



Addendum to the operating instructions



CM3C.., CM3P.., CM3G.. servomotors with MOVILINK® DDI interface

CM3C63 – 100, CM3P71 – 100, CM3G71 – 80



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1 General information

The differences between the motors with the MOVILINK® DDI interface and the standard CM3C.., CM3P.. and CM3G.. motors are described in this document.

This document is an addendum to the following documents:

- "Synchronous servomotors CM3C63 – 100 / CM3P71 – 100 (medium inertia / high dynamics)" operating instructions
- "PxG® integrated precision planetary gearmotors – PxG® CM3G.. series" operating instructions

The operating instructions are still valid.

2 Safety notes

2.1 Functional safety

The product does not include a safety sub-function. As an option, functionally safe motor options can be installed on the product.

The product is not permitted to perform any safety function without higher-level safety systems.

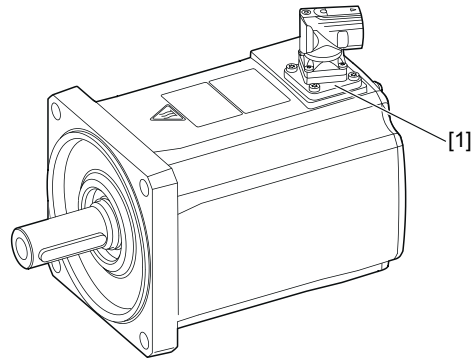
To use the functionally safe motor options, refer to the product manual and the additional operating instructions for the motor options of the present motor. To use safety sub-functions, please refer to the product manual of the inverter used.

3 Motor structure

3.1 Basic structure

The following figures are merely schematic representations. Discrepancies may occur depending on the size and design.

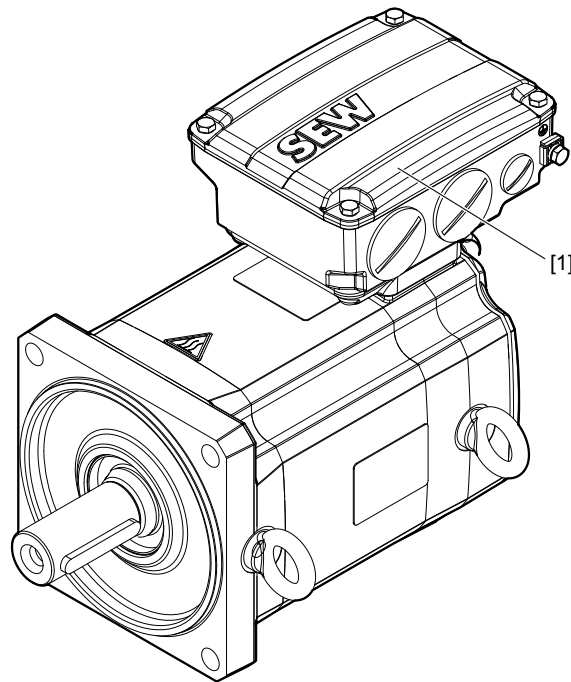
The following figure shows an example of a servomotor with MOVILINK® DDI interface:



9007229930536843

[1] Hybrid connector

The following figure shows an example of a servomotor with terminal box:



49400969227

[1] Terminal box

3.3 Type designation

The following table shows an example of a type designation:

CM3C71L-45A-N/BK/DI/PK/AZ2Z/SD1	
CM3C	Motor series
71	Motor size
L	Motor length
45	Speed class
A	System voltage
N	Shaft design
BK	Brake
DI	MOVILINK® DDI interface
PK	Temperature sensor
AZ2Z	Encoders
SD1	Connection variant

3.4 Type designation of the MOVILINK® DDI interface

The type designation of the MOVILINK® DDI interface describes the characteristics of the MOVILINK® DDI communication unit integrated in the motor. The type designation does not describe the equipment of the motor. The equipment is defined by the motor type code.

DI0E00	
DI	DI = MOVILINK® DDI
0	0 = Motor-external or inverter-integrated brake control and supply 1 = BS1Z motor-integrated brake control via MOVILINK® DDI 2 = BG1Z motor-integrated brake control via MOVILINK® DDI
E	B = Temperature detection, no extended electronic nameplate (no automatic startup), no encoder functionality C = Extended electronic nameplate, motor temperature or thermal motor protection, no encoder functionality E = Extended electronic nameplate, motor temperature or thermal motor protection and encoder functionality for a MOVILINK® DDI connection unit internal to the motor E = For a MOVILINK® DDI connection unit outside of the motor with non-extended nameplate without automatic startup F = Extended electronic nameplate, encoder functionality, no motor temperature and no thermal motor protection
00	00 = No further optional equipment 10 = DriveRadar® DU1Z sensor modules mounted in the terminal box

Example for DI0E00

Motors of the DR.. or CM.. series with MOVILINK® DDI without a motor-integrated brake control.

The motor can be configured and used in a control cabinet topology or in a decentralized topology. Depending on the inverter assignment, the motor can be operated with one of the following inverters:

- MOVITRAC® advanced control cabinet inverter
- MOVIDRIVE® technology, MOVIDRIVE® modular, MOVIDRIVE® system control cabinet inverters
- MOVIMOT® flexible decentralized inverter
- MOVIMOT® advanced decentralized inverter (DR.. motor)
- MOVIMOT® performance decentralized inverter (CM3.. motor)

Example for DI2E10

Motors of the DR.. series with MOVILINK® DDI without encoder, but with motor-integrated BG1Z brake control and the DU1Z DriveRadar® SensorModule.

The motor can be used in a control cabinet topology. Depending on the inverter assignment, the motor can be operated with one of the following inverters:

- MOVITRAC® advanced control cabinet inverter
- MOVIDRIVE® technology, MOVIDRIVE® modular, MOVIDRIVE® system control cabinet inverters

Example for DI1E00

Motors of the CM.. series with MOVILINK® DDI, encoder and motor-integrated BS1Z brake control.

The motor can be used in a control cabinet topology. Depending on the inverter assignment, the motor can be operated with one of the following inverters:

- MOVITRAC® advanced control cabinet inverter
- MOVIDRIVE® technology, MOVIDRIVE® modular, MOVIDRIVE® system control cabinet inverters

4 Designs and options

4.1 Synchronous servomotors

Designation	Description
gearmotors	CM3C.. series (medium inertia)
CM3P..	CM3P.. series (high dynamics)
CM3G.. ¹⁾	CM3G.. series (dynamics, direct mounting) PxG® integrated
63, 71, 80, 100	Sizes
S, M, L	Lengths
-20, -30, -45, -60	Speed classes: -20 = 2000 min ⁻¹ -30 = 3000 min ⁻¹ -45 = 4500 min ⁻¹ -60 = 6000 min ⁻¹
A	System voltage: A = 400 V
-N, -K, -P, -E	Shaft design: -N = Shaft without key -K = Shaft with key -P = Shaft with pinion shaft end -E = Shaft with push-in pinion

1) In preparation.

4.2 Brakes and brake control

4.2.1 Terms and definitions

Term	Definition
Acceleration function	Describes the function of a brake control with which the brake is released particularly quickly. Alternative designations: Accelerator function, high-speed excitation, electronic switching
Rapid disconnection	Describes the function of a brake control with which the brake is applied particularly quickly. Alternative designations: cut-off in the DC and AC circuits, disconnection on the DC and AC sides, disconnection on the DC side, fast switch-off, rapid application, AC/DC disconnection, DC disconnection
Brake application time	Describes the time between removal of the control signal and complete build-up of the braking torque.
Brake release time	Describes the time between the control signal and the complete reduction of the braking torque. Alternative designation: Response time

4.2.2 Brakes and brake options

Designation	Description
/BK	Permanent-magnet holding brake
/BKB	Permanent-magnet holding brake
/BZ ¹⁾	Spring-loaded holding brake with increased working capacity
/BZ..D ¹⁾	Spring-loaded holding brake with increased working capacity for operation on direct DC voltage supply.
/BZ..Z	Spring-loaded holding brake with increased working capacity for operation with the integrated BS1Z brake control
/HR	Manual brake release of BZ.., BZ..D, and BZ..Z brake Automatic re-engaging

1) Optionally available as a safety brake.

4.2.3 Motor-integrated brake control

Designation	Description
BG1Z ¹⁾	Integrated brake control for MOVILINK® DDI, motor-external brake supply AC 200 – 500 V with installed 230 V brake, condition monitoring of the brake, brake diagnostics, wear detection.
BS1Z ¹⁾	Integrated brake control for MOVILINK® DDI For DC 24 V brakes with condition monitoring of the brake Brake diagnostics, brake wear detection

1) Not compatible for controlling a safety brake.

For further information, refer to chapter "Brake voltages for BG1Z brake control" (→ 67).

4.2.4 Brake control for control cabinet installation

Designation	Description
B	Brake control for decentralized inverters Supply from the DC link of the decentralized inverter (MOVIMOT® flexible and MOVIMOT® performance)
BME	Brake control for control cabinet installation Half-wave rectifier without electronic switching.
BMP	Brake control for control cabinet installation Half-wave rectifier with electronic switching Integrated voltage relay for cut-off in the DC circuit
BMH	Brake control for control cabinet installation Half-wave rectifier with electronic switching and heating function
BMK(B)	Brake control for control cabinet installation Half-wave rectifier with electronic switching Control input (DC 24 V), fast disconnection and status display via LED
BST	Brake control for control cabinet installation Safe brake control with electronic changeover Control input (DC 24 V) and safe control input, fast disconnection Supply via the DC link of the inverter
SBM	Brake control for control cabinet installation Safe brake control with electronic changeover Control input (DC 24 V), safe control input and status feedback, fast disconnection Supply via the DC link of the inverter
BMV	Brake control for control cabinet installation Control with electronic switching Control input (DC 24 V), fast disconnection Supply of 24 V brakes

4.3 Temperature sensor/temperature detection

Designation	Description
/PK	Pt1000 temperature sensor

4.4 Encoder

Designation	Description	Capability class
–	Without encoder	–
/EZ2Z	Single-turn encoder, MOVILINK® DDI	Medium Class
/AZ2Z	Multi-turn encoder, MOVILINK® DDI	Medium Class
/EZ4Z	Single-turn encoder, MOVILINK® DDI	High Class
/AZ4Z	Multi-turn encoder, MOVILINK® DDI	High Class
/EK0Z ¹⁾	Single-turn encoder, MOVILINK® DDI	High class
/AK0Z ¹⁾	Multi-turn encoder, MOVILINK® DDI	High class

1) Optionally available as a safety encoder.

4.5 Connection variants

Designation	Description
/SD1	M23 motor/brakemotor hybrid connector (motor, brake, communication) for MOVILINK® DDI Connector on the motor side Can be selected for nominal motor current up to 23 A
/SDB	M40 motor/brakemotor hybrid connector (motor, brake, communication) for MOVILINK® DDI Axial connector on the motor side Can be selected for nominal motor current up to 49 A
/KD	Cable gland on terminal box For motor/brakemotor hybrid cable (motor, brake, communication) for MOVILINK® DDI For separate power and signal cables With hybrid cables for nominal motor current of up to 49 A With separate power and signal cables for higher nominal motor currents
/KDD	Terminal box with straight signal connector (M23) for MOVILINK® DDI Motor and brakemotor cables connected via cable gland, signal cable plug-gable
/KD1	M23 hybrid connector motor/brakemotor (motor, brake, communication) for MOVILINK® DDI Axial or angled connector on the motor side Can be selected for nominal motor current up to 23 A
/KDB	M40 hybrid connector for motor/brakemotor (motor, brake, communication) for MOVILINK® DDI Axial connector on the motor side Can be selected for nominal motor current up to 49 A

4.6 Cable glands of the terminal boxes

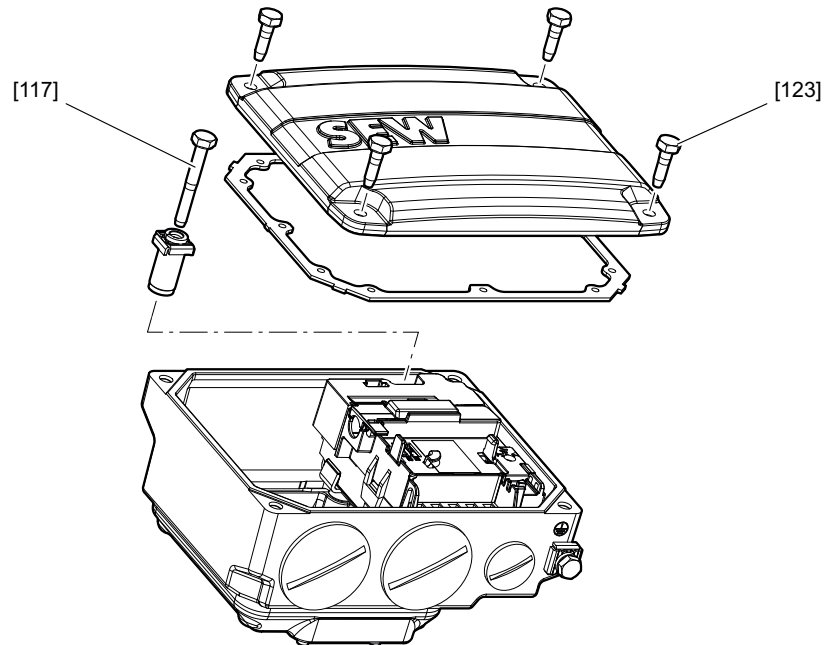
Designation	Motor size	Brake control	Metric thread	Inch thread
KD	63	–	3 × M20 × 1.5 3 × M25 × 1.5	3 × 1/2'' 3 × 3/4''
KD	71 – 100	–	1 × M16 × 1.5 2 × M32 × 1.5	2 × 1/2'' 1 × 3/4''
KD	63 – 100	BG1Z	1 × M16 × 1.5 2 × M32 × 1.5	2 × 1/2'' 1 × 3/4''
KDD	80 – 100	–	1 × M16 × 1.5 2 × M32 × 1.5	2 × 1/2'' 1 × 3/4''
KDD	80 – 100	BG1Z	1 × M16 × 1.5 1 × M32 × 1.5	1 × 1/2'' 1 × 3/4''

5 Mechanical installation

5.1 Tightening torques in the terminal box

For conversion and rotating of the terminal box, contact the SEW-EURODRIVE service.

The following figure shows an example of an open terminal box:



50675597195

Size	Item number	Tightening torque in Nm
KD terminal box: CM3C63 – 100 CM3P63 – 100	117	6
KDD terminal box: CM3C80 – 100 CM3P80 – 100	123	4

For the torques of the power connections on the terminal box, refer to the "Synchronous Servomotors (Medium Inertia), CM3C63 – 100" operating instructions.

6 Electrical installation

6.1 Information on connector connection

With SD1 and SDB, cable entry takes place using an adjustable right-angle connector. SEW-EURODRIVE recommends to align the right-angle connector while the mating connector is plugged in.

NOTICE

Damage to the right-angle connector when the right-angle connector is rotated without a mating connector.

Damage to the connector thread and to the sealing surface.

- Align the right-angle connector only while the mating connector is plugged in.
- If there is no mating connector at hand, do not use pliers to adjust the right-angle connector.

NOTICE

Potential damage to the right-angle connector.

Possible damage to property.

- Do not align the right-angle connector frequently.

INFORMATION



- Comply with the permitted bending radii of the cables.
- When using low-capacity trailing cables, the bending radii are larger than for the previously used standard cables.
- SEW-EURODRIVE recommends the use of low-capacity cables.
- Use cables with a permitted continuous operating temperature of minimum 80 °C.

INFORMATION



The connector should only be rotated to install and connect the motor. Do not turn the plug connector regularly once it has been installed.

INFORMATION



To protect the motor protection devices or the brake control from damage, you must not route unshielded supply cables alongside switched-mode power cables.

Shielded supply cables may be routed together with switched-mode power lines in one cable.

Switched-mode power cables are:

- Output cables from servo inverters, converters, and brake units
- Supply cables for braking resistors and similar options

6.2 Brakes and brake control

6.2.1 Combinable brake controls

The brake is typically powered through a brake control. It is necessary to differentiate between the following supply types:

- Operation using an external brake control from the local AC voltage supply system or the DC link of control cabinet inverters
 - Supply with rectified AC voltage and brake control from SEW-EURODRIVE for control cabinet installation (Series: BME..., BMP..., BMH..., BMK(B).)
 - Supply from the DC link of frequency inverters for the control cabinet with safe brake control from SEW-EURODRIVE (Series: BST..., SBM...)
- Operation with protective extra-low voltage DC 24 V from the local voltage supply system
 - Supply with brake control from SEW-EURODRIVE for control cabinet installation (BMV.. series)
 - Supply without brake control
- Supply via DB00 inverter output from frequency inverters from SEW-EURODRIVE for control cabinet installation.
- Operation with motor-integrated brake control
- Operation with HV brake control B and supply from the DC link of decentralized inverters from SEW-EURODRIVE (Series: MOVIMOT® flexible and MOVIMOT® performance)

Depending on the brake type, the following options are available for MOVILINK® DDI:

Supply type	BK..	BZ..	BZ..D	BZ..Z
AC system with external brake control	–	✓	–	–
Integrated brake control BG1Z, BS1Z	BS1Z	BG1Z	–	BS1Z
HV brake control B decentralized inverter	–	✓	–	–
DC system with or without brake control	✓	✓	✓	–
Direct brake control inverter output DB00 ¹⁾	BK05 only And BK06	–	–	–

1) Only available with MOVIDRIVE® modular.

- ✓ Available
- Not available

Observe the specifications for the brake control and for the supply voltage on the nameplate of the motor when connecting.

If you want to remove the brakes from the local DC voltage supply system without using the BMV.. brake control, you must implement a suitable overvoltage protection with the aid of varistors on the system side. The varistors are not included in the scope of delivery of the motor. Observe the project planning notes in the motor catalog from SEW-EURODRIVE.

Operation of the brake with different supply types is not permitted (e.g. with a third-party brake control).

The integrated B.1Z brake control has extensive monitoring and protection functions of the brake. Configure the fusing as line protection for the supply cable. Observe the acceleration and holding current of the brake during dimensioning.

6.2.2 Fusing against damage due to overvoltage or short circuit

To obtain protection against overvoltage damages (e.g. due to short circuit), a sufficiently dimensioned fusing must be used at the supply cables.

When the brakes are supplied by the DC link of frequency inverters from SEW-EURODRIVE, the BST. and SBM. brake controls (control cabinet installation), as well as HV brake control B and brake output DB00 have the corresponding protection device.

If the brakes are being supplied from the local voltage supply system (AC or DC), a suitable protection must be realized on the system side. The operating currents of the brakes and the type of supply are decisive for the dimensioning.

- With an external brake control (e.g. BME., BMH., BMK(B). or DC supply from the local voltage grid), observe the project planning notes in the motor catalog.
- The integrated B.1Z brake control provides extensive monitoring and protection functions for the brake. Configure the fusing appropriately as line protection for the supply cable. Observe the acceleration and holding current of the brake when dimensioning the connection cable. See chapter "Operating currents" (→ 73).

Observe the additional project planning notes on dimensioning in the catalog, or contact SEW-EURODRIVE.

6.3 Wiring diagram overview

The wiring diagrams listed below are a selection for motors with MOVILINK® DDI. You can access further wiring diagrams using the serial number of the drive in the SEW-EURODRIVE OnlineSupport.

6.3.1 Wiring diagrams for connection with SD1 plug connector (M23)

Part number	Size	Brake	integrated brake control	Encoder
63274108	CM3C63 – 100 CM3P71 – 100	/BK..., /BZ..., /BZ..D	–	encoderless, AZ2Z, EZ2Z, AZ4Z, EZ4Z, AK0Z, EK0Z
63364921		/BK..., /BZ..Z	BS1Z	AZ2Z, EZ2Z, AZ4Z, EZ4Z
63463946		/BZ.. with DC 24 V supply voltage	–	encoderless, AZ2Z, EZ2Z, AZ4Z, EZ4Z, AK0Z, EK0Z
63274108	CM3G63 – 100	/BKB..	–	encoderless, AZ2Z, EZ2Z, AZ4Z, EZ4Z, AK0Z, EK0Z
63364921		/BKB..	BS1Z	AZ2Z, EZ2Z, AZ4Z, EZ4Z

6.3.2 Wiring diagrams for connection with plug connector SDB (M40)

Part number	Size	Brake	integrated brake control	Encoder
63274116	CM3C80 – 100 CM3P80 – 100	/BK..., /BZ..., /BZ..D	–	encoderless, AZ2Z, EZ2Z, AZ4Z, EZ4Z, AK0Z, EK0Z
63364948		/BK..., /BZ..Z	BS1Z	AZ2Z, EZ2Z, AZ4Z, EZ4Z
63463873		/BZ.. with DC 24 V supply voltage	–	encoderless, AZ2Z, EZ2Z, AZ4Z, EZ4Z, AK0Z, EK0Z

6.3.3 Wiring diagrams for connection with KD1 plug connector (M23)

Part number	Size	Brake	integrated brake control	Encoder
63350386	CM3C63 – 100 CM3P71 – 100	/BZ..	BG1Z	AZ2Z, EZ2Z, AZ4Z, EZ4Z

6.3.4 Wiring diagrams for connection with plug connector KDB (M40)

Part number	Size	Brake	integrated brake control	Encoder
63350408	CM3C80 – 100 CM3P80 – 100	/BZ..	BG1Z	AZ2Z, EZ2Z, AZ4Z, EZ4Z

6.3.5 Wiring diagrams for connection with KD terminal box

Part number	Size	Brake	integrated brake control	Encoder
63329379	CM3C63	/BK.., /BZ.., /BZ..D /BZ.. with DC 24 V supply voltage	–	encoderless, AZ2Z, EZ2Z, AZ4Z, EZ4Z, AK0Z, EK0Z
63274124	CM3C71 – 100 CM3P71 – 100	/BK.., /BZ.., /BZ..D /BZ.. with DC 24 V supply voltage	–	encoderless, AZ2Z, EZ2Z, AZ4Z, EZ4Z, AK0Z, EK0Z
63365030	CM3C63	/BK.., /BZ..Z	BS1Z	AZ2Z, EZ2Z, AZ4Z, EZ4Z
63364999	CM3C71 – 100 CM3P71 – 100	/BK.., /BZ..Z	BS1Z	AZ2Z, EZ2Z, AZ4Z, EZ4Z
63349450	CM3C63 – 100 CM3P71 – 100	/BZ..	BG1Z	AZ2Z, EZ2Z, AZ4Z, EZ4Z

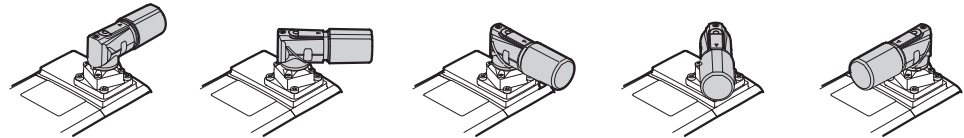
6.3.6 Wiring diagrams for connection with KDD terminal box

Part number	Size	Brake	integrated brake control	Encoder
63274132	CM3C80 – 100 CM3P80 – 100	/BK.., /BZ.., /BZ..D /BZ.. with DC 24 V supply voltage	–	encoderless, AZ2Z, EZ2Z, AZ4Z, EZ4Z, AK0Z, EK0Z
63358387		/BK.., /BZ..Z	BS1Z	AZ2Z, EZ2Z, AZ4Z, EZ4Z
63350416		/BZ..	BG1Z	AZ2Z, EZ2Z, AZ4Z, EZ4Z

6.4 Connecting single-cable technology

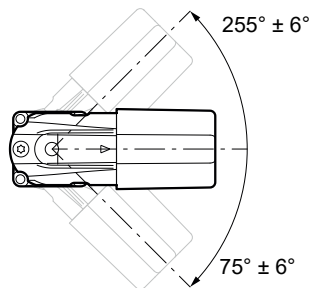
Using the fully digital MOVILINK® DDI interface by SEW-EURODRIVE allows for connecting motors using single-cable technology. With this technology, all data of the motor, such as encoder data, temperature data, startup data, and data of further sensors is digitally transferred via a hybrid cable.

The right-angle connector can be rotated to achieve all required positions:



18014430805019019

The right-angle connector has the following alignment range:



9007255266069259

6.4.1 Connecting SD1 hybrid plug connectors (M23)

The connection diagram of the connector depicts the contact end of the connections.

Function
Motor connection for motors with MOVILINK® DDI interface

Connection type
M23, male, male thread, TE Connectivity – Intercontec products, series 723, used by SEW-EURODRIVE, SpeedTec equipment, coding ring: none, protected against contact

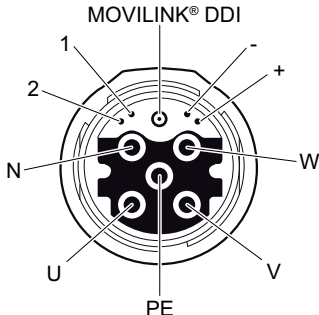
Connection diagram

Motor assignment				
Contact	Signal	Without brake	With BK../BZ..D brake	With BZ.. brake
U	U	Motor phase U	Motor phase U	Motor phase U
V	V	Motor phase V	Motor phase V	Motor phase V
W	W	Motor phase W	Motor phase W	Motor phase W
A	Depending on the option	Do not connect	Brake - (5/15)	Do not connect
B	Depending on the option	Do not connect	Do not connect	Brake 15
C	Depending on the option	Do not connect	Do not connect	Brake 13
D	Depending on the option	Do not connect	Brake + (3/13)	Brake 14
PE	PE	Protective earth	Protective earth	Protective earth
DDI	MOVILINK® DDI	MOVILINK® DDI	MOVILINK® DDI	MOVILINK® DDI

Contact	Signal	With BK../BZ..Z brake with BS1Z brake control	With BZ.. brake With 24 V DC supply voltage
U	U	Motor phase U	Motor phase U
V	V	Motor phase V	Motor phase V
W	W	Motor phase W	Motor phase W
A	Depending on the option	GND	Brake 15
B	Depending on the option	DC 24 V	Do not connect
C	Depending on the option	Do not connect	Brake 14
D	Depending on the option	Do not connect	Brake 13
PE	PE	Protective earth	Protective earth
DDI	MOVILINK® DDI	MOVILINK® DDI	MOVILINK® DDI

6.4.2 Connecting SDB hybrid plug connectors (M40)

The connection diagram of the connector depicts the contact end of the connections.

