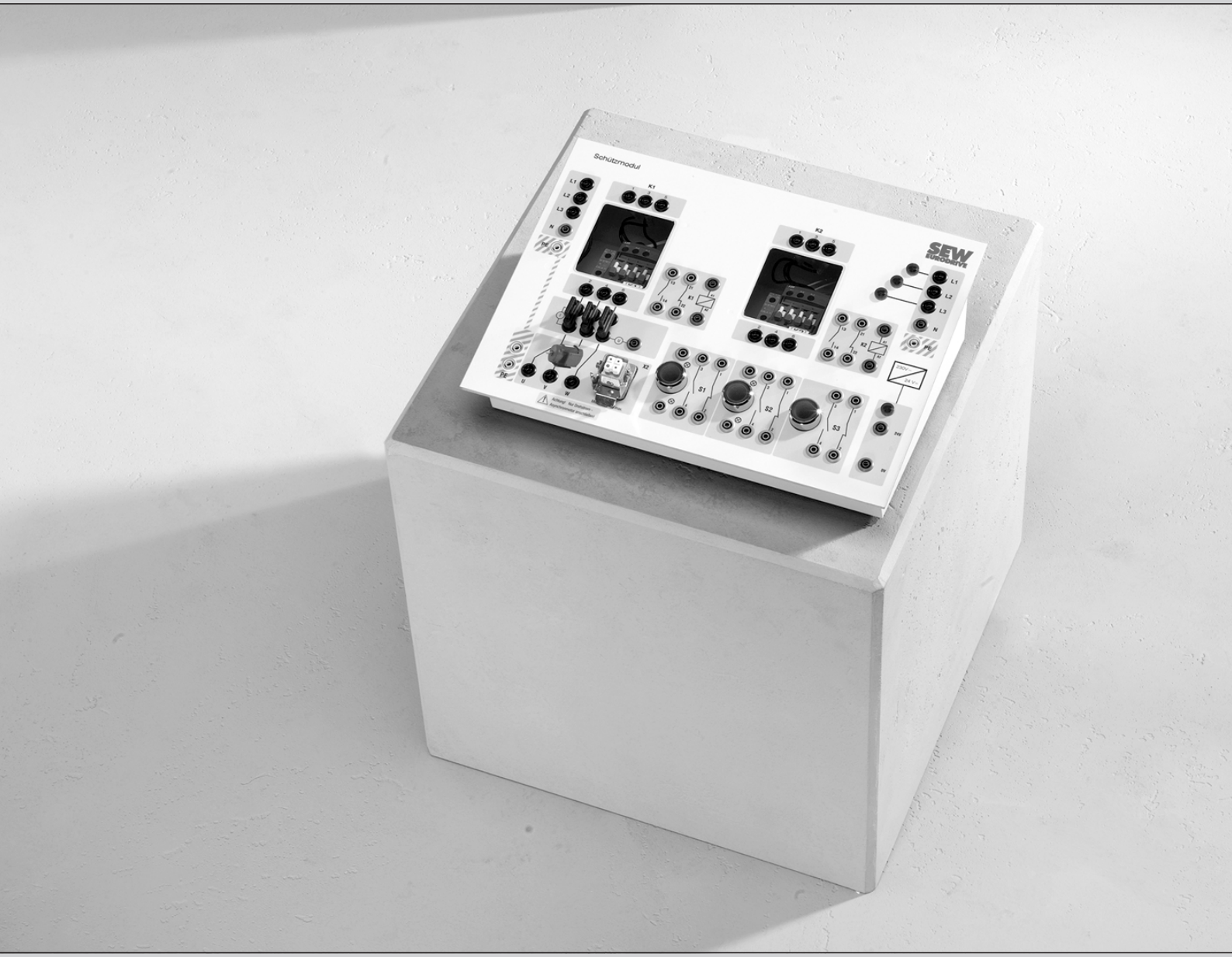
SEW EURODRIVE

Operating Instructions



Didactics – Electromechanics

Reversing Contactor Switch Module

Edition 12/2018

28522273/EN

Table of contents

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1 General information

1.1 About this documentation

The current version of the documentation is the original.

