL_nom}	V	DC 560 at $V_{line} = 400$ V						
Maximum DC link voltage V_{DCL_max}	V	DC 980						
PWM frequency f_{PWM}	kHz	4, 8, 16 (adjustable)						
Maximum output frequency f_{max}	Hz	599 See chapter "Characteristics of the control modes" (→ 86)						
Connection contacts X2	–	"Cage clamp terminal" (→ 183)						

1) In inverter operation, it is technically impossible to provide the full line voltage (with direct power supply) at the output. The output voltage is generated from the DC link circuit and depends, among other things, on the level of its voltage, the control mode, and the operating point. Typically, the maximum output voltage in motor operation is approx. 8% below the line voltage.

Brake chopper

	Unit	MCC91A-....-5E3-4..						
Size		0S						
Type		0010	0016	0020	0025	0032	0040	0055
Minimum braking resistance value R_{BR_min}	Ω	90						
Brake chopper continuous power	kW	0.7	1.1	1.4	1.7	2.2	2.8	3.8
Brake chopper peak power	kW	150% × brake chopper continuous power						
Connection contacts X2	–	"Cage clamp terminal" (→ 183)						

General

	Unit	MCC91A-....-5E3-4..						
Size		0S						
Type		0010	0016	0020	0025	0032	0040	0055
Power section nominal power loss ¹⁾	W	7	11	15	19	27	34	50
Power consumption 24 V	W	1						
Interference suppression	–	EMC filter limit value category C2 in accordance with EN 61800-3						
PE connection	–	M4 screw (with terminal clip)						
Permitted number of times power may be switched on/off per minute	min ⁻¹	1						
Minimum switch-off time for power off	s	10						
Mass	kg	1.7						

1) To calculate the thermal power loss, add the values of "Power consumption 24 V" and "Power section nominal power loss".

4.4.2 Size 0L

Input

	Unit	MCC91A-....-5.3-4..				
Size		0L				
Type		0070	0095	0125	0160	0240
Nominal line voltage (according to EN 50160) V_{line}	V	3 × AC 380 – 500				
Nominal current AC I_{line}	A	6.3	8.6	11.3	14.4	21.6
Line frequency f_{line}	Hz	50 – 60 ± 5%				
Controlled rectifier	–	No				
Connection contacts X1	–	"Cage clamp terminal" (→ 183)				

Output

	Unit	MCC91A-....-5.3-4..				
Size		0L				
Type		0070	0095	0125	0160	0240
Output voltage V_{out}	V	$0 - V_{line}^{1)}$				
Motor power ASM P_{Mot}	kW	3	4	5.5	7.5	11
Nominal output current I_N at the smallest possible PWM frequency	A	7	9.5	12.5	16	24
Overload capacity	–	150%: max. 30 s at $f_{PWM} = 4$ kHz				
Continuous output current at $f = 0$ Hz	–	$75\% \times I_N$ at $f_{PWM} = 4$ kHz				
Apparent output power S_N	kVA	4.8	6.6	8.7	11.1	16.8
Nominal DC link voltage V_{DCL_nom}	V	DC 560 at $V_{line} = 400$ V				
Maximum DC link voltage V_{DCL_max}	V	DC 980				
PWM frequency f_{PWM}	kHz	4, 8, 16 (adjustable)				
Maximum output frequency f_{max}	Hz	599 See chapter "Characteristics of the control modes" (→ 86)				
Connection contacts X2	–	"Cage clamp terminal" (→ 183)				

1) In inverter operation, it is technically impossible to provide the full line voltage (with direct power supply) at the output. The output voltage is generated from the DC link circuit and depends, among other things, on the level of its voltage, the control mode, and the operating point. Typically, the maximum output voltage in motor operation is approx. 8% below the line voltage.

Brake chopper

	Unit	MCC91A-....-5.3-4..				
Size		0L				
Type		0070	0095	0125	0160	0240
Minimum braking resistance value R_{BR_min}	Ω	42			24	
Brake chopper continuous power	kW	4.8	6.6	8.7	11.1	16.8
Brake chopper peak power	kW	$150\% \times$ brake chopper continuous power				
Connection contacts X2	–	"Cage clamp terminal" (→ 183)				

General

	Unit	MCC91A-....-5.3-4..				
Size		0L				
Type		0070	0095	0125	0160	0240
Power section nominal power loss ¹⁾	W	63	83	120	147	236
Power consumption 24 V	W	1				20
Interference suppression	–	EMC filter limit value category C2 in accordance with EN 61800-3				EMC filter limit value category C3 in accordance with EN 61800-3
PE connection	–	M4 screw (with terminal clip)				
Permitted number of times power may be switched on/off per minute	1/min	1				
Minimum switch-off time for power off	s	10				
Mass	kg	2.7			2.8	5.3

1) To calculate the thermal power loss, add the values of "Power consumption 24 V" and "Power Section nominal power loss".

4.5 Technical data of the MCC91A.. basic device 1 × AC 200 – 240 V

All technical data refers to a nominal line voltage of AC 230 V.

4.5.1 Size 0S

Input

	Unit	MCC91A-....-2E1-4..			
Size		0S			
Type		0017	0025	0034	0042
Nominal line voltage (according to EN 50160) V_{line}	V	1 × AC 200 – 240			
Nominal current AC I_{line}	A	5.5	7.1	8.9	11.1
Line frequency f_{line}	Hz	50 – 60 ± 5%			
Controlled rectifier	–	Yes (precharge circuit)			
Connection contacts X1	–	"Connectors " (→ 183)			

Output

	Unit	MCC91A-....-2E1-4..			
Size		0S			
Type		0017	0025	0034	0042
Output voltage V_{out}	V	0 – $V_{line}^{1)}$			
Motor power ASM P_{Mot}	kW	0.25	0.37	0.55	0.75
Nominal output current I_N at the smallest possible PWM frequency	A	1.7	2.5	3.4	4.2
Overload capacity	–	150% × I_N : max. 30 s at $f_{PWM} = 4$ kHz			
Continuous output current at $f = 0$ Hz	–	75% × I_N at $f_{PWM} = 4$ kHz			
Apparent output power S_N	kVA	0.68	1	1.35	1.67
Nominal DC link voltage V_{DCL_nom}	V	DC 325 at $V_{line} = 230$ V			
Maximum DC link voltage V_{DCL_max}	V	DC 650			
PMV frequency f_{PWM}	kHz	4, 8, 16 (adjustable)			
Maximum output frequency f_{max}	Hz	599 See chapter "Characteristics of the control modes" (→ 86)			
Connection contacts X2	–	"Connectors " (→ 183)			

1) In inverter operation, it is technically impossible to provide the full line voltage (with direct power supply) at the output. The output voltage is generated from the DC link circuit and depends, among other things, on the level of its voltage, the control mode, and the operating point. Typically, the maximum output voltage in motor operation is approx. 8% below the line voltage.

Brake chopper

	Unit	MCC91A-....-2E1-4..			
Size		0S			
Type		0017	0025	0034	0042
Minimum braking resistance value R_{BR_min}	Ω	61			
Brake chopper continuous power	kW	0.68	1	1.35	1.67
Brake chopper peak power	kW	150% × apparent output power S_N			
Connection contacts X2	–	"Connectors " (→ 183)			

General

	Unit	MCC91A-....-2E1-4..			
Size		0S			
Type		0017	0025	0034	0042
Power section nominal power loss ¹⁾	W	15	24	36	48
Power consumption 24 V	W	1			
Interference suppression	–	EMC filter limit value category C2 in accordance with EN 61800-3			

	Unit	MCC91A-....-2E1-4..			
Size		0S			
Type		0017	0025	0034	0042
PE connection	—	M4 screw			
Permitted number of times power may be switched on/off per minute	min ⁻¹	0.5			
Minimum switch-off time for power off	s	10			
Mass	kg	1.7			

1) To calculate the thermal power loss, add the values of "24 V power consumption" and "Nominal power loss of the power section".

4.5.2 Size 0L

Input

	Unit	MCC91A-....-2E1-4..		
Size		0L		
Type		0055	0070	0093
Nominal line voltage V_{line} (in accordance with EN 50160)	V	1 × AC 200 – 240		
Nominal current AC I_{line}	A	14.8	16	20
Line frequency f_{line}	Hz	50 – 60 ± 5%		
Controlled rectifier	—	Yes (precharge circuit)		
Connection contacts X1	—	"Connectors " (→ 183)		

Output

	Unit	MCC91A-....-2E1-4..		
Size		0L		
Type		0055	0070	0093
Output voltage V_{out}	V	0 – $V_{line}^{1)}$		
Motor power ASM P_{Mot}	kW	1.1	1.5	2.2
Nominal output current I_N at the smallest possible PWM frequency	A	5.5	7	9.3
Overload capacity	—	150% × I_N ; max. 30 s at $f_{PWM} = 4$ kHz		
Continuous output current at $f = 0$ Hz	—	75% × I_N at $f_{PWM} = 4$ kHz		
Apparent output power S_N	kVA	2.2	2.8	3.7
Nominal DC link voltage V_{DCL_nom}	V	DC 325 at $V_{line} = 230$ V		
Maximum DC link voltage V_{DCL_max}	V	DC 650		
PWM frequency f_{PWM}	kHz	4, 8, 16 (adjustable)		
Maximum output frequency f_{max}	Hz	599 See chapter "Characteristics of the control modes" (→ 86)		
Connection contacts X2	—	"Connectors " (→ 183)		

1) In inverter operation, it is technically impossible to provide the full line voltage (with direct power supply) at the output. The output voltage is generated from the DC link circuit and depends, among other things, on the level of its voltage, the control mode, and the operating point. Typically, the maximum output voltage in motor operation is approx. 8% below the line voltage.

Brake chopper

	Unit	MCC91A-....-2E1-4..		
Size		0L		
Type		0055	0070	0093
Minimum braking resistance value R_{BR_min}	Ω	24		
Brake chopper continuous power	kW	2.2	2.8	3.7
Brake chopper peak power	kW	150% × apparent output power S_N		
Connection contacts X2	—	"Connectors " (→ 183)		

31986846/EN – 03/2025

General

	Unit	MCC91A-....-2E1-4..		
Size		0L		
Type		0055	0070	0093
Power section nominal power loss ¹⁾	W	57	76	110
Power consumption 24 V	W	1		
Interference suppression	—	EMC filter limit value category C2 in accordance with EN 61800-3		
PE connection	—	M4 screw		
Permitted number of times power may be switched on/off per minute	min ⁻¹	0.5		
Minimum switch-off time for power off	s	10		
Mass	kg	2.7		

1) To calculate the thermal power loss, add the values of "Power consumption 24 V" and "Power section nominal power loss".

4.6 Electronics data

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

4.6.1 X5: DC 24 V voltage supply input (optional, only when gateway is plugged in)

	Specification
Quantity	1
DC 24 V voltage supply	Connection of external power supply unit 24 V according to IEC 61131 DC 24 V -10%, +20%
Connection	X5: 24 V X5: GND
Connection contacts	"Connectors" (→ 183)

4.6.2 X25: Auxiliary voltage output VO24

The VO24 auxiliary voltage output only supplies voltage when the line voltage is applied to the inverter.

	Specification
Quantity	1
Voltage	According to IEC 61131, DC 24 V -10%, +20%
Maximum output current	50 mA ¹⁾
Connection	X25:VO24
Connection contact	"Cage clamp terminal" (→ 183)
Maximum cable length	30 m

1) The inverter supplies a total of 150 mA max. for the following 24 V outputs: X25: VO24, DIO1, DIO2, X6:5 VO24_STO. This limitation must be taken into account during project planning.