Function	
Motor connection for motors with MOVILINK® DDI interface	
Connection type	
M40, male, male thread, TE Connectivity – Intercontec products, series 740, used by SEW-EURODRIVE, SpeedTec equipment, coding ring: none, protected against contact	
Connection diagram	
	

Motor assignment				
Contact	Signal	Without brake	With BK../BZ...D brake	With BZ.. brake
U	U	Motor phase U	Motor phase U	Motor phase U
V	V	Motor phase V	Motor phase V	Motor phase V
W	W	Motor phase W	Motor phase W	Motor phase W
1	Depending on the option	Do not connect	Brake - (5/15)	Do not connect
+	Depending on the option	Do not connect	Do not connect	Brake 15
–	Reserved	Do not connect	Do not connect	Do not connect
2	Depending on the option	Do not connect	Brake + (3/13)	Brake 14
N	Depending on the option	Do not connect	Do not connect	Brake 13
PE	PE	Protective earth	Protective earth	Protective earth
DDI	MOVILINK® DDI	MOVILINK® DDI	MOVILINK® DDI	MOVILINK® DDI

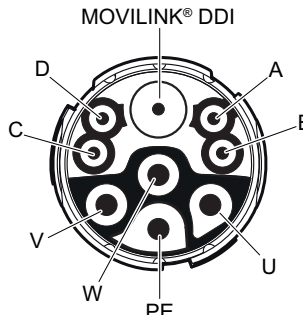
Contact	Signal	With BZ..Z brake with BS1Z brake control	With BZ.. brake With 24 V DC supply voltage
U	U	Motor phase U	Motor phase U
V	V	Motor phase V	Motor phase V
W	W	Motor phase W	Motor phase W
1	Depending on the option	GND	Brake 15
+	Depending on the option	DC 24 V	Do not connect
–	Depending on the option	Do not connect	Do not connect
2	Depending on the option	Do not connect	Brake 13
N	Depending on the option	Do not connect	Brake 14
PE	PE	Protective earth	Protective earth
DDI	MOVILINK® DDI	MOVILINK® DDI	MOVILINK® DDI

6.4.3 Connection with KD1 hybrid plug connector (M23)

The connection diagram of the connector depicts the contact end of the connections.

Function
Motor connection for motors with MOVILINK® DDI interface

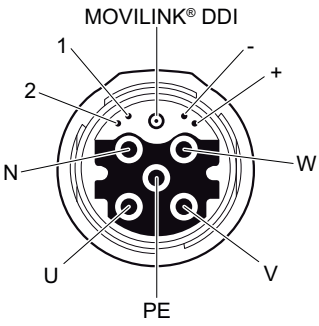
Connection type
M23, male, male thread, TE Connectivity – Intercontec products, series 723, used by SEW-EURODRIVE, SpeedTec equipment, coding ring: none, protected against contact

Connection diagram


Motor assignment			
Contact	Signal	Without brake	With BZ.. brake with BG1Z brake control
U	U	Motor phase U	Motor phase U
V	V	Motor phase V	Motor phase V
W	W	Motor phase W	Motor phase W
A	Reserved	Do not connect	Do not connect
B	Depending on the option	Do not connect	BG1Z N supply system (L2)
C	Depending on the option	Do not connect	Do not connect
D	Depending on the option	Do not connect	BG1Z L1 (phase) supply system
PE	PE	Protective earth	Protective earth
DDI	MOVILINK® DDI	MOVILINK® DDI	MOVILINK® DDI

6.4.4 Connection with KDB hybrid plug connector (M40)

The connection diagram of the connector depicts the contact end of the connections.

Function			
Motor connection for motors with MOVILINK® DDI interface			
Connection type			
M40, male, male thread, TE Connectivity – Intercontec products, series 740, used by SEW-EURODRIVE, SpeedTec equipment, coding ring: none, protected against contact			
Connection diagram			
			
Motor assignment			
Contact	Signal	Without brake	With BZ.. brake with BG1Z brake control
U	U	Motor phase U	Motor phase U
V	V	Motor phase V	Motor phase V
W	W	Motor phase W	Motor phase W
1	Reserved	Do not connect	Do not connect
+	Depending on the option	Do not connect	BG1Z N supply system (L2)
–	Reserved	Do not connect	Do not connect
N	Depending on the option	Do not connect	Do not connect
2	Depending on the option	Do not connect	BG1Z L1 (phase) supply system
PE	PE	Protective earth	Protective earth
DDI	MOVILINK® DDI	MOVILINK® DDI	MOVILINK® DDI

6.5 Connection with terminal box

Optionally, you can connect the power and signal cables with conductor end sleeves via a terminal box.

INFORMATION



To protect the motor protection devices or the brake control from damage, you must not route unshielded supply cables alongside switched-mode power cables.

Shielded supply cables may be routed together with switched-mode power lines in one cable.

Switched-mode power cables are:

- Output cables from servo inverters, converters, and brake units
 - Supply cables for braking resistors and similar options
-
- Check the cross section of the cables.
 - Screw on the connections and the PE. Check for correct connection.
 - An EMC screw fitting must be used for the cable entry of the signal cable to ensure a perfect shield connection.

⚠ WARNING



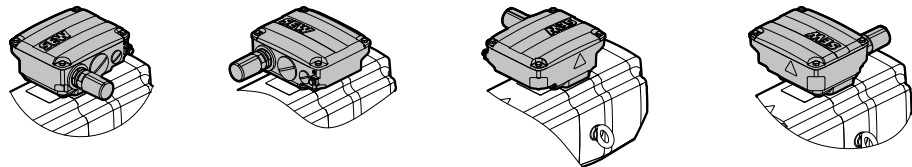
Risk of electric shock if signal cables or signal wires come into contact with power connections.

Fatal or serious injuries.

- The single conductors of signal cables (e.g. of encoders or temperature sensors) of the encoder cable must have minimum clearance of 4 mm from all bare and live parts of the terminal board and the eyelets.
- All single conductors of signal cables (e.g. of encoders or temperature sensors) or individual signal cables (e.g. with MOVILINK® DDI) must be insulated by the cable jacket or insulating tubing up to the connection to the terminal strip. Please ensure that the insulation cannot slip.

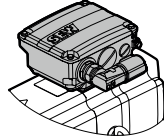
You can align the terminal box with hybrid plug connector KD1/KDB and the signal plug connector KDD in all desired positions.

To rotate the terminal box, contact SEW-EURODRIVE.



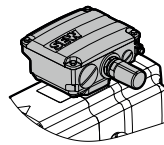
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The KD1 hybrid plug connectors are also optionally available in angled positions. You can align the KD1 right-angle plug connector in a similar way to the SD1 plug connectors.



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The KDD terminal box design is available for motors with high motor power and currents. The signal plug connector is used to connect the MOVILINK® DDI interface. The motor and brake power supply is ensured via a cable gland in the terminal box.



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6.5.1 KD terminal box connection option



⚠ WARNING

Danger of electric shock and damage to the motor if terminal box is turned.

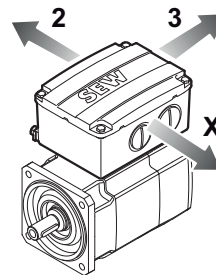
Electric shock and irreparable damage to the motor circuit board.

- The position of the terminal box is specified when the motor is ordered. The terminal box must not be turned afterwards. Contact SEW-EURODRIVE, if required.

Optionally, you can connect the power and signal cables via a terminal box.

- Option /KD: Connection of the hybrid cable via conductor end sleeves in the terminal box.

The cable entry position is specified with x, 2, 3.



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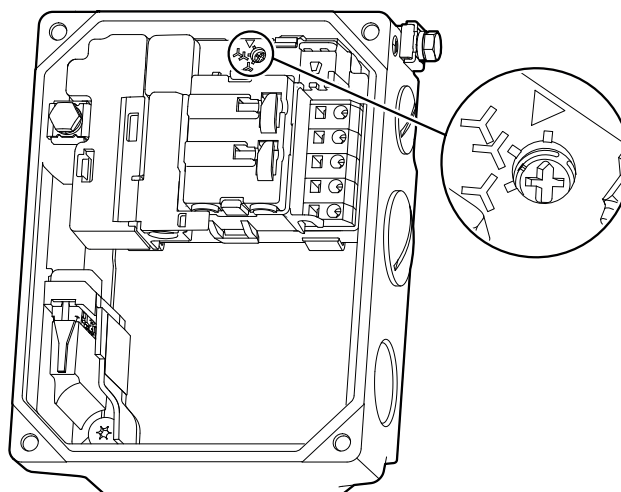
With motor size CM3C63.. in a fixed mounting position "x", cable entry is possible from three sides.

6.5.2 Connection cross section

Motor	Power rating		Brake		Encoder/resolver/ thermal motor protection		Cable bushing
	Connection	Maximum connection cross section	Connection	Maximum connection cross section	Connection	Maximum connection cross section	Diameter
CM3C63	Spring terminals	4 millimeters ²	Spring terminals	1.5 millimeters ²	Spring terminals	1.5 millimeters ²	M25 × 1.5 (3×) M20 × 1.5 (3×)
CM3C71 – 100 CM3P71 – 100	M6 bolt	10 millimeters ²	Spring terminals	2.5 millimeters ²	Spring terminals	2.5 millimeters ²	M32 × 1.5 (2×) M16 × 1.5 (1×)

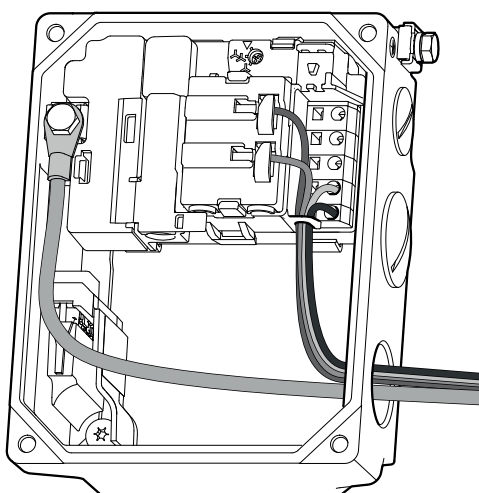
6.5.3 Terminal box connections

Observe the possible combinations of the brake control options according to chapter "Technical data for brake controls BG.Z, BS.Z, B.." (→ 64).



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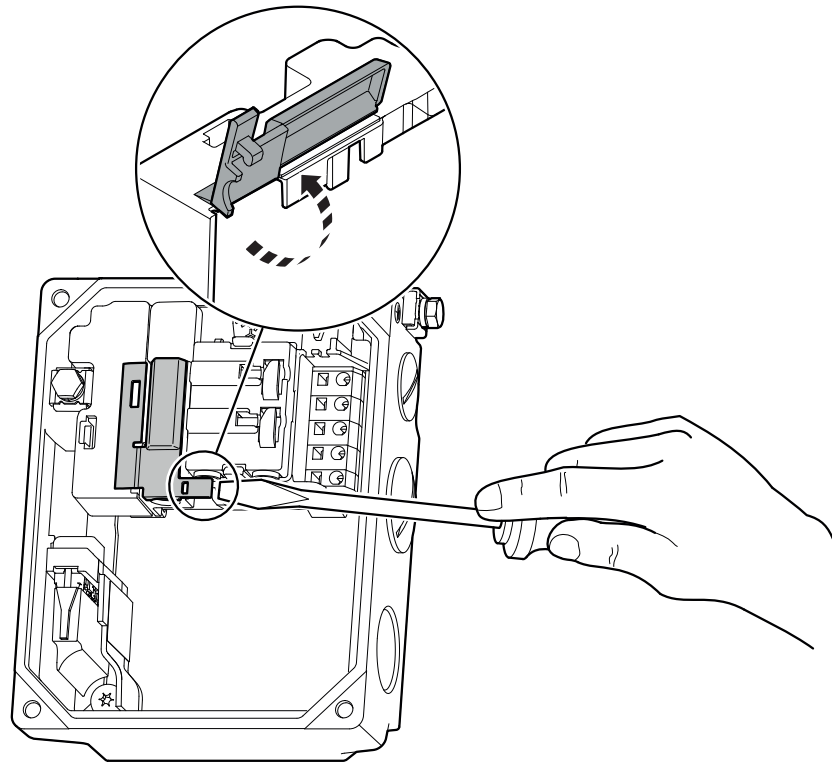
1. For the brake connection, use cables with a cross section of 1.0 mm² (for a motor power cross section of up to 4 mm²) or 1.5 mm² (for a motor power cross section of 6 mm² or greater) with a single-core conductor end sleeve with a plastic collar. The connection of the brake to the PE connection of the motor is ensured internally. An additional PE connection is not required.



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- ✓ All unconnected conductors, e.g., brake conductors, must be individually insulated and mechanically fixed in the terminal box.
- ✓ The unused conductors must not be connected to PE, ground or the shielding.

- ✓ PE from the MOVILINK® DDI hybrid cable or the motor power cable is connected securely to the grounding point of the motor terminal box as shown. Use ring cable lugs.
 - ✓ Use EMC cable glands to connect the shield of the MOVILINK® DDI hybrid cable or the motor brake power cable to the terminal box housing.
 - ✓ The enclosed insulating caps can be used for insulation.
2. Store the unused conductors of the brake cable in the supplied insulation clamps as shown in the diagram. (The appropriate clamps for storing the unused brake cables are supplied with the motor.)
- ⇒ When using a brakemotor, make sure that the conductor end sleeves are insulated.
 - ⇒ When screwing the PE cable in place, make sure that the cable does not protrude over the sealing surface of the cover gasket.

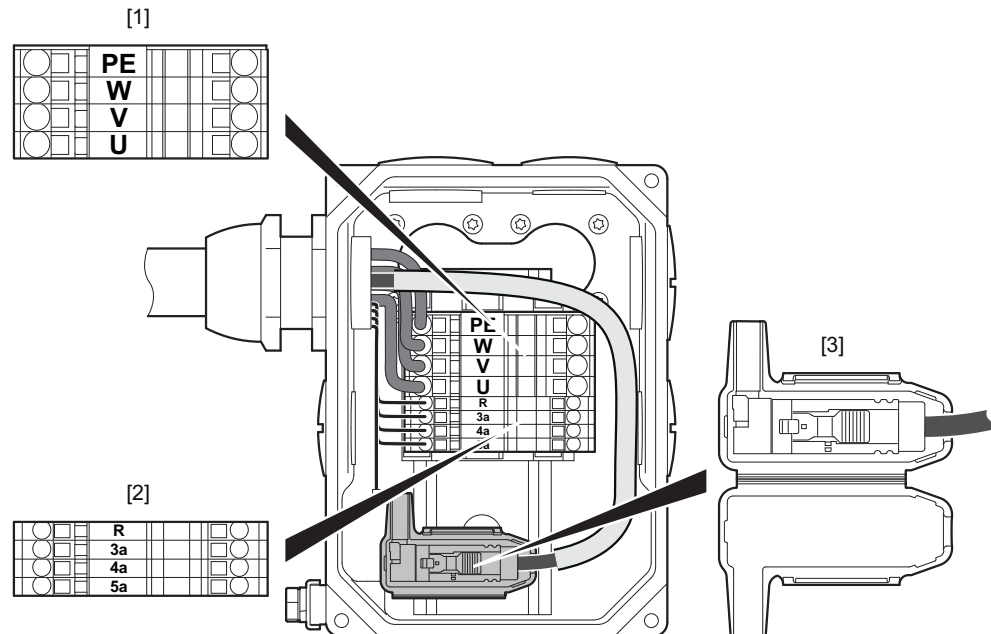


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3. Use a screwdriver to release the catch mechanism at the point highlighted in the graphic.
4. Insert the FAKRA compatible coaxial connector until it engages in place.
5. Close the cover.

6.5.4 Terminal assignment of terminal box CM3C63

Connect all unattached litz wires to the reserve terminal "R".



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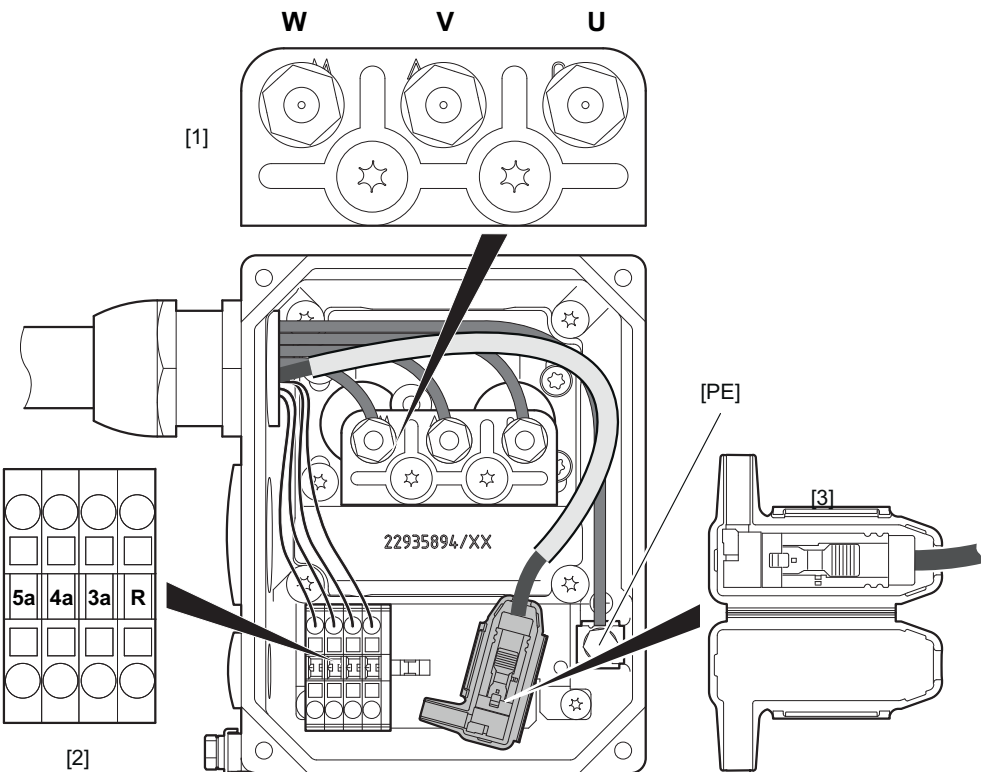
Assignment		
Terminal [1]	No.	Connection
Motor	U	Motor phase U
	V	Motor phase V
	W	Motor phase W
	PE	Protective earth

Assignment					
Terminal [2]	No.	Brake control connection			
		BMV..	BME.., BMP.., BMH.., BMK.., BST, SBM, MOVIMOT® flexible	Direct brake control with MOVI-C®	BS1Z..
BK.. brake Brake BZ.D	3a	—	—	—	—
	4a	13	—	DB 00	—
	5a	15	—	GND	—
BZ.. brake	3a	—	14	—	—
	4a	—	13	—	—
	5a	—	15	—	—
Brake BZ..Z	3a	—	—	—	—
	4a	—	—	—	DC 24 V
	5a	—	—	—	GND

Connection	
Connector [3]	FAKRA plug-in connection: Open the FAKRA connector housing and connect the MOVILINK® DDI cable.

6.5.5 Terminal assignment of terminal box KD CM3C71 – 100

Connect all unattached litz wires to the reserve terminal "R".



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Assignment		
Terminal [1]	No.	Connection
Motor	U	Motor phase U
	V	Motor phase V
	W	Motor phase W
	PE	Protective earth

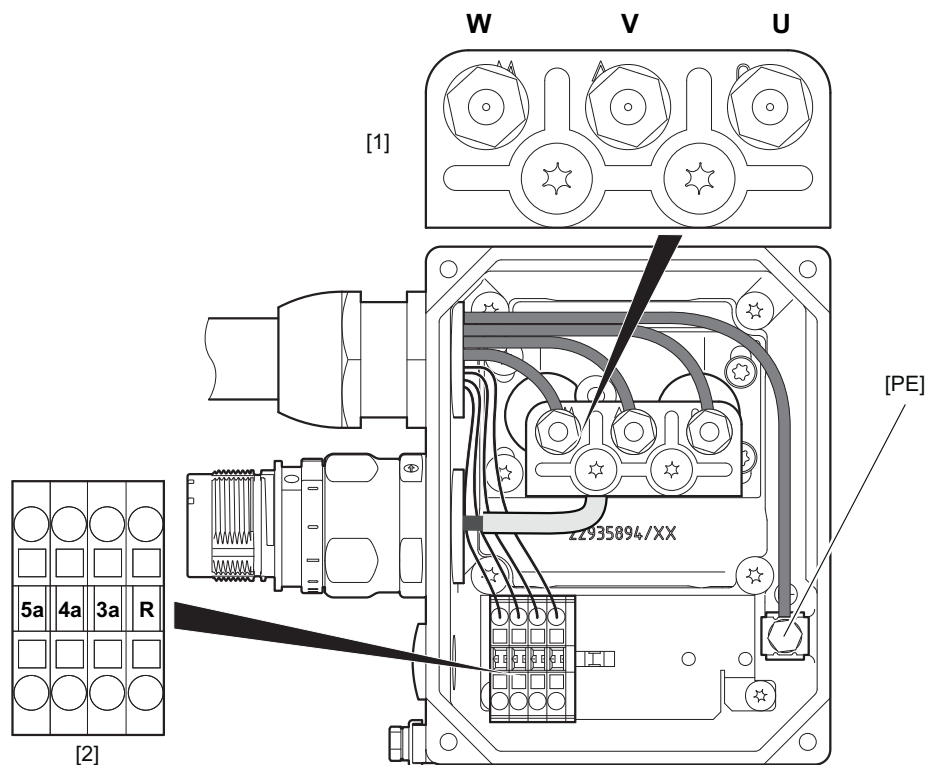
Assignment				
Terminal [2]	No.	Brake control connection		
		BMV..	BME...,BMP..., BMH..., BMK..., BST, SBM, MOVIMOT® flexible	BS1Z..
BK... brake BZ...D brake	3a	–	–	–
	4a	13	–	–
	5a	15	–	–
BZ... brake	3a	14 (DC 24 V)	14	–
	4a	13 (DC 24 V)	13	–
	5a	15 (DC 24 V)	15	–
Brake BZ...Z	3a	–	–	–
	4a	–	–	DC 24 V
	5a	–	–	GND

Connection	
Connector [3]	FAKRA plug-in connection: Open the FAKRA connector housing and connect the MOVILINK® DDI cable.

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6.5.6 Terminal assignment of terminal box KDD CM3C80 – 100

Connect all unattached litz wires to the reserve terminal "R".



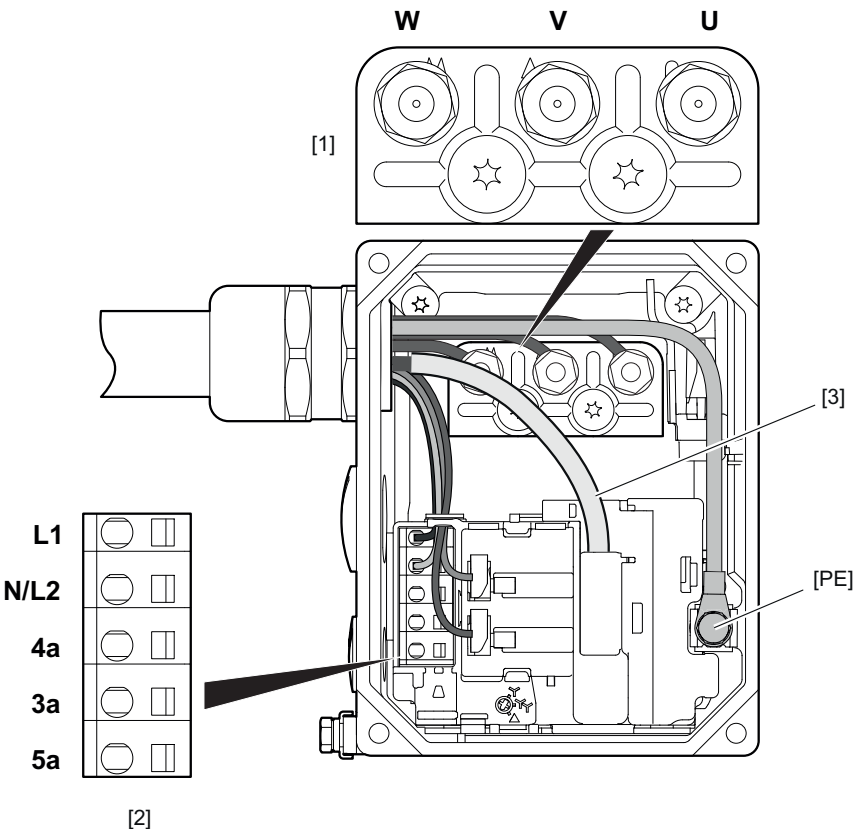
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Assignment		
Terminal [1]	No.	Connection
Motor	U	Motor phase U
	V	Motor phase V
	W	Motor phase W
	PE	Protective earth

Assignment				
Hybrid connector KDD M23 [2]	No.	BMV..	Brake control connection BME..., BMP..., BMH..., BMK..., BST, SBM, MOVIMOT® flexible	BS1Z
BK.. brake	3a	–	–	–
	4a	13	–	–
	5a	15	–	–
BZ.. brake	3a	14 (DC 24 V)	14	–
	4a	13 (DC 24 V)	13	–
	5a	15 (DC 24 V)	15	–
Brake BZ..Z	3a	–	–	–
	4a	–	–	DC 24 V
	5a	–	–	GND

Connection	
Connector [3]	FAKRA plug-in connection: Open the FAKRA connector housing and connect the MOVILINK® DDI cable.

