

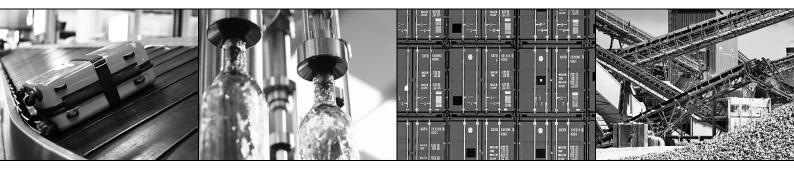
# **Operating Instructions**



Electronic Motor **DRC.-...-SNI**Single Line Network Installation

Edition 10/2013 20219741 / EN





# Contents



# **Contents**

1	Gen	eral information	<del>(</del>
	1.1	How to use this documentation	6
	1.2	Structure of the safety notes	6
	1.3	Rights to claim under warranty	7
	1.4	Exclusion of liability	7
	1.5	Copyright	7
	1.6	Product names and trademarks	7
2	Safe	ety notes	ε
	2.1	General information	8
	2.2	Target group	8
	2.3	Designated use	9
	2.4	Other applicable documentation	9
	2.5	Transportation, storage	9
	2.6	Installation	10
	2.7	Electrical connection	10
	2.8	Safe disconnection	10
	2.9	Operation	11
3	Unit	structure	12
	3.1	DRC drive unit	12
	3.2	Cable entry positions	13
	3.3	Example nameplate and type designation of the drive unit	14
	3.4	Electronics	15
	3.5	Application options	18
	3.6	Example nameplate and type designation of electronics	20
	3.7	DRC drive units in ASEPTIC / ASEPTICplus design	22
4	Mec	hanical installation	24
	4.1	Installation notes	24
	4.2	Required tools and resources	24
	4.3	Installation requirements	25
	4.4	Setting up the drive unit	26
	4.5	Application options	29
	4.6	Tightening torques	32
	4.7	Drive units with optional ASEPTIC / ASEPTICplus design	35
5	Elec	trical installation	42
	5.1	Installation planning considering EMC aspects	42
	5.2	Installation instructions	44
	5.3	Installation topology (example)	50
	5.4	Terminal assignment of DRC1/2	51
	5.5	Terminal assignment of DRC3/4	
	5.6	Connecting DRC drive units	
	5.7	Cable routing and shielding	
	5.8	EMC cable glands	64
	5.9	Required power leads	65



# Contents



	5.10	Plug connectors	6 <i>1</i>
	5.11	Assignment of optional plug connectors	72
	5.12	Application options	81
6	Start	up	83
	6.1	Startup notes	83
	6.2	Lifting applications	84
	6.3	Prerequisties for startup	84
	6.4	Description of DIP switches	85
	6.5	Startup procedure	87
	6.6	Starting up the GIO13B application option	89
7	Oper	ration of MOVITOOLS <sup>®</sup> MotionStudio	92
	7.1	About MOVITOOLS® MotionStudio	92
	7.2	First steps	92
	7.3	Connection mode	95
	7.4	Executing functions of the units	97
8	Para	meters	99
	8.1	Overview of parameters of the command PCB	99
	8.2	Overview of parameters for application options	101
	8.3	Overview of power section parameters	103
	8.4	Description of command PCB parameters	116
	8.5	Description of application option parameters	119
	8.6	Description of power section parameters	123
9	Oper	ration	151
	9.1	Local mode (only in conjunction with optional plug connector)	151
	9.2	Releasing the brake without drive enable signal	153
10	Servi	ice	155
	10.1	Malfunctions of the mechanical DRC drive	
	10.2	Evaluating error messages	
	10.3	Switch-off responses	
	10.4	Reset of error messages	
	10.5	Description of status and operating displays	159
	10.6	Error table	162
	10.7	Unit replacement	164
	10.8	SEW-EURODRIVE Service	166
	10.9	Shutdown	167
	10.10	Storage	167
	10.11	Extended storage	167
	10.12	2 Disposal	168
11	Inspe	ection and maintenance	169
	11.1	Determining the operating hours	169
	11.2	Inspection and maintenance intervals	170
	11.3	Inspection and maintenance work	172



# Contents



12	Tech	178	
	12.1	Technical data	178
	12.2	Technical data of application options	181
	12.3 Braking resistors		183
	12.4	Technical data of the brake	197
	12.5	ASEPTIC / ASEPTICplus variants	198
	12.6	Surface protection	199
	12.7	Screw fittings	201
	12.8	Connection cables	202
	12.9	Dimension drawings	204
13	EC d	eclaration of conformity	212
14	Address list		213
	Index	v	225



# General information How to use this documentation

#### 1 General information

#### 1.1 How to use this documentation

The documentation is an integral part of the product and contains important information on operation and service. The documentation is written for all employees who assemble, install, start up, and service this product.

The documentation must be accessible and legible. Make sure that persons responsible for the system and its operation, as well as persons who work independently on the unit, have read through the documentation carefully and understood it. If you are unclear about any of the information in this documentation, or if you require further information, contact SEW-EURODRIVE.

# 1.2 Structure of the safety notes

#### 1.2.1 Meaning of signal words

The following table shows the graduation and meaning of the signal words for safety notes, warnings regarding potential risks of damage to property, and other notes.

Signal word	Meaning	Consequences if disregarded		
▲ DANGER!	Imminent hazard	Severe or fatal injuries		
▲ WARNING!	Possible dangerous situation	Severe or fatal injuries		
▲ CAUTION!	Possible dangerous situation	Minor injuries		
NOTICE	Possible damage to property	Damage to the drive system or its environment		
INFORMATION	Useful information or tip: Simplifies handling of the drive system.			

#### 1.2.2 Design of the section-related safety notes

Section-related safety notes do not apply to a specific action, but to several actions pertaining to one subject. The symbols used either indicate a general hazard or a specific hazard.

This is the formal structure of a safety note for a specific section:



#### **▲ SIGNAL WORD!**

Type and source of danger.

Possible consequence(s) if disregarded.

• Measure(s) to prevent the danger.

#### 1.2.3 Design of the embedded safety notes

Embedded safety notes are directly integrated into the instructions just before the description of the dangerous action.

This is the formal structure of an embedded safety note:

A SIGNAL WORD! Type and source of hazard.

Possible consequence(s) if disregarded.

Measure(s) to prevent the hazard.





## 1.3 Rights to claim under warranty

A requirement of fault-free operation and fulfillment of any rights to claim under limited warranty is that you adhere to the information in the documentation. Therefore read the documentation before you start working with the unit.

# 1.4 Exclusion of liability

You must comply with the information contained in this documentation to ensure safe operation and to achieve the specified product characteristics and performance features. SEW-EURODRIVE assumes no liability for injury to persons or damage to equipment or property resulting from non-observance of these operating instructions. In such cases, any liability for defects is excluded.

# 1.5 Copyright

© 2013 SEW-EURODRIVE. All rights reserved.

Unauthorized duplication, modification, distribution or any other use of the whole or any part of this documentation is strictly prohibited.

#### 1.6 Product names and trademarks

All product names in this documentation are trademarks or registered trademarks of their respective titleholders.



# 2 Safety notes

The following basic safety notes must be read carefully to prevent injury to persons and damage to property. The operator must ensure that the basic safety notes are read and adhered to. Ensure that persons responsible for the system and its operation, as well as persons who work independently on the unit, have read through the operating instructions carefully and understood them. If you are unclear about any of the information in this documentation, or if you require further information, please contact SEW-EURODRIVE.

#### 2.1 General information

Never install damaged products or take them into operation. Submit a complaint to the shipping company immediately in the event of damage.

During operation, DRC drive units can have live, bare and movable or rotating parts as well as hot surfaces, depending on their degree of protection.

Removing covers without authorization, improper use as well as incorrect installation or operation may result in severe injuries to persons or damage to property.

Refer to the documentation for additional information.

# 2.2 Target group

**Only qualified electricians** are authorized to install, start up or service the units or correct unit faults (observing IEC 60364 or CENELEC HD 384 or DIN VDE 0100 and IEC 60664 or DIN VDE 0110 as well as national accident prevention guidelines).

Qualified electricians in the context of these basic safety notes are all persons familiar with installation, assembly, startup and operation of the product who possess the necessary qualifications.

All persons involved in any other work, such as transportation, storage, operation and disposal, must be trained appropriately.





#### 2.3 Designated use

DRC drive units are components intended for installation in electrical systems or machines.

In case of installation in machines, taking the DRC drive units into operation (i.e. start of designated operation) is prohibited until it is determined that the machine meets the requirements stipulated in EC Directive 2006/42/EC (Machinery Directive).

Startup (i.e. the start of designated use) is only permitted under observance of EMC directive 2004/108/EC (EMC Directive).

DRC drive units comply with the regulations of the Low Voltage Directive 2006/95/EC. The standards given in the declaration of conformity are applied to the DRC drive units.

You must observe the technical data and information on the connection requirements as provided on the nameplate and in the documentation.

#### 2.3.1 Safety functions

DRC drive units may <u>not</u> perform safety functions unless these functions are described and expressly permitted.

#### 2.3.2 Lifting applications

DRC drive units are not designed for use as safety devices in lifting applications.

#### 2.4 Other applicable documentation

Note also the following documentation:

- "DRC Gearmotors" catalog
- · Operating instructions for the gear unit (only for DRC gearmotors)

You can download or order these publications on the Internet (http://www.sew-eurodrive.com under the heading "Documentation").

#### 2.5 Transportation, storage

Observe the notes on transportation, storage and proper handling. Comply with the requirements for climatic conditions stated in chapter "Technical Data". Tighten installed eyebolts securely. They are only designed for the weight of the DRC motor without gear unit. Mounted gear units have separate suspension attachments, which must be used according to the gear unit operating instructions when lifting the DRC gearmotor. Do not attach any additional loads. Use suitable, sufficiently rated handling equipment (e.g. rope guides) if required.





#### 2.6 Installation

The units must be installed and cooled according to the regulations and specifications in the corresponding documentation.

Protect the DRC drive units from improper strain.

The following applications are prohibited unless explicitly permitted:

- · Use in potentially explosive atmospheres.
- Use in areas exposed to harmful oils, acids, gases, vapors, dust, radiation, etc.
- Use in non-stationary applications that are subject to mechanical vibration and shock loads as stated in the documentation for DRC drive units.

Important: DRC drive units and corresponding mount-on parts must not protrude into footways.

#### 2.7 Electrical connection

Working on live parts of DRC drive units is not permitted.

The drive is operated as a generator due to the kinetic energy of the system/machine. Secure the output shaft against rotation before opening the wiring compartment.

Electrical installation must be carried out in compliance with pertinent regulations (e.g. cable cross sections, fusing, protective conductor connection). For any additional information, refer to the applicable documentation.

You find notes on EMC-compliant installation, such as shielding, grounding, arrangement of filters and routing of lines, in the documentation of the DRC drive units. The manufacturer of the system or machine is responsible for maintaining the limits established by EMC legislation.

Protective measures and protection devices must comply with the regulations in force (e.g. EN 60204-1 or EN 61800-5-1).

#### 2.8 Safe disconnection

DRC drive units meet all requirements for safe disconnection of power and electronics connections in accordance with EN 61800-5-1. All connected circuits must also satisfy the requirements for safe disconnection to ensure reliable isolation.



#### 2.9 Operation

Systems with integrated DRC drive units must be equipped with additional monitoring and protection devices according to the applicable safety guidelines, such as the law governing technical equipment, accident prevention regulations, etc. Additional protective measures may be necessary for applications with increased potential risk. Changes to DRC drive units using the operating software are permitted.

#### **WARNING**



Do not touch live components and power connections immediately after separation of the DRC drive units from the supply voltage because some capacitors might still be charged.

Severe or fatal injuries.

Wait at least for 5 minutes after the supply voltage has been switched off.

The connection boxes must be closed and screwed on before the supply voltages are connected to DRC drive units.

The unit may still be live and connected to the power supply even if the operation LEDs and other display elements are no longer illuminated.

Mechanical blocking or internal safety functions of the unit can cause a motor standstill. Eliminating the cause of the problem or performing a reset may result in the drive restarting automatically. If this is not permitted for the driven machine for safety reasons, disconnect the unit from the supply system before correcting the fault.

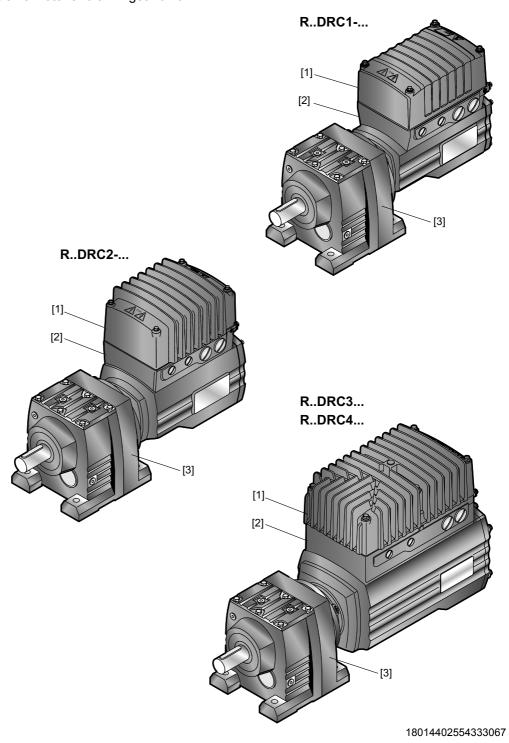
Caution: Danger of burns: The surface temperatures of DRC drive units can be more than 60 °C during operation.



# 3 Unit structure

### 3.1 DRC drive unit

The following figure shows drive units consisting of a DRC1/DRC2/DRC3/DRC4 electronic motor and an R gear unit:



- [1] Electronics cover
- [2] DRC electronic motor with connection unit
- [3] Gear unit (here: R gear unit)



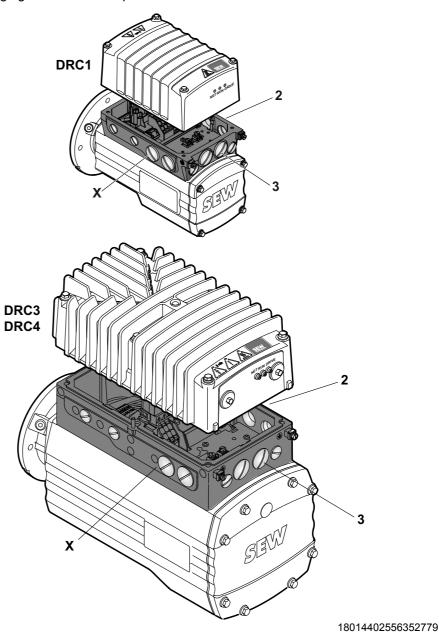


# 3.2 Cable entry positions

The DRC electronic motor is equiped with the following cable entries as standard:

- Position X + 2 + 3
  - X: 2 x M25 x 1.5 + 2 x M16 x 1.5
  - 2: 2 x M25 x 1.5 + 2 x M16 x 1.5
  - 3: 2 x M25 x 1.5 + 2 x M16 x 1.5

The following figure shows examples with DRC1 and DRC3/4 electronic motors:



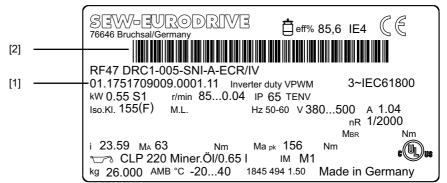
#### **Unit structure**

Example nameplate and type designation of the drive unit

#### 3.3 Example nameplate and type designation of the drive unit

#### 3.3.1 Nameplate

The following figure gives an example of a DRC nameplate. For the structure of the type designation, refer to chapter "Type designation".

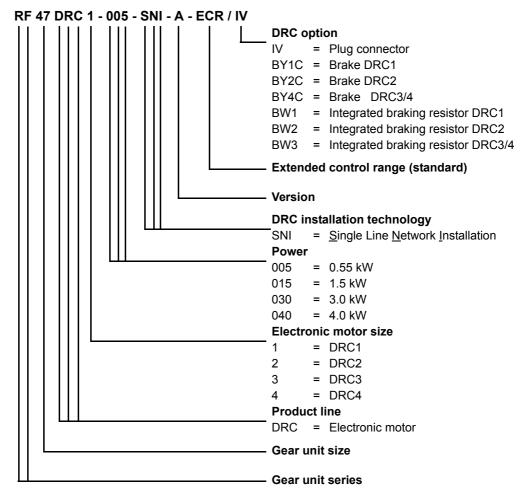


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- [1] Unique serial number
- [2] The bar code on the nameplate (code 39) according to ISO/IEC 16388 represents the unique serial number (with a period as separator).

#### 3.3.2 Type designation

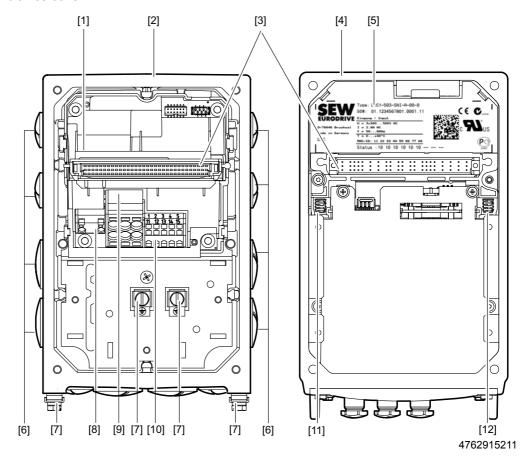
The following table shows the type designation of the DRC drive unit:



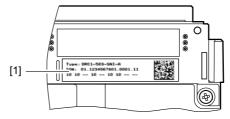
#### 3.4 Electronics

#### 3.4.1 DRC1/2 electronics cover (inside) and connection box

The following figure shows the connection box and the bottom side of the DRC1/2 electronics cover:



[1] Nameplate of drive unit, see following detailed view



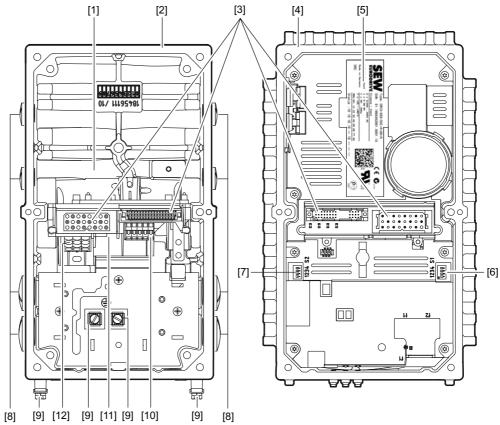
- [2] Connection box
- [3] Plug connector connection unit for DRC electronics cover
- [4] DRC electronics cover
- [5] Electronics cover nameplate
- [6] Cable glands
- [7] Screws for PE connection 🗐
- [8] Braking resistor connection
- [9] Line connection L1, L2, L3
- [10] Electronics terminal strips
- [11] DIP switches S2/1 S2/4
- [12] DIP switches S1/1 S1/4





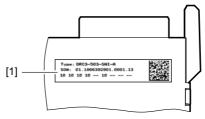
#### 3.4.2 DRC3/4 electronics cover (inside) and connection box

The following figure shows the connection box and the bottom side of the DRC3/4 electronics cover:



8593214859

#### [1] Nameplate of drive unit, see following detailed view

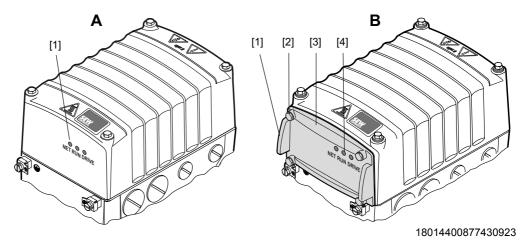


- [2] Connection box
- [3] Plug connector connection unit for DRC electronics cover
- [4] DRC electronics cover
- [5] Electronics cover nameplate
- [6] DIP switches S1/1 S1/4
- [7] DIP switches S2/1 S2/4
- [8] Cable glands
- [9] Screws for PE connection (4)
- [10] Electronics terminal strips
- [11] Braking resistor connection, not visible in this illustration (terminals are below the connector). For details, see chapter "Electrical installation".
- [12] Line connection L1, L2, L3



#### 3.4.3 **Electronics cover (outside)**

The following figure shows the possible variants of the electronic cover using one frame size as an example:



A Electronics cover without application slot B Electronics cover with application slot [1] LED displays

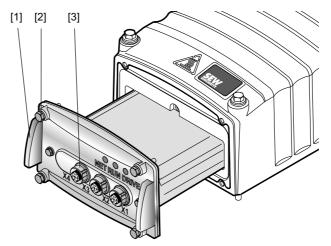
- [1] Assembly/disassembly handle
- [2] Retaining screws (4x)
- [3] Application cover
- [4] LED displays



# 3.5 Application options

#### 3.5.1 GIO12B application option

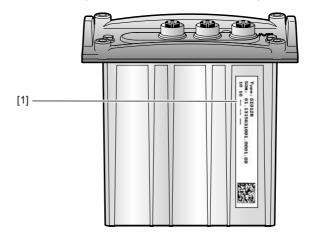
The following figure shows the GIO12B application option:



9007201622841227

- [1] Assembly/disassembly handle
- [2] Retaining screws (4x)
- [3] M12 plug connector for digital I/Os

The following figure shows the position of the GIO12B nameplate:



18014401210968331

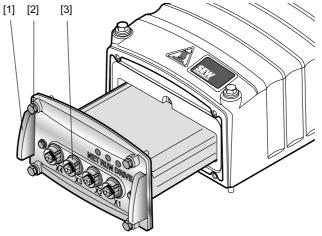
[1] Nameplate





#### 3.5.2 GIO13B application option

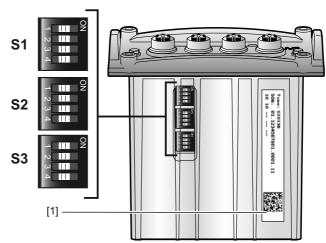
The following figure shows the GIO13B application option:



9007201839769867

- [1] Assembly/disassembly handle
- [2] Retaining screws (4x)
- [3] M12 plug connector for digital/analog I/Os

The following figure shows the DIP switches S1 to S3 of the GIO13B application option:



18014401245670283

[1] Nameplate

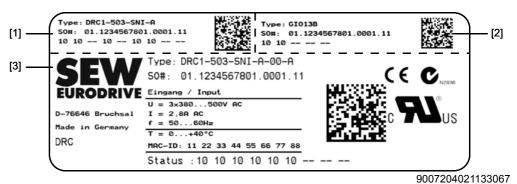
#### **Unit structure**

Example nameplate and type designation of electronics

#### 3.6 Example nameplate and type designation of electronics

#### 3.6.1 Nameplate

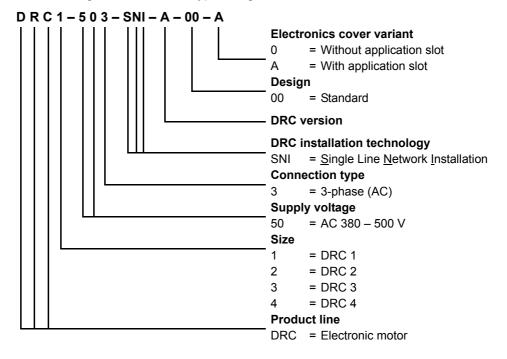
The following figure gives an example of a DRC nameplate. For the structure of the type designation, refer to chapter "Type designation".



- [1] Nameplate of connection unit
- [2] Nameplate of application option
- [3] Electronics cover nameplate

#### 3.6.2 Type designation electronics cover

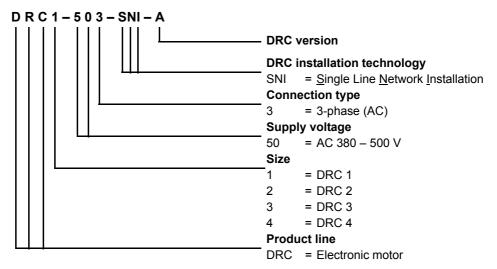
The following table shows the type designation of the electronics cover:





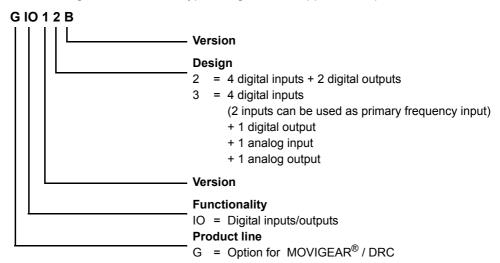
#### 3.6.3 Type designation of connection unit

The following table shows the type designation of the connection unit:



#### 3.6.4 Type designation of application options

The following table shows the type designation of application options:



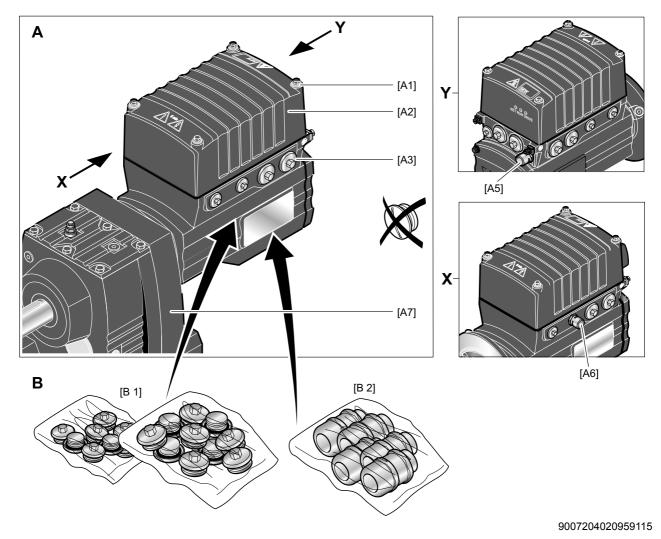
# Unit structure DRC drive units

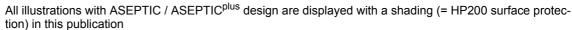
# DRC drive units in ASEPTIC / ASEPTICplus design

# 3.7 DRC drive units in ASEPTIC / ASEPTIC<sup>plus</sup> design

The following figure shows the additional characteristics of DRC drive units in ASEPTIC / ASEPTIC<sup>plus</sup> design:

- The ASEPTIC / ASEPTIC<sup>plus</sup> variant is delivered with screw plugs made of stainless steel as standard.
- Plastic screw plugs can be chosen instead. To achieve degree of protection IP66 and compatibility with cleaning agents, you have to replace the plastic screw plugs by suitable screw fittings made of stainless steel.







#### Scope of delivery

[A1] DRC1/2:

Mounting screws for cover made of stainless

steel

DRC3/4:

Mounting screws for cover are zinc-plated

Surface protection OS2 to OS4 for ASEPTIC design / OS4 for ASEPTIC<sup>plus</sup> design, see chapter [A2]

"Technical data and dimension sheets"

Standard: [A3] Optional:

> Screw plugs made of stainless steel Plastic screw plugs. To achieve degree of pro-

tection IP66 and compatibility with cleaning agents, you have to replace the plastic screw plugs by suitable screw fittings made of stainless

**Unit structure** 

Factory-installed pressure compensation fitting (M16) with mounting positions M5, M6 [A5]

[A6] Factory-installed pressure compensation fitting (M16) with mounting position M1, M2, M4, M4

> Optional plug connectors (see chapter "Electrical installation") are available in connection with the ASEPTIC / ASEPTIC plus version.

#### [A7] Features of gear units in ASEPTIC design

- Surface protection finish OS2 to OS4

Features of gear units in ASEPTIC plus design

- Available for gear units with solid shaft, hollow shaft with key or TorqLOC for the following gear unit sizes: R27-87, F27-87, K37-87 and W37
- Gear unit output shaft including all retaining parts on the output shaft, such as screws, keys, shrink disk, etc., are made of stainless steel
- If technically possible, the oil seals on the output are configured as double oil seals made from FKM (Viton®)
- The breather valve of the gear units is made from stainless steel
- Surface protection finish OS4 for compatibility with common cleaning agents and disinfectants
- All surface recesses sprayed with elastic rubber compound
- All gear unit options can be selected
- All mounting positions M1 to M6 are available

#### В Required screw fittings

Screw plugs made of stainless steel 1) [B1] Cable glands made of stainless steel 1) [B2]

The required screw fittings can be ordered from SEW-EURODRIVE. For an overview, refer to chapter "Technical Data / Optional metal screw fittings".

1) Make sure to select plug seals that are compatible with the used cleaning agents



### 4 Mechanical installation

#### 4.1 Installation notes



#### **INFORMATION**

Adhere to the safety notes during installation.

#### **WARNING**



Improper installation/disassembly of DRC drive units and mount-on components.

Risk of injury.

- · Adhere to the notes about installation and disassembly.
- Before releasing shaft connections, make sure that there are no active torsional moments present (tensions within the system).

#### **▲ WARNING**





Dangerous voltages may still be present for up to 5 minutes after disconnection from the power supply.

Severe or fatal injuries.

- Disconnect the DRC drive unit from the power supply before you start working on the unit and secure it against unintentional reconnection to the power supply.
- Secure the output shaft against rotation.
- Wait for at least 5 minutes before removing the electronics cover.

#### 4.2 Required tools and resources

- · Set of wrenches
- · Torque wrench
- · Mounting device
- Compensation elements (shims and spacing rings), if necessary
- · Mounting materials for output components
- Lubricant (e.g. NOCO<sup>®</sup> Fluid)
- · Standard parts are not included in the delivery

#### 4.2.1 Installation tolerances for shaft ends

The following table shows the permitted tolerances of shaft ends and flanges of the DRC motor.

Shaft end	Flanges
<ul> <li>Diameter tolerance according to EN 50347</li> <li>ISO j6 with Ø ≤ 26 mm</li> <li>Center bore in accordance with DIN 332, shape DR</li> </ul>	Centering shoulder tolerance in accordance with EN 50347  • ISO j6 with Ø ≤ 250 mm

#### 4.2.2 Tolerances for torque ratings

The specified torques must be adhered to with a tolerance of +/- 10%.





# 4.3 Installation requirements

Check that the following conditions have been met:

- The entries on the nameplate of the DRC unit match the voltage supply system.
- The drive is undamaged (no damage caused by transportation or storage)
- Ambient temperature according to the operating instructions, nameplate and lubricant table in chapter "Technical data/lubricants".
- The drive must not be assembled in the following ambient conditions:
  - Potentially-explosive atmosphere
  - Oils
  - Acids
  - Gases
  - Vapors
  - Radiation
- For special designs: The drive is designed in accordance with the actual ambient conditions.
- Clean the output shafts and flange surfaces thoroughly to ensure they are free of anti-corrosion agents, contamination or similar. Use a commercially available solvent. Do not expose the sealing lips of the oil seals to the solvent – damage to the material.
- When the drive is installed in abrasive ambient conditions, protect the output end oil seals against wear.



#### 4.4 Setting up the drive unit

#### 4.4.1 Information

- Only install the DRC drive unit on a level, low-vibration, and torsionally rigid support structure.
- Observe the mounting position specified on the motor nameplate.
- Thoroughly remove any anti-corrosion agent from the shaft end. Use a commercially available solvent. Do not allow the solvent to penetrate the bearings and shaft seals

   this could damage the material.
- Align the motor carefully to avoid placing any unacceptable strain on the motor shafts. Observe the permitted overhung and axial loads specified in the "DRC Gearmotors" catalog.
- · Do not jolt or hammer the shaft end.
- Ensure that cooling air supply is unobstructed and that air discharged by other units does not influence cooling.
- Balance components that were subsequently mounted to the shaft with a half key (output shafts are balanced with a half key).
- Use suitable cable glands for the supply leads (use reducing adapters if necessary).
- Seal the cable entry properly.
- Thoroughly clean the sealing surfaces of the DRC cover before re-assembly.
- If the corrosion protection coating is damaged, restore the coating.
- Check whether the degree of protection specified in the operating instructions and on the nameplate is permitted in the ambient conditions on site.

Change in mounting position Make sure to read the following information when you operate the electronic motor in a mounting position other than the one indicated in the order:

Adjust the position of the pressure compensation fitting, if necessary.





#### 4.4.2 Electronics cover



#### **▲ WARNING**

Burns caused by hot surfaces.

Severe injuries.

Let the units cool down before touching them.

#### **NOTICE**



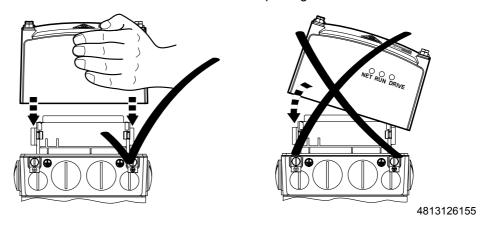
Loss of the guaranteed degree of protection.

Possible damage to property.

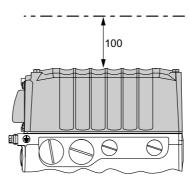
- When the DRC electronics cover is removed from the connection box, you have to protect it from humidity, dust or foreign particles.
- Check to see that the DRC electronics cover was mounted properly.

Installing the electronics cover

- Use only electronics covers that match the size.
- Be careful not to tilt the electronics cover when placing it on the connection box.



Minimum installation clearance Note the minimum installation clearance (see following figure) required to remove the DRC electronics cover. For detailed dimension drawings, refer to chapter "Technical Data".



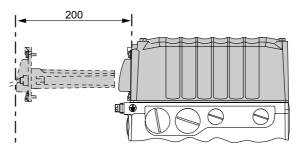




# **Mechanical installation** Setting up the drive unit

Min. installation clearance of application options

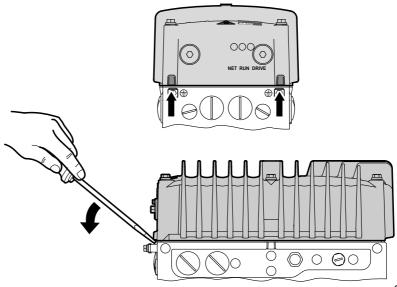
Note the minimum installation clearance (see following figure) required to install and remove the application options.



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Removing the electronics cover

The following figure shows how you can lever off the electronics cover in the intended places.



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#### 4.4.3 Installation in damp locations or in the open

Drives are supplied in corrosion-resistant versions for use in damp areas or in the open. Repair any damage to the paint work if necessary.

Observe the notes in chapter "Drive units with optional ASEPTIC / ASEPTIC plus design".

#### 4.4.4 Painting drive units

#### **NOTICE**

Breather valves and oil seals may be damaged during painting or re-painting.

Potential damage to property.

- Clean the surface of the drive unit and make sure it is free from grease.
- Thoroughly cover the breather valves and sealing lip of the oil seals with strips prior to painting.
- · Remove the strips after painting.





## 4.5 Application options



#### **▲** WARNING

Burns caused by hot surfaces.

Severe injuries.

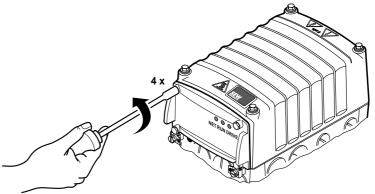
Let the units cool down before touching them.

#### 4.5.1 Removing the application cover

DRC drive units with application slot in the electronics cover are delivered with an application cover as standard.

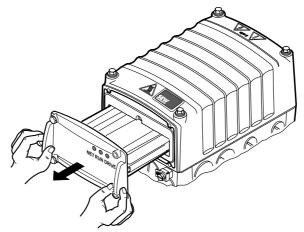
You have to remove the application cover in order to install an application option:

1. Loosen the 4 retaining screws.



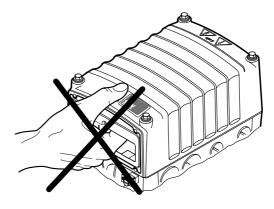
27021600114547979

2. Remove the application cover.



# Mechanical installation Application options

Never use the application slot as a handle when the application cover or application option is not installed.



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### 4.5.2 Installing application options

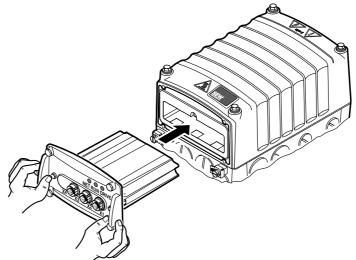
#### **NOTICE**



Loss of the guaranteed degree of protection.

Possible damage to property.

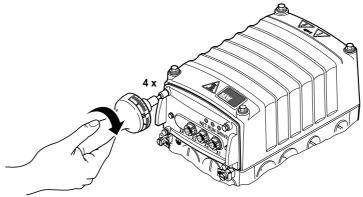
- In disassembled condition, you have to protect the GIO13 application option from moisture, dust or foreign particles as there are openings for DIP switches.
- Make sure that the application cover is mounted properly.
- 1. You have to remove the application cover or, depending on the design, the paint protector in order to install an application option:
- 2. Insert the option into the application slot.





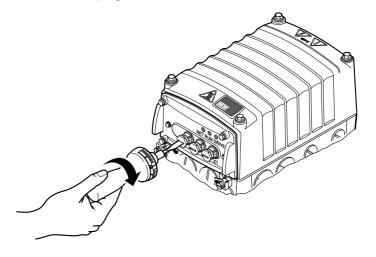


3. Secure the option with the 4 retaining screws. The permitted tightening torque for the retaining screws is 1.4 - 1.6 Nm.



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- 4. Use the provided screw plugs to seal the connectors that are not in use. The permitted tightening torque is:
  - Plastic screw plug: 2.0 to 2.4 Nm
  - Stainless steel screw plug: 2.0 to 2.4 Nm



# 4.6 Tightening torques



#### **A** WARNING

Burns caused by hot surfaces.

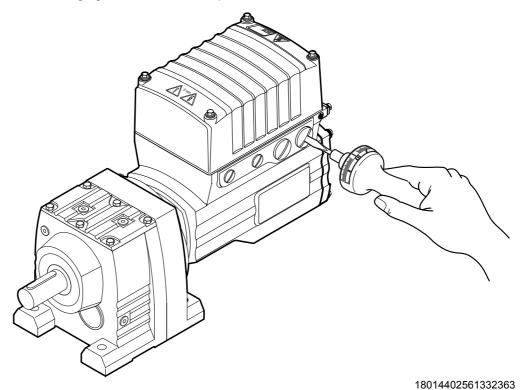
Severe injuries.

· Let the units cool down before touching them.

#### 4.6.1 Blanking plugs

Tighten the plastic blanking plugs included in the delivery with 2.5 Nm:

Example The following figure shows an example.







#### 4.6.2 Cable glands

Tightening torques

Tighten the EMC cable glands <u>optionally</u> supplied by SEW-EURODRIVE to the following torques:

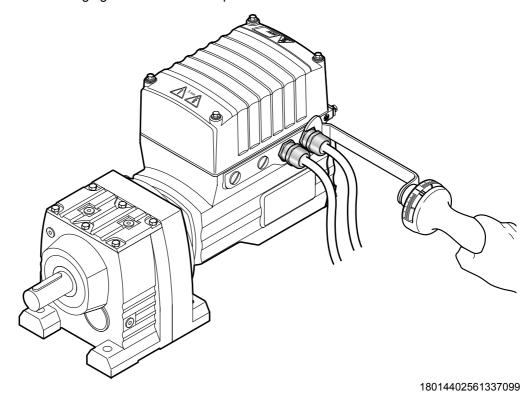
Screw fitting	Part num- ber	Contents	Size	Outer diameter of cable	Tightening torque
EMC cable glands (nickel-	1820 478 3	10 pc	M16 x 1.5	5 to 9 mm	4.0 Nm
plated brass)	1820 480 5	10 pc	M25 x 1.5	11 to 16 mm	7.0 Nm
EMC cable glands (stainless	1821 636 6	10 pc	M16 x 1.5	5 to 9 mm	4.0 Nm
steel)	1821 638 2	10 pc	M25 x 1.5	11 to 16 mm	7.0 Nm

The cable retention in the cable gland must withstand the following removal force of the cable from the cable gland:

- Cable with outer diameter > 10 mm: ≥ 160 N
- Cable with outer diameter < 10 mm: = 100 N

#### Example

The following figure shows an example.

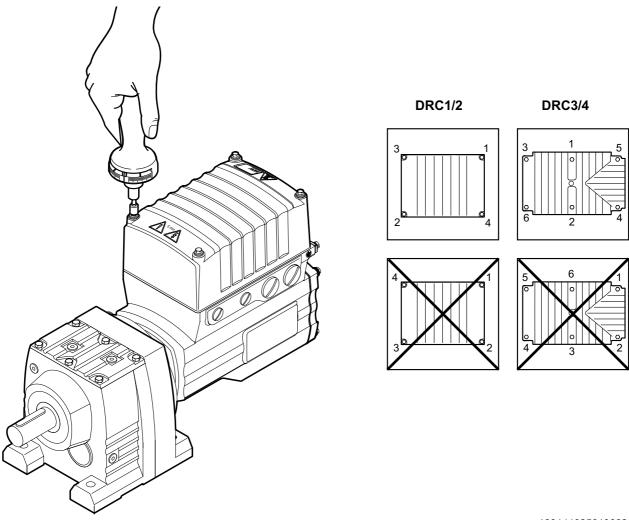




#### 4.6.3 DRC electronics cover

Proceed as follows when installing the DRC electronics cover: Insert the screws and tighten them with the tightening torque specified for that size according to the sequence shown in the picture below.

- DRC electronic motor size 1/2: 6.0 Nm
- DRC electronic motor size 3/4: 9.5 Nm







# 4.7 Drive units with optional ASEPTIC / ASEPTIC<sup>plus</sup> design

#### 4.7.1 Installation notes



#### NOTICE

Loss of degree of protection IP66 and incompatibility with cleaning agents.

Possible damage to property.

 Replace the optionally supplied plastic screw plugs with suitable stainless steel screw fittings.

Adhere to the following additional notes for DRC drive units in optional ASEPTIC / ASEPTIC<sup>plus</sup> design:

- Make sure to prevent moisture and dirt from entering the unit during installation.
- After electrical installation, make sure that the sealing and sealing surfaces are clean during assembly.
- When performing maintenance work, check the condition of the gaskets as well as the tightening torques of the screw fittings. If damaged: Consult SEW-EURODRIVE.
- When the electronics cover is opened after an operating period of ≥ 6 months, the
  gasket between the connection box and the electronics cover must always be replaced. For this purpose it is essential that you observe the chapter "Inspection and
  maintenance".
- Make sure to install the cables with a drip loop. Observe the permitted bending radii
  of the installed cables for cable routing.
- Use only stainless steel cable glands and connection glands offered by SEW-EURODRIVE, see chapter "Technical data and dimension sheets".
- You must seal unused cable bushings and plug connectors with suitable screw plugs, see chapter "Technical data and dimension sheets".

