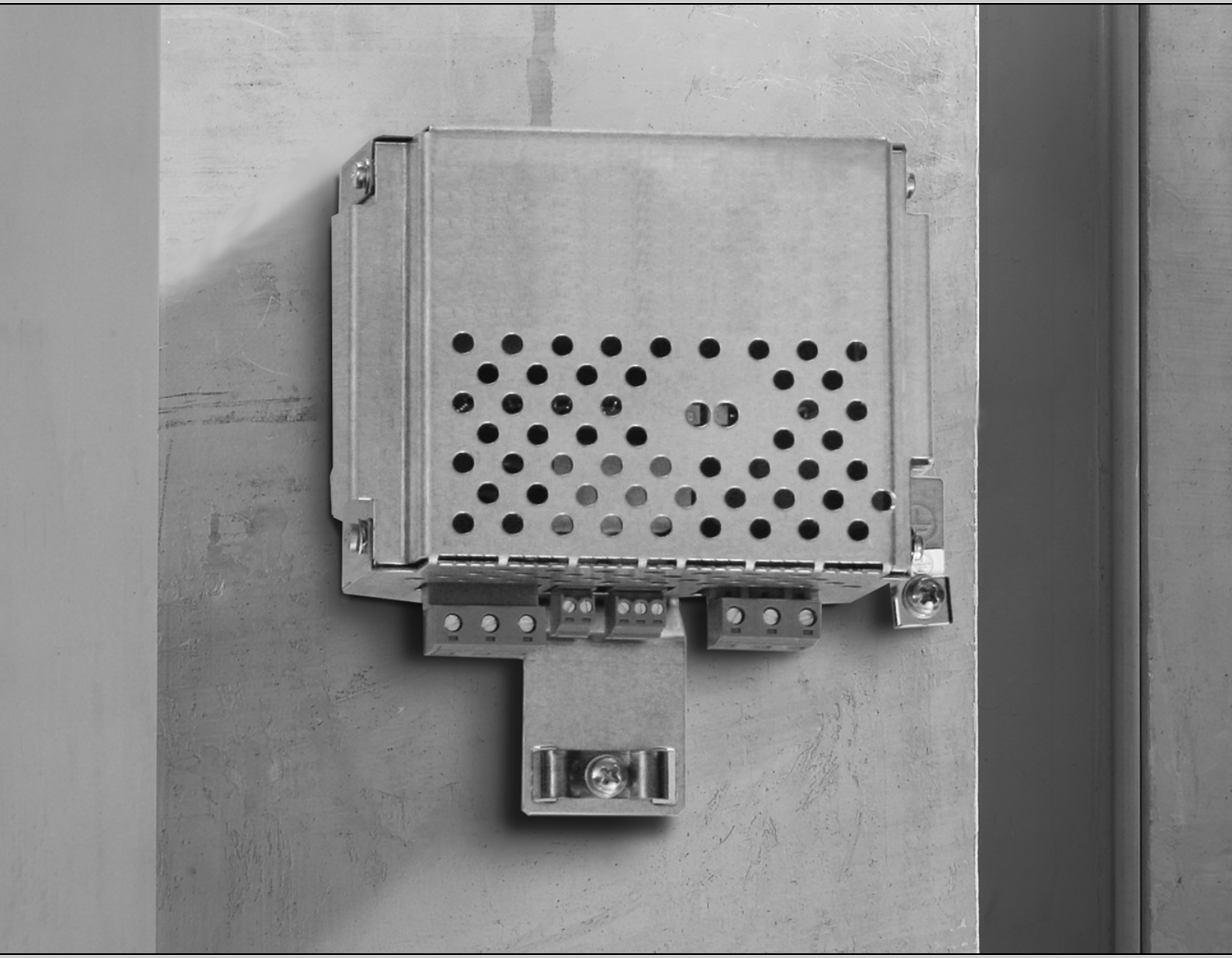
SEW EURODRIVE

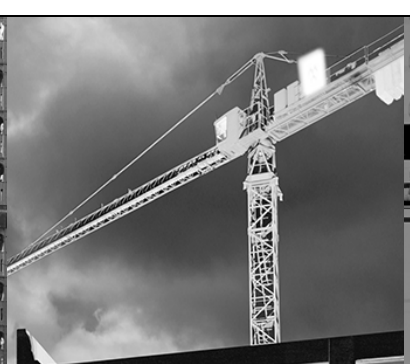
Operating Instructions



Safety-Relevant BST Brake Module
for control cabinet installation

Edition 05/2009

16796012 / EN

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1 General Information

1.1 How to use the operating instructions

The operating instructions are an integral part of the product and contain important information for operation and service. The operating instructions are written for all persons who assemble, install, start up, and service this product.

The operating instructions must be legible and accessible at all times. Make sure that staff responsible for the plant and its operation, as well as persons who work independently on the unit, have read 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, contact SEW-EURODRIVE.

1.2 Structure of the safety notes

The safety notes in these operating instructions are designed as follows:

Pictogram	SIGNAL WORD
	Type and source of danger. Possible consequence(s) if the safety notes are disregarded. • Measure(s) to prevent the danger.

Pictogram	Signal word	Meaning	Consequences if disregarded
Example:  General danger  Specific danger, e.g. electric shock	**DANGER**	Imminent danger	Severe or fatal injuries
	WARNING	Possible dangerous situation	Severe or fatal injuries
	CAUTION	Possible dangerous situation	Minor injuries
	NOTICE	Possible damage to property	Damage to the drive system or its environment
	**TIP**	Useful information or tip. Simplifies the handling of the drive system.	

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 operating instructions. Therefore, read the operating instructions before you start working with the unit

1.4 Exclusion of liability

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

1.5 Copyright notice

2 Safety Notes

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

2.1 Preliminary information

This document contains safety-related conditions for the operation of the safety-relevant BST brake module with safe disconnection of the brake.

The classification to category 3 according to EN 954-1, or performance level d according to EN ISO 13849-1 applies to the control and not to the brake.

2.2 General information

Never install or start up damaged products. Submit a complaint to the shipping company immediately in the event of damage.

All work related to transportation, storage, setup/mounting, connection, startup, maintenance and repair may only be carried out by qualified personnel, in strict observation of:

- The relevant detailed operating instructions
- The warning and safety signs
- All other project planning documents, operating instructions and wiring diagrams related to the drive
- The specific regulations and requirements for the system
- The national/regional regulations governing safety and the prevention of accidents

The requirements for the safety switching device and the permitted circuit variants are specified in detail in section "Requirements for external safety switching devices" (see page 16) and must be strictly observed.

The system/machine manufacturer must perform a system/machine-specific risk analysis. This is to take into account the safety-relevant BST brake module as well as the mechanical brake design.

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

Refer to the documentation for additional information.

2.3 Target group

Only qualified personnel is allowed to perform installation, startup, fault repair and servicing (observe IEC 60364 or CENELEC HD 384 or DIN VDE 0100 and IEC 60664 or DIN VDE 0110 as well as national accident prevention guidelines).

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

Any activities regarding transportation, storage, operation, and disposal must be carried out by persons who have been instructed appropriately.

2.4 Designated use

The safety-relevant BST brake module is responsible for the power supply and control of disk brakes from SEW-EURODRIVE. For the permitted combination of safety-relevant BST brake module and SEW disk brake, refer to the section "Permitted unit combinations" in the "Safety-Relevant Conditions" chapter. The safety-relevant BST brake module is intended for industrial systems and may only be used in accordance with the information provided in SEW-EURODRIVE's technical documentation and the information given on the nameplate.

2.5 Transport

Inspect the shipment for any damage that may have occurred in transit as soon as you receive the delivery. Inform the shipping company immediately. It may be necessary to preclude startup.

2.6 Installation/assembly

Observe the notes in section "Mechanical Installation" (see page 21).

2.7 Startup/operation

- When the safety-related control voltage $V_{24\ V\ safe}$ / functional control voltage $V_{24\ V\ in}$ is disconnected, the DC link voltage $V_{DC\ link}$ is still present at the brake module.
- The safety concept is only suitable for performing mechanical work on the system / machine components.
- All poles must be disconnected from the supply system when work is carried out on the electrical section of the system. Dangerous voltages may still be present for up to 10 minutes after disconnection from the power supply source.
- You have to take into account that, in case of a fault, the application time of the connected brake is longer, which means the drive might coast.
  - For maximum brake application times, refer to chapter "Technical Data" of the operating instructions for the BST and SEW disk brakes.
  - Note: If coasting to a halt results in application-dependent hazards, take additional protective measures (e.g. movable covers with closure), which cover the hazardeous area until persons are no longer in danger.
  - The additional protective covers must be designed and integrated to meet the requirements stipulated in EN ISO 12100-1 and the requirements determined for the machine based on the risk analysis.
  - After activating the stop command, access to the machine must remain blocked until the drive has reached standstill, or the access time has to be determined to ensure that an adequate safety distance is maintained.
- The conditions of LED V1 and LED V2 must not be regarded as safety-relevant. The fact that the LED V1 and LED V2 are no longer illuminated does not indicate that the safety-relevant BST brake module is de-energized and the brake is applied. Even if LED V1 and LED V2 are not illuminated, DC link voltage $V_{DC\ link}$ might be present at the BST brake module.

2.8 Inspection/maintenance

Observe the notes in chapter "Inspection/Maintenance" (see page 27).

2.9 Disposal

Dispose the BST in accordance with the material structure and the regulations in force for instance as:

- Iron
- Copper
- Aluminum
- Plastic

3 Integrated Safety Technology

The safety technology of the safety-relevant BST brake module described in this document has been developed and tested in accordance with the following safety requirements:

- Category 3 according to EN 954-1
- Performance level d according to EN ISO 13849-1

This was certified by TÜV Nord. Copies of the TÜV certificate and the corresponding report are available from SEW-EURODRIVE on request.

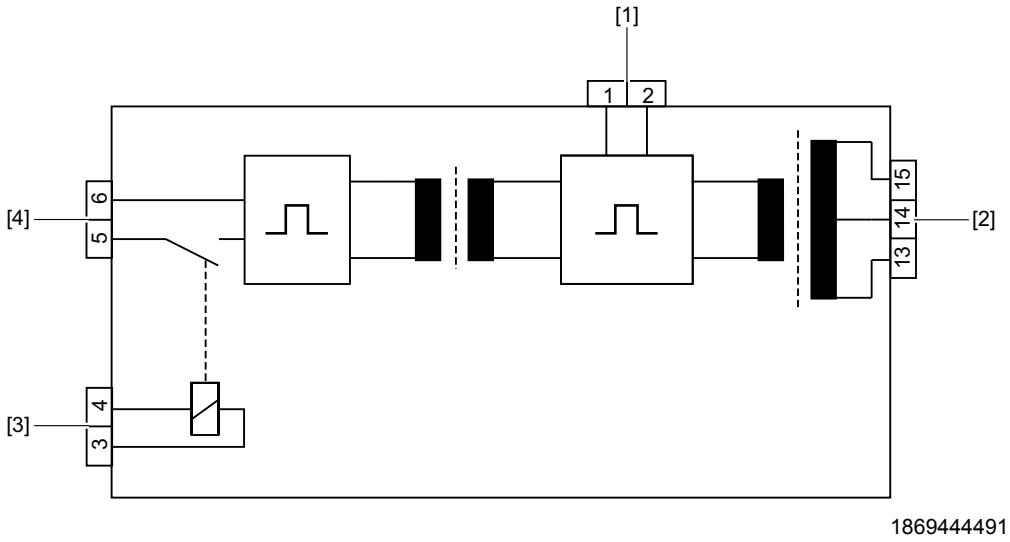
3.1 Safe condition

Safety-relevant use of the BST brake module means the **de-energized condition of the connected brake is defined as safe condition**. This is the basis for the safety concept.

3.2 Safety concept

- The safety-relevant BST brake module enables the connection of an external fail-safe safety switching device/safety controller. The safety switching device disconnects the safe control voltage $V_{24\ V\ safe}$ when a connected control device (e.g. emergency stop device) is activated.
- Disconnecting the safe control voltage $V_{24\ V\ safe}$ means the connected brake is disconnected from the power supply. The power supply required for releasing the connected brake is interrupted safely.
- Instead of separating the brake control galvanically from the power supply using contactors or switches, the disconnection procedure described here prevents the power semiconductors in the safety-relevant BST brake module from being activated, in this way ensuring safe disconnection. This means that all connected brakes are de-energized although the supply voltage is still present at the safety-relevant BST brake module.

3.2.1 Block diagram BST



[1] DC link voltage input $V_{DC\ link}$ (terminal 1/2)
[2] Brake output (terminals 13/14/15)
[3] Functional control voltage input $V_{24\ V\ in}$ (terminal 3/4)
[4] Safety-relevant control voltage input $V_{24\ V\ safe}$ (terminal 5/6)

3.3 Safety function

The following drive-related safety function can be used:

- **SBC** (Safe Brake Control according to IEC 61800-5-2)

  The SBC function safely de-energizes the connected brake by disconnecting the safety-relevant control voltage $V_{24\ V\ safe}$. The safety-relevant control voltage must be disconnected using a suitable external safety switching device/safety controller.

