

Bewegung durch Perfektion | Movement by Perfection

ZIEHL-ABEGG



Die Königsklasse
The Royal League

Die Königsklasse in Lufttechnik, Regeltechnik und Antriebstechnik | The Royal League in ventilation, control and drive technology



ZA top
SM200.40C

Gearless permanent magnet synchronous motor

Original operating instructions

Store for future use!

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1 General information

1.1 Application

The ZAtop is designed as a gearless drive for traction sheave rope elevators.

No other drive applications are permitted without the disengagin by the ZIEHL-ABEGG SE company!

1.2 Structure of the operating instructions

This manual is part of the drive and must always be kept in its vicinity for reference at all times. All persons involved in mounting, operation, maintenance or repair of the drive must have read and understood this manual. ZIEHL-ABEGG SE takes no responsibility for damage or disruption caused by disregard of this manual.

1.3 Target group

The operating instructions address persons entrusted with planning, installation, commissioning and maintenance and servicing and who have the corresponding qualifications and skills for their job.

1.4 Exclusion of liability

ZIEHL-ABEGG SE is not liable for damage due to misuse, improper use or as a consequence of unauthorized repairs or modifications.

1.5 Copyright

The copyright to this operation instructions is held by ZIEHL-ABEGG SE, Künzelsau. This operation instructions must not be wholly or partly reproduced for competitive purposes, used in any unauthorised way or made available to third parties without our agreement.

2 Safety instructions

2.1 General



ZIEHL-ABEGG SE electric motors are not ready-to-use products and may only be operated after having been installed into machines or plants and established their safety, depending on the application, by protective grating, barriers, constructive devices or other adequate measures (see also DIN EN ISO 13857)!


Installation, connection to the power supply and commissioning may only be performed by qualified service personnel! The relevant regulations must be observed!



Planners, manufacturers and operators of system parts or entire systems are responsible for the correct and safe mounting and a reliable operation.

2.2 Pictographs

Safety instructions are highlighted with warning triangles and are depicted according to the degree of hazard as follows.

	<p>Danger! General hazardous area. Death or severe injury or significant property damage can occur if the corresponding precautions are not taken!</p>
	<p>Warning! Middle or slight bodily harm is possible if the corresponding precautions are not taken!</p>
CAUTION!	<p>Caution! Material damage is possible if the corresponding precautions are not taken.</p>

	<p>Danger! Danger by dangerous, electric voltage! Death or severe injury can occur if the corresponding precautions are not taken!</p>
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	Information Important additional information and advice for user.
	Warning! Danger by hot surface! Slight bodily harm is possible if the corresponding precautions are not taken!

2.3 General safety instructions



Danger!

When the motor shaft is turning, voltage will be induced and applied to the connection terminals!



Danger!

▷ The motor has casted eyelets or threads to suit eyebolts. The eyelets are for the transport of the motor including sheave and brake only. Do not lift higher loads with these eyelets for example a socket, ropes, etc. Use adequate hoists. **Danger to life!**



Warning!

▷ Dependent on the working conditions the surface temperature can be very high. **Danger of burns!**

- ▷ The motor is only to be operated within the ranges specified on the type plate!
- ▷ Use the motor only as intended and only for the specified tasks in the purchase order!
- ▷ **When the motor current is off, it can not develop any electric torque. When opening the brakes the lift will accelerate uncontrolled! Therefore it is recommended to short-circuit the motor windings, when the motor current is off. This induces a speed dependent braking torque similar to the friction of a worm gearbox. The short-circuit has to be made by main contacts of the contactors, because the current is approx. rated current. In any case do not short-circuit the windings, while the motor wires still carry current.**
- ▷ Safety features, for example the brake release monitoring, may not be dismantled, circumvented or made inoperative!
- ▷ A temperature sensor is installed into the winding as motor protection and must be connected!

2.4 Requirements placed on the personnel / due diligence

- ▷ Installation, connection to the power supply and commissioning may only be performed by qualified service personnel! The relevant regulations must be observed!
- ▷ Planners, manufacturers and operators of system parts or entire systems are responsible for the correct and safe mounting and a reliable operation.

3 Product overview

3.1 Operational area

The ZAtop, a permanent magnet inner-rotor synchronous motor, offers all benefits which a modern elevator motor asks for:

- simple installation
- best controllability
- lowest noise level
- highest travel comfort
- compact design

Due to the very compact design the ZAtop is ideal for machine roomless elevators. Of course the certified brakes provide maximum security and are approved as a safety device for ascending car overspeed protection. Protected through registered design and patents application pending one can for the very first time build a new dimension of machine roomless elevators.

3.2 Transport

- ▷ ZIEHL-ABEGG SE electric motors are packed by the manufacturer for the types of transport and storage agreed upon.
- ▷ Transport the motor(s) either with the original packing or at the casted eyelets or eyebolts using adequate hoists.
- ▷ Transport motor without any additional load and taking the centre of gravity into account!
- ▷ The threads in the shaft ends are not to suit eyebolts to transport the motor.
- ▷ Avoid excessive vibration and shocks.
- ▷ Check packing and motor for possible damage and report the forwarding agency about any damages caused by transport. Shipping damages are not covered by our guarantee!

3.3 Storage

- ▷ Store the motor in the original packaging in a dry area protected from the weather or protect it from dirt and weather until final mounting.
- ▷ Extreme heat or cold (storage temperature -20 °C to +60 °C) must be avoided!
- ▷ High humidity which can lead to condensation must be avoided.
- ▷ Avoid aggressive conditions (for example salt spray)!
- ▷ Avoid excessive storage times (we recommend max. one year) and check motor bearing for correct function before installing the motor. (Ease the brakes and move the rotor by hand. Take care if the bearing makes untypical noises)

3.4 Disposal / recycling



Disposal must be carried out professionally and environmentally friendly in accordance with the legal stipulations.

4 Mechanical installation

4.1 General mounting advises

- ▷ Mounting, electrical connection and commissioning are only to be performed by trained service personnel. Adhere to all machinery-related requirements and specifications supplied by the system manufacturer or machine builder.

CAUTION!

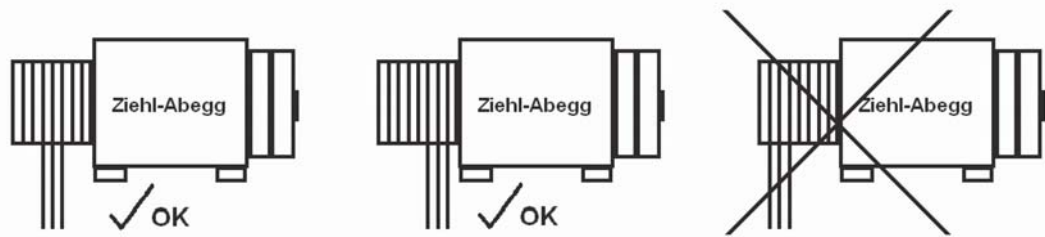
Caution!

- ▷ When working at or in the lift, the drive and especially the brakes have to be covered and protected against dust and chips.

Any violation will result in a loss of guarantee on the motors and accessories!

The following general rules apply:

- ▷ The rope pull may be vertical or horizontal.
- ▷ **At lateral (horizontal) rope pull, the motor housing must be supported on the side. The fixings screws of the motor must not be loaded with shearing force!**
- ▷ If the traction sheave should offer more grooves than the actual number of ropes, the ropes must be applied on the sheave either centred or towards the motor side.



- ▷ Do not install distorted.
- ▷ Do not apply any force (levering, bending). Above all, do not expose the rotor to any heavy mechanical shocks.
- ▷ Carry out the electrical connection in accordance with the enclosed wiring diagram.
- ▷ Before starting installation, the drive must be checked for transport damage, especially the cables have to be checked.
- ▷ No welding must be carried out on the drive. The drive must not be used as an earthing point for welding. Magnets and bearings could be destroyed.
- ▷ The cooling-airflow around the motor must not be obstructed.
- ▷ Keep at least 290 mm space between the brake and the wall (axial direction) to make access to the encoder possible.

4.2 Patent situation

Please pay attention to the patent situation concerning the use of elevator machines in the shaft. When using the ZAtop according to our installation examples there are no problems with patents. In doubt please contact ZIEHL-ABEGG SE.

- ▷ When installing the motor in the elevator shaft, the motor can be placed in the shaft head, with the motor axle parallel to the nearest wall.
- ▷ The motor must not be hanged over the cabin.
- ▷ The motor should be fastened at the framework, Halfen cast-in channels or girders. The drive must not be placed or fastened onto all four guide rails.
- ▷ If the girder that supports the motor is fastened at one wall, the motor has to be installed on top of the girder. A hanging motor is not permissible!

4.3 Mounting the drive unit

- ▷ On the bottom side of the socket are 4 threads.
- ▷ The motor has to be fixed with 4 screws M20 - 8.8 at the mounting plate.
Tightening torque M20 - 8.8: 390 Nm
- ▷ Screw-in depth at least 1.5 times of screw size. (minimum 30 mm, maximum 40 mm)
- ▷ Fasten the screws crosswise in at least two steps to the required tightening torque.
- ▷ The permissible unevenness for the mounting surface is 0.3 mm.
- ▷ The mounting surface has to be rigid and robust enough to withstand the forces.
- ▷ For the installation, insulating elements should be used to absorb the vibration.

4.4 Fastening the brake

The drive will be delivered with the mounted brake.
Brake fixation in accordance with the brake operating instructions.



Information

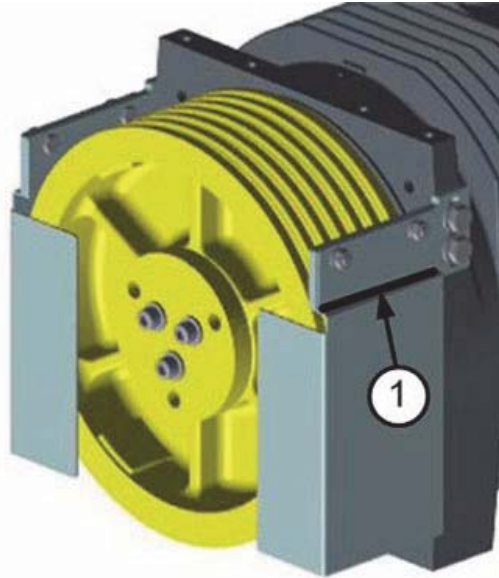
An exchange of the brake can be carried out only with special centering tool. Please contact the ZIEHL-ABEGG SE customer service in case of a brake exchange!

4.5 Fastening rope protection clamp

- ▷ The drive unit is equipped with two rope protection clamps.
- ▷ Each of the two protection clamps will be fastened at the housing with two screws M8 x 16 and washers.

Tightening torque M8 - 8.8: 23 Nm

- ▷ Through the longholes in the clamp the required distance to the ropes can be adjusted.



- ▷ **Exception: When traction sheave diameter 320 mm with rope pull down. The rope protection clamp can at the bending edge (1) can be set with great force, the required distance to the ropes.**
- ▷ The rope protection clamps must be fastened in a distance of 2 - 3 mm to the ropes.
- ▷ **On installations with rope pull upwards a protection must be installed to prevent foreign bodies to entering between rope and traction sheave.**

5 Electrical installation

5.1 Safety precautions

Mounting, electrical connection and commissioning are only to be performed by trained service personnel. Adhere to all machinery-related requirements and specifications supplied by the system manufacturer or machine builder.

5.2 EMC directive

The adherence to the EMC Directive 2004/108/EC only pertains to this product if controllers tested and recommended by ZIEHL-ABEGG SE are used, which have been installed in accordance with the corresponding controller description and in line with the EMC. If the product is integrated unprofessionally into a system or complemented by and operated with components (e. g. regulators and controllers) which have not been recommended, the operator of the complete system alone shall be responsible for adhering to the EMC Directive 2004/108/EC.

5.3 Motor connection

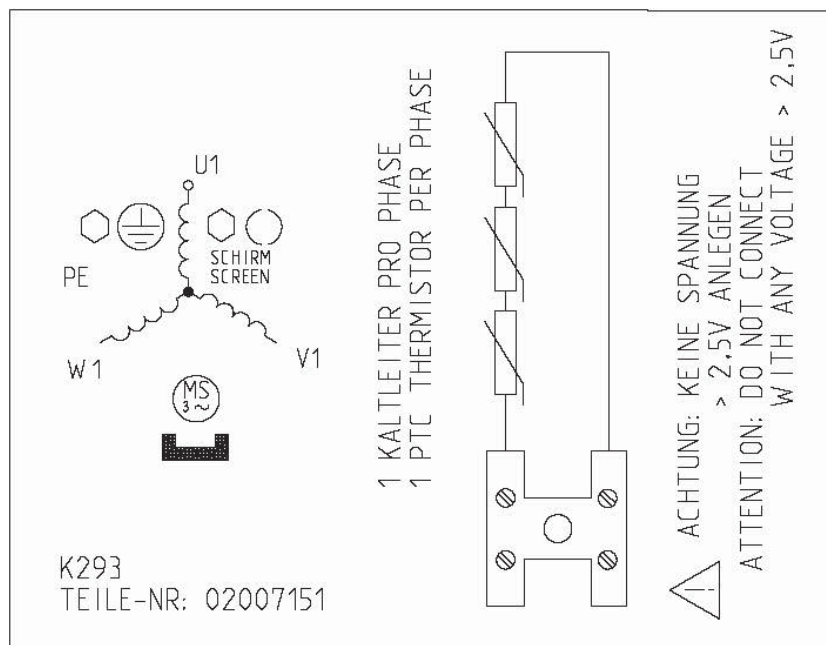
CAUTION!

- ▷ The drive must not be connected to the mains supply without a controller!
- ▷ The motor is permitted to be used at frequency inverters with a maximum DC-link voltage of < 750 V DC!
- ▷ A screened motor cable has to be used. The screen has to be connected on both ends. The maximum motor cable length is 25 m.
- ▷ If no other agreement was met, the absolute encoder offset is set to 0 To do that, connect the direct current with **U to +** and **V and W to -**.
- ▷ The motor connection lines U, V and W have to be connected on the motor and inverter side to the correct phases and must not be changed. Otherwise the motor may speed up uncontrolled.
- ▷ The motor is protected by PTC-resistors. The connection has to be made via a PTC resistor controller! The admissible test voltage of PTC resistors is maximum 2.5 V DC.

Mechanical connection conditions

Motor rated current [A]	Terminal board	Thread
up to 20	M 8	M 25
> 20 - 25	M 8	M 32
> 25 - 35	M 8	M 32
> 35 - 50	M 8	M 40
> 50 - 63	M 8	M 40

Wiring diagram Motor



permissible tightening torque for bolts M8: 6 Nm

5.4 Absolute encoder connection



Caution!

Never touch the connection contacts on the position absolute encoder or on the cable! The electronics can be destroyed by static electricity.

- ▷ The absolute encoder must be connected to the frequency inverter.
- ▷ The absolute encoder contains components that may be damaged by electrostatic discharge. The body of the person touching them must first be discharged, for example, by touching a conductive, earthed object, (e.g. bright metal parts of a control panel), immediately beforehand.
- ▷ A shielded cable must be used for the encoder connection. It is recommended to use a ZIEHL-ABEGG SE cable which guarantees a sufficient shield connection.
- ▷ The absolute encoder must not be detached mechanically in order not to lose the factory settings. If the absolute encoder has been detached, the new encoder-offset has to be determined with the frequency inverter. Please see the inverter operation instructions for this procedure.