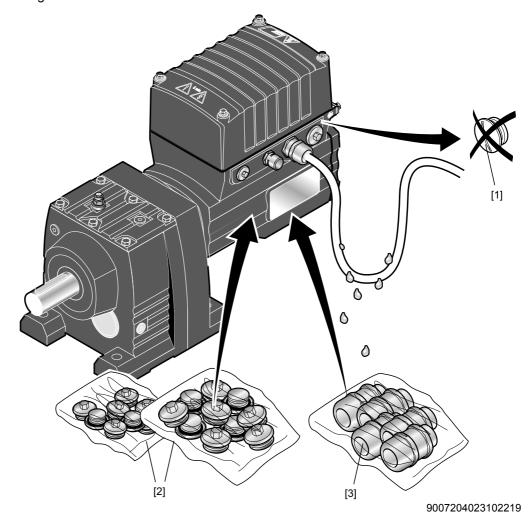


### **Mechanical installation**

# Drive units with optional ASEPTIC / ASEPTICplus design

Example

The following figure gives an example of a cable entry with drip loop and the replacement of the plastic screw plugs supplied as an option with suitable stainless steel screw fittings.



- [1] The optionally delivered plastic screw plugs must be replaced by suitable screw plugs made of stainless steel.
- [2] Stainless steel screw plugs, if required (see chapter "Technical data and dimension sheets")
- [3] Required stainless steel cable glands (see chapter "Technical data and dimension sheets")





### Mounting positions

DRC drive units in optional ASEPTIC / ASEPTIC<sup>plus</sup> design are delivered with pressure compensation and breather valve installed according to the mounting position.

This is why DRC drive units in optional ASEPTIC / ASEPTIC<sup>plus</sup> design must only be used in the mounting position specified in the order.

### · Permitted cable routing

The following cable entries are permitted for the ASEPTIC / ASEPTIC<sup>plus</sup> design depending on the mounting position and the position of the electronics cover:

Permitted cable routing			Position of electronics cover				
		0° (R)	90° (B)	180° (L)	270° (T)		
Gearmotor mounting posi-	M1	X/3	X/2/3	2/3	X/2/3		
tions	M2		X/2/3				
	М3	2/3	X/2/3	X/3	X/2/3		
	M4	X / 2					
	M5	X/2/3	2/3	X/2/3	X/3		
	М6	X/2/3	X/3	X/2/3	2/3		
Stand-alone motor mounting	B5	X/3	X/2/3	2/3	X/2/3		
positions	V1	X/2					
	V3		X / :	2/3			

· Permitted mounting options for the DAC electronics variant

Only the mounting positions marked in gray are permitted for the DAC electronics variant in connection with the ASEPTIC / ASEPTIC<sup>plus</sup> design depending on the position of the electronics cover.

Permitted mounting options for the DAC electronics variant		Position of electronics cover				
		0° (R)	90° (B)	180° (L)	270° (T)	
Gearmotor mounting positions	M1					
	M2					
	М3					
	M4					
	M5					
	М6					
Stand-alone motor mount-	B5					
ing positions	V1					
	V3					

• Restrictions in conjunction with GIO... application options

Application options cannot be used together with the ASEPTIC / ASEPTIC plus design in mounting position M4 (V1).



# 1

### **Mechanical installation**Drive units with optional ASEPTIC / ASEPTICplus design

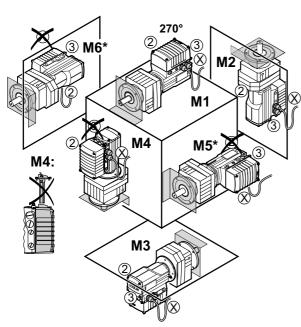
Mounting positions of ASEPTIC / ASEPTIC<sup>plus</sup> design The following figure shows the position of the DRC drive unit when installed in mounting positions M1 to M6:

# Position of electronics cover: 0° M4: M4: M3\* M3\*

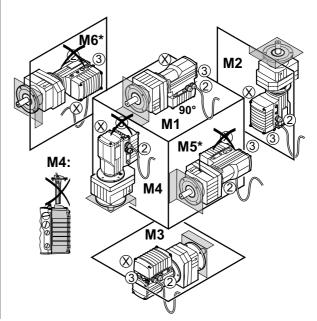
1807 3 M2 M4: M4: M5 M3\*

Position of electronics cover: 180°

Position of electronics cover: 270°



Position of electronics cover: 90°



18014403278065803

\* Mounting positions M5 and M6 in connection with the DAC electronics variant Design for wet areas not possible.

Application options in connection with the design for wet areas and M4 mounting position not possible.



**Mechanical installation** 



#### Tightening torques for optional ASEPTIC / ASEPTIC<sup>plus</sup> design 4.7.2



### **▲ WARNING**

Burns caused by hot surfaces.

Severe injuries.

Let the units cool down before touching them.

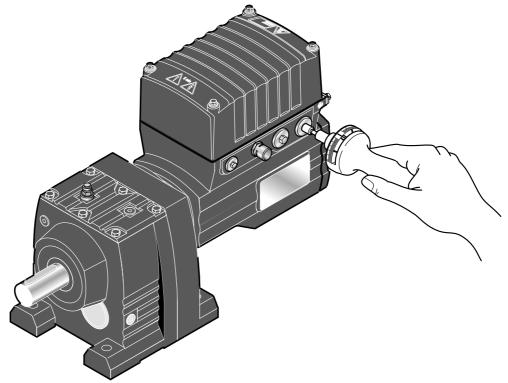
Blanking plugs

Tighten the blanking plugs optionally included in the delivery by SEW-EURODRIVE with 6.8 Nm:

Type of screw fitting	Contents	Size	Part number	Tightening torque
Screw plugs	10 pc	M16 x 1.5	1 824 734 2	6.8 Nm
Hexagon (made of stainless steel)	10 pcs	M25 x 1.5	1 824 735 0	6.8 Nm

Example

The following figure shows an example. The number and position of cable entries depends on the variant you have ordered.





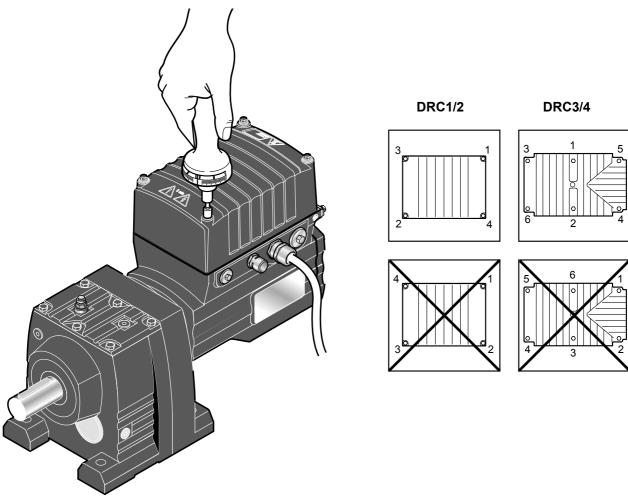
### Mechanical installation

### Drive units with optional ASEPTIC / ASEPTICplus design

DRC electronics cover

Proceed as follows when installing the DRC electronics cover: Insert the screws and tighten them with the tightening torque specified for that size according to the sequence shown in the picture below.

- DRC electronic motor size 1/2: 6.0 Nm
- DRC electronic motor size 3/4: 9.5 Nm





### Mechanical installation Drive units with optional ASEPTIC / ASEPTICplus design



### EMC cable glands

Tighten the EMC cable glands <u>optionally</u> included in the delivery by SEW-EURODRIVE with the following tightening torques:

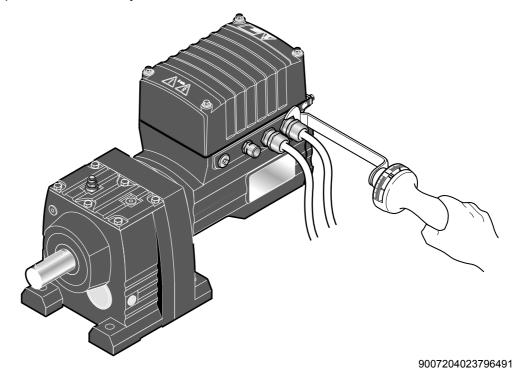
Screw fitting	Part num- ber	Contents	Size	Outer diameter of cable	Tightening torque
EMC cable glands (nickel-	1820 478 3	10 pcs	M16 x 1.5	5 to 9 mm	4.0 Nm
plated brass)	1820 480 5	10 pcs	M25 x 1.5	11 to 16 mm	7.0 Nm
EMC cable glands (stainless	1821 636 6	10 pcs	M16 x 1.5	5 to 9 mm	4.0 Nm
steel)	1821 638 2	10 pcs	M25 x 1.5	11 to 16 mm	7.0 Nm

The cable retention in the cable gland must withstand the following removal force of the cable from the cable gland:

- Cable with outer diameter > 10 mm: ≥ 160 N
- Cable with outer diameter < 10 mm: = 100 N</li>

### Example

The following figure shows an example. The number and position of cable entries depends on the variant you have ordered.



### Elec Insta

### Electrical installation

Installation planning considering EMC aspects

### 5 Electrical installation



### **INFORMATION**

Adhere to the safety notes during installation.

### 5.1 Installation planning considering EMC aspects

### 5.1.1 Notes on arranging and routing installation components

Successful installation of decentralized drives depends on selecting the correct cables, providing correct grounding and a functioning equipotential bonding.

Always apply the relevant standards.

Note the following:

### 5.1.2 EMC-compliant installation



### **INFORMATION**

This drive system is not designed for operation on a public low voltage supply system that supplies residential areas.

This is a product with restricted availability in accordance with IEC 61800-3. This product may cause EMC interference. In this case, it is recommended for the operator to take suitable measures.

For detailed information on EMC compliant installation, refer to the publication "Electromagnetic Compatibility in Drive Engineering" from SEW-EURODRIVE.

With respect to the EMC regulation, frequency inverters and compact drives cannot be seen as stand-alone units. They can only be evaluated in terms of EMC when they are integrated in a drive system. Conformity is declared for a described, CE-typical drive system. These operating instructions contain further information about this topic.

### 5.1.3 Cable selection, routing and shielding



### **WARNING**

Electric shock caused by faulty installation.

Severe or fatal injuries.

- Take the utmost care when installing the units.
- · Observe the connection examples.

For more information on cable selection, routing and shielding, refer to chapter "Cable routing and shielding".

### 5.1.4 Equipotential bonding

Regardless of the protective earth connection, it is essential that **low-impedance**, **HF-capable equipotential bonding** is provided (see also EN 60204-1 or DIN VDE 0100-540):

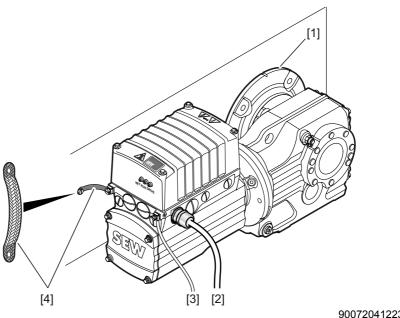
 Establish a connection over a wide surface area between the DRC drive unit and the mounting rail.





To do so, use a ground strap (HF litz wire), for example, to connect the DRC drive unit and the plant's grounding point.

### Example



- [1] Conductive connection over a large area between drive unit and mounting plate
- [2] PE conductor in the supply cable
- [3] 2. PE conductor via separate terminals
- [4] EMC-compliant equipotential bonding, for example using a ground strap (HF litz wire)
- Do not use the cable shield of data lines for equipotential bonding.



### 5.2 Installation instructions

### 5.2.1 Connecting power supply cables

- The rated voltage and rated frequency of the DRC drive unit must correspond with the data of the power supply system.
- Cable cross section: According to input current I<sub>line</sub> at rated power (see chapter "Technical data and dimension sheets").
- Install line fuses at the beginning of the power supply cable behind the supply bus junction. Select the fuse size according to the cable cross section.
- Use only copper cables with a minimum temperature range of 85 °C as connection cable.
- DRC drive units are intended to be operated on voltage supply systems with grounded star point (TN and TT systems).

### 5.2.2 Permitted cable cross section of terminals

Line terminals

Adhere to the permitted cable cross sections for installation:

Line terminals X2	without conductor end sleeve	with conductor end sleeve (with or without insulating shroud)			
Connection cross section (mm²)	0.5 mm <sup>2</sup> – 10 mm <sup>2</sup>	0.5 mm <sup>2</sup> – 6 mm <sup>2</sup>			
Connection cross section (AWG)	AWG20 – AWG8	AWG20 – AWG10			
Stripping length	13 mm – 15 mm				
Current carrying capacity	24 A (max. loop-through current)				

### External braking resistor terminals

Adhere to the permitted cable cross sections for installation:

External braking resistor terminals X5	without conductor end sleeve	with conductor end sleeve (with or without insulating shroud)		
Connection cross section (mm²)	$0.08 \text{ mm}^2 - 4.0 \text{ mm}^2$	0.25 mm <sup>2</sup> – 2.5 mm <sup>2</sup>		
Connection cross section (AWG)	AWG28 – AWG12	AWG 23 – AWG 14		
Stripping length	8 mm – 9 mm			

### Control terminals

Adhere to the permitted cable cross sections for installation:

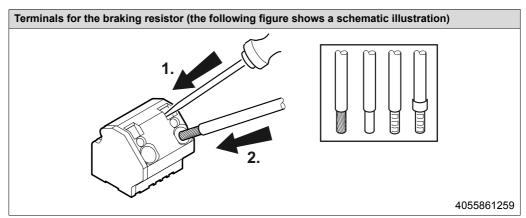
Control terminals X7	without conductor end sleeve	with conductor end sleeve (without insulating shroud)	with conductor end sleeve (with insulat- ing shroud)		
Connection cross section (mm²)	0.08 mm <sup>2</sup>	0.25 mm <sup>2</sup> – 1.5 mm <sup>2</sup>			
Connection cross section (AWG)	AWG 28 -	AWG 23 – AWG 16			
Stripping length	5 mm – 6 mm				
Current carrying capacity	3.5 A (max. loop-through current)				





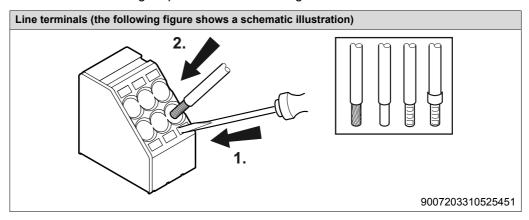
### 5.2.3 Terminal activation for the braking resistor

Adhere to the following sequence when activating the terminals for the braking resistor:



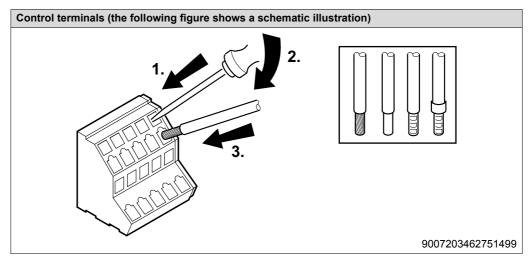
### 5.2.4 Line terminal actuation

Adhere to the following sequence when activating the line terminals:



### 5.2.5 Control terminal actuation

Adhere to the following sequence when activating the control terminals:





### 5.2.6 Line protection and residual current device (RCD or RCM)

### **▲** WARNING



Electric shock due to incorrect RCD type

Severe or fatal injuries.

- The connected DRC drive units can cause direct current in the protective earth conductor. In cases where an earth-leakage circuit breaker is used for protection against direct or indirect contact, only a type B earth-leakage circuit breaker is permitted on the power supply side of DRC drive units.
- Install the fuses at the beginning of the power supply cables behind the supply bus junction.
- A conventional residual current device is not permitted. RCDs sensitive to universal current are permitted. During normal operation of DRC, earth-leakage currents of > 3.5 mA can occur.
- SEW-EURODRIVE recommends to not use residual current devices. However, if a residual current device is stipulated for direct or indirect protection against contact, observe the above note.

#### 5.2.7 Line contactor



### NOTICE

Damage to the DRC inverter due to jogging of the line contactor.

Damage to the DRC inverter.

- Do not use the line contactor (see wiring diagram) for jog mode but only for switching the inverter on and off. For jog mode, use the control commands.
- Observe a minimum switch-off time of 2 s for the line contactor.
- Use only a contactor of utilization category AC3 (EN 60947-4-1) as a line contactor.





#### 5.2.8 Notes on PE connection



### **▲ WARNING**

Electric shock due to incorrect connection of PE.

Severe or fatal injuries.

- The permitted tightening torque for the screw is 2.0 2.4 Nm (18 21 lb.in).
- Observe the following notes regarding PE connection.

Prohibited assembly	Recommendation: Assembly with forked cable lug Permitted for all cross sections	Assembly with solid connecting wire Permitted for cross sections up to Max. 2.5 mm <sup>2</sup>
	M5	≤ 2.5 mm²
9007201632452235	9007201632429067	9007201632413579

[1] Forked cable lug suitable for M5 PE screws

Earth-leakage currents ≥ 3.5 mA may occur during normal operation. To meet the requirements of EN 61800-5-1, observe the following notes:

- The protective earth (PE) connection must meet the requirements for plants with high earth-leakage currents.
- This usually means
  - installing a PE connection cable with a minimum cross section of 10 mm<sup>2</sup>
  - or installing a second PE connection cable in parallel with the original PE connection.



#### 5.2.9 Installation above 1000 m asl

You can install DRC drive units at altitudes from 1000 m to a maximum of 4000 m above sea level<sup>1)</sup> provided the following conditions are met:

- The nominal continuous power is reduced due to the reduced cooling above 1000 m (see chapter "Technical data and dimension sheets").
- Above 2000 m above sea level, the air and creeping distances are only sufficient for overvoltage category II. If the installation requires overvoltage category III, you will have to install additional external overvoltage protection to limit overvoltage peaks to 1.5 kV phase-to-phase and 2.5 kV phase-to-ground.
- If safe electrical disconnection is required, it must be implemented outside the unit for altitudes of 2000 m above sea level and higher (safe electrical disconnection in accordance with EN 61800-5-1).
- At installation altitudes between 2000 m and 4000 m above sea level, the permitted rated power supply voltages are reduced as follows:
  - By 6 V per 100 m

#### 5.2.10 Protection devices

- DRC drive units are equipped with integrated protection devices against overload.
- Cable protection must be implemented using external overload devices.
- Observe the relevant standards concerning cable cross section, voltage drop and installation type.



#### **INFORMATION**

It is essential that you adhere to the installation instructions in the documentation of the controller you use.

<sup>1)</sup> The maximum altitude is limited by the reduced electric strength due to the lower air density.





### 5.2.11 UL-compliant installation



### **INFORMATION**

Due to UL requirements, the following chapters are always printed in English independent of the language of the publication:

#### Power terminals

Observe the following notes for UL-compliant installation:

- Use 75 °C copper wire only.
- · DRC uses cage clamp terminals

### Short circuit current rating

Suitable for use on a circuit capable of delivering not more than 200,000 rms symmetrical amperes when protected by 40 A, 600 V non-semiconductor fuses or 500 V minimum 40 A maximum inverse time circuit breakers.

DRC, the max. voltage is limited to 500 V.

### 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.

The table below lists the permitted maximum branch circuit protection:

Series	Non-semiconductor fuses	Inverse time circuit breakers
DRC	40 A / 600 V	500 V minimum / 40 A maximum

### Motor overload protection

The DRC motor is provided with load and speed-sensitive overload protection and thermal memory retention upon shutdown or power loss.

The trip current is adjusted to 150% of the rated motor current.

### Ambient temperature

The DRC motor is suitable for an ambient temperature of 40 °C, max. 60 °C with derated output current. To determine the output current rating at temperatures above 40 °C, the output current should be derated by 3.0% per K between 40 °C and 60 °C.

#### Wiring diagrams

For wiring diagrams, refer to chapter "Electrical installation".



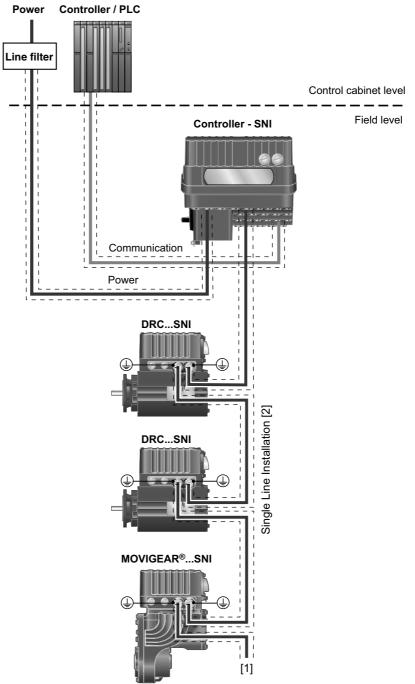
### 5.3 Installation topology (example)

### i

### **INFORMATION**

The following figure shows a basic installation topology with DRC-SNI.

Observe the installation instructions in the documentation of the controller you are using.



- [1] A maximum of 10 SNI actuators in total
- [2] Permitted cable length between controller and last actuator max. 100 m





### 5.4 Terminal assignment of DRC1/2

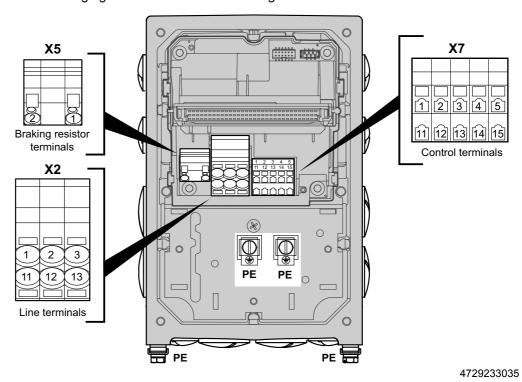


### **A WARNING**

Electric shock due to regenerative operation while turning the shaft. Severe or fatal injuries.

• Secure the output shaft against rotation when the electronics cover is removed.

The following figure shows the terminal assignment of DRC1/2-SNI:



Assignment				
Terminal	No	Name	Marking	Function (permitted tightening torque)
X2 line	1	L1	brown	Actuator supply phase L1 with SNI communication – IN
terminals	2	L2	Black	Actuator supply phase L2 with SNI communication – IN
	3	L3	Gray	Actuator supply phase L3 with SNI communication – IN
	11	L1	brown	Actuator supply phase L1 with SNI communication – OUT
	12	L2	Black	Actuator supply phase L2 with SNI communication – OUT
	13	L3	Gray	Actuator supply phase L3 with SNI communication – OUT
<b>(1)</b>	_	PE	_	Protective earth connection (2.0 to 3.3 Nm )
X5 braking	1	BW	_	Braking resistor connection
resistor ter- minals	2	BW	-	Braking resistor connection



### **INFORMATION**

The communication method requires that you must observe the order of the line phases L1, L2, L3 between SNI controller and SNI stations 1 to 10.



### **Electrical installation**Terminal assignment of DRC1/2

Assignment				
Terminal	No	Name	Marking	Function
X7 control	1	STO+	Yellow	Input STO +
terminals	2	STO -	Yellow	Input STO –
	3	+24 V_SEN	-	Input for DC 24 V voltage supply for sensors The sensor supply voltage is then available at the optional plug connector
	4	0V24_SEN	_	Input for 0V24 reference potential for sensors
	5	24V_O	_	DC 24 V output
	11	STO+	Yellow	Output STO + (to loop through)
	12	STO -	Yellow	Output STO – (to loop through)
	13	+24 V_SEN	_	Looping through of the DC 24 V voltage supply for sensors
	14	0V24_SEN	_	Looping of the 0V24 reference potential for sensors
	15	0V24_O	_	0V24 reference potential output





### 5.5 Terminal assignment of DRC3/4

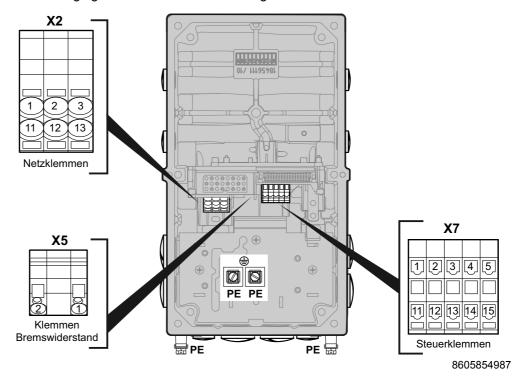


### **▲** WARNING

Electric shock due to regenerative operation while turning the shaft. Severe or fatal injuries.

• Secure the output shaft against rotation when the electronics cover is removed.

The following figure shows the terminal assignment of DRC3-SNI:



Assignment				
Terminal	No	Name	Marking	Function (permitted tightening torque)
X2 line	1	L1	Brown	Actuator supply phase L1 with SNI communication – IN
terminals	2	L2	Black	Actuator supply phase L2 with SNI communication – IN
	3	L3	Gray	Actuator supply phase L3 with SNI communication – IN
	11	L1	Brown	Actuator supply phase L1 with SNI communication – OUT
	12	L2	Black	Actuator supply phase L2 with SNI communication – OUT
	13	L3	Gray	Actuator supply phase L3 with SNI communication – OUT
<b>(1)</b>	_	PE	-	Protective earth connection (2.0 to 3.3 Nm )
X5 braking	1	BW	-	Braking resistor connection
resistor ter- minals	2	BW	_	Braking resistor connection

### INFORMATION



The communication method requires that you must observe the order of the line phases L1, L2, L3 between SNI controller and SNI stations 1 to 10.





### **Electrical installation**Terminal assignment of DRC3/4

Assignment				
Terminal	No	Name	Marking	Function
X7 control	1	STO +	Yellow	Input STO +
terminals	2	STO -	Yellow	Input STO –
	3	+24 V_SEN	_	Input for DC 24 V voltage supply for sensors The sensor supply voltage is then available at the optional plug connector
	4	0V24_SEN	_	Input for 0V24 reference potential for sensors
	5	24V_O	_	DC 24 V output
	11	STO+	Yellow	Output STO + (to loop through)
	12	STO -	Yellow	Output STO – (to loop through)
	13	+24 V_SEN	_	Looping through of the DC 24 V voltage supply for sensors
	14	0V24_SEN	_	Looping of the 0V24 reference potential for sensors
	15	0V24_O	_	0V24 reference potential output





### 5.6 Connecting DRC drive units

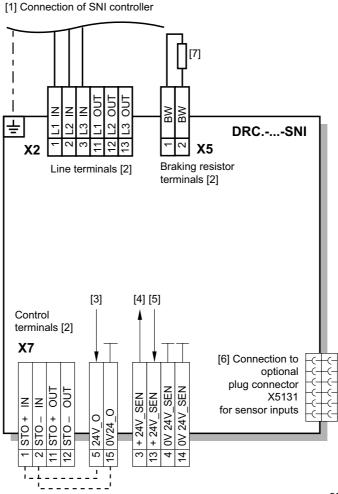
### **▲ WARNING**

No safe disconnection of the DRC drive unit.



Severe or fatal injuries.

- Do not use the 24 V output (terminals 5, 15,) for safety-related applications with DRC drive units.
- You may only jumper the STO input with 24 V when the DRC drive unit need not fulfill any safety function.



- [1] See documentation of the SNI controller
- [2] See chapter "Terminal assignment"
- [3] DC 24 V output
- [4] Sensor supply input, the sensor supply voltage is then available at the optional plug connector for sensor inputs
- [5] Looping of the sensor supply input
- [6] See chapter "Optional plug connector assignment"
- [7] Braking resistor connection



## Electrical installation Cable routing and shielding

### 5.7 Cable routing and shielding

### 5.7.1 Installation material kit (part no. 1 824 826 8)

Each DRC drive unit<sup>1)</sup> is delivered with an accessory bag that contains installation material for cable shielding:

### • A1: Installation material for line cables and hybrid cables:

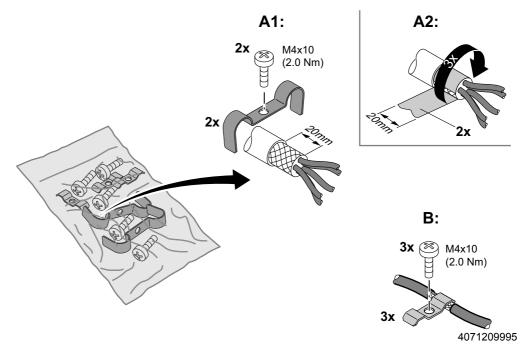
2 x shield clamps and screws<sup>2)</sup> to connect the shield of line cables or hybrid cables (outer shield).

### · A2: Conductive film:

2 x pieces of conductive film to wind around the braid shield. Use the conductive film if required.

#### · B: Installation material for control cables and data cables:

3 x shield clamp with screw<sup>2)</sup> to connect the shield of control cables or data cables (STO, CAN, binary signals).



### **INFORMATION**

For some installation variants, you do not need all the parts of the accessory kit.



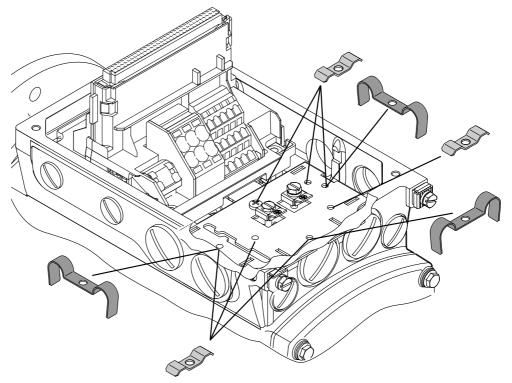
<sup>2)</sup> Self cutting, which is why the holes in the connection box do not have a thread.





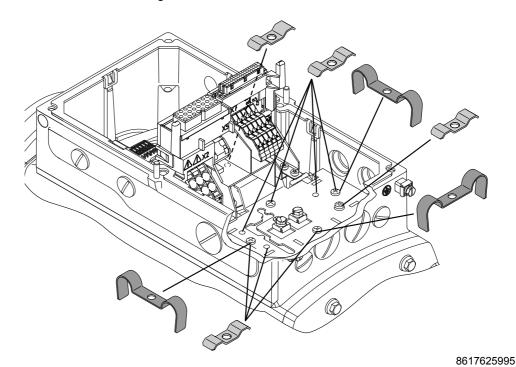
### 5.7.2 Basic mounting options for DRC1/2

The following figure shows the possible mounting options for the DRC1/2 electronics motor. The following chapters show common examples and contain important notes on cable selection and routing.



### 5.7.3 Basic mounting options for DRC3/4

The following figure shows the possible mounting options for the DRC3/4 electronics motor. The following chapters show common examples and contain important notes on cable selection and routing.







### 5.7.4 Notes on cable routing and shielding

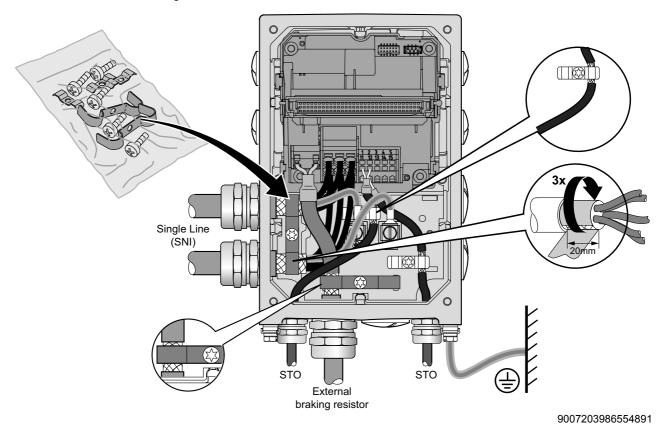
Note the following when routing and shielding the cables:

- · Cable selection
  - Only use cable types prescribed by SEW-EURODRIVE.
  - It is essential that you observe chapter "Technical data and dimension sheets / Specification of recommended connection cables for single line installation" in the operating instructions.
  - Always use metal cable glands due to their attenuation properties.
  - Use shielded cables for the optional external braking resistor.
  - The shield must have good EMC properties (high shield attenuation) and must not be used for mechanical protection of the cable.
- · Cable shielding Control cables
  - Connect the shields of the control cables to the metal housing of the unit using the shield clamps of the installation material kit. To do so, strip off the cable sheath around the shield connection surface.
  - As an alternative, you can use optionally available EMC cable glands to connect the shield of control cables, see chapter "EMC cable glands".
- Cable shield external braking resistor
  - Connect the cable shield of the cable for an external braking resistor to the metal housing of the unit using the shield clamps of the installation material kit. To do so, strip off the cable sheath around the shield connection surface.
- Cable shielding Supply system cable (single line)
  - Wind the conductive film included in the installation material kit around the braid shield three times, if required.
  - Connect the cable shields of the supply system cable (single line) to the metal housing of the unit using the shield clamps of the installation material kit.
- · Observe the permitted bending radii of the installed cables for cable routing.



# Electrical installation Cable routing and shielding

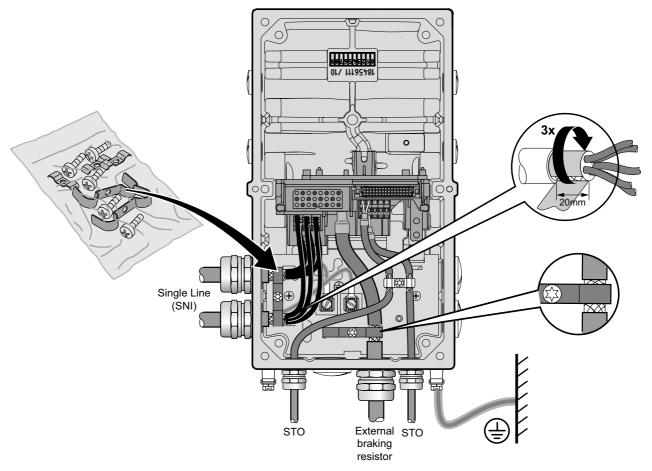
### Recommended cable routing for DRC1/2





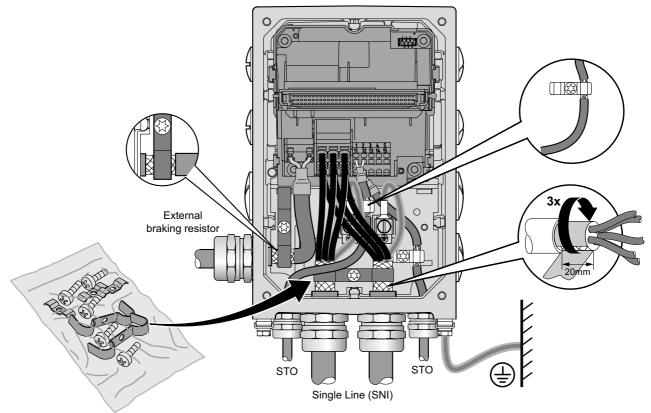


### Recommended cable routing for DRC3/4



# Electrical installation Cable routing and shielding

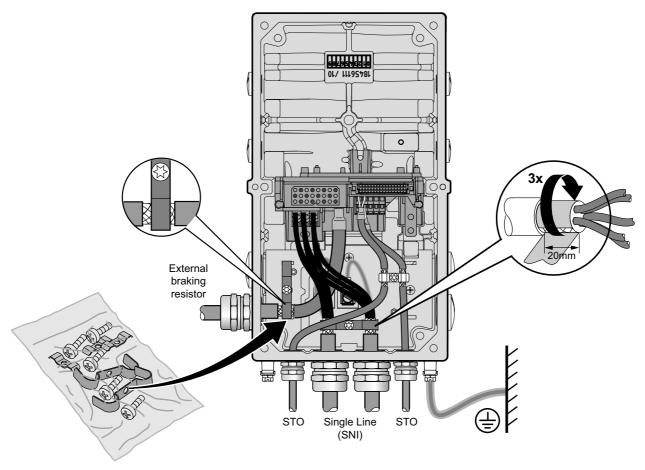
### Alternative cable routing for DRC1/2







### Alternative cable routing for DRC3/4

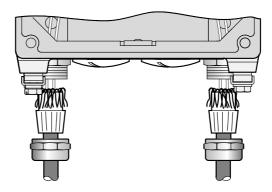


### Electrical installation EMC cable glands

### 5.8 EMC cable glands

### 5.8.1 Cable shielding (alternative) – control cables

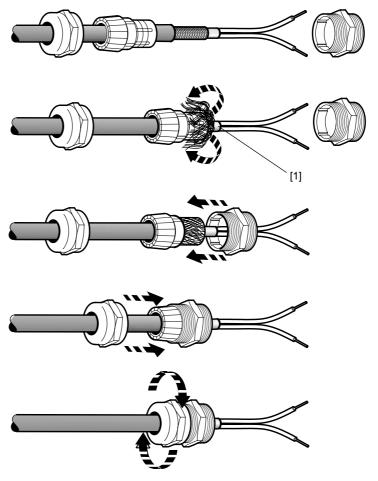
As an alternative to using shield clamps for control cables (STO, binary signals), you can use EMC cable glands, which are available as an option, to connect the shield.



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### 5.8.2 Assembly of EMC cable glands

Fit the EMC cable glands supplied by SEW-EURODRIVE according to the following figure:



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[1] Important: Cut off the insulating foil, do not just fold it back.





### 5.9 Required power leads

The following table shows the available SNI supply system cables:

SNI supply system cable				
Lengths that can be preassembled	Conformity / part number	Cable type 1)	Length/ Installation type	Cable cross-sec- tion / oper- ating voltage
Cable reel 30 m Cable reel 100 m Cable reel 200 m  Open cable end (not prefabricated)	CE: 1 330 330 9	HELU-KABEL TOPFLEX® – EMV-UV- 2YSLCYK-J	Fixed	
Cable reel 30 m Cable reel 100 m Cable reel 200 m  Open cable end (not prefabricated)	UL: 1 909 215 6	HELU-KABEL TOPFLEX® – EMV-UV- 2YSLCYK-J- UL/CSA	Fixed	2.5 mm <sup>2</sup> / AC 500 V
Cable reel 30 m Cable reel 100 m Cable reel 200 m  Open cable end (not prefabricated)	CE/UL: 1 909 509 0	HELU-KABEL TOPSERV <sup>®</sup> – 109	Fixed	

### Electrical installation Required power leads

SNI supply system cable				
Lengths that can be preassembled	Conformity / part number	Cable type 1)	Length/ Installation type	Cable cross-sec- tion / oper- ating voltage
Cable reel 30 m Cable reel 100 m Cable reel 200 m  Open cable end (not prefabricated)	CE: 1 330 550 6	HELU-KABEL TOPFLEX® – EMV-UV- 2YSLCYK-J	Fixed	
Cable reel 30 m Cable reel 100 m Cable reel 200 m  Open cable end (not prefabricated)	UL: 1 909 216 4	HELU-KABEL TOPFLEX® – EMV-UV- 2YSLCYK-J- UL/CSA	Fixed	4 mm <sup>2</sup> / AC 500 V
Cable reel 30 m Cable reel 100 m Cable reel 200 m  Open cable end (not prefabricated)	CE/UL: 1 909 510 4	HELU-KABEL TOPSERV® – 109	Fixed	

<sup>1)</sup> See also technical data



### **INFORMATION**

You find more permitted SNI cables (e.g. for UL-compliant installation) in the technical data / "Required connection cables for single line installation" chapter.

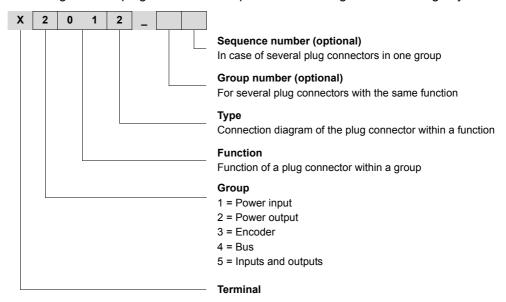


### 5.10 Plug connectors

The wiring diagrams of the plug connectors depict the contact end of the connection.

### 5.10.1 Designation key

The designation of plug connectors is specified according to the following key:



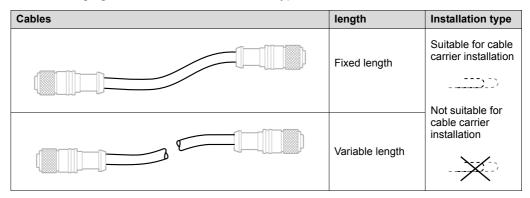
#### 5.10.2 Connection cable

Connection cables are not included in the scope of delivery.

You can order prefabricated cables from SEW-EURODRIVE. They are described in the following sections. Specify the part number and length of the required cable in your order.

The number and type of required connection cables depend on the design of the units and the components to be connected. This is why not all cables in the list are actually required.

The following figures show the various cable types:



Cable routing

Observe the permitted bending radii of the installed cables for cable routing. For detailed information, refer to chapter "Technical data / Dimension sheets / Plug connectors including mating connectors".



### **Electrical installation**Plug connectors

Cable types



#### **INFORMATION**

For detailed information about cable types, see chapter "Technical data and dimension sheets".

Use of prefabricated cables with plug connectors

SEW-EURODRIVE uses prefabricated cables for certifications, type tests and approval of the units. The cables available from SEW-EURODRIVE meet all the requirements necessary for the functions of the unit and the connected components. The units under consideration are always the basic units including all connected components and corresponding connection cables.

This is why SEW-EURODRIVE recommends to use only the prefabricated cables specified in the documentation.

When using units with integrated safety functions according to EN ISO 13849, you also have to adhere to all the conditions and requirements for the installation and routing of cables described in the documentation for the units concerning functional safety.

Use of third-party cables with plug connectors

If third-party cables are used – even if these cables are technically adequate – SEW-EURODRIVE does not accept any liability and cannot guarantee unit properties or functions.

When using third-party cables to connect the unit and/or unit components, make sure to comply with all applicable national regulations. Note that the technical features of the unit or system of units might be affected inadvertently when using non-SEW cables. This concerns in particular the following properties:

- Mechanical properties (such as IP degree of protection, cable carrier suitability)
- Chemical properties (such as the absence of silicone and halogen, resistance against substances)
- Thermal properties (e.g. temperature stability, heating of the unit, flammability class)
- EMC behavior (such as interference emission limit values, compliance with interference immunity values stipulated in standards)
- Functional safety (approvals according to EN ISO 13849-1)

Third-party cables not explicitly recommended by SEW-EURODRIVE must meet at least the requirements of the following standards and have been permitted according to these plug connector standards:

- IEC 60309
- IEC 61984

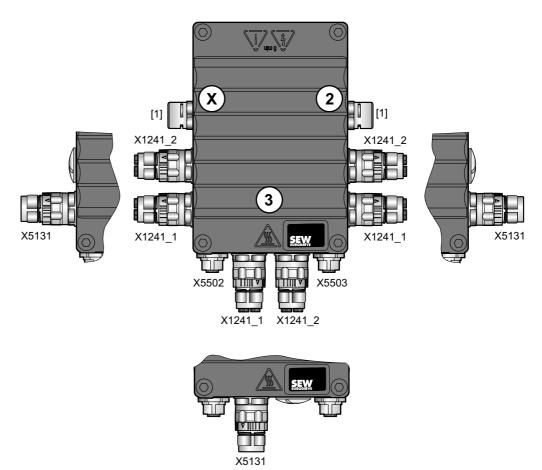


### 5.10.3 Plug connector positions

The following figure shows possible plug connector positions. A difference is made between plug connectors with selectable position and plug connectors with fixed position:

Plug connector	Color	Position	Position
X5131: Digital inputs/outputs	_	As required	X, 2 or 3, not together with X1241_1, X1241_2
X5502: STO	Orange	Fixed	3 (left)
X5503: STO	Orange	Fixed	3 (right)
X1241_1: AC 400 V connection with SNI	Red	As required	X, 2 or 3, not together with X5131
X1241_2: AC 400 V connection with SNI	Red	As required	X, 2 or 3, not together with X5131
[1] Optional pressure compensation	_	Fixed	Depends on mounting position

1) Plug connector X1241\_1 is also available separately (i.e. without plug connector X1241\_2).