6.5.7 Terminal assignment of terminal box KD CM3C63 – 100 with BG1Z



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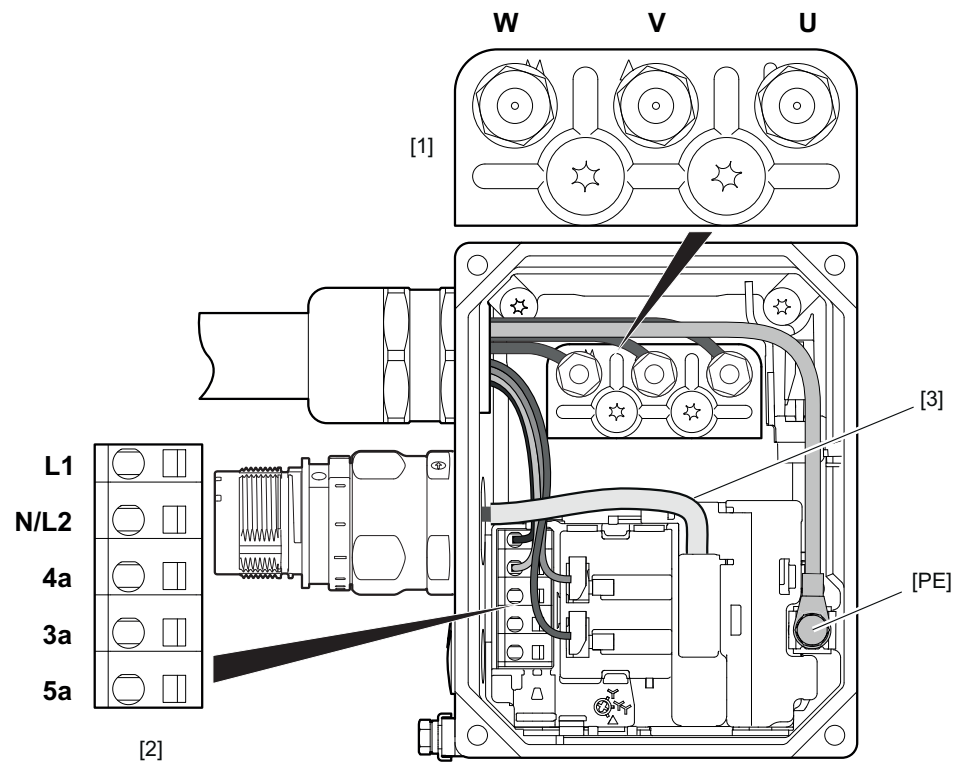
Assignment		
Terminal [1]	No.	Connection
Motor	U	Motor phase U
	V	Motor phase V
	W	Motor phase W
	PE	Protective earth

Assignment		
Terminal [2]	No.	Brake control connection BG1Z..
BZ.. brake	L1	Brake supply system, phase L1
	N/L2	Brake supply, neutral conductor or phase 2
	4a	Brake core WH
	3a	Brake core RD
	5a	Brake core BU

Connection	
Connector [3]	FAKRA plug-in connection: Open the FAKRA connector housing and connect the MOVILINK® DDI cable.

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6.5.8 Terminal assignment of terminal box KDD CM3C80 – 100 with BG1Z



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Assignment		
Terminal [1]	No.	Connection
Motor	U	Motor phase U
	V	Motor phase V
	W	Motor phase W
	PE	Protective earth

Assignment		
Terminal [2]	No.	Brake control connection BG1Z..
BZ.. brake	L1	Brake supply system, phase L1
	N/L2	Brake supply, neutral conductor or phase 2
	4a	Brake core WH
	3a	Brake core RD
	5a	Brake core BU

Connection	
Connector [3]	FAKRA plug-in connection: Open the FAKRA connector housing and connect the MOVILINK® DDI cable.

6.6 UL-compliant installation

INFORMATION



Due to UL requirements, the following chapter is always printed in English and in some cases in French, regardless of the language of this documentation.

6.6.1 Branch Circuit Protection

Integral solid state short circuit protection does not provide branch circuit protection. Branch circuit protection must be provided in accordance with the National Electrical Code and any additional local codes (US) or Canadian Electrical Code, Part 1 (CA).

WARNING - The opening of the branch-circuit protective device may be an indication that a fault current has been interrupted. To reduce the risk of fire or electric shock, current-carrying parts and other components of the controller should be examined and replaced if damaged. If burnout of the current element of an overload relay occurs, the complete overload relay must be replaced.

ATTENTION - LE DÉCLENCHEMENT DU DISPOSITIF DE PROTECTION DU CIRCUIT DE DÉRIVATION PEUT ÊTRE DÙ À UNE COUPURE QUI RÉSULTE D'UN COURANT DE DÉFAUT. POUR LIMITER LE RISQUE D'INCENDIE OU DE CHOC ÉLECTRIQUE, EXAMINER LES PIÈCES PORTEUSES DE COURANT ET LES AUTRES ÉLÉMENTS DU CONTRÔLEUR ET LES REMPLACER S'ILS SONT EN DOMMAGÉS. EN CAS DE GRILLAGE DE L'ÉLÉMENT TRAVERSÉ PAR LE COURANT DANS UN RELAIS DE SURCHARGE, LE RELAIS TOUT ENTIER DOIT ÊTRE REMPLACÉ

Model	Non Semiconductor Fuses (currents are maximum, voltages minimum values), any Listed	Inverse-Time Circuit Breaker (currents are maximum, voltages minimum values), any Listed
BG1Z	40 A	40 A
BGext ¹⁾	40 A	40 A

1) External brake control

6.6.2 Surrounding Air Temperature Rating

Rated for Surrounding Air Temperature of 80 °C in the terminal box of the device they are mounted in.

7 Connection technology

7.1 Cables for MOVILINK® DDI

The MOVILINK® DDI interface requires a coaxial cable for data transmission between the motor and the inverter. Depending on the motor cable cross section that is required, the coaxial cable is in the form of a hybrid cable (up to 10 mm²) or in separate cables (> 10 mm²).

The coaxial cable requires a FAKRA connector at the inverter and motor sides. SEW-EURODRIVE provides prefabricated cables with connectors already fitted. In addition, bulk cables are offered on rolls. In this case, the connectors must be installed by the customer. The FAKRA connectors can be assembled using the "MOVILINK® DDI Tool Set 1".

More information can be found in the "MOVI-C® Modular Automation System – Digital Motor Integration" manual.

Single-cable technology up to 10 mm²

Prefabricated hybrid cables for motors with MOVILINK® DDI interface are structured as follows:

- 1 conductor for the PE connection
- 3 conductors for controlling the motor
- 4 cores for brake control
- 1 coaxial cable for MOVILINK® DDI

With this universal hybrid cable, all variants of the brake can be controlled.

Multi-cable technology larger than 10 mm²

For cross sections larger than 10 mm², the coaxial cable is routed separately in a cable. Individual coaxial cables are available as prefabricated cables.

On the motor side, the coaxial cable is connected either via an M23 signal connector with MOVILINK® DDI, via an M23 hybrid connector with MOVILINK® DDI and the brake cores, or via a cable gland.

Number of plugging positions

The coaxial technology of MOVILINK® DDI allows multiple plugging positions. Up to 4 plugging positions (up to 200 m) or 6 plugging positions (up to 100 m) are permitted. For additional plugging positions, contact SEW-EURODRIVE.

The plugging positions of the FAKRA plug connector within the motor in the terminal box, on the encoder module, or on the inverter itself are not counted.

Examples for the numbering system of the plugging positions:

- Cable from MOVIDRIVE® to the motor with SD1 (M23 plug connector): 1 plugging position
- Cable from MOVITRAC® advanced to the motor with SDB (M40 connector) connected to an extension cable M40 to M40: 2 plugging positions
- Cable from MOVIDRIVE® to the motor with KD1 (M23 connector): 1 plugging position
- Cable from MOVIMOT® flexible with M23 to the motor with KD1 (M23 connector): 2 plugging positions
- Cable from MOVIDRIVE® to the motor with KD1 (M23 connector) connected to an extension cable M23 to M23: 2 plugging positions

- Cable from MOVIMOT® flexible with M23 to the motor with KD1 (M23 connector) connected to an extension cable M23 to M23: 3 plugging positions
- Cable from MOVIDRIVE® to motor with KD (hybrid cable gland without plug connector): 0 plugging positions

Interlocking of the plug connectors

MOVILINK® DDI cables with plugs are supplied as standard with quick-locking SpeedTec plugs. Please note that this interlocking must be fully closed to ensure interference-free signal transmission via MOVILINK® DDI.

Inverter in decentralized design

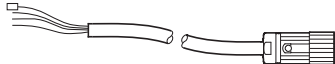
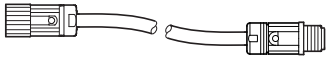
Influencing factors: Depending on the decentralized inverter, there is a general cable length limit. Please refer to the product documentation for the decentralized inverter MOVIMOT® flexible and MOVIPRO® technology.

Inverter in control cabinet

Influencing factors: Depending on the control cabinet inverter, there is a cable length limit based on the PWM frequency and the inverter design. Please refer to the product documentation for the respective control cabinet inverter MOVIDRIVE® technology, modular or system as well as MOVITRAC® advanced.

7.1.1 Overview of options for motor cables

If the cable is specified as open, the motor power and braking power supply is implemented via conductor end sleeves. The signal connection is made via the FAKRA coaxial plug.

Motor cable		Description
Inverter side	Motor side	
		Open end power cores and FAKRA coaxial connector to open end power cores and FAKRA coaxial connector
		Open end power cores and FAKRA coaxial connector to M23 Open end power cores and FAKRA coaxial connector to M40
		M23 to open end power cores and FAKRA coaxial connector M40 to open end power cores and FAKRA coaxial connector M23 to FAKRA coaxial plug
		M23 to M23 M40 to M40 M23 to M40 M40 to M23

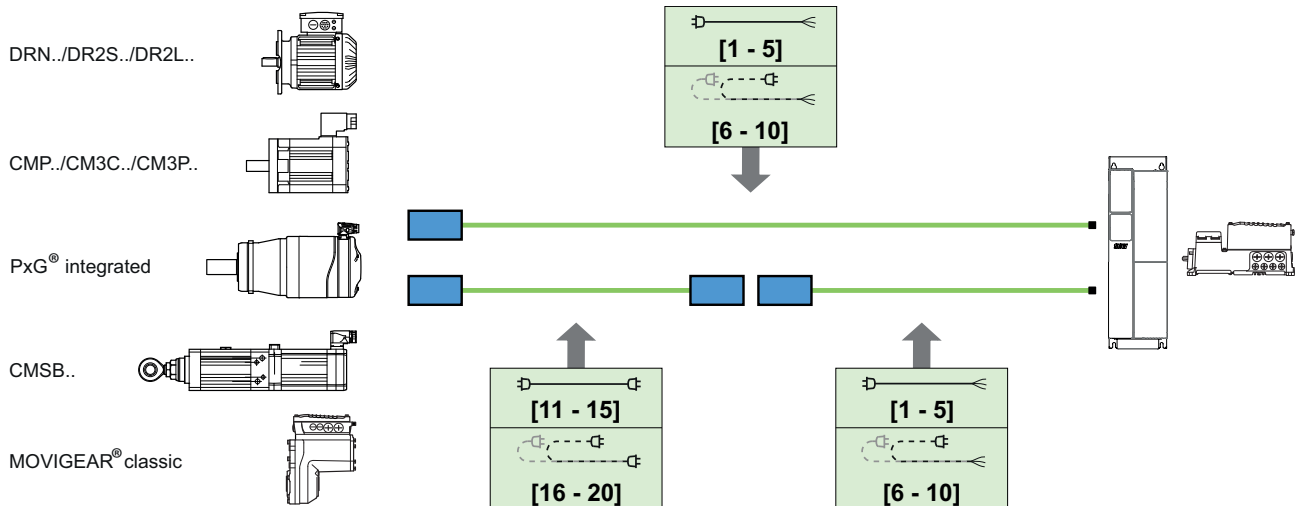
7.1.2 Legend

Symbol	Meaning
	Fixed installation
	Cable carrier installation
	Cables with connector
	Cable with open end, cut off or with conductor end sleeves

7.1.3 Hybrid cables with connector on the motor side, open end on the inverter side

The cable is used for the following inverters:

- MOVIDRIVE®
- MOVITRAC® advanced
- MOVIMOT® flexible

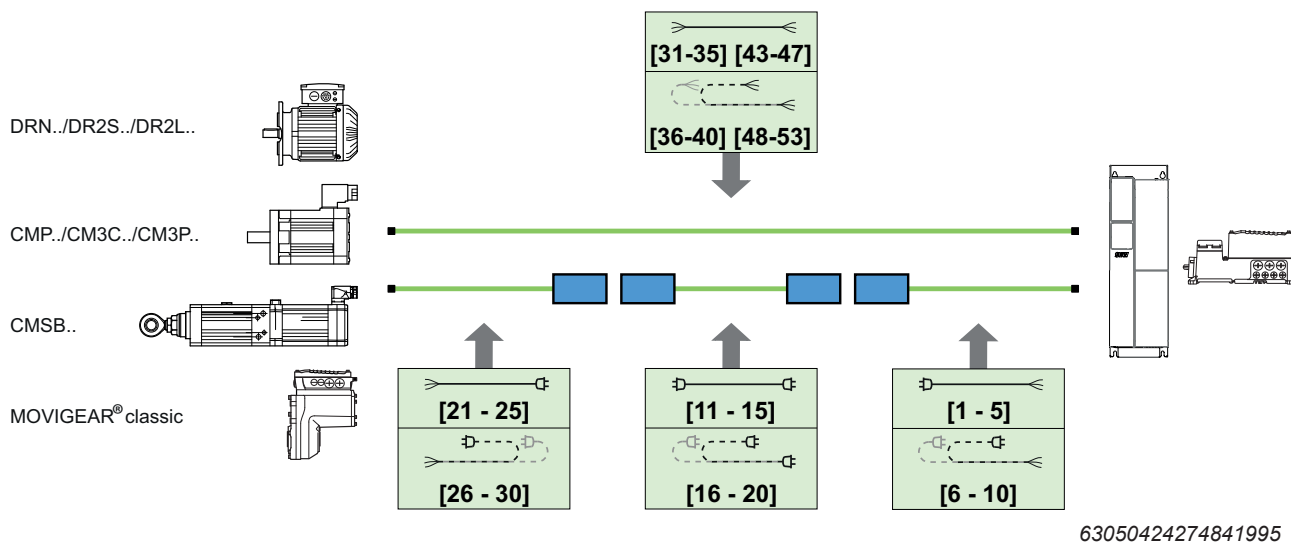


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7.1.4 Hybrid cables with open end on the motor side, open end on the inverter side

The cable is used for the following inverters:

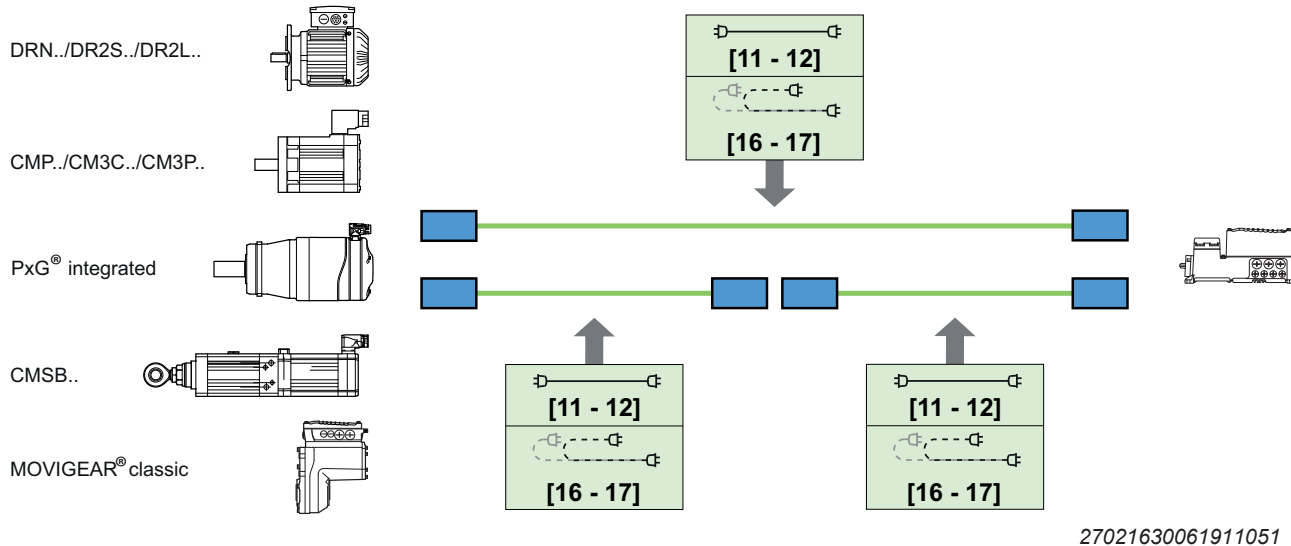
- MOVIDRIVE®
- MOVITRAC® advanced
- MOVIMOT® flexible



7.1.5 Hybrid cables with connector on the motor side, connector on the inverter side

The cable is used for the following inverters:

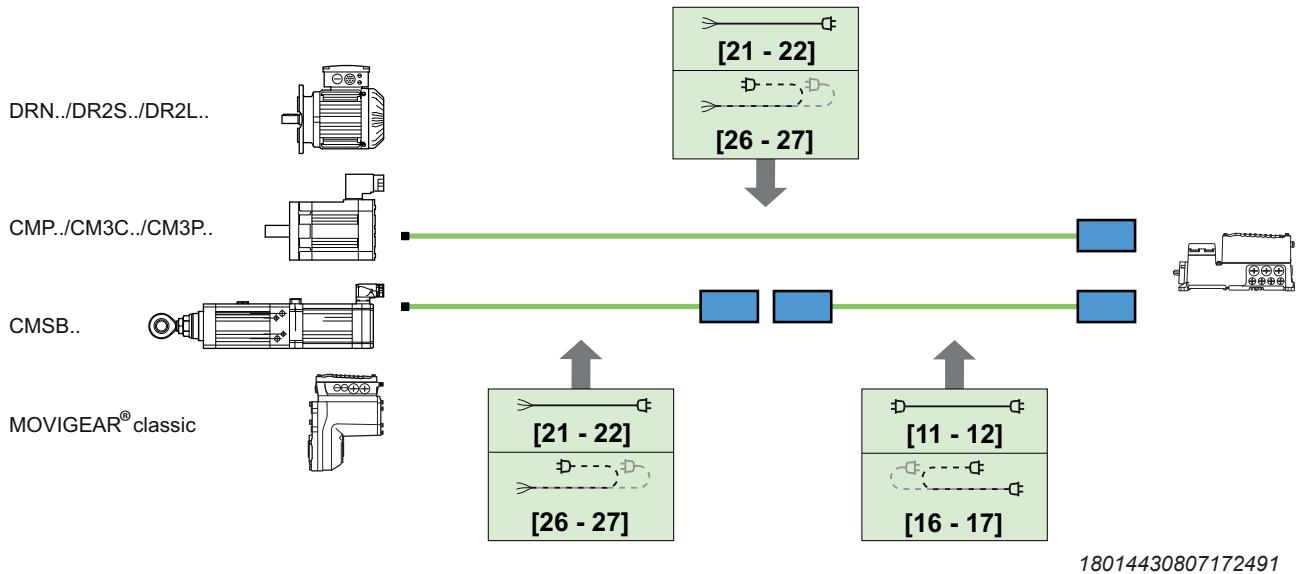
- MOVIMOT® flexible



7.1.6 Hybrid cables with open end on the motor side, connector on the inverter side

The cable is used for the following inverters:

- MOVIMOT® flexible

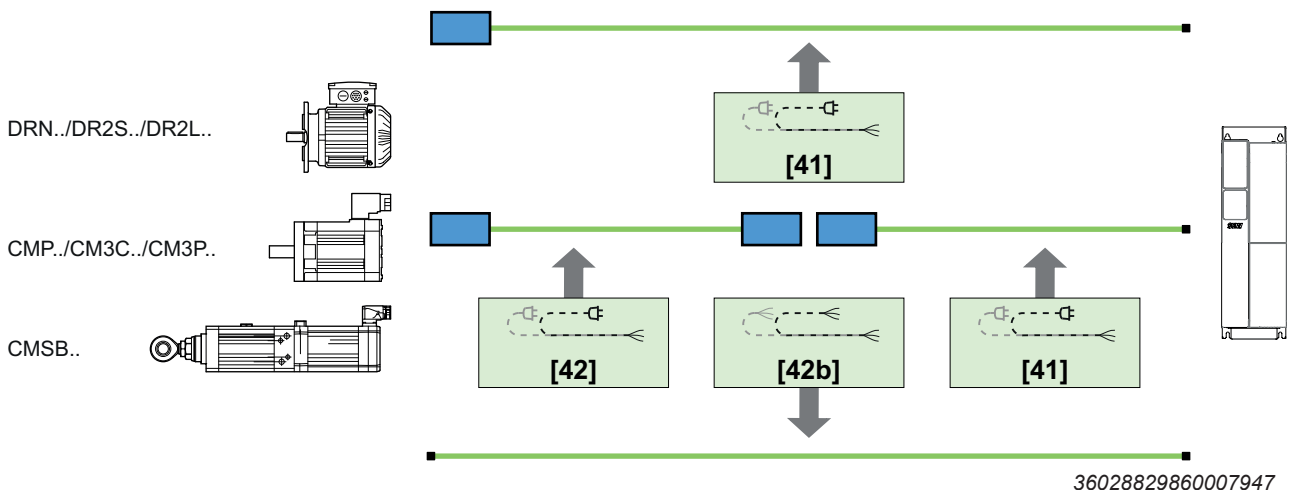


7.1.7 Coaxial signal cable with plug or open end on motor side, with open end on inverter side

The coaxial cable is required for a cross section greater than 10 mm² for the conductors for controlling the motor and contains the data line for the MOVILINK® DDI connection. The cable for connecting the motor and the brake must be laid separately.

The cable is used for the following inverters:

- MOVIDRIVE®
- MOVITRAC® advanced



7.1.8 Cable tables

The available connection options depend on the series of your motor or gearmotor.

The prefabricated cables with open ends on the motor side and on the inverter side can also be supplied as cable reels in lengths of 30 m, 100 m and 200 m. These cables are not prefabricated.

For more information on assembly, refer to the addendum to the "MOVILINK® DDI Tool Set 1" operating instructions.

Cables with hybrid connectors or open ends for power and FAKRA coaxial connectors

The following table shows prefabricated cables for MOVILINK® DDI.

"Open" means that the power conductors for the motor and brake are open and MOVILINK® DDI is connected via a FAKRA coaxial connector. If there is purely an open signal cable, only the FAKRA coaxial connector is present.

No.	Part number	Cross section in mm ²	Installation type	Motor connection	Motor side	Inverter side
[1]	28123808	4 × 1.5 + 4 × 1 + coaxial cable	Fixed installation	SD1/KD1	M23	Open
[2]	28123816	4 × 2.5 + 4 × 1 + coaxial cable	Fixed installation	SD1/KD1	M23	Open
[3]	28123824	4 × 4 + 4 × 1 + coaxial cable	Fixed installation	SD1/KD1	M23	Open
[4]	28123832	4 × 6 + 4 × 1.5 + coaxial cable	Fixed installation	SDB/KDB	M40	Open
[5]	28123840	4 × 10 + 4 × 1.5 + coaxial cable	Fixed installation	SDB/KDB	M40	Open
[6]	28123743	4 × 1.5 + 2 × (2 × 1) + coaxial cable	Cable carrier installation	SD1/KD1	M23	open
[7]	28123751	4 × 2.5 + 2 × (2 × 1) + coaxial cable	Cable carrier installation	SD1/KD1	M23	open
[8]	28123778	4 × 4 + 2 × (2 × 1) + coaxial cable	Cable carrier installation	SD1/KD1	M23	open
[8b] ¹⁾	28148576	4 × 1.5 + 2 × (2 × 1) + coaxial cable	Cable carrier installation	SD1/KD1	M23 ¹⁾	open
[9]	28123786	4 × 6 + 2 × (2 × 1.5) + coaxial cable	Cable carrier installation	SDB/KDB	M40	open
[10]	28123794	4 × 10 + 4 × 1.5 + coaxial cable	Cable carrier installation	SDB/KDB	M40	Open
[11]	28123905	4 × 1.5 + 4 × 1 + coaxial cable	Fixed installation	SD1/KD1	M23	M23
[12]	28123913	4 × 2.5 + 4 × 1 + coaxial cable	Fixed installation	SD1/KD1	M23	M23
[13]	28123921	4 × 4 + 4 × 1 + coaxial cable	Fixed installation	SD1/KD1	M23	M23
[14]	28123948	4 × 6 + 4 × 1.5 + coaxial cable	Fixed installation	SDB/KDB	M40	M40
[15]	28123956	4 × 10 + 4 × 1.5 + coaxial cable	Fixed installation	SDB/KDB	M40	M40
[16]	28123859	4 × 1.5 + 2 × (2 × 1) + coaxial cable	Cable carrier installation	SD1/KD1	M23	M23
[17]	28123867	4 × 2.5 + 2 × (2 × 1) + coaxial cable	Cable carrier installation	SD1/KD1	M23	M23
[18]	28123875	4 × 4 + 2 × (2 × 1) + coaxial cable	Cable carrier installation	SD1/KD1	M23	M23
[18b]	28147170	4 × 4 + 2 × (2 × 1) + coaxial cable (motor phases replaced)	Cable carrier installation	SD1/KD1	M23	M23
[19]	28123883	4 × 6 + 2 × (2 × 1.5) + coaxial cable	Cable carrier installation	SDB/KDB	M40	M40
[20]	28123891	4 × 10 + 4 × 1.5 + coaxial cable	Cable carrier installation	SDB/KDB	M40	M40
[21]	28124367	4 × 1.5 + 4 × 1 + coaxial cable	Fixed installation	KD	Open	M23
[22]	28124375	4 × 2.5 + 4 × 1 + coaxial cable	Fixed installation	KD	Open	M23
[23]	28124383	4 × 4 + 4 × 1 + coaxial cable	Fixed installation	KD	Open	M23
[23b]	28183908	4 × 1 + coaxial cable (brake + coaxial cable only)	Fixed installation	KD	open	M23
[24]	28143884	4 × 6 + 4 × 1.5 + coaxial cable	Fixed installation	KD	Open	M40
[25]	28143892	4 × 10 + 4 × 1.5 + coaxial cable	Fixed installation	KD	Open	M40
[26]	28124332	4 × 1.5 + 2 × (2 × 1) + coaxial cable	Cable carrier installation	KD	open	M23
[27]	28124340	4 × 2.5 + 2 × (2 × 1) + coaxial cable	Cable carrier installation	KD	open	M23
[28]	28124359	4 × 4 + 2 × (2 × 1) + coaxial cable	Cable carrier installation	KD	open	M23
[29]	28143868	4 × 6 + 2 × (2 × 1.5) + coaxial cable	Cable carrier installation	KD	open	M40
[30]	28143876	4 × 10 + 4 × 1.5 + coaxial cable	Cable carrier installation	KD	Open	M40
[31]	28152395	4 × 1.5 + 4 × 1 + coaxial cable	Fixed installation	KD	Open	Open
[32]	28152409	4 × 2.5 + 4 × 1 + coaxial cable	Fixed installation	KD	Open	Open
[33]	28152417	4 × 4 + 4 × 1 + coaxial cable	Fixed installation	KD	Open	Open

No.	Part number	Cross section in mm ²	Installation type	Motor connection	Motor side	Inverter side
[34]	28152425	4 × 6 + 4 × 1.5 + coaxial cable	Fixed installation	KD	Open	Open
[35]	28152433	4 × 10 + 4 × 1.5 + coaxial cable	Fixed installation	KD	Open	Open
[36]	28152441	4 × 1.5 + 2 × (2 × 1) + coaxial cable	Cable carrier installation	KD	open	open
[37]	28152468	4 × 2.5 + 2 × (2 × 1) + coaxial cable	Cable carrier installation	KD	open	open
[38]	28152476	4 × 4 + 2 × (2 × 1) + coaxial cable	Cable carrier installation	KD	open	open
[39]	28152484	4 × 6 + 2 × (2 × 1.5) + coaxial cable	Cable carrier installation	KD	open	open
[40]	28152492	4 × 10 + 4 × 1.5 + coaxial cable	Cable carrier installation	KD	Open	Open
[41]	28129431	Coaxial cable	Cable carrier installation	SMCD/SBCD/ KDD	M23	Open
[42]	28138376	Coaxial cable	Cable carrier installation	SMCD/SBCD/ KDD	M23	M23
[42b]	28183762	Coaxial cable	Cable carrier installation	KD	Open	Open

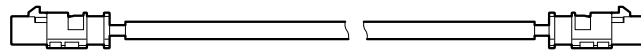
1) Version as right-angle connector.