4.6.3 X25: Auxiliary voltage output REF1

	Specification
Quantity	1
Voltage	According to IEC 61131, DC 24 V -10%, +20%
Maximum output current	50 mA
Connection	X25:REF1
Connection contact	"Cage clamp terminal" (→ 183)
Maximum cable length	30 m

4.6.4 X25: Digital input or digital output DIO01 – DIO02

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

	Specification
Quantity	2
Design	Type 2 according to IEC 61131-2
Cycle time	2 ms
Response time	175 µs plus cycle time
Maximum output current	50 mA ¹⁾
Short-circuit protection	Yes
Connection	X25:DIO01 – X25:DIO02: Selection option, see parameter menu
Connection contacts	"Cage clamp terminal" (→ 183)
Maximum cable length	30 m

1) The inverter supplies a total of 150 mA max. for the following 24 V outputs: X25: VO24, DIO1, DIO2, X6:5 VO24_STO. This limitation must be taken into account during project planning.

4.6.5 X25: Analog input AI1 and analog input/analog output AIO1

	Specification
Quantity	2 (1 input and 1 input/output)
Cycle time	2 ms
Response time	175 µs plus cycle time
Resolution	10 bit
Short-circuit protection	Yes
Connection	X25:REF1 Reference voltage output: 10 V, $I_{max} = 3$ mA X25:AI1 Analog input AI1: 0 – 10 V, input resistance $R_i \geq 20$ kΩ, 0 (4) – 20 mA ($R_i = 250$ Ω) X25:GND The input is referenced to GND, analog input voltage or current, switchable via DIP switch S4. X25:AIO1 Analog input or analog output AIO1 parameterizable: • AIO1 as analog input: 0 – 10 V, input resistance $R_i \geq 20$ kΩ • AIO1 as analog output: 0 – 10 V, $I_{max} = 1$ mA
Connection contacts	"Cage clamp terminal" (→ 183)
Maximum cable length	30 m

4.6.6 X26: Digital inputs DI01 – DI04

	Specification
Quantity	4
Design	Types 1 and 3 according to IEC 61131-2
Cycle time	2 ms
Response time	100 µs plus cycle time
Current consumption	6 mA at 30 V
Connection	X26:DI01 – X26:DI04: Selection option, see parameter menu
Connection contacts	"Cage clamp terminal" (→ 183)
Maximum cable length	30 m

4.6.7 X26: Relay output DOR

	Specification
Quantity	1
Current-carrying capacity of relay contacts	$U_{\max} = \text{DC } 30 \text{ V}$, $I_{\max} = \text{DC } 0.8 \text{ A}$
Connection	X26:DOR-C, common relay contact X26:DOR-NO, NO contact X26:DOR-NC, NC contact Selection option, see parameter menu
Connection contacts	"Cage clamp terminal" (→ 183)
Maximum cable length	30 m

4.6.8 X26: DB00 brake control

	Specification
Quantity	1
Output voltage	DC 24 V -10%, +20%
Current-carrying capacity	150 mA, 3.6 W, protection circuit required for inductive load (e.g. freewheeling diode or varistor)
Connection	X26:DB00 X26:GND
Connection contacts	"Cage clamp terminal" (→ 183)
Maximum cable length between inverter and brake control	30 m

4.6.9 X26: Sensor input for temperature evaluation of the TF1 motor

	Specification
Quantity	1
Temperature sensors with evaluation capability	PTC thermistor (TF) Bimetallic temperature switch (TH) Temperature sensor KTY84-130 (KY) Pt1000 (PK or PI)
Response threshold TF	1830 Ω
Connection	X26:TF1 X26:GND
Connection contacts	"Cage clamp terminal" (→ 183)

4.6.10 X6: STO terminal (optional)

The VO24_STO auxiliary voltage output only supplies voltage when the line voltage is applied to the inverter.

	Specification
Quantity	1 (optional)
Design	Type 2 according to IEC 61131-2
Power consumption	150 mW
Minimum voltage rise	1 V/ms
Connection ../CSO..	The following terminals are connected internally: • X6:1 and X6:3 F_STO_P • X6:2 and X6:4 F_STO_M X6:5 VO24_STO ¹⁾ X6:6 GND Input capacitance F_STO_P against F_STO_M and against GND: • Typical: 300 pF • Maximum: 500 pF Due to the current carrying capacity, a maximum of 10 devices can be connected to one another via terminal X6.
Connection contacts	"Cage clamp terminal" (→ 183)
Maximum cable length	30 m

1) The inverter supplies a total of 150 mA max. for the following 24 V outputs: X25: VO24, DIO1, DIO2, X6:5 VO24_STO. This limitation must be taken into account during project planning.

31986846/EN – 03/2025

4.7 CFX11A-E gateway for EtherNet/IP™ and Modbus TCP

4.7.1 Information



INFORMATION

The gateway for EtherNet/IP™ and Modbus TCP is available as an option.

4.7.2 Description

The gateway makes it possible to connect the inverter to EtherNet/IP™- or Modbus TCP-based higher-level automation, project planning, and visualization systems. The gateway has the following characteristics:

- EtherNet/IP™ or Modbus TCP
- Media redundancy
- Integrated switch with cut-through procedure

When using the gateway, you can communicate directly with the devices via Ethernet and use the MOVISUITE® engineering software for startup, diagnostics, and parameterization purposes.

Seven additional inverters can be connected to the gateway using the CFC11A communication module.

Only the CBG21A keypad can be used with the gateway (prerequisite: Keypad firmware FW7.00).

4.7.3 Technical data

CFX11A-E gateway for EtherNet/IP™ and Modbus TCP	
Ambient temperature	-10 – 55 °C ¹⁾
Application protocols	EtherNet/IP™, Modbus TCP, HTTP, SNMP, DHCP, SEW Application Services
Degree of protection	IP20 in accordance with EN 60529
Power consumption	3 W
Network protocols	ARP
Media redundancy (DLR)	Yes
Baud rate	100 Mbaud/10 Mbaud, full duplex/half duplex
Connection technology	2 × RJ45
Ethernet switch	Integrated
Ethernet switch switching technology	Cut through
Ethernet switch latency period	5.5 µs
Manufacturer ID	013B _{hex} (EtherNet/IP™)
EDS file name	SEW MOVI-C MOVITRAC Gateway CFX.eds
Port numbers used	Port overview, see Online Support
Purchase order number	28315049

CFX11A-E gateway for EtherNet/IP™ and Modbus TCP

Dimensions in mm (W × H × D)	53 × 158 × 39
------------------------------	---------------

1) At clock frequency of basic device > 4 kHz: -10 – 50 °C.

4.8 CFX11A-N gateway for PROFINET**4.8.1 Information****INFORMATION**

The CFX11A-N gateway for PROFINET is available as an option.

4.8.2 Description

The gateway makes it possible to connect the inverter to PROFINET-based, higher-level automation, project planning, and visualization systems.

When using the gateway, you can communicate directly with the devices via Ethernet and use the MOVISUITE® engineering software for startup, diagnostics, and parameterization purposes.

Seven additional inverters can be connected to the gateway using the CFC11A communication module.

Only the CBG21A keypad can be used with the gateway (prerequisite: Keypad firmware FW7.00).

4.8.3 Technical data

CFX11A-N gateway for PROFINET	
Ambient temperature	-10 – 55 °C ¹⁾
PROFINET	RT, IRT ²⁾ (Isochronous Realtime)
Degree of protection	IP20 in accordance with EN 60529
Power consumption	3 W
Conformance class	C
Netload class	3
Topology detection (LLDP)	Yes
Automatic addressing (LLDP, DCP)	Yes
Media redundancy (MRP)	Yes
I&M data	I&M0 – I&M5
Manufacturer ID	010A _{hex}
Baud rate	100 MBaud, full duplex
Connection technology	2 × RJ45
Ethernet switch	Integrated
Ethernet switch switching technology	Cut through
Ethernet switch latency period	5.5 µs

31986846/EN – 03/2025

CFX11A-N gateway for PROFINET	
EtherType 8892 _{hex}	PROFINET
EtherType 88B5	Address Editor from SEW-EURODRIVE
GSD file name	GSDML-V2.43-SEW-MOVI-C-MOVITRAC-gateway-20240411-074616
SEW engineering (firmware update, diagnostics)	Yes
Port numbers used	Port overview, see Online Support
Purchase order number	28315022
Dimensions in mm (W × H × D)	53 × 158 × 39

1) At clock frequency of basic device > 4 kHz: -10 – 50 °C.

2) IRT up to gateway, no forwarding to lower-level axes with communication module.

4.9 CFX11A-S gateway for EtherCAT®/SBus^{PLUS} (in preparation)

4.9.1 Information

INFORMATION



CFX11A-S gateway for EtherCAT®/SBus^{PLUS} is available as an option.

4.9.2 Description

The CFX11A-S gateway establishes a powerful EtherCAT®/SBus^{PLUS} connection to MOVI-C® CONTROLLERS. EtherCAT® stations from SEW-EURODRIVE or other manufacturers can now be controlled and diagnosed by a MOVI-C® CONTROLLER.

The functions of the MOVI-C® CONTROLLER are:

- Freely programmable sequence control according to IEC 61131 for automating drive and logic tasks
- Central data storage for all inverters of the MOVI-C® modular automation system from SEW-EURODRIVE on EtherCAT®/SBus^{PLUS}
- Plug-and-play device replacement through automatic data recovery
- Central setpoint input
- EtherCAT®/SBus^{PLUS} master for SEW-EURODRIVE components and for peripheral devices with EtherCAT® interface
- Fieldbus device interface to higher-level control systems
- Diagnostics and visualization of the automation system

Seven additional inverters can be connected to the gateway using the CFC11A communication module.

Only the CBG21A keypad can be used with the gateway.

4.9.3 Technical data

CFX11A-S gateway for EtherCAT®/SBus ^{PLUS}	
Ambient temperature	-10 – 55 °C ¹⁾
Power consumption	2 W
Degree of protection	IP20 in accordance with EN 60529
Automatic baud rate detection	Yes, full duplex
Supported baud rate	100 MBaud
Connection technology	2 × RJ45
Product code	B _{hex}
Manufacturer ID	59 _{hex}
Device family	MOVI-C®
Application protocols	EtherCAT®, SdO, FoE
Permitted cable types	Category 5 and higher, class D according to IEC 11801
Maximum cable length	100 m
Purchase order number	28315030
Dimensions in mm (W × H × D)	53 × 158 × 39

1) At clock frequency of basic device > 4 kHz: -10 – 50 °C.

4.10 CFC11A communication module

INFORMATION



The CFC11A communication module is available as an option.

4.10.1 Description

The CFC11A communication module forms the extended communication connection of up to 7 additional inverters for the CFX11A-E, CFX11A-N, and CFX11A-S gateways. No keypads can be used with the CFC11A communication module. Operation and engineering are performed via the gateway.

The communication connection between the gateway and all other communication modules is established via a ribbon cable, which is included with the CFC11A communication module.

4.10.2 Technical data

CFC11A communication module	
Ambient temperature	-10 – 60 °C
Degree of protection	IP20 in accordance with EN 60529
Power consumption	0.4 W
Purchase order number	28315138
Dimensions in mm (W × H × D)	45 × 100 × 20

4.11 CSO safety options

The CSO safety option can establish the STO safe stop function according to PL d via terminals.

For more information, refer to the **Product manual** > chapter "Project planning for functional safety" (→ 125).

4.12 Technical data – functional safety

4.12.1 STO safety sub-function

The following table shows the technical data of the STO safety sub-function for devices with the CSO safety option.