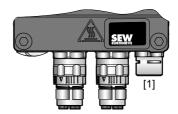




# Electrical installation Plug connectors

### 5.10.4 Restrictions in conjunction with pressure compensation

In connection with optional pressure compensation and mounting positions M5 and M6, the position for the STO plug connectors is occupied by the pressure compensation fitting [1]. In this case, plug connectors for STO are not possible:



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### 5.10.5 Plug connector variant



### **A** CAUTION

Possible damage of the right-angle connector in case of rotation without mating connector.

Irreparable damage to the thread, damage to the sealing surface.

Do not use pliers to adjust the right-angle connector before connecting it.



### **A** CAUTION

Adjusting the right-angle connector too often can damage it.

Potential damage to property

- Adjust the plug connector only when installing and connecting the drive unit.
- Do not turn the plug connector regularly once it has been installed.

The following M23 plug connectors are available:

- [1] "Straight" plug connector
- [2] "Right-angle" plug connector

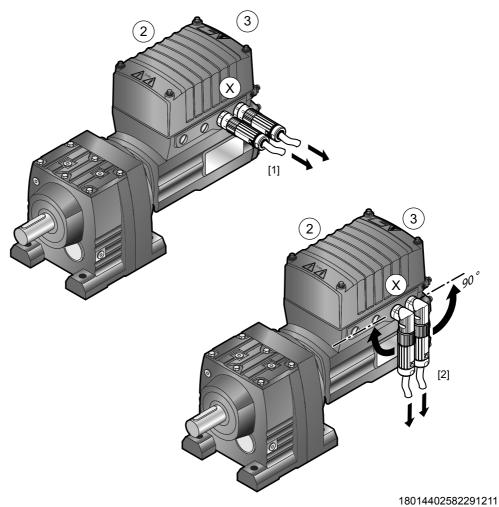
Once the mating connector has been plugged in, the "right-angle" connector can be adjusted without using additional tools.



### Electrical installation Plug connectors



### Example



10014402302291211

### i

### **INFORMATION**

The plug connector option "right-angle" cannot be used with DRC1 to DRC4 electronic motors in connection with plug connector position 3.

### 5.10.6 Using plug connectors assembled by yourself



### **INFORMATION**

Power and hybrid plug connectors as well as the associated assembly tools are also available from Intercontec.

# Electrical installation Assignment of optional plug connectors

### 5.11 Assignment of optional plug connectors



### **▲ WARNING**

Electric shock when disconnecting or connecting voltage-carrying plug connectors.

Severe or fatal injuries

- Switch off the power supply voltage.
- Never plug or unplug plug connectors while they are energized.

### 5.11.1 X1241\_1 and X1241\_2: AC 400 V connection with SNI

The following table shows information about this connection:

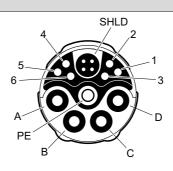
#### Function

AC 400 V connection for supplying the unit/for looping through With Single Line Network Installation (SNI)

#### **Connection type**

M23, SEW insert, SpeedTec equipment, Intercontec, female, coding ring: red, protected against contact

### Wiring diagram



2497125387

Assignment		
No.	Name	Function
Α	L1_SNI	Actuator supply phase L1 with SNI communication
В	L2_SNI	Actuator supply phase L2 with SNI communication
С	L3_SNI	Actuator supply phase L3 with SNI communication
D	n.c.	Not connected
PE	PE	PE connection
1	n.c.	Not connected
2	n.c.	Not connected
3	n.c.	Not connected
4	n.c.	Not connected
5	n.c.	Not connected
6	n.c.	Not connected
7	n.c.	Not connected
8	n.c.	Not connected
9	n.c.	Not connected
10	n.c.	Not connected
SHLD	n.c.	Not connected



### **INFORMATION**

The communication method requires that you must observe the order of the line phases L1, L2, L3 between SNI controller and SNI stations 1 to 10.



#### **Electrical installation**

### Assignment of optional plug connectors



#### Connection cable

The following table provides an overview of the cables available for this connection:

Connection cable	Confor- mity / part number	Cable type See also technical data	Length/ Installa- tion type	Cable cross-section / operating voltage
	CE: 18127509	HELU- KABEL <sup>®</sup> TOPFLEX <sup>®</sup> – EMV-UV- 2YSLCYK-J	Variable	
M23, M23, Coding ring: red ring: red	UL: 18150381	HELU- KABEL® TOPFLEX® – EMV-UV- 2YSLCYK- J-UL/CSA	Variable	2.5 mm <sup>2</sup> / AC 500 V
9	CE/UL: 1 812 067 9	HELU- KABEL <sup>®</sup> TOPSERV <sup>®</sup> – 109	Variable	
	CE: 1 812 751 7	HELU- KABEL <sup>®</sup> TOPFLEX <sup>®</sup> – EMV-UV- 2YSLCYK-J	Variable	
Open M23, Coding ring: red	UL: 1 815 040 3	HELU- KABEL <sup>®</sup> TOPFLEX <sup>®</sup> - EMV-UV- 2YSLCYK- J-UL/CSA	Variable	2.5 mm <sup>2</sup> / AC 500 V
9	CE/UL: 1 812 068 7	HELU- KABEL <sup>®</sup> TOPSERV <sup>®</sup> – 109	Variable	
	CE: 1 812 752 5	HELU- KABEL <sup>®</sup> TOPFLEX <sup>®</sup> – EMV-UV- 2YSLCYK-J	Variable	
M23, M23, Coding ring: red ring: red	UL: 1 815 041 1	HELU- KABEL® TOPFLEX® – EMV-UV- 2YSLCYK- J-UL/CSA	Variable	4 mm <sup>2</sup> / AC 500 V
· ·	CE/UL: 1 812 069 5	HELU- KABEL® TOPSERV® – 109	Variable	
	CE: 18127533	HELU- KABEL <sup>®</sup> TOPFLEX <sup>®</sup> – EMV-UV- 2YSLCYK-J	Variable	
Open M23, Coding ring: red	UL: 1 815 325 9	HELU- KABEL® TOPFLEX® – EMV-UV- 2YSLCYK- J-UL/CSA	Variable	4 mm <sup>2</sup> / AC 500 V
J. T.	CE/UL: 1 812 070 9	HELU- KABEL <sup>®</sup> TOPSERV <sup>®</sup> – 109	Variable	



Connection of cables with open end

The following table shows the conductor assignment of the cable with the following part number:

Part number	Signal name	Color coding
1 812 751 7	L1_SNI	Brown
1 815 040 3	L2_SNI	Black
1 812 753 3	L3_SNI	Gray
1 815 325 9	PE	Green/yellow

Part number	Signal name	Core color/designation
	L1_SNI	Black / 1
1 812 068 7 1 812 070 9	L2_SNI	Black / 2
	L3_SNI	Black / 3
	PE	Green/yellow





#### 5.11.2 X5131: Digital inputs/outputs

The following table shows information about this connection:

Function	
Digital inputs/outputs for DRC MotionControl	
Connection type	
M23, P insert 12-pole, SpeedTec-capable, Intercontec, female, 0°-coded	
Wiring diagram	
10 2 2 3 4 11 7	2264820107

Assi	Assignment			
No.	Name	Function Motion control inputs DIP switch S2/3 = OFF	Function Local mode DIP switch S2/3 = ON	
1	DI01	DI01 sensor input	CW/stop	
2	DI02	DI02 sensor input	CCW/stop	
3	DI03	DI03 sensor input	Setpoint f1/f2	
4	DI04	DI04 sensor input	Changeover Automatic/local mode	
5	n.c.	Not connected	Not connected	
6	n.c.	Not connected	Not connected	
7	n.c.	Not connected	Not connected	
8	+24V_O	Reserved	DC 24 V output	
9	0V24V_O	Reserved	0V24 reference potential	
10	0V24V_SEN	0V24 reference potential for sensors <sup>1)</sup> Must be supplied via terminals X7.4	Reserved	
11	+24 V_SEN	DC 24 V sensor supply <sup>1)</sup> Must be supplied via terminals X7.3	Reserved	
12	FE	Equipotential bonding/functional ground	Equipotential bonding/functional ground	

<sup>1)</sup> see operating instructions, chapter "Connecting DRC drive units"



#### **INFORMATION**

Use actuator/sensor distributors with 4 slots for the sensor inputs. Use the DC 24 V output only for local mode.



#### Connection cable

The following table provides an overview of the cables available for this connection:

Connection cable	Conformity / part num- ber	Length/ installation type	Operating voltage
Open M23, 12-pole, 0°-coded	CE/UL: 1 174 145 7	Variable	DC 60 V

Connection of cables with open end

The following table shows the conductor assignment of the cable with the following part number:

#### 1 174 145 7

Signal name	Color coding
DI01	Pink
DI02	Gray
DI03	Red
DI04	Blue
Reserved	Yellow
Reserved	Green
Reserved	Purple
+24V_O	Black
0V24_O	Brown
0V24_SEN	White
+24 V_SEN	Gray/pink
FE	Red/blue





#### 5.11.3 X5502: STO

#### **▲** WARNING

No safety-related disconnection of the DRC drive unit.



Severe or fatal injuries.

- Do not use the 24 V output (pins 1 and 3) for safety-related applications with DRC drive units.
- You may only jumper the STO connection with 24 V when the DRC drive unit need not fulfill any safety function.

The following table shows information about this connection:

Function	
Connection for safe torque off (STO)	
Connection type	
M12, 5-pole, female, A-coded	
Wiring diagram	
	1,,2



Assignment		
No.	Name	Function
1	+24V_O	DC 24 V output
2	STO -	STO - connection
3	0V24_O	0V24 reference potential
4	STO+	STO + connection
5	res.	Reserved

Connection cable



#### **INFORMATION**

Use only shielded cables for this connection and only suitable plug connectors that connect the shield with the unit in an HF-capable manner.

The following table provides an overview of the cables available for this connection:

Connection cable	Confor- mity / part number	Cable type	Length/ Installa- tion type	Cable cross- section / operating voltage
	CE: 1 812 496 8	LEONI BETAflam <sup>®</sup> – 145C-flex	Variable	2×
M12, 5-pole, A-coded  M12, 5-pole, A-coded	CE / UL: 1 814 740 2	HELU- KABEL® MULTI- SPEED® – 500-C-PUR UL/CSA	Variable	0.75 mm <sup>2</sup> / DC 60 V
	CE: 1 812 497 6	LEONI BETAflam <sup>®</sup> – 145C-flex	Variable	2×
Open M12, 5-pole, A-coded	CE / UL: 1 814 769 0	HELU- KABEL® MULTI- SPEED® – 500-C-PUR UL/CSA	Variable	0.75 mm <sup>2</sup> / DC 60 V

Connection of cables with open end

The following table shows the conductor assignment of the cable with the following part number:

1 812 497 6, 1 814 769 0, 1 812 739 8 and 1 815 344 5

Signal name	Core color/designation
STO -	Black / 1
STO+	Black / 2





#### 5.11.4 X5503: STO

The following table shows information about this connection:

Function	l			
Connection	Connection for safe torque off (STO)			
Connecti	ion type			
M12, 5-pc	ole, male, A-coded			
Wiring di	iagram			
Assignm	ent		2264818187	
No.	Name	Function		
1	res.	Reserved		
2	STO -	STO - connection		
3	res.	Reserved		
4	STO+	STO + connection		
5	res.	Reserved		

#### Connection cable



#### **INFORMATION**

Use only shielded cables for this connection and only suitable plug connectors that connect the shield with the unit in an HF-capable manner.

The following table provides an overview of the cables available for this connection:

Connection cable		Confor- mity / part number	Cable type	Length/ Installa- tion type	Cable cross- section / operating voltage
		CE: 1 812 496 8	LEONI BETAflam <sup>®</sup> – 145C-flex	Variable	2×
M12, 5-pole,	M12, 5-pole,	CE / UL: 1 814 740 2	HELU- KABEL <sup>®</sup> MULTI- SPEED <sup>®</sup> – 500-C-PUR	Variable	0.75 mm <sup>2</sup> / DC 60 V
A-coded	A-coded		UL/CSA		

#### 5.11.5 STO jumper plug



#### **▲ WARNING**

Safety-related disconnection of the DRC drive unit is not possible when using the STO jumper plug.

Severe or fatal injuries.

 You may only jumper the STO input with 24 V when the DRC drive unit need not fulfill any safety function.



#### **▲ WARNING**

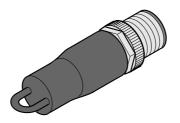
Disablement of safety-related disconnection of other drive units due to parasitic voltages when using an STO jumper.

Severe or fatal injuries.

You may only use the STO jumper when all incoming and outgoing STO connections have been removed from the drive unit.

The STO jumper plug can be connected to the STO plug connector X5502 of the DRC drive unit. The STO jumper plug deactivates the safety functions of the DRC drive unit.

The following figure shows the STO jumper plug, part number 1 174 709 9:

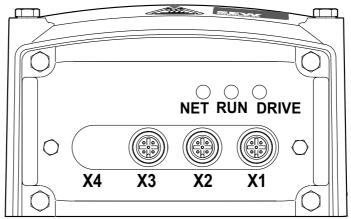




#### 5.12 Application options

#### 5.12.1 GIO12B

The following figure shows the M12 plug connectors of the GIO12B option:



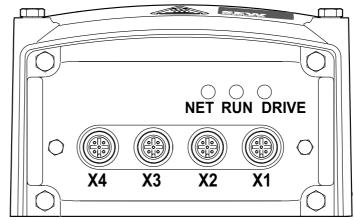
Function		
Connection of I/Os		
Connection type		
M12, 5-pole, female, A-coded		
Wiring diagram		
	4 3	
		2264816267

Assig	Assignment							
No. Name		Name	Function					
Х3	3 1 +24 V		DC 24 V sensor supply					
	2	DI13	Digital input DI13 (switching signal)					
	3	0V24	0V24 reference potential for sensors					
	4	DI12	Digital input DI12 (switching signal)					
	5	res.	Reserved					
X2	1	+24 V	DC 24 V sensor supply					
	2	DI11	Digital input DI11 (switching signal)					
	3	0V24	0V24 reference potential for sensors					
	4	DI10	Digital input DI10 (switching signal)					
	5	res.	Reserved					
X1	1	+24 V	DC 24 V actuator supply					
	2	DO11	Digital output DO11 (switching signal)					
	3	0V24	0V24 reference potential for actuators					
	4	DIO10	Digital output DO10 (switching signal)					
	5	res.	Reserved					

# Electrical installation Application options

#### 5.12.2 GIO13B

The following figure shows the M12 plug connectors of the GIO13B option:



Function	
Connection of I/Os	
Connection type	
M12, 5-pole, female, A-coded	
Wiring diagram	
	3
	2264816267

Assig	nment							
No.		Name	Function					
X4	1	AI10+	Analog input Al10+ Diff. input 1					
	2	Al10-	Analog input Al10- Diff. input 2					
	3	0V24	0V24 reference potential for sensors					
	4	AO10	Analog output AO10 4 – 20 mA					
	5	res.	Reserved					
Х3	1	+24 V	DC 24 V sensor supply					
	2	DI13 / LFI B	Digital input DI13 / primary frequency (B)					
	3	0V24	0V24 reference potential for sensors					
	4	DI12 / LFI A	Digital input DI12 / primary frequency (A)					
	5	res.	Reserved					
X2	1	+24 V	DC 24 V sensor supply					
	2	DI11	Digital input DI11					
	3	0V24	0V24 reference potential for sensors					
	4	DI10	Digital input DI10					
	5	res.	Reserved					
X1	1	DO10_A1	Relay contact (common)					
	2	DO10_A3	Relay contact (NC contact)					
	3	0V24	0V24 reference potential for actuators					
	4	DO10_A2	Relay contact (NO contact)					
	5	res.	Reserved					





#### 6 Startup

#### 6.1 Startup notes



#### **INFORMATION**

It is essential to adhere to the safety notes during startup.



#### **▲ WARNING**

Risk of injury due to missing or defective protection covers.

Severe or fatal injuries.

- Install the protective covers of the system according to the instructions.
- Never start up the DRC drive unit without protective covers.

#### **▲ WARNING**



Electric shock caused by dangerous voltages in the connection box. Dangerous voltages may still be present for up to 5 minutes after disconnection from the power supply system.

Severe or fatal injuries.

- Before removing the electronics cover, switch off the power to the DRC drive units using a suitable external disconnecting device.
- Secure the drive unit against unintended re-connection to the voltage supply.
- Secure the output shaft against rotation.
- Wait for at least 5 minutes before removing the electronics cover.



#### **▲ WARNING**

Burns caused by hot surfaces.

Severe injuries

· Let the units cool down before touching them.



#### WARNING

Unit malfunction due to incorrect unit setting.

Severe or fatal injuries.

- Observe the startup notes.
- The installation must only be carried out by qualified personnel.
- Use only settings that are consistent with the function.



#### **NOTICE**

Unit error 45 or 94 due to power disconnection during the initialization phase.

Possible damage to property.

 After replacing the cover and switching on the power supply, wait at least for 15 s before disconnecting the drive from the supply system again.



#### **INFORMATION**

- Before startup, remove the paint protection cap from the LED displays.
- Before startup, remove paint protection film from the nameplates.
- Observe a minimum switch-off time of 2 seconds for the line contactor.







#### INFORMATION

• To ensure fault-free operation, do not disconnect or connect signal cables during operation.

#### 6.2 Lifting applications



#### **WARNING**

Risk of fatal injury if the hoist falls.

Severe or fatal injuries.

- The DRC drive unit is not designed for use as a safety device in lifting applications.
- Use monitoring systems and mechanical protection devices to ensure safety.

#### 6.3 Prerequisties for startup

The following conditions apply to startup:

- Correct project planning for the DRC drive unit. For project planning notes, refer to the catalog.
- The DRC drive unit must be installed correctly both mechanically and electrically.
- Appropriate safety measures prevent the drives from starting up unintentionally.
- Appropriate safety measures must be taken to prevent risk of injury or damage to the machine.

#### 6.3.1 Torque limiting





Gear unit overloaded by the motor.

Possible damage to property.

- The maximum output torque might have to be limited to the torque specified on the nameplate.
- · Observe the DRC gearmotor catalog.





#### 6.4 Description of DIP switches

#### 6.4.1 Overview

#### NOTICE

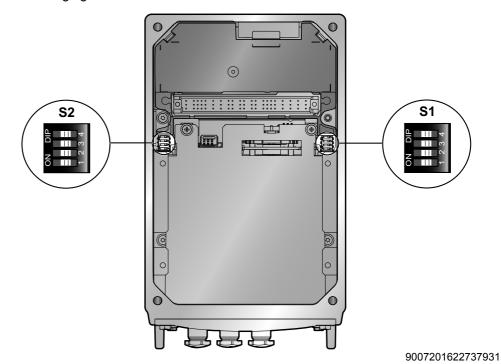


Damage to the DIP switches caused by using unsuitable tools.

Possible damage to property.

- To set the DIP switches, use only suitable tools, such as a slotted screwdriver with a blade width of no more than 3 mm.
- The force used for setting the DIP switches must not exceed 5 N.

The following figure shows the DIP switches S1 and S2:



DIP switch S1 The following table shows the functions of DIP switch S1:

DIP switch	\$1								
	1	4							
	Binary coding SNI unit address								
	Bit 2 <sup>0</sup>	Bit 2 <sup>1</sup>	Bit 2 <sup>2</sup>	Bit 2 <sup>3</sup>					
ON	Bit 2 <sup>0</sup>	Bit 2 <sup>1</sup>	<b>Bit 2<sup>2</sup></b>	Bit 2 <sup>3</sup>					

#### DIP switch S2 The following table shows the functions of DIP switch S2:

DIP switch	S2							
	1	2	3	4				
	Binary coding operating mode  Bit 2 <sup>0</sup> Bit 2 <sup>1</sup>		Use of the motion control inputs	Reserved				
ON	1	1	Local mode	res.				
OFF	0	0	Sensors	res.				



#### 6.4.2 Description of the DIP switches

DIP switches S1/1 to S1/4

#### **Setting the SNI address**

These DIP switches are used to set the SNI addresses of DRC drive units. You can set addresses from 0 to 9. Other settings are not permitted.

SNI address	0	1	2	3	4	5	6	7	8	9
S1/1	_	Х	_	Х	_	Х	-	Х	-	Х
S1/2	_	1	Х	Х	_	_	Х	Х	-	_
S1/3	_	-	_	-	Х	Х	Х	Х	-	_
S1/4	_	-	_	_	_	_	_	_	Х	Х

X = ON

- = OFF

DIP switches S2/1 to S2/2

#### Setting the operating mode

This DIP switch is used to set the operating mode of the DRC drive unit. It determines how the unit is controlled.

When using MOVIFIT® SNI, the operating mode must be set to "SNI-SEWOS", when using MOVIFIT® FDC SNI, it must be set to "VARIABLE".

Mode	MOVIFIT® SNI (SNI-SEWOS)	Reserved	Reserved	MOVIFIT® FDC (VARIABLE)
S2/1	_	X	_	X
S2/2	_	_	Х	Х

X = ON

- = OFF

#### DIP switch S2/3

#### Use of the motion control inputs

Use this DIP switch to determine the function of the motion control inputs (accessible only via optional M23 plug connector).

- When DIP switch S2/3 is set to "OFF", the motion control inputs are used for connecting and evaluating sensors. It is not possible to control the actuator via the motion control inputs.
- When DIP switch S2/3 is set to "ON", the motion control inputs can be used for local mode:

Motion control inputs	Functionality with DIP switch S2/3 = ON
Motion control input 1	CW/stop
Motion control input 2	CCW/stop
Motion control input 3	Setpoint selection n_f1 / n_f2
Motion control input 4	Local/automatic





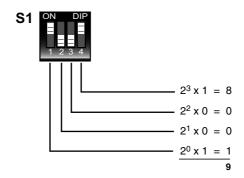
#### 6.5 Startup procedure

- 1. It is essential that you observe the startup instructions.
- 2. Disconnect all components from the voltage supply and use an external disconnecting device to avoid unintentional re-connection.
- 3. Check the correct connection of all connected DRC drive units and, if installed, of the options. Observe chapter "Electrical Installation".
- 4. Set the DRC unit address:
  - ▲ WARNING Uncontrolled drive enable due to incorrect address setting.

Severe or fatal injuries.

- · Assign each device address only once.
- · Check the address settings before you enable the drive for the first time.

The following figure shows an example of the DIP switch setting for address 9:



2441445259

The following table shows how to set the DIP switches for unit addresses 0 to 9. Other settings are not permitted.

SNI address	0	1	2	3	4	5	6	7	8	9
S1/1	_	Х	_	Х	_	Х	_	Х	_	Х
S1/2	-	-	Х	Х	-	-	Х	Х	-	1
S1/3	-	-	_	-	Х	Х	Х	Х	-	_
S1/4	_	_	_	_	_	_	_	_	Х	Х

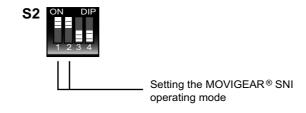
X = ON

- = OFF

**NOTICE** Damage to the DIP switches caused by using unsuitable tools.

Possible damage to property.

- To set the DIP switches, use only suitable tools, such as a slotted screwdriver with a blade width of no more than 3 mm.
- The force used for setting the DIP switches must not exceed 5 N.
- 5. Set the operating mode with DIP switch S2:







The operating mode determines how the unit is controlled. The following table shows the setting options:

When using MOVIFIT® SNI, the operating mode must be set to "SNI-SEWOS", when using MOVIFIT® FDC SNI, it must be set to "VARIABLE".

Mode	MOVIFIT® SNI (SNI-SEWOS)	Reserved	Reserved	MOVIFIT <sup>®</sup> FDC (VARIABLE)
S2/1	_	X	_	X
S2/2	_	_	Х	Х

X = ON

- = OFF

**NOTICE** Damage to the DIP switches caused by using unsuitable tools.

Possible damage to property.

- To set the DIP switches, use only suitable tools, such as a slotted screwdriver with a blade width of no more than 3 mm.
- The force used for setting the DIP switches must not exceed 5 N.
- 6. Secure the DRC electronics covers on the connection boxes.
- 7. Start up the assigned SNI controller, observing the instructions in the documentation of the controller you use.





#### 6.6 Starting up the GIO13B application option



#### **A WARNING**

Burns caused by hot surfaces.

Severe injuries

Let the units cool down before touching them.

#### 6.6.1 Overview of DIP switches



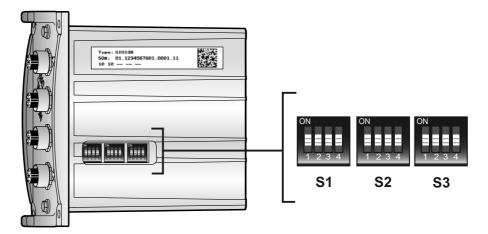
#### NOTICE

Loss of the guaranteed degree of protection.

Possible damage to property.

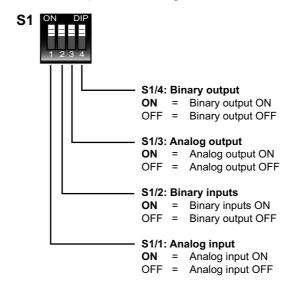
- In disassembled condition, you have to protect the GIO13B application option from moisture, dust or foreign particles as there are openings for DIP switches.
- Make sure that the application cover is mounted properly.

The following figure shows the position of the DIP switches in the GIO13B application option:



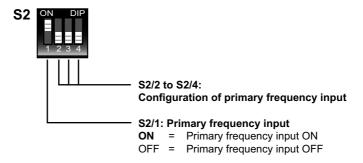
#### 6.6.2 Setting the DIP switches

DIP switch S1 The following figure shows the possible settings for DIP switch S1:



9007201137841035

DIP switch S2 The following figure shows the possible settings for DIP switch S2:



9007201137842955

The DIP switches S2/1 to S2/3 are used to configure the primary frequency input. The following table shows the corresponding configuration options:

DIP switch Configuration		Configuration	
S2/2	S2/3	S2/4	Primary frequency input, maximum frequency
OFF	OFF	OFF	f = 1 kHz
ON	OFF	OFF	f = 2 kHz
OFF	ON	OFF	f = 5 kHz
ON	ON	OFF	f = 10 kHz
OFF	OFF	ON	f = 20 kHz
ON	OFF	ON	f = 40 kHz
OFF	ON	ON	f = 80 kHz
ON	ON	ON	f = 120 kHz





DIP switch S3 The following figure shows the possible settings for DIP switch S3:

i

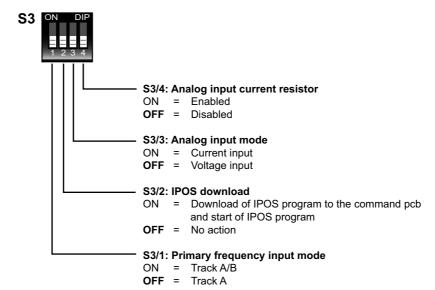
#### **INFORMATION**

If the current input mode is set with DIP switch "S3/3 = ON", the current resistor must be activated with DIP switch "S3/4 = ON".

### i

#### **INFORMATION**

Notice: Setting DIP switch S3/2 to "ON" will overwrite any IPOS program on the command pcb.



Refresh times of primary frequency inputs depending on the set scaling frequency			
Scaling frequency	Refresh times [ms]		
[Hz]	LFI mode = trace A	LFI mode = traces A + B	
1	500	250	
2	250	125	
5	100	50	
10	50	25	
20	25	12	
40	12	6	
80	6	3	
120	3	2	

# Operation of MOVITOOLS® MotionStudio About MOVITOOLS® MotionStudio

### 7 Operation of MOVITOOLS® MotionStudio

#### 7.1 About MOVITOOLS® MotionStudio

#### 7.1.1 Tasks

The software package enables you to perform the following tasks:

- · Establish communication with units
- · Execute functions of the units

#### 7.1.2 Establishing communication with the units

The SEW Communication Server is integrated into the MOVITOOLS® MotionStudio software package for establishing communication with the units.

The SEW Communication Server allows you to create **communication channels**. Once the channels are established, the units communicate via these communication channels using their communication options. You can operate up to four communication channels at the same time.

MOVITOOLS® MotionStudio supports the following types of communication channels:

- · Serial (RS-485) via interface adapters
- · System bus (SBus) via interface adapters
- Ethernet
- EtherCAT
- Fieldbus (PROFIBUS DP/DP-V1)
- · Tool Calling Interface

The available channels can vary depending on the units and its communication options.

#### 7.1.3 Executing functions of the units

The software package offers uniformity in executing the following functions:

- Parameterization (e. g. in the parameter tree of the unit)
- Startup
- · Visualization and diagnostics
- Programming

The following basic components are included in the MOVITOOLS® MotionStudio software package, allowing you to use the units to execute functions:

- MotionStudio
- MOVITOOLS<sup>®</sup>

#### 7.2 First steps

#### 7.2.1 Starting the software and creating a project

Proceed as follows to start MOVITOOLS® MotionStudio and create a project:

- Start MOVITOOLS<sup>®</sup> MotionStudio from the Windows start menu via: [Start]/[Programs]/[SEW]/[MOVITOOLS-MotionStudio]/[MOVITOOLS-MotionStudio]
- 2. Create a project with a name and directory.



### Operation of MOVITOOLS® MotionStudio





#### 7.2.2 Establishing communication and scanning the network

Proceed as follows to establish a communication with  ${\rm MOVITOOLS}^{\circledR}$  MotionStudio and scan your network:

- 1. Set up a communication channel to communicate with your units.
- 2. Scan your network (unit scan). Press the [Start network scan] button [1] in the toolbar.



#### 7.2.3 Additional information



#### **INFORMATION**

The PC is connected to the DRC inverter via the employed controller or gateway. For detailed information on how to configure a communication channel, refer to the documentation of the controller used.



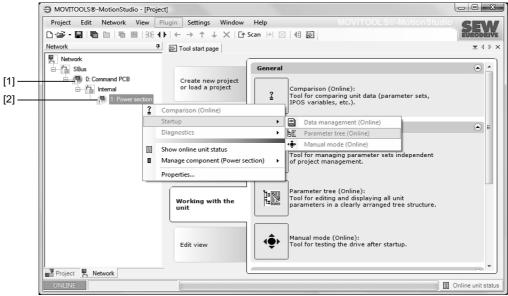


## **Operation of MOVITOOLS® MotionStudio** First steps

#### 7.2.4 Configuring units

Proceed as follows to configure a unit:

- 1. Select the unit in the network view.
- 2. Right-click to open the context menu and display the tools for configuring the unit.

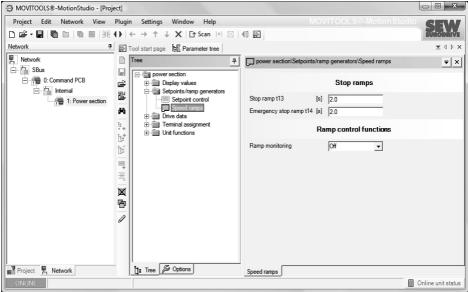


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- [1] Command PCB
- [2] Power section

The example shows the context menu with the tools for a DRC power section [2]. The communication mode is set to "online" and the unit is scanned in the network view.

3. Select a tool (e.g. "Parameter tree") to configure the unit.





## Operation of MOVITOOLS® MotionStudio Connection mode



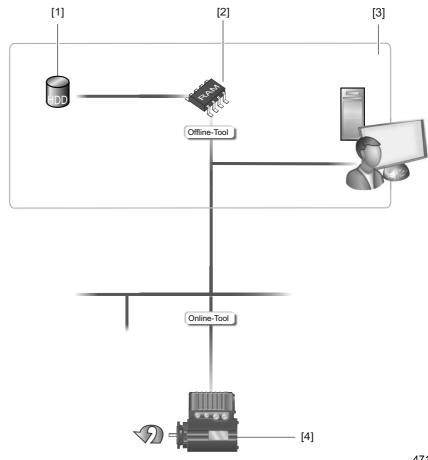
#### 7.3 Connection mode

#### 7.3.1 Overview

MOVITOOLS® MotionStudio differentiates between "online" and "offline" connection mode. You determine the connection mode yourself. Depending on the selected connection mode, you can choose offline or online tools specific to your unit.

Offline tools / online tools overview

The following figure illustrates the two types of tools:



4710632331

- [1] Hard drive of the engineering PC
- [2] RAM of the engineering PC
- [3] Engineering PC
- [4] Unit

Offline tools / online tools description

The following figure illustrates the two types of tools:

Tools	Description
Offline tools	Changes made using offline tools affect "ONLY" the RAM [2] at first.  Save your project so that the changes can be stored on the hard disk [1] of your engineering PC [3].  Execute the "Download (PC->unit)" function if you want to transfer the changes to your unit [4] as well.
Online tools	<ul> <li>Changes made using online tools affect "ONLY" the unit [4] at first.</li> <li>Execute the "Upload (unit-&gt;PC)" function if you want to transfer the changes to your RAM [2].</li> <li>Save your project so that the changes can be stored on the hard disk [1] of your engineering PC [3].</li> </ul>



## **Operation of MOVITOOLS® MotionStudio**Connection mode



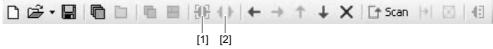
#### INFORMATION

- The "online" connection status is NOT a response message which informs you that
  you are currently connected to the unit or that your unit is ready for communication.
  Should you require this feedback, observe chapter "Setting the cyclical accessibility test" in the online help (or the manual) of MOVITOOLS® MotionStudio.
- Project management commands (such as "download" and "upload"), the online unit status, and the "unit scan" work independently of the set connection mode.
- MOVITOOLS<sup>®</sup> MotionStudio starts up in the connection mode that was set before the program was closed.

#### 7.3.2 Selecting the connection mode (online or offline)

Proceed as follows to set the connection mode:

- 1. Select the connection mode:
  - "Switch to online mode" [1] for functions (online tools) that should directly influence the unit.
  - "Switch to offline mode" [2] for functions (offline tools) that should influence your project.



- [1] "Switch to online mode" icon
- [2] "Switch to offline mode" icon
- 2. Select the unit node.
- 3. Right-click to open the context menu and display the tools for configuring the unit.



### Operation of MOVITOOLS® MotionStudio

Executing functions of the units



#### 7.4 Executing functions of the units

#### 7.4.1 Parameterizing a unit

Units are parameterized in the parameter tree. The parameter tree displays all unit parameters, grouped into folders.

You can manage the unit parameters using the context menu and the toolbar. The following steps illustrate how to read or edit the unit parameters.

#### 7.4.2 Reading or changing unit parameters

Proceed as follows to read or change unit parameters:

- 1. Switch to the required view (project view or network view).
- 2. Select the connection mode:
  - Click the "Switch to online mode" button [1] if you want to read or change parameters directly in the **unit**.
  - Click the "Switch to offline mode" button [2] if you want to read or change parameters in the **project**.

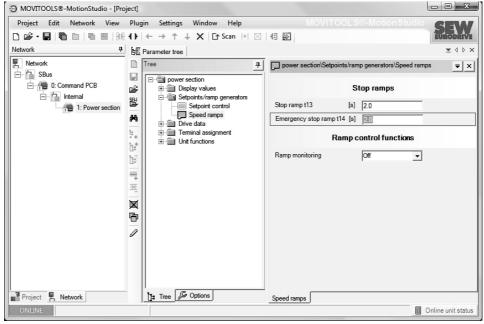


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- [1] "Switch to online mode" icon
- [2] "Switch to offline mode" icon
- 3. Select the unit you want to parameterize.
- 4. Open the context menu and select the [Parameter tree] command.

This opens the "Parameter tree" view on the right.

5. Expand the "Parameter tree" to the node you require.







#### Operation of MOVITOOLS® MotionStudio

#### Executing functions of the units

- 6. Double-click to display a particular group of unit parameters.
- 7. Press the enter key to finalize any changes you make to numerical values in the input fields.

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#### **INFORMATION**

For detailed information about the unit parameters, refer to chapter "Parameters".

#### 7.4.3 Starting up the units (online)

Do the following to start up the units (online):

- 1. Switch to the network view.
- 2. In the toolbar, click on "Switch to online mode" [1].



- [1] "Switch to online mode" icon
- 3. Select the unit you want to start up.
- 4. Open the context menu and select the [Startup] / [Startup] command. The Startup wizard opens.
- 5. Follow the instructions of the startup wizard. Then load the startup data into your unit.





#### 8 Parameters

#### 8.1 Overview of parameters of the command PCB

#### 8.1.1 Display values

Index	Parameter name	MOVITOOLS <sup>®</sup> MotionStudio Display (Range / factory setting)	MOVILINK <sup>®</sup> scaling
Command PCB parame	eters \ display values \ <u>unit status</u>		
Unit status	-		
8310.0	Operating state	[Text]	
DIP switch			
9621.10, bit 0	Setting of DIP switch S1/1	[Bit field]	
9621.10, bit 1	Setting of DIP switch S1/2	[Bit field]	
9621.10, bit 2	Setting of DIP switch S1/3	[Bit field]	
9621.10, bit 3	Setting of DIP switch S1/4	[Bit field]	
9621.10, bit 4	Setting of DIP switch S2/1	[Bit field]	
9621.10, bit 5	Setting of DIP switch S2/2	[Bit field]	
9621.10, bit 6	Setting of DIP switch S2/3	[Bit field]	
9621.10, bit 7	Setting of DIP switch S2/4	[Bit field]	
Command PCB parame	eters \ display values \ digital inputs		
8334.0, bit 1	Digital input DI01 status	[Bit field]	
8334.0, bit 2	Digital input DI02 status	[Bit field]	
8334.0, bit 3	Digital input DI03 status	[Bit field]	
8334.0, bit 4	Digital input DI04 status	[Bit field]	
Command PCB parame	eters \ display values \ <u>unit data</u>		
Command level			
_	Unit series	[Text]	
9701.1, 9701.2, 9701.3, 9701.4, 9701.5	Unit names	[Text]	
9823.1, 9823.2, 9823.3, 9823.4, 9823.5	Unit signature	[Text]	
9701.30	Command level firmware	[Text]	
9701.31	Firmware status of command level	[Text]	
SNI interface			
9701.36	SNI interface firmware	[Text]	
9701.37	Firmware status of SNI interface	[Text]	
Application option			
10453.1	Application option type	[Text]	
Command PCB parame	eters \ display values \ address settings		
SNI network			
8995.0	MAC address	[Text]	
8996.0	MAC address	[Text]	
		•	

# Parameters Overview of parameters of the command PCB

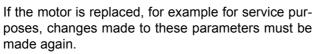
#### 8.1.2 Parameters that can be changed

#### Storage location

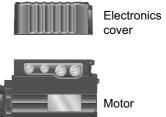


#### **INFORMATION**

The following parameters are stored in the DRC motor.



The changes remain active after changing the electronics cover.



