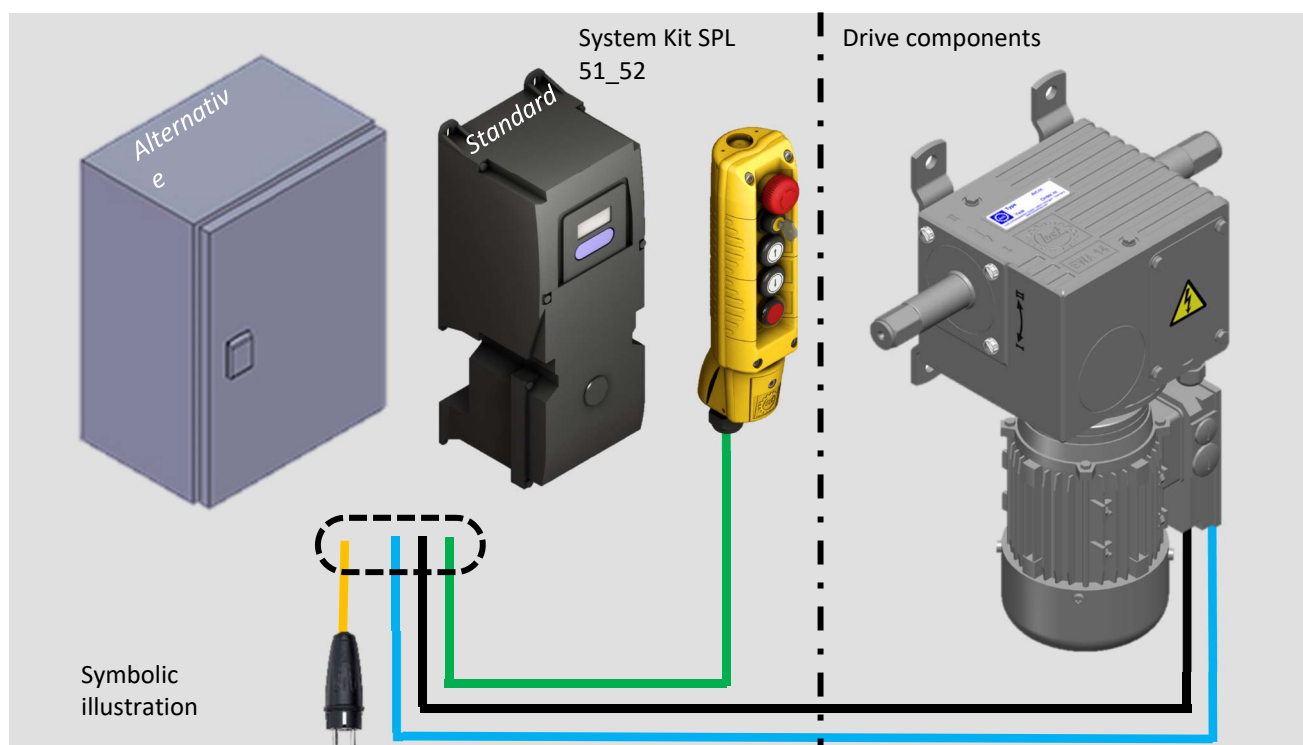


Installation and Operating Instructions

System Kit SPL51_52



Read the Installation and Operating Instructions before starting any work!

Translation of the Original Operating Instructions

Type: System kit SPL51_52

No. Article 37051.xxxx.xxxx / 37052.xxxx.xxxx / Document ProFile 25943

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1 General Information

1.1 Information about these instructions

These instructions enable safe and efficient use of the system kit. The instructions are part of the system kit and must be kept in the immediate vicinity and accessible to the personnel at all times.

The personnel must have carefully read and understood these instructions before starting any work. The basic prerequisite for safe working is compliance with all safety instructions and handling instructions given in these instructions.

In addition, local accident prevention regulations and general safety regulations for the area of application apply.

Illustrations in these instructions are for basic understanding only and may differ from the actual version.

The instructions for the installed components, such as the gear motor or the rack-and-pinion gear units, also apply in addition to these Installation and Operating Instructions.

For the exact product description of the delivered version, see the delivery note and type plate.

1.2 Explanation of symbols

Safety information

Safety instructions in these instructions are identified by symbols. The safety instructions are introduced by signal words which express the extent of the hazard.



DANGER!

This combination of symbol and signal word indicates an immediate hazardous situation which, if not avoided, will result in death or serious injury.



