

Movement by Perfection



ZAsyn2

Gearless elevator machine

SM500.12AL-B

SM500.16AL-B

Issue 2024/29

Original operating instructions
Store for future use!

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1 Introduction

1.1 Liability

Compliance with the following specifications serves to ensure product safety. Should the information specified especially with regard to general safety, transport, storage, assembly, operating conditions, start-up, service, maintenance, cleaning and disposal/recycling not be observed, safe operation of the product may not be guaranteed posing a possible danger to life and limb of users and third parties. Thus, deviations from the specifications below can lead to the loss of legal materials defect liability as well as to the buyer's liability for the product rendered unsafe by deviation from the specifications.

1.2 Validity and meaning of the instructions

These instructions apply to ZAtop SM500.xxAL-B elevator machines.

The model range can be identified by the type designation, see *Motor rating plate, page 11*.

These instructions apply only to the product ZIEHL-ABEGG and not to the complete system. If additional devices are used or installed, the respective instructions must be observed.

The instructions provide guidelines for safe work.

- ▷ Store the instructions so that they are accessible to all persons who work with the product.
- ▷ Pass the instructions on to subsequent users.
- ▷ Read and follow the instructions in full.

1.3 Target group of the instructions

The target group of these instructions are transport personnel, fitters who have been instructed in mechanical and electrical engineering, electricians, electrically instructed personnel, start-up and maintenance personnel, see *Requirements placed on the personnel, page 5*.

1.4 Applicable documents

Observe the following documents for instructions:

- Order confirmation
 - Design
 - Instructions for the frequency inverter
 - Assembly instructions A-TIAxx_xx for spare parts
- Latest versions of the A-TIA at: <https://www.ziehl-abegg.com/bal>

2 Safety instructions

2.1 Intended use

The product is not ready for use, but designed as an elevator machine consisting of a motor, traction sheave, brake and absolute encoder for rope elevators with and without a machine room. The product is a gearless elevator machine.

The instructions are part of the product. The product is only intended for use according to these instructions.

2.2 Requirements placed on the personnel

The client of the required measures in the product life cycle is responsible for ensuring that the personnel carrying out the work are sufficiently qualified.

Personnel	Minimum requirements, knowledge and experience
Planners and project designers	They are responsible for the project planning of the complete system. They have knowledge of applicable standards, legal requirements and safety regulations.
Transport personnel	They can deal safely with industrial trucks, loads and transport regulations. They can identify and avoid hazards that can occur when transporting the product. They have also been instructed and trained in the necessary protective equipment and protective measures to use.
Assembly personnel	They can deal safely with tools, loads and assembly instructions. They can identify and avoid hazards during assembly of the product. They have also been instructed and trained in the necessary protective equipment and protective measures to use.
Electrician	They have technical training in the field of electrical engineering. They can identify and avoid hazards associated with electricity. They have also been instructed and trained in the necessary protective equipment and protective measures to use. They comply with the technical regulations and have the following electrotechnical knowledge: ▫ Read and fully understand electronic connection diagrams. ▫ Understand all relationships regarding the safety devices. ▫ Are familiar with the function and design of the electrical components used.
Electrically trained personnel	Personnel instructed or supervised by a qualified electrician. They can identify and avoid hazards associated with electricity. They have been instructed in the assigned tasks and possible hazards in the event of improper conduct. They have also been instructed and trained in the necessary protective equipment and protective measures to use.
Start-up technician	They handle the entire system safely. They can identify and avoid hazards that may occur during start-up. They have also been instructed and trained in the necessary protective equipment and protective measures to use.
Maintenance personnel	They handle the entire system safely. They can identify and avoid hazards that may occur during service and maintenance. They have also been instructed and trained in the necessary protective equipment and protective measures to use. They can detect and avoid hazards associated with electricity.

2.3 Live parts

Touching live parts poses a risk of death due to electric shock.

- ▷ Do NOT touch connection points of wires, terminal points, parts of the motor winding, or the capacitor.
- ▷ Disconnect the product from the power supply before carrying out any work and secure it against being switched back on.
- ▷ The safe isolation from the supply must be checked using a two-pole voltage detector.
- ▷ Do NOT insert objects or limbs through openings.
- ▷ Use the product according to the IP degree of protection.
- ▷ Check the product for damage; do NOT use the product if the insulation is defective.

2.4 Powerful magnetic fields

Strong magnetic fields are generated in the brake and could lead to life-threatening danger for persons with pace-makers.

- ▷ Do NOT allow persons with pacemakers to come near the elevator machine.
- ▷ Disconnect the product from the power supply before carrying out any work and secure it against being switched



back on.

- ▷ Check the product for damage.

2.5 Protective device

Reaching into the nip guard, rope retainer or rope guard during operation can lead to serious injuries. DO NOT reach into the elevator machine during operation.

- ▷ DO NOT reach into the machine while the elevator machine is in operation.
- ▷ Wait for the product to come to a standstill.

2.6 Do not touch the ropes

Touching the ropes during operation can cause serious injury.

- ▷ Operate the product with the traction sheave cover, rope guard or rope retainer.
- ▷ DO NOT touch the ropes while the elevator machine is in operation.
- ▷ Wait for the product to come to a standstill.

2.7 Rotating parts

At high speeds and in poor lighting, rotating parts are not visible and can cause serious injury

- ▷ DO NOT put the product into operation if protective devices are missing.
- ▷ Observe the safety distances in the danger area.
- ▷ DO NOT place any objects or limbs in the traction sheave pull-in range.

2.8 Automatic restart

When working on the product with voltage applied, the product can start up again automatically and cause serious injuries.

- ▷ Switch off the product. Before working on the product, ensure that it is de-energised and secured against being switched on again.

2.9 Modifications and spare parts

Unauthorised modifications and unauthorised spare parts can lead to serious injuries.

- ▷ Do NOT modify the product.
- ▷ Before making changes, obtain written approval from ZIEHL-ABEGG.
- ▷ Use spare parts from ZIEHL-ABEGG.

2.10 Do not disassemble components

Dismantling components can cause serious injury.

- ▷ DO NOT remove or decommission any components, e.g. traction sheave cover, brake release monitoring.

2.11 Welding work

Welding work in the machine room or elevator shaft can result in serious injuries.

- ▷ DO NOT use the product as a grounding point for welding.

2.12 Protect the product from contamination

Contamination on the product and safety-relevant components can lead to serious injuries.

- ▷ Protect the product from dust, dirt, welding work and water. Cover the product when working in or on the eleva-

tor.

- ▷ Remove any assembly residue in the machine room or elevator shaft.
- ▷ Do NOT expose the brakes and traction sheave to lubricants; in particular, the rotor braking surface and the grooves of the traction sheave must be clean.
- ▷ DO NOT clean electrical components, e.g. microswitches, with water or other liquids.

2.13 Hot surfaces

Hot surfaces on the product can cause burns.

- ▷ Allow the product to cool down before starting work.
- ▷ Wear protective equipment, e.g. safety gloves.

2.14 Explosion hazard

The product becomes hot during operation and can cause an explosive atmosphere to explode.

- ▷ If an explosive atmosphere can occur, assess the risks and take precautions to prevent a fire.

2.15 Excessive vibrations

Increased vibrations can lead to failure and shorten the service life of the product.

- ▷ Ensure low vibration operation and avoid system resonances.
- ▷ Avoid resonance-critical speeds, depending on the control unit.

2.16 Electrostatic charge

Electrostatic charging can lead to material damage.

- ▷ Discharge yourself before working on electrical components, e.g. by touching grounded metallic parts.
- ▷ Do not touch the pins of the encoder line and the electronics.

2.17 Impacts and shocks

Handle the product with care. Impacts and shocks lead to visible and invisible material damage.

- ▷ Transport the product in its original packaging.
- ▷ Do not step on the product.

2.18 Observe temperature ranges and air humidity

Too high or too low temperatures or too high air humidity can lead to material damage, especially to the brake.

- ▷ Observe the specified ambient temperatures, see *Ambient conditions*, page 74.
- ▷ Observe the specified air humidity, see *Ambient conditions*, page 74.

2.19 Subsequent coating

Subsequent coating of the product can lead to material damage.

- ▷ Do NOT coat the product without consulting ZIEHL-ABEGG.

3 Transport and storage

Personnel qualifications: Transport personnel



3.1 Transport

⚠ WARNING

Crushing hazard due to suspended loads and uncontrolled moving parts.

- ▷ Wear safety helmet, safety gloves and safety shoes.
- ▷ Only move loads under supervision.
- ▷ Do NOT walk or reach under suspended loads.
- ▷ Set down the load when you leave the work area.
- ▷ Secure the product during transport.



1	Suspension points
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Procedure:

1. Transport the product in its original packaging on the pallet.
2. Unpack the product.
3. Check the product for damage.
4. Select the lifting gear according to the weight on the rating plate.
5. Transport the product on both suspension points (1).
6. Dispose of the packing material in accordance with local regulations.

3.2 Storage

Prerequisite:

The product is stored in the ambient conditions specified in the technical data, see *Ambient conditions*, page 74.

Procedure:

- ▷ Protect the product from moisture, dirt and heat sources.
- ▷ Storage up to 12 months: Before installation, release the brake and turn the motor shaft by hand.
- ▷ Storage longer than 12 months: Every 3 months, release the brake and manually turn the motor shaft 3 turns in both directions.

4 Product overview

4.1 ZAsyn2 SM500



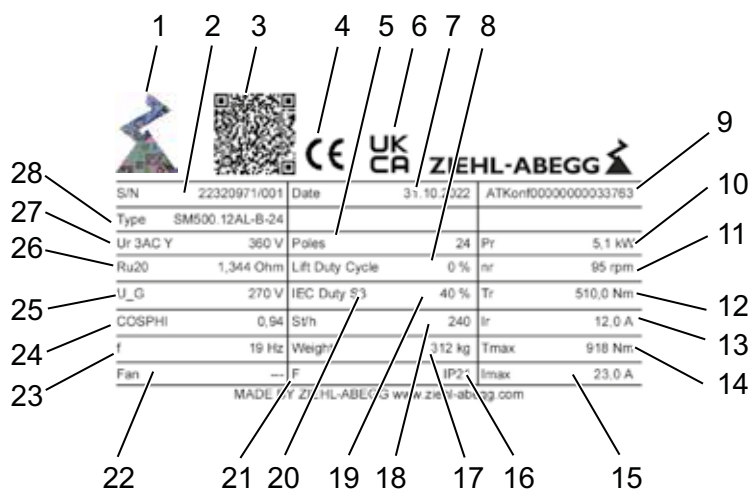
1	Rope guard
2	Traction sheave
3	Suspension point
4	Rope retainer, optional
5	Housing elevator machine

6	Terminal box, motor
7	Absolute encoder
8	Brake YLZK4600 with cover plate
9	Terminal box, brake



4.2 Motor rating plate

Example:



1	Hologram
2	Motor number
3	QR code
4	Product certification CE mark
5	Number of poles
6	Product certification UK CA mark
7	Date of manufacture
8	Allowed on time in typical elevator operation
9	Part number
10	Rated power
11	Rated speed
12	Rated torque
13	Rated current
14	Acceleration torque

15	Acceleration current
16	Degree of protection
17	Weight
18	Trips per hour
19	On time as per IEC
20	Mode
21	Insulation class
22	Forced ventilation type
23	Rated frequency
24	Cosine phi - power factor
25	Generator voltage
26	Winding resistance
27	Rated voltage/mains form/circuit type
28	Motor type

4.3 Function description of the elevator machine

Rope retainer and rope guard

The rope retainer and rope guard prevent ropes from leaving the grooves of the traction sheave during maintenance work, e. g. when the rope is slack.

Traction sheave

The traction sheave is the rope carrier of the elevator machine.

Suspension points

The suspension points are designed exclusively for transporting the elevator machine including brake and traction sheave.

Brake

The brake circuits act between the stator housing and rotor.

The brake is intended as a holding brake for static applications. Dynamic braking must be limited to EMERGENCY STOP braking during operation and inspection.

The brake does not wear if the brake is used only as a holding brake.

The more often the brake is used for EMERGENCY STOP, the greater the wear on the friction lining. Check the air gap, see *Checking the air gap of brake YLZK4600, page 26*.

Brake cover plate

The cover plate on the brake serves as protection against damage to the microswitch.

Absolute encoder

The absolute encoder sends signals to the frequency inverter for control.

Terminal box, brake

The brake is connected in the terminal box. The connection diagram is affixed to the cover.

Terminal box, motor

The motor is connected in the terminal box. The connection diagram is affixed to the cover.

5 Installation

Personnel qualifications: Assembly personnel



WARNING

Crushing hazard due to suspended loads and uncontrolled moving parts.

- ▷ Wear safety helmet, safety gloves and safety shoes.
- ▷ Only move loads under supervision.
- ▷ Do NOT walk or reach under suspended loads.
- ▷ Set down the load when you leave the work area.
- ▷ Secure the product during transport.

ATTENTION Material damage due to additional loads.

- ▷ DO NOT transport additional loads on the suspension point, e.g. ropes.

5.1 Preparing for installation

Procedure:

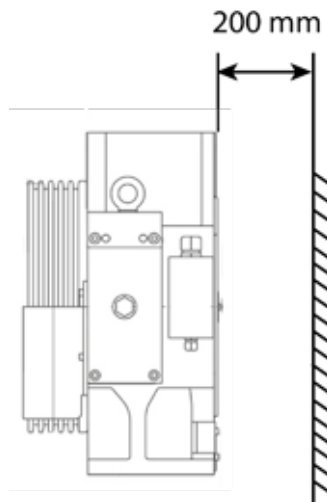
1. Observe the storage duration, see *Storage*, page 9.
2. Select the lifting gear according to the weight on the rating plate.
3. Transport the product on the suspension points.
4. Check the product for damage and dirt. Do NOT put damaged products into operation.
5. Visually check that the locking varnish on the fixing screws on the brake, absolute encoder and traction sheave is present and undamaged.
6. Check that the air supply for cooling the elevator machine is not impaired.



7. Position the elevator machine.

To facilitate connection of the absolute encoder, maintain a distance of at least 200 mm behind the elevator machine.

If the distance cannot be maintained, the elevator machine must be moved for replacement.



5.2 Installing the elevator machine

ATTENTION Material damage due to installation under tension.

- ▷ DO NOT install the elevator machine under tension.
- ▷ Observe the permissible unevenness for the screw contact surface of 0.3 mm.
- ▷ Design the mounting surface so that it is rigid and stable enough to absorb the forces that occur.

In addition, use the following special tool:

- Torque wrench for tightening torque of 390 Nm

Prerequisite:

Use the following screw types:

- 4 hexagon head screws ISO4014 - M20 - 8.8
- 4 hexagon head screws ISO 4017 - M20 - 8.8
- 4 cylinder screws ISO 4762 - M20 - 8.8

Procedure:

1. Mount the elevator machine with the 4 screws.
2. Fasten the screws with a tightening torque of 390 Nm in a crosswise pattern in at least two steps.

5.3 Fitting ropes and adjusting the rope guard

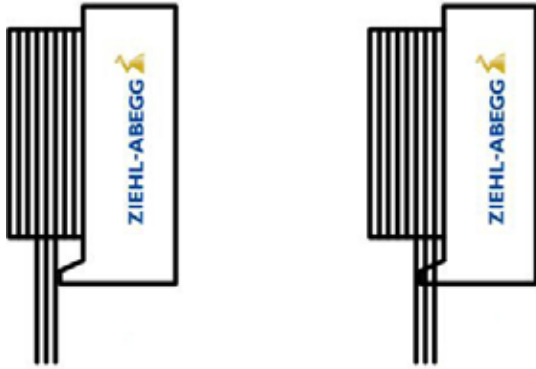
Prerequisite:

The rope retainer and rope guard are removed, see *Replacing the rope guard and rope retainer*, page 28.

Procedure:

ATTENTION! Material damage due to incorrect rope pull force.

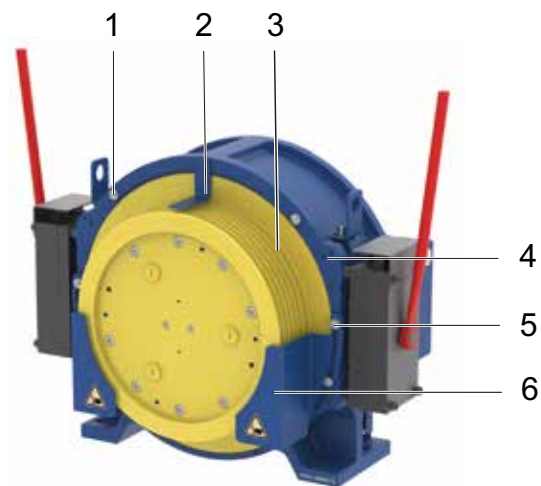
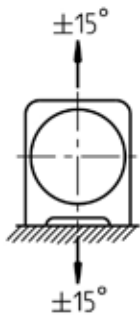
- ▷ If the traction sheave has more grooves than there are ropes, place the ropes in the centre or towards the elevator machine housing.



