



**SEW**  
**EURODRIVE**

# Operating Instructions



Application controller  
**MOVIPRO® PHE..B-A15-.1X0B1A-00/000**



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## 1 General information

### 1.1 How to use this documentation

This documentation is an integral part of the product. The documentation is intended for all employees who perform assembly, installation, startup, and service work on the product.

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

### 1.2 Structure of the safety notes

#### 1.2.1 Meaning of signal words

The following table shows the grading and meaning of the signal words for safety notes.

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

#### 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 hazard.

#### Meaning of the hazard symbols

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

| Hazard symbol | Meaning        |
|---------------|----------------|
|               | General hazard |

| Hazard symbol   | Meaning                                 |
|---|---|
|  | 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 hazard.

## 1.3 Rights to claim under limited warranty

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

## 1.4 Exclusion of liability

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

## **1.5 Product names and trademarks**

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

## **1.6 Copyright**

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## 2 Safety notes

### 2.1 Preliminary information

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

The following safety notes are primarily concerned with the use of the unit described in these operating instructions. If you use other SEW components, also refer to the safety notes for these particular components in the corresponding documentation.

Please also observe additional safety notes provided in applicable chapters of this document.

### 2.2 General information



#### ▲ WARNING

Depending on its enclosure, the unit may have live, uninsulated as well as moving or rotating parts and hot surfaces during operation.

Severe or fatal injuries.

- All work related to transport, storage, setup/installation, connection, startup, maintenance and repair may only be performed by trained specialists in observance of:
  - The relevant detailed documentation
  - The warning and safety signs on the unit
  - All other relevant project planning documents, operating instructions and wiring diagrams
  - The specific regulations and requirements for the system
  - The national/regional regulations governing safety and accident prevention
- Never install damaged products.
- Submit a complaint to the shipping company immediately in the event of damage.

Removing required covers without authorization, improper use or incorrect installation and operation may result in severe injury to persons, or damage to machinery.

Refer to the following sections for more information.

## 2.3 Target group

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 servicing of the product, who possess the following qualifications:

- Training in mechanical engineering, e.g. as a mechanic or mechatronics technician (final examinations must have been passed).
- They are familiar with this documentation.

Any electronic work may only be performed by adequately qualified electricians. 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:

- Training in electrical engineering, e.g. as an electronics technician or mechatronics technician (final examinations must have been passed)
- They are familiar with this documentation.

In addition to that, these persons must be familiar with the relevant safety regulations and laws, especially with the requirements, especially with the requirements of the standards, directives and laws specified in this documentation. The above-mentioned persons must have the express authorization of the company to operate, program, configure, label and ground units, systems and circuits in accordance with the standards of safety technology.

All work in the areas of transportation, storage, operation and waste disposal must be carried out by persons who are trained appropriately.

## 2.4 Designated use

The device is intended for installation in electrical plants or machines. The device can be used in mobile operation in industrial and commercial plants for the operation of AC asynchronous motors with squirrel cage rotor. The motors must be suitable for operation with inverters. Do not connect any other loads to the device. The device can take on control and communication tasks.

In case of installation in electrical systems or machines, startup of the device (i.e. start of designated operation) is prohibited until it is determined that the machine meets the requirements stipulated in the EC Directive 2006/42/EC (machine guideline). Observe standard EN 60204-1. Startup (i.e. the start of designated use) is only permitted under observance of the EMC directive (2004/108/EC).

The unit may not be used to transport humans or animals. The unit may not be used to operate lifting applications or cranes.

The device meets the requirements stipulated in the low voltage directive 2006/95/EC. The standards contained in the declaration of conformity are applied to the device.

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

## 2.5 Other applicable documentation

Observe the corresponding documentation for all connected devices.

## 2.6 Transport

Immediately upon delivery, inspect the shipment for any damage that may have occurred in transit. Inform the shipping company immediately about any damage. You may need to suspend startup.

Observe the following notes when transporting the unit:

- Before transportation, cover the connections with the supplied protection caps.
- Only place the unit on the cooling fins or on the side without connectors during transportation.
- Ensure that the unit is not subject to mechanical impact during transportation.

If necessary, use suitable, sufficiently dimensioned handling equipment. Remove the securing devices used for transportation prior to startup.

Observe the information on climatic conditions as stated in chapter "Technical data".

## 2.7 Installation and assembly

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

Protect the unit from excessive strain. Ensure that components are not deformed and that insulation spaces are maintained, particularly during transportation. Electrical components must not be mechanically impaired or irreparably damaged.

The following applications are prohibited unless explicitly permitted:

- Use in potentially explosive atmospheres
- Use in areas exposed to harmful oils, acids, gases, vapors, dust, radiation, etc.

Observe the notes in chapter "Mechanical installation".

## 2.8 Electrical connection

Observe applicable national accident prevention regulations when working on a live unit.

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

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

Necessary preventive measures for the unit are:

| Type of power transmission | Protective measure   |
|----------------------------|--|
| Direct power supply        | <ul style="list-style-type: none"> <li>Protective grounding</li> </ul> |

## 2.9 Safe disconnection

The unit meets all requirements for reliable isolation of power and electronics connections in accordance with EN 61800-5-1. All connected circuits must also meet the requirements for reliable isolation.

## 2.10 Startup/operation



### ▲ CAUTION

Danger of burns due to hot surfaces of the unit or connected options, e.g. braking resistors

Injury

- Provide for covers to secure hot surfaces.
- Install the protection devices according to the regulations.
- Check the protection devices on a regular basis.
- Let the unit and the connected options cool down before you start working on them.

Do not deactivate monitoring and protection devices even for a test run.

The unit may only be operated in a weather-protected production hall. The environment must be free of corrosive gases, conductive dust and salt mist.

When in doubt, switch off the unit whenever changes occur in relation to normal mode (e.g. increased temperatures, noise, oscillation). Determine the cause of the fault and consult SEW-EURODRIVE, if necessary.

Where required, systems in which such units are installed must be equipped with additional monitoring and protection devices in accordance with the respective applicable safety regulations, e.g. the law governing technical equipment, accident prevention regulations, etc.

Additional protective measures may be necessary for applications with increased hazard potential. You have to check the effectiveness of protection devices each time you change the configuration.

Connections which are not being used must be covered with the supplied protection caps during operation.

Do not touch live components or power connections immediately after disconnecting the unit from the voltage supply because some capacitors may still be charged. Adhere to a minimum switch-off time of 10 minutes. Observe the corresponding labels on the unit.

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

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

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

## 2.11 Inspection/maintenance



### **▲ WARNING**

Danger of electric shock due to exposed, live parts in the unit.

Severe or fatal injuries.

- Never open the unit.
  - Only SEW-EURODRIVE is authorized to carry out repairs.
-

### 3 Unit structure

#### 3.1 Type designation

The type designation comprises the following characteristic unit data:

|           |   |
|-----------|---|
| <b>P</b>  | <b>Product range:</b><br>P = MOVIPRO®   |
| <b>H</b>  | <b>Control type:</b><br>H = Drive controller  |
| <b>E</b>  | <b>Housing type:</b><br>E = Compact housing   |
| <b>.</b>  | <b>Motor interface:</b><br>1 = HAN® Q8 / 0<br>2 = HAN® 10E                            |
| <b>.</b>  | <b>Signal interfaces:</b><br>1 = Basic variant 1<br>2 = Basic variant 2               |
| <b>B</b>  | <b>Variant:</b><br>B = Basic  |
| <b>-</b>  |   |
| <b>A</b>  | <b>Type of power supply:</b><br>A = Conductor rail                                    |
| <b>15</b> | <b>Maximum unit input power:</b><br>15 = 1.5 kW                                       |
| <b>-</b>  |   |
| <b>.</b>  | <b>Brake control:</b><br>2 = Control for 2-wire brake<br>3 = Control for 3-wire brake |
| <b>1</b>  | <b>Operation:</b><br>1 = With operating switch  |
| <b>X</b>  | <b>External axis</b><br>X = Connection of external axis                               |
| <b>0</b>  | <b>Type of external axis:</b><br>0 = Without external axis                            |
| <b>B1</b> | <b>Communication:</b><br>B1 = Half-wave / binary control                              |
| <b>A</b>  | <b>Generation:</b><br>A = 1. Generation   |
| <b>-</b>  |   |

|    |   |
|----|---|
| 00 | <b>Version:</b><br>00 = Series          |
| /  |   |
| 0  | <b>Option 1:</b><br>0 = Without option  |
| 00 | <b>Option 2:</b><br>00 = Without option |

### 3.2 Scope of delivery

The scope of delivery includes the following components:

| Component  |
|--|
| Application controller MOVIPRO® PHE..B-A15-.1X0B1A-00/000                              |
| Protective covers for motor and signal connections and the braking resistor connection |

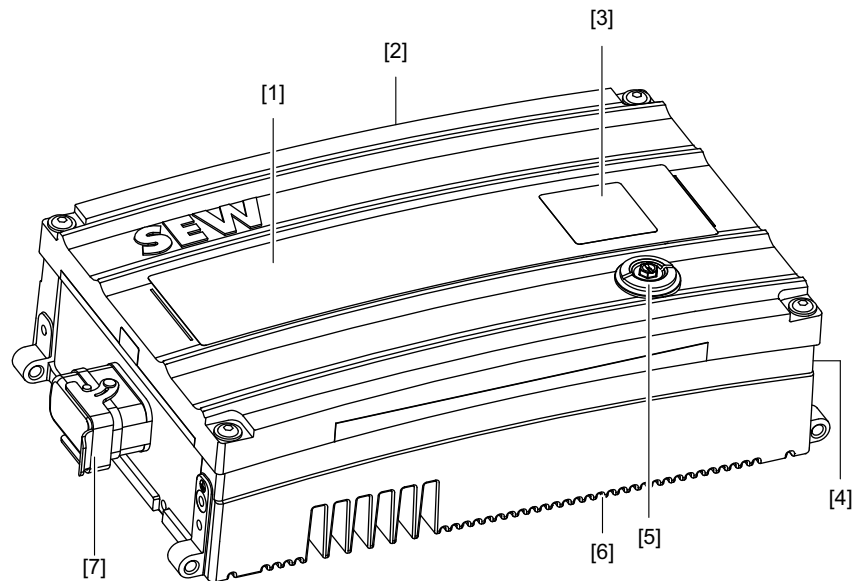
### 3.3 Short designation

The following short designations are used in this documentation:

| Unit  | Short designation |
|---|-------------------|
| Application controller MOVIPRO® PHE..B-A15-.1X0B1A-00/000 | Unit              |

### 3.4 Basic unit

The following figure gives an overview of the main parts of the unit and the location of the identifiers:

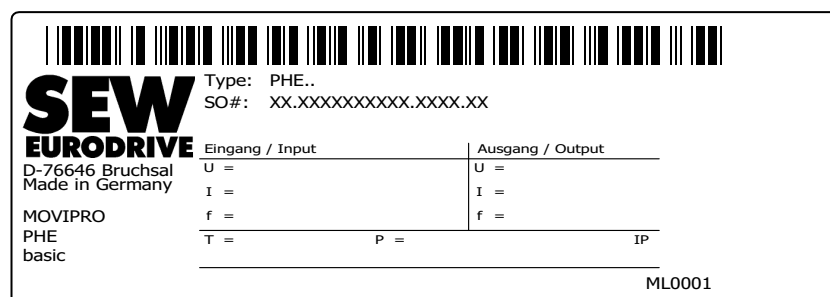


9333973259

- [1] Status and error code sticker
- [2] Nameplate
- [3] Status display and infrared interface
- [4] Connection block A (connections depend on the unit variant)
- [5] Service interface
- [6] PE connection
- [7] Motor connection (connection depends on the unit variant)

### 3.5 Nameplate

Each unit has a nameplate that provides important information. The following figure shows an example of a nameplate:



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The nameplate lists the following information:

- Type designation (*Type*)
- Production number (*SO#*)

- Voltage ( $U$ )
- Current ( $I$ )
- Frequency ( $f$ )
- Ambient temperature ( $T$ )
- Rated output power ( $P$ )
- Degree of protection ( $IP$ )

### 3.6 Accessories

#### INFORMATION



The scope of delivery does not include accessories, such as installation and mounting material or connection cables.

#### INFORMATION



The following prerequisites must be fulfilled to ensure fault-free operation:

- The M12 parameter memory must be plugged in.
- For unit variant 1, you must connect the jumper plug stated in the table below or a suitable external operating switch at the connection for external operating switches (X1511). For detailed information, refer to chapter "X1551: DC 24 V connection for external operating switches" (→ 36).

The accessories available for this unit are listed below. If you are not sure which accessories you need, the SEW-EURODRIVE staff will be glad to help you with your selection.

|  |          |
|--|----------|
| EMS angle bracket  | 28218248 |
| For more information, refer to "MOVIPRO® EMS angle bracket fastening set."   |          |
| Jumper plug  | 11747099 |
| M12 parameter memory   | 17976340 |
| USB/M12 adapter cable  | 19104979 |
| For more information, refer to the "MOVIVISION® EMS basic" manual.   |          |
| USB11A interface adapter (USB to RS485)  | 08248311 |
| BW200-003 / k1.5   | 08282919 |
| BW200-005 / k1.5   | 08282838 |
| For information on the braking resistors, refer to chapter "Technical data / Output data".                                   |          |
| PZO00A-BFBIR0-000S-00 keypad   | 17976014 |
| For detailed information, refer to the "MOVIPRO® Accessories – PZO00A-BFBIR0-000S-00 Remote Control" operating instructions. |          |
| Sensor/actuator box 4/3-L-M12-M8   | 19111142 |

## **4 Mechanical installation**

### **4.1 Requirements**



#### **▲ WARNING**

Risk of crushing if the load falls

Severe or fatal injuries

- Do not stand under the load.
- Secure the area in which the mechanical installation is to take place.



#### **NOTICE**

Danger of collision.

Damage to plant and unit components

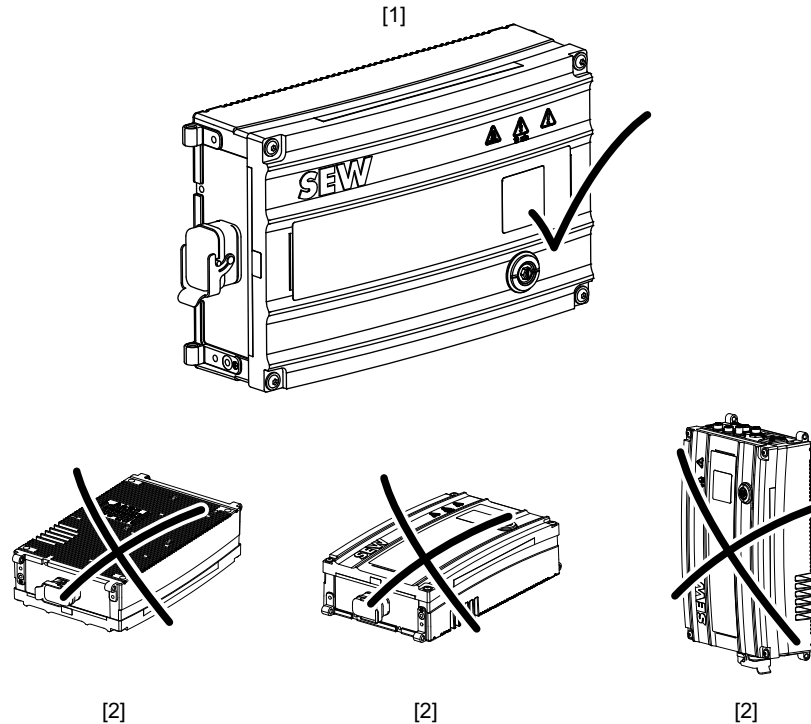
- Always position the unit so that it will not collide with other components, design elements or persons along the travel distance.

The following preconditions must be fulfilled for the mechanical installation.