WARNING!

This combination of symbol and signal word indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.



CAUTION!

This combination of symbol and signal word indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury.



NOTE!

This combination of symbol and signal word indicates a potentially hazardous situation which, if not avoided, could result in property damage and environmental damage.

Special safety instructions

The following symbols are used in safety instructions to draw attention to special dangers:



DANGER!

This combination of symbol and signal word indicates an immediately dangerous situation caused by electric current. Failure to observe this information will result in serious or fatal injury.





Tips and recommendations



This symbol highlights useful tips and recommendations as well as information for efficient and trouble-free operation.

Further markings

The following markings are used in these instructions to highlight handling instructions, results, lists, references and other elements:

Marking	Explanation
	Step-by-step handling instructions
	Results of handling steps
	References to Sections of these instructions and other applicable documents
	Listings without a fixed sequence
<i>[Pushbutton]</i>	Operating elements (e. g., pushbuttons, switches, buttons)
<i>"Display"</i>	Screen elements (e. g., menus, texts in software interfaces)

1.3 Limitation of liability

All information and notes in these instructions have been compiled in accordance with the applicable standards and regulations, the state of the art and our many years of knowledge and experience.

The manufacturer accepts no liability for damage in the following cases:

- Non-observance of these instructions
- Use deviating from the intended purpose
- Use of untrained personnel
- Unauthorised conversions
- Technical modifications
- Use of non-approved spare parts

The actual scope of delivery may deviate from the explanations and illustrations described here in the case of special versions, usage of additional order options or due to the latest technical changes.

The obligations agreed in the delivery contract, the general terms and conditions as well as the delivery conditions of the manufacturer and the legal regulations valid at the time of conclusion of the contract shall apply.

1.4 Technical data

1.4.1 SPL 51 Article 37051.xxxx.xxxx

Application limits of system kit in combination with the drive system

These application limits apply when no separate technical specifications are agreed in the supply contract.

■ Lifting power max.	15 KN
■ Stroke length max. (*)	1,900 mm
■ Lifting speed approx.	430 mm/min.
■ Mechanism group (DIN 15020)	1Cm with load spectrum L3
■ Service life (**)	400 h with T1 (≤0.25 h daily)
■ User standard	DIN EN 1570-1 / DIN EN 280 + MRL
■ Ambient temperature of control	-25 °C to +50 °C
■ Protection class of drive	IP 55
■ Protection class of alternative control cabinet	IP 44 max. 75 dB (A)
■ Noise level	(PL)c
■ Performance level	230 V 1~ / 50 Hz / 1.1 kW / max. 13 A
■ Mains connection	120 rpm
■ Shaft speed (gear output)	

Relative humidity max. 80% at 20 °C and max. 55% at 26 °C

(*) Most unfavourable load distribution, max. 40% of the lifting power per rack

(**) Running time t_i max. 5 min. then $t_p > 30$ min.



1.4.2 SPL 52 37052.xxxx.xxxx

Application limits of system kit in combination with the drive system

These application limits apply when no separate technical specifications are agreed in the supply contract.

■ Lifting power max.	12 KN
■ Stroke length max. (*)	2,100 mm
■ Lifting speed approx.	860 mm/min.
■ Mechanism group (DIN 15020)	1Cm with load spectrum L3
■ Service life (**)	200 h with T1 (≤0.25 h daily)
■ User standard	DIN EN 1570-1 / DIN EN 280 + MRL
■ Ambient temperature of control	-25 °C to +50 °C
■ Protection class	IP 55
■ Protection class of alternative control cabinet	IP 44 max. 75 dB (A)
■ Noise level	(PL)c
■ Performance level	230 V 1~ / 50 Hz / 2.2 kW / max. 13 A
■ Mains connection	120 rpm
■ Shaft speed (gear output)	

Relative humidity max. 80% at 20 °C and max. 55% at 26 °C

(*) Most unfavourable load distribution, max. 40% of the lifting power per rack

(**) Running time t_i max. 5 min. then $t_p > 30$ min.

2 Safety

This Section provides an overview of all important safety aspects for the protection of persons and for safe and trouble-free operation. Further task-related safety instructions are contained in the Sections on the individual service life phases.

2.1 Intended use

The components described serve as a drive installation kit/attachment kit for lifting platforms for use as a height-adjustable assembly aid with passenger or goods transport.

Intended use also includes compliance with all information in these instructions.