Contacts SV120 round connector at absolute encoder ECN1313 (ZIEHL-ABEGG SE standard)

Pin	Signal	Description
A	DATA	Data line for communication with the absolute encoder
B	DATA /	Data line inverse
C	5 V Sensor Up	Sensor cable for encoder voltage (5 V positive)
D	5 V Up	Controlled +5 V voltage supply (positive)
E	0 V Un	Ground voltage supply absolute encoder (negative)
F	B+ (sine)	Analog track B (sine)
G	CLOCK /	Clock signal invers
H	CLOCK	Clock signal for serial transfer
J	0 V Sensor Un	Sensor cable for encoder voltage (negative)
K	A+ (cosine)	Analog track A (cosine)
L	A- (cosine inverse)	Analog track A invers (cosine invers)
M	B- inverse (sine inverse)	Analog track B invers (sine invers)

5.5 Brake connection

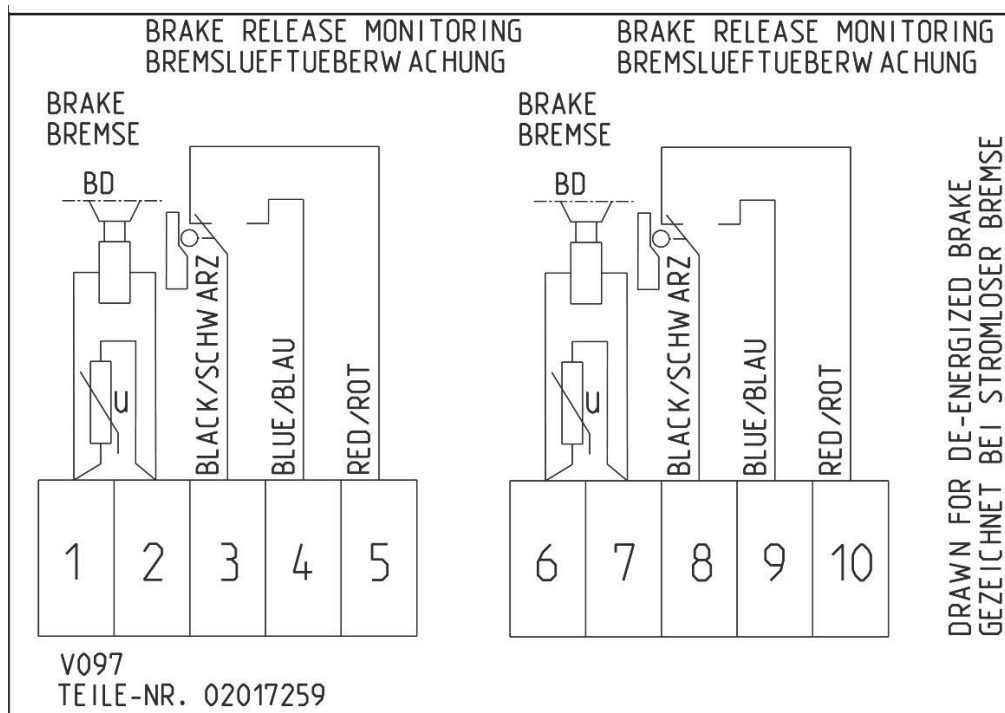
- ▷ **Please also refer to the operating instructions of the brake.**
- ▷ **The brake is designed for static applications only. Any dynamic braking must be restricted to emergency braking and test braking. At static use, there is no brake wear. Therefore the brake is almost maintenance free.**
- ▷ **Open the brakes:**
If exist, Electrical release of the brakes with a supply by accumulators/UPS is possible. Mechanical release of the brakes is possible. Hand release version is available as an option.
 - ▷ The brake circuits can be opened mechanically. They are separated from each other.
 - ▷ **The brake has to be released by overexcitation. A fast acting rectifier has to be installed.**
 - ▷ The terminal box for the brake may be removed from the motor and mounted on site for a better attainability.
 - ▷ The brake is only allowed to be supplied with power when fastened to the motor and after having connected the protective conductor of the motor at the control and the motor side.
 - ▷ The brakes have to be protected against over voltage from switching by varistors. The brakes are supplied with varistors ex factory.
 - ▷ **The brake release monitoring has to be evaluated; otherwise the type certificate is not fulfilled! The change of state of both brake circuits have to be monitored separately.**
 - ▷ The brake release monitoring is realized by micro-switches. Please assure with adequate wiring, that the contact-current is at least 10 mA to keep the contacts clean.
 - ▷ After a long storage period, the brake rotor may stick to the bearing bracket. Then the motor will not move even if the brake is released. In this case, please demount the brake from the motor and separate the brake rotor and the bearing bracket with care.



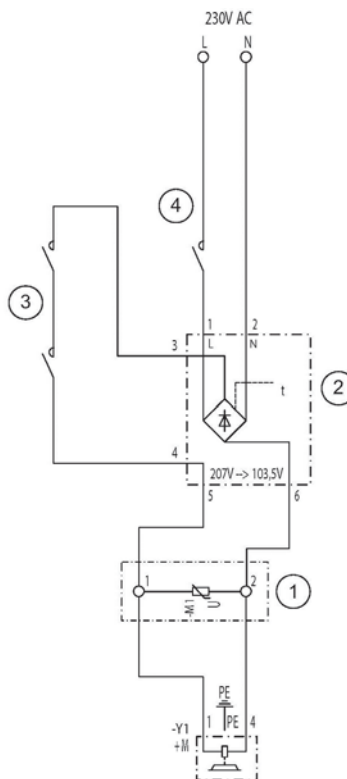
Danger!

The levers for hand release must be removed after brake hand release action.

Wiring diagram brake



Circuit example for overexcitement type Roba-switch



- 1 Brake junction box
- 2 Rectifier with overexcitement
- 3 Contacts dependent on the safety circuit, use main contacts
- 4 Contacts brake contactor, use main contacts

5.5.1 Triggering of the brakes

It is recommended to switch the brake through two contactors, one is switching the AC-side (K4) and the other is switching the DC-side (K3).

To reduce noises during brake disconnect the brakes should be switched to the alternating current side (K4), while normal operation. The brakes are switched-off slower and thus quieter through the rectifier.

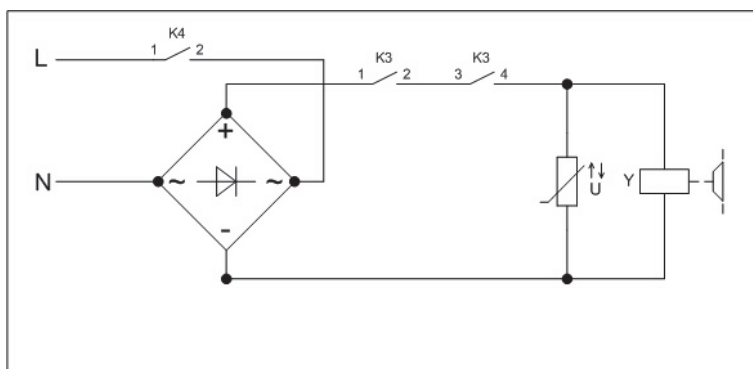
To ensure instantaneous brake application in emergencies, during inspection drives and return rides, use a second contactor (K3), which disconnects the brakes from the direct current side. Integrate this contactor into the safety circuit.

Caution!

CAUTION!

Brakes, which are connected to the direct current side, must be protected against excess voltage from the switching actions by using corresponding varistors!

Due to the high operating current, master contactors must be used to switch the brakes!



Simplified diagram for brake activation

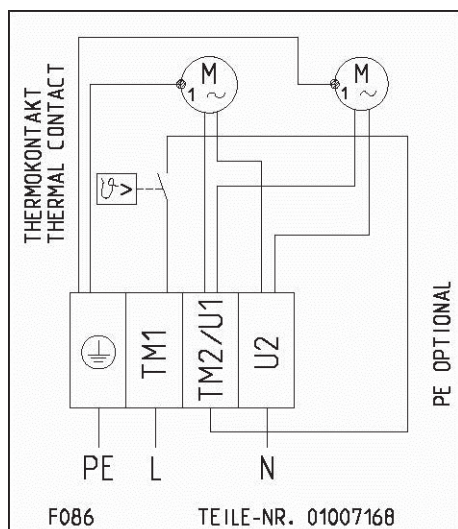
The contacts from K3 must close before the contact from K4 and are only permitted to open after the contact from K4 has opened.

5.6 Connection forced ventilation

The forced ventilation is optional and can be added afterwards.

Connection data		
Voltage	220 - 240	V
Frequency	50 / 60	Hz
output	2 x 20 / 19	W
Current	2 x 0.125 / 0.11	A

Wiring diagram forced ventilation



On-site connection must be made by the customer according to the wiring diagram in the separate terminal box of the external ventilation.

6 Start-up

6.1 Operating conditions

- ▷ The drive must be installed in a not free accessible machine room or a closed hoistway.
- ▷ Be aware of the protection class specified on the name plate.
- ▷ Do not operate the motor in an explosive atmosphere.
- ▷ The ambient temperature may be within 0 °C and +40 °C.
- ▷ Maximum permissible humidity 95 %, not wet.
- ▷ Reduced cooling when installed 1000 m above sea level. Therefore, the torque by 1 % per 100 m must be reduced or the duty cycle time of 1.5 % per 100 m.
- ▷ Please contact ZIEHL-ABEGG SE in case of orders deviating from the corresponding application conditions.

6.2 First-time start-up

Before first-time start-up, check the following:

- ▷ Installation and electrical connection have been properly completed.
- ▷ Safety devices are installed.
- ▷ All leftover installation materials and other foreign materials have been removed.
- ▷ The protective earth is connected.
- ▷ Motor protection correctly connected and operative.
- ▷ Cable entries closed.
- ▷ Mounting, installation position and accessories are o.k.
- ▷ Connection data corresponds to the data on the name plate.

6.3 Drive approval test

6.3.1 Half load test

Due to the short-circuit of the motor while the VVVF is inactive, the motor will create a speed depending braking torque. This braking torque will be produced already at a very low speed.

If the car with half load does not move when the brakes are opened, the short-circuit wiring should be deactivated. After that the test should be repeated.

After testing the short-circuit wiring must be activated again.

Half load test (alternative):

If deactivating of the short-circuit wiring is not possible or not desired, the testing of 50 % balance can be made as follows:

With half load the motor current has to be measured in up and down direction. Mostly this is possible at the VVVF (please see operating instructions of your VVVF). The measured currents should not divert by more than 10 %.

6.3.2 Testing the brake according EN 81-1

- ▷ When testing the brakes, the short-circuit wiring has to be deactivated to only test the effect of the brake.
- ▷ It is recommended to perform the tests when the car position is about in the middle of the shaft.

1. Overload

The test shall be carried out whilst the car is descending at rated speed with 125 % of the rated load and interrupting the supply to the motor and the brake.

2. Failure of one brake circuit:

The test shall be carried out whilst the car is descending at rated speed with rated load.

To simulate the failure of one brake circuit, the brake circuits have to be released separated from each other, also if the safety circuit is open. The brake circuits can be released mechanically or electrically. This state must not be permanently, it has to be done by a key button or equivalent. While using this function the safety circuit should always be opened.

While performing this test the elevator has to be observed. If there should be no visible deceleration, the open brake circuit has to be closed immediately! The elevator has to be put out of service and the brake to be checked!

As an example take a look at simplified diagram. The diagram is to be understood analogously. Their adaptation to other applications must be investigated. ZIEHL-ABEGG does not guarantee their suitability in such circumstances.

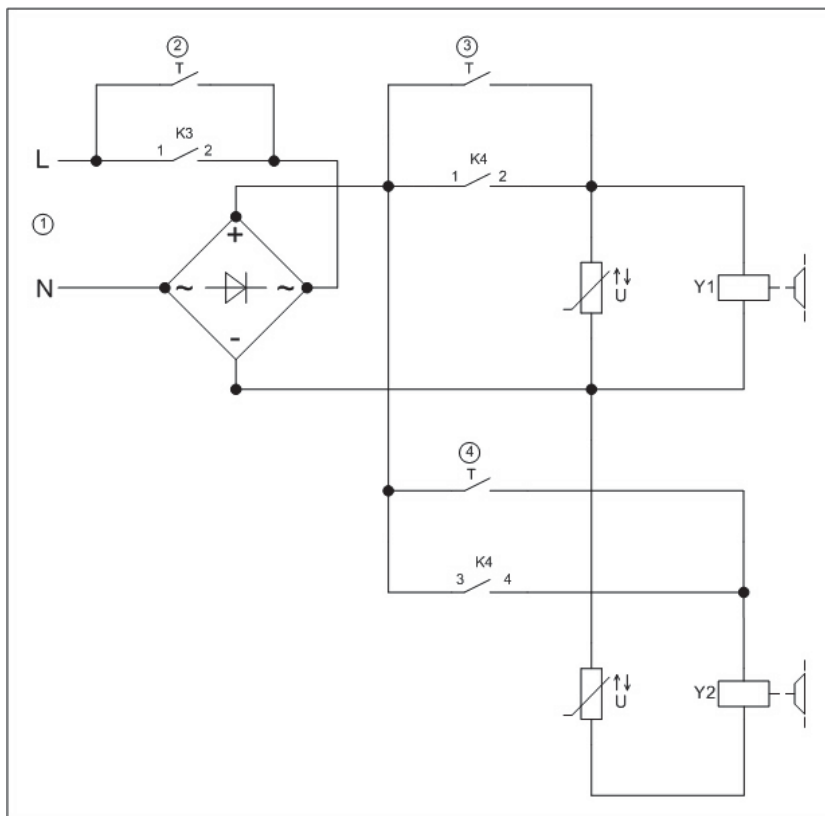
If the circuitry is made corresponding simplified diagram:

Press one of the key buttons at nominal speed until the elevator stops. Repeat the test by pressing the other key button to test the second brake circuit.

3. Testing the micro switches

The micro switches have to be single tested. According to their use as a normally open or normally closed contact one micro switch contact at a time has to be opened or close.

If there is a wrong or missing micro switch signal, a travel must not be started.



Simplified diagram for brake activation

- 1 Voltage supply
- 2 Button two circuit test
- 3 / 4 "Open brake" button

6.4 Pull out of safety gear

If the lift car loaded with rated load is caught by the trap due to a fault or during the TÜV inspection, the trap device could be fairly tight. In such a case it is quite possible that the drive torque is insufficient to pull the lift car out of the trap.

With gearless drives in machine rooms, a handwheel does not make any sense because there is no gear reduction. That is because due to the low moment arm of force, only slight force can be applied. A handwheel could even present a hazard, as even with only a slight imbalance in the installation, it is no longer possible to stop the elevator with the handwheel.

With gearless drives in the shaft, the motor is usually not accessible. A handwheel is unnecessary in such a layout.

In both cases with gearless drives, applicable is: One must fall back on a chain hoist or similar if the drive torque is insufficient or if there is a lack of drive on the rope. It makes sense to keep a suitable chain hoist ready during the TÜV inspection.

Note

Note that an overload in the car leads to an increase in the motor torque. 25 % overload results in 150 % of the required motor torque! As regulated drives are normally designed for a maximum torque of ca. 170 - 200 %, only slight reserves are available during such special cases.

For that reason it is recommended, just as described in EN 81-1 Appendix D.2 j), to perform a TÜV trap inspection in the door area so that the car can be unloaded there to relieve the drive.

6.5 Emergency evacuation



Attention!

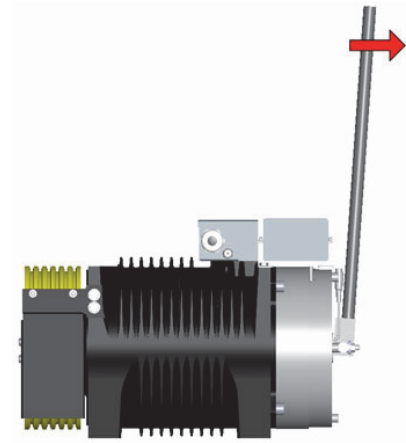
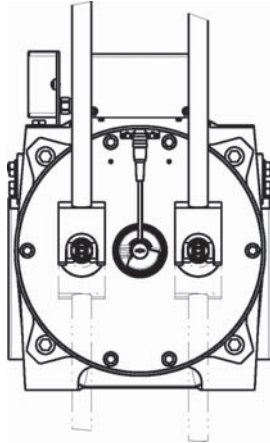
The measures for emergency evacuation described below may only be performed by instructed persons for maintenance of the lift or qualified personnel of lift companies.

6.5.1 Manual emergency evacuation

In case of power failure or failure of the recovery control, emergency rescue is only possible by releasing the brakes manually. The picture shows how the levers must be actuated for hand release.

Manual lifting of the brake

The levers for hand release can be inserted with an offset of 180°.



possible insertion positions of the levers for hand release brake manuell released



Danger!

High force for mechanical release of the brake is required!

The levers for hand release must be removed after brake hand release action.

When the brakes are released manually, the lift moves in the direction of the greater weight. If there is a balance between the cabin and the counterweight, the cabin must be made heavier by suitable means.

To reduce the acceleration of the lift, we recommend to short-circuit the motor for the evacuation. The short-circuit is generated by the motor contactors.

The short-circuit generates a speed-dependent braking torque. The maximum braking torque is achieved at lower speeds.

Depending on the system type and weight ratios, it is possible that due to the short-circuit generated braking torque is not sufficient to limit the lift speed. So the speed must be monitored closely during evacuation and evacuation interrupted if necessary.

Manual release of the brake is finished when a floor is reached. Now the lift door can be opened with a triangular key.

The lift manufacturer's safety instructions have priority!

A brake with a mechanical hand release system is available optionally. The mechanical hand release system can be added afterwards.

6.5.2 Electrical emergency evacuation

The electrical emergency evacuation is described in the operation instructions of the control, the inverter and, if available, an evacuation unit with UPS.