- Trained specialists perform the installation.
- The information provided in the technical data and the permitted conditions for the operating location of the unit are observed.
- The minimum clearance and distance and the required gaps for using a mounting plate are complied with; see the "Minimum clearance" section.
- The unit is only mounted using the intended mounting options.
- The selection and dimensioning of the mounting and locking elements are in line with the applicable standards, the technical data of the units and the local requirements.
- The bore dimensions are calculated in line with the respective type of fixture. See the following sections.
- The mounting and locking elements fit into the existing bores, threads and counter-sinks.
- All display and actuator elements are visible and accessible after installation.

### 4.1.1 Mounting position

The following figure shows permitted and not permitted mounting positions:



12012232715

[1] Permitted vertical mounting position

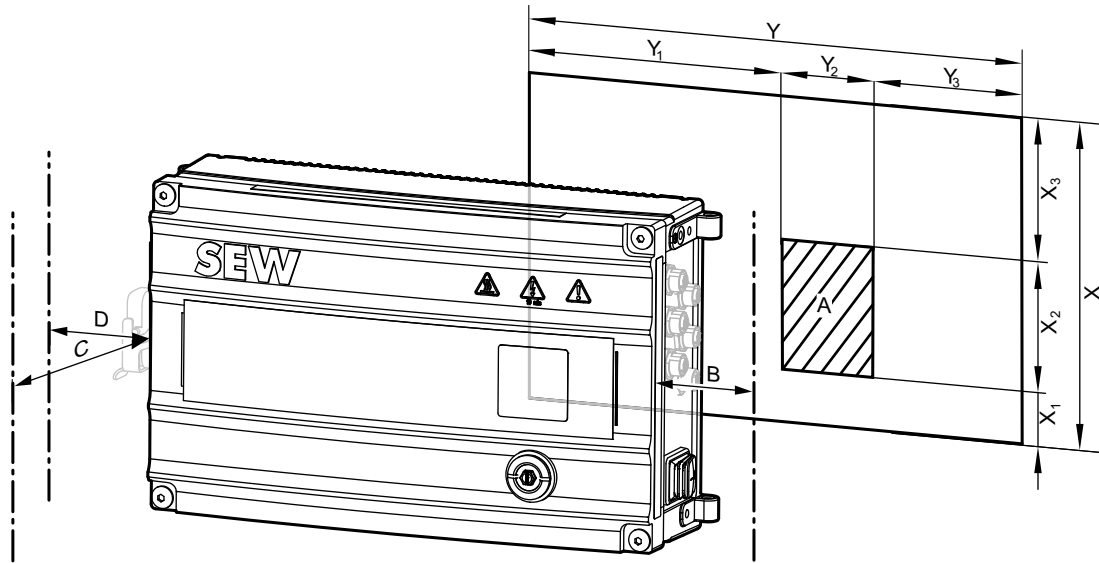
[2] Mounting positions that are not permitted

### 4.1.2 Minimum clearance

#### INFORMATION



- Observe the required minimum clearance for:
  - the connection of the cables and plug connectors
  - Handling of the display, diagnostics and operating elements
  - heat convection at the level of the cooling fins, if installed
- Refer to the dimension drawing in the chapter "Technical data" for information on the required space.



9718375051

The following table lists the minimum distances and clearances. Housing dimensions are listed in chapter "Technical Data".

| Clearance                          | Function   | Size   |
|------------------------------------|--|--|
| <b>A: Back of the housing</b>      | Cut-out for contacts of the contact conductors   | $X_1 = 19.5 \text{ mm}$ , $X_2 = 81 \text{ mm}$ ,<br>$X_3 = 102.5 \text{ mm}$<br>$Y_1 = 175 \text{ mm}$ , $Y_2 = 57 \text{ mm}$ ,<br>$Y_3 = 91 \text{ mm}$ |
| <b>B: to the side on the right</b> | Room for connection cables, plug connectors, mounted elements and actuator elements, e.g. maintenance switch | $> 120 \text{ mm}$   |
| <b>C: Housing cover</b>            | Space for display elements, diagnostics elements and actuator elements, e.g. service unit                    | see dimension drawing  |
| <b>D: to the side on the left</b>  | Room for connection cables, plug connectors, mounted elements and actuator elements, e.g. maintenance switch | $> 120 \text{ mm}$   |

#### 4.1.3 Cooling

Note the following:

- Avoid heat sources in the immediate proximity of the unit.

### 4.2 Mounting



#### ⚠ WARNING

Electric shock from live connections

Severe or fatal injuries

- Avoid contact with the feed plug X1261 to the rear of the unit using constructive measures.



#### NOTICE

External force too high

Damage to the thread or the screw


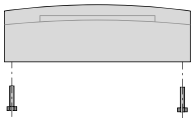
- Do not exceed the maximum tightening torque of 3.1 Nm - 3.5 Nm (27 - 31 in-lb).

Use the accessories that are available from SEW-EURODRIVE for mounting:

- "Mounting kit with EMS angle brackets", part number 28218248

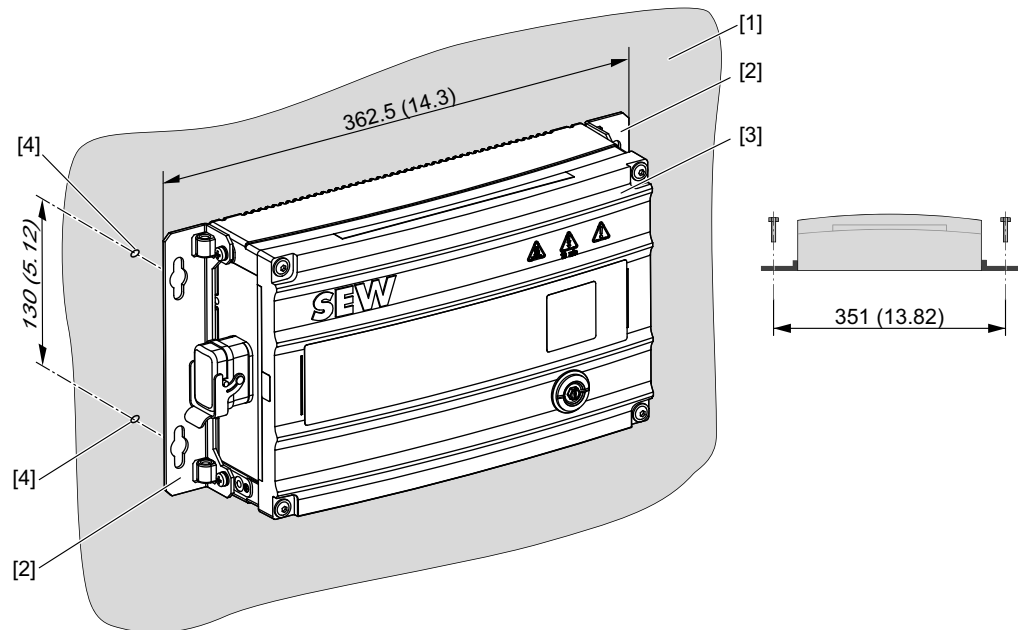
The included brackets are mounted to the narrow sides of the unit.

Use one of the following mechanical mounting options:

| Variant |   |   | Mounting  |
|---------|---|---|---|
| 1       |  | Fixed angle brackets  | <ul style="list-style-type: none"> <li>• 4 × screwed</li> </ul> |
| 2       |  | Tapped holes on the back of the unit<br>(see chapter "Technical data"). | <ul style="list-style-type: none"> <li>• 4 × screwed</li> </ul> |

#### 4.2.1 Fixed angle brackets

The following figure shows the main mounting elements and dimensions:



11936279947

- [1] Mounting surface
- [2] Mounting bracket
- [3] Unit
- [4] Tapped holes

#### Mounting angle bracket

Required material:

- EMS angle bracket (28218248) mounting set with:
  - 2 x angle bracket
  - 4 x M5 x 16 screw

1. Mount the angle bracket to the connection sides of the unit with the M5 screws via the available tapped holes on the unit.

**Mounting the unit**

1. Refer to the dimension sheet for the distances regarding the boreholes for mounting the angle bracket.
2. Mark the boreholes at the installation location.
3. Cut 2 M5 threads for the hinges at the marked locations on each side.
4. Use suitable locking devices, e.g. lock washer according to DIN 7980 and washers according to DIN EN ISO 7090.
5. Mount the unit on the angle brackets with 2 suitable M5 screws with the required length on each side, e.g. pan cap screws according to DIN EN ISO 4762.

**4.2.2 Tapped holes on the rear of the unit**

The unit features 4 tapped holes on the rear of the unit. Refer to the dimension drawing in the chapter "Technical data" for information on the dimensions for mounting using tapped holes.

## **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.

#### **5.1.1 Information on PE connection**



##### **⚠ WARNING**

Electric shock due to incorrect connection of PE

Severe or fatal injuries

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

Leakage currents  $\geq 3.5$  mA can occur during normal operation. To meet the requirements of EN 61800-5-1, observe the following notes:

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

Refer to chapter "Preventive measures against electrical hazards" (→ 26) for more information on the PE connection.

#### **5.1.2 Residual current device**



##### **⚠ WARNING**

Electric shock due to incorrect RCD type.

Severe or fatal injuries.

- The unit can cause direct current in the protective earth. In cases where an residual current device (RCD) is used for protection against direct or indirect contact, only an RCD of type B on the power supply side of the frequency inverter is permitted.
- Do not use a conventional RCD as a protective device. Universal current-sensitive RCDs are permitted as a protective device. During normal operation of the unit, earth-leakage currents of  $> 3.5$  mA may occur.
- SEW-EURODRIVE recommends that you do not use RCDs. However, if a residual current device is stipulated for direct or indirect protection against contact, observe the above note.
- Install the fuses at the beginning of the power supply cables behind the supply bus junction.

**Line fuse types**

Line protection types in operation classes gL, gG:

- Rated fusing voltage  $\geq$  rated line voltage
- Depending on the frequency inverter utilization, the rated fusing current must be designed for 100% of the frequency rated inverter current.

Line protection switches with characteristics B, C:

- Power circuit breaker rated voltage  $\geq$  rated mains voltage
- The rated voltage of the line protection switch must be 10% above the frequency inverter current.

**5.2 Low-voltage supply systems**

The unit is only suitable and approved for operation on the following systems:

- TN and TT systems with directly grounded star point

**5.3 Contactors**

Only use contactors in utilization category AC-3 (EN 60947-4-1) as line and brake contactors.

**5.4 Electromagnetic compatibility (EMC)****INFORMATION**

The unit can cause EMC interference within the permitted limit range according to DIN EN 61800-3.

This unit is a drive system of the category C3 (see DIN EN 61800-3).

---

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

**5.5 Cable routing**

Observe the following when installing the cables:

- Use suitable cables to connect power supply and communication. Refer to chapter "Electrical connections" for descriptions of connections.
- Route power cables and signal cables in separate cable ducts.
- Maintain the greatest possible distance between power cables and signal cables.
- Avoid using long cables running parallel to one another.

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

## 5.6 Installation altitude higher than 1000 m above sea level

Units with a system voltage of phase to earth of 300 V or phase to phase of 500 V can be used at an altitude of more than 1000 m above sea level up to a maximum of 4000 m above sea level under the following conditions:

- The nominal continuous power is reduced due to the reduced cooling above 1000 m, see chapter "Technical data".
- Above 2000 m asl, the air and creeping distances are only sufficient for overvoltage class 2. If the installation calls for overvoltage class 3, you will have to install additional external overvoltage protection to limit overvoltage peaks to 2.5 kV phase-to-phase and phase-to-ground.
- If safe electrical disconnection is required, it must be implemented outside the unit at altitudes of more than 2000 m above sea level (safe electrical disconnection in accordance with EN 61800-5-1 and EN 60204-1).
- Overvoltage classes according to EN 60664

## 5.7 Shielding

### Required material:

Use shielded power supply and electronics cables.

1. Connect the shield and make sure it is grounded over a wide area at both ends.
2. When using cables with multiple shielding, you also have to ground the inner shields on both ends over a wide area.

### Required documents:

For external bus connections, refer to the bus-specific installation instructions.

## 5.8 Unit output



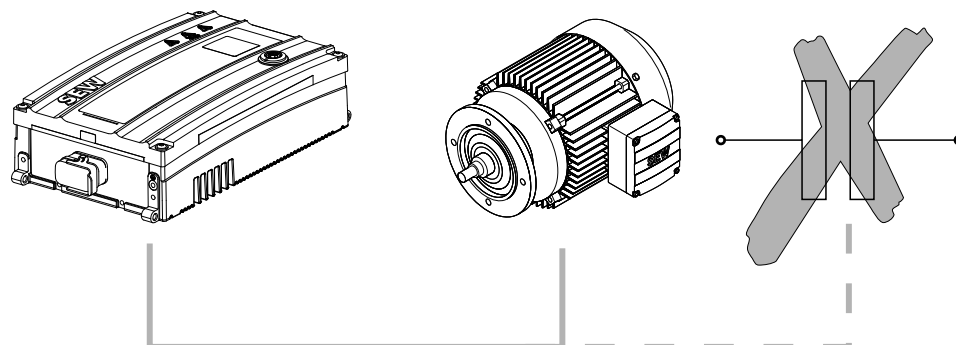
### NOTICE

Damage to the unit if the unit output is subjected to capacitive loads.

Damage to the units

- Only connect ohmic/inductive loads.
- Never connect capacitive loads.

The unit output must not be connected to capacitive loads. A capacitive load occurs, for example, when very long cables are used to connect the motor.



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The motor supply cable must not exceed a length of 3 m (9.8 ft).

### 5.9 Motor types



#### NOTICE

Danger owing to faulty triggering of motor monitoring

Damage to property

- Only connect motors with thermostat (TH) to the unit.

The unit is optimized for the following SEW motor types:

- DRS71S4 with TH
- DRS71M4 with TH
- DRE80M4 with TH
- DRE90M4 with TH

### 5.10 Protective measures against electrical hazards

#### 5.10.1 PE connection



#### ▲ WARNING

Electric shock due to incorrect connection of PE or equipotential bonding.

Severe or fatal injuries.

- Comply with the installation notes.

#### Direct power supply

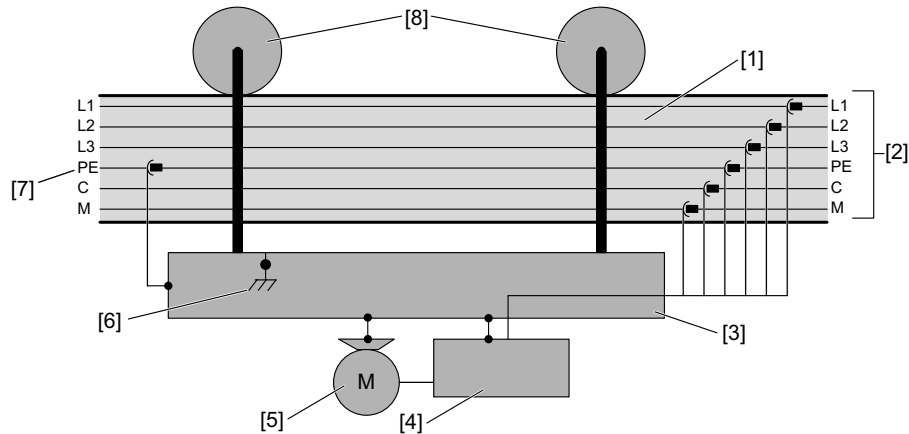
In mobile systems with direct power supply, all electrical equipment such as motor, application controller, etc., must be equipped with protective grounding (PE).

Comply with the following rules:

- Ground the unit with the shortest possible route (PE).
- Use a green/yellow grounding cable.

The protective grounding is ensured via 2 mobile pick-ups, also known as sliding contacts.