Cable for independently creating an open end with FAKRA coaxial plug

No.	Part number	Cross section in mm ²	Installation type	Motor connection	Motor side	Inverter side
[43]	28123395	4 × 1.5 + 4 × 1 + coaxial cable	Fixed installation	KD	cut off	cut off
[44]	28123409	4 × 2.5 + 4 × 1 + coaxial cable	Fixed installation	KD	cut off	cut off
[45]	28123417	4 × 4 + 4 × 1 + coaxial cable	Fixed installation	KD	cut off	cut off
[46]	28123425	4 × 6 + 4 × 1.5 + coaxial cable	Fixed installation	KD	cut off	cut off
[47]	28123433	4 × 10 + 4 × 1.5 + coaxial cable	Fixed installation	KD	cut off	cut off
[48]	28123336	4 × 1.5 + 2 × (2 × 1) + coaxial cable	Cable carrier installation	KD	cut off	cut off
[49]	28123344	4 × 2.5 + 2 × (2 × 1) + coaxial cable	Cable carrier installation	KD	cut off	cut off
[50]	28123352	4 × 4 + 2 × (2 × 1) + coaxial cable	Cable carrier installation	KD	cut off	cut off
[51]	28123360	4 × 6 + 2 × (2 × 1.5) + coaxial cable	Cable carrier installation	KD	cut off	cut off
[52]	28123379	4 × 10 + 4 × 1.5 + coaxial cable	Cable carrier installation	KD	cut off	cut off
[53]	25672568	Coaxial signal cable	Cable carrier installation	KD	cut off	cut off

7.1.9 Adapter cable for MOVILINK® DDI FAKRA plug connector to FAKRA plug connector

Adapter cables are available for connecting the open FAKRA plug connector. This enables the connection of self-prefabricated cables with an open end and a FAKRA plug connector. The FAKRA plug connector is compatible with all prefabricated cables for MOVILINK® DDI with open end from SEW-EURODRIVE.



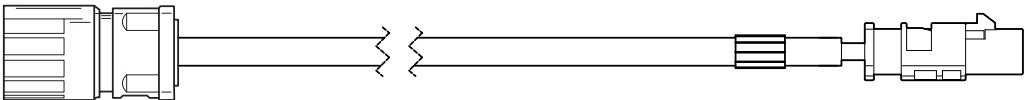
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Part number	Installation type	Length	Connection	Motor side	Inverter side
28170792	Fixed	200 mm	FAKRA Coaxial	male	male

7.1.10 Cabling the connection box with MOVILINK® DDI signal connectors

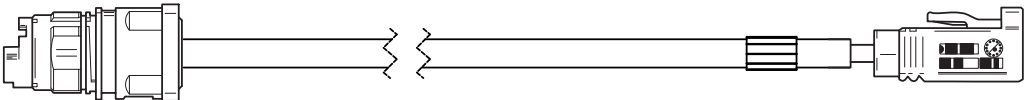
	28177428	28177436
	[1]	[2]
Structure	M23 female front wall mounting > FAKRA code L male	FAKRA code L female > M23 male front wall mounting
Length	145 mm Connected to [2]: 280 mm (Connector overlapping)	145 mm Connected to [1]: 280 mm (Connector overlapping)
Operating temperature	-20 °C to +80 °C	
Degree of protection	IP66 (plugged in)	
Motor side	M23, female contact	FAKRA code L, female contact
Inverter side	FAKRA code L male connector	M23, male connector

28177428



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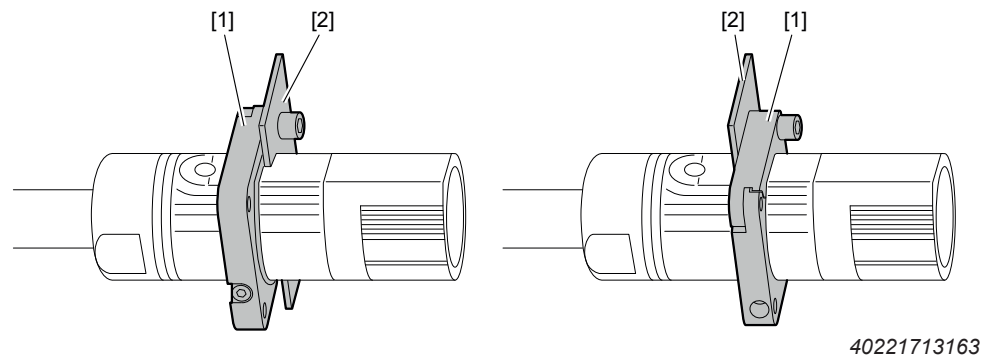
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7.1.11 Hybrid cables with connectors at the housings

TE Connectivity offers hinged flanges for routing prefabricated hybrid cables for MOVILINK® DDI with connectors in unit housings. These can be ordered directly from TE Connectivity under the following designation and item number.



- [1] Hinged flange for rear wall mounting (left)
Hinged flange for front wall mounting (right)
- [2] Housing wall

Observe the assembly instructions from TE Connectivity.

Manufacturer	Part number	Type	Operating temperature	Degree of protection
TE Connectivity	E0.0222.002-P00	Flange, hinged, two-piece for M23 connectors, 723/923 series	-20 °C to +60 °C	IP65/IP67 with blind hole mounting
TE Connectivity	E0.0058.002-000	Flange, hinged, two-piece for M40 straight connectors, 740/940 series	-20 °C to +60 °C	IP65/IP67 with blind hole mounting

7.2 Pin assignment of the motor cables for MOVILINK® DDI interface

7.2.1 Hybrid cables for motors without brake

Connecting cables with connectors on the motor side for the following motors:

- DRN../DR2../DRU.. AC motors
- CMP../CM3C../CM3P../CMSB.. synchronous motors
- PxG® integrated precision planetary gearmotor
- Drive unit MOVIGEAR® classic

The following table shows the conductor assignment of the cables:

MOVIDRIVE® modular/system/technology, MOVITRAC® advanced

Motor side						Inverter side		
Contact			Signal	Core color	Core color IEC 60757	Marking	Contact	Description
M23	M40	open					open	
U	U	U	U	Black	BK	U/L1	U	Motor phase U
V	V	V	V	Black	BK	V/L2	V	Motor phase V
W	W	W	W	Black	BK	W/L3	W	Motor phase W
A	1	Insulate	Reserved	Yellow	YE	A	Insulate	Do not connect
B	+	Insulate	Reserved	Orange	OG	B	Insulate	Do not connect
C	N	Insulate	Reserved	Pink	PK	C	Insulate	Do not connect
D	2	Insulate	Reserved	Violet	VT	D	Insulate	Do not connect
PE	PE	PE	PE	Yellow/green	GNYE	–	PE	Protective earth
DDI	DDI	Coaxial con- nector	MOVILINK® DDI	Violet	VT	–	Coaxial connector	MOVILINK® DDI

MOVIMOT® flexible

Motor side						Inverter side	
Contact		Signal	Core color	Core color IEC 60757	Marking	Assembly	Description
M23	M40						
U	U	U	Black	BK	U/L1	Not prefabricated	Motor phase U
V	V	V	Black	BK	V/L2		Motor phase V
W	W	W	Black	BK	W/L3		Motor phase W
A	1	A	Yellow	YE	A		Connection A
B	+	B	Orange	OG	B		Connection B
C	N	C	Pink	PK	C		Connection C
D	2	D	Violet	VT	D		Connection D
PE	PE	PE	Yellow/green	GNYE	–	Coaxial connector	Protective earth
DDI	DDI	MOVILINK® DDI	Violet	VT	–		MOVILINK® DDI

Insulate each unconnected conductor end.

7.2.2 Hybrid cables for motors with BE.. or BZ.. brake with DC 24 V supply voltage

Connecting cables with connectors on the motor side for the following motors:

- DRN../DR2../DRU.. AC motors
- CM3C../CM3P.. synchronous motors

The following table shows the conductor assignment of the cables:

MOVIDRIVE® modular/system/technology, MOVITRAC® advanced

Motor side						Inverter side		
Contact			Signal	Core color	Core color IEC 60757	Marking	Contact	Description
M23	M40	open					open	
U	U	U	U	Black	BK	U/L1	U	Motor phase U
V	V	V	V	Black	BK	V/L2	V	Motor phase V
W	W	W	W	Black	BK	W/L3	W	Motor phase W
A	1	Yellow	15	Yellow	YE	A	Yellow	Brake 15
B	+	Orange	Reserved	Orange	OG	B	Orange	Do not connect
C	N	Pink	14	Pink	PK	C	Pink	Brake 14
D	2	Violet	13	Violet	VT	D	Violet	Brake 13
PE	PE	PE	PE	Yellow/green	GNYE	–	PE	Protective earth
DDI	DDI	Coaxial con- nector	MOVILINK® DDI	Violet	VT	–	Coaxial connector	MOVILINK® DDI

MOVIMOT® flexible

Motor side						Inverter side	
Contact		Signal	Core color	Core color IEC 60757	Marking	Assembly	Description
M23	M40						
U	U	U	Black	BK	U/L1	U	Motor phase U
V	V	V	Black	BK	V/L2	V	Motor phase V
W	W	W	Black	BK	W/L3	W	Motor phase W
A	1	A	Yellow	YE	A	Yellow	Brake 15
B	+	B	Orange	OG	B	Orange	Do not connect
C	N	C	Pink	PK	C	Pink	Brake 14
D	2	D	Violet	VT	D	Violet	Brake 13
PE	PE	PE	Yellow/green	GNYE	–	PE	Protective earth
DDI	DDI	MOVILINK® DDI	Violet	VT	–	Coaxial connector	MOVILINK® DDI

Insulate each unconnected conductor end.

7.2.3 Hybrid cables for motors with BE.. or BZ.. brake

Connecting cables with connectors on the motor side for the following motors:

- DRN../DR2../DRU.. AC motors
- CM3C../CM3P.. synchronous motors

The following table shows the conductor assignment of the cables:

MOVIDRIVE® modular/system/technology, MOVITRAC® advanced

Motor side						Inverter side		
Contact			Signal	Core color	Core color IEC 60757	Marking	Contact	Description
M23	M40	open					open	
U	U	U	U	Black	BK	U/L1	U	Motor phase U
V	V	V	V	Black	BK	V/L2	V	Motor phase V
W	W	W	W	Black	BK	W/L3	W	Motor phase W
A	1	Yellow	Reserved	Yellow	YE	A	Yellow	Do not connect
B	+	Orange	15	Orange	OG	B	Orange	Brake 15
C	N	Pink	13	Pink	PK	C	Pink	Brake 13
D	2	Violet	14	Violet	VT	D	Violet	Brake 14
PE	PE	PE	PE	Yellow/green	GNYE	–	PE	Protective earth
DDI	DDI	Coaxial con- nector	MOVILINK® DDI	Violet	VT	–	Coaxial connector	MOVILINK® DDI

MOVIMOT® flexible

Motor side						Inverter side	
Contact		Signal	Core color	Core color IEC 60757	Marking	Assembly	Description
M23	M40						
U	U	U	Black	BK	U/L1	Not prefabricated	Motor phase U
V	V	V	Black	BK	V/L2		Motor phase V
W	W	W	Black	BK	W/L3		Motor phase W
A	1	A	Yellow	YE	A		A
B	+	B	Orange	OG	B		B
C	N	C	Pink	PK	C		C
D	2	D	Violet	VT	D		D
PE	PE	PE	Yellow/green	GNYE	–	Coaxial connector	Protective earth
DDI	DDI	MOVILINK® DDI	Violet	VT	–		MOVILINK® DDI

Insulate each unconnected conductor end.

7.2.4 Hybrid cables for motors with BK.., BKB.. or BP.. brake

Connecting cables with connectors on the motor side for the following motors:

- CMP../CM3C../CM3P../CMSB.. synchronous motors
- PxG® integrated precision planetary gearmotor

The following table shows the conductor assignment of the cables:

MOVIDRIVE® modular/system/technology, MOVITRAC® advanced

Motor side						Inverter side	
Contact		Signal	Core color	Core color IEC 60757	Marking	Assembly	Description
M23	M40						
U	U	U	Black	BK	U/L1	Not prefabricated	Motor phase U
V	V	V	Black	BK	V/L2		Motor phase V
W	W	W	Black	BK	W/L3		Motor phase W
A	1	Brake -	Yellow	YE	A		Brake -
B	+	Reserved	Orange	OG	B		Do not connect
C	N	Reserved	Pink	PK	C		Do not connect
D	2	Brake +	Violet	VT	D		Brake +
PE	PE	PE	Yellow/green	GNYE	–		Protective earth
DDI	DDI	MOVILINK® DDI	Violet	VT	–	Coaxial connector	MOVILINK® DDI

MOVIMOT® flexible

Motor side						Inverter side	
Contact		Signal	Core color	Core color IEC 60757	Marking	Assembly	Description
M23	M40						
U	U	U	Black	BK	U/L1	Not prefabricated	Motor phase U
V	V	V	Black	BK	V/L2		Motor phase V
W	W	W	Black	BK	W/L3		Motor phase W
A	1	A	Yellow	YE	A		A
B	+	B	Orange	OG	B		B
C	N	C	Pink	PK	C		C
D	2	D	Violet	VT	D		D
PE	PE	PE	Yellow/green	GNYE	–		Protective earth
DDI	DDI	MOVILINK® DDI	Violet	VT	–	Coaxial connector	MOVILINK® DDI

Insulate each unconnected conductor end.

7.2.5 Hybrid cables for motors with BE..., BE.H or BZ.. brake and with integrated BG1Z brake control

Connecting cables with connectors on the motor side for the following motors:

- DRN../DR2../DRU.. AC motors
- CM3C../CM3P.. synchronous motors

The following table shows the conductor assignment of the cables:

MOVIDRIVE® modular/system/technology, MOVITRAC® advanced

Motor side						Inverter side	
Contact		Signal	Core color	Conductor color IEC 60757	Marking	Assembly	Description
M23	M40						
U	U	U	Black	BK	U/L1	Not prefabricated	Motor phase U
V	V	V	Black	BK	V/L2		Motor phase V
W	W	W	Black	BK	W/L3		Motor phase W
A	1	Reserved	Yellow	YE	A		Do not connect
B	+	N (L2)	Orange	OG	B		Brake neutral conductor N (phase L2)
C	N	Reserved	Pink	PK	C		Do not connect
D	2	L1 (phase)	Violet	VT	D		Brake phase L1
PE	PE	PE	Yellow/green	GNYE	–	Coaxial connector	Protective earth
DDI	DDI	MOVILINK® DDI	Violet	VT	–		MOVILINK® DDI

Insulate each unconnected conductor end.

7.2.6 Hybrid cables for motors with BZ.Z, BZ.D or BK.. brake and with integrated BS1Z brake control

Connecting cables with connectors on the motor side for the following motors:

- CM3C../CM3P../CMSB.. synchronous motors

The following table shows the conductor assignment of the cables:

MOVIDRIVE® modular/system/technology, MOVITRAC® advanced

Motor side						Inverter side	
Contact		Signal	Core color	Conductor color IEC 60757	Marking	Assembly	Description
M23	M40						
U	U	U	Black	BK	U/L1	Not prefabricated	Motor phase U
V	V	V	Black	BK	V/L2		Motor phase V
W	W	W	Black	BK	W/L3		Motor phase W
A	1	GND	Yellow	YE	A		GND brake
B	+	24 V	Orange	OG	B		Brake DC 24 V
C	N	Reserved	Pink	PK	C		Do not connect
D	2	Reserved	Violet	VT	D		Do not connect
PE	PE	PE	Yellow/green	GNYE	–	Coaxial connector	Protective earth
DDI	DDI	MOVILINK® DDI	Violet	VT	–		MOVILINK® DDI

Insulate each unconnected conductor end.

7.2.7 Connection of MOVILINK® DDI coaxial signal cable for motors without hybrid cable

The power cable and signal cable can only be routed together up to a cable cross section of 10 mm². With larger cable cross sections, the power cable is routed separately from the signal cable.

Connecting cables with connectors on the motor side for the following motors:

- DRN../DR2../DRU.. AC motors
- CMP../CM3C../CM3P../CMSB.. synchronous motors

The following table shows the conductor assignment of the cables:

MOVIDRIVE® modular/system/technology, MOVITRAC® advanced

Motor side						Inverter side				
Contact			Signal	Core color	Core color IEC 60757	Marking	Contact			Description
M23	M40	open					M23	M40	open	
Reserved			Reserved	Black	BK	U/L1	Do not connect			Do not connect
				Black	BK	V/L2				
				Black	BK	W/L3				
				Yellow	YE	A				
				Orange	OG	B				
				Pink	PK	C				
				Violet	VT	D				
				Yellow/green	GNYE	—				
DDI	DDI	Coaxial con- nector	MOVILINK® DDI	Violet	VT	—	Coaxial connector			MOVILINK® DDI

Insulate each unconnected conductor end.

7.3 Connector specification of hybrid connectors and signal connectors

The following table describes the properties of the hybrid connectors:

	SD1 (M23)	SDB (M40)
Operating conditions		
Operating temperature range of prefabricated cables ¹⁾	Cables for fixed installation: -40 °C to +80 °C (if moved occasionally -10 °C to +80 °C) Cable for cable carrier installation: -30°C to +80°C	
Degree of protection	IP67 (plugged in)	
Electrical properties		
Rated current	Power: max. 25 A at 4 mm ² Signal: max. 2 A at 1 mm ²	Power: max. 70 A at 10 mm ² Signal: max. 7 A at 1.5 mm ²
Nominal voltage	Power: DC 850 V, AC 630 V	Power: DC 850 V, AC 630 V
Rated impulse voltage	Power: 6000 V Signal: 4000 V	Power: 6000 V Signal: 2500 V
Materials		
Housing and union nut	Nickel-plated die-cast zinc	
Clamping ring and shield element	Nickel-plated brass	Die-cast zinc, nickel-plated brass
Gasket	EPDM	
Insulator and grounding contact	PA 6.6 modified, UL 94/V0 beryllium copper	PA, UL 94/V0 copper
Cable clamps	PA 66/V0	

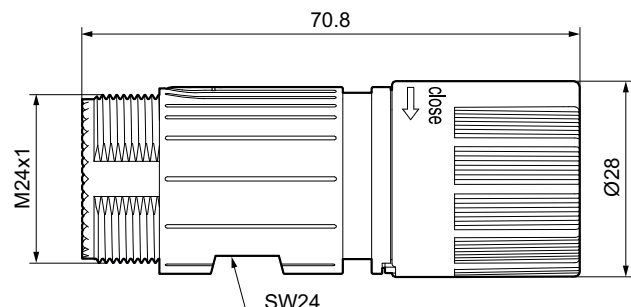
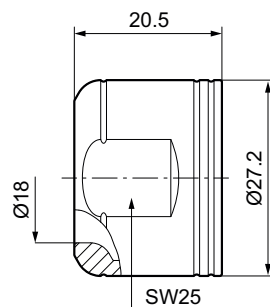
1) Observe the motor limitations.

The brake is connected via signal pins. The rated voltage of the signal pins depends on the connected option, e.g. the brake or brake control, and is not specified.

Note that the permitted motor current, the brake, or the connection cross section used may require a limitation of the current during project planning.

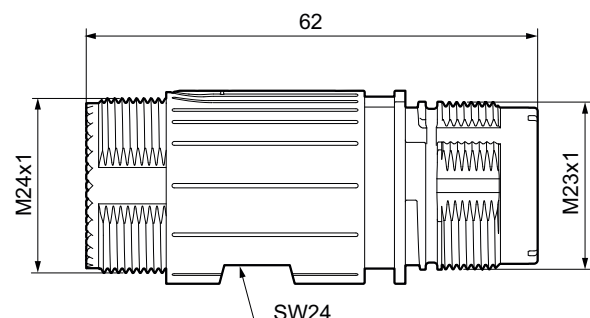
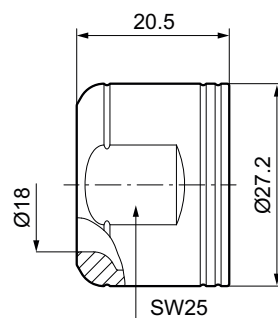
7.3.1 Mechanical dimensions of the connectors

M23 straight, motor side



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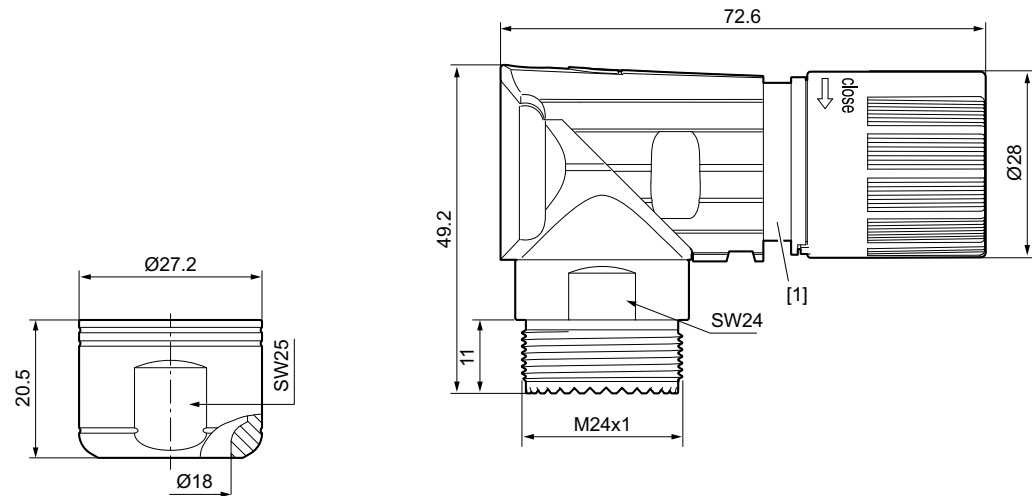
M23 straight, inverter side



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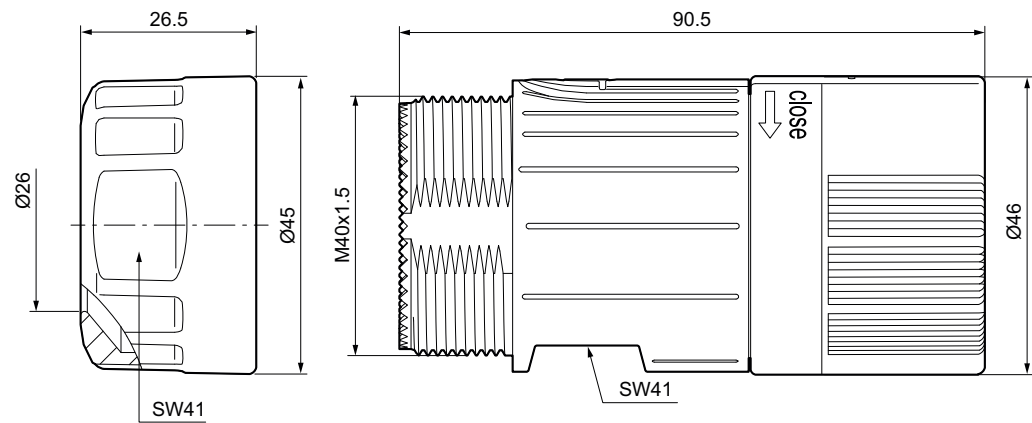
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M23 angled, motor side



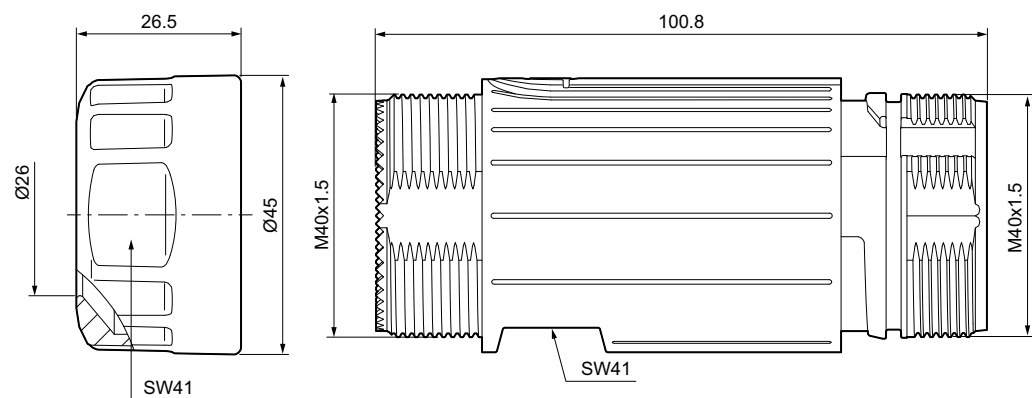
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M40 straight, motor side