#### Setpoints/ ramp generators

Index	Parameter name	MOVITOOLS <sup>®</sup> MotionStudio Display (Range / factory setting)	MOVILINK <sup>®</sup> scaling		
Command PCB parameters	Command PCB parameters \ setpoints/ramp generators \ setpoints				
10096.35	Setpoint n_f1	0.00 - <u>1500.00</u> - 2000.00 [rp	m] 1 digit = 0.001 rpm		
10096.36	Setpoint n_f2	0.00 - <u>200.00</u> - 2000.00 [rpn	] 1 digit = 0.001 rpm		

#### Unit functions

Index	Parameter name	MOVITOOLS <sup>®</sup> MotionStudio Display (Range / factory setting)	MOVILINK <sup>®</sup> scaling		
Command PCB parameter	Command PCB parameters \ unit functions \ setup				
8594.0	Factory setting	<ul> <li>0 = No</li> <li>1 = Standard</li> <li>2 = Delivery status</li> </ul>			

#### Application option

Index	Parameter name	MOVITOOLS <sup>®</sup> MotionStudio Display (Range / factory setting)	MOVILINK <sup>®</sup> scaling		
Command PCB parameter	Command PCB parameters \ application option \ communication				
10453.1	Application option type ID	[Text]			
10453.4	Application option monitoring	• 0 = Off • 1 = On			

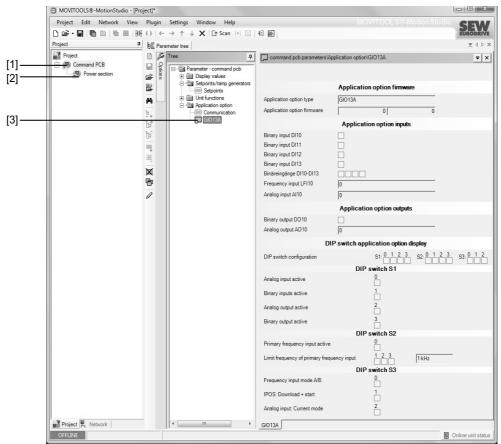




#### 8.2 Overview of parameters for application options

#### 8.2.1 Display of application option in MOVITOOLS® MotionStudio

The parameters of the application option are displayed in the parameter tree of the command PCB:



- [1] Command PCB
- [2] Power section
- [3] Application option

# Parameters Overview of parameters for application options

#### 8.2.2 GIO12B application option

Index	Parameter name	MOVITOOLS® MotionStudio  Display  (Range / factory setting)
Command PCB pa	rameters \ application option \ GIO12B	
10453.1	Application option type	[Text]
Application option	inputs	
9619.11, bit 2	Digital input DI10	[Bit field]
9619.11, bit 3	Digital input DI11	[Bit field]
9619.11, bit 4	Digital input DI12	[Bit field]
9619.11, bit 5	Digital input DI13	[Bit field]
Application option	outputs	
9619.112, bit 0	Digital output DO10	[Bit field]
9619.112, bit 1	Digital output DO11	[Bit field]

#### 8.2.3 GIO13B application option

Index	Parameter name	MOVITOOLS <sup>®</sup> MotionStudio Display (Range / factory setting)	MOVILINK <sup>®</sup> scaling
Command PCB parame	eters \ application option \ GIO13B		
Application option firm	ware		
10453.1	Application option type	[Text]	
10453.16	Application option firmware	[Text]	
10453.17	Firmware status application option	[Text]	
Application option inpu	uts		
9619.11, bit 0	Digital input DI10	[Bit field]	
9619.11, bit 1	Digital input DI11	[Bit field]	
9619.11, bit 2	Digital input DI12	[Bit field]	
9619.11, bit 3	Digital input DI13	[Bit field]	
9619.26	Frequency input LFI10	[Text]	
9619.36	Analog input Al10	[Text]	
Application option out	outs	1	
9619.112, bit 0	Digital output DO10	[Bit field]	
9619.123	Analog output AO10	[Text]	
Display application opt	ion DIP switches	1	
10453.12, bits 0 to 10	DIP switch configuration	[Bit field]	
DIP switch S1		1	
10453.12, bit 0	Analog input active	[Bit field]	
10453.12, bit 1	Digital inputs active	[Bit field]	
10453.12, bit 2	Analog output active	[Bit field]	
10453.12, bit 3	Digital output active	[Bit field]	
DIP switch S2			
10453.12, bit 4	Primary frequency input active	[Bit field]	
10453.12, bits 5 to 7	Limit frequency of primary frequency input	[Bit field]	
DIP switch S3		1	
10453.12, bit 8	Frequency input mode A/B	[Bit field]	
10453.12, bit 9	IPOS: Download + start	[Bit field]	
10453.12, bit 10	Analog input: Voltage mode	[Bit field]	





#### 8.3 Overview of power section parameters

#### 8.3.1 Display values

Index	Parameter name	MOVITOOLS <sup>®</sup> MotionStudio Display (Range / factory setting)	MOVILINK <sup>®</sup> scaling	
Power section par	rameters \ display values \ <u>process values</u>			
Actual drive value	es			
8318.0	Actual speed	[rpm]	1 digit = 0.001 rpm	
8501.0	User display	[Text]		
Output currents				
8321.0	Apparent output current	[%I <sub>N</sub> ]	1 digit = 0.001 %I <sub>N</sub>	
8322.0	Active output current	[%]	1 digit = 0.001 %	
8326.0	Apparent output current	[A]	1 digit = 0.001 %	
Actual unit values	•		-1	
8325.0	DC link voltage	[V]	1 digit = 0.001 %	
8730.0	Unit utilization	[%]	1 digit = 0.001 %	
8327.0	Heat sink temperature	[°C]	1 digit = 1 °C	
Motor status			<u>. I</u>	
8323.0	Motor utilization	[%]	1 digit = 0.001 %	
9872.255	Motor temperature	[°C]	1 digit = 10 <sup>-6</sup> °C	
Power section par	rameters \ display values \ unit status			
Device status				
9702.2	Power section status	[Text]		
9702.7	Drive status	[Text]		
9702.5	Error code	[Text]		
10071.1	Suberror code	[Text]		
10404.5	Error source	[Text]		
Statistical data				
8328.0	Operating hours	[h]	1 digit = 1 min = 1/60 h	
8329.0	Enable hours	[h]	1 digit = 1 min = 1/60 h	
8330.0	Work	[kWh]	1 digit = 1Ws = 1/3600000	
Power section par	rameters \ display values \ digital inputs			
Digital inputs	-			
8334.0, bit 0	Digital input DI00 status	Fixed assignment: /controller in	hibit	
8334.0, bit 1	Digital input DI01 status	[Bit field]		
8334.0, bit 2	Digital input DI02 status	[Bit field]	[Bit field]	
8334.0, bit 3	Digital input DI03 status	[Bit field]		
8334.0, bit 4	Digital input DI04 status	[Bit field]		
8335.0	Digital input DI01 function	[Text]	[Text]	
8336.0	Digital input DI02 function	[Text]	[Text]	
8337.0	Digital input DI03 function	[Text]		
8338.0	Digital input DI04 function	[Text]		

# **Parameters**Overview of power section parameters

Index	Parameter name	MOVITOOLS <sup>®</sup> MotionStu Display (Range / factory setting	
Virtual digital inputs	}		
8348.0, bit 0	Digital input DI10 status	[Bit field]	
8348.0, bit 1	Digital input DI11 status	[Bit field]	
8348.0, bit 2	Digital input DI12 status	[Bit field]	
8348.0, bit 3	Digital input DI13 status	[Bit field]	
8348.0, bit 4	Digital input DI14 status	[Bit field]	
8348.0, bit 5	Digital input DI15 status	[Bit field]	
8348.0, bit 6	Digital input DI16 status	[Bit field]	
8348.0, bit 7	Digital input DI17 status	[Bit field]	
8340.0	Digital input DI10 function	[Text]	
8341.0	Digital input DI11 function	[Text]	
8342.0	Digital input DI12 function	[Text]	
8343.0	Digital input DI13 function	[Text]	
8344.0	Digital input DI14 function	[Text]	
8345.0	Digital input DI15 function	[Text]	
8346.0	Digital input DI16 function	[Text]	
8347.0	Digital input DI17 function	[Text]	
Power section parar	meters \ display values \ digital outputs		
Virtual digital output			
8360.0, bit 0	Digital output DO10 status	[Bit field]	
8360.0, bit 1	Digital output DO11 status	[Bit field]	
8360.0, bit 2	Digital output DO12 status	[Bit field]	
8360.0, bit 3	Digital output DO13 status	[Bit field]	
8360.0, bit 4	Digital output DO14 status	[Bit field]	
8360.0, bit 5	Digital output DO15 status	[Bit field]	
8360.0, bit 6	Digital output DO16 status	[Bit field]	
8360.0, bit 7	Digital output DO17 status	[Bit field]	
8352.0	Digital output DO10 function	[Text]	
8353.0	Digital output DO11 function	[Text]	
8354.0	Digital output DO12 function	[Text]	
8355.0	Digital output DO13 function	[Text]	
8356.0	Digital output DO14 function	[Text]	
8357.0	Digital output DO15 function	[Text]	
8358.0	Digital output DO16 function	[Text]	
8359.0	Digital output DO17 function	[Text]	
Power section parar	meters \ display values \ <u>unit data</u>		
Basic unit			
9701.10	Unit series	[Text]	
9701.11	Variant identification	[Text]	
9701.1 – 9701.5	Unit name	[Text]	
10204.2	Unit variant	[Text]	
9823.1 – 9823.5	Device signature	[Text]	
8361.0	Nominal unit current (rms)	[A]	1 digit = 0.001 %
10079.9	Motor size	[Text]	l .
9610.1	Nominal motor torque	[Nm]	1 digit =
			0.00001 Nm (10 <sup>-5</sup> )



# **Parameters** Overview of power section parameters



Index	Parameter name	MOVITOOLS <sup>®</sup> MotionStudio Display (Range / factory setting)	MOVILINK <sup>®</sup> scaling
Basic unit firmware			
9701.30	Basic unit firmware	[Text]	
9701.31	Firmware status basic unit	[Text]	
Power section param	eters \ display values \ gear unit data		
10079.3	Gear unit reduction ratio "numerator" (only in connection with MOVIGEAR® drive units)	[Text]	
10079.4	Gear unit reduction ratio "denominator" (only in connection with MOVIGEAR® drive units)	[Text]	
_	Gear unit reduction ratio (only in connection with MOVIGEAR® drive units)	[Text]	
10079.5	Number of gear unit stages (only in connection with MOVIGEAR® drive units)	[Text]	
Power section param	eters \ display values \ fault memory 0-4 \ fault	memory t-0	
Fault status			
8366.0	Error t-0 error code	[Text]	
10072.1	Error t-0 suberror code	[Text]	
8883.0	Error t-0 internal	[Text]	
10404.6	Source of error t-0	[Text]	
Input/output status			
8371.0, bit 04	Digital inputs DI00 – DI04 t-0	[Bit field]	
8376.0, bit 07	Digital inputs (virtual) DI10 – DI17 t-0	[Bit field]	
8386.0, bit 07	Digital outputs (virtual) DO10 – DO17 t-0	[Bit field]	
Actual drive values	·	·	
8401.0	Actual speed t-0	[rpm]	1 digit = 0.001 rpm
8406.0	Apparent output current t-0	[%]	1 digit = 0.001 %
8411.0	Active output current t-0	[%]	1 digit = 0.001 %
8416.0	Unit utilization t-0	[%]	1 digit = 0.001 %
8441.0	Motor utilization t-0	[%]	1 digit = 0.001 %
8421.0	DC link voltage t-0	[V]	1 digit = 0.001 %
Device status			
8391.0	Power section status t-0	[Text]	
8426.0	Operating hours t-0	[h]	1 digit = 1 min = 1/60 h
8431.0	Enable hours t-0	[h]	1 digit = 1 min = 1/60 h
10083.1	Work t-0	[kWh]	1 digit = 1Ws = 1/3600000
Temperatures	Tarana	T	
8396.0	Heat sink temperature t-0	[°C]	1 digit = 1 °C
10070.1	Motor temperature t-0	[°C]	1 digit = 10 <sup>-6</sup> °C
-	eters \ Display values \ Error memory 0-4 \ <u>Erro</u>	r memory t-1	
Fault status	Emant 4 amon and	[T 4]	
8367.0	Error t-1 error code	[Text]	
10072.2	Error t-1 suberror code	[Text]	
8884.0	Error t-1 internal	[Text]	
10404.7	Source of error t-1	[Text]	
Input/output status			

# **Parameters**Overview of power section parameters

Index	Parameter name	MOVITOOLS <sup>®</sup> MotionStudio Display (Range / factory setting)	MOVILINK <sup>®</sup> scaling
8372.0, bit 04	Digital inputs DI00 – DI04 t-1	[Bit field]	
8377.0, bit 07	Digital inputs (virtual) DI10 – DI17 t-1	[Bit field]	
8387.0, bit 07	Digital outputs (virtual) DO10 – DO17 t-1	[Bit field]	
Actual drive values	6		
8402.0	Actual speed t-1	[rpm]	1 digit = 0.001 rpm
8407.0	Apparent output current t-1	[%]	1 digit = 0.001 %
8412.0	Active output current t-1	[%]	1 digit = 0.001 %
8417.0	Unit utilization t-1	[%]	1 digit = 0.001 %
8442.0	Motor utilization t-1	[%]	1 digit = 0.001 %
8422.0	DC link voltage t-1	[V]	1 digit = 0.001 %
Device status			
8392.0	Power section status t-1	[Text]	
8427.0	Operating hours t-1	[h]	1 digit = 1 min = 1/60 h
8432.0	Enable hours t-1	[h]	1 digit = 1 min = 1/60 h
10083.2	Work t-1	[kWh]	1 digit = 1Ws = 1/3600000
Temperatures			
8397.0	Heat sink temperature t-1	[°C]	1 digit = 1 °C
10070.2	Motor temperature t-1	[°C]	1 digit = 10 <sup>-6</sup> °C
Power section para	meters \ Display values \ Error memory 0-4 \ <u>Err</u>	or memory t-2	
Fault status			
8368.0	Error t-2 error code	[Text]	
10072.3	Error t-2 suberror code	[Text]	
8885.0	Error t-2 internal	[Text]	
10404.8	Source of error t-2	[Text]	
Input/output status			
8373.0, bit 04	Digital inputs DI00 – DI04 t-2	[Bit field]	
8378.0, bit 07	Digital inputs (virtual) DI10 – DI17 t-2	[Bit field]	
8388.0, bit 07	Digital outputs (virtual) DO10 – DO17 t-2	[Bit field]	
Actual drive values			
8403.0	Actual speed t-2	[rpm]	1 digit = 0.001 rpm
8408.0	Apparent output current t-2	[%]	1 digit = 0.001 %
8413.0	Active output current t-2	[%]	1 digit = 0.001 %
8418.0	Unit utilization t-2	[%]	1 digit = 0.001 %
8443.0	Motor utilization t-2	[%]	1 digit = 0.001 %
8423.0	DC link voltage t-2	[V]	1 digit = 0.001 %
Device status			
8393.0	Power section status t-2	[Text]	
8428.0	Operating hours t-2	[h]	1 digit = 1 min = 1/60 h
8433.0	Enable hours t-2	[h]	1 digit = 1 min = 1/60 h
10083.3	Work t-2	[kWh]	1 digit = 1Ws = 1/3600000
Temperatures			
8398.0	Heat sink temperature t-2	[°C]	1 digit = 1 °C
10070.3	Motor temperature t-2	[°C]	1 digit = 10 <sup>-6</sup> °C
	meters \ Display values \ Error memory 0-4 \ Err		1



# **Parameters** Overview of power section parameters



Index	Parameter name	MOVITOOLS <sup>®</sup> MotionStudio Display (Range / factory setting)	MOVILINK <sup>®</sup> scaling
8369.0	Error t-3 error code	[Text]	
10072.4	Error t-3 suberror code	[Text]	
8886.0	Error t-3 internal	[Text]	
10404.9	Source of error t-3	[Text]	
Input/output status			
8374.0, bit 04	Digital inputs DI00 – DI04 t-3	[Bit field]	
8379.0, bit 07	Digital inputs (virtual) DI10 – DI17 t-3	[Bit field]	
8389.0, bit 07	Digital outputs (virtual) DO10 – DO17 t-3	[Bit field]	
Actual drive values			
8404.0	Actual speed t-3	[rpm]	1 digit = 0.001 rpm
8409.0	Apparent output current t-3	[%]	1 digit = 0.001 %
8414.0	Active output current t-3	[%]	1 digit = 0.001 %
8419.0	Unit utilization t-3	[%]	1 digit = 0.001 %
8444.0	Motor utilization t-3	[%]	1 digit = 0.001 %
8424.0	DC link voltage t-3	[V]	1 digit = 0.001 %
Device status	j ,		
8394.0	Power section status t-3	[Text]	
8429.0	Operating hours t-3	[h]	1 digit = 1 min = 1/60 h
8434.0	Enable hours t-3	[h]	1 digit = 1 min = 1/60 h
10083.4	Work t-3	[kWh]	1 digit = 1Ws =
			1/3600000
Temperatures			
8399.0	Heat sink temperature t-3	[°C]	1 digit = 1 °C
10070.4	Motor temperature t-3	[°C]	1 digit = 10 <sup>-6</sup> °C
Power section parame	ters \ Display values \ Error memory 0-4 \ <u>Err</u>	or memory t-4	
Fault status			
8370.0	Error t-4 error code	[Text]	
10072.5	Error t-4 suberror code	[Text]	
8887.0	Error t-4 internal	[Text]	
10404.10	Source of error t-4	[Text]	
Input/output status			
8375.0, bit 04	Digital inputs DI00 – DI04 t-4	[Bit field]	
8380.0, bit 07	Digital inputs (virtual) DI10 – DI17 t-4	[Bit field]	
8390.0, bit 07	Digital outputs (virtual) DO10 – DO17 t-4	[Bit field]	
Actual drive values			
8405.0	Actual speed t-4	[rpm]	1 digit = 0.001 rpm
8410.0	Apparent output current t-4	[%]	1 digit = 0.001 %
8415.0	Active output current t-4	[%]	1 digit = 0.001 %
8420.0	Unit utilization t-4	[%]	1 digit = 0.001 %
8445.0	Motor utilization t-4	[%]	1 digit = 0.001 %
8425.0	DC link voltage t-4	[V]	1 digit = 0.001 %
Device status	1	1	1
8395.0	Power section status t-4	[Text]	
8430.0	Operating hours t-4	[h]	1 digit = 1 min = 1/60 h
8435.0	Enable hours t-4	[h]	1 digit = 1 min = 1/60 h
10083.5	Work t-4	[kWh]	1 digit = 1Ws =
			1/3600000

# **Parameters**Overview of power section parameters

Index	Parameter name	MOVITOOLS <sup>®</sup> MotionStudio Display (Range / factory setting)	MOVILINK <sup>®</sup> scaling			
Temperatures						
8400.0	Heat sink temperature t-4	[°C]	1 digit = 1 °C			
10070.5	Motor temperature t-4	[°C]	1 digit = 10 <sup>-6</sup> °C			
Power section parameters \ display values \ process data monitor						
Process data de	escription					
8451.0	Process data configuration	[Text]				
Process output	data (receive data)					
8455.0	PO1 Setpoint	[Text]				
8456.0	PO2 Setpoint	[Text]				
8457.0	PO3 Setpoint	[Text]				
Process input of	data (send data)					
8458.0	PI1 Actual value	[Text]				
8459.0	Pl2 Actual value	[Text]				
8460.0	PI3 Actual value	[Text]				





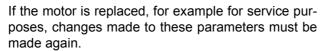
#### 8.3.2 Parameters that can be changed

Storage location

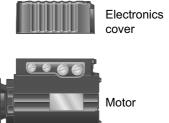


#### **INFORMATION**

The following parameters are stored in the DRC motor.



The changes remain active after changing the electronics cover.



#### Setpoints/ramp generators

Index	Parameter name	Unit	Meaning / value range	
Power section parameters \ setpoints/ramp generators \ setpoint monitoring				
Setpoint adjustr	nent			
8468.0	Setpoint filter	0.00 – <u>5.00</u> – 3000.00 [ms]	1 digit = 0.001 ms	
Setpoint stop fu	nction	,		
8578.0	Setpoint stop function	• <u>0 = Off</u> • 1 = On		
8579.0	Stop setpoint	<u>160</u> – 500 rpm	1 digit = 0.001 rpm	
8580.0	Start offset	0 – <u>30</u> – 500 [rpm]	1 digit = 0.001 rpm	
Power section p	parameters \ setpoints/ramp generators \ <u>s</u>	peed ramps	·	
Ramp generator	r 1			
8470.0	Ramp t11 up CW	0.0 - <u>4.0</u> - 2000.0 [s]	1 digit = 0.001 s	
8471.0	Ramp t11 down CW	0.0 - <u>4.0</u> - 2000.0 [s]	1 digit = 0.001 s	
8472.0	Ramp t11 up CCW	0.0 - <u>4.0</u> - 2000.0 [s]	1 digit = 0.001 s	
8473.0	Ramp t11 down CCW	0.0 - <u>4.0</u> - 2000.0 [s]	1 digit = 0.001 s	
Stop ramps				
8476.0	Stop ramp t13	0.0 - <u>2.0</u> - 2000.0 [s]	1 digit = 0.001 s	
8477.0	Emergency stop ramp t14	0.0 - <u>2.0</u> - 2000.0 [s]	1 digit = 0.001 s	
Ramp monitorin	g functions			
8928.0	Ramp monitoring	• <u>0 = Off</u> • 1 = On		
Power section p	parameters \ setpoints/ramp generators \ <u>fi</u>	xed setpoints		
Fixed internal se	etpoints			
8489.0	Fixed setpoint n11	-2000.0 – <u>150.0</u> – 2000.0 [rpm]	1 digit = 0.001 rpm	
8490.0	Fixed setpoint n12	-2000.0 – <u>750.0</u> – 2000.0 [rpm]	1 digit = 0.001 rpm	
8491.0	Fixed setpoint n13	-2000.0 – <u>1500.0</u> – 2000.0 [rpm]	1 digit = 0.001 rpm	

# Parameters Overview of power section parameters

#### Drive data



## **NOTICE**

Damage to the DRC drive unit.

Potential damage to property

• Consult SEW-EURODRIVE before you change the torque limit.

Index	Parameter name	MOVITOOLS <sup>®</sup> MotionStudio Display (Range / factory setting)	MOVILINK <sup>®</sup> scaling
Power section pa	arameters \ drive data \ motor parameters	, , , , , , , , , , , , , , , , , , , ,	
Motor operating	mode		
8574.0	Operating mode (display value)	<ul> <li>16 = Servo</li> <li>18 = Servo &amp; IPOS</li> </ul>	
Motor direction of	of rotation	, , , , , , , , , , , , , , , , , , ,	
8537.0	Direction of rotation reversal	• <u>0 = Off</u> • 1 = On	
Modulation			
8827.0	PWM frequency	• 0 = 4 kHz • 1 = 8 kHz	
Power section pa	arameters \ drive data \ monitoring functions		
Speed monitorin	g		
8557.0	Speed monitoring	<ul> <li>0 = Off</li> <li>1 = Motor mode</li> <li>2 = Regenerative mode</li> <li>3 = Motor/regenerative</li> </ul>	
8558.0	Speed monitoring delay time	0.00 - <u>1.00</u> - 10.00 [s]	1 digit = 0.001 s
Power section pa	arameters \ drive data \ <u>limit values</u>		
Setpoint limits			
8516.0	Minimum speed	0.0 – <u>200.0</u> – 2000.0 [rpm]	1 digit = 0.001 rpm
8517.0	Maximum speed	0.0 – 200.0 – <u>2000.0</u> [rpm]	1 digit = 0.001 rpm
Drive limits			
8518.0	Current limit	In connection with mechatronic MOVIGEAR® drive unit: $0 - \underline{250} - 400 \ [\%I_N]$	1 digit = 0.001 %I <sub>N</sub>
		In conjunction with DRC electronic motor: 0 – 250 – 300 [%I <sub>N</sub> ]	1 digit = 0.001 %I <sub>N</sub>
9951.3	Effective current limit	Only in connection with mechatronic MOVIGEAR® drive unit: 0 – 400 [%I <sub>N</sub> ]	1 digit = 0.001 %I <sub>N</sub>
8688.0	Torque limit	In connection with mechatronic MOVIGEAR® drive unit: $0 - \underline{250} - 400  [\% _{N}]$	1 digit = 0.001 %I <sub>N</sub>
		In conjunction with DRC electronic motor: $0 - \underline{250} - 300  [\%I_N]$	1 digit = 0.001 %I <sub>N</sub>



## Terminal assignment

Index	Parameter name	MOVITOOLS <sup>®</sup> MotionStudio MOVILINK <sup>®</sup> scaling Display (Range / factory setting)
Power section pa	arameters \ terminal assignment \ <u>digital i</u>	nputs
Digital inputs		
8334.0, bit 0	Digital input DI00 status	Fixed assignment: /controller inhibit
8334.0, bit 1	Digital input DI01 status	[Bit field]
8334.0, bit 2	Digital input DI02 status	[Bit field]
8334.0, bit 3	Digital input DI03 status	[Bit field]
8334.0, bit 4	Digital input DI04 status	[Bit field]
8335.0	Digital input DI01 function	0 = No function
8336.0	Digital input DI02 function	1 = Enable/Stop     2 = CW/stop
8337.0	Digital input DI03 function	• 3 = CCW/stop • 4 = n11
8338.0	Digital input DI04 function	<ul> <li>5 = n12</li> <li>8 = Speed ramp switchover</li> <li>9 = Reserved</li> <li>10 = Reserved</li> <li>11 = /External fault</li> <li>12 = Error reset</li> <li>13 = Reserved</li> <li>14 = /Limit switch right</li> <li>15 = /Limit switch left</li> <li>16 = IPOS input</li> <li>17 = Reference cam</li> <li>18 = Reference travel start</li> <li>19 = Slave free running</li> <li>20 = Setpoint acceptance active</li> <li>30 = /Controller inhibit</li> </ul>
Virtual digital inp	outs	
8348.0, bit 0	Digital input DI10 status	[Bit field]
8348.0, bit 1	Digital input DI11 status	[Bit field]
8348.0, bit 2	Digital input DI12 status	[Bit field]
8348.0, bit 3	Digital input DI13 status	[Bit field]
8348.0, bit 4	Digital input DI14 status	[Bit field]
8348.0, bit 5	Digital input DI15 status	[Bit field]
8348.0, bit 6	Digital input DI16 status	[Bit field]
8348.0, bit 7	Digital input DI17 status	[Bit field]
8340.0	Digital input DI10 function	• <u>0 = No function</u> • 1 = Enable/Stop
8341.0	Digital input DI11 function	• 2 = CW/stop
8342.0	Digital input DI12 function	• 3 = CCW/stop • 4 = n11
8343.0	Digital input DI13 function	• 5 = n12
8344.0	Digital input DI14 function	8 = Speed ramp switchover     9 = Reserved
8345.0	Digital input DI15 function	• 10 = Reserved • 11 = /External fault
8346.0	Digital input DI16 function	• 11 = /External fault • 12 = Error reset
8347.0	Digital input DI17 function	<ul> <li>13 = Reserved</li> <li>14 = /Limit switch right</li> <li>15 = /Limit switch left</li> <li>16 = IPOS input</li> <li>17 = Reference cam</li> <li>18 = Reference travel start</li> <li>19 = Slave free running</li> <li>20 = Setpoint acceptance active</li> <li>30 = /Controller inhibit</li> </ul>

# Parameters Overview of power section parameters

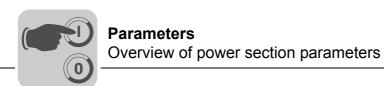
Index	Parameter name	MOVITOOLS <sup>®</sup> MotionStudio MOVILINK <sup>®</sup> scaling Display (Range / factory setting)	
Power section parameters \ terminal assignment \ digital outputs			
Virtual digital outp	outs		
8360.0, bit 0	Digital output DO10 status	[Bit field]	
8360.0, bit 1	Digital output DO11 status	[Bit field]	
8360.0, bit 2	Digital output DO12 status	[Bit field]	
8360.0, bit 3	Digital output DO13 status	[Bit field]	
8360.0, bit 4	Digital output DO14 status	[Bit field]	
8360.0, bit 5	Digital output DO15 status	[Bit field]	
8360.0, bit 6	Digital output DO16 status	[Bit field]	
8360.0, bit 7	Digital output DO17 status	[Bit field]	
8352.0	Digital output DO10 function	• <u>0 = No function</u>	
8353.0	Digital output DO11 function	• 1 = /Fault • 2 = Ready	
8354.0	Digital output DO12 function	3 = Output stage ON	
8355.0	Digital output DO13 function	4 = Rotating field ON     5 = Brake released	
8356.0	Digital output DO14 function	6 = Brake applied	
8357.0	Digital output DO15 function	7 = Motor standstill     8 = Reserved	
8358.0	Digital output DO16 function	9 = Speed reference signal     10 = Speed reference signal	
8359.0	Digital output DO17 function	<ul> <li>10 - Speed retrietice signal</li> <li>11 = Setpoint-actual value comparison signal</li> <li>12 = Current reference signal</li> <li>13 = Imax signal</li> <li>14 = /Warning motor utilization 1</li> <li>19 = IPOS in position</li> <li>20 = IPOS referenced</li> <li>21 = IPOS output</li> <li>22 = /IPOS fault</li> <li>27 = STO - safe torque off</li> <li>34 = Process data bit</li> </ul>	





### Diagnostic functions

Index	Parameter name	MOVITOOLS <sup>®</sup> MotionStudio Display (Range / factory setting)	MOVILINK <sup>®</sup> scaling
Power section p	parameters \ diagnostics functions \ refere	ence signals	
Speed reference	e message		
8539.0	Speed reference value	0.0 1500.0 2000.0 [rpm]	1 digit = 0.001 rpm
8540.0	Hysteresis	0.0 100.0 500.0 [rpm]	1 digit = 0.001 rpm
8541.0	Deceleration time	0.0 1.0 9.0 [s]	1 digit = 0.001 s
8542.0	Signal = "1" if:	<ul> <li>0 = n &lt; n ref</li> <li>1 = n &gt; n ref</li> </ul>	
Speed window s	signal		
8543.0	Window center	0 1500 2000 [rpm]	1 digit = 0.001 rpm
8544.0	Range width	<u>0</u> 2000 [rpm]	1 digit = 0.001 rpm
8545.0	Deceleration time	0 1 9 [s]	1 digit = 0.001 s
8546.0	Signal = "1" if:	• <u>0 = inner</u> • 1 = external	
Speed setpoint/	actual value comparison		
8547.0	Hysteresis	1 100 300 [rpm]	1 digit = 0.001 rpm
8548.0	Deceleration time	0 1 9 [s]	1 digit = 0.001 s
8549.0	Signal = "1" if:	<ul> <li>0 = n &lt;&gt; nset</li> <li>1 = n = nset</li> </ul>	
Current reference	ce signal		
8550.0	Current reference value	0 100 400 [%]	1 digit = 0.001 %
8551.0	Hysteresis	0 5 30 [%]	1 digit = 0.001 %
8552.0	Deceleration time	0 1 9 [s]	1 digit = 0.001 s
8553.0	Signal = "1" if:	<ul> <li>0 = I &lt; Iref</li> <li>1 = I &gt; Iref</li> </ul>	
Imax signal	'	,	
8554.0	Hysteresis	<u>5</u> 50 [%]	1 digit = 0.001 %
8555.0	Deceleration time	0 1 9 [s]	1 digit = 0.001 s
8556.0			



### Technology functions

Index	Parameter name	MOVITOOLS <sup>®</sup> MotionStudio Display (Range / factory setting)	MOVILINK <sup>®</sup> scaling
Power section	parameters \ technology functions \ IPOS refere	nce travel	
8702.0	IPOS axis referenced (display value)	• <u>0 = No</u> • 1 = Yes	
8623.0	Reference offset	<u>0</u> – 2147483647	
8624.0	Reference speed 1	0 – <u>200</u> – 2000 [rpm]	1 digit = 0.001 rpm
8625.0	Reference speed 2	0 – <u>50</u> – 2000 [rpm]	1 digit = 0.001 rpm
8626.0	Reference travel type	<ul> <li>0 = Left zero pulse</li> <li>1 = Left end of reference cam</li> <li>2 = Right end of reference cam</li> <li>3 = Limit switch right</li> <li>4 = Limit switch left</li> <li>5 = No reference travel</li> <li>6 = Reference cam flush with r</li> <li>7 = Reference cam flush with left</li> <li>8 = Without enable</li> </ul>	ight limit switch
8839.0	Reference travel to zero pulse	• 0 = No • <u>1 = Yes</u>	
10455.1	Cam distance (display value)	Increments [inc]	

#### Control functions

Index	Parameter name	MOVITOOLS <sup>®</sup> MotionStudio Display (Range / factory setting)	MOVILINK <sup>®</sup> scaling
Power section parameters \ control functions \ \ \frac{brake functions}{}			
8893.0	Activate "Brake release without drive enable"	• 0 = No • <u>1 = Yes</u>	
8584.0	Brake function	• 0 = Off • <u>1 = On</u>	
9833.20	Brake application for STO	• 0 = No • 1 = Yes	





#### **Unit functions**

Index	Parameter name	MOVITOOLS <sup>®</sup> MotionStudio Display (Range / factory setting)	MOVILINK <sup>®</sup> scaling		
Power section parame	eters \ unit functions \ setup				
8594.0	Factory setting	<ul> <li>0 = No</li> <li>1 = Standard</li> <li>2 = Delivery status</li> </ul>			
8595.0	Parameter lock	• <u>0 = No</u> • 1 = Yes			
Power section parame	eters \ unit functions \ error monitoring				
Programmable respon	ises				
9729.16	Response ext. Error	0 = No response     1 = Display only     2 = Output stage inhibit / locked     3 = Emergency stop / locked     4 = Stop / locked     5 = Output stage inhibit / waiting     6 = Emergency stop / waiting     7 = Stop / waiting			
9729.4	Line phase failure response	0 = No response     1 = Display only     2 = Output stage inhibit / locked     3 = Emergency stop / locked     4 = Stop / locked     5 = Output stage inhibit / waiting     6 = Emergency stop / waiting     7 = Stop / waiting			
9729.9	TF signal response	0 = No response     1 = Display only     2 = Output stage inhibit / locked     3 = Emergency stop / locked     4 = Stop / locked     5 = Output stage inhibit / waiting     6 = Emergency stop / waiting     7 = Stop / waiting			
8615.0	Only in connection with DSC ( <u>Direct SBus Installation</u> ) unit variant: SBus 1 timeout response	O = No response I = Display only C = Output stage inhibit / locked G = Emergency stop / locked F = Output stage inhibit / waiting G = Emergency stop / waiting F = Stop / waiting			
Error acknowledgeme	Error acknowledgement				
8617.0	Manual reset	• <u>0 = No</u> • 1 = Yes			
Power section parame	eters \ unit functions \ scaling of actual spee	d value			
8747.0	Scaling factor for user display numerator	<u>1</u> – 65535			
8748.0	Scaling factor for user display denominator	<u>1</u> – 65535			
8772.0	User unit	[Text]			
8773.0	User unit	[Text]			

# 0

#### Parameters

#### Description of command PCB parameters

#### 8.4 Description of command PCB parameters

#### 8.4.1 Display values

Command pcb parameters \ display values \ unit status

Operating status index 8310.0

The parameter indicates the current operating state.

Setting of DIP switch S1, S2 index 9621.10 The parameter indicates the setting of DIP switches S1 and S2:

DIP switch	Bit in index 9621.10	Functionality	
S1/1	0	Unit address	Unit address bit 2 <sup>0</sup>
S1/2	1		Unit address bit 2 <sup>1</sup>
S1/3	2		Unit address bit 2 <sup>2</sup>
S1/4	3		Unit address bit 2 <sup>3</sup>
S2/1	4	Binary coding operat-	Operating mode bit 2 <sup>0</sup>
S2/2	5	ing mode	Operating mode bit 2 <sup>1</sup>
S2/3	6	Use of the motion control inputs	0: Sensors 1: Local mode
S2/4	7	res.	Reserved

Display of the DIP switch setting is independent of whether the DIP switch function is activated or deactivated.

Command pcb parameters \ display values \ digital inputs

Digital input DI01 index 8334.0, bit 1

The parameter indicates the state of digital input DI01.

Digital input DI02 index 8334.0, bit 2

The parameter indicates the state of digital input DI02.

Digital input DI03 index 8334.0, bit 3

The parameter indicates the state of digital input DI03.

Digital input DI04 index 8334.0, bit 4

The parameter indicates the state of digital input DI04.

Command pcb parameters \ display values \ unit data

Unit series The parameter indicates the unit series, for example DRC.

Unit name index 9701.1 – 9701.5 The parameter indicates the type designation of the command PCB.

Unit signature index 9823.1 – 9823.5

The parameter is used to indicate and enter the device signature. This parameter is used to assign a name to the command PCB so you can identify it in the hardware tree

or in other visualization elements.





Firmware command level index 9701.30, 9701.31 The parameter indicates the part number of the firmware used in the command PCB.

Firmware SNI interface index 9701.36, 9701.37

The parameter indicates the program version of the firmware used for SNI communica-

tion.

Application option type index 10453.1

The parameter indicates the designation of the application option inserted in the appli-

peindex 10453.1 cation slot.

Command pcb parameters \ display values \ address settings

MAC address index 8995.0 – 8996.0 The parameter indicates the MAC address of the DRC SNI drive unit.

#### 8.4.2 Setpoints/ramp generators

Command PCB parameters \ setpoints/ramp generators \ setpoints

Setpoint n\_f1 index 10096.35

Use this parameter to set setpoint "n\_f1".

- Unit: [rpm]
- Setting range: 0 <u>1500</u> 2000 rpm

The setpoint "n\_f1" is valid if

 local mode is active (DIP switch S2/3 = "1") and a "0" signal is present at digital input DI03 "f1/f2".

Setpoint n\_f2 index 10096.36

Use this parameter to set setpoint "n\_f2".

- Unit: [rpm]
- Setting range: 0 200 2000 rpm

The setpoint n\_f2 is valid if

 local mode is active (DIP switch S2/3 = "1") and a "1" signal is present at digital input DI03 "f1/f2".



#### Description of command PCB parameters

#### 8.4.3 Unit functions

Command pcb parameters \ unit functions \ setup

Factory setting index 8594.0

Parameter 8594.0 is used to reset the factory settings stored in the EEPROM for almost all parameters.

Setting range:

- <u>0 = No</u>
- 1 = Standard
- 2 = Delivery status

The following data is not reset when "standard" is selected:

- IPOS program
- Speed task 1 / 2

The "delivery state" setting also resets the data listed above.

Once the data has been reset, parameter 8594.0 automatically reverts to "NO".

#### 8.4.4 Application option

Command PCB parameters \ application option \ communication

Application option type ID index 10453.1

The parameter shows the designation of the application option inserted in the application slot.

Application option monitoring index 10453.4

Use this parameter to set communication monitoring with the application option:

- 0 = Off
- <u>1 = On</u>





#### 8.5 Description of application option parameters

#### 8.5.1 GIO12B application option

Command PCB parameters \ application option \ GIO12B

Application option type index 10453.1

The parameter shows the designation of the application option inserted in the applica-

tion slot.

Digital input DI10 index 9619.11,

The parameter indicates the state and function of digital input DI10 of the application op-

tion.

Digital input DI11 index 9619.11, bit 2

bit 1

bit 3

The parameter indicates the state and function of digital input DI11 on the application

option.

Digital input DI12 index 9619.11,

The parameter indicates the state and function of digital input DI12 on the application

option.

Digital input DI13 index 9619.11, bit 4

The parameter indicates the state and function of digital input DI13 on the application

option.

**5**. . . . . .

Digital output The parameter indicates the state and function of digital output DO10 on the application

option.

DO10 index 9619.112,

bit 0

טונ ט

Digital output

DO11

index 9619.112,

bit 1

The parameter indicates the state and function of digital output DO11 on the application

option.

#### 8.5.2 GIO13B application option

Command PCB parameters \ application option \ GIO13B

Application option firmware

Application option type index 10453.1

The parameter shows the designation of the application option inserted in the applica-

tion slot.

Application option firmware

index 10453.16

index 10453.17

The parameter indicates the program version of the firmware used in the application

option.

Firmware status of application option

The parameter indicates the status of the firmware used in the application option.

Application option inputs

Digital input DI10 index 9619.11, bit 0

The parameter indicates the state and function of digital input DI10 of the application op-

tion.



#### Description of application option parameters

You can activate the digital inputs using DIP switch S1/2 of the application option (activated = DIP switch set to "ON").

Digital input DI11 index 9619.11, bit 1

The parameter indicates the state and function of digital input DI11 of the application op-

tion.

You can activate the digital inputs using DIP switch S1/2 of the application option (activated = DIP switch set to "ON").

Digital input DI12 index 9619.11, bit 2

The parameter indicates the state and function of digital input DI12 on the application option.

You can activate the digital inputs using DIP switch S1/2 of the application option (activated = DIP switch set to "ON").

Digital input DI13 index 9619.11, bit 3

The parameter indicates the state and function of digital input DI13 on the application option.

You can activate the digital inputs using DIP switch S1/2 of the application option (activated = DIP switch set to "ON").

Frequency input LFI10 index 9619.26 LFI10 frequency input of the application option.

You can activate the frequency input using DIP switch S2/1 of the application option (activated = DIP switch set to "ON").

The scaling is:

 $0 \text{ Hz} \triangleq 0 \text{ digit}$ 

The maximum frequency is set to ≜ ± 32767 digits

The maximum frequency is set using DIP switches S2/2 to S2/4.

Track A mode: 0 - 32767 digits

Tracks A/B mode: - 32767 digits - +32767 digits

You set the mode of the frequency input using DIP switch S3/1.





Analog input AI10 index 9619.36

Analog input Al10 of the application option.

You can activate the analog input using DIP switch S1/1 of the application option (activated = DIP switch set to "ON").

The scaling is:

Voltage input: 0 V ≜ 0 digit

< 4 mA ≜ -1 (wire breakage detection)

You set the mode of the analog input using DIP switch S3/3.

If you set the current input mode using DIP switch "S3/3 = ON", then you have to activate the current resistor using DIP switch "S3/4 = ON".

Voltage input mode S3/3 = OFF

S3/4 = OFF

Current input mode S3/3 = ON

S3/4 = ON

#### Application option outputs

Digital output

Digital output DO10 of the application option.

Analog output AO10 of the application option

DO10

index 9619.112,

bit 0

You can activate the digital output using DIP switch S1/4 of the application option

(activated = DIP switch set to "ON").

Analog output

A010

The scaling is:

index 9619.123

32767 digits ≙ 20 mA

0 digit ≙ 4 mA

You can activate the analog output using DIP switch S1/3 of the application option

(activated = DIP switch set to "ON").

Display of application option DIP switch settings

DIP switch configuration index 10453.12, bits 0 to 10 The parameter indicates the DIP switch configuration of the application option.

DIP switch S1

Index 10453.12, bit 0 analog input activated The parameter indicates the setting of DIP switch S1/1 of the application option.



#### Description of application option parameters

Index 10453.12, bit 1 digital inputs activated The parameter indicates the setting of DIP switch S1/2 of the application option.

Index 10453.12, bit 2 analog output activated The parameter indicates the setting of DIP switch S1/3 of the application option.

Index 10453.12, bit 3 digital output activated The parameter indicates the setting of DIP switch S1/4 of the application option.

DIP switch S2

Index 10453.12, bit 4 master frequency input activated The parameter indicates the setting of DIP switch S2/1 of the application option.

Index 10453.12, bits 5 to 7 limit frequency of master frequency input The parameter indicates the setting of DIP switches S2/1 to S2/4 of the application option.

DIP switch S3

Index 10453.12, bit 8 master frequency input A/B mode The parameter indicates the setting of DIP switch S3/1 of the application option.

Index 10453.12, bit 9

IPOS: Download +

start

The parameter indicates the setting of DIP switch S3/2 of the application option.

Index 10453.12, bit 10 analog input: Voltage mode The parameter indicates the setting of DIP switch S3/3 of the application option.





#### 8.6 Description of power section parameters

#### 8.6.1 Display values

Power section parameters \ display values \ process values

Actual speed index 8318.0

The parameter indicates the motor speed:

Unit: [rpm]

Resolution +/– 0.2 rpm

User display index 8501.0

The user display is defined by the following parameters:

· 8747.0 Scaling factor for user display numerator

· 8748.0 Scaling factor for user display denominator

• 8772.0/8773.0 User-defined unit

Unit: [Text]

Apparent output current index 8321.0

The parameter indicates the apparent current:

• Unit: [% I<sub>N</sub>]

Active output current index 8322.0

The parameter indicates the active current. The display value is positive when torque is applied in the positive direction of rotation; negative when torque is applied in negative direction of rotation.

Unit: [% I<sub>N</sub>]

Apparent output current index 8326.0

The parameter indicates the apparent output current:

Unit: [A]

DC link voltage index 8325.0

The parameter indicates the voltage measured in the DC link circuit:

• Unit: [V]

Unit utilization index 8730.0

The parameter indicates the unit utilization lxt:

• Unit: [%]

Heat sink temperature index 8327.0

The parameter indicates the heat sink temperature of the power section:

Unit: [°C]

Motor utilization index 8323.0

The parameter indicates the motor utilization calculated using motor model and current.

• Unit: [%]

Motor temperature index 9872.255

The parameter indicates the measured motor temperature.

• Unit: [°C]



#### Description of power section parameters

Power section parameters \ display values \ unit status

Status of power section index 9702.2

The parameter indicates the status of the power section:

- 0 = Not ready
- 1 = Ready, output stage inhibited
- 2 = Ready, output stage enabled

## Drive status index 9702.7

The parameter indicates the operating state of the power section:

- 0 = Inhibited
- 1 = Controller inhibit
- 2 = System error
- 3 = No enable
- 6 = Enabled
- 7 = Rapid stop
- 8 = Integrator stop
- 9 = Emergency stop
- 11 = Limit switch operation
- 12 = Pos. operation
- 15 = Reference travel
- 18 = Release brake
- 19 = Apply brake

# Error and error code index 9702.5

The parameter indicates a pending error with error number in plain text.

Error and suberror code

index 10071.1

The parameter provides detailed information on the error of an error group.

Error source index 10404.5

The parameter indicates the error source of a pending error:

- 0 = No error
- 1 = Power section
- 2 = Command PCB

# Operating hours index 8328.0

The parameter indicates the total number of hours for which the inverter has been connected to the supply system or an external DC 24 V supply.

- · Storage cycle every 15 min
- Unit: [h]

## Enable hours index 8329.0

The parameter indicates the total number of hours for which the power section was in ENABLE operating state:

- · Storage cycle every 15 min
- Unit: [h]





Energy index 8330.0

The parameter indicates the total of active electrical energy the motor has consumed:

- Storage cycle every 15 min
- Unit: [kWh]

#### Power section parameters \ display values \ \ \frac{digital inputs}{}

Digital inputs
DI00 - DI04
index 8334.0,
bit 0 – bit 4

The parameter shows the present state of digital inputs DI00 – DI04.