The following figure shows a sample mobile system with direct power supply via sliding contacts:



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- [1] Stationary system section
- [2] Power supply
- [3] Vehicle support frame
- [4] Application controller
- [5] Motor
- [6] Vehicle mass
- [7] PE
- [8] Wheels

### 5.10.2 Unit connection point for grounding

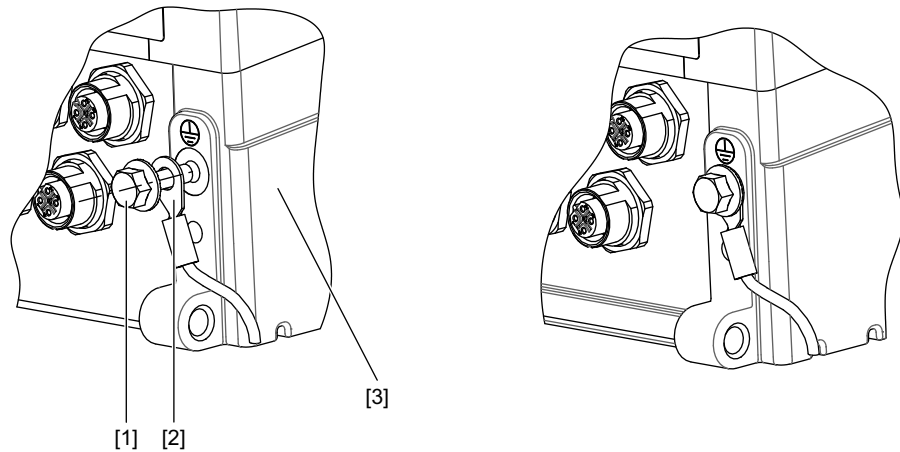
#### Unit without braking resistor

The connection point for grounding is indicated with a  $\oplus$  symbol on the housing.

Proceed as follows to attach the grounding:

1. Screw the PE connection cable [2] to the housing [4] using a M5 × 10 [1] screw.

The following figure shows the positions of the connection point and the sequence in which to install the individual parts:

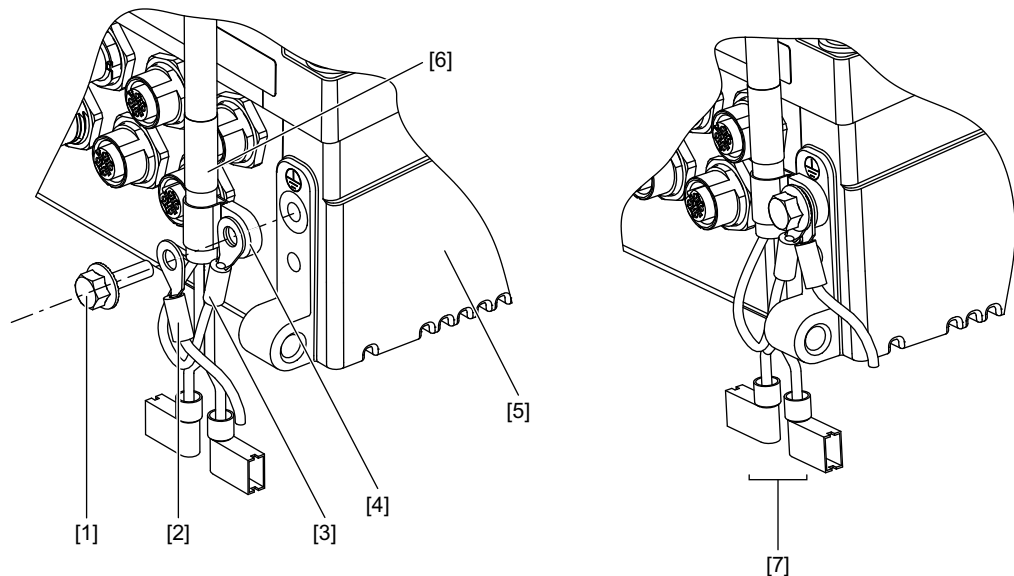


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#### Unit with braking resistor

The connection point for grounding / equipotential bonding is indicated with a  $\oplus$  symbol on the housing.

The following figure shows the position of the connection point and the sequence in which to install the individual parts:



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### *Preparing the braking resistor cable*

Proceed as follows to install the braking resistor cable:

1. Remove the plastic sheath of the braking resistor cable [6] over a length of at least 260 mm.
2. Remove the shield of the braking resistor cable [6] over a length of at least 30 mm.
3. Fold back the braided shield over the plastic sheath of the braking resistor cable [6].
4. Fix the braided shield in position with heat shrink tubing. Make sure that at least 20 mm of the braided shield remain blank.
5. Shorten the PE connection cable of the braking resistor [3] to at least 85 mm.
6. Crimp the ring cable lug for M5 to the PE connection cable of the braking resistor [3].
7. Crimp a suitable female push-on connector (6.3 mm) to each of the remaining conductors of the braking resistor [7].

### *Installing the PE connection*

Proceed as follows to attach the grounding:

1. Guide the shield terminal [4] over the braking resistor cable [6] and place the shield terminal [4] on the braided shield.
2. Screw the PE connection cable of the braking resistor [3], the PE connection cable [2] of the equipotential bonding and the shield terminal [4] on the housing with a M5 × 10 [1] screw. Ensure that the braided shield of the braking resistor cable is completely surrounded by the shield terminal.
3. Plug the brown conductor of the braking resistor into the push-on connector +R of the stationary converter X1261.
4. Plug the white conductor of the braking resistor into the push-on connector -R of the stationary converter X1261.

## 6 Electrical connections

### 6.1 Terminal strips



#### ▲ WARNING

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

- Disconnect all supply voltages.
- Make sure that the unit is de-energized.
- Never plug or unplug the plug connectors while they are energized.



#### ▲ WARNING

Electric shock due to live contacts and conductors

The operating switch only switches off the internal 24 V supply for the frequency inverter.

- Only use the operating switch to stop the drive during operation.
- Do not use the operating switch for work on live parts.

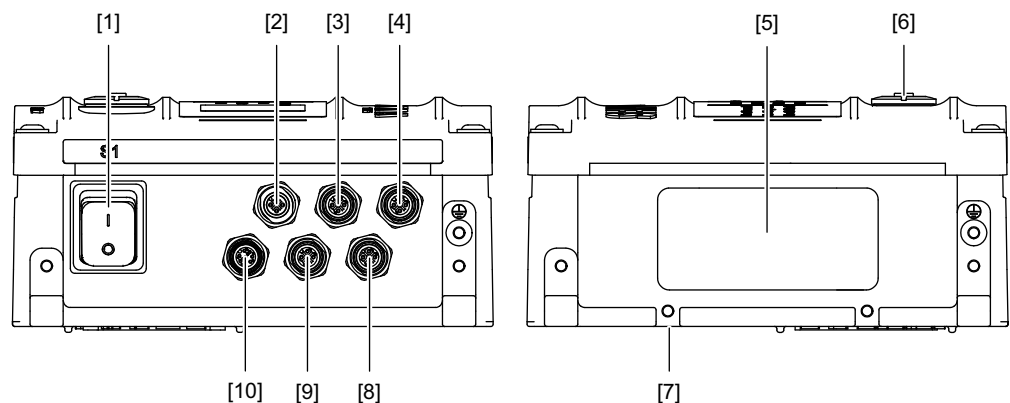


#### ▲ WARNING

Unintentional start up of the motor

The operating switch switches off the internal 24 V supply for the frequency inverter only at one pole.

- Only use the operating switch to stop the drive during operation.
- Do not use the operating switch for safety-related stopping of the drive.



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|     |         |   |
|-----|---------|---|
| [1] | S1      | Operating switch  |
| [2] | X4441   | M12 parameter memory                                    |
| [3] | X5002_2 | Digital inputs – communication and control unit         |
| [4] | X5002_1 | Digital inputs/outputs – communication and control unit |
| [5] | X2011   | Unit variant 1 Motor with brake control                 |
|     | X2013   | Unit variant 2 Motor with brake control                 |
| [6] | X4022   | RS485 interface – service                               |

- [7] X1261 AC 400 V contact conductor connection
- [8] X4011 RS485 interface – external
- [9] X1551 Unit variant 1 DC 24 V connection for external operating switches
- X5002\_3 Unit variant 2 Digital inputs – communication and control unit
- [10] X5003 Unit variant 1 Digital inputs – communication and control unit
- X5002\_4 Unit variant 2 Digital inputs – communication and control unit

## 6.2 Designation key

The designations of the connections are based on the following structure: *Xabbc\_mn*.  
The individual positions represent the following information:

|           |   |
|-----------|---|
| <b>X</b>  | <b>Terminal</b>   |
| <b>a</b>  | <b>Group</b><br>1 = Power input<br>2 = Power output<br>3 = Encoder<br>4 = Bus<br>5 = Inputs and outputs |
| <b>bb</b> | <b>Function</b><br>Function of the connection within a group  |
| <b>c</b>  | <b>Type</b><br>Wiring diagram of the connection within a function                                       |
| –         |   |
| <b>m</b>  | <b>Group number (optional)</b><br>groups connections with the same signal                               |
| <b>n</b>  | <b>Sequence number (optional)</b><br>for several connections in one group                               |

### 6.3 Using prefabricated cables

SEW-EURODRIVE uses prefabricated cables for certifications, type tests and approval of the units. The cables provided by SEW-EURODRIVE fulfill all requirements necessary to ensure that the unit and all connected components function properly. The units under consideration are always the basic units including all connected components and corresponding connection cables.

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

#### 6.3.1 Use of third-party cables

If third-party cables are used – even if these cables are technically equivalent – SEW-EURODRIVE will not accept any liability and cannot guarantee compliance with unit properties or that the unit will function correctly.

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

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

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

- IEC 60309
- IEC 61984
- IEC 60204

## 6.4 Cable structure

### 6.4.1 Designation

The cable design is specified as follows. The example is a cable with a (4X2X0.25) design.

|      |  |
|------|--|
| (    | Cable shield   |
| 4    | Number of core pairs (in twisted cables only)                  |
| X    |  |
| 2    | Number of cores  |
| X    | G - with green-yellow PE conductor<br>X - without PE conductor |
| 0.25 | Core cross section in mm <sup>2</sup>                          |
| )    | Cable shield   |
| +    | A plus sign is added to cores with other features.             |
| ...  |  |

### 6.4.2 Examples

The following examples illustrate the cable designation:

- **3G1.5:**  
Cable with 3 cores of 1.5 mm<sup>2</sup> each, one green-yellow cable
- **((2X2X0.25)+4G2.5):**  
Shielded hybrid cable with
  - 4 twisted-pair cables of 0.25 mm<sup>2</sup> each, shielded, and
  - 4 power cores of 2.5 mm<sup>2</sup> each, one green-yellow cable.

## 6.5 Representation of connections

The following wiring diagrams show the contact end of the connections.

## 6.6 X1261: AC 400 V contact conductor connection



### ⚠ WARNING

Electric shock from blank live connections.

Severe or fatal injuries.

- Use safe, insulated female push-on connectors for installation.
- To avoid coming into contact with unused male push-on connectors, you have to install the touch guard on unused male push-on connectors.



### ⚠ WARNING

Electric shock from live connections

Severe or fatal injuries

- Note the following points for selecting suitable female push-on connectors:
- Use safe, insulated female push-on connectors for installation.
- The installed female push-on connectors must comply with the standard DIN 46 245 part 3, DIN 46 247 part 3 or DIN 46 346 part 3.
- Use the female push-on connector only with the insulating housing specified by the manufacturer.
- Make sure that each female push-on connector is plugged in correctly and latched.
- The latching function of the female push-on connector cannot be guaranteed for multiple use. Therefore, use a new female push-on connector after single use.



### NOTICE

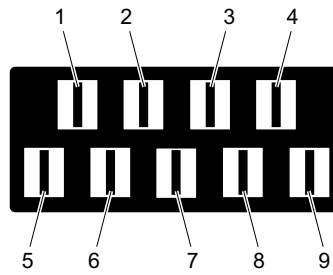
Damage caused by corrosion

Damage to connection X1261

- The push-on contacts of connection X1261 are accessible from the outside. Ensure that the push-on contacts do not come into contact with water or other corrosive substances.

The following table shows information about this connection:

| Function                              |
|---------------------------------------|
| AC 400 V contact conductor connection |
| Connection type                       |
| Male push-on connectors 6.3           |
| Wiring diagram                        |



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## Assignment

| No. | Name             | Function  |
|-----|------------------|---|
| 1   | +R               | Braking resistor (+)  |
| 2   | -R               | Braking resistor (-)  |
| 3   | PE               | PE connection   |
| 4   | M                | Signal output of controller   |
| 5   | L <sub>X/M</sub> | Line connection phase X / jumper to signal contact control<br>This phase is used for the signal output. |
| 6   | L <sub>Y</sub>   | Line connection phase Y   |
| 7   | L <sub>Z</sub>   | Line connection phase Z   |
| 8   | C2               | Reserved  |
| 9   | C1               | Control input   |

## 6.6.1 Connection recommendation

## INFORMATION



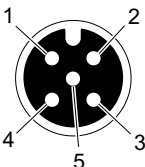
Phase L1, phase L2 or phase L3 can be connected to the control input C1 independent of phase L<sub>X/M</sub>. For more information, see the section "Technical data".

The phase that is connected to LX/M is output at the signal output. Select the connection assignment from the following recommendations depending on the desired signal phase:

| L <sub>X/M</sub> | L <sub>Y</sub> | L <sub>Z</sub> |
|------------------|----------------|----------------|
| L1               | L2             | L3             |
| L2               | L3             | L1             |
| L3               | L1             | L2             |

## 6.7 X1551: DC 24 V connection for external operating switches

The following table shows information about this connection:

| Function   |         |                                 |
|--|---------|---------------------------------|
| DC 24 V connection for external operating switches                                 |         |                                 |
| Connection type  |         |                                 |
| M12, 5-pole, female, A-coded   |         |                                 |
| Wiring diagram   |         |                                 |
|  |         |                                 |
| 9007201519557259   |         |                                 |
| Assignment   |         |                                 |
| No.  | Name    | Function                        |
| 1  | +24 V   | DC 24 V output                  |
| 2  | 0V24_SW | Input 0V24 reference potential  |
| 3  | 0V24    | Output 0V24 reference potential |
| 4  | +24V_SW | DC 24 V input                   |
| 5  | res.    | Reserved                        |

### 6.7.1 Connection component

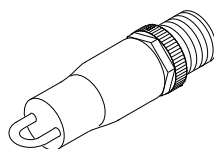
The following components are suitable for this connection:

#### Jumper plug

Part number 11747099

Structure: bridged 1+4 / 2+3

Connection: M12



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## 6.8 X2011: Motor with brake control



### NOTICE

Damage or malfunction due to motors with built-in brake rectifiers

Damage to the drive system or its environment

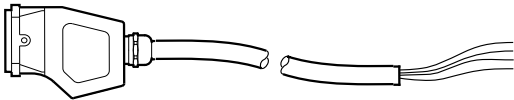

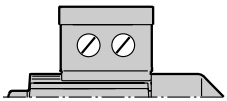
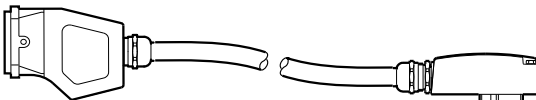

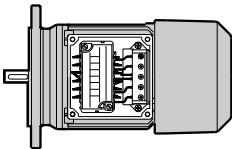
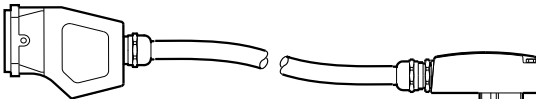

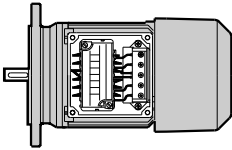
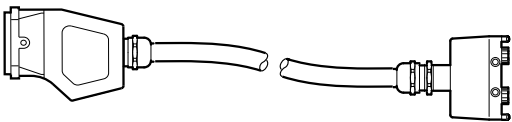
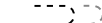
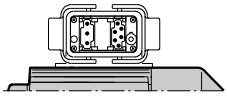
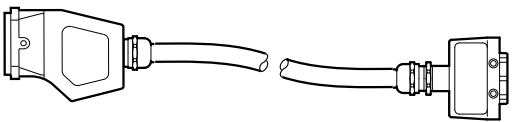
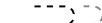
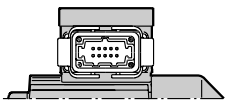
- You must not use motors with built-in brake rectifiers in conjunction with MOVIPRO® units.