7 Faults and remedy

Failure	Causes	Adjustment
Running noise	Bearing defective	Contact customer service
	VVVF-settings wrong	Check VVVF settings
	Absolute encoder defective	Change absolute encoder
Excessive temperature / Temperature protection trips	Motor surface covered	Remove cover from motor or mount with more distance to motor.
	Ambient temperature higher than 40 °C	Enhance shaft ventilation
	VVVF-settings wrong	Check VVVF settings
Motor will not start	Motor phases connected incorrect	Check motor connection
	VVVF defective	Check VVVF
	Brake does not release	See brake faults
Brake switching noises	Brake is switched on the DC-side	Change brake wiring to AC-switching at normal operation. Add overvoltage protection.
	Air gap of brake too big	Replacement of the brake rotors
Brake does not release	Power supply too low. The voltage at the brake is too low.	Check power supply, change wiring (and transformer) size
	Brake control wrong / defective	Check brake wiring
	Brake coil defective	Replace brake (Special tools necessary! Contact ZIEHL-ABEGG SE customer service)
	Brake worn out	Replace brake rotors (Special tools necessary! Contact ZIEHL-ABEGG SE customer service)
Brake release monitoring does not switch	Micro switches defective	Replace the micro switch
	Contacts dirty	Switch micro switches with a higher contact current, at least 10 mA or change micro-switches

8 Service and maintenance

8.1 General notes on maintenance

- ▷ Observe the safety-at-work regulations!
- ▷ Disassembling the machine can only be done with special devices!
- Caution, strong magnetic force!**
- ▷ Never use a high-pressure cleaner (e. g. a steam jet cleaner) for cleaning the motor!
- ▷ Take note of abnormal operating noise.
- ▷ The bearings have a lifetime lubrication. There is no possibility to relubricate. Maintenance is not necessary for the bearings.

To check the brake wear or to check the traction sheave, the following instructions have to be referred:

It is not possible to adjust the brakes. The brakes cannot be readjusted. Replace the both brake rotors when the maximum air gap has been reached.

The brake wear has to be checked with the brake closed, therefore:

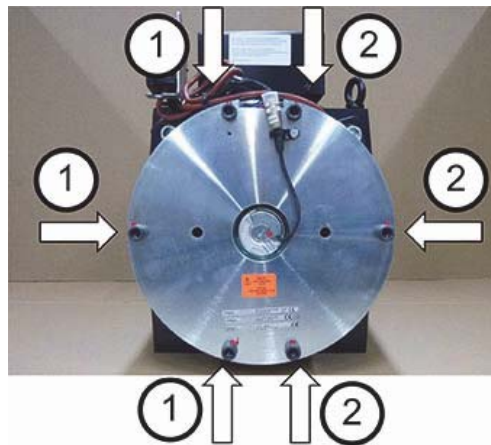
- ▷ Make sure that all moving parts have stopped, secure them mechanically if required!
- ▷ Make sure that the elevator can not be moved from any other person than the one who does the check!

8.2 Inspection intervals

	During commissioning or after the first 3 months	every year
Distance of the rope protection clamp	X	X
Checking the air gap of the brake	X	X
Visual inspection of the fixing screws on the housing, brakes and traction sheave. The locking varnish must be free of damage.	X	X
Check the traction sheave if worn out		X
Check the microswitch		X

Note: All fixing screws on the housing, brakes and traction sheave are marked with locking varnish. That means a loosened screw is optically visible. If a screw does get turned, it must be tightened using the prescribed tightening torque, the old locking varnish needs to be removed and marking has to be made again.

8.2.1 Checking the air gap



1. The airgap is to be checked with the de-energized brake, 3 times at the circumference of both brakes (brake 1 + brake 2). The maximum value of the three has to be taken into account.
2. If the maximum value of the air gap is exceeded on one of the magnets, it must be changed the brake rotor and the O-ring.

Maximum admissible air gap after wear: 0.35 ^{+0,1} mm!

Caution!

Feeler gauge do not introduce more than 10 mm into the air gap, to avoid damage to the dampers of noise or deterioration by the springs.

8.3 Spare parts

Spare parts and accessories not supplied by ZIEHL-ABEGG SE have not been tested or approved by us. These parts may be lower in function or quality and therefore can reduce functionality or safety of the installation. ZIEHL-ABEGG SE will assume no liability or guarantee for damages caused by spare parts that are not approved.

Available spare parts:

- Absolute encoder
- Brake (complete)
- Brake rotor & O-rings
- Micro switch for Brake
- Mechanical hand release system
- Traction sheave
- Rope guard
- Forced cooling

8.3.1 Replacement of the absolute encoder ECN1313/ERN1387

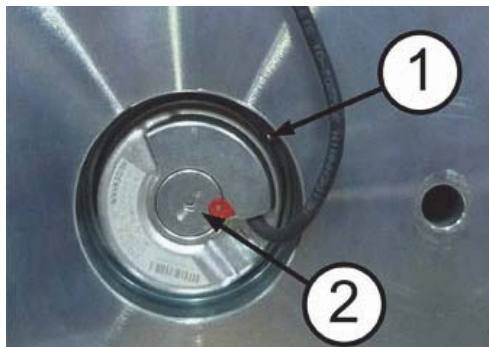
The absolute encoder is mounted on the motor drive shaft opposite the power take off side (see arrow).



8.3.1.1 Required tool for the replacement of the absolute encoder:

- Wire cutter
- Allen wrench SW 2
- Allen wrench SW 4
- Torque key for a tightening torque of 5.2 Nm with Allen key SW 4
- Screw M10 x 25 (included in toolkit, article 70027450)

8.3.1.2 Dismounting the absolute encoder



1. Unscrew the clamping screw (1) with an allen wrench SW 2. The position of the clamping screw can diversify.
2. Remove the cover of the encoder (2) with an allen wrench SW 4.
3. Unscrew the central fixing screw (3) with an allen wrench SW 4 for 1 - 2 revolutions. The absolute encoder can be turned now.



4. Tighten the screw M10 x 25 (4) with the fitting tool until the absolute encoder is loose. Due to the tightening the screw is pressing onto the central fixing screw (3) and pulls the absolute encoder off the drive shaft.
5. Screw out the screw M10 x 25 (4) as well as the central fixing screw.

- Screw the screw M10 x 25 (4) onto the absolute encoder again. Take the absolute encoder from the motor shaft with the support of the screw.



Caution!

Due to electrostatic discharge the absolute encoder can be destroyed! Do not touch the pins of the encoder cable as well as the electronics of the absolute encoder!

8.3.1.3 Mounting the absolute encoder

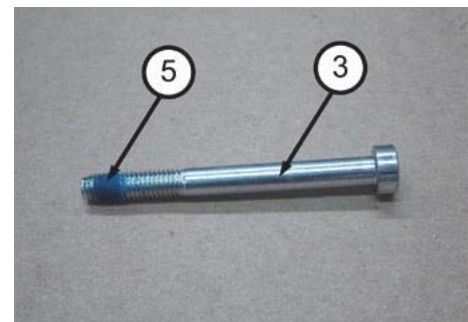


Caution!

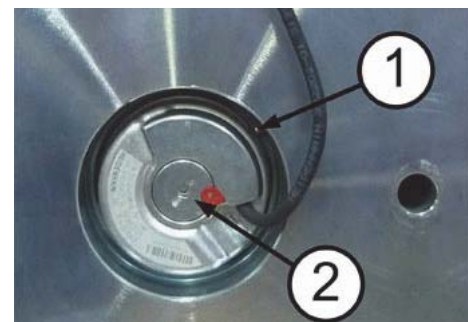
Never touch the connection contacts on the position absolute encoder or on the cable! The electronics can be destroyed by static electricity.



- The brakes are used to centre the absolute encoder.



- Attach the absolute encoder to the drive shaft.
- Provide threadlocker Loctite 243 (5) or similar threadlocker material to the thread of the central fixing screw (3).



- Tighten the central fixing screw (3) with an allen wrench SW 4
Tightening torque: 5.2 Nm
- Fix the cover of the encoder (2) with an allen wrench SW 4

6. Adjust the cable outlet by turning the absolute encoder and tighten the clamping screw (1) with an allen key SW 2 The position of the clamping screw can diversify.
Tightening torque: 1.2 Nm
7. Carry out the alignment of the absolute encoder corresponding to the operation instructions of the frequency inverter.

8.3.2 Replacement of the brake

During the mounting as well as the dismantling also the operating manual of the brake has to be observed.



Risk of death!

When dismantling the brake make sure that the cabin and the counterweight are mechanically secured against movement!



Risk of death!

Incorrect mounting of the brake can have influence on the braking action!

The brake bodies are mounted on the opposite side of the power take off. (see arrow)



Brake with mechanical hand release system

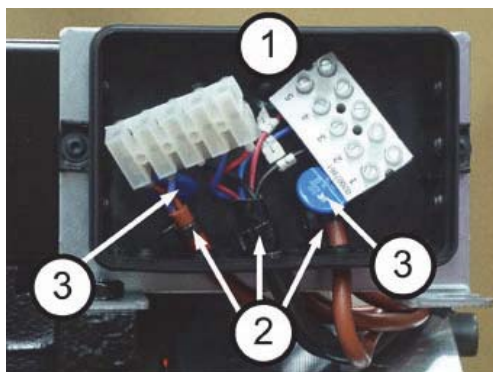
A brake with a mechanical hand release system is available optionally. The mechanical hand release system can be added afterwards.

8.3.2.1 Required tool for the replacement of the brake:

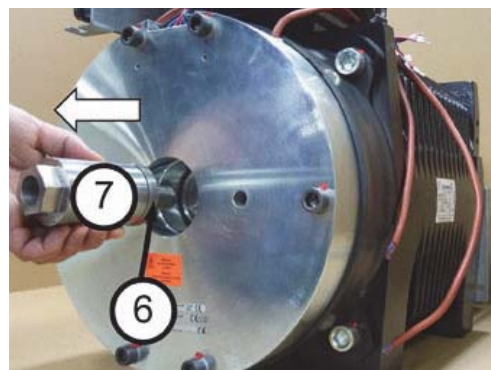
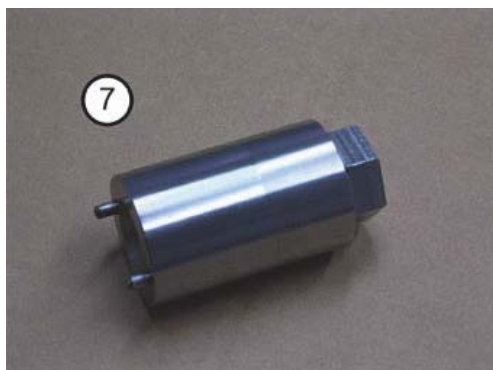
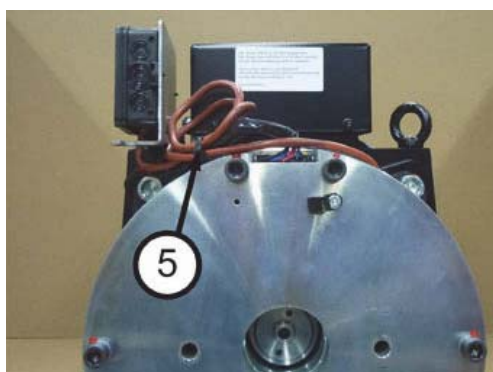
- ZIEHL-ABEGG toolkit article 70027450
- Tool for replacing the absolute encoder (see chapter "Replacement of the absolute encoder")
- Wire cutter
- Cable stripper
- Crimper
- Slotted screwdriver 0.6 x 3.5
- Allen key SW 10
- Allen key SW 17
- 2 mounting bolts 12 x 220 (included in toolkit, article 70027450)
- screw wrench SW 32
- Torque key for a tightening torque of 111 Nm with allen wrench SW 10
- Wrench (included in toolkit, article 70027450)
- Assembly shaft (included in toolkit, article 70027450)

8.3.2.2 Dismounting the brake

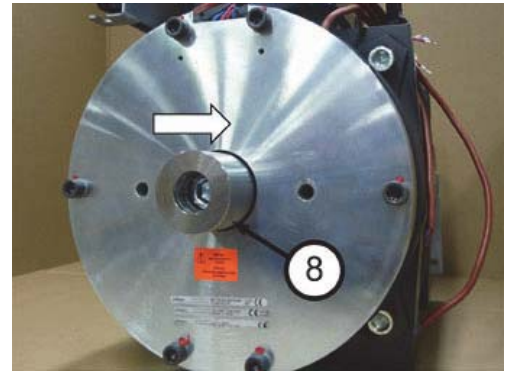
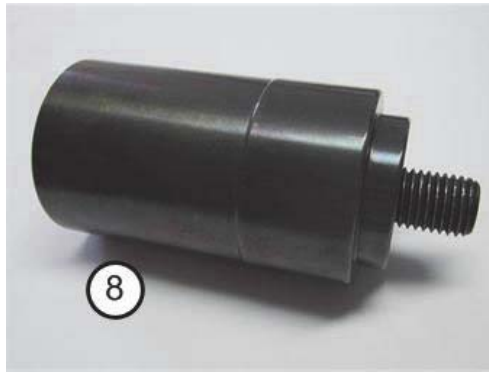
1. Dismount the absolute encoder (see chapter "Replacement of the absolute encoder").



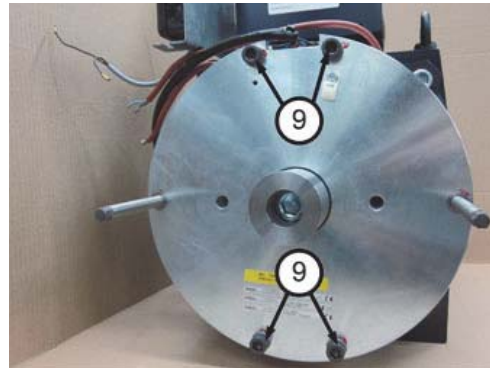
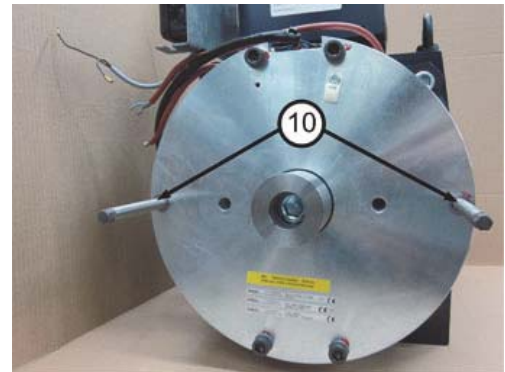
2. Disconnect the electrical connection (1) of both brakes.
3. Carefully remove strain reliefs (2) of all connecting cables with wire cutters.
4. Cut off varistors (3).
5. Feed all connecting cables (4) out of the terminal box.



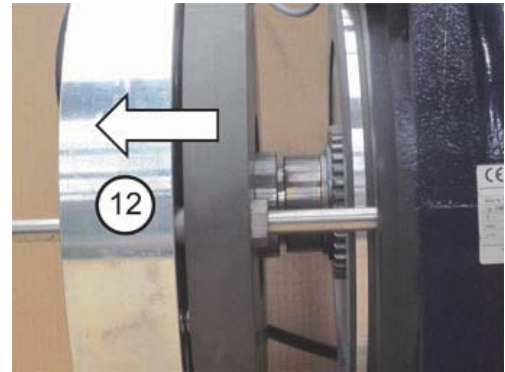
6. Remove the cable ties (5) at the brake lines
7. Unscrew adapter shaft (6) from the motor shaft with wrench (7) and screw wrench SW 32



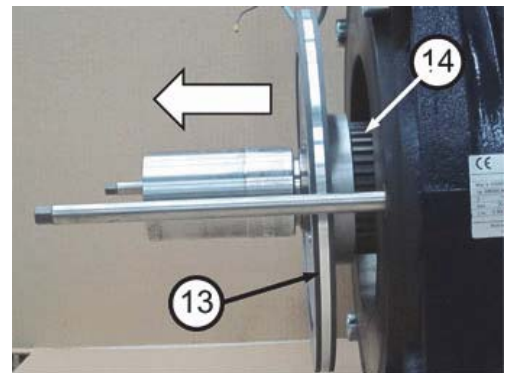
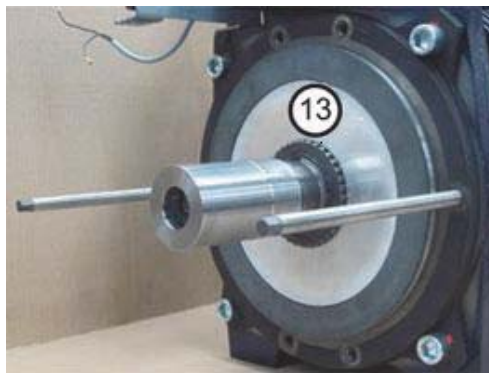
8. Screw assembly shaft (8) onto the motor shaft using SW 17 allen wrench.
Torque: 60 Nm



9. First completely loosen the both hexagon head screws (9) from the right and the left side of the brake, using an allen wrench SW 10
10. These screws are replaced through the two mounting bolts 12 x 220 (10) from the toolkit, article 70027450
11. Then loosen the remaining four hexagon head screws (9) with an allen wrench SW 10 always in change.