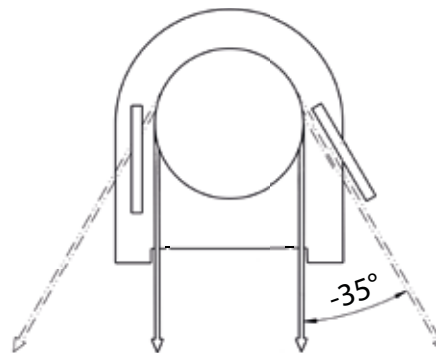
1. Place the ropes on the traction sheave (3).

ATTENTION! Material damage due to resulting rope force direction.

- ▷ Only run the main rope pull in the vertical direction.
- ▷ The rope force direction of $\pm 15^\circ$ resulting from the rope pull must be met without side interlocking support.



2. Fasten the rope guard (6) to the housing (4) with 2 cylinder screws M6 x 16 - 8.8 and washers (5).
3. Adjust the distance between the rope guard and the ropes to 2 to 3 mm using the slot. The rope guard is adjustable on both sides: 0° to 35° .



4. Fasten the cylinder screws M6 x 16 - 8.8 (5) with a tightening torque of 9.5 Nm.
5. Fasten the optional third Fasten the rope retainer (2) to the housing (4) with 2 cylinder screws M6 x 16 - 8.8 and 2 washers (1). If the cable pulling direction is opposite to the direction of the foot, an additional rope retainer can be fitted.
6. Adjust the distance between the rope retainer and the ropes using the slot.
7. Fasten the cylinder screws M6 x 16 - 8.8 (1) with a tightening torque of 9.5 Nm.

6 Electrical installation

Personnel qualification: qualified electrician or electrically instructed personnel



6.1 Connecting the elevator machine

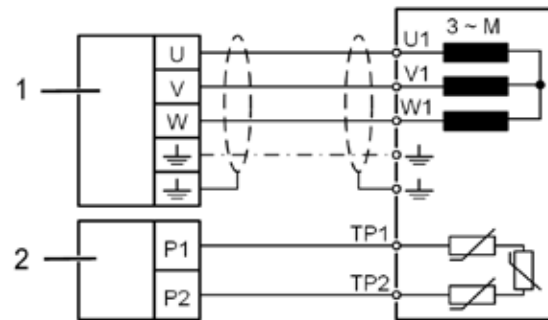
Prerequisite:

- Length of motor cable: maximum 25 m
- Shielded lines
- Determine the cable cross-section depending on the motor current and ambient conditions.

Procedure:

1. Connect the frequency inverter (1) in the correct phase according to the connection diagram.
2. Connect the motor temperature monitoring (2) according to the connection diagram.

If the actual direction of travel does not match the selected direction of travel, do NOT replace the phase connections; instead change the direction of rotation of the elevator machine in the parameterization of the frequency inverter, see *operating instructions for the frequency inverter*.



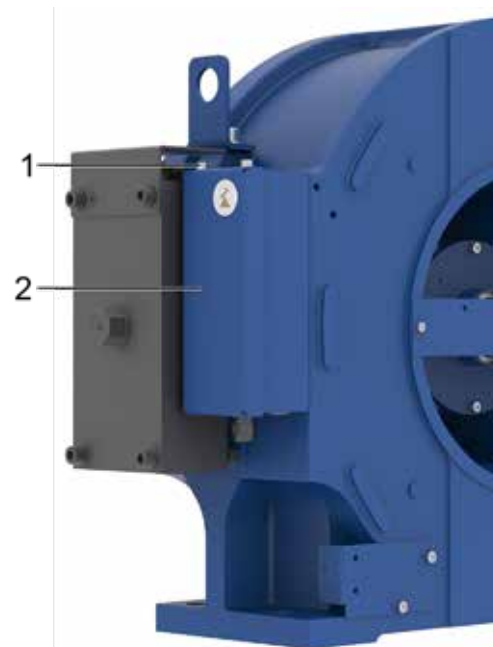
6.2 Connecting the shielding for the motor cable

Prerequisite:

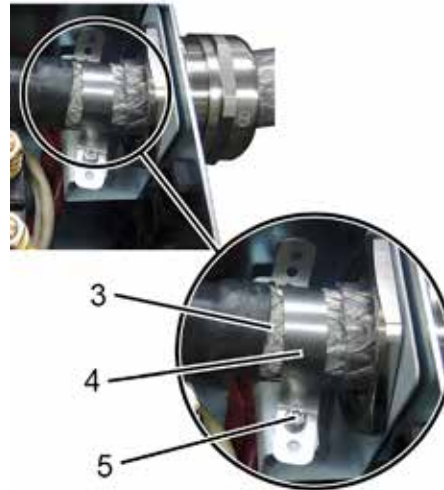
- A shielded motor cable is connected on the side of the motor.
- The shield must cover a large area on the side of the frequency inverter.
- On the motor cable, the insulation is removed to a length of 10 mm for supporting the metal strap.

Procedure:

1. Remove and keep the two M6 x 10 fixing screws(1) on top of the terminal box cover (2).



2. Unscrew one of the two fixing screws (5) on the metal strap (4).
3. Position the motor cable (3). The metal strap (4) must make contact with the exposed part of the motor cable (3).
4. Fasten the metal strap (4) with the fixing screw M4 x 10 (5) with a tightening torque of 2.8 Nm.
5. Connect the temperature monitoring, see *Release monitoring of the brakes*, page 17.
6. Position the cover of the terminal box (2).
7. Fasten the fixing screws M6 x 10 (1) with a tightening torque of 9.5 Nm.



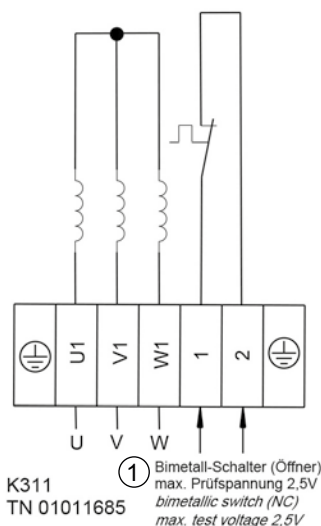
6.3 Connecting temperature monitoring devices

The temperature is monitored by a thermal switch.

ATTENTION Material damage due to incorrect connection of the temperature monitoring.

- ▷ Only connect the temperature monitoring to terminals 1 and 2 that are suitable for the monitoring type.
- ▷ DO NOT apply voltage greater than 2.5 V.

Connection diagram K311



1	Bi-metal switch, normally closed contact, maximum test voltage 2.5 V
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6.4 Connecting the absolute encoder

The offset of the absolute encoder is set to 0 at the factory. For this purpose, DC voltage is connected with U to the positive terminal (+) and V and W to the negative terminal (-).



ATTENTION Loss of factory setting due to loosened screws.

- ▷ DO NOT loosen any bolts on the absolute encoder.
- ▷ If screws have been loosened or the frequency inverter used has a different offset than described, calibrate the absolute encoder, see *frequency inverter operating instructions*.

Prerequisite:

- Absolute encoder cable length: maximum 25 m
- Shielded line

Procedure:

1. Use the supplied cable or design a corresponding cable, see contact assignments of the existing absolute encoder, see *Contact assignment absolute encoder ECN1313 EnDat, page 17*
2. Refer to the table for the connections and cable length, see *Connection and cable length of the absolute encoder, page 17*
3. Adjust the absolute encoder, see *frequency inverter operating instructions*.

6.5 Connection and cable length of the absolute encoder

Absolute encoder ECN1313 EnDat	
Connection	Plug M16 x 0.75 SV120
Cable length	24.5 cm (9.64 ")
Frequency inverter connecting cable	optional
Extension cord	optional

6.6 Contact assignment absolute encoder ECN1313 EnDat

Plug ZIEHL-ABEGG M16 x 0.75 SV 120	Function	Description
A	DATA+	Data line for communication with absolute encoder
B	DATA-	Data line inverse
C	Sensor Up	Sensor cable, voltage supply, positive
D	Up	Voltage supply +5 V DC
E	0 V	Ground voltage supply
F	B+	Analog track B sine
G	CLOCK-	Clock line inverse
H	CLOCK+	Clock line for serial transfer
J	Sensor 0 V	Sensor cable, absolute encoder voltage, negative
K	A+	Analog track A cosine
L	A-	Analog track A cosine inverse
M	B-	Analog track B sine inverse

6.7 Release monitoring of the brakes

For details, see Appendix *Operating instructions for brake YLZK4600, page 42*.

Release monitoring is used to monitor the operating state of the brakes. The elevator control system must evaluate

the signals of the microswitches for release monitoring, see *Connection diagram V119, page 18*.

Procedure:

1. Evaluate the release monitoring of the brakes. Monitor and evaluate the change in state of the two brakes separately.
If one of the microswitches for release monitoring does not modify its signal during the start of travel, the elevator machine must not move. If it does, check the function of the release monitoring.
- The brakes are supplied with factory-installed and calibrated release monitoring. If a microswitch fails, replace the microswitch:
- see technical data, *Microswitch, page 75*

- see, *Replacing the microswitch, page 32*

6.8 Connecting the brake

ATTENTION Material damage due to overheated brakes.

If the duty cycle is repeatedly too high, the brake may close prematurely.

- ▷ DO NOT release the brake permanently.
- ▷ DO NOT exceed the brake's maximum allowed on time of 60%.

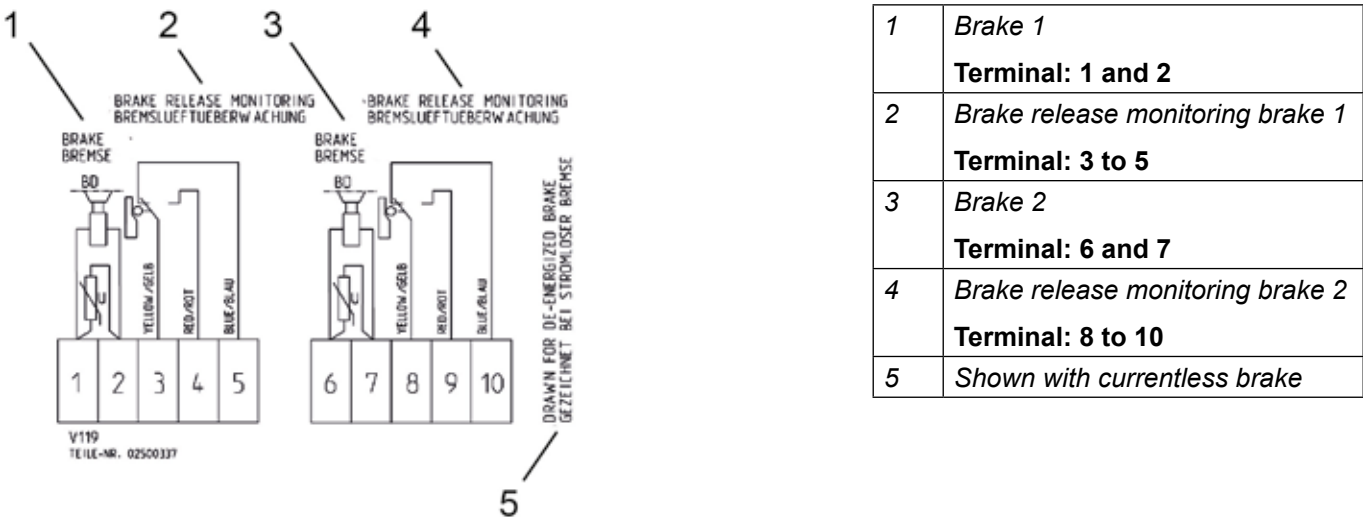
Prerequisite:

- The brakes are de-energised.
- The motor protective conductor is connected by the customer to the terminal box of the drive.

Procedure:

Connect the brake, see the *connection diagram V119*.

Connection diagram V119



6.9 Actuating the brake

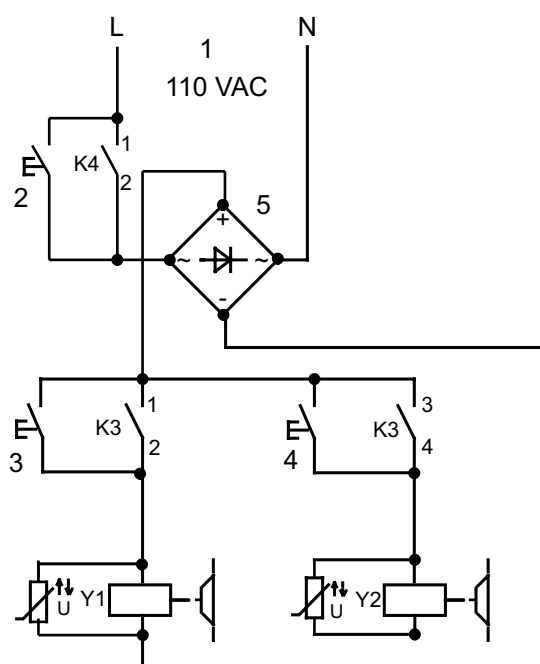
ATTENTION Material damage due to excessive voltage.

- ▷ DO NOT remove the installed varistors.



Procedure:

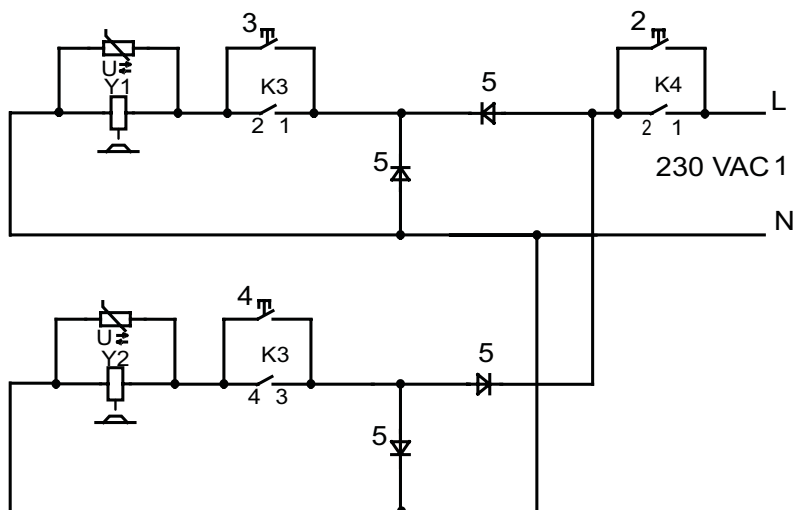
1. Connect the brakes according to one of the 3 wiring suggestions, see *Circuit proposal 1 – Voltage supply 110 VAC – Brake control with a bridge rectifier*, page 19 or *Circuit proposal 2 – 230 VAC voltage supply – Brake control with 2 one-way rectifiers*, page 19 or *Circuit proposal 3 – 230 VAC voltage supply – Brake control with a bridge rectifier*, page 20. Check the circuit suggestion with the applicable notified body regulations.
2. To reduce noise when the brake is switched off, switch the brake to the AC side (K4). The brake closes more slowly and quietly through the rectifier.
3. Insert a 2nd contactor (K3) that disconnects the brake circuits on the DC side. In an emergency, the brake is applied without delay during the inspection run and return run.

Circuit proposal 1 – Voltage supply 110 VAC – Brake control with a bridge rectifier

1	Voltage supply
2	Dual circuit test button
3	Button "Open brakes"
4	Button "Open brakes"
5	Rectifier diode, at least 2 A current rating/1000 V blocking voltage
K3	Brake contactor, activated by safety circuit
K4	Brake contactor, activated by control or frequency inverter

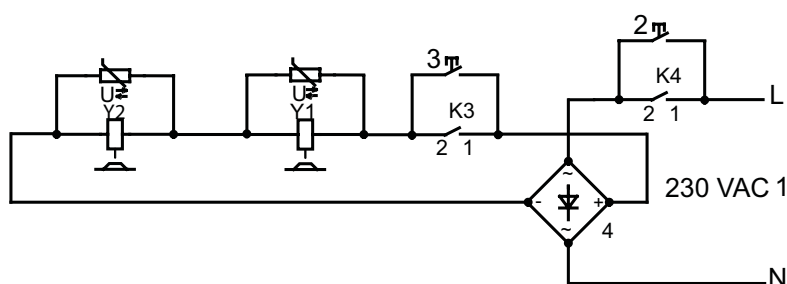
Circuit proposal 2 – 230 VAC voltage supply – Brake control with 2 one-way rectifiers

- In order to prevent adverse mains feedback, connect one of the two rectifiers to the AC voltage with opposite polarity.