This documentation is an integral part of the product. The documentation is intended for all employees who perform work on the product.

Make sure this documentation is accessible and legible. Ensure that persons responsible for the systems and their operation as well as persons who work on the product independently have read through the documentation carefully and understood it. If you are unclear about any of the information in this documentation, or 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
⚠ **DANGER**	Imminent hazard	Severe or fatal injuries
⚠ **WARNING**	Possible dangerous situation	Severe or fatal injuries
⚠ **CAUTION**	Possible dangerous situation	Minor injuries
NOTICE	Possible damage to property	Damage to the product or its environment
INFORMATION	Useful information or tip: Simplifies handling of the product.	

1.2.2 Structure of section-related safety notes

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

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

SIGNAL WORD

Type and source of hazard.

Possible consequence(s) if disregarded.

- Measure(s) to prevent the hazard.

Meaning of the hazard symbols

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

Hazard symbol	Meaning
	General hazard

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Hazard symbol	Meaning
	Warning of dangerous electrical voltage
	Warning of hot surfaces

1.2.3 Structure of embedded safety notes

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

This is the formal structure of an embedded safety note:

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

1.3 Decimal separator in numerical values

In this document, a period is used to indicate the decimal separator.

Example: 30.5 kg

1.4 Rights to claim under limited warranty

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

1.5 Applicable documentation

Observe the following applicable documents:

- Operating instructions ABB CP-D 24/1.3: "Primary switched-mode power supply”
- Operating instructions ABB AF09Z-30-10-21: “AC / DC operated- with screw terminals”
- Data sheet ABB CAL4-11: "Auxiliary contact CAL4-11"
- "DR..71 – 315, DRN80 – 315 AC Motors" operating instructions

Always use the latest edition of documentation and software.

The SEW-EURODRIVE website (www.sew-eurodrive.com) provides a wide selection of documents for download in various languages. If required, you can also order printed and bound copies of the documentation from SEW-EURODRIVE.

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1.6 Product names and trademarks

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

1.7 Copyright notice

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2 Safety notes

2.1 Preliminary information

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

2.2 Target group

The product is intended for persons in training facilities that are equipped with the appropriate furnishings in classrooms and laboratories. Furnishings are, for example, experimental stands, laboratory benches, energy cells, control panels and control consoles as well as control cabinets with pick-up positions for electrical energy.

The focus is on the transfer of knowledge to non-specialists. Before using the products, non-specialists must be instructed about the safety-relevant aspects described in this document.

Specialist for mechanical work

Any mechanical work on the products must be carried out by a qualified specialist. Specialists in the context of this documentation are persons familiar with the design, mechanical installation, troubleshooting, and maintenance of the product who possess the following qualifications:

- Qualification in the field of mechanical engineering in accordance with the national regulations.
- They are familiar with this documentation.

Specialist for electrotechnical work

Any electrical work on the products must be carried out by adequately qualified electricians. Qualified electricians in the context of this documentation are persons familiar with electrical installation, startup, troubleshooting, and maintenance of the product who possess the following qualifications:

- Qualification in the field of electrical engineering in accordance with the national regulations.
- They are familiar with this documentation.

Additional qualification

In addition to that, these persons must be familiar with the valid safety regulations and laws, as well as with the requirements of the standards, directives, and laws specified in this documentation. The persons must have the express authorization of the company to operate, program, parameterize, label, and ground units, systems, and circuits in accordance with the standards of safety technology.

Instructed persons

All work in the areas of transportation, storage, operation and waste disposal must be carried out by persons who are trained appropriately. The purpose of the instruction is that the persons are capable of performing the required tasks and work steps in a safe and correct manner.