The safe digital input F_STO_P corresponds to type 3 according to IEC 61131-2.

The reference potential for F_STO_P is STO_M (contact at terminal X6:2).

	Terminal	Technical data		
STO safety contact	X6	–		
Electrical data of safe digital input F_STO_P		Minimum	Typical	Maximum
Input voltage range	X6:1	DC -3 V	DC 24 V	DC 30 V
Input capacitance against STO_M		–	300 pF	500 pF
Input capacitance against GND		–	300 pF	500 pF
Power consumption of F_STO_P at DC 24 V		–	–	150 mW
Input voltage for ON state (STO)		DC 11 V	–	–
Input voltage for OFF state (STO)		–	–	DC 5 V
Permitted leakage current of the external safety controller		–	–	1 mA
Minimum voltage rise		1 V/ms		

	Terminal	Technical data
MCC91A-.../CSO...		The following terminals are connected internally: • X6:1 and X6:3 • X6:2 and X6:4 Due to the current carrying capacity, a maximum of 10 devices can be connected to one another via terminal X6.
Connection contacts		Connector - 1 core: 0.25 – 1.5 mm² - 2 cores: 0.25 – 0.5 mm² (Twin conductor end sleeve)
Maximum cable length		30 m

4.12.2 MOVISAFE® CSO characteristic safety values

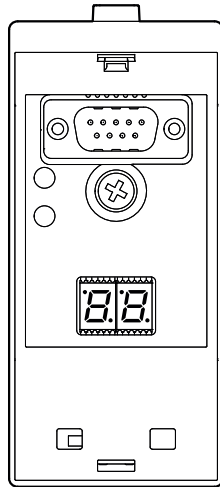
	Characteristic values	
	EN 62061/EN 61800-5-2	EN ISO 13849-1
Tested safety class/standard basis	SIL 2	PL d
Probability of dangerous failure per hour (PFH _D value)	30 × 10 ⁻⁹ 1/h	
Service life	20 years, after which the component must be replaced with a new one.	
Proof test interval	> 20 years	—
Safe state	Safe Torque Off (STO)	
Safety sub-function	STO, SS1 ¹⁾ according to EN 61800-5-2	

1) With suitable external control

4.13 CDM11A diagnostic module

4.13.1 Description

The CDM11A diagnostic module is the interface to the MOVISUITE® engineering software. The module contains two 7-segment displays for displaying the device status. The module is required to use the CBG11A, CBG21A, and CBG22A keypads.



CDM11A properties:

- 2-digit 7-segment display
- Output of fault codes and status
- Engineering interface

4.13.2 Technical data

INFORMATION



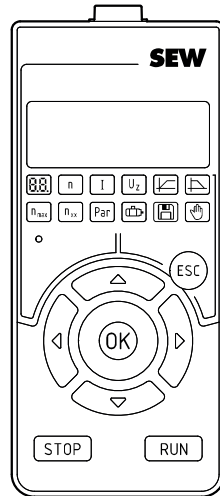
The CDM11A diagnostic module can only be plugged directly onto the inverter.

CDM11A diagnostic module	
Power consumption	0.25 W
Dimensions in mm (W × H × D)	46 × 100 × 20
Screen type	2-digit 7-segment display
Engineering interface	D-sub, 9-pin
Part number	28265092

4.14 CBG01A keypad

4.14.1 Description

The CBG01A keypad enables operation, parameterization, and output of fault codes for the inverters. The keypad is connected directly to the basic device.



CBG01A properties:

- 5-digit 7-segment display
- Output of fault codes, status and operating state
- Startup of asynchronous motors:
 - with or without brake (firmware-dependent)
 - with or without temperature sensors (depending on firmware)
 - without encoder
- Simple diagnostics
- Saving and copying a parameter set
- Language: none (7-segment display)

For more information, refer to the "Keypad CBG01A" manual.

4.14.2 Technical data

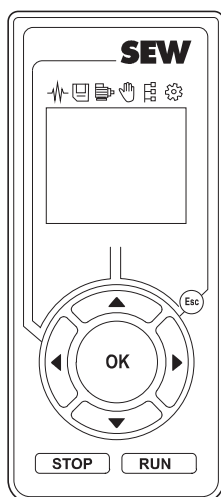
CBG01A keypad	
Ambient temperature	0 to 60 °C
Degree of protection	IP40 in accordance with EN 60529
Power consumption	0.25 W
Dimensions in mm (W × H × D)	45 × 100 × 19
Screen type	5-digit 7-segment display
Part number	28269993

4.15 CBG11A keypad

4.15.1 Description

The keypad enables convenient startup, operation, parameterization, and diagnostics of inverters of the MOVI-C® modular automation system due to the full-text display.

The keypad has a mini USB interface with gateway function. A connection from the inverter to a PC can be established using this interface for engineering with MOVISUITE®.



CBG11A properties:

- 38 mm monochrome display (1.5")
- Startup of asynchronous motors:
 - with or without brake
 - with or without temperature sensors
 - without encoder
- Diagnostics
- Saving and copying a parameter set
- Firmware update of the inverter via USB connection
- Connection to MOVISUITE® engineering software via keypad
- Determination of load moment of inertia
- Access to all parameters
- Language: EN
- Door mounting frame COG11A available

The CDM11A diagnostic module is required to plug the keypad directly onto the inverter.

A COG11A door mounting frame is available for using the keypad remotely on a control panel or control cabinet door. In this case, the UKS52A cable is also required.

4.15.2 Technical data

CBG11A keypad	
Part number	28233646
Ambient temperature	0 – 60 °C
Degree of protection	IP40 according to EN 60529
Power consumption	0.6 W
Dimensions in mm (W × H × D)	45 × 100 × 20
Display dimensions in mm (W × H)	28.5 × 23
Diagonal screen measurement	38 mm (1.5")
Screen resolution in pixels (W × H)	78 × 64
Screen type	Monochrome display
Engineering interface	USB 2.0 mini B, female
Connection interface	D-sub 9-pin, female

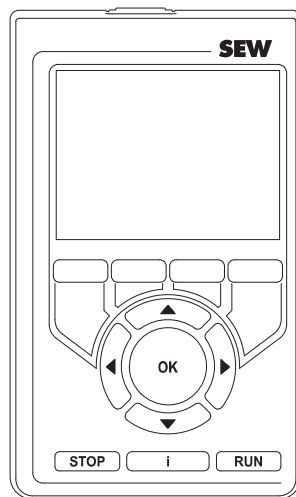
CBG11A keypad	
Mechanical strength	3M5 according to DIN EN 60721-3-3: 1995 5M1 according to DIN EN 60721-3-5: 1997

4.16 CBG21A keypad

4.16.1 Description

The keypad enables convenient startup, operation, parameterization, and diagnostics of inverters of the MOVI-C® modular automation system due to the full-text display.

The keypad has a mini USB interface with gateway function. A connection from the inverter to a PC can be established using this interface for engineering with MOVISUITE®.



CBG21A properties:

- 61 mm color display (2.4")
- Startup of asynchronous and synchronous motors:
 - with or without brake
 - with or without temperature sensors
 - with or without encoder
- Diagnostics
- Saving and copying several parameter sets
- Firmware update of the inverter via USB connection
- Connection to MOVISUITE® engineering software via keypad
- Determination of load moment of inertia
- Optimization of the drive train in terms of clearance and stiffness
- Access to all parameters
- Languages: DE/EN/FR/IT/ES/KO/PT/HU/ZH/RU
- Door mounting frame COG11A available

The CDM11A diagnostic module is required to plug the keypad directly onto the inverter.

A COG11A door mounting frame is available for using the keypad remotely on a control panel or control cabinet door. In this case, the UKS22A cable is also required.

4.16.2 Technical data

CBG21A keypad	
Part number	28238133
Ambient temperature	-10 – 60 °C
Degree of protection	IP40 in accordance with EN 60529
Power consumption	1.4 W

31986846/EN – 03/2025

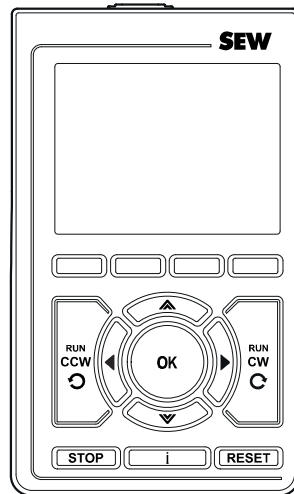
CBG21A keypad	
Dimensions in mm (W × H × D)	65 × 110 × 20
Display dimensions in mm (W × H)	49 × 37
Diagonal screen measurement	61 mm (2.4")
Screen resolution in pixels (W × H)	320 × 240
Screen type	Color display
Engineering interface	USB 2.0 mini B, female
Connection interface	D-sub 9-pin, female
Mechanical strength	3M5 according to DIN EN 60721-3-3: 1995 5M1 according to DIN EN 60721-3-5: 1997
Internal memory	128 MB (sufficient for several hundred data sets) The memory can also be used for im- ages, documents, projects, etc.

4.17 CBG22A local keypad

4.17.1 Description

The full-text display of the local keypad enables a convenient display of customer-specific information texts of the higher-level controller. It also enables the operator to perform diagnostics and manual operation.

The local keypad has a mini USB interface with gateway function. A connection from the inverter to a PC can be established using this interface for engineering with MOVISUITE®.



CBG22A properties:

- 61 mm color display (2.4")
- Display of customer-specific information texts of the higher-level controller, diagnostics and manual mode by the operator
- Simple and intuitive manual mode¹⁾ for continued operation in the event of a system failure
- Comprehensive diagnostics methods
- Exclusively read-only access to parameters in order to protect against incorrect use
- Optional access to functions and states of the control elements and data transfer for Ethernet-based communication methods of the drive systems
- Connection to MOVISUITE® engineering software via keypad
- COG11A door mounting frame available
- Languages: DE, EN, FR, ES, PT, ZH, RU

1) Only in combination with devices with key switch

The CDM11A diagnostic module is required to plug the keypad directly onto the inverter.

The CBG22A local keypad can either be plugged directly onto the inverter or used remotely. The COG11A door mounting frame is available for using the keypad remotely on a control panel or control cabinet door. In this case, the UKS52A cable is also required. If the CBG22A local keypad is plugged directly onto the inverter, manual mode cannot be used.

4.17.2 Technical data

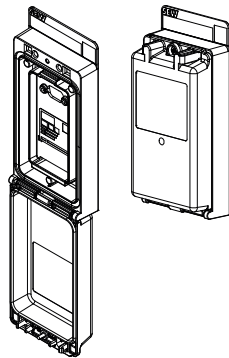
CBG22A local keypad	
Part number	28277554
Ambient temperature	-10 – 60 °C
Degree of protection	IP40 in accordance with EN 60529
Power consumption	1.4 W
Dimensions in mm (W × H × D)	65 × 110 × 20
Display dimensions in mm (W × H)	49 × 37
Diagonal screen measurement	61 mm (2.4")
Screen resolution in pixels (W × H)	320 × 240

31986846/EN – 03/2025

CBG22A local keypad	
Screen type	Color display
Engineering interface	USB 2.0 mini B, female
Connection interface	D-sub 9-pin, female
Mechanical strength	3M5 according to DIN EN 60721-3-3: 1995 5M1 according to DIN EN 60721-3-5: 1997

4.18 COG11A door mounting frame

4.18.1 Description



The COG11A door mounting frame allows the CBG11A, CBG21A, and CBG22A keypads to be used remotely from the inverter, e.g. on the control cabinet door or an operating panel.