Digital input DI00 is always assigned with /controller inhibit.

Digital inputs DI00 - DI04 index 8335.0 -8338.0 The parameter shows the current function assignment of digital inputs DI00 – DI04.

Digital input DI00 is always assigned with /controller inhibit.

Digital inputs DI10 – DI17 index 8348.0, bits 0 – 7 The parameter indicates the present state of the digital input of an application option (e.g. GIO12B). If the option is not installed, the virtual digital inputs will be displayed.

Digital inputs DI10 - DI17 index 8340.0 -8347.0 The parameter indicates the current function assignment of the digital input of an application option (e.g. GIO12B). If the option is not installed, the virtual digital inputs will be displayed.

#### Power section parameters \ display values \ \ digital outputs

Digital outputs		
DO10 - DO17		
index 8360.0,		
bits 0 – 7		

The parameter indicates the present state of the digital outputs of an application option (e.g. GIO12B). If the option is not installed, the virtual digital outputs will be displayed.

Digital outputs DO10 - DO17 index 8352.0 -8359.0 The parameter indicates the current function assignment of the digital outputs of an application option (e.g. GIO12B). If the option is not installed, the virtual digital outputs

will be displayed.



#### Description of power section parameters

Power section parameters \ display values \ unit data

Unit series index 9701.10

The parameter indicates the unit series, for example "DRC".

Variant ID index 9701.11

The parameter indicates the unit generation, for example "B".

Unit name index 9701.1, 9701.2, 9701.3, 9701.4, 9701.5 The parameter indicates the type designation of the power section.

Unit variant index 10204.2

The parameter indicates the DRC installation technology, e.g.:

- DBC = Direct Binary Communication
- DAC = Direct AS-Interface Communication
- DSC = Direct SBus Communication
- SNI = Single Line Network Installation

Unit signature index 9823.1, 9823.2, 9823.3, 9823.4, 9823.5

The parameter is used to indicate and enter the unit signature. This parameter is used to assign a name to the power section so you can identify it in the hardware tree or in other visualization elements.

Nominal unit current (rms) index 8361.0

The parameter indicates the nominal unit current (rms value).

Unit: [A]

Motor size index 10079.9

The parameter indicates the size of the DRC drive unit.

Nominal motor torque index 9610.1

The parameter indicates the available continuous torque of the motor.

Unit: [Nm × 10<sup>-5</sup>]

Basic unit firmware index 9701.30

The parameter indicates the part number of the firmware used in the power section.

Status of basic unit firmware index 9701.31

The parameter indicates the status of the firmware used in the power section.



## Description of power section parameters



Power section parameters \ Display values \ Error memory 0-4 \ Error memory t-0-4

There are 5 error memories (t-0-t-4). The errors are stored in a chronological sequence with the most recent error event being stored in error memory t-0. If there are more than 5 errors, the error event of longest standing, stored in t-4, is deleted.

Programmable error responses: see chapter "Unit functions/error monitoring".

The following information available at the time of the error is stored and can be used for detailed diagnostics:

- · State of digital inputs / digital outputs
- Actual speed
- · Apparent output current
- · Active current
- Unit utilization
- · Motor utilization
- · DC link voltage
- · Power section status
- · Operating hours
- · Enable hours
- Work
- · Heat sink temperature
- Motor temperature
- · Electronics temperature

Error t-0 – 4 error code index 8366.0, 8367.0, 8368.0, 8369.0, 8370.0 The parameter shows the error group with error number and in plain text.

Error t-0 – 4 suberror code index 10072.1, 10072.2, 10072.3, 10072.4, 10072.5

The parameter provides detailed information on the error of an error group.

Error t-0 – 4 internal index 8883.0, 8884.0, 8885.0, 8886.0, 8887.0 The parameter provides detailed information on the error – can only be evaluated by SEW-EURODRIVE.

Source of error t-0 - 4 index 10404.6, 10404.7, 10404.8, 10404.9, 10404.10 The parameter indicates the error source:

- <u>0 = No error</u>
- 1 = Power section
- 2 = Command PCB



#### Description of power section parameters

Digital inputs DI00 - DI04 t-0 - 4 index 8371.0, 8372.0, 8373.0, 8374.0, 8375.0 bits 0 - 4 The parameter indicates the state of the digital inputs at the time of the error.

Digital inputs DI10 - DI17 t-0 - 4 index 8376.0, 8377.0, 8378.0, 8379.0, 8380.0 bits 0 - 7 The parameter indicates the state of the digital inputs at the time of the error.

Digital outputs DO10 – DO17 t-0 – 4 index 8386.0, 8387.0, 8388.0, 8389.0, 8390.0 bits 0 – 7

The parameter indicates the state of the digital outputs at the time of the error.

Actual speed t-0 – 4 index 8401.0, 8402.0, 8403.0, 8404.0, 8405.0 The parameter indicates the actual motor speed at the time of the error.

Unit [rpm]

Apparent output current t-0 – 4 index 8406.0, 8407.0, 8408.0, 8409.0, 8410.0 The parameter indicates the apparent output current in percent of the nominal unit current at the time of the error.

Unit [%]

Active output current t-0 – 4 index 8411.0, 8412.0, 8413.0, 8414.0, 8415.0 The parameter indicates the active output current in percent of the nominal unit current at the time of the error.

Unit [%]

Unit utilization t-0 – 4 index 8414.0, 8417.0, 8418.0, 8419.0, 8420.0 The parameter indicates the unit utilization lxt at the time of the error.

Unit: [%]

Motor utilization t-0 – 4 index 8441.0, The parameter indicates the motor utilization calculated using the motor model and the current at the time of the error.

index 8441.0, 8442.0, 8443.0, 8444.0, 8445.0

Unit: [%]

DC link voltage t-0 – 4 index 8421.0, 8422.0, 8423.0, 8424.0, 8425.0 The parameter indicates the voltage measured in the DC link at the time of the error.

• Unit: [V]





Power section status t-0 – 4 index 8391.0, 8392.0, 8393.0, 8394.0, 8395.0 The parameter indicates the operating state of the power section at the time of the error:

- 0 = Inhibited
- 1 = Controller inhibit
- 2 = System error
- 3 = No enable
- 6 = Enabled
- 7 = Rapid stop
- 8 = Integrator stop
- 9 = Emergency stop
- 11 = Limit switch operation
- 12 = Pos. operation
- 15 = Reference travel
- 18 = Release brake
- 19 = Apply brake

Operating hours t-0 - 4 index 8426.0, 8427.0, 8428.0, 8429.0, 8430.0 The parameter indicates the total number of hours for which the inverter has been connected to the supply system at the time of the error.

- Storage cycle every 15 min
- Unit: [h]

Enable hours t-0 – 4 index 8431.0, 8432.0, 8433.0, 8434.0, 8435.0 The parameter indicates the total number of hours for which the power section was in ENABLE operating state at the time of the error.

- Storage cycle every 15 min
- Unit: [h]

Work t-0 – 4 index 10083.1, 10083.2, 10083.3, 10083.4, 10083.5 The parameter indicates the total of active electrical energy the motor has consumed at the time of the error.

· Storage cycle every 15 min

Heat sink temperature t-0 – 4 index 8396.0, 8397.0, 8398.0,

8399.0, 8400.0

The parameter indicates the heat sink temperature of the power section at the time of the error.

Unit: [°C]

Motor temperature t-0 - 4 index 10070.1, 10070.2, 10070.3,

10070.4, 10070.5

The parameter indicates the motor temperature measured at the time of the error.

• Unit: [°C]

Power section parameters \ display values \ process data monitor

Process data configuration

index 8451.0

The parameter indicates the set process data word configuration.





## Description of power section parameters

PO1 – PO3 setpoint index 8455.0, 8456.0, 8457.0 The parameter indicates the value currently transmitted in the process data word.

PO setpoint	Description
Index 8455.0	Index 8304.0
PO1 Setpoint	Setpoint description PO1
Index 8456.0	Index 8305.0
PO2 Setpoint	Setpoint description PO2
Index 8457.0	Index 8306.0
PO3 Setpoint	Setpoint description PO3

PI1 – PI3 actual value index 8458.0, 8459.0, 8460.0 The parameter indicates the value currently transmitted in the process data word.

PO setpoint	Description
Index 8458.0	Index 8307.0
PI1 Actual value	Actual value description PO1
Index 8459.0	Index 8308.0
PI2 Actual value	Actual value description PO2
Index 8460.0	Index 8309.0
PI3 Actual value	Actual value description PO3





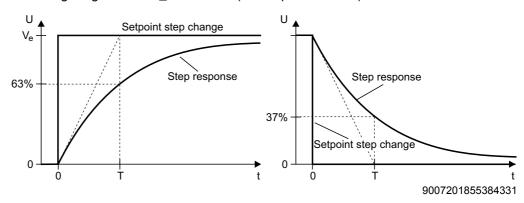
#### 8.6.2 setpoints/ramp generators

Power section parameters \ setpoints/ramp generators \ setpoint monitoring

Setpoint filter index 8468.0

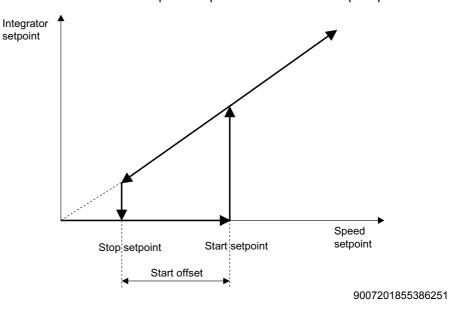
The speed ramp is filtered. The filter can be used for dampening stepped setpoint selections, e.g. from external controllers or interference pulses at the analog input.

• Setting range:  $T = 0 - \underline{5} - 3000 \text{ ms}$  (0 = setpoint filter off)



Setpoint stop function index 8578.0; stop setpoint index 8579.0; start offset index 8580.0 If the setpoint stop function is activated, the inverter is enabled when the speed setpoint is larger than the stop setpoint + start offset.

Inverter enable is revoked when the speed setpoint falls below the stop setpoint.



#### Description of power section parameters

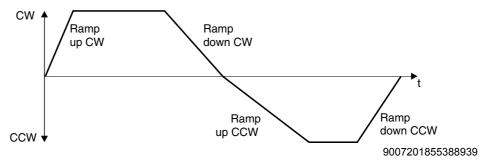
Power section parameters \ setpoints/ramp generators \ \ speed ramps

Ramp t11 up/down CW/CCW index 8470.0 8471.0, 8472.0, 8473.0 These parameters are used to set ramp t11:

- Parameter 8470.0 ramp t11 up CW
- Parameter 8471.0 ramp t11 down CW
- Parameter 8472.0 ramp t11 up CCW
- Parameter 8473.0 ramp t11 down CCW

The ramp times refer to a setpoint step change of  $\Delta n = 3000$  rpm. The ramp takes effect when the speed setpoint is changed and the enable is revoked via the CW/CCW terminal.

- Unit: [s]
- Setting range: 0 2 2000 s



Stop ramp t13 index 8476.0

This parameter is used to set stop ramp t13:

- Unit: [s]
- Setting range: 0 2 2000 s

The stop ramp is active in the event of a power failure or an error (parameterizable error responses).

Emergency stop ramp t14 index 8477.0 This parameter is used to set emergency stop ramp t14:

- Unit: [s]
- Setting range: 0 2 2000 s

The emergency stop ramp is activated in the event of an error (parameterizable error responses).

The system monitors whether the drive reaches zero speed within the set time. After the set time expires, the output stage is inhibited and the brake (if installed) is applied even if zero speed has not yet been reached.

Ramp monitoring index 8928.0

This parameter is used to activate ramp monitoring:

· Setting range: YES / NO

If you set the deceleration ramps to a value that is much shorter than can be physically achieved in the system, the rotating drive will be stopped once the monitoring time has expired.

The respective ramp time also has to be increased, if the ramp timeout is definitely triggered by a preset ramp that cannot be traveled. This parameter is an additional monitoring function for speed monitoring. However, it only applies to the deceleration ramp. This means the parameter can be used to monitor the deceleration ramp, stop ramp or emergency stop ramp if speed monitoring is not desired.





Power section parameters \ setpoints/ramp generators \ \fixed setpoints

Fixed setpoints n11, n12, n13 index 8489.0, 8490.0, 8491.0 Use this parameter to set the fixed setpoints n11, n12, n13:

• Setting range: 0 – 2000 rpm

You can activate up to three fixed setpoints (binary coded) using the virtual digital inputs or process data words.

Fixed setpoints	Factory setting
Index 8489.0	n11 = 150 rpm
Internal setpoint n11	
Index 8490.0	n12 = 750 rpm
Internal setpoint n12	
Index 8491.0	n13 = 1500 rpm
Internal setpoint n13	

Programming the input terminals:

Response	Virtual terminal		
	n11	n12	Enable/Stop
Stop with t13	х	х	0
Fixed setpoint not active	0	0	1
n11 effective	1	0	1
n12 effective	0	1	1
n13 effective	1	1	1

# Parameters Description

#### Description of power section parameters

#### 8.6.3 Drive data

Power section parameters \ drive data \ motor parameters

Operating mode index 8574.0

The parameter indicates the set operating mode:

• 16 = Servo

18 = Servo & IPOS

Direction of rotation reversal index 8537.0

This parameter is used to activate direction of rotation reversal.

Setting range: ON / OFF:

- OFF: The motor turns CW for a positive setpoint and CCW for a negative setpoint.
- ON: The motor turns CCW for a positive setpoint and CW for a negative setpoint.

If you alter the "Direction of rotation reversal" parameter after the system has been referenced, the system will lose its reference point for the absolute position. The result may be undesirable movements of the axis.

#### **▲** WARNING



Risk of injury due to undesirable movements of the axis.

Severe or fatal injuries.

 Never change the "Direction of rotation reversal" parameter after referencing the system.

PWM frequency index 8827.0

This parameter is used to set the nominal cycle frequency at the inverter output. The cycle frequency can change automatically depending on the unit utilization:

- 0 = 4 kHz
- 1 = 8 kHz

Power section parameters \ drive data \ monitoring functions

The following monitoring functions have been implemented to monitor what happens to drive-specific parameters in the specific application and to be able to react in case of impermissible deviations. You can set the response to triggered monitoring functions under "Unit functions/error monitoring".

Speed monitoring index 8557.0

This parameter is used to activate speed monitoring.

Setting range:

- OFF
- MOTOR MODE
- REGENERAT. MODE
- MOTOR / REGENERATIVE

The speed required by the setpoint can only be achieved if there is sufficient torque available to meet the load requirements. Once the current limit (index 8518.0) has been reached, the unit assumes that the torque has reached its maximum and the desired speed cannot be reached. The speed monitoring function trips if this state persists for the specified delay time (index 8558.0).

Delay time for speed monitoring index 8558.0 This parameter is used to set the delay time for speed monitoring:

Setting range: 0 – <u>1</u> – 10 s





The set current limit can be reached briefly during acceleration, deceleration, or load peaks. You can prevent the speed monitoring from responding too sensitively by setting the delay time accordingly. The current limit must be reached permanently for the duration of the delay time before the monitoring function trips.

#### Power section parameters \ drive data \ \ \frac{limit values}{2}

Minimum speed index 8576.0

This parameter is used to set the speed value, the lower limit of which must not be exceeded even when zero is selected as the setpoint.

• Setting range: 0 – 2000 rpm

Minimum speed index 8517.0

This parameter is used to set the speed value, which cannot be exceeded by a setpoint specification:

• Setting range: 0 – 2000 rpm

If  $n_{min} > n_{max}$  is set, then  $n_{max}$  applies.

Current limit index 8518.0

This parameter is used to set the current limit:

Setting range: 0 – <u>250</u> – 300 % I<sub>N</sub>

The user specifies the current limit in % IN based on the continuous apparent current of the power section. The actually effective current limit calculated by the unit can be lower to protect the gear unit. It is shown in the parameter "effective current limit".

Torque limit index 8688.0



#### NOTICE

Damage to the DRC drive unit.

Potential damage to property

Consult SEW-EURODRIVE before you change the torque limit.

This parameter is used to set the torque limit:

• Setting range: 0 – <u>250</u> – 300 %

The parameter limits the maximum torque of the motor. It acts on the setpoint of the motor torque ( $k_T \times I_{N \text{ inverter}}$ ).

## Description of power section parameters

#### 8.6.4 Terminal assignment

Power section parameters \ terminal assignment \ \ \frac{digital inputs}{}

Digital inputs DI01 – DI04 index 8334.0, bits 0 – 4 The parameters show the status of digital inputs DI00 to DI04.

Digital inputs DI01 - DI04 index 8335.0 -8338.0 This parameter is used to specify the assignment of digital inputs DI01 – D04. Digital input DI00 is always assigned with /controller inhibit.

You can program the digital inputs to the following functions:

Function	Effect in case of		
runction	"0" signal	"1" signal	
0 = No function	_	_	
1 = Enable/Stop	Stop at t13	Enable	
2 = CW/stop	Stop at t11 or t12	Enable CW	
3 = CCW/stop	Stop at t11 or t12	Enable CCW	
4 = n11 n13	External setpoints only	n11 n13	
5 = n12	External setpoints only	n12	
8 = Speed ramp switchover	1. ramp (t11) active	2. ramp (t12) active	
9 = Reserved	_	-	
10 = Reserved	_	-	
11 = /External error, 0 active	External fault	-	
12 = Error reset	Reset on positive edge ("0" to "1")		
13 = Reserved			
14 = /Limit switch right	Right limit switch reached	Not reached	
15 = /Limit switch left	Left limit switch reached	Not reached	
16 = IPOS input	Function depends on IPOS function		
17 = Reference cam	Not activated	Activated	
18 = Reference travel start	_	Start referencing for IPOS	
19 = Slave free running	Master-slave operation	Free-running slave	
20 = Setpoint acceptance active	Do not accept	Accept setpoint	
30 = /Controller inhibit, 0 active	Controller inhibit active	Controller enabled	





Digital inputs DI10 – DI17 index 8348.0, bits 0 – 7 The parameters show the status of the virtual digital inputs DI10 to DI17.

Digital inputs DI10 - DI17 index 8340.0 -8347.0 This parameter is used to specify the assignment of virtual digital inputs DI10 – DI17, or the assignment of the digital inputs of an application option. You can program the digital inputs to the following functions:

Function	Effect in case of		
runction	"0" signal	"1" signal	
0 = No function	-	_	
1 = Enable/Stop	Stop at t13	Enable	
2 = CW/stop	Stop at t11 or t12	Enable CW	
3 = CCW/stop	Stop at t11 or t12	Enable CCW	
4 = n11 n13	External setpoints only	n11 n13	
5 = n12	External setpoints only	n12	
8 = Speed ramp switchover	1. ramp (t11) active	2. ramp (t12) active	
9 = Reserved	-	_	
10 = Reserved	-	_	
11 = /External error, 0 active	External fault	_	
12 = Error reset	Reset on positive edge ("0" to "1")		
13 = Reserved			
14 = /Limit switch right	Right limit switch reached	Not reached	
15 = /Limit switch left	Left limit switch reached	Not reached	
16 = IPOS input	Function depends on IPOS function		
17 = Reference cam	Not activated	Activated	
18 = Reference travel start	-	Start referencing for IPOS	
19 = Slave free running	Master-slave operation	Free-running slave	
20 = Setpoint acceptance active	Do not accept	Accept setpoint	
30 = /Controller inhibit, 0 active	Controller inhibit active	Controller enabled	

#### Description of power section parameters

Power section parameters \ terminal assignment \ \ \frac{digital outputs}{}

Digital outputs DO10 – DO17 index 8360.0, bits 0 – 7 The parameters show the status of the virtual digital outputs DO10 to DO17.

Digital outputs DO10 - DO17 index 8352.0 -8359.0 This parameter is used to specify the assignment of virtual digital outputs DO10 - DO17, or the assignment of the digital outputs of an application option. You can program the digital outputs to the following functions:



#### **INFORMATION**

The binary signals are only valid if the inverter has signaled "ready" after it has been switched on and if no error message has been issued. Binary signals have "0" status while the unit is being initialized.

Several terminals can be assigned the same function.

Function	Digital output has		
runction	"0" signal	"1" signal	
0 = No function	Always "0" signal	_	
1 = /Fault	Collective fault signal	_	
2 = Ready	Not ready	Ready for operation	
3 = Output stage ON	Unit inhibited	Unit enabled and motor energized	
4 = Rotating field ON	No rotating field	Rotating field	
5 = Brake released <sup>1)</sup>	In conjunction with mechatronic MOVIGEAR® drive unit:  DynaStop® is activated	In conjunction with mechatronic MOVIGEAR® drive unit:  DynaStop® is deactivated	
	In conjunction with DRC electronic motor: Brake applied	In conjunction with DRC electronic motor: Brake released	
6 = Brake applied <sup>1)</sup>	In conjunction with mechatronic MOVIGEAR® drive unit:	In conjunction with mechatronic MOVIGEAR® drive unit:	
	DynaStop® is deactivated  In conjunction with DRC electronic motor:  Brake released	DynaStop® is activated  In conjunction with DRC electronic motor:  Brake applied	
7 = Motor standstill	Motor is running	Motor is at standstill	
8 = Reserved	-	_	
9 = Speed reference signal	n > n <sub>ref</sub> (n < n <sub>ref</sub> )	n < n <sub>ref</sub> (n > n <sub>ref</sub> )	
10 = Speed reference signal	Speed is outside (within) speed window	Speed is within (outside) speed window	
11 = Setpoint/actual value comparison signal	n <> n <sub>set</sub> (n = n <sub>set</sub> )	$n = n_{set} (n <> n_{set})$	
12 = Current reference signal	I > I <sub>ref</sub> (I < I <sub>ref</sub> )	I < I <sub>ref</sub> (I > I <sub>ref</sub> )	
13 = Imax signal	I < I <sub>max</sub> (I = I <sub>max</sub> )	=   <sub>max</sub> (  <   <sub>max</sub> )	
14 = /Warning motor utilization	100% pre-warning of motor protection function	_	
19 = IPOS in position	Position not reached	Position reached	
20 = IPOS referenced	No referencing	Referencing finished	
21 = IPOS output	Depends on IPOS program		
22 = /IPOS fault	IPOS program error message	_	



## Description of power section parameters



Function	Digital output has		
	"0" signal	"1" signal	
27 = STO – safe torque off	Not active	Active	
34 = Process data bit	Bit not set	Bit set	

<sup>1)</sup> Controlled by the inverter The "Brake released" and "Brake applied" signals are intended to be passed on to a master controller.

# Parameters Description

Description of power section parameters

#### 8.6.5 Diagnostic functions

Power section parameters \ diagnostics functions \ reference signals

The following reference values are used for detecting and reporting certain operating states. All signals of this parameter group can be output via virtual digital outputs.

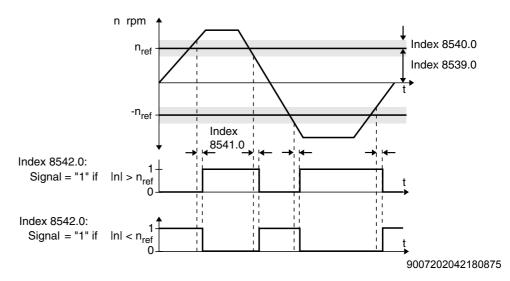
# i

#### **INFORMATION**

The signals are only valid if the inverter has signaled "ready" after switch-on and no error is indicated.

# Speed reference signal

Signal if the speed is less than or greater than the set reference speed.



Speed reference value index 8539.0

Setting range: 0 – <u>1500</u> – 6000 rpm

Hysteresis index 8540.0

Setting range:  $0 - \underline{100} - 500 \text{ rpm}$ 

Delay time index 8541.0

Setting range:  $0 - \underline{1} - 9 \text{ s}$ 

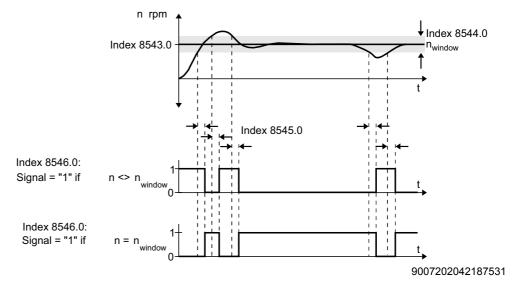
Signal = "1" if: Index 8542.0

 $\underline{\mathsf{n}} < \underline{\mathsf{n}}_{\mathsf{ref}} / \, \mathsf{n} > \mathsf{n}_{\mathsf{ref}}$ 



Speed window signal

Signals whether the speed is within or outside the set window range.



Window center index 8543.0

Setting range: 0 - 1500 - 6000 rpm

Range width index 8544.0

Setting range: <u>0</u> – 6000 rpm

0044.0

Delay time index

8545.0

Setting range:  $0 - \underline{1} - 9 s$ 

Signal = "1" if: Index 8546.0

Setting range: WITHIN / OUTSIDE

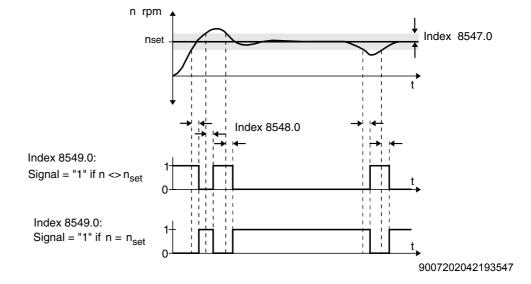




## Description of power section parameters

Speed setpoint / actual value comparison

Signal if the speed is equal to or not equal to the setpoint speed.



Hysteresis index 8547.0

Setting range:  $1 - \underline{100} - 300 \text{ rpm}$ 

Delay time index 8548.0

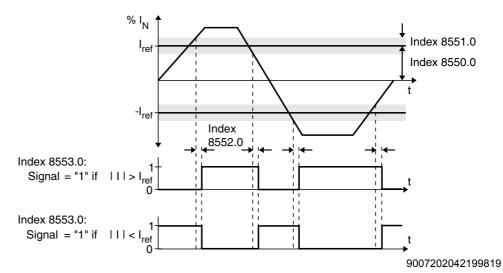
Setting range:  $0 - \underline{1} - 9 s$ 

Signal = "1" if: Index 8549.0 Setting range:  $\underline{n = n_{setpt}} / n <> n_{setpt}$ 



Current reference signal

Signal if the output current is greater than or less than the reference value.



Current reference value index 8550.0

Setting range: 0 - 100 - 400 % I<sub>N</sub>

Hysteresis index 8551.0

Setting range:  $0 - \underline{5} - 30 \% I_N$ 

Delay time index 8552.0

Setting range:  $0 - \underline{1} - 9$  s

Signal = "1" with index 8553.0

 $\underline{\mathsf{I}} < \underline{\mathsf{I}}_{\underline{\mathsf{ref}}} / \, \mathsf{I} > \mathsf{I}_{\underline{\mathsf{ref}}}$ 

Imax signal

Signal if the inverter has reached the current limitation.

Hysteresis index 8554.0

Setting range:  $\underline{5}$  – 50 % I<sub>N</sub>

Delay time index 8555.0

Setting range:  $0 - \underline{1} - 9$  s

Signal = "1" with index 8556.0

 $\underline{\mathsf{I} < \mathsf{I}_{\max}} / \mathsf{I} = \mathsf{I}_{\max}$ 

# Parameters Description

Description of power section parameters

#### 8.6.6 Technology functions



#### INFORMATION

For detailed information on the following parameters, refer to the "IPOS<sup>plus®</sup>" manual.

Power section parameters \ technology functions \ IPOS reference travel

#### **WARNING**

Risk of injury if the drive unit starts up automatically.

Severe or fatal injuries.



- · Ensure that the motor cannot start unintentionally.
- Note that modifying these parameters without knowledge of the IPOS<sup>plus®</sup> program, which may be active, can cause unexpected movements and result in unwanted loads on the mechanical drive train. It is essential that you are familiar with the IPOS<sup>plus®</sup> manual to make the setting for these parameters.

Reference travel is used to establish a **machine zero** to which all absolute positioning commands refer. For this purpose, you can choose between various so-called reference strategies index travel strategies 8626.0 reference travel type. These strategies define appropriate travel modes, for example, to search for a reference cam. Using the reference point determined by reference travel, the machine zero point can be changed using P900 Reference offset according to the following equation:

Machine zero = reference position + reference offset

.

The speeds of the travel movements required for the reference travel type are set using index 8624.0 reference speed 1 / index 8625.0 reference speed 2.

IPOS axis referenced index 8702.0

The parameter indicates whether the DRC drive was referenced.

Reference offset index 8623.0

Reference offset (zero offset) is used to determine the machine zero (origin).

• Setting range:  $-(2^{31}-1) - 0 - 2^{31}-1$ 

The following applies: Machine zero = reference position + reference offset

The corresponding actual positions are indicated by IPOS<sup>plus®</sup> variables.

H511 Actual position motor encoder

The reference offset becomes active after reference travel has been completed successfully.

#### Description of power section parameters



**Parameters** 

#### Reference speed 1 index 8624.0

Reference speed 1 determines the travel speed for the first part of the reference travel. Stop ramp t13 is always used to change the speed. The search directions during reference travel are determined by the respective reference travel type. The speed is in effect until the reference cam has been reached.

Setting range: 0 - 200 - 2000 rpm

#### Reference speed 2 index 8625.0

Reference speed 2 determines the travel speed for the second part of the reference travel. Stop ramp t13 is always used to change the speed. The search directions during reference travel are determined by the respective reference travel type. The speed is effective from the time the drive leaves the reference cam until it reaches the first zero pulse.

Setting range: 0 - 50 - 2000 rpm

The reference speed is limited to 50 rpm for reference travel type 0 and for referencing to a zero pulse.

#### Reference travel type index 8626.0

The reference travel type specifies the reference travel strategy that is used to establish the machine zero of a machine.

Setting range: 0 – 8

This setting also defines the search direction for the reference cam in the individual referencing phases.

Use parameter index 8839.0 referencing to zero pulse to determine if the reference travel takes place to the edge change of the reference cam or the next zero pulse of the encoder.

The drive must be ready for operation and enabled for all types of reference travel to take place.

Some types are available that work without a reference cam.

#### Type 0: Left zero pulse

- First search direction is CCW
- Reference position = Left zero pulse from current position
- Machine zero = reference position + reference offset

#### Type 1: Left end of the reference cam

- First search direction is CCW
- Reference position = First zero pulse or falling edge to the left of the reference cam
- Machine zero = reference position + reference offset

#### Type 2: Right end of the reference cam

- First search direction is CW
- Reference position = First zero pulse or falling edge to the right of the reference
- Machine zero = reference position + reference offset

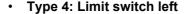
#### Type 3: Limit switch right

- First search direction is CW
- Reference position = First zero pulse or falling edge to the left of the right limit switch.
- Machine zero = reference position + reference offset
- Reference travel should take place to zero pulse.



## Parameters Description

#### Description of power section parameters



- First search direction is CCW
- Reference position = First zero pulse or falling edge to the right of the left limit switch.
- Machine zero = reference position + reference offset
- Reference travel should take place to zero pulse.

#### Type 5: No reference travel

- Reference position = current position
- Machine zero = reference offset

#### Type 6: Reference cam flush with right limit switch

- First search direction is CW
- Reference position = First zero pulse or falling edge to the left of the reference cam
- Machine zero = reference position + reference offset
- Note: Reference cam and limit switch must be flush!

#### Type 7: Reference cam flush with left limit switch

- First search direction is CCW
- Reference position = First zero pulse or falling edge to the right of the reference cam
- Machine zero = reference position + reference offset
- Note: Reference cam and limit switch must be flush!

#### · Type 8: Without enable

- Reference position = current position
- Machine zero = reference offset

Referencing to zero pulse index 8839.0 Setting range: YES/NO.

- YES: The drive is referenced to the zero pulse of the selected IPOS<sup>plus®</sup> encoder.
- NO: Reference travel takes place on the falling edge of the reference cam.

Cam distance index 10455.0

Indicates the distance between reference cam and 0 pulse after reference travel in increments.

#### 8.6.7 Control functions

Power section parameters \ control functions \ brake functions

Activation of brake release without drive enable signal index 8893.0

#### **▲ WARNING**

Risk of fatal injury if the hoist falls.

Severe or fatal injuries.

Never use the function "Brake release without drive enable signal" for hoist applications!



#### **Parameters** Description of power section parameters



This parameter is used to set the function "Brake release without drive enable":

- 0 = NO
- 1 = YES

When the function is set to YES, the brake can be released even if there is no drive enable signal.



#### INFORMATION

For more information about releasing the brake without drive enable, refer to chapter "Operation".

Brake function index 8584.0

This function gives users the option to choose between electrically holding the load and mechanical brake application in hold status.



#### **INFORMATION**

- The brake is always applied when /CONTROL.INHIBIT = 0.
- When "STO safe torque off" is activated, the brake is applied (not safety-related) as set in parameter "Index 9833.20 - brake application for STO".

The parameter defines whether the brake is applied or not when the enable signal is withdrawn (enable = "0").

- 0 = OFF: The drive decelerates along the set ramp. When the speed is "0", the brake remains open and the drive generates a holding torque.
- 1 = ON: The drive decelerates along the set ramp. When the speed is "0", the brake is applied.



#### **Parameters**

#### Description of power section parameters

Brake application for STO index 9833.20

The parameter defines whether the brake is applied or not (not safety-related) when STO (safe torque off) is triggered.

- 0 = NO: The brake status remains unchanged when STO is triggered.
- <u>1 = YES</u>: The brake is applied when STO is triggered.



#### **INFORMATION**

Note the information about permitted "emergency braking operations" in chapter "Technical Data".

#### 8.6.8 Unit functions

Power section parameters \ unit functions \ setup

Factory setting index 8594.0

Parameter 8594.0 is used to reset the factory settings stored in the EEPROM for almost all parameters.

Setting range:

- <u>0 = No</u>
- 1 = Standard
- 2 = Delivery status

The following data is not reset when "standard" is selected:

- IPOS program
- Speed control
- Limits
- · Serial communication SBus 1
- Speed task 1 / 2
- · Error memory
- · Statistical data

The "delivery state" setting also resets the data listed above.

Once the data has been reset, parameter 8594.0 automatically reverts to "NO".

Parameter lock index 8595.0

Setting range: ON / OFF

Setting parameter 8595.0 to "ON" prevents any change to the parameters (except for index 8617.0 manual reset and the parameter lock itself). This makes sense, for example, after the drive settings have been optimized. Index 8595.0 must be set to "OFF" to enable changes to parameters again.



#### **INFORMATION**

The parameter lock also acts on the SBus interface and on IPOSplus®





Power section parameters \ unit functions \ error monitoring

#### **A** WARNING

Risk of injury if the drive unit starts up automatically.



Severe or fatal injuries.

 Error messages can be automatically reset depending on the programmed error response, i.e. the drive units receive the current process output data from the controller again as soon as the error is corrected.
 If, for safety reasons, this is not permitted for the driven machine, disconnect the unit from the supply system before correcting the error.

The following responses can be programmed:

Response	Description
[0] NO RESPONSE	The error is not displayed, and there is no error response. The signaled error is ignored.
[1] DISPLAY ONLY	The error is displayed and the error output is set (if programmed). The unit performs no other error responses. The error can be reset (fieldbus, auto reset).
[2] OUTPUT STAGE INHIBIT / LOCKED	The inverter switches off immediately and issues an error message. The output stage is inhibited and the brake (if installed) is applied. The ready signal is revoked and the error output is set, if programmed. A restart is only possible after an error reset during which the inverter is reinitialized.
[3] EMERGENCY STOP / LOCKED	The drive is braked along the set emergency stop ramp t14. Once the stop speed is reached, the output stage is inhibited and the brake (if installed) is applied. The error is signaled immediately. The ready signal is revoked and the error output is set, if programmed. A restart is only possible after an error reset during which the inverter is reinitialized.
[4] STOP / LOCKED	The drive is braked along the set stop ramp t13. Once the stop speed is reached, the output stage is inhibited and the brake (if installed) is applied. The error is signaled immediately. The ready signal is revoked and the error output is set, if programmed. A restart is only possible after an error reset during which the inverter is reinitialized.
[5] OUTPUT STAGE INHIBIT / WAITING	The inverter switches off immediately and issues an error message. The output stage is inhibited and the brake (if installed) is applied. The error is signaled via the terminal, if programmed. The ready signal is removed. The drive restarts without unit re-initialization if the error is rectified by an internal procedure or by an error reset.
[6] EMERGENCY STOP / WAITING	The drive is braked along the set emergency stop ramp t14. Once the stop speed is reached, the output stage is inhibited and the brake (if installed) is applied. The error is signaled immediately. The error is signaled via the terminal, if programmed. The ready signal is removed. The drive restarts without unit re-initialization if the error is rectified by an internal procedure or by an error reset.
[7] STOP / WAITING	The drive is braked along the set stop ramp t13. Once the stop speed is reached, the output stage is inhibited and the brake (if installed) is applied. The error is signaled immediately. The error is signaled via the terminal, if programmed. The ready signal is removed. The drive restarts without unit re-initialization if the error is rectified by an internal procedure or by an error reset.

Response ext. error index 9729.16 Factory setting: EMERGENCY STOP / WAITING

The error is only triggered in the ENABLED inverter status. Index 9729.16 is used to program the error response that is triggered by an input terminal that is programmed to "/EXT. ERROR".



#### **Parameters**

#### Description of power section parameters

Line phase failure response index 9729.4

Factory setting: DISPLAY ONLY

The supply system input phases are monitored for failure of a single phase. If a phase failure is detected in two phases, then the DC link will be de-energized, which corresponds to a supply system disconnection.

Since the supply system input phases cannot be monitored directly, monitoring has to be done indirectly via the DC link ripple, which increases drastically if one phase fails. The DC link voltage is monitored at a time interval  $D_t$ = 1 ms for dropping below a minimum voltage level that depends on the rated supply voltage of the unit.

The result is the following nominal guide value for detecting a phase failure:

50 Hz system: approx. t<sub>max</sub> = 3.0 s
 60 Hz system: approx. t<sub>max</sub> = 2.5 s

The programmed response is activated when a line phase failure is detected.

Temperature sensor trip response index 9729.9

Factory setting: EMERGENCY STOP / WAITING

Index 9729.9 is used to program the error response which is triggered by the temperature sensor monitoring function of the TF or TH which may be installed in the motor winding.

Manual reset index 8617.0

Setting range: YES / NO

YES: The pending error is reset. Index 8617.0 automatically reverts to NO after the reset. Activating the manual reset does not have any effect if there is no error present.

NO: No reset.

Power section parameters \ unit functions \ scaling of actual speed value

Scaling factor for user display numerator index 8747.0 Setting range: 1 - 65535

Actual speed scaling defines a user-specific display parameter "index 8501.0 user display". For example, the user display is to be shown in 1/s.

This requires a scaling factor of 1/60. This means the numerator scaling factor has to be set to 1 and the denominator scaling factor to 60. The scaling unit 1/s is entered in "index 8772.0/8773.0 user-defined unit".

Scaling factor for user display denominator index 8748.0 Setting range: 1 – 65535

Actual speed scaling defines a user-specific display parameter "index 8501.0 user display". For example, the user display is to be shown in 1/s.

This requires a scaling factor of 1/60. This means the numerator scaling factor has to be set to 1 and the denominator scaling factor to 60. The scaling unit 1/s is entered in "index 8772.0/8773.0 user-defined unit".

User-defined unit index 8772.0, 8773.0

Factory setting: rpm.

Max. 8 ASCII characters; displayed in "index 8501.0 user display".





### 9 Operation

#### 9.1 Local mode (only in conjunction with optional plug connector)

#### 9.1.1 Notes

#### **▲ WARNING**

Electric shock caused by dangerous voltages in the connection box. Dangerous voltages may still be present for up to 5 minutes after disconnection from the power supply system.



Severe or fatal injuries.

- Before removing the electronics cover, switch off the power to the DRC drive units using a suitable external disconnecting device.
- Secure the drive unit against unintended re-connection to the voltage supply.
- Secure the output shaft against rotation.
- Wait for at least 5 minutes before removing the electronics cover.

### **WARNING**

Burns caused by hot surfaces.

Severe injuries

· Let the units cool down before touching them.



#### Operation

Local mode (only in conjunction with optional plug connector)

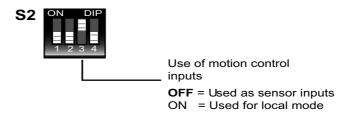
#### 9.1.2 Activating local mode



#### INFORMATION

Local mode can only be activated when the drive is <u>not</u> enabled.

Set DIP switch S2/3 to "ON" (also see "Startup" chapter). This allows for local mode with optional plug connector "X5131" (also see "Electrical Installation" chapter).



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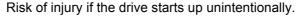
The setting of the DIP switch determines whether motion control input "DI04" can be used to switch between sensor inputs and local mode irrespective of the set function.

When DIP switch S2/3 is set to "ON" and motion control input DI04 is set to "1", then motion control inputs DI01 to DI03 are used for local mode with the following functions:

Motion control inputs	Functionality when DIP switch S2/3 = ON
DI01	CW/stop
DI02	CCW/stop
DI03	Setpoint selection "0" = Setpoint n_f1 active (parameter 10096.35, factory set to 1500 rpm) "1" = Setpoint n_f2 active (parameter 10096.36, factory set to 200 rpm)
DI04	Switching between local mode / automatic mode

#### 9.1.3 Deactivating local mode







Severe or fatal injuries.

- Before deactivating local mode, take measures to prevent the drive unit from starting up unintentionally, e.g. activating "STO".
- Take additional safety precautions depending on the application to avoid injury to people and damage to machinery.





#### 9.2 Releasing the brake without drive enable signal

#### 9.2.1 Notes



#### **▲** WARNING

Risk of fatal injury if the hoist falls.

Severe or fatal injuries.

 Never use the function "Releasing the brake without drive enable signal" for hoist applications.

#### 9.2.2 Activating the function

Activate the function by setting parameter 8893.0 "Activating brake release without drive enable signal" to the value "1 = YES (also see chapter "Parameters"). This makes it possible to release the brake even without drive enable signal and when the unit is in controller inhibit state.

#### 9.2.3 Functional description of automatic mode (bus mode)



#### **INFORMATION**

For releasing the brake without drive enable signal, observe the notes in the documentation of the controller that you use.



#### Operation

#### Releasing the brake without drive enable signal

#### 9.2.4 Functional description of local mode (only in conjunction with optional plug connector)

Activate local mode by setting DIP switch S2/3 = ON. Refer to the "Local mode" chapter.