2.3 Designated use

The product is designed for training purposes only. Operating the product in private, craft, trade or for industrial purposes is not permitted. The product is not intended for installation in electrical plants or machines. The product is not intended for use in applications (such as lifting applications).

The product can be used for operating AC asynchronous motors with squirrel-cage rotors. The product is not suited for operating AC synchronous motors.

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Startup (i.e. start of regular operation) is permitted with adherence to EMC guideline only.

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

2.4 Transport

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

Observe the following notes when transporting the device:

- Before transportation, cover the connections with the supplied protection caps.
- Place the product only on the base plate during transport.
- Ensure that the product is not subject to mechanical impact.

If necessary, use suitable, sufficiently dimensioned handling equipment.

2.5 Setup and installation

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

The product is suited for operation on laboratory benches and on tables. Use standard laboratory or training equipment where the products can be placed properly and safely without posing any risk to the learners.

Protect the product from strong mechanical strain. The product and its mounting parts must never protrude into the path of persons or vehicles. Ensure that components are not deformed and insulation spaces are not changed, particularly during transportation and handling. Electric components must not be mechanically damaged or destroyed.

The following applications are prohibited unless the device is explicitly designed for such use:

- Use in potentially explosive atmospheres
- Use in areas exposed to harmful oils, acids, gases, vapors, dust, and radiation
- Operation in applications with impermissibly high mechanical vibration and shock loads in excess of the regulations stipulated in EN 61800-5-1
- Use at an elevation of more than 4000 m above sea level

2.6 Electrical connection

Familiarize yourself with the applicable national accident prevention regulations before working on the product.

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

Ensure that all of the required covers are correctly attached after the electrical installation.

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

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Ground connections are required as preventive measures.

2.7 Startup and operation

Before startup, make sure that the 4 mm sockets, buttons, and switches are intact.

It might be necessary to equip locations where such devices are used 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.

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

Cover unused connections with the supplied protection caps during operation.

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

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

Electric shock due to moving the device while voltage is applied. Do not move the product while voltage is applied.

Do not separate the connection to the product during operation. This may result in dangerous electric arcs damaging the product.

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

10 minutes.

Observe the corresponding information signs on the product.

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

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

2.8 Inspection and maintenance

Only perform maintenance and repair work once the product has been secured and disconnected from the power supply. Ensure a de-energized state of the product before you start working on it. Ensure a de-energized state for the entire time you work on the product.

Repair work may only be carried out by SEW-EURODRIVE.

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3 Device structure

3.1 Scope of delivery

The following components are included in the delivery:

- Labeled front panel
- Housing
- 3 bridges (black)