	TIP
	Safety-relevant brake control must be carried out using the safety-relevant control voltage $V_{24\ V\ safe}$ (terminal 5/6) only.

3.4 Restrictions

⚠ DANGER

Voltage is still present at the DC link connection of the frequency inverter even when disconnecting the safety-relevant control voltage $V_{24\ V\ safe}$ / functional control voltage $V_{24\ V\ in}$.

Severe or fatal injuries from electric shock.

- If work is carried out on the electrical section of the brake system, the supply voltage must be disconnected using an external maintenance switch.

TIP

- The safety concept is only suitable for performing mechanical work on the system / machine components.
- A system/machine-specific risk analysis must be carried out by the system/ machine manufacturer and be observed when using the drive system with BST.

4 Safety-Relevant Conditions

The safety function of BST can only be used for safe operation of the system/machine if it is integrated correctly in an application-specific, higher-level safety function or safety system. It is essential that the system/machine manufacturer conducts a system/machine-specific risk analysis (e.g. according to EN ISO 14121) and validates the required safety conditions and functions prior to startup. The system/machine manufacturer and the operator are responsible for compliance of the system/machine with applicable safety regulations.

The following requirements are mandatory when installing and operating the BST brake module in safety-relevant applications.

The conditions are divided into the following sections:

- Approved device combinations
- Installation requirements (see page 14)
- Requirements for external safety controller (see page 16)
- Startup requirements (see page 17)
- Operation requirements (see page 18)

4.1 Permitted unit combinations

Only approved SEW disk brakes may be connected to the BST module.

The following unit combinations with BST are permitted for safety-relevant applications:

Unit designation	Part number	Approved SEW disk brakes
BST 0.6S-460V-00	0 829 971 4	All brake coils with a coil voltage of AC 460 V and a coil power ≤ 120 W. Several brake coils can be connected for redundant systems. In this case, the total power must not exceed 120 W.
BST 0.7S-400V-00	1 300 077 2	All brake coils with a coil voltage of AC 400 V and a coil power ≤ 120 W. Several brake coils can be connected for redundant systems. In this case, the total power must not exceed 120 W.
BST 1.2S-230V-00	1 300 133 7	All brake coils with a coil voltage of AC 230 V and a coil power ≤ 120 W. Several brake coils can be connected for redundant systems. In this case, the total power must not exceed 120 W.

4.2 Requirements on the installation

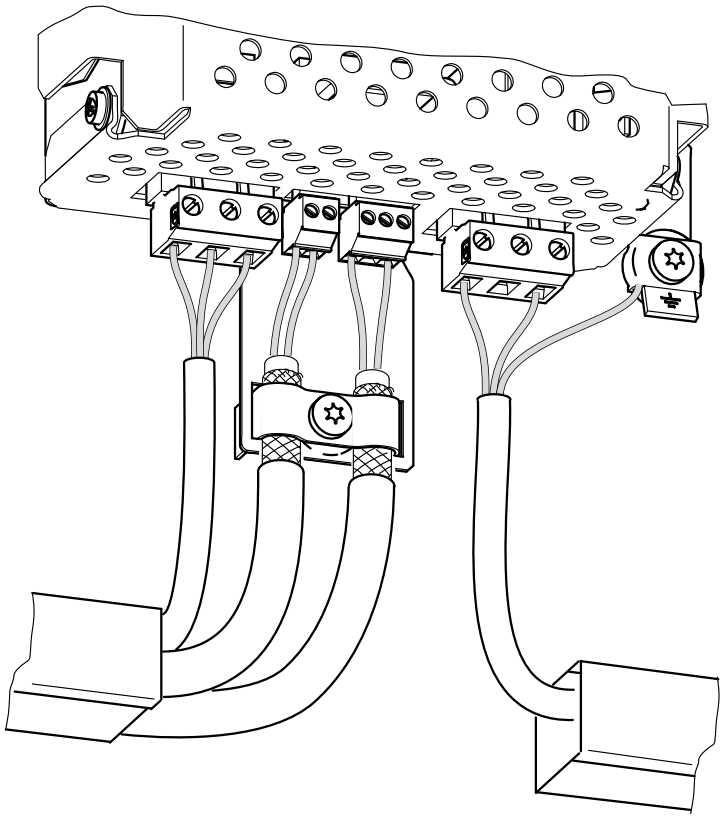
The line between the safety switching device/safety controller and the safety-relevant BST brake module, terminal 5/6 ($V_{24\ V\ safe}$) is referred to as safety-relevant control line (for safe disconnection).

Observe the following requirements on the installation:

- Power lines and safety-related control lines have to be installed in separate cables.
- The total cable length between the safety switching device/safety controller and the safety-relevant BST brake module is limited to a maximum length of 100 m for EMC reasons.
- The total cable length between the safety-relevant BST brake module and the connected brake must not exceed 200 m.
- Wiring must comply with EN60204-1.
- The installation space (control cabinet) must have at least degree of protection IP54.
- The safety-relevant control lines must be routed according to EMC guidelines and as follows:
  - Outside an electrical installation space: Shielded cables must be routed permanently (fixed) and protected against external damage, or other equivalent measures.
  - Individual conductors can be routed inside an electrical installation space. Observe the respective regulations governing the application.
  - It is essential that you apply the shielding at both ends on the housing.
- The safety-relevant control voltage $V_{24\ V\ safe}$ may not be used for feedback.
- You have to make sure that there is no transient coupling to the safety-related control voltage $V_{24\ V\ safe}$.
- When designing the safety circuits, always observe the values specified for safety components.
- For any DC 24 V voltage supply (safety-relevant control voltage $V_{24\ V\ safe}$ and functional control voltage $V_{24\ V\ in}$) of the safety-relevant BST brake module, only voltage sources with safe disconnection (SELV/PELV) according to IEC 60364 (≙ VDE 0100) must be used.

  In case of a single fault, the voltage between the outputs or between any output and grounded parts may not exceed DC 60 V.
- Do not interconnect brake cables of different brake control systems.
- For disconnection of group drives, observe the switching capacity of the safety switching device and the maximum permitted voltage drop on the safety-related control voltage $V_{24\ V\ safe}$.
- Adhere to the technical data of the BST module and the brake.
- Adhere to the general installation regulations in the "Installation" chapter.

The following figure shows EMC compliant installation.



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4.3 Requirements on external safety controller

A safety switching device can be used as an alternative to a safety controller. The following requirements apply analogously.

- For safety-relevant applications up to category 3 to EN 954-1, the safety controller and all other safety-relevant subsystems must be approved for at least category 3 to EN 954-1 or performance level d to EN ISO 13849-1 or SIL 2 to EN 61508.
- For safety-relevant applications up to performance level d to EN ISO 13849-1, the safety controller and all other safety-relevant subsystems must be approved for at least performance level d to EN ISO 138491 or SIL 2 to EN 61508. For determining the performance level, the method described in EN ISO 13849-1 for combining several safety-relevant subsystems (without PFH value calculation) can be used. However, we recommend to determine the PFH value for the overall application. PFH = 0 can be assumed for the safety-relevant BST brake module.

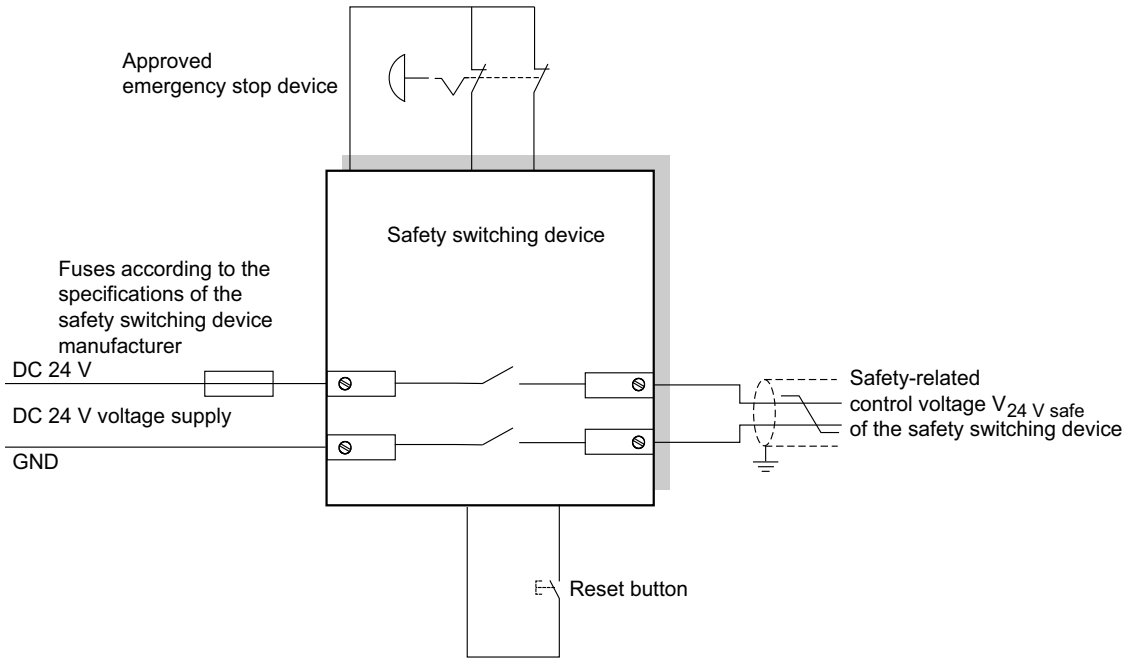
Application	Requirement on the safety controller
Category 3 according to EN 954-1	Category 3 according to EN 954-1 Performance level d according to EN ISO 13849-1 SIL 2 according to EN 61508
Performance level d according to EN ISO 13849-1	Performance level d according to EN ISO 13849-1 SIL 2 according to EN 61508

- The wiring of the safety controller must be suitable for the required safety class, (see manufacturer documentation). The safety-related control voltage $V_{24\ V\ safe}$ can be safely disconnected either at the positive, or the positive and negative pole. SEW-EURODRIVE recommends bipolar disconnection.
- The values specified for the safety controller must be strictly adhered to when designing the circuit.
- The switching capacity of the safety relays or the relay outputs of the safety controller must correspond at least to the maximally permitted, limited output current of the safety-relevant control voltage $V_{24\ V\ safe}$. **Observe the manufacturer's instructions concerning the permitted contact loads and fusing that my be required for the safety contacts. If there are no manufacturer's instructions for fusing, the contacts must be protected with 0.6 times the nominal value of the maximum contact rating specified by the manufacturer**.
- To ensure protection against unintended restart in accordance with EN 1037, the safety controllers must be designed and connected in such a way that resetting the control device alone does not lead to a restart. A restart may only be carried out after a manual reset of the safety circuit.
- The input of the safety-relevant control voltage $V_{24\ V\ safe}$ of the safety-relevant BST brake module (terminal 5/6) is equipped with a serial polarity protection diode and a buffer capacitor with C = 6 µF. This must be considered as load when dimensioning the switching output.

4.3.1 Sample circuit for a "safety switching device"

The following figure shows the basic connection of an external safety switching device (according to the before mentioned requirements).

Observe the information in the respective manufacturer's data sheets for connection.



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4.4 Requirements on startup

- Startup must be documented and the functionality of the safety functions must be demonstrated. Observe the limitations for the safety functions of the BST brake module in chapter "Restrictions" for the verification of the safety functions. Non-safety-relevant parts and components that affect the result of the verification test (e.g. brake rampe of a frequency inverter) must be deactivated, if necessary.
- For using the BST brake module in safety-relevant applications, it is essential that you perform and record startup checks for the disconnecting device and correct wiring.
- During the startup procedure/function test, the correct assignment of the respective voltage supply connection must be checked by means of a measurement.
  - Safety-relevant control voltage $V_{24\ V\ safe}$: Terminal 5/6
  - Functional control voltage $V_{24\ V\ in}$: Terminal 3/4
- The function check must be carried out separately for all potentials.
- Observe the notes in the "Startup" chapter.