1	Voltage supply
2	Dual circuit test button
3	Button "Open brakes"
4	Button "Open brakes"
5	Rectifier diode, at least 2 A current rating/1000 V blocking voltage
K3	Brake contactor, activated by safety circuit
K4	Brake contactor, activated by control or frequency inverter

Circuit proposal 3 – 230 VAC voltage supply – Brake control with a bridge rectifier



1	Voltage supply
2	Dual circuit test button
3	Button "Open brakes"
4	Rectifier
K3	Brake contactor, activated by safety circuit

7 Start-up

Personnel qualifications: Start-up technician

7.1 Checking the elevator system with half load

One of the two tests can be used to check whether the CW-balance is correct.

Half load test with current measurement

Procedure:

1. Load the car according to its counterweight-balance.
Typical load: 50% of the payload.
2. Start a trip. When the car is roughly in the middle of the shaft, measure the motor current in both directions of travel.
If the difference between the two motor currents is greater than 10% , correct the counterweight-balance and repeat the measurement.

Releasing the half load test via the brake

Procedure:

1. Load the car according to its counterweight-balance.
Typical load: 50% of the payload.
2. Position the car roughly in the middle of the shaft.
3. Deactivate the short circuit of the motor winding, if present.
4. Release the brake. With a load corresponding to the counterweight-balance, the car must not move. If the car moves, correct the counterweight-balance and release the brake again.
5. Reactivate the short circuit of the motor winding, if present.

7.2 Checking the brake according to EN 81-20:2020

Perform the tests according to EN 81–20:2020:

Prerequisite:

1. Position the car in the middle of the shaft during the tests.
2. Observe the car during the tests.



Test procedure 1: Check the brake with overload, 125% load

ATTENTION Material damage due to heating of the motor.

- ▷ DO NOT travel upwards with 125% of the load.
- ▷ Transport the load upwards in two parts.
- ▷ Only travel downwards with 125% of the load.
- ▷ The trip may only be short in duration.

Procedure:

1. Load the car with 125% of the nominal load.
2. Start a descent. Wait until a constant speed is reached. Disconnect the power supply to the motor and the brake. The car must come to a standstill.

If there is no noticeable delay, restore the power supply immediately. Repeat the test or stop the elevator.

Test procedure 2: Checking the brake in the event of a brake circuit failure at rated speed and as the cabin descends

ATTENTION Material damage due to permanently open brakes.

- ▷ DO NOT open permanently the brakes, e.g. electrical release with a button.

Prerequisite:

- ▷ If a brake circuit failure is simulated, it must be possible to keep the two brake circuits open from each other electrically.

Procedure:

1. Deactivate the short circuit of the motor winding, if present.
2. Load the car with the nominal load.
3. Start a descent. Wait until a constant speed is reached. Disconnect the power supply to the motor and the 2nd brake circuit. Keep the 1st brake circuit open. The car must be brought to a standstill.
If there is no noticeable deceleration, immediately close the open brake circuit. Repeat the test or stop the elevator.
4. If the test was successful, repeat the test for the 2nd brake circuit.
5. Reactivate the short circuit of the motor winding, if present.

7.3 Pulling the car out of the safety catch

Motor torque increases to 150 % of the required motor torque at 125 % load.

Prerequisite:

- The safety catch is engaged.
- The elevator machine is designed for a maximum torque of 170 – 200% of the rated torque.

Procedure:

1. Perform the capture release in the area of a door according to the specifications set out by the elevator manufacturer. The lower the load in the car, the better the car release function.
If the torque of the elevator drive is not sufficient, unload the car and start a new attempt.
If the torque of the elevator machine is still not sufficient, attach the block and tackle to the top of the cabin.
2. Release the engaged safety catch.

7.4 Checking emergency evacuation by releasing the brakes

This test is not mandatory. We recommend this test for checking the function of the hand release system or the electrical emergency supply for releasing the brake during emergency evacuation of trapped persons.

ATTENTION Material damage due to uncontrolled acceleration and overspeeding.

If there is no braking action, the elevator may accelerate in an uncontrolled manner.

- ▷ NO persons in the car.
- ▷ Follow the elevator manufacturer's safety instructions.

Procedure:

1. Short circuit the motor winding for evacuation. Create the short circuit via the motor protection or an electronic circuit, e.g. in the frequency inverter. The acceleration of the elevator decreases.
2. Release the brake with the levers for hand release or an electrical emergency power supply, see *Checking the brake manual release function with mechanical levers for hand release, page 22*. The elevator moves in the direction of the higher weight. When the car is balanced, put weight on the car.
Monitor the evacuation speed. If the allowed evacuation speed is exceeded, stop the emergency evacuation by closing the brake and repeat step 2.
As soon as the floor is reached, close the brakes.
3. Open the elevator door.

7.5 Releasing the brakes

7.5.1 Checking the brake manual release function with mechanical levers for hand release

The brake YLZK4600 can be equipped with one mechanical release lever each.

The mechanical release levers can be attached offset by 60° and moved by a maximum of 15° to the right or left.

Release force: 80 Nm



WARNING

Risk of injury from uncontrolled load movement.

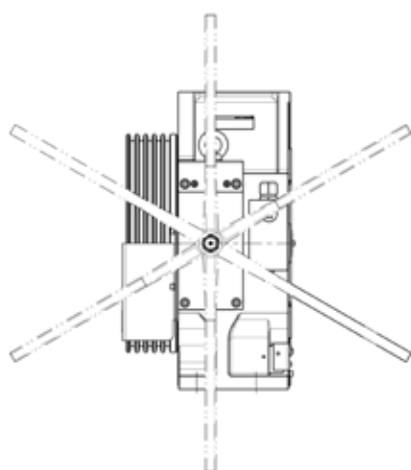
- ▷ Carefully open the mechanical hand release system.
- ▷ Observe the car movement.

ATTENTION Material damage due to permanently open brakes.

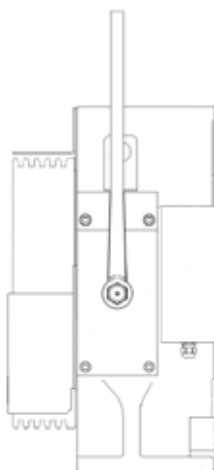
- ▷ DO NOT open permanently the brakes, e.g. electrical release with a button.

Position of mechanical lever for hand release

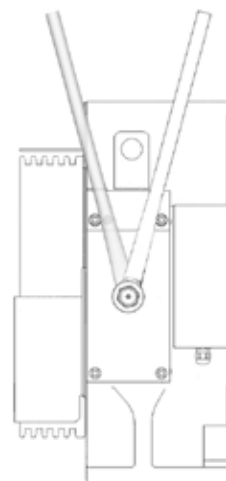




Possible insertion positions



Neutral position



Actuated release lever

Prerequisite:

- The mechanical release levers are plugged in and move easily.
- The YLZK4600 brakes are each equipped with one mechanical release lever.

Procedure:

1. Carefully move the mechanical release levers to the right or left. Only actuate the manual release levers until the car starts moving.
Observe the car movement during the release process. If the speed of the car is too high, stop the release process.
2. Return the mechanical levers for hand release to the neutral position.
3. Remove and store the mechanical release levers after releasing the brakes.

7.5.2 Releasing brake with electrical emergency power supply UPS

The brakes can be electrically released with an uninterruptible power supply (UPS), see circuit proposals *Actuating the brake*, page 18.

7.6 Automatic emergency evacuation

Carry out the automatic emergency evacuation with the elevator control system according to the operating instructions of the frequency inverter or the evacuation unit with UPS.

8 Troubleshooting

8.1 Failures

Failure	Possible cause	Remedy
The elevator machine makes noises.	The bearing is defective.	▷ Contact service.
	The settings in the frequency inverter are incorrect.	▷ Check the settings in the frequency inverter, refer to the <i>frequency inverter operating instructions</i> .
	The absolute encoder is defective.	▷ Replace the absolute encoder, see <i>Replacing the absolute encoder</i> , page 34

Failure	Possible cause	Remedy
The operating temperatures are too high or the temperature monitoring has triggered.	The elevator machine is covered.	▷ Install the covers at a greater distance.
	The ambient temperature is above 40° C (104 °F).	▷ Improve shaft ventilation.
	The settings in the frequency inverter are incorrect.	▷ Check the settings in the frequency inverter, refer to the <i>frequency inverter operating instructions</i> .
	The elevator machine is overloaded.	▷ Check the motor current, see <i>Motor rating plate, page 11</i> and on the rating plate on the drive.
The elevator machine does not start.	The elevator machine is not connected with the correct phases.	▷ Check the connections, see <i>Connecting the elevator machine, page 15</i>
	The frequency inverter is defective.	▷ Check the frequency inverter, refer to the <i>frequency inverter operating instructions</i> .
	The brake does not release.	▷ See Failure: <i>The brake does not release.</i>
The elevator machine does not rotate when the brake is released.	The lining carriers of the brake stick to the brake surface after a long storage time.	▷ Release or disassemble the brake. ▷ Carefully loosen the lining carriers of the emergency brake from the brake surface.
The elevator machine moves when the brake is closed.	The lining carriers of the brake are worn.	▷ Check the brakes for wear and air gap, see <i>Checking the air gap of brake YLZK4600, page 26</i>
	The grooves of the traction sheave are soiled.	▷ Clean the grooves of the traction sheave with isopropanol.
	The brake surface is soiled.	▷ Clean the brake surface: 1. Remove the brakes, see <i>Operating instructions for brake YLZK4600, page 42</i> 2. Clean the brake surface with isopropanol.
	The counterweight-balance is incorrect.	▷ Check and adjust the weights.
The brake makes loud switching noises.	The brake is switched on the DC side first.	▷ Also switch the brake on the AC side in normal operation, refer to the <i>frequency inverter operating instructions</i> . ▷ Provide an additional protective circuit, refer to the <i>frequency inverter operating instructions</i> .
	The wear limit of the brake has been reached.	▷ Exchange brake liner.



Failure	Possible cause	Remedy
The brake does not release.	The voltage supply is too low. The operating voltage on the brake is too low.	▷ Check the voltage supply. ▷ Check the operating voltage on the brake, see <i>Operating instructions for brake YLZK4600</i>, page 42. ▷ Increase the cable cross-section and the transformer.
	The actuation of the brake is incorrect or defective.	▷ Check the brake actuation, see <i>Actuating the brake</i>, page 18.
	The brake coil is defective.	▷ Replace the brake, see <i>Operating instructions for brake YLZK4600</i>, page 42. ▷ Contact service.
	The wear limit of the brake has been reached.	▷ Replace the brake, see <i>Operating instructions for brake YLZK4600</i>, page 42. ▷ Contact service.
The release monitoring does not switch.	One of the microswitches is defective.	▷ Replace the microswitch, see <i>Replacing the microswitch</i>, page 32.
	The contacts are soiled.	▷ Switch the microswitch with a higher contact current, at least 10 mA. ▷ Replace the microswitch, see <i>Replacing the microswitch</i>, page 32. ▷ Replace the brake, see <i>Operating instructions for brake YLZK4600</i>, page 42. ▷ Contact service.

9 Service

Personnel qualifications: Maintenance personnel

9.1 Service plan

⚠ WARNING Risk of injury from high magnetic fields.

▷ DO NOT disassemble the elevator machine.

Intervals	Component	Activity
After the first 3 months, then annually.	Rope retainer	▷ Check the clearance of 2 mm to 3 mm to the ropes, see <i>Fitting ropes and adjusting the rope guard</i>, page 13.
	Brake	▷ Check the brake air gap, see <i>Checking the air gap of brake YLZK4600</i>, page 26. ▷ Check the function of the lever for hand release, see <i>Checking the brake manual release function with mechanical levers for hand release</i>, page 22. ▷ Check the microswitches are working correctly, see <i>Operating instructions for brake YLZK4600</i>, page 42.
	Fixing screws on the brake, absolute encoder, housing and traction sheave	▷ Carry out a visual check to make sure that the locking varnish is not damaged. For the traction sheave, carry out the visual inspection through the viewing slots in the traction sheave cover. In the event of damage, contact ZIEHL-ABEGG.
Yearly	Traction sheave	▷ Visually inspect the grooves of the traction sheave. ▷ If the traction sheave is damaged, replace it, see <i>Replacing the traction sheave</i>, page 30. ▷ Check the wear limit of the traction sheave, see <i>Checking the wear limit of the traction sheave</i>, page 27.
	Microswitch	▷ Check the microswitches are working correctly, see <i>Operating instructions for brake YLZK4600</i>, page 42.

9.2 Checking the air gap of brake YLZK4600

If the brake only closes when the elevator is stationary, the brake is wear-free. The friction linings wear out during frequent EMERGENCY STOP braking.

Procedure:

1. De-energise the elevator machine.
2. Wait for all moving parts to come to a standstill and secure them against restarting.

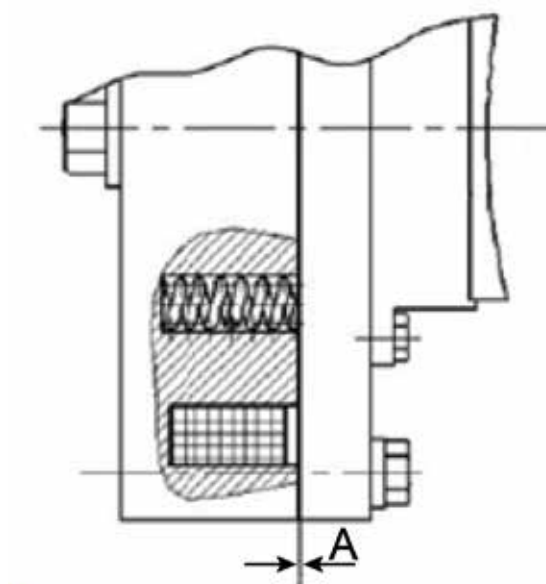
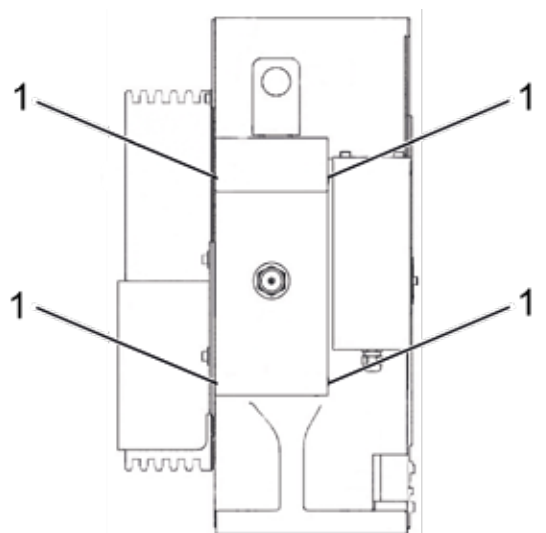
ATTENTION! Material damage caused by inserting the feeler gauge too deeply.

- ▷ Insert the feeler gauge to a maximum of 10 mm into the air gap.



3. Check the air gap (A) at the 4 marked points on each brake.

If the air gap is greater than 0.6 mm, adjust the air gap, see *Operating instructions for brake YLZK4600*, page 42.



9.3 Checking the wear limit of the traction sheave

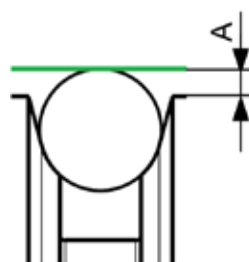
The wear limit of the traction sheave is checked depending on the groove shape.

Seat groove, unhardened

- ▷ Check the distance A from the elevator rope to the traction sheave.

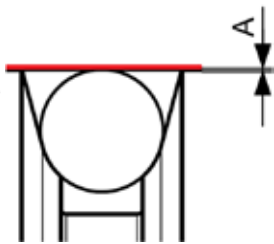
A > 0 mm

ALL of the elevator ropes extend beyond the outer diameter of the traction sheave. The traction sheave is OK.



A ≤ 0 mm

At least ONE of the elevator ropes does not extend beyond the outer diameter of the traction sheave. Replace the traction sheave, see *Replacing the traction sheave*, page 30.

