



SEW
EURODRIVE

Operating instructions



MOVIR-U®



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1 General information

1.1 About this documentation

The current version of the documentation is the original.

This documentation is an integral part of the product. The documentation is written for all employees who assemble, install, start up, and service this product.

Make sure this documentation is accessible and legible. Ensure that persons responsible for the machinery and its operation as well as persons who work on the product independently have read through the documentation carefully and understood it. If you are unclear about any of the information in this documentation or 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 grading and meaning of the signal words for safety 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 product or its environment
INFORMATION	Useful information or tip: Simplifies handling of the product.	

1.2.2 Structure of section-related safety notes

Section-related safety notes do not apply to a specific action but to several actions pertaining to one subject. The hazard 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 hazard.

Possible consequence(s) if disregarded.

- Measure(s) to prevent the hazard.

Meaning of the hazard symbols

The hazard symbols in the safety notes have the following meaning:

Hazard symbol	Meaning
	General hazard
	Warning of dangerous electrical voltage
	Warning of hot surfaces
	Warning of risk of crushing
	Warning of suspended load
	Warning of automatic restart

1.2.3 Structure of 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:

▲ SIGNAL WORD Type and source of hazard. Possible consequence(s) if disregarded. Measure(s) to prevent the hazard.

1.3 Rights to claim under limited warranty

Read the information in this documentation. This is essential for fault-free operation and fulfillment of any rights to claim under limited warranty. Read the documentation before you start working with the product.

1.4 Exclusion of liability

Read the information in this documentation, otherwise safe operation is impossible. You must comply with the information contained in this documentation 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, SEW-EURODRIVE assumes no liability for defects.

1.5 Other applicable documentation

Note also the following documentation:

- "DR.71 – 315 AC Motors" operating instructions

You can download or order this publication on the Internet (<http://www.sew-eurodrive.com> under the heading "Documentation").

1.6 Product names and trademarks

The brands and product names in this documentation are trademarks or registered trademarks of their respective titleholders.

1.7 Copyright notice

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2 Safety notes

2.1 Preliminary information

The following general safety notes serve the purpose of preventing injury to persons and damage to property. They primarily apply to the use of products described in this documentation. If you use additional components, also observe the relevant warning and safety notes.

2.2 Operator's duties

Make sure that the basic safety notes are read and observed. Make sure that persons responsible for the machinery and its operation as well as persons who work on the device independently 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.

The operator must ensure that the following works are only performed by qualified personnel:

- Transport
- Storage
- Setup and assembly
- Installation and connection
- Startup
- Maintenance and repair
- Shutdown
- Disassembly
- Waste disposal

Make sure persons working on the product adhere to the following regulations, requirements, documents and information:

- National and regional safety and accident prevention regulations
- Warning and safety signs on the product
- All other relevant project planning documents, installation and startup instructions, wiring diagrams and schematics
- Do not assemble, install or operate damaged products
- All specific specifications and requirements for the system

Make sure that systems with the product installed are equipped with additional monitoring and protection devices. Observe the applicable safety regulations and legislation governing technical equipment and accident prevention regulations.

2.3 Target group

Specialist for mechanical work	Any mechanical work may only be performed by adequately qualified personnel. Qualified personnel in the context of this documentation are persons familiar with the design, mechanical installation, troubleshooting and maintenance of the product, who possess the following qualifications: • Qualification in the field of mechanics according to applicable national regulation. • They are familiar with this documentation
Specialist for electrotechnical work	Any electronic work may only be performed by adequately skilled persons (electrically). Qualified electricians in the context of this documentation are persons familiar with electrical installation, startup, troubleshooting and servicing of the product who possess the following qualifications: • Qualification in the field of electrical engineering according to applicable national regulation. • They are familiar with this documentation In addition to that, these persons must be familiar with the valid safety regulations and laws, as well as with the requirements of the standards, directives and laws specified in this documentation. The above mentioned persons must have the authorization expressly issued by the company to operate, program, configure, label and ground devices, systems and circuits in accordance with the standards of safety technology.
Instructed persons	All work in the areas of transportation, storage, operation and waste disposal must be carried out by persons who are trained appropriately. The purpose of the training is to give persons the ability to perform the required tasks and work steps in a safe and correct manner.

2.4 Designated use

The product is intended for installation in electrical systems or machines.

In case of installation in electrical systems or machines, startup of the product is prohibited until it is determined that the machine meets the requirements stipulated in the local laws and directives. For Europe, Machinery Directive 2006/42/EC as well as the EMC Directive 2014/30/EU apply. Observe EN 60204-1 (Safety of machinery - electrical equipment of machines). The product meets the requirements stipulated in the Low Voltage Directive 2014/35/EU.

The standards given in the declaration of conformity apply to the product.

The systems can be mobile or stationary. The motors must be suitable for operation with inverters. Do not connect any other loads to the product. Never connect capacitive loads to the product.

The product can be used to operate the following motors in industrial and commercial systems:

- AC asynchronous motors with squirrel-cage rotor

Technical data and information on the connection conditions are provided on the nameplate and in chapter "Technical data" in the documentation. Always comply with the data and conditions.

Unintended or improper use of the product may result in severe injury to persons and damage to property.

Do not use the product as a climbing aid.

2.4.1 Lifting applications

The product may not be used for lifting applications or on slopes.

2.5 Functional safety technology

The product must not perform any safety functions without a higher-level safety system unless explicitly allowed by the documentation.

2.6 Transport

Inspect the shipment for damage as soon as you receive the delivery. Inform the shipping company immediately about any damage. If the product is damaged, it must not be assembled, installed or started up.

Observe the following notes when transporting the device:

- Ensure that the product is not subject to mechanical impact.
- Before transportation, cover the connections with the supplied protection caps.
- Only place the product on the cooling fins or on the side without connectors during transportation.
- Always use lifting eyes if available.

If necessary, use suitable, sufficiently dimensioned handling equipment.

Observe the information on climatic conditions in chapter "Technical data" of the documentation.

2.7 Installation/assembly

Ensure that the product is installed and cooled according to the regulations in the documentation.

Protect the product from excessive mechanical strain. The product and its mounted components must not protrude into the path of persons or vehicles. Ensure that components are not deformed and that insulation spaces are maintained, particularly during transportation. Electric components must not be mechanically damaged or destroyed.

Observe the notes in the chapter "Mechanical installation" of the documentation.

2.7.1 Restrictions of use

The following applications are prohibited unless explicitly permitted:

- Use in potentially explosive areas
- Use in areas exposed to harmful oils, acids, gases, vapors, dust, and radiation
- Operation in applications with impermissibly high mechanical vibration and shock loads in excess of the regulations stipulated in EN 61800-5-1
- Operation at installation altitudes above 2000 m above sea level

2.8 Electrical connection

Make yourself familiar with the applicable national accident prevention guidelines before you work on the product.

Perform electrical installation according to the pertinent regulations (e.g. cable cross sections, fusing, protective conductor connection). The documentation at hand contains additional information.

Make sure that all required covers are installed correctly after electrical installation.

Make sure that preventive measures and protection devices comply with the applicable regulations (e.g. EN 60204-1 or EN 61800-5-1).

2.8.1 Required preventive measure

Make sure that the product is correctly attached to the ground connection.

2.9 Protective separation

The product meets all requirements for protective separation of power and electronics connections in accordance with EN 61800-5-1. To ensure protective separation, all connected circuits must also meet the requirements for protective separation.

2.10 Startup/operation

Observe the safety notes in the chapters "Startup" and "Operation" in the documentation.

Make sure that the present transport protection is removed.

Do not deactivate monitoring and protection devices of the machine or system even for a test run.

Make sure the connection boxes are closed and screwed before connecting the supply voltage.

Depending on the degree of protection, products may have live, uninsulated, and sometimes moving or rotating parts, as well as hot surfaces during operation.

Additional preventive measures may be required for applications with increased hazard potential. You have to check the protection devices after each modification.

When in doubt, switch off the product whenever changes occur in relation to normal operation. Possible changes are, e.g., increased temperatures, noise, or oscillation. Determine the cause. Contact SEW-EURODRIVE if necessary.

When the device is switched on, dangerous voltages are present at all power connections as well as at any connected cables and terminals. This also applies even when the product is inhibited and the motor is at standstill.

Do not separate the connection to the product during operation.

This may result in dangerous electric arcs damaging the product.

If you disconnect the product from the voltage supply, do not touch any live components or power connections because capacitors might still be charged. Observe the following minimum switch-off time:

1 minute.

Observe the corresponding information signs on the product.

The fact that the operation LED and other display elements are no longer illuminated does not indicate that the product has been disconnected from the supply system and no longer carries any voltage.

Mechanical blocking or internal safety functions of the product can cause a motor standstill. Eliminating the cause of the problem or performing a reset may result in the drive re-starting automatically. If, for safety reasons, this is not permitted for the drive-controlled machine, first disconnect the product from the supply system and then start troubleshooting.

Risk of burns: The surface temperature of the product can exceed 60 °C during operation.

Do not touch the product during operation.

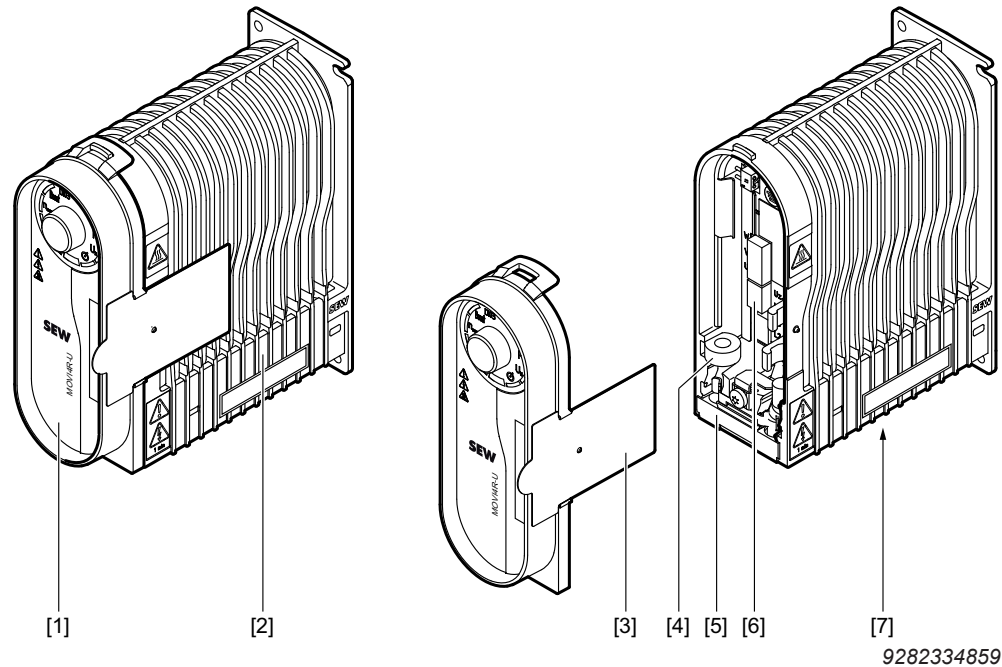
Let the product cool down before touching it.

3 Device structure

3.1 MOVI4R-U® inverter

MOVI4R-U® is an inverter for controlling asynchronous motors.

The following figure illustrates the structure of the size 1 MOVI4R-U® inverter:



- [1] Control plate
- [2] Housing with cooling fins
- [3] Instruction sign
- [4] EMC toroidal core
- [5] Cable seal
- [6] Power section
- [7] Fan (optional)

3.1.1 Device properties of MOVI4R-U® inverters

The MOVI4R-U® inverter is characterized by the following:

- Robust housing with IP54 protection
- Frequency inverter with V/f control
- Power range:
 - from 0.09 to 1.1 kW (size 1)
 - from 0.25 to 4.0 kW (size 2)
- Digital input control or operation at the unit
- Setpoint selection using the analog input or settings can be made on the unit
- 2 speed setpoints
- Simple startup and operation at the control plate
- Quick replacement of the power section and the control plate
- The housing can be reused

3.2 MOVI4R-U® inverter type designation

3.2.1 Nameplate of the complete device

The following figure shows an example of the nameplate of the complete MOVI4R-U® inverter device (on the side of the housing):

Input: 1x230V/5.2A/50..60Hz
Output: 3x..U _{input} /2,0A/2..100Hz

9007208906083339

The following figure shows an example of the nameplate of the complete MOVI4R-U® inverter device (on the front of the control plate):

01.7407919905.0001.00
MUWA037-231-S00-00

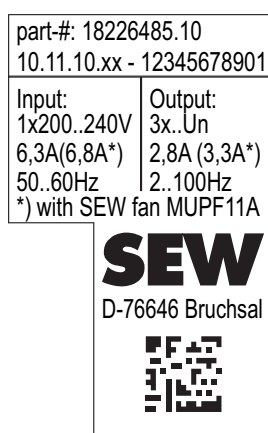


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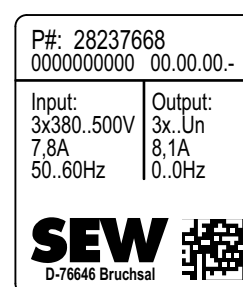
3.2.2 Power section nameplate

The following figures show examples of the nameplates of the power section:

Size 1



Size 2



The nameplate of the power section can be found on the front of the power section. It is not visible from the outside when the device is closed.

3.2.3 Type designation

The following table shows an example of the type designation of the MOVI4R-U® inverter:

MU	Series	MU = MOVI4R-U®
W	Series	W = For mounting close to the motor
A	Version A	
037	Output power	025 = 0.25 kW 037 = 0.37 kW 055 = 0.55 kW 075 = 0.75 kW 110 = 1.1 kW 150 = 1.5 kW 220 = 2.2 kW 300 = 3.0 kW 400 = 4.0 kW
—		
23	Connection voltage	23 = AC 200 – 240 V 40 = AC 380 – 400 V 50 = AC 380 – 500 V
1	Connection type	1 = 1-phase 3 = 3-phase
—		
S00	Control plate	S00 = Standard control unit
—		
00	Design	00 = Standard
/		
PF	Option	PF = Fan

3.3 Control plate type designation

3.3.1 Control plate nameplate

The following figure shows an example of the nameplate of the control plate:



9007208907436555

The nameplate of the control plate can be found on the control plate (inside the unit). It is not visible from the outside when the device is closed.

3.3.2 Type designation

The following table shows an example of the type designation of the control plate **MUOP11A**:

MU	Series	MU = MOVI4R-U®
OP	Component	OP = Control plate
11	Design	11 = Standard
A	Version	A = Size 1 B = Size 2

4 Mechanical installation

4.1 Installation instructions

4.1.1 General information



NOTICE

Loss of guaranteed degree of protection if the MOVI4R-U® inverter is installed incorrectly or not at all.

Damage to the MOVI4R-U® inverter.

- Protect the power section and the control plate from dust and moisture when removing the control plate from the housing.

Note the following when installing the MOVI4R-U® inverter:

- Observe the general safety notes.
- Only install the MOVI4R-U® inverter on a level, low-vibration, and torsionally rigid support structure.
- Ensure sufficient clearance around the unit to allow for adequate cooling air supply. Warm outlet air of other units must not be drawn in.
- Comply with all instructions referring to the technical data and the permissible conditions where the unit is operated.
- Use only the provided attachment options when mounting the drive.
- Seal unused cable entries.

The degree of protection specified in the technical data only applies if the MOVI4R-U® inverter is properly installed.

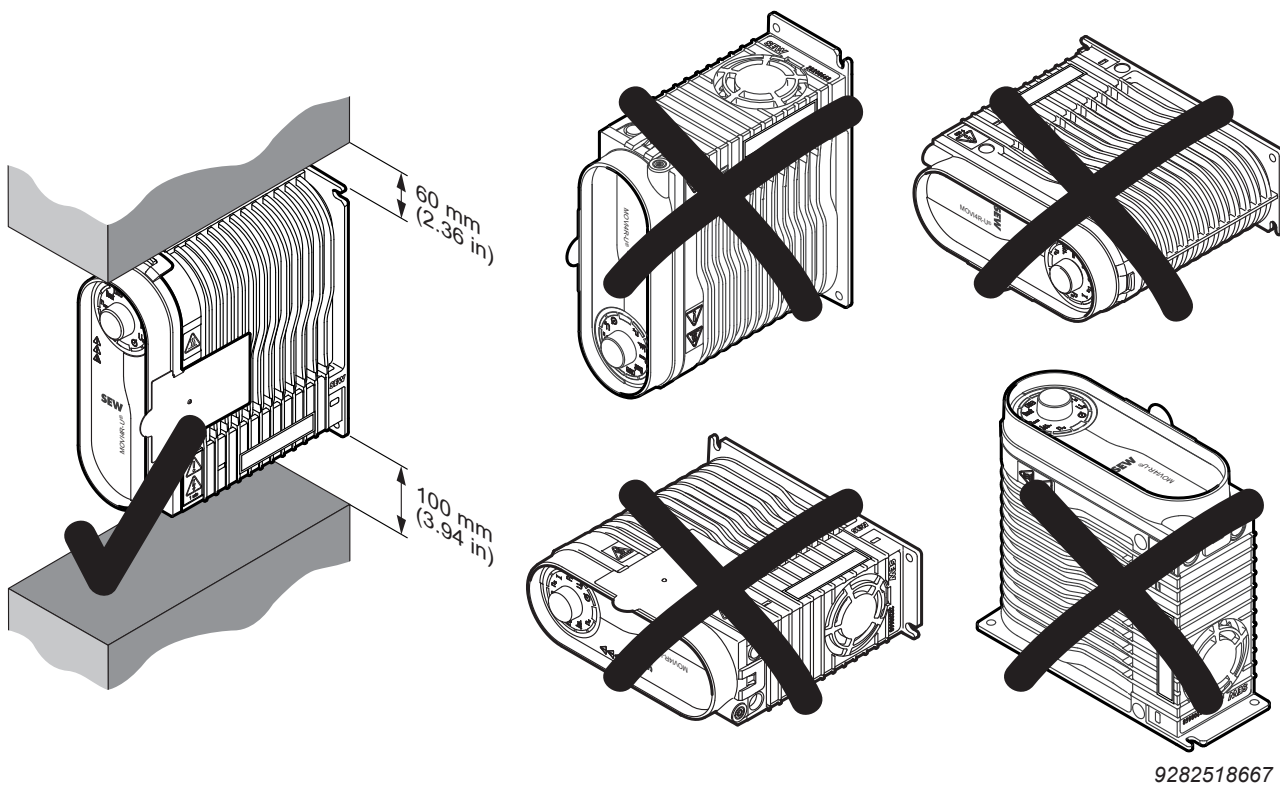
4.1.2 Installation requirements

Make sure that the following requirements are met before you start installing the unit:

- The entries on the nameplate of the MOVI4R-U® inverter match the voltage supply system.
- The MOVI4R-U® inverter is undamaged (no damage caused by transportation or storage).
- The ambient temperature corresponds to the specifications in chapter "Technical data".

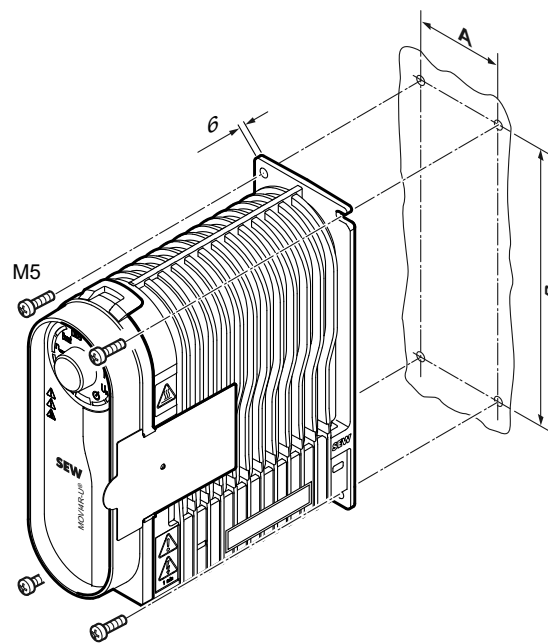
4.2 Mounting position

The MOVI4R-U® inverter may only be installed according to the following mounting positions.



4.3 Installation of MOVI4R-U®

Mount the MOVI4R-U® inverter with 4 M5 screws according to the following figure (tightening torque 2.0 – 2.4 Nm):



	A	B
Size 1	55 mm	175 mm
Size 2	90 mm	210 mm

9007208537276683

5 Electrical installation

5.1 General information

Observe the following notes on electrical installation:

- Observe the general safety notes.
- Comply with all instructions referring to the technical data and the permissible conditions where the unit is operated.
- Seal unused cable entries.

5.2 Installation planning taking EMC aspects into account



INFORMATION

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

MOVI4R-U® devices can cause EMC interference within the permitted limit range according to EN 61800-3 (see technical data). In this case, it is recommended for the user to take suitable measures.

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

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

Always apply the **relevant standards**.

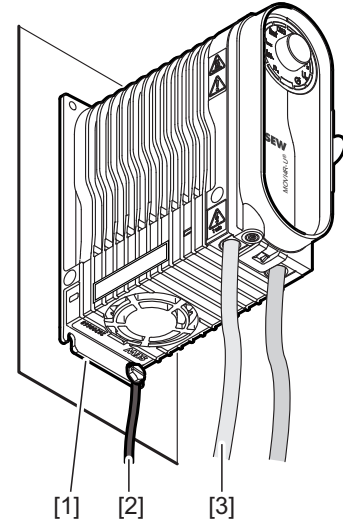
Observe the notes in the following chapters in particular.

5.2.1 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 MOVI4R-U® housing and the system (untreated, unpainted, uncoated mounting surface).

- [1] Conductive connection over a large area between MOVI4R-U® inverter and the mounting plate
- [2] PE conductor on housing
- [3] PE conductor in the supply system cable



Do not use the cable shields of data lines for equipotential bonding.

5.2.2 Data cables (digital inputs/outputs)

Route the data cables for the digital inputs/outputs separately from cables that emit interference (such as control cables of solenoid valves, motor cables).

5.2.3 Cable shields

- Must have good EMC properties (high screening attenuation).
- May not serve only as mechanical protection for the cable.
- Must be connected to a wide area of the device's metal housing at the cable ends.

5.3 Installation instructions

5.3.1 Connecting supply system cables

- The nominal voltage and frequency of the MOVI4R-U® inverter must correspond to the data for the supply system.
- Install permitted fuses at the beginning of the supply system cables behind the supply bus junction.

The following fuses are permitted:

- Fuses in utilization category gG
- Power circuit breakers with characteristic B or C
- Motor circuit breaker

Size the fuses according to the cable cross section.

- Size the cable cross section according to the input current I_{grid} for rated power (see operating instructions, "Technical data" chapter).

Operation on IT network

Operation of MOVI4R-U® inverters on IT supply systems is in preparation.

5.3.2 Line contactor



NOTICE

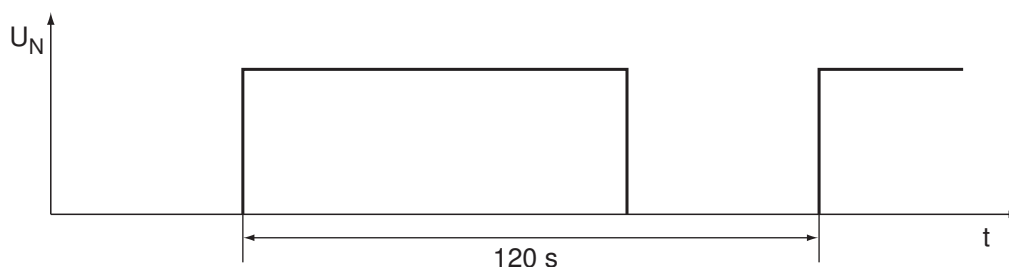
Damage due to jog mode.

Damage to the MOVI4R-U® inverter.

- Do not use the line contactor for jog mode, but only for switching the MOVI4R-U® inverter on and off. In jog mode, use the control signals (digital inputs).
- Observe the minimum switch-off time for the line contactor:
 - 20 s for MOVI4R-U® with 1-phase voltage supply.
 - 2 s for MOVI4R-U® with 3-phase voltage supply.

Switching on and off

- Use only a contactor of utilization category AC3 (EN 60947-4-1) as a line contactor.
- Ensure a minimum time of 120 s between 2 mains activations for MOVI4R-U® units with 1-phase voltage supply of AC 230 V.



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- Do not turn the supply system on or off more than once per minute.

5.3.3 Selecting the residual current device

The inverter can cause a direct current in the protective earthing conductor.

Proceed as follows when selecting the residual current device:

1. If using a residual current device is not mandatory according to the standards, SEW-EURODRIVE recommends not using a residual current device.
2. **⚠ WARNING!** No protection against electric shock if an incorrect type of residual current device is used. Severe or fatal injuries.
If a residual current device (residual current protection device RCD or residual current monitor RCM) is required, use a universal current sensitive type B RCD or RCM.
3. If a residual current device is required, then select the residual current device according to the requirements for personnel, fire, or system protection. During selection, be mindful of the trigger characteristic, the delay, and the trigger rated current of the residual current device.
4. During project planning, make sure that operation-related leakage currents are kept as low as possible in the system.
5. If the operation-related leakage currents are too high, then you can divide the current supply among several residual current devices.