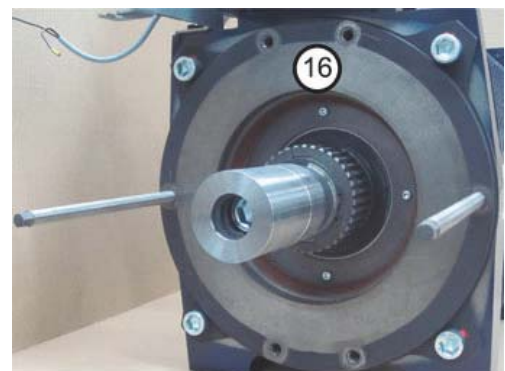
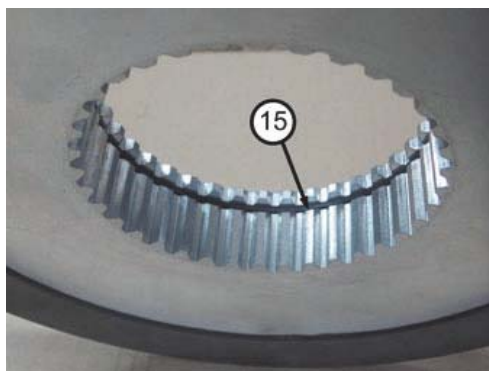
12. **Caution!** Due to the great weight of the brake bodies, we recommend use of an eye bolt M12 (11) and an appropriate lifting gear to secure.
13. Take off the brake bodies (12).
ATTENTION! Weight of the brake bodies is approx. 25 kg!



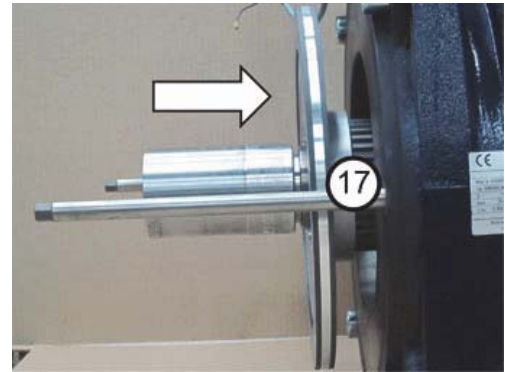
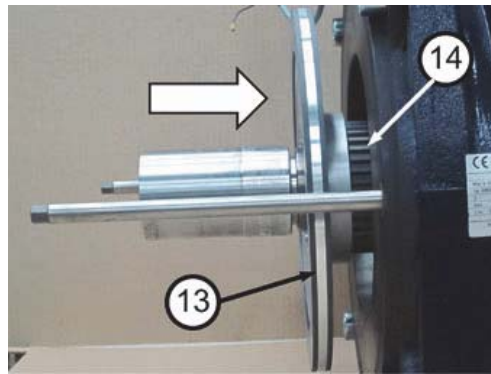
14. Remove the brake rotor (13) from the toothed motor shaft (14). The brake rotor may only be removed manually.
ATTENTION! Do not work with screwdrivers to loosen the brake rotor!
The friction lining can be damaged by the screwdrivers! Brake discs with damaged friction linings may not be mounted any more!

8.3.2.3 Mounting the brake

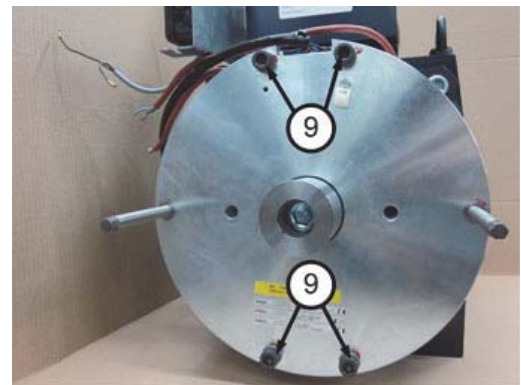
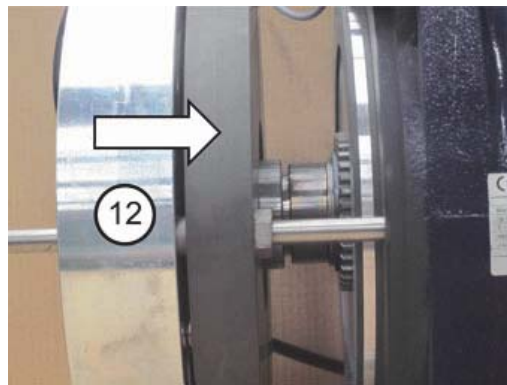
Brakes with retrofitted mechanical hand release system, please observe the chapter "Retrofitting mechanical hand release system"



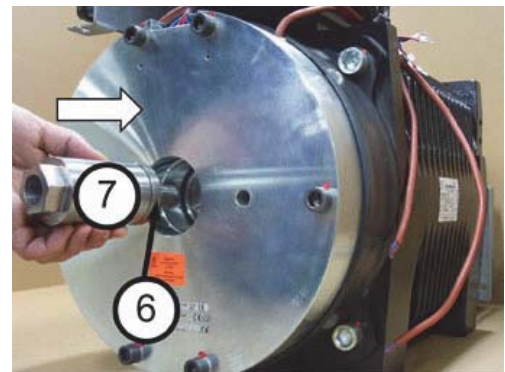
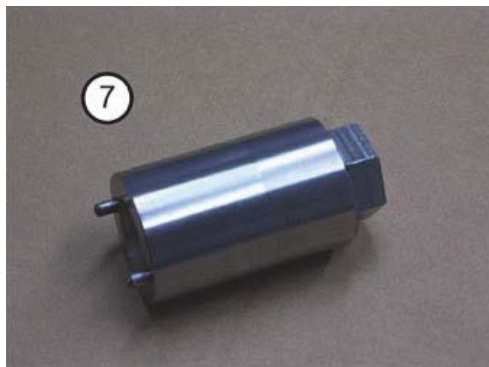
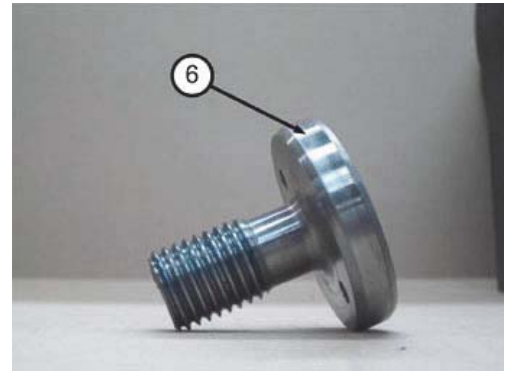
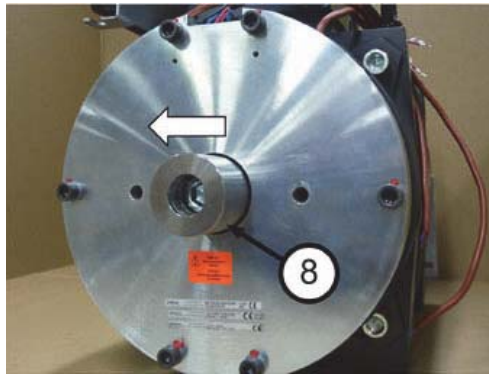
1. Grease the O-ring (example given Vaseline) and place it in the groove (15) of the brake rotor (13).
2. Ensure that the frictionlining of the brake rotor (13) and the braking surface (16) from the flange bearing bracket of the motor is free of dirt and grease.



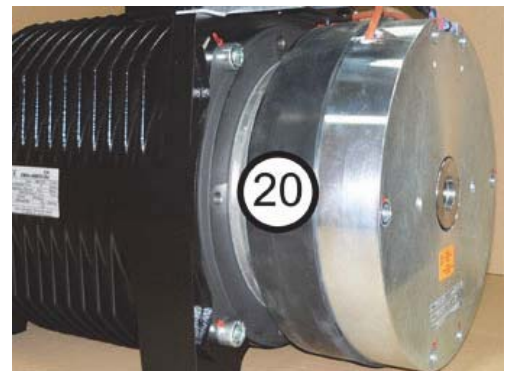
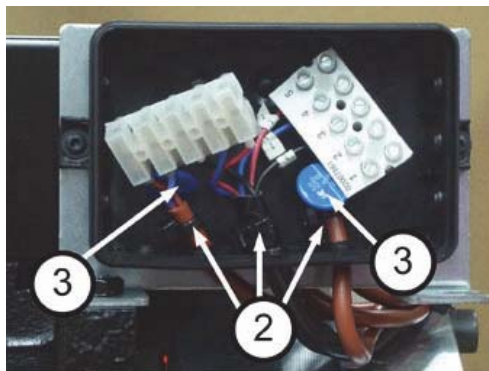
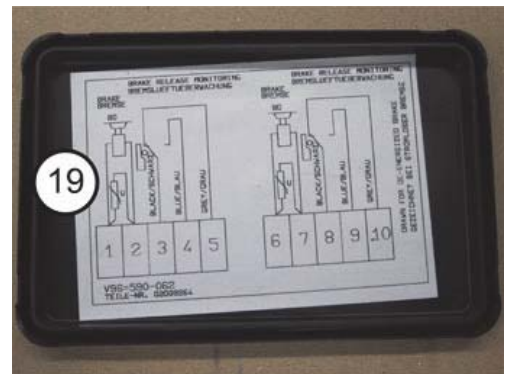
3. Push the brake rotor (13) onto the toothed motor shaft (14) with slight pressure.
ATTENTION! It must be noted that:
The stepped brake rotor collar (17) must face to the machine wall.
4. Make sure that the gear teeth engage easily.
5. O-ring may not be damaged.



6. Push the brake bodies (12) onto the assembly shaft (8).
ATTENTION! Weight of the brake bodies approx. 25 kg
7. Fasten the brake bodies evenly with four hexagon head screws (9).
Tightening torque 50 Nm
Do not forget the washers!
8. Loosen the both mounting bolts 12 x 220 (10).
9. Screw the both hexagon head screws (9).
Tightening torque 50 Nm
Do not forget the washers!
10. Attach stepwise all six hexagon head screws (9) evenly crosswise.
Tightening torque: 111 Nm
11. Secure the hexagon head screws (9) with locking varnish.



12. Release assembly shaft (8) loosen with an allen wrench SW 17 and take it off the motor shaft.
13. Provide threadlocker Loctite 243 or a similar product to the thread of the adapter shaft (6).
14. Screw the adapter shaft (6) onto the motor shaft with wrench (7) and screw wrench SW 32
Tightening torque: 60 Nm



15. Bundle the connection cables (4) of the magnet coils and the release monitoring and lead it into the terminal box (18).

16. Connect the magnet coils, the release monitoring and the varistors (3) according to the wiring diagram (19) in the top cover of the connection box (18).
17. Fit strain reliefs (2).
18. Fit dust cover (20).
19. Mount the absolute encoder (see chapter "Replacement of the absolute encoder").

8.3.2.4 Check the micro switches for the release monitoring

After the mounting of the brake, the function of the micro switches shall be checked.

1. Connect the circuit inductor to the connecting terminals 3/4 and 8/9 respectively (normally open contact).
2. Check the function of the micro switch:
 - Brake de-energised: contact is open.
 - Brake energised: contact is closed.
3. If the function is not given, the micro switches have to be adjusted (see chapter "Adjusting the micro switches for the release monitoring").

8.3.2.5 Adjusting the micro switches for the release monitoring

Required tool for adjusting the micro switches:

- Circuit inductor
- screw wrench SW 8
- Feeler gauge 0,1 mm
- Feeler gauge 0,15 mm

The adjusting is only necessary if the micro switches are not working correctly.

The micro switches are on the side of the brake body (see arrows).

WARNING! Ensure that you select the appropriate micro switch for the magnet to be adjusted.



1. De-energize the brake.
2. Connect the circuit inductor to the connecting terminals 3/4 and 8/9 respectively (normally open contact).
3. Please see the chapter "Enclosure - Brake operation instructions" for the further procedure for setting the micro switches for the release monitor.
4. After making the correct setting, apply locking varnish to adjusting screw.

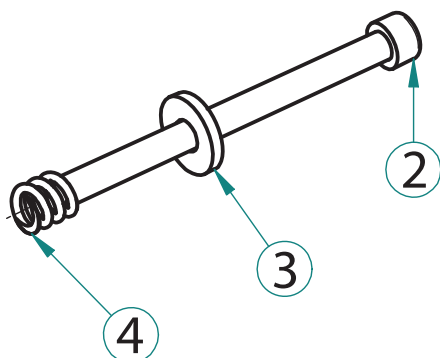
8.3.2.6 Retrofitting the hand release system

Required tools for the retrofitting of the hand release system:

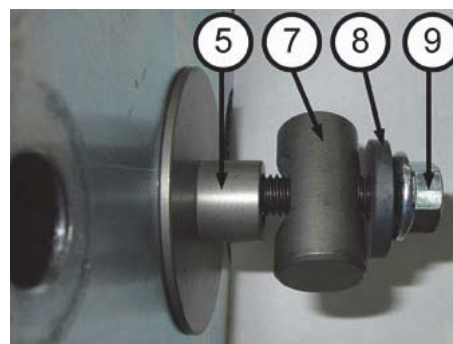
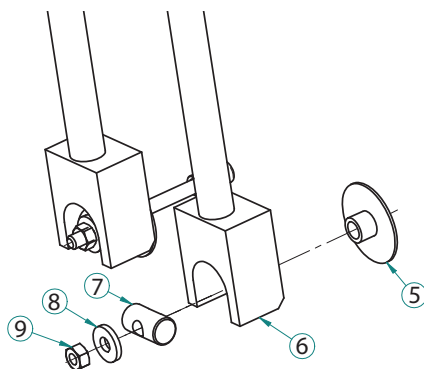
- Tool for replacing the absolute encoder (see chapter "Replacement of the absolute encoder")
- Tool for replacing the brake (see chapter "Replacement of the brake")
- Flat wrench SW 15
- Allen wrench SW 8
- 3 Feeler gauges 2 mm

Mounting the hand release system:

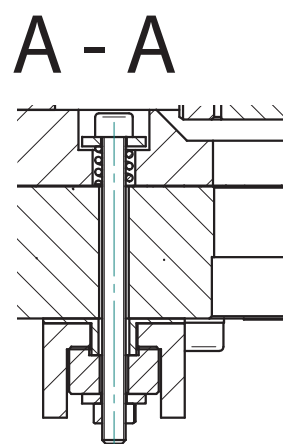
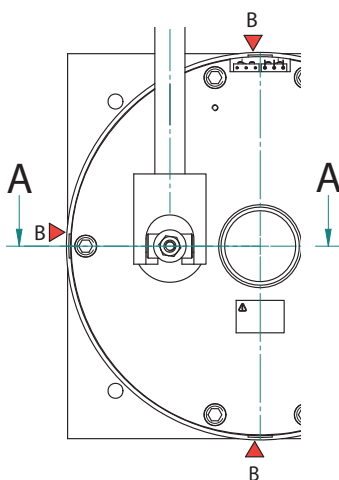
1. Dismount the absolute encoder (see chapter "Replacement of the absolute encoder").
2. Dismount the brake bodies (see chapter "Dismounting the brake").



3. On the armature side of the brake body, insert the screw (2), with washer (3) and spring (4) into the holes (1) provided.



4. Mount the flange (5) on the screw (2) at the front. Mount the axle (7) and the disk (8). Fit the nut (9) and tighten lightly.



5. Insert 3 x 2 mm feeler gauges into the air gap of the first brake body at the places marked [B], see figure.
6. Energise the brake.
7. Tighten the nut (9) with the flat wrench SW 15 and the allen wrench SW 8 until the armature disk is touching the feeler gauges.
Air gap $2^{+0.3}$ mm
8. Secure the nut (9) with threadlocker Loctite 243
9. Remove the feeler gauge.
10. Repeat on the second brake body.
11. Mount the brake bodies (see chapter "Mounting the brake").
12. Mount the absolute encoder (see chapter "Mounting the absolute encoder").

8.3.3 Replacement of the traction sheave



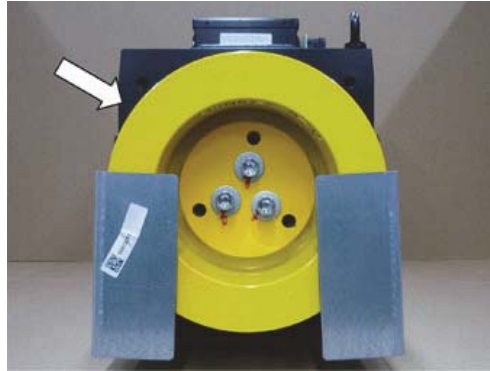
Warning!

Due to incorrect mounting the traction sheave can get loose from the drive shaft!

Requirements:

- Release the traction sheave and put the ropes off the traction sheave.
- Secure the traction sheave so that it does not jump off the drive shaft.