The UKS22A and UKS52A prefabricated cables are required for the connection between the COG11A and the inverter and must be ordered separately.

4.18.2 Technical data

Door mounting frame COG11A	
Part number	28265688
Purpose of use	Door mounting frame for the following keypads: • CBG11A, part number 28233646 • CBG21A, part number 28238133 • CBG22A, part number 28277554
Scope of delivery	• COG11A (door mounting frame with cover) • Seal • Drilling template • 3 screws Ø 4 mm × 16 mm
Connection	D-sub connector, 9-pin, female
Protection class	IP65 with tightening torque of 1.2 – 1.4 Nm for the cover screw Enclosure UL Type I

Door mounting frame COG11A	
Dimensions in mm (H × W × D)	- Closed: 169 × 79.6 × 42 - Open: 315 × 79.6 × 29
Maximum metal thickness of the control cabinet door	7 mm
Space required to open the cover	200 mm

For further information, refer to the installation instructions "Door mounting frame COG11A".

Prefabricated cables

Only use cables provided by SEW-EURODRIVE. Use the UKS22A cable for the CBG11A and CBG21A keypads. The UKS52A cable also has a contact for a switch or key switch. As long as this contact is not closed, the inverter cannot be operated in manual mode with the CBG22A keypad. This allows the CBG22A keypad to be locked against unauthorized access.

Length	Part number	Type
5 m	25721763	UKS22A
Variable, 1 – 10 m ¹⁾	28149963	UKS52A ²⁾
2 m	28152751	
5 m	28152646	
10 m	28156870	

1) In 1 m increments.

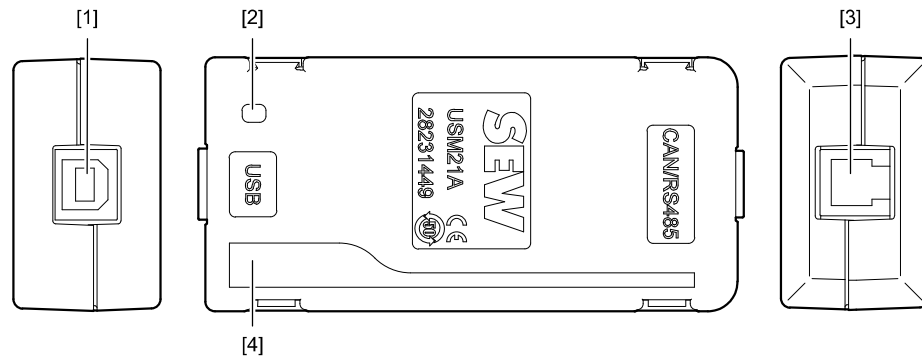
2) A port saver is required for this cable type. This is included in the scope of delivery.

4.19 USM21A interface adapter

4.19.1 Description

The USM21A interface adapter is used to connect a PC to the X32 service interface of the CDM11A diagnostic module on the inverter.

The following figure shows the USM21A interface adapter:



18014432680689163

- [1] USB socket type B
- [2] Bus status display
- [3] RJ10 socket
- [4] Interface adapter status display

4.19.2 Technical data

USM21A interface adapter	
Part number	28231449
Interference immunity	Complies with EN 61800-3
Ambient temperature	0 – 40 °C
Storage temperature	-25 – 70 °C according to EN 60721-3-3, class 3K3
Degree of protection	IP20 in accordance with EN 60529
Interfaces	RJ10 socket (device connection) USB socket type B (PC connection)
Mass	200 g
Dimensions in mm (L × W × H)	92.5 × 43 × 25

An order using part number 28231449 includes the following parts:

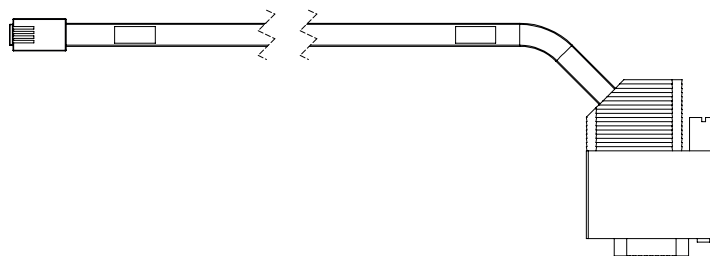
- USM21A interface adapter
- USB connection cable for the USM21A – PC connection
- Serial interface cable with 2 RJ10 connectors



INFORMATION

To connect the inverter to the USM21A, you need an additional serial interface cable with an RJ10 connector and a 9-pin D-sub connector, part number 18123864.

This cable must be ordered separately.



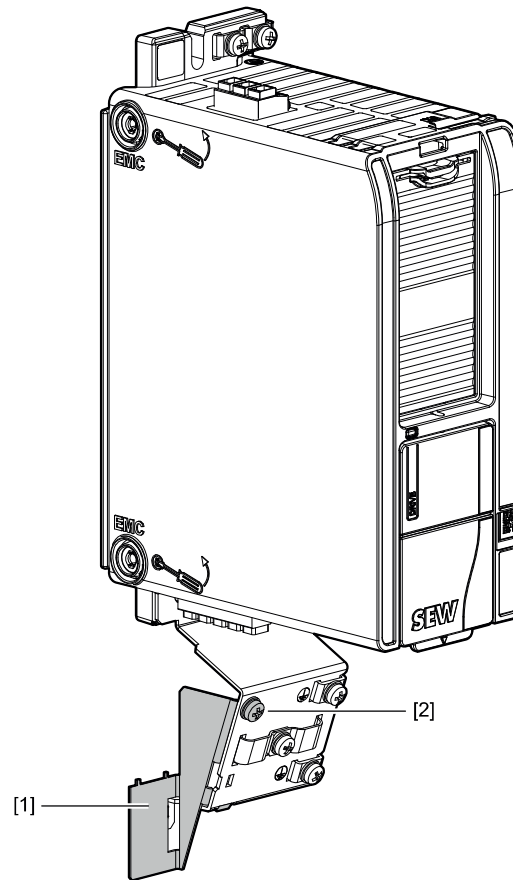
26663013387

The CDM11A diagnostic module is required to connect the inverter to the USM21A interface adapter.

4.20 CLH21A shield plate extension

The CLH21A shield plate extension (mounting rail on a standard shield plate) is used to mount additional terminal blocks or modules onto the inverter shield plate. The brake rectifier from SEW-EURODRIVE or a multi-level terminal block, for example, can be attached to the CLH21A shield plate extension.

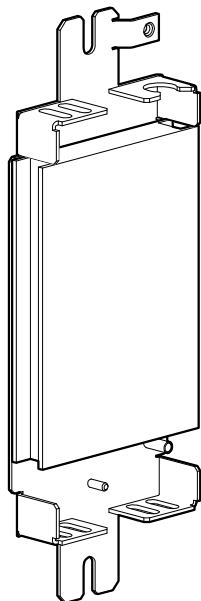
The shield plate extension is used with the inverters of size 0S and 0L (part number CLH21A: 28265572).



49906007179

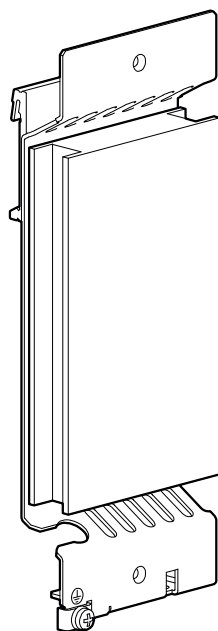
- [1] Shield plate extension
- [2] Retaining screw

4.21 CLH31A and CLH41A support plates with braking resistors



The CLH31A and CLH41A support plates with integrated braking resistors offer a space-saving solution for storing small braking resistors in the control cabinet. The assignment to the inverters can be found in chapter "Technical data and assignment to an inverter" (→ 64).

4.22 CLH51A and CLH61A support plates for mounting rail installation



The CLH51A and CLH61A support plates with integrated braking resistors offer a space-saving solution for storing small braking resistors in the control cabinet. In addition, the support plates CLH51A and CLH61A can be used to mount the inverter on a DIN EN 60715 mounting rail (35 mm × 7.5 mm) in the control cabinet. The two support plates are each available with and without mounted braking resistor:

- CLH51A without braking resistor: Part number 28290097
- CLH61A without braking resistor: Part number 28290143

The assignment to the inverters can be found in chapter "Technical data and assignment to an inverter" (→ 64).

4.23 BW../BW..-T braking resistors

4.23.1 Description

The BW../BW..-T braking resistors are adapted to the technical characteristics of the inverter. Braking resistors with different continuous and peak braking powers are available.

The braking resistors can be protected against overload and overtemperature by the customer when a thermal overload relay is used. The tripping current is set to the value I_F . For further information, refer to chapter "Technical data and assignment to an inverter" (→ 64).

A flat-type resistor has internal thermal protection (fuse cannot be replaced) that interrupts the current circuit in the event of overload. The configuration guidelines and the documented assignments of the drive inverter and braking resistor must be adhered to.

Note that with flatpack resistors, the internal thermal protection is only effective at line voltages ≥ 380 V. For line voltages < 380 V, the protection of the braking resistors against overload and overtemperature can only be ensured otherwise, e.g. with a customer-supplied thermal overload relay.

A PTC braking resistor protects itself (reversible) against regenerative overload by changing abruptly to high resistance and no longer consuming any more energy. The inverter then switches off and signals an "overvoltage" fault.

INFORMATION



Use only the following protection devices:

- Internal temperature switch T
- External thermal overload relay

→ Further information can be found in the chapter "Protecting braking resistors against thermal overload" (→ 193).

4.23.2 Parallel connection of braking resistors

Two identical braking resistors are connected in parallel for some inverter/resistor combinations. In this case, protect each braking resistor against overload and overtemperature using a thermal overload relay.

The temperature switches must be connected in series for braking resistors in the BW..-T series.

4.23.3 Technical data and assignment to an inverter

Technical data

Braking resistor		Unit	BW120-001	BW100-002/ M	BW100-001	BW100-002	BW100-006- T	BW168-T	BW268-T
Part number		—	18176011	25664514	08281718	08281653	18204198	18201334	18204171
Peak braking power		kW	6.9	9.4	6.9			10	
Current-carrying capacity	100% cdf	kW	0.03	0.15	0.1	0.15	0.6	0.8	1.2
	50% cdf	kW	0.06	0.3	0.15	0.3	1.1	1.4	2.2
	25% cdf	kW	0.1	0.6	0.3	0.6	1.9	2.6	3.8
	12% cdf	kW	0.18	1	0.5	1	3.6	4.8	7.2
	6% cdf	kW	0.3	1.8	0.9	1.8	5.7	7.6	10
	Observe the regenerative power limit of the device, see chapter "Technical data" (→ 31).								
Resistance value R _{BR}		Ω	117	100 ±10%	100	100 ±10%		68 ±10%	
Tripping current of external monitoring device I _F ¹⁾		A	—	1.2	0.8	1	2.4	3.4	4.2
Design		—	PTC braking resistor in the housing	Flatpack resistor in the housing	Flatpack resistor		Wire resistor		
Power connections		mm ²	Single core				Screw terminal		
Core length at the braking resistor		mm	170	300	510	510	—		
Cable cross section		mm ²	0.5	2.1	1.3		0.5 – 10		
Tightening torque		Nm	—				1.7 ²⁾		
PE connection		—	—				M4 bolt		
Tightening torque PE		Nm	—				1.7 ²⁾		
Degree of protection in accordance with EN 60529		—	IP20	IP40	IP54	IP54	IP20		
Ambient temperature ϑ _{amb}		°C	-20 – 40		-25 – 40		-30 – 40		
Derating at ambient temperature > 40 °C		—	-4% P _N /10 K up to maximum 60 °C						
Thermal overload protection		—	Self-protection	Fuse			Temperature switch		
Noise characteristics		—	Unobtrusive				Low		
Mass		kg	0.95	1.7	0.3	0.6	3	4	4.9

1) The tripping current must be reduced by 2% / 10 K at an ambient temperature above 40 °C.