Any use going beyond the intended use or any other use shall be regarded as misuse.



WARNING!

Danger in case of misuse!

Misuse of the system kit can lead to dangerous situations.

- Do not use in potentially explosive areas

2.2 Basic hazards

The following Section describes residual risks which can also emanate from the system kit when used as intended.

In order to reduce the risks of personal injury and damage to property and to avoid dangerous situations, the safety instructions listed here and the safety instructions in the other Sections of these instructions must be observed.

Electric current



DANGER!

Danger to life from electric current!

Contact with live parts may result in immediate danger to life due to electric shock. Damage to the insulation or individual components can be life-threatening.

- Work on the electrical system must only be carried out by qualified electricians.
- If the insulation is damaged, switch off the power supply immediately and have it repaired.
- Before starting work on active parts of electrical systems and equipment, make sure these are de-energized and secured for the duration of the work. Observe the 5 safety rules during this work:
 - Switch off free from voltage
 - Secure against restarting
 - Determine the absence of voltage
 - Earthing and short-circuiting
 - Cover or block off adjacent live parts
- Never bridge fuses or put them out of operation. Observe the correct current rating when replacing fuses
- Keep moisture away from live parts. This can lead to a short circuit.

Attention!

Electric current after disconnection from the mains



DANGER!

Danger to life from electric current!

Dangerous electric voltage

During operation and up to 20 minutes after disconnection from the mains, dangerous electric voltages may be present at the product connections.

The leakage current to earth (PE) is > 3.5 mA AC or > 10 mA DC.

Possible effects:

- Death or serious injury from electric shock

Protective measures

- Only carry out all work on the product when it is de-energised.
- Check the device is free from voltage!

2.3 Plant operator responsibility

Plant operator

The plant operator is the person who personally operates the machine with the included system kit for commercial or economic purposes or who makes it available to a third party for use/application and who bears the legal product responsibility for the protection of the user, personnel or third parties during operation.

Plant operator duties

The unit is used in the commercial sector. The operator of the machine is therefore subject to the legal obligations for occupational safety.

The safety, accident prevention and environmental protection regulations applicable to the area of use must be observed in addition to the safety instructions in these instructions.

The following applies in particular:

- The plant operator must obtain information about the applicable occupational health and safety regulations and, in a risk assessment, additionally determine hazards that result from the specific working conditions at the machine's place of use. The plant operator must implement these in the form of Operating Instructions for the operation of the machine.
- The plant operator must check during the entire period of use of the machine whether the prepared Operating Instructions correspond to the current status of the regulations and, if necessary, adapt them.
- The plant operator must clearly regulate and define the responsibilities for installation, operation, troubleshooting, maintenance and cleaning.
- The plant operator must ensure that all persons handling the machine have read and understood these instructions. In addition, the plant operator must train the personnel at regular intervals and inform them about the dangers.
- The plant operator must provide the personnel with the required protective equipment and issue binding instructions for wearing the required protective equipment.

Furthermore, the plant operator is responsible for ensuring that the machine is always in technically perfect condition. Therefore, the following applies:

- The plant operator must ensure the maintenance intervals described in these instructions are observed.
- The plant operator must have all safety devices checked regularly for functionality and completeness.

2.4 Personnel requirements

2.3.1 Qualifications

The various tasks described in these instructions place different demands on the qualifications of the persons entrusted with these tasks.



WARNING!

Danger if persons are inadequately qualified!

Inadequately qualified persons cannot assess the risks involved in handling the machine and expose themselves and others to the risk of serious or fatal injury.

- All work should only be carried out by qualified persons.
- Keep insufficiently qualified persons out of the work area.

Only persons who can be expected to carry out this work reliably are permitted to carry out all work. Persons whose ability to react is influenced, e.g. by drugs, alcohol or medication, are not permitted.

In these instructions, the qualifications of the persons listed below for the various tasks are defined:

Operator

The operator has been instructed in a briefing by the plant operator about the tasks assigned and possible dangers in case of improper behaviour. The operator may only perform tasks that go beyond operation during normal operation if this is specified in these instructions and the plant operator has expressly entrusted him/her with this task.

Qualified electrician

Due to their technical training, knowledge and experience as well as knowledge of the relevant standards and regulations, qualified electricians are able to carry out work on electrical systems and to recognize and avoid potential hazards independently.

Qualified electricians are specially trained for the working environment involved and know the relevant standards and regulations.