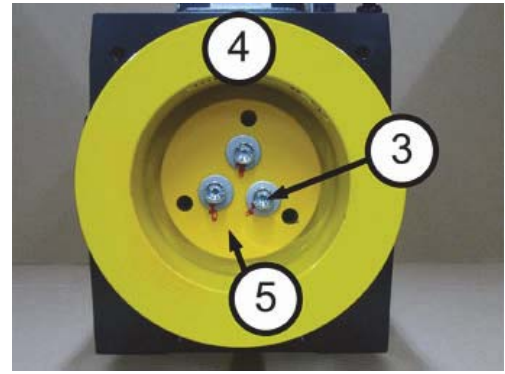
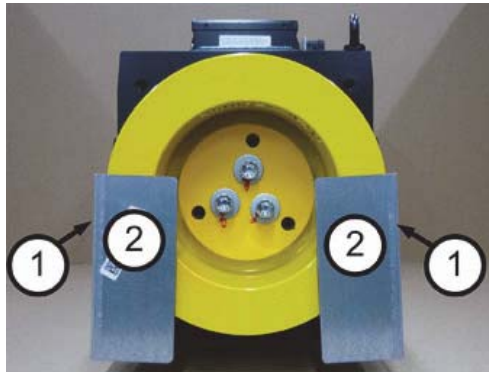
The traction sheave is mounted on the power take-off side of the motor (see arrow).



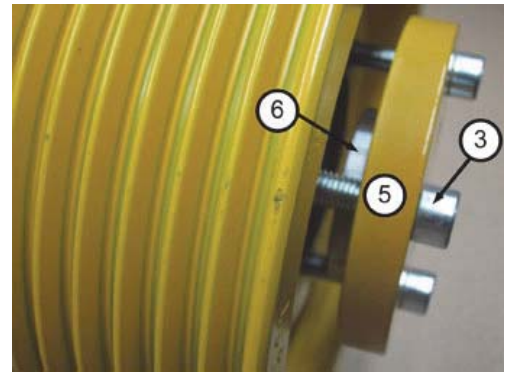
8.3.3.1 Required tools for the replacement of the traction sheave:

- screw wrench SW 13
- Screw wrench SW 17
- Allen key SW 10
- Torque key for a tightening torque of 79 Nm with allen key SW 10
- 5 - 8 mm spacer or hexagon nut

8.3.3.2 Dismounting the traction sheave



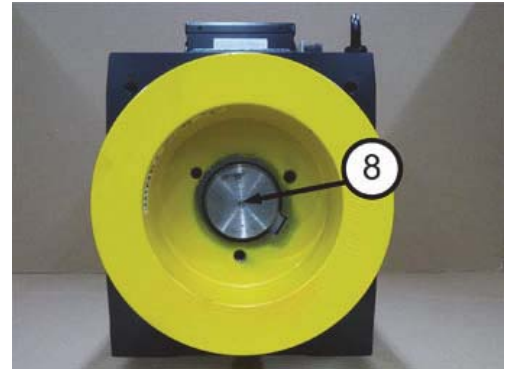
1. Undo the fixing screws (1) of the rope guards (2) with a screw wrench SW 13 or rather SW 17 (depending on width and diameter) and remove the rope guards (2).
2. Release the fixing screws M12 x 45 (3) of the traction sheave (4) with an allen wrench SW 10 and remove the fixing plate (5).



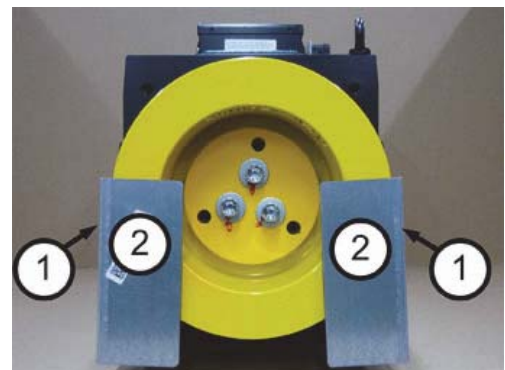
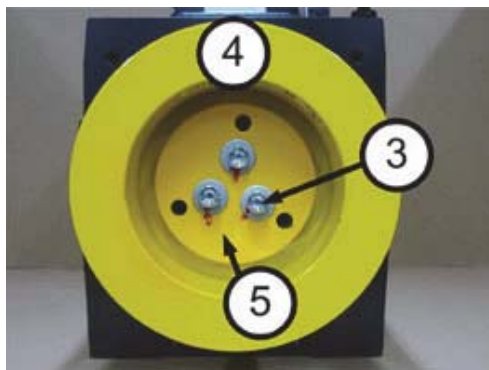
3. Turn the front plate (5) to press off.
4. 5 - 8 mm spacer or hexagon nut (6) must be placed between shaft end and front plate (5).
5. Screw front plate (5) to the traction sheave (4) at the outer circle of holes using hex socket screws M12 x 45 (3).
6. Tighten the screws M12 x 45 (3) uniformly with an allen wrench SW 10. By tightening the screws the traction sheave (4) will be pulled from the drive shaft (8).

8.3.3.3 Mounting the traction sheave

1. Clean the traction sheave (4) and the motor shaft (8). Both parts have to be free of dirt and grease.



2. The parallel key (7) has to be available.
3. Put traction sheave (4) on drive shaft (8). The bores for screws M12 must point outwards. Observe the position of the groove for the parallel key.



4. Screw front plate (5) to the drive shaft (8) at the inner circle of holes using three screws M12 x 45 (3). Apply threadlocker Loctite 243 or a similar product to the fixing screws.
Do not forget the washers!
5. Tighten the fixing screws (3) with a torque wrench with an allen screw SW 10 uniformly in two steps:
 - Tightening torque step 1: 50 Nm
 - Tightening torque step 2: 79 Nm
6. Coat the fastening screws (3) with sealing varnish.
7. Fit rope guards (2) with screw wrench SW 13 or rather SW 17

8.3.4 Fastening bearing brackets



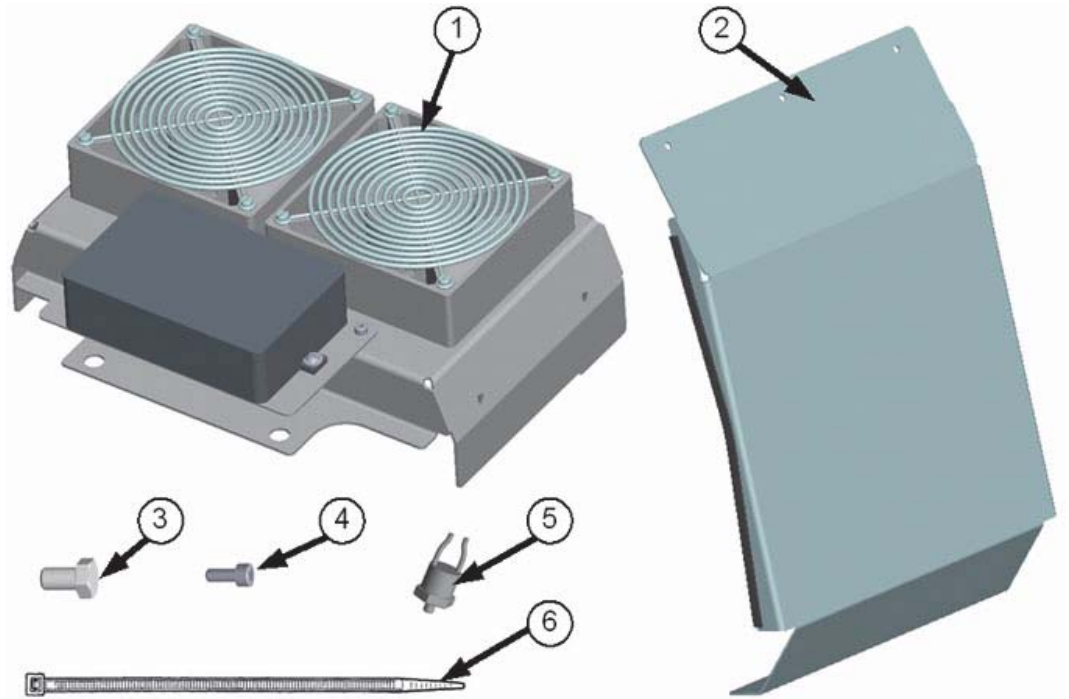
The mounting and dismounting of the magnet rotor and the flange bearing bracket must only be carried out by qualified personnel and with special devices in the factory.

8.3.5 Retrofitting the forced ventilation

8.3.5.1 Required tools for the retrofitting of the forced ventilation:

- screw wrench SW 16
- Allen wrench SW 3

8.3.5.2 Scope of delivery

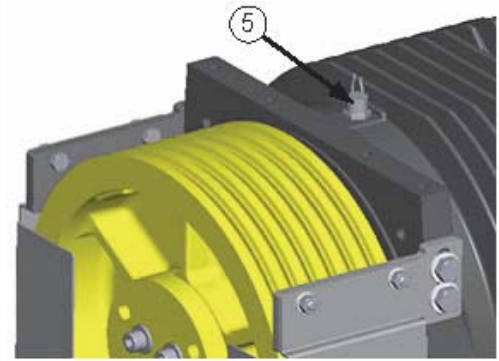
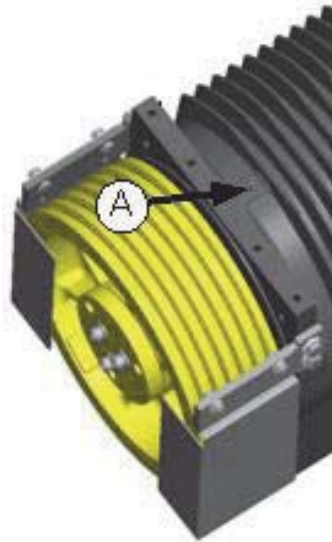


Parts list:

Pos.	Count	Description
1	1	pre-assembled forced ventilation
2	1	Air guide plate with edge protection
3	2	hexagonal screws ISO 4017 - M10 x 16 - 8.8
4	2	hex socket screw ISO 4762 - M4 x 10 - 8.8
5	1	thermostatic switch included insulating tube
6	1	cable tie

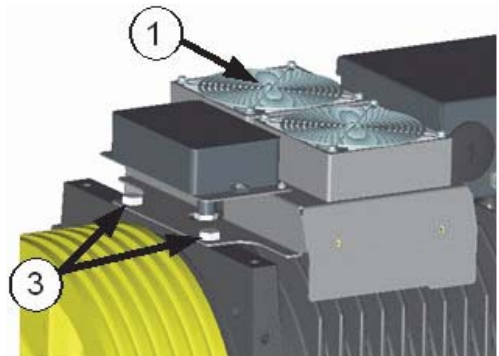
The accessories pos. 3, 4, 5 and 6 lie in the terminal box of the pre-assembled forced ventilation (1), packed in a bag.

8.3.5.3 Mounting of the thermostatic switch

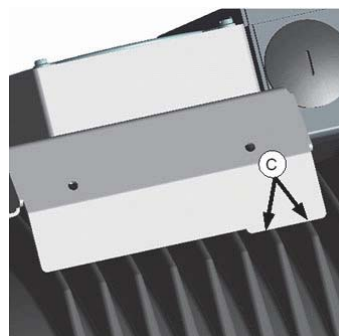


1. Screw the thermostatic switch (5) with a **tightening torque of 3 Nm** into the intended thread (A).
A exceeding of the tightening torque leads to the damage of the thermostat switch.

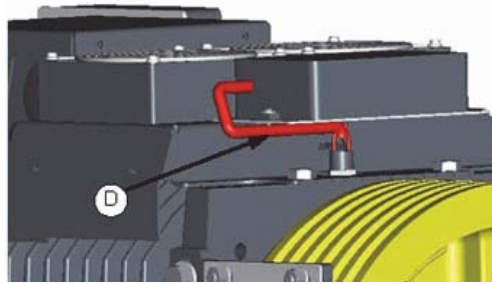
8.3.5.4 Mounting of the forced ventilation



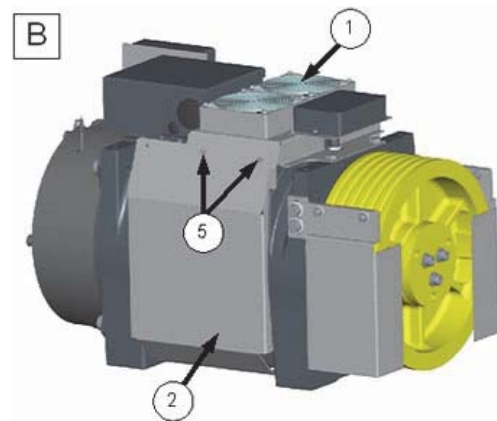
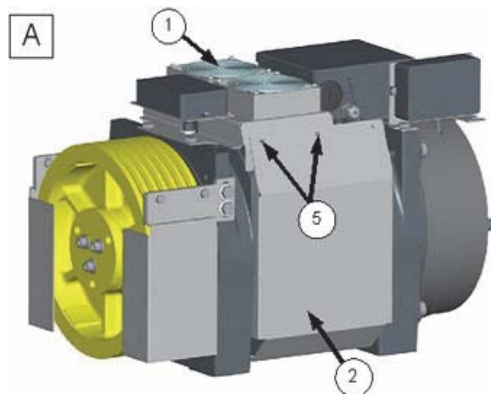
1. Attach the pre-assembled forced ventilation (1) with the both hexagon bolts M10 x 16 - 8.8 (3) at the thread (B) of the motor housing.



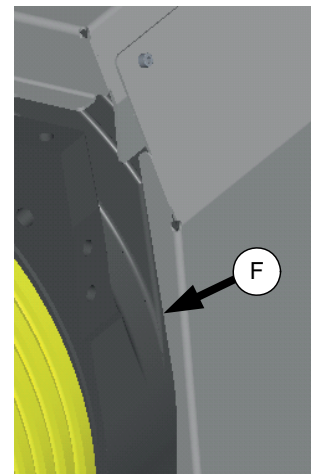
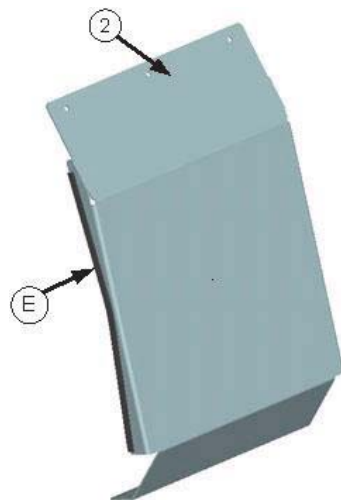
2. The pre-assembled forced ventilation contacted on two ribs (C).



3. Insert the insulating tube (D) of the thermostatic switch into the terminal box according to the illustration.
4. Attach the cable tie (6) as strain relief.



5. Attach the air guide plate (2) with both hex socket screws M4 x 10 - 8.8 (4) at the pre-assembled forced ventilation (1).
6. The air guide plate (2) can be attached either on the right [A] or on the left [B] side from the motor.



7. The edge protection (E) of the air guide plate (2) bear on with the motor housing (F).

9 Enclosure

9.1 Technical data

Motor type	200.40C		
Suspension	1:1	2:1	
typical payload*	800	1600	kg
Rated torque	710		Nm
Maximum torque	1200		Nm
permissible radial load	3300		kg
Rated brake torque	2 x 800		Nm
Speed	1,6		m/s
Total weight	330		kg
Traction sheave			
- Diameter	240		mm
- Width	173		mm
- Rope diameter	6 - 7		mm
- Standard number of grooves	16		
- Standard groove distance	10		mm

Table shows typical data, other values possible.

Other rope diameters and groove distances are possible.

* Dependent on travel, compensation ropes may be necessary.