The following table shows information about this connection:

| Function   |      |                               |
|--|------|-------------------------------|
| Power connection for motor with brake up to 4.0 kW |      |                               |
| Connection type                                    |      |                               |
| Han® Q 8/0, female                                 |      |                               |
| Wiring diagram                                     |      |                               |
| <p style="text-align: right;">9007201696170251</p> |      |                               |
| Assignment   |      |                               |
| No.  | Name | Function                      |
| 1  | U    | Motor phase U output          |
| 2  | 14   | SEW brake terminal 14 (white) |
| 3  | W    | Motor phase W output          |
| 4  | 15   | SEW brake terminal 15 (blue)  |
| 5  | TH   | Motor temperature sensor (+)  |
| 6  | 13   | SEW brake terminal 13 (red)   |
| 7  | V    | Motor phase V output          |
| 8  | TH   | Motor temperature sensor (–)  |
| PE   | PE   | PE connection                 |

## 6.8.1 Connection cable

The following table shows the cables available for this connection:

| Connection cable and component |   |  |               |  |
|--------------------------------|---|--|---------------|--|
| Power                          | Hybrid cable  | Length/<br>installation<br>type  | Cable<br>type | Drive  |
| Up to<br>2.2 kW<br>(IEC / UL)  | <b>Part number</b> 18125794<br><br>Han® Q 8/0                      Open (terminal<br>box connection<br>M4) | Variable<br>length<br>   | D/1.5         | DRS71<br>DRE80<br>DRE90<br>         |
|                                | <b>Part number</b> 18127703<br><br>Han® Q 8/0                      IS                                     | Variable<br>length<br>   |               | DRS71 ↘<br>DRE80 ↘<br>DRE90 ↘<br>  |
|                                | <b>Part number</b> 18127681<br><br>Han® Q 8/0                      IS                                    | Variable<br>length<br> |               | DRS71 △<br>DRE80 △<br>DRE90 △<br> |
|                                | <b>Part number</b> 18127711<br><br>Han® Q 8/0                      ABB8                                  | Variable<br>length<br> |               | DRS71<br>DRE80<br>DRE90<br>       |
|                                | <b>Part number</b> 18127738<br><br>Han® Q 8/0                      ABB8                                  | Variable<br>length<br> |               | DRS71<br>DRE80<br>DRE90<br>       |

## 6.9 X2011: Motor with brake control



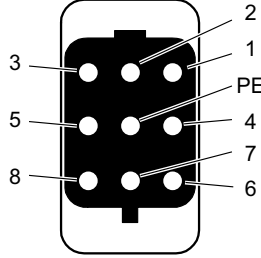
### NOTICE

Damage or malfunction due to motors with built-in brake rectifiers

Damage to the drive system or its environment

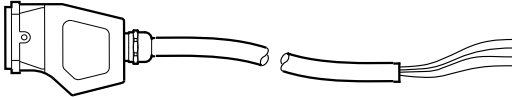

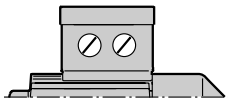
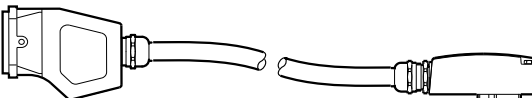

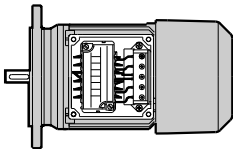
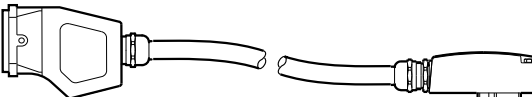

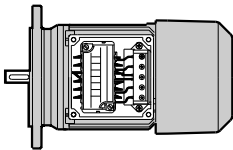
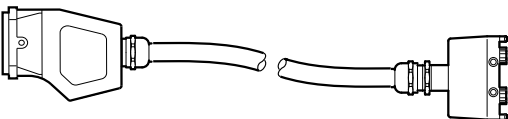

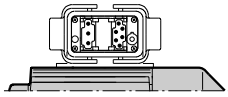
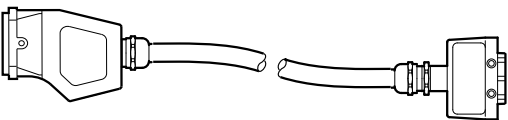

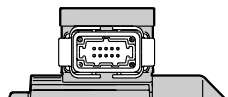
- You must not use motors with built-in brake rectifiers in conjunction with MOVIPRO® units.

The following table shows information about this connection:

| Function   |      |                               |
|--|------|-------------------------------|
| Power connection for motor with brake up to 4.0 kW   |      |                               |
| Connection type  |      |                               |
| Han® Q 8/0, female   |      |                               |
| Wiring diagram   |      |                               |
|  <p style="text-align: right;">9007201696170251</p> |      |                               |
| Assignment   |      |                               |
| No.  | Name | Function                      |
| 1  | U    | Motor phase U output          |
| 2  | 14   | SEW brake terminal 14 (white) |
| 3  | W    | Motor phase W output          |
| 4  | 15   | SEW brake terminal 15 (blue)  |
| 5  | TH   | Motor temperature sensor (+)  |
| 6  | 13   | SEW brake terminal 13 (red)   |
| 7  | V    | Motor phase V output          |
| 8  | TH   | Motor temperature sensor (–)  |
| PE   | PE   | PE connection                 |

## 6.9.1 Connection cable

The following table shows the cables available for this connection:

| Connection cable and component |   |  |               |  |
|--------------------------------|---|--|---------------|--|
| Power                          | Hybrid cable  | Length/<br>installation<br>type  | Cable<br>type | Drive  |
| Up to<br>2.2 kW<br>(IEC / UL)  | <b>Part number</b> 18125794<br><br>Han® Q 8/0                      Open (terminal<br>box connection<br>M4) | Variable<br>length<br>   | D/1.5         | DRS71<br>DRE80<br>DRE90<br>         |
|                                | <b>Part number</b> 18127703<br><br>Han® Q 8/0                      IS                                     | Variable<br>length<br>   |               | DRS71 ↘<br>DRE80 ↘<br>DRE90 ↘<br>  |
|                                | <b>Part number</b> 18127681<br><br>Han® Q 8/0                      IS                                    | Variable<br>length<br> |               | DRS71 △<br>DRE80 △<br>DRE90 △<br> |
|                                | <b>Part number</b> 18127711<br><br>Han® Q 8/0                      ABB8                                  | Variable<br>length<br> |               | DRS71<br>DRE80<br>DRE90<br>       |
|                                | <b>Part number</b> 18127738<br><br>Han® Q 8/0                      ABB8                                  | Variable<br>length<br> |               | DRS71<br>DRE80<br>DRE90<br>       |

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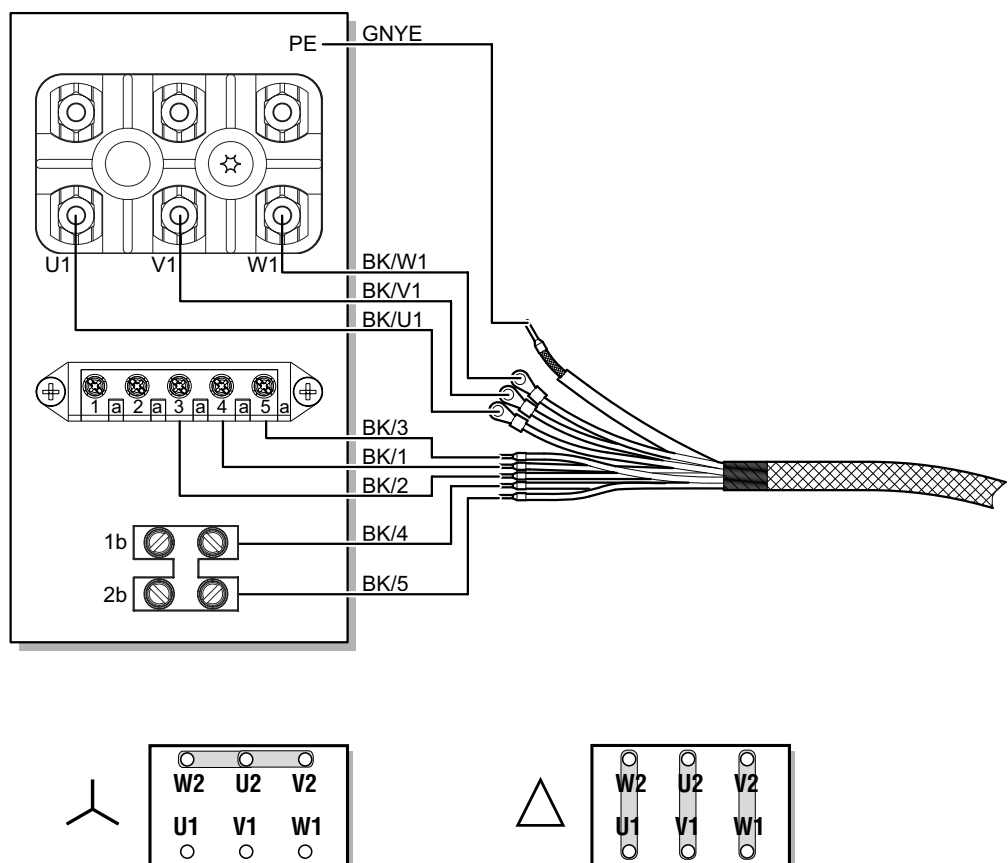
## Conductor assignment

The following tables shows the conductor assignment of the cable with the following part number and the corresponding motor terminals of the DR.. motor:

18125794

| Motor terminal DR motor | Wire color/hybrid cable designation      |
|-------------------------|--|
| U1                      | Black/U1                                 |
| V1                      | Black/V1                                 |
| W1                      | Black/W1                                 |
| 4 a                     | Black/1                                  |
| 3 a                     | Black/2                                  |
| 5 a                     | Black/3                                  |
| 1b                      | Black/4                                  |
| 2b                      | Black/5                                  |
| PE connection           | Green/yellow + shield end (inner shield) |

The following figure shows an example connection of the hybrid cable to the terminal box of the DR.. motor. However, also observe the wiring diagram of the respective motor.



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6.10 X2013: Motor with brake control



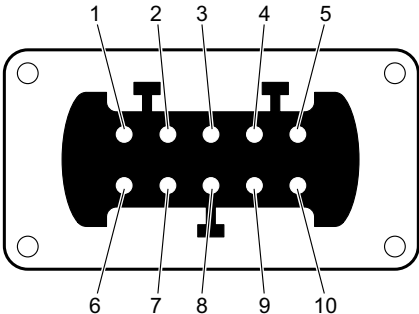
NOTICE

Damage or malfunction due to motors with built-in brake rectifiers.

Damage to the drive system or its environment.

- You must not use motors with built-in brake rectifiers in conjunction with MOVIPRO® units.

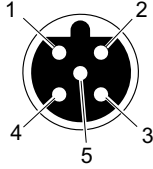
The following table shows information about this connection:

| Function  |      |                               |
|---|------|-------------------------------|
| Power connection for motor with brake up to 4 kW                                    |      |                               |
| Connection type   |      |                               |
| Han® 10 E   |      |                               |
| Wiring diagram  |      |                               |
|  |      |                               |
| 11988312971   |      |                               |
| Assignment  |      |                               |
| No.   | Name | Function                      |
| 1   | U    | Motor phase U output          |
| 2   | V    | Motor phase V output          |
| 3   | W    | Motor phase W output          |
| 4   | 13   | SEW brake terminal 13 (red)   |
| 5   | 15   | SEW brake terminal 15 (blue)  |
| 6   | 14   | SEW brake terminal 14 (white) |
| 7   | res. | Reserved                      |
| 8   | res. | Reserved                      |
| 9   | TH   | Motor temperature sensor (+)  |
| 10  | TH   | Motor temperature sensor (–)  |
| PE  | PE   | PE connection                 |

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## 6.11 X4011: RS485 interface – external

The following table shows information about this connection:

| Function  |       |                     |
|---|-------|---------------------|
| RS485 interface for external components   |       |                     |
| Connection type   |       |                     |
| M12, 5-pole, female, B-coded  |       |                     |
| Wiring diagram  |       |                     |
|  <p style="text-align: right;">9007201609172107</p> |       |                     |
| Assignment  |       |                     |
| No.   | Name  | Function            |
| 1   | +24 V | DC 24 V output      |
| 2   | RS-   | RS485 data line (-) |
| 3   | GND   | Reference potential |
| 4   | RS+   | RS485 data line (+) |
| 5   | res.  | Reserved            |

## 6.12 X4022: RS485 interface – service

The following table shows information about this connection:

| Function  |      |                     |
|---|------|---------------------|
| RS485 service interface   |      |                     |
| Connection type   |      |                     |
| RJ10  |      |                     |
| Wiring diagram  |      |                     |
| <div>  </div> |      |                     |
| 9007201697324427  |      |                     |
| Assignment  |      |                     |
| No.   | Name | Function            |
| 1   | GND  | Reference potential |
| 2   | RS-  | RS485 data line (-) |
| 3   | RS+  | RS485 data line (+) |
| 4   | +5 V | DC 5 V output       |

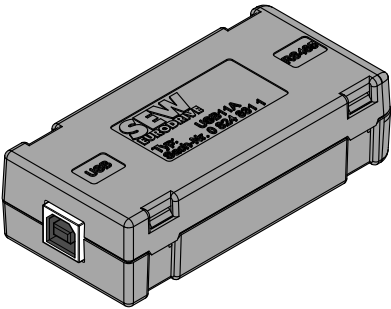
### 6.12.1 Connection components

The following table shows the component available for this connection:

#### USB11A interface adapter

Part number 08248311

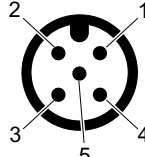
Connection: RJ10



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### 6.13 X4441: M12 parameter memory

The following table shows information about this connection:

| Function  |      |                     |
|---|------|---------------------|
| Interface for connecting the M12 parameter memory                                 |      |                     |
| Connection type   |      |                     |
| M12, 5-pole, male, A-coded  |      |                     |
| Wiring diagram  |      |                     |
|  |      |                     |
| 9007201519559179  |      |                     |
| Assignment  |      |                     |
| No.   | Name | Function            |
| 1   | GND  | Reference potential |
| 2   | +5 V | DC 5 V output       |
| 3   | D-   | Data line (-)       |
| 4   | D+   | Data line (+)       |
| 5   | res. | Reserved            |

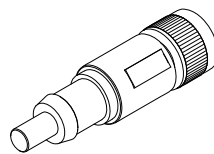
#### 6.13.1 Connection component

The following components are suitable for this connection:

##### M12 parameter memory

Part number 17976340

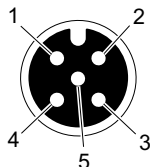
Connection: M12



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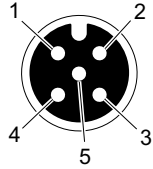
### 6.14 X5002\_1: Digital inputs/outputs – communication and control unit

The following table shows information about this connection:

| Function   |       |  |
|--|-------|--|
| Digital inputs/outputs of the communication and control unit                       |       |  |
| Connection type  |       |  |
| M12, 5-pole, female, A-coded   |       |  |
| Wiring diagram   |       |  |
|  |       |  |
| 9007201519557259   |       |  |
| Assignment   |       |  |
| No.  | Name  | Function                               |
| 1  | +24 V | DC 24 V output                         |
| 2  | DIO01 | Digital input / digital output DIO01   |
| 3  | 0V24  | 0V24 reference potential               |
| 4  | DIO00 | Digital input / digital output DIO00   |
| 5  | FE    | Equipotential bonding/functional earth |