5.3.4 Permitted outer cable diameter and cable cross section

Power terminals

Observe the permitted outer cable diameters and cable cross sections for installation:

Power terminals	Size 1	Size 2
Outer cable diameter		
Power supply cable:	7.0 – 10.0 mm	8.0 – 11.5 mm
Motor cable:	8.0 – 11.5 mm	8.0 – 11.5 mm
Cable cross section	0.25 – 2.5 mm ²	
Conductor end sleeves	• Connect only single-wire conductors or flexible conductors with conductor end sleeves (DIN 46228, material E-CU) with or without plastic collars. • Permitted length of the conductor end sleeve: at least 8 mm	
Tightening torque screw	0.5 – 0.6 Nm	

Control terminals

Observe the permitted outer cable diameters and cable cross sections for installation:

Control terminals	
Outer cable diameter	Control cable: 5.0 – 7.5 mm
Cable cross section	

Control terminals	
- Flexible conductor (bare litz wire) - Conductor with conductor end sleeve without plastic collar	0.25 mm ² – 1.5 mm ² AWG24 – AWG16
Conductor with conductor end sleeve with plastic collar	0.25 mm ² – 0.75 mm ² AWG24 – AWG19
Tightening torque screw	0.22 – 0.25 Nm

5.3.5 Notes on PE connection

▲ WARNING

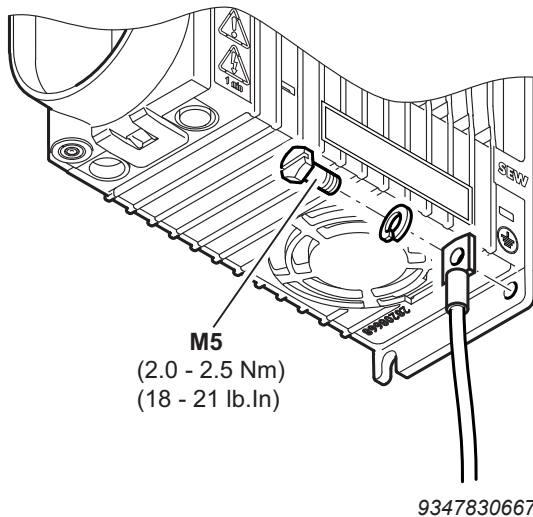


Electric shock due to incorrect connection of PE.

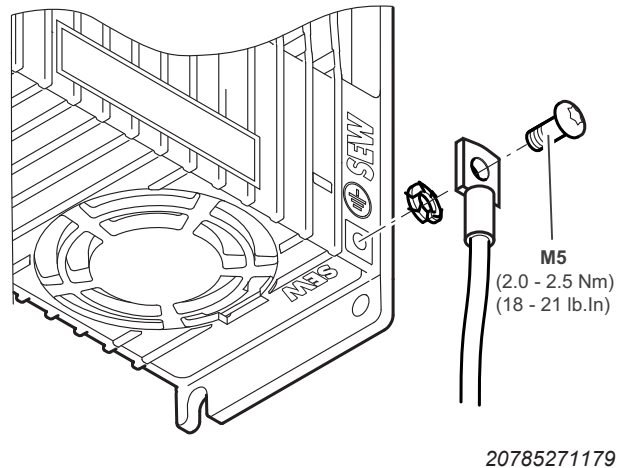
Severe or fatal injuries.

- Observe the following notes regarding PE connection.

Size 1



Size 2



Earth-leakage currents ≥ 3.5 mA may occur during normal operation. In order to fulfill 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^2
 - or installing a second PE connection cable in parallel with the original PE connection.

INFORMATION



The cross section of the second PE connection cable must be at least as large as the cross section of the PE.

Minimum cross section of the PE and the second PE connection cable:

- 2.5 mm^2 , if there is a mechanical protection.
- 4.0 mm^2 , if there is no mechanical protection.

5.3.6 Protection devices

MOVI4R-U® inverters are equipped with integrated protection devices against overload of the drive. External motor protection devices are not necessary.

External measures are required to fully meet the requirements of the EN 61800-5-1 standard for motor protection. One possible measure is, for example, protection by detecting the temperature of the motor with a temperature sensor and the associated evaluation.

5.3.7 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.

With respect to the EMC regulation, frequency inverters cannot be operated 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.

5.3.8 Installation above 1000 m amsl

MOVI4R-U® inverters can also be operated at an altitude of 1000 – 2000 m amsl. Therefore, observe the following basic conditions.

- At heights above 1000 m amsl, the nominal continuous power is reduced due to reduced cooling: I_N reduction by 1% per 100 m.

5.3.9 Information Regarding UL

Field Wiring Power Terminals

Use 60/75 °C solid or stranded copper wire only sized at AWG 14 minimum. Suitable for 1 wire per terminal.

Tighten terminals to 5 – 7 in-lb.

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.

Short Circuit Current Rating

Suitable for use on a circuit capable of delivering not more than 10,000 rms symmetrical amperes when protected as follows:

For 240 V systems:

250 V minimum, 20 A maximum, non-semiconductor fuses
250 V minimum, 20 A maximum, inverse time circuit breakers with an interrupting rating not less than 10,000 rms symmetrical amperes
Type E Combination Motor Controller Model MS132-2.5, manufactured by ABB, rated 500 V, 2.5 A
Type E Combination Motor Controller Model 140M-C2E-C10, manufactured by Allen Bradley, rated 500 V, 2.5 A

For 480 V systems:

500 V minimum, 20 A maximum, non-semiconductor fuses
500 V minimum, 20 A maximum, inverse time circuit breakers with an interrupting rating not less than 10,000 rms symmetrical amperes
Type E Combination Motor Controller Model MS132-2.5, manufactured by ABB, rated 500 V, 2.5 A
Type E Combination Motor Controller Model 140M-C2E-C10, manufactured by Allen Bradley, rated 500 V, 2.5 A

Suitable for motor group installation on a circuit capable of delivering not more than 10,000 rms symmetrical amperes when protected as follows:

For 240 V systems:

- 250 V minimum, 20 A maximum non-semiconductor fuses or
- 250 V minimum, 20 A maximum inverse time circuit breakers with an interrupting rating not less than 10,000 rms symmetrical amperes

For 480 V systems:

- 500 V minimum, 20 A maximum, non-semiconductor fuses or
- 500 V minimum, 20 A maximum, inverse time circuit breakers with an interrupting rating not less than 10,000 rms symmetrical amperes.

Motor Overload Protection

MOVI4R-U® 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.

Surrounding Air Temperature Rating

MOVI4R-U® is suitable for a max surrounding air ambient of 40 °C.

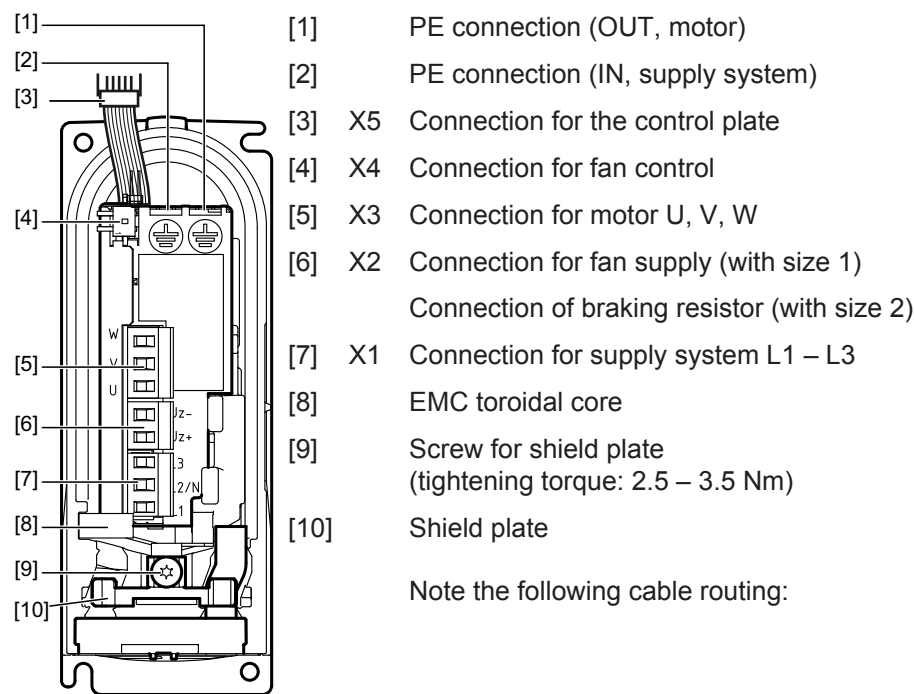
Wiring Diagram

For wiring diagrams, refer to the operating instructions > chapter "Electrical Installation".

5.4 MOVI4R-U® inverter

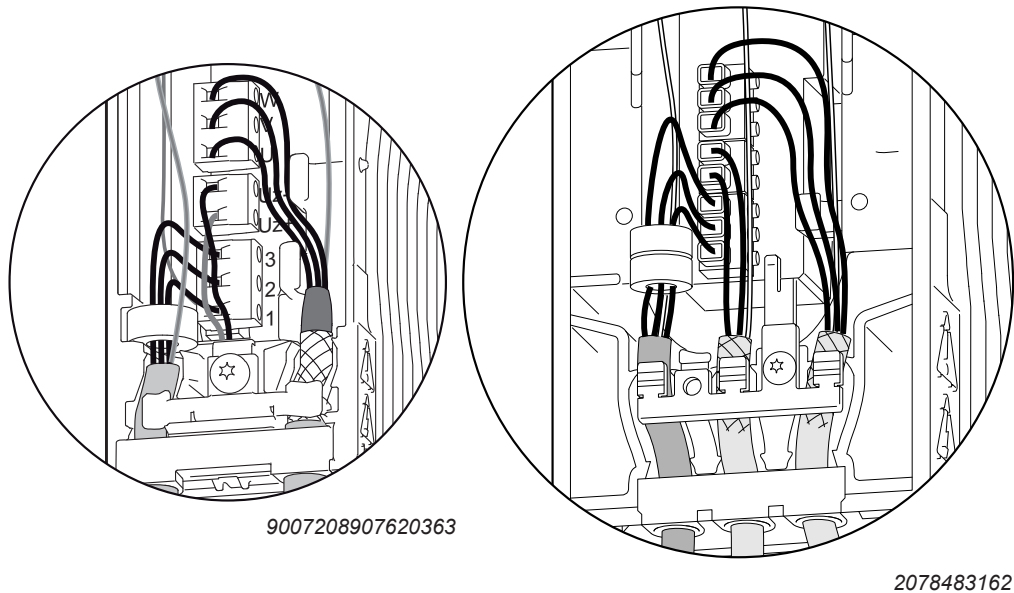
5.4.1 Power section connections

The following figure shows the electrical connection of the power section:



Size 1

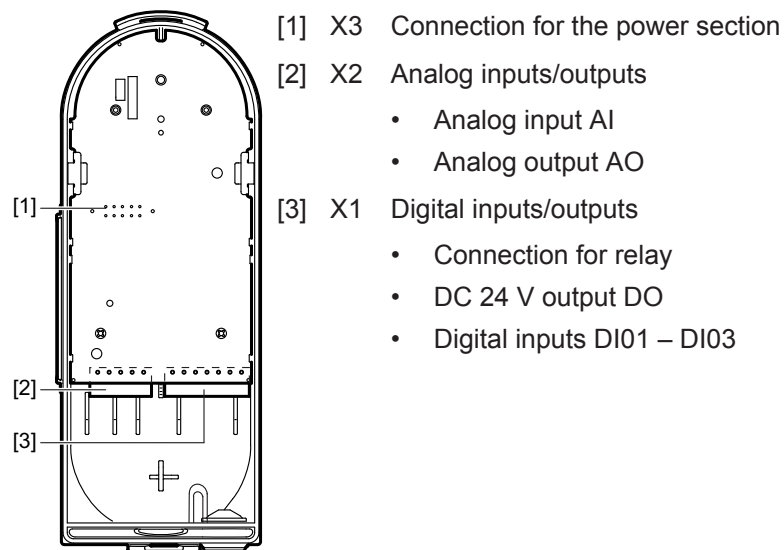
Size 2



Refer to chapter "Electrical connections" for connection and cable assignment.

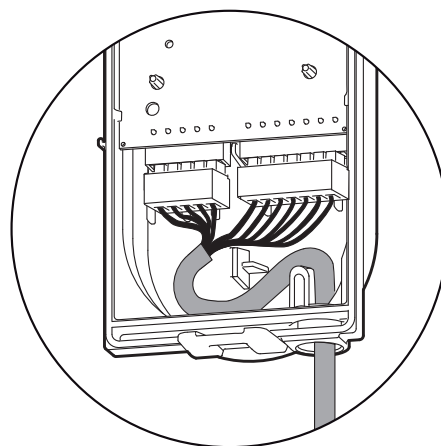
5.4.2 Control plate connections

The following figure shows the electrical connections on the back of the MUOP11A control plate:



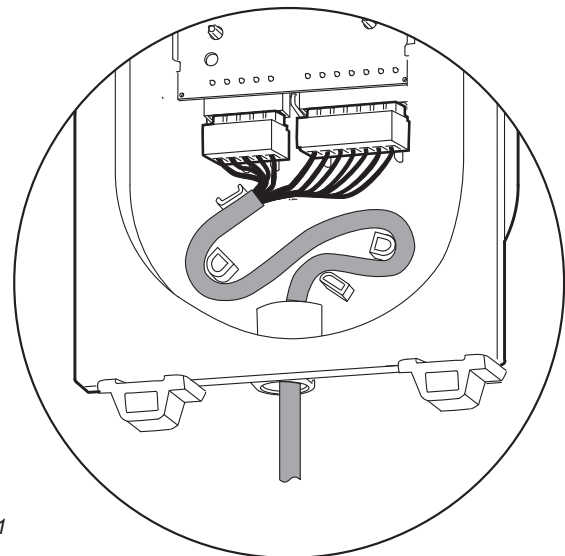
Note the following cable routing:

Size 1



9687031051

Size 2



20781056907

Refer to chapter "Electrical connections" for connection and cable assignment.

Wiring diagram for MUOP11A control plate

X1: Digital inputs/outputs

- 1 Relay NO contact
- 2 Common relay
- 3 Relay NC contact
- 4 DC 24 V output
- 5 Digital input DI01 (enable)
- 6 Digital input DI02 (direction of rotation)
- 7 Digital input DI03 (setpoint source, fault reset)

X2: Analog inputs/outputs

- 1 Reference potential/mass
- 2 +10 V output
- 3 Analog input, 0 – 10 V
- 4 Analog output, 0 – 10 V
- 5 Reference potential/mass

MUOP11A	
X1	
REL NO	1
REL C	2
REL NC	3
24 V	4
DI01	5
DI02	6
DI03	7
X2	
COM	1
REF10V	2
AIN	3
AOUT	4
COM	5

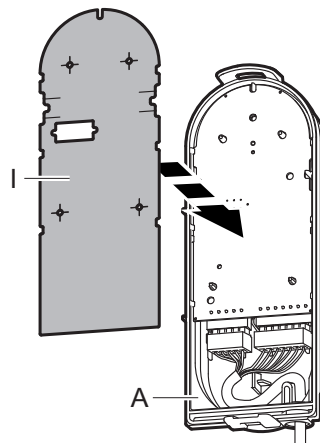


⚠ WARNING

Danger of electric shock. If the insulating sheet is not installed, protective separation of the MOVI4R-U® inverter cannot be ensured.

Severe or fatal injuries.

- Plug the insulating sheet [I] onto the control plate [A] according to the following figure

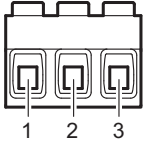


9404825483

5.5 Electrical connections

5.5.1 X1: Connection for supply system

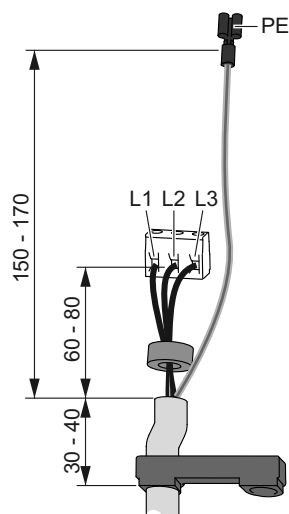
The following table shows information about this connection:

Function		
Unit supply line connection		
Connection type		
Terminals, separable		
• 2-pole (for 1-phase supply) • 3-pole (for 3-phase supply)		
Connection image		
		
Assignment		
No.	Name	Function
1	L3	Line connection phase L3 (with 3-phase supply)
2	L2/N	Line connection phase L2
3	L1	Line connection phase L1

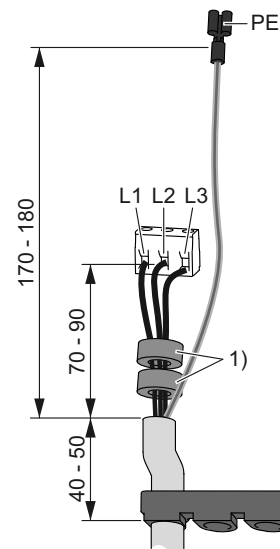
Power supply cable assembly

Assemble the power supply cable as shown in the following figures:

Size 1



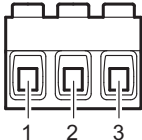
Size 2



- 1) Before operating the MOVI4R-U® inverter with a PWM frequency of 16 kHz, you must install 2 EMC toroidal cores on the power supply cable.

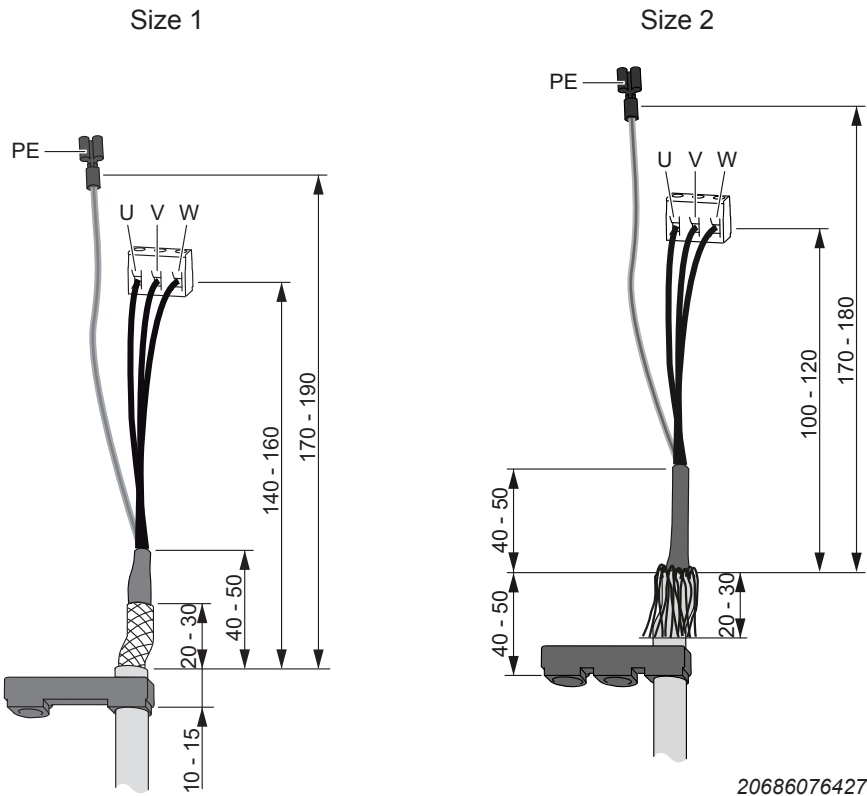
5.5.2 X3: Motor connection

The following table shows information about this connection:

Function		
Motor connection		
Connection type		
Terminals, separable, 3-pole		
Connection image		
		
Assignment		
No.	Name	Function
1	W	Motor phase W output
2	V	Motor phase V output
3	rev	Motor phase U output

Motor cable assembly

Assemble the motor cable as shown in the following figures:



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5.5.3 X2: Connection for fan supply (size 1) or braking resistor (size 2)

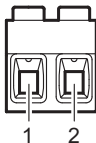
NOTICE

Damage to the device due to unauthorized connection of a braking resistor at the X2 connection of the MOVI4R-U® inverter of size 1.

Damage to the MOVI4R-U® inverter.

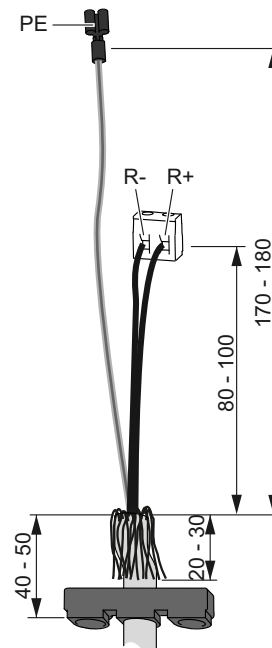
- Only connect the **fan supply** at the X2 connection with MOVI4R-U® inverters of **size 1**.
- Only connect a **braking resistor** at the X2 connection with MOVI4R-U® inverters of **size 2**.

The following table shows information about this connection:

Function				
Size 1	Size 2			
Connection for fan supply	Braking resistor connection			
Connection type				
Terminals, separable, 2-pole				
Wiring diagram				
				
Assignment				
	Size 1	Size 2		
No.	Name	Function	Name	Function
1	UZ-	DC link voltage -	R-	Braking resistor -
2	UZ+	DC link voltage +	R+	Braking resistor +

Braking resistor cable assembly

Assemble the braking resistor cable with size 2 as shown in the following figure:

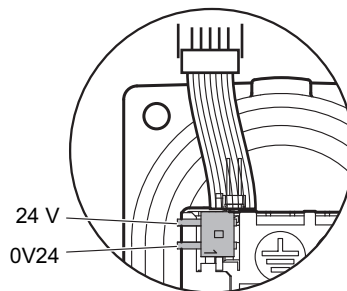


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5.5.4 X4: Connection for fan control

The following table shows information about this connection:

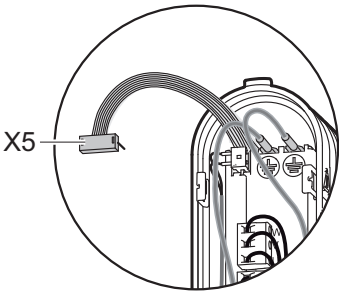
Function		
Connection for fan controller		
Connection type		
Terminals, separable, 2-pole		
Connection image		
		
Assignment		
No.	Name	Function
1	0V24	Reference potential
2	+24 V	+24 V control signal



5.5.5 X5: Connection for the control plate (on the power section)

The following table shows information about this connection:

Function		
Connection for the control plate on the power section		
Connection type		
Ribbon cable plug connector, male, 10-pole		
Connection image		
Assignment		
No.	Name	Function
1	COM	Reference potential
2	COM	Reference potential
3	RxD	Receive line
4	+24 V	24 V voltage supply
5	TxD	Transmit line
6	TxD	Transmit line
7	+24 V	24 V voltage supply
8	RxD	Receive line
9	COM	Reference potential
10	COM	Reference potential



19835683595

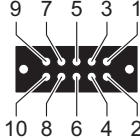
Ribbon cable

The ribbon cable for connecting the power section and the control plate is equipped with 2 ribbon cable plug connectors (10-pin, 1 male + 1 female). The ribbon cable is assembled at the factory; it is connected using the plug connector on to the top of the power section and guided to the front to the control plate.

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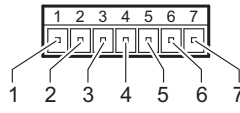
5.5.6 X3: Connection for the power section (on the control plate)

The following table shows information about this connection:

Function		
Connection of the power section on the control plate		
Connection type		
Ribbon cable plug connector, female, 10-pole		
Connection image		
		
Assignment		
No.	Name	Function
1	COM	Reference potential
2	COM	Reference potential
3	RxD	Receive line
4	+24 V	24 V voltage supply
5	TxD	Transmit line
6	TxD	Transmit line
7	+24 V	24 V voltage supply
8	RxD	Receive line
9	COM	Reference potential
10	COM	Reference potential

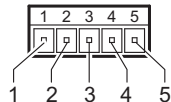
5.5.7 X1: Digital inputs/outputs

The following table shows information about this connection:

Function		
Digital inputs/outputs (on the control plate)		
Connection type		
Terminals, separable, 7-pole		
Connection image		
		
Assignment		
No.	Name	Function
1	REL NO	Relay NO contact
2	REL C	Common relay
3	REL NC	Relay NC contact
4	+24 V	DC 24 V output
5	DI01	Digital input DI01 (enable)
6	DI02	Digital input DI02 (direction of rotation)
7	DI03	Digital input DI03 (setpoint source, fault reset)

5.5.8 X2: Analog inputs/outputs

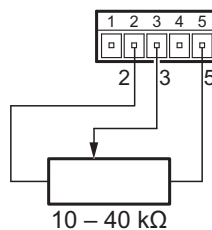
The following table shows information about this connection:

Function		
Analog inputs/outputs (on the control plate)		
Connection type		
Terminals, separable, 5-pole		
Connection image		
		
Assignment		
No.	Name	Function
1	COM	Reference potential/mass
2	REF10V	+10 V output
3	AIN	Analog input, 0 – 10 V
4	AOUT	Analog output, 0 – 10 V
5	COM	Reference potential/mass

Connection of potentiometer

You can set the speed setpoint of the MOVI4R-U® drive between 0 and 100% of the maximum speed n_{max} using an external potentiometer.

1. Insert the connection cable into the cable seal on the control plate from below.
2. Connect the external potentiometer to the control plate as shown in the following figure:



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6 Startup

6.1 General information



INFORMATION

You must comply with the general safety notes in chapter "Safety Notes" during start-up.



⚠ WARNING

Risk of crushing due to missing or defective protective covers.

Severe or fatal injuries.

- Install the protective covers of the plant according to the instructions, also see the operating instructions of the motor and the gear unit.
- Never start up the drive if the protective covers are not installed.



⚠ WARNING

Risk of burns due to hot surfaces of the inverter, in particular the cooling fins.

Serious injuries.

- Do not touch the inverter until it has cooled down sufficiently.



⚠ WARNING

Inverter malfunction due to incorrect settings.

Severe or fatal injuries.

- Observe the startup instructions.
- Always have the installation carried out by a trained specialist.
- Only use settings that are correct for the function.



INFORMATION

- Observe the minimum switch-off time for the line contactor:
 - 20 s for MOVI4R-U® with 1-phase voltage supply.
 - 2 s for MOVI4R-U® with 3-phase voltage supply.