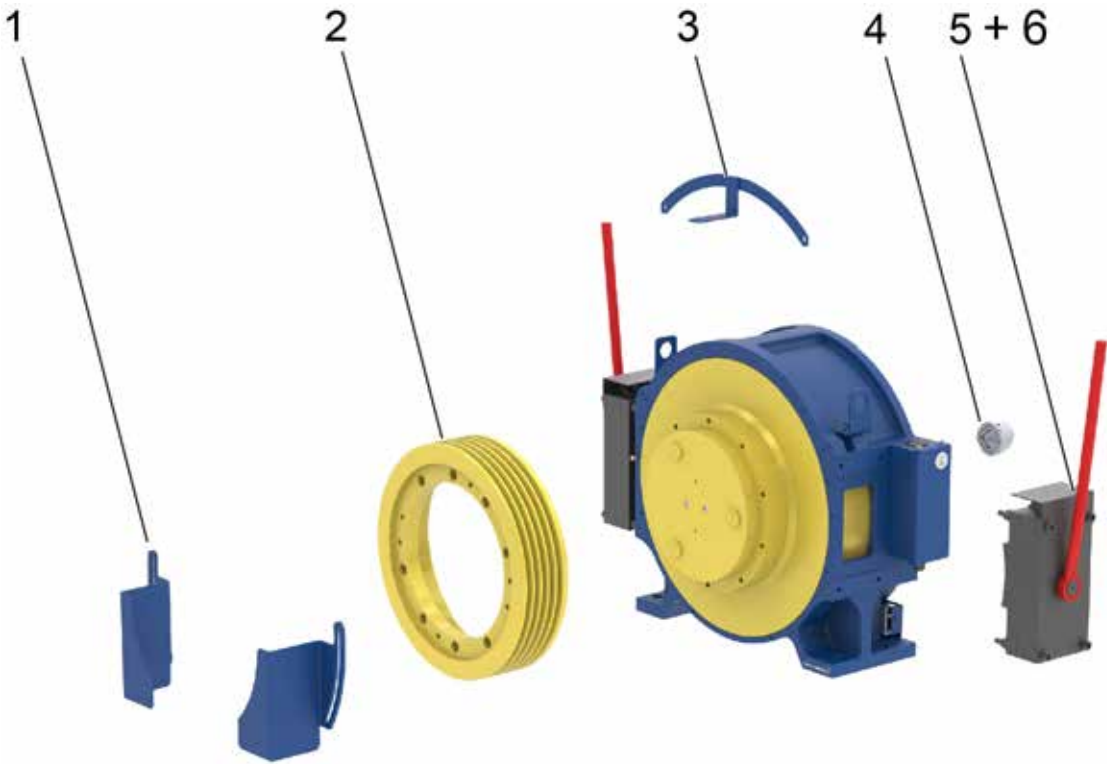


V-groove, hardened

- ▷ Visually inspect the flanks of the groove and elevator cables
- If the hardened flanks on the mating surface of the elevator cables show clearly visible signs of wear, replace the traction sheave, see *Replacing the traction sheave*, page 30.

9.4 Available spare parts

When ordering spare parts, always state the motor number of the elevator machine, see *Motor rating plate*, page 11



1	Rope guard
2	Traction sheave
3	Rope retainer, optional

4	Absolute encoder
5	Brake YLZK4600
6	Microswitch

9.5 Replacing the rope guard and rope retainer

Personnel qualifications: Assembly personnel



In addition, use the following special tool:

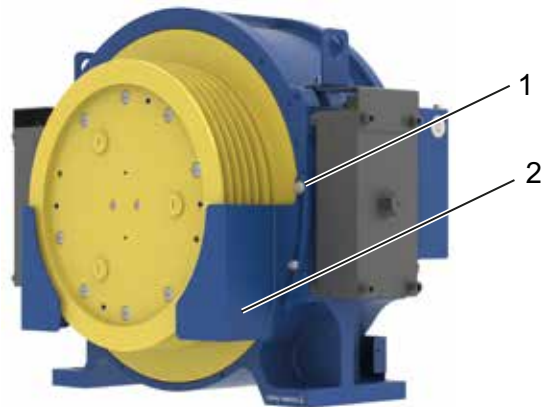
- Torque wrench for tightening torque of 9.5 Nm

Scope of delivery:

- 2 rope guard plates
- 4 cylinder screws M6 x 16 - 8.8 and 4 washers
- Rope retainer, optional
- 2 cylinder screws M6 x 16 and washers, optional

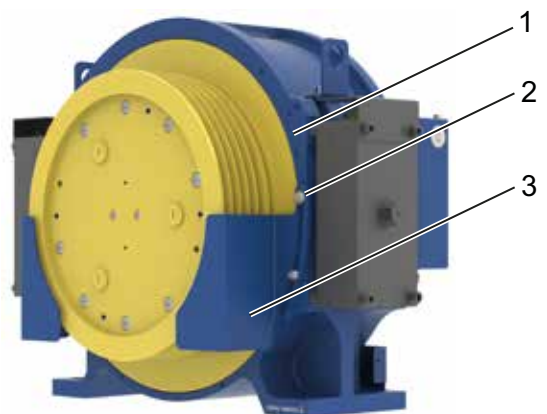
Removing the rope guard:

1. Remove and keep the cylinder screws and washers (1).
2. Remove and store the rope guard (2).

**Mounting the rope guard**

1. Screw the new rope guard (3) to the housing (1) with the new M6 x 16 - 8.8 cylinder screws and washers (2).
2. Adjust the distance to the ropes to 2 mm to 3 mm using the slot in the rope guard (3). Tighten the cylinder screws (2) to 9.5 Nm.

After replacing the rope guard, dispose of the old rope guard with all dismantled parts according to local regulations.



Removing the rope retainer

1. Remove and keep the cylinder screws and washers (2).
2. Remove and store the rope retainer (1).



Mounting the rope retainer

1. Screw on the new rope retainer (1) with the new M6 x 16 - 8.8 cylinder screws (2) and washers onto the housing (3).
2. Adjust the distance to the ropes to 2 mm to 3 mm using the slot in the rope retainer (1). Tighten the cylinder screws (2) to 9.5 Nm.

After replacing the rope retainer, dispose of the old rope retainer with all removed parts according to local regulations.



9.6 Replacing the traction sheave

Personnel qualifications: Assembly personnel

⚠ WARNING Severe injuries from falling parts.

- ▷ Make sure there are NO persons below the elevator machine.
- ▷ Secure the cabin before starting work.

In addition, use the following special tool:

- Torque wrench for tightening torque of 79 Nm

Scope of delivery:



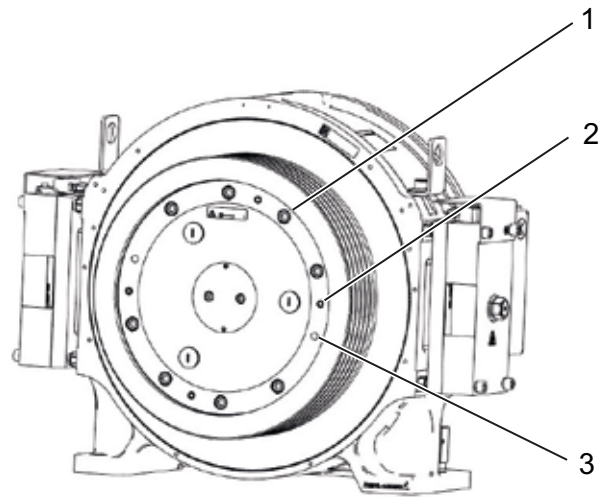
- Traction sheave
- 8 cylinder screws M12 x 40 - 8.8
- 4 clamping pins Ø10 mm

Prerequisite:

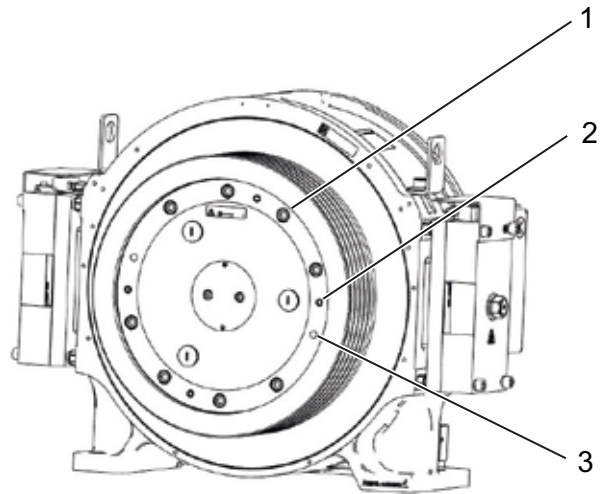
- De-energise the elevator machine and secure it against being switched on again.
- Wait until all moving parts have come to a standstill.

Dismantling the traction sheave**Procedure:**

1. Mount the counterweight.
2. To gain access to a free length of rope, lift the cabin, for example with a block and tackle adapted to the weight of the cabin.
3. Secure the cabin with additional aids, the block and tackle and the safety catch alone are NOT sufficient.
4. Remove the rope retainer and rope guard, see *Replacing the rope guard and rope retainer, page 28*.
5. Loosen and remove the 8 cylinder screws M12 x 40 - 8.8 (1).
6. Screw two of the cylinder screws into the forcing thread (2). Screw in the screws crosswise, pressing off the traction sheave while doing so.
7. Remove the 4 clamping pins Ø10 mm (3).
8. Clean the threads on the drive shaft.
9. Clean the mounting surfaces of the drive shaft.

**Installing the traction sheave****Procedure:**

1. Clean the seat on the new traction sheave.
All mounting surfaces on the drive shaft must be free from dirt and grease.
2. Drive in the 4 new clamping pins Ø10 mm (2).
3. Place the new traction sheave on the centring of the drive shaft. Pay attention to position of the clamping pins (2).
4. Apply Loctite® 243 to the 8 new cylinder screws M12 x 40 - 8.8 (1).
5. Screw in the 8 cylinder screws M12 x 40 - 8.8 (1) crosswise. Fasten the screws alternately in a circular motion with a tightening torque of 79 Nm.
6. Apply thread lock to the cylinder screws.
7. Fit the ropes.
Make sure that the ropes are correctly seated in the grooves of the traction sheave and the deflection pulleys.
8. Mount the rope retainer and rope guard, see *Replacing the rope guard and rope retainer*, page 28.



9.7 Replacing brake YLZK4600

See *Operating instructions for brake YLZK4600*, page 42.

9.8 Replacing the microswitch

Personnel qualifications: Assembly personnel

Scope of delivery:

- 1 x microswitch with raised head screws
- Feeler gauge

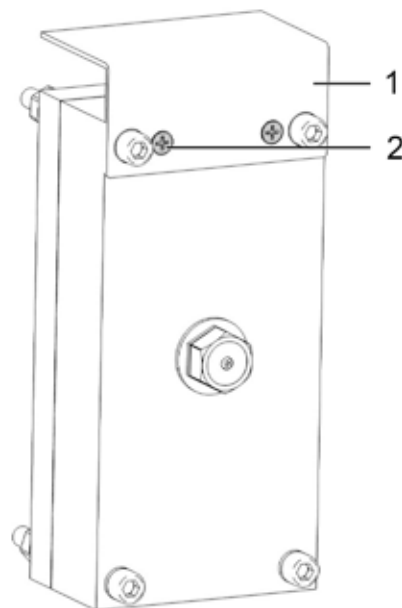
Removing the microswitch

Procedure:

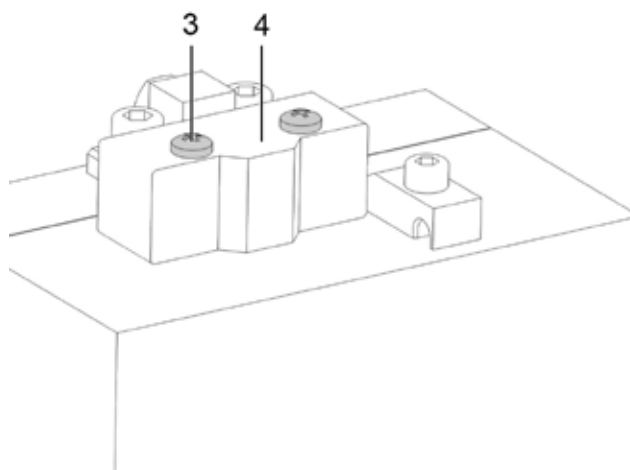
1. Disconnect the brake from the voltage supply.
2. Disconnect the microswitch in the brake terminal box, see *Connecting the brake*, page 18.



3. Remove and store the countersunk screws (2).
4. Remove and store the cover plate (1).



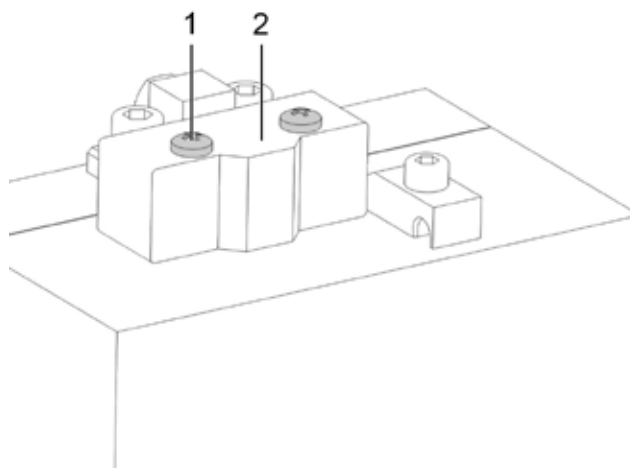
5. Remove and store the raised head screws (3).
6. Remove the microswitch with cover (4).



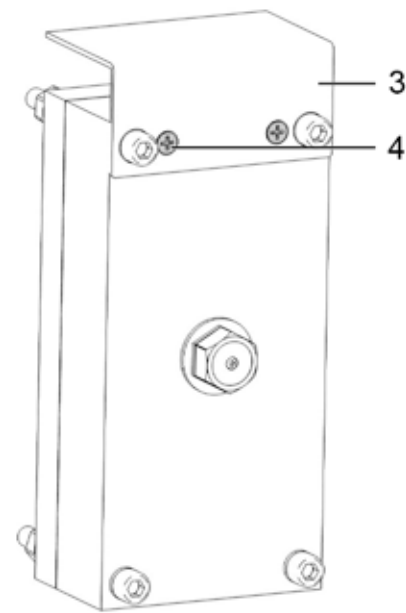
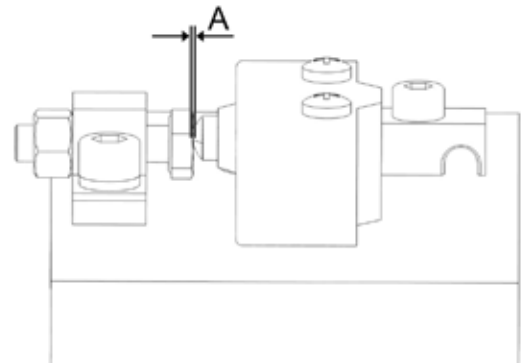
Mounting the microswitch

Procedure:

1. Position the new microswitch with cover (2).
2. Loosely fasten the new raised head screws (1).



- 3. Adjust the distance (A) of the microswitch, see *Operating instructions for brake YLZK4600, page 42*.
- 4. Fasten the raised head screws (1) hand-tight.
- 5. Check the distance (A) of the microswitch, see *Operating instructions for brake YLZK4600, page 42*.
- 6. Position the cover plate (3) and hand-tighten the countersunk screws M6 x 12 (4).



- 7. Connect the microswitch in the terminal box of the brake, see *Connecting the brake, page 18*.
- 8. Connect the brake to the voltage supply.
- 9. Check the microswitch is working correctly, see *Release monitoring of the brakes, page 17*.

Dispose of all disassembled parts of the microswitch according to local regulations.

9.9 Replacing the absolute encoder

Personnel qualifications: Assembly personnel

Procedure:

Replace the absolute encoder as described in the separate assembly instructions.

Absolute encoder	Assembly instructions
	https://www.ziehl-abegg.com/bal/
ECN1313 EnDat	A-TIA17_02
ECN1313 SSI	
ERN 1387	A-TIA17_02



10 Taking out of operation

Personnel qualifications: Qualified electrician or electrically instructed personnel

Procedure:

1. Disconnect the line voltage to the motor and secure against being switched back on.

WARNING! Electric shock from live parts.

▷ Wait for 5 minutes.

2. Open the terminal box.
3. Check that there is no voltage present.
4. Disconnect all connections.
5. Remove the traction sheave cover, rope retainer and rope guard.
6. Remove the ropes.
7. Loosen the fixing screws of the elevator machine.
8. Remove the elevator machine.

11 Disposal



- ▷ Dispose of the product professionally and in an environmentally friendly way in accordance with the respective national legal stipulations.
- ▷ Separate the materials by type and in an environmentally-friendly way.
- ▷ If necessary, employ a specialised contractor to handle the disposal.

12 Certificates

12.1 EC/EU declaration of conformity

EC/EU declaration of conformity

- Translation -
(english)
A-KON20_01-GB
2021/31 Index 002

Manufacturer: ZIEHL-ABEGG SE
Heinz-Ziehl-Straße
74653 Künzelsau
Germany

The manufacturer shall bear sole responsibility for issuing this EC/EU declaration of conformity.