Operator/ specialist personnel of the plant operator

All work on the system may only be carried out by trained and instructed specialist personnel of the plant operator or by the manufacturer. This specialist personnel have technical education in the field of mechatronics. The work includes:

- Assembly
- Installation
- Commissioning
- Set-up and retrofitting
- Operation
- Cleaning
- Maintenance
- Troubleshooting and repair
- Decommissioning
- Dismantling

The specialized personnel have been trained by the plant operator and the manufacturer for the tasks assigned to them and, due to their technical training, knowledge and experience as well as knowledge of the relevant regulations, are able to carry out the work assigned and to recognize and avoid possible dangers independently.

Disposal personnel

Disposal may only be carried out by qualified personnel of the plant operator.

2.3.2 Instruction

The operator must instruct the personnel on a regular basis. For better follow-up, an instruction log must be created with the following minimum contents:

- Date of instruction
- Name of instructed person
- Contents of instruction
- Name of instructor
- Signatures of instructed person and instructor

2.4 Personal protective equipment

Personal protective equipment serves to protect persons from adverse effects on safety and health at work.

During the various operations on and with the machine, the personnel must wear personal protective equipment, which is referred to separately in the individual Sections of these instructions.

Generally wear during all work:

Protective clothing



Protective clothing is tight-fitting workwear with low tear strength, narrow sleeves and no protruding parts. It is mainly used to protect against being caught by moving machine parts. Do not wear rings, chains and other jewellery.

Safety shoes



Safety shoes protect the feet from crushing, falling parts and slipping on slippery surfaces.

Description of the personal protective equipment

Personal protective equipment is explained in the following:



Protective gloves

These protective gloves are designed to protect hands from mechanical hazards (stab, cut, impact, abrasion, vibration).



Industrial safety helmet

Industrial safety helmets protect the head against falling objects, swinging loads, and bumping into stationary objects.

2.5 Safety devices



WARNING!

Danger to life due to non-functioning safety devices!

If the safety devices do not function or are rendered ineffective, there is a risk of extremely serious injuries or even death.

- Before starting work, check that all safety devices are functional and correctly installed.
- Never disable or bridge safety devices.
- Ensure all safety devices are always accessible.

Emergency stop in pendant station



Fig. 1: Emergency stop button in pendant station

An emergency stop button is installed in the pendant station.

Pressing the emergency stop button de-energizes the system kit by switching off the power supply.

The emergency stop button is unlocked by turning it clockwise.



WARNING!

Danger to life from uncontrolled restarting!

Uncontrolled restarting the machine can lead to serious injuries or even death.

- Before switching on again, make sure the cause has been rectified and all safety devices have been installed and are in working order.
- Only unlock the emergency stop button when there is no longer any danger.

2.6 Behaviour in the event of fire and accidents

Preventive measures

- Always be prepared for fire and accidents!
- Keep first aid equipment (first aid kit, blankets, etc.) and fire extinguishing equipment in working order and within easy reach.
- Familiarize personnel with accident reporting, first aid and rescue equipment.
- Keep access roads clear for rescue vehicles.

Measures in the event of a fire outbreak and accidents

- Immediately trigger emergency stop using emergency stop device (press emergency stop button in pendant station).
- If there is no danger to your own health, remove persons from the danger zone.
- If necessary, initiate first aid measures.
- Alert fire brigade and/or rescue service.
- Fire outbreak: If there is no danger to your own health, fight the fire with fire extinguishers and continue firefighting until the fire brigade arrives.
- Inform the responsible person at the place of action.
- Keep access roads clear for rescue vehicles.
- Direct emergency vehicles.

In general, the company's safety rules of conduct apply!

Before operating the machine, read the posted rescue plan.

2.7 Signs

The following symbols and information signs are located in the work area. They refer to the immediate environment in which they are located.



WARNING!

Danger when signs are illegible!

Over time, stickers and signs may become dirty or otherwise unrecognisable so that hazards cannot be identified and necessary operating instructions cannot be followed. This may result in injury.

- Keep all safety, warning and operating instructions in a clearly legible condition at all times.
- Replace damaged signs or stickers immediately.

2.7.1 Mandatory signs

Follow the instructions



Do not use the designated machine until you have read the instructions.

2.7.2 Prohibition signs

Access for unauthorised persons prohibited



Only persons authorised by the plant operator may enter the hazardous area.