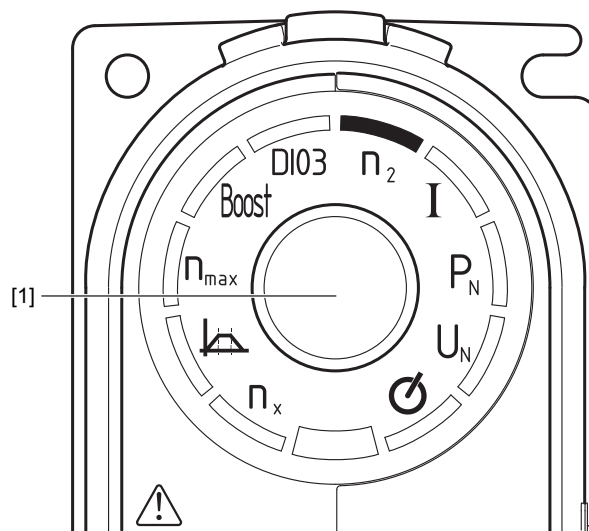
6.2 Requirements

The following conditions apply to startup:

- The MOVI4R-U® inverter and the drive must be installed correctly both mechanically and electrically.
- The insulating sheet is connected to the control plate; see the “Control plate unit replacement” > “Installing the control plate” chapters.
- Appropriate safety measures prevent the drive from starting up unintentionally.
- Appropriate safety measures must be taken to prevent risk of injury or damage to the machine.

6.3 Control knob

The following figure shows the control knob of the MOVI4R-U® inverter (size 1):



9282816651

[1] Control knob with pushbutton

6.3.1 Description

The control knob is used for startup, parameterization and operation of the drive.

The control knob is a combination of a rotary button and a pushbutton.

There are 10 function LEDs and 1 status LED arranged around the control knob. The function LED that is currently illuminated or flashing indicates the current position of the control knob.

6.3.2 Levels

The control plate has the following operating levels:

Level 0

Status display:

When the line voltage is switched on, the status LED shows the status of the MOVI4R-U® inverter (status display).

If no fault is present, the status LED should light up yellow.

- To switch to level 1, select n_x , then briefly press the control knob.

Level 1

You can select the desired function or special function in level 1.

- To select a **function** in level 1, proceed as follows:
 - Turn the control knob until the LED of the desired function lights up.
 - Briefly press the control knob.
- Briefly press the control knob without prior turning to switch to level 0.
- To select a **special function** in level 1, proceed as follows:
 - Turn the control knob until the LED 9 nominal motor voltage lights up.
 - Briefly press the control knob.
 - Turn the control knob until the LED of the desired special function lights up.
 - Give the control knob a longer press.

Level 2

Level 2 is used for:

- Setting or displaying the value of the selected function.
- Selecting the special function.

Level 3

Level 3 is used for:

- Saving the value of the selected function.
- Setting or displaying the value of the selected special function.

Level 4

Level 4 is used for saving the value of the selected special function.

INFORMATION



For an overview of the functions and special functions, refer to the following page.

6.3.3 Overview of functions

The following image shows an overview of the MOVI4R-U® functions:

Functions

Level 0 (status display)

Status LED is lit



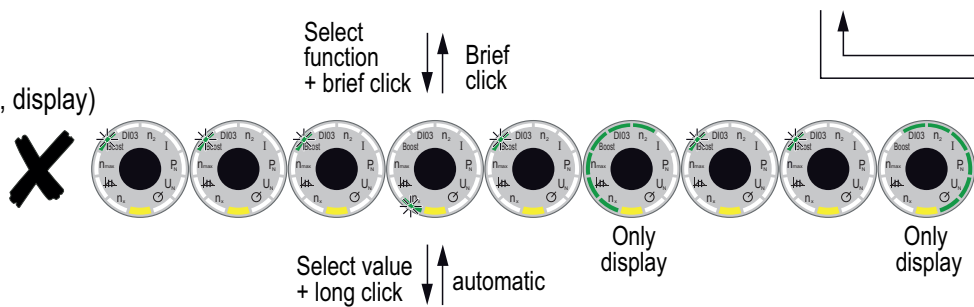
Level 1 (function selection)

1 LED is lit



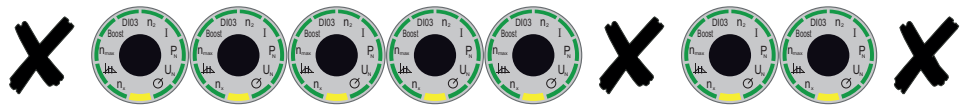
Level 2 (value selection, display)

Bargraph display
or
1 LED
flashes slowly



Level 3 (save value)

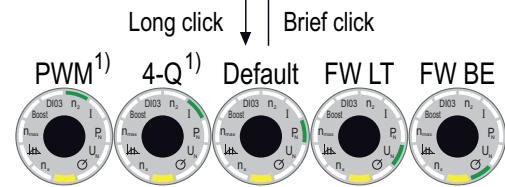
All LEDs
light up briefly



Special functions

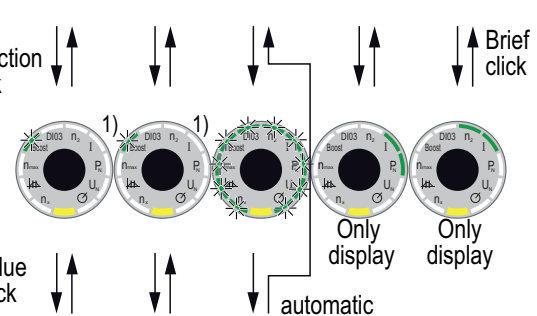
Level 2 (special function selection)

1 LED
is lit



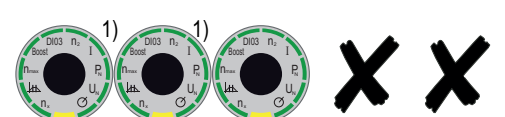
Level 3 (value selection, display)

Several LEDs are lit,
1 LED flashes quickly
or
all LEDs flash quickly



Level 4 (save value)

All LEDs
light up briefly

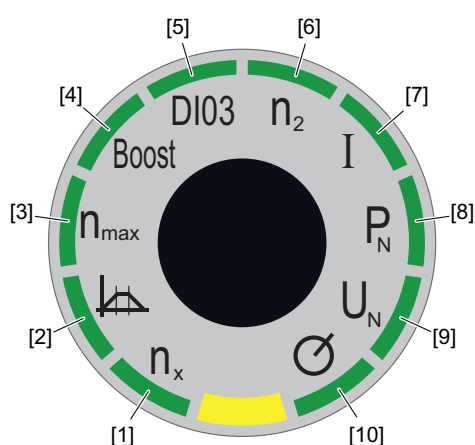


19925748619

1) Only with size 2

6.4 Functions

You can choose from the following functions in level 1:



- [1] n_x Actual speed value display + setpoint setting
- [2] Acceleration/deceleration
- [3] n_{max} Maximum speed
- [4] Boost Boost
- [5] DI03 Terminal assignment DI03/setpoint source
- [6] n_2 Fixed speed setpoint
- [7] I Inverter output current (only display)
- [8] P_N Nominal motor power
- [9] V_N Nominal motor voltage
- [10] Manual mode

The following table shows an overview of setting options of the functions. The factory settings are indicated in **bold**.

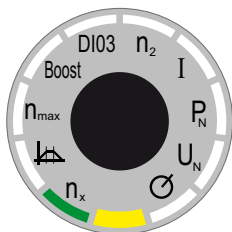
LED		Functions in level 1												
		1		2		3	4	5	6	7	8		9	10
		n_x				n_{max}	Boost	DI03	n_2	I	P_N		V_N	
		% n_{max}		$min^{-1}s^{-1}$		min^{-1}	V		% n_{max}	% I_M	kW		V	% n_{max}
		 									BG1	BG2		 
1	n_x	10	100	12 000	50	0	Potentiometer ¹⁾	10	20	0.09	0.25	230	10	100
2		20	90	6000	100	5	0: Potentiometer ¹⁾	20	40	0.12	0.37	400	20	90
							1: AI							
3	n_{max}	30	80	3000	250	10	1: Fault reset/potentiometer ¹⁾	30	60	0.18	0.55	400	30	80
4	Boost	40	70	2000	500	15	1: Fault reset/AI	40	80	0.25	0.75	400	40	70
5	DI03	50	60	1000	750	20	0: Potentiometer ¹⁾	50	100	0.37	1.1	400	50	60
							1: n_2							
6	n_2	60	50	500	1000	25	0: AI	60	120	0.55	1.5	400 ²⁾	60	50
							1: n_2					PWM ³⁾		
7	I	70	40	250	1500	30	Potentiometer ¹⁾	70	140	0.75	2.2	400 ²⁾	70	40
												4-Q ³⁾		
8	P_N	80	30	100	2000	35	Potentiometer ¹⁾	80	160	1.1	3.0	Default	80	30

LED		Functions in level 1												
		1		2	3	4	5	6	7	8		9	10	
		n_x			n_{max}	Boost	DI03	n_2	I	P_N		V_N		
		% n_{max}		$min^{-1}s^{-1}$	min^{-1}	V		% n_{max}	% I_M	kW		V	% n_{max}	
										BG1	BG2			
9	V_N	90	20	50	2500	40	Potentiometer ¹⁾	90	180	1.5	4.0	FW LT	90	20
10		100	10	10	3000	50	Potentiometer ¹⁾	100	200	2.2	5.5	FW BE	100	10

1) The setpoint setting is made on the control knob in level 0.
2) Only with size 1
3) Only with size 2

6.4.1 Function 1 actual speed value display + setpoint setting

Select function.

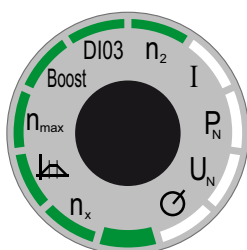


Select function 1 actual speed value display in level 1 and briefly press the control knob.

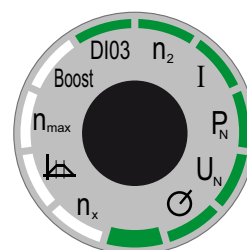
The illuminated LEDs show the current actual speed value of the drive as a "bargraph display". The display is scaled from 10 to 100% of n_{max} .

Set the value.

When rotating in **clockwise direction**, all LEDs from LED 1 through to the LED that signals the current actual speed value are illuminated.



When rotating in **counterclockwise direction**, all LEDs from LED 10 through to the LED that signals the current actual speed value are illuminated.



If the setpoint source is set to "potentiometer" (see function 5), set the speed setpoint as follows:

Increasing the speed setpoint.

You can increase the speed setpoint by turning the control knob to the right.

You can increase the speed setpoint by turning the control knob to the left.

Decreasing the speed setpoint.

You can decrease the speed setpoint by turning the control knob to the left.

You can decrease the speed setpoint by turning the control knob to the right.

Turn the control knob slowly for small acceleration values. The actual speed value could otherwise unintentionally overshoot.

Display of the speed

The LEDs 1 – 10 show the current direction of rotation and the actual speed value of the motor as a "bargraph display", according to the following assignment.

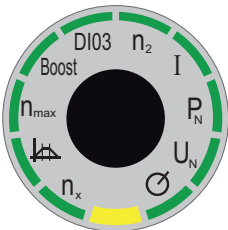
CW rotation			CCW rotation	
LED	Actual speed value n_x % n_{max}		LED	Actual speed value n_x % n_{max}
1 n_x	10		10 – 1 n_x	100
1 – 2	20		10 – 2	90
1 – 3 n_{max}	30		10 – 3 n_{max}	80
1 – 4 Boost	40		10 – 4 Boost	70
1 – 5 DI03	50		10 – 5 DI03	60
1 – 6 n_2	60		10 – 6 n_2	50
1 – 7 I	70		10 – 7 I	40
1 – 8 P_N	80		10 – 8 P_N	30
1 – 9 V_N	90		10 – 9 V_N	20
1 – 10	100		10	10

Set the speed using the control knob.

Saving values.

To save the set speed value as restart speed, give the control knob a longer press. If the drive is enabled, the motor accelerates to the saved speed when the line voltage is switched on.

All LEDs briefly flash to confirm your entry.



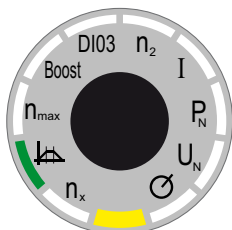
Exit function.

To switch to level 1, briefly press the control knob.

6.4.2 Function 2 acceleration/deceleration

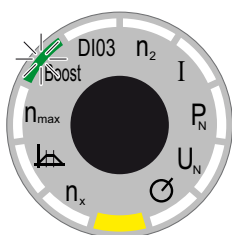
Select function.

Select function 2 acceleration/deceleration in level 1 and briefly press the control knob.



Set the value.

The flashing LED shows the acceleration and deceleration of the motor during every change of speed according to the following assignment:



LED	Acceleration/deceleration  $\text{min}^{-1}\text{s}^{-1}$	Ramp time ¹⁾ s
1 n_x	12000	0.25
2 	6000	0.5
3 $n_{\max}$	3000	1.0
4 Boost	2000	1.5
5 DI03	1000	3
6 n_2	500	6
7 I	250	12
8 P_N	100	30
9 V_N	50	60
10 	10	300

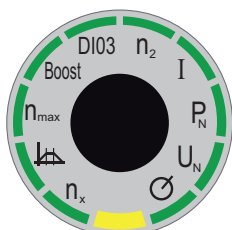
1) Ramp time = Duration for acceleration from 0 to 3000 rpm

Set motor acceleration/deceleration using the control knob.

Saving values.

To save the value, give the control knob a longer press.

All LEDs briefly flash to confirm your entry.

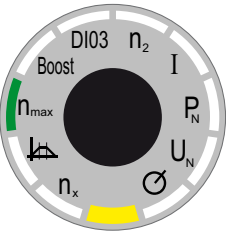


Exit function.

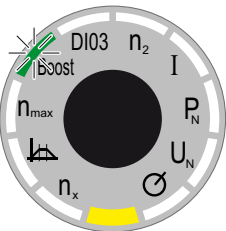
To switch to level 1, briefly press the control knob.

6.4.3 Function 3 maximum speed

Select function. Select function 3 maximum speed in level 1 and briefly press the control knob.



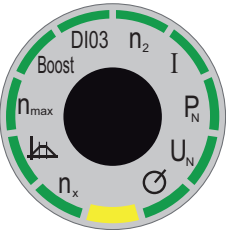
Set the value. The flashing LED shows the maximum speed according to the following assignment:



LED	Maximum speed $n_{\max}$ min^{-1}
1 n_x	50
2	100
3 $n_{\max}$	250
4 Boost	500
5 DI03	750
6 n_2	1000
7 I	1500
8 P_N	2000
9 V_N	2500
10	3000

Set the maximum motor speed using the control knob.
To save the value, give the control knob a longer press.
All LEDs briefly flash to confirm your entry.

Saving values.



Exit function. To switch to level 1, briefly press the control knob.

6.4.4 Function 4 boost

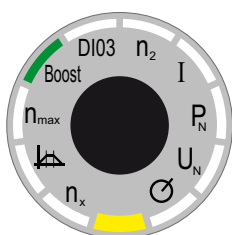
At very low speeds, the V/f operating mode of the inverter leads to a small torque due to the ohmic resistance of the winding.

To increase the torque in the lower speed range, you can set a higher value for the voltage offset (boost) in the lower frequency range in this function.

You can increase the motor torque at very low speeds using an increasing voltage offset.

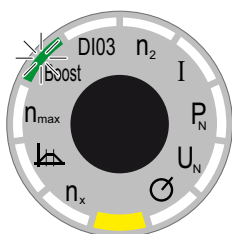
Select function.

Select function 4 boost in level 1 and briefly press the control knob.



Set the value.

The flashing LED shows the voltage offset of the V/f characteristic (boost) according to the following assignment:



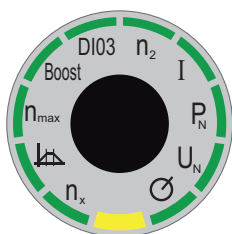
LED		Voltage offset (Boost)	
		V	
1	n_x	0	
2		5	
3	n_{max}	10	
4	Boost	15	
5	DI03	20	
6	n_2	25	
7	I	30	
8	P_N	35	
9	V_N	40	
10		50	

Set the voltage offset of the V/f characteristic curve using the control knob.

Saving values.

To save the value, give the control knob a longer press.

All LEDs briefly flash to confirm your entry.

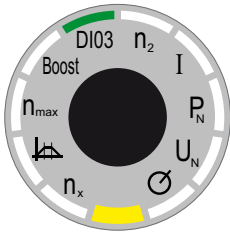


Exit function.

To switch to level 1, briefly press the control knob.

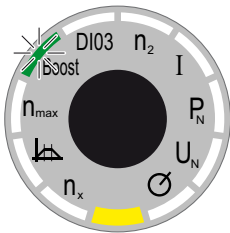
6.4.5 Function 5 terminal assignment DI03/setpoint source

Select function.



Select function 5 terminal assignment DI03/setpoint source in level 1 and briefly press the control knob.

Set the value.



The flashing LED shows the function of the digital input DI03 according to the following assignment:

LED	Function of digital input DI03/setpoint source (→ 67) Delivery state or firmware display
1 n_x	Digital input DI03 does not have any function. The speed is specified on the control knob by setting the setpoint n_x from 0 – 100% of n_{max} .
2	Switching the speed setpoint source potentiometer¹⁾ – AI DI03 = 0 V The speed is specified using the control knob (potentiometer)¹⁾ in level 0 from 0 – 100% of n_{max} . DI03 = 24 V The speed is specified by the analog input AI (0 – 10 V) from 0 – 100% of n_{max} .
3 n_{max}	Fault reset and setpoint source potentiometer¹⁾ Reset device errors by setting the digital input DI03 = 24 V. (Setpoint source = potentiometer ¹⁾ in level 0)
4 Boost	Fault reset and setpoint source AI Reset device errors by setting the digital input DI03 = 24 V. (Setpoint source = AI)
5 DI03	Switching the speed setpoint source potentiometer¹⁾ – n_2 The setpoint source determines the setting (potentiometer ¹⁾ or n_2). See chapter "Setpoint source" (→ 67).
6 n_2	Switching the speed setpoint source AI – n_2 The setpoint source determines the setting (AI or n_2). See chapter "Setpoint source" (→ 67).
7 I	Digital input DI03 does not have any function. The speed is specified on the control knob by setting the setpoint n_x from 0 – 100% of n_{max} .
8 P_N	
9 V_N	
10	

1) With the setting "potentiometer", the speed is specified using the control knob in level 0.

Set the function of the digital input DI03 using the control knob.

Saving values.

To save the value, give the control knob a longer press.

All LEDs briefly flash to confirm your entry.

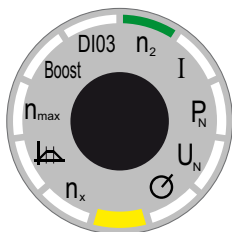
Exit function.

To switch to level 1, briefly press the control knob.

6.4.6 Function 6 fixed speed setpoint n_2

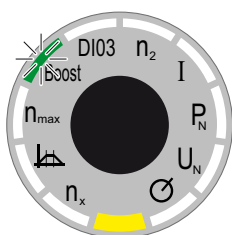
Select function.

Select function 6 fixed speed setpoint n_2 in level 1 and briefly press the control knob.



Set the value.

The flashing LED shows the fixed speed setpoint n_2 according to the following assignment:



LED	Fixed speed setpoint n_2 % n_{max}
1 n_x	10
2	20
3 n_{max}	30
4 Boost	40
5 DI03	50
6 n_2	60
7 I	70
8 P_N	80
9 V_N	90
10	100

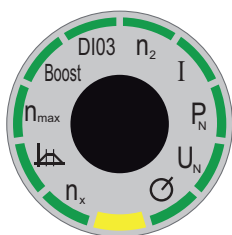
Set the fixed speed setpoint n_2 using the control knob.

The fixed speed setpoint n_2 can only be activated when value 5 or 6 in function 5 is set, see function 5.

Saving values.

To save the value, give the control knob a longer press.

All LEDs briefly flash to confirm your entry.



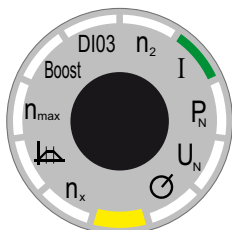
Exit function.

To switch to level 1, briefly press the control knob.

6.4.7 Function 7 inverter output current (only display)

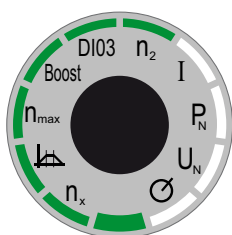
Select function.

Select function 7 inverter output current in level 1 and briefly press the control knob.



Display value.

The illuminated LEDs show the current output current of the MOVI4R-U® inverter as a "bargraph display":



LED	Inverter output current I	
	% I_N	
1 n_x	20	
1 – 2	40	
1 – 3 n_{max}	60	
1 – 4 Boost	80	
1 – 5 DI03	100	
1 – 6 n_2	120	
1 – 7 I	140	
1 – 8 P_N	160	
1 – 9 V_N	180	
1 – 10	200	

The display is scaled from 0 to 200% of the nominal motor current of the started up motor.

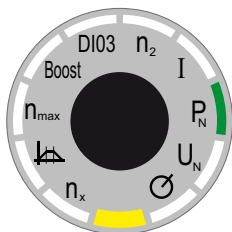
Exit function.

To switch to level 1, briefly press the control knob.

6.4.8 Function 8 nominal motor power

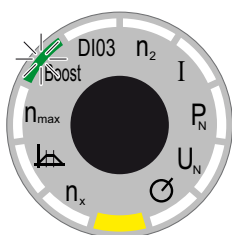
Select function.

Select function 8 nominal motor power in level 1 and briefly press the control knob.



Set the value.

The flashing LED shows the nominal motor power according to the following assignment:



LED	Nominal motor power P_N	
	Size 1 kW	Size 2 kW
1 n_x	0.09	0.25
2 (diagonal line)	0.12	0.37
3 n_{max}	0.18	0.55
4 Boost	0.25	0.75
5 DI03	0.37	1.1
6 n_2	0.55	1.5
7 I	0.75	2.2
8 P_N	1.1	3.0
9 V_N	1.5	4.0
10 (circle with cross)	2.2	5.5

Set the nominal motor power using the control knob.

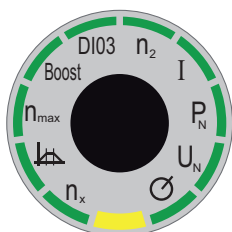
NOTICE! Overload of the connected motor possible due to incorrect setting of the nominal motor power. The default nominal motor power of size 1 is set to 0.25 kW and of size 2 is set to 1.5 kW. Damage to the motor.

Set the nominal motor power only according to the value specified on the nameplate of the connected motor. Operating the motor (e.g. 0.25 kW) with the inverter set to a higher nominal motor power (e.g. 0.75 kW) can destroy the motor.

Saving values.

To save the value, give the control knob a longer press.

All LEDs briefly flash to confirm your entry.



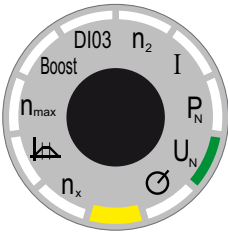
Exit function.

To switch to level 1, briefly press the control knob.

6.4.9 Function 9 nominal motor voltage

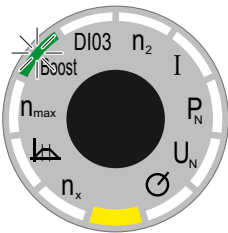
Select function.

Select function 9 nominal motor voltage in level 1 and briefly press the control knob.



Set the value.

The flashing LED 1 – 7 shows the nominal motor voltage according to the following assignment:



LED	Nominal motor voltage U_N Selection special function	
	Size 1 V	Size 2 V
1 n_x	230	
2 I	400	
3 n_{max}	400	
4 Boost	400	
5 DI03	400	
6 n_2	400	Special function 6 PWM frequency (PWM)
7 I	400	Special function 7 4-quadrant operation (4-Q)
8 P_N	Special function 8 delivery state (default)	
9 V_N	Special function 9 firmware power section (FW LT)	
10 $\emptyset$	Special function 10 firmware control plate (FW BE)	

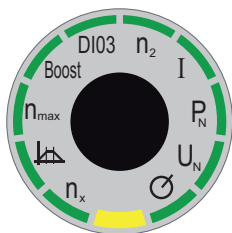
Set the nominal motor voltage using the control knob or select a special function.

NOTICE! Overload of the connected motor possible due to incorrect setting of the nominal motor voltage. The default nominal motor voltage is set to 230 V. Damage to the motor.

Set the nominal motor voltage only according to the value specified on the nameplate of the motor. Operating the motor (e.g. 230 V) with the inverter set to a higher nominal motor voltage (e.g. 400 V) can destroy the motor.

Saving values.

To save the value, give the control knob a longer press.
All LEDs briefly flash to confirm your entry.



Select special function.

Select a value between 8 and 10 (with size 1) or between 6 and 10 (with size 2) in function 9. To switch to the selected special function, give the control knob a longer press.

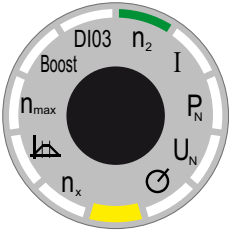
Exit function.

To switch to level 1, briefly press the control knob.

Special function 6 PWM frequency (PWM)

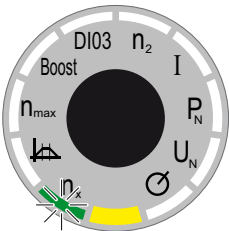
(Only with size 2)

Select special function.



Select the special function 6 PWM frequency in function 9 nominal motor voltage and give the control knob a longer press.

Set the value.



The flashing LED shows the PWM frequency of the motor according to the following assignment:

LED	PWM frequency kHz
1 n _x	4
2 – 10  – 	16

Set the PWM frequency of the motor using the control knob.

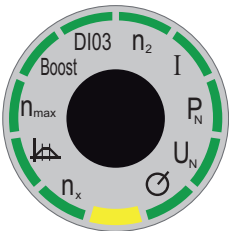
Note the following:

- The nominal output of the inverter that is specified in the technical data applies to the pulse width modulation frequency (PWM frequency) of 4 kHz.
- The PWM frequency 16 kHz is not possible in every operating point and depends on the speed (stator frequency f_s) and the thermal load (heat sink temperature) of the inverter.
- An essential factor for operation with a PWM frequency of 16 kHz is the stator frequency f_s . A 4-pole motor with a nominal motor voltage of 400 V and a rated motor frequency of 50 Hz in a 400 V supply system can only be operated with a PWM frequency of 16 kHz from a speed of 375 min⁻¹.
- For other motor/network voltage combinations, the required stator frequency f_s from which a PWM frequency of 16 kHz is possible should be calculated using the following formula:

$$f_s = U_{line} / U_N \times f_N / 4$$

- f_s Stator frequency
- V_{line} Line voltage
- V_N Nominal motor voltage
- f_N Nominal motor frequency

Saving values.