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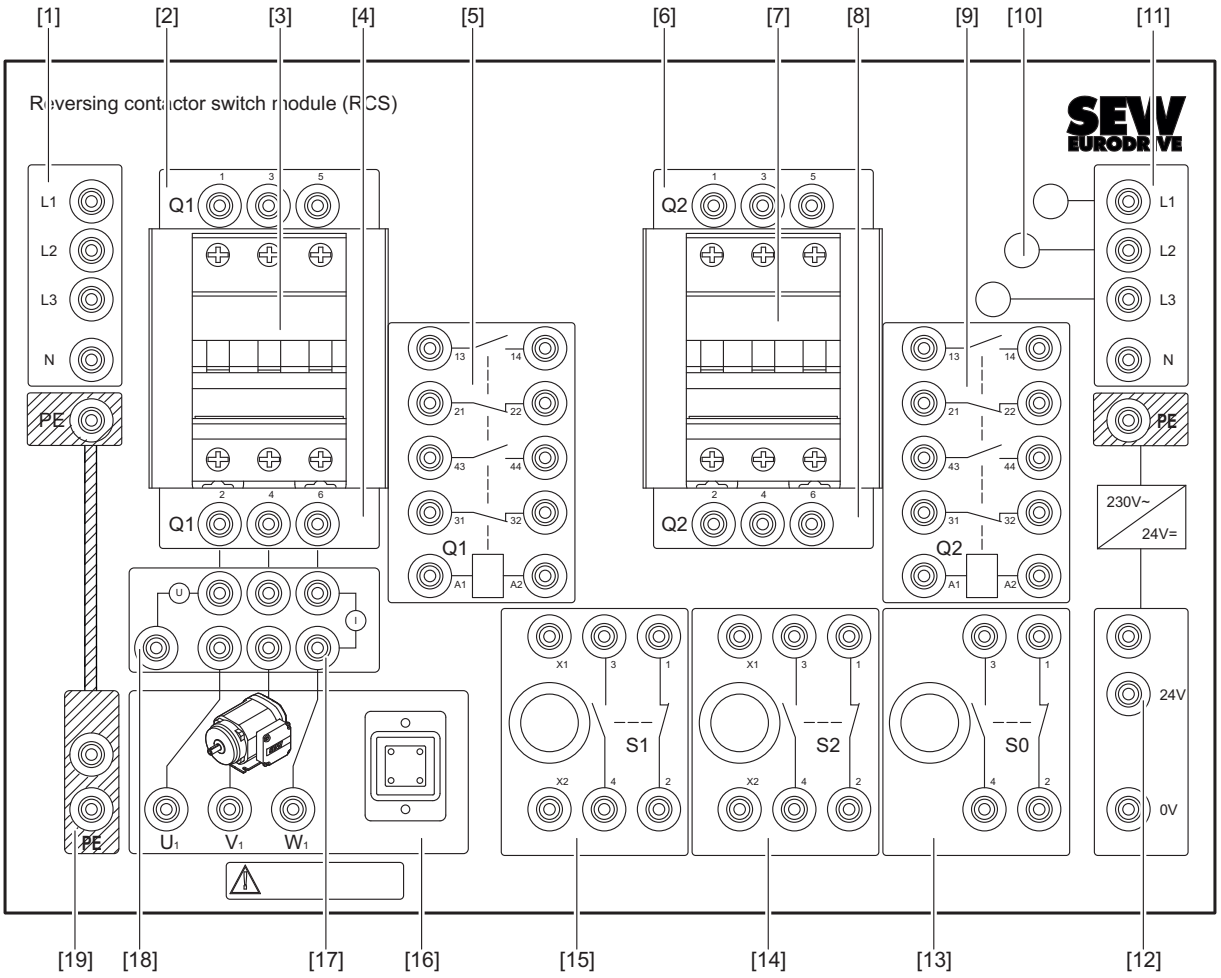
3.2 Basic device



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[1] Power input
[2] Power contactor input Q1
[3] Power contactor 1
[4] Power contactor output Q1
[5] Auxiliary contacts Q1
[6] Power contactor input Q2
[7] Power contactor 2
[8] Power contactor output Q2
[9] Auxiliary contact Q2
[10] Power indicators
[11] Line output
[12] 24 V voltage supply
[13] Pushbutton with NO contact and NC contact S0
[14] Pushbutton with NO contact and NC contact S2
[15] Pushbutton with NO contact and NC contact S1
[16] Motor connection
[17] Sockets for current measurement
[18] Socket for voltage measurement
[19] PE: PE connection

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4 Installation

4.1 Important information

INFORMATION

- Observe the documentation of components connected or mounted to the module (e.g. motor, inverter).
- Comply with all instructions referring to the technical data and the permissible conditions where the device is operated.

⚠ WARNING

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

Severe or fatal injuries.

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

⚠ CAUTION

Short circuit due to incorrectly set jumpers.

Damage to property and injury.

- Insert the jumpers only in the contact points provided for this purpose.

INFORMATION

Only connect AC asynchronous motors to the device output.

4.1.1 Device output

Only connect ohmic/inductive load (motor).