4.5 Requirements on the operation

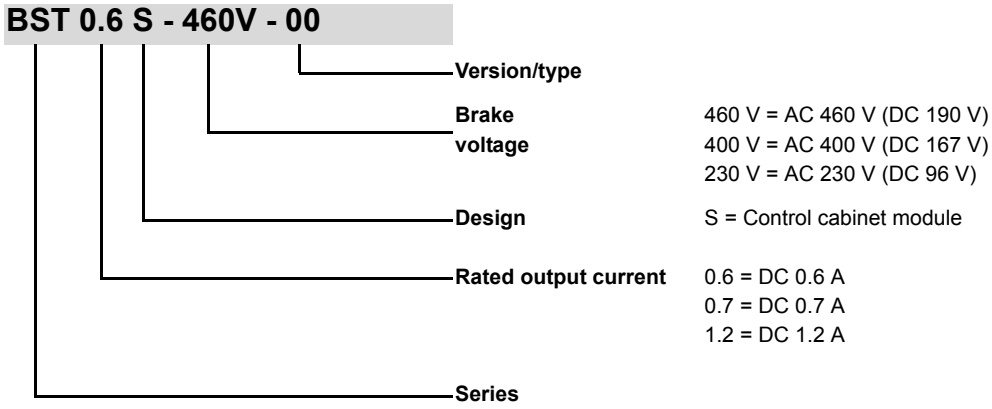
- Operation is only allowed within the limits specified in the data sheets. This applies to both the external safety relay as well as the BST.
- The safety functions must be checked at regular intervals to ensure proper functioning. The period of time between the tests should be specified in accordance with the risk analysis.
- Also observe the information in the "Inspection/Maintenance" chapter.

5 Unit Design

5.1 Nameplate, unit designation

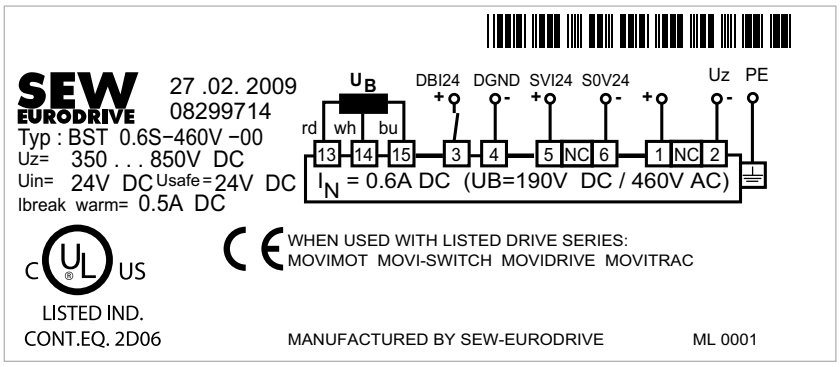
5.1.1 Example: Unit designation

The following characteristic unit data can be read from the unit designation:



5.1.2 Example: Nameplate

The following figure shows a nameplate of BST 0.6S-460V-00:



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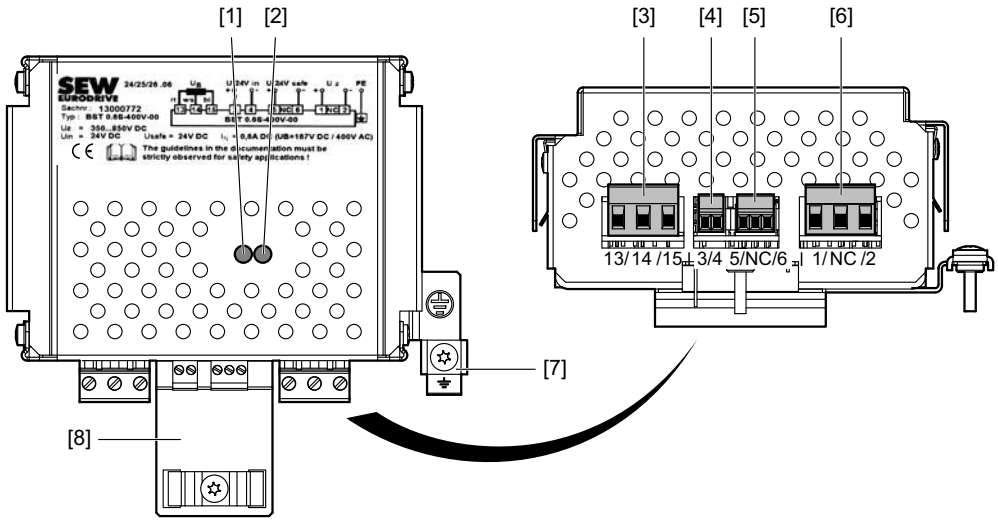
5.2 Scope of delivery of BST

The scope of delivery includes:

- 1 safety-relevant BST brake module with installed holding fixture for support rail mounting
- 4 attached plug connectors for terminal connections

5.3 Safety-relevant BST brake module

The following figure shows the unit design of BST x.xS-xxxV-00:



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[1] LED V1 for indicating the operating state
[2] LED V2 for indicating the operating state
[3] Terminals 13/14/15: Brake connection
[4] Terminals 3/4 : For connecting the functional control voltage $V_{24\ V\ in}$
[5] Terminals 5/6 : For connecting the safety-relevant control voltage $V_{24\ V\ safe}$
[6] Terminals 1/2 : For DC link voltage $+V_{DC\ link}$
[7] PE connection
[8] Retaining plate / shield plate

5.4 Terminal assignment

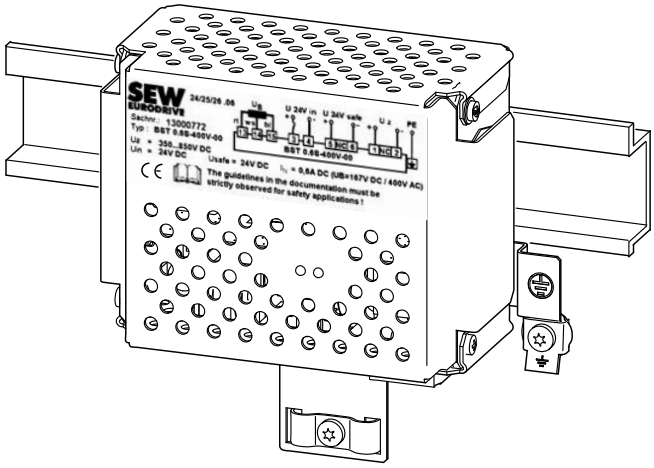
Terminal		Function
1 **2**	**$+V_{DC\ link}$** **$-V_{DC\ link}$**	DC link voltage input
5 **6**	**SVI24** **S0V24**	Safety-relevant control voltage $V_{24\ V\ safe}$ input Reference potential for safety-relevant control voltage $V_{24\ V\ safe}$
3 **4**	**DBI24** **DGND**	Functional control voltage $V_{24\ V\ in}$ input: Reference potential for functional control voltage $V_{24\ V\ in}$
13 **14** **15**	**RD** **WH** **BU**	Brake output
⏚		Protective grounding

6 Installation

6.1 Mechanical installation

6.1.1 Support rail mounting

The BST module is mounted onto a support rail in the control cabinet.



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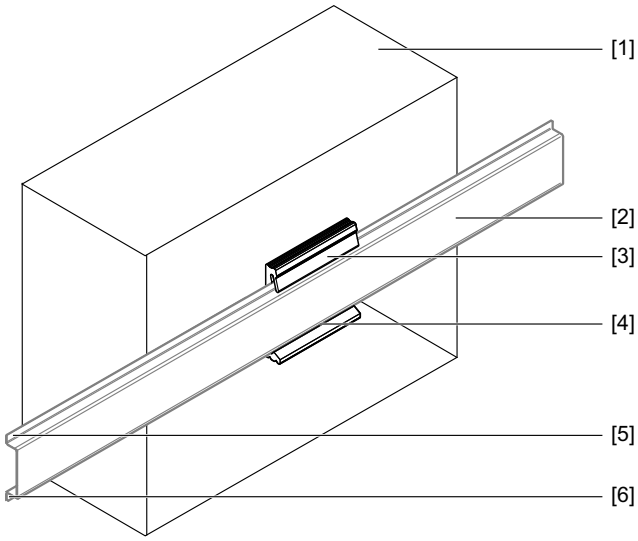
Mounting



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[1] Safety-relevant BST brake module
[2] Support rail
[3] Upper holding fixture of the BST
[4] Notch, lower holding fixture of the BST
[5] Upper support rail edge
[6] Lower support rail edge

1. The upper holding fixture of the BST [3] is spring-loaded. First, insert the BST into the upper support rail edge [5] with the upper holding fixture only.
2. Next, press the BST downward towards the support rail until the notch [4] clicks into place on the lower support rail edge [6].

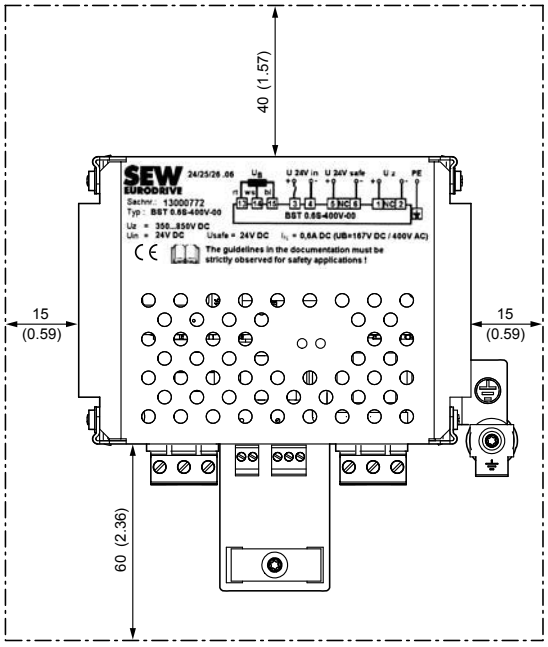
   The spring at the upper holding fixture causes the lower support rail edge to be pressed into the notch so that the BST [1] is secured onto the support rail [2].

Removal

1. Press onto the BST. This causes the lower support rail edge [6] to come off the notch [4]. At the same time, remove the BST from the lower holding fixture.
2. You can remove the BST from the support rail once the lower lock unfastens.

Minimum clearance and mounting position

- Leave 40 mm clearance at the top, 60 mm at the bottom and 15 mm at the sides for optimum cooling. Make sure air circulation in the clearance is not impaired by cables or other installation equipment.
- Ensure unobstructed cooling air supply and make sure that the units are not subjected to heated air from nearby components.
- Install the units vertically only. Do not install them horizontally, tilted or upside down.



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All dimensions in mm (in).

6.2 Electrical installation

	TIP
	All poles must be disconnected from the supply system when work is carried out on the electrical section of the system. Dangerous voltages may still be present for up to 10 minutes after disconnection from the power supply source.

6.2.1 Notes on electrical installation

Supply cable (terminal 1/2)

The supply cable must meet the following conditions:

- The supply cables to the BST carry a high DC voltage (max. DC 1000 V). The rated voltage of the cable must amount to at least V_0/V = 300 V / 500 V (in accordance with DIN VDE 0298).
- The inverter supply system must have a grounded star point (TT/TN). The operation is not permitted for IT systems or systems grounded via an outer conductor.
- Cable cross section: 0.75 mm^2 – 2.5 mm^2 (AWG 19 – AWG 13)
- Max. cable length: 100 m (328 ft)
- All poles of the supply cable are protected with two corresponding DC fuses F1/F2 (recommended 1000 V/4 A).

	TIP
	The fuses may not be required in compliance with IEC 60364-4-43 ((VDE 100 part 430) and EN 60204-1 if the supply cable to the BST is protected by the input fuse located in front of the inverter, or if the following conditions are met: • Keep the cable length to the BST as short as possible. Maximum length: 3 m • Do not lay cables in the vicinity of inflammable substances. • Reduce the risk of short cirucits to a minimum. • Use the greatest possible cable cross section.