If parameter 8893.0 is set to "1 = ON" and local mode is activated with DI04 and DIP switch S2/3 set to "ON", the brake can be released under the following conditions by setting the signal at DI03:

Terminal s	Terminal status			Unit	Error	Brake function
DI01	DI02	DI03	DI04 auto- matic/lo-	status	status	
R →	L 🕡	f1/f2	cal mode			
"1"	"0"	"0"	"1"	Enabled	No	The brake is controlled by
"0"	"1"				unit error	the DRC inverter, setpoint f1
"1"	"0"	"1"	"1"	Enabled	No	The brake is controlled by
"0"	"1"				unit error	the DRC inverter, setpoint f2
"1"	"1"	"0"	"1"	No enable signal	No unit error	The brake is controlled by the DRC inverter
"0"	"0"	"0"	"1"	No enable signal	No unit error	Brake applied
"1"	"1"	"1"	"1"	No enable signal	No unit error	The brake is controlled by the DRC inverter
"0"	"0"	"1"	"1"	Control- ler inhibit or STO	No unit error	Brake is released for manual operation
All states p	ossible		"1"	Error	unit error	Brake applied

#### Setpoint selection

Setpoint selection in binary control depending on the state of terminal f1/f2:

Enable status	DI03	Active setpoint
Enabled	f1/f2 = "0"	Setpoint n_f1 active (parameter 10096.35, factory set to 1500 rpm)
Enabled	f1/f2 = "1"	Setpoint n_f2 active (parameter 10096.36, factory set to 200 rpm)

#### LED display

The DRIVE LED flashes periodically when the brake has been released for manual mode.

#### **WARNING**

Risk of injury if the drive starts up unintentionally.



Severe or fatal injuries.

- Before deactivating local mode, take measures to prevent the drive unit from starting up unintentionally, e.g. activating "STO".
- Take additional safety precautions depending on the application to avoid injury to people and damage to machinery.





### 10 Service

#### **NOTICE**



Improper handling of DRC drive units may lead to damage.

Possible damage to property

- Note that only qualified personnel is permitted to repair drives from SEW-EURODRIVE.
- · Consult the SEW-EURODRIVE Service department.

#### 10.1 Malfunctions of the mechanical DRC drive

#### 10.1.1 Malfunctions of the DRC motor

Malfunctions	Possible cause	Remedy
Motor heats up excessively and trips an error	Overload	Measure power, use larger motor or reduce load, if necessary, check travel profile
	Ambient temperature too high	Observe permitted temperature range
	Insufficient cooling	Clean the drive
Running noise on motor	Bearing damage	Consult SEW-EURODRIVE Service     Replace motor
	Vibration of rotating parts	Rectify cause, possible imbalance
Oil leaks in the connection box or at the motor/flange gasket (only with gearmo- tors)	Internal seal defective	Consult SEW-EURODRIVE     Have seal changed by SEW-EURO-DRIVE Service or a qualified technician trained by SEW-EURODRIVE.

# **Service**Malfunctions of the mechanical DRC drive

#### 10.1.2 Brake malfunctions

Malfunctions	Possible cause	Remedy		
Brake does not release	Electronics cover faulty	Consult SEW-EURODRIVE Service     Replace electronics cover		
	Max. permitted working air gap exceeded because brake lining worn down	Consult SEW-EURODRIVE     Have brake lining replaced by SEW-EURODRIVE Service or a qualified technician trained by SEW-EURO-DRIVE		
	Brake defective	Consult SEW-EURODRIVE     Have brake replaced by SEW-EURO-DRIVE Service or a qualified technician trained by SEW-EURODRIVE		
Motor does not brake	Brake lining worn	Consult SEW-EURODRIVE     Have brake lining replaced by SEW-EURODRIVE Service or a qualified technician trained by SEW-EURO-DRIVE		
	Incorrect braking torque.	Consult SEW-EURODRIVE     Have braking torque changed by SEW-EURODRIVE Service or a qualified technician trained by SEW-EURODRIVE		
	Oil leakage (only with gearmotors)	Consult SEW-EURODRIVE     Have leakage remedied by SEW-EURODRIVE Service or a qualified technician trained by SEW-EURO-DRIVE		



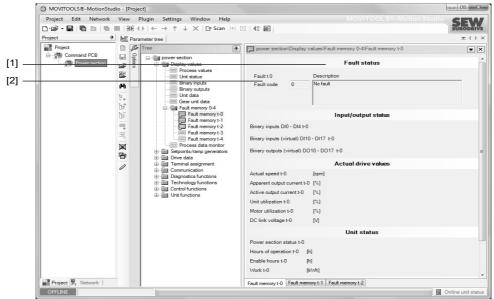


#### 10.2 Evaluating error messages

#### 10.2.1 MOVITOOLS® MotionStudio

The following section shows a sample evaluation of an error message in MOVITOOLS® MotionStudio:

- 1. In MOVITOOLS® MotionStudio, open the DRC parameter tree (power section). Observe chapter "Operation of MOVITOOLS® MotionStudio".
- 2. In the parameter tree, select the following node (here for error memory t-0, for example):
  - <u>Power section</u> parameters / display values / error memory 0-4 / error memory t-0
     [2]
- 3. In the error status group [1], you can read out error messages:



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- [1] Error messages group
- [2] Power section parameters / display values / error memory 0-4 / error memory t-0

#### 10.3 Switch-off responses

There are 4 switch-off responses depending on the error; the inverter remains blocked in error status:

#### 10.3.1 Output stage inhibit (immediate switch-off)

The unit can no longer decelerate the drive; the output stage goes to high resistance in the event of a fault. The brake, if installed, is applied immediately.

#### 10.3.2 Stop

The drive is decelerated with stop ramp t13. When the stop speed is reached, the brake is applied immediately, if installed. The output stage then goes to high resistance.

#### 10.3.3 Emergency stop

The drive is decelerated using emergency stop ramp t14. When the stop speed is reached, the brake is applied immediately, if installed. The output stage then goes to high resistance.

#### 10.3.4 Standard stop

The drive is decelerated with the set standard ramp. When the stop speed is reached, the brake is applied immediately, if installed. The output stage then goes to high resistance.

#### 10.4 Reset of error messages

An error message can be acknowledged:

- · By switching the power off and on again
- · Via the controller/PLC: Send "reset command"

#### **WARNING**

Eliminating the cause of the problem or performing a reset may result in the drive restarting automatically.

Severe or fatal injuries.

· Prevent the drive from starting up inadvertently, for example by activating STO.

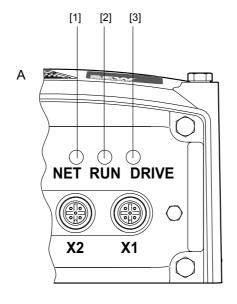


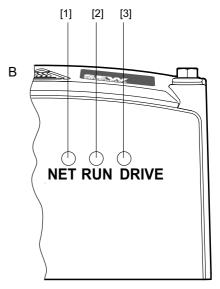


### 10.5 Description of status and operating displays

#### 10.5.1 LEDs

The following figure shows the DRC LEDs:





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- [A] = Variants with application slot
- [B] = Variants without application slot
- [1] NET LED
- [2] RUN LED
- [3] "DRIVE" status LED

#### 10.5.2 "NET" LED

NET LED			
Color	LED status	Description	
Green	Steady light	Communication with the controller not established completely. Reboot required.	
Green	flashing	Communication active; data packages are being sent and received.	
GREEN/RED	Flashing (mixed color orange)	Communication active; data packages are being sent and received, Ethernet collision.	

#### Service

## Description of status and operating displays

#### 10.5.3 "RUN" LED

RUN LED				
LED color	LED status	Operating state	Description	
-	Off	Not ready	No line voltage  → Check supply cable and line voltage for interruption.	
Yellow	Flashing steadily	Not ready	Initialization phase	
Green	Flashing steadily	Not ready	Power section parameters are being loaded or firmware is being updated	
Green	Steady light	Ready for operation	System ready	
Yellow	Steady light	Ready but unit inhibited	"STO" signal detected, safe stop  → Check voltage at STO terminal	
Green/y ellow	With alter- nating col- ors	Ready but timeout	Cyclical data exchange – communication interrupted (error 47 or 67).  → No SBus/SNI connection between DRC inverter and controller. Check and establish connection, especially terminating resistor.  → EMC influence Check shielding of data lines and improve, if necessary.  → Protocol time between the individual telegrams is longer than the set time (timeout interval). Shorten telegram cycle.	
Red	Steady light	Error	Possible errors:  CPU error (17, 37)  NV memory error (25)  Error while transmitting parameters (97)  IPOS error (10)  Boot synchronization error (40, 41)  Safety error (119)  More detailed diagnostic information via Drive LED.	

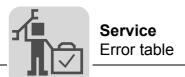
#### 10.5.4 "DRIVE" status LED

DRIVE LED	DRIVE LED					
LED color	LED status	Operating state	Description			
-	Off	Not ready	No line voltage			
Yellow	Flashing steadily	Not ready	Initialization phase or line voltage not OK.			
Yellow	Flashing briefly at regular intervals	Ready for operation	In conjunction with mechatronic MOVIGEAR® drive unit:  Deactivating DynaStop® without drive enable active			
			In conjunction with DRC electronic motor: Brake release without drive enable signal active			
Yellow	Steady light	Ready but unit inhibited	Line voltage OK, output stage inhibited			
Yellow	2 x flashing, pause	Ready but manual mode/local mode without unit enable signal	Line voltage OK			
Green/yel- low	With alternating colors	Ready but timeout	Communication interrupted during cyclical data exchange (error 43, 46, or 47)			
Green	Steady light	Unit enabled	Motor in operation			
Green	Flashing evenly, fast	Current limit active	Drive operating at current limit			
Green	Flashing steadily	Ready for operation	Line voltage OK but no enable signal. Output stage is energized.			
Green/red	With alternating colors (2 x green, 2 x red)	Ready for operation	Displayed error is pending. Output stage is energized.			
Yellow/red	With alternating colors (2 x green, 2 x red)	Ready for operation	Displayed error is pending. Output stage inhibited.			





DRIVE LED			
LED color	LED status	Operating state	Description
Red	Steady light	Fault 40	Boot synchronization error
		Fault 41	Watchdog option error
		Fault 116	MOVI-PLC® timeout
		Fault 119	Safety error
Red	Flashing slowly	Fault 08	Speed monitoring error
		Fault 26	External terminal error
		Fault 30	Emergency stop timeout error
		Fault 15	Encoder error
		Fault 16	Incorrect startup
		Fault 45	Initialization error Incorrect motor/inverter assignment
		Fault 50	Internal voltage supply too low
		Errors 17, 18, 37, 53	CPU error
		Fault 25	NV memory error
		Error 27, 29	"Limit switch" error
		Fault 39	"Reference travel" error
		Fault 42	Positioning lag error
		Fault 94	Checksum error
		Fault 97	Parameter transmission error
		Errors 10, 32, 77	IPOS error
		Fault 123	Positioning interruption error
Red	2x flashing, break	Fault 07	DC link voltage too high
Red	3x flashing, break	Fault 01	Overcurrent in output stage
		Fault 11	Overtemperature of heat sink or electronics
Red	4x flashing, break	Fault 31	TF trip
		Fault 44	Ixt utilization/UL monitoring
		Fault 52	Machine control error
Red	5x flashing, break	Fault 89	Only in conjunction with DRC electronic motor: Brake overtemperature
Red	6x flashing, break	Fault 06	Line phase failure
		1	<u> </u>



#### 10.6 Error table

Error code	Description	Switch-off response	Cause/solution
Fault 01	Overcurrent in output stage	Output stage inhibit / locked	Short circuit on inverter output.  — Check the connection between the inverter output and the motor as well as the motor winding for short circuits.  Reset error by switching the unit off or via error reset function.
Fault 06	Line phase failure	Parameterizable	Check the supply system cable for phase failure. Reset error by switching the unit off or via error reset function
Fault 07	DC link voltage too high	Output stage inhibit/waiting	<ul> <li>Ramp time too short → Extend ramp time</li> <li>Faulty braking resistor connection → Check braking resistor connection and correct it, if necessary</li> <li>Invalid voltage range of the supply input voltage → Check supply input voltage for permitted voltage range</li> </ul>
			Reset error by switching the unit off or via error reset function.
Fault 08	Speed monitoring error	Output stage inhibit/waiting	Speed monitoring has tripped, load on the drive too high  → Reduce the load on the drive
			→ Extend the n-monitoring delay time
			→ Check current and torque limits
			→ Deactivate speed monitoring
			Reset error by switching the unit off or via error reset function.
Fault 10	IPOS error	Output stage inhibit / locked	Faulty IPOS program (e.g. invalid command)
		minibit / locked	→ Correct program
			Reset error by switching the unit off or via error reset function.
Fault 11	Overtemperature of heat sink or electronics	Emergency stop/waiting	→ Clean the heat sink
	SITIK OF ELECTIONICS	Stop/waiting	→ Lower the ambient temperature
			<ul> <li>→ Prevent heat build-up</li> <li>→ Reduce the load on the drive</li> </ul>
			Reset error by switching the unit off or via error reset function.
Fault 15	Encoder error	Output stage	Loose encoder plug connection → check encoder plug connector
rault 13	Litedder error	inhibit / locked	on connection board  • Encoder defective → contact SEW Service
Fault 16	Incorrect startup	Output stage	Encoder not calibrated
	·	inhibit / locked	→ Contact SEW Service
Fault 17	CPU error	Output stage inhibit / locked	Reset error by switching the unit off or via error reset function. Consult SEW Service if the error recurs.
Fault 18	CPU error	Output stage	Reset error by switching the unit off or via error reset function.
		inhibit / locked	Consult SEW Service if the error recurs.
Fault 25	NV memory error	Output stage	Error while accessing NV memory
	,	inhibit / locked	Set the delivery status and re-parameterize the unit.
			Consult SEW Service if the error re-occurs.
Fault 26	External terminal error	Parameterizable	External error signal read-in at programmable terminal
			→ Rectify external error
			ightarrow Reset error by switching the unit off or via error reset function.
Fault 27	"Limit switch" error	Output stage	A limit switch was reached in positioning mode → Check travel
		inhibit / locked	range • Wire breakage / both limit switches missing or inverted → Check
			wiring
Fault 29	"Limit switch" error	Emergency	A limit switch was reached in positioning mode → Check travel
		stop/waiting	range
			Wire breakage / both limit switches missing or inverted → Check wiring
Fault 30	Emergency stop timeout	Output stage	Emergency stop ramp too short → Extend emergency stop ramp
. aun 30	error	inhibit/waiting	<ul> <li>Drive overloaded → Check project planning</li> </ul>
	1	1	T. Control of the con



Error code	Description	Switch-off response	Cause/solution
Fault 31	TF trip	Parameterizable	Thermal overload of the motor or short circuit/wire breakage of the temperature sensor.  → Lower the ambient temperature  → Prevent heat build-up  → Reduce the load on the drive Leave the motor to cool for at least one minute before you reset the error by switching off the unit or via error reset function.  Consult SEW Service if the error recurs.
Fault 32	IPOS error	Output stage inhibit / locked	Faulty IPOS program (e.g. invalid command)  → Correct program  Reset error by switching the unit off or via error reset function.
Fault 37	CPU error	Output stage inhibit / locked	Reset error by switching the unit off or via error reset function. Consult SEW Service if the error recurs.
Fault 39	"Reference travel" error	Output stage inhibit / locked	The reference cam is missing or does not switch  → Check reference cam  Limit switches are connected incorrectly  → Check limit switch connection  Reference travel type was changed during reference travel  → Check reference travel type setting and required parameters.
Fault 40	Boot synchronization error	Output stage inhibit / locked	Command PCB defective or connection to command PCB interrupted.  → Contact SEW Service
Fault 41	Watchdog option error	Output stage inhibit / locked	Command PCB defective or connection to command PCB interrupted.  → Contact SEW Service  Option defective or connection to option interrupted.  → Check whether an option is installed  → Replace the option
Fault 42	Lag error positioning	Output stage inhibit/waiting	Emergency stop ramp too short → Extend emergency stop ramp     P-component of positioning controller too small → Increase P-component     Value of lag error tolerance too small → Increase lag error tolerance → Check whether mechanical components can move freely
Fault 43	Timeout – manual operation via any interface	Parameterizable	Connection between unit and PC interrupted → Check and reestablish connection.
Fault 44	Ixt utilization / UL monitoring	Output stage inhibit/waiting	Output stage overload  → Reduce the load on the drive Reset error by switching the unit off or via error reset function.
Fault 45	Initialization error Motor-inverter assignment incorrect	Output stage inhibit / locked	<ul> <li>Hardware defective → Contact SEW Service.</li> <li>Incorrect motor/inverter assignment → Replace electronics.</li> </ul>
Fault 46	Timeout – internal SBus connection between command PCB and power section	Emergency stop/waiting	Contact SEW Service.
Fault 47	Communication interrupted during cyclical data exchange.	Parameterizable	No SBus connection between DRC inverter and controller. Check and establish connection, especially terminating resistor.     EMC influence Check shielding of data lines and improve, if necessary.     Protocol period between the individual telegrams is longer than the set time (timeout time). Shorten telegram cycle.  Command PCB error     Connection to AS-Interface master interrupted → Check and reestablish connection.     Connection between AS-Interface option and command PCB interrupted → Contact SEW Service.
Fault 50	Internal voltage supply too low	Output stage inhibit / locked	Hardware defective → Contact SEW Service.



Error code	Description	Switch-off response	Cause/solution
Fault 52	Machine control error	Output stage inhibit / locked	<ul> <li>Operation without encoder a speed that is too low → Increase speed</li> <li>Load too high in controlled operation → Reduce load on the drive Reset error by switching the unit off or via error reset function. Consult SEW Service if the error recurs.</li> </ul>
Fault 53	CPU error	Output stage inhibit / locked	Reset error by switching the unit off or via error reset function. Consult SEW Service if the error recurs.
Fault 77	IPOS error	Output stage inhibit / locked	Faulty IPOS program (e.g. invalid command)  → Correct program  Reset error by switching the unit off or via error reset function.
Fault 89	Only in conjunction with DRC electronic motor:	Output stage inhibit / locked	Brake coil not sufficient to dissipate the regenerative energy.  → Use braking resistor
	Brake overtemperature		Wrong size of braking resistor selected.  → Use larger braking resistor
Fault 94	Checksum error	Output stage inhibit / locked	NV memory defective.  → Contact SEW Service
Fault 97	Parameter transmission error	Output stage inhibit / locked	Error during data transmission  → Repeat copying process Set the delivery status and re-parameterize the unit.
Fault 116	MOVI-PLC® timeout	Emergency stop/waiting	Timeout in communication with higher-level controller
Fault 119	Safety error	Output stage inhibit / locked	Safety hardware faulty  → Contact SEW Service
Fault 123	Positioning interruption error	Stop / waiting	Target monitoring when interrupted positioning process is resumed.  Target would be overrun.  → Perform positioning process without interruption until it is complete.

#### 10.7 Unit replacement

#### **▲** WARNING

5 minutes

Electric shock caused by dangerous voltages in the connection box. Dangerous voltages may still be present for up to 5 minutes after disconnection from the power supply system.

Severe or fatal injuries.

- Before removing the electronics cover, switch off the power to the DRC drive units using a suitable external disconnecting device.
- Secure the drive unit against unintended re-connection to the voltage supply.
- Secure the output shaft against rotation.
- · Wait for at least 5 minutes before removing the electronics cover.

#### 10.7.1 Replacing the electronics cover



#### NOTICE

Unit error 45 or 94 due to power disconnection during the initialization phase.

Possible damage to property.

- After replacing the cover and switching on the power supply, wait at least for 15 s before disconnecting the drive from the supply system again.
- 1. Observe the safety notes!



- 2. Remove the screws and take off the electronics cover from the connection box.
- 3. Compare the data on the nameplate of the previous electronics cover with the data on the nameplate of the new electronics cover.

## i

#### **INFORMATION**

Always replace the electronics cover with an electronics cover with the same part number.

- 4. Set all the controls (e.g. DIP switches, see "Startup" chapter) on the new electronics cover in the same way as the controls of the previous electronics cover.
- 5. Place the new electronics cover onto the connection box and screw it on.
- 6. Supply voltage to the drive.
- 7. Check the functions of the new electronics cover.





#### 10.7.2 Replacing the motor

- 1. Observe the safety notes!
- 2. When you replace the motor including the electronics cover, you also have to carry out the steps described in chapter "Replacing the electronics cover".
- 3. Disassemble the motor. Also observe chapter "Mechanical Installation" and the operating instructions of the gear unit, if applicable.
- 4. Compare the data on the nameplate of the old motor with the nameplate data of the new motor..



#### INFORMATION

Always replace the motor with a motor that has the same properties.

- 5. Mount the motor. Also observe chapter "Mechanical Installation" and the operating instructions of the gear unit, if applicable.
- 6. Perform the installation according to the "Electrical Installation" chapter.
- 7. Place the electronics cover onto the connection box and screw it on.
- 8. Supply voltage to the drive.
- Parameters that can be changed are saved in the motor (see "Parameters" chapter).
   This means you have to change these parameters again when you replace the motor



#### INFORMATION

If you only replace the electronics cover, the parameter changes are preserved.

10. Check the functions of the new motor.

#### 10.8 SEW-EURODRIVE Service

#### 10.8.1 Sending in a unit for repair

If a fault cannot be rectified, please contact the SEW-EURODRIVE Electronics Service (see "Address List").

When you contact the SEW Electronics Service, always quote the digits on the status label so that our service personnel can assist you more effectively.

#### Provide the following information when sending the unit in for repair:

- Serial number (see nameplate)
- · Type designation
- Unit variant
- Short description of the application (application, control mode, etc.)
- · Nature of the fault
- · Accompanying circumstances
- Your own presumptions as to what has happened
- · Any unusual events preceding the problem, etc.



#### 10.9 Shutdown

To shut down the DRC drive unit, de-energize it using appropriate measures.



#### **▲ WARNING**

Electric shock due to charged capacitors.

Severe or fatal injuries.

- Before removing the electronics cover, switch off the power to the DRC drive units using a suitable external disconnecting device.
- Secure the drive unit against unintended re-connection to the voltage supply.
- Secure the output shaft against rotation.
- · Wait for at least 5 minutes before removing the electronics cover.

#### 10.10 Storage

Observe the following instructions when shutting down or storing DRC drive units:

- If you shut down and store the DRC drive unit for a longer period, you must close open cable entries and cover contacts with protective caps.
- Make sure that the unit is not subject to mechanical impact during storage.

Observe the notes on storage temperature in the "Technical Data" chapter.

#### 10.11 Extended storage

#### 10.11.1 Electronics

If the unit is stored for a long time, connect it to the supply system voltage for at least 5 minutes every 2 years. Otherwise, the unit's service life may be reduced.

Procedure in case maintenance has been neglected Electrolytic capacitors are used in the inverters. They are subject to aging effects when de-energized. This effect can damage the capacitors if the unit is connected using the nominal voltage after a longer period of storage. If you have not performed maintenance regularly, SEW-EURODRIVE recommends that you increase the line voltage slowly up to the maximum voltage. This can be done, for example, by using a variable transformer for which the output voltage has been set according to the following overview. After you have completed the regeneration process, the unit can be used immediately or stored again for an extended period with maintenance.

The following stages are recommended:

AC 400/500 V units:

- Stage 1: AC 0 V to AC 350 V within a few seconds
- Stage 2: AC 350 V for 15 minutes
- Stage 3: AC 420 V for 15 minutes
- Stage 4: AC 500 V for 1 hour



## 10.12 Disposal

Observe the applicable regulations: Dispose of the following materials in accordance with the regulations in force:

- · Aluminum scrap
  - Housing parts
- · Steel scrap:
  - Shafts
  - Rolling bearing
  - Flange rings
- Electronics scrap (circuit boards)
- · Plastic (housing), sheet metal, copper, etc.



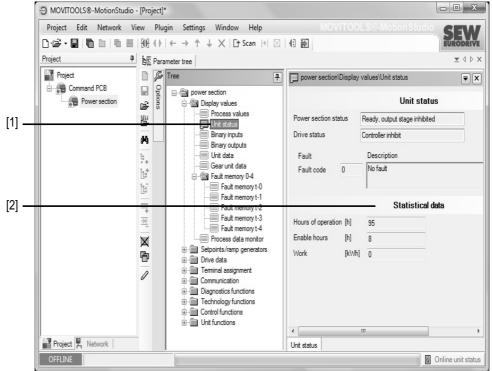


#### 11.1 Determining the operating hours

#### 11.1.1 About MOVITOOLS® MotionStudio

To facilitate inspection and maintenance planning, you can read out the performed operating hours of DRC drive units. Proceed as follows to determine the performed hours of operation:

- 1. In MOVITOOLS<sup>®</sup> MotionStudio, open the DRC parameter tree. See chapter "Configuration and diagnostics".
- 2. In the parameter tree, select the node "DRC power section parameters / display values / unit status" [1].
- 3. In the statistics data group [2], you can read out the performed hours of operation:



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- [1] Power section parameters / display values / unit status
- [2] Statistics data group



# **Inspection and maintenance**Inspection and maintenance intervals

### 11.2 Inspection and maintenance intervals

#### 11.2.1 Motor

The following table shows the inspection intervals for DRC motors:

Time interval	What to do?	Who is permitted to perform the work?
Every 3,000 hours of operation, at least every 6 months	Check running noise for possible bearing damage	Qualified personnel at customer site
	In the event of a bearing damage: Have the bearing replaced by SEW-EURODRIVE	SEW-EURODRIVE Service
	Service or qualified personnel trained by SEW-EURODRIVE.	Qualified personnel trained by SEW-EURO-DRIVE
Recommendation: Every 10,000 hours of opera-	Have the motor inspected by SEW-EURO-DRIVE Service or qualified personnel	SEW-EURODRIVE Service
tion <sup>1)</sup>	trained by SEW-EURODRIVE.	Qualified personnel trained by SEW-EURO-DRIVE
When the electronics cover is removed after an operating period of ≥ 6 months.	When the electronics cover is opened after an operating period of ≥ 6 months, the gasket between the connection box and the electronics cover must always be replaced. The 6-month period can be shortened by harsh ambient/operating conditions, e.g. cleaning with aggressive chemicals or frequent temperature fluctuations.	Qualified personnel at customer site
Each time the electronics cover is removed	Visual inspection of the gasket between connection box and electronics cover Replace the gasket if it is damaged or separating from the connection box.	Qualified personnel at customer site
Varying (depending on external factors)	Touch up or renew the surface protection/anticorrosion coating.	Qualified personnel at customer site

Wear times are influenced by many factors. The system manufacturer must calculate the required inspection/maintenance intervals individually in accordance with the project planning documents.



#### Inspection and maintenance intervals



#### 11.2.2 Brake

The following table shows the inspection intervals for DRC brakes:

If used as a holding brake:				
Time interval	What to do?	Who is permitted to perform the work?		
Every 2 years <sup>1)</sup>	Have the brake inspected by SEW-EURODRIVE Service or qualified	SEW-EURODRIVE Service		
	personnel trained by SEW-EURO- DRIVE.	Qualified personnel trained by SEW-EURO-DRIVE		

1) Wear times are influenced by many factors. The system manufacturer must calculate the required inspection/maintenance intervals individually in accordance with the project planning documents.

If used a	If used as a holding brake with braking work done in case of emergency braking operations						
Time int	Time interval			What to do?	Who is permitted to perform the work?		
Every 3,000 hours of operation, every 2 years at the latest <sup>1)</sup>			ı, every 2	Have the brake inspected by SEW-EURODRIVE Service or qualified	SEW-EURODRIVE Service		
			personnel trained by SEW-EURO- DRIVE.	Qualified personnel trained by SEW-EURO-DRIVE			
After this done: <sup>1)</sup>	After this much braking work has been done: <sup>1)</sup>		Have wear parts replaced by SEW-EURODRIVE Service or qualified	SEW-EURODRIVE Service			
Brake	DRC	Brak- ing torque [Nm]	Brak- ing work [MJ]	personnel trained by SEW-EURO- DRIVE.			
BY1C	DRC1	7 / 2.5	40				
BY2C	DRC2	14 / 7	65		Qualified personnel		
BY4C	DRC3	28 / 14	85		trained by SEW-EURO- DRIVE		
BY4C	DRC4	40	55				
BY4C	DRC4	20	85				

Wear times are influenced by many factors. The system manufacturer must calculate the required inspection/maintenance intervals individually in accordance with the project planning documents.



Inspection and maintenance work

#### 11.3 Inspection and maintenance work

#### 11.3.1 Preliminary work regarding inspection and maintenance

Observe the following notes before you start with inspection/maintenance work on the DRC motor.

#### **A** WARNING



Danger of falling hoist.

Severe or fatal injuries.

Secure or lower the hoist before you carry out any work (risk of falling).

#### **▲ WARNING**

Risk of injury if the drive starts up unintentionally.

Electric shock caused by dangerous voltages in the connection box. Dangerous voltages may still be present for up to 5 minutes after disconnection from the power supply system.

Severe or fatal injuries.

- Before removing the electronics cover, de-energize the DRC drive units via a suitable external disconnection device.
- Secure the drive unit against unintended re-connection of the voltage supply.
- Secure the output shaft against rotation.
- · Wait for at least 5 minutes before removing the electronics cover.

#### **▲** WARNING

Burns caused by hot surfaces.

Severe injuries.

· Let the units cool down before touching them.



#### NOTICE

Damage to the DRC drive unit

Potential damage to property

 Note that only the SEW-EURODRIVE Service or qualified personnel trained by SEW-EURODRIVE is allowed to carry out maintenance work on the motor or the brake.



#### Inspection and maintenance work



#### 11.3.2 Replacing the output oil seal

- 1. Observe the notes in chapter "Preliminary work for inspection and maintenance".
- 2. Remove the DRC drive unit from the system.
- 3. **IMPORTANT:** Oil seals with a temperature below 0 °C may get damaged during installation.

Potential damage to property.

- Store oil seals at ambient temperatures over 0 °C.
- Warm up the oil seals before you install them, if necessary.
- 4. When changing the oil seal, ensure that there is a sufficient grease reservoir between the dust lip and protective lip, depending on the type of gear unit.
- 5. If you use double oil seals, fill one-third of the gap with grease.
- 6. Do not install the oil seal on the same track.
- 7. Touch up or renew the surface protection/anticorrosion coating.

#### 11.3.3 Painting the drive unit

- 1. Observe the notes in chapter "Preliminary work for inspection and maintenance".
- 2. **IMPORTANT:** Breather valves and oil seals may be damaged during painting or repainting.

Potential damage to property.

- Clean the surface of the drive unit and make sure it is free from grease.
- Thoroughly cover the breather valves and sealing lip of the oil seals with strips prior to painting.
- · Remove the strips after painting.

#### 11.3.4 Cleaning the drive unit

Observe the notes in chapter "Preliminary work for inspection and maintenance".

Excessive dirt, dust or shavings can have a negative impact on the function of synchronous motors; in extreme cases, these factors can cause the motor to break down.

For this reason, you must clean the drives at regular intervals (after one year at the latest) to ensure a sufficiently large area for heat dissipation.

Insufficient heat dissipation can have unwanted consequences. The bearing service life is reduced through operation at impermissibly high temperatures (bearing grease degrades).

#### 11.3.5 Connection cables

Observe the notes in chapter "Preliminary work for inspection and maintenance".

Check the connection cable for damage at regular intervals and replace if necessary.





# **Inspection and maintenance**Inspection and maintenance work

#### 11.3.6 Replacing the gasket between connection box and electronics cover

Spare part kit

The gasket is available as spare part from SEW-EURODRIVE.

Contents	Part number		
	DRC1 electronic motor DRC2 electronic motor	DRC3 electronic motor DRC4 electronic motor	
1 pcs	2 821 162 6	2 821 165 0	
10 pcs	2 821 163 4	2 821 166 9	
50 pcs	2 821 164 2	2 821 167 7	

Steps

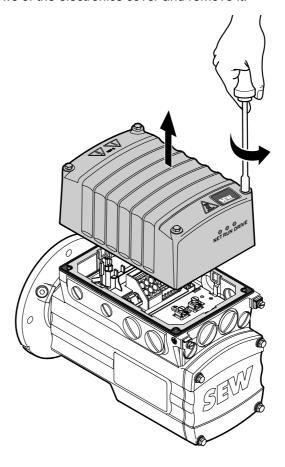


#### **NOTICE**

Loss of the guaranteed degree of protection.

Possible damage to property.

- When the electronics cover is removed from the connection box, you have to protect it from humidity, dust or foreign particles.
- Make sure that the electronics cover is mounted properly.
- 1. Observe the notes in chapter "Preliminary work for inspection and maintenance".
- 2. Loosen the screws of the electronics cover and remove it.



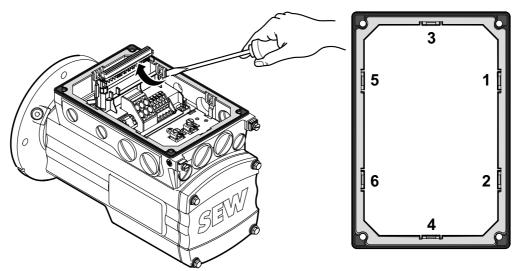
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# **Inspection and maintenance**Inspection and maintenance work

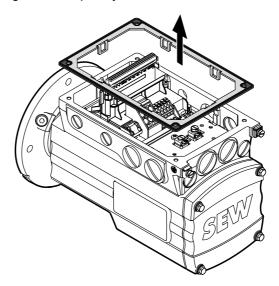


- 3. **NOTICE** Loss of the guaranteed degree of protection.
  - Possible damage to property.
  - · Make sure not to damage the sealing surfaces when removing the gasket.
- 4. Loosen the used gasket by levering it off the retaining cams. This becomes easier when you keep to the sequence shown in the figure below.



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5. Remove the used gasket completely from the connection box.



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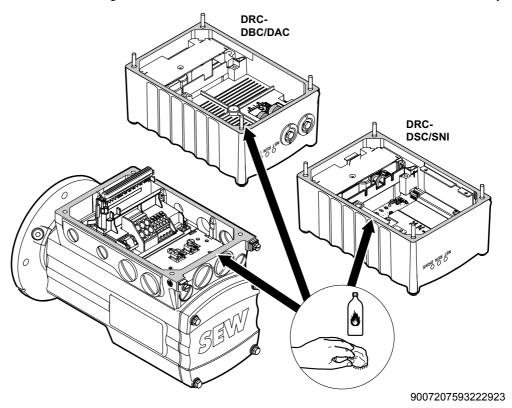
# **Inspection and maintenance**Inspection and maintenance work

6. **A CAUTION:** Risk of injury due to sharp edges.

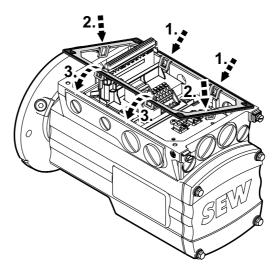
Cuts.

- · Use protective gloves for cleaning.
- Work may only be carried out by qualified personnel.

Clean the sealing surfaces of the connection box and the electronics cover carefully.



7. Place the new gasket on the connection box and fix it in position with the retaining cams. This becomes easier when you keep to the sequence shown in the figure below.



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8. Check the installation and startup of the drive unit using the applicable operating instructions.



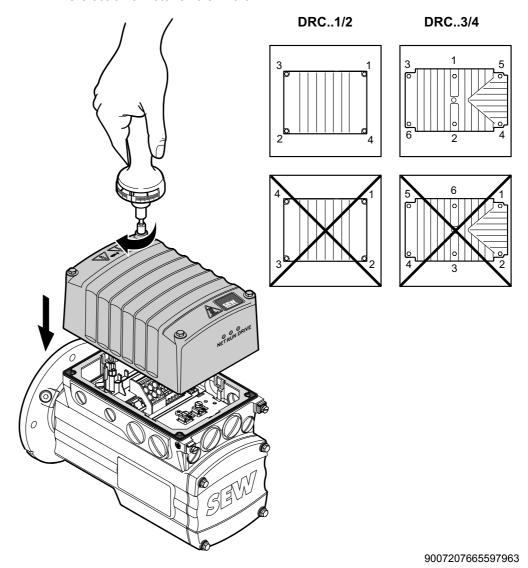
Inspection and maintenance work



9. Place the electronics cover on the connection box again and fasten it.

Proceed as follows when installing the DRC electronics cover: Insert the screws and tighten them with the tightening torque specified for that size according to the sequence shown in the picture below.

- DRC electronic motor size 1/2: 6.0 Nm
- DRC electronic motor size 3/4: 9.5 Nm.



SEW-EURODRIVE



# **Technical data and dimension sheets** Technical data

### 12 Technical data and dimension sheets

#### 12.1 Technical data

#### 12.1.1 General technical data of DRC

DRC type		DRC1	DRC2	DRC3	DRC4	
Supply voltages V <sub>line</sub>		3 x AC 380 V -5	3 x AC 380 V -5 % to AC 500 V +10 %			
Line frequency	f <sub>line</sub>	50 Hz 60 Hz				
Input current	I <sub>N</sub>	1.04 A	2.8 A	5.3 A	6.3 A	
	I <sub>max</sub>	2.6 A	7.0 A	13.25 A	11.8 A	
Nominal output current	I <sub>N motor</sub>	1.3 A	3.4 A	6.8 A	7.8 A	
Current carrying capacity of terminals			structions, chapter "E cable cross section of		n / Installation instruc-	
Motor power S1	P <sub>Mot</sub>	<b>0.55 kW</b> 0.75 HP	<b>1.5 kW</b> 2.0 HP	<b>3.00 kW</b> 4.0 HP	<b>4.00 kW</b> 5.4 HP	
Nominal motor speed	n <sub>N</sub>	2000 rpm	2000 rpm	2000 rpm	2000 rpm	
Nominal motor torque	M <sub>N</sub>	2.65 Nm	7.20 Nm	14.3 Nm	19.1 Nm	
Maximum motor torque	M <sub>max</sub>	6.6 Nm to 2000 rpm	18.0 Nm to 1500 rpm	35.8 Nm to 1500 rpm	36.2 Nm to 1800 rpm	
Mass moment of inertia of the motor	J <sub>mot</sub> 1)	1.416 kgm <sup>2</sup> × 10 <sup>-4</sup>	3.6226 kgm <sup>2</sup> × 10 <sup>-4</sup>	16.85 kgm <sup>2</sup> × 10 <sup>-4</sup>	23.23 kgm <sup>2</sup> × 10 <sup>-4</sup>	
	J <sub>mot</sub> <sup>2)</sup>	2.031 kgm <sup>2</sup> × 10 <sup>-4</sup>	5.3266 kgm <sup>2</sup> × 10 <sup>-4</sup>	20.55 kgm <sup>2</sup> × 10 <sup>-4</sup>	26.93 kgm <sup>2</sup> × 10 <sup>-4</sup>	
PWM frequency		4 / 8 kHz	·	·		
External braking resistor	R <sub>min</sub>	100 Ω	100 Ω	68 Ω	68 Ω	
Interference immunity		EN 61800-3; 2. Environment (industrial environment)				
Interference emission		EN 61800-3 cate	EN 61800-3 category C2 (class A group 2 of EN 55011)			
Climate class		EN 60721-3-3, c	EN 60721-3-3, class 3K3			
Storage temperature	$\theta_{S}$	-25 °C to +70 °C (EN 60721-3-3)				
Proof of mechanical strength		According to EN	61800-5-1			
Degree of protection	IP	Standard: IP 65 according to EN 60529 (DRC housing closed and all cable glands sealed)				
		With optional ASEPTIC / ASEPTIC <sup>plus</sup> design: IP 66 according to EN 60529 (DRC housing closed and all cable glands sealed)				
Operating mode		S1, DB (EN 6003	34-1)			
Type of cooling		Self-cooling to D	Self-cooling to DIN 41751 and EN 61800-5-1			
Signaling functions		Display elements on housing to indicate the unit state				
Installation altitude h		Up to h ≤ 1000 m without restrictions.  The following restrictions apply to heights ≥ 1000 m:  • From 1000 m to max. 4000 m:  – I <sub>N</sub> reduction by 1% per 100 m  • From 2000 m to max. 4000 m:				
		Over 2000 m onl overvoltage cate	<ul> <li>V<sub>N</sub> reduced by AC 6 V per 100 m</li> <li>Over 2000 m only overvoltage category II, external measures are required for overvoltage category III.</li> <li>Overvoltage categories according to EN 60664-1.</li> </ul>			
Mass	m <sup>1)</sup>	12.40 kg	17.20 kg	34.6 kg	38.6 kg	
	m <sup>2)</sup>	13.00 kg	18.23 kg	36.5 kg	40.5 kg	
Required preventive measures		Grounding the ur	nit			

- 1) Without brake
- 2) With brake



# Technical data and dimension sheets Technical data



#### 12.1.2 Ambient temperature of DRC

DRC type	DRC1	DRC2	DRC3	DRC4	
Ambient temperature	₿ <sub>A</sub>	0 °C to +60 °C		–25 °C to +60 °C	
I <sub>N motor</sub> reduction Ambient temperature		3 % I <sub>N motor</sub> per K at 40 °C to 60 °C		3 % I <sub>N motor</sub> per K at 40 °C to 60 °C	

#### 12.1.3 Current carrying capacity of terminals and plug connectors

Current carrying capacity of terminals and plug connectors				
Supply system terminals         X2         24 A (max. loop-through current)				
Control terminals X7		3.5 A (max. loop-through current)		
Signal plug connector X5131		400 mA (max. current for 24 V sensor supply)		

#### 12.1.4 Motion control inputs

Motion control inputs				
Input type DI01 to DI04 <sup>1)</sup>		PLC-compatible according to EN 61131-2 (digital inputs type 1) $R_i \approx 3.0 \text{ k}\Omega \text{ , } I_E \approx 10 \text{ mA, sampling interval 2 ms}$		
Number of inputs		4		
Signal level		+15 V to +30 V "1" = Contact closed -3 V to +5 V "0" = Contact open		
Permitted total current For 4 sensors		400 mA		

<sup>1)</sup> Only in conjunction with optional plug connector X5131

#### 12.1.5 Internal voltage supply 24V\_O

Internal voltage supply for non-safety-related enable signal via STO input				
Voltage supply +24V_O		DC 24 V to EN 61131-2, interference voltage proof and short circuit proof		
	0V24_O			
Permitted total current		60 mA		
Required current for STO-IN supply		30 mA		





#### Technical data and dimension sheets

Technical data

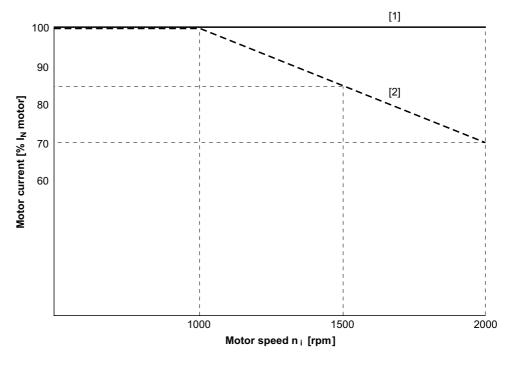
#### 12.1.6 Derating factors

Affected unit variants The table shows the unit variants for which you have to/do not have to use the additional  $I_{N\ motor}$  reduction in the following chapter:

I <sub>N motor</sub> reduction					
<u>not</u> required	Required				
DRC1 (all variants)	-				
DRC2DSC without application option DRC2SNIwithout application option DRC2DBC	DRC2DSC with application option DRC2SNI with application option DRC2DAC				
DRC3 (all variants)	-				
DRC4DSC without application option DRC4SNI without application option DRC4DBC	DRC4DSC with application option DRC4SNI with application option DRC4DAC				

I<sub>N motor</sub> reduction

The following figure shows the  $I_{N\ Motor}$  reduction depending on the motor speed:



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- [1] Ambient temperature  $\leq$  35 °C
- [2] Ambient temperature = 40 °C



#### **INFORMATION**

Derating is based on typical operating conditions with a supply voltage of 24 V (sensor supply, input voltage of STO input).