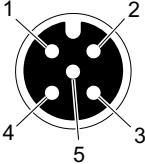
## 6.15 X5002\_2: Digital input – communication and control unit

The following table shows information about this connection:

| Function   |       |  |
|--|-------|--|
| Digital input of communication and control unit                                    |       |  |
| Connection type  |       |  |
| M12, 5-pole, female, A-coded   |       |  |
| Wiring diagram   |       |  |
|  |       |  |
| 9007201519557259   |       |  |
| Assignment   |       |  |
| No.  | Name  | Function                               |
| 1  | +24 V | DC 24 V output                         |
| 2  | DI03  | Digital input DI03                     |
| 3  | 0V24  | 0V24 reference potential               |
| 4  | DI02  | Digital input DI02                     |
| 5  | FE    | Equipotential bonding/functional earth |

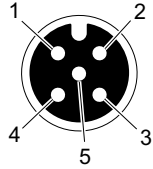
### 6.16 X5002\_3: Digital input – communication and control unit

The following table shows information about this connection:

| Function   |       |  |
|--|-------|--|
| Digital input of communication and control unit                                    |       |  |
| Connection type  |       |  |
| M12, 5-pole, female, A-coded   |       |  |
| Wiring diagram   |       |  |
|  |       |  |
| 9007201519557259   |       |  |
| Assignment   |       |  |
| No.  | Name  | Function                               |
| 1  | +24 V | DC 24 V output                         |
| 2  | DI05  | Digital input DI05                     |
| 3  | 0V24  | 0V24 reference potential               |
| 4  | DI04  | Digital input DI04                     |
| 5  | FE    | Equipotential bonding/functional earth |

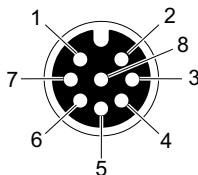
## 6.17 X5002\_4: Digital input – communication and control unit

The following table shows information about this connection:

| Function  |       |  |
|---|-------|--|
| Digital input of communication and control unit   |       |  |
| Connection type   |       |  |
| M12, 5-pole, female, A-coded  |       |  |
| Wiring diagram  |       |  |
|  <p style="text-align: right;">9007201519557259</p> |       |  |
| Assignment  |       |  |
| No.   | Name  | Function                               |
| 1   | +24 V | DC 24 V output                         |
| 2   | DI07  | Digital input DI07                     |
| 3   | 0V24  | 0V24 reference potential               |
| 4   | DI06  | Digital input DI06                     |
| 5   | FE    | Equipotential bonding/functional earth |

### 6.18 X5003: Digital input – communication and control unit

The following table shows information about this connection:

| Function   |       |                     |
|--|-------|---------------------|
| Digital input of communication and control unit                                    |       |                     |
| Connection type  |       |                     |
| M12, 8-pole, female, A-coded   |       |                     |
| Wiring diagram   |       |                     |
|  |       |                     |
| 27021600248109323  |       |                     |
| Assignment   |       |                     |
| No.  | Name  | Function            |
| 1  | DI04  | Digital input DI04  |
| 2  | DI05  | Digital input DI05  |
| 3  | DI06  | Digital input DI06  |
| 4  | DI07  | Digital input DI07  |
| 5  | +24 V | DC 24 V output      |
| 6  | res.  | Reserved            |
| 7  | GND   | Reference potential |
| 8  | res.  | Reserved            |

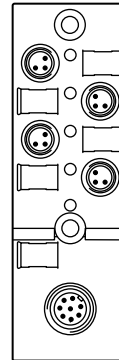
### 6.18.1 Connection components

The following components are suitable for this connection:

#### Sensor/actuator box

Part number: 19111142



Connection: M8



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Connection cable

The following table shows the available cables for the sensor/actuator box:

| Connection cable and component  |  |   |
|---|--|---|
| Cable   |  | Length/installation type  |
| <p>Length 1 m: Part number 18161073</p> <p>Length 2 m: Part number 18161081</p> <p>Length 3 m: Part number 18161103</p> <p>Length 4 m: Part number 18161111</p> <p>Length 5 m: Part number 18161138</p> <div></div> <p>M12, male, straight</p> <p>M12, female, straight</p> |  | <p>fixed length</p>  |

## 7 Startup

### 7.1 General information



#### INFORMATION

Observe the general safety notes in chapter "Safety notes / General information".



#### ▲ WARNING

Risk of injury due to uncontrolled unit behavior caused by ineffective emergency stop circuit

Severe or fatal injuries

- The installation must be carried out by qualified personnel only.



#### ▲ WARNING

Risk of injury due to unit malfunction caused by incorrect unit setting

Severe or fatal injuries

- The installation must be carried out by qualified personnel only.
- Check the parameters and data sets.
- Only use settings that are suitable for operation.



#### ▲ WARNING

Risk of crushing if the motor starts up unintentionally.

Severe or fatal injuries.

- Comply with the startup instructions.
- Ensure that persons are not present in the danger zone of system parts.
- Deactivate automatic restarting.
- Switch off the operating switch.
- Decouple the drive.
- Disconnect the vehicle from the supply system.



#### ▲ WARNING

Electric shock due to missing or defective protection covers.

Severe or fatal injuries.

- Install the protective covers according to the regulations.
- The installation must be carried out by qualified personnel only.
- Never start the unit if the protective covers are not installed.

**⚠ WARNING**

Danger of electric shock due to open connections.

Severe or fatal injuries.

- The installation must be carried out by qualified personnel only.
- Never start the unit if the touch guard is not installed.

**NOTICE**

Danger due to arcing.

Damage to electrical components.

- Do not plug or unplug the power connectors during operation.

**INFORMATION**

To ensure the correct functioning of the system, do not connect or disconnect the signal lines during operation.

## 7.2 Requirements

**INFORMATION**

To ensure fault-free operation, the M12 parameter memory must be plugged in.

**The following conditions apply to startup:**

- The unit must be installed correctly both mechanically and electrically.
- The system and connected drives must be configured correctly.
- Appropriate safety measures are taken to prevent the drives from starting up unintentionally.
- Appropriate safety measures must be taken to prevent risk of injury or damage to machine.

**The following hardware is required for startup:**

- PC or laptop with USB interface
- USB11A interface adapter

## **7.3 Unit configuration**

### **7.3.1 Settings**

The unit is configured during startup. Use the X4022 interface (RS485 service interface of the communication and control unit) to establish the connection to the processor unit of the device.

### **7.3.2 Configuration software**

Use the latest version of the following software to make all the required settings:

- MOVIVISION® EMS basic

You will find additional information in "MOVIVISION® EMS basic" manual.

## 8 Operation



### ▲ WARNING

When the unit is switched on, dangerous voltages are present at the connectors and at any connected cables and motor terminals. This also applies even when the frequency inverter of the unit is inhibited and the motor is at standstill.

Severe or fatal injuries from electric shock.

- Do not switch under load.
- Before working on the unit, disconnect it from the voltage supply. Dangerous voltages may still be present at the terminals and connections for up to 10 minutes after disconnection from the power supply.
- The unit output may only be switched when the output stage of the frequency inverter is inhibited.



### ▲ WARNING

Risk of crushing if the motor starts up unintentionally.

Severe or fatal injuries.

- Comply with the startup instructions.
- Ensure that persons are not present in the danger zone of system parts.
- Deactivate automatic restarting.
- Switch off the operating switch.
- Decouple the drive.
- Disconnect the vehicle from the supply system.



### ▲ WARNING

Electric shock due to charged capacitors

Severe or fatal injuries

- Observe a minimum switch-off time after disconnecting the power supply: **10 minutes**



### ▲ CAUTION

Danger of burns due to hot surfaces of the unit or connected options, e.g. braking resistors

Injury

- Provide for covers to secure hot surfaces.
- Install the protection devices according to the regulations.
- Check the protection devices on a regular basis.
- Let the unit and the connected options cool down before you start working on them.

## INFORMATION



To ensure fault-free operation, the M12 parameter memory must be plugged in.

## 8.1 Cyclic duration factor (CDF)

The cyclic duration factor (CDF) is the ratio between the load duration and the cycle duration. The duration of the duty cycle is the sum of times of operation and times at rest and de-energized. A typical value for the cycle duration is ten minutes.

$$CDF = \frac{\text{Total switch-on time } (t_1 + t_2 + t_3)}{\text{Cycle duration } (T)} \times 100\%$$

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## 8.2 Duty types

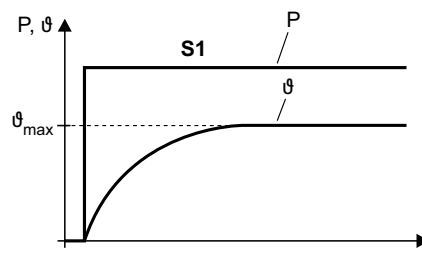
### 8.2.1 Environmental conditions

The following ambient conditions apply according to cdf specification IEC 60034-1 (2005):

- Ambient temperature  $\vartheta_U$  [ $+5\text{ °C} - +40\text{ °C}$  ( $+41 - +104\text{ °F}$ )]  
Every temperature increase by  $1\text{ °C}$  ( $1.8\text{ °F}$ ) results in a cdf decrease of 4%.
- $I_D = 100\% I_N$  at  $f_{PWM} = 4\text{ kHz}$
- Installation location up to 1000 m asl

### 8.2.2 Duty type S1

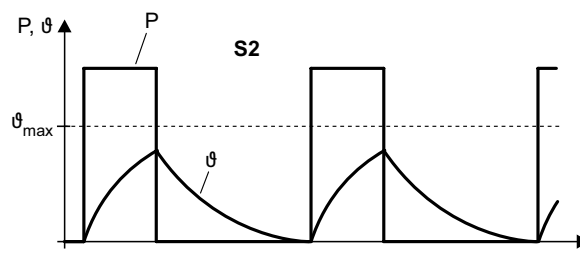
**Continuous duty:** Operation with a constant load state, the motor achieves a thermal steady state.



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### 8.2.3 Duty type S2

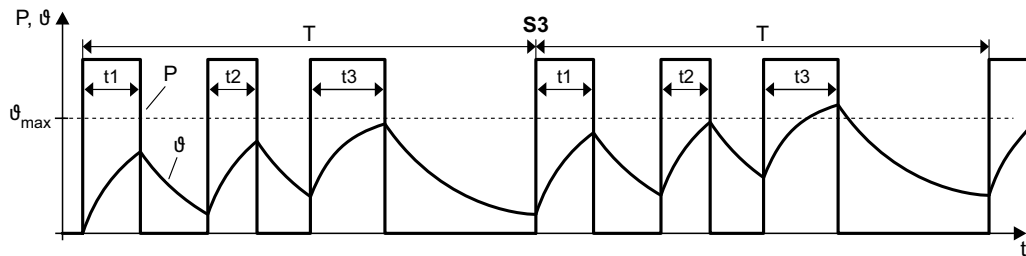
**Short-time duty:** Operation at constant load for a limited, given time followed by a time at rest. The motor returns to ambient temperature during the rest period.



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### 8.2.4 Duty type S3

**Intermittent periodic duty:** The switch-on sequence does not affect the temperature rise. Characterized by a sequence of identical duty cycles, each including a time of operation at constant load and a time at rest. Described by the relative cyclic duration factor (cdf) in %.



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### 8.2.5 Duty types S4 – S10

**Intermittent periodic duty:** The startup current affects the temperature rise. Characterized by a sequence of identical duty cycles, each including a time of operation at constant load and a time at rest. Described by the relative cyclic duration factor (cdf) in % and the number of cycles per hour.

### 8.3 Status reports

The status display of the unit displays the following information depending on parameterization and operating state:

- In automatic operation:
  - Active drive command or active drive command and speed limitation
  - Part data
- In manual operation:
  - Active command
- In error status:
  - Err or ErP
  - Error code
- When establishing a connection with the IR remote control:
  - Vehicle ID
- In all other operating states:
  - Operating state

For detailed information about possible status messages, refer to the relevant software documentation and the project description of the system solution, chapter "Operation".

### 8.3.1 List of faults

Depending on the parameterization in MOVIVISION®, the errors are shown as an error number or as an error group. For detailed information about parameterization, refer to the "MOVIVISION® EMS basic" manual.

In case of a malfunction, the status display of the unit displays the following error codes.

| Code | Meaning   | Possible cause  | Measure   |
|------|---|---|---|
| 302  | Overcurrent   | <ul style="list-style-type: none"> <li>Short circuit at frequency inverter output</li> </ul>  | <ul style="list-style-type: none"> <li>Check the connection between the frequency inverter output and the motor as well as the motor winding for short circuits.</li> <li>Reset the error by switching off the 24 V supply voltage or via error reset.</li> </ul> |
| 303  | Thermal overload of the output stage or internal unit error | Heat sink is dirty  | <ul style="list-style-type: none"> <li>Clean the heat sink.</li> <li>Reset the error by switching off the 24 V supply voltage or via error reset.</li> </ul>  |
|      |   | Ambient temperature too high  | <ul style="list-style-type: none"> <li>Lower ambient temperature.</li> <li>Reset the error by switching off the 24 V supply voltage or via error reset.</li> </ul>  |
|      |   | Heat build-up in frequency inverter   | <ul style="list-style-type: none"> <li>Prevent heat build-up.</li> <li>Reset the error by switching off the operating switch.</li> </ul>  |
|      |   | Drive load too high   | <ul style="list-style-type: none"> <li>Reduce the load on the drive.</li> <li>Reset the error by switching off the operating switch.</li> </ul>   |
| 304  | Frequency inverter offline                                  | Frequency inverter switched off   | Switch on frequency inverter.   |
|      |   | Error on internal bus   | Reset the error by switching off the operating switch.  |
| 308  | Internal error  | Error message of the frequency inverter   | Contact SEW-EURODRIVE.  |
| 309  | Initialization error frequency inverter                     | Frequency inverter switched off   | Switch on operating switch.   |
|      |   | Error on internal bus   | Reset the error by switching off the operating switch.  |
|      |   | Incorrect frequency inverter parameters   | <ul style="list-style-type: none"> <li>Correct parameters.</li> <li>Contact SEW-EURODRIVE.</li> </ul>   |
| 312  | Brake chopper   | <ul style="list-style-type: none"> <li>Overcurrent in brake output</li> <li>Braking resistor defective</li> <li>Braking resistance value too low</li> </ul> | <ul style="list-style-type: none"> <li>Check braking resistor connection.</li> <li>Replace braking resistor.</li> </ul>   |

| Code | Meaning                  | Possible cause  | Measure  |
|------|--------------------------|---|--|
| 313  | DC link voltage too high | <ul style="list-style-type: none"> <li>Faulty connection between brake coil / braking resistor</li> </ul>   | <ul style="list-style-type: none"> <li>Check the braking resistor/brake coil connection. Correct, if necessary.</li> <li>Reset the error by switching off the operating switch.</li> </ul> |
|      |                          | <ul style="list-style-type: none"> <li>Incorrect internal resistance of brake coil/braking resistor</li> </ul>  | <ul style="list-style-type: none"> <li>Check the internal resistance of the brake coil/braking resistor.</li> <li>Reset the error by switching off the operating switch.</li> </ul>        |
|      |                          | <ul style="list-style-type: none"> <li>Thermal overload of braking resistor</li> <li>Wrong size of braking resistor selected</li> </ul>                                   | <ul style="list-style-type: none"> <li>Dimension the braking resistor correctly.</li> <li>Reset the error by switching off the operating switch.</li> </ul>                                |
|      |                          | <ul style="list-style-type: none"> <li>Invalid voltage range of supply input voltage</li> </ul>   | <ul style="list-style-type: none"> <li>Check supply input voltage for permitted voltage range.</li> <li>Reset the error by switching off the operating switch.</li> </ul>                  |
| 314  | Speed monitoring         | <ul style="list-style-type: none"> <li>Speed deviation due to operation at the current limit</li> </ul>   | <ul style="list-style-type: none"> <li>Reduce the load on the drive.</li> <li>Reset the error by switching off the 24 V supply voltage or via error reset.</li> </ul>                      |
| 317  | Open output              | <ul style="list-style-type: none"> <li>2 or all output phases interrupted</li> <li>Rated motor power too small in relation to nominal frequency inverter power</li> </ul> | <ul style="list-style-type: none"> <li>Check connection between frequency inverter and motor.</li> </ul>   |