Functional control cable (terminal 3/4)

The functional control cable must meet the following conditions:

- Cable cross section of 0.5 mm^2 – 1.5 mm^2 (AWG 20 – AWG 16)
- Max. cable length: 100 m (328 ft)

Safety-related control cable (terminal 5/6)

The safety-related control cable must meet the following conditions:

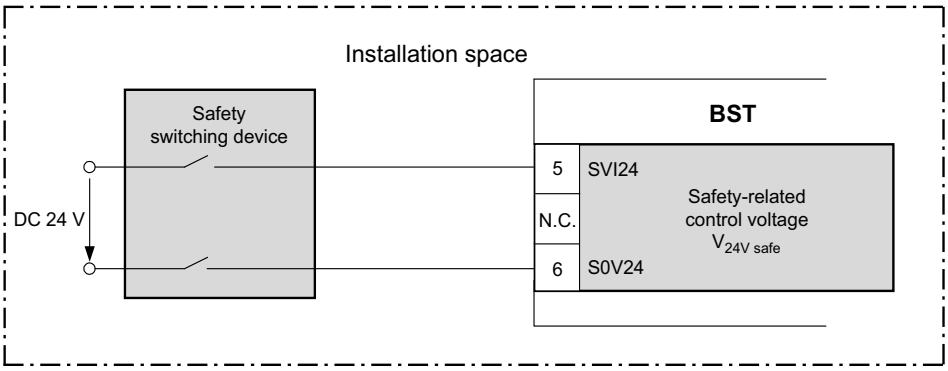
- Cable cross section of 0.5 mm^2 – 1.5 mm^2 (AWG 20 – AWG 16)
- Max. cable length: 100 m (328 ft)

Brake cable (terminal 13/14/15)

- Cable cross section of 0.75 mm^2 – 2.5 mm^2 (AWG 19 – AWG 13)
- Max. cable length: 200 m (656 ft)

6.2.2 Double-pole safe disconnection

The following figure shows the wiring inside the installation space:



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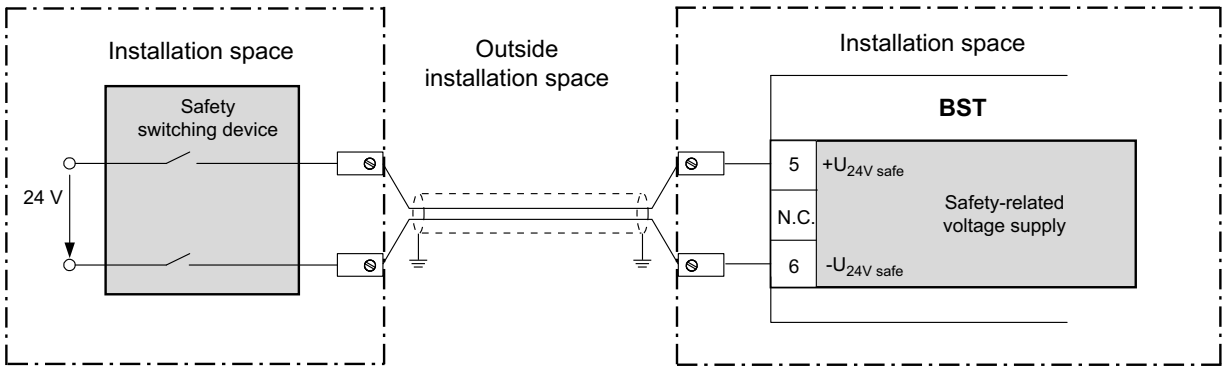
The following figure shows the wiring outside the installation space:



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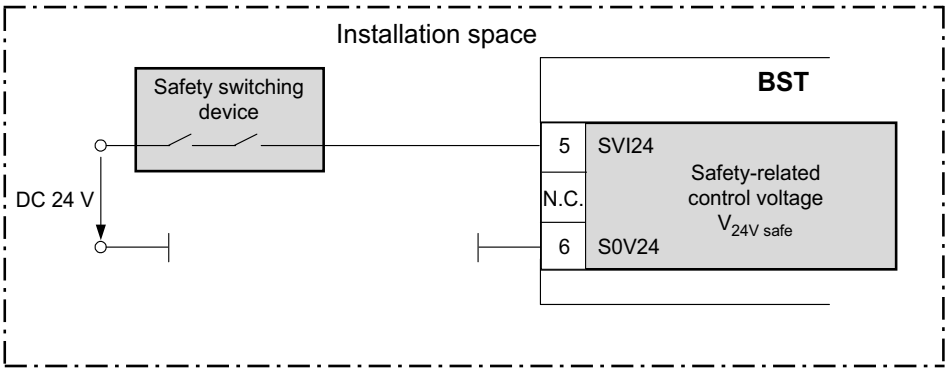
6.2.3 Single-pole safe disconnection

The following figure shows the wiring inside the installation space:



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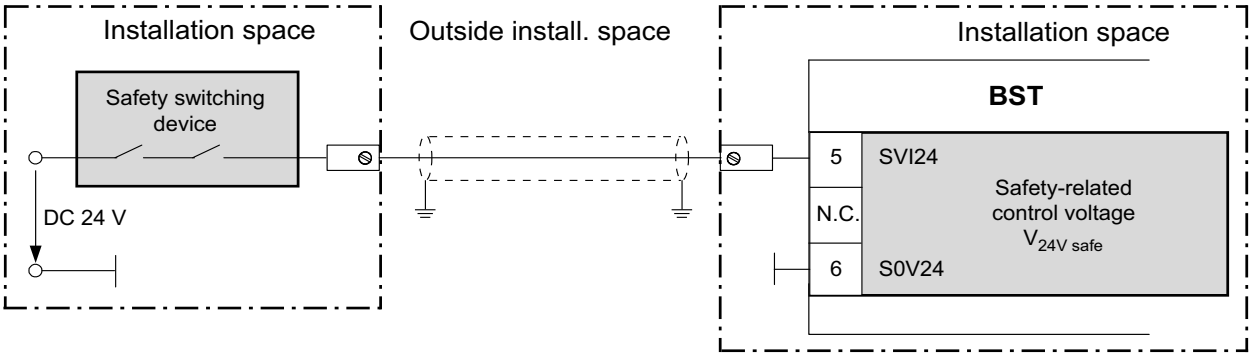
The following figure shows the wiring outside the installation space:



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	TIP
	Safe single-pole disconnection is only permitted when short circuits in the safety-relevant control cable between safety relay and BST can be ruled out (fault elimination according to EN ISO 13849-2). SEW-EURODRIVE recommends bipolar disconnection.

7 Startup

7.1 Operating states

- The brake is activated with the functional control voltage $V_{24\ V\ in}$ when the DC link voltage $V_{DC\ link}$ and the safety-relevant control voltage $V_{24\ V\ safe}$ are present.

  $V_{24\ V\ in}$ is present ≙ Brake released.

  $V_{24\ V\ in}$ is not present ≙ Brake applied.
- If the safety-related control voltage $V_{24\ V\ safe}$ is disconnected, the brake is safely de-energized (**SBC**).
- If the DC link voltage $V_{DC\ link}$ is disconnected, the brake is de-energized.

The brake is released with high-sped excitation.

Rapid brake application (DC and AC switch-off) occurs when it is controlled using the $V_{24\ V\ in}$ functional control voltage or the $V_{24\ V\ safe}$ safety-related control voltage.

The response time for releasing and applying the brake results from the response time of the BST $t_R \leq 6$ ms and the response or application time of the brake connected. For information on response or application times, refer to the applicable operating instructions for motors.

7.1.1 Operating state display

LEDs V1 and V2 indicate the operating state of the control inputs.

- LED V1: State of the safety-relevant control voltage $V_{24\ V\ safe}$.
- LED V2: State of the brake when the DC link voltage $V_{DC\ link}$ is present.

LED V1	LED V2	$U_{24\ V\ safe}$	$U_{24\ V\ in}$	Operating state
Off	Off	Off	Off	Brake de-energized
Off	Off	Off	On	Brake de-energized
Lights orange	Off	On	Off	Brake de-energized
Lights orange	Lights green	On	On	Brake energized when $V_{DC\ link}$ is present

TIPS

- The states of LED V1 and LED V2 must not be regarded as safety-relevant.
- The fact that LED V1 and LED V2 are no longer illuminated does not indicate that the safety-relevant BST brake module is de-energized and the brake is applied.
- Even if LED V1 and LED V2 are not illuminated, DC link voltage $V_{DC\ link}$ might be present at the BST brake module.

8 Inspection/Maintenance

⚠ DANGER

Risk of crushing if the hoist falls.

Severe or fatal injuries.

- Secure or lower hoist drives (danger of falling)
- Isolate the inverter, the motor and the brake from the power supply before starting work, safeguarding them against accidental startup.
- Only use genuine spare parts in accordance with the valid parts list.
- Always install a new brake controller at the same time as replacing the brake coil.
- Observe the notes in the operating instructions for AC motors and brakemotors.
- Only qualified personnel may perform maintenance for the brake.

⚠ DANGER

There may still be dangerous voltages inside the unit and at the terminal strips for up to 10 minutes after the BST has been disconnected from the power supply.

Severe or fatal injuries from electric shock.

- Disconnect the BST from the power supply and ensure that the unit cannot be switched on unintentionally.
- Wait for 10 minutes before carrying out any maintenance or inspection work.
- Prior to maintenance or inspection work, make sure that the BST is de-energized.

⚠ CAUTION

The surface of the safety-relevant BST brake module can be very hot during operation.

Danger of burns.

- Let the BST cool down before you start working on it.

8.1 Inspection and maintenance intervals

The required inspection/maintenance intervals must be calculated by the system manufacturer according to the specific project planning documents for individual applications, in accordance with the regionally valid standards.

8.2 Checking the brake function

The brake function must be checked according to the instructions of the system manufacturer after inspection/maintenance work.

8.3 Service

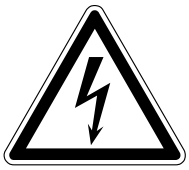
Have the following information available when you require assistance from the SEW-EURODRIVE service:

- Nameplate data (complete)
- Type and extent of the problem
- Time the problem occurred and any accompanying circumstances
- Assumed cause

8.4 Unit replacement procedure

Proceed as follows to replace a BST:

- Observe the notes regarding inspection/maintenance work for the BST.



⚠ DANGER

There may still be dangerous voltages inside the unit and at the terminal strips for up to 10 minutes after the BST has been disconnected from the power supply.

Severe or fatal injuries from electric shock.

- Disconnect the BST from the power supply and ensure that the unit cannot be switched on unintentionally.
- Wait for 10 minutes before carrying out any maintenance or inspection work.
- Prior to maintenance of inspection work, make sure that the BST is de-energized.

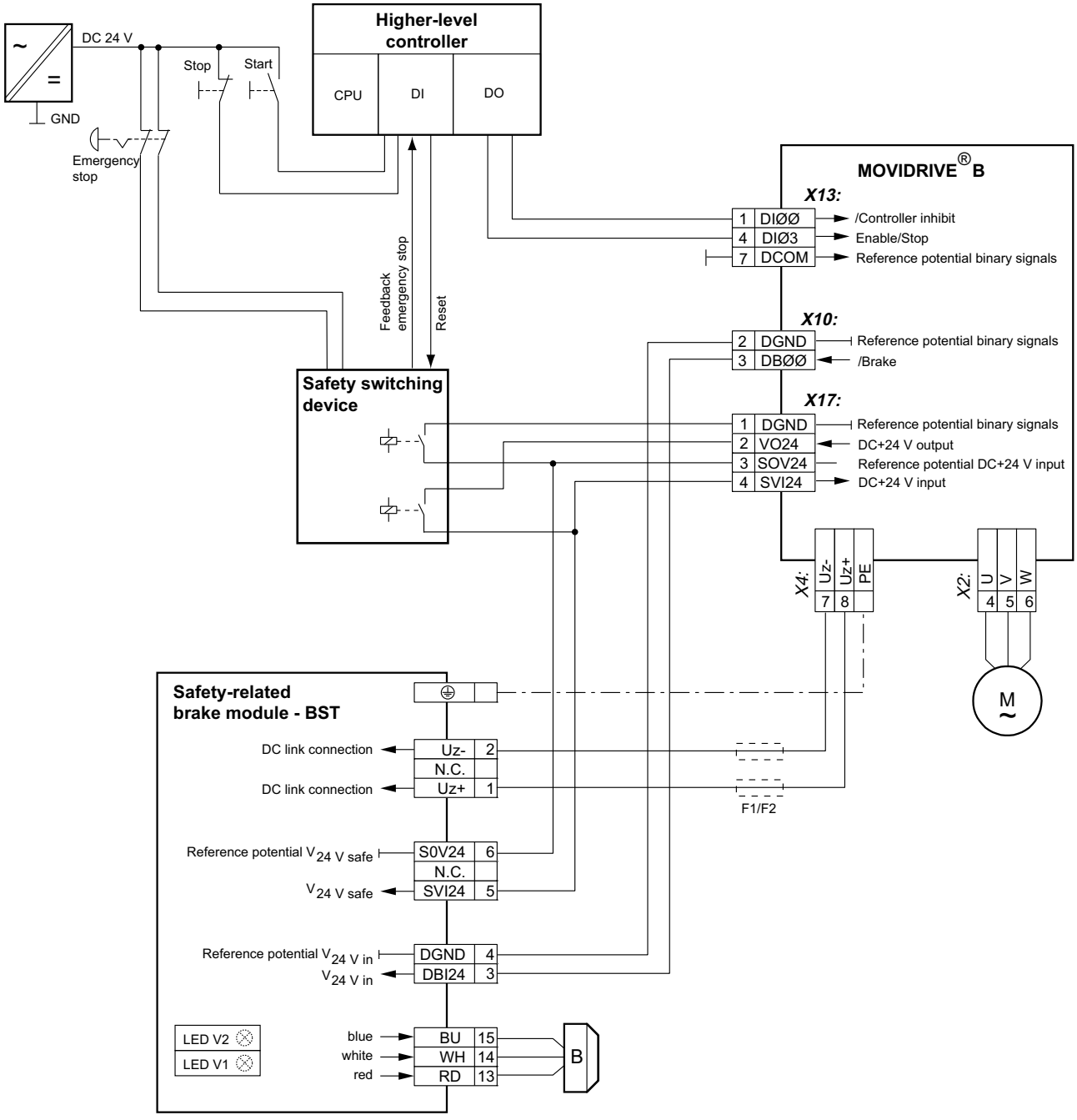
- Compare the data on the nameplate of the BST to be replaced with the new one.
- Remove all connecting terminals.
- Disconnect the PE and the shield clamps.
- Push lightly on the opposite side of the connection terminals and remove the BST from the support rail.
- Install the new BST on the support rail. Observe chapter "Mechanical Installation".
- Connect the PE and the shield.
- Connect all connection terminals.