2) Adhere to the specified tightening torques with a tolerance of +/- 10%.

Assignment

The assignment considers the maximum possible peak braking power of the inverter.

Braking resistor	BW120-001	BW100-002/ M	BW100-001 ¹⁾	BW100-002	BW100-006- T	BW168-T	BW268-T
MCC91A-....-5.3..	0010 – 0055	0010 – 0055				–	
MCC91A-....-2.1..	–					0017 – 0042	

1) This combination may only be used for line voltages ≥ 380 V.

Technical data

Braking resistor		Unit	BW047-010-T	BW147-T	BW247-T
Part number		—	17983207	18201342	18200842
Peak braking power		kW	14.6		
Current-carrying capacity	100% cdf	kW	1	1.2	2
	50% cdf	kW	1.8	2.2	3.6
	25% cdf	kW	3.2	3.8	6.4
	12% cdf	kW	6	7.2	12
	6% cdf	kW	9.5	11.4	14.6
Observe the regenerative power limit of the inverter, see chapter "Technical data" (→ 31).					
Resistance value R_{BR}		Ω	47 ±10%		
Tripping current of external monitoring device $I_F^{(1)}$		A	4.6	5.1	6.5
Design		—	Wire resistor		
Power connections		—	Screw terminal		
Cable cross section		mm ²	0.5 – 10		
Tightening torque		Nm	1.7 ²⁾		
PE connection		—	M4 bolt		
Tightening torque PE		Nm	1.7 ²⁾		
Degree of protection in accordance with EN 60529		—	IP20		
Ambient temperature ϑ_{amb}		°C	-30 – 40		
Derating at ambient temperature > 40 °C			-4% $P_N/10$ K up to maximum 60 °C		
Thermal overload protection		—	Temperature switch		
Noise characteristics		—	Low		
Mass		kg	4	4.9	6.7

1) The tripping current must be reduced by 2% / 10 K at an ambient temperature above 40 °C.

2) Adhere to the specified tightening torques with a tolerance of +/- 10%.

Assignment

The assignment considers the maximum possible peak braking power of the inverter.

Braking resistor	BW047-010-T	BW147-T	BW247-T
MCC91A-....-5.3..	0070 – 0125		
MCC91A-....-2.1..	—		

Technical data

Braking resistor		Unit	BW027-016-T	BW027-024-T	BW027-042-T
Part number		—	17983215	17983231	19155301
Peak braking power		kW	25.4		
Current-carrying capacity	100% cdf	kW	1.6	2.4	4.2
	50% cdf	kW	2.9	4.3	7.6
	25% cdf	kW	5.1	7.7	13.3
	12% cdf	kW	9.6	14.4	23.9
	6% cdf	kW	15.2	22.8	25.4
Observe the regenerative power limit of the device, see chapter "Technical data" (→ 31).					
Resistance value R_{BR}		Ω	27 $\pm$ 10%		
Tripping current of external monitoring device $I_F^{1)}$		A	7.7	9.4	12.5
Design		—	Wire resistor		Frame resistor
Power connections		—	Screw terminal		
Cable cross section		mm ²	0.5 – 10		Max. 4
Tightening torque		Nm	1.7 ²⁾		1.8 ²⁾
PE connection		—	M4 bolt		M5 bolt
Tightening torque PE		Nm	1.7 ²⁾		2.3 ²⁾
Degree of protection in accordance with EN 60529		—	IP20		
Ambient temperature ϑ_{amb}		°C	-30 – 40		
Derating at ambient temperature > 40 °C		—	-4% $P_N/10$ K up to maximum 60 °C		
Thermal overload protection		—	Temperature switch		
Noise characteristics		—	Low		
Mass		kg	5.8	8	10

1) The tripping current must be reduced by 2% / 10 K at an ambient temperature above 40 °C.

2) Adhere to the specified tightening torques with a tolerance of +/- 10%.

Assignment

The assignment considers the maximum possible peak braking power of the inverter.

Braking resistor	BW027-016-T	BW027-024-T	BW027-042-T
MCC91A-....-5.3..	0160 – 0240		
MCC91A-....-2.1..	0055 – 0093	0070 – 0093	—

Technical data BW..-T signal contact

Signal contact BW..-T	Unit	General electronics data
Cross section	mm ²	0.75 – 2.5
Tightening torque	Nm	1
Switching capacity	V	DC 2 A / DC 24 V (DC 11) and AC 2 A / AC 230 V (AC 11)
Switch contact (NC contact)	–	according to EN 60730

Technical data of braking resistors with CLH..A support plate

Braking resistor	Unit	CLH31A/ BW4	CLH31A/ BW2	CLH31A/ BW072-001	CLH31A/ BW100-001	CLH41A/ BW027-001	CLH41A/ BW047-001
Part number	–	28284712	28284720	28284739	28284755	28284747	28284763
Current-carrying capacity at 100% cdf	kW	0.025		0.1			
Resistance value R _{BR}	Ω	88	175	72	100 ±10%	27	47
Tripping current of external monitoring device I _F	A	–	–	0.9	0.8	1.5	1.1
Design	–	PTC		Flatpack resistor			
Power connections	–	Single core					
Core length at the braking resistor	mm	170		510			
Cable cross section	mm ²	0.75		1.5			
Tightening torque	Nm	–	–	–	–	–	–
PE connection	–	–	–	–	–	–	–
Tightening torque PE	Nm	–	–	–	–	–	–
Degree of protection according to EN 60529	–	IP20		IP65			
Ambient temperature ϑ_{amb}	°C	-20 – +40					
Derating at ambient temperature > 40 °C		--4% P _N /10 K up to +80 °C					
Thermal overload protection	–	Self-protection		Fuse			
Noise characteristics	–	Unobtrusive					
Mass	kg	0.08		0.3			

The braking resistors with CLH31A and CLH41A support plate are supplied as a combination of support plate and integrated braking resistor. There is a choice of braking resistors with different ratings for each support plate.

Braking resistors mounted to the support plate may not achieve the load capacity specified in the table at 100% cdf. The specifications for the nominal power of the inverter can be observed in submounted operation at 4 kHz, 40 °C, and 400 V.

Assignment of braking resistors with CLH..A support plate

Braking resistor	CLH31A/BW4	CLH31A/BW2	CLH31A/ BW072-001	CLH31A/ BW100-001 ¹⁾	CLH41A/ BW027-001	CLH41A/ BW047-001
MCC91A-....-5.3..	–	0010 – 0055	–	0010 – 0055	0160	0070 – 0125
MCC91A-....-2.1..	0017 – 0042	–	0017 – 0042	–	0055 – 0093	–

1) This combination may only be used for line voltages ≥ 380 V.

Technical data of braking resistors with support plate for mounting rail installation

Braking resistor	Unit	CLH51A/ BW4	CLH51A/ BW2	CLH51A/ BW072-001	CLH51A/ BW100-001	CLH61A/ BW027-001	CLH61A/ BW047-001
Part number	—	28290100	28290119	28290127	28290135	28290151	28290178
Current-carrying capacity at 100% cdf	kW	0.025		0.1			
Resistance value R _{BR}	Ω	88	175	72	100 ±10%	27	47
Tripping current of external monitoring device I _F	A	—	—	0.9	0.8	1.5	1.1
Design	—	PTC		Flatpack resistor			
Power connections	—	Single core					
Core length at the braking resistor	mm	170		510			
Cable cross section	mm ²	0.75		1.5			
Tightening torque	Nm	—	—	—	—	—	—
PE connection	—	—	—	—	—	—	—
Tightening torque PE	Nm	—	—	—	—	—	—
Degree of protection according to EN 60529	—	IP20		IP65			
Ambient temperature ϑ_{amb}	°C	-20 – +40					
Derating at ambient temperature > 40 °C	—	-5% P _N /10 K up to +80 °C					
Thermal overload protection	—	Self-protection					
Noise characteristics	—	Unobtrusive					
Mass	kg	0.08		0.3			

The braking resistors with CLH51A and CLH61A support plate are supplied as a combination of support plate and integrated braking resistor. There is a choice of braking resistors with different ratings for each support plate.

Braking resistors mounted to the support plate may not achieve the load capacity specified in the table at 100% cdf. The specifications for the nominal power of the inverter can be observed in submounted operation at 4 kHz, 40 °C and 400 V.

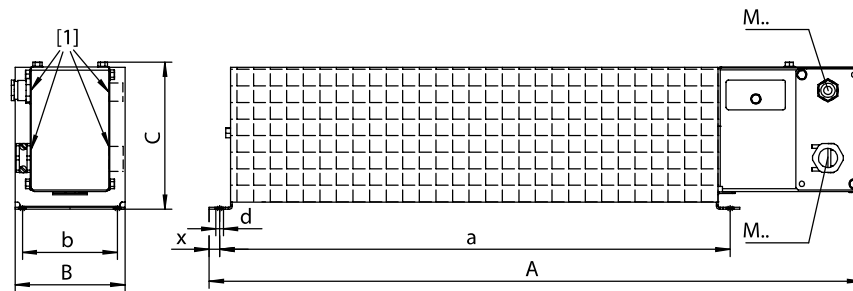
Assignment of braking resistors with support plate for mounting rail installation

Braking resistor	CLH51A/BW4	CLH51A/BW2	CLH51A/ BW072-001	CLH51A/ BW100-001 ¹⁾	CLH61A/ BW027-001	CLH61A/ BW047-001
MCC91A-....-5,3..	—	0010 – 0055	—	0010 – 0055	0160	0070 – 0125
MCC91A-....-2,1..	0017 – 0042	—	0017 – 0042	—	0055 – 0093	—

1) This combination may only be used for line voltages $\geq$ 380 V.