Product description: ZAsyn2 Gearless elevator machine

Type: SM500...AL-B

The type specifications contain further additions for different versions, for example SM500.16AL-B-24/S

Valid from serial number: 21010001/1 or higher

The above mentioned products of this declaration fulfil all relevant provisions of the following Directives of the Union:

Machinery directive 2006/42/EC

EMC Directive 2014/30/EU

The following harmonised standards have been used:

EN ISO 12100:2010	Safety of machine tools - General principles for design - Risk assessment and risk reduction
EN 60034-1:2010 + AC:2010	Rotating electrical machines - Part 1: Rating and performance
EN 81-20:2020	Safety rules for the construction and installation of elevators - Lifts for the transport of persons and goods - Part 20: Passenger and goods passenger elevators
EN 60204-1:2018	Safety of machinery - Electrical equipment of machines - Part 1: General requirements

For the assessment of the products concerning electromagnetic compatibility the following standards have been used.

EN 12015:2014	Electromagnetic compatibility- Productfamily standard for lifts, escalators and moving walks - Emission
---------------	--



This declaration relates exclusively to the product in the state in which it was placed on the market, and excludes components which are added and/or operations carried out subsequently by the final user.

The authorised representative for the assembly of the technical file is:
Mr. Roland Hoppenstedt (see above for address).

Künzelsau, 03.08.2021
(place and date of issue)

ZIEHL-ABEGG SE
Werner Bundscherer
Director Drive Division
(name, function)



(signature)

ZIEHL-ABEGG SE
Roland Hoppenstedt
Technical Director Drive Division
(name, function)



(signature)

12.2 EU declaration of conformity

EU declaration of conformity

- Translation -
(english)
A-KON20_03-GB
2022/43 Index 003

Manufacturer: ZIEHL-ABEGG SE
Heinz-Ziehl-Straße
74653 Künzelsau
Germany

The manufacturer is solely responsible for issuing this EU Declaration of Conformity.

Product description: Electromagnetic spring applied brakes

Type: YLZK4600/0.3-29

Serial number: see product label

The above mentioned products of this declaration fulfil all relevant provisions of the following Directives of the Union:

Lift Directive 2014/33/EU

The following harmonized standards have been applied:

EN 81-20:2020	Safety rules for the construction and installation of elevators - Lifts for the transport of persons and goods - Part 20: Passenger and goods passenger elevators
EN 81-50:2020	Safety rules for the construction and installation of lifts – Testing – Part 50: Construction rules, calculations and testing of lift components

EU-Type Examination acc. to Annex IV, A and Random Checking acc. to Annex IX (module C2) of the Directive 2014/33/EU:

TÜV SÜD Industrie Service GmbH
Westendstr. 199
80686 München - Germany
Identification number: 0036

Safety function

Braking device as part of the protection device against overspeed for the car moving in upwards direction and braking element against unintended car movement.

EU Type Examination Certificate

EU-BD 1100

This declaration relates exclusively to the product in the state in which it was placed on the market, and excludes components which are added and/or operations carried out subsequently by the final user.

The authorised representative for the assembly of the technical file is:
Mr. André Lagies(see above for address).

Künzelsau, 26.10.2022
(Location, date of issue)

ZIEHL-ABEGG SE
Roland Hoppenstedt
Technical Director Drive Technology
(name, function)

i.V. R. Hoppenstedt

(signature)

ZIEHL-ABEGG SE
André Lagies
Head of R&D Machines Drive Technology
(name, function)

i.V. A. Lagies

(signature)

12.3 EC Type Examination Certificate

See *Operating instructions for brake YLZK4600*, page 42.

12.4 TÜV statement on calculation of positive locking connection

The ZAsyn2 SM500 elevator machines are constructed with no shaft with a brake that acts on the traction sheave in the immediate vicinity.

Thus, there are no variations from EN 81-20:2014, section 5.6.6.4 and section 5.6.7.4, as the brake acts directly on the traction sheave due to the positive locking connection of the traction sheave and rotor.

For this reason, no certificate is necessary for calculations on the shaft or the positive locking connection.

This statement has also been confirmed by the authorised body:

TÜV SÜD Industrie Service GmbH

Elevators and Safety Components Department

Gottlieb-Daimler-Strasse 7

70794 Filderstadt

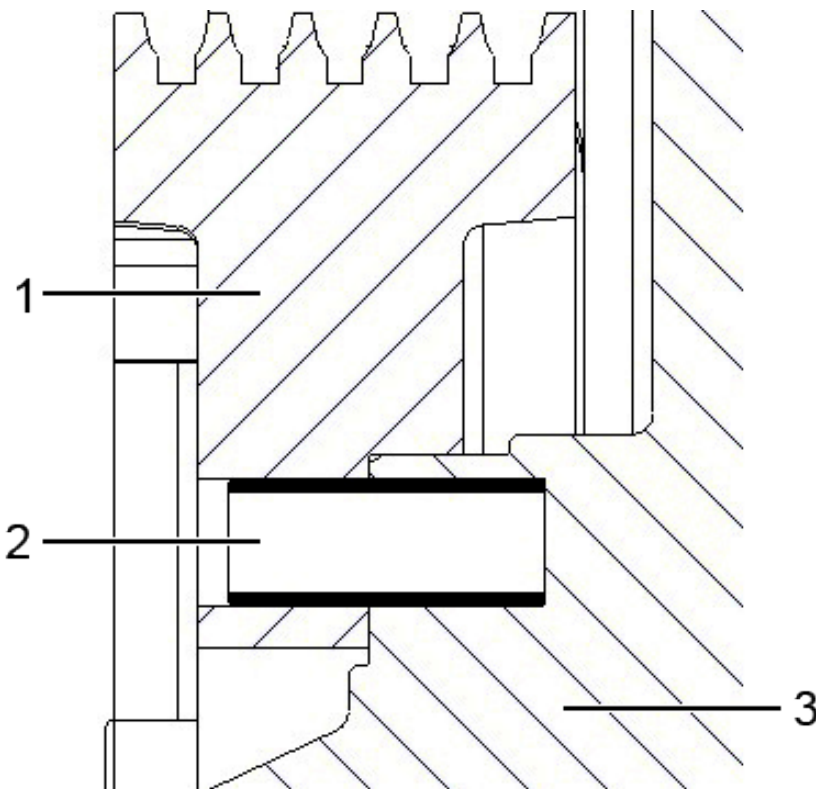
Germany

Ms Caroline D'hein on 10/11/2015.

We have verified the positive locking connection of the traction sheave with the following calculation.

12.5 Calculation of tight fit

Positelocking connection between traction sheave and rotor



1	Positive locking with 2 clamping pins at bolt circle 290 mm
2	Traction sheave
3	One-piece rotor with brake disk

Existing:

2 x Clamping pin ISO 13337 - 10 x 50 - St

Minimum permissible shear force: $F_{zul} = 20 \text{ kN}$

Maximum brake torque: $M = 1.5 \times 2 \times 1000 \text{ Nm}$

Hole circle diameter: $d = 300 \text{ mm}$

Rotor material: EN-GJL-250

Traction sheave material: EN-GJS-600-3

Existing shear-off force:

$$F = \frac{M}{d/2} = \frac{1,5 \times 2 \times 1000 \text{ Nm}}{0,15 \text{ m}} = 20 \text{ kN}$$

Protection against shear-off:

$$S = \frac{2 \times F_{zul}}{F} = \frac{2 \times 20 \text{ kN}}{20 \text{ kN}} = 2$$

Existing hole bearing stress:

$$\sigma = \frac{F}{2 \times d \times l/2} = \frac{20000 \text{ N}}{2 \times 10 \text{ mm} \times 25 \text{ mm}} = 40 \frac{\text{N}}{\text{mm}^2}$$

Permissible hole bearing stress for EN-GJL-250:

$$\sigma_{zul} = \frac{1.5 \times R_{p0.1}}{S_M} = \frac{1.5 \times 165 \frac{\text{N}}{\text{mm}^2}}{1.1} = 225 \frac{\text{N}}{\text{mm}^2}$$

Protection against plastic deformation:

$$S = \frac{\sigma_{zul}}{\sigma} = \frac{225 \frac{\text{N}}{\text{mm}^2}}{40 \frac{\text{N}}{\text{mm}^2}} = 5.6$$

13 Appendix

13.1 Operating instructions for brake YLZK4600

english 

Movement by Perfection



YLZK4600

Electromagnetic brake

Issued 2024/29

Original operating instructions
Store for future use!

A-TBA19_09-GB 2024/29 Index 003 | 01013442-GB

ZIEHL-ABEGG 



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1 Introduction

1.1 Liability

Compliance with the following specifications serves to ensure product safety. Should the information specified especially with regard to general safety, transport, storage, assembly, operating conditions, start-up, service, maintenance, cleaning and disposal/recycling not be observed, safe operation of the product may not be guaranteed posing a possible danger to life and limb of users and third parties. Thus, deviations from the specifications below can lead to the loss of legal materials defect liability as well as to the buyer's liability for the product rendered unsafe by deviation from the specifications.

1.2 Validity and meaning of the instructions

These instructions are valid for the electromagnetic brake YLZK4600.

The model range can be identified by the type designation, see *Brake rating plate*, page 9.

These instructions apply only to the product ZIEHL-ABEGG SE uand not to the complete system. If additional devices are used or installed, the respective instructions must be observed.

The instructions provide guidelines for safe work.

- ▷ Store the instructions so that they are accessible to all persons who work with the product.
- ▷ Pass the instructions on to subsequent users.
- ▷ Read and follow the instructions in full.

1.3 Target group of the operating instructions

The target group of these operating instructions is transport personnel, fitters who have been instructed in mechanical and electrical engineering, electricians, electrically instructed personnel, start-up and maintenance personnel, see *Requirements placed on the personnel*, page 4.

1.4 Applicable documents

Observe the following documents for instructions:

- Order confirmation
- Design
- Instructions for the elevator machine

2 Safety instructions

2.1 Intended use

The product is not ready for use, but rather designed as a component of the elevator machine.

The instructions are part of the product. The product is only intended for use according to these instructions.

2.2 Requirements placed on the personnel

The client of the required measures in the product life cycle is responsible for ensuring that the personnel carrying out the work are sufficiently qualified.

Personnel	Minimum requirements, knowledge and experience
Planners and project designers	They are responsible for the project planning of the complete system. They have knowledge of applicable standards, legal requirements and safety regulations.



Personnel	Minimum requirements, knowledge and experience
Transport personnel	They can deal safely with industrial trucks, loads and transport regulations. They can identify and avoid hazards that can occur when transporting the product. They have also been instructed and trained in the necessary protective equipment and protective measures to use.
Assembly personnel	They can deal safely with tools, loads and assembly instructions. They can identify and avoid hazards during assembly of the product. They have also been instructed and trained in the necessary protective equipment and protective measures to use.
Electrician	They have technical training in the field of electrical engineering. They can identify and avoid hazards associated with electricity. They have also been instructed and trained in the necessary protective equipment and protective measures to use. They comply with the technical regulations and have the following electrotechnical knowledge: ▫ Read and fully understand electronic connection diagrams. ▫ Understand all relationships regarding the safety devices. ▫ Are familiar with the function and design of the electrical components used.
Electrically trained personnel	Personnel instructed or supervised by a qualified electrician. They can identify and avoid hazards associated with electricity. They have been instructed in the assigned tasks and possible hazards in the event of improper conduct. They have also been instructed and trained in the necessary protective equipment and protective measures to use.
Start-up technician	They handle the entire system safely. They can identify and avoid hazards that may occur during start-up. They have also been instructed and trained in the necessary protective equipment and protective measures to use.
Maintenance personnel	They handle the entire system safely. They can identify and avoid hazards that may occur during service and maintenance. They have also been instructed and trained in the necessary protective equipment and protective measures to use. They can identify and avoid hazards associated with electricity.

2.3 Live parts

Live parts pose a risk of death due to electric shock.

- ▷ Do not touch connection points of wires, terminal points, parts of the motor winding, or the capacitor.
- ▷ Disconnect the product from the power supply before carrying out any work and secure it against being switched back on.
- ▷ Do not insert objects or limbs through openings.
- ▷ Use the product according to the IP degree of protection.
- ▷ Check the product for damage; do not use the product if the insulation is defective.

2.4 Powerful magnetic fields

Strong magnetic fields are generated in the brake. These pose a life-threatening risk to people with pacemakers.

- ▷ Do NOT allow persons with pacemakers to come near the elevator machine.
- ▷ Disconnect the product from the power supply before carrying out any work and secure it against being switched back on.
- ▷ Check the product for damage.

2.5 Rotating parts

Rotating parts are not visible at high speeds and in poor lighting. Serious injury may result.



- ▷ DO NOT put the product into operation if protective devices are missing.
- ▷ Observe the safety distances in the danger area.
- ▷ DO NOT place any objects or limbs in the traction sheave pull-in range.

2.6 Modifications and spare parts

Unauthorised modifications and unauthorised spare parts can lead to serious injuries.

- ▷ Do not modify the device.
- ▷ Before making changes, obtain written approval from ZIEHL-ABEGG SE.
- ▷ Use spare parts from ZIEHL-ABEGG SE.

2.7 Do not disassemble components

Dismantling components leads to safety gaps during operation. This may result in severe injuries.

- ▷ DO NOT remove or decommission any components, e.g. traction sheave cover, brake release monitoring.

2.8 Protect the product from contamination

Contamination on the product and safety-relevant components can lead to serious injuries.

- ▷ Protect the product from dust, dirt, welding work and water. Cover the product when working in or on the elevator.
- ▷ Do NOT expose the brake liners and the brake surface of the drive rotor to lubricants.
- ▷ DO NOT clean electrical components, e.g. microswitches, with water or other liquids.

2.9 Hot surfaces

Hot surfaces on the product can cause burns.

- ▷ Allow the product to cool down before starting work.
- ▷ Wear protective equipment, e.g. safety gloves.

2.10 Impacts and shocks

Handle the product with care. Impacts and shocks lead to visible and invisible material damage.

- ▷ Transport the product in its original packaging.
- ▷ Do not step on the product.

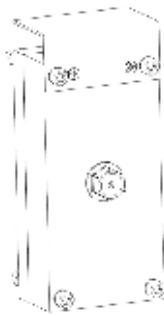
2.11 Observe temperature ranges and air humidity

Excessively high or low temperatures or excessively high ambient humidity may result in material damage to the brake.



- ▷ Observe the specified ambient temperatures, *Ambient conditions*, page 27.
- ▷ Observe the specified air humidity, *Ambient conditions*, page 27.

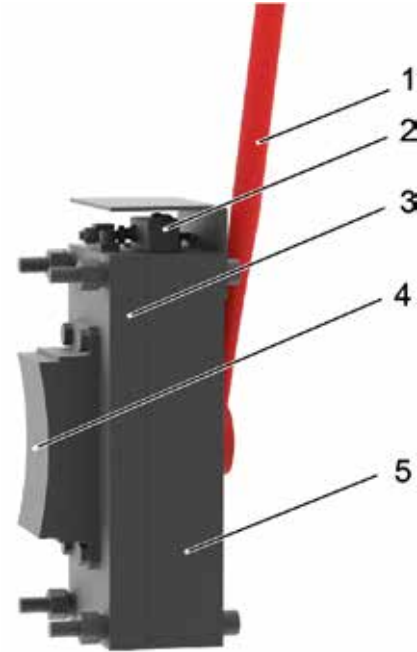
3 Scope of delivery

Designation	Figure	Number
Brake body		1
Levers for hand release		1
Hexagon head screw M10 x 110 - 8.8 with washer		4
Adhesive LOCTIE 243		
Locking varnish		2



4 Product overview

4.1 YLZK4600

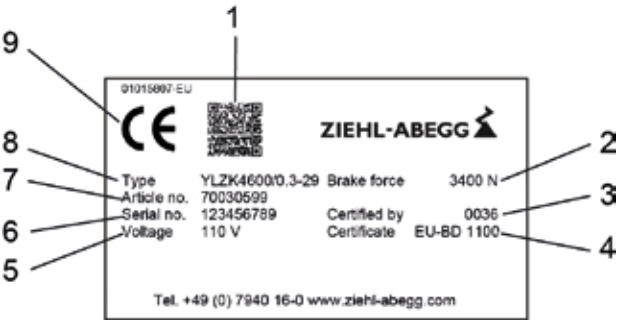


1	Lever for hand release
2	Microswitch
3	Anchor plate
4	Brake liner
5	Coil former



4.2 Brake rating plate

Example of brake rating plate:



1	QR Code
2	Brake force [N]
3	Certification body
4	Certificate
5	Voltage [V]

6	Serial number
7	Part number
8	Type
9	CE mark

4.3 Function description of the brake

YLZK460 is a spring-applied, electromagnetically-released brake. It serves as part of the protective device for preventing the ascending car from overspeeding and unintended movement.

When de-energised, compression springs push the anchor plate onto the motor rotor. This brakes the rotor. When the brake is energised, the magnetic force of the coils in the coil formers pulls the anchor plate away from the rotor and towards the coil former. This releases the brake and means the rotor will not decelerate.

The brake is operated without overexcitement.