To save the value, give the control knob a longer press.

All LEDs briefly flash to confirm your entry.

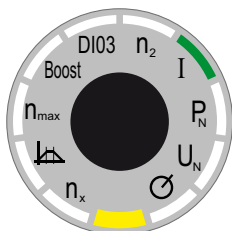
Exit special function.

To switch to function 9 nominal motor voltage (level 2), briefly press the control knob.

Special function 7 4-quadrant operation (4-Q)**(Only with size 2)**

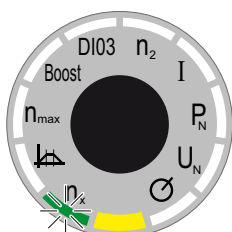
Select special function.

Select the special function 7 4-quadrant operation in function 9 nominal motor voltage and give the control knob a longer press.



Set the value.

The flashing LED shows if the 4-quadrant operation is activated:



LED		4-quadrant operation
1	n_x	inactive (2-quadrant operation)
2 – 10	 – 	active (4-quadrant operation)

Set the 4-quadrant operation or the 2-quadrant operation operating mode using the control knob.

- 2-quadrant operation:

Applications **without** generative operating points can be operated without braking resistor.

Set the special function 7 to "2-quadrant operation" (LED 1).

- 4-quadrant operation:

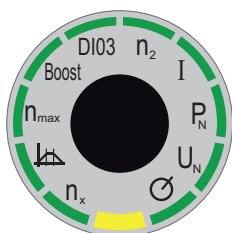
Applications **with** generative operating points must be operated with braking resistor.

Set the special function 7 to "4-quadrant operation" (LED 2 – 10).

Saving values.

To save the value, give the control knob a longer press.

All LEDs briefly flash to confirm your entry.



Exit special function.

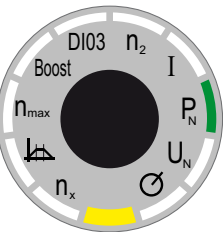
To switch to function 9 nominal motor voltage (level 2), briefly press the control knob.

Special function 8 delivery state (default)

Prerequisite With this special function, you can reset the operating parameters of the MOVI4R-U® inverter to the delivery state.

This is only possible if the drive is **not** enabled.

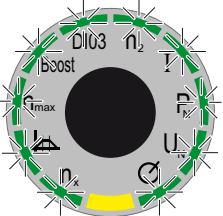
Select special function. Select the special function 8 delivery state in function 9 nominal motor voltage and give the control knob a longer press.



All LEDs flash simultaneously. Now, the drive can no longer be enabled.

To switch back to function 9 nominal motor voltage, briefly press the control knob.

Delivery state To reset the inverter back to delivery state, press the control knob until all LEDs briefly light up.



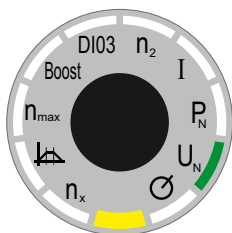
All settable functions will be reset to their default value.

Exit special function. The control plate then automatically switches to function 9 nominal motor voltage.

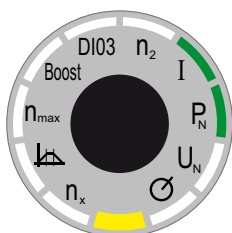
Special function 9 firmware power section (FW LT)

Select special function.

Select the special function 9 firmware power section in function 9 nominal motor voltage and give the control knob a longer press.



Display firmware power section



In special function 9 firmware power section, the illuminated LEDs show the firmware release number of the power section in binary format, see the table to the right.

LED		Significance	
1	n_x	2^9	512
2		2^8	256
3	n_{max}	2^7	128
4	Boost	2^6	64
5	DI03	2^5	32
6	n_2	2^4	16
7	I	2^3	8
8	P_N	2^2	4
9	V_N	2^1	2
10		2^0	1

Example: LEDs I and P_N light up.

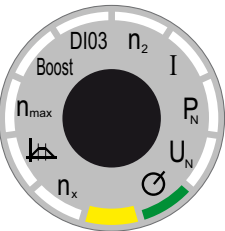
Release No. = $2^3 + 2^2 = 8 + 4 = 12$

Exit special function.

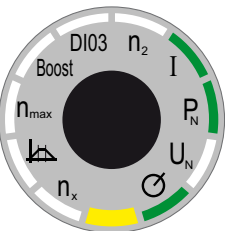
To switch to function 9 nominal motor voltage (level 2), briefly press the control knob.

Special function 10 firmware control plate (FW BE)

Select special function.
 Select the special function 10 firmware control plate in function 9 nominal motor voltage and give the control knob a longer press.



Display firmware power section



In special function 10 firmware control plate, the illuminated LEDs show the firm-ware release number of the control plate in binary format; see the table to the right.

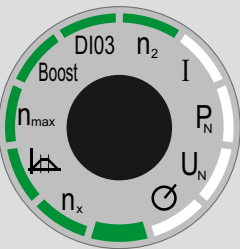
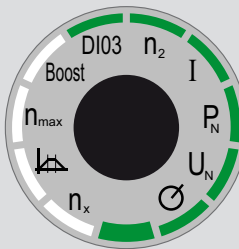
LED		Significance	
1	n_x	2^9	512
2		2^8	256
3	n_{max}	2^7	128
4	Boost	2^6	64
5	DI03	2^5	32
6	n_2	2^4	16
7	I	2^3	8
8	P_N	2^2	4
9	V_N	2^1	2
10		2^0	1

Example: LEDs I, P_N and V_N light up.
Release No. = $2^3 + 2^2 + 2^0 = 8 + 4 + 1 = 13$

Exit special func- tion.
 To switch to function 9 nominal motor voltage (level 2), briefly press the control knob.

Display of the speed

The illuminated LEDs show the current direction of rotation and the speed setpoint of the motor as a "bargraph display", according to the following assignment.

CW rotation		CCW rotation	
			
LED	Speed setpoint manual mode 	LED	Speed setpoint manual mode 
	% n_{max}		% n_{max}
1 n_x	10	10 – 1 n_x	100
1 – 2 	20	10 – 2 	90
1 – 3 n_{max}	30	10 – 3 n_{max}	80
1 – 4 Boost	40	10 – 4 Boost	70
1 – 5 DI03	50	10 – 5 DI03	60
1 – 6 n_2	60	10 – 6 n_2	50
1 – 7 I	70	10 – 7 I	40
1 – 8 P_N	80	10 – 8 P_N	30
1 – 9 V_N	90	10 – 9 V_N	20
1 – 10 	100	10 	10

Deactivating manual mode



⚠ WARNING

Risk of crushing if the drive starts up unintentionally. When manual mode is deactivated, the binary signals at the digital inputs are active. When manual mode is deactivated, the drive can start up unintentionally if it has been enabled by the binary signals.

Severe or fatal injuries.

- Before deactivating manual mode, set the binary signals in such way that the drive is not enabled.
- Change the binary signals again only after deactivating manual mode.

To deactivate manual mode and to switch to level 1, briefly press the control knob.

6.5 Startup procedure

Proceed as follows to start up the MOVI4R-U® inverter:

6.5.1 Setting parameters

NOTICE

Overload of the motor due to incorrect setting of the nominal motor power or the nominal motor voltage.

Damage to the motor.

- Observe the values specified on the motor nameplate when setting the nominal motor power and the nominal motor voltage.

- Check the connection of the MOVI4R-U® inverter.
⇒ See chapter "Electrical installation".
- NOTICE!** Loss of guaranteed degree of protection if the inverter is not sealed correctly. Inverter damage.
Make sure the MOVI4R-U® inverter is sealed correctly.
- Set digital input DI01 to 0 V.
- Switch on the line voltage.
⇒ If no fault is present, the status LED should light up yellow.
⇒ If there is a fault present, the status LED lights up red, see chapter "Fault list MOVI4R-U®".
- Set the following values in the functions:

	Acceleration/deceleration	(10 – 12000 min ⁻¹ s ⁻¹)
n _{max}	Maximum speed	(50 – 3000 min ⁻¹)
Boost	Voltage offset V/f characteristic curve	(0 – 50 V)
P _N	Nominal motor power	(according to motor nameplate)
V _N	Nominal motor voltage	(according to motor nameplate)

The remaining procedure for startup depends on the required operating mode.

6.5.2 Startup in different operating modes

After presetting parameters, perform the following steps:

Manual mode



⚠ WARNING

Risk of crushing if the drive starts up unintentionally. When manual mode is deactivated, the binary signals at the digital inputs are active. When manual mode is deactivated, the drive can start up unintentionally if it has been enabled by the binary signals.

Severe or fatal injuries.

- Before deactivating manual mode, set the binary signals in such way that the drive is not enabled.
- To deactivate manual mode and to switch to level 1, briefly press the control knob.

1. Activate manual mode in function 10.
2. Enable the motor by setting the motor's direction of rotation and the speed setpoint using the control knob.

You can now control the drive in function 10, see the "Function 10 manual mode" chapter.

Binary controller

1. In function 5, select the setpoint sources (n_x , n_2 , AI) that digital input DI03 should switch between, see the "Control / setpoint source" chapter.
2. Select the desired speed setpoint.
 - ⇒ When selecting setpoint source n_x , set speed setpoint n_x using function 1.
 - ⇒ When selecting setpoint source n_2 , set fixed speed setpoint n_2 using function 6.
 - ⇒ When selecting setpoint source AI, set the speed setpoint by setting the voltage on analog input AI.
3. Select the setpoint source (n_x , n_2 , AI) by setting digital input DI03 = 0 V or 24 V (see the following chapter).
4. Select the direction of rotation by setting digital input DI02 = 0 V (clockwise rotation) or 24 V (counterclockwise rotation).
5. Enable the drive by setting the digital input DI01 = 24 V.

6.6 Control/setpoint source

6.6.1 Control signal source

The following table shows the control signal source and enabled direction of rotation of the MOVI4R-U® inverter depending on the settings on the control plate and the terminal signal levels:

Control signal source	Enable	Terminal signal level		
		DI01 Enable	DI02 Direction of rotation	Supply system L1 – L3
Manual mode	CCW rotation	X	X	On
	CW rotation			
Binary signals	No enable	0 V	X	On
	CCW rotation	+24 V	+24 V	
	CW rotation	+24 V	0 V	

6.6.2 Setpoint source

The speed setpoint of the MOVI4R-U® inverter depends on the following factors:

- Maximum speed $n_{\max}$
- Manual mode activated/inactivated by control knob
- Setting in function 5 “Terminal assignment DI03/setpoint source”
- Speed setpoint n_x , fixed speed setpoint n_2 or analog input AI

The following table shows the setting of the speed setpoint:

Setting		Terminal signal level DI03	Speed setpoint		
Manual mode	Function 5 (DI03)		Scaling by		Setpoint % $n_{\max}$
Active	X	X	Control knob (clockwise rotation)	⌚ = 1 – 10	0 – 100%
			Control knob (counterclockwise rotation)	⌚ = 10 – 1	0 – 100%

Setting		Terminal signal level DI03	Speed setpoint		
Manual mode	Function 5 (DI03)		Scaling by		Setpoint % n_{max}
Inactive	1, 3, 7 – 10	X	Setpoint ¹⁾	$n_x = 0 - 10$	0 – 100%
	2	0 V	Setpoint ¹⁾	$n_x = 0 - 10$	0 – 100%
		+24 V	Analog input	AI = 0 – 10 V	0 – 100%
	4	X	Analog input	AI = 0 – 10 V	0 – 100%
	5	0 V	Setpoint ¹⁾	$n_x = 0 - 10$	0 – 100%
		+24 V	Fixed setpoint ¹⁾	$n_2 = 1 - 10$	10 – 100%
	6	0 V	Analog input	AI = 0 – 10 V	0 – 100%
		+24 V	Fixed setpoint ¹⁾	$n_2 = 1 - 10$	10 – 100%

1) Setting on the control knob

X = any

6.7 87-Hz operation

MOVI4R-U® units are also designed for 87-Hz operation.

Set the following values for the 87-Hz operation:

- Set function 9 nominal motor voltage to 230 V (LED 1 n_x) for MOVI4R-U® units with a connection voltage of 3 x 400 V.
- Set a value higher than $\sqrt{3}$ * nominal motor speed in function 3 maximum speed.

With speed $\geq \sqrt{3}$ * nominal motor speed, the motor operates in the field weakening range. The full motor torque is **not** available.

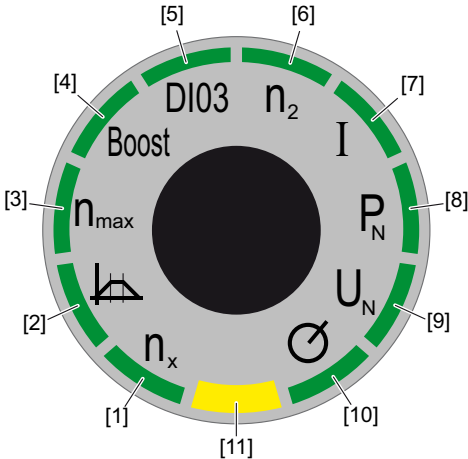
7

Operation

7.1

Operating display (LEDs)

The following figure shows the LEDs of the MOVI4R-U® inverter:



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[1] – [10]

LED 1 – 10

[11]

Status LED

7.1.1

LED 1 – 10

LEDs 1 – 10 are used to visualize the functions, setpoints, actual values and parameters. It is for this reason that the LED display depends on the current status of the MOVI4R-U® inverter.

LED 1 – 10	Operating status MOVI4R-U® inverter	Response display
Lights up (1 LED)	Level 1	No. of function
Lights up (bargraph display)	Setting a setpoint, display of an actual value	Setpoint/actual value
Flashing (400 ms on) (100 ms off)	Setting a parameter	Parameter value
Flashing (100 ms on) (400 ms off)	A fault occurred. See chapter "Fault list MOVI4R-U®".	No. of fault code

Refer to the “Functions” chapter for more information on the meaning of the LEDs.

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7.1.2 Status LED

The status LED shows the current status of the MOVI4R-U® inverter:

Status LED	Meaning
Off	No voltage supply.
Yellow	MOVI4R-U® inverter is ready for operation.
Green	MOVI4R-U® inverter is enabled.
Red	A fault has occurred. The inverter is not ready for operation. See chapter "Fault list".

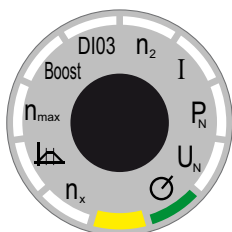
7.2 Manual mode

In manual mode, you control inverter enable, the direction of rotation, and speed using only the control knob.

Connect the voltage supply.

Select function 10 manual mode in level 1 and briefly press the control knob.

Activating
manual mode.

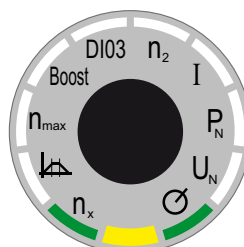


Manual mode

Manual mode is now active.

LEDs 1 and 10 are lit up.

The drive is not enabled.



Increase
speed.

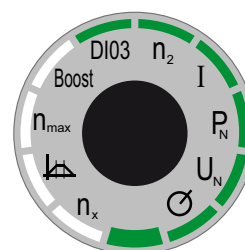
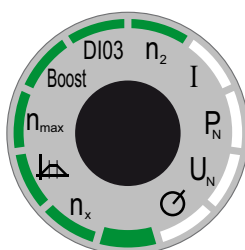
When you turn the control knob to the right, you enable **clockwise rotation** and increase the speed setpoint to n_{max} .

When you turn the control knob to the left, you enable **counterclockwise rotation** and increase the speed setpoint to n_{max} .

Decrease
speed.

When you then turn the control knob to the left again, you decrease the speed setpoint to 0.

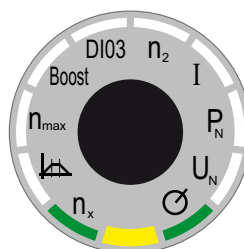
When you then turn the control knob to the right again, you decrease the speed setpoint to 0.



Stop drive.

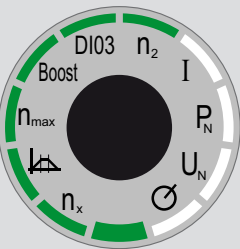
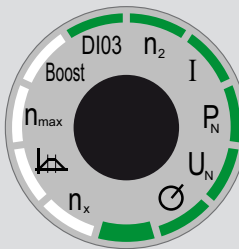
You disable the drive when you set the speed setpoint to 0.

LEDs 1 and 10 are lit up.



Display of
the speed

The illuminated LEDs show the current direction of rotation and the speed setpoint of the motor as a "bargraph display", according to the following assignment.

CW rotation		CCW rotation	
			
LED	Speed setpoint manual mode 	LED	Speed setpoint manual mode 
	% n_{max}		% n_{max}
1 n_x	10	10 – 1 n_x	100
1 – 2 	20	10 – 2 	90
1 – 3 n_{max}	30	10 – 3 n_{max}	80
1 – 4 Boost	40	10 – 4 Boost	70
1 – 5 DI03	50	10 – 5 DI03	60
1 – 6 n_2	60	10 – 6 n_2	50
1 – 7 I	70	10 – 7 I	40
1 – 8 P_N	80	10 – 8 P_N	30
1 – 9 V_N	90	10 – 9 V_N	20
1 – 10 	100	10 	10

Deactivating
manual mode



⚠ WARNING

Risk of crushing if the drive starts up unintentionally. When manual mode is deactivated, the binary signals at the digital inputs are active. When manual mode is deactivated, the drive can start up unintentionally if it has been enabled by the binary signals.

Severe or fatal injuries.

- Before deactivating manual mode, set the binary signals in such way that the drive is not enabled.
- Change the binary signals again only after deactivating manual mode.

To deactivate manual mode and to switch to level 1, briefly press the control knob.

8 Service

8.1 MOVI4R-U® fault list

The status LED lights up red when a fault occurs on the MOVI4R-U® drive. In level 1, one of the 10 LEDs (100 ms on, 400 ms off) also flashes. The flashing LED shows the fault according to the following fault list:

Status LED		LED	Code	Fault Meaning	Measure
lights up red	1	n_x	00	Reserved	• Contact the SEW-EURODRIVE Service.
	2		45	Initialization power section	• Reset fault. • If this problem reoccurs repeatedly, contact SEW-EURODRIVE service.
	3	n_{max}	11	Overtemperature power section	• Check inverter cooling. • Provide additional space or cooling, if necessary. • Retrofit a fan.
	4	Boost	50	Supply voltage power section	• Hardware defect → Replace power section.
	5	DI03	06	Line phase failure	• Check the power supply cables for phase failure.
	6	n_2	43	Communication with power section	• Check the connection cable between the control plate and the power section. • When this connection has been reestablished, MOVI4R-U® automatically resets the fault.
	7	I	01	Overcurrent at inverter output to the motor	• Check motor and motor cable for phase short circuits or ground faults. • Check load for blocking, stalling, or shock loads. • Ensure that the “Nominal motor voltage” and “Nominal motor power” parameters are set according to the motor nameplate. • Reduce the acceleration/deceleration parameters.
	8	P_N	84	UL motor protection (thermal overload)	• Reduce the load on the motor. • Ensure that the “Nominal motor power” parameter is set according to the motor nameplate. • Reduce the “Boost” parameter at a very low speed.
	9	V_N	07	DC link overvoltage	• Check whether the supply voltage is too high. • If the inverter switches off during deceleration, reduce the acceleration/deceleration parameters.
	10		—	Unknown fault code	• Contact the SEW-EURODRIVE Service.

8.1.1 Error reset

Remedy the cause of the fault. Then reset the fault by giving the control knob a longer press (>1 s). You can also reset the fault with digital input DI03 (see chapter “Function 5 ...”). In terminal mode, you can reset the fault only when digital input DI01 = 0 V (no enable).

8.2 Spare parts

Size 1

The following spare parts are available for the MOVI4R-U® inverter in size 1:

Spare part	Part number
Housing for design without fan	18151213
Housing for design with fan	18155529
Power section AC 1 x 200 – 240 V	28213556
Power section AC 3 x 200 – 240 V	28213688
Power section AC 3 x 380 – 500 V	28213661
Flat cable between power section and control plate	19104936
MUOP11A control plate	18258328
MUPF11A Fan	28208668
Cable seal for cables with Ø = 7 – 10 mm / 8 – 11.5 mm	18151221
Shield plate	18151248
Screw (for shield plate)	00130591
EMC toroidal core	19103360

Size 2

The following spare parts are available for the MOVI4R-U® inverter in size 2:

Spare part	Part number
Housing for design with fan	18190332
Power section AC 3 x 380 – 500 V	28237668
Flat cable between power section and control plate	19104936
Control plate MUOP11B	28237706
Fan MUPF11B	28237692
Cable seal for cables with Ø = 8 – 11.5 mm	18190170
Shield plate	18190189
Screw (for shield plate)	00130591
EMC toroidal core	19103360

8.3 Device replacement

This chapter describes the device replacement and retrofitting of the following components:

- Power section
- Control plate
- Fans

You can reuse the housing.

INFORMATION



Refer to the operating conditions in the "Technical data" chapter.

8.3.1 Power section unit replacement



▲ WARNING

Electric shock from capacitors that have not been fully discharged.

Severe or fatal injuries.

- Disconnect the inverter from the power. Observe the minimum switch-off time after disconnection from the supply system:
 - **1 minute**

Power section removal

Remove the power section from the housing as follows:

1. **If required:**

To make removal easier, undo the retaining screws and remove the MOVI4R-U® inverter from the installation location.

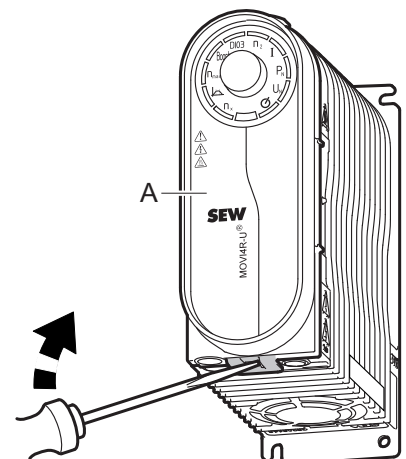
2. Remove the instruction sign from the control plate.

3. Unlock the lower mounting lug on the control plate using a screwdriver (blade width max. 4.5 mm) and remove the control plate [A] from the housing.

NOTICE The lower mounting lug can become damaged by being bent too far.

If the lower mounting lug is bent too far (plastic deformation), the mounting lug will no longer latch in when closing the housing, making the control plate defective.

- Unlock the mounting lug with a screwdriver only enough to remove the control plate.

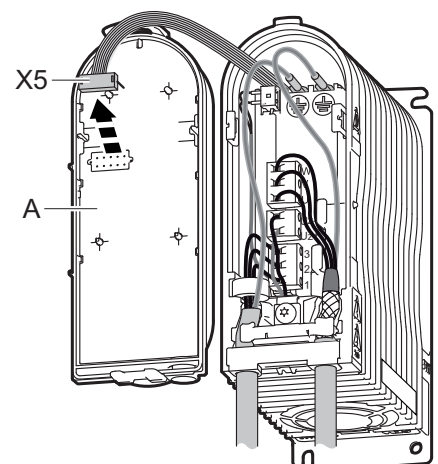


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4. Unplug plug connector X5 on the ribbon cable from the control plate [A].

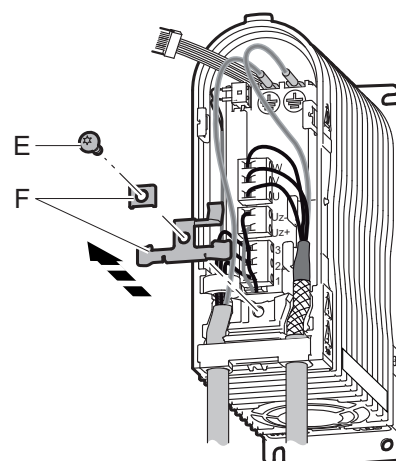
NOTICE Damage to the ribbon cable due to tensile load.

- Do not pull on the ribbon cable, but rather on the plug connector.



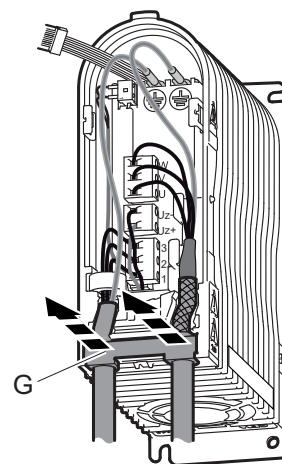
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5. Undo the shielding screw [E] using a hexalobular screwdriver (Torx) T25 and remove the shield plate [F].

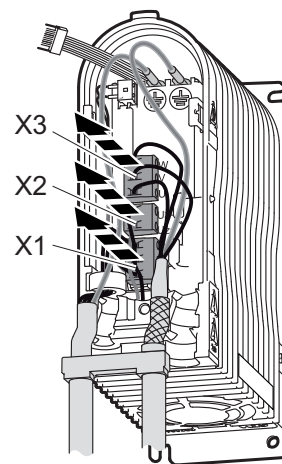


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6. Remove the cable seal [G] together with the power supply cable and the motor cable from the housing.