9 Applications

The following figures show the wiring diagrams for SBC with simultaneous STO (Safe Torque Off).

	TIPS
	• For safe single- and double-pole disconnection, refer to chapter "Electrical Installation" (see page 23) • DC fuses F1/F2 are not required if the before mentioned requirements for the supply cable are met. • Observe chapter "Electrical Installation" (see page 23).

9.1 Disconnection of single drives via inverter (MOVIDRIVE® B as example)



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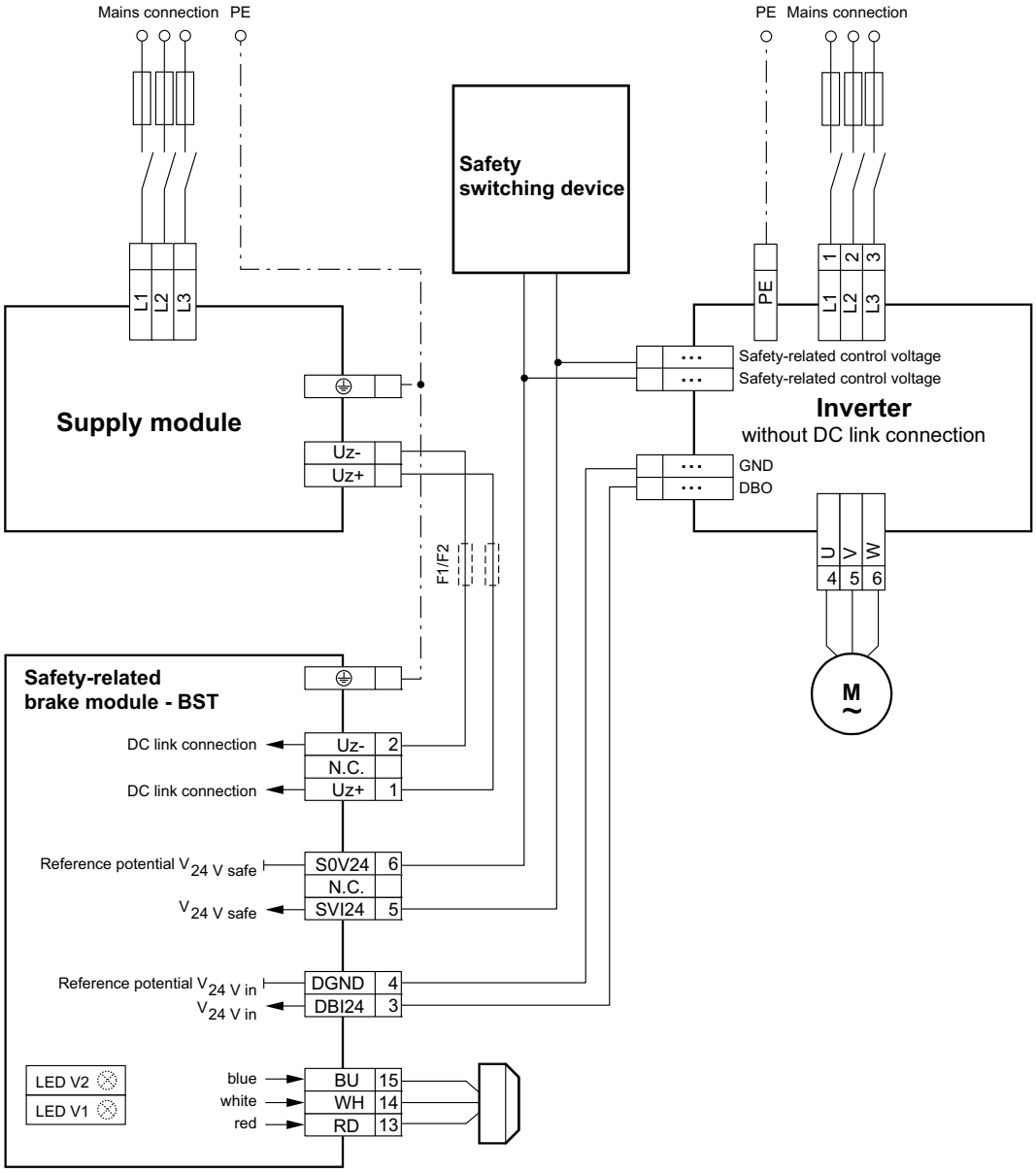
9.2 Disconnection of single drives via inverter (MOVIAXIS® as example)



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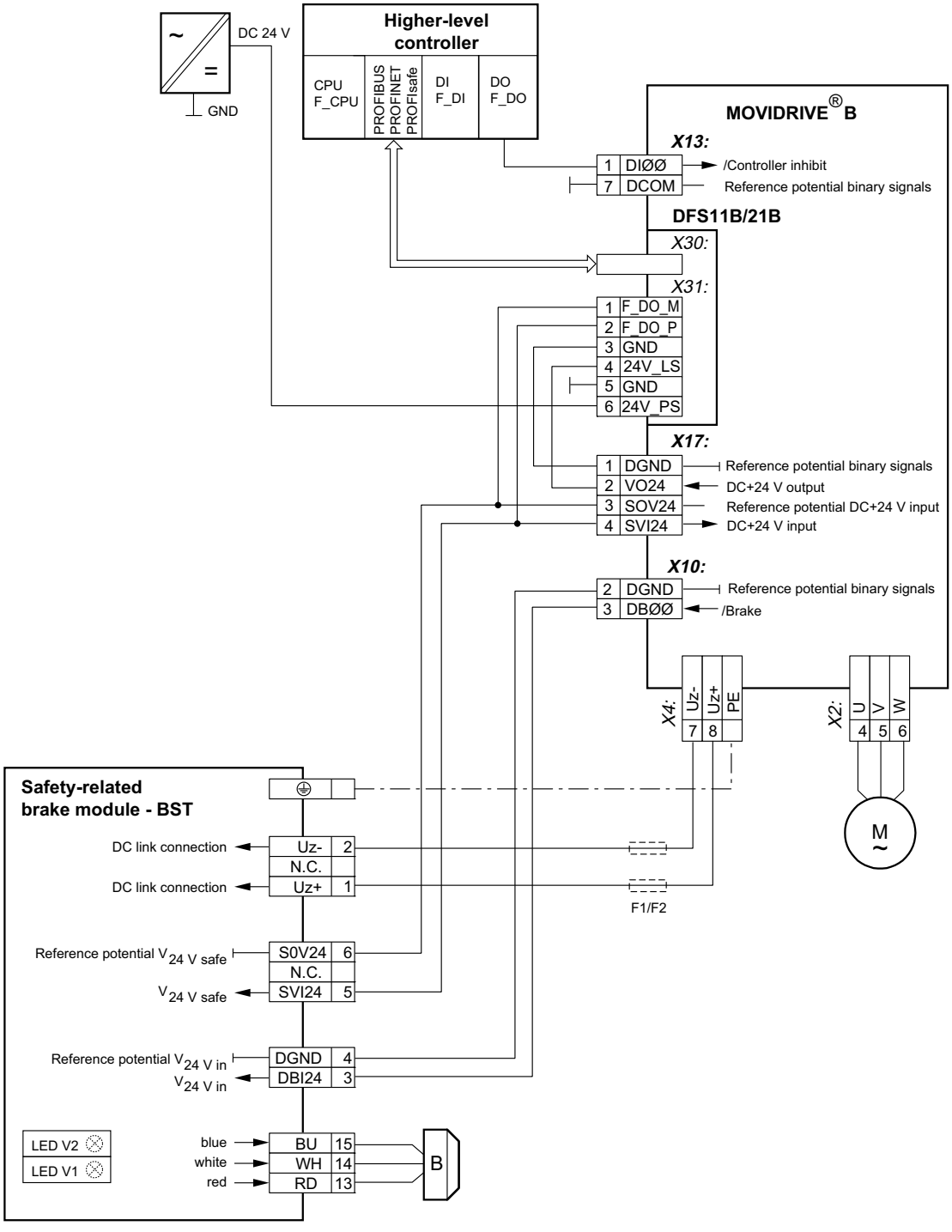
9.3 Disconnection of single drives via inverter and DFS11B/21B fieldbus interface



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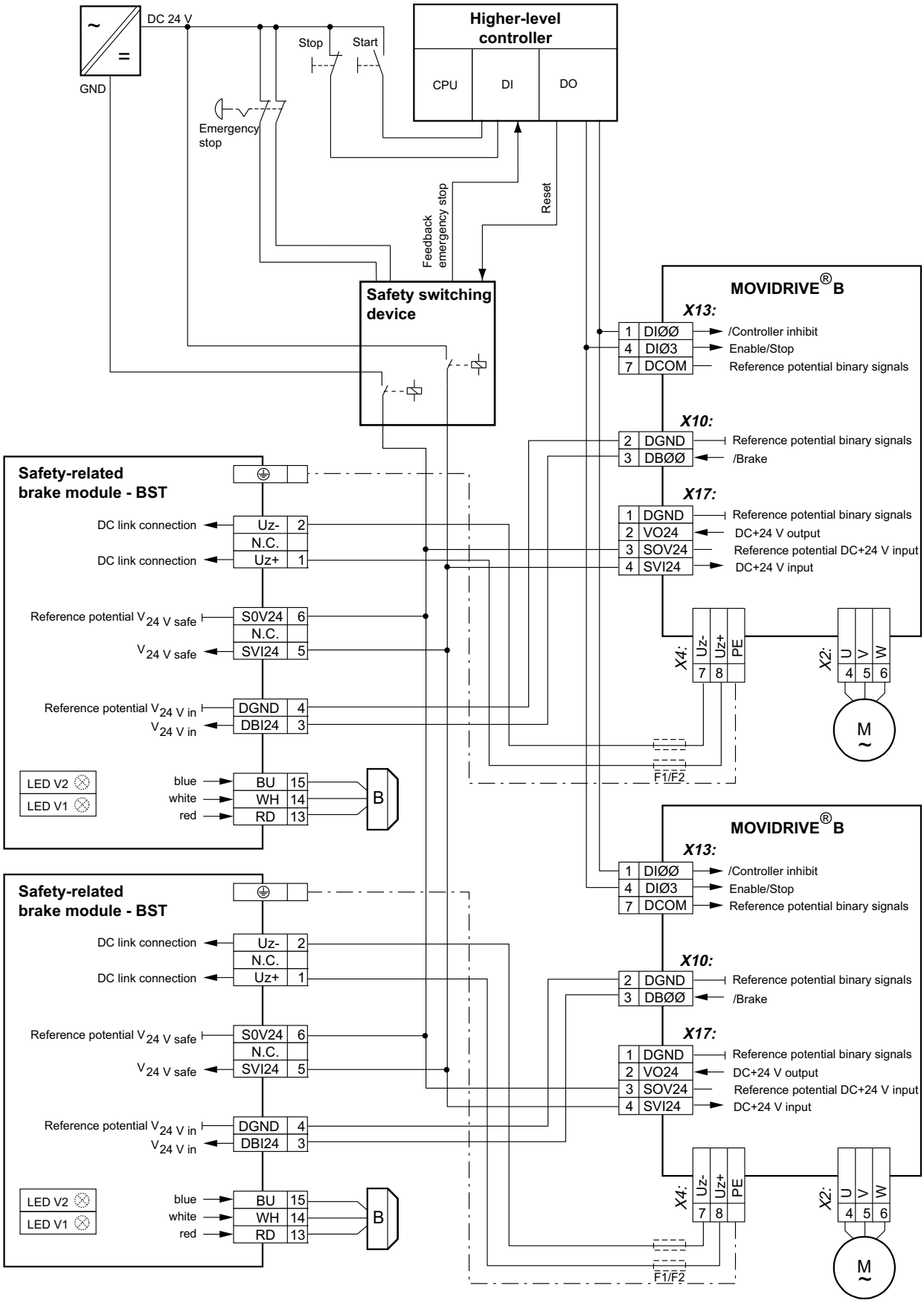
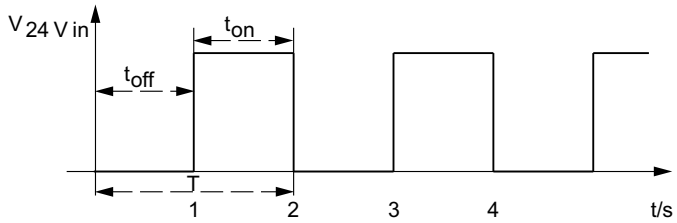
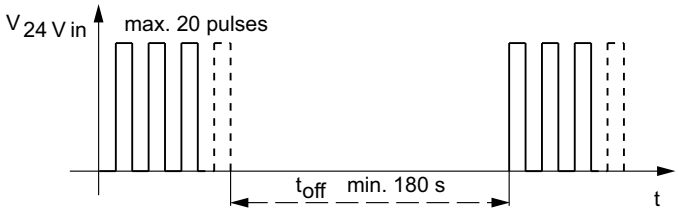
9.4 Group disconnection via inverter