Protection class

Component	Protection class
Motor	IP 42
Absolute encoder	IP 40
Brake (electrical)	IP 54
Brake (mechanical)	IP 41
Complete machine without forced ventilation	IP 21
Forced cooling	IP 21

9.2 Dimension sheets

Motoranschluss
 beidseitig möglich
 1 x max. $\varnothing 40$
 1 x $\varnothing 16$ mit Verschraubung M16
Motor connection possible on both sides
 1 x max. $\varnothing 40$
 1 x $\varnothing 16$ with cable gland M16

Bremsenschlusskasten
 beidseitig montierbar
Brake connection box mountable on both sides

Geber
Encoder

Seilschutz
 rope guard
 150°-180°

Rillenzahl
 schematisch dargestellt
Number of grooves drawn schematically

Dimensions:
 L1, L6, L3, $F_{max. 32.4kN}$, $\varnothing 1$, 27, 66, L4, 300, 67, 177, 437, 180, 40, 70, 220, 295, L8, 4xM20

Motor typ <i>Motor type</i>	D1	L1	L3	L4	L6	L8	$\frac{kg}{max.}$
SM200.40C 160	682	143	121.5	598.5	322	285	
SM200.40C 240	643.5	124	97	574	322	294	
SM200.40C 240	692	173	121.5	598.5	322	302	
SM200.40C 320	643.5	112	97	574	340	297	
SM200.40C 400	643.5	95	97	574	458	309	
SM200.40C 500	643.5	90	97	574	558	327	

Benennung
Title ZAtop SM 200.40C

Index <i>index</i>	Änderung <i>revision</i>	Datum <i>date</i>	Name <i>name</i>
A07	A1/106 erstellt drawn post-ft ZBCC/00	10.11.2014 22.06.2010	maa etz

Zeichnungsnummer
drawing number
 A-M-6453

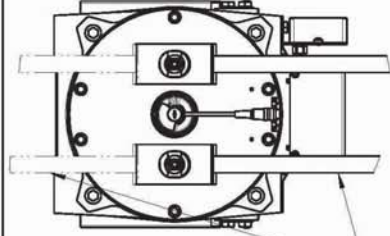
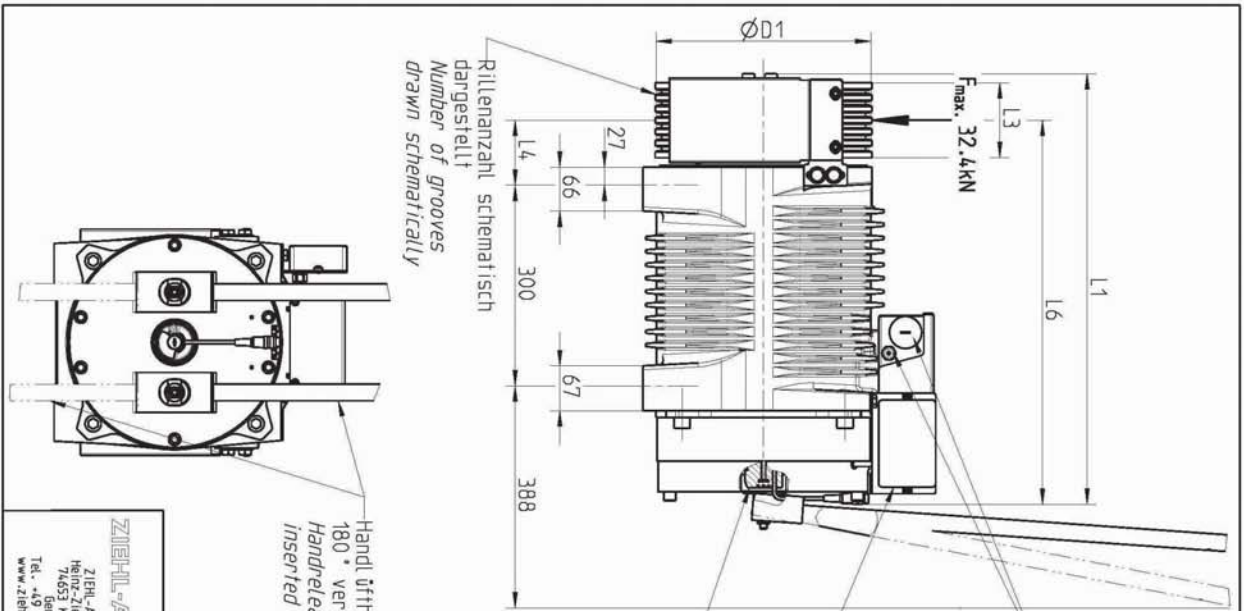
Maße in mm
dimensions in mm

Abbildung
image
 Darstellung schematisch gezeichnet -
 Änderungen vorbehalten
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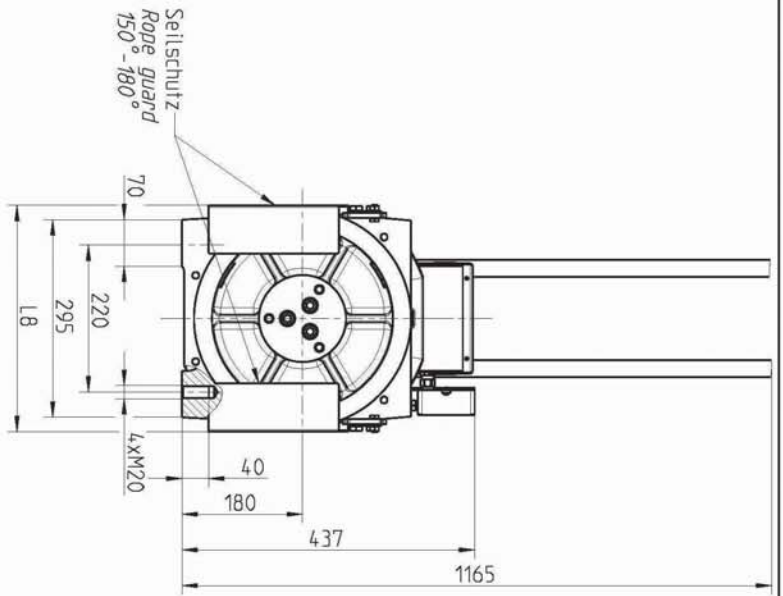


Handl. üfthebel um jeweils 180° versetzt einsteckbar
 Handleaselevers may inserted each 180°

Motoranschluss
 beidseitig möglich
 1 x max. Ø40
 1 x Ø16 mit Verschraubung M16
 Motor connection
 possible on both sides
 1 x max. Ø40
 1 x Ø16 with cable gland M16

Bremsenanschluss
 beidseitig montierbar
 Brake connection
 mountable on both sides

Gebber
 Encoder



MotorTyp Motor type	D1	L1	L3	L4	L6	L8	kg max.
SM200.40C	160	682	14.3	121.5	598.5	322	297
SM200.40C	240	643.5	124	97	574	322	306
SM200.40C	240	692	173	121.5	598.5	322	314
SM200.40C	320	643.5	112	97	574	340	310
SM200.40C	400	643.5	95	97	574	458	321
SM200.40C	500	643.5	90	97	574	558	339

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Genehmigung
 ZAtop SM200.40C

Änderungen vorbehalten
 schematical drawn image -
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Index Index	Änderung revision	Datum date	Name name
A05	A4.1706	11.11.2016	ma
erstellt drawn	geprüft checked	23.04.2010	tue

Zeichnungsnummer drawing number
A-M-6460

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Rillenzahl schematisch dargestellt
Number of grooves drawn schematically

Motoranschluss beidseitig möglich
 1 x max. Ø40
 1 x Ø16 mit Verschraubung M16
Motor connection possible on both sides
 1 x max. Ø40
 1 x Ø16 with cable gland M16

Geber Encoder

Seilschutz rope guard
 150° - 180°

Bremsenanschluss beidseitig montierbar
Brake connection mountable on both sides

Luftleitblech beidseitig montierbar
Air deflector mountable on both sides

Wandabstand wall distance

F_{max.} 32.4kN

Dimensions: L1, L6, L3, L4, L8, 200, 27, 66, 300, 177, 67, 170, 320, 423, 437, 180, 40, 70, 220, 295, 18, 4xM20, ØD1

Motor type	D1	L1	L3	L4	L6	L8	kg max
SM200.40C 160	682	143	121.5	598.5	322	295	
SM200.40C 240	643.5	124	97	574	322	304	
SM200.40C 240	692	173	121.5	598.5	322	312	
SM200.40C 320	643.5	112	97	574	340	308	
SM200.40C 400	643.5	95	97	574	458	319	
SM200.40C 500	643.5	90	97	574	558	337	

Genehmigung / title ZAtop SM200.40C

Index / Index	Änderung / revision	Datum / date	Name / name
A05	A11106	11.11.2014	maa
	erstellt / drawn	22.10.2010	etj
	geprüft / checked	08.08.2007	

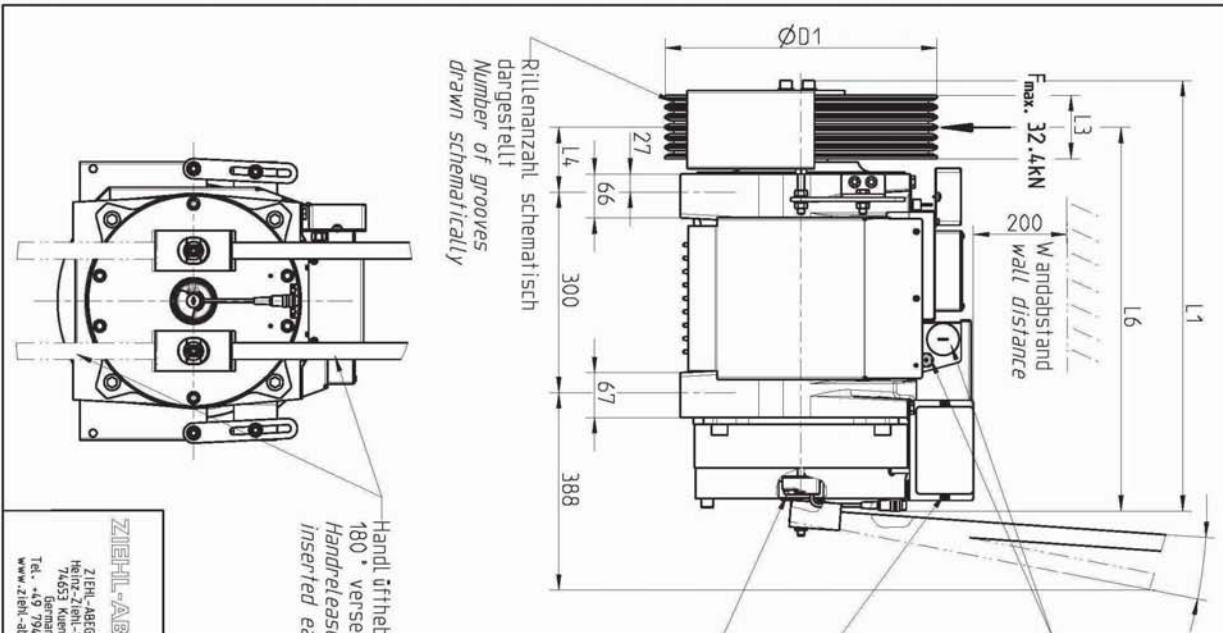
Zeichnungsname / drawing number A-M-6472

Maße in mm / dimensions in mm

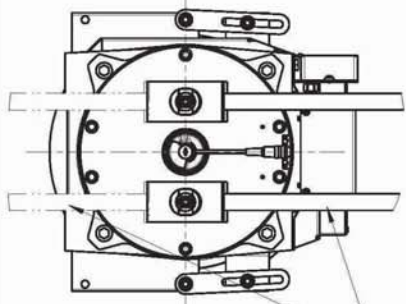
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 Handleaselevators may inserted each 180°



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 subject to modifications

Index	Änderung	Datum	Name
A05	A14.1106	12.11.2016	maa
erstellt	15.06.2012		
gepr. BH			

Titel	ZAtop SM200.40C
Skizze in mm	
Zeichnungsnummer	A-M-6557

MotorTyp	D1	L1	L3	L4	L6	L8	kg max.
SM200.40C 160	682	14.3	121.5	598.5	322	300	
SM200.40C 240	643.5	12.4	97	574	322	309	
SM200.40C 240	692	17.3	121.5	598.5	322	317	
SM200.40C 320	643.5	11.2	97	574	340	313	
SM200.40C 400	643.5	9.5	97	574	458	324	
SM200.40C 500	643.5	9.0	97	574	558	342	

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9.3 EC/EU declaration of conformity

EC/EU declaration of conformity

- original -
(english)
A-KON16_01 1612 Index 001

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

The manufacturer is solely responsible for issuance of the EC/EU declaration of conformity.

Product description: ZAtop Gearless elevator machine

Type: SM160... SM190... SM200... SM225... SM250...

The type specifications contain further additions for different versions, for example SM250.60B-20/S.

Serial number: 16010001/1 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 81-20:2014	Safety rules for the construction and installation of lifts - Lifts for the transport of persons and goods - Part 20: Passenger and goods passenger lifts
EN 60204-1:2006 + A1:2009 + AC:2010	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 - Product family 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, 20.04.2016
(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)

9.4 Operating instructions brake



S
E
R
V
I
C
E

M
A
N
U
A
L

SM416gb - rev 06/10

Electrically Released Brake

ERS VAR07 SZ 800/800



WARNER ELECTRIC EUROPE
Rue Champfleür, B.P. 20095, F- 49182 St Barthélemy d'Anjou Cedex
Tél. +33 (0)2 41 21 24 24, Fax + 33 (0)2 41 21 24 00
www.warnerelectric-eu.com

We, **WARNER ELECTRIC EUROPE**, 7, rue Champfleury, B.P. 20095, F-49182 St Barthélemy d'Anjou Cedex
declare that the brakes made in our factory from St Barthélemy d'Anjou, and hereafter designated:

ERS VAR07 SZ 800/800 - Warner Electric Part Number 112107270

Fully comply with directive 95/16/EC on Lifts, and are intended for incorporation into an installation or for assembly with other equipment, with the aim of constituting a machine subject to the application of directive 98/37/EC and the directive on Electromagnetic Compatibility 89/336 (modified). Compliance with the basic requirements of the Low Voltage Directive 73/23 (modified) is guaranteed by our full compliance with the following standards: NFC 79300 and VDE 0580/8.65.

Drawn up in St Barthélemy d'Anjou, April 2009

David EBLING, General Managing Director

CONTENTS



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2.1	Restrictions on use	4
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5	Electrical connection	6
5.1	Important recommendations	6
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7	Hand release (option)	6
8	Tools	7
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1 Technical specifications

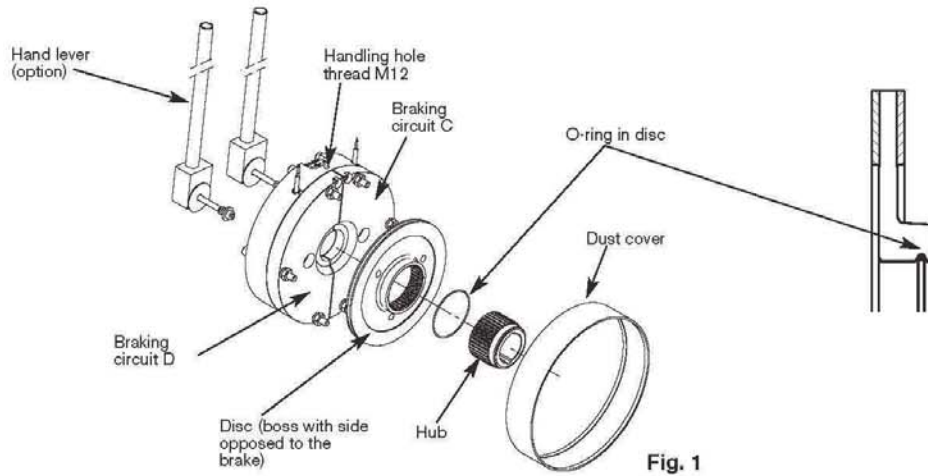


Fig. 1

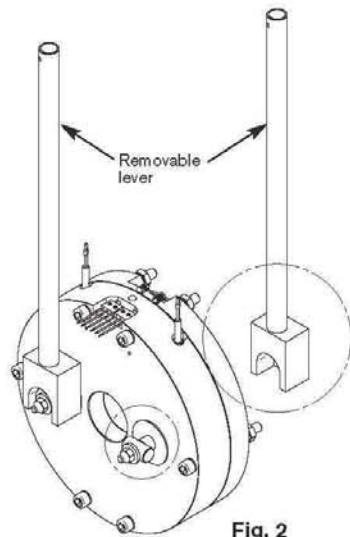


Fig. 2

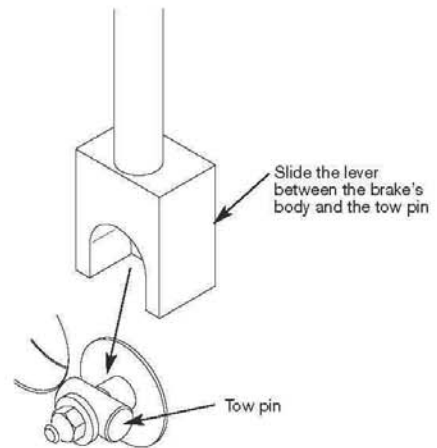



Fig. 2a

Table 1		ERS VAR07	
 EC Type Certificate in accordance with directive 95/16/CE:		ABV826	
		Warning: use a power supply with overexcitation	
Size		SZ 800/800	
Ziehl Abegg Part number		02012031	
Warner Electric Part Number		112107270	
Nominal torque		Nm	2 x 800
Per magnet	Voltage (inrush) (1 sec.) +5%/-10%	VDC	207
	Voltage (holding) +5%/-10%	VDC	103,5
	Power (inrush)	Watt	331
	Power (holding)	Watt	84
Maximum speed		min ⁻¹	400
Nominal airgap		mm	0,35 ^{+0,1/0}
Maximum airgap (after wear)		mm	0,6
Cyclic duration factor		ED	60%
Weight		kg	49,5



Symbol designating an action that might damage the brake



Symbol designating an action that might be dangerous to human safety



Symbol designating an electrical action that might be dangerous to human safety

2 Precautions and restrictions on use
2.1 Restrictions on use

- For the brake to comply with directive 95 / 16 / EC, the integrator must observe the general conditions for installation, including the mandatory use of a speed limiting device, in compliance with EN 81-1 paragraphs 9.9 and 9.10.10., as stated in the EC type-examination certificate from TÜV SÜD Industrie Service (see ABV number in Table 1).