Technical data of application options



# 12.2 Technical data of application options

## 12.2.1 GIO12B application option

GIO12B application option	
Degree of protection	IP66
Number of inputs	4
Number of outputs	2
Connection technology	M12 plug connector (A-coded, female)
Input type	PLC-compatible according to EN 61131-2 (digital inputs type 3) R <sub>i</sub> about 8 k $\Omega$ , sampling cycle 4 ms Signal level +11 V to +30 V "1" = Contact closed -3 V to +5 V "0" = Contact open
Output type	PLC-compatible to EN 61131-2, interference-voltage-proof and short-circuit-proof
Sensor/actuator supply	DC 24 V to EN 61131-2, Interference voltage-proof and short-circuit-proof
Permitted total current	250 mA (total of all connected sensors/actuators, maximum individual load: 250 mA)
Part number	1 823 801 7

### 12.2.2 GIO13B application option

GIO13B application option				
Digital inputs / digital outputs				
Number of digital inputs	4 (2 inputs can be used as primary frequen	ncy input)		
Primary frequency input	The primary frequency input function occupies a maximum of 2 digital inputs. The function is used to evaluate frequency input signals that are provided, for example, by a distance encoder (A/B tracks or only A track) or an external controller.  The frequency value is then converted into a digital value for further processing.  Input frequency range: 0 to 120 KHz  Signal voltage: HTL signal level			
Input type	$R_i$ about 8 k $\Omega$ , sampling cycle 4 ms	Signal level +11 V to +30 V "1" = Contact closed		
Number of digital outputs	1			
Output type	Relay with change-over contact  U <sub>max</sub> = DC 30 V  I <sub>min</sub> = DC 100 mA  I <sub>max</sub> = DC 800 mA			
Analog inputs / analog output	s			
Number of analog inputs	1			
Analog input type	Differential input			
	$\begin{tabular}{lll} Voltage input & Current input \\ V_{in} = DC 0 to +10V & I_{in} = DC 4 to 20 mA \\ Resolution 10 bit & Resolution 10 bit \\ Internal resistance $R_i$ > 10 k$\Omega$ & Internal resistance $R_i$ = 250 $\Omega$ \\ \end{tabular}$			
Number of analog outputs	1			
Analog output type	Output characteristics: 4 to 20 mA Max. output voltage: 25 V Short-circuit-proof Resolution 10 bit			



# **Technical data and dimension sheets** Technical data of application options

GIO13B application option	
General technical data	
Degree of protection	IP65 (only when installed)
Connection technology	M12 plug connector (A-coded, female)
Sensor/actuator supply	DC 24 V to EN 61131-2, Interference voltage-proof and short-circuit-proof
Permitted total current	140 mA (total of all connected sensors/actuators, maximum individual load: 140 mA)
Part number	1 822 652 3

Refresh times of primary frequency inputs depending on the set scaling frequency			
Scaling frequency	Refresh times [ms]		
[Hz]	LFI mode = trace A	LFI mode = traces A + B	
1	500	250	
2	250	125	
5	100	50	
10	50	25	
20	25	12	
40	12	6	



# Technical data and dimension sheets Braking resistors



## 12.3 Braking resistors

#### 12.3.1 Overview

The DRC electronics motor is equipped with 2 brake choppers. The following table shows their possible use in regenerative mode:

Application	Drive	Dissipation of regenerative energy		nerative energy
		Brake chopper 1		Brake chopper
Very small amount of	DRC electronic motor with brake	Brake coil  M 3 ~	+	
regenerative energy	DRC electronic motor without brake	Brake coil 1)  M 3 ~	•	_
Small amount of	DRC electronic motor with brake	Brake coil  M 3 ~	+	Integrated braking resistor
regenerative energy	DRC electronic motor without brake	Brake coil 1)  M 3 ~	•	
Medium/large amount of regenerative	DRC electronic motor with brake	Brake coil  M 3 ~	+	External braking resistor
or regenerative energy	DRC1 electronic motor without brake	Brake coil 1)  M 3 ~	F	

<sup>1)</sup> Also for motors <u>without</u> brake, a brake coil (without brake disk) is always integrated to dissipate regenerative energy.

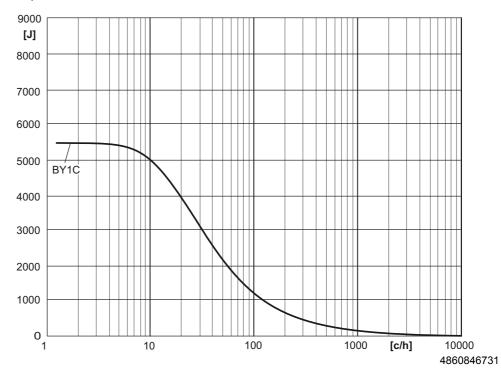
**Braking resistors** 

#### 12.3.2 4Q operation with integrated brake coil

- In 4Q operation, the brake coil can be used as a braking resistor.
- The brake coil (without brake disk) is also integrated in motors without a brake.
- Brake voltage is generated internally within the unit, which means it is grid-independent.
- 4Q operation with only the integrated brake coil is recommended for applications with very small amounts of regenerative energy.
- If the amount of regenerated energy is too high for the application, you can use an additional internal or external braking resistor.

#### BY1C (DRC1)

The following figure shows the permitted regenerative load on the BY1C brake coil (DRC1):

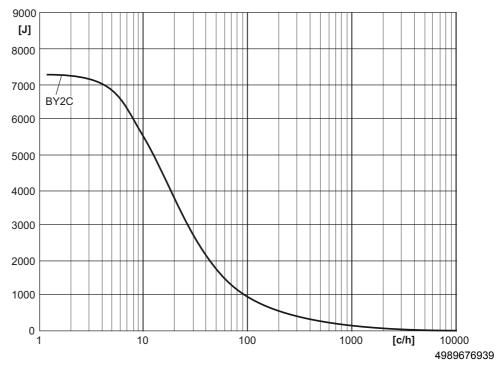




# Technical data and dimension sheets Braking resistors

#### BY2C (DRC2)

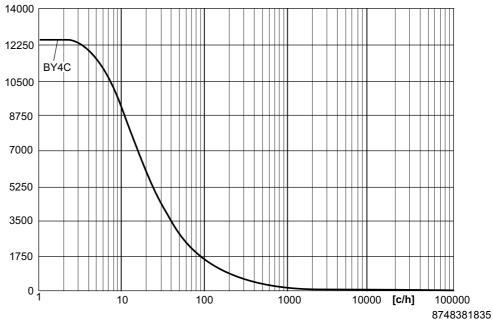
The following figure shows the permitted regenerative load on the BY2C brake coil (DRC2):



c/h = cycles per hour

## BY4C (DRC3/4)

The following figure shows the permitted regenerative load on the BY4C brake coil (DRC $^3/4$ ):







**Braking resistors** 

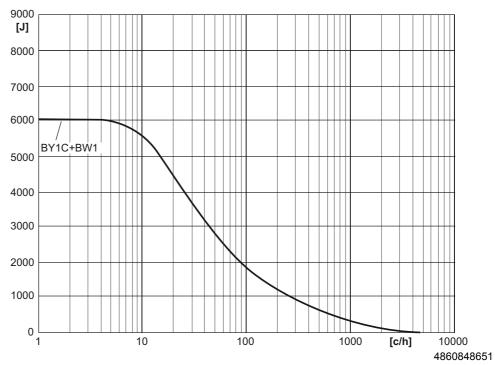
#### 12.3.3 4Q operation with integrated brake coil and integrated braking resistor

- 4Q operation with integrated braking resistor is recommended for applications in which the level of regenerative energy is low.
- The resistor protects itself (reversible) against regenerative overload by changing abruptly to high resistance and no longer consuming any more energy. The inverter then trips with overvoltage error.
- If the amount of regenerated energy is too high for the application, you can use an external braking resistor as an alternative.

BY1C brake coil and integrated BW1 braking resistor (DRC1)

### Regenerative load capacity for a brake ramp of 10 s

The following figure shows the permitted regenerative energy load of the BY1C brake coil in combination with the integrated BW1 braking resistor for a brake ramp of 10 s:



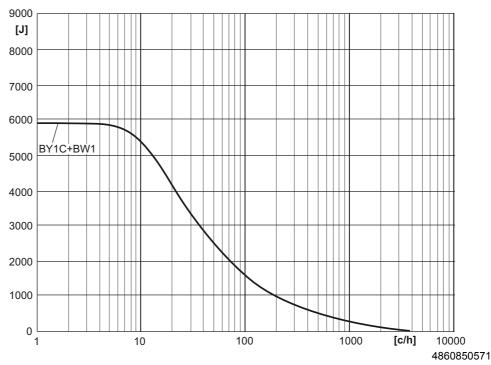


**Braking resistors** 



#### Regenerative load capacity for a brake ramp of 4 s

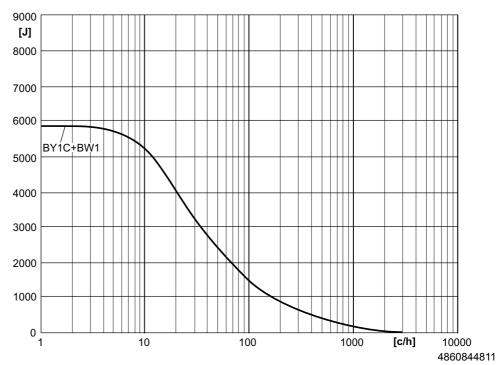
The following figure shows the permitted regenerative energy load of the BY1C brake coil in combination with the integrated BW1 braking resistor for a brake ramp of 4 s:



c/h = cycles per hour

#### Regenerative load capacity for a brake ramp of 0.2 s

The following figure shows the permitted regenerative energy load of the BY1C brake coil in combination with the integrated BW1 braking resistor for a brake ramp of 0.2 s:





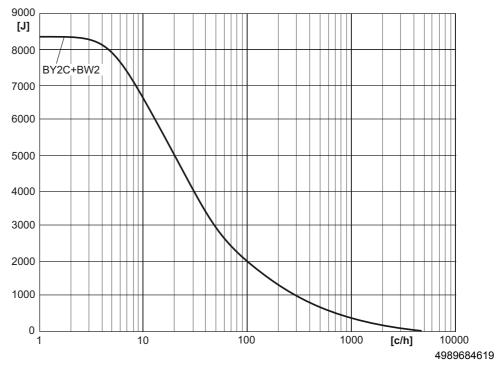


**Braking resistors** 

BY2C brake coil and integrated BW2 braking resistor (DRC2)

#### Regenerative load capacity for a brake ramp of 10 s

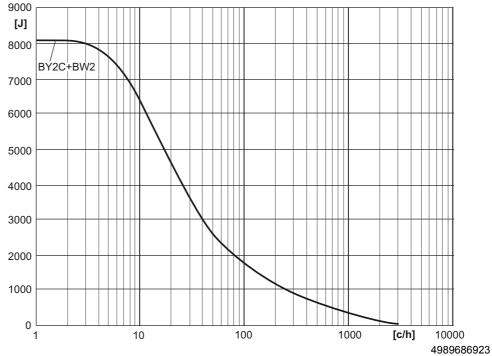
The following figure shows the permitted regenerative energy load of the BY2C brake coil in combination with the integrated BW2 braking resistor for a brake ramp of 10 s:



c/h = cycles per hour

#### Regenerative load capacity for a brake ramp of 4 s

The following figure shows the permitted regenerative energy load of the BY2C brake coil in combination with the integrated BW2 braking resistor for a brake ramp of 4 s:



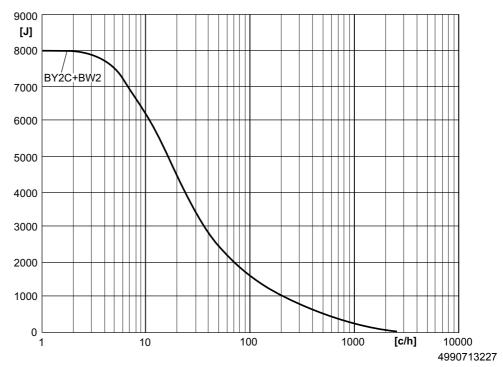


**Braking resistors** 



#### Regenerative load capacity for a brake ramp of 0.2 s

The following figure shows the permitted regenerative energy load of the BY2C brake coil in combination with the integrated BW2 braking resistor for a brake ramp of 0.2 s:



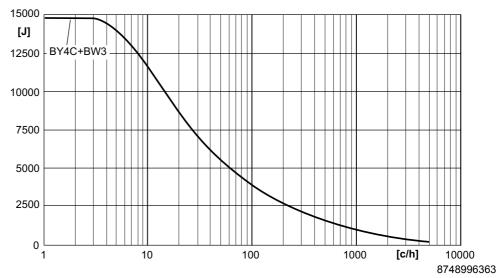


**Braking resistors** 

Brake coil BY4C and integrated braking resistor BW3 (DRC3/4)

#### Regenerative load capacity for a brake ramp of 10 s

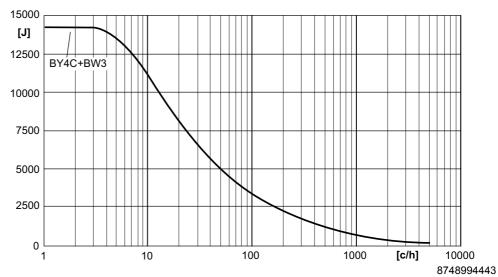
The following figure shows the permitted regenerative energy load of the BY4C brake coil in combination with the integrated BW3 braking resistor for a brake ramp of 10 s:



c/h = cycles per hour

#### Regenerative load capacity for a brake ramp of 4 s

The following figure shows the permitted regenerative energy load of the BY4C brake coil in combination with the integrated BW3 braking resistor for a brake ramp of 4 s:



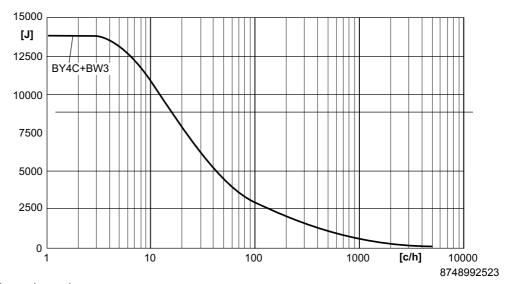


**Braking resistors** 



#### Regenerative load capacity for a brake ramp of 0.2 s

The following figure shows the permitted regenerative energy load of the BY4C brake coil in combination with the integrated BW3 braking resistor for a brake ramp of 0.2 s:





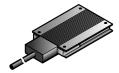
# **Technical data and dimension sheets** Braking resistors

#### 12.3.4 4Q operation with integrated brake coil and external braking resistor

4Q operation with external braking resistor is necessary for applications with a large amount of regenerative energy.

The following tables show the external braking resistors that are available for DRC electronic motors.

#### BW...-../K-1.5



	BW100-005/K-1.5	BW150-003/K-1.5
Part number	0 828 286 2	0 828 2927
Function	Dissipating the regenerative energy	,
Degree of protection	IP65	IP65
Resistance	100 Ω	150 Ω
Power in S1, 100% cdf	200 W	100 W
Dimensions W x H x D	252 x 15 x 80 mm	146 x 15 x 80 mm
Cable length	1.5 m	1.5 m

#### BW...-...-T

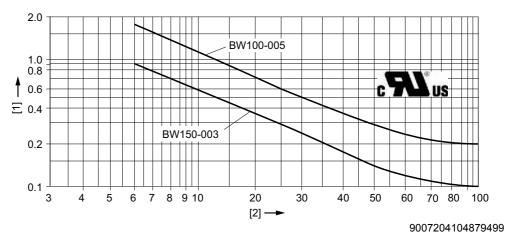


	BW150-006-T	BW100-009-T	BW68-006-T	BW68-012-T
Part number	1 796 956 5	1 796 957 3	1 797 000 8	1 797 001 6
Function	Dissipating the re	egenerative energy	y	
Degree of protection	IP66	IP66	IP66	IP66
Resistance	150 Ω	100 Ω	68 Ω	68 Ω
Power in S1, 100% cdf	600 W	900 W	600 W	1200 W
Dimensions W x H x D	285 x 75 x 174 mm	435 x 75 x 174 mm	285 x 75 x 174 mm	635 x 75 x 174 mm
Prescribed connection cables	Shielded cables with a thermal resistance of T <sub>amb</sub> ≥ 90 °C (194 °F)			
Maximum permitted cable length	15 m	15 m	15 m	15 m

#### 12.3.5 Technical data of BW100-005/K-1.5 and BW150-003/K-1.5

Power diagrams

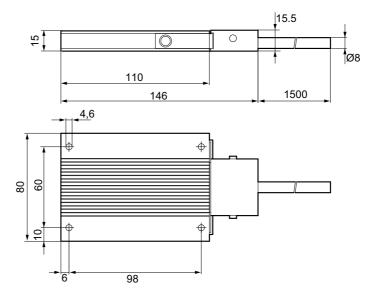
The following figure shows the rating diagrams of the braking resistors BW100-005/K-1.5, BW150-003/K-1.5:



- [1] Power in kW
- [2] Cyclic duration factor cdf in %

Dimension drawing of BW150-003/K-1.5

The following figure shows the dimensions of the external braking resistor BW150-003/K-1.5:



4850134027

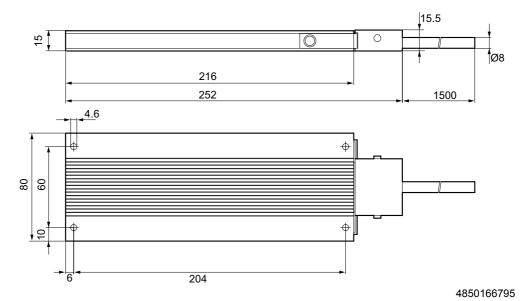




**Braking resistors** 

Dimension drawing of BW100-005/K-1.5

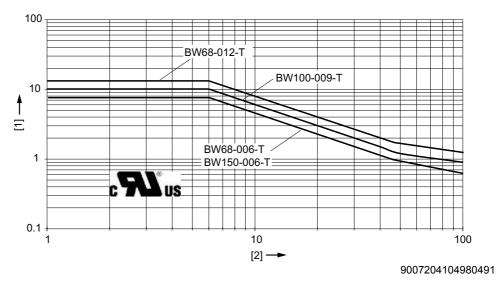
The following figure shows the dimensions of the external braking resistor BW100-005/K-1.5:



#### 12.3.6 Technical data of BW150-006-T, BW100-009-T, BW068-006-T, and BW068-012-T

Power diagrams

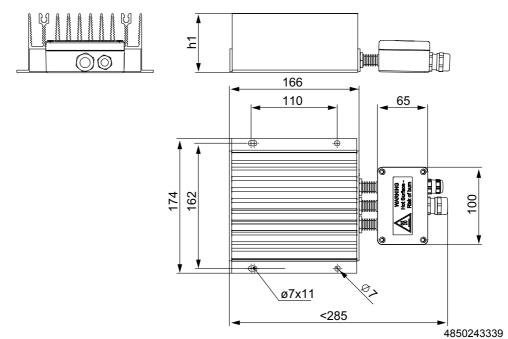
The following figure shows the rating diagrams of the braking resistors BW150-006-T, BW100-009-T, BW068-006-T, and BW068-012-T:



- [1] Power in kW
- [2] Cyclic duration factor cdf in %

cdf = cyclic duration factor of the braking resistor, based on a cycle time of 120 s.

Dimension drawing of BW150-006-T / BW068-006-T The following figure shows the dimensions of the external braking resistors BW150-006-T and BW068-006-T

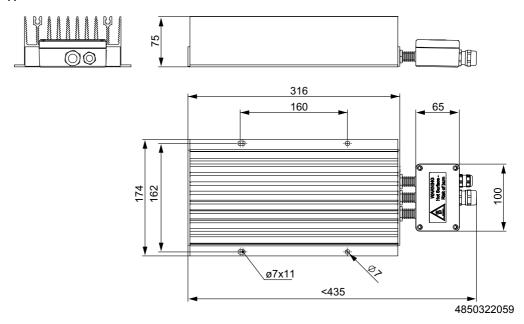




# **Technical data and dimension sheets**Braking resistors

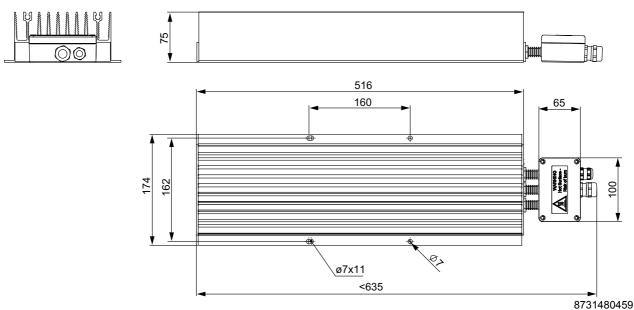
Dimension drawing of BW100-009-T

The following figure shows the dimensions of the external braking resistor BW100-009-  $\ensuremath{\mathsf{T}}^{\boldsymbol{\cdot}}$ 



Dimension drawing of BW068-012-T

The following figure shows the dimensions of the external braking resistor BW068-012-  $\ensuremath{\mathsf{T}}^{\text{-}}$ 



Technical data of the brake



#### 12.4 Technical data of the brake

#### 12.4.1 Braking work, braking torque

Туре	Braking torque	Braking work per emergency braking operation	Max. number of emergency braking opera- tions <sup>1)</sup>	Braking work until maintenance
	[Nm]	[kJ]		[MJ]
BY1C (DRC1)	7	5	10 / h	40
BTTC (DRCT)	2.5	5	10 / h	40
BY2C (DRC2)	14	15	10 / h	65
B120 (BR02)	7	15	10 / h	65
BY4C (DRC3)	28	17	10 / h	85
B140 (DRC3)	14	17	10 / h	85
BY4C (DRC4)	40	10.5	10 / h	55
B140 (BR04)	20	10.5	10 / h	85

Emergency braking means that the brake is applied at high speed instead of decelerating the drive along a ramp and applying the brake only after reaching the stop speed. This can occur in case of a controller inhibit signal, a drive fault (depending on the set fault response), or STO (depending on the parameter settings).

#### **NOTICE**



Damage to the DRC drive unit

Potential damage to property

 Note that only the SEW-EURODRIVE Service or qualified personnel trained by SEW-EURODRIVE is permitted to carry out maintenance/inspection work on the brake or to change the braking torque.

#### 12.4.2 Response and application times

Туре	Braking torque	Response time t <sub>1</sub>	Application time t <sub>2</sub>
	[Nm]	[ms]	[ms]
BY1C (DRC1)	7	100	200
BTIC (DRCI)	2.5	100	400
PV2C (DBC2)	14	100	200
BY2C (DRC2)	7	100	250
BY4C (DRC3)	28	100	200
B14C (DRC3)	14	100	200
BY4C (DRC4)	40	100	200
B140 (DR04)	20	100	200



### ASEPTIC / ASEPTICplus variants

#### 12.5 ASEPTIC / ASEPTIC<sup>plus</sup> variants

#### 12.5.1 Surface protection

The properties of OS2 – OS4 in connection with ASEPTIC variants or OS4 in connection with ASEPTIC<sup>plus</sup> variants are listed in chapter "Surface protection".

#### 12.5.2 Cleaning

Do not mix cleaning and disinfecting agents under any circumstances.

Never mix acids and chloralkalis, as poisonous chlorine gas will result.

Strictly observe the safety instructions of the cleaning agent manufacturer.

#### 12.5.3 Sealing material

Resistance to cleaning agents

The sealing material used in DRC motors has been tested for resistance to cleaning agents.

Resistance to the following cleaning agents was proven in the tests performed by the company ECOLAB®:

Alkaline and chlorinated alkaline foam cleaning agents			
Designation Application concentration Application temperature			
P3-topax 12	5%	40 °C	

Acid foam cleaning agents			
Designation	Application concentration	Application temperature	
P3-topax 56	5%	40 °C	
P3-topax 58	5%	40 °C	

TFC cleaner		
Designation	Application concentration	Application temperature
P3-topactive 200	4%	40 °C
P3-topactive 500	4%	40 °C

Disinfectant		
Designation	Application concentration	Application temperature
P3-topax 990	5%	23 °C

DI water	_	40 °C

#### **Product specifications:**

P3-topax 19 Alkaline foam cleaning agent

P3-topax 56 Acid foam cleaning agent based on phosphoric acid P3-topax 58 Acid foam cleaning agent based on organic acids

P3-topactive 200 Alkaline cleaning agent for operational cleaning as TFC application
P3-topactive 500 Acid cleaning agent for operational cleaning as TFC application
P3-topax 990 Alkaline foam disinfectant based on alkylamine acetate

DI water Demineralized water



Surface protection



#### 12.6 Surface protection

#### 12.6.1 General information

SEW-EURODRIVE offers the following optional protective measures for DRC motors that are operated under special ambient conditions.

· OS surface protection

Special optional protective measures are also available for the gear unit / motor, see "DRC Gearmotors" catalog.

#### 12.6.2 Surface protection

Instead of standard surface protection, DRC motors can be equipped with OS1 to OS4 surface protection as an option. The special procedure Z can also be performed in addition. Special measure Z means that large contour recesses are filled with rubber before painting.

Surface protect	tion	Ambient conditions	Application examples
Standard		Suitable for machines and systems in buildings and rooms indoors with neutral atmospheres.  Similar to corrosivity category <sup>1)</sup> :  C1 (negligible)	Machines and systems in the automobile industry     Conveyor systems in logistics areas     Conveyor systems at airports
OS1		Suited for environments prone to condensation and atmospheres with low humidity or contamination, such as applications outdoors under roof or with protection. Similar to corrosivity category:  C2 (low)	Systems in saw mills     Hall gates     Agitators and mixers
OS2		Suited for environments with high humidity or mean atmospheric contamination, such as applications outdoors subject to direct weathering.  Similar to corrosivity category:  C3 (moderate)	<ul> <li>Funiculars and chair-lifts</li> <li>Applications in gravel plants</li> </ul>
OS3		Suited for environments with high humidity and occasionally severe atmospheric and chemical contamination. Occasionally acidic or caustic wet cleaning. Also for applications in coastal areas with moderate salt load.  Similar to corrosivity category:  C4 (high)	<ul> <li>Sewage treatment works</li> <li>Port cranes</li> <li>Mining applications</li> </ul>
OS4		Suitable for environments with permanent humidity or severe atmospheric or chemical contamination. Regular acidic and caustic wet cleaning, also with chemical cleaning agents. Similar to corrosivity category <sup>2)</sup> :  C5-1 (very high)	<ul> <li>Drives in malting plants</li> <li>Wet areas in the beverage industry</li> <li>Conveyor belts in the food industry</li> </ul>

- 1) According to DIN EN ISO 12 944-2
- 2) According to DIN EN ISO 12944-2, classification of ambient conditions





Surface protection

#### 12.6.3 Resistance of OS4 surface treatment to cleaning agents

SEW-EURODRIVE has had the resistance of the base coat and top coat of the OS4 surface coating independently tested and certified for cleaning agents and disinfectants from leading manufacturers.

Providing these recommended cleaning agents and disinfectants are used and that the specified cleaning intervals, temperatures and cleaning schedules are complied with, the best possible results can be achieved with ASEPTIC gearmotors in terms of service life and performance.

The following prerequisites were applied to the testing cycle:

- The testing cycle (1500 cycles) simulated daily cleaning according to product-specific instructions for a time period of five years.
- Evaluation took place approximately 7 days after regeneration.
- Evaluation of visual changes (color, degree of lustre) and changes in protective properties according to DIN EN ISO 4628-1.
- OS4 coating system on steel or aluminum base.
- Cleaning agents supplied by Henkel-ECOLAB<sup>®</sup>

Cleaning agents	Product specification	Major ingredi- ents	Con- centra- tion	Load cycle	Test temper- ature	Decorative changes <sup>1)</sup>	Changes in pro- tective properties <sup>1)</sup>
P3-topax 19	Alkaline foam cleaning agent	Alkalis, surfac- tants, complexing agents	3%	20 min	60 °C	1	0
P3-topax 56	Acid foam cleansing agent	Acids, surfac- tants, inhibitors	3%	20 min	60 °C	4	0
P3-topax 58	Acid foam cleaning agent based on organic acids	Surfactants, organic acids	5%	20 min	60 °C	0	0
P3-topax 66	Alkaline foam cleansing agent and disinfectant based on active chlorine	Alkalis, active chlorine, surfac- tants	5%	20 min	60 °C	2	0
P3-topax 68	Alkaline foam cleansing agent with active chlorine (suitable for aluminum)	Alkalis, active chlorine, surfac- tants	5%	20 min	60 °C	1	0
P3- topax 99	Alkaline foam disinfectant	Basis: Salts, organic acids	2%	20 min	60 °C	3	0
P3-topactive 200	Alkaline cleansing agent for operational cleansing as TFC application	Alkalis, surfac- tants, complexing agents	4%	20 min	60 °C	1	0
P3-topactive 500	Acid cleansing agent for operational cleansing as TFC application	Inorganic acids, surfactants	3%	20 min	60 °C	4	0
P3-oxonia	Disinfectant for closed systems	Basis: Hydrogen peroxide	1%	30 min	60 °C	1	0
P3-oxonia active	Disinfectant for closed systems	Basis: Hydrogen peroxide, pera- cetic acid	3%	10 min	20 °C	0	0
P3-topactive DES	Foam and TFC-capable disinfectant	Basis: Peracetic acid, surfactants	3%	30 min	20 °C	0	0
P3-oxysan ZS	Disinfectant for closed systems	Basis: Peroxide compounds	1%	30 min	20 °C	0	0

<sup>1)</sup> Assessment: 0 = No change, to 5 = Very severe changes





#### 12.7 Screw fittings

The following tables show the screw connections available from SEW-EURODRIVE:

#### 12.7.1 Cable glands / screw plugs

Type of screw fitting	Figure	Contents	Size	Tighten- ing torque <sup>1)</sup>	Part number
Screw plugs		10 pcs	M16 x 1.5	6.8 Nm	1 824 734 2
Hexagon (made of stainless steel)		10 pcs	M25 x 1.5	6.8 Nm	1 824 735 0
EMC cable gland	77	10 pcs	M16 x 1.5	4 Nm	1 820 478 3
(nickel-plated brass)		10 pcs	M25 x 1.5	7 Nm	1 820 480 5
EMC cable gland	- MD	10 pcs	M16 x 1.5	4 Nm	1 821 636 6
(made of stainless steel)		10 pcs	M25 x 1.5	7 Nm	1 821 638 2

<sup>1)</sup> The specified torques must be adhered to with a tolerance of +/- 10%.

#### 12.7.2 Screw fittings: plug connectors/pressure compensation

Type of screw fitting	Figure	Contents	Size	Tighten- ing torque <sup>1)</sup>	Part number
M23 plug (made of stainless steel)		1 pcs	M23 x 1.5	Tighten fully	1 909 455 8
M12 plug for plug connectors with male thread (made of stainless steel)		10 pcs	M12 x 1.0	2.3 Nm	1 820 279 9
M12 plug for plug connectors with female thread (made of stainless steel)		10 pcs	M12 x 1.0	2.3 Nm	1 820 227 6
Pressure compensation fitting (made of stainless steel)		1 pcs	M16 x 1.5	4 Nm	1 820 409 0

<sup>1)</sup> The specified torques must be adhered to with a tolerance of +/- 10%.

#### Technical data and dimension sheets Connection cables

#### 12.8 Connection cables

#### 12.8.1 Required connection cables for single line installation

SEW-EURODRIVE prescribes the following cable types for the connection between DRC SNI drive units and SNI controllers:

HELUKABEL TOPFLEX®

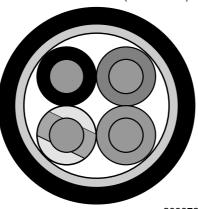
- HELUKABEL TOPFLEX® EMV-UV-2YSLCYK-J
- HELUKABEL TOPFLEX® EMV-UV-2YSLCYK-J/UL/CSA

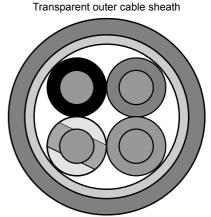
(UL-compliant installation)

• HELUKABEL TOPFLEX® - EMV-2YSLCY-J

The following figure shows the cable structure:

HELUKABEL TOPFLEX® - EMV-UV-2YSLCYK-J - EMV-UV-2YSLCYK-J/UL/CSA Black outer cable sheath (UV-resistant) HELUKABEL TOPFLEX® - EMV-2YSLCY-J





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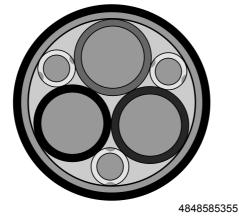
2688418699

HELUKABEL TOPFLEX® – EMV-UV-3 PLUS 2YSLCYK-J

The following figure shows the cable structure:

HELUKABEL TOPFLEX® - EMV-UV-3 PLUS 2YSLCYK-J

Black outer cable sheath (UV-resistant)



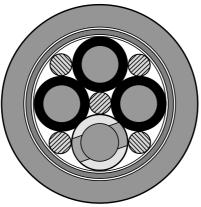


HELUKABEL TOPSERV® • HELUKABEL TOPSERV® - 109

(UL-compliant installation)

The following figure shows the cable structure:

HELUKABEL TOPSERV® – 109 Sheath color: orange (RAL 2003)



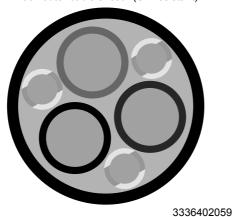
8867456779

LAPP ÖLFLEX®

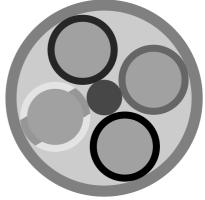
LAPP ÖLFLEX® SERVO 2YSLCYK-JB
 LAPP ÖLFLEX® SERVO 2YSLCY-JB

The following figures show the cable structure:

LAPP ÖLFLEX® SERVO 2YSLCYK-JB Black outer cable sheath (UV-resistant)



LAPP ÖLFLEX® SERVO 2YSLCY-JB Transparent outer cable sheath



2640950539



#### **INFORMATION**

The low operating capacitance of the specified cables achieves a high signal quality.

The shielding prevents interference emission resulting from the data transmission modulated onto the line.

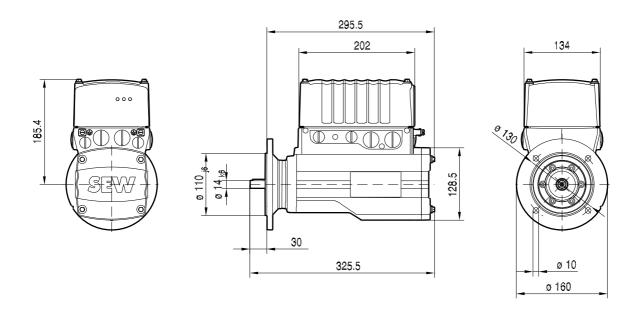


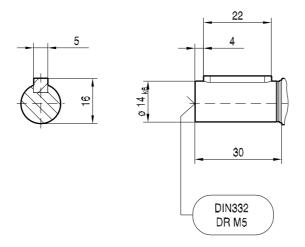
Dimension drawings

## 12.9 Dimension drawings

## 12.9.1 DRC1 with IEC flange<sup>1)</sup>

DRC1 08 104 00 12





8733045515

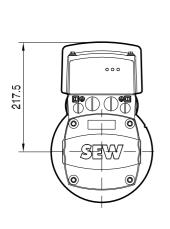


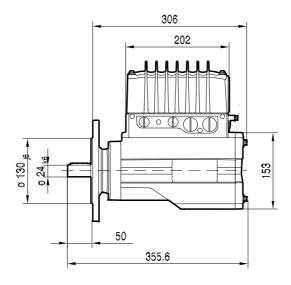
Dimension drawings

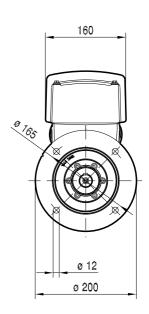


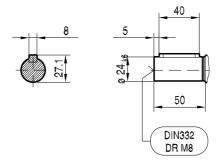
# 12.9.2 DRC2 with IEC flange<sup>1)</sup>

DRC2 08 105 00 12









8733039755



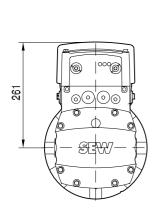


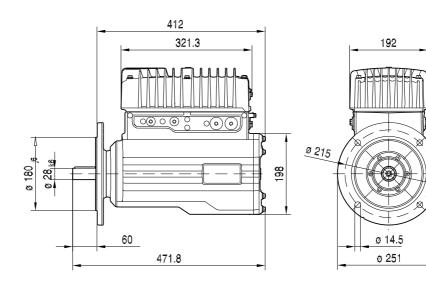
**Dimension drawings** 

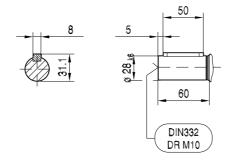
# 12.9.3 DRC3/4 with IEC flange<sup>1)</sup>

DRC3/DRC4

08 309 00 13







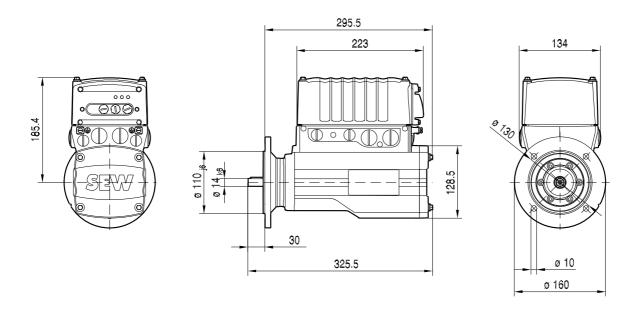
8733041675

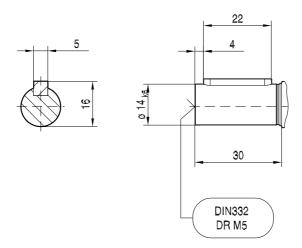




## 12.9.4 DRC1 with IEC flange and application option<sup>1)</sup>

DRC1 + GIO 08 095 00 12





8733037835



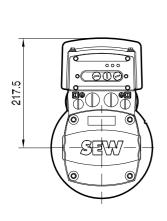


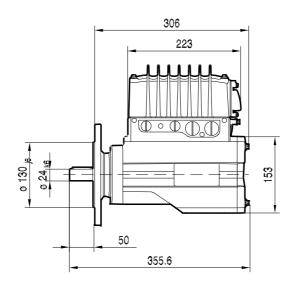
**Dimension drawings** 

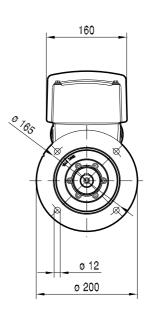
## 12.9.5 DRC2 with IEC flange and application option<sup>1)</sup>

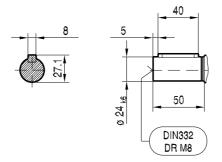
DRC2 + GIO

08 101 00 12

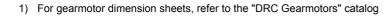








8733047435





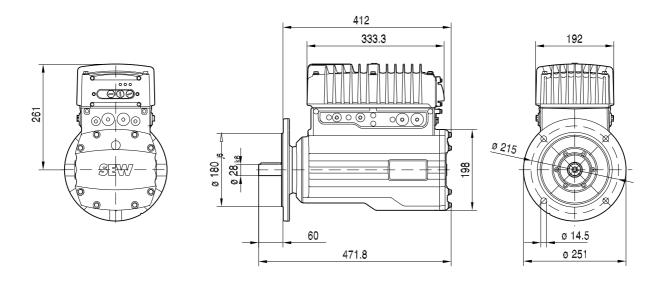
Dimension drawings

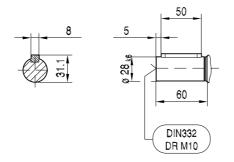


12.9.6 DRC3/4 with IEC flange and application option<sup>1)</sup>

## DRC3/DRC4 + GIO

08 308 00 13





8733043595





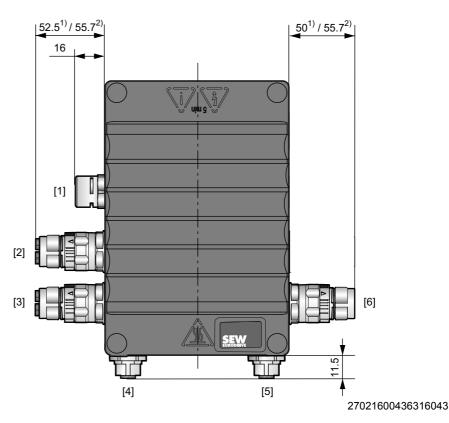
**Dimension drawings** 

## 12.9.7 Plug connectors



#### **INFORMATION**

- The following figure shows an example of the additional dimensions of the optional plug connectors for a possible plug connector configuration.
- For more information, refer to chapter "Electrical Installation / Plug connector positions".



1) "Straight" plug connector variant

[6] X5131: Digital inputs/outputs

2) "Right-angle" plug connector variant

Key

[1]	Pressure compensation fitting in connection with the optional package for wet areas (MOVIGEAR®) / ASEPTIC variant (DRC).
[2]	X1241_2: AC 400 V connection with SNI
[3]	X1241_1: AC 400 V connection with SNI
[4]	X5502: STO – IN
[5]	X5503: STO – OUT

# **Dimension drawings**

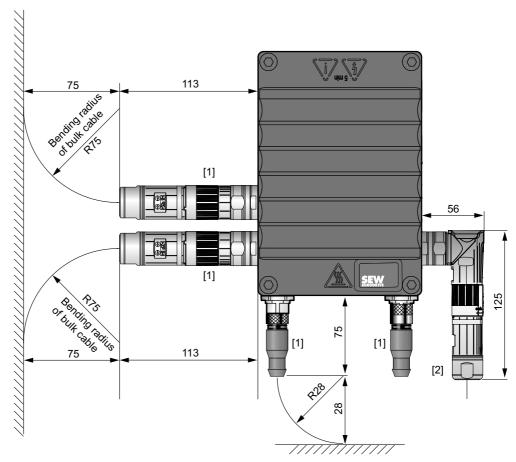


#### 12.9.8 Plug connectors including mating connectors



#### **INFORMATION**

- The following figure shows the additional dimensions / bending radii of the optional plug connectors including mating connector in connection with prefabricated cables from SEW-EURODRIVE.
- For more information, refer to chapter "Electrical Installation / Plug connector positions".