10 Technical Data

10.1 General technical data

Brake module		BST 1.2S-230V-00	BST 0.7S-400V-00	BST 0.6S-460V-00
Part number		1300 1337	1300 0772	0829 9714
Interference immunity		according to EN 61800-3		
Interference emission with EMC-compliant installation		according to EN 61800-3		
Degree of protection		IP20		
Mounting		on support rail in control cabinet (control cabinet must have have at least degree of protection IP54)		
Ambient temperature	T_A	-15 °C to +60 °C		
DC link voltage **Terminal 1/2**	$V_{DC\ link}$	DC 350 V – 850 V (at P_A ≥ 95 W at least DC 450 V)		
Power consumption **Terminal 1/2**	P_E	150 W, depending on brake type (holding coil) Short-term: max. 800 W / 200 ms (accelerator coil)		
Functional control voltage **Terminal 3/4**	$V_{24\ V\ in}$	Signal level according to DIN EN 61131-2 type 1 DC +15 V to +30 V (> 2mA) => 1 / contact closed DC -3 V to +5V (< 2 mA) => 0 / contact open For the control input at terminals 3 and 4, only use voltage sources with safe disconnection (SELV/PELV) in accordance with IEC 60364 (≙ VDE 0100).		
Brake voltage **Terminal 13/15**	V_B	DC 96 V	DC 167 V	DC 190 V
AC brake coil voltage		AC 230 V	AC 400 V	AC 460 V
Rated output current **Terminal 13/15**	I_N	DC 1.2 A	DC 0.7 A	DC 0.6 A
Output current **Terminal 13/15**	$I_{brake\ warm}$	DC 1.0 A	DC 0.6 A	DC 0.5 A
		At P_A = 120 W, the rated output current reduces in warm state.		
Acceleration current **Terminal 13/14**	I_B	4 – 8.5 times the holding current depending on the brake type		
Max. output power	P_A	P_A ≤ 120 W		
Brake output **Terminal 13/14/15**		The figures relate to the SEW standard brake coils (two-coil system) Holding coil: Terminal 13_{red} / 15_{blue} Accelerator coil: Terminal 13_{red} / 14_{white} Several brake coils can be connected for redundant systems. The sum of the individual power levels must not exceed the max. output power.		
Supply cable **Terminal 1/2**	$V_{DC\ link}$	Rated cable voltage: min. V_0 / V = 300 V / 500 V (to DIN VDE 0298) Cable cross section: 0.75 mm² – 2.5 mm² (AWG 19 – AWG 13) Max. cable length: 100 m (328 ft)		
Functional control cable **Terminal 3/4**	$V_{24\ V\ in}$	Cable cross section: 0.5 mm² – 1.5 mm² (AWG 20 – AWG 16) Max. cable length: 100 m (328 ft)		
Brake cable **Terminal 13/14/15**		Cable cross section of 0.75 mm² – 2.5 mm² (AWG 19 – AWG 13) Max. cable length: 200 m (656 ft) at min. 1.5 mm² (AWG 16)		
Power loss	P_V	Max. 30 W		
Storage temperature		-20 °C to +70 °C (EN 60721-3-3, class 3K3)		
Dimensions W × H × D		134 mm × 70 mm × 135 mm (5.28 in × 2.76 in × 5.31 in)		
Weight		About 0.79 kg (1.7 lb)		
Switching cycles		500 000 switching cycles (brake released and brake applied)		

Brake module	BST 1.2S-230V-00	BST 0.7S-400V-00	BST 0.6S-460V-00
Minimum clock cycle of the control at P_A ≥ 70 W	Clock cycle of the control ≥ 2 s. The timeout t_{off} must last at least 1 s.  Shorter cycle times are possible for teach mode. In this case, the timeout lasts 3 minutes.  		

10.2 Safety-related control voltage

The following table shows the technical data for safety-related control voltage $V_{24\ V\ safe}$ at terminals 5/6:

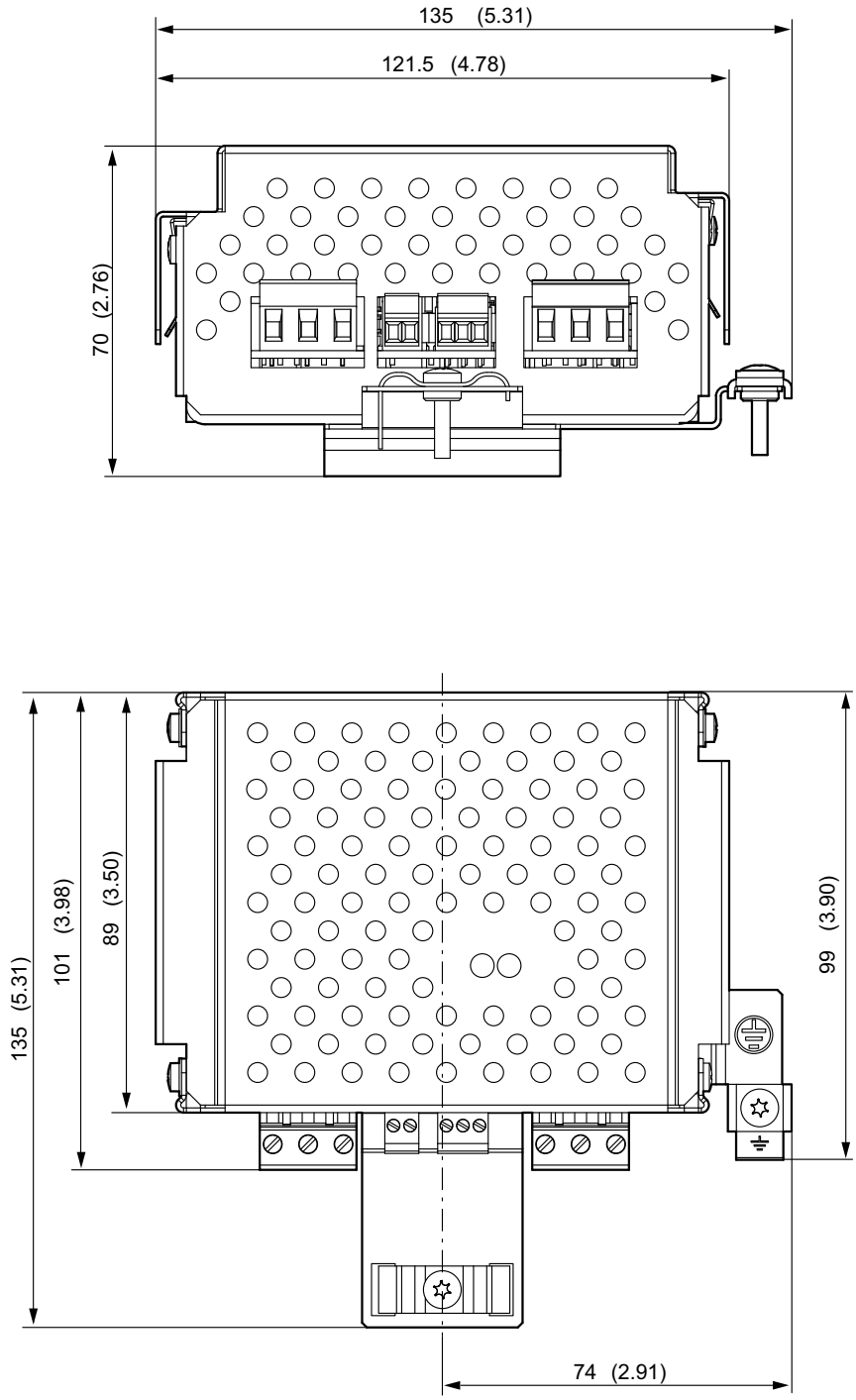
Safety-related control voltage $V_{24\ V\ safe}$	Min.	Typical	Max.
Input voltage range according to DIN EN 61131-2 DC 24 V	DC 20.4 V	DC 24 V	DC 28.8 V
Input capacitance		4.7 µF	6 µF
Switch-on/switch-off threshold		DC 10 V	
Input voltage for OFF state (brake de-energized)			DC 6 V
Duration from switching off the safety-related control voltage at BST until switching off the brake voltage V_B plus the brake application time of the connected brake.			6 ms
Safety-related control cable			
• Cable length			100 m (328 ft)
• Cable cross section	0.5 mm^2 (AWG 20)		1.5 mm^2 (AWG 16)

10.3 Safety-related characteristic values

Brake module	BST 1.2S-230V-00	BST 0.7S-400V-00	BST 0.6S-460V-00
Part number	1300 1337	1300 0772	0829 9714
Safe condition	Brake de-energized		
Highest possible safety category	Performance level d according to EN ISO 13849-1 Safety category 3 according to EN 954-1		
Probability of dangerous failure per hour (PFH value)	0 (fault exclusion)		
Service life	Max. 20 years		

10.4 Dimension drawing of BST in control cabinet design

The following figure shows the dimension drawings of BST in control cabinet design:



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All dimensions in mm (in).

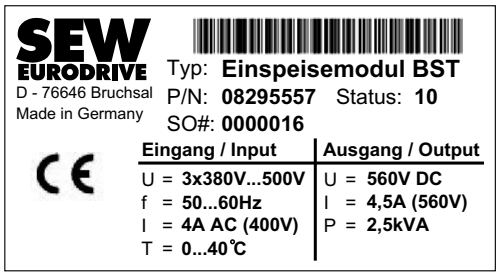
11 Supply Module for BST (in preparation)

Part number: 08295557

The supply module is used when the inverter is not fitted with a DC link connection. In this case, the supply module provides the DC link voltage $V_{DC\ link}$ for the BST.

11.1 Nameplate

The following figure shows an example nameplate of the supply module:



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11.2 Technical data

Supply module	
Part number	08295557
Rated mains voltage	3 × AC 380 V – 500 V
Rated input current	4 A
Output voltage	DC 513 V – 680 V
Rated output current	DC 4.5 A
Temperature	0 °C to 40 °C

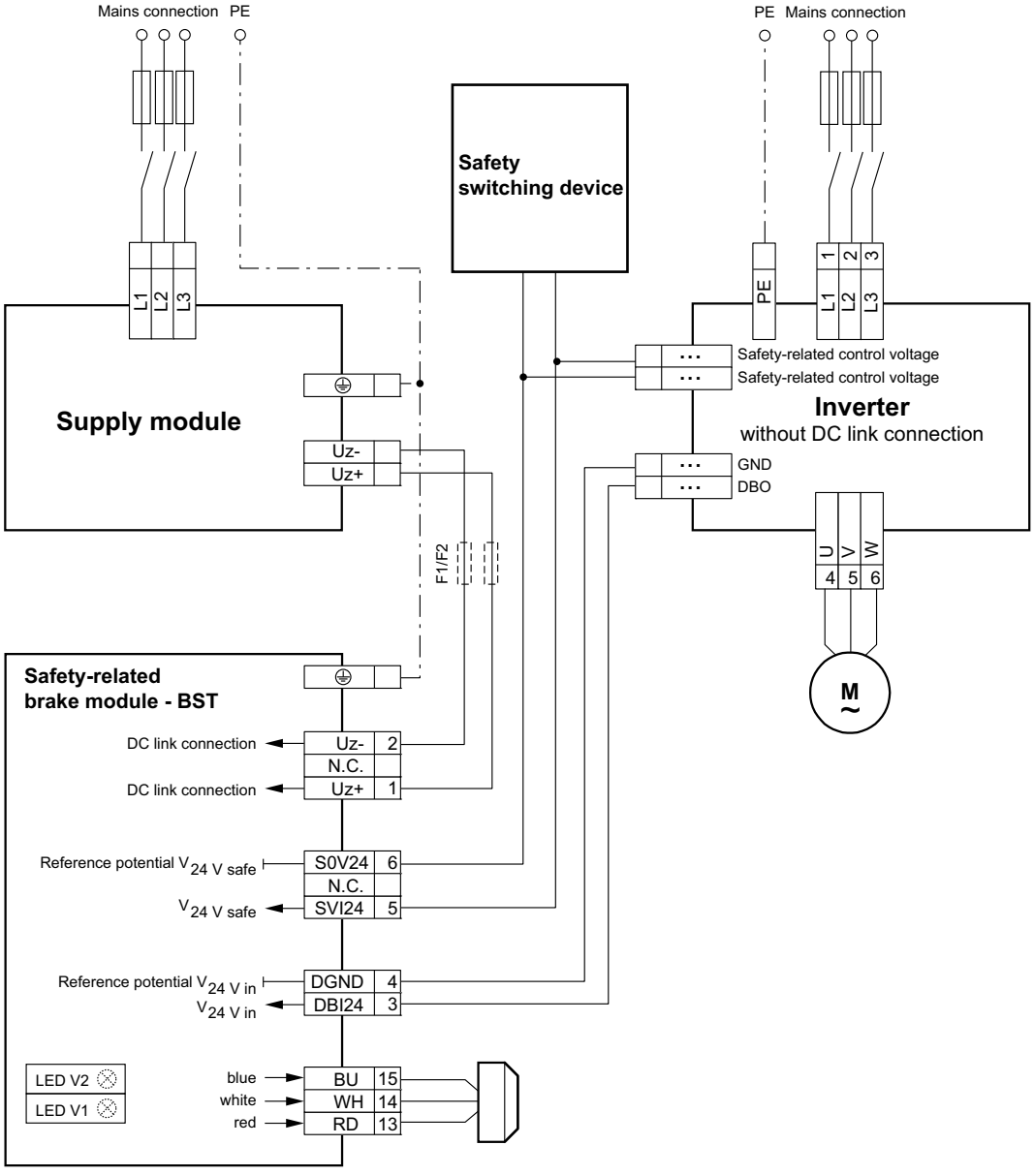
11.3 Terminal assignment

Terminal	Function
L1 **L2** **L3**	Mains voltage input
+$V_{DC\ link}$ **-$V_{DC\ link}$**	DC link voltage output
⏚	Protective grounding

11.4 Wiring diagram

	TIPS
	• For safe single- and double-pole disconnection, refer to chapter "Electrical Installation" (see page 23) • DC fuses F1/F2 are not required if the before mentioned requirements for the supply cable are met. • Observe chapter "Electrical Installation" (see page 23).