The switch status of the brakes is monitored by micro switches. Every time the status of the brake changes, the micro switches transmit a signal as to whether the brake is open or closed. During start-up of the brakes, the micro switches are connected as normally open contacts. The signals of the two switching states must be evaluated by the customer.

5 Start-up

Personnel qualifications: Start-up technician

5.1 Releasing the brake

The hand release system is set at the factory.

Procedure:



- 1. Attach the lever for hand release, which is supplied as a loose part, to the brake.
- 2. Operate the lever for hand release as far as it will go. The lever for hand release can be swivelled to the right or left.



6 Troubleshooting

Personnel qualifications: Maintenance personnel

6.1 Failures

Failure	Possible cause	Remedy
The brake does not release.	Incorrect voltage at the rectifier.	▷ Apply the correct voltage.
	The operating voltage at the brake is too low.	▷ Check the voltage supply. ▷ Check the operating voltage at the brake. ▷ Increase the cable cross-section. ▷ Increase the transformer size.
	The actuation of the brake is incorrect or defective.	▷ Check the brake actuation.
	The brake coil is defective.	▷ Replace the brake. ▷ Replace the brake.
	The rectifier has failed.	▷ Replace the rectifier.
	The wear limit of the brake liner has been reached.	▷ Replace the brake liner.
The release monitoring does not switch.	The micro switch is defective.	▷ Replace the micro switch, see <i>Operating instructions A-TBA20_04</i> .
	The contacts are soiled.	▷ Switch the micro switch with a contact current of at least 10 mA. ▷ Replace the micro switch, see <i>Operating instructions A-TBA20_04</i> . ▷ Replace the brake. ▷ Contact service.

7 Service

Personnel qualifications: Maintenance personnel

7.1 Service plan

Intervals	Component	Activity
Regular	Brake	▷ Check the operating voltage.



Intervals	Component	Activity
Annually	Brake	▷ Check whether the air gap needs to be adjusted, see <i>Adjusting the air gap</i> , page 15.

7.2 Replacing the brake

Personalqualifikation: Montagepersonal



DANGER Life-threatening danger due to uncontrolled movement and high weight.

- ▷ Secure the car and the counterweight.
- ▷ Secure the brake body.
- ▷ NEVER walk or reach under suspended loads.
- ▷ Wear safety helmet, safety gloves and safety shoes.

In addition, use the following special tools:

- Open-end wrench, size 18
- Triangular key with tightening torque 70 Nm with Allen key, size 8
- Feeler gauge
- Cutters
- Cable stripper
- Crimper
- Flat-head screwdriver 0,6 x 3,5
- Wrench
- Assembly bolt M10 (item 02501616)

In addition, use the following aids:

- ZIEHL-ABEGG assembly kit item 70029992
 - Varistor
 - Wire end sleeves
 - Micro-active cloth
 - Feeler gauge
 - Thread-locking fluid 20 ml
 - Quick cleaner LOCTITE® 7063™ 400 ml

7.2.1 Removing the brake



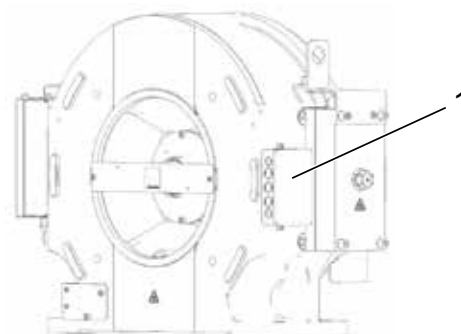
DANGER Live parts, e.g. wire connection points or terminal connections, pose a life-threatening hazard due to electric shock.

- ▷ Disconnect the brake from the voltage supply before dismantling.

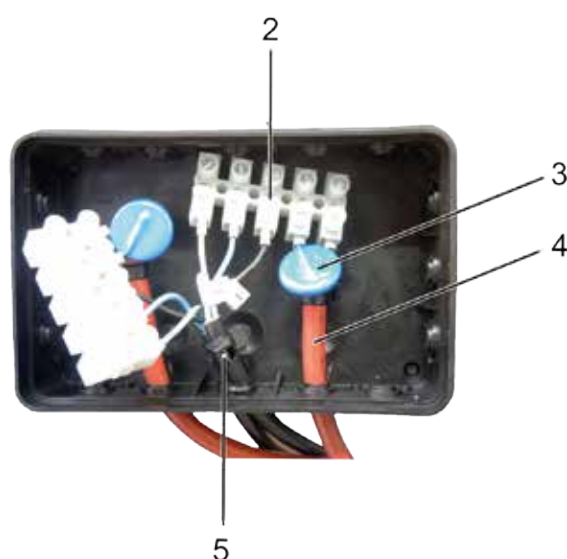
Procedure:



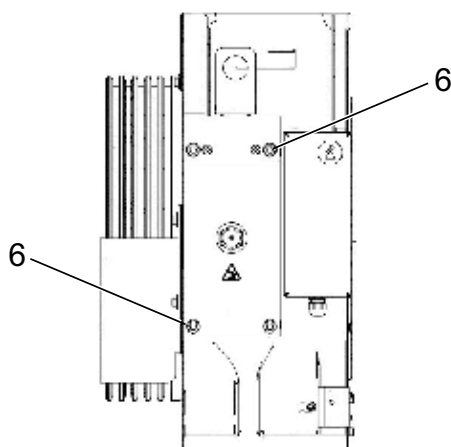
1. Remove the cover of the terminal box (1).



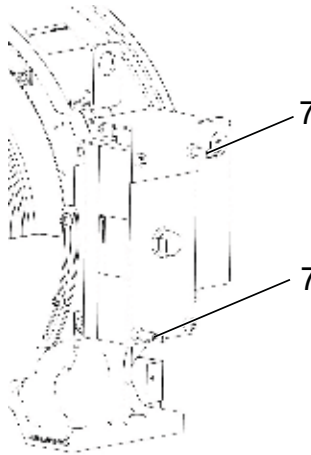
2. Disconnect the electrical connection (2) of both brake bodies.
3. Carefully remove the strain relief on all connecting cables with the wire cutters.
4. Cut off the varistors (3).
5. Feed all connecting cables (4) out of the terminal box.



6. Carefully remove the cable ties of all connecting cables on the housing's mounting base using the wire cutters.
7. Unscrew the 2 M10 hexagon head screws (6) in a cross-wise pattern.



8. Screw in the 2 M10 assembly bolts (7) for disassembly and hand-fasten.



9. Unscrew the two other M10 hexagon head screws in a cross-wise pattern.
10. Remove the brake from the drive. When doing so, take care not to damage the cables.
11. Dispose of all disassembled parts in accordance with local regulations.

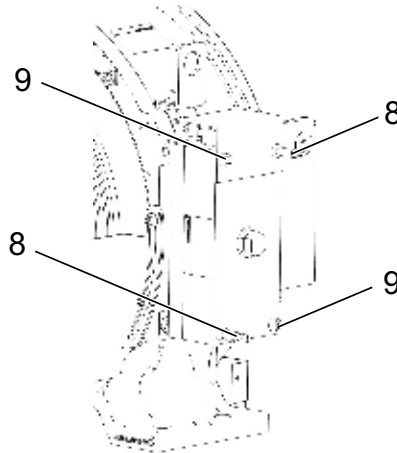
7.2.2 Assembling the brake

Prerequisite:

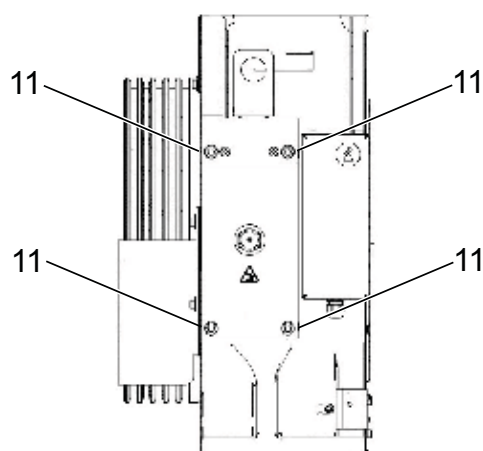
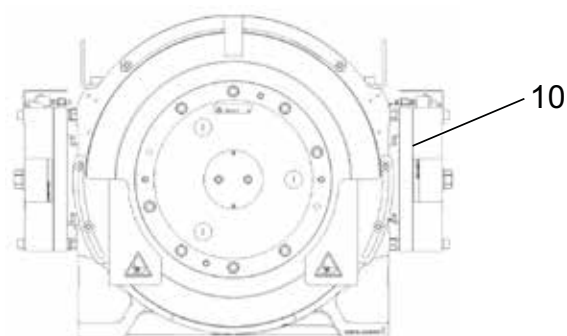
- The curvature of the brake liner matches the curvature of the drive's rotor. The contact surface must be more than 75%.

Procedure:

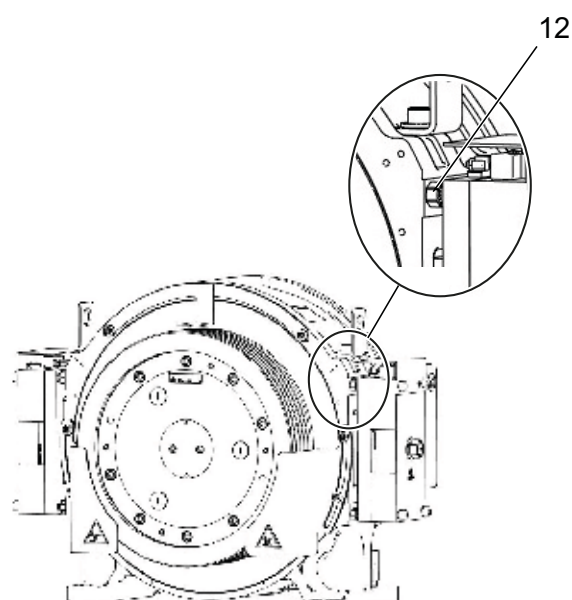
1. Pull the brake onto the 2 diagonally arranged M10 assembly bolts (8) and manually screw in 2 M10 hexagon head screws (9) diagonally.
2. Unscrew the M10 assembly bolts (8) and screw in the 2 M10 hexagon head screws (9) hand-tight.



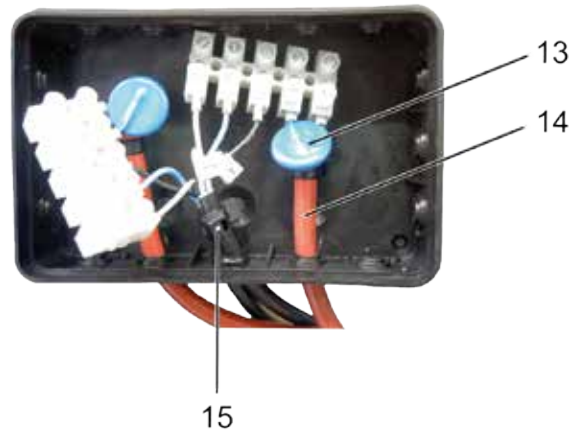
3. Fasten the 4 hexagon head screws evenly. When fastening the screws, the air gap (10) between the anchor plate and the coil former decreases. Fasten the screws until the air gap at the 4 marked positions (11) is 0.45–0.55 mm.
4. Use a feeler gauge to make sure that the air gap is 0.45–0.55 mm at 4 marked positions (11).



5. Unscrew the 4 adjusting nuts (14) until they touch the drive housing.
6. Fasten the 4 adjusting nuts.
7. Fasten the 4 M10 hexagon head screws with a tightening torque of 70 Nm



8. Bundle together the connecting cables (14) of the solenoids and the release monitoring and guide into the terminal box (1).
9. Connect the solenoids, release monitoring and varistors according to the connection diagram in the top cover of the terminal box (1).
10. Install strain relief (15) on all connecting cables.
11. Close the cover to the terminal box (1).
12. Install a brake on both sides of the rotor.



7.3 Adjusting the air gap

The brake liner is a wear part, which can increase the air gap. As the air gap increases, the noise when opening and closing the brake can become louder.

After the air gap has been adjusted, always make a note of how many mm the air gap has been adjusted by. This note must be kept on file. It will be required for replacing the brake liner, see *Replacing the brake liner*, page 16.



DANGER

Live parts, e.g. wire connection points or terminal connections, pose a life-threatening hazard due to electric shock.

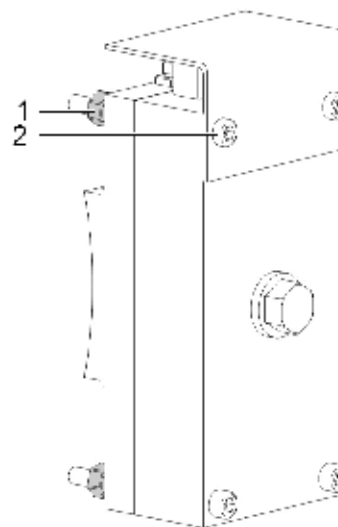
▷ Disconnect the brake from the voltage supply before performing maintenance work.

Prerequisite:

- The air gap is greater than 0.6 mm.
- The noise level exceeds 75 dB.

Procedure:

1. Measure the air gap with a feeler gauge below an M10 hexagon head screw (2).
2. Slightly loosen this M10 hexagon head screw (2).
3. Carefully adjust **the air gap to a value between 0.45 and 0.55 mm using the adjusting nut (1) of the M10 hexagon head screw (2)**. Turning the adjusting nut to the left decreases the air gap, turning it to the right increases the air gap. When the adjusting nut is turned 24° to the left, or approximately half of one hexagonal flank of the adjusting nut, the air gap decreases by 0.1 mm.



4. Fasten the hexagon head screw with a tightening torque of 70 Nm.
When tightening the M10 hexagon head screw, make sure that the adjusting nut does not turn as well and, if necessary, counterhold the adjusting nut with a spanner.
5. Use a feeler gauge to make sure that the air gap is 0.45 – 0.55 mm below the M10 hexagon head screw.
6. Perform the same procedure for the remaining M10 hexagon head screws and adjusting nuts.

7.4 Replacing the brake liner

Both brake liners must be replaced. Brake liners are available as spare parts from ZIEHL-ABEGG SE.

In addition, use the following special tool:

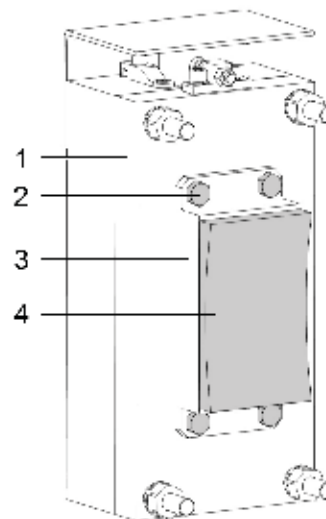
- Triangular key with tightening torque 20 Nm with Allen key, size 13

Prerequisite:

- The air gap has been adjusted by more than 5 mm in total.
- The brake is disassembled.

Procedure:

1. Unscrew the 4 M8 fixing screws (2) of the brake liner carrier (3).
2. Remove the brake liner carrier (3).
3. Remove the brake liner (4) and place a new brake liner on the brake liner carrier (3).
4. Place the brake liner carrier (3) on the anchor plate (1).
5. Screw in the 4 M8 fixing screws (2) of the brake liner carrier (3) and fasten with a tightening torque of 16 to 20 Nm.
6. Install the brake, see *Assembling the brake*, page 13.



7.5 Adjusting the micro switch

Prerequisite:

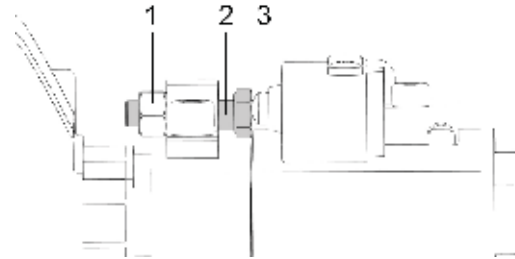
- The brake is at ambient temperature.

Procedure:

1. Disconnect the brake from the voltage supply.



2. Insert a feeler gauge with a thickness of 0.2 mm between the switching contact (3) and the bushing screw (2).
3. Unscrew the bushing screw until the switch responds. Monitor the response of the switch with a multimeter.
4. Pull out the feeler gauge with a thickness of 0.2 mm.



5. Insert a feeler gauge with a thickness of 0.15 mm between the switching contact (3) and the bushing screw (2). The switch must not react.
6. Insert the feeler gauge with a thickness of 0.2 mm between the switching contact (3) and the bushing screw (2). The switch must respond.
7. Tighten the counter nut (1).

8 Certificates

8.1 EU declaration of conformity

EU declaration of conformity

- Translation -
(english)
A-KON20_03-GB
2022/43 Index 003

Manufacturer: ZIEHL-ABEGG SE
Heinz-Ziehl-Straße
74653 Künzelsau
Germany

The manufacturer is solely responsible for issuing this EU Declaration of Conformity.