| Code | Meaning   | Possible cause   | Measure  |
|------|---|--|--|
| 318  | Thermal overload of motor                                   | • Ambient temperature too high   | • Lower ambient temperature.<br>• Reset the error by switching off the operating switch.   |
|      |   | • Heat build-up at the motor   | • Prevent heat build-up.<br>• Reset the error by switching off the operating switch.   |
|      |   | • Motor load too high  | • Reduce the load on the motor.<br>• Reset the error by switching off the operating switch.  |
|      |   | • Speed too low  | • Increase speed.<br>• Reset the error by switching off the operating switch.  |
|      |   | • The error is displayed shortly after the motor has been started.   | • Check drive parameters.<br>• Reset the error by switching off the operating switch.  |
|      |   | • The temperature monitoring of the motor (TH winding thermostat) has triggered.                                       | • Reduce the load on the motor.<br>• Reset the error by switching off the operating switch.  |
|      |   | • The connection to the TH winding thermostat of the motor is interrupted.<br>• The motor connector is not plugged in. | • Check connection.  |
| 320  | Phase failure   | • Phase failure  | • Check supply system leads including conductor rail, current consumers and unit connection for phase failure.<br>• Reset the error by switching off the operating switch. |
| 321  | Thermal overload of the output stage or internal unit error | • Heat sink is dirty   | • Clean the heat sink.<br>• Reset the error by switching off the 24 V supply voltage or via error reset.   |
|      |   | • Ambient temperature too high   | • Lower ambient temperature.<br>• Reset the error by switching off the 24 V supply voltage or via error reset.   |
|      |   | • Heat build-up in frequency inverter  | • Prevent heat build-up.<br>• Reset the error by switching off the operating switch.   |
|      |   | • Drive load too high  | • Reduce the load on the drive.<br>• Reset the error by switching off the operating switch.  |

| Code | Meaning                                  | Possible cause  | Measure   |
|------|--|---|---|
| 322  | Overcurrent                              | <ul style="list-style-type: none"> <li>Short circuit at frequency inverter output</li> </ul>                        | <ul style="list-style-type: none"> <li>Check the connection between the frequency inverter output and the motor as well as the motor winding for short circuits.</li> <li>Reset the error by switching off the 24 V supply voltage or via error reset.</li> </ul>     |
| 323  | Thermal brake overload                   | Line voltage too high   | Select suitable line voltage.   |
|      |  | Grid very asymmetrical  | Check symmetry of the grid. Eliminate unbalanced load.  |
|      |  | <ul style="list-style-type: none"> <li>Braking power higher than 20 W</li> <li>Wrong brake type selected</li> </ul> | Reduce braking power. Increase ramp time.   |
| 601  | Distance sensor offline                  | Distance sensor defective   | Replace distance sensor.  |
|      |  | Distance sensor not connected   | Check wiring.   |
| 607  | Phase failure                            | Error in the current supply   | <ul style="list-style-type: none"> <li>Check supply system leads including conductor rail, current consumers and unit connection for phase failure.</li> <li>Reset the error by switching off the operating switch.</li> </ul>  |
| 608  | Infrared connection canceled             | Infrared connection to operator terminal physically interrupted for more than 15 seconds                            | Establish infrared connection via operator terminal.  |
| OFF  | Operating switch switched off            | Operating switch switched off   | Switch on operating switch.   |
| 609  |  | Interruption of external operating switch connection  | Check wiring of external operating switch.  |
| 610  | M12 parameter memory connection          | M12 parameter memory was plugged in or out during operation   | <ul style="list-style-type: none"> <li>Do not plug the M12 parameter memory in or out during operation.</li> <li>Plug in the M12 parameter memory correctly and secure the connection nut.</li> <li>Reset the error by switching off the operating switch.</li> </ul> |
| 611  | Error while reading M12 parameter memory | M12 parameter memory not plugged in or not plugged in correctly   | Plug in the M12 parameter memory correctly.   |
|      |  | Data on M12 parameter memory faulty   | Write new M12 parameter memory.   |
|      |  | Incompatible M12 parameter memory connected   | Connect compatible M12 parameter memory.  |
|      |  | M12 parameter memory defective  | Replace M12 parameter memory.   |

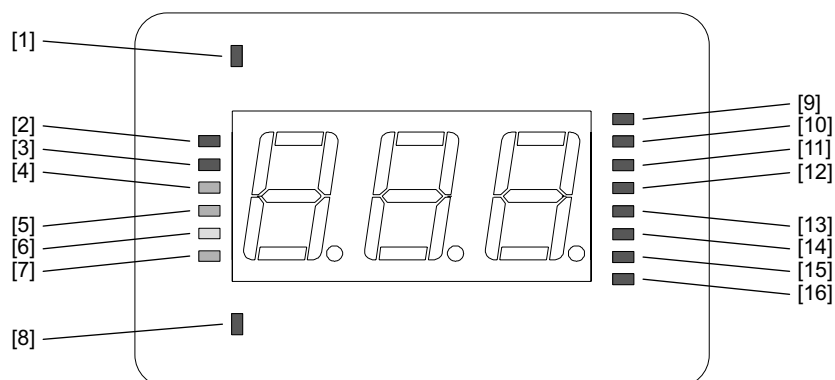
| Code       | Meaning                                  | Possible cause  | Measure                                       |
|------------|--|---|---|
| 612        | Error while writing M12 parameter memory | • M12 parameter memory not plugged in or not plugged in correctly | • Plug in the M12 parameter memory correctly. |
|            |  | • Incompatible M12 parameter memory connected                     | • Connect compatible M12 parameter memory.    |
|            |  | • M12 parameter memory defective                                  | • Replace M12 parameter memory.               |
| PSE<br>XXX | Memory error                             | • Internal error  | • Contact SEW-EURODRIVE.                      |

The error groups have the following meaning:

| Error group | Meaning                      | Code                    |
|-------------|------------------------------|-------------------------|
| 651         | Error motor connection       | 317, 322                |
| 652         | Overload capacity            | 303, 313, 314, 318, 323 |
| 653         | Frequency inverter defective | 302, 312                |
| 654         | Other error                  | 304, 308, 309, 320, 321 |

### 8.3.2 Status LEDs

The unit features additional LEDs for servicing. The status LEDs display additional status information. The following table is used exclusively for diagnostics by SEW Service.



11948037899

|      | LED                           | LED status       | Description  |
|------|-------------------------------|------------------|--|
| [1]  | Positive half-wave command    | Lights up red    | The unit receives positive half-waves from the command rail.   |
| [2]  | Phase failure                 |                  | There is a phase failure.  |
| [3]  | Software status               | Flashing red     | The unit software in the controller is running.  |
| [4]  | 24 V supply                   | Lights up green  | Internal 24 V supply ok.   |
| [5]  | Service interface supply      |                  | The service interface is supplied with power.  |
| [6]  | Frequency inverter bus supply | Lights up yellow | The frequency inverter bus is supplied with power. This LED only lights up when the operating switch is switched on. |
| [7]  | CPU supply                    | Lights up green  | The CPU is supplied with power.  |
| [8]  | Negative half-wave command    | Lights up red    | The unit receives negative half-waves from the command rail.   |
| [9]  | DIO00                         |                  | The digital input 0 or the digital output 0 is set.  |
| [10] | DIO01                         |                  | The digital input 1 or the digital output 1 is set.  |
| [11] | DI02                          |                  | The digital input is set.  |
| [12] | DI03                          |                  |  |
| [13] | DI04                          |                  |  |
| [14] | DI05                          |                  |  |
| [15] | DI06                          |                  |  |
| [16] | DI07                          |                  |  |

## 9 Service

### 9.1 Inspection/maintenance

The unit is maintenance-free. SEW-EURODRIVE does not stipulate any regular inspection work. However, it is recommended that you check the following parts regularly:

- Connection cables:  
Damaged or fatigued cables must be replaced immediately.

### INFORMATION



Repairs may only be carried out by SEW-EURODRIVE

### 9.2 Unit replacement

#### 9.2.1 Notes on replacing units

The following unit data is stored on the M12 parameter memory in order to facilitate rapid unit replacement:

- Application parameters
- Vehicle ID
- Component part and production data

If you connect the M12 parameter memory to a replacement unit, the data is transferred automatically to the replacement unit. The replacement unit is therefore immediately ready for operation.

### INFORMATION



Observe the following notes when replacing a unit:

- Only connect or disconnect the M12 parameter memory when the application controller is switched off.
- All unit-specific data is stored on the M12 parameter memory. This facilitates quick and easy replacement during servicing.
- You will find additional information in the "MOVIVISION® EMS basic" manual.

#### 9.2.2 Replacing the unit

Proceed as follows to replace the unit:

1. De-energize the conductor rail, disconnect the unit from the power supply, and remove it from the plant.
2. Loosen the screw fitting of the M12 parameter memory and remove it from the unit.
3. Plug the M12 parameter memory into the X4441 plug connector of a new unit and tighten the screw.
4. Install the new unit in the plant.
5. Switch the power supply back on.

For more information, refer to the "MOVIVISION® EMS basic" manual.

### 9.3 Cleaning

Before cleaning the unit, disconnect it from the power supply. De-energize the conductor rail, if required.

Clean the unit only with solvent-free cleaning agent.

### 9.4 Display

The status display indicates the status of the unit. For detailed information about possible error messages, refer to the chapter "Error list" and in the chapter "Malfunctions" in the corresponding software documentation.

### 9.5 Error information of the frequency inverter



#### ▲ WARNING

Risk of automatic restart of the drive after fault elimination or after a reset.

Fatal or severe injuries and damage to property.

- Disconnect the unit from the power supply before rectifying a fault if automatic restart of the driven machine after fault elimination is not permitted for safety reasons.
- After a reset, make sure that the drive can start up automatically depending on the setting.

#### 9.5.1 Error memory

The error memory stores the 10 most recent error messages.

The following information is stored when an error occurs:

- Time stamp
- Current command (positive/negative half-wave or full wave)
- Unit status
- Error that has occurred (error code)
- Error counter (1 - 10)

For more information, refer to the "MOVIVISION® EMS basic" manual.

### 9.5.2 Acknowledge error



#### ▲ WARNING

Risk of crushing if the motor starts up unintentionally.

Severe or fatal injuries.

- Comply with the startup instructions.
- Set the controller inhibit.
- Switch off the output stage.
- Decouple the drive.
- Deactivate the auto-reset function for drives that start up automatically.

An error message can be acknowledged by:

- Switching the voltage supply off and then on:  
Always maintain a minimum switch-off time of 1 minute.
- Switching the operating switch on and off:  
Always maintain a minimum switch-off time of 1 minute.

### 9.6 Shutdown

To shut down the unit, disconnect it using appropriate measures.



#### ▲ WARNING

Electric shock due to charged capacitors

Severe or fatal injuries

- Observe a minimum switch-off time after disconnecting the power supply: **10 minutes**

### 9.7 Storage

Observe the following instructions when shutting down or storing the unit:

- If you shut down and store the unit for a longer period, you must cover the connections with the protective caps supplied.
- Place the unit on a side without connectors during storage.
- Make sure that the unit is not subject to mechanical impact during storage.
- Connect the unit to the power supply for at least 5 minutes every 2 years.

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

### 9.8 Extended storage

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

**Procedure when maintenance has been neglected:**

Electrolytic capacitors are used in the inverters. They are subject to aging effects when de-energized. This effect can damage the capacitors if the unit is connected using the nominal voltage after a longer period of storage.

If you have not performed maintenance regularly, SEW-EURODRIVE recommends that you increase the line voltage slowly up to the maximum voltage. This can be done, for example, by using a variable transformer for which the output voltage has been set according to the following overview.

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

## 9.9 Waste disposal

Observe the applicable national regulations. Dispose of materials separately in accordance with the regulations in force, for example:

- Electronics scrap (circuit boards)
- Plastic
- Sheet metal
- Copper
- Aluminum

## 9.10 Additional information

For additional service information, refer to chapter "Service" of the project description of the system solution.

## 10 Technical data

### 10.1 Basic unit

The unit has the following technical data:

| General                                   |  |
|---|--|
| Dimensions W x H x D                      | 350 × 203 × 98 mm (13.78 × 8 × 3.85 in)  |
| Weight                                    | 4.5 kg (9.92 lb)   |
| Ambient conditions                        |  |
| Ambient temperature<br>(without derating) | +5 – +40 °C (+41 – +104 °F)<br>(non-condensing, no moisture condensation)<br>The unit provides intrinsic thermal safety. Once the heat sink temperature exceeds a certain level, a disconnection is triggered and an "Overtemperature" error message is generated. |
| Ambient temperature<br>(with derating)    | +40 – +60 °C (+104 – +140 °F)<br>1 % / K of the output power   |
| Storage temperature                       | –25 – +70 °C (–13 – +158 °F)   |
| Climate class                             | Class 3K3  |
| Degree of protection                      | IP65 (excluding X1261 connection, see chapter "X1261: AC 400 V contact conductor connection (→ 34)")   |
| Vibration resistance                      | IEC 60721-3-2:1997: 2M2<br>IEC 721-3-3:1994: 3M4<br>IES 60721-3-5:1997: 5M2<br>IEC 721-3-7:1995: 7M2   |
| Interference immunity                     | Meets EN 61800-3<br>Interference suppression A to EN 55011   |

### 10.2 Input data

The following table shows the technical data of the inputs.

| Power supply            |  |
|-------------------------|--|
| Supply type             | 3-phase AC connection, TT or TN system with directly grounded star point |
| Input voltage range     | 3 × AC 380 – 500 V   |
| Nominal input voltage   | 3 × AC 400 V   |
| Nominal input current   | AC 3.5 A   |
| Nominal input frequency | 50...60 Hz   |

| Command input  |                                   |
|--|-----------------------------------|
| Input voltage range (measured against the star point of the inputs $L_x$ , $L_y$ , $L_z$ ) | AC 170 – 300 V                    |
| Current consumption  | 3 – 6 mA $\pm$ 10 %               |
| Input frequency  | 50 – 60 Hz                        |
| Phase position   | 0 – 360 °                         |
| Digital inputs   |                                   |
| Variant  | Compatible with IEC61131-2 type 3 |
| Current consumption  | 5 mA                              |
| High level   | DC +11 – +30 V                    |
| Low level  | DC -3 – +5 V                      |

### 10.3 Output data

The unit outputs have the following technical data:

| General information                                       |  |
|---|--|
| Duty type   | S1 (IEC 60034-1)                                       |
| Minimum permitted braking resistance (4Q operation)       | 150 $\Omega$   |
| Axis data   |  |
| Nominal output power (at $f_{PWM} = 16$ kHz)              | 1.3 kW (1.7 HP)  |
| Nominal output power (at $f_{PWM} = 8$ kHz)               | 1.5 kW (2.0 HP)  |
| Current limitation  | AC 6 A, motor<br>Duration depending on the utilization |
| Output voltage  | 3 $\times$ AC 0 – 500 V                                |
| PWM frequency   | Selectable:<br>16 / 8 / 4 kHz or<br>8/4 kHz            |
| Motor protection  | TH   |
| Maximum motor cable length                                | 3 m (16 ft)  |
| Maximum brake holding current (of 2-wire brake variant)   | DC 0.41 A  |
| Output voltage of brake control (of 2-wire brake variant) | DC 0.45 * ( $V_{Ly} - V_{Lz}$ )                        |



## NOTICE

Total current of the external 24 V consumers too high

Device damage

- Ensure that the total current of all external 24 V consumers at the digital outputs and the RS485 interface does not exceed 500 mA.