4.1.2 Cable

Use the following cables:

- Standardized safety cables for use in classrooms or laboratories.
- 4 mm laboratory safety plug connectors with rigid insulating sleeve, suited for nominal voltages of up to 1000 V.
- Didactics connection cable from SEW-EURODRIVE.

The cable must not be longer than 3 m.

4.1.3 PE line connection according to EN 61800-5-1

Earth-leakage currents of ≥ 3.5 mA can occur during normal operation. Observe the following for reliable PE connection:

- Supply system cable < 10 mm^2:

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  - Second PE conductor with the same cross section as the supply system cable routed parallel to the protective earth via separate terminals, or
  - Copper PE conductor with a cross section of 10 mm²
- Supply system cable 10 to 16 mm²:
  - Copper protective earth conductor with the same cross section as the supply system cable.
- Supply system cable 16 to 35 mm²:
  - Copper PE conductor with a cross section of 16 mm²
- Supply system cable > 35 mm²:
  - Copper PE conductor with half the cross section of the supply system cable.

4.1.4 Interference emission

Recommendation: Use shielded motor cables for EMC compliant installation.

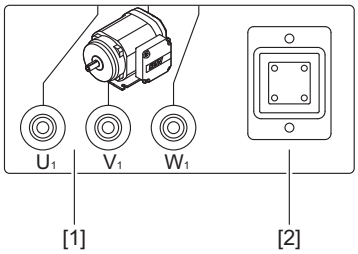
4.2 Motor connection

NOTICE

Damage to the didactics module due to overload.

Damage to property.

- Only connect one motor to the didactics module.



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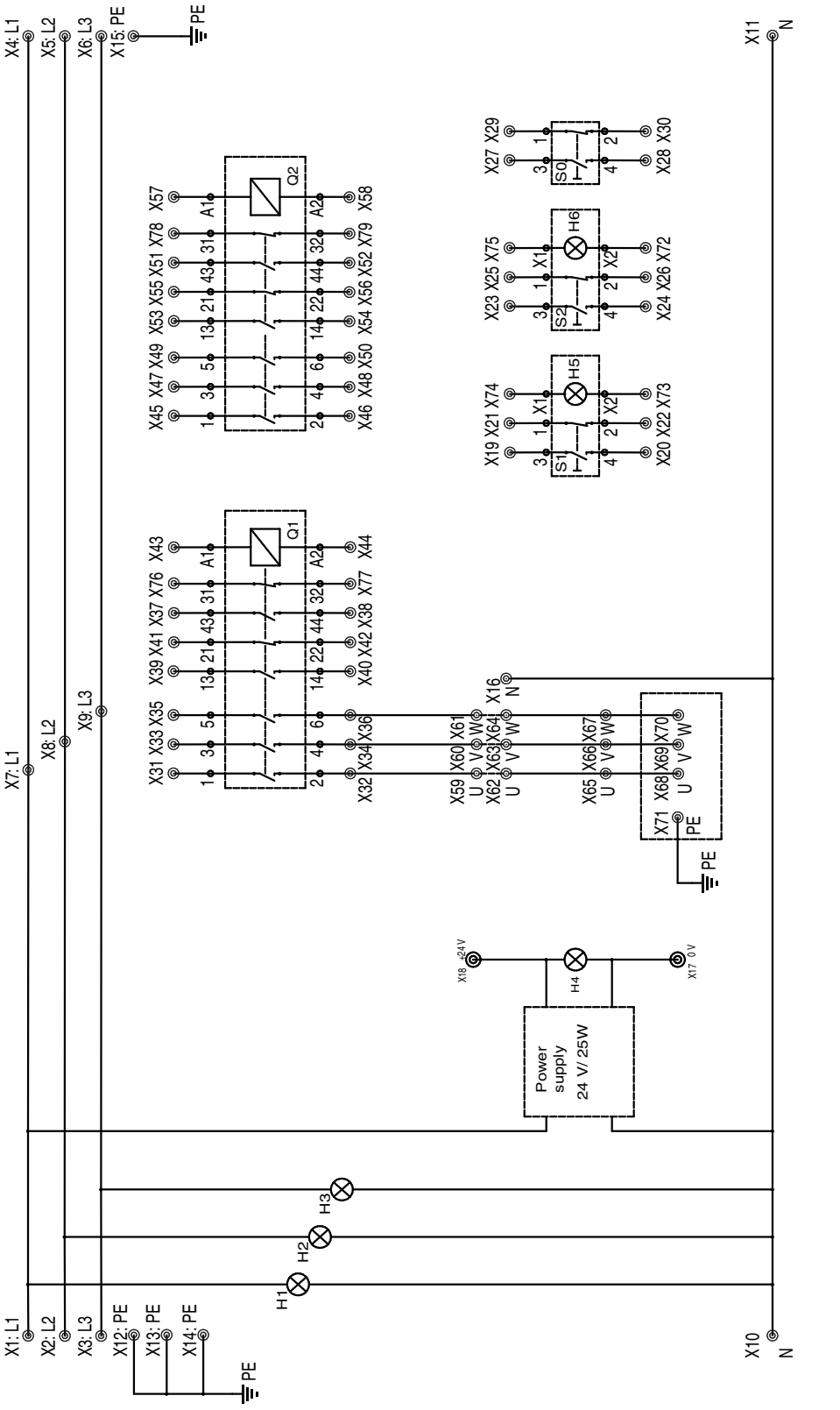
[1] Motor phases U, V, W
[2] Motor connection HARTING connector type Han®Q5 EMC female
Article no.: Connector: 09620030301, insert: 09120053101