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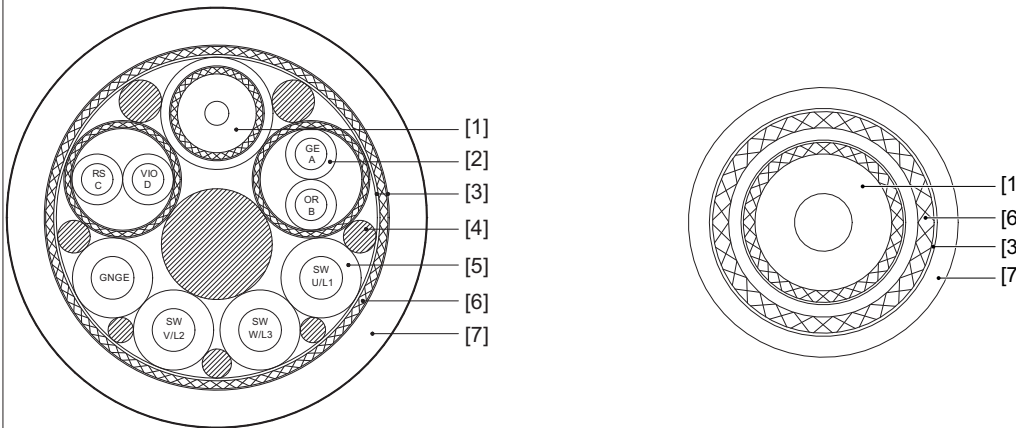
M40 straight, inverter side



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7.4 Cable specification of the motor hybrid cables for MOVILINK® DDI

7.4.1 Cable carrier installation

Type	LEHC 005769	LEHC 005770	LEHC 005771	LEHC 005772	LEHC 005773	LEC 005951	
Part number of bulk cable, not prefabricated	28123336	28123344	28123352	28123360	28123379	25672568	
Cross section of power cores	4 × 1.5 mm ²	4 × 2.5 mm ²	4 × 4.0 mm ²	4 × 6.0 mm ²	4 × 10 mm ²	–	
Cross section of brake cores	2 × 1.0 mm ²	2 × 1.0 mm ²	2 × 1.0 mm ²	2 × 1.5 mm ²	4 × 1.5 mm ²	–	
Mechanical design							
		 29346392715					
[1]	Coaxial cable	Coax Z50 in accordance with RG58					
	Conductor	Stranded copper wire, tinned, 19 × 0.182 mm					
	Dielectric	Polypropylene Ø 2.95					
	Shielding	Braided copper wire, tinned, 0.128 mm					
		Optical coverage min. 90%					
	Sheath	TPE					
	Diameter	4.2 mm					
	Color	Violet					
[2]	Cores	2 shielded conductor pairs 2 × 1.0 mm ²	2 shielded conductor pairs 2 × 1.0 mm ²	2 shielded conductor pairs 2 × 1.0 mm ²	2 shielded conductor pairs 2 × 1.5 mm ²	Shielded element 4 × 1.5 mm ²	–
		Stranded copper wire, bare					–
		Single wire 0.15 mm					–
		In accordance with DIN EN 60228 Class 6					–
		IEC 60228 Class 6					–
	Insulation	Polypropylene					–
	Shielding	Braided copper wire 0.10 mm, tinned	Braided copper wire 0.10 mm, tinned	Braided copper wire 0.10 mm, tinned	Braided copper wire 0.10 mm, tinned	Braided copper wire 0.128 mm, tinned	–
		Optical coverage at least 85%					–
	Diameter	2.1 mm	2.1 mm	2.1 mm	2.4 mm	2.4 mm	–
	Colors	Yellow with black A label					–
		Orange with black B label					–
		Pink with black C label					–
		Violet with black D label					–
[3]	Banding	–					–
[4]	Filler	–					–

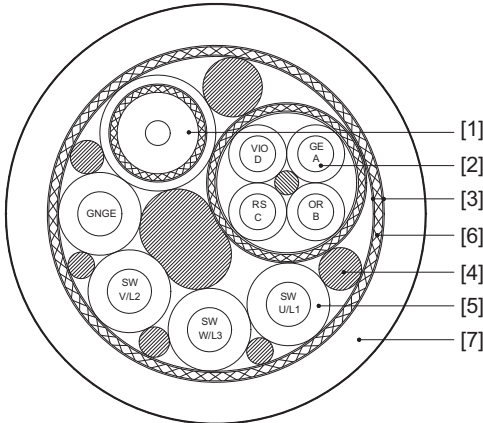
Type		LEHC 005769	LEHC 005770	LEHC 005771	LEHC 005772	LEHC 005773	LEC 005951
Part number of bulk cable, not prefabricated		28123336	28123344	28123352	28123360	28123379	25672568
Cross section of power cores		4 × 1.5 mm ²	4 × 2.5 mm ²	4 × 4.0 mm ²	4 × 6.0 mm ²	4 × 10 mm ²	–
Cross section of brake cores		2 × 1.0 mm ²	2 × 1.0 mm ²	2 × 1.0 mm ²	2 × 1.5 mm ²	4 × 1.5 mm ²	–
[5]	Cores	4 × 1.5 mm ²	4 × 2.5 mm ²	4 × 4.0 mm ²	4 × 6.0 mm ²	4 × 10 mm ²	–
	Conductor	Stranded copper wire, bare					–
		Single wire 0.15 mm	Single wire 0.15 mm	Single wire 0.15 mm	Single wire 0.2 mm	Single wire 0.2 mm	–
		In accordance with DIN EN 60228 Class 6					–
		IEC 60228 Class 6					–
	Diameter	3.0 mm	3.6 mm	3.75 mm	4.6 mm	5.8 mm	–
	Insulation	Polypropylene					–
Colors	Green-yellow: PE Black with white print: U/L1; V/L2; W/L3					–	
[6]	Shield	Braided tinned copper wires, 0.15 mm	Braided tinned copper wires, 0.15 mm	Braided tinned copper wires, 0.15 mm	Braided tinned copper wires, 0.2 mm	Braided tinned copper wires, 0.2 mm	Braided tinned copper wires, 0.128 mm
		Optical coverage at least 85%					Nom. optical coverage 90%
[7]	Outer cable jacket	Polyurethane, flame retardant, halogen-free					
	Color	Matt orange					Matt black
	Label	SEW-EURODRIVE 28123336 4 × 1.5 + 2 × 2 × 1C + 1 × Z50	SEW-EURODRIVE 28123344 4 × 2.5 + 2 × 2 × 1C + 1 × Z50	SEW-EURODRIVE 28123352 4 × 4.0 + 2 × 2 × 1C + 1 × Z50	SEW-EURODRIVE 28123360 4 × 6.0 + 2 × 2 × 1.5C + 1 × Z50	SEW-EURODRIVE 28123379 4 × 10 + 4 × 1.5C + 1 × Z50	SEW-EURODRIVE 25672568 1 × Z50
		LEHC005769 Rev. 0 E522945-Bizlink® 	LEHC005770 Rev.0 E522945-Bizlink® 	LEHC005771 Rev.0 E522945-Bizlink® 	LEHC005772 Rev.0 E522945-Bizlink® 	LEHC005773 Rev.0 E522945-Bizlink® 	LEHC005951 Rev.0 E522945-Bizlink® 
		AWM STYLE 21223 I/II A/B 80 °C 1000 V FT1 week/year of production					AWM STYLE 11892 I/II A/B 80 °C 300V FT1 Week/year of production
	Diameter	15.7 mm	16.7 mm	17.0 mm	19.7 mm	22.1 mm	7.0 mm
Electrical properties							
	Operating voltage conductors V ₀ /V	0.6 kV/1.0 kV					0.3 kV/0.3 kV
	Operating voltage	Max. 1000 V (according to UL Style 21223)					Max. 300 V (according to UL Style 11892)
	Surge impedance coaxial cable	50 Ω ± 2 Ω					
Mechanical properties							
	Bending radius	Min. 3 × outer diameter for one-time installation Min. 5 × outer diameter for fixed installation Min. 7.5 × outer diameter in the cable carrier					Min. 5 × outer diameter for one-time installation Min. 8 × outer diameter for fixed installation Min. 15 × outer diameter in the cable carrier
	Travel speed	Max. 5 m/s					3 m/s
	Acceleration	Max. 50 m/s ²					Max. 20 m/s ²
	Bending cycles	5 million cycles minimum					3 million cycles minimum
	Horizontal length	Max. horizontal travel 20 m					–
	Torsional stability	±180 °/m					–

Type		LEHC 005769	LEHC 005770	LEHC 005771	LEHC 005772	LEHC 005773	LEC 005951
Part number of bulk cable, not prefabricated		28123336	28123344	28123352	28123360	28123379	25672568
Cross section of power cores		4 × 1.5 mm²	4 × 2.5 mm²	4 × 4.0 mm²	4 × 6.0 mm²	4 × 10 mm²	–
Cross section of brake cores		2 × 1.0 mm²	2 × 1.0 mm²	2 × 1.0 mm²	2 × 1.5 mm²	4 × 1.5 mm²	–
	Torsional cycles	1 million cycles (at ±180 °/m) maximum					–
	Suspended installation	Maximum vertically suspended installation: 45 m (Strain relief required for connection plugs and cable glands)					
	Installation in loops	Yes (Minimum bending radius of the loops 15 × outer diameter)					
	Mass	332 kg/km	392 kg/km	444 kg/km	626 kg/km	827 kg/km	72.7 kg/km
	Copper content	200.63 kg/km	250.25 kg/km	305.26 kg/km	450.88 kg/km	607.28 kg/km	38.40 kg/km
Thermal characteristics							
	Operating temperature	Fixed installation: -40 °C to +90 °C (20000 h) Fixed installation: -40 °C to +105 °C (3000 h) Cable carrier installation: -30°C to +90°C					–
	Operating temperature according to cURus	Fixed installation: -40°C to +80°C Cable carrier installation: -30°C to +80°C					
Chemical characteristics							
	Oil resistance	DIN VDE 0282-10/HD 22.10 S2					DIN EN 50363-10-2
	Flame retardance	UL 1581 section 1060 Vertical Flame Test (FT1) CSA C22.2 No.3-92 Vertical Flame Test (FT1) IEC 60332-1-2					
Other characteristics							
		EU Directive 2011/65/EU (RoHS), Free of paint-wetting impairment substances, Halogen-free according to IEC 60754-1, General fuel resistance, General resistance to acids, alkalis, and cleaning agents, General resistance against dusts, General resistance against microbes and fungi, Generally hydrolysis-resistant, General resistance against UV radiation					
Approvals							
		UL Subject 758, Style 21223 CSA - C22.2 No. 210 cURus E522945 UL Style 21223 80 °C 1000 V FT1 cUL AWM I/II A/B 80 °C 1000 V FT1					UL Subject 758, Style 11892 CSA - C22.2 No. 210 cURus E522945 UL Style 11892 80 °C 300 V FT1 cUL AWM I/II A/B 80 °C 300 V FT1

7.4.2 Fixed installation

Type	LEHC 005775	LEHC 005776	LEHC 005777	LEHC 005778	LEHC 005779
Part number of bulk cable, not prefabricated	28123395	28123409	28123417	28123425	28123433
Cross section of power cores	4 × 1.5 mm ²	4 × 2.5 mm ²	4 × 4.0 mm ²	4 × 6.0 mm ²	4 × 10 mm ²
Cross section of brake cores	4 × 1.0 mm ²	4 × 1.0 mm ²	4 × 1.0 mm ²	4 × 1.5 mm ²	4 × 1.5 mm ²

Mechanical design

		 29346395147				
[1]	Coaxial cable	Coax Z50 in accordance with RG58				
	Conductor	Stranded copper wire, tinned, 19 × 0.182 mm				
	Dielectric	Polypropylene Ø 2.95				
	Shielding	Braided copper wire, tinned, 0.128 mm				
		Optical coverage at least 90%				
	Sheath	TPE				
	Diameter	4.2 mm				
Color	Violet					
[2]	Cores	Shielded element 4 × 1.0 mm ²	Shielded element 4 × 1.0 mm ²	Shielded element 4 × 1.0 mm ²	Shielded element 4 × 1.5 mm ²	Shielded element 4 × 1.5 mm ²
		Stranded copper wire, bare				
		Single wire 0.20 mm	Single wire 0.20 mm	Single wire 0.20 mm	Single wire 0.25 mm	Single wire 0.25 mm
		In accordance with DIN EN 60228 Class 5				
		IEC 60228 Class 5				
	Insulation	Polypropylene				
	Shielding	Braided copper wire 0.128 mm, tinned				
		Optical coverage at least 85%				
	Diameter	2.1 mm	2.1 mm	2.1 mm	2.35 mm	2.35 mm
	Colors	Yellow with black A label				
		Orange with black B label				
		Pink with black C label				
		Violet with black D label				
[3]	Banding	—	—	—	—	—
[4]	Filler	—	—	—	—	—
[5]	Cores	4 × 1.5 mm ²	4 × 2.5 mm ²	4 × 4.0 mm ²	4 × 6.0 mm ²	4 × 10 mm ²
	Conductor	Stranded copper wire, bare				
		Single wire 0.25 mm	Single wire 0.25 mm	Single wire 0.30 mm	Single wire 0.30 mm	Single wire 0.40 mm
		In accordance with DIN EN 60228 Class 5				
		IEC 60228 Class 5				
	Diameter	3.0 mm	3.6 mm	3.75 mm	4.7 mm	5.8 mm
Insulation	Polypropylene					
Colors	Green-yellow: PE Black with white print: U/L 1: V/L 2: W/L 3					

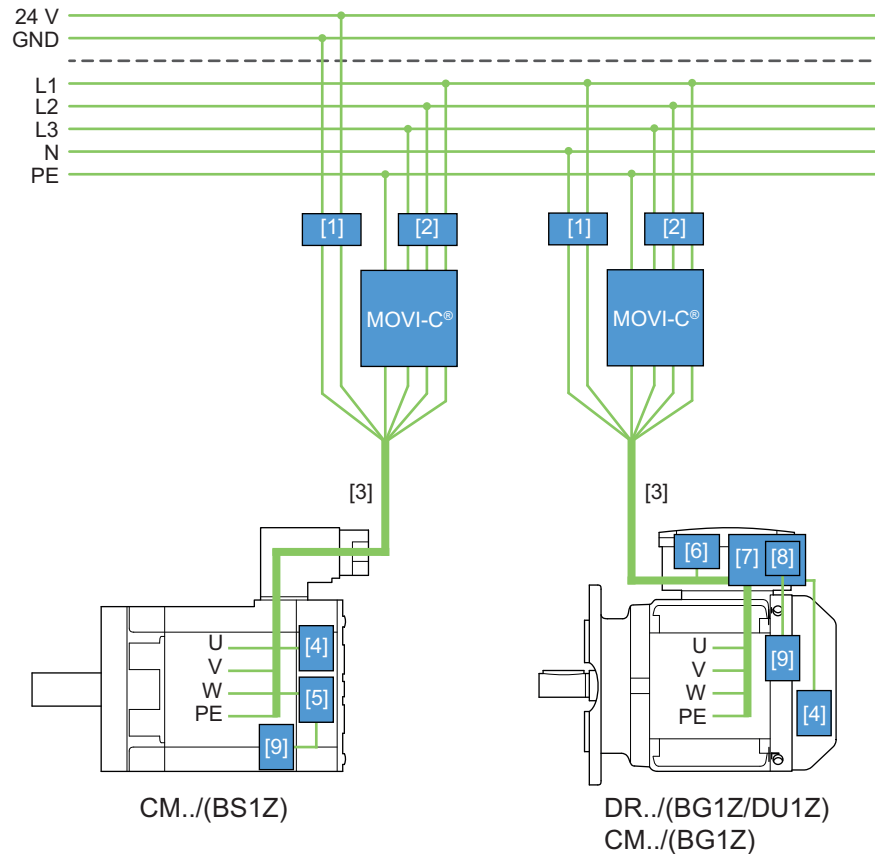
Type		LEHC 005775	LEHC 005776	LEHC 005777	LEHC 005778	LEHC 005779
Part number of bulk cable, not prefabricated		28123395	28123409	28123417	28123425	28123433
Cross section of power cores		4 × 1.5 mm ²	4 × 2.5 mm ²	4 × 4.0 mm ²	4 × 6.0 mm ²	4 × 10 mm ²
Cross section of brake cores		4 × 1.0 mm ²	4 × 1.0 mm ²	4 × 1.0 mm ²	4 × 1.5 mm ²	4 × 1.5 mm ²
[6]	Shield	Braided tinned copper wires, 0.15 mm	Braided tinned copper wires, 0.15 mm	Braided tinned copper wires, 0.15 mm	Braided tinned copper wires, 0.20 mm	Braided tinned copper wires, 0.20 mm
Optical coverage at least 85%						
	Outer cable jacket	PVC				
	Color	Orange				
[7]	Label	SEW-EURODRIVE 28123395 4 × 1.5 + 4 × 1C + 1 × Z50	SEW-EURODRIVE 28123409 4 × 2.5 + 4 × 1C + 1 × Z50	SEW-EURODRIVE 28123417 4 × 4.0 + 4 × 1C + 1 × Z50	SEW-EURODRIVE 28123425 4 × 6.0 + 4 × 1.5C + 1 × Z50	SEW-EURODRIVE 28123433 4 × 10 + 4 × 1.5C + 1 × Z50
		LEHC005775 Rev. 0 E522945-Bizlink 	LEHC005776 Rev. 0 E522945-Bizlink 	LEHC005777 Rev.0 E522945-Bizlink 	LEHC005778 Rev.0 E522945-Bizlink 	LEHC005779 Rev.0 E522945-Bizlink 
		AWM STYLE 2570 I/II A/B 80 °C 1000V FT1 Week/year of production				
	Diameter	15.2 mm	16.1 mm	16.4 mm	19.0 mm	21.8 mm
Electrical properties						
	Operating voltage conductors V ₀ /V	0.6 kV/1.0 kV				
	Operating voltage according to UL style 21223	Max. 1000 V				
	Surge impedance coaxial cable	50 Ω ± 2 Ω				
Mechanical properties						
	Bending radius	Min. 3 × outer diameter for one-time installation Min. 5 × outer diameter for fixed installation Min. 10 × outer diameter if moved occasionally				
	Suspended installation	Maximum vertically suspended installation: 45 m (Strain relief required for connection plugs and cable glands)				
	Installation in loops	Yes (Minimum bending radius of the loops 15 × outer diameter)				
	Mass	322 kg/km	361 kg/km	412 kg/km	576 kg/km	791 kg/km
	Copper content	183.37 kg/km	223.28 kg/km	280.45 kg/km	408.81 kg/km	570.61 kg/km
Thermal characteristics						
	Operating temperature	Fixed installation: -40 °C to +90 °C (20000 h) Fixed installation: -40 °C to +105 °C (3000 h) If moved occasionally: -10°C to +90°C				
	Operating temperature according to cURus	Fixed installation: -40°C to +80°C If moved occasionally: -10°C to +80°C				
Chemical characteristics						
	Oil resistance	DIN EN 50363-4-1 (test method according to DIN EN 60811-404)				
	Flame retardance	UL 1581 section 1060 Vertical Flame Test (FT1) CSA C22.2 No.3-92 Vertical Flame Test (FT1) IEC 60332-1-2				
Other characteristics						
		EU Directive 2011/65/EU (RoHS)				
Approvals						
		UL Subject 758, Style 2570 CSA - C22.2 No. 210 cURus E522945 UL Style 2570 80 °C 1000 V FT1 cUL AWM I/II A/B 80 °C 1000 V FT1				

8 Technical data

8.1 Topology diagram

The following figure shows an example of a topology diagram:

- For drives supplied by inverters, observe the operating instructions for the frequency inverter.



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- | | |
|--|--------------------------------------|
| [1] Miniature circuit breaker of the brake | [6] DU1Z |
| [2] Miniature circuit breaker of the in-
verter | [7] MOVILINK® DDI communication unit |
| [3] Hybrid cable/multi-cable technology | [8] BG1Z |
| [4] Encoder | [9] Brake |
| [5] BS1Z | |

8.2 General technical data for drives with MOVILINK® DDI

8.2.1 Connection options with MOVILINK® DDI

	Connection options
Connection technology	SD1: M23 hybrid connector (angled: adjustable) 1.5 – 4 mm² motor connection, 1 mm² brake connection SDB: M40 hybrid connector (angled: adjustable) 6 – 10 mm² motor connection, 1.5 mm² brake connection KD1: Hybrid connector M23 on terminal box (straight, angled: adjustable) 1.5 – 4 mm² motor connection, 1 mm² brake connection KDB: M40 hybrid connector on the terminal box (straight) 6 – 10 mm² motor connection, 1.5 mm² brake connection KD: Cable gland on the terminal box for hybrid cables 1.5 – 10 mm² motor connection, 1 – 1.5 mm² brake connection KDD: Motor and brake connection via cable gland M23 signal plug connector (straight) at the terminal box
Cable length	≤ 200 m (depending on inverter type, brake, brake control and PWM frequency of the motor control)

8.2.2 Supply voltage for MOVILINK® DDI electronics

The motor-integrated electronics of MOVILINK® DDI are generally supplied with a voltage of 24 V by an inverter from the MOVI-C® modular automation system. The inverters provide at least 150 mA of current. Depending on the 24 V configuration of the entire drive train, and taking the optional equipment of the motor and the selected inverter into account, the inverter may require an external 24 V backup voltage supply.

The following table provides an overview of the options of the MOVILINK® DDI modular system. The listed values are maximum permitted values that may be required by the options at the minimum permissible supply voltages.

Option	Power demand 24 V supply via MOVILINK® DDI
Without encoder	60 mA
Encoder EZ2Z	60 mA
Encoder AZ2Z	60 mA
Encoder EZ4Z	60 mA
Encoder AZ4Z	60 mA
EK0Z safety encoder	110 mA
AK0Z safety encoder	110 mA
Integrated BS1Z brake control	40 mA
Integrated BG1Z brake control	40 mA

Example:

A motor with MOVILINK® DDI and AZ4Z encoder and integrated BS1Z brake control requires an electronics current demand of 100 mA and can be operated without additional 24 V backup voltage.

8.2.3 Derating of standard motors with MOVILINK® DDI

Note the derating depending on the ambient temperature and the motor series. For more information, refer to the "MOVI-C® Modular Automation System – Digital Motor Integration with MOVILINK® DDI" manual.

8.2.4 Use of the integrated BG1Z brake control in the wide voltage range

The brake control system operates with a brake and can operate it in the wide voltage range. The control process adjusts adaptively to the external supply voltage. This results in noticeable noise emissions depending on the voltage. These can vary in frequency and volume depending on changes in the supply voltage. This characteristic is caused by the adaptive adjustment technology.

For further information, refer to chapter "Brake voltages for BG1Z brake control" (→ 67).

8.3 Parameter access for MOVILINK® DDI options

To access the parameters of the MOVILINK® DDI options, use the SEW-EURODRIVE module "SEW_MOVI-C_SingleParameterAccess" from version 1.7. The module can be found in the Online Support Portal of SEW-EURODRIVE under "Software" in the package "TIA example project MOVI-C: Individual parameter access".

Link: <https://t1p.de/mvpj4>

The following tables contain the definitions of the parameters of the options for MOVILINK® DDI brakes. The parameters are composed of the parameter index and the subindex.

Example: Parameter 10056.20 (10056=Parameter index, 20=Subindex)

In this example, the subindex indicates how often the brake control has opened since the counter of the brake was last reset.

8.4 Encoder technical data

Encoders with electronic interface have internal temperature monitoring. SEW-EURODRIVE recommends using the temperature monitoring to avoid errors and failures due to excessively high temperatures.

Note that in case of emergency stop braking operations from speeds $> 20 \text{ min}^{-1}$, the encoders can output warnings or errors if the negative acceleration exceeds certain limit values. These messages must be checked or acknowledged before restart.

8.4.1 EZ2Z, AZ2Z, EZ4Z, and AZ4Z encoders with MOVILINK® DDI interface

Encoder	EZ2Z	AZ2Z	EZ4Z	AZ4Z
Encoder ability class	Medium class		High class	
Motor	CM3C63 – 100 CM3P63 – 100			
Combinations Brake/brake control	With motor-integrated BG1Z brake control: BZ brake With motor-integrated BS1Z brake control: BZ.Z, BK brake With motor-external brake control: BK, BZ, BZ.D brake			
Combinations Motor protection/temperature	PK (Pt1000 in the stator)			
Combinations Forced cooling fan	Yes			
Frequency inverter ¹⁾	MOVI-C® modular automation system Decentralized inverters mounted close to the motor: MOVIMOT® flexible, MOVIPRO® technology Motor-integrated, decentralized inverters: MOVIMOT® performance			
Encoder type	Single-turn	Multi-turn	Single-turn	Multi-turn
Encoder sensors	Magnetic		Magnetic, inductive	
Analog resolution, incremental	–			
Digital resolution, absolute single-turn	12 bit		18 bit	
Digital resolution, absolute multi-turn	–	16 bit	–	16 bit
Electrical interface	MOVILINK® DDI, coaxial			
Current demand (24 V supply via MOVILINK® DDI)	For an overview of the current requirements, refer to chapter "Supply voltage for MOVILINK® DDI elec- tronics" (→ 58)			
Run-up time after startup	< 1 sec		< 1.7 sec	
Maximum permitted magnetic field external to the motor	Outer contour of the motor: 25 mT / 20 kA/m			
Vibrations EN 60068-2-6	≤ 10 g (f > 18.5 Hz)			
Shocks EN 60068-2-27	≤ 100 g (t = 6 ms, 18 pulses)			
Maximum mechanical speed	10000 min ⁻¹			
Maximum speed during operation ²⁾	7200 min ⁻¹			
Electronic nameplate	ET2000 (MOVILINK® DDI, integrated)			
Working temperature of en- coder T _E ³⁾	-40 °C to +110 °C		-40 °C to +110 °C	
Ambient temperature of motor T _A ³⁾	With the MOVI-C® modular automation system and MOVIMOT® flexible or MOVIPRO® technology de- centralized inverters: Encoderless: -40 °C to +60 °C EZ2Z/AZ2Z: -40 °C to +60 °C EZ4Z/AZ4Z: -40 °C to +60 °C With MOVIMOT® performance decentralized inverters: See the corresponding documentation for MOVIMOT® performance			
Degree of protection EN 60529	Integrated, see motor degree of protection			
Installation altitude	≤ 3866 m			
Functional safety	–			
Explosion protection 2014/34/ EU (ATEX) / IECEx	–			

- 1) Observe the availability and possible combinations of frequency inverter and motor or gearmotor.
- 2) The specifications apply to the respective option. Observe potential constraints or derating of the motor or gearmotor. Monitor encoders using electronic temperature detection in order to prevent malfunctions.
- 3) The specifications apply to the respective option installed in the motor. Observe potential constraints or derating by the motor, gearmotor, or other options. Monitor encoders using electronic temperature detection in order to prevent malfunctions.