### 24 V voltage supply of RS485 interface

|                 |                               |
|-----------------|-------------------------------|
| Nominal voltage | DC 24 V +20 % / -15 %         |
| Nominal current | Max. DC 500 mA per connection |

## INFORMATION



The unit features load- and speed-dependent overload protection with thermal memory.

### Overload protection

|            |                           |
|------------|---------------------------|
| Trip level | 140% of the motor current |
| Trip time  | 60 –134 s <sup>1)</sup>   |

1) Depending on speed and start temperature

## INFORMATION



The signal output is fed via  $L_{X/M}$ . See section "X1261:AC 400 V PE connection" (→ 34) for additional information.

### Signal output

|                                     |  |
|-------------------------------------|--|
| Relay contact                       | Permitted voltage: max. 230 V<br>Permitted load current: max. 15 mA, resistive |
| Integrated short-circuit protection | PTC  |

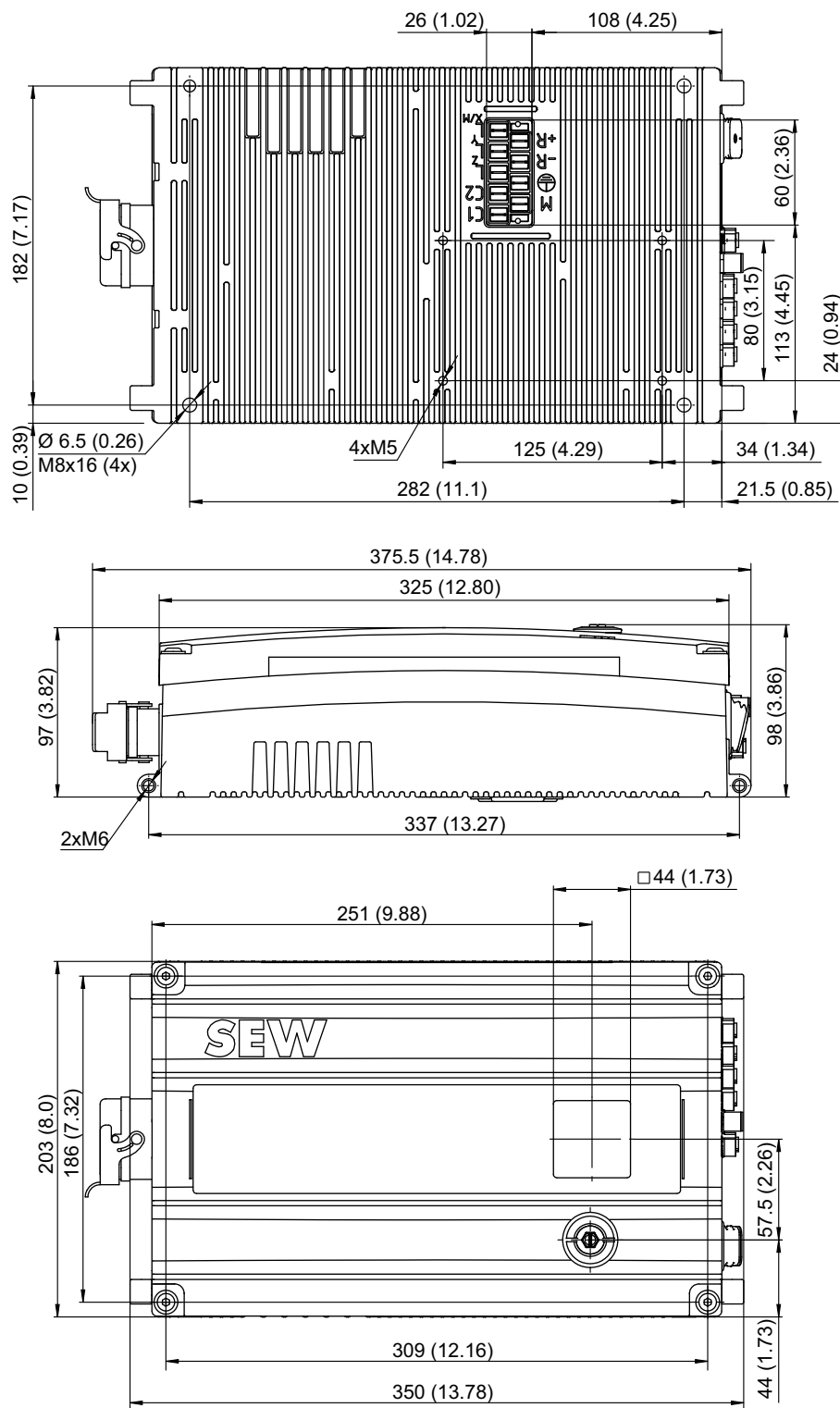
### Digital outputs

|                        |  |
|------------------------|--|
| Variant                | Short-circuit-proof  |
| Nominal output current | Max. DC 500 mA per digital output  |
| Inductive loads        | Dissipation of inductive switch-off energy up to 0.7 J per output<br>Freewheeling diodes are not integrated. |
| Low level              | DC 0 V, $I_{LEAK} = 10 \mu A$  |
| High level             | DC 24 V + 20% / - 15%, $R_{ON} = 320 m\Omega$  |

## 10.4 Dimension drawings

### 10.4.1 Basic unit

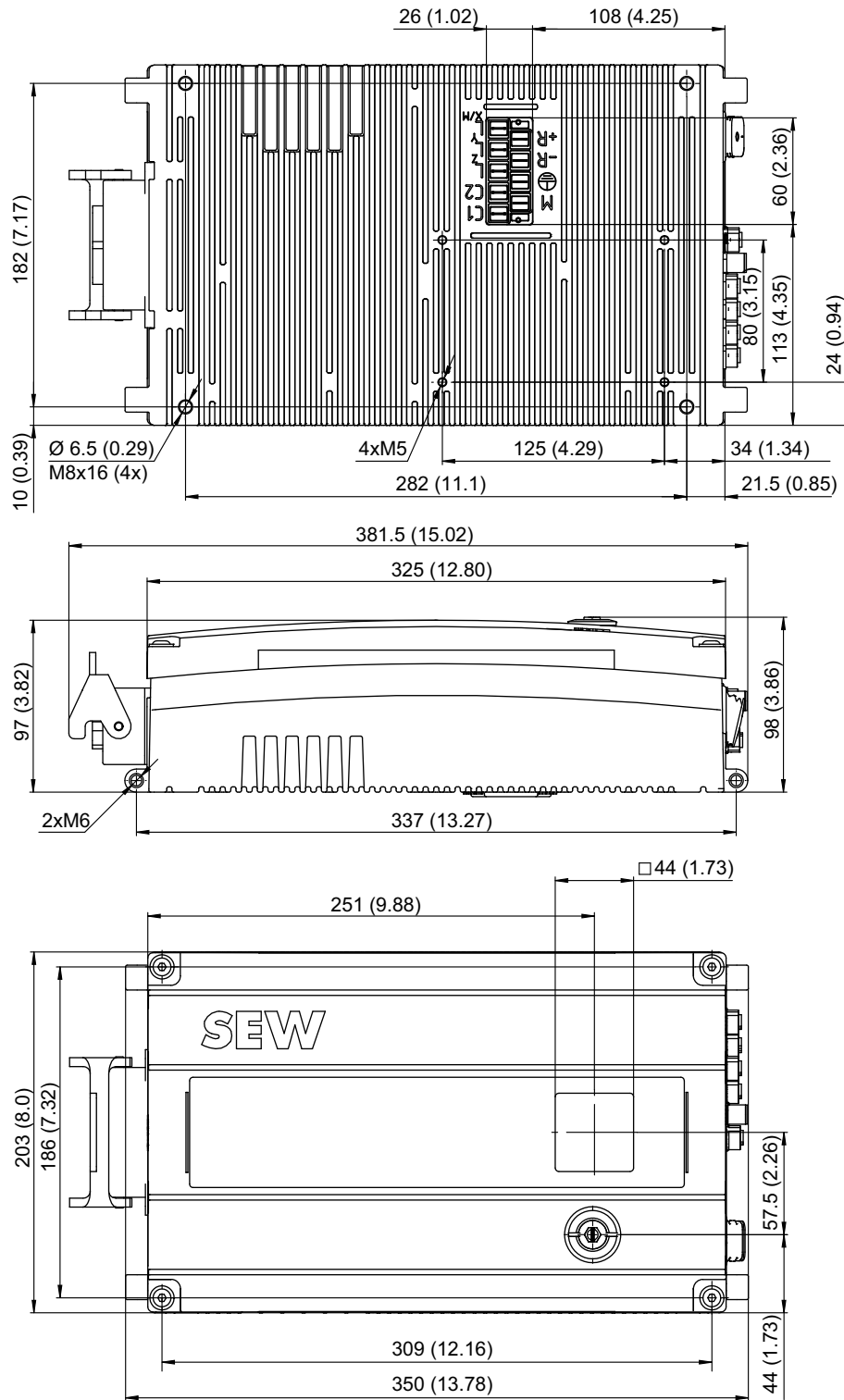
#### Unit variant 1



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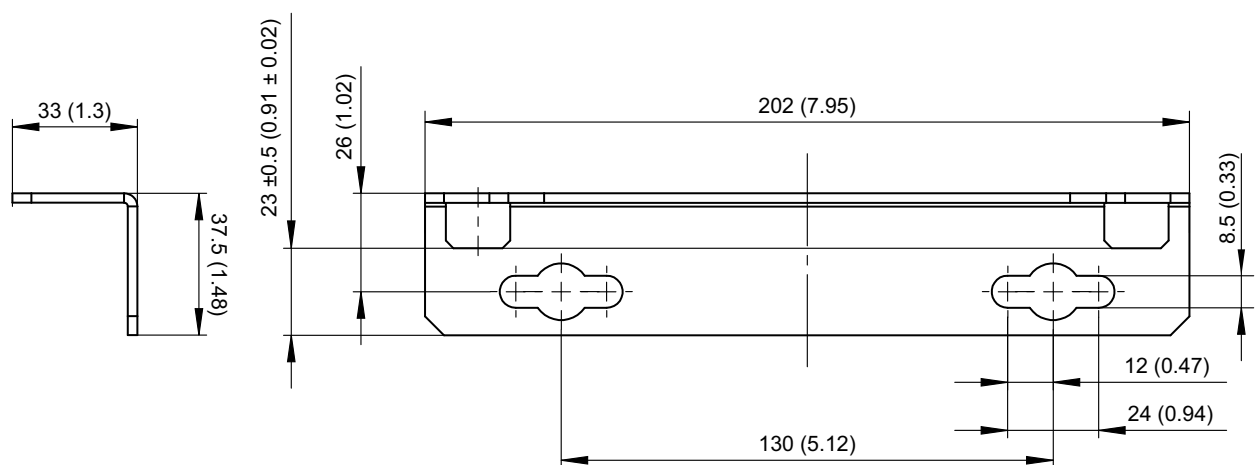
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Unit variant 2



11986078859

### 10.4.2 Mounting bracket



11949327243

## 11 Declaration of conformity

## EC Declaration of Conformity



Translation of the original text

900140014



**SEW-EURODRIVE GmbH & Co KG**  
**Ernst-Blickle-Straße 42, D-76646 Bruchsal**

declares under sole responsibility that the

drive systems of the series **PHE..B-A15-.1X0B1A-00/000**

are in conformity with

Low Voltage Directive **2006/95/EC**

EMC Directive **2004/108/EC** 4)

Applied harmonized standards: **EN 61800-5-1:2007**  
**EN 61800-3:2005+A1:2012**

- 4) According to the EMC Directive, the listed products are not independently operable products. EMC assessment is only possible after these products have been integrated in an overall system. For the assessment, the product was installed in a typical plant configuration.

Bruchsal **29.04.2014**

Place

Date

Johann Soder  
 Managing Director Technology

a) b) c)

- a) Authorized representative for issuing this declaration on behalf of the manufacturer  
 b) Authorized representative for compiling the technical documents  
 c) Address is identical with address of manufacturer

9007208566703243

## 12 Address list

| Germany  |   |                                       |                             |
|--|---|---------------------------------------|-----------------------------|
| <b>Headquarters</b><br><b>Production plant</b><br><b>Sales</b>       | <b>Bruchsal</b>                             | SEW-EURODRIVE GmbH & Co KG            | Tel. +49 7251 75-0          |
|  |   | Ernst-Blickle-Strasse 42              | Fax +49 7251 75-1970        |
|  |   | 76646 Bruchsal, Germany               | http://www.sew-eurodrive.de |
|  |   | P.O. box                              | sew@sew-eurodrive.de        |
|  |   | Postfach 3023 • 76642 Bruchsal        |                             |
| <b>Service Competence Center</b>                                     | <b>Central</b>                              | SEW-EURODRIVE GmbH & Co KG            | Tel. +49 7251 75-1710       |
|  |   | Ernst-Blickle-Straße 1                | Fax +49 7251 75-1711        |
|  |   | 76676 Graben-Neudorf, Germany         | sc-mitte@sew-eurodrive.de   |
|  | <b>North</b>                                | SEW-EURODRIVE GmbH & Co KG            | Tel. +49 5137 8798-30       |
|  |   | Alte Ricklinger Straße 40-42          | Fax +49 5137 8798-55        |
|  |   | 30823 Garbsen (near Hanover), Germany | sc-nord@sew-eurodrive.de    |
|  | <b>East</b>                                 | SEW-EURODRIVE GmbH & Co KG            | Tel. +49 3764 7606-0        |
|  |   | Dänkritzer Weg 1                      | Fax +49 3764 7606-30        |
|  |   | D-08393 Meerane (near Zwickau)        | sc-ost@sew-eurodrive.de     |
| <b>South</b>   | SEW-EURODRIVE GmbH & Co KG                  | Tel. +49 89 909552-10                 |                             |
|  | Domagkstraße 5                              | Fax +49 89 909552-50                  |                             |
|  | D-85551 Kirchheim (near Munich)             | sc-sued@sew-eurodrive.de              |                             |
| <b>West</b>  | SEW-EURODRIVE GmbH & Co KG                  | Tel. +49 2173 8507-30                 |                             |
|  | Siemensstraße 1                             | Fax +49 2173 8507-55                  |                             |
|  | 40764 Langenfeld (near Düsseldorf), Germany | sc-west@sew-eurodrive.de              |                             |
| <b>Electronics</b>   | SEW-EURODRIVE GmbH & Co KG                  | Tel. +49 7251 75-1780                 |                             |
|  | Ernst-Blickle-Strasse 42                    | Fax +49 7251 75-1769                  |                             |
|  | 76646 Bruchsal, Germany                     | sc-elektronik@sew-eurodrive.de        |                             |
| <b>Drive Service Hotline / 24 h hotline</b>                          |   |                                       | +49 800 SEWHELP             |
|  |   |                                       | +49 800 7394357             |
| Additional addresses for service in Germany are provided on request. |   |                                       |                             |