9007204039096587

- [1] "Straight" plug connector
- [2] "Right-angle" plug connector





# 13 EC declaration of conformity

# **EC** Declaration of Conformity



901340111

SEW-EURODRIVE GmbH & Co KG Ernst-Blickle-Straße 42, D-76646 Bruchsal

declares under sole responsibility that the

electronic motors of the series

DRC2 DRC3 DRC4

possibly in connection with

gear units of the series

R..; RES F.. K..; KES W.. S..

are in conformity with

Machinery Directive 2006/42/EC 1)

Low Voltage Directive 2006/95/EC

EMC Directive 2004/108/EC 4)

Applied harmonized standards: EN ISO 13849-1:2008 5)

EN 61800-5-1:2007 EN 61800-3:2004

- The products are intended for installation in machines. Startup is prohibited until it has been established that the machinery into which these products are to be incorporated complies with the provisions of the aforementioned Machinery Directive.
- 4) According to the EMC Directive, the listed products are not independently operable products. EMC assessment is only possible after these products have been integrated in an overall system. The assessment was verified for a typical system constellation, but not for the individual product.

Johann Soder

5) All safety-relevant requirements of the product-specific documentation (operating instructions, manual, etc.) must be met over the entire product life cycle.

Bruchsal 15.10.13

Place Date Managing Director Technology

a) Authorized representative for issuing this declaration on behalf of the manufacturer
 b) Authorized representative for compiling the technical documents



9347856907

a) b)



# 14 Address list

Germany			
Headquarters Production Sales	Bruchsal	SEW-EURODRIVE GmbH & Co KG Ernst-Blickle-Straße 42 D-76646 Bruchsal P.O. Box Postfach 3023 • D-76642 Bruchsal	Tel. +49 7251 75-0 Fax +49 7251 75-1970 http://www.sew-eurodrive.de sew@sew-eurodrive.de
Production / Indus- trial Gears	Bruchsal	SEW-EURODRIVE GmbH & Co KG Christian-Pähr-Str.10 D-76646 Bruchsal	Tel. +49 7251 75-0 Fax +49 7251 75-2970
Service Competence Center	Mechanics / Mechatronics	SEW-EURODRIVE GmbH & Co KG Ernst-Blickle-Straße 1 D-76676 Graben-Neudorf	Tel. +49 7251 75-1710 Fax +49 7251 75-1711 sc-mitte@sew-eurodrive.de
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	East	SEW-EURODRIVE GmbH & Co KG Dänkritzer Weg 1 D-08393 Meerane (near Zwickau)	Tel. +49 3764 7606-0 Fax +49 3764 7606-30 sc-ost@sew-eurodrive.de
	South	SEW-EURODRIVE GmbH & Co KG Domagkstraße 5 D-85551 Kirchheim (near München)	Tel. +49 89 909552-10 Fax +49 89 909552-50 sc-sued@sew-eurodrive.de
	West	SEW-EURODRIVE GmbH & Co KG Siemensstraße 1 D-40764 Langenfeld (near Düsseldorf)	Tel. +49 2173 8507-30 Fax +49 2173 8507-55 sc-west@sew-eurodrive.de
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	Additional address	sses for service in Germany provided on reques	st!

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Service		B. P. 20185	http://www.usocome.com
		F-67506 Haguenau Cedex	sew@usocome.com
Production	Forbach	SEW-USOCOME	Tel. +33 3 87 29 38 00
		Zone industrielle	
		Technopôle Forbach Sud	
		B. P. 30269	
		F-57604 Forbach Cedex	
Assembly	Bordeaux	SEW-USOCOME	Tel. +33 5 57 26 39 00
Sales		Parc d'activités de Magellan	Fax +33 5 57 26 39 09
Service		62 avenue de Magellan - B. P. 182	
		F-33607 Pessac Cedex	
	Lyon	SEW-USOCOME	Tel. +33 4 72 15 37 00
		Parc d'affaires Roosevelt	Fax +33 4 72 15 37 15
		Rue Jacques Tati	
		F-69120 Vaulx en Velin	
	Nantes	SEW-USOCOME	Tel. +33 2 40 78 42 00
		Parc d'activités de la forêt	Fax +33 2 40 78 42 20
		4 rue des Fontenelles	
		F-44140 Le Bignon	



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		2 rue Denis Papin F-77390 Verneuil l'Etang	
	Additional address	es for service in France provided on request!	
	Additional address	es for service in France provided on request:	
Algeria			
Sales	Algiers	REDUCOM Sarl	Tel. +213 21 8214-91
		16, rue des Frères Zaghnoune Bellevue	Fax +213 21 8222-84 info@reducom-dz.com
		16200 El Harrach Alger	http://www.reducom-dz.com
Argentina			
Assembly Sales	Buenos Aires	SEW EURODRIVE ARGENTINA S.A. Ruta Panamericana Km 37.5, Lote 35	Tel. +54 3327 4572-84 Fax +54 3327 4572-21
Sales		(B1619IEA) Centro Industrial Garín	sewar@sew-eurodrive.com.ar
		Prov. de Buenos Aires	http://www.sew-eurodrive.com.ar
Australia			
Australia	Melbourne	SEW-EURODRIVE PTY, LTD.	Tel. +61 3 9933-1000
Sales	Melbourne	27 Beverage Drive	Fax +61 3 9933-1000
Service		Tullamarine, Victoria 3043	http://www.sew-eurodrive.com.au
			enquires@sew-eurodrive.com.au
	Sydney	SEW-EURODRIVE PTY. LTD.	Tel. +61 2 9725-9900
		9, Sleigh Place, Wetherill Park	Fax +61 2 9725-9905
		New South Wales, 2164	enquires@sew-eurodrive.com.au
Austria			
Assembly	Wien	SEW-EURODRIVE Ges.m.b.H.	Tel. +43 1 617 55 00-0
Sales		Richard-Strauss-Strasse 24	Fax +43 1 617 55 00-30
Service		A-1230 Wien	http://www.sew-eurodrive.at sew@sew-eurodrive.at
			sew@sew-eurounve.at
Belarus			
Sales	Minsk	SEW-EURODRIVE BY	Tel.+375 17 298 47 56 / 298 47 58
		RybalkoStr. 26	Fax +375 17 298 47 54
		BY-220033 Minsk	http://www.sew.by sales@sew.by
			54.00@5059
Belgium			
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Sales Service		Researchpark Haasrode 1060 Evenementenlaan 7	Fax +32 16 386-336
GGI AICE		BE-3001 Leuven	http://www.sew-eurodrive.be info@sew-eurodrive.be
Service Compe-	Industrial Gears	SEW-EURODRIVE n.v./s.a.	Tel. +32 84 219-878
tence Center		Rue de Parc Industriel, 31	Fax +32 84 219-879
		BE-6900 Marche-en-Famenne	http://www.sew-eurodrive.be
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Brazil			
Production	São Paulo	SEW-EURODRIVE Brasil Ltda.	Tel. +55 11 2489-9133
Sales		Avenida Amâncio Gaiolli, 152 - Rodovia Presi-	Fax +55 11 2480-3328
Service		dente Dutra Km 208 Guarulhos - 07251-250 - SP	http://www.sew-eurodrive.com.br
		SAT - SEW ATENDE - 0800 7700496	sew@sew.com.br
		57.1. SETT/TIETEDE 0000 1700+00	



# Address list



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	Joinville	SEW-EURODRIVE Brasil Ltda. Rua Dona Francisca, 12.346 – Pirabeiraba 89239-270 – Joinville / SC	Tel. +55 47 3027-6886 Fax +55 47 3027-6888 filial.sc@sew.com.br
	Indaiatuba	SEW-EURODRIVE Brasil Ltda. Estrada Municipal Jose Rubim, 205 Rodovia Santos Dumont Km 49 13347-510 - Indaiatuba / SP	Tel. +55 19 3835-8000 sew@sew.com.br
Bulgaria			
Sales	Sofia	BEVER-DRIVE GmbH Bogdanovetz Str.1 BG-1606 Sofia	Tel. +359 2 9151160 Fax +359 2 9151166 bever@bever.bg
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Canada			
Assembly Sales Service	Toronto	SEW-EURODRIVE CO. OF CANADA LTD. 210 Walker Drive Bramalea, ON L6T 3W1	Tel. +1 905 791-1553  Fax +1 905 791-2999  http://www.sew-eurodrive.ca I.watson@sew-eurodrive.ca
	Vancouver	SEW-EURODRIVE CO. OF CANADA LTD. Tilbury Industrial Park 7188 Honeyman Street Delta, BC V4G 1G1	Tel. +1 604 946-5535 Fax +1 604 946-2513 b.wake@sew-eurodrive.ca
	Montreal	SEW-EURODRIVE CO. OF CANADA LTD. 2555 Rue Leger Lasalle, PQ H8N 2V9	Tel. +1 514 367-1124 Fax +1 514 367-3677 a.peluso@sew-eurodrive.ca
	Additional addre	esses for service in Canada provided on request!	
Chile			
Assembly Sales Service	Santiago	SEW-EURODRIVE CHILE LTDA. Las Encinas 1295 Parque Industrial Valle Grande LAMPA RCH-Santiago de Chile P.O. Box Casilla 23 Correo Quilicura - Santiago - Chile	Tel. +56 2 75770-00 Fax +56 2 75770-01 http://www.sew-eurodrive.cl ventas@sew-eurodrive.cl
China			
Production Assembly Sales Service	Tianjin	SEW-EURODRIVE (Tianjin) Co., Ltd. No. 46, 7th Avenue, TEDA Tianjin 300457	Tel. +86 22 25322612 Fax +86 22 25323273 info@sew-eurodrive.cn http://www.sew-eurodrive.cn
Assembly Sales Service	Suzhou	SEW-EURODRIVE (Suzhou) Co., Ltd. 333, Suhong Middle Road Suzhou Industrial Park Jiangsu Province, 215021	Tel. +86 512 62581781 Fax +86 512 62581783 suzhou@sew-eurodrive.cn







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ı		Guangzhou 510530	
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		Shenyang, 110141	
	Wuhan	, 0	Tel. +86 27 84478388
	vvullali	SEW-EURODRIVE (Wuhan) Co., Ltd. 10A-2, 6th Road	Fax +86 27 84478389
		No. 59, the 4th Quanli Road, WEDA	wuhan@sew-eurodrive.cn
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	Xi'An	SEW-EURODRIVE (Xi'An) Co., Ltd.	Tel. +86 29 68686262
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		Xi'An High-Technology Industrial Development	xian@sew-eurodrive.cn
		Zone	
		Xi'An 710065	
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Colombia			
Assembly	Bogotá	SEW-EURODRIVE COLOMBIA LTDA.	Tel. +57 1 54750-50
Sales		Calle 22 No. 132-60	Fax +57 1 54750-44
Service		Bodega 6, Manzana B	http://www.sew-eurodrive.com.co
		Santafé de Bogotá	sew@sew-eurodrive.com.co
Croatia			
Sales	Zagreb	KOMPEKS d. o. o.	Tel. +385 1 4613-158
Service	-	Zeleni dol 10	Fax +385 1 4613-158
1		HR 10 000 Zagreb	kompeks@inet.hr
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Service		253 01 Hostivice	http://www.sew-eurodrive.cz
			sew@sew-eurodrive.cz
	Drive Service	HOT-LINE +420 800 739 739 (800 SEW SEW)	Servis:
	Hotline / 24 Hour	,	Tel. +420 255 709 632
	Service		Fax +420 235 358 218
			servis@sew-eurodrive.cz
Denmark			
Assembly	Copenhagen	SEW-EURODRIVEA/S	Tel. +45 43 9585-00
Sales	-	Geminivej 28-30	Fax +45 43 9585-09
Service		DK-2670 Greve	http://www.sew-eurodrive.dk
			sew@sew-eurodrive.dk
Egypt			
Sales	Cairo	Copam Egypt	Tel. +20 2 22566-299 +1 23143088
Service		for Engineering & Agencies	Fax +20 2 22594-757
		33 El Hegaz ST, Heliopolis, Cairo	http://www.copam-egypt.com/
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Lotoma			T-1 +070 0500000



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Reti tee 4

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Fax +372 6593231

veiko.soots@alas-kuul.ee



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Service		FIN-15860 Hollola 2	http://www.sew-eurodrive.fi sew@sew.fi
Service	Hollola	SEW-EURODRIVE OY	Tel. +358 201 589-300
Gervice	Hollola	Keskikankaantie 21	Fax +358 3 780-6211
		FIN-15860 Hollola	http://www.sew-eurodrive.fi
			sew@sew.fi
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Assembly		Valurinkatu 6, PL 8	Fax +358 201 589-310
		FI-03600 Karkkila, 03601 Karkkila	sew@sew.fi
			http://www.sew-eurodrive.fi
Gabon			
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		Feu Rouge Lalala	Fax +241 741059
		1889 Libreville	esg_services@yahoo.fr
		Gabun	
Great Britain			
Assembly	Normanton	SEW-EURODRIVE Ltd.	Tel. +44 1924 893-855
Sales		DeVilliers Way	Fax +44 1924 893-702
Service		Trident Park	http://www.sew-eurodrive.co.uk
		Normanton	info@sew-eurodrive.co.uk
		West Yorkshire	
		WF6 1GX	
	Drive Service H	Hotline / 24 Hour Service	Tel. 01924 896911
Greece			
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		P.O. Box 80136	http://www.boznos.gr
		GR-18545 Piraeus	info@boznos.gr
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Hungary			
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Service		H-1037 Budapest	Fax +36 1 437 06-50
		Kunigunda u. 18	http://www.sew-eurodrive.hu
			office@sew-eurodrive.hu
India			
Registered Office	Vadodara	SEW-EURODRIVE India Private Limited	Tel. +91 265 3045200, +91 265
Assembly		Plot No. 4, GIDC	2831086
Sales		POR Ramangamdi • Vadodara - 391 243	Fax +91 265 3045300, +91 265 2831087
Service		Gujarat	http://www.seweurodriveindia.com
			salesvadodara@seweurodrivein-
			dia.com







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		Rancheepuram Dist, Tahiii Nadu	
Ireland			
Sales	Dublin	Alperton Engineering Ltd.	Tel. +353 1 830-6277
Service		48 Moyle Road Dublin Industrial Estate Glasnevin, Dublin 11	Fax +353 1 830-6458 info@alperton.ie http://www.alperton.ie
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Sales	Tel-Aviv	Liraz Handasa Ltd. Ahofer Str 34B / 228 58858 Holon	Tel. +972 3 5599511  Fax +972 3 5599512  http://www.liraz-handasa.co.il  office@liraz-handasa.co.il
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			sewit@sew-eurodrive.it
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Sales	Almaty	ТОО "СЕВ-ЕВРОДРАЙВ" пр.Райымбека, 348 050061 г. Алматы Республика Казахстан	Тел. +7 (727) 334 1880 Факс +7 (727) 334 1881 http://www.sew-eurodrive.kz sew@sew-eurodrive.kz
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Α		Braking resistor, integrated	184, 186
Ambient temperature	179	BW1	186
Application option		BW2	188
Removing the application cover	29	BW3	190
Application options	18, 29, 81	BY1C + BW1 (DRC1)	186
DIP switches	89	BY2C + BW2 (DRC2)	188
GIO12B	18, 181	BY4C + BW3 (DRC3/4)	190
GIO13B	19, 181	Braking torque	197
Installing application options	30	Braking work	197
Parameter description	119	BW068-006-T	195
Parameter overview	101	BW068-012-T	195, 196
Startup	89	BW1	186, 187
Technical data	181	BW100-005/K-1.5	192, 193, 194
Application times	197	BW100-009-T	192, 195, 196
ASEPTIC design		BW150-003/K-1.5	192, 193
Installation notes		BW150-006-T	192, 195
Mounting positions	37	BW2	188, 189
Tightening torques		BW3	190, 191
ASEPTIC variant		BW68-006-T	192
Technical data	198	BW68-012-T	192
ASEPTIC version		BY1C (DRC1)	184
Unit structure	22	BY1C + BW1 (DRC1)	186
		BY2C (DRC2)	185
В		BY2C + BW2 (DRC2)	188
Brake		BY4C (DRC3/4)	185
Application times	197	BY4C + BW3 (DRC3/4)	190
Braking torque			
Braking work		С	
Response times		Cable cross section	44
Technical data		Cable entry, position	
Brake coil		Cable glands	
BY1C (DRC1)	184 185	Cable routing	
BY1C + BW1 (DRC1)		Cable shielding	
BY2C (DRC2)		Cables	_, · ·
BY2C + BW2 (DRC2)		Required	202
BY4C + BW3 (DRC3/4)		Change in mounting position	
Brake malfunctions		Circuit breaker	
Braking resistors, overview		Cleaning	
Braking resistor, external		Cleaning agents	
BW100-005/K-1.5		Clean.	
BW100-009-T		Command PCB	
BW150-003/K-1.5		Parameter description	116
BW150-006-T		Parameter overview	
BW190-000-1	102		





Connection10	Dimension drawings204
Application options81	BW068-006-T195
Cable routing56	BW068-012-T196
Cable shielding56	BW100-005/K-1.5194
EMC aspects42	BW100-009-T196
EMC cable glands64	BW150-003/K-1.5193
Installation instructions44	BW150-006-T195
Installation topology50	DRC1 with IEC flange204
Plug connector assignment72	DRC1 with IEC flange + application option207
Plug connectors67	DRC2 with IEC flange205
Terminal assignment51, 53	DRC2 with IEC flange + application option208
Wiring diagram DRC55	DRC3/4 with IEC flange206
Connection box15	DRC3/4 with IEC flange + application option209
Connection cables	Plug connectors210
Inspection and maintenance173	Plug connectors with mating connectors211
Notes67	DIP switches S1 and S285
Required65, 202	Disposal168
Copyright7	
Current carrying capacity of terminals/plug	E
connectors179	EC declaration of conformity212
	Electronics cover
D	Embedded safety notes6
Declaration of conformity212	EMC42, 64
Derating factors180	EMC cable glands
Description of power section fucntions	Installation64
Control functions146	Overview201
Description of power section parameters	Equipotential bonding42
Diagnostic functions140	Error
Drive data134	Error message evaluation157
Setpoints/ramp generators131	Error table162
Technology functions144	Reset158
Terminal assignment136	Switch-off responses158
Designated use9	Exclusion of liability7
Determining the operating hours169	Extended storage164, 167
Diagnostics	,
Brake malfunctions156	G
Error message evaluation157	GIO12B18, 81, 181
Error table162	GIO13B
LEDs159	010 100 10, 62, 101
Malfunctions of the DRC motor155	•
MOVITOOLS® MotionStudio157	Increasion 160
	Inspection
	Connection cables
	Determining the operating hours
	Inspection intervals
	Preliminary work172



Application options	Installation	10	Installing the electronics cover	27
ASEPTIC design   35   Blanking plugs (ASEPTIC design)   39   Electronics cover (ASEPTIC design)   39   Electronics cover (ASEPTIC design)   40   NET* LED   160   EMC cable glands   33   ElMC cable glands   43   ElMC cable glands   44   ElMC cable selection   45   EMC cable glands   44   ElMC cable glands   45   Elmc c			_	
Blanking plugs (ASEPTIC design)	• • • • • • • • • • • • • • • • • • • •			-
Blanking plugs (ASEPTIC design)   39   Electronics cover   27, 34   Elec	-		1	
Electronics cover (ASEPTIC design)			<del>-</del>	
Electronics cover (ASEPTIC design)				160
EMC cable glands (ASEPTIC design)         33         "RUN" LED         160           EMC cable glands (ASEPTIC design)         41         LED indicators         159           Requirements         25         Line contactor         .46           Installation altitude         48         Line contactor         .46           Installation instructions         44         Activation         .152           Installation requirements         25         Line contactor         .46           Installation instructions         44         Activation         .152           Installation (electrical)         42         Activation         .152           Application options         81         M         Maintenance         .169           Cable cross section         .44         Connection cables         .151           Cable selection         .56         Cable shielding         .42, 56         Cannection cables         .173           EMC cable glands         .64         EMC cable glands         .64         Reducable glands         .64           EMC compliant installation         .42         Installation instructions         .44         Replacing the output oil seal         .173           Malrottiable of the protection         .46         Reparatist bording </td <td></td> <td></td> <td></td> <td></td>				
EMC cable glands (ASEPTIC design)				
Requirements				
Setting up the drive unit				
Installation altitude				_
Installation instructions			·	
Installation requirements			· · · · · · · · · · · · · · · · · · ·	
Installation topology				
Application options	·			
Application options			Notes	131
Maintenance	· · · · · · · · · · · · · · · · · · ·			
Cable cross section         .44           Cable routing         .42, 56           Cable selection         .56           Cable shielding         .42, 56           Earth-leakage circuit breaker         .46           EMC aspects         .42           EMC cable glands         .64           EMC compliant installation         .42           Equipotential bonding         .42           Installation altitudes         .48           Installation instructions         .44           Installation topology         .50           Line contactor         .46           Line protection         .46           PE connection         .47           Plug connectors         .67           Power supply cables         .44           Protection devices         .48           Terminal actuation         .45           Terminal assignment         .51, 53           UL-compliant installation         .49           Wiring diagram DRC         .55           Installation (mechanical)         .49           Application options         .29           ASEPTIC design         .35           Electronics cover         .27           Installation notes <td></td> <td></td> <td></td> <td></td>				
Cable routing         .42, 56         Cleaning the drive unit         .173           Cable selection         .56         Connection cables         .173           Cable shielding         .42, 56         Maintenance intervals         .170           Earth-leakage circuit breaker         .46         Maintenance intervals         .170           EMC aspects         .42         Painting the drive unit         .173           EMC coble glands         .64         ReMC compliant installation         .42         Preliminary work         .172           EMC compliant installation         .42         Replacing the output oil seal         .173           Malfunctions of the DRC drive         .155         Motion control inputs         .86, 179           Movitrools® MotionStudio         .92         Connection mode offline/online         .95           Line contactor         .46         Creating a project         .92           Line protection         .47         Plug connectors         .67           Power supply cables         .44         Perotection devices         .48           Terminal actuation         .45         Executing functions         .92           Viring diagram DRC         .55         Sating the active unit         .92           Installation (mechanic				
Cable selection         .56         Commercial content of the perating hours         173           Cable shielding         .42, 56         Maintenance intervals         170           Earth-leakage circuit breaker         .46         Painting the operating hours         170           EMC aspects         .42         Painting the drive unit         173           EMC cable glands         .64         Painting the drive unit         173           EMC compliant installation         .42         Preliminary work         172           Replacing the output oil seal         .173           Motion control inputs         .61         Motion control inputs         .66           Installation instructions         .44         MoVITOOLS® MotionStudio         .92           Configuring units         .94         Connection mode offline/online         .95           Line protection         .46         Eastablishing communication         .92           Pec connection         .47         Establishing communication         .92           Power supply cables         .44         Protection devices         .48         Evaluating error messages         .157           Executing functions         .92         Starting the software         .92           UL-compliant installation         .49			_	
Cable shielding         42, 56           Earth-leakage circuit breaker         46           EMC aspects         42           EMC cable glands         64           EMC compliant installation         42           EMC compliant installation         42           Equipotential bonding         42           Installation altitudes         48           Installation instructions         44           Installation topology         50           Line contactor         46           Line protection         46           PE connection         47           Plug connectors         67           Power supply cables         44           Protection devices         48           Terminal actuation         45           Terminal assignment         51,53           UL-compliant installation         49           Wiring diagram DRC         55           Installation (mechanical)         50           Application options         29           ASEPTIC design         35           Electronics cover         27           Installation notes         24           Requirements         25           Setting up the drive unit	_			
Earth-leakage circuit breaker				
EMC aspects         42         Failting the dive unit         175           EMC cable glands         64         Preliminary work         172           EMC compliant installation         42         Replacing the output oil seal         173           Equipotential bonding         42         Malfunctions of the DRC drive         155           Installation altitudes         48         Movition control inputs         86, 179           Installation instructions         44         Movition control inputs         86, 179           Movition control inputs         86, 179         Movition control inputs         86, 179           Movition control inputs         86, 179         Movition control inputs         86, 179           Movition control inputs         86, 179         Movition control inputs         86, 179           Movition control inputs         86, 179         Movition control inputs         86, 179           Movition control inputs         86, 179         Movition control inputs         86, 179           Movition control inputs         86, 179         Movition control inputs         86, 179           Movition Control inputs         86, 179         Configuring units         92           Configuring units         92         Exaction in the dovion and part of the part of the part of the part of the				
EMC cable glands         64         Reflittmary work         172           EMC compliant installation         42         Replacing the output oil seal         173           Equipotential bonding         42         Malfunctions of the DRC drive         155           Installation altitudes         48         Multinuctions of the DRC drive         155           Installation instructions         44         MOVITOOLS® MotionStudio         92           Line contactor         46         Configuring units         94           Line protection         46         Creating a project         92           Line protection         46         Establishing communication         92           Performance         47         Evaluating error messages         157           Power supply cables         44         Parameterization         92           Power supply cables         44         Parameterization         97           Protection devices         48         Scanning the network         93           Terminal actuation         45         Starting the software         92           UL-compliant installation         49         Nameplate         Drive unit         14           ASEPTIC design         35         Electronics         20			-	
EMC compliant installation         42         Replacing the dudy oil seal.         175           Equipotential bonding         42         Malfunctions of the DRC drive         155           Installation altitudes         48         Motion control inputs         86, 179           Installation instructions         44         MoVITOOLS® MotionStudio         92           Installation topology         50         Configuring units         94           Line contactor         46         Creating a project         92           Line protection         46         Establishing communication         92           PE connection         47         Evaluating error messages         157           Plug connectors         67         Executing functions         92, 93           Evaluating error messages         157         Executing functions         92, 97           Power supply cables         44         Parameterization         97           Ferminal actuation         45         Scanning the network         93           Terminal assignment         51,53         Starting the software         92           UL-compliant installation         49         Nameplate         Drive unit         14           Electronics cover         27         Notes <t< td=""><td>•</td><td></td><td><u> </u></td><td></td></t<>	•		<u> </u>	
Equipotential bonding	_			
Installation altitudes				
Installation instructions				
Installation topology				
Line contactor         46         Conflection mode online on line on				
Line protection       46       Creating a project       92         PE connection       47       Establishing communication       92, 93         Plug connectors       67       Evaluating error messages       157         Power supply cables       44       Protection devices       48         Perminal actuation       45       Scanning the network       93         Terminal assignment       51, 53       Starting the software       92         UL-compliant installation       49       Wiring diagram DRC       55         Installation (mechanical)       N       Nameplate         ASEPTIC design       35       Electronics cover       27         Installation notes       24       Drive unit       14         Electronics       20         Notes       Designation in the documentation       6         Setting up the drive unit       26         Tightening torques       32	. •			
PE connection         47           Plug connectors         67           Power supply cables         44           Protection devices         48           Terminal actuation         45           Terminal assignment         51, 53           UL-compliant installation         49           Wiring diagram DRC         55           Installation (mechanical)         N           ASEPTIC design         35           Electronics cover         27           Installation notes         24           Requirements         25           Setting up the drive unit         26           Tightening torques         32				
Plug connectors	•		Establishing communication	92, 93
Power supply cables				
Protection devices	_		_	
Terminal actuation         45           Terminal assignment         51, 53           UL-compliant installation         49           Wiring diagram DRC         55           Installation (mechanical)         N           Application options         29           ASEPTIC design         35           Electronics cover         27           Installation notes         24           Requirements         25           Setting up the drive unit         26           Tightening torques         32			Parameterization	97
Terminal assignment       51, 53       Starting the software       92         UL-compliant installation       49         Wiring diagram DRC       55         Installation (mechanical)       N         ASEPTIC design       35         Electronics cover       27         Installation notes       24         Requirements       25         Setting up the drive unit       26         Tightening torques       32			_	
UL-compliant installation 49 Wiring diagram DRC 55 Installation (mechanical) Application options 29 ASEPTIC design 35 Electronics cover 27 Installation notes 24 Requirements 25 Setting up the drive unit 26 Tightening torques 32			_	
Wiring diagram DRC       55         Installation (mechanical)       N         Application options       29         ASEPTIC design       35         Electronics cover       27         Installation notes       24         Requirements       25         Setting up the drive unit       26         Tightening torques       32	_		Tasks	92
Installation (mechanical)  Application options 29  ASEPTIC design 35  Electronics cover 27  Installation notes 24  Requirements 25  Setting up the drive unit 26  Tightening torques 32	•			
Application options 29 ASEPTIC design 35 Electronics cover 27 Installation notes 24 Requirements 25 Setting up the drive unit 26 Tightening torques 32  Nameplate Drive unit 14 Electronics 20 Notes Designation in the documentation 6			N	
ASEPTIC design	· · · · · · · · · · · · · · · · · · ·	20	Nameplate	
Electronics cover	• • • • • • • • • • • • • • • • • • • •		Drive unit	14
Installation notes			Electronics	20
Requirements			Notes	
Setting up the drive unit			Designation in the documentation	6
Tightening torques32			-	





0	
Operation	11, 151
Local mode with optional plug co	nnector151
Releasing the brake without drive	e enable signal
P	
Paint protection cap	83
Paint protection film	
Painting	
Parameter description	116
Application options	119
Command PCB	116
Power section	123

Parameter description command pcb
Setpoints/ramp generators117
Unit functions118
Parameter description for application options
GIO12B119
GIO13B119
Parameter description for command PCB
Application option118
Display values116
Parameter description for power section
Display values123
Unit functions148



Parameter index		8327.0		123
10070.1	129	8328.0		124
10070.2	129	8329.0		124
10070.3	129	8330.0		125
10070.4	129	8334.0, bit 1		116
10070.5	129	8334.0, bit 2		116
10071.1	124	8334.0, bit 3		116
10072.1	127	8334.0, bit 4		116
10072.2	127	8334.0, bits 0 – 41	25,	136
10072.3	127	8335.01	25,	136
10072.4	127	8336.01	25,	136
10072.5	127	8337.01	25,	136
10079.9	126	8338.01	25,	136
10083.1	129	8340.01	25,	137
10083.2	129	8341.01	25,	137
10083.3	129	8342.01	25.	137
10083.4		8343.01		
10083.5	129	8344.01		
10096.35		8345.01	,	
10096.36		8346.01		
10204.2		8347.01	,	
10404.10	-	8348.0, bits 0 – 71		
10404.5		8352.01		
10404.6		8353.01		
10404.7		8354.01	,	
10404.8		8355.01		
10404.9		8356.01	,	
10453.1117, 118, 1		8357.01	,	
10453.12, bit 0		8358.01		
10453.12, bit 1		8359.01		
10453.12, bit 10		8360.0, bits 0 – 71	,	
10453.12, bit 2		8361.0		
10453.12, bit 3		8366.0		
10453.12, bit 4		8367.0		
10453.12, bit 8		8368.0		
10453.12, bit 9		8369.0		
10453.12, bits 0 – 10		8370.0		
10453.12, bits 5 – 7		8371.0, bits 0 – 4		128
10453.16		8372.0, bits 0 – 4		
10453.17	119	8373.0, bits 0 – 4		
10453.4		8374.0, bits 0 – 4		
10455.0	146	8375.0, bits 0 – 4		
8310.0		8376.0, bits 0 – 7		
8318.0		8377.0, bits 0 – 7		
8321.0		8378.0, bits 0 – 7		
8322.0		8379.0, bits 0 – 7		
8323.0		8380.0, bits 0 – 7		
8325.0		8386.0, bits 0 – 7		
8326.0		8387.0, bits 0 – 7		



8388.0, bits 0 – 7128	8443.0	. 128
8389.0, bits 0 – 7128	8444.0	.128
8390.0, bits 0 – 7128	8445.0	.128
8391.0129	8451.0	.129
8392.0129	8455.0	.130
8393.0129	8456.0	.130
8394.0129	8457.0	.130
8395.0129	8458.0	.130
8396.0129	8459.0	.130
8397.0129	8460.0	.130
8398.0129	8468.0	.131
8399.0129	8470.0	.132
8400.0129	8471.0	.132
8401.0128	8472.0	.132
8402.0128	8473.0	.132
8403.0	8476.0	.132
8404.0	8477.0	.132
8405.0128	8489.0	.133
8406.0	8490.0	.133
8407.0128	8491.0	.133
8408.0128	8501.0	.123
8409.0	8517.0	.135
8410.0128	8518.0	. 135
8411.0128	8537.0	.134
8412.0128	8539.0	.140
8413.0	8540.0	.140
8414.0128	8541.0	.140
8415.0128	8542.0	.140
8417.0128	8543.0	.141
8418.0128	8544.0	.141
8419.0128	8545.0	.141
8420.0128	8546.0	.141
8421.0128	8547.0	.142
8422.0128	8548.0	.142
8423.0128	8549.0	.142
8424.0128	8550.0	.143
8425.0128	8551.0	.143
8426.0129	8552.0	.143
8427.0129	8553.0	.143
8428.0129	8554.0	.143
8429.0129	8555.0	.143
8430.0	8556.0	.143
8431.0129	8557.0	.134
8432.0129	8558.0	.134
8433.0129	8574.0	.134
8434.0129	8576.0	
8435.0129	8578.0	.131
8441.0128	8579.0	.131
8442.0128	8580.0	



8584.0	.147	9702.7	.124
8594.0118,	148	9729.16	.149
8595.0	.148	9729.4	.150
8617.0	.150	9729.9	.150
8623.0	.144	9823.1116,	126
8624.0	.145	9823.2116,	126
8625.0	.145	9823.3116,	126
8626.0	.145	9823.4116,	126
8688.0	.135	9823.5116,	126
8702.0	.144	9833.20	.148
8730.0	.123	9872.255	.123
8747.0	.150	Parameter index 9701.30117,	126
8748.0	.150	Parameters	99
8772.0	.150	Application options	.101
8773.0	.150	Command PCB	99
8827.0	.134	Parameterizing units in the parameter tree	
8839.0		Power section	
8883.0	.127	Reading/changing unit parameters	
8884.0	.127	PE connection	
8885.0		Plug connector	
8886.0		Designation key	
8887.0		Plug connectors	
8893.0		Assignment	72
8928.0		Connection cables	
8996.0	.117	Dimension drawing210,	
9610.1		Plug connector positions	
9619.112, bit 0119,		Plug connector variant	
9619.112, bit 1		Restrictions	
9619.11, bit 0		Power section	
9619.11, bit 1119,		Parameter description	.123
9619.11, bit 2119,		Parameter overview	
9619.11, bit 3119,		Power supply cables	
9619.11, bit 4		Product names	
9619.123		Protection devices	48
9619.26	.120	Protective cover	83
9619.36	.121	Putting into storage	9
9621.10		ğ ğ	
9701.1116,	400	R	
9701.10	400	Regenerative load capacity	
9701.11		Brake coil184,	185
9701.2116,	126	Brake coil and integrated braking resistor	
9701.3116,	126	188,	
9701.31117,		BY1C (DRC1)184,	
9701.36		BY1C + BW1 (DRC1)	
9701.37		BY2C (DRC2)	
9701.4116,		BY2C + BW2 (DRC2)	
9701.5116,		BY4C + BW3 (DRC3/4)	
9702.2		- ( <del>-</del> ,	
9702.5			





Releasing the brake without drive enable signal153	Service
Activating the function153	Brake malfunctions
Functional description of automatic mode153	Disposal
Functional description of local mode with optional	Error message eval
plug connector154	Extended storage
Notes153	LEDs
Removing the electronics cover27	Malfunctions of the
Repair166	MOVITOOLS® Moti
Replace the oil seal173	Reset of error mess
Replacing the connection box / electronics cover	SEW-EURODRIVE
gasket174	Switch-off response
Required tools and resources24	Unit replacement
Reset	Setting up the drive ur
Residual current device46	Shutdown
Response times197	
Rights to claim under warranty7	Signal words in the sa
	SNI
S	Address
	Operating mode
Safe disconnection	Required connectio
Safety notes	Startup
Design of section-related6	Description of the D
Design of the embedded6	Drive units
Designated use9	GIO13B application
Designation in the documentation6	Lifting applications.
Electrical connection10	Prerequisites for sta
General information8	Starting up a unit
Installation10	Startup instructions
Operation11	STO jumper plug
Other applicable documentation9	Storage
Safe disconnection10	Surface protection
Target group8	Switch-off responses .
Transportation, storage9	
Screw fittings201	т
Plug connectors201	Target group
Pressure compensation201	Technical data
Screw plugs201	Ambient temperatur
Sealing material198	Application options.
Section-related safety notes6	ASEPTIC variant
Sensor inputs	
r	Brake
	Braking resistors
	Braking work, brakii

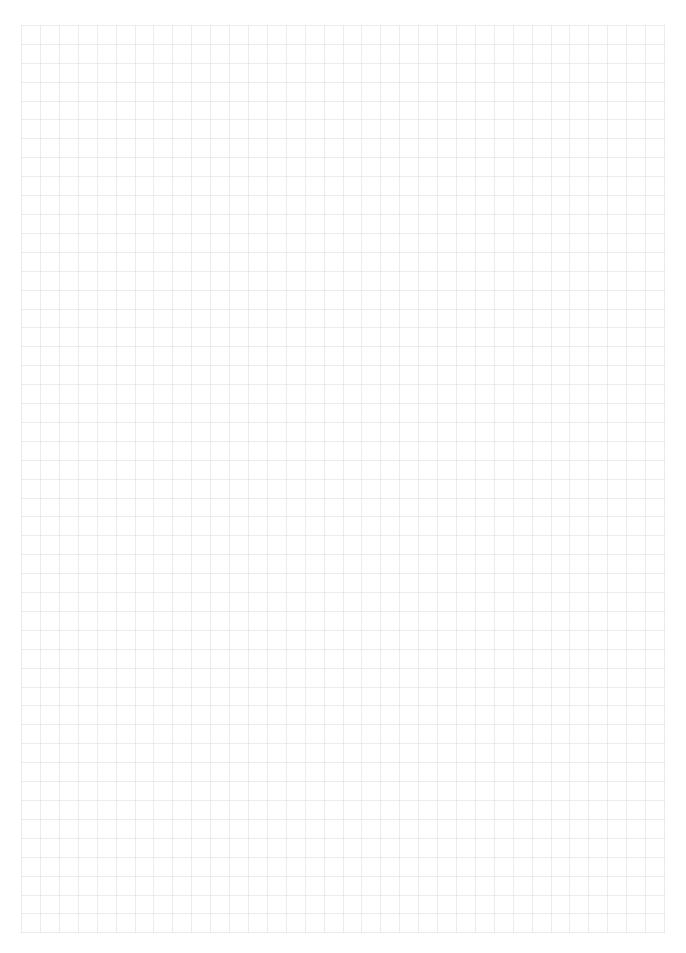
Service	
Brake malfunctions	156
Disposal	168
Error message evaluation	157
Extended storage	164
LEDs	159
Malfunctions of the DRC motor	155
MOVITOOLS® MotionStudio	
Reset of error messages	158
SEW-EURODRIVE Service	
Switch-off responses	
Unit replacement	
Setting up the drive unit	26
Shutdown	
Signal words in the safety notes	6
SNI	
Address	86
Operating mode	86
Required connection cables	
Startup	
Description of the DIP switches	
Drive units	
GIO13B application option	
Lifting applications	84
Prerequisites for startup	84
Starting up a unit	98
Startup instructions	83
STO jumper plug	80
Storage	167
Surface protection	199
Switch-off responses	
Т	
Target group	8
Technical data	
Ambient temperature	
Application options	
ASEPTIC variant	
Brake	
Braking resistors	
Braking work, braking torque	
Connection cables	
Current carrying capacity of terminals/plug	
, , , , , , , , , , , , , , , , , , , ,	



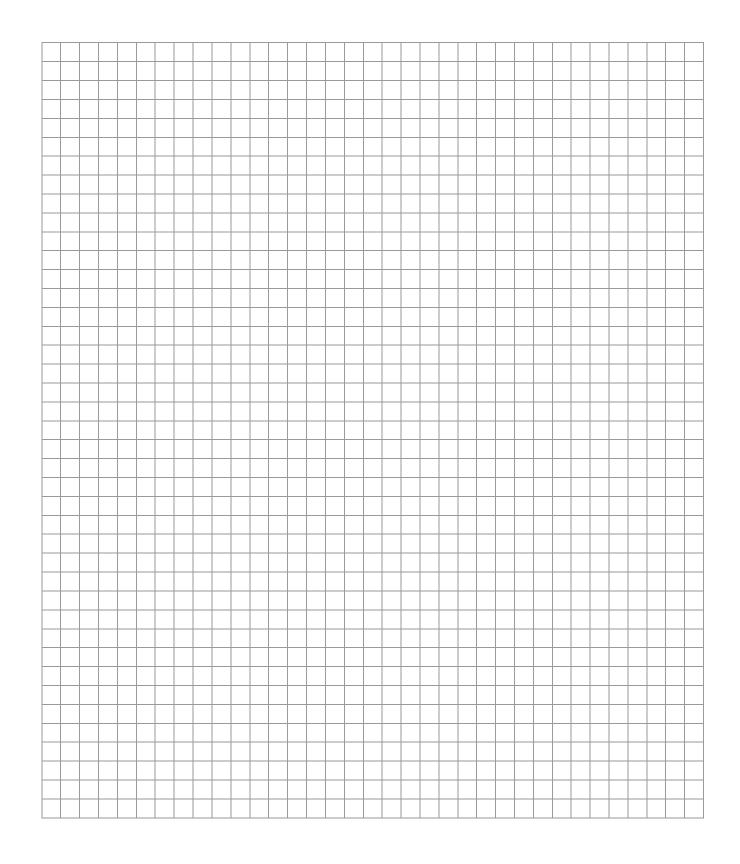
connectors179	Unit structure12
Derating factors180	Application options18
Dimension drawings204	Cable entry position13
General technical data178	DRC drive unit12
Internal voltage supply179	Electronics15
Motion control inputs179	Nameplate and type designation
Response and application times of the brake 197	of electronics20
Screw fittings201	Nameplate and type designation
Surface protection199	of the drive unit14
Terminal activation45	Optional ASEPTIC version22
Terminal actuation45	
Terminal assignment51, 53	X
Tightening torques32	X1241_1
Application options30	Assignment72
Blanking plugs32	Connection cables, available73
Blanking plugs (ASEPTIC design)39	X1241_2
Electronics cover34	Assignment72
Electronics cover (ASEPTIC design)40	Connection cables, available73
EMC cable glands33	X5131
EMC cable glands (ASEPTIC design)41	Assignment75
Trademarks7	Connection cables, available76
Transport9	X5502
Type designation	Assignment77
Drive unit14	Connection cables, available78
Electronics20	X5503
Plug connectors67	Assignment79
	Connection cables, available79
U	
UL-compliant installation49	0 9
Unit replacement164	4Q operation
·	With integrated brake coil184
	With integrated brake coil and external braking
	resistor192
	With integrated brake coil and integrated braking
	recistor 186

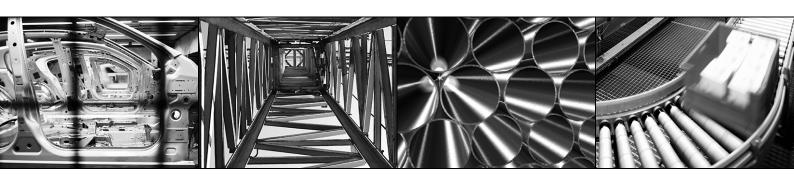














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