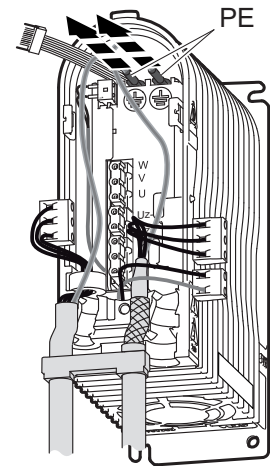
7. Remove the separable terminals of the following cables from the power section:
 - X3: Motor cable (U, V, W)
 - X2: Fan cable (Uz+, Uz-) with size 1
 - X2: Braking resistor cable (R+, R-) with size 2
 - X1: Power supply cable (L1 – L3)



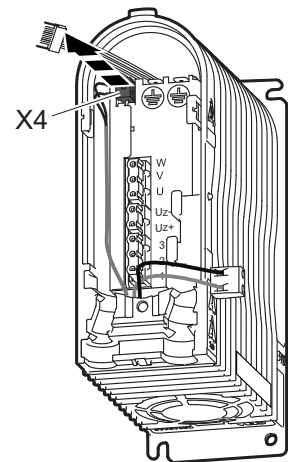
8. Remove both grounding cables of the PE connections ⊕ from the power section.

NOTICE Damage to the grounding cables due to tensile loads on the cores.

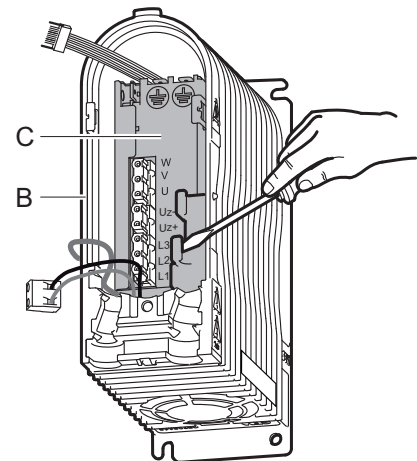
- Do not pull on the cores, but rather on the cable lugs.



9. Remove the separable fan terminal X4 (control) from the power section.

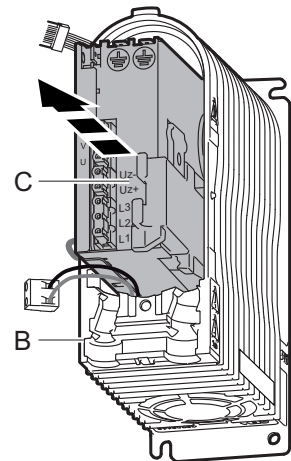


10. Carefully lever the power section [C] out of the housing [B] using a screwdriver according to the figure to the right.

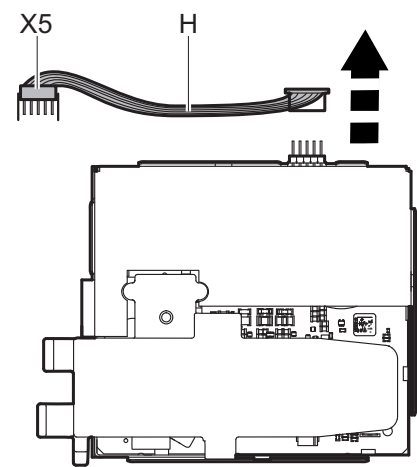


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11. Remove the power section [C] from the housing [B].



12. Remove the plug connector of the ribbon cable [H] from the power section.



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Power section installation

Compare the data on the nameplate of the previous power section with the data on the nameplate of the new power section. Only replace the power section with a power section with the same part number.

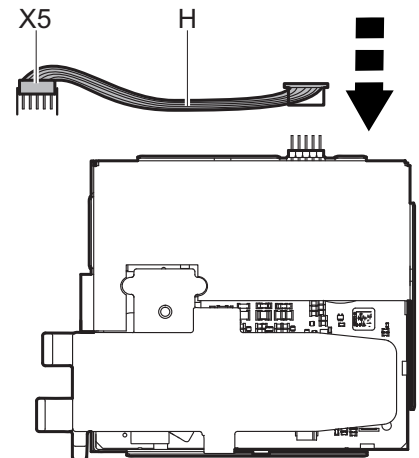
Install the power section in the housing as follows:

1. **NOTICE** Risk of short circuit due to loose foreign objects in the housing.

Inverter damage.

- Ensure that no loose foreign objects (e.g. metal chips, nuts, screws, conductors) remain in the housing.

2. Plug the plug connector of the ribbon cable [H] onto the power section.

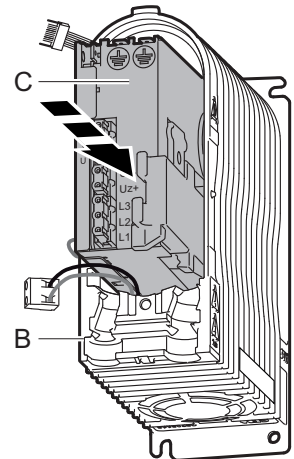


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3. Slide the power section [C] into the housing [B] and carefully press the power section on.

NOTICE Damage to the fan cable or the ribbon cable due to crushing.

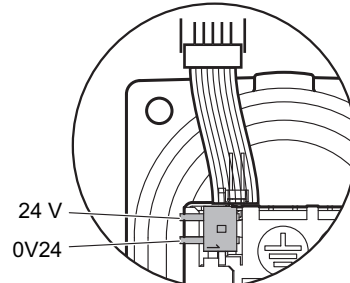
- Make sure you do not jam both fan cables and the ribbon cable.



4. If the power supply cable, the motor cable, or the cable seal are damaged, replace them as follows:
 - Undo the screws for the separable line and motor terminals, and pull the cores out of the terminals.
 - Pull the cable out of the cable seal.
 - If necessary, remove the jacket insulation from the cables at the same height as the shield plate. In order to ensure a shield connection over a large area, the cable shield there must be blank over a width of about 1.5 cm.
 - Insert correct power supply and motor cables in the correct cable seal.
 - Connect the cores to the separable line and motor terminals. In doing so, observe the terminal assignment, see the "Electrical connections" chapter.

5. Plug the separable terminals/cable lugs of the following components onto the power section:

- PE core, motor ⊕
- PE core, supply system ⊕
- X4 fan cable control



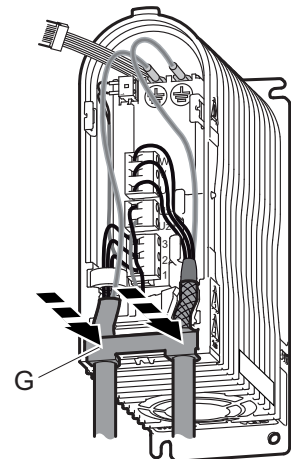
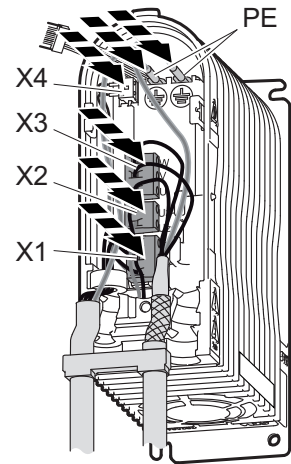
- X3 motor cable (U, V, W)
- X2: Fan cable (Uz+, Uz-) with size 1
- X2: Braking resistor cable (R+, R-) with size 2
- X1 power supply cable (L1, L2, L3)

6. Push the cable seal [G] together with the power supply cable and the motor cable into the housing.

NOTICE Faulty shield connection.

EMC problems.

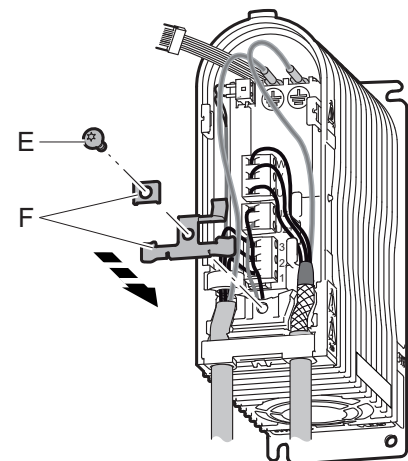
- Ensure that the sections with blank cable shields are positioned at the same height as the shield plate, see figure on the right.



7. Place the shield plate and the grounding screw [F] on the motor cable and power supply cable, and screw the shield plate using the shielding screw [E] (tightening torque: 2.0 - 3.5 Nm) onto the housing.

NOTICE Damage to cables/cores due to crushing.

- Make sure that you do not jam any other cables/cores under the shield plate.

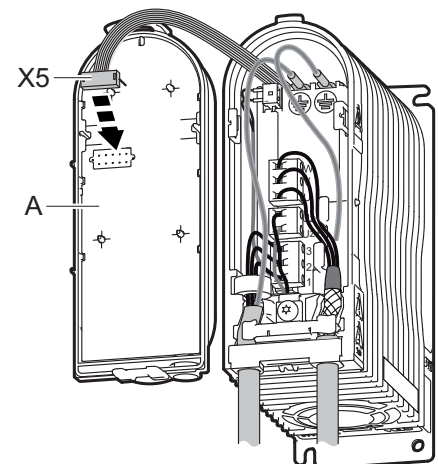


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8. Connect plug connector X5 of the ribbon cable to the control plate [A].
9. **NOTICE** Loss of guaranteed degree of protection due to missing or faulty sealing.

Inverter damage.

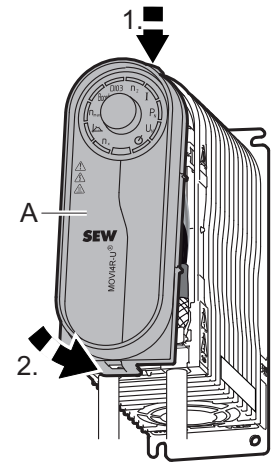
- Ensure that the sealing on the edge of the control plate is complete and not damaged (no notches, no deep pressure marks).



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10. Mount the lug of the control plate in the fastening slot at the top of the housing and attach the control plate [A] to the housing.

Make sure that the lower mounting lug engages properly.



11. Insert the instruction sign from the front into the holding fixture on the side of the control plate.
12. Install the MOVI4R-U® inverter at the installation location.
13. Supply voltage to the MOVI4R-U® inverter.
14. Check whether the MOVI4R-U® inverter is functioning properly.

8.3.2 Control plate device replacement



⚠ WARNING

Electric shock from capacitors that have not been fully discharged.

Severe or fatal injuries.

- Disconnect the inverter from the power. Observe the minimum switch-off time after disconnection from the supply system:
– **1 minute**

Removing the control plate

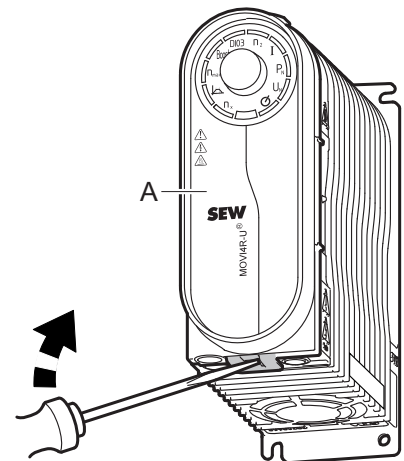
Remove the control plate from the housing as follows:

1. Remove the instruction sign from the control plate.
2. Unlock the lower mounting lug on the control plate using a screwdriver (blade width max. 4.5 mm) and remove the control plate [A] from the housing.

NOTICE The lower mounting lug can become damaged by being bent too far.

If the lower mounting lug is bent too far (plastic deformation), the mounting lug will no longer latch in correctly when closing the housing, making the control plate defective.

- Unlock the mounting lug with a screwdriver only enough to remove the control plate.

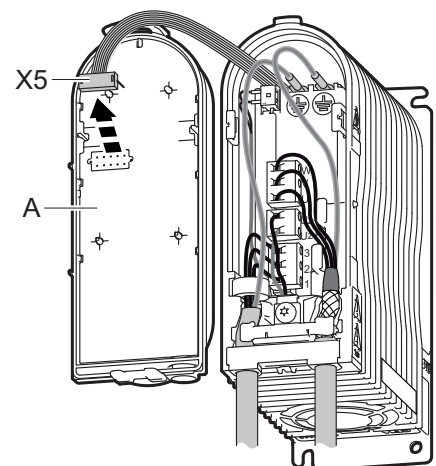


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3. Unplug plug connector X5 on the ribbon cable from the control plate [A].

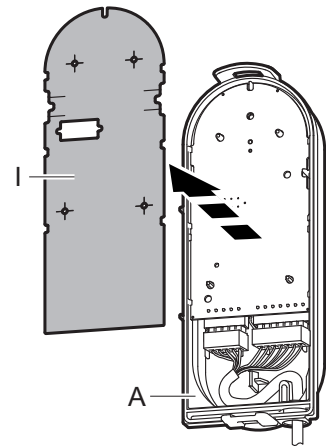
NOTICE Damage to the ribbon cable due to tensile load.

- Do not pull on the ribbon cable, but rather on the plug connector.

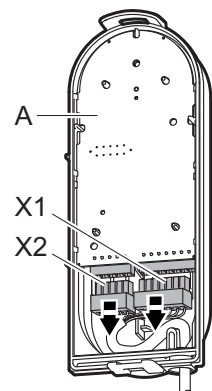


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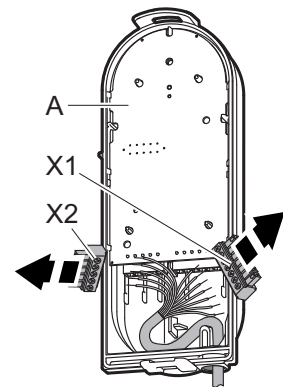
4. Remove the insulating sheet [I] from the control plate [A].



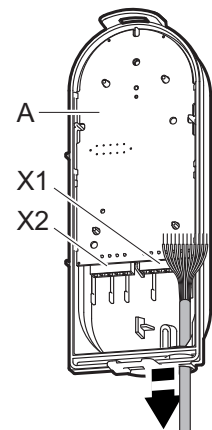
5. Remove both separable terminals X1 and X2 from the control plate [A].



6. Undo the screws for the terminals X1 and X2, and pull all the cores out of the terminals.



7. Remove the control cable from the control plate [A].



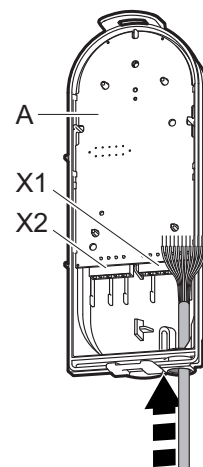
Installing the control plate

Compare the data on the inner nameplate of the old control plate with the data on the inner nameplate of the new control plate.

Only replace the control plate with a control plate with the same part number.

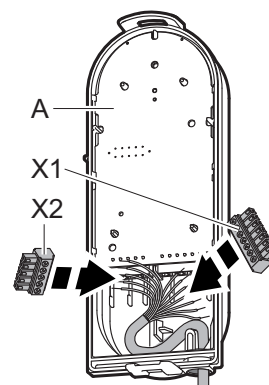
Install the control plate on the housing as follows:

1. Insert the control cable into the cable seal on the control plate [A] from below.

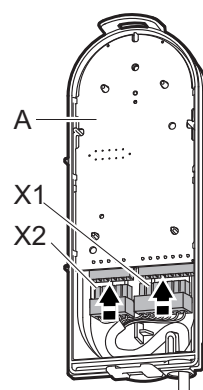


2. Connect the control cable cores to the separable terminals X1 and X2.

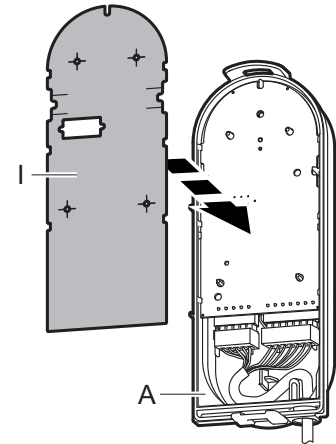
In doing so, observe the assignment of terminals X1 and X2 according to the "Electrical connections" chapter.



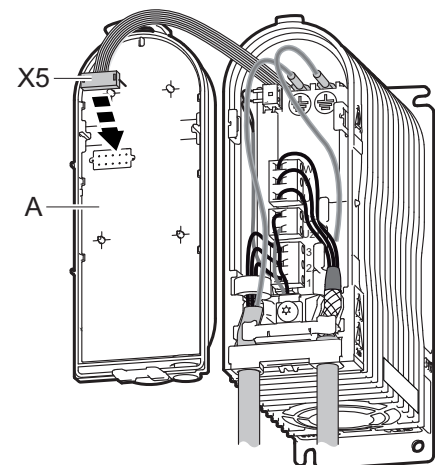
3. Plug both separable terminals X1 and X2 into the control plate [A].



4. **⚠ WARNING!** Danger of electric shock. If the insulating sheet is not installed, protective separation of the MOVI4R-U® inverter cannot be ensured.
Severe or fatal injuries.
- Plug the insulating sheet [I] onto the control plate [A] according to the figure to the right.

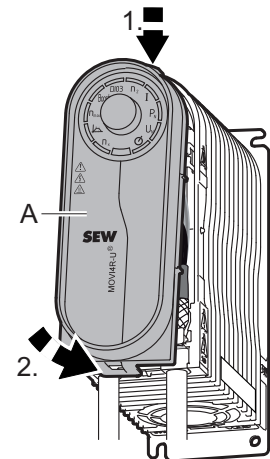


5. Connect plug connector X5 of the ribbon cable to the control plate [A].
6. **NOTICE** Loss of guaranteed degree of protection due to missing or faulty sealing.
Inverter damage.
- Ensure that the sealing on the edge of the control plate is complete and not damaged (no notches, no deep pressure marks).



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7. Mount the lug of the control plate in the fastening slot at the top of the housing and attach the control plate [A] to the housing.
Make sure that the lower mounting lug engages properly.



8. Insert the instruction sign into the holding fixture on the side of the control plate.
9. Install the MOVI4R-U® inverter at the installation location.
10. Supply voltage to the MOVI4R-U® inverter.
11. Check whether the MOVI4R-U® inverter is functioning properly.

8.3.3 Device replacement/retrofitting fan



⚠ WARNING

Electric shock from capacitors that have not been fully discharged.

Severe or fatal injuries.

- Disconnect the inverter from the power. Observe the minimum switch-off time after disconnection from the supply system:
 - **1 minute**

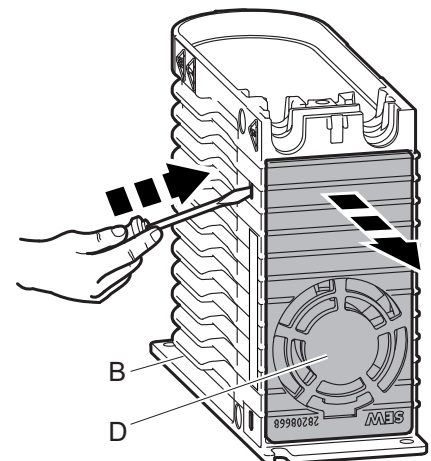
If high operating temperatures occur frequently on a MOVI4R-U® inverter that is not equipped with a fan (e.g. fault, power section overtemperature), you can retrofit the inverter with the MUPF11. fan:

Fan removal

Remove the fan from the housing as follows:

1. Remove the power section from the housing according to the “Power section removal” chapter.
2. Unlock all fan detents by pushing a screwdriver (blade width max. 4.5 mm) into each lateral opening on the bottom of the housing.

While doing to, gently release the fan [D] from the housing [B].



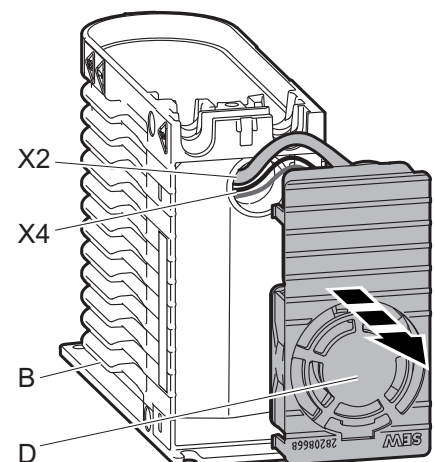
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3. Carefully pull the fan [D] from below out of the housing [B].

While doing so, first remove the long fan cable (control) X4 and then the short fan cable (supply) X2 from inside the housing.

NOTICE Fan does not function due to incorrect connection of the fan cable conductors.

- Do **not** undo the fan cable cores from the terminal.



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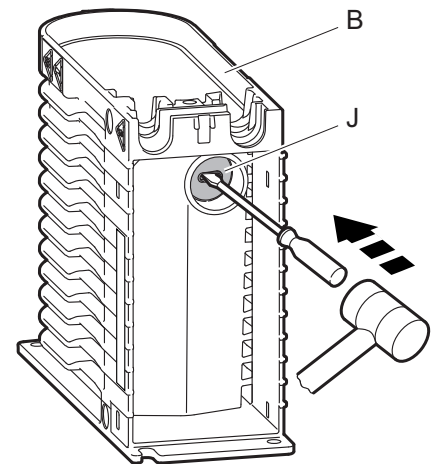
Fan mounting

Install the fan in the housing as follows:

1. If there is no opening between the fan space and the inside of the housing [B], open up the knock-out [J] in the housing using a hammer and a screwdriver (blade width min. 6 mm), see figure to the right.

NOTICE Damage to the fan cable due to sharp break lines.

- Deburr the break line that has been generated by opening up the knock-out.



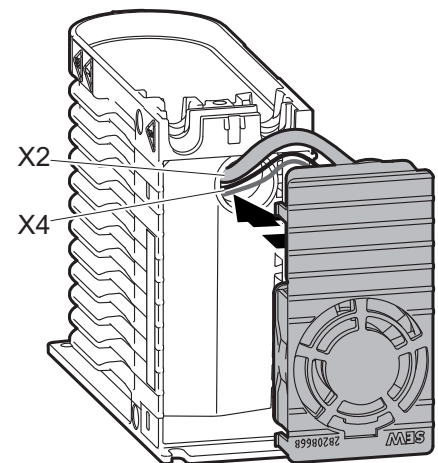
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2. **NOTICE** Risk of short circuit due to loose foreign objects in the housing.

Inverter damage.

- Ensure that no loose foreign objects (e.g. metal chips, nuts, screws, conductors) remain in the housing.

3. First route the short fan cable (supply) X4 and then the long fan cable (control) X2 from below through the opening into the housing.

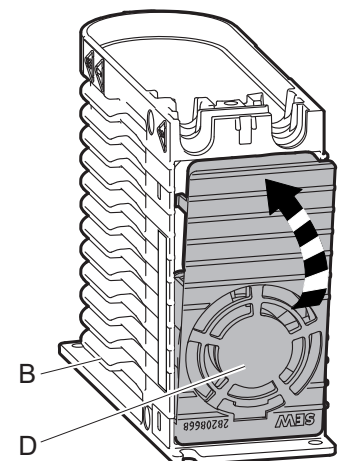


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4. Mount the fan [D] from below onto the housing [B] and carefully push it in.

NOTICE Insufficient fastening of the fan.

- Ensure that all fan detents latch in properly.



5. Install the power section and the control plate on the housing according to the chapter "Power section installation".

8.4 Inspection/maintenance

The MOVI4R-U® inverter is maintenance-free. SEW-EURODRIVE does not prescribe any inspection or maintenance work for the MOVI4R-U® inverter.

Exception: For extended storage, refer to the instructions in the "Service" > "Extended storage" chapter.

8.4.1 Repairs

Only SEW-EURODRIVE is authorized to carry out repairs.

8.5 Shutdown

To shut down the drive, de-energize the MOVI4R-U® inverter using appropriate measures.



▲ WARNING

Electric shock from capacitors that have not been fully discharged.

Severe or fatal injuries.

- Disconnect the inverter from the power. Observe the minimum switch-off time after disconnection from the supply system:
 - **1 minute**

8.6 Storage

Observe the following instructions when shutting down or storing the MOVI4R-U® inverter:

- If you shut down and store the MOVI4R-U® inverter, you must close open cable bushings.
- Make sure that the unit is not subject to mechanical impact during storage.

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

8.7 Extended storage

MOVI4R-U® is equipped with capacitors which are subject to aging effects when de-energized.

The capacity and impedance of the built-in capacitors of MOVI4R-U® do not change significantly during extended storage. However, the leakage current of the capacitors slowly increases.

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.

8.8 Disposal

You can reuse the aluminum housing.

If necessary, you only need to replace the power section, the control plate and/or the fan (see previous chapters).

The power section, the control plate and the fan consist of:

- Plastic
- Electronic components

Dispose of all these components in accordance with applicable regulations.

INFORMATION



The MOVI4R-U® is a product that complies with SEW-EURODRIVE's sustainability concept. A process for the return of the product is in preparation.

9 Technical data

9.1 Conformity

9.1.1 CE marking

- Low voltage directive:

The MOVI4R-U® drive system fulfills the regulations of the low voltage directive 2014/35/EU.

- Electromagnetic compatibility (EMC):

MOVI4R-U® units are designed for use as components for installation in machinery and systems. They comply with the EMC product standard EN 61800-3 "Variable-speed electrical drives". Provided that the installation notes are followed, the requirements for CE marking of the entire machine/system equipped with these units on the basis of the EMC directive 2014/30/EU are met. For detailed information on EMC compliant installation, refer to the documentation "Electromagnetic Compatibility in Drive Engineering" from SEW-EURODRIVE.



The CE mark on the nameplate represents conformity with the low voltage directive 2014/35/EU and the EMC directive 2014/30/EU.

9.1.2 UL approval



UL and cUL approval has been granted for the MOVI4R-U® device series.

9.1.3 RCM approval (in preparation)



RCM approval for the MOVI4R-U® inverter series is in preparation.

RCM certifies conformity with the ACMA (Australia Communication and Media Authority).

9.1.4 EAC marking (in preparation)



EAC marking for the MOVI4R-U® inverter series is in preparation.

The EAC marking on the nameplate certifies the conformity with the safety requirement of the Custom Union.