8.4.2 EK0Z and AK0Z encoders with MOVILINK® DDI interface

Encoder	EK0Z	AK0Z
Encoder ability class	High class	
Motor	CM3C63 – CM3C100	
Combinations Brake/brake control	With motor-external brake control: BK, BZ, BZ.D brake	
Combinations Motor protection/temperature	PK (Pt1000 in the stator)	
Combinations Forced cooling fan	Yes	
Frequency inverters	MOVI-C® modular automation system Decentralized inverters mounted close to the motor: MOVIMOT® flexible	
Encoder type	Single-turn	Multi-turn
Encoder sensors	Optical, mechanical	
Analog resolution, incremental	–	
Digital resolution, absolute single-turn	18 bit	
Digital resolution, absolute multi-turn	–	12 bit
Electrical interface	MOVILINK® DDI, coaxial	
Power demand (24 V supply via MOVILINK® DDI)	For an overview of the current requirements, refer to "Supply voltage for MOVILINK® DDI electronics" (→ 58)	
Run-up time after startup	< 1.7 sec	
Maximum permitted magnetic field external to the motor	Outer contour of the motor: 25 mT / 20 kA/m	
Vibrations EN 60068-2-6	≤ 10 g (f > 18.5 Hz)	
Shocks EN 60068-2-27	≤ 100 g (t = 6 ms, 18 pulses)	
Maximum mechanical speed	12000 min ⁻¹	9000 min ⁻¹
Maximum speed during operation ¹⁾	12 000 min ⁻¹	9000 min ⁻¹
Electronic nameplate	ET2000 (MOVILINK® DDI, integrated)	
Working temperature of en- coder T _E ¹⁾	-20 °C to +110 °C	
Ambient temperature of motor T _A ¹⁾	With MOVI-C® control cabinet inverters and MOVIMOT® flexible decentralized inverters: Encoderless: -40 °C to +60 °C EK0Z/AK0Z: -20 °C to +60 °C	
Degree of protection EN 60529	Integrated, see motor degree of protection	
Installation altitude	≤ 3866 m Safety encoder: 3800 m	
Functional safety	SIL 2/PL d (optional)	
Explosion protection 2014/34/ EU (ATEX) / IECEx	–	

1) The specifications apply to the respective option installed in the motor. Observe potential constraints or derating by the motor, gear-motor, or other options. Monitor encoders using electronic temperature detection in order to prevent malfunctions.

8.5 Safety encoders with MOVILINK® DDI function parameters

Determining the remaining service life for EK0Z and AK0Z

The maximum service life of synchronous motors with BK.. or BKB.. brake and EK0Z or AK0Z safety encoder is 10 years.

The safety encoders with MOVILINK® DDI, in conjunction with the safety options from the MOVI-C® modular automation system, electronically determine the remaining service life while taking into account thermal aging. The remaining service life until the motor with safety encoder must be shut down is counted from the production date.

The following relation can be used to check whether the remaining service life is sufficient for the safety encoder.

The safety encoder must be shut down if the following conditions apply:

- **Parameter "Prediction of remaining service life" - Times without voltage supply - Brake correction value ≤ 0**
 - For synchronous motors with BK.. or BKB.. brake and EK0Z or AK0Z safety encoder: Brake correction value = 10 years
 - For all other motors and brakes: Brake correction value = 0 years

Examples:

- CM3C../BK../AK0Z: P10060.161 = 15 years; times without voltage supply = 5 years; brake correction value = 10 years → 0 years remaining service life
- CM3G../BKB../AK0Z: P10060.161 = 15 years; times without voltage supply = 5 years; brake correction value = 10 years → 0 years remaining service life
- DRN../BE../AK8Z: P10060.161 = 17 years; times without voltage supply = 3 years; brake correction value = 0 years → 14 years remaining service life

The safety encoder may be used as long as none of the other factors (bearing service life, number of emergency stop braking operations) has been exceeded.

The following table lists the parameters that contain the forecast of the remaining service life and the histogram of the operating times in the respective temperature range. The parameters can be read using the MOVISUITE® engineering software and using a controller via parameter access:

Display text	Index	Subindex	Offset	Unit
Prediction of remaining service life	10060	161	–	Minutes
Runtime in temperature range < 90 °C	10060	162	0	Minutes
Runtime in temperature range 90 °C < 95 °C	10060	162	1	Minutes
Runtime in temperature range 95 °C < 100 °C	10060	162	2	Minutes
Runtime in temperature range 100 °C < 105 °C	10060	162	3	Minutes
Runtime in temperature range 105 °C < 110 °C	10060	162	4	Minutes
Runtime in temperature range 110 °C < 115 °C	10060	162	5	Minutes
Runtime in temperature range > 115 °C	10060	162	7	Minutes

Observe the following additional documents for the respective motor:

- "Built-in encoders, add-on encoders, and safety encoders for DR.., DRN.., DRU.., DR2.., EDR.., EDRN.. AC motors" product manual
- Addendum to the operating instructions "Safety encoders and safety brakes – CMP.., CMPZ.., CM3C.., ECM3C.., CM3P.., CM3G.. – Functional safety"

8.6 Technical data of the brake

For more information on the brake and on the technical data, refer to the manual "CM3.., ECM3C.., CMP(Z).., CMSB.., CFM.., DRC.. synchronous servomotors. - Project Planning for BK.., BKB.., BP.., BR.., BY.., BZ.. brakes".

8.7 Brake controls BG.Z, BS.Z, B

8.7.1 Functional description

Brake controls with an extended functional scope are available in the MOVILINK® DDI option portfolio. The options of the BG.Z, BS.Z, and B series are brake controls that are integrated in the drive or inverter.

BG.Z and BS.Z are connected in the control cabinet via the MOVILINK® DDI interface in the MOVI-C® modular automation system, whereas HV brake control B is an option of the decentralized inverters from the MOVI-C® modular automation system.

In addition to the basic function of brake monitoring, these brake controls have implemented functions for condition monitoring of the brake and its wear condition and for self-monitoring of the brake control as standard.

At the same time, the BG.Z, BS.Z brake controls and option B are assistance systems which are intended to simplify maintenance and fault diagnostics. This does not replace or override standard prescribed maintenance intervals.

The BS..Z brake controls make it possible to operate spring-loaded brakes from the BZ..Z series and permanent magnet brakes from the BK.. and BP.. series with a DC 24 V protective extra-low voltage, and supplement the MOVILINK® DDI portfolio in the area of synchronous servo motors.

With the MOVI-C® control cabinet inverters, the brake control and the brake are permanently supplied from the local supply voltage network. The brake switching function takes place via the MOVILINK® DDI interface and the BG..Z or BS..Z brake controls. With decentralized MOVI-C® inverters, the brake is controlled directly from the DC link of the inverter via the integrated HV brake control.

BG.Z brake control

With their wide voltage input (supply with low voltage according to IEC 60050 in the specified range), the BG.Z brake controls enable the operation of spring-loaded brakes from the BE.., BE.H (with DR.. AC motors by SEW-EURODRIVE) and BZ.. series. (for CM3C.. servomotors by SEW-EURODRIVE) in a wide range of supply voltages. Previously, it was necessary to select a rated brake voltage to adapt to the local AC voltage network.

With these brake controls, the use of a rated brake voltage is possible over the entire supply voltage range in a completely network-independent way. This gives you logistical and maintenance advantages, since only one type of brake in a rated brake voltage with a brake control must be used. The same type of brakemotor and the same spare parts can be used.

For further information, refer to "Brake voltages for BG1Z brake control" (→ 67).

HV brake control B

The HV brake control B is an option of the decentralized inverters from the MOVI-C® modular automation system for inverter-integrated control of spring-loaded brakes. It combines the network-independent brakemotor version with the advantages of the decentralized infrastructure, and it represents a fully integrated solution for brake control and brake diagnostics that can be implemented without a separate brake supply. With its wide voltage input (supply with low voltage according to IEC 60050 in the specified range), the HV brake control B enables spring-loaded brakes from the BE.. and BE.H, as well as BZ.. series to be operated in a large supply voltage range. Previously, it was necessary to select a rated brake voltage to adapt to the local AC voltage network. With these brake controls, the use of a rated brake voltage is possible over the

entire supply voltage range in a completely network-independent way. This provides you with an advantage in terms of logistics and maintenance, since only one brake type needs to be used in one rated brake voltage with one brake control. The same type of brakemotor and the same spare parts can be used.

8.7.2 Technical data

Combination options of brake control with inverters from the MOVI-C® modular automation system

The combination of a BG1Z brake control (MOVILINK® DDI type code DI2..) or a BS1Z brake control (MOVILINK® DDI type code DI1..) with a decentralized inverter of type MOVIMOT® flexible is not possible. MOVIMOT® flexible uses the integrated brake control B (HV brake control). If MOVIMOT® flexible is used, no BG1Z brake control (MOVILINK® DDI type code DI0..) may be integrated.

The combination of a BG1Z brake control (MOVILINK® DDI type code DI2..) or a BS1Z brake control (MOVILINK® DDI type code DI1..) is possible with control cabinet inverters MOVIDRIVE® and MOVITRAC® from the MOVI-C® modular automation system, but no motor-external brake control may be used if a BG1Z brake control is used. If no BG1Z brake control is integrated (MOVILINK® DDI type code DI0..), motor-external brake controls can be used.

It cannot be combined with MOVIDYN®.

Note that the wide voltage range of the supply from AC 200 V to 500 V is realized when using the integrated BG1Z brake control with a brake (brake coil variant). Depending on the brake type and the brake size, certain brakes are installed. For details refer to the following table:

		BS1Z ¹⁾	BG1Z ¹⁾	B (HV brake control)
Inverters	—	MOVI-C® modular automation system: MOVITRAC® advanced MOVIDRIVE® modular MOVIDRIVE® technology MOVIDRIVE® system		MOVI-C® modular automation system: MOVIMOT® flexible MOVIMOT® advanced MOVIMOT® performance
Motors, motor sizes, brake types ²⁾	—	CMP50 – 63: BK.. CM3C63 – 100: BZ..Z, BK.. CM3P63 – 100: BZ..Z, BK.. CMSB50 – 63: BK..	CM3C63 – 100: BZ.. CM3P71 – 100: BZ.. DRN, DR2., DRU 71 – 132M: BE.. and BE.H	CM3C63 – 100: BZ.. CM3P71 – 100: BZ.. DRN, DR2., DRU 71 – 132M: BE.. and BE.H
Electrical interface	—	MOVILINK® DDI, coaxial		
Power demand (24 V supply via MOVILINK® DDI)	—	40 mA		—
Motor	MOVILINK® DDI-type designation	DI1..	DI2..	DI0..
Brake control installation	—	Motor-internal in the installation space of the encoder (B-side)	Motor-internal in the terminal box	Integrated in the inverter
Operating temperature range	Ambient temperature of the motor	-40 °C to +60 °C		(-30 °C) ³⁾ -20 to +60 °C
Supply voltage	Voltage at the input terminal of the brake control	DC 24 V ±10%	AC 200 – 500 V ±10%	AC 110 – 500 V ±10%
Brake voltage	Nominal voltage of the brake winding	BZ05Z – BZ5Z: DC 24 V	BZ05 – BZ5: AC 110 V BE03 – BE5: AC 230 V BE11 – BE32: AC 184 V BE60 – BE62: AC 230 V BE1H – BE2H: AC 230 V	BE03 – BE32: AC 120 V – 500 V BZ05 – BZ5: AC 110 V, AC 400 V, AC 460 V, AC 500 V
Operating current and Operating current factor	—	For more information, refer to "Fusing against damage due to overvoltage or short circuit" (→ 18).		
Functional safety	Availability with safety brakes	No		

		BS1Z ¹⁾	BG1Z ¹⁾	B (HV brake control)
Explosion protection	Availability for applications in an explosion-protected area	No		
Supported brake types	–	BK..., BZ.Z	BZ..., BE..., BE.H	BZ...1 BE..., BE.H
Brake control	Supported braking torques ²⁾	Per brake type/size: All standard braking torques		
	Control functions	Release, application (normal de-excitation), Rapid application (rapid excitation)		Release, rapid application (rapid excitation)
	Monitoring functions of the brake control and the brake	Output stage (hardware and temperature faults) Brake monitoring (temperature, short circuit and interruption) Startup (initialization) Computer and memory errors		
Cable length, maximum ⁴⁾	–	The cable lengths depend on the brake type.	≤ 200 m	≤ 15 m

1) Only available in combination with EZ4Z, AZ4Z, EZ2Z or AZ2Z encoder system.

2) For the technical data of the brakes, see the catalogs/operating instructions for the respective motor types.

3) In preparation

4) In addition, depending on the selected inverter type, the configured PWM frequency, the brake type and the given voltage range, observe the system manual of the respective inverter.

Cable lengths for the brake supply with BS1Z

The following table shows the possible cable lengths for the BS1Z brake control depending on the core cross section:

Brake	Connector	Cable length in m	
		Core cross section 1 millimeter ²	Core cross section 1.5 mm ² ¹⁾
BK01	SD1, KD, KDD	≤ 94	≤ 138
BK02		≤ 123	≤ 180
BK03, BK04, BK05		≤ 61	≤ 90
BK06, BK07, BK08		≤ 55	≤ 80
BKB02		≤ 69	≤ 101
BKB05		≤ 59	≤ 86
BKB1		≤ 48	≤ 71
BZ05Z		≤ 50	≤ 73
BZ1Z	SD1, SDB, KD, KDD	≤ 34	≤ 49
BZ3Z		≤ 26	≤ 38
BZ5Z		≤ 30	≤ 45

1) The core cross section is not possible with the SD1 plug connector.

Brake voltages for the BG1Z brake control

Brake	Supply voltage	Selection in the product configurator	Operating voltage of the brake
	in AC V	in AC V	in AC V
BZ05	200 – 500	230	110
BZ1			110
BZ3			110
BZ5			110

For more information on the brake and on the technical data, refer to the manual "CM3.., ECM3C.., CMP(Z).., CMSB.., CFM.., DRC.. synchronous servomotors. - Project Planning for BK.., BKB.., BP.., BR.., BY.., BZ.. brakes".

Supply voltage: The supply voltage is applied externally to the motor as an electrical supply for the brake system. The specified voltage range can be used. The brake control handles the adjustment to the brake. The brake does not have to be selected for a specific line voltage.

Selection in the product configurator: The brake voltage is always selected based on the specified value in the SEW-EURODRIVE product configurator. This value is the nominal value for selecting the brake. This allows for the assignment of the brake control. Note that the operating voltage may deviate from this.

Operating voltage of the brake in alternating current: The AC operating voltage of the brake is the configured brake voltage as displayed in the "Drive train" field of the MOVISUITE® engineering software. As a nominal value, this voltage defines the brake winding and therefore also the corresponding spare part for maintenance purposes. Always specify this value for service purposes.

Operating voltage of the brake in direct current: The DC operating voltage is the voltage applied to the brake coil and is generated by the BG1Z brake control. Due to the energy-saving and current-controlled operation of the BG1Z brake control, it can be smaller than the DC voltage of the brake.

Resistances of the brake coil

Resistance of the winding: This value is used for practical identification during service or maintenance. In a voltage-free drive, you can trace which brake winding has been installed by measuring the resistance. Always specify this value for service purposes.

For information on the resistances, refer to the operating instructions for the motor. The following table shows an excerpt:

Rated voltage V_N	BZ05		BZ05Z	BZ1		BZ1Z	BZ3		BZ3Z	BZ5		BZ5Z
V_{AC}	R_{BS} Ω	R_{TS} Ω	R_H Ω	R_{BS} Ω	R_{TS} Ω	R_H Ω	R_{BS} Ω	R_{TS} Ω	R_H Ω	R_{BS} Ω	R_{TS} Ω	R_H Ω
38	–	–	9.3	–	–	8.3	–	–	8.3	–	–	6.4
110	20.4	92.5	–	14.5	63.8	–	11.4	50.8	–	9.13	38.3	–

R_{BS} Accelerator coil resistance at 20 °C

R_{TS} Coil section resistance at 20 °C

V_N Rated voltage (rated voltage range)

Function parameters of the BS1Z brake control

Note that the parameters of the integrated brake control cannot currently be measured with the scope function of MOVISUITE®. This function is in preparation.

Note that measured actual value data is not saved so that it is safe in case of power failure. These values are continuously re-measured. Static data, such as the enable hour counter, is stored cyclically in a fail-safe manner. This data still exists in the brake control, even if the inverter is replaced.

		Data type and unit	Parameters of BS1Z	BS1Z ¹⁾
Brake supply voltage	—	[int32] in V	8584.23	Input voltage applied to B.1Z
Output stage temperature	—	[int32] in 1e-2 °C	8584.61	Temperature of the B.1Z printed board assembly
Switching operations	Brake control	[uint32] Switching operations	10056.20	Number of brake openings by the brake control
Status of Brake control	—	[int32]	8437.1	Shows the status of the brake control. The status of the brake can vary, e.g., due to manual brake release. Possible states: • 0: Closed • 1: Opening in progress • 2: Open • 3: Closing in progress
Working air gap	—	[float32] in mm	10056.18	Currently measured air gap of brake Accuracy ± 0.15 mm
Status bits	—	[int32]	8437.2	Status bits for control status of brake control. The status of the brake can vary, e.g., due to manual brake release. • 0: Apply brake • 1: Release brake Status bits for validity of measured values: • 3: Brake temperature valid • 4: Brake lining reserve valid • 5: Thermal brake load valid Status bits for internal error: • 6: Air gap detection error
Brake condition monitoring (Condition monitoring)	Condition monitoring functions	—	—	Air gap measurement, brake lining reserve Brake temperature Relative thermal brake coil utilization
	Air gap measurement, brake lining reserve ²⁾ (ratio size, specification in %)	[int32] in %	10056.19	100% brake lining reserve: minimum air gap (no wear) 0% brake lining reserve: maximum air gap (maximum wear) Counting increment and air gap range depending on brake type and size (the diagnosis refers to the air gap of the brake)
	Thermal brake load (ratio size, specification in %)	[uint32] in %	10056.3	0%: ≤ 20 °C or no measured value available 100%: ≥ Maximum temperature of the respective brake coil
	Drive running hours counter	[uint32] in min	8328.2	Number of minutes in which the brake was released (storage cycle 1 minute)
	Power-applied hours counter	[uint32] in min	8328.1	Number minutes that the device was supplied with operating voltage via MOVILINK® DDI (storage cycle 1 minute)
	Reset operating hours counter	[int32]	8328.10	Resetting the power-applied hours and drive running hours • 0: No • 1: Yes
	Switching operations Brake	[uint32] Switching operations	10056.21	Number of brake openings since last reset of counter
	Switching operations Reset brake	[int32]	10056.25	Reset of switching operations to 0 (e.g. after a maintenance interval) • 0: No • 1: Yes

		Data type and unit	Parameters of BS1Z	BS1Z ¹⁾
Fault memory T0 to T4	Error code	[uint32]	834(1-5).2	Number of the fault that has occurred Structure of error code: • Bit 0 – 7: Subfault • Bit 8 – 15: Main fault
	Fault timestamp	[uint32]	834(1-5).4	Without set system time: Parameter corresponds to power-applied hours in seconds With set system time: Parameter corresponds to time in seconds based on 01.01.2000 (EtherCAT®, SBUS ^{PLUS})
	Power-applied hours	[uint32] in min	834(1-5).5	Number of power-applied hours at the time when the error occurred
	Input voltage	[float32] in V	834(1-5).25	Input voltage at the time of the error
	Output stage temperature	[int32] in 1e-2 °C	834(1-5).26	Output stage temperature at the time of the error
	State	[int32]	834(1-5).60	State of the brake control at the time of the error 0: Closed 1: Opening in progress 2: Open 4: Closing in progress
	Error code	[uint32]	8365.1	Currently pending error Structure of error code: • Bit 0 – 7: Subfault • Bit 8 – 15: Main fault
Clear error memory	–	[int32]	8340.1	Deletion of error memory and automatic reset to "No" • 0: No • 1: Yes

1) Only available in combination with EZ4Z or AZ4Z encoder system.

2) Measured value available after first release procedure.

Function parameters of the BG1Z brake control

Note that the parameters of the integrated brake control cannot currently be measured with the scope function of MOVISUITE®. This function is in preparation.

Note that measured actual value data is not saved so that it is safe in case of power failure. These values are continuously re-measured. Static data, such as the enable hour counter, is stored cyclically in a fail-safe manner. This data still exists in the brake control, even if the inverter is replaced.

		Data type and unit	Parameters of BG1Z	BG1Z
Brake supply voltage	—	[int32] in V	8584.23	Input voltage applied to B.1Z
Output stage temperature	—	[int32] in 1e-2 °C	8584.61	Temperature of the B.1Z printed board assembly
Switching operations	Brake control	[uint32] Switching operations	10056.20	Number of brake openings by the brake control
Status of Brake control	—	[int32]	8437.1	Shows the status of the brake control. The status of the brake can vary, e.g., due to manual brake release. Possible states: • 0: Closed • 1: Opening in progress • 2: Open • 3: Closing in progress
Working air gap	—	[float32] in mm	10056.18	Currently measured air gap of brake Accuracy ± 0.15 mm
Brake condition monitoring (Condition monitoring)	Condition monitoring functions	—	—	Air gap measurement, brake lining reserve Brake temperature Relative thermal brake coil utilization
	Air gap measurement, brake lining reserve ¹⁾ (ratio size, specification in %)	[int32] in %	10056.19	100% brake lining reserve: minimum air gap (no wear) 0% brake lining reserve: maximum air gap (maximum wear) Counting increment and air gap range depending on brake type and size (the diagnosis refers to the air gap of the brake)
	Thermal brake load (ratio size, specification in %)	[uint32] in %	10056.3	0%: ≤ 20 °C or no measured value available 100%: ≥ Maximum temperature of the respective brake coil
	Drive running hours counter	[uint32] in min	8328.2	Number of minutes in which the brake was released (storage cycle 1 minute)
	Power-applied hours counter	[uint32] in min	8328.1	Number minutes that the device was supplied with operating voltage via MOVILINK® DDI (storage cycle 1 minute)
	Reset operating hours counter	[int32]	8328.10	Resetting the power-applied hours and drive running hours • 0: No • 1: Yes
	Switching operations Brake	[uint32] Switching operations	10056.21	Number of brake openings since last reset of counter
	Switching operations Reset brake	[int32]	10056.25	Reset of switching operations to 0 (e.g. after a maintenance interval) • 0: No • 1: Yes
Status bits	—	[int32]	8437.2	Status bits for control status of brake control. The status of the brake can vary, e.g., due to manual brake release. • 0: Apply brake • 1: Release brake Status bits for validity of measured values: • 3: Brake temperature valid • 4: Brake lining reserve valid • 5: Thermal brake load valid Status bits for internal error: • 6: Air gap detection error

		Data type and unit	Parameters of BG1Z	BG1Z
Fault memory T0 to T4	Error code	[uint32]	834(1-5).2	Number of the fault that has occurred Structure of error code: • Bit 0 – 7: Subfault • Bit 8 – 15: Main fault
	Fault timestamp	[uint32]	834(1-5).4	Without set system time: Parameter corresponds to power-applied hours in seconds With set system time: Parameter corresponds to time in seconds based on 01.01.2000 (EtherCAT®, SBUS ^{PLUS})
	Power-applied hours	[uint32] in min	834(1-5).5	Number of power-applied hours at the time when the error occurred
	Input voltage	[float32] in V	834(1-5).25	Input voltage at the time of the error
	Output stage temperature	[int32] in 1e-2 °C	834(1-5).26	Output stage temperature at the time of the error
	State	[int32]	834(1-5).60	State of the brake control at the time of the error 0: Closed 1: Opening in progress 2: Open 4: Closing in progress
	Error code	[uint32]	8365.1	Currently pending error Structure of error code: • Bit 0 – 7: Subfault • Bit 8 – 15: Main fault
Clear error memory	–	[int32]	8340.1	Deletion of error memory and automatic reset to "No" • 0: No • 1: Yes

1) Measured value available after first release procedure.

Function parameters of B brake control

Note that the parameters of the integrated brake control cannot currently be measured with the scope function of MOVISUITE®. This function is in preparation.

Note that measured actual value data is not saved so that it is safe in case of power failure. These values are continuously re-measured. Static data, such as the enable hour counter, is stored cyclically in a fail-safe manner. This data still exists in the brake control, even if the inverter is replaced.