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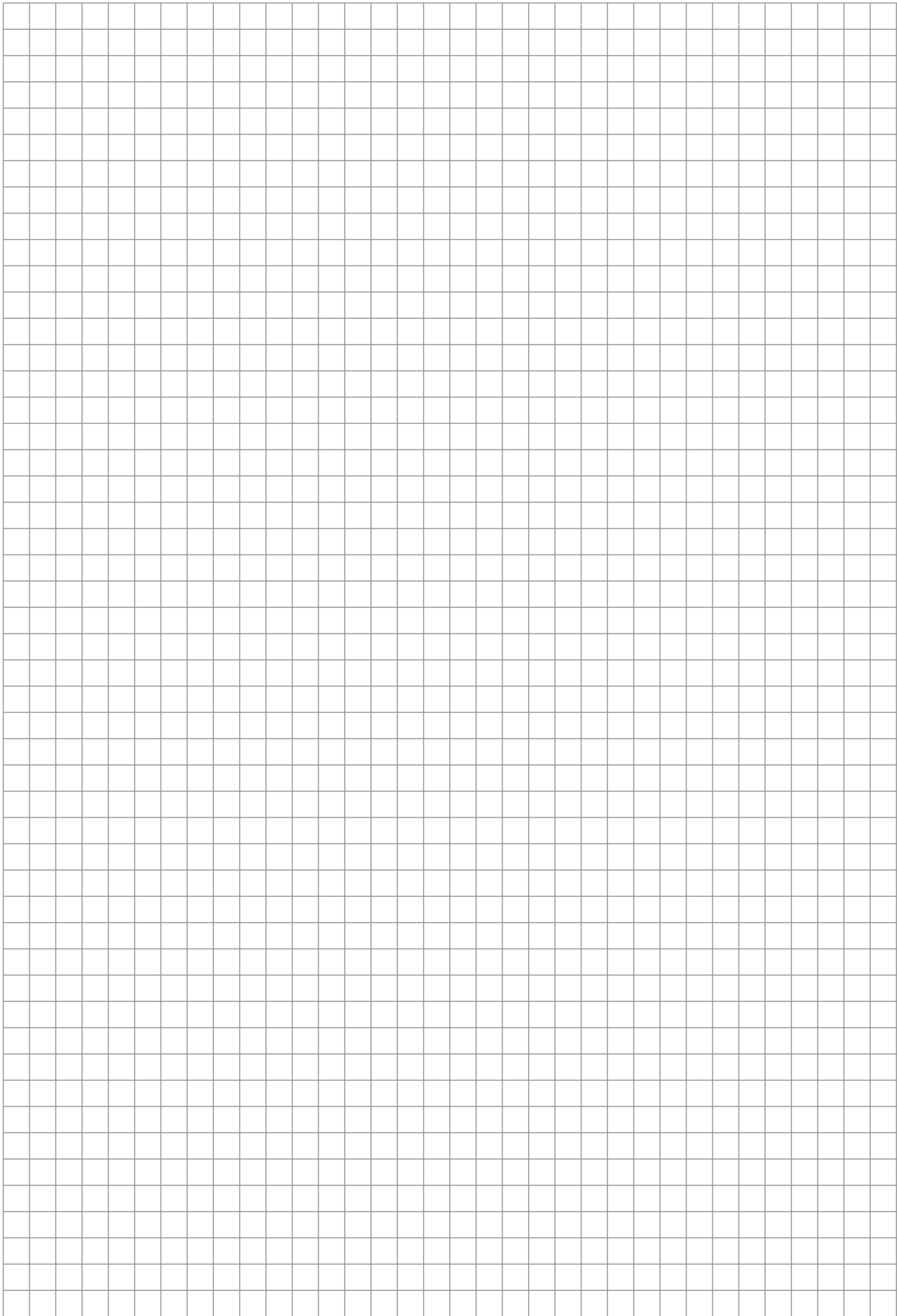
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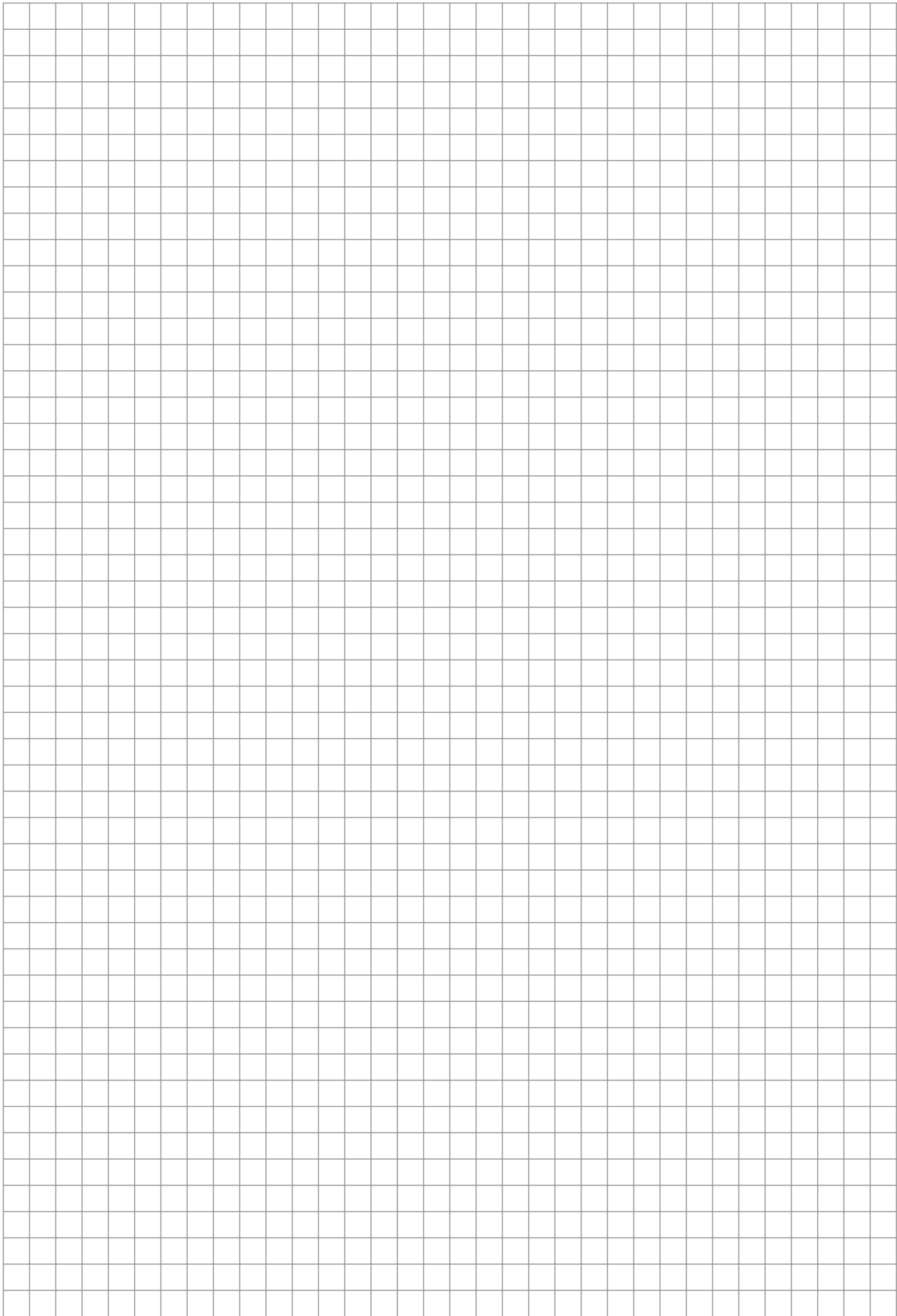
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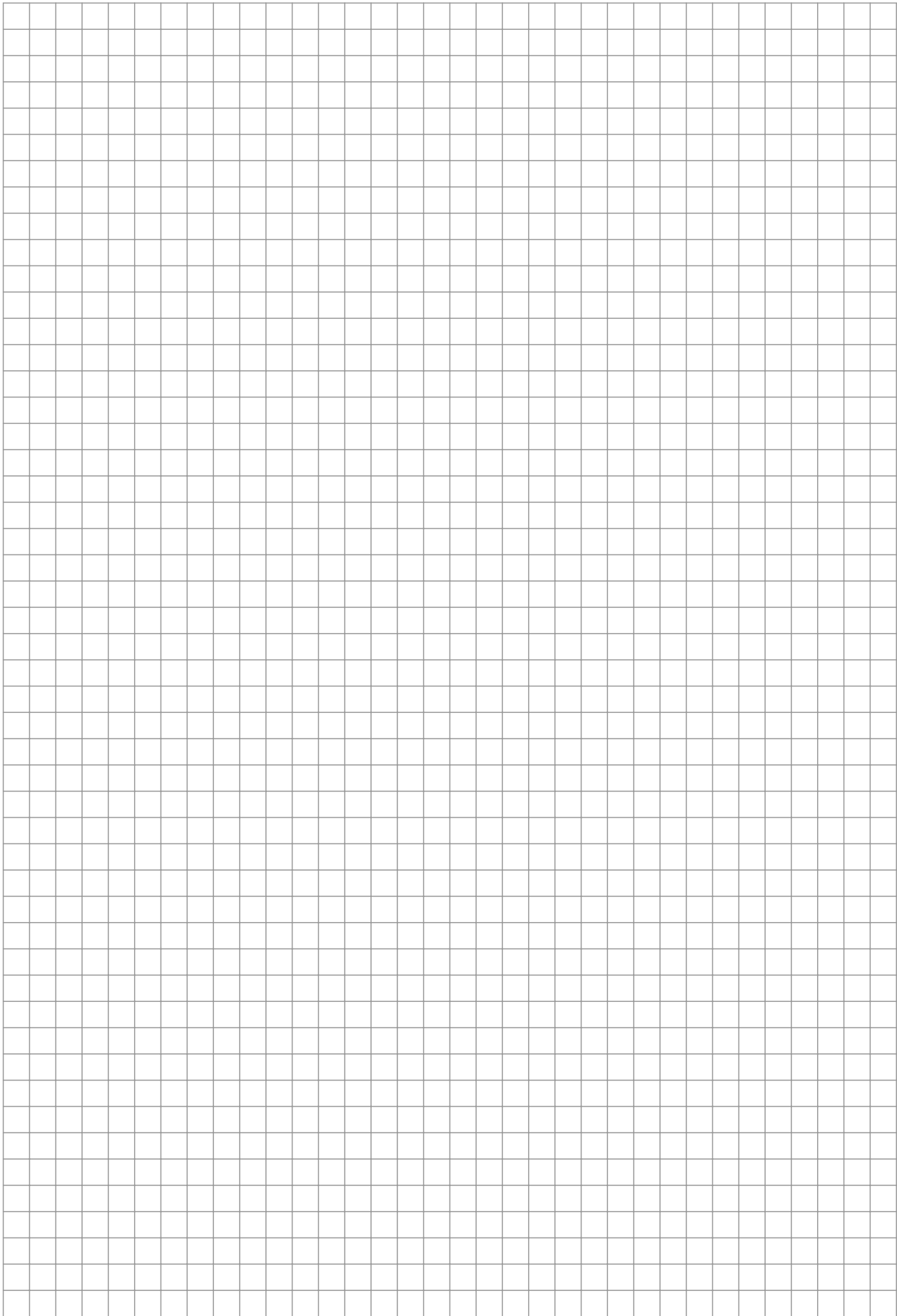
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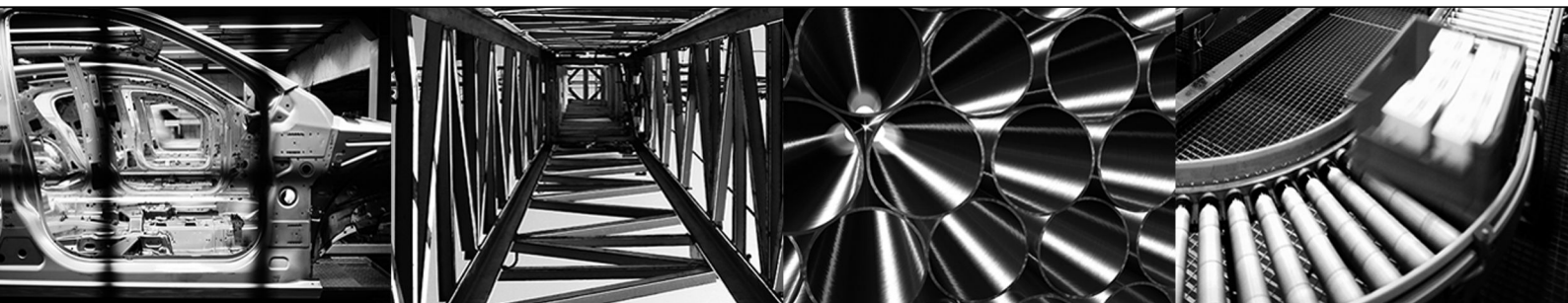
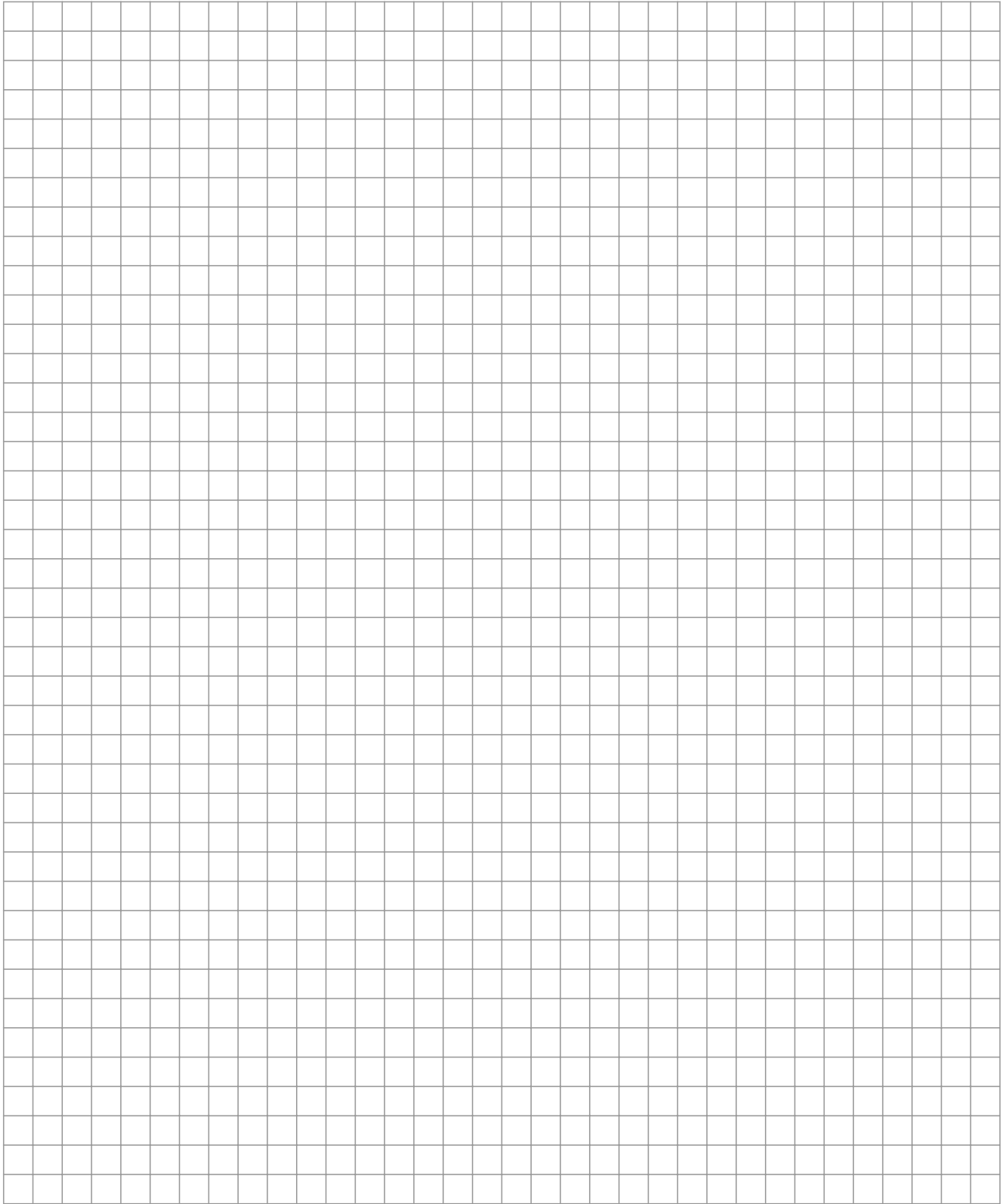
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