Product description: Electromagnetic spring applied brakes

Type: YLZK4600/0.3-29

Serial number: see product label

The above mentioned products of this declaration fulfil all relevant provisions of the following Directives of the Union:

Lift Directive 2014/33/EU

The following harmonized standards have been applied:

EN 81-20:2020	Safety rules for the construction and installation of elevators - Lifts for the transport of persons and goods - Part 20: Passenger and goods passenger elevators
EN 81-50:2020	Safety rules for the construction and installation of lifts – Testing – Part 50: Construction rules, calculations and testing of lift components

EU-Type Examination acc. to Annex IV, A and Random Checking acc. to Annex IX (module C2) of the Directive 2014/33/EU:

TÜV SÜD Industrie Service GmbH
Westendstr. 199
80686 München - Germany
Identification number: 0036

Safety function

Braking device as part of the protection device against overspeed for the car moving in upwards direction and braking element against unintended car movement.

EU Type Examination Certificate

EU-BD 1100

This declaration relates exclusively to the product in the state in which it was placed on the market, and excludes components which are added and/or operations carried out subsequently by the final user.



The authorised representative for the assembly of the technical file is:
Mr. André Lagies(see above for address).

Künzelsau, 26.10.2022
(Location, date of issue)

ZIEHL-ABEGG SE
Roland Hoppenstedt
Technical Director Drive Technology
(name, function)


(signature)

ZIEHL-ABEGG SE
André Lagies
Head of R&D Machines Drive Technology
(name, function)


(signature)

8.2 EC Type Examination Certificate

ZERTIFIKAT

CERTIFICATE

認証証書

CERTIFICADO

CERTIFICAT


Industrie Service

EU-TYPE EXAMINATION CERTIFICATE

According to Annex IV, Part A of Directive 2014/33/EU

Certificate No.:	EU-BD 1100
Notified Body:	TÜV SÜD Industrie Service GmbH Westendstr. 199 80686 Munich - Germany Identification No. 0036
Certificate Holder:	ZIEHL-ABEGG SE Heinz-Ziehl-Str. 1 74653 Künzelsau - Germany
Manufacturer of the Test Sample: (Manufacturer of Serial Production – see Enclosure)	YOU LI AN MACHINERY & ELECTRICS Shenyang Tieling County Industrial Park Eco- nomic Zone Yi Road Park South Ring Road No.1 112600 - China
Product:	Braking device acting on the traction sheave, as part of the protection device against overspeed for the car moving in upwards direction and braking element against unintended car movement
Type:	YLZK4600/0.3-29
Directive:	2014/33/EU
Reference Standards:	EN 81-20:2014 EN 81-50:2014
Test Report:	EU-BD 1100 of 2019-09-30
Outcome:	The safety component conforms to the essential health and safety requirements of the mentioned Directive as long as the requirements of the annex of this certificate are kept.
Date of Issue:	2019-09-30


Achim Janocha
Notified Body LCC


TUV®

**Annex to the EU-Type Examination Certificate
No. EU-BD 1100 of 2019-09-30**



1 Scope of application

- 1.1 Use as braking device – part of the the protection device against overspeed for the car moving in upwards direction – permissible brake force and tripping speed
- 1.1.1 Permissible brake force when the braking device acts on the traction sheave while the car is moving upwards

Permissible brake force [N] (Single brake) [N]	Maximum permissible tripping speed at the effective brake drum diameter [m/s]
3400	15.0

1.1.2 Maximum tripping speed of the lift

The maximum tripping speed of the lift shall be calculated on the basis of the maximum tripping speed on the brake drum as defined in 1.1.1, taking into account the diameter and the car suspension.

$$v = \frac{D_{TS} \times v_{BS}}{D_{BS} \times i}$$

v = tripping speed (m/s)
 D_{TS} = Diameter of the traction sheave from rope's center to rope's center (m)
 D_{BS} = Diameter of the effective brake drum (m)
 v_{BS} = Gliding speed on the effective brake drum diameter (m/s)
 i = Ratio of the car suspension

- 1.2 Use as braking element – part of the protection device against unintended car movement (acting in up and down direction) – permissible brake force, tripping speed and characteristics
- 1.2.1 Nominal brake force and response times with relation to a brand-new brake element

Nominal brake force * [N]	Maximum permissible tripping speed at the ef- fective brake drum di- ameter [m/s]	Maximale Reaktionszeiten** [ms]		
		t ₁₀	t ₅₀	t ₉₀
3400	15.0	80	150	220

Explanations:

* **Nominal brake force:** Brake force assured for installation operation by the safety component manufacturer.

** **Response times:** t_x time difference between the drop of the braking power until establishing X% of the nominal brake force, t₅₀ optionally calculated t₅₀ = (t₁₀ + t₉₀)/2 or value taken from the examination recording

1.2.2 Assigned execution features

Type of powering / deactivation	continuous current / continuous current end
Brake control	serial or parallel
Nominal air gap	0.35 – 0.45 mm
Damping elements	YES
Overexcitation	NO

Note: The English text is a translation of the German original. In case of any discrepancy, the German version is valid only.

Page 1 of 2



Annex to the EU-Type Examination Certificate No. EU-BD 1100 of 2019-09-30



2 Conditions

- 2.1 Above mentioned safety component represents only a part at the protection device against over-speed for the car moving in upwards direction and unintended car movement. Only in combination with a detecting and triggering component in accordance with the standard (two separate components also possible), which must be subjected to an own type-examination, can the system created fulfil the requirements for a protection device.
- 2.2 The installer of a lift must create an examination instruction to fulfil the overall concept, add it to the lift documentation and provide any necessary tools or measuring devices, which allow a safe examination (e. g. with closed shaft doors).
- 2.3 The single brakes have to be arranged symmetrically around the circumference of the brake drum. In order to comply with the redundancy required in section 5.6.6.2 of EN 81-20:2014 (D), at least two braking circuits (single brake actuator) must be used.
- 2.4 Where more than two braking circuits are used, redundancy requirements necessitate that a sufficient braking effect as outlined in section 5.9.2.2.2.1 of EN 81-20:2014 (D) is still maintained if one of the braking circuit fails. It is not assumed that two braking circuits will fail simultaneously.
- 2.5 Traction sheave and brake drum form one component unit (screwed and bolted).
- 2.6 The setting of the brake force has to be secured against unauthorized adjustment (e. g. sealing lacquer).
- 2.7 The identification drawing no. YLZK4600/0.3-29 including stamp dated 2019-09-30 shall be included to the EU type-examination for the identification and information of the general construction and operation and distinctness of the approved type.
- 2.8 The EU type-examination certificate may only be used in combination with the corresponding annex and enclosure (List of authorized manufacturer of the serial production). The enclosure will be updated immediately after any change by the certification holder.

3 Remarks

- 3.1 In the scope of this type-examination it was found out, that the brake device also functions as a brake for normal operation, is designed as a redundant system and therefore meets the requirements to be used also as a part of the protection device against overspeed for the car moving in upwards direction and as braking element as part of the protection device against unintended car movement.
- 3.2 Checking whether the requirements as per section 5.9.2.2 of EN 81-20:2014 (D) have been complied with is not part of this type examination.
- 3.3 Other requirements of the standard, such as reduction of brake moment respectively brake force due to wear or operational caused changes of traction are not part of this type examination.
- 3.4 This EU type-examination certificate was issued according to the following standards:
 - EN 81-20:2014 (D), part 5.6.6.11, 5.6.7.13
 - EN 81-50:2014 (D), part 5.7 and 5.8

A revision of this EU type-examination certificate is inevitable in case of changes or additions of the above-mentioned standards or of changes of state of the art.

Note: The English text is a translation of the German original. In case of any discrepancy, the German version is valid only.

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Original operating instructions

Certificates

**Enclosure to the EU-Type Examination Certificate
No. EU-BD 1100 of 2019-09-30**



Authorised Manufacturer of Serial Production – Production Sites (valid from: 2022-01-31):

Company	ZIEHL-ABEGG SE
Address	Heinz-Ziehl-Str. 1 74653 Künzelsau - Germany

- END OF DOCUMENT -

Based on: Application from ZIEHL-ABEGG SE of 2022-01-31

Page 1 of 1



30 SEP. 2019

GEPRÜFT / APPROVED

TUV SUD Industrie Service GmbH

Prüflaboratorium für Produkte & Dienstleistungen

Westendstraße 199

80688 München

Sachverständigen / Expert

Technical parameters

1. Rated voltage : DC110V;

2. Rated Current : 1.53A;

3. Working gap : 0.35~0.45mm;

4. Surface temperature : ≤60K;

5. Brake wheel diameter : Ø500;

6. Noise : ≤58dB;

7. Duty : S4 (≤60%) ;

8. Brake torque : 800~1000N. m;

9. Insulation grade: IP43;

10. Protection grade: F.

Technical specification

1. After the brake assembly, the hand opening should be flexible;

2. This is the left brake.

274.5

245

220±0.15

152

68

95±0.1

120

76.4

33

116

110

R250±0.5

4-M10

16

A

A

A---A

Switch lead wire

Coil lead wire

Block type brake assembly diagram

YLZK4600/0.3-29

Ratio

1:3

Design Lin Ming Sanzifeng

Audit Approval Zhang Jun

Process Date 20180601

Jianing Youlan Electromechanical Equipment Co., Ltd.

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A-TBA20_04-GB 2024/29 Index 006

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9 Appendix

9.1 Micro switch operating instructions



tend Microswitch

TM

Feature

- Wide variety of actuators, operating position can be adjusted.
- High open and closed capacity(15A) ● High precision
- Wide range of operating speed

Specification

Rated value

Rated Voltage	Non-inductive load(A)				Inductive load(A)				Inrush current(A)	
	Resistive load		Bulb load		Inductive load		Motor Load			
	NC	NO	NC	NO	NC	NO	NC	NO	NC	NO
125 VAC	15	3	1.5		15	5	2.5			
250 VAC	15	2.5	1.25		15	3	1.5			
500 VAC	3	1.5	0.75		2.5	1.5	0.75			
8 VDC	15	3	1.5		15	5	2.5			
14 VDC	15	3	1.5		10	5	2.5			
30 VDC	6(2)	3	1.5		5	5	2.5			
125 VDC	0.4	0.4	0.4		0.05	0.05	0.05			
250 VDC	0.2	0.2	0.2		0.03	0.03	0.03			

Characteristic

Speed	0.01mm~1m/sec
Frequency	Mechanical:240times/min Electrical:20times/min
Contact resistance	≤15mΩ(initial stage)
Insulation resistance	≥100MΩ(at 500VDC)
Withstand voltage	Between discontinuous terminals: 1000VAC,50/60Hz,1min Between current carrying parts and ground connection: 2000VAC,50/60Hz,1min
Vibration	(10~20Hz):1.5mm double-amplitude Mis-operation durability:10~55Hz
Dynamic shock	Mechanical durability:1,000m/sec ² Mis-operation durability:300m/sec ²
Operating temp.	Normal type:-25°C~+80°C Sealed type:-15°C~+80°C
Humidity	Normal type:Max.85%RH Sealed type:Max.95%RH
Lifetime	Mechanical:≥20,000,000 Electrical:≥500,000
Weight	22~58g

Operating characteristic

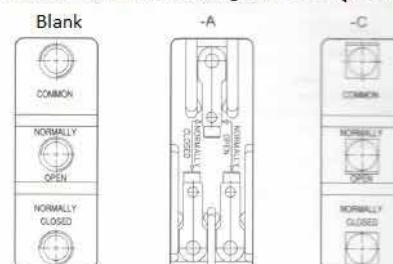
型 式	TM-1300	TM-1301	TM-1303	TM-1305	TM-1306	TM-1307	TM-1308	TM-1309
OF Max	350g	300g	300g	350g	350g	350g	350g	350g
RF Min	114g	50g	50g	114g	114g	114g	114g	114g
PT Max	0.4mm	4mm	4mm	0.4mm	0.4mm	0.4mm	0.4mm	0.4mm
OT Min	0.13mm	1.6mm	1.6mm	1.6mm	1.6mm	5.5mm	3.58mm	3.58mm
MD Max	0.05mm	1.3mm	1.3mm	0.05mm	0.05mm	0.05mm	0.05mm	0.05mm
FP Max		20.6mm	31.8mm					
OP	15.9±0.4mm	17.4±0.8mm	28.6±0.8mm	28.2±0.5mm	21.5±0.5mm	21.8±0.8mm	33.4±1.2mm	33.4±1.2mm



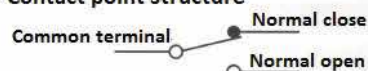
- All types of TM product can provide optional screw terminal, welding terminal and quick terminal.

- A--Welding terminal, C--Quick terminal, Blank--Screw terminal.

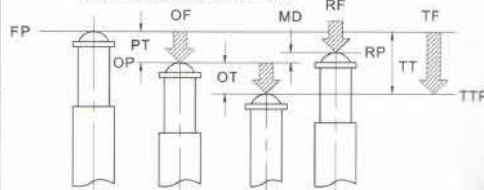
- Screw terminal ● Welding terminal ● Quick terminal



Contact point structure



Operating characteristic



- Operating Restore
- OF: Operating force TTP: Total movement position
- RF: Restoring force PT: Operating movement
- TF: Total force OT: Over movement
- FP: Free position MD: Miss-distance
- OP: Operating position TT: Total movement
- RP: Restoring position



10 Technical data

10.1 Degree of protection

The YLZK4600 brake has an electrical degree of protection IP 43.

10.2 Ambient conditions

Condition	Unit	Values
Ambient temperature	°C	0 - 45
Ambient temperature for storage	°C	-20 - +60
Humidity for storage	%	< 50

10.3 Brakes

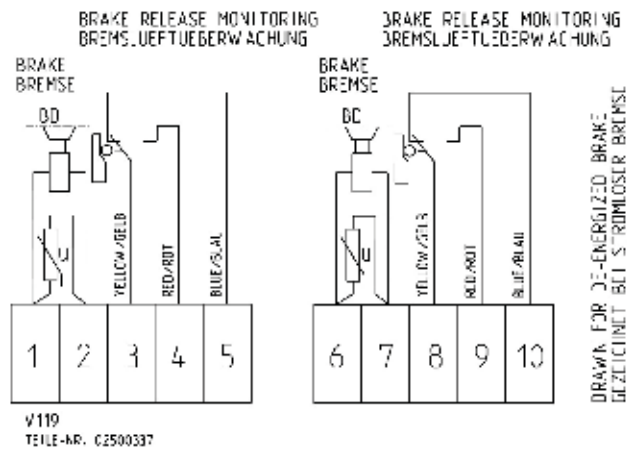
Brake type	Unit	YLZK4600/0.3-29
Operating torque	Nm	850–1000
Operating voltage	V DC	104–110
Current	A	1.53
Power	W	168
On time		S4 <60%
Nominal air gap ¹	mm	0.45...0.55
Limit air gap ²	mm	0.65
Hand release force	mm	80
Increase in surface temperature	K	<60
Brake drum diameter	mm	500
Maximum operating cycles per hour		360
Noise level	dB	<58
Insulation grade		F
Protection class		I
Total weight	kg	18

¹⁾ Measured at the height of the M10 hexagon head screws (11) at the circumference of the brake.

²⁾ The nominal torque is provided up to the limit air gap.