9.2 MOVI4R-U® inverter 1 x 200 – 240 V (size 1)

MOVI4R-U® type		MUWA 025- 231-...-00 ER001010	MUWA 037- 231-...-00 ER001011	MUWA 055- 231-...-00/PF ER001012
Order ID				
Rated output power	P_N	0.25 kW	0.37 kW	0.55 kW
Connection voltage	V_{line}	AC 1 x 230 V	AC 1 x 230 V	AC 1 x 230 V
Permitted range		AC 1 x 200 – 240 V according to EN 50160 ±10%		
Line frequency	f_{line}	50/60 Hz ±5%		
Nominal line current	I_{line}	AC 3.2 A	AC 5.2 A	AC 6.3 A
Unaffected short-circuit current according to EN 61800-5-1		10 kA		
Maximum rated current		20 A		
Output voltage	V_{out}	0 – V_{line} (output is short-circuit proof)		
Output frequency	f_A	2 – 100 Hz		
Operating point		AC 3 x 230 V at 50 Hz		
Nominal output current	I_N	AC 1.2 A	AC 2.0 A	AC 2.7 A
Recommended power asynchronous motor P_{ASM}	P	0.25 kW (0.37 HP)	0.37 kW (0.5 HP)	0.55 kW (0.75 HP)
PWM frequency		4 kHz		
Efficiency		> 96%		
Current limiting	I_{max}	Motor and generator mode: 150%, 60 s		
Motor cable length		max. 25 m shielded, max. 50 m unshielded		
Interference immunity		Complies with EN 61800-3		
Interference emission		Meets category C3 according to EN 61800-3 (EMC toroidal core installed)		
Ambient temperature	ϑ_{amb}	-25 °C to +40 °C		
Climate class		EN 60721-3-3, class 3K3		
Storage temperature ¹⁾		-25 °C to +75 °C		
Maximum permitted vibration and shock load		According to EN 50178 In accordance with EN 60721-3-3, class 3M7		
Degree of protection		IP54 (housing closed, all cable bushings sealed)		
Operating mode		S1 (EN 60034-1 and 1-3)		
Type of cooling (DIN 41751)		Natural cooling		Fan cooling
Installation altitude		h ≤ 1000 m: no reduction h > 1000 m: I_N reduction by 1% per 100 m h _{max} = 2000 m		
Mass		Approx. 1.7 kg		Approx. 1.8 kg

MOVI4R-U® type		MUWA 025- 231-...-00	MUWA 037- 231-...-00	MUWA 055- 231-...-00/PF
Order ID		ER001010	ER001011	ER001012
Dimensions (W x H x D)		Approx. 70 x 180 x 190 mm		
Preventive measures		Grounding of the device		

1) If the device is undergoing extended storage, connect it to the line voltage for at least 5 minutes every 2 years. Otherwise, the device's service life may be reduced.

9.3 MOVI4R-U® inverter 3 x 200 – 240 V (size 1)

MOVI4R-U® type		MUWA 025- 233-...-00	MUWA 037- 233-...-00	MUWA 055- 233-...-00
Order ID		ER001013	ER001014	ER001015
Rated output power	P_N	0.25 kW	0.37 kW	0.55 kW
Connection voltage	V_{line}	AC 3 x 230 V	AC 3 x 230 V	AC 3 x 230 V
Permitted range		AC 3 x 200 – 240 V according to EN 50160 ±10%		
Line frequency	f_{line}	50/60 Hz ±5%		
Nominal line current	I_{line}	AC 1.2 A	AC 1.9 A	AC 2.2 A
Unaffected short-circuit current according to EN 61800-5-1		10 kA		
Maximum rated current		20 A		
Output voltage	V_{out}	0 – V_{line} (output is short-circuit proof)		
Output frequency	f_A	2 – 100 Hz		
Operating point		AC 3 x 230 V at 50 Hz		
Nominal output current	I_N	AC 1.2 A	AC 2.0 A	AC 2.7 A
Recommended power asynchronous motor P_{ASM}	P	0.25 kW (0.37 HP)	0.37 kW (0.5 HP)	0.55 kW (0.75 HP)
PWM frequency		4 kHz		
Efficiency		> 96%		
Current limiting	I_{max}	Motor and generator mode: 150%, 60 s		
Motor cable length		max. 25 m shielded, max. 50 m unshielded		
Interference immunity		Complies with EN 61800-3		
Interference emission		Meets category C3 according to EN 61800-3 (EMC toroidal core installed)		
Ambient temperature	ϑ_{amb}	-25 °C to +40 °C		
Climate class		EN 60721-3-3, class 3K3		
Storage temperature ¹⁾		-25 °C to +75 °C		
Maximum permitted vibration and shock load		According to EN 50178 In accordance with EN 60721-3-3, class 3M7		
Degree of protection		IP54 (housing closed, all cable bushings sealed)		
Operating mode		S1 (EN 60034-1 and 1-3)		
Type of cooling (DIN 41751)		Natural cooling		
Installation altitude		h ≤ 1000 m: no reduction h > 1000 m: I_N reduction by 1% per 100 m h _{max} = 2000 m		
Mass		Approx. 1.7 kg		

MOVI4R-U® type		MUWA 025- 233-...-00	MUWA 037- 233-...-00	MUWA 055- 233-...-00
Order ID		ER001013	ER001014	ER001015
Dimensions (W x H x D)		Approx. 70 x 180 x 190 mm		
Preventive measures		Grounding of the device		

1) If the device is undergoing extended storage, connect it to the line voltage for at least 5 minutes every 2 years. Otherwise, the device's service life may be reduced.

9.4 MOVI4R-U® inverter 3 x 200 – 240 V (size 2)

MOVI4R-U® type		MUWA 075- 233-...-00/PF ER001026	MUWA 110- 233-...-00/PF ER001027	MUWA 150- 233-...-00/PF ER001028
Order ID				
Rated output power	P_N	0.75 kW	1.1 kW	1.5 kW
Connection voltage	V_{line}	AC 3 x 230 V	AC 3 x 230 V	AC 3 x 230 V
Permitted range		AC 3 x 200 – 240 V according to EN 50160 ±10%		
Line frequency	f_{line}	50/60 Hz ±5%		
Nominal line current	I_{line}	AC 2.5 A	AC 3.7 A	AC 5.0 A
Unaffected short-circuit current according to EN 61800-5-1		10 kA		
Maximum rated current		20 A		
Output voltage	V_{out}	0 – V_{line} (output is short-circuit proof)		
Output frequency	f_A	2 – 100 Hz		
Operating point		AC 3 x 230 V at 50 Hz		
Nominal output current	I_N	AC 3.1 A	AC 4.5 A	AC 5.9 A
Recommended power asynchronous motor P_{ASM}	P	0.75 kW (1.0 HP)	1.1 kW (1.5 HP)	1.5 kW (2.0 HP)
PWM frequency		4/16 kHz		4 kHz
Efficiency		> 96%		
Current limiting	I_{max}	Motor and generator mode: 150%, 60 s		
Braking resistor		min. 68 Ω		
Motor cable length		max. 25 m shielded, max. 50 m unshielded		
Interference immunity		Complies with EN 61800-3		
Interference emission		Meets category C3 according to EN 61800-3 (EMC toroidal core installed)		
Ambient temperature	ϑ_{amb}	-25 °C to +60 °C ($\vartheta_U > 40$ °C: P_N reduction by 3% per K)		
Climate class		EN 60721-3-3, class 3K3		
Storage temperature ¹⁾		-25 °C to +75 °C		
Maximum permitted vibration and shock load		According to EN 50178 In accordance with EN 60721-3-3, class 3M7		
Degree of protection		IP54 (housing closed, all cable bushings sealed)		
Operating mode		S1 (EN 60034-1 and 1-3)		
Type of cooling (DIN 41751)		Fan cooling		
Installation altitude		h ≤ 1000 m: no reduction h > 1000 m: I_N reduction by 1% per 100 m $h_{max} = 2000$ m		

MOVI4R-U® type		MUWA 075- 233-...-00/PF	MUWA 110- 233-...-00/PF	MUWA 150- 233-...-00/PF
Order ID		ER001026	ER001027	ER001028
Mass		Approx. 2.8 kg		
Dimensions (W x H x D)		Approx. 105 x 193 x 228 mm		
Preventive measures		Grounding of the device		

1) If the device is undergoing extended storage, connect it to the line voltage for at least 5 minutes every 2 years. Otherwise, the device's service life may be reduced.

9.5 MOVI4R-U® inverter 3 x 380 – 400 V (size 1)

MOVI4R-U® type		MUWA
Order ID		075-403-...-00
		ER001021
Rated output power	P_N	0.75 kW
Connection voltage	V_{line}	AC 3 x 400 V
Permitted range		AC 3 x 380 – 400 V according to EN 50160 ±10%
Line frequency	f_{line}	50/60 Hz ±5%
Nominal line current	I_{line}	AC 1.5 A
Unaffected short-circuit current according to EN 61800-5-1		10 kA
Maximum rated current		20 A
Output voltage	V_{out}	0 – V_{line} (output is short-circuit proof)
Output frequency	f_A	2 – 100 Hz
Operating point		AC 3 x 400 V at 50 Hz
Nominal output current	I_N	AC 1.7 A
Recommended power asynchronous motor P_{ASM}	P	0.75 kW (1.0 HP)
PWM frequency		4 kHz
Efficiency		> 96%
Current limiting	I_{max}	Motor and generator mode: 150%, 60 s
Motor cable length		max. 25 m shielded, max. 50 m unshielded
Interference immunity		Complies with EN 61800-3
Interference emission		Meets category C3 according to EN 61800-3 (EMC toroidal core installed)
Ambient temperature	ϑ_{amb}	-25 °C to +40 °C
Climate class		EN 60721-3-3, class 3K3
Storage temperature¹⁾		-25 °C to +75 °C
Maximum permitted vibration and shock load		According to EN 50178 In accordance with EN 60721-3-3, class 3M7
Degree of protection		IP54 (housing closed, all cable bushings sealed)
Operating mode		S1 (EN 60034-1 and 1-3)
Type of cooling (DIN 41751)		Natural cooling
Installation altitude		$h \leq 1000$ m: no reduction $h > 1000$ m: I_N reduction by 1% per 100 m $h_{max} = 2000$ m
Mass		Approx. 1.7 kg

MOVI4R-U® type		MUWA
Order ID		075-403-...-00
Dimensions (W x H x D)		ER001021
Preventive measures		Approx. 70 x 180 x 190 mm
		Grounding of the device

1) If the device is undergoing extended storage, connect it to the line voltage for at least 5 minutes every 2 years. Otherwise, the device's service life may be reduced.

9.6 MOVI4R-U® inverter 3 x 380 – 500 V (size 1)

MOVI4R-U® type		MUWA 025- 503-...-00	MUWA 037- 503-...-00	MUWA 055- 503-...-00	MUWA 075- 503-...-00/PF	MUWA 110- 503-...-00/PF
Order ID		ER001016	ER001017	ER001018	ER001019	ER001020
Rated output power	P _N	0.25 kW	0.37 kW	0.55 kW	0.75 kW	1.1 kW
Connection voltage	V _{line}	AC 3 x 400 V				
Permitted range		AC 3 x 380 – 500 V according to EN 50160 ±10%				
Line frequency	f _{line}	50/60 Hz ±5%				
Nominal line current	I _{line}	AC 0.6 A	AC 1.0 A	AC 1.4 A	AC 1.5 A	AC 2.2 A
Unaffected short-circuit current according to EN 61800-5-1		10 kA				
Maximum rated current		20 A				
Output voltage	V _{out}	0 – V _{line} (output is short-circuit proof)				
Output frequency	f _A	2 – 100 Hz				
Operating point		AC 3 x 400 V at 50 Hz				
Nominal output current	I _N	AC 0.7 A	AC 1.1 A	AC 1.6 A	AC 1.7 A	AC 2.5 A
Recommended power asynchronous motor P _{ASM}	P	0.25 kW (0.37 HP)	0.37 kW (0.5 HP)	0.55 kW (0.75 HP)	0.75 kW (1.0 HP)	1.1 kW (1.5 HP)
PWM frequency		4 kHz				
Efficiency		> 96%				
Current limiting	I _{max}	Motor and generator mode: 150%, 60 s				
Motor cable length		max. 25 m shielded, max. 50 m unshielded				
Interference immunity		Complies with EN 61800-3				
Interference emission		Meets category C3 according to EN 61800-3 (EMC toroidal core in- stalled)				
Ambient temperature	ϑ _{amb}	-25 °C to +40 °C				
Climate class		EN 60721-3-3, class 3K3				
Storage temperature ¹⁾		-25 °C to +75 °C				
Maximum permitted vi- bration and shock load		According to EN 50178 In accordance with EN 60721-3-3, class 3M7				
Degree of protection		IP54 (housing closed, all cable bushings sealed)				
Operating mode		S1 (EN 60034-1 and 1-3)				
Type of cooling (DIN 41751)		Natural cooling			Fan cooling	
Installation altitude		h ≤ 1000 m: no reduction h > 1000 m: I _N reduction by 1% per 100 m h _{max} = 2000 m				
Mass		Approx. 1.7 kg			Approx. 1.8 kg	

MOVI4R-U® type		MUWA 025- 503-...-00	MUWA 037- 503-...-00	MUWA 055- 503-...-00	MUWA 075- 503-...-00/PF	MUWA 110- 503-...-00/PF
Order ID		ER001016	ER001017	ER001018	ER001019	ER001020
Dimensions (W x H x D)		Approx. 70 x 180 x 190 mm				
Preventive measures		Grounding of the device				

1) If the device is undergoing extended storage, connect it to the line voltage for at least 5 minutes every 2 years. Otherwise, the device's service life may be reduced.

9.7 MOVI4R-U® inverter 3 x 380 – 500 V (size 2)

MOVI4R-U® type		MUWA 150- 503-...-00/PF ER001022	MUWA 220- 503-...-00/PF ER001023	MUWA 300- 503-...-00/PF ER001024	MUWA 400- 503-...-00/PF ER001025
Order ID					
Rated output power	P _N	1.5 kW	2.2 kW	3.0 kW	4.0 kW
Connection voltage	V _{line}	AC 3 x 400 V			
Permitted range		AC 3 x 380 – 500 V according to EN 50160 ±10%			
Line frequency	f _{line}	50/60 Hz ±5%			
Nominal line current	I _{line}	AC 3.0 A	AC 4.4 A	AC 5.8 A	AC 7.8 A
Unaffected short-circuit current	SCCR	10 kA			
according to EN 61800-5-1	I _{CC}				
Maximum rated current		20 A			
Output voltage	V _{out}	0 – V _{line} (output is short-circuit proof)			
Output frequency	f _A	2 – 100 Hz			
Operating point		AC 3 x 400 V at 50 Hz			
Nominal output current	I _N	AC 3.4 A	AC 4.8 A	AC 6.4 A	AC 8.1 A
Recommended power asynchronous motor	P	1.5 kW (2.0 HP)	2.2 kW (3.0 HP)	3.0 kW (4.0 HP)	4.0 kW (5.4 HP)
P _{ASM}					
PWM frequency		4/16 kHz		4 kHz	
Efficiency		> 96%			
Current limiting	I _{max}	Motor and generator mode: 150%, 60 s			
Braking resistor		min. 68 Ω			
Motor cable length		max. 25 m shielded, max. 50 m unshielded			
Interference immunity		Complies with EN 61800-3			
Interference emission		Meets category C3 according to EN 61800-3 (EMC toroidal core installed)			
Ambient temperature	ϑ _{amb}	-25 °C to +60 °C (ϑ _U > 40 °C: P _N reduction by 3% per K)			
Climate class		EN 60721-3-3, class 3K3			
Storage temperature ¹⁾		-25 °C to +75 °C			
Maximum permitted vibration and shock load		According to EN 50178, according to EN 60721-3-3 class 3M7			
Degree of protection		IP54 (housing closed, all cable bushings sealed)			
Operating mode		S1 (EN 60034-1 and 1-3)			
Type of cooling (DIN 41751)		Fan cooling			
Installation altitude		h ≤ 1000 m: no reduction h > 1000 m: I _N reduction by 1% per 100 m h _{max} = 2000 m			

MOVI4R-U® type		MUWA 150- 503-...-00/PF	MUWA 220- 503-...-00/PF	MUWA 300- 503-...-00/PF	MUWA 400- 503-...-00/PF
Order ID		ER001022	ER001023	ER001024	ER001025
Mass		Approx. 2.8 kg			
Dimensions (W x H x D)		Approx. 105 x 193 x 228 mm			
Preventive measures		Grounding of the device			

1) If the device is undergoing extended storage, connect it to the line voltage for at least 5 minutes every 2 years. Otherwise, the device's service life may be reduced.

9.8 Inputs

9.8.1 Digital inputs DI01 – DI03

Digital inputs X1:5, X1:6, X1:7		
Input type	PLC-compatible according to EN 61131-2 type 1 or 3 R_i approx. 3 k Ω , IE = 10 mA, sampling cycle $\leq$ 8 ms	
Signal level	+11 V – +30 V	= "1" = Contact closed
	-3 V – +5 V	= "0" = Contact open
Control functions	DI01:	approval
	DI02:	Direction of rotation
	DI03:	Programmable, see chapter "Control / setpoint source"

9.8.2 Analog input AI

Analog input X2:3	
Input type	Unipolar analog input
Signal level	DC 0 – 10 V ($R_i > 40$ k Ω)
Control function	Speed setting

9.9 Outputs

9.9.1 DC 24 V output

DC 24 V output X1:4	
Output type	PLC-compatible to EN 61131-2, interference-voltage-proof and short-circuit-proof
Rated current	50 mA
Leakage current	Max. 0.2 mA

DC 24 V output X1:4	
Function	DC-24 V supply for digital inputs

9.9.2 Analog output AO

Analog output X2:4	
Output type	Unipolar analog output
Signal level	DC 0 – 10 V (0 – n_{max}) $R_L = 10 - 40 \text{ k}\Omega$
Function	Actual speed feedback

9.9.3 Reference output REF

Reference output X2:2	
Reference output voltage	DC 10 V + 5% $R_L = 10 - 40 \text{ k}\Omega$
Function	Reference voltage for analog signals

9.9.4 Relay contact REL

Relay contact X1:1, X1:2; X1:3		
Contact details	DC 30 V, 1.0 A DC 30 V according to DIN 60947-5-1 (only SELV or PELV circuits)	
Response time	$\leq 8 \text{ ms}$	
Function	Inverter enable feedback	
	Inverter not enabled:	Contact REL NO – REL C open Contact REL NC – REL C closed
	Inverter enabled:	Contact REL NO – REL C closed Contact REL NC – REL C open

9.10 Technical data of options

9.10.1 MUPF11A Fan

Option	MUPF11A
Supply voltage	DC 200 – 800 V
Control voltage	DC 19 – 30 V
Service	3 W

Option	MUPF11A
degree of protection	IP54
Ambient temperature	-25 °C to + 40 °C

9.11 Motor assignment

MOVI4R-U® inverters are suitable for 4-pole asynchronous motors according to the following assignment:

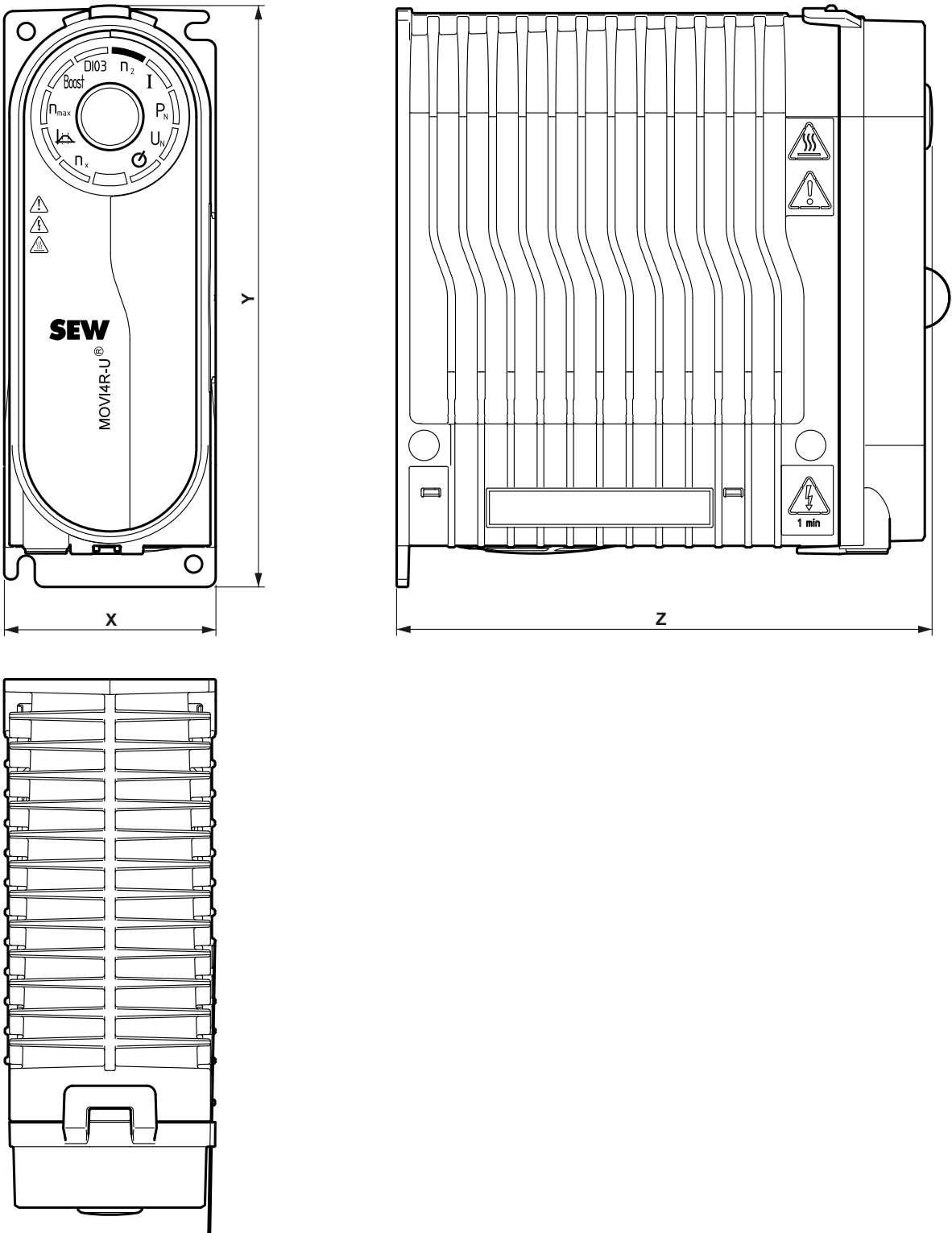
Size 1

V _{line}	MOVI4R-U®			Motor							
	Fans	Type	Service kW	Nominal power P _N							
				kW							
1 x 200 – 240 V	without fan	MUWA025-231-...-00	0.25	0.09	0.18	0.25	—	—	—	—	—
		MUWA037-231-...-00	0.37	0.09	0.18	0.25	0.37	—	—	—	—
	with fan	MUWA055-231-...-00/PF	0.55	0.09	0.18	0.25	0.37	0.55	—	—	—
3 x 200 – 240 V	without fan	MUWA025-233-...-00	0.25	0.09	0.18	0.25	—	—	—	—	—
		MUWA037-233-...-00	0.37	0.09	0.18	0.25	0.37	—	—	—	—
		MUWA055-233-...-00	0.55	0.09	0.18	0.25	0.37	0.55	—	—	—
3 x 380 – 400 V	without fan	MUWA075-403-...-00	0.75	0.09	0.18	0.25	0.37	0.55	0.75	—	—
3 x 380 – 500 V	without fan	MUWA025-503-...-00	0.25	0.09	0.18	0.25	—	—	—	—	—
		MUWA037-503-...-00	0.37	0.09	0.18	0.25	0.37	—	—	—	—
		MUWA055-503-...-00	0.55	0.09	0.18	0.25	0.37	0.55	—	—	—
	with fan	MUWA075-503-...-00/PF	0.75	0.09	0.18	0.25	0.37	0.55	0.75	—	—
		MUWA110-503-...-00/PF	1.1	0.09	0.18	0.25	0.37	0.55	0.75	1.1	—

Size 2

V _{line}	MOVI4R-U®			Motor								
	Fans	Type	Service kW	Nominal power P _N								
				kW								
3 x 200 – 240 V	with fan	MUWA075-233-...-00/PF	0.75	0.25	0.37	0.55	0.75	—	—	—	—	—
		MUWA110-233-...-00/PF	1.1	0.25	0.37	0.55	0.75	1.1	—	—	—	—
		MUWA150-233-...-00/PF	1.5	0.25	0.37	0.55	0.75	1.1	1.5	—	—	—
3 x 380 – 500 V	with fan	MUWA150-503-...-00/PF	1.5	0.25	0.37	0.55	0.75	1.1	1.5	—	—	—
		MUWA220-503-...-00/PF	2.2	0.25	0.37	0.55	0.75	1.1	1.5	2.2	—	—
		MUWA300-503-...-00/PF	3.0	0.25	0.37	0.55	0.75	1.1	1.5	2.2	3.0	—
		MUWA400-503-...-00/PF	4.0	0.25	0.37	0.55	0.75	1.1	1.5	2.2	3.0	4.0

9.12 MOVI4R-U® dimension drawing



9007208545591179

	X	Y	Z
Size 1	70 mm	191 mm	176 mm
Size 2	105 mm	228.2 mm	193.2 mm

10 Address list

Argentina

Assembly Sales	Buenos Aires	SEW EURODRIVE ARGENTINA S.A. Ruta Panamericana Km 37.5, Lote 35 (B1619IEA) Centro Industrial Garín Prov. de Buenos Aires	Tel. +54 3327 4572-84 Fax +54 3327 4572-21 http://www.sew-eurodrive.com.ar sewar@sew-eurodrive.com.ar
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Australia

Assembly Sales Service	Melbourne	SEW-EURODRIVE PTY. LTD. 27 Beverage Drive Tullamarine, Victoria 3043	Tel. +61 3 9933-1000 Fax +61 3 9933-1003 http://www.sew-eurodrive.com.au enquires@sew-eurodrive.com.au
	Sydney	SEW-EURODRIVE PTY. LTD. 9, Sleigh Place, Wetherill Park New South Wales, 2164	Tel. +61 2 9725-9900 Fax +61 2 9725-9905 enquires@sew-eurodrive.com.au

Austria

Assembly Sales Service	Vienna	SEW-EURODRIVE Ges.m.b.H. Richard-Strauss-Straße 24 1230 Wien	Tel. +43 1 617 55 00-0 Fax +43 1 617 55 00-30 http://www.sew-eurodrive.at sew@sew-eurodrive.at
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Bangladesh