Operation with necklace prohibited



There is a risk of drawing in or entanglement on moving parts.
Remove necklaces before entering designated area.

Operation with tie prohibited



There is a risk of drawing in or entanglement on moving parts.
Remove tie before entering designated area.

Operation with long hair prohibited



There is a risk of drawing in or entanglement on moving parts. People with long hair must use a hair net or hood.

Reaching in prohibited



There is a risk of being caught by moving parts and a risk of abrasions and burns from friction.

2.7.3 Warning signs

Electrical voltage



Only qualified electricians may work in the area marked in this way.

Unauthorised persons must not enter the marked workplaces or open the marked cabinet.

2.8 Spare parts



WARNING!

Risk of injury when using incorrect spare parts!

The use of incorrect or faulty spare parts can result in hazards for the personnel, damage, malfunctions or total failure.

- Only use original spare parts from the manufacturer or spare parts approved by the manufacturer.
- If unclear, always contact the manufacturer

3 Design and Function

3.1 Drives and monitoring

3.1.1 Mechanical drive system

Assembly example of gear motor with HZW xx.xxxx components

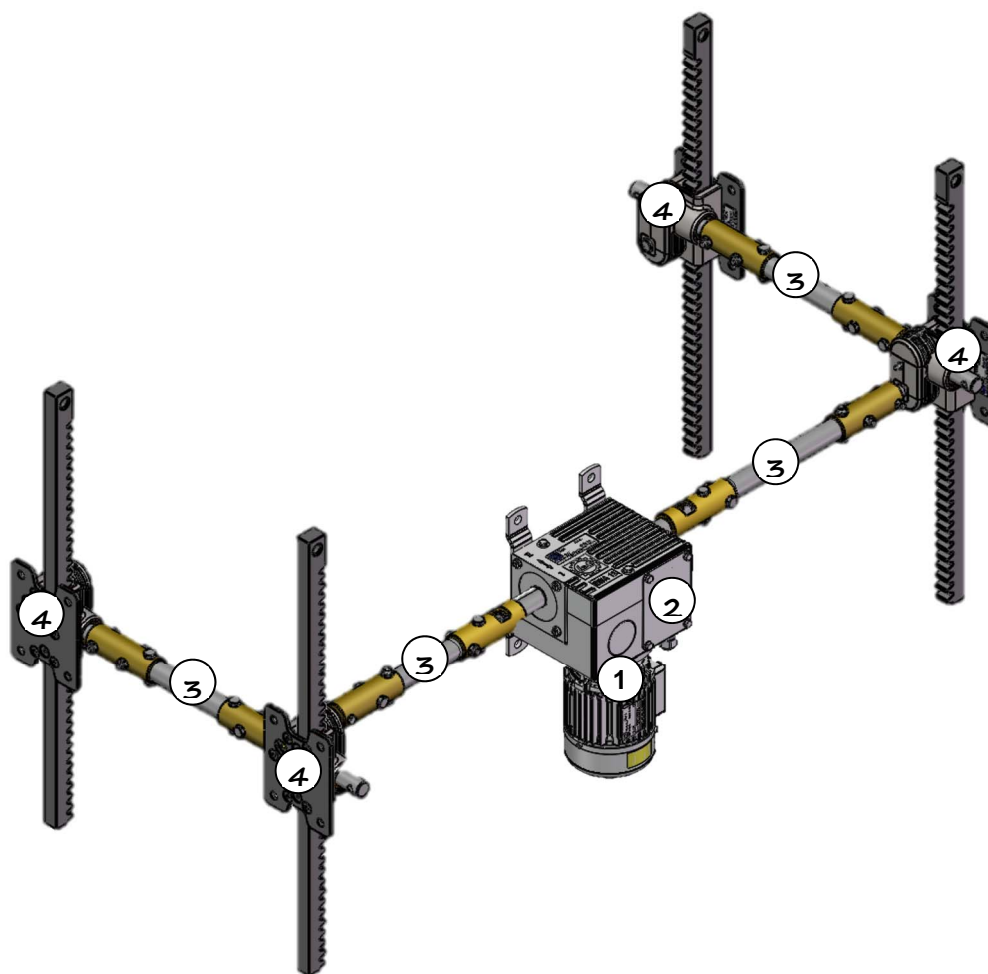


Fig. 2: Symbolic representation of a combination option

The gear motor (1) with integrated limit switch system (2) is connected to the rack-and-pinion gear units (4) via customer-side connecting shafts (3) (acc. to DIN 2440, medium-heavy).