Supply module for supplying the BST from a separate supply system:



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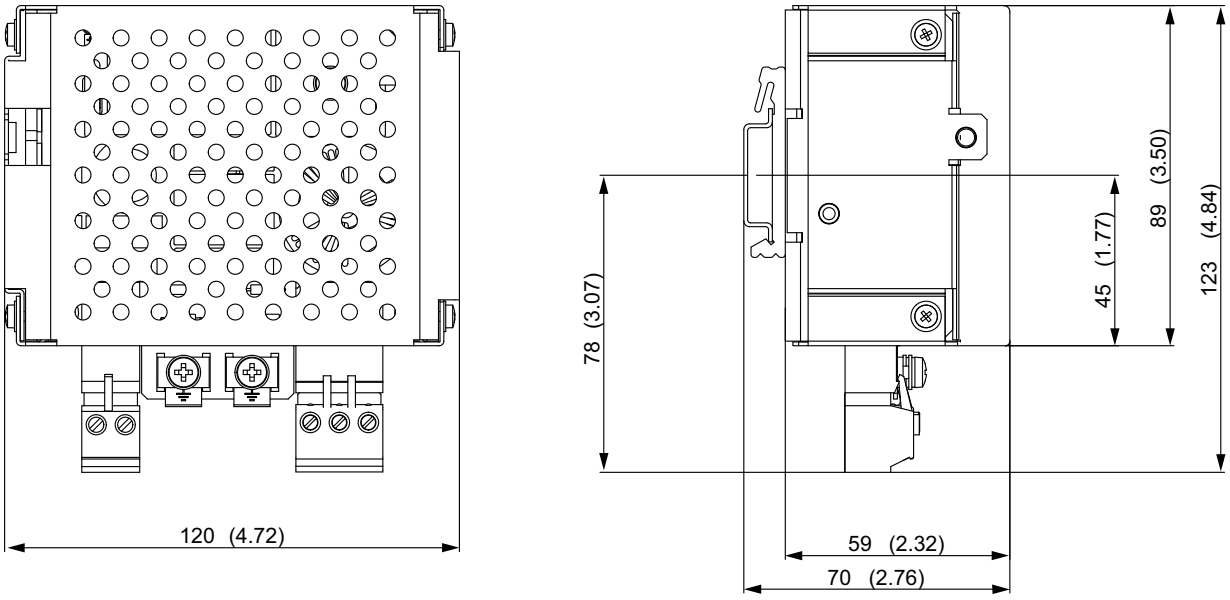
11.5 Dimension drawings

The supply module can be mounted either at the front or side of the support rail.

All dimensions in mm (in).

11.5.1 Installation at the front of the support rail (standard)



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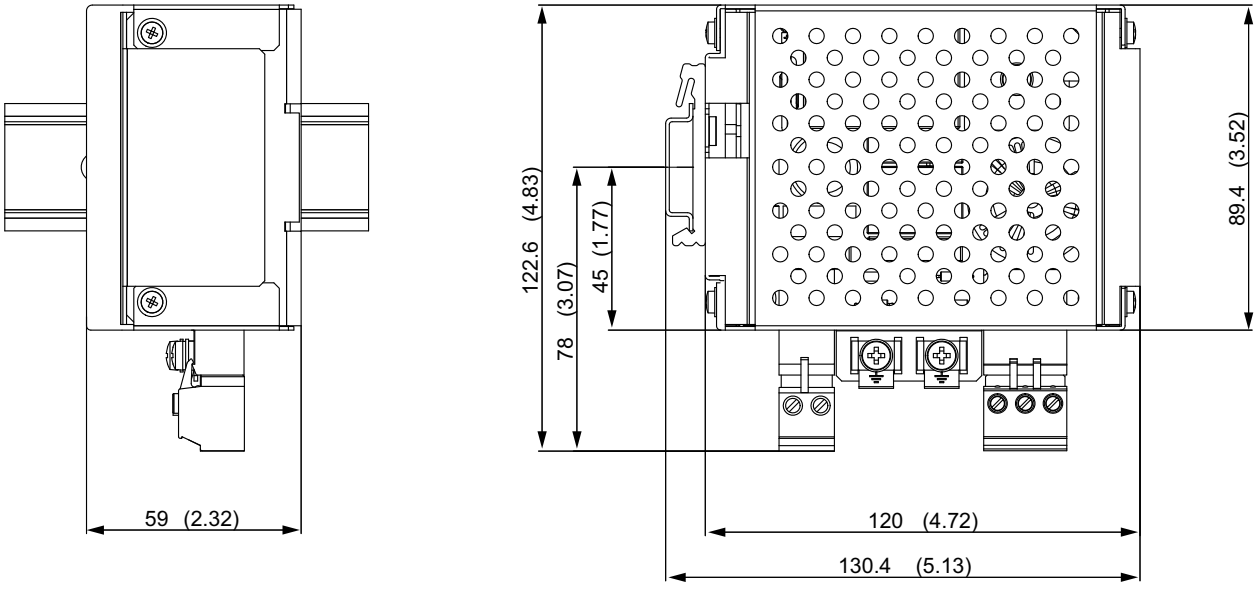
11.5.2 Installation at the side of the support rail



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12 Address List

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	Lyon	SEW-USOCOME Parc d'Affaires Roosevelt Rue Jacques Tati F-69120 Vaulx en Velin	Tel. +33 4 72 15 37 00 Fax +33 4 72 15 37 15
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	Sydney	SEW-EURODRIVE PTY. LTD. 9, Sleigh Place, Wetherill Park New South Wales, 2164	Tel. +61 2 9725-9900 Fax +61 2 9725-9905 enquires@sew-eurodrive.com.au

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Service Competence Center	**Industrial Gears**	**SEW Caron-Vector** Rue de Parc Industriel, 31 BE-6900 Marche-en-Famenne	Tel. +32 84 219-878 Fax +32 84 219-879 http://www.sew-eurodrive.be service-wallonie@sew-eurodrive.be
	Antwerp	**SEW Caron-Vector** Glasstraat, 19 BE-2170 Merksem	Tel. +32 3 64 19 333 Fax +32 3 64 19 336 http://www.sew-eurodrive.be service-antwerpen@sew-eurodrive.be

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	Additional addresses for service in Brazil provided on request!		

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	Shenyang	SEW-EURODRIVE (Shenyang) Co., Ltd. 10A-2, 6th Road Shenyang Economic Technological Development Area Shenyang, 110141	Tel. +86 24 25382538 Fax +86 24 25382580 shenyang@sew-eurodrive.cn
	Wuhan	SEW-EURODRIVE (Wuhan) Co., Ltd. 10A-2, 6th Road No. 59, the 4th Quanli Road, WEDA 430056 Wuhan	Tel. +86 27 84478398 Fax +86 27 84478388
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Assembly **Sales** **Service**	**Kopenhagen**	SEW-EURODRIVEA/S Geminivej 28-30 DK-2670 Greve	Tel. +45 43 9585-00 Fax +45 43 9585-09 http://www.sew-eurodrive.dk sew@sew-eurodrive.dk

Egypt			
Sales **Service**	**Cairo**	Copam Egypt for Engineering & Agencies 33 El Hegaz ST, Heliopolis, Cairo	Tel. +20 2 22566-299 + 1 23143088 Fax +20 2 22594-757 http://www.copam-egypt.com/ copam@datum.com.eg
Service	**Sharjah**	Copam Middle East (FZC) Sharjah Airport International Free Zone P.O. Box 120709 Sharjah **United Arabian Emirates**	Tel. +971 6 5578-488 Fax +971 6 5578-499 copam_me@eim.ae

Estonia			
Sales	**Tallin**	ALAS-KUUL AS Reti tee 4 EE-75301 Peetri küla, Rae vald, Harjumaa	Tel. +372 6593230 Fax +372 6593231 veiko.soots@alas-kuul.ee

Finland			
Assembly **Sales** **Service**	**Lahti**	SEW-EURODRIVE OY Vesimäentie 4 FIN-15860 Hollola 2	Tel. +358 201 589-300 Fax +358 3 780-6211 sew@sew.fi http://www.sew-eurodrive.fi
Production **Assembly** **Service**	**Karkkila**	SEW Industrial Gears Oy Valurinkatu 6, PL 8 FI-03600 Karkkila, 03601 Karkkila	Tel. +358 201 589-300 Fax +358 201 589-310 sew@sew.fi http://www.sew-eurodrive.fi

Gabon			
Sales	**Libreville**	ESG Electro Services Gabun Feu Rouge Lalala 1889 Libreville Gabun	Tel. +241 741059 Fax +241 741059

Great Britain			
Assembly **Sales** **Service**	**Normanton**	SEW-EURODRIVE Ltd. Beckbridge Industrial Estate P.O. Box No.1 GB-Normanton, West- Yorkshire WF6 1QR	Tel. +44 1924 893-855 Fax +44 1924 893-702 http://www.sew-eurodrive.co.uk info@sew-eurodrive.co.uk

Greece			
Sales **Service**	**Athen**	Christ. Boznos & Son S.A. 12, Mavromichali Street P.O. Box 80136, GR-18545 Piraeus	Tel. +30 2 1042 251-34 Fax +30 2 1042 251-59 http://www.boznos.gr info@boznos.gr

Hong Kong			
Assembly **Sales** **Service**	**Hong Kong**	SEW-EURODRIVE LTD. Unit No. 801-806, 8th Floor Hong Leong Industrial Complex No. 4, Wang Kwong Road Kowloon, Hong Kong	Tel. +852 36902200 Fax +852 36902211 contact@sew-eurodrive.hk

Hungary			
Sales **Service**	**Budapest**	SEW-EURODRIVE Kft. H-1037 Budapest Kunigunda u. 18	Tel. +36 1 437 06-58 Fax +36 1 437 06-50 office@sew-eurodrive.hu

India			
Registered Office **Assembly** **Sales** **Service**	**Vadodara**	SEW-EURODRIVE India Private Limited Plot No. 4, GIDC POR Ramangamdi • Vadodara - 391 243 Gujarat	Tel. +91 265 2831086 Fax +91 265 2831087 http://www.seweurodriveindia.com sales@seweurodriveindia.com subodh.ladwa@seweurodriveindia.com
Assembly **Sales** **Service**	**Chennai**	SEW-EURODRIVE India Private Limited Plot No. K3/1, Sipcot Industrial Park Phase II Mambakkam Village Sriperumbudur - 602105 Kancheepuram Dist, Tamil Nadu	Tel. +91 44 37188888 Fax +91 44 37188811 c.v.shivkumar@seweurodriveindia.com

Ireland			
Sales **Service**	**Dublin**	Alperton Engineering Ltd. 48 Moyle Road Dublin Industrial Estate Glasnevin, Dublin 11	Tel. +353 1 830-6277 Fax +353 1 830-6458 info@alperton.ie http://www.alperton.ie

Israel			
Sales	**Tel-Aviv**	Liraz Handasa Ltd. Ahofer Str 34B / 228 58858 Holon	Tel. +972 3 5599511 Fax +972 3 5599512 http://www.liraz-handasa.co.il office@liraz-handasa.co.il

Italy			
Assembly **Sales** **Service**	**Milano**	SEW-EURODRIVE di R. Blickle & Co.s.a.s. Via Bernini,14 I-20020 Solaro (Milano)	Tel. +39 02 96 9801 Fax +39 02 96 799781 http://www.sew-eurodrive.it sewit@sew-eurodrive.it