		Data type and unit	Inverter parameters	B ¹⁾ (HV brake control)
Switching operations	Brake control	[uint32] Switching operations	8437.20	Number of brake openings by the brake control
Status of Brake control	—	[int32]	8437.1	Shows the status of the brake control. The status of the brake can vary, e.g., due to manual brake release. Possible states: • 0: Closed • 1: Opening in progress • 2: Open • 3: Closing in progress
Working air gap	—	[float32] in mm	8437.13	Currently measured air gap of brake Accuracy ± 0.15 mm
Brake condition recording ²⁾ (Condition monitoring)	Functions for condition recording	—	—	Air gap measurement, brake lining reserve Brake temperature Relative thermal brake coil utilization
	Air gap measurement, brake lining reserve ³⁾ (ratio size, specification in %)	[int32] in %	8437.11	100% brake lining reserve: minimum air gap (no wear) 0% brake lining reserve: maximum air gap (maximum wear) Counting increment and air gap range depending on brake type and size (the diagnosis refers to the air gap of the brake)
	Thermal brake load (ratio size, specification in %)	[uint32] in %	8437.12	0%: ≤ 20 °C or no measured value available 100%: $\geq$ Maximum temperature of the respective brake coil
	Drive running hours counter	[uint32] in min	—	—
	Power-applied hours counter	[uint32] in min	—	—
	Reset operating hours counter	[int32]	—	• 0: No • 1: Yes
	Switching operations Brake	[uint32] Switching operations	8437.21	Number of brake openings since last reset of counter
	Switching operations Reset brake	[int32]	8437.25	Reset of switching operations to 0 (e.g. after a maintenance interval) • 0: No • 1: Yes
Status bits	—	—	8437.2	Status bits for control status of brake control. The status of the brake can vary, e.g., due to manual brake release. • 0: Apply brake • 1: Release brake Status bits for validity of measured values: • 3: Brake temperature valid • 4: Brake lining reserve valid • 5: Thermal brake load valid Status bits for internal faults: • 6: Air gap detection error

1) Brake controls B and BG.Z: Operation takes place with low voltage in accordance with IEC 60050 within the specified supply range.

2) Other functions on request.

3) Measured value available after first release procedure.

8.8 Operating currents

The tables in this section show the operating currents of BZ.. and BZ..Z brakes when supplied from the local supply system with BG1Z or BS1Z brake control.

The acceleration current I_B (= inrush current) flows only for a short time (depending on brake sizes between 100 – 600 ms) when the brake is released.

The values for the holding currents I_H are effective values. Only use devices for the current measurement that are suitable for the measurement of effective values.

The operating currents specified below are nominal values. They relate to a coil temperature of +20 °C. If the heat rises above a coil temperature of +20 °C, the operating current increases because the closed loop system integrated into the BG1Z or BS1Z must compensate for the rise in winding resistance due to the temperature.

Legend

The following tables list the operating currents of the brakes at different voltages. The following values are specified:

V_N	Nominal voltage (rated voltage range) of the brake in V (AC or DC)
I_H	Brake holding current in A (AC or DC). Effective value of the supply current in the supply cable to the brake control by SEW-EURODRIVE
I_B	Acceleration current in A (AC or DC) when operated with an SEW-EURODRIVE brake control for high-speed excitation
I_B/I_H	Inrush current ratio ESV

	BZ05Z	BZ1Z	BZ3Z	BZ5Z	BZ05	BZ1	BZ3	BZ5
Inrush current ratio ESV	16.7	12.3	11.1	9.6	6.8	6.1	5.8	5.4

Nominal voltage V_N (Rated voltage range)		BZ05	BZ1	BZ3	BZ5
		Nominal holding current I_H			
AC V		AC A			
BG1Z	200 – 500 V	0.12	0.16	0.22	0.3

Nominal voltage V_N (Rated voltage range)		BZ05Z	BZ1Z	BZ3Z	BZ5Z
		Nominal holding current I_H			
DC V		DC A			
BS1Z	24 V	0.18	0.3	0.48	0.36

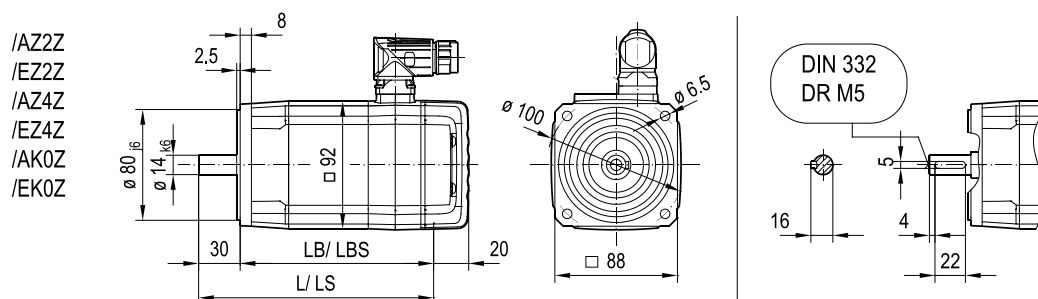
9 Dimension sheets

9.1 MOVILINK® DDI

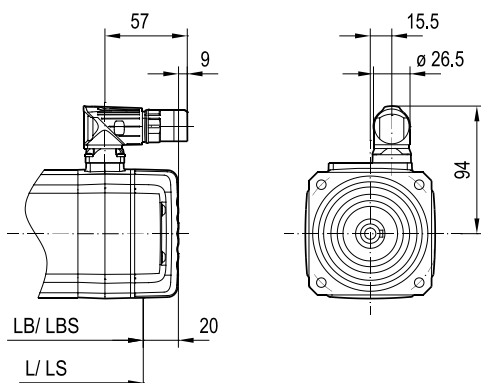
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08 358 03 22

CM3C63S/M/L BK /DI

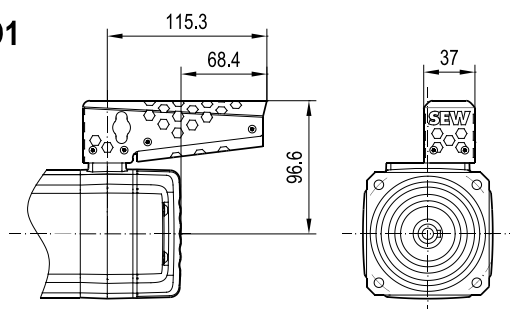


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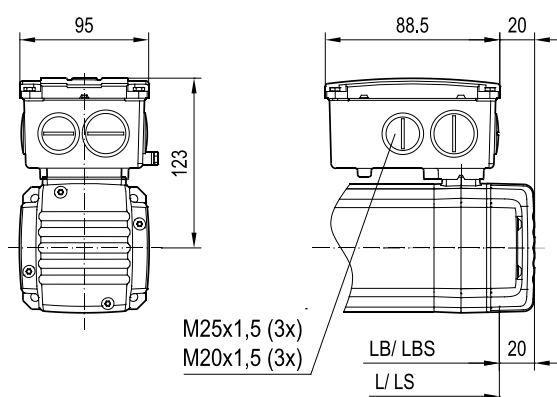


ECM3C

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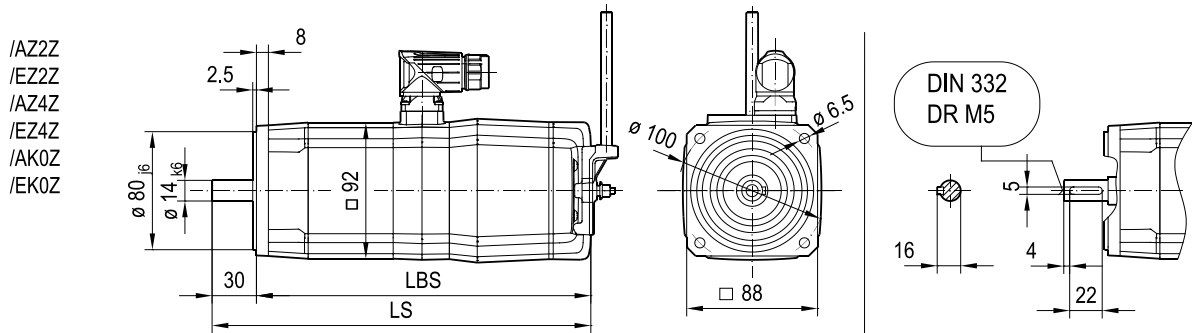
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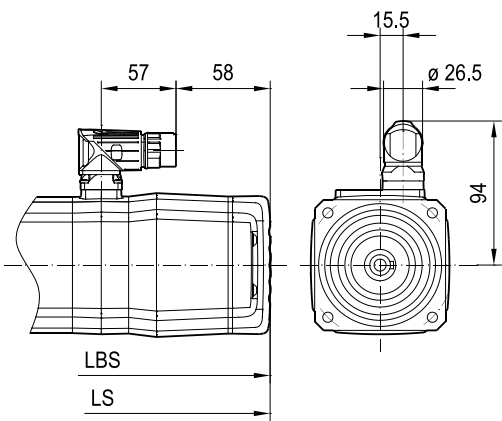
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	S	M	L					
LB	140	178	216					
L	170	208	246					
LBS	180	218	256					
LS	210	248	286					

CM3C63S/M/L BZ(D)/ BZ(Z) /DI

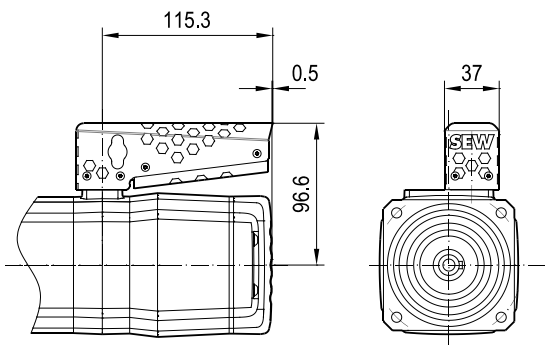
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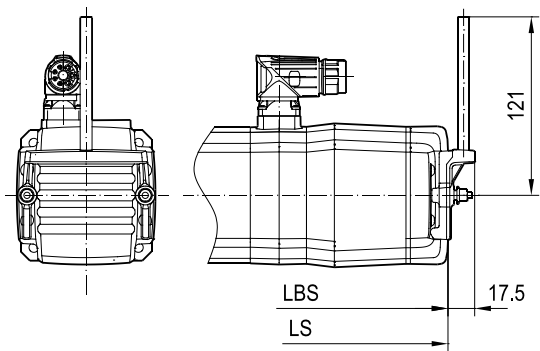
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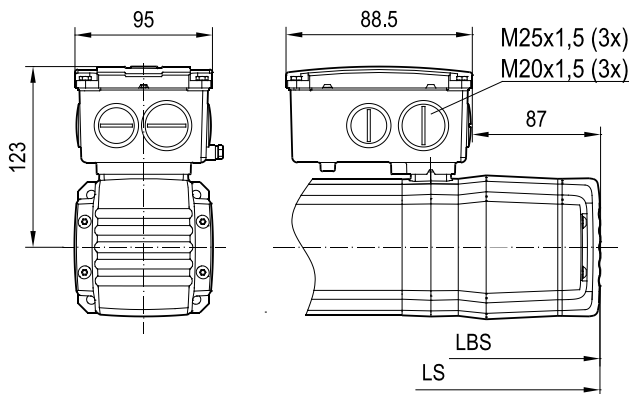
ECM3C
/SD1



/HR



/KD



	CM3C63							
	S	M	L					
LBS	223	261	299					
LS	253	291	329					

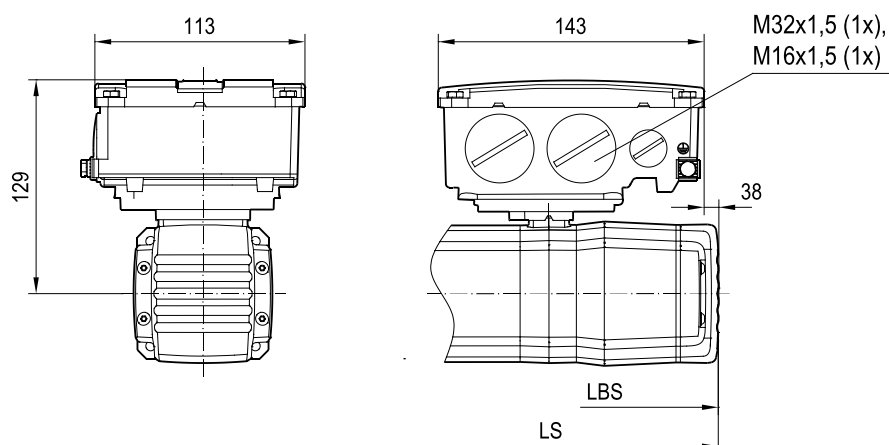
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CM3C63S/M/L BZ /DI /BG1Z

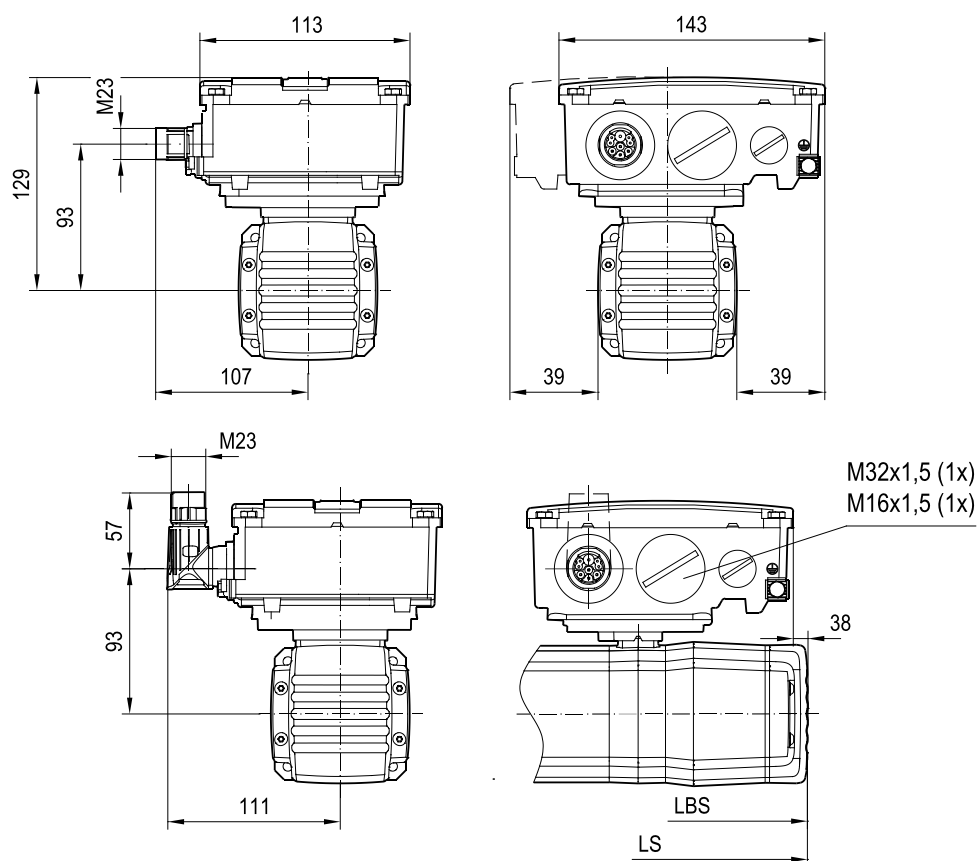
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/KD1



	CM3C63							
	S	M	L					
LBS	223	261	299					
LS	253	291	329					

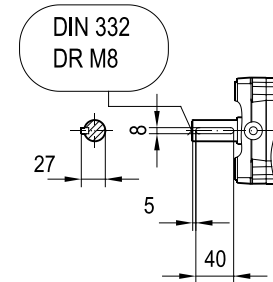
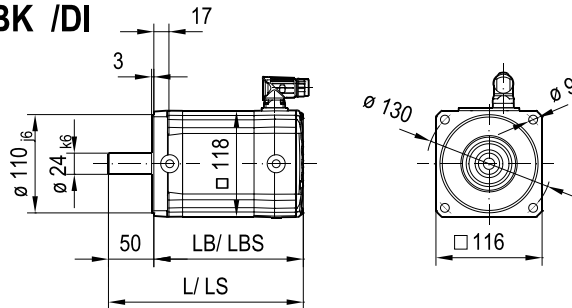
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CM3C71S/M/L /DI

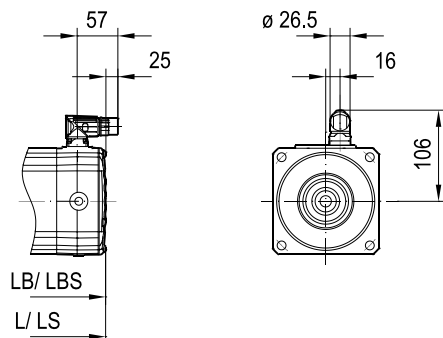
08 359 03 22

CM3C71S/M/L BK /DI

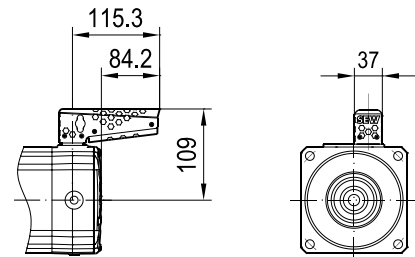
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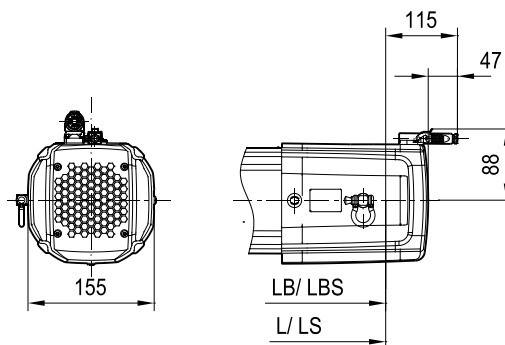
/SD1



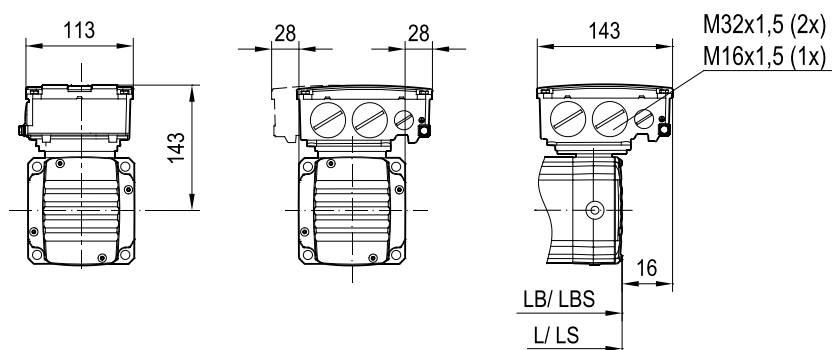
ECM3C
/SD1



/VR



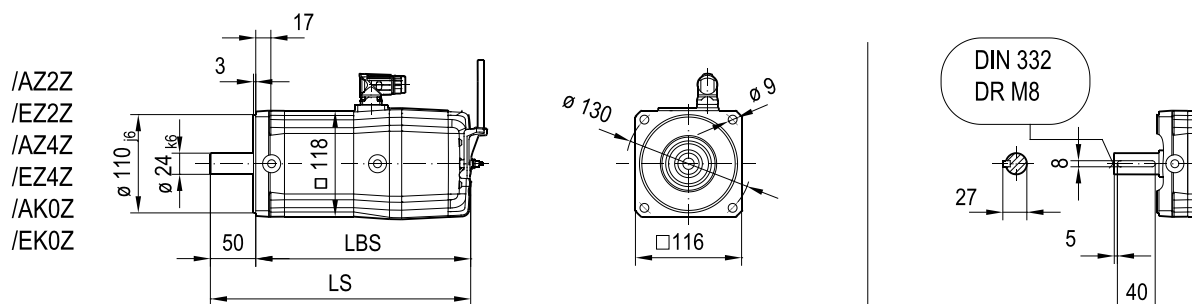
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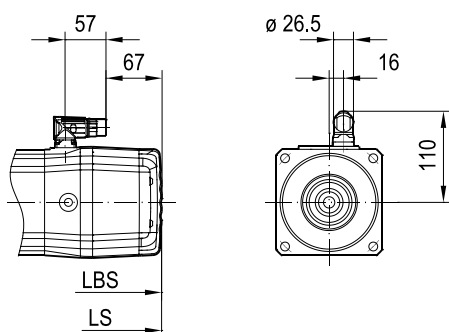
	CM3C71							
	S	M	L					
LB	170	192	237					
L	220	242	287					
LBS	236	258	303					
LS	286	308	353					

CM3C71S/M/L BZ(D)/ BZ(Z) /DI

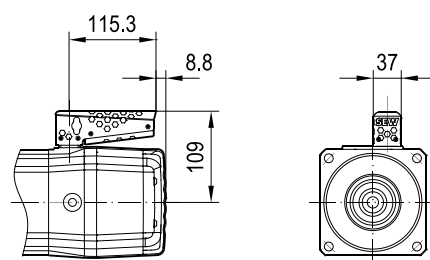
09 236 03 22



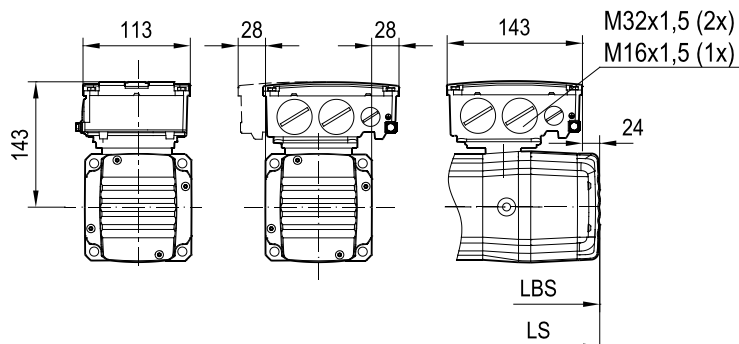
/SD1



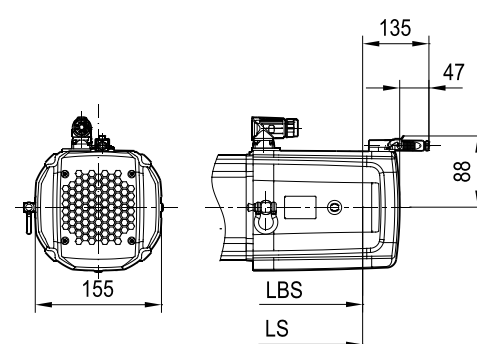
ECM3C
/SD1



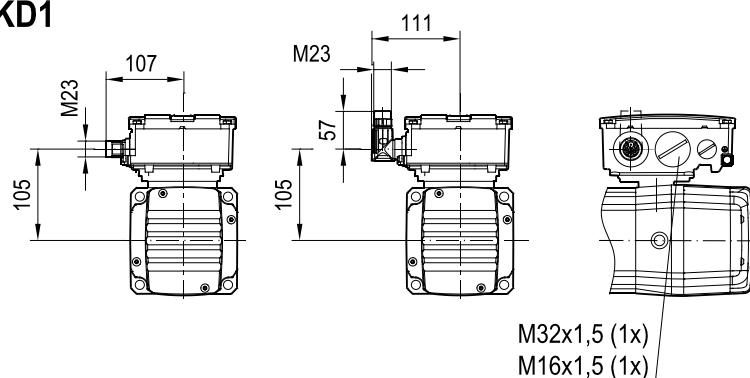
/KD



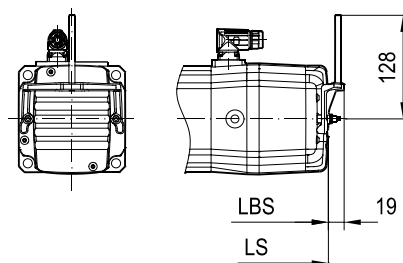
/VR



/KD1



/HR

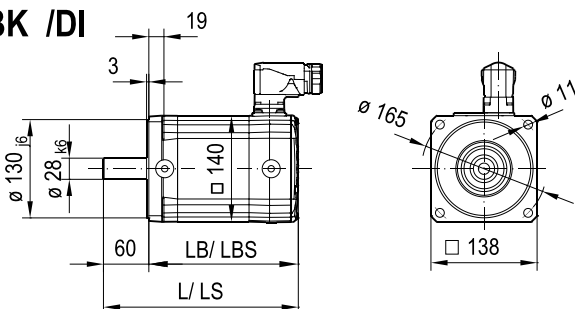


	CM3C71							
	S	M	L					
LBS	258	280	325					
LS	308	330	375					

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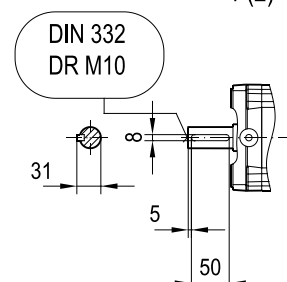
CM3C80S/M/L /DI
CM3C80S/M/L BK /DI

/AZ2Z
/EZ2Z
/AZ4Z
/EZ4Z
/AK0Z
/EK0Z

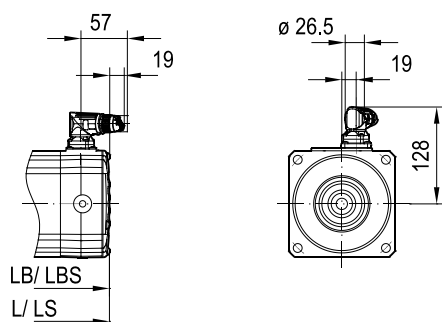


08 360 03 22

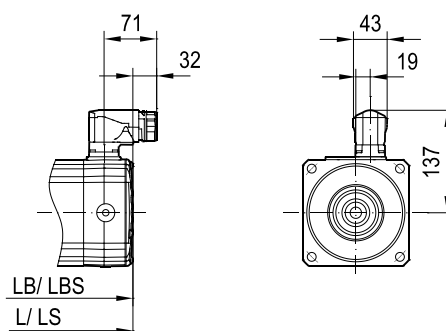
1 (2)