10.4 Connection diagram V119

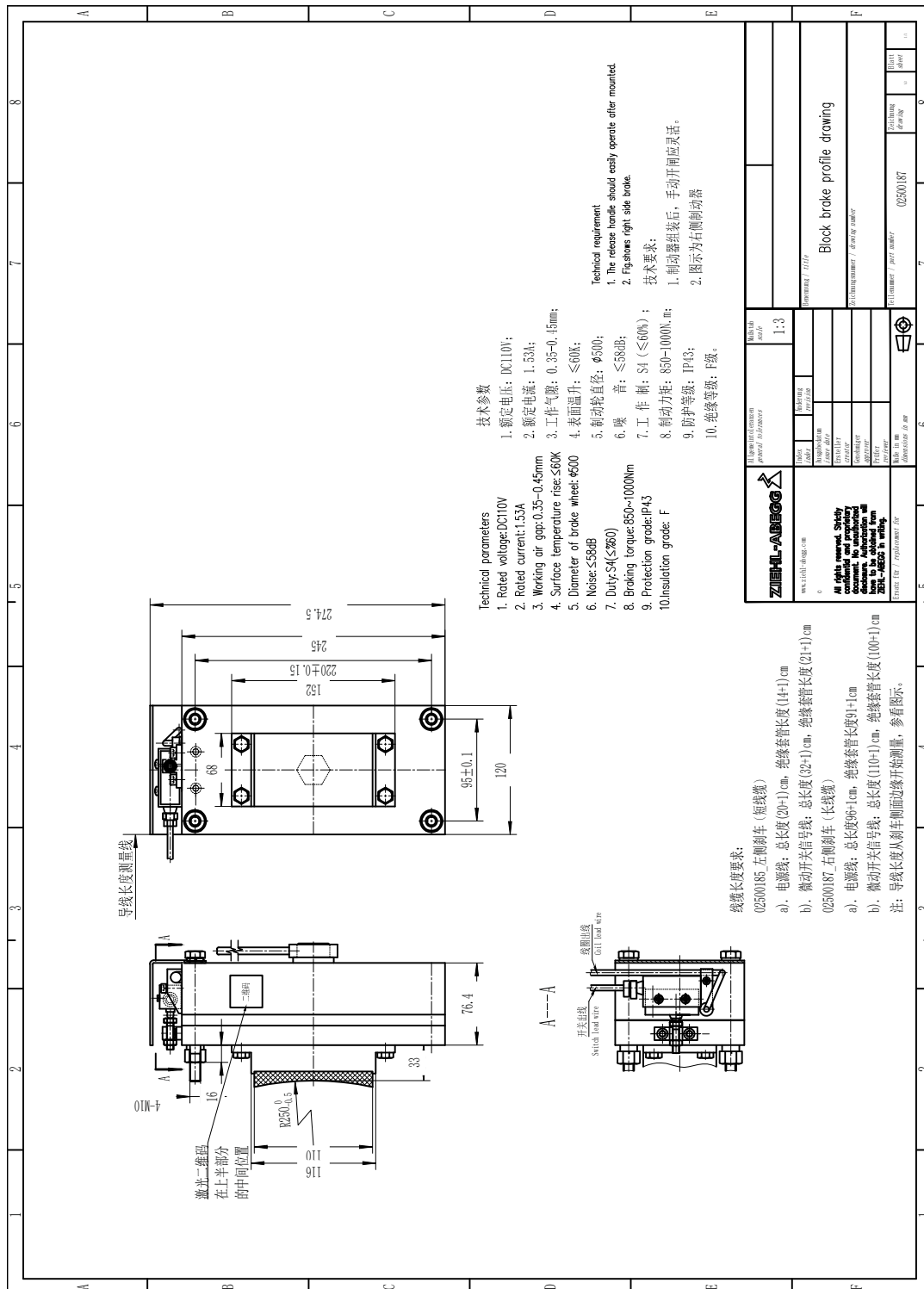


10.5 Microswitch

Rating	Unit	Value
Minimum	mA	10
	V DC	12
Maximum	A	15
	V AC	250
Recommended	mA	10 to 50
	V DC	24



10.6 Dimension sheet



10.7 Legend for dimension sheet

1	Nominal voltage: 110 VDC
2	Nominal current: 1,53 A
3	Air gap: 0,35 - 0,45 mm
4	Increase in surface temperature: ≤60K
5	Brake rotor diameter: ø 500
6	Noise level: ≤ 58 dB
7	Operating mode, on time: S4, ≤ 60%
8	Brake torque: 850 - 1000 Nm
9	Protection rating: IP43
10	Insulation class: F



Notes

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ZIEHL-ABEGG 

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14 Technical data

14.1 Motor

Standard configuration, further configurations are possible.

Motor type	Unit	ZAsyn2 SM500.12	ZAsyn2 SM500.16
Suspension		2:1	2: 1
Typical payload*	kg	800	1,000
Nominal torque	Nm	510	640
Maximum torque	Nm	918	1152
Maximum short-circuit torque	Nm	550 at 30 rpm	650 at 20 rpm
Permissible axle load	kN	1770/3000**	1770/3000**
Speed	m/s	1.0/1.5/1.6/1.75	1.0/1.5/1.6/1.75

*Balance ropes may be required depending on the travel distance.

** Only with rope pull in direction of the motor foot.

14.2 Traction sheave

Motor type	Unit	ZAsyn2 SM500.12	ZAsyn2 SM500.16
Traction sheave diameter	mm	400	400
Traction sheave width	mm	90	90

14.3 Degree of protection

Motor	IP 21
Absolute encoder	IP 40
Electrical brakes	IP 43
Mechanical brakes	IP 10
Microswitch	IP 67
Elevator machine total	IP 21

14.4 Ambient conditions

Condition	Unit	Values
Ambient temperature during transport and storage	°C	-20 to +60
	°F	-4 to +140
Ambient temperature for operation	°C	0 to +40
	°F	+34 to +104
Air humidity	%	max. 95 Condensation prohibited
Mounting height		from 1000 m above sea level Torque reduction by 1% per 100 m or duty cycle reduction by 1.5% per 100 m.



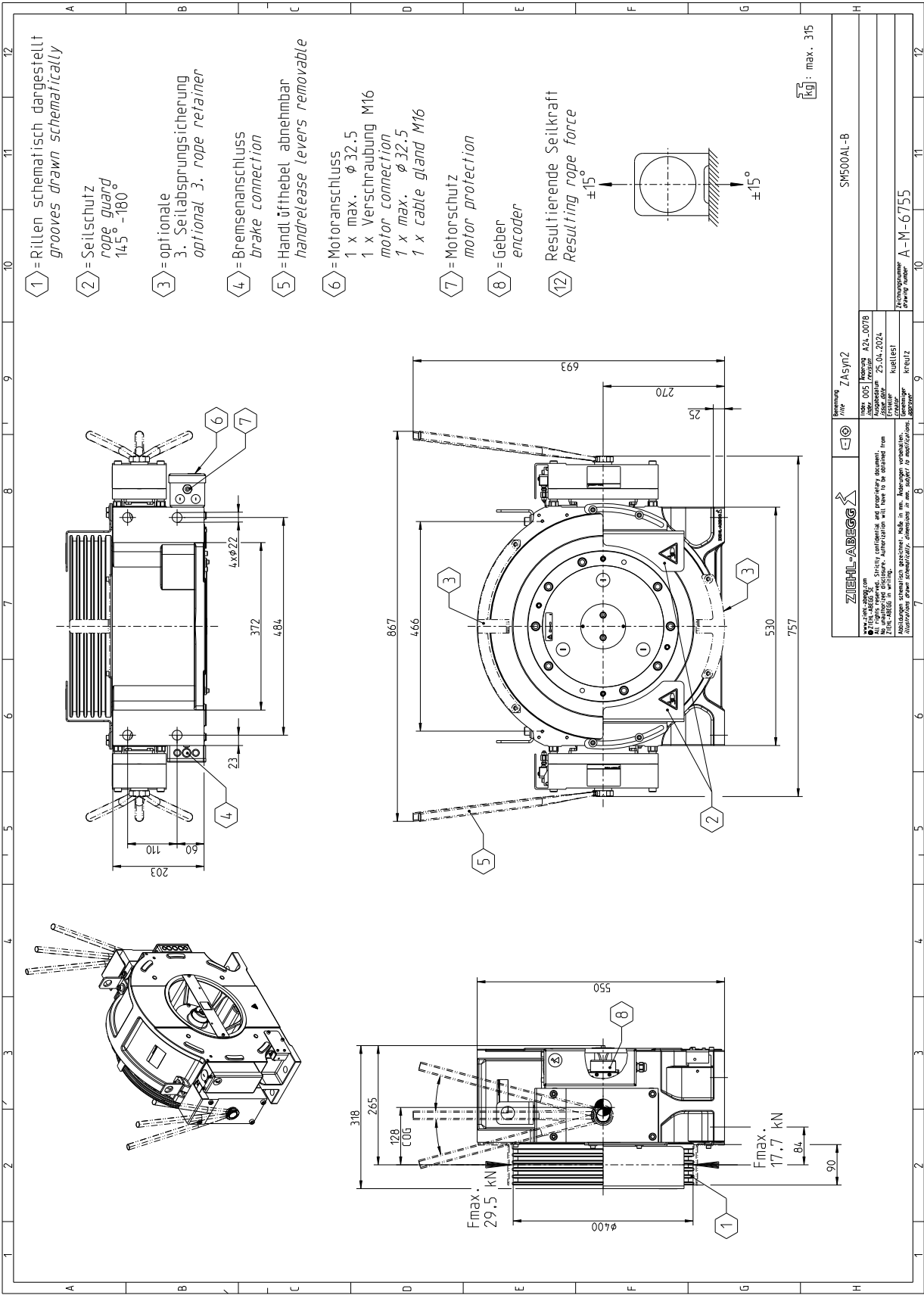
14.5 Brake YLZK4600

Brake type	Unit	YLZK4600/0.3-29 Size 800
Operating torque	Nm	850–1000
Operating voltage	V DC	110
Current	A	1.53
Electrical protection rating		IP43
Mechanical protection rating		IP10

14.6 Microswitch

Rating	Unit	Value
Minimum	mA	10
	V DC	12
Maximum	A	15
	V AC	250
Recommended	mA	10 to 50
	V DC	24

14.7 Dimension sheet

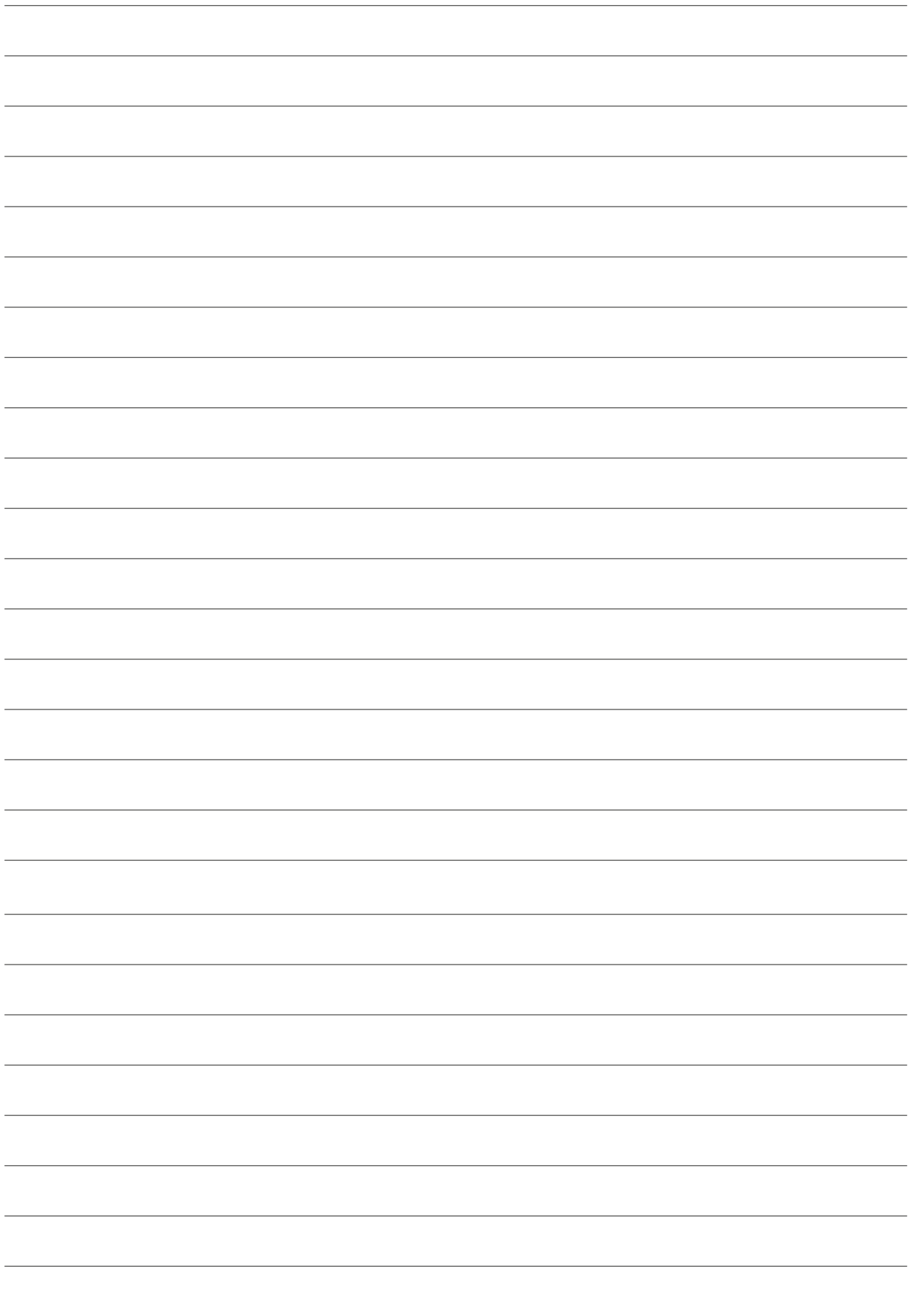


14.8 Legend for dimension sheet

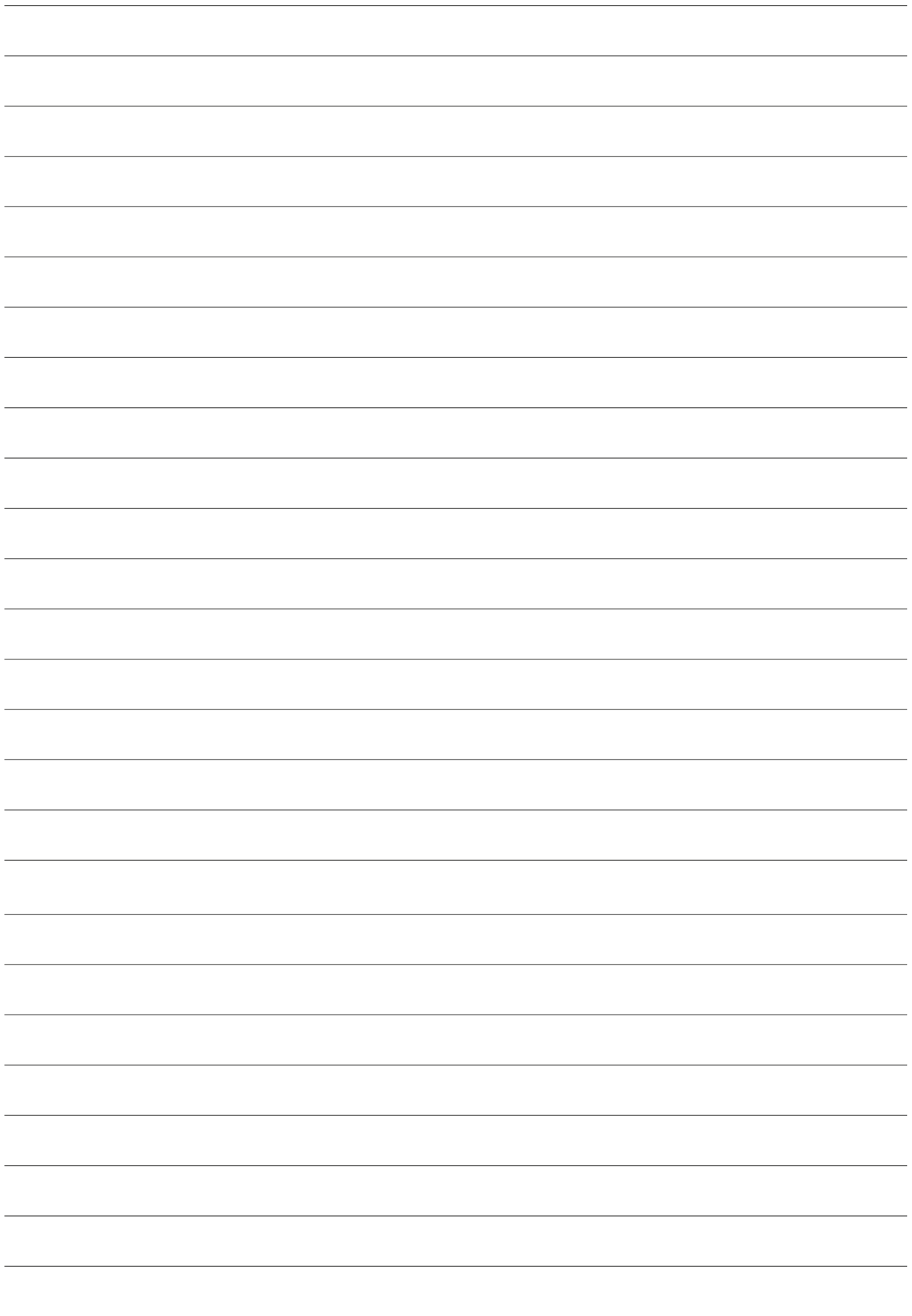
1	<i>Grooves represented schematically</i>
2	<i>Rope guard 145° to 180°</i>
3	<i>Optional 3rd Rope retainer</i>
4	<i>Brake connection</i>
5	<i>Removable lever for hand release</i>
6	<i>Motor connection</i> <i>1 x max. ø 32.5</i> <i>1 x screw connection M16</i>

7	<i>Motor protection</i>
8	<i>Absolute encoder</i>
12	<i>Resulting rope force</i>

[illegible]



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