This brake can in no way replace the system against the overspeed of the cabin downwards

- This brake is designed to work in dry conditions. Any contact with oil, grease, water or abrasive dust generate a decreased torque.

Warning : It is the responsibility of the customer to install the covers needed to avoid pollution of friction faces.

- Torque subject to decrease in case of water contamination. Use of both brake circuits mandatory.

Warning : brake must be replace after water contamination.

- This product is not suitable for use according to ATEX/94/9/EC.

- These units are designed for use in an ambient temperature between 0° C and +40° C maximum.

Warning : at low temperature, any freezing of the friction face, due to condensation, generates a loss of torque. It is the responsibility of the customer to take measures to avoid this problem.



- If maximum rotation speeds are exceeded, the guarantee is no longer valid.

- It is mandatory to follow instructions and datas given in documentation and marking of the units, in order to ensure the performance of the brake.

- This brake may only be used in a "horizontal axis".

- The customer must be careful not to alter the factory-set airgap. This is in order to ensure the brakes will be properly released.

- Protection class
 Electrical : IP42
 Mechanical : IP10 without dust cover
 : IP41 with dust cover

- Insulation class F 155 °C

- Normal use will not lead to any noticeable wear on the lining. Any dynamic braking is restricted to emergency and test braking.

2.2 Precautions and safety measures

- During maintenance, make sure that the mechanism to be held by the brake, is stopped and that there is no risk of it accidentally starting up. All intervention have to be made by qualified personnel, using this manual.



- Any modification made to the brake without the express authorisation of a representative of Warner Electric, in the same way than any use out of the contractual specifications accepted by "Warner Electric", will result in the warranty being invalidated and Warner Electric will no longer be liable in any way with regard to conformity.

3 Installation

3.1 Transport / storage



This brake is delivered in standard packaging that will keep it intact for a period of 6 months during ground transport.

3.2 Handling



- Avoid any impact to the brake so that its performance is not impaired

- Never lift the brake by its cables



When handling, use the handling holes intended for this purpose (see Fig. 1, thread M12)

3.3 Installation

Specifications for the customer's friction face:

Material: Steel (150 to 250 HV) or Cast iron

Roughness ≤ Ra 3,2

Protection: Phosphatizing (dry) or nitriding

Geometrical tolerances:

	0,1	Customer's shaft axis
	0,1	

The brake is delivered pre-assembled with pre-set microswitch and airgap. Fixing screws are supplied separately.

- Put the hub into position on the customer's shaft and block it axially (retainer not provided).
- Put the O-ring into the disc (see Fig. 1).
- Assemble the disc (boss with side opposed to the brake).
- Switch on the current to magnet.

NOTE: Secure the fixing screws using the safety washer supplied.


- Tighten the fixing screws, (star sequence tightening, first to initial torque, final setting torque after, see Table 2). The supply of current to the brakes should be switched on throughout this operation.
- Make all electrical connections permanent.
- Put the dust cover into position.


Size	ERS VAR07 SZ800/800
Fixing screws	6 x CHc M12 DIN912
Cs initial torque (Nm)	50
Cs ± 10 % (Nm)	111
Hexagonal head dim. of adjusting screw (mm)	21


Table 2

4 Maintenance

4.1 Checking the airgap

 Check the airgap at each maintenance inspection.

 **Reminder:** This brake is intended for a static application as a safety brake. Any dynamic braking is restricted to emergency and test braking. Normal use will not lead to any noticeable wear on the lining.

 Airgap has to be measured in 3 points at the circumference and at each braking circuit (see Fig. 3b). If the maximum value of the airgap is exceeded for one of the two circuits, change the disc and the O-ring.

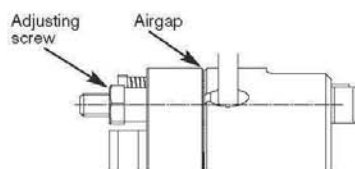


Fig. 3a

Position of the measuring shims by circuit:

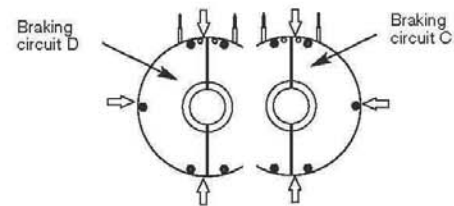




Fig. 3b


Note :

- Do not introduce the shims more than 10 mm into the airgap.
- Avoid the springs and the dampers of noise.

4.2 Disc exchange

 During maintenance, make sure that the mechanism to be braked, by the brake, is stopped and that there is no risk of it accidentally starting up. All interventions have to be made by qualified personnel, owning this manual.

 **Warning:** It's mandatory that disassembling and assembling of the encoder is done according the instructions of the drive manufacturer.

 **Attention** not to damage the electric cables during the maintenance action

- Disconnect the brake electrically
- Remove the fixation screws
- Remove the brake
- Clean the friction faces with a clean and dry cloth.

This brake is designed to work in dry conditions. Friction faces must be kept completely clean of any oil, grease or abrasive dust.

- After the worn friction disc is replaced, assemble the brake according chapter 3.3.

4.3 Adjusting the microswitch

Slide a shim 0,1mm thick close to the screw in the corresponding airgap. Switch on the current and tighten the adjusting hexagon screw M5 (8/flat) in contact with the microswitch until you reach the actuation point. Remove the shim. Check that it functions correctly by a few successive energising and releases (see Fig. 4).
 Fit again a 0,1 mm thick gauge and check if the adjustment is stable. Fit a 0,15 mm thick gauge and check that the microswitch is not actuated.

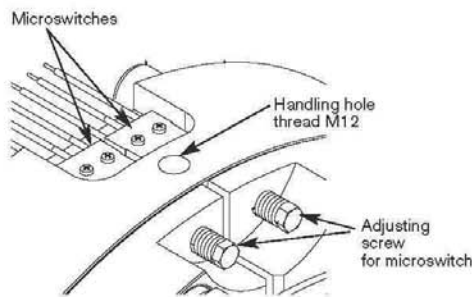
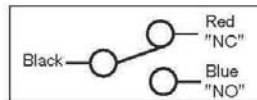


Fig. 4

Operation microswitch

Current range 10 mA min. to 100 mA max. at 24 VDC.

For maximum electrical lifetime of the microswitch ensure switching under resistive load only.

5 Electrical connection

Brakes **ERS VAR07** operate on a direct current supply, respect to polarity.

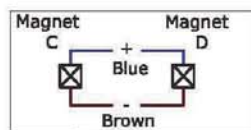


Fig. 5

5.1 Important recommendations

- All work on the electrical connections have to be made with power off.
- Make sure that the nominal supply voltage is always maintained (a lack of power results in a reduced maximum airgap).
- When switching on DC-side the coil must be protected against voltage spikes.



Emergency braking : for emergency braking the switching OFF must be connected on DC side, in order to obtain short engaging time of the brake.

Service braking ; for service braking, the switching OFF and the switching ON must be connected on AC current side, in order to obtain silent switching.

The connecting wires must be thick enough to help prevent sudden drops in voltage between the source and the brake.

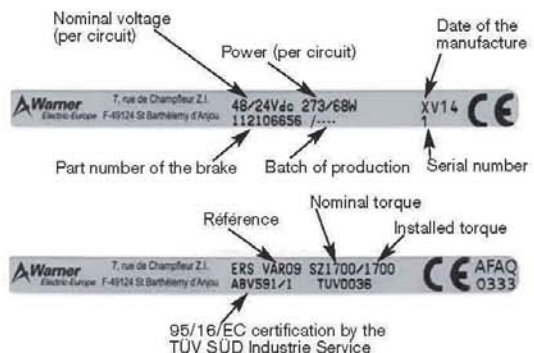
Cross section	0 to 10 m	From 10 to 20 m
	1,5 mm ²	2,5 mm ²

Tolerances on the supply voltage at the brake terminals +5% / -10% (NF C 79-300).

6 Spare parts

Part
Friction disc
Microswitch
O-ring Kit

Thank you to join to your request for spare part, the reference and the part number of the brake.



7 Hand release (option)



The adjustment of the airgap or the exchange of disc must obligatorily be carried out before reaching the maximum airgap (see table 1). This in order to avoid any problem of operation, related to the travel of the lever.

- Slide the hand lever between the brake's body and the tow pin (see fig. 2a).
- Act on the end of the lever to release the brake.
- After intervention, to remove brake 2 levers.



Any intervention must be carried out by competent personnel and in possession of this service manual.

8 Tools


Tools	Fonction
Airgap adjustment shims	Airgap and microswitch adjustment
Open jawed spanner 21 mm A/F	Airgap adjustment
Torque wrench (measurement range > 120 Nm) with hexagonal socket insert 10 mm A/F	Airgap adjustment
Open jawed spanner 8 mm A/F	Microswitch adjustment
Multimeter	Voltage checking




9 Troubleshooting and fault elimination

Troubleshooting		
Fault	Cause	Remedy
Brake does not release	<ul style="list-style-type: none"> • OEX time too short • Power supply is too low • Power supply is interrupted • Airgap too large • Worn disc • Coil is damaged • Airgap too small 	<ul style="list-style-type: none"> • Readjust the OEX time • Adjust power supply • Reconnect power supply, check the adjustment of microswitch • Re-adjust the airgap (chapter 4.1) • Change disc and readjust the airgap • Replace the brake • Re-adjust the airgap (chapter 4.1)
Brake does not brake	<ul style="list-style-type: none"> • Voltage present at switch off position • Grease on friction faces 	<ul style="list-style-type: none"> • Check the microswitch's adjustment and the customer's power supply • Clean the friction faces, change the disc
Nuisance braking	<ul style="list-style-type: none"> • Power supply is too low • Wrong information from microswitch 	<ul style="list-style-type: none"> • Adjust power supply • Re-adjust the microswitch
Brake vibration under holding voltage	<ul style="list-style-type: none"> • Bad electrical connection (incorrect polarity) 	<ul style="list-style-type: none"> • Reconnect the brake (chapter 5)

Subject to alteration without prior notice

9.5 EU declaration of conformity of the brake

Warner Electric Europe 7, rue Champfleur B.P. 20095 49182 St Barthélemy d'Anjou	DECLARATION OF CONFORMITY TO THE DIRECTIVE 2014/33/EU																																																																																																																																									
<p>This is to declare that the following safety device listed in appendix III point 2 of the directive 2014/33/EU</p> <p>Product : Braking system</p> <p>According to the following specification :</p>																																																																																																																																										
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 15%;">Brake type</th> <th style="width: 10%;">Part N°</th> <th style="width: 15%;">Drawing N°</th> <th style="width: 10%;">Voltage</th> <th style="width: 10%;">Torque</th> <th style="width: 15%;">EU type examination + NB</th> <th style="width: 10%;">T10</th> <th style="width: 10%;">T90</th> </tr> </thead> <tbody> <tr> <td>ERS VAR09 SZ800/800</td> <td>30343291</td> <td>I-112108048-c/d</td> <td>24 Vdc</td> <td>2x 800 Nm</td> <td>EU-BD591 NB0036</td> <td>110 ms</td> <td>240 ms</td> </tr> <tr> <td>ERS VAR09 SZ800/800</td> <td>30343333</td> <td>I-112108048-c/d</td> <td>207 Vdc</td> <td>2x 800 Nm</td> <td>EU-BD591 NB0036</td> <td>110 ms</td> <td>240 ms</td> </tr> <tr> <td>ERS VAR09 SZ800/600</td> <td>30343340</td> <td>I-112108048-c/d</td> <td>207 Vdc</td> <td>2x 600 Nm</td> <td>EU-BD591 NB0036</td> <td>110 ms</td> <td>240 ms</td> </tr> <tr> <td>ERS VAR09 SZ800 H/R</td> <td>30343461</td> <td>I-112108045-c/d</td> <td>207 Vdc</td> <td>2x 800 Nm</td> <td>EU-BD591 NB0036</td> <td>110 ms</td> <td>240 ms</td> </tr> <tr> <td>ERS VAR09 SZ1700/1200</td> <td>30346146</td> <td>I-112108138-c/d</td> <td>207 Vdc</td> <td>2x 1200 Nm</td> <td>EU-BD591 NB0036</td> <td>65 ms</td> <td>155 ms</td> </tr> <tr> <td>ERS VAR09 SZ1700/1200</td> <td>30346145</td> <td>I-112108138-c/d</td> <td>24 Vdc</td> <td>2x 1200 Nm</td> <td>EU-BD591 NB0036</td> <td>65 ms</td> <td>155 ms</td> </tr> <tr> <td>ERS VAR09 SZ1700/1200 H/R</td> <td>30346144</td> <td>I-112108141-c/d</td> <td>207 Vdc</td> <td>2x 1200 Nm</td> <td>EU-BD591 NB0036</td> <td>65 ms</td> <td>155 ms</td> </tr> <tr> <td>ERS FENIX 09 10-1000</td> <td>30343395</td> <td>I-112108041-c/d</td> <td>207 Vdc</td> <td>2x 1000 Nm</td> <td>EU-BD906 NB0036</td> <td>100 ms</td> <td>160 ms</td> </tr> <tr> <td>ERS FENIX 09 10-1000</td> <td>30343417</td> <td>I-112108041-c/d</td> <td>24 Vdc</td> <td>2x 1000 Nm</td> <td>EU-BD906 NB0036</td> <td>100 ms</td> <td>160 ms</td> </tr> <tr> <td>ERS FENIX 09 10-1000 H/R</td> <td>30343419</td> <td>I-112108037-c/d</td> <td>207 Vdc</td> <td>2x 1000 Nm</td> <td>EU-BD906 NB0036</td> <td>100 ms</td> <td>160 ms</td> </tr> <tr> <td>ERS VAR08 SZ1050/1000</td> <td>30343705</td> <td>I-112108060</td> <td>180/90 Vdc</td> <td>1000 Nm</td> <td>EU-BD590 NB0036</td> <td>125 ms</td> <td>260 ms</td> </tr> <tr> <td>ERS VAR08 SZ1700/1550</td> <td>30343612</td> <td>I-112108111</td> <td>207/103 Vdc</td> <td>1550 Nm</td> <td>EU-BD590 NB0036</td> <td>70 ms</td> <td>200 ms</td> </tr> <tr> <td>ERS VAR10 SZ2500/2500</td> <td>30343459</td> <td>I-112108033</td> <td>207/103 Vdc</td> <td>2500 Nm</td> <td>EU-BD592 NB0036</td> <td>70 ms</td> <td>170 ms</td> </tr> <tr> <td>ERS VAR10 SZ5000/5000</td> <td>30343936</td> <td>I-112108072-c/d</td> <td>207/103 Vdc</td> <td>5000 Nm</td> <td>EU-BD592 NB0036</td> <td>125 ms</td> <td>255 ms</td> </tr> <tr> <td>ERS VAR10 SZ5000/5800</td> <td>30343941</td> <td>I-112108072-c/d</td> <td>207/103 Vdc</td> <td>5800 Nm</td> <td>EU-BD592 NB0036</td> <td>130 ms</td> <td>300 ms</td> </tr> <tr> <td>ERS VAR07 SZ800/800 AZ</td> <td>30315457</td> <td>I-112108002</td> <td>207 Vdc</td> <td>2x 800 Nm</td> <td>EU-BD819/1 NB0036</td> <td>100 ms</td> <td>150 ms</td> </tr> </tbody> </table>			Brake type	Part N°	Drawing N°	Voltage	Torque	EU type examination + NB	T10	T90	ERS VAR09 SZ800/800	30343291	I-112108048-c/d	24 Vdc	2x 800 Nm	EU-BD591 NB0036	110 ms	240 ms	ERS VAR09 SZ800/800	30343333	I-112108048-c/d	207 Vdc	2x 800 Nm	EU-BD591 NB0036	110 ms	240 ms	ERS VAR09 SZ800/600	30343340	I-112108048-c/d	207 Vdc	2x 600 Nm	EU-BD591 NB0036	110 ms	240 ms	ERS VAR09 SZ800 H/R	30343461	I-112108045-c/d	207 Vdc	2x 800 Nm	EU-BD591 NB0036	110 ms	240 ms	ERS VAR09 SZ1700/1200	30346146	I-112108138-c/d	207 Vdc	2x 1200 Nm	EU-BD591 NB0036	65 ms	155 ms	ERS VAR09 SZ1700/1200	30346145	I-112108138-c/d	24 Vdc	2x 1200 Nm	EU-BD591 NB0036	65 ms	155 ms	ERS VAR09 SZ1700/1200 H/R	30346144	I-112108141-c/d	207 Vdc	2x 1200 Nm	EU-BD591 NB0036	65 ms	155 ms	ERS FENIX 09 10-1000	30343395	I-112108041-c/d	207 Vdc	2x 1000 Nm	EU-BD906 NB0036	100 ms	160 ms	ERS FENIX 09 10-1000	30343417	I-112108041-c/d	24 Vdc	2x 1000 Nm	EU-BD906 NB0036	100 ms	160 ms	ERS FENIX 09 10-1000 H/R	30343419	I-112108037-c/d	207 Vdc	2x 1000 Nm	EU-BD906 NB0036	100 ms	160 ms	ERS VAR08 SZ1050/1000	30343705	I-112108060	180/90 Vdc	1000 Nm	EU-BD590 NB0036	125 ms	260 ms	ERS VAR08 SZ1700/1550	30343612	I-112108111	207/103 Vdc	1550 Nm	EU-BD590 NB0036	70 ms	200 ms	ERS VAR10 SZ2500/2500	30343459	I-112108033	207/103 Vdc	2500 Nm	EU-BD592 NB0036	70 ms	170 ms	ERS VAR10 SZ5000/5000	30343936	I-112108072-c/d	207/103 Vdc	5000 Nm	EU-BD592 NB0036	125 ms	255 ms	ERS VAR10 SZ5000/5800	30343941	I-112108072-c/d	207/103 Vdc	5800 Nm	EU-BD592 NB0036	130 ms	300 ms	ERS VAR07 SZ800/800 AZ	30315457	I-112108002	207 Vdc	2x 800 Nm	EU-BD819/1 NB0036	100 ms	150 ms
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Warner Electric Europe 7, rue Champfleur B.P. 20095 49182 St Barthélemy d'Anjou	DECLARATION OF CONFORMITY TO THE DIRECTIVE 2014/33/EU	
<p>Year of manufacture : See brake label Manufactured by : Warner Electric Europe</p> <p>That has obtained the UE type examination N° (<u>see table above</u>) by the following notified body :</p> <p><u>Notified body (NB)</u> TÜV SÜD Industrie Service GmbH Westendstr. 199 D 80686 MÜNCHEN</p> <p>Covered par the Quality Insurance attestation Module E N°2002/2820/013D delivered by the following body :</p> <p style="text-align: center;">AFNOR Certification NB 0333 11 rue Francis de Pressensé 93571, La pleine St Denis Cedex France</p> <p>Is compliant with the Directive 2014/33/EU and applied the harmonized standard EN81-20:2014 and EN81-50:2014</p>		
Function : Operation Quality Manager Name : Ms Lucie Godicheau Date : 25/04/16 Visa : 	 <p>WARNER ELECTRIC EUROPE CS 20095 49182 ST-BARTHELEMY D'ANJOU CEDEX Tél. 02 41 21 24 24 Fax. 02 41 21 24 00 E-mail : warnerelectric-eu.com</p>	