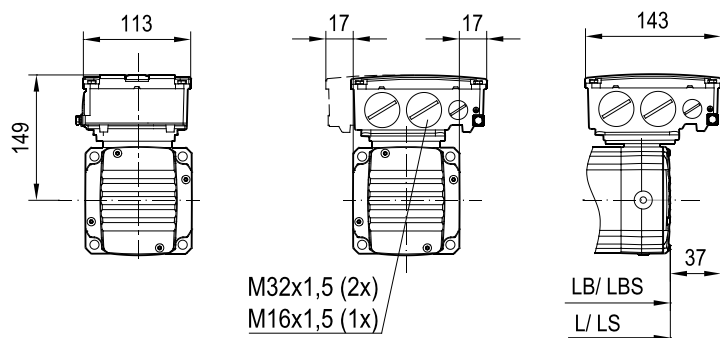
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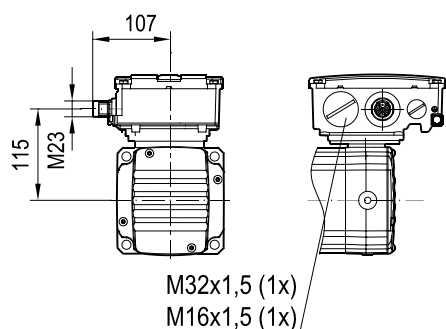
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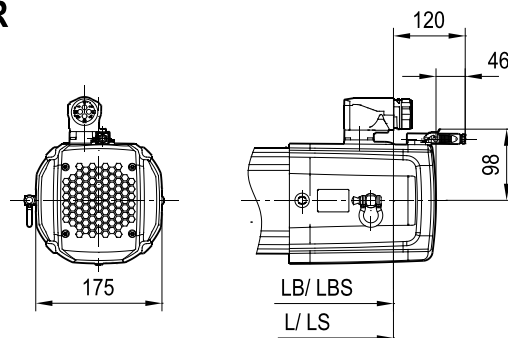
/KD



/KDD



/VR

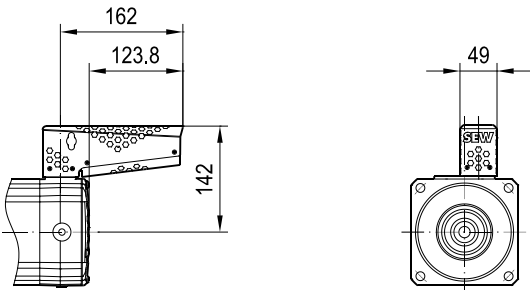


	CM3C80							
	S	M	L					
LB	198	224	277					
L	258	284	337					
LBS	266	292	345					
LS	326	352	405					

CM3C80S/M/L /DI
 CM3C80S/M/L BK /DI

08 360 03 22
 2 (2)

ECM3C
 /SD1
 /SDB



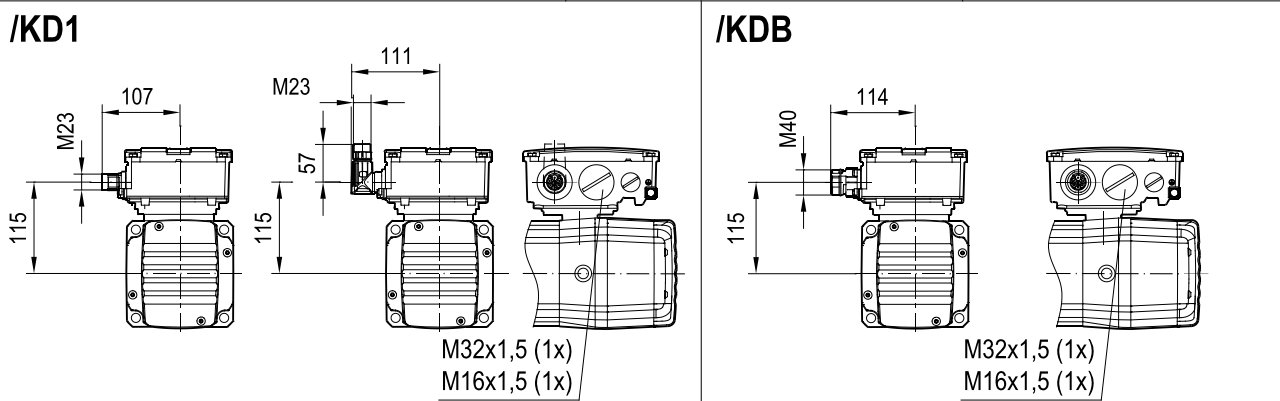
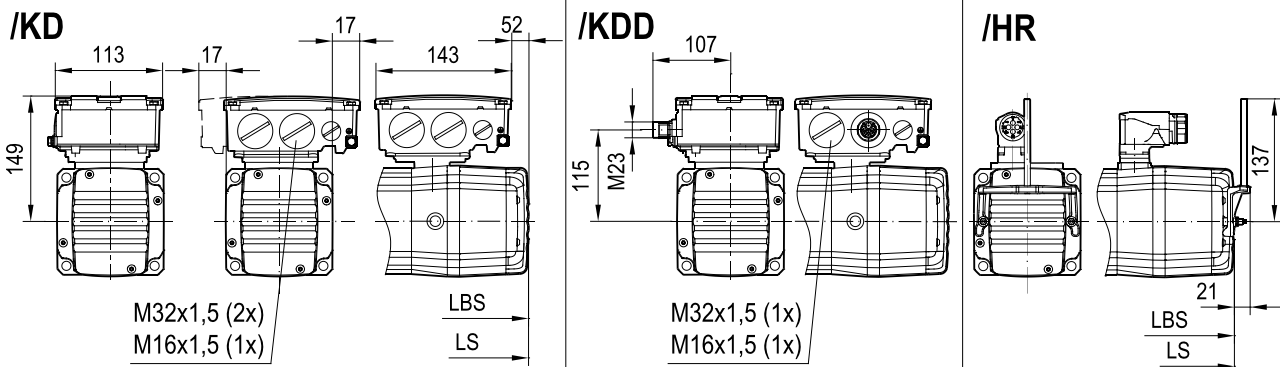
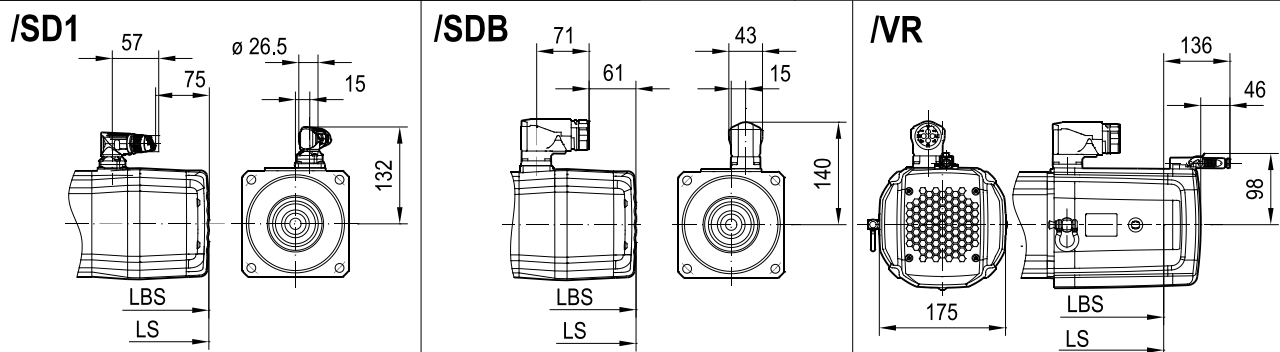
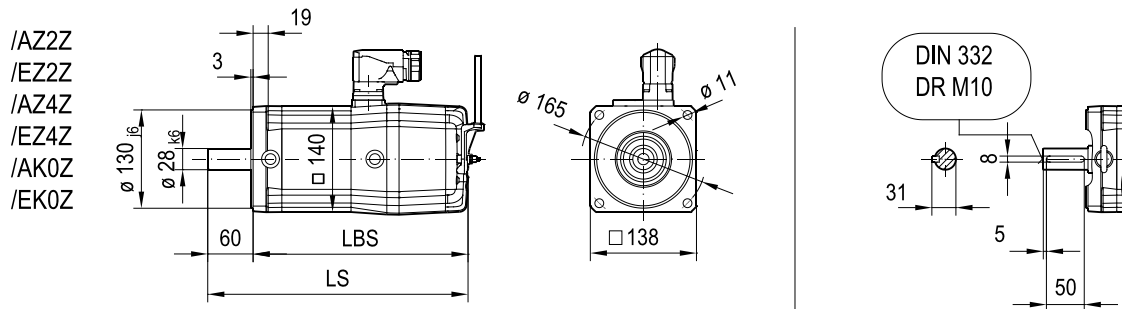
	CM3C80							
	S	M	L					
LB	198	224	277					
L	258	284	337					
LBS	266	292	345					
LS	326	352	405					

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CM3C80S/M/L BZ(D)/ BZ(Z) /DI

09 237 03 22

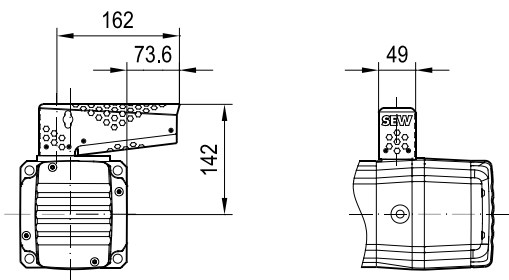
1 (2)



	CM3C80							
	S	M	L					
LBS	288	314	367					
LS	348	374	427					

CM3C80S/M/L BZ(D)/ BZ(Z) /DI
 ECM3C
 /SD1
 /SDB

09 237 03 22
 2 (2)



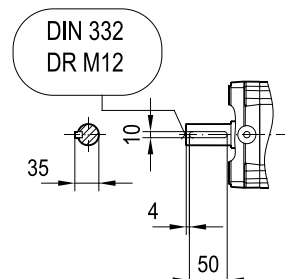
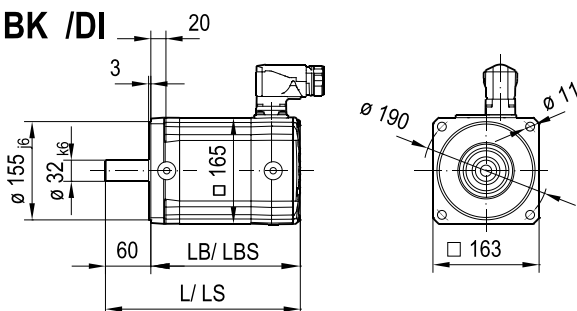
	CM3C80							
	S	M	L					
LBS	288	314	367					
LS	348	374	427					

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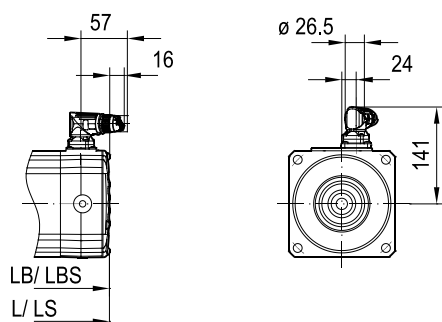
CM3C100S/M/L /DI
CM3C100S/M/L BK /DI

08 361 03 22

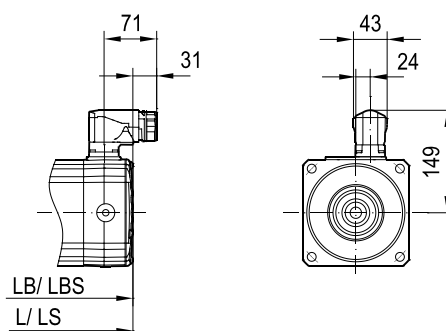
/AZ2Z
/EZ2Z
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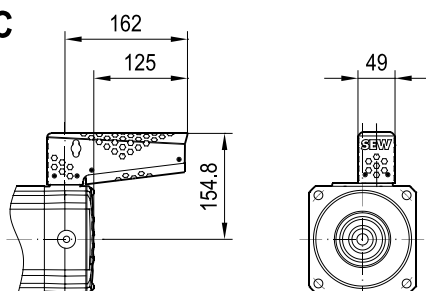
/SD1



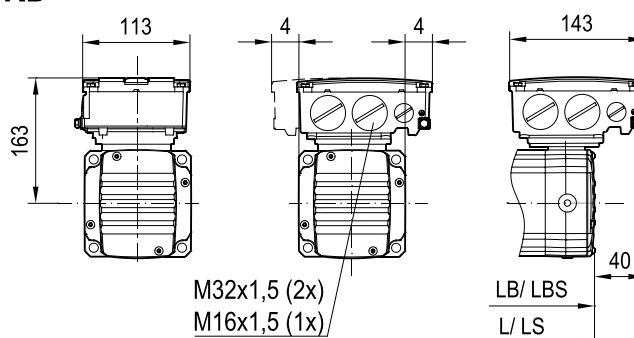
/SDB



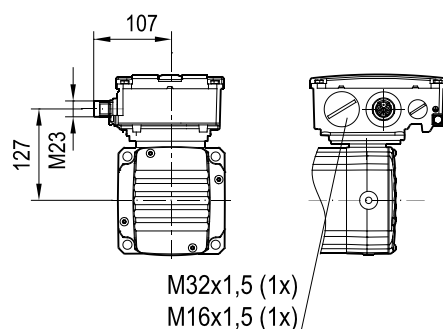
ECM3C
/SD1
/SDB



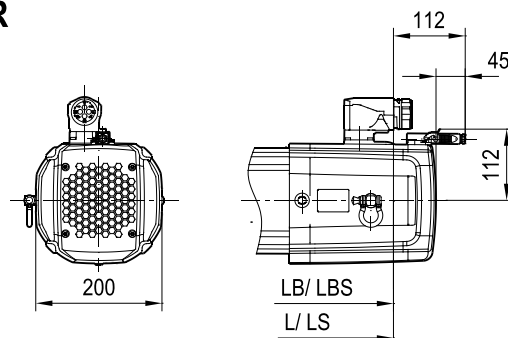
/KD



/KDD



/VR

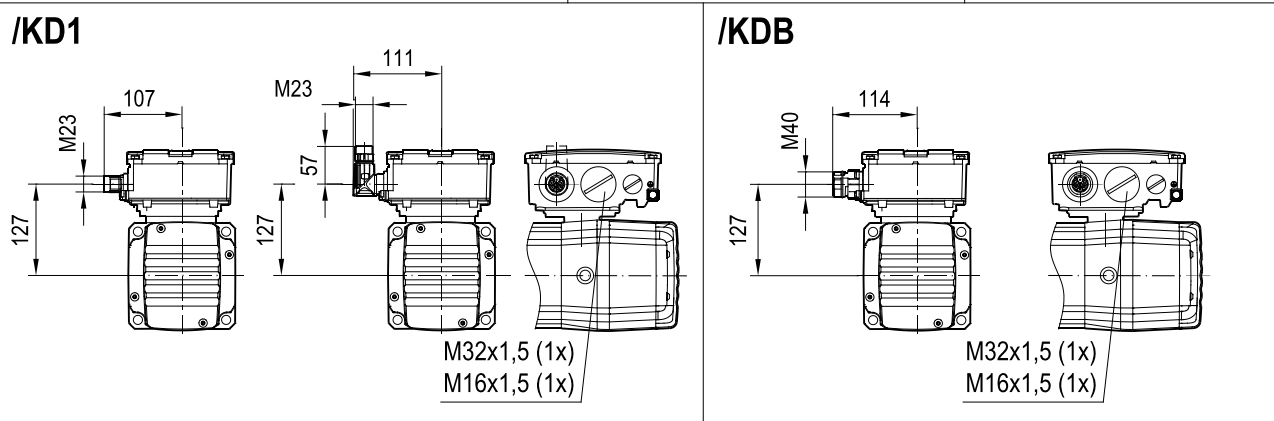
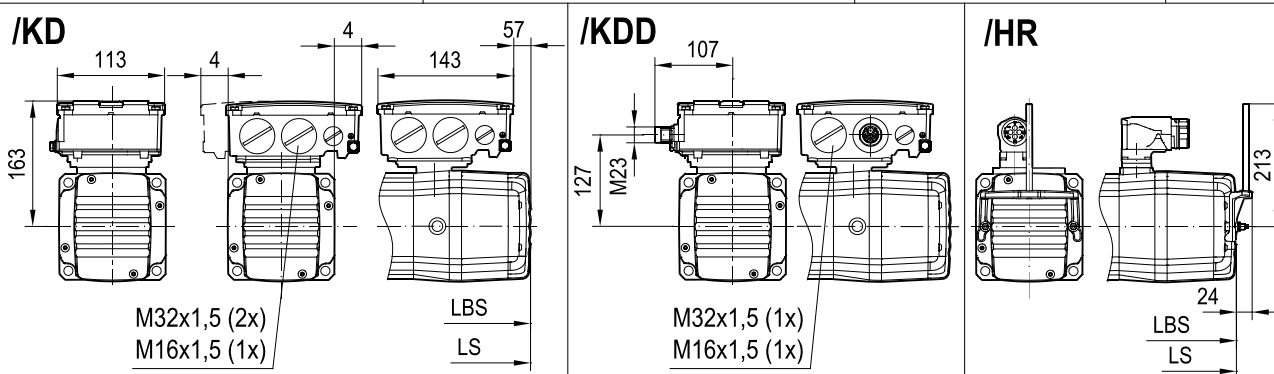
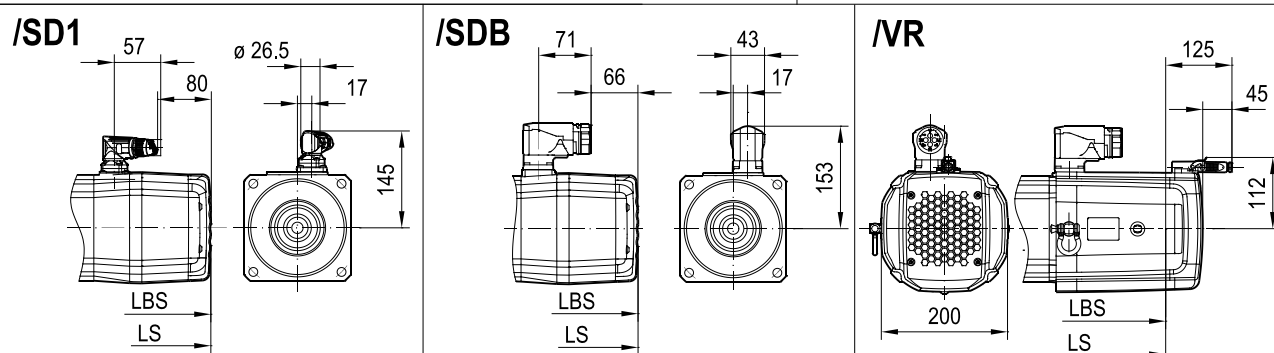
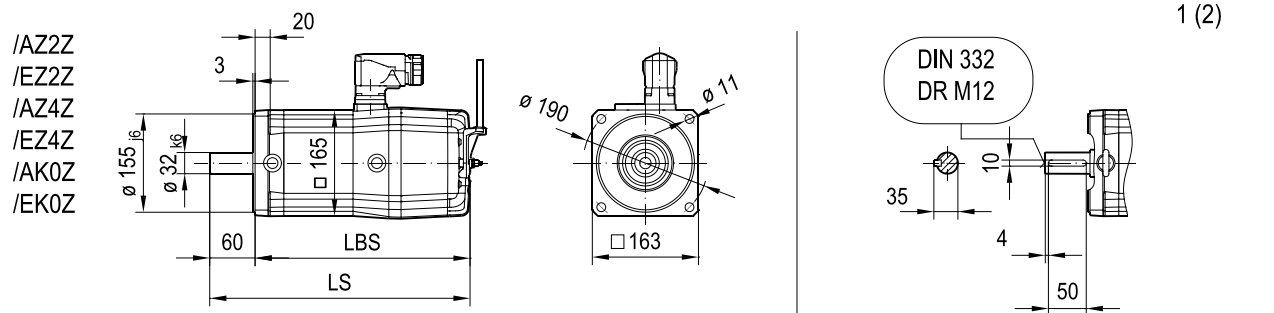


	CM3C100							
	S	M	L					
LB	216	244	301					
L	276	304	361					
LBS	290	318	375					
LS	350	378	435					

CM3C100S/M/L BZ(D)/ BZ(Z) /DI

09 238 03 22

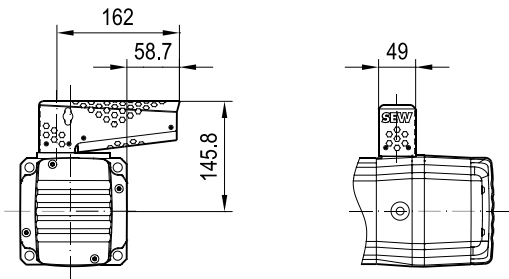
1 (2)



	CM3C100							
	S	M	L					
LBS	312	340	397					
LS	372	400	457					

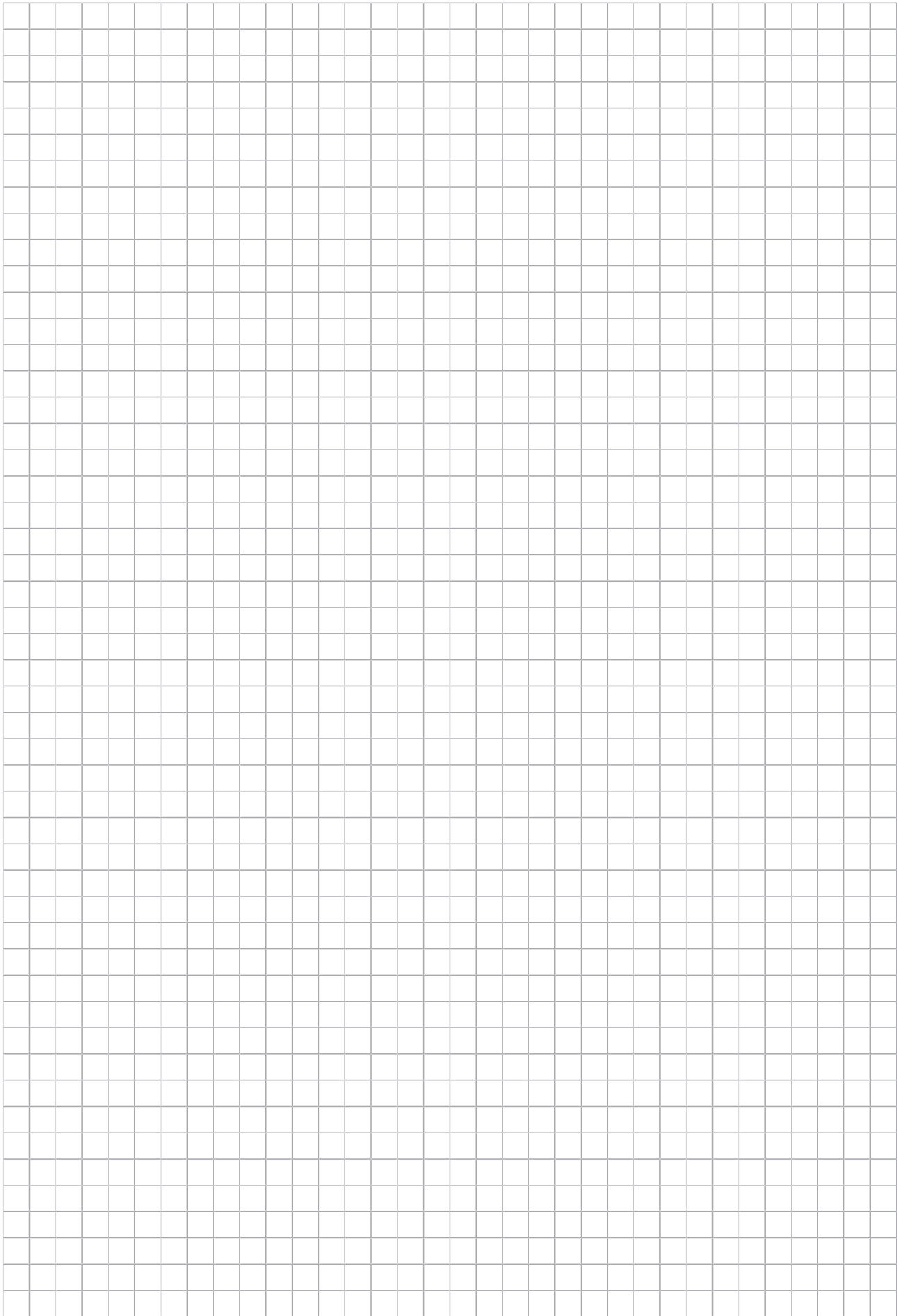
CM3C100S/M/L BZ(D)/ BZ(Z) /DI
ECM3C
/SD1
/SDB

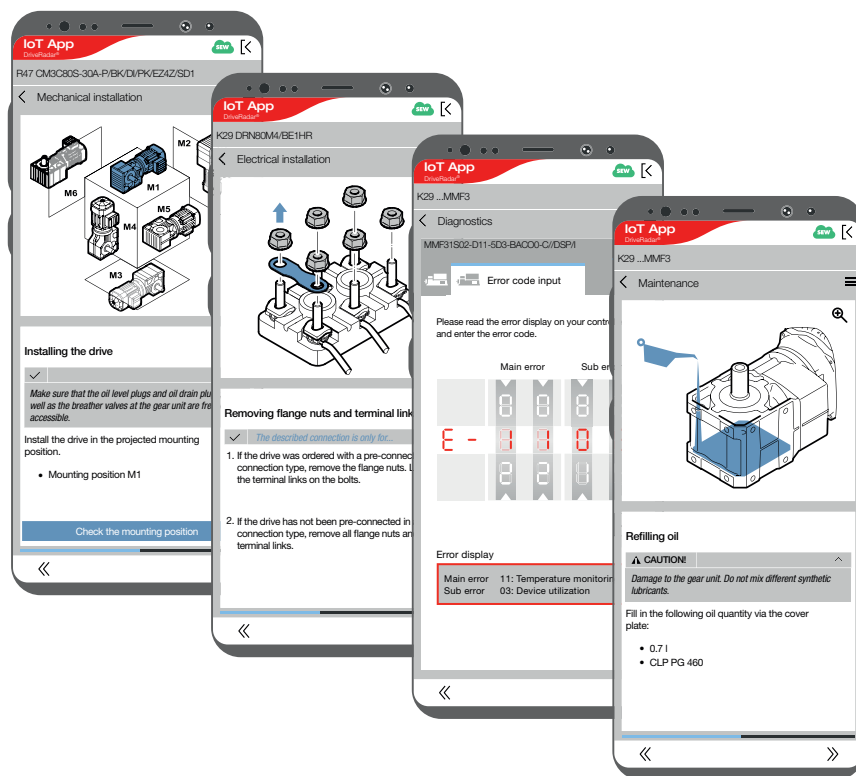
09 238 03 22
2 (2)



	CM3C100							
	S	M	L					
LBS	312	340	397					
LS	372	400	457					

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