Sales	Bangladesh	SEW-EURODRIVE INDIA PRIVATE LIMITED 345 DIT Road East Rampura Dhaka-1219, Bangladesh	Tel. +88 01729 097309 salesdhaka@seweurodrivebangladesh.com
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Belarus

Sales	Minsk	Foreign unitary production enterprise SEW- EURODRIVE Novodvorskiy village council 145 223016, Minsk region	Tel. +375 17 319 47 56 / +375 17 378 47 58 Fax +375 17 378 47 54 http://www.sew-eurodrive.by sew@sew-eurodrive.by
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Belgium

Assembly Sales Service	Brussels	SEW-EURODRIVE n.v./s.a. Researchpark Haasrode 1060 Evenementenlaan 7 3001 Leuven	Tel. +32 16 386-311 Fax +32 16 386-336 http://www.sew-eurodrive.be info@sew-eurodrive.be
Service Competence Center	Industrial Gears	SEW-EURODRIVE n.v./s.a. Rue du Parc Industriel, 31 6900 Marche-en-Famenne	Tel. +32 84 219-878 Fax +32 84 219-879 http://www.sew-eurodrive.be info@sew.be

Brazil

Production Sales Service	São Paulo	SEW-EURODRIVE Brasil Ltda. Estrada Municipal José Rubim, 205 – Rodovia Santos Dumont Km 49 Indaiatuba – 13347-510 – SP	Tel. +55 19 3835-8000 sew@sew.com.br
Assembly Sales Service	Rio Claro	SEW-EURODRIVE Brasil Ltda. Rodovia Washington Luiz, Km 172 Condomínio Industrial Conpark Caixa Postal: 327 13501-600 – Rio Claro / SP	Tel. +55 19 3522-3100 Fax +55 19 3524-6653 montadora.rc@sew.com.br
	Joinville	SEW-EURODRIVE Brasil Ltda. Jvl / Ind 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

Bulgaria

Sales	Sofia	BEVER-DRIVE GmbH Bogdanovetz Str.1 1606 Sofia	Tel. +359 2 9151160 Fax +359 2 9151166 bever@bever.bg
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Cameroon

Sales	Douala	SEW-EURODRIVE SARLU Ancienne Route Bonabéri P.O. Box B.P 8674 Douala-Cameroun	Tel. +237 233 39 12 35 Fax +237 233 39 02 10 www.sew-eurodrive.ci/ info@sew-eurodrive.cm
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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 l.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. 2001 Ch. de l'Aviation Dorval Quebec H9P 2X6	Tel. +1 514 367-1124 Fax +1 514 367-3677 n.paradis@sew-eurodrive.ca

Chile

Assembly Sales Service	Santiago de Chile	SEW-EURODRIVE CHILE LTDA Las Encinas 1295 Parque Industrial Valle Grande LAMP Santiago de Chile P.O. Box Casilla 23 Correo Quilicura - Santiago - Chile	Tel. +56 2 2757 7000 Fax +56 2 2757 7001 http://www.sew-eurodrive.cl ventas@sew-eurodrive.cl
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China

Production Assembly Sales Service	Tianjin	SEW-EURODRIVE (Tianjin) Co., Ltd. No. 78, 13th Avenue, TEDA Tianjin 300457	Tel. +86 22 25322612 Fax +86 22 25323273 http://www.sew-eurodrive.cn info@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
	Guangzhou	SEW-EURODRIVE (Guangzhou) Co., Ltd. No. 9, JunDa Road East Section of GETDD Guangzhou 510530	Tel. +86 20 82267890 Fax +86 20 82267922 guangzhou@sew-eurodrive.cn
	Shenyang	SEW-EURODRIVE (Shenyang) Co., Ltd. 10A-2, 6th Road Shenyang Economic Technological Development Area Shenyang, 110141	Tel. +86 24 25382538 Fax +86 24 25382580 shenyang@sew-eurodrive.cn
	Taiyuan	SEW-EURODRIVE (Taiyuan) Co., Ltd. No.3, HuaZhang Street, TaiYuan Economic & Technical Development Zone ShanXi, 030032	Tel. +86-351-7117520 Fax +86-351-7117522 taiyuan@sew-eurodrive.cn
	Wuhan	SEW-EURODRIVE (Wuhan) Co., Ltd. 10A-2, 6th Road No. 59, the 4th Quanli Road, WEDA 430056 Wuhan	Tel. +86 27 84478388 Fax +86 27 84478389 wuhan@sew-eurodrive.cn
	Xi'An	SEW-EURODRIVE (Xi'An) Co., Ltd. No. 12 Jinye 2nd Road Xi'An High-Technology Industrial Development Zone Xi'An 710065	Tel. +86 29 68686262 Fax +86 29 68686311 xian@sew-eurodrive.cn
Sales Service	Hong Kong	SEW-EURODRIVE LTD. Unit No. 801-806, 8th Floor Hong Leong Industrial Complex No. 4, Wang Kwong Road Kowloon, Hong Kong	Tel. +852 36902200 Fax +852 36902211 contact@sew-eurodrive.hk

Colombia			
Assembly Sales Service	Bogota	SEW-EURODRIVE COLOMBIA LTDA. Calle 17 No. 132-18 Interior 2 Bodega 6, Manzana B Santafé de Bogotá	Tel. +57 1 54750-50 Fax +57 1 54750-44 http://www.sew-eurodrive.com.co sew@sew-eurodrive.com.co
Croatia			
Sales Service	Zagreb	KOMPEKS d. o. o. Zeleni dol 10 10 000 Zagreb	Tel. +385 1 4613-158 Fax +385 1 4613-158 kompeks@inet.hr
Czech Republic			
Assembly Sales Service	Hostivice	SEW-EURODRIVE CZ s.r.o. Floriánova 2459 253 01 Hostivice	Tel. +420 255 709 601 Fax +420 235 350 613 http://www.sew-eurodrive.cz sew@sew-eurodrive.cz
Denmark			
Assembly Sales Service	Copenhagen	SEW-EURODRIVE A/S Geminivej 28-30 2670 Greve	Tel. +45 43 95 8500 Fax +45 43 9585-09 http://www.sew-eurodrive.dk sew@sew-eurodrive.dk
Service	Vejle	SEW-EURODRIVE A/S Bødkervej 2 7100 Vejle	Tel. +45 43 9585 00 http://www.sew-eurodrive.dk sew@sew-eurodrive.dk
Egypt			
Technical Office	Cairo	SEW-EURODRIVE Representative Office in Egypt 47 Office Building, Section 1, City Centre, New Cairo Cairo	Tel. +20 2 2503 2807 Fax +20 2 2503 2801 info@sew-eurodrive.eg
Estonia			
Sales	Tallin	ALAS-KUUL AS Loomäe tee 1, Lehmja küla 75306 Rae vald Harjumaa	Tel. +372 6593230 Fax +372 6593231 http://www.alas-kuul.ee info@alas-kuul.ee
Finland			
Assembly Sales Service	Hollola	SEW-EURODRIVE OY Vesimäentie 4 15860 Hollola	Tel. +358 201 589-300 Fax +358 3 780-6211 http://www.sew-eurodrive.fi sew@sew.fi
Service	Hollola	SEW-EURODRIVE OY Keskikankaantie 21 15860 Hollola	Tel. +358 201 589-300 Fax +358 3 780-6211 http://www.sew-eurodrive.fi sew@sew.fi
	Tornio	SEW-EURODRIVE Oy Lossirannankatu 5 95420 Tornio	Tel. +358 201 589 300 Fax +358 3 780 6211 http://www.sew-eurodrive.fi sew@sew.fi
Production Assembly	Karkkila	SEW Industrial Gears Oy Santasalonkatu 6, PL 8 03620 Karkkila, 03601 Karkkila	Tel. +358 201 589-300 Fax +358 201 589-310 http://www.sew-eurodrive.fi sew@sew.fi
France			
Production Sales	Haguenau	SEW USOCOME 48-54 route de Soufflenheim B. P. 20185 67506 Haguenau Cedex	Tel. +33 3 88 73 67 00 http://www.usocom.com sew@usocom.com
Production	Forbach	SEW USOCOME Zone industrielle Technopôle Forbach Sud B. P. 30269 57604 Forbach Cedex	Tel. +33 3 87 29 38 00
	Brumath	SEW USOCOME 1 Rue de Bruxelles 67670 Mommenheim Cedex	Tel. +33 3 88 37 48 00

France

Assembly Sales Service	Bordeaux	SEW USOCOME Parc d'activités de Magellan 62 avenue de Magellan – B. P. 182 33607 Pessac Cedex	Tel. +33 5 57 26 39 00 dtcbordeaux@usocome.com
	Haguenau	SEW USOCOME 48-54 route de Soufflenheim B. P. 20185 67506 Haguenau Cedex	Tel. +33 3 88 73 67 00 dtchaguenau@usocome.com
	Lyon	SEW USOCOME 75 rue Antoine Condorcet 38090 Vaulx-Milieu	Tel. +33 4 74 99 60 00 dtclyon@usocome.com
	Nantes	SEW USOCOME Parc d'activités de la forêt 4 rue des Fontenelles 44140 Le Bignon	Tel. +33 2 40 78 42 00 dtcnantes@usocome.com
	Paris	SEW USOCOME Zone industrielle 2 rue Denis Papin 77390 Verneuil l'Étang	Tel. +33 1 64 42 40 80 dtcparis@usocome.com

Gabon

Representation: Cameroon

Germany

Headquarters Production Sales	Bruchsal	SEW-EURODRIVE GmbH & Co KG Ernst-Blickle-Straße 42 76646 Bruchsal	Tel. +49 7251 75-0 Fax +49 7251 75-1970 http://www.sew-eurodrive.de sew@sew-eurodrive.de
Production / Industrial Gears	Bruchsal	SEW-EURODRIVE GmbH & Co KG Christian-Pähr-Str. 10 76646 Bruchsal	Tel. +49 7251 75-0 Fax +49 7251 75-2970
Production / Precision Gear Units	Bruchsal	SEW-EURODRIVE GmbH & Co KG Ernst-Blickle-Straße 42 76646 Bruchsal	Tel. +49 7251 75-0 Fax +49 7251 75-1970 sew@sew-eurodrive.de
Production	Graben	SEW-EURODRIVE GmbH & Co KG Ernst-Blickle-Straße 1 76676 Graben-Neudorf	Tel. +49 7251 75-0 Fax +49 7251-2970
Service Competence Center	Mechanics / Mechatronics	SEW-EURODRIVE GmbH & Co KG Ernst-Blickle-Straße 1 76676 Graben-Neudorf	Tel. +49 7251 75-1710 Fax +49 7251 75-1711 scc-mechanik@sew-eurodrive.de
	Electronics	SEW-EURODRIVE GmbH & Co KG Christian-Pähr-Straße 12 76646 Bruchsal	Tel. +49 7251 75-1780 Fax +49 7251 75-1769 scc-elektronik@sew-eurodrive.de
	MAXOLU- TION® Factory Automation	SEW-EURODRIVE GmbH & Co KG Eisenbahnstraße 11 76646 Bruchsal	Tel. +49 7251 75-0 Fax +49 7251 75-1970 sew@sew-eurodrive.de
Drive Technology Center	North	SEW-EURODRIVE GmbH & Co KG Alte Ricklinger Straße 43 30823 Garbsen (Hannover)	Tel. +49 5137 8798-30 Fax +49 5137 8798-55 dtc-nord@sew-eurodrive.de
	East	SEW-EURODRIVE GmbH & Co KG Dänkritzter Weg 1 08393 Meerane (Zwickau)	Tel. +49 3764 7606-0 Fax +49 3764 7606-20 dtc-ost@sew-eurodrive.de
	South	SEW-EURODRIVE GmbH & Co KG Domagkstraße 5 85551 Kirchheim (München)	Tel. +49 89 909551-21 Fax +49 89 909551-50 dtc-sued@sew-eurodrive.de
	West	SEW-EURODRIVE GmbH & Co KG Siemensstraße 1 40764 Langenfeld (Düsseldorf)	Tel. +49 2173 8507-10 Fax +49 2173 8507-50 dtc-west@sew-eurodrive.de
Drive Center	Berlin	SEW-EURODRIVE GmbH & Co KG Melitta-Schiller-Straße 8 12526 Berlin	Tel. +49 306331131-30 Fax +49 306331131-36 dc-berlin@sew-eurodrive.de
	Bremen	SEW-EURODRIVE GmbH & Co KG Allerkai 4 28309 Bremen	Tel. +49 421 33918-10 Fax +49 421 33918-22 tb-bremen@sew-eurodrive.de

Germany			
	Hamburg	SEW-EURODRIVE GmbH & Co KG Hasselbinnen 11 22869 Schenefeld	Tel. +49 40298109-60 Fax +49 40298109-70 dc-hamburg@sew-eurodrive.de
	Saarland	SEW-EURODRIVE GmbH & Co KG Gottlieb-Daimler-Straße 4 66773 Schwalbach Saar – Hülzweiler	Tel. +49 6831 48946 10 Fax +49 6831 48946 13 dc-saarland@sew-eurodrive.de
	Ulm	SEW-EURODRIVE GmbH & Co KG Dieselstraße 18 89160 Dornstadt	Tel. +49 7348 9885-0 Fax +49 7348 9885-90 dc-ulm@sew-eurodrive.de
	Würzburg	SEW-EURODRIVE GmbH & Co KG Nürnbergerstraße 118 97076 Würzburg-Lengfeld	Tel. +49 931 27886-60 Fax +49 931 27886-66 dc-wuerzburg@sew-eurodrive.de
Drive Service Hotline / 24 Hour Service			0 800 SEWHELP 0 800 7394357
Great Britain			
Assembly Sales Service	Normanton	SEW-EURODRIVE Ltd. DeVilliers Way Trident Park Normanton West Yorkshire WF6 1GX	Tel. +44 1924 893-855 Fax +44 1924 893-702 http://www.sew-eurodrive.co.uk info@sew-eurodrive.co.uk
Greece			
Sales	Athens	Christ. Boznos & Son S.A. 12, K. Mavromichali Street P.O. Box 80136 18545 Piraeus	Tel. +30 2 1042 251-34 Fax +30 2 1042 251-59 http://www.boznos.gr info@boznos.gr
Hungary			
Sales Service	Budapest	SEW-EURODRIVE Kft. Csillaghegyi út 13. 1037 Budapest	Tel. +36 1 437 06-58 Fax +36 1 437 06-50 http://www.sew-eurodrive.hu office@sew-eurodrive.hu
Iceland			
Sales	Reykjavik	Varma & Vélaverk ehf. Knarrarvogi 4 104 Reykjavik	Tel. +354 585 1070 Fax +354 585)1071 https://vov.is/ vov@vov.is
India			
Registered Office Assembly Sales Service	Vadodara	SEW-EURODRIVE India Private Limited 302, NOTUS IT PARK, Sarabhai Campus, Beside Notus Pride, Genda Circle, Vadodara 390023 Gujarat	Tel. +91 265 3045200 Fax +91 265 3045300 https://www.seweurodriveindia.com salesvadodara@seweurodriveindia.com
Assembly Sales Service	Chennai	SEW-EURODRIVE India Private Limited Plot No. K3/1, Sipcot Industrial Park Phase II Mambakkam Village Sriperumbudur - 602105 Kancheepuram Dist, Tamil Nadu	Tel. +91 44 37188888 Fax +91 44 37188811 saleschennai@seweurodriveindia.com
	Pune	SEW-EURODRIVE India Private Limited Plant: Plot No. D236/1, Chakan Industrial Area Phase- II, Warale, Tal- Khed, Pune-410501, Maharashtra	Tel. +91 21 35 628700 Fax +91 21 35 628715 salespune@seweurodriveindia.com
	Tapukara	SEW-EURODRIVE India Private Limited Plot No SP-6-46, Tapukara, Karoli Industrial Area, No. 1, district : Alwar , Rajasthan - 301707	Tel. +91 265 3045200 Fax +91 265 3045300 tapukara.plant@seweurodriveindia.com
Sales	Gurgaon	SEW-EURODRIVE India Private Limited Global Business Park, Sector -26, M.G. Road, Sikanderpur Unit No. 205, 2nd Floor, Tower – D Gurugram 122002, Haryana	Tel. +91 9958376669 salesgurgaon@seweurodriveindia.com

Indonesia			
Registered Office Sales Service	Jakarta	PT SEW EURODRIVE INDONESIA Palma Tower, 16th Floor, Unit H & I, Jl R.A. Kartini II-S Kav 06 Pondok Pinang, Kebayoran Lama Jakarta Selatan 12310	Tel. +62 21 7593 0272 Fax +62 21 7593 0273 sales.indonesia@sew-eurodrive.com https://www.sew-eurodrive.com.sg
Sales	Medan	PT. Serumpun Indah Lestari Jl.Pulau Solor no. 8, Kawasan Industri Medan II Medan 20252	Tel. +62 61 687 1221 Fax +62 61 6871429 / +62 61 6871458 / +62 61 30008041 sil@serumpunindah.com serumpunindah@yahoo.com http://www.serumpunindah.com
	Jakarta	PT. Cahaya Sukses Abadi Komplek Rukan Puri Mutiara Blok A no 99, Sunter Jakarta 14350	Tel. +62 21 65310599 Fax +62 21 65310600 csajkt@cbn.net.id
	Jakarta	PT. Agrindo Putra Lestari Jl.Pantai Indah Selatan, Komplek Sentra In- dustri Terpadu, Pantai indah Kapuk Tahap III, Blok E No. 27 Jakarta 14470	Tel. +62 21 2921-8899 Fax +62 21 2921-8988 aplindo@indosat.net.id http://www.aplindo.com
	Surabaya	PT. TRIAGRI JAYA ABADI Jl. Sukosemolo No. 63, Galaxi Bumi Permai G6 No. 11 Surabaya 60111	Tel. +62 31 5990128 Fax +62 31 5962666 sales@triagri.co.id http://www.triagri.co.id
	Surabaya	CV. Multi Mas Jl. Raden Saleh 43A Kav. 18 Surabaya 60174	Tel. +62 31 5458589 Fax +62 31 5317220 sianhwa@sby.centrin.net.id http://www.cvmultimas.com
Ireland			
Sales Service	Dublin	Alpert Engineering Ltd. 48 Moyle Road Dublin Industrial Estate Glasnevin, Dublin 11	Tel. +353 1 830-6277 Fax +353 1 830-6458 http://www.alpert.ie info@alpert.ie
Israel			
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
Italy			
Assembly Sales Service	Milan	SEW-EURODRIVE S.a.s. di SEW S.r.l. & Co. Via Bernini,12 20033 Solaro (Milano)	Tel. +39 02 96 980229 Fax +39 02 96 980 999 http://www.sew-eurodrive.it milano@sew-eurodrive.it
Ivory Coast			
Sales	Abidjan	SEW-EURODRIVE SARL Ivory Coast Rue des Pêcheurs, Zone 3 26 BP 916 Abidjan 26	Tel. +225 27 21 21 81 05 Fax +225 27 21 25 30 47 info@sew-eurodrive.ci http://www.sew-eurodrive.ci
Japan			
Assembly Sales Service	Iwata	SEW-EURODRIVE JAPAN CO., LTD 250-1, Shimoman-no, Iwata Shizuoka 438-0818	Tel. +81 538 373811 Fax +81 538 373814 http://www.sew-eurodrive.co.jp sewjapan@sew-eurodrive.co.jp
Kazakhstan			
Sales Service	Almaty	SEW-EURODRIVE LLP 291-291A, Tole bi street 050031, Almaty	Tel. +7 (727) 350 5156 Fax +7 (727) 350 5156 http://www.sew-eurodrive.com kazakhstan@sew-eurodrive.com
	Tashkent	Representative Office SEW-EURODRIVE Representative office in Uzbekistan 95A Amir Temur ave, office 401/3 100084 Tashkent	Tel. +998 97 134 01 99 http://www.sew-eurodrive.uz sew@sew-eurodrive.uz

Ulaanbaatar	IM Trading LLC Olympic street 28B/3 Sukhbaatar district, Ulaanbaatar 14230, MN	Tel. +976-77109997 Fax +976-77109997 imt@imt.mn
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Latvia

Sales	Riga	SIA Alas-Kuul Katlakalna 11C 1073 Riga	Tel. +371 6 7139253 Fax +371 6 7139386 http://www.alas-kuul.lv info@alas-kuul.com
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Lebanon

Sales (Lebanon)	Beirut	Gabriel Acar & Fils sarl B. P. 80484 Bourj Hammoud, Beirut	Tel. +961 1 510 532 Fax +961 1 494 971 ssacar@inco.com.lb
Sales (Jordan, Kuwait , Beirut Saudi Arabia, Syria)		Middle East Drives S.A.L. (offshore) Sin El Fil. B. P. 55-378 Beirut	Tel. +961 1 494 786 Fax +961 1 494 971 http://www.medrives.com info@medrives.com

Lithuania

Sales	Alytus	UAB Irseva Statybininku 106C 63431 Alytus	Tel. +370 315 79204 Fax +370 315 56175 http://www.irseva.lt irmantas@irseva.lt
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Luxembourg

Representation: Belgium

Macedonia

Sales	Skopje	Boznos DOOEL Dime Anicin 2A/7A 1000 Skopje	Tel. +389 23256553 Fax +389 23256554 http://www.boznos.mk
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Malaysia

Assembly Sales Service	Johor	SEW-EURODRIVE SDN BHD No. 95, Jalan Seroja 39, Taman Johor Jaya 81000 Johor Bahru, Johor West Malaysia	Tel. +60 7 3549409 Fax +60 7 3541404 sales@sew-eurodrive.com.my
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Mexico

Assembly Sales Service	Quéretaro	SEW-EURODRIVE MEXICO S.A. de C.V. SEM-981118-M93 Tequisquiapan No. 102 Parque Industrial Quéretaro C.P. 76220 Querétaro, México	Tel. +52 442 1030-300 Fax +52 442 1030-301 http://www.sew-eurodrive.com.mx scmexico@sew-eurodrive.com.mx
Sales Service	Puebla	SEW-EURODRIVE MEXICO S.A. de C.V. Calzada Zavaleta No. 3922 Piso 2 Local 6 Col. Santa Cruz Buenavista C.P. 72154 Puebla, México	Tel. +52 (222) 221 248 http://www.sew-eurodrive.com.mx scmexico@sew-eurodrive.com.mx

Mongolia

Technical Office	Ulaanbaatar	IM Trading LLC Olympic street 28B/3 Sukhbaatar district, Ulaanbaatar 14230, MN	Tel. +976-77109997 Tel. +976-99070395 Fax +976-77109997 http://imt.mn/ imt@imt.mn
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Morocco

Sales Service Assembly	Bouskoura	SEW-EURODRIVE Morocco SARL Parc Industriel CFCIM, Lot. 55/59 27182 Bouskoura Grand Casablanca	Tel. +212 522 88 85 00 Fax +212 522 88 84 50 http://www.sew-eurodrive.ma sew@sew-eurodrive.ma
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Namibia			
Sales	Swakopmund	DB MINING & INDUSTRIAL SUPPLIES CC Einstein Street Strauss Industrial Park Unit1 Swakopmund	Tel. +264 64 462 738 Fax +264 64 462 734 anton@dbminingnam.com
Netherlands			
Assembly Sales Service	Rotterdam	SEW-EURODRIVE B.V. Industrieweg 175 3044 AS Rotterdam Postbus 10085 3004 AB Rotterdam	Tel. +31 10 4463-700 Fax +31 10 4155-552 Service: 0800-SEWHELP http://www.sew-eurodrive.nl info@sew-eurodrive.nl
New Zealand			
Assembly Sales Service	Auckland	SEW-EURODRIVE NEW ZEALAND LTD. P.O. Box 58-428 82 Greenmount drive East Tamaki Auckland	Tel. +64 9 2745627 Fax +64 9 2740165 http://www.sew-eurodrive.co.nz sales@sew-eurodrive.co.nz
	Christchurch	SEW-EURODRIVE NEW ZEALAND LTD. 30 Lodestar Avenue, Wigram Christchurch	Tel. +64 3 384-6251 Fax +64 3 384-6455 sales@sew-eurodrive.co.nz
Nigeria			
Sales	Lagos	Greenpeg Nig. Ltd 64C Toyin Street Opebi-Allen Ikeja Lagos-Nigeria	Tel. +234-701-821-9200-1 http://www.greenpeg ltd.com sales@greenpeg ltd.com
Norway			
Assembly Sales Service	Moss	SEW-EURODRIVE A/S Hornebergvegen 11 B 7038 Trondheim	Tel. +47 69 24 10 20 Fax +47 69 24 10 40 http://www.sew-eurodrive.no sew@sew-eurodrive.no
Pakistan			
Sales	Karachi	Industrial Power Drives Al-Fatah Chamber A/3, 1st Floor Central Com- mercial Area, Sultan Ahmed Shah Road, Block 7/8, Karachi	Tel. +92 21 452 9369 Fax +92-21-454 7365 seweurodrive@cyber.net.pk
Paraguay			
Sales	Fernando de la Mora	SEW-EURODRIVE PARAGUAY S.R.L Nu Guazu No. 642 casi Campo Esperanza Santisima Trinidad Asuncion	Tel. +595 991 519695 Fax +595 21 3285539 sewpy@sew-eurodrive.com.py
Peru			
Assembly Sales Service	Lima	SEW EURODRIVE DEL PERU S.A.C. Los Calderos, 120-124 Urbanizacion Industrial Vulcano, ATE, Lima	Tel. +51 1 3495280 Fax +51 1 3493002 http://www.sew-eurodrive.com.pe sewperu@sew-eurodrive.com.pe
Philippines			
Sales	Makati	P.T. Cerna Corporation 4137 Ponte St., Brgy. Sta. Cruz Makati City 1205	Tel. +63 2 519 6214 Fax +63 2 890 2802 mech_drive_sys@ptcerna.com http://www.ptcerna.com
Poland			
Assembly Sales Service	Łódź	SEW-EURODRIVE Polska Sp.z.o.o. ul. Techniczna 5 92-518 Łódź	Tel. +48 42 293 00 00 Fax +48 42 293 00 49 http://www.sew-eurodrive.pl sew@sew-eurodrive.pl
	Service	Tel. +48 42 293 0030 Fax +48 42 293 0043	24 Hour Service Tel. +48 602 739 739 (+48 602 SEW SEW) serwis@sew-eurodrive.pl