You can connect the motor via the 4 mm connections of the U, V and W motor phases, or via the connector.

4.3 Wiring diagram



5 Startup

5.1 Important information

INFORMATION

- Before startup, make sure that the product is not damaged.
- Check that all protective covers are installed correctly.
- Observe the information and safety notes in the documentation of the circuit breaker when installing the circuit breaker.

⚠ WARNING

Danger of electric shock due to open connections.

Severe or fatal injuries.

- Never start the device if the touch guard is not installed.

⚠ WARNING

Risk of injury due to device malfunction caused by incorrect device setting.

Severe or fatal injuries.

- Make sure that the installation was carried out by trained specialists.
- Check the parameters and data sets.
- Only use settings that are correct for the function.

NOTICE

Danger due to arcing.

Damage to electrical components.

- Do not disconnect power connections during operation.
- Do not connect power connections during operation.

INFORMATION

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

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6 Operation

6.1 Important information

INFORMATION

- Check that all protective covers are installed correctly.
- Observe the documentation of components connected or mounted to the module (e.g. motor, inverter).

⚠ WARNING

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

Severe or fatal injuries.

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

⚠ CAUTION

Risk of burns due to hot surfaces of the device 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 device and the connected options cool down before you start working on them.

6.2 Pushbutton with NO contact and NC contact function

NOTICE

Damage due to high voltage.

Possible damage to property.

- The voltages that are applied may not exceed 24 V.

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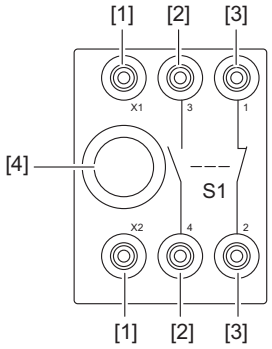

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[1] Voltage supply X1/X2
[2] NO contact 3/4
[3] NC contact 1/2
[4] Pushbutton

Contacts X1 and X2 [1] supply the LED of the pushbutton with voltage [4]. The figure also applies to the NO and NC contacts S0 and S2.

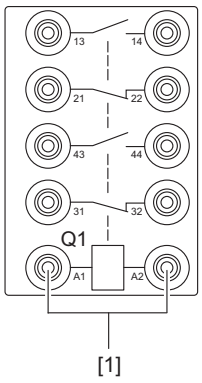
6.3 Auxiliary contacts

NOTICE

Damage due to high voltage.