4.23.4 Dimension drawings and dimensions

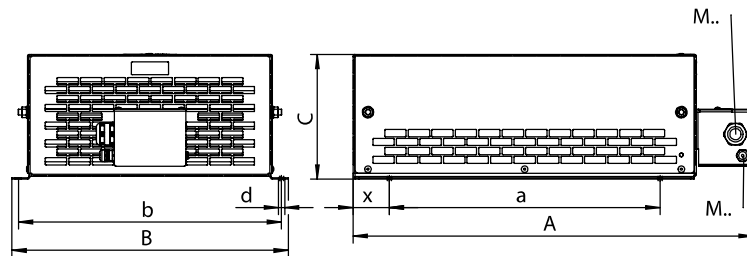
Wire resistor



9007218129604875

Braking resistor	Main dimensions in mm			Mounting dimensions in mm				Cable gland
	A	B	C	a	b	d	x	
BW100-006-T	549	92	125	430	80	6.5	8	M25 + M12
BW047-010-T	749	92	125	630	80	6.5	8	M25 + M12
BW147-T	549	185	125	430	150	6.5	8	PG16 + M12
BW247-T	749	185	125	630	150	6.5	8	PG16 + M12
BW027-016-T	649	185	125	530	150	6.5	8	M25 + M12
BW027-024-T	649	275	125	530	240	6.5	8	M25 + M12
BW168-T	449	185	120	326	150	6.5	8	M25 + M12
BW268-T	549	185	120	426	150	6.5	8	M25 + M12

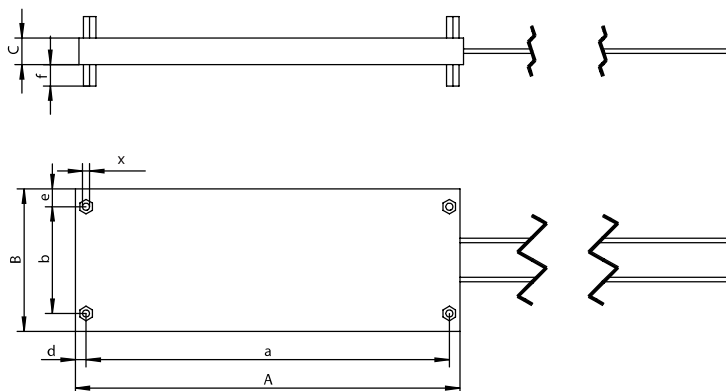
Frame resistor



9007218129614603

Braking resistor	Main dimensions in mm			Mounting dimensions in mm				Cable gland
	A	B	C	a	b	d	x	
BW027-042-T	570	390	180	380	370	6.5	55	M25 + M12

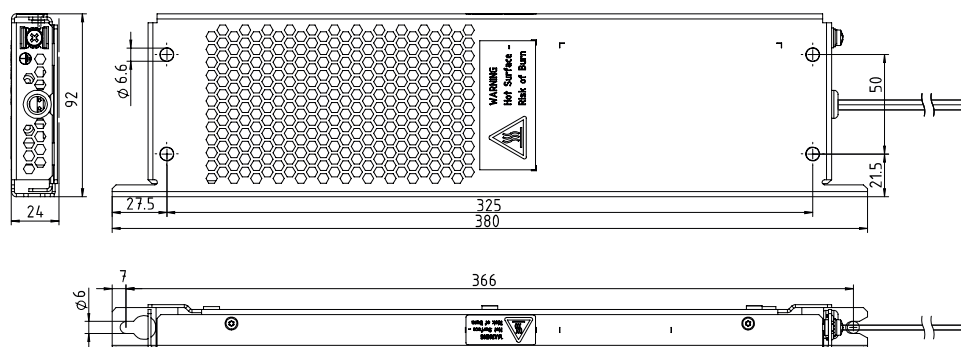
Flat-type resistor



9007218129619467

Braking resistor	Main dimensions in mm			Mounting dimensions in mm				Connection length in mm
	A	B	C	a	b	d	x	
BW100-001	110	80	15	98	60	—	—	300
BW100-002	216	80	15	204	60	—	—	300

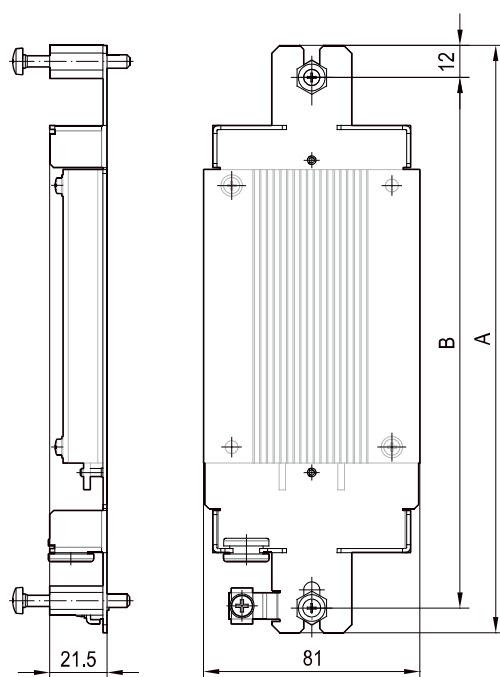
BW120-001 resistor



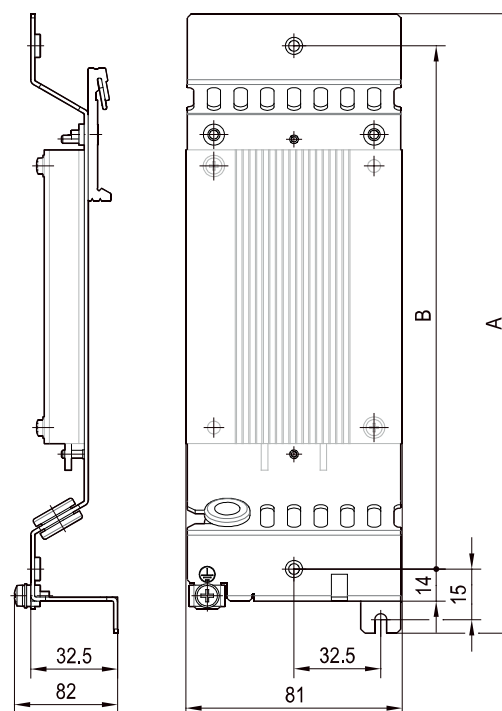
Length of connections: 130 mm

Braking resistor with CLH..A support plate

CLH31A/CLH41A



CLH51A/CLH61A



9007242148896651

Braking resistor with support plate	Main dimensions in mm	
	A	B
CLH31A	220	200
CLH41A	310	288
CLH51A with mounting rail installation	232	196
CLH61A with mounting rail installation	318.5	288.5

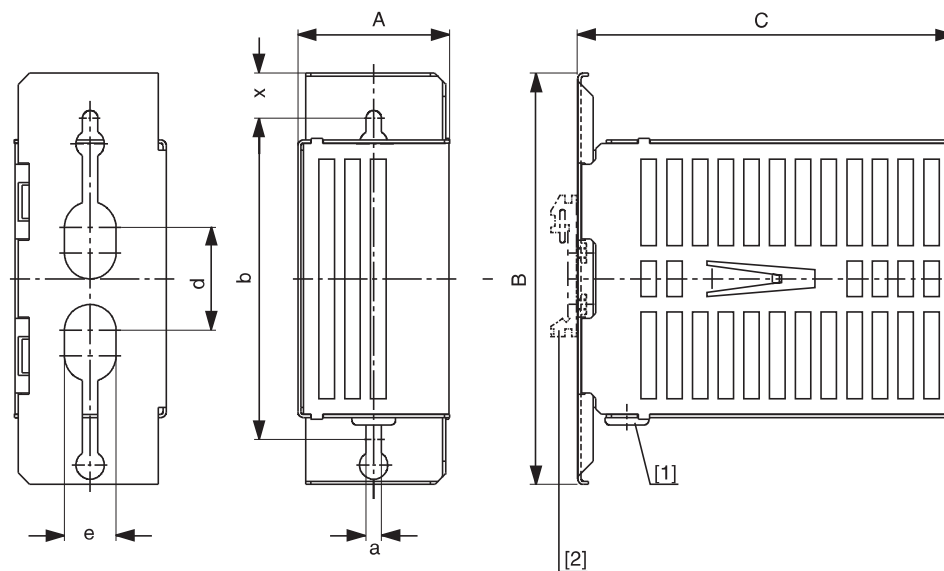
BS.. touch guard

Description

A BS.. touch guard is available for flatpack resistors.

Touch guard	Part number	Braking resistor
BS003	8131511	BW100-001
BS005	813152X	BW100-002

Dimension sheet and dimensions



1455849867

[1] Grommet

[2] Mounting rail fastening HS001 for mounting rail installation (can be ordered separately, part number 8221944)

Type	Main dimensions in mm			Mounting dimensions in mm					Mass in kg
	A	B	C	b	d	e	a	x	
BS003	60	160	146	125	40	20	6	17.5	0.35
BS005	60	160	252	125	4	20	6	17.5	0.5

4.24 NF.. line filter

4.24.1 Description

NF.. line filters are used to suppress electromagnetic interference between the supply system and the inverter. Line filters may be required to comply with the interference emissions of limit class C2 according to EN 61800-3.

INFORMATION



Do not switch between the NF.. line filter and inverter.

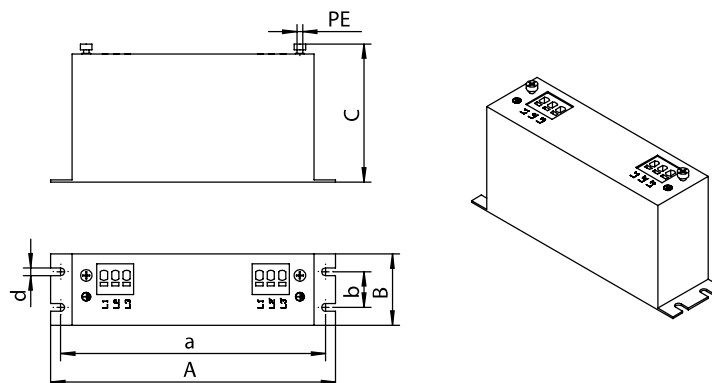
4.24.2 Technical data

Line filter	Unit	NF0055-503	NF0120-503	NF0220-503
Part number	–	17984319	17984270	17984300
Nominal line voltage V_{line} (in accordance with EN 50160)	V	3 × AC 200 – 500 V		
Line frequency f_{line}	Hz	50 – 60 ± 5%		
Nominal current I_N	A	5.5	12	22
Nominal power loss	W	4	6	30
Ambient temperature ϑ_{amb}	°C	0 – 45		
Derating at ambient temperature > 45 °C	–	-3% I_N/K up to maximum 60 °C		
Connection contact L1/L2/L3 – L1'/L2'/L3'	–	Spring-loaded terminals		
Cross section L1/L2/L3 – L1'/L2'/L3'	mm ²	0.25 – 6		
Tightening torque L1/L2/L3 – L1'/L2'/L3'	Nm	–		
PE connection contact	–	M4 screw		M5 screw
Tightening torque PE	Nm	1.5		3
Degree of protection according to EN 60529	–	IP20		
Mass	kg	1	1	1.4

4.24.3 Assignment to an inverter

Line filter	NF0055-503	NF0120-503	NF0220-503
MCC91A-....-5.3..	0010 – 0055	0070 – 0125	0160 – 0240

4.24.4 Dimension drawings and dimensions



18891135115

Line filter	Main dimensions in mm				Mounting dimensions in mm			Connection
	A	B	C	E	a	b	d	PE
NF0055-503	200	50	97	–	186	25	5.5	M4
NF0120-503	200	50	97	–	186	25	5.5	M4
NF0220-503	230	55	102	–	216	30	5.5	M5

31986846/EN – 03/2025

4.25 ND.. line choke

4.25.1 Description

An ND.. line choke can be used as an option:

- To support overvoltage protection
- To smoothen the line current, to reduce harmonics
- For protection in the event of distorted line voltage
- Limiting the charging current when several inverters are connected together in parallel on the input end with a shared line contactor (nominal current of line choke = total of inverter currents)

Connect a line choke for limiting the inrush current:

- With 5 or more 3-phase devices
- With 2 or more 1-phase devices

4.25.2 Technical data

Line choke	Unit	ND0070-503	ND0160-503	ND0300-503
Part number	–	17984173	17984181	17983800
Nominal line voltage (in accordance with EN 50160) V_{line}	V	3 × AC 200 – 500		
Line frequency f_{line}	Hz	50 – 60 ± 5%		
Nominal current I_N	A	7	16	30
Nominal inductance	mH	0.36	0.2	0.1
Nominal power loss	W	4	9	11
Ambient temperature ϑ_{amb}	°C	-10 – 45 Derating at ambient temperature > 45 °C: -3% I_N /K up to maximum 60 °C		
Connection contact L1/L2/L3 – L1'/L2'/L3'	–	Screw terminal		
Cross section L1/L2/L3 – L1'/L2'/L3'	mm ²	0.2 – 4		0.2 – 10
Tightening torque L1/L2/L3 – L1'/L2'/L3'	Nm	0.8 ¹⁾		1.6 ¹⁾
PE connection contacts	–	M4 screw		M5 screw
Tightening torque PE	Nm	1.5		3
Degree of protection according to EN 60529	–	IPXXB		
Mass	kg	0.5	1.3	1.95

1) Adhere to the specified tightening torques with a tolerance of +/- 10%.