3.1.2 Drive

Gear motor with integrated limit switch system + SPL 51_52 (system kit)

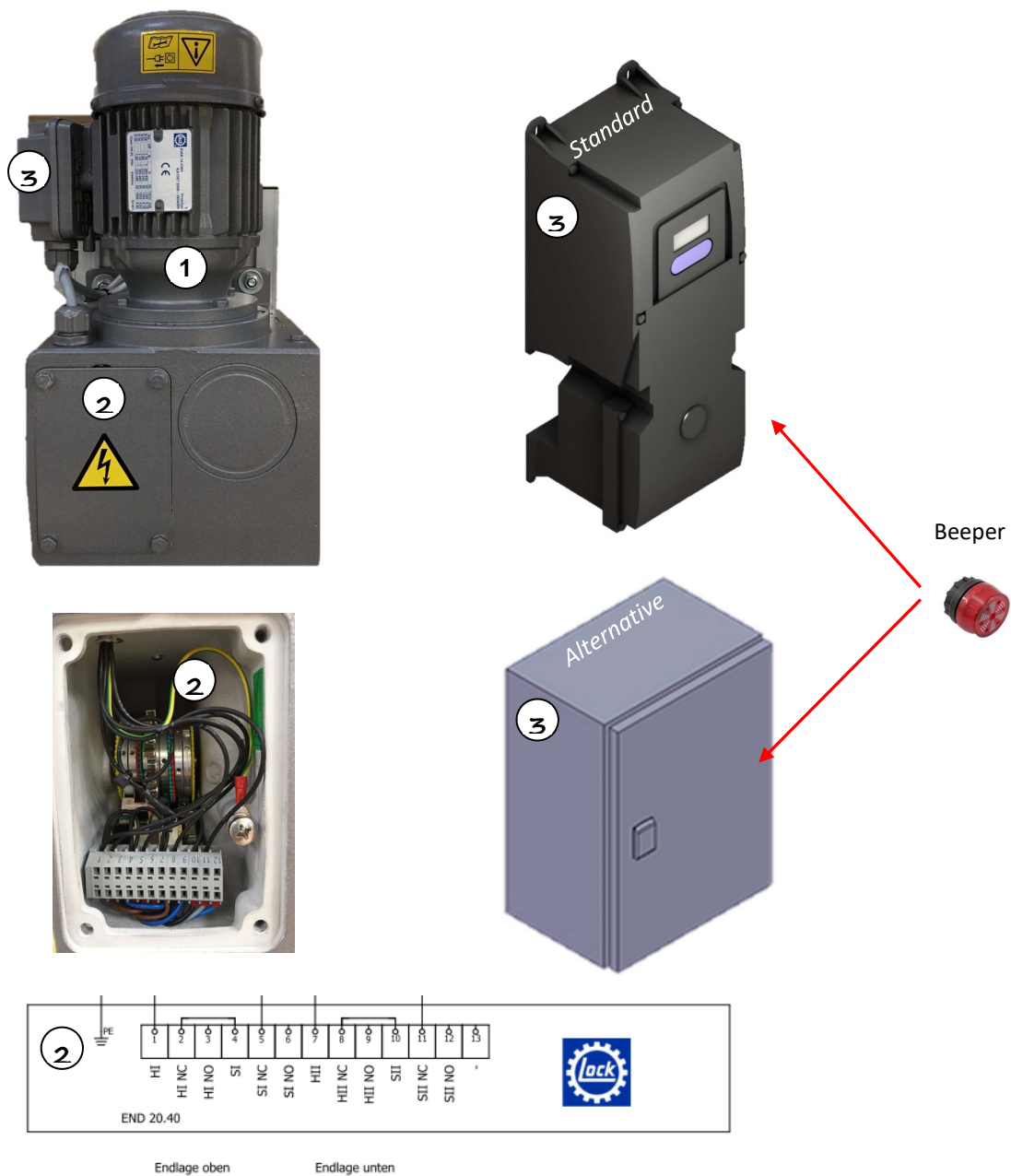


Fig. 3: Drive, system kit SPL 51_52, limit switches and circuit diagram representation of limit position switch connection

Gear motor (1) / with integrated limit switch system (2) moves UP or DOWN when triggered by the \uparrow / \downarrow keys on the pendant station via the control (3). The limit switches HI and SI as well as HII and SII are connected in series at the factory (2) and connected to the SPL 51_52 control unit (3). Reaching the end positions up/down is detected by the end position switches.