Ivory Coast			
Sales	**Abidjan**	SICA Ste industrielle et commerciale pour l'Afrique 165, Bld de Marseille B.P. 2323, Abidjan 08	Tel. +225 2579-44 Fax +225 2584-36

Japan			
Assembly **Sales** **Service**	**Iwata**	SEW-EURODRIVE JAPAN CO., LTD 250-1, Shimoman-no, Iwata Shizuoka 438-0818	Tel. +81 538 373811 Fax +81 538 373814 http://www.sew-eurodrive.co.jp sewjapan@sew-eurodrive.co.jp

Korea			
Assembly **Sales** **Service**	**Ansan-City**	SEW-EURODRIVE KOREA CO., LTD. B 601-4, Banweol Industrial Estate 1048-4, Shingil-Dong Ansan 425-120	Tel. +82 31 492-8051 Fax +82 31 492-8056 http://www.sew-korea.co.kr master@sew-korea.co.kr

Korea			
	Busan	SEW-EURODRIVE KOREA Co., Ltd. No. 1720 - 11, Songjeong - dong Gangseo-ku Busan 618-270	Tel. +82 51 832-0204 Fax +82 51 832-0230 master@sew-korea.co.kr

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

Lebanon			
Sales	**Beirut**	Gabriel Acar & Fils sarl B. P. 80484 Bourj Hammoud, Beirut	Tel. +961 1 4947-86 +961 1 4982-72 +961 3 2745-39 Fax +961 1 4949-71 ssacar@inco.com.lb

Lithuania			
Sales	**Alytus**	UAB Irseva Naujoji 19 LT-62175 Alytus	Tel. +370 315 79204 Fax +370 315 56175 info@irseva.lt http://www.sew-eurodrive.lt

Luxembourg			
Assembly **Sales** **Service**	**Brüssel**	CARON-VECTOR S.A. Avenue Eiffel 5 B-1300 Wavre	Tel. +32 10 231-311 Fax +32 10 231-336 http://www.sew-eurodrive.lu info@caron-vector.be

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

Mexico			
Assembly **Sales** **Service**	**Quéretaro**	SEW-EURODRIVE MEXICO SA DE CV SEM-981118-M93 Tequisquiapan No. 102 Parque Industrial Quéretaro C.P. 76220 Quéretaro, México	Tel. +52 442 1030-300 Fax +52 442 1030-301 http://www.sew-eurodrive.com.mx scmexico@seweurodrive.com.mx

Morocco			
Sales	**Casablanca**	Afit 5, rue Emir Abdelkader MA 20300 Casablanca	Tel. +212 22618372 Fax +212 22618351 ali.alami@premium.net.ma

Netherlands			
Assembly **Sales** **Service**	**Rotterdam**	VECTOR Aandrijftechniek B.V. Industrieweg 175 NL-3044 AS Rotterdam Postbus 10085 NL-3004 AB Rotterdam	Tel. +31 10 4463-700 Fax +31 10 4155-552 http://www.vector.nu info@vector.nu

New Zealand			
Assembly **Sales** **Service**	**Auckland**	SEW-EURODRIVE NEW ZEALAND LTD. P.O. Box 58-428 82 Greenmount drive East Tamaki Auckland	Tel. +64 9 2745627 Fax +64 9 2740165 http://www.sew-eurodrive.co.nz sales@sew-eurodrive.co.nz
	Christchurch	SEW-EURODRIVE NEW ZEALAND LTD. 10 Settlers Crescent, Ferrymead Christchurch	Tel. +64 3 384-6251 Fax +64 3 384-6455 sales@sew-eurodrive.co.nz

Norway			
Assembly **Sales** **Service**	**Moss**	SEW-EURODRIVE A/S Solgaard skog 71 N-1599 Moss	Tel. +47 69 24 10 20 Fax +47 69 24 10 40 http://www.sew-eurodrive.no sew@sew-eurodrive.no

Peru			
Assembly **Sales** **Service**	**Lima**	SEW DEL PERU MOTORES REDUCTORES S.A.C. Los Calderos, 120-124 Urbanizacion Industrial Vulcano, ATE, Lima	Tel. +51 1 3495280 Fax +51 1 3493002 http://www.sew-eurodrive.com.pe sewperu@sew-eurodrive.com.pe

Poland			
Assembly **Sales** **Service**	**Lodz**	SEW-EURODRIVE Polska Sp.z.o.o. ul. Techniczna 5 PL-92-518 Łódź	Tel. +48 42 676 53 00 Fax +48 42 676 53 45 http://www.sew-eurodrive.pl sew@sew-eurodrive.pl
		24 Hour Service	Tel. +48 602 739 739 (+48 602 SEW SEW) sewis@sew-eurodrive.pl

Portugal			
Assembly **Sales** **Service**	**Coimbra**	SEW-EURODRIVE, LDA. Apartado 15 P-3050-901 Mealhada	Tel. +351 231 20 9670 Fax +351 231 20 3685 http://www.sew-eurodrive.pt infosew@sew-eurodrive.pt

Romania			
Sales **Service**	**Bucureşti**	Sialco Trading SRL str. Madrid nr.4 011785 Bucuresti	Tel. +40 21 230-1328 Fax +40 21 230-7170 sialco@sialco.ro

Russia			
Assembly **Sales** **Service**	**St. Petersburg**	ZAO SEW-EURODRIVE P.O. Box 36 195220 St. Petersburg Russia	Tel. +7 812 3332522 +7 812 5357142 Fax +7 812 3332523 http://www.sew-eurodrive.ru sew@sew-eurodrive.ru

Senegal			
Sales	**Dakar**	SENEMECA Mécanique Générale Km 8, Route de Rufisque B.P. 3251, Dakar	Tel. +221 338 494 770 Fax +221 338 494 771 senemeca@sentoo.sn

Serbia			
Sales	**Beograd**	DIPAR d.o.o. Ustanicka 128a PC Košum, IV floor SCG-11000 Beograd	Tel. +381 11 347 3244 / +381 11 288 0393 Fax +381 11 347 1337 office@dipar.co.yu

Singapore			
Assembly **Sales** **Service**	**Singapore**	SEW-EURODRIVE PTE. LTD. No 9, Tuas Drive 2 Jurong Industrial Estate Singapore 638644	Tel. +65 68621701 Fax +65 68612827 http://www.sew-eurodrive.com.sg sewsingapore@sew-eurodrive.com

Slovakia			
Sales	**Bratislava**	SEW-Eurodrive SK s.r.o. Rybničná 40 SK-831 06 Bratislava	Tel. +421 2 33595 202 Fax +421 2 33595 200 sew@sew-eurodrive.sk http://www.sew-eurodrive.sk
	Žilina	SEW-Eurodrive SK s.r.o. Industry Park - PChZ ulica M.R.Štefánika 71 SK-010 01 Žilina	Tel. +421 41 700 2513 Fax +421 41 700 2514 sew@sew-eurodrive.sk
	Banská Bystrica	SEW-Eurodrive SK s.r.o. Rudlovská cesta 85 SK-974 11 Banská Bystrica	Tel. +421 48 414 6564 Fax +421 48 414 6566 sew@sew-eurodrive.sk
	Košice	SEW-Eurodrive SK s.r.o. Slovenská ulica 26 SK-040 01 Košice	Tel. +421 55 671 2245 Fax +421 55 671 2254 sew@sew-eurodrive.sk

Slovenia			
Sales **Service**	**Celje**	Pakman - Pogonska Tehnika d.o.o. UI. XIV. divizije 14 SLO - 3000 Celje	Tel. +386 3 490 83-20 Fax +386 3 490 83-21 pakman@siol.net

South Africa			
Assembly **Sales** **Service**	**Johannesburg**	SEW-EURODRIVE (PROPRIETARY) LIMITED Eurodrive House Cnr. Adcock Ingram and Aerodrome Roads Aeroton Ext. 2 Johannesburg 2013 P.O.Box 90004 Bertsham 2013	Tel. +27 11 248-7000 Fax +27 11 494-3104 http://www.sew.co.za info@sew.co.za
	Cape Town	SEW-EURODRIVE (PROPRIETARY) LIMITED Rainbow Park Cnr. Racecourse & Omuramba Road Montague Gardens Cape Town P.O.Box 36556 Chempet 7442 Cape Town	Tel. +27 21 552-9820 Fax +27 21 552-9830 Telex 576 062 cfoster@sew.co.za
	Durban	SEW-EURODRIVE (PROPRIETARY) LIMITED 2 Monaco Place Pinetown Durban P.O. Box 10433, Ashwood 3605	Tel. +27 31 700-3451 Fax +27 31 700-3847 cdejager@sew.co.za

Spain			
Assembly **Sales** **Service**	**Bilbao**	SEW-EURODRIVE ESPAÑA, S.L. Parque Tecnológico, Edificio, 302 E-48170 Zamudio (Vizcaya)	Tel. +34 94 43184-70 Fax +34 94 43184-71 http://www.sew-eurodrive.es sew.spain@sew-eurodrive.es

Sweden			
Assembly **Sales** **Service**	**Jönköping**	SEW-EURODRIVE AB Gnejsvägen 6-8 S-55303 Jönköping Box 3100 S-55003 Jönköping	Tel. +46 36 3442 00 Fax +46 36 3442 80 http://www.sew-eurodrive.se jonkoping@sew.se

Switzerland			
Assembly **Sales** **Service**	**Basel**	Alfred Imhof A.G. Jurastrasse 10 CH-4142 Münchenstein bei Basel	Tel. +41 61 417 1717 Fax +41 61 417 1700 http://www.imhof-sew.ch info@imhof-sew.ch

Thailand			
Assembly **Sales** **Service**	**Chonburi**	SEW-EURODRIVE (Thailand) Ltd. 700/456, Moo.7, Donhuaroh Muang Chonburi 20000	Tel. +66 38 454281 Fax +66 38 454288 sewthailand@sew-eurodrive.com

Tunisia			
Sales	**Tunis**	T. M.S. Technic Marketing Service Zone Industrielle Mghira 2 Lot No. 39 2082 Fouchana	Tel. +216 71 4340-64 + 71 4320-29 Fax +216 71 4329-76 tms@tms.com.tn

Turkey			
Assembly **Sales** **Service**	**Istanbul**	SEW-EURODRIVE Hareket Sistemleri San. ve Tic. Ltd. Sti. Bagdat Cad. Koruma Cikmazi No. 3 TR-34846 Maltepe ISTANBUL	Tel. +90 216 4419164, 3838014, 3738015 Fax +90 216 3055867 http://www.sew-eurodrive.com.tr sew@sew-eurodrive.com.tr

Ukraine			
Sales **Service**	**Dnepropetrovsk**	SEW-EURODRIVE Str. Rabochaja 23-B, Office 409 49008 Dnepropetrovsk	Tel. +380 56 370 3211 Fax +380 56 372 2078 http://www.sew-eurodrive.ua sew@sew-eurodrive.ua

USA			
Production **Assembly** **Sales** **Service** **Corporate Offices**	**Southeast Region**	SEW-EURODRIVE INC. 1295 Old Spartanburg Highway P.O. Box 518 Lyman, S.C. 29365	Tel. +1 864 439-7537 Fax Sales +1 864 439-7830 Fax Manufacturing +1 864 439-9948 Fax Assembly +1 864 439-0566 Fax Confidential/HR +1 864 949-5557 http://www.seweurodrive.com cslyman@seweurodrive.com
Assembly **Sales** **Service**	**Northeast Region**	SEW-EURODRIVE INC. Pureland Ind. Complex 2107 High Hill Road, P.O. Box 481 Bridgeport, New Jersey 08014	Tel. +1 856 467-2277 Fax +1 856 845-3179 csbridgeport@seweurodrive.com
	Midwest Region	SEW-EURODRIVE INC. 2001 West Main Street Troy, Ohio 45373	Tel. +1 937 335-0036 Fax +1 937 440-3799 cstroy@seweurodrive.com
	Southwest Region	SEW-EURODRIVE INC. 3950 Platinum Way Dallas, Texas 75237	Tel. +1 214 330-4824 Fax +1 214 330-4724 csdallas@seweurodrive.com
	Western Region	SEW-EURODRIVE INC. 30599 San Antonio St. Hayward, CA 94544	Tel. +1 510 487-3560 Fax +1 510 487-6433 cshayward@seweurodrive.com
	Additional addresses for service in the USA provided on request!		

Venezuela			
Assembly **Sales** **Service**	**Valencia**	SEW-EURODRIVE Venezuela S.A. Av. Norte Sur No. 3, Galpon 84-319 Zona Industrial Municipal Norte Valencia, Estado Carabobo	Tel. +58 241 832-9804 Fax +58 241 838-6275 http://www.sew-eurodrive.com.ve ventas@sew-eurodrive.com.ve sewfinanzas@cantv.net

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