4.25.3 Assignment to an inverter

Line choke	ND0070-503	ND0160-503	ND0300-503
MCC91A-....-5.3..	0010 – 0070	0095 – 0160	0240

4.25.4 Technical data

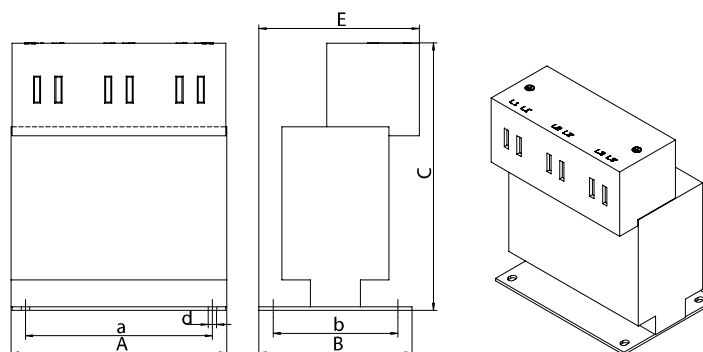
Line choke	Unit	ND0250-201
Part number	–	18001424
Nominal line voltage (in accordance with EN 50160) V_{line}	V	1 × AC 200 – 240
Line frequency f_{line}	Hz	50 – 60 ± 5%
Nominal current I_N	A	25
Nominal inductance	mH	1.17
Nominal power loss	W	27
Ambient temperature ϑ_{amb}	°C	-10 – 40 Derating at ambient temperature > 40 °C: -3% I_N /K up to maximum 60 °C
Connection contact L1/L2/L3 – L1'/L2'/L3'	–	Screw terminal
Cross section L1/L2/L3 – L1'/L2'/L3'	mm ²	0.2 – 16
Tightening torque L1/L2/L3 – L1'/L2'/L3'	Nm	1.6 ¹⁾
PE connection contact	mm	Connection lug for tab connector 6.3 × 0.8
Degree of protection in accordance with EN 60529		IPXXA
Mass	kg	1.5

1) Adhere to the specified tightening torques with a tolerance of +/- 10%.

4.25.5 Assignment to an inverter

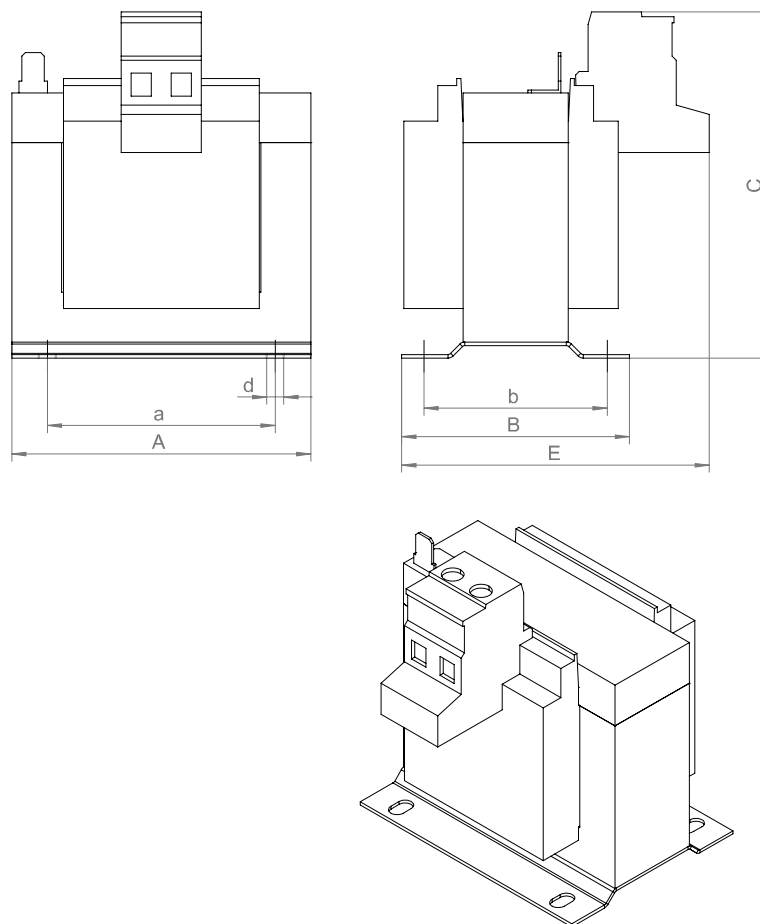
Line choke	ND0250-201
MCC91A-....-2.1..	0017 – 0093

4.25.6 Dimension drawings and dimensions



18891130251

Line choke	Main dimensions in mm				Mounting dimensions in mm			Connection
	A	B	C	E	a	b	d	
ND0070-503	78	57	105	56	65	40	4.8	M4
ND0160-503	96	70	120	65	71	54	4.8	M4
ND0300-503	121	86	145	86	105	70	4.8	M5



36108348299

Line choke	Main dimensions in mm				Mounting dimensions in mm			Connection
	A	B	C	E	a	b	d	PE
ND0250-201	84	64	98	87	64	51.5	4.8	6.3 × 0.8

4.26 HF.. output filter

4.26.1 Description

The HF.. output filter is a sine filter used to smooth the output voltages of inverters:

- Discharge currents in the motor cables are suppressed.
- Motor winding insulations of third-party motors that are not suitable for inverters are protected.
- For long motor cables (> 100 m), overvoltage peaks are prevented.

4.26.2 Technical data

Output filter	Unit	HF0055-503	HF0125-503	HF0240-503
Part number	–	17985110	17985129	17985137
Nominal voltage	V	3 × 0 – 500 V		
Nominal current I_N	A	5.5	12.5	24
Nominal power loss	W	80	120	200
Ambient temperature ϑ_{amb}	°C	0 – 45 Derating at ambient temperature > 45 °C: -3% I_N /K up to maximum 60 °C		

31986846/EN – 03/2025

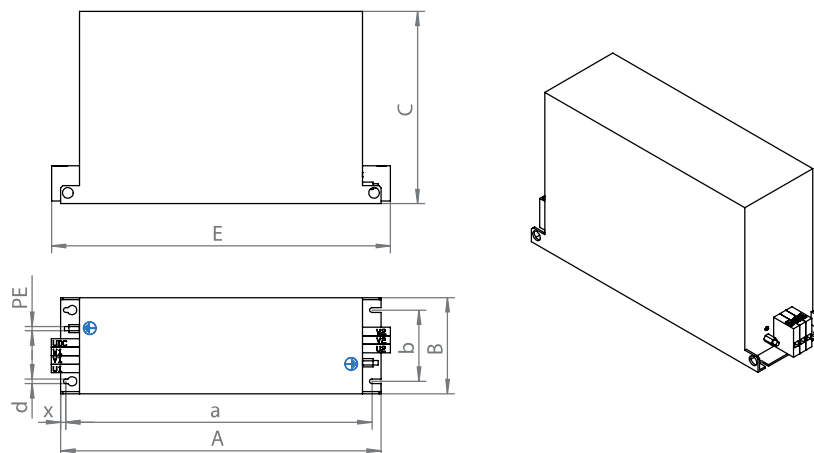
Output filter	Unit	HF0055-503	HF0125-503	HF0240-503
Connection contacts U1/V1/W1/UDC – U2/V2/W2	–	Screw terminal		
Cross section U1/V1/W1/UDC – U2/V2/W2	mm ²	0.2 – 10		2.5 – 16
Tightening torque U1/V1/W1/UDC – U2/V2/W2	Nm	1.6 ¹⁾		3 ¹⁾
PE connection contacts	–	M6 bolt		
Tightening torque PE	Nm	6		
Degree of protection in accordance with EN 60529	–	IPXXB		
Mass	kg	8	18	25

1) Adhere to the specified tightening torques with a tolerance of +/- 10%.

4.26.3 Assignment to an inverter

Output filter	HF0055-503	HF0125-503	HF0240-503
MCC91A-....-5.3..	0010 – 0055	0070 – 0125	0160 – 0240
MCC91A-....-2E1..	0017 – 0055	0070 – 0093	–

4.26.4 Dimension drawings and dimensions



9007218523812619

Output filter	Main dimensions in mm				Mounting dimensions in mm				Connection PE
	A	B	C	E	a	b	d	x	
HF0055-503	310	105	160	–	290	75	6.5	7	M6
HF0125-503	390	120	215	–	370	90	6.5	7	M6
HF0240-503	450	135	270	–	430	100	6.5	7	M6

4.27 HD.. output choke

4.27.1 Description

The HD.. output choke suppresses interference emission from the unshielded motor cable.

4.27.2 Technical data

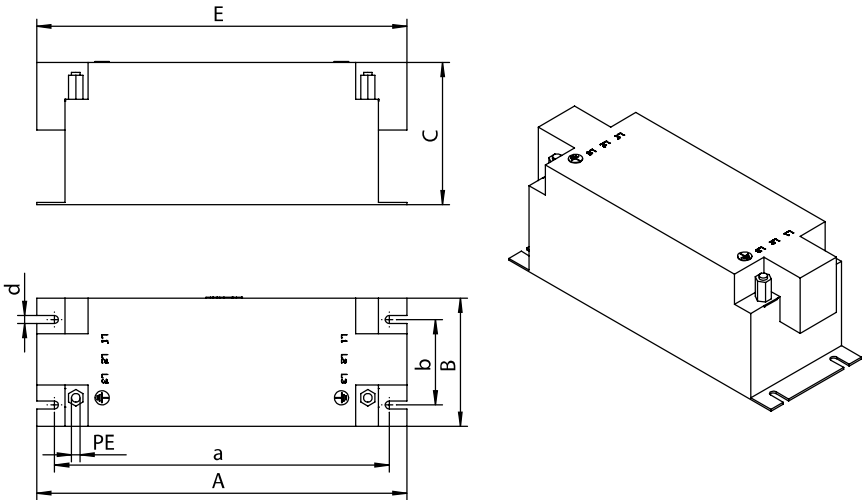
Output choke	Unit	HD0125-503	HD0240-503
Part number	–	17985153	17985188
Nominal voltage	V	3 × 0 – 500 V	
Nominal current I_N	A	12,5	24
Nominal power loss	W	2.9	6
Ambient temperature ϑ_{amb}	°C	0 – 45 Derating at ambient temperature > 45 °C: -3% I_N /K up to maximum 60 °C	
Connection contacts U1/V1/W1/UDC – U2/V2/W2	–	Screw terminal	
Cross section U1/V1/W1/UDC – U2/V2/W2	mm ²	0,2 – 10	2,5 – 16
Tightening torque U1/V1/W1/UDC – U2/V2/W2	Nm	1.6 ¹⁾	3 ¹⁾
PE connection contacts	–	M6 bolt	
Tightening torque PE	Nm	6	
Degree of protection in accordance with EN 60529	–	IPXXB	
Mass	kg	0,85	1,46

1) Adhere to the specified tightening torques with a tolerance of +/- 10%.