3.2 Displays and controls

3.2.1 Control / pendant station

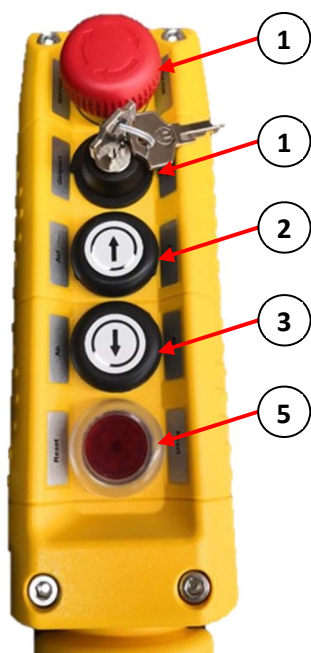


Fig. 4: Overview of pendant station (front view)

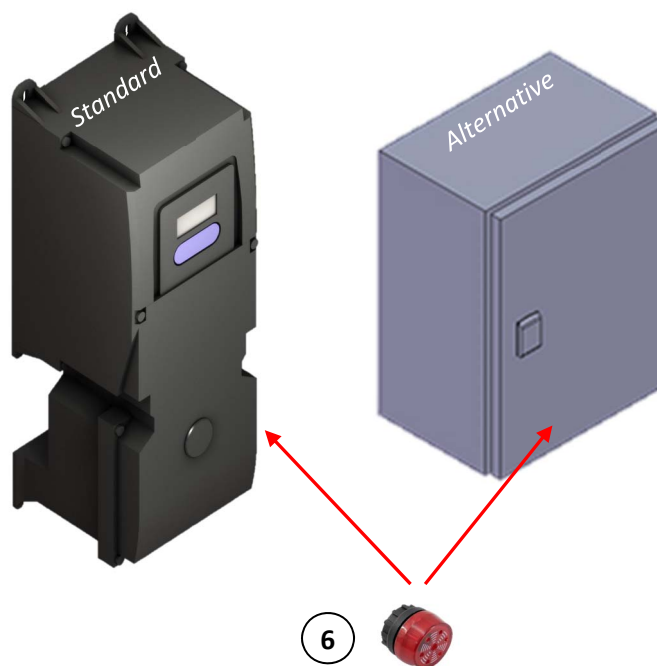


Fig.5: Overview of control cabinet (front view)

The following controls and devices are installed on the pendant station:

- **Emergency stop button (1)** [rotary release]
- **Key switch (2)** [control voltage ON]
- **Button (3)** [UP] controls the drive upwards
- **Button (4)** [DOWN] controls drive downwards
- **Illuminated pushbutton red (5)** [Fault/Reset] Display / acknowledgment of control system faults
- **Acoustic signal emitter (6)** drive in operation

4 Installation

4.1 Safety during installation

Electrical system



DANGER!

Danger to life from electric current!

Contact with live components can lead to serious injury or even death.

- Before starting work, switch off the electrical supply and secure it against being switched on again.

Improper installation and initial commissioning



WARNING!

Risk of injury due to improper installation and initial commissioning!

Improper installation and initial commissioning can lead to serious injuries and considerable damage to property.

- Before starting work, ensure sufficient space for assembly.
- Handle open, sharp-edged components with care.
- Ensure order and cleanliness at the installation site! Loose components and tools lying on top or around are sources of accidents.
- Install components in a professional manner. Observe the specified screw tightening torques.
- Secure components so that they do not fall or topple over.
- Before initial commissioning, observe the following:
 - Ensure all installation operations have been performed and completed in accordance with the specifications and information in these instructions.
 - Ensure no persons are in the danger area.



4.2 Installation

Keep clearances

Sufficient free space around the working platform / lifting table is required for safe assembly, operation and disassembly.

Installation

Personnel: ■ Specialist personnel of the plant operator

Connecting the electric power supply

Personnel: ■ Qualified electrician

1. Ensure that the main switch is switched off.
2. Provide grounding for electrostatically sensitive components.
3. Plug in supply line 230V 1Ph+N+PE 50Hz with Schuko plug.
4. Carry out required measurements.

Check after installation

Personnel: ■ Specialist personnel of the plant operator

1. Check all safety devices for correct and complete assembly.
2. Visually inspect the entire equipment, safety devices and covers for damage.