Damage to property.

- Apply a maximum voltage of 24 V to the connections A1 and A2 of the contactor coil Q1 and Q2.



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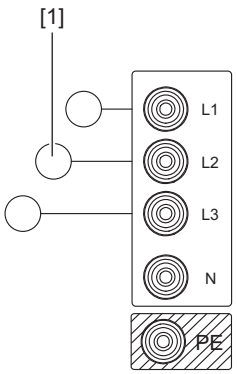
[1] Connections A1 and A2

Q1 and Q2 are the spoils of the power contactors Q1 and Q2.

6.4 Power indicators



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As soon as there is voltage at the didactics module, the power indicators [1] are lit.

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7 Service

7.1 Electronics Service by SEW-EURODRIVE

If you are unable to rectify a fault, contact SEW-EURODRIVE Service. For the addresses, refer to www.sew-eurodrive.com.

When contacting the SEW-EURODRIVE service, always specify the following information so that our service personnel can assist you more effectively:

- Information on the device type on the nameplate (e.g. type designation, serial number, part number, product key, purchase order number)
- Brief description of the application
- Fault message on the status display
- Nature of the fault
- Accompanying circumstances
- Any unusual events preceding the problem

7.2 Waste disposal

Dispose of the product and all parts separately in accordance with their material structure and the national regulations. Put the product through a recycling process or contact a specialist waste disposal company. If possible, divide the product into the following categories:

- Iron, steel or cast iron
- Stainless steel
- Magnets
- Aluminum
- Copper
- Electronic parts
- Plastics

The following materials are hazardous to health and the environment. These materials must be collected and disposed of separately.

- Oil and grease

  Collect used oil and grease separately according to type. Ensure that the used oil is not mixed with solvent. Dispose of used oil and grease correctly.
- Screens
- Capacitors

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8 Technical data

Reversing contactor switch module	
Part number	18979297
Degree of protection	IP20
Power supply connection	3-phase AC connection
Operating voltage	400 V
Control voltage	24 V
Line frequency	50 Hz
Nominal current	16 A
Dimensions W × H × D	420 mm × 135 mm × 295 mm

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9 Standards and certifications

The SEW-EURODRIVE components were developed and tested based on the latest, national standards and certifications.

If special approvals are necessary for additional requirements, request them separately from SEW-EURODRIVE.

9.1 EC declaration of conformity

The EC declarations of conformity for the SEW components are listed on the website of SEW-EURODRIVE with the respective products.

9.2 Certifications

The certificates for the SEW components are listed on the website of SEW-EURODRIVE with the respective products.

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10 Address list

Germany			
Headquarters Production Sales	Bruchsal	SEW-EURODRIVE GmbH & Co KG Ernst-Blickle-Straße 42 76646 Bruchsal	Tel. +49 7251 75-0 Fax +49 7251 75-1970 http://www.sew-eurodrive.de sew@sew-eurodrive.de
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Production	Graben	SEW-EURODRIVE GmbH & Co KG Ernst-Blickle-Straße 1 76676 Graben-Neudorf	Tel. +49 7251 75-0 Fax +49 7251-2970
	Östringen	SEW-EURODRIVE GmbH & Co KG, Werk Östringen Franz-Gurk-Straße 2 76684 Östringen	Tel. +49 7253 9254-0 Fax +49 7253 9254-90 oestringen@sew-eurodrive.de
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	Ulm	SEW-EURODRIVE GmbH & Co KG Dieselstraße 18 89160 Dornstadt	Tel. +49 7348 9885-0 Fax +49 7348 9885-90 dc-ulm@sew-eurodrive.de
	Würzburg	SEW-EURODRIVE GmbH & Co KG Nürnbergerstraße 118 97076 Würzburg-Lengfeld	Tel. +49 931 27886-60 Fax +49 931 27886-66 dc-wuerzburg@sew-eurodrive.de
Drive Service Hotline / 24 Hour Service			0 800 SEWHELP 0 800 7394357