4.27.3 Assignment to an inverter

Output choke	HD0125-503	HD0240-503
MCC91A-....-5.3..	0010 – 0125	0160 – 0240
MCC91A-....-2E1..	0017 – 0093	–

4.27.4 Dimension drawings and dimensions



9007218145873675

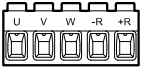
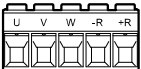
Output choke	Main dimensions in mm				Mounting dimensions in mm			Connection
	A	B	C	E	a	b	d	PE
HD0125-503	153	62.5	72.5	151	138	40	5.5	M6
HD0240-503	173	92.5	82.5	178	158	65	5.5	M6

4.28 Standard accessories

Inverter	Shield plate	Quantity	Scope of delivery	Description	Part number accessory pack
Size 0S, 0L	Shield plate for motor and control cables	1	Included in the scope of delivery	Shield plate for shield support and strain relief	28306880

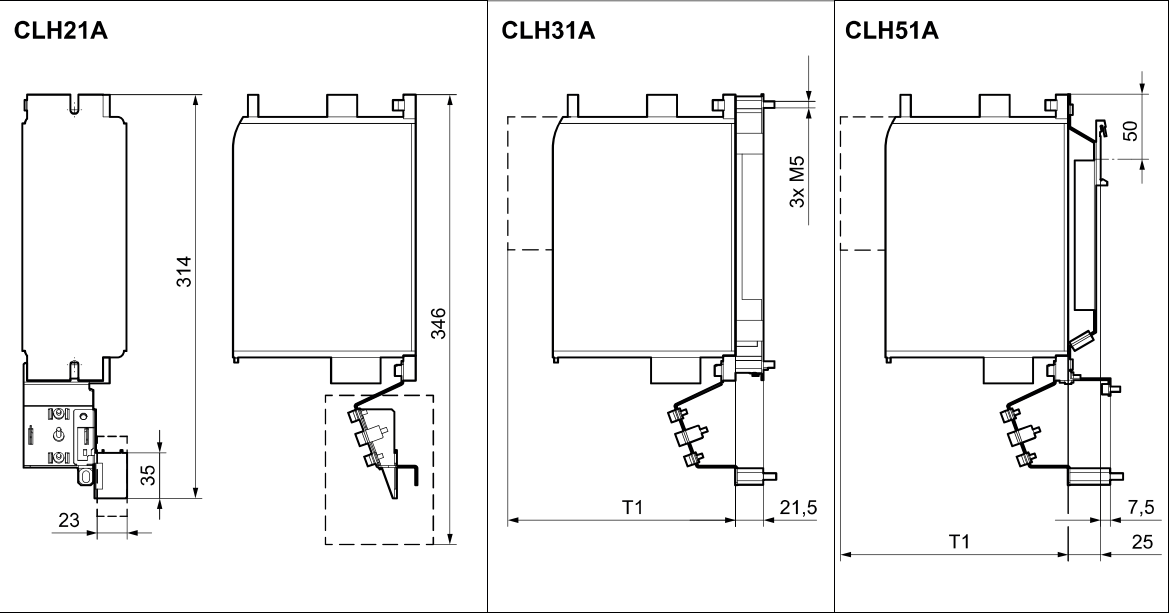
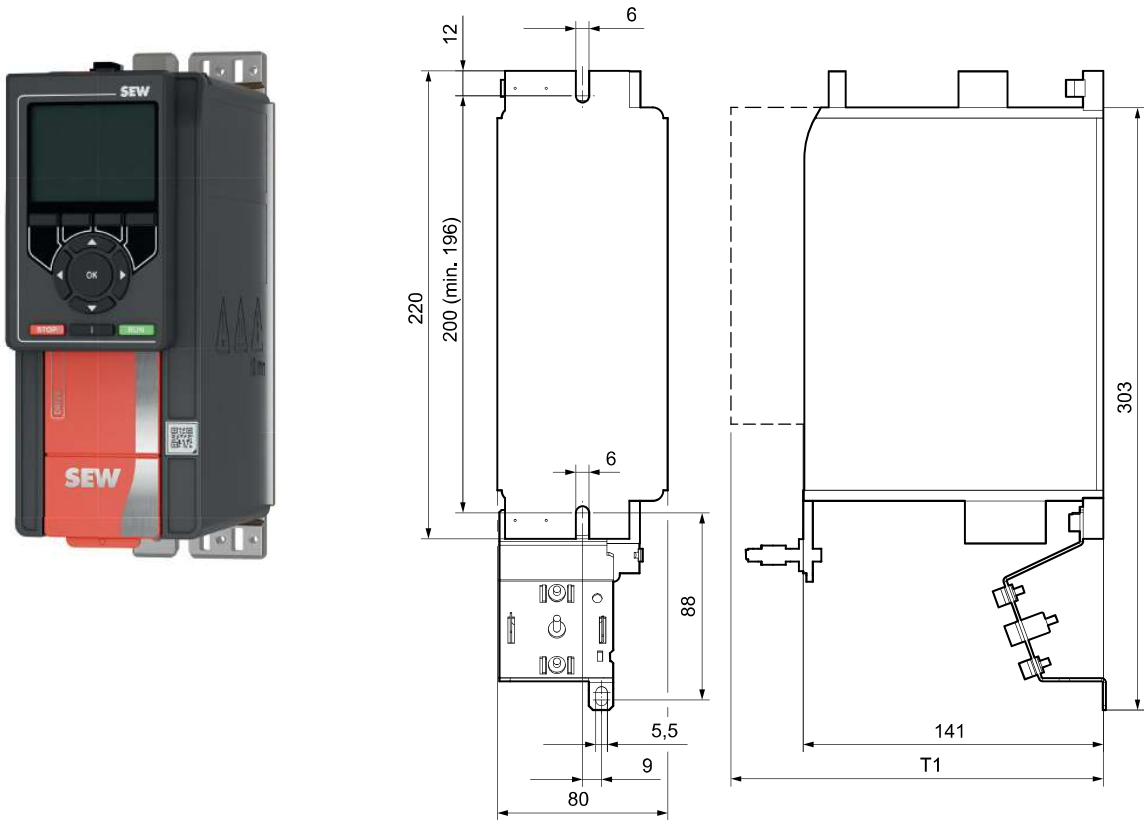
4.29 Connectors

The following list is used for re-ordering connectors:

Representation	Slot	Function	Size	Part number
	X1	Line connection, 1-phase	0S	25680498
	X1	Line connection, 3-phase	0S	25680501
	X1	Line connection, 1-phase	0L	25680536
	X1	Line connection, 3-phase	0L	25680544
	X2	Motor connection	0S	25680528
	X2	Motor connection	0L	25680552
	X6	STO-E connector (with jumpers)	All	28129458
	X5	DC 24 V supply voltage	Gateway	19148410

4.30 Dimension drawings

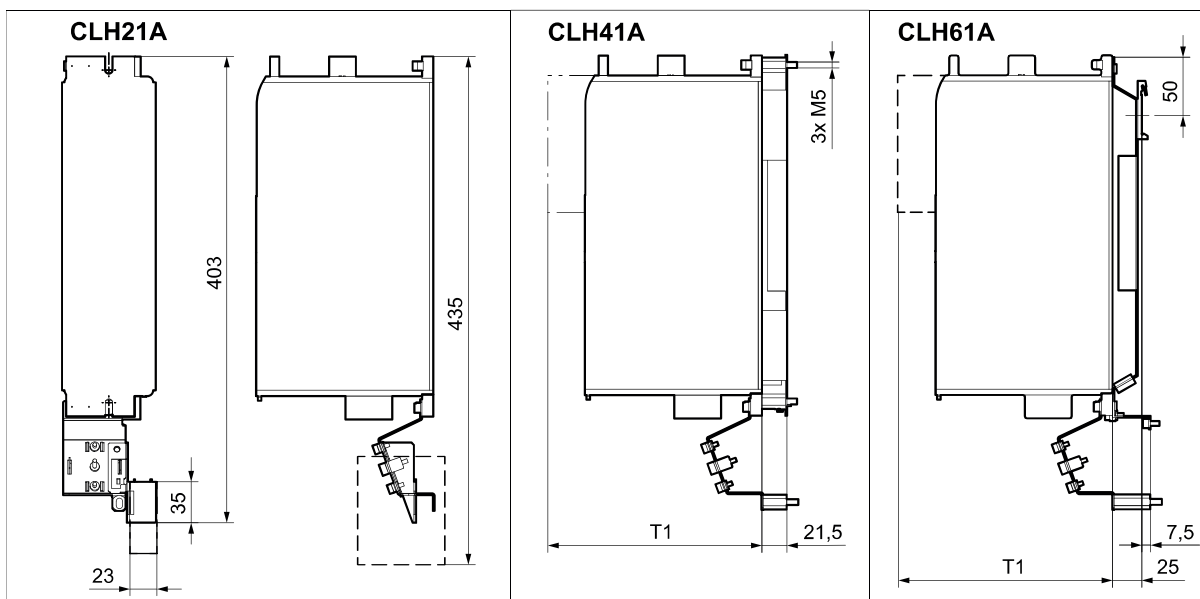
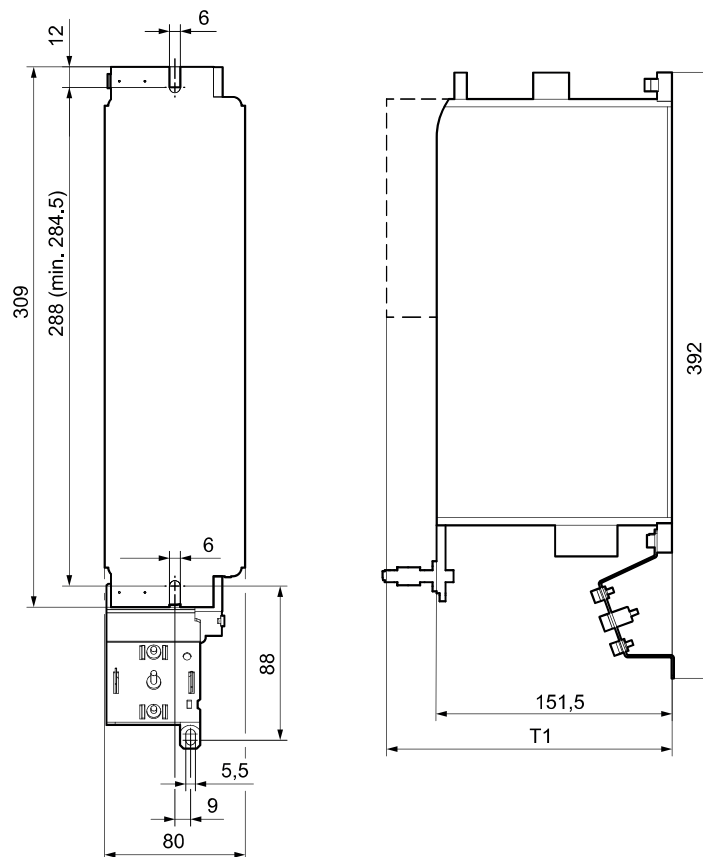
4.30.1 Size 0S with CLH21A, CLH31A, CLH51A



	-	CDM11A/CFC11A	CDM11A/CFX11A-..	CFX11A
	CBG01A	-	CBG11A/CBG21A/CBG22A	-
T1	148	150	168	164

9007251085399435

31986846/EN – 03/2025

4.30.2 Size 0L with CLH21A, CLH41A, CLH61A


	-	CDM11A/CFC11A	CDM11A/CFX11A-..	CFX11A
	CBG01A	-	CBG11A/CBG21A/CBG22A	-
T1	158	160	178	174

31986846/EN – 03/2025