Portugal			
Assembly Sales Service	Coimbra	SEW-EURODRIVE, LDA. Av. da Fonte Nova, n.º 86 3050-379 Mealhada	Tel. +351 231 20 9670 Fax +351 231 20 3685 http://www.sew-eurodrive.pt infosew@sew-eurodrive.pt
Romania			
Sales Service	Bucharest	Sialco Trading SRL str. Brazilia nr. 36 011783 Bucuresti	Tel. +40 21 230-1328 Fax +40 21 230-7170 http://www.sialco.ro sialco@sialco.ro
Senegal			
Sales	Dakar	SENEMECA Mécanique Générale Km 8, Route de Rufisque B.P. 3251, Dakar	Tel. +221 338 494 770 Fax +221 338 494 771 http://www.senemeca.com senemeca@senemeca.sn
Serbia			
Sales	Belgrade	DIPAR d.o.o. Ustanicka 128a PC Košum, IV floor 11000 Beograd	Tel. +381 11 347 3244 / +381 11 288 0393 Fax +381 11 347 1337 office@dipar.rs
Singapore			
Assembly Sales Service	Singapore	SEW-EURODRIVE PTE. LTD. 9, Tuas Drive 2 Singapore 638644	Tel. +65 68621701 Fax +65 68612827 http://www.sew-eurodrive.com.sg sewsingapore@sew-eurodrive.com
Slovakia			
Sales	Bernolákovo	SEW-Eurodrive SK s.r.o. Priemyselná ulica 6267/7 900 27 Bernolákovo	Tel. +421 2 48 212 800 http://www.sew-eurodrive.sk sew@sew-eurodrive.sk
Slovenia			
Sales Service	Celje	Pakman - Pogonska Tehnika d.o.o. Ul. XIV. divizije 14 3000 Celje	Tel. +386 3 490 83-20 Fax +386 3 490 83-21 pakman@siol.net
South Africa			
Assembly Sales Service	Johannesburg	SEW-EURODRIVE (PROPRIETARY) LIMITED 32 O'Connor Place Eurodrive House Aeroton Johannesburg 2190 P.O.Box 90004 Bertsham 2013	Tel. +27 11 248-7000 Fax +27 11 248-7289 http://www.sew.co.za info@sew.co.za
	Cape Town	SEW-EURODRIVE (PROPRIETARY) LIMITED Rainbow Park Cnr. Racecourse & Omuramba Road Montague Gardens Cape Town P.O.Box 36556 Chempet 7442	Tel. +27 21 552-9820 Fax +27 21 552-9830 Telex 576 062 bgriffiths@sew.co.za
	Durban	SEW-EURODRIVE (PROPRIETARY) LIMITED 48 Prospecton Road Isipingo Durban P.O. Box 10433, Ashwood 3605	Tel. +27 31 902 3815 Fax +27 31 902 3826 cdejager@sew.co.za
	Nelspruit	SEW-EURODRIVE (PROPRIETARY) LIMITED 7 Christie Crescent Vintonia P.O.Box 1942 Nelspruit 1200	Tel. +27 13 752-8007 Fax +27 13 752-8008 robermeyer@sew.co.za

South Korea			
Assembly Sales Service	Ansan	SEW-EURODRIVE Korea Co., Ltd. 7, Dangjaengi-ro, Danwon-gu, Ansan-si, Gyeonggi-do, Zip 425-839	Tel. +82 31 492-8051 Fax +82 31 492-8056 http://www.sew-eurodrive.kr master.korea@sew-eurodrive.com
	Busan	SEW-EURODRIVE Korea Co., Ltd. 28, Noksansandan 262-ro 50beon-gil, Gangseo-gu, Busan, Zip 618-820	Tel. +82 51 832-0204 Fax +82 51 832-0230
Assembly Service	Siheung	SEW-EURODRIVE Korea Co., Ltd. 35, Emtibeui 26-ro 58beon-gil, Siheung-si, Gyeonggi-do	http://www.sew-eurodrive.kr
Spain			
Assembly Sales Service	Bilbao	SEW-EURODRIVE ESPAÑA, S.L. Parque Tecnológico, Edificio, 302 48170 Zamudio (Vizcaya)	Tel. +34 94 43184-70 http://www.sew-eurodrive.es sew.spain@sew-eurodrive.es
Sri Lanka			
Sales	Colombo	SM International (Pte) Ltd 254, Galle Raod Colombo 4, Sri Lanka	Tel. +94 1 2584887 Fax +94 1 2582981
Swaziland			
Sales	Manzini	C G Trading Co. (Pty) Ltd Simunye street Matsapha, Manzini	Tel. +268 7602 0790 Fax +268 2 518 5033 charles@cgtrading.co.sz www.cgtradingswaziland.com
Sweden			
Assembly Sales Service	Jönköping	SEW-EURODRIVE AB Gnejsvägen 6-8 553 03 Jönköping Box 3100 S-550 03 Jönköping	Tel. +46 36 34 42 00 Fax +46 36 34 42 80 http://www.sew-eurodrive.se jonkoping@sew.se
Switzerland			
Assembly Sales Service	Basel	Alfred Imhof A.G. Jurastrasse 10 4142 Münchenstein bei Basel	Tel. +41 61 417 1717 Fax +41 61 417 1700 http://www.imhof-sew.ch info@imhof-sew.ch
Taiwan			
Sales	Taipei	Ting Shou Trading Co., Ltd. 6F-3, No. 267, Sec. 2 Tung Huw S. Road Taipei	Tel. +886 2 27383535 Fax +886 2 27368268 Telex 27 245 sewtwn@ms63.hinet.net http://www.tingshou.com.tw
	Nan Tou	Ting Shou Trading Co., Ltd. No. 55 Kung Yeh N. Road Industrial District Nan Tou 540	Tel. +886 49 255353 Fax +886 49 257878 sewtwn@ms63.hinet.net http://www.tingshou.com.tw
Tanzania			
Sales	Daressalam	SEW-EURODRIVE PTY LIMITED TANZANIA Plot 52, Regent Estate PO Box 106274 Dar Es Salaam	Tel. +255 0 22 277 5780 Fax +255 0 22 277 5788 http://www.sew-eurodrive.co.tz info@sew.co.tz
Thailand			
Assembly Sales Service	Chonburi	SEW-EURODRIVE (Thailand) Ltd. 700/456, Moo.7, Donhuaroh Muang Chonburi 20000	Tel. +66 38 454281 Fax +66 38 454288 sewthailand@sew-eurodrive.com https://www.sew-eurodrive.co.th
Tunisia			
Sales	Tunis	T. M.S. Technic Marketing Service Zone Industrielle Mghira 2 Lot No. 39 2082 Fouchana	Tel. +216 79 40 88 77 Fax +216 79 40 88 66 http://www.tms.com.tn tms@tms.com.tn

Turkey			
Assembly Sales Service	Kocaeli-Gebze	SEW-EURODRIVE Ana Merkez Gebze Organize Sanayi Böl. 400 Sok No. 401 41480 Gebze Kocaeli	Tel. +90 262 9991000 04 Fax +90 262 9991009 http://www.sew-eurodrive.com.tr sew@sew-eurodrive.com.tr
Ukraine			
Assembly Sales Service	Dnipropetrovsk	SEW-EURODRIVE, LLC Robochya str., bld. 23-B, office 409 49008 Dnipro	Tel. +380 56 370 3211 Fax +380 56 372 2078 http://www.sew-eurodrive.ua sew@sew-eurodrive.ua
United Arab Emirates			
Drive Technology Center	Dubai	SEW-EURODRIVE FZE PO Box 263835 Jebel Ali Free Zone – South, P.O. Box Dubai, United Arab Emirates	Tel. +971 (0)4 8806461 Fax +971 (0)4 8806464 info@sew-eurodrive.ae
Uruguay			
Assembly Sales	Montevideo	SEW-EURODRIVE Uruguay, S. A. Jose Serrato 3569 Esquina Corumbe CP 12000 Montevideo	Tel. +598 2 21181-89 Fax +598 2 21181-90 sewuy@sew-eurodrive.com.uy
USA			
Production Sales Service	Southeast Region	SEW-EURODRIVE INC. 1295 Old Spartanburg Highway P.O. Box 518 Lyman, S.C. 29365	Tel. +1 864 439-7537 Fax Sales +1 864 439-7830 Fax Production +1 864 439-9948 Fax Assembly +1 864 439-0566 Fax Confidential/HR +1 864 949-5557 http://www.seweurodrive.com cslyman@seweurodrive.com
Assembly Sales Service	Northeast Region	SEW-EURODRIVE INC. Pureland Ind. Complex 2107 High Hill Road, P.O. Box 481 Bridgeport, New Jersey 08014	Tel. +1 856 467-2277 Fax +1 856 845-3179 csbridgeport@seweurodrive.com
	Midwest Region	SEW-EURODRIVE INC. 2001 West Main Street Troy, Ohio 45373	Tel. +1 937 335-0036 Fax +1 937 332-0038 cstroy@seweurodrive.com
	Southwest Region	SEW-EURODRIVE INC. 202 W. Daniieldale Rd. DeSoto, TX 75115	Tel. +1 214 330-4824 Fax +1 214 330-4724 csdallas@seweurodrive.com
	Western Region	SEW-EURODRIVE INC. 30599 San Antonio St. Hayward, CA 94544	Tel. +1 510 487-3560 Fax +1 510 487-6433 cshayward@seweurodrive.com
	Wellford	SEW-EURODRIVE INC. 148/150 Finch Rd. Wellford, S.C. 29385 SEW-EURODRIVE INC. 220 Finch Rd. Wellford, S.C. 29385-9630	Tel. +1 864 439-7537 Fax +1 864 661 1167 IGOrders@seweurodrive.com
Additional addresses for service provided on request!			
Vietnam			
Sales	Ho Chi Minh City	SEW-EURODRIVE PTE. LTD. RO at Hochim- inh City Floor 8, KV I, Loyal building, 151-151 Bis Vo Thi Sau street, ward 6, District 3, Ho Chi Minh City, Vietnam	Tel. +84 937 299 700 huytam.phan@sew-eurodrive.com
	Hanoi	MICO LTD Quảng Trị - North Vietnam / All sectors except Construction Materials 8th Floor, Ocean Park Building, 01 Dao Duy Anh St, Ha Noi, Viet Nam	Tel. +84 4 39386666 Fax +84 4 3938 6888 nam_ph@micogroup.com.vn http://www.micogroup.com.vn
Zambia			
Representation: South Africa			

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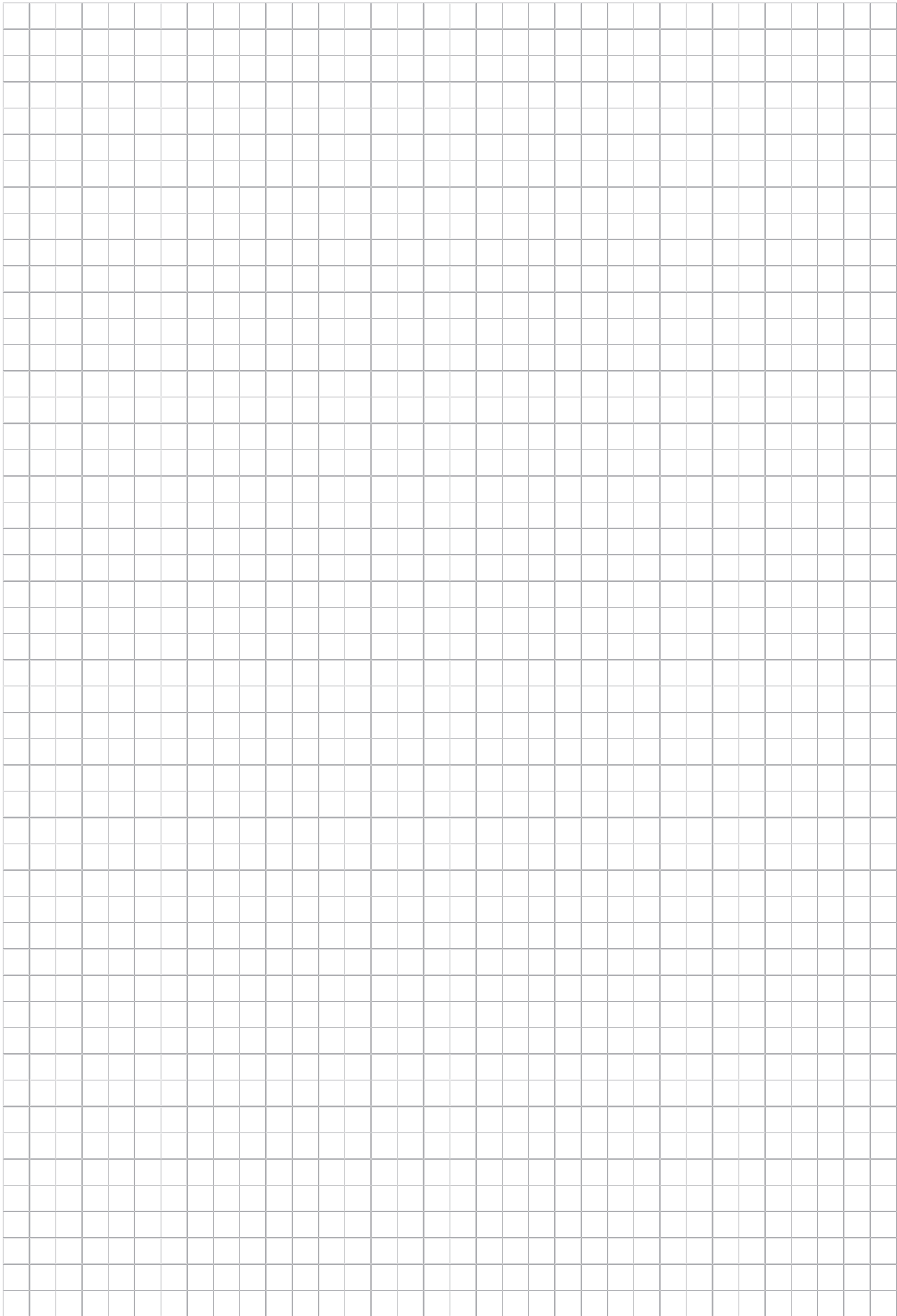
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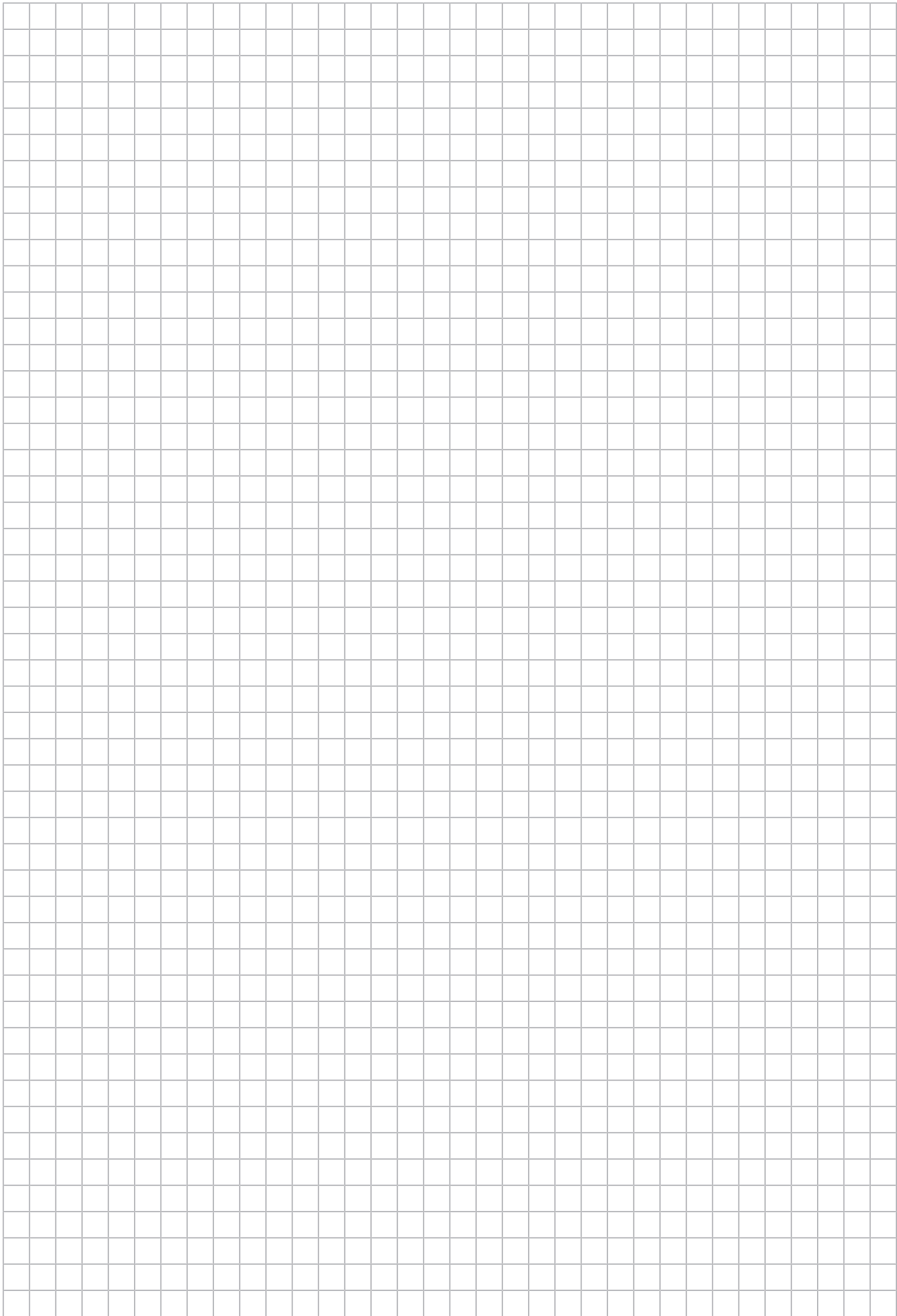
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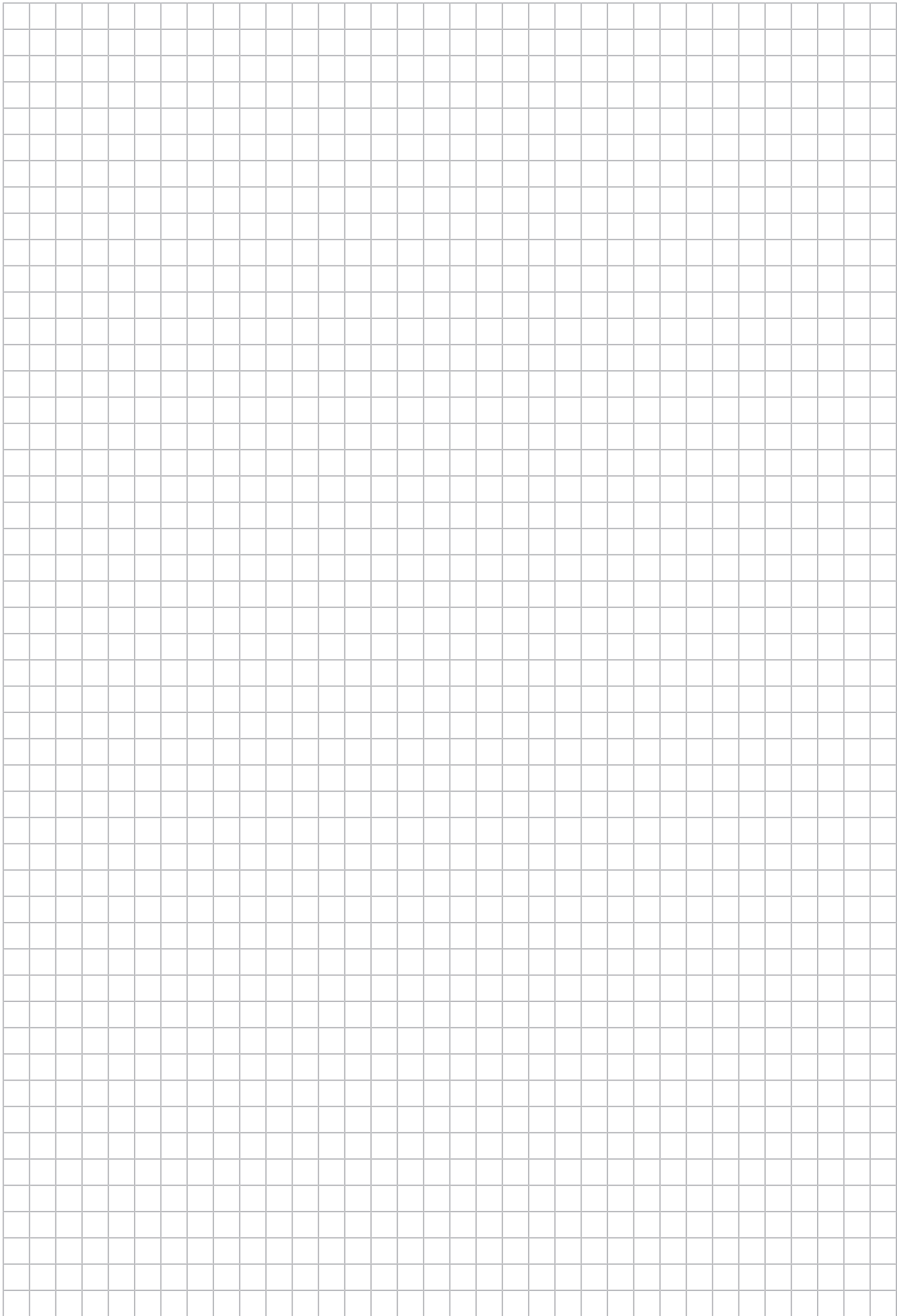
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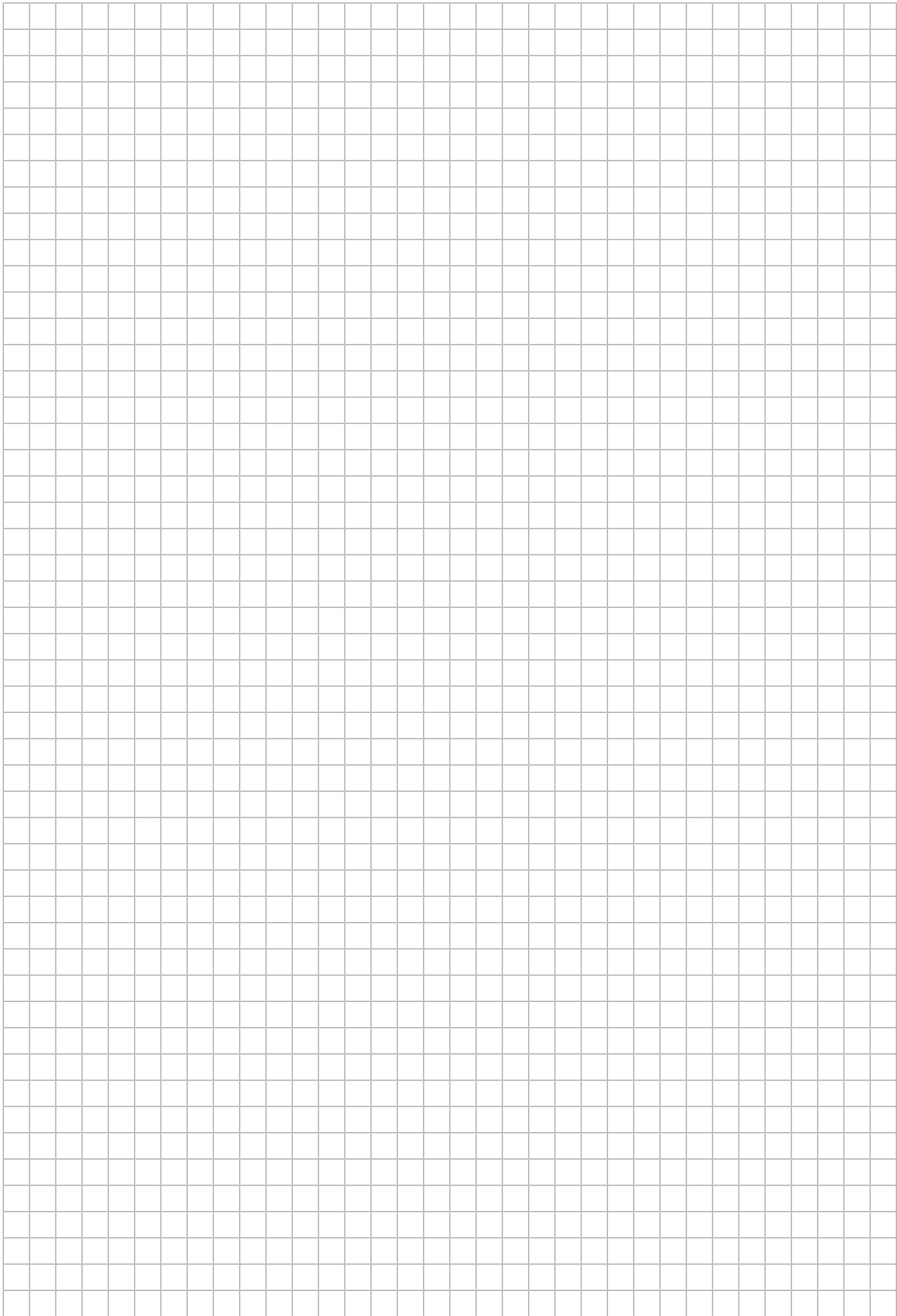
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SEW-EURODRIVE
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SEW
EURODRIVE

SEW-EURODRIVE GmbH & Co KG
Ernst-Blickle-Str. 42
76646 BRUCHSAL
GERMANY
Tel. +49 7251 75-0
Fax +49 7251 75-1970
sew@sew-eurodrive.com
→ www.sew-eurodrive.com