If necessary, replace damaged components.

4.3 Commissioning



Initial commissioning of the drive components has already been carried out by the manufacturer at the factory.

For use on lifting platforms, commissioning of the complete system by the installer is necessary as described below.

Personnel: ■ Specialist personnel of the plant operator

1. Check the correct installation position of the drive components, sensors and safety switches!
2. Check that no components restrict the travel range.
3. Housing of control unit closed.

5 Operation

5.1 Safety during operation

Improper operation



WARNING!

Danger of personal injury due to improper operation!

Improper operation can lead to serious injuries and considerable damage to property.

- Carry out all operating steps in accordance with the information and notes in these instructions.
- Before starting work, observe the following:
Ensure all covers and safety devices (limit switches) are installed and working properly.

Never override or bypass safety devices during operation.

5.2 Switching on

Check before switching on

Personnel: ■ Operator

1. Ensure no unauthorised persons are in the working range of the machine.
2. Ensure the safety and information signs are undamaged.
3. Have a qualified electrician check that the safety switchgear (emergency stop button) is functioning, otherwise replace it immediately.
4. Check electrical lines for visible damage.

Checking the safety devices

Checking the supply lines

Switching on



Fig. 6: Emergency stop button

1. Plug in the Schuko plug of the supply line and unlock the emergency stop button on the pendant station by turning it clockwise.



Fig. 7: Key switch

2. Release the drive by turning the key switch to position 1.



Fig. 8: Illuminated pushbutton fault

3. Acknowledge pending faults (display lights up red) by pressing. If the display goes out, the drive is ready.

5.3 Switching off

Switching off in normal operation

Personnel: ■ Operator



Fig. 9: Key switch

1. Lock the drive by turning the key switch to position 0.

Switching off in case of emergency



Fig. 10: Emergency stop button

2. Switch off the drive using the emergency stop button on the pendant station.

6 Faults

6.1 Safety during troubleshooting

Electrical system



DANGER!

Danger to life from electric current!

Contact with live components can lead to serious injury or even death.

Before starting work, switch off the electrical supply and secure it against being switched on again.

Improper work for fault clearance



WARNING!

Danger of personal injury due to improper fault clearance!

Improper work to rectify faults can lead to serious injuries and considerable damage to property.

- Before starting work, ensure sufficient space for assembly.
- Ensure order and cleanliness at the installation site! Loose components and tools lying on top or around each other are sources of accidents.
- When components have been removed, ensure correct assembly, refit all fasteners and maintain screw tightening torques.
- Before restarting, observe the following:
 - Ensure all troubleshooting operations have been performed and completed in accordance with the specifications and information in these instructions.
 - Ensure no persons are in the danger area.

Ensure all covers and safety devices are installed and working properly.

6.2 Fault / message displays

- Acoustic signal of beeper



Fig. 3: Acoustic signal emitter on the control

Pos.	Signal	Description
1	Drive in operation	The beeper sounds when the drive moves UP or DOWN.

- Fault indicator on pendant station lights up



Pos.	Signal	Description
1	Frequency converter fault	Control is malfunctioning. Identify faults according to the fault and message list.

6.3 Troubleshooting

In the event of a fault

1. Determine cause of fault
2. Correct fault as indicated in Fault list.

6.4 Fault and message list

No.	Message	Cause	Clearance
1	Drive does not run	Mains supply interrupted	Check supply line
2	Drive does not run	Key switch in position 0	Set key switch to position 1 (pendant station master or pendant station slave)
3	Drive does not run	Emergency stop button actuated	Unlock button by turning clockwise
4	Illuminated pushbutton Fault lights up on the pendant station	Frequency converter control malfunctioning	Acknowledge the fault by pressing the illuminated pushbutton on the pendant station.
6	Acoustic signal is emitted even when the drive is not running	At least one contact on the relay remains stuck	Change defective relay
7	Acoustic signal is not emitted even when the drive is running	Acoustic signal emitter or relay defective	Change defective device
8	Customer-supplied residual current device (RCDs or RCDs) trips in IT supply networks	<p>Insulation faults in the system components</p> <p>Leakage current of frequency converter in connection with other components is too high.</p>	<p>Identify and replace defective components.</p> <p>When using IP66 frequency converters, devices without mains filters should be used. Additional "low leakage" filters are then required.</p> <p>For IP20 frequency converters in the control cabinet, the screws marked "IT" on the product can be removed.</p>