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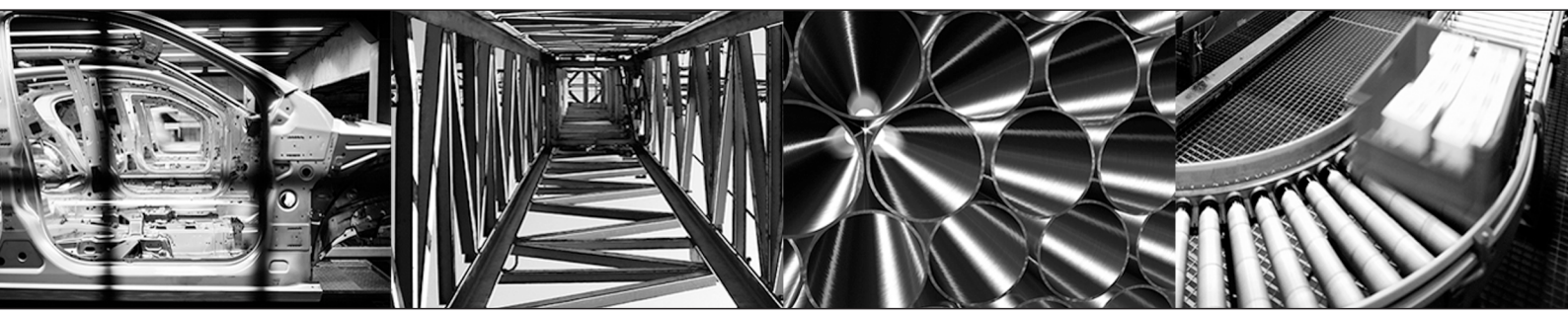

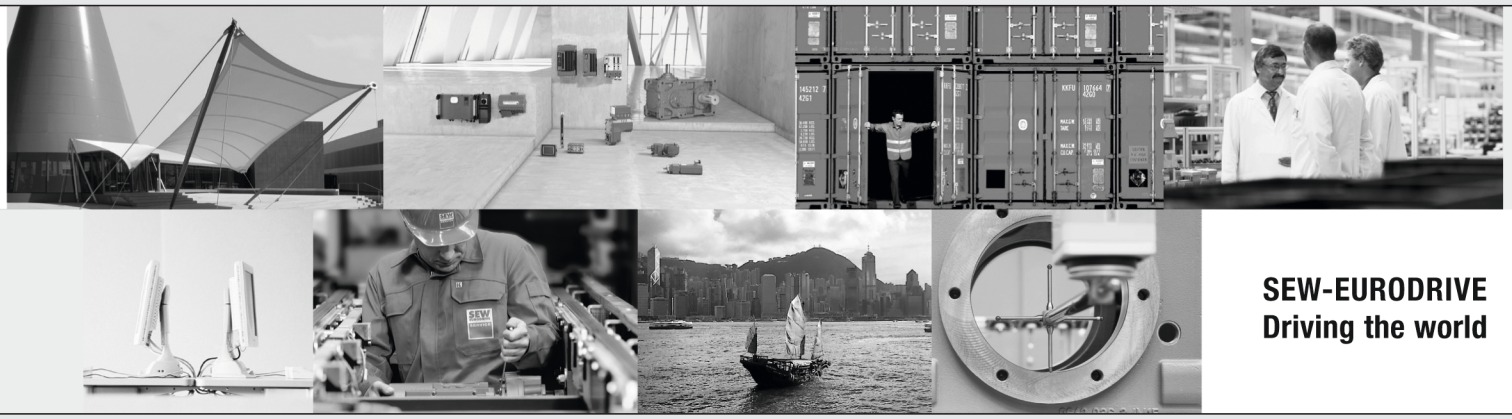

SEW-EURODRIVE
Driving the world

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