9.6 EU type-examination certificate

ZERTIFIKAT ◆ CERTIFICATE ◆ 認 証 証 書 ◆ CERTIFICADO ◆ CERTIFICAT



Industrie Service

EU TYPE-EXAMINATION CERTIFICATE

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

Certificate No.: EU-BD 819/1

Certification Body of the Notified Body: TÜV SÜD Industrie Service GmbH
Westendstr. 199
80686 Munich - Germany
Identification No. 0036

Certificate Holder: WARNER Electric Europe
7, rue de Champfleür
BP 20095
49124 Saint Barthélemy d'Anjou - France

Manufacturer of the Test Sample: WARNER Electric Europe
7, rue de Champfleür
BP 20095
49124 Saint Barthélemy d'Anjou - France
(Manufacturer of Serial Production – see Enclosure)

Product: Braking device acting on the shaft of 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: ERS VAR07
Size:
SZ300/___, SZ420/___, SZ420/___ SY,
SZ600/___, SZ600/___ SY, SZ800/___,
SZ800/___ AZ

Directive: 2014/33/EU


Reference Standards: EN 81-20:2014
EN 81-50:2014
EN 81-1:1998+A3:2009

Test Report: EU-BD 819/1 of 2016-03-09

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: 2016-03-09

Date of Validity: from 2016-04-20


Werner Rau
Certification Body "lifts and cranes"



TUV®

**Annex to the EU Type-Examination Certificate
 No. EU-BD 819/1 of 2016-03-09**



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 torques and tripping rotary speeds

1.1.1 Permissible brake torques and maximum tripping rotary speeds of the traction sheave when the brake device acts on the shaft of the traction sheave while the car is moving upward

Size	Permissible brake torque [Nm]	Max. tripping rotary speed of the traction sheave [rpm]
SZ300/___	482 - 747	300
SZ300/___	434 - 689	600
SZ420/___	547 - 999	300
SZ420/___	502 - 788	600
SZ420/___SY	603 - 1070	600
SZ600/___	947 - 1306	300
SZ600/___	724 - 1045	600
SZ600/___SY	811 - 1688	600
SZ800/___	1144 - 2177	300
SZ800/___AZ	1007 - 1871	400
SZ800/___	1042 - 1997	600

1.1.2 Maximum tripping speed of the overspeed governor and maximum rated speed of the lift

The maximum tripping speed of the overspeed governor and the maximum rated speed of the lift must be calculated on the basis of the traction sheave's maximum tripping rotary speed as outlined above taking into account traction sheave diameter and car suspension.

$$v = \frac{D_{TS} \times \pi \times n}{60 \times i}$$

v = Tripping (rated) speed (m/s)
 D_{TS} = Diameter of the traction sheave from rope's centre to rope's centre (m)
 π = 3,14
 n = Rotary speed (rpm)
 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 torques, tripping rotary speeds and characteristics

1.2.1 Nominal brake torques and response times with relation to a brand-new brake element

Size	Min. nominal brake torque* [Nm]	Intermediate nominal brake torque * [Nm]	Max. nominal brake torque * [Nm]	Max. tripping rotary speed [rpm]	Maximum response times** [ms] with / without overexcitation		
					t ₁₀	t ₅₀	t ₉₀
SZ300/___	2 x 250 = 500			300	60	93	125
SZ300/___			2 x 350 = 700	300	50	100	150
SZ300/___	2 x 250 = 500			600	55	88	120
SZ300/___			2 x 315 = 630	600	50	90	130
SZ420/___	2 x 250 = 500			300	60	90	120
SZ420/___			2 x 450 = 900	300	50	105	160
SZ420/___	2 x 225 = 450			600	60	75	90
SZ420/___			2 x 350 = 700	600	60	80	100
SZ420/___SY	2 x 360 = 720			600	95	128	160

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

**Annex to the EU Type-Examination Certificate
 No. EU-BD 819/1 of 2016-03-09**



Industrie Service

SZ420/___SY			2 x 420 = 840	600	95	148	200
SZ600/___	2 x 420 = 840			300	80	120	160
SZ600/___		2 x 550 = 1100		300	50	85	120
SZ600/___			2 x 600 = 1200	300	50	100	150
SZ600/___	2 x 315 = 630			600	70	90	110
SZ600/___			2 x 500 = 1000	600	50	90	130
SZ600/___SY	2 x 550 = 1100			600	80	108	135
SZ800/___	2 x 665 = 1330			300	65	95	125
SZ800/___			2 x 1000 = 2000	300	55	153	250
SZ800/___AZ	2 x 667 = 1334			400	120	160	200
SZ800/___AZ			2 x 800 = 1600	400	100	125	150
SZ800/___	2 x 665 = 1330			600	65	103	140
SZ800/___		2 x 800 = 1600		600	55	93	130
SZ800/___			2 x 900 = 1800	600	55	115	175

Interim values can be interpolated

Explanations:

- * **Nominal brake torque:** Brake torque 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 torque, t_{50} optionally calculated $t_{50} = (t_{10} + t_{90})/2$ or value taken from the examination recording

1.2.2 Assigned execution features

Size	Type of powering / deactivation	Brake control	Nominal air gap [mm]	Damping elements / adhesive foil integrated	Overexcitation
SZ300/___	Continuous current / continuous current end	serial	0.6	yes / yes	at double non-release voltage
SZ420/___	Continuous current / continuous current end	serial	0.6	yes / yes	at double non-release voltage
SZ420/___SY	Continuous current / continuous current end	serial or parallel	0.65	yes / no	at double non-release voltage
SZ600/___	Continuous current / continuous current end	serial	0.6	yes / yes	at double non-release voltage
SZ600/___SY	Continuous current / continuous current end	serial or parallel	0.65	yes / no	at double non-release voltage
SZ800/___	Continuous current / continuous current end	parallel	0.6	yes / yes	at double non-release voltage
SZ800/___AZ	Continuous current / continuous current end	parallel	0.65	no / no	no

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.

**Annex to the EU Type-Examination Certificate
 No. EU-BD 819/1 of 2016-03-09**



Industrie Service

- 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 manufacturer of the drive unit must provide calculation evidence that the connection traction sheave – shaft – brake disc and the shaft itself is sufficiently safe, if the brake disc is not a direct component of the traction sheave (e. g. casted on). The shaft itself has to be statically supported in two points.
 An evidence must be enclosed with the technical documentation of the lift.
- 2.4 The setting of the brake torque has to be secured against unauthorized adjustment (e. g. sealing lacquer).
- 2.5 The respective identification drawing according to the following table shall be included to the EU type-examination certificate for the identification and information of the general construction and operation and distinctness of the approved type:

Size	No. of the identification drawing	Date of stamp
SZ300/___	1 12 107185	01.07.2009
SZ420/___	1 12 107272	15.03.2010
SZ420/___SY	I-1 12 108237	09.03.2016
SZ600/___	1 12 107273	15.03.2010
SZ600/___SY	I-1 12 108239	09.03.2016
SZ800/___	I-1 12 107213	09.03.2016
SZ800/___AZ	I-1 12 108244	09.03.2016

- 2.6 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 The brake moments effectively adjusted of one brake circuit will be marked at the blank after the type designation ERS VAR07 SZXXX/___ XX.
- 3.2 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.
- 3.3 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.
- 3.4 Other requirements of the standard, such as reduction of brake torque respectively brake force due to wear or operational caused changes of traction are not part of this type examination.
- 3.5 This EU type-examination certificate was issued according to the following standards:
 - EN 81-1:1998 + A3:2009 (D), Annex F.7 and F.8
 - 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
- 3.6 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.

**Enclosure to the EU Type-Examination Certificate
No. EU-BD 819/1 of 2016-03-09**



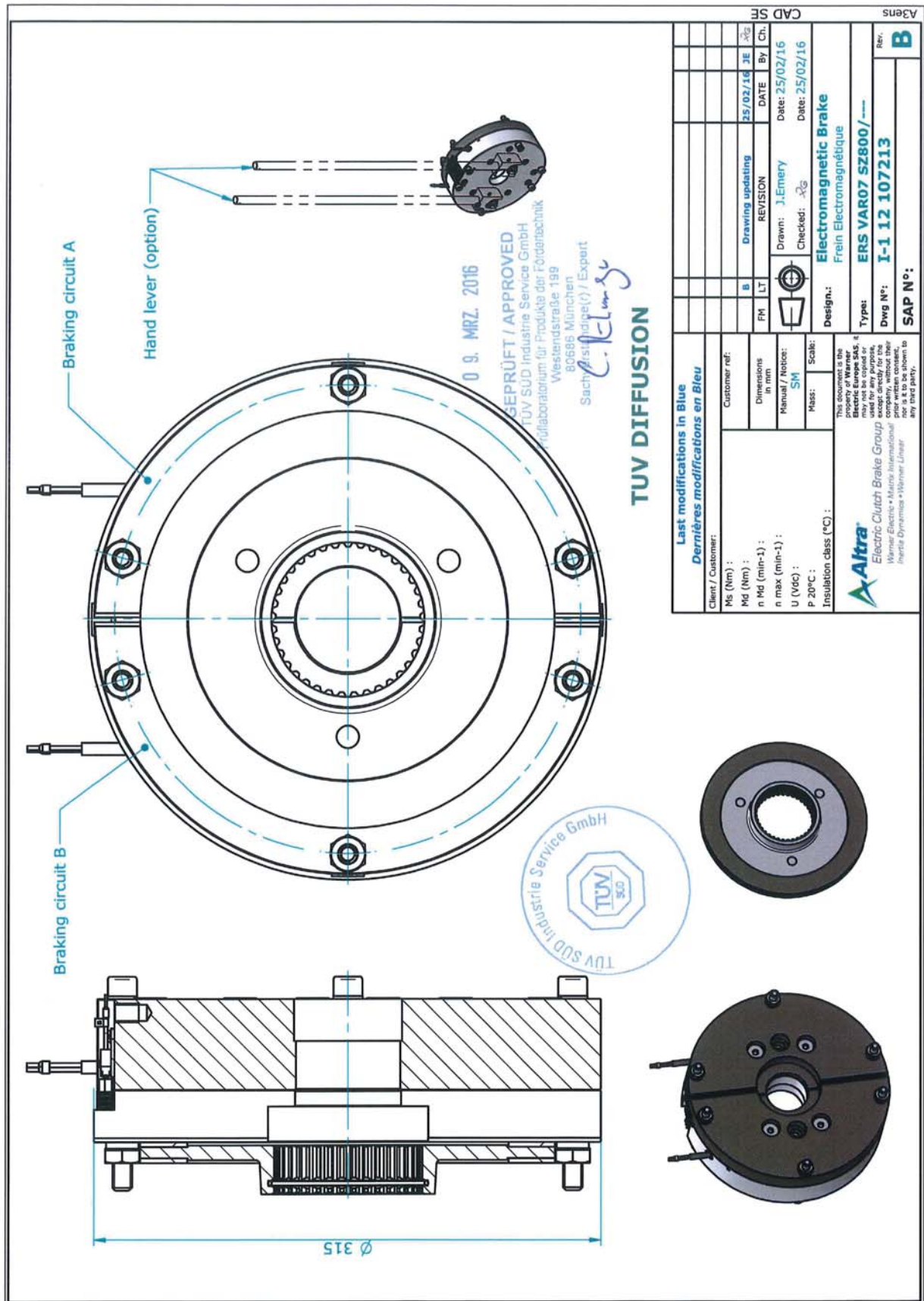
Industrie Service

Authorised Manufacturer of Serial Production – Production Sites (valid from: 2016-01-22):

Company WARNER Electric Europe
Address 7, rue de Champfleür
BP 20095
49124 Saint Barthélemy d'Anjou - France

Company Altra Industrial Motion Shenzhen Co. Ltd.
Address Dabo Industry Zone
18 Huanzhen Road
Bogang County, Shajing Town
Baoan District, Shenzhen City
518104 Guangdong province - China (PRC)

- END OF DOCUMENT -



Ø 315

Braking circuit B

Braking circuit A

Hand lever (option)

TUV DIFFUSION

Last modifications in Blue
Dernières modifications en Bleu

0 9. MRZ. 2016

GEPRÜFT / APPROVED
 TÜV SÜD Industrie Service GmbH
 Prüfzentralfür Produkte der Feinmechanik
 Westendstraße 199
 80586 München
 Sachvers. Mündigkeit / Expert
 C. Kelting

TUV SÜD Industrie Service GmbH

Client / Customer:		Customer ref.:	
Mod (Nm) :		Dimensions in mm:	
n Mod (min-1) :		Manual / Notice:	SM
n max (min-1) :		Mass:	
U (Vdc) :		Scale:	
P 20°C :		This document is the property of ZIEHL-ABEGG. It may not be copied or reproduced in any way without the written consent of ZIEHL-ABEGG. It is to be shown to any other party.	
Insulation class (°C) :		Design: Frein électromagnétique Electromagnetic brake	
Type: ERS VARD7 SZ800/--- AZ		Type: I-1 12 108244	
Dwg No: I-1 12 108244		SAP No: A	
Rev: A		Rev: A	

REVISION: 25/02/16 JE x/c
 Drawn: J.Emery Date: 25/02/16
 Checked: x/c Date: 25/02/16

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	IS-FT1-MUC/cr Christian Rührmeyer	+49 89 5791-3450 christian.ruehrmeyer@tuv-sued.de	+49 89 5791-3337	2016-03-21 Warner_Bestätigung_EN81-20_50_160321_en.docx	1 of 3

Fulfillment of requirements concerning type-examinations of ascending car overspeed protection means (ACOP) and protection devices against unintended car movement according to the harmonized standard EN 81-50:2014 (D) by (EC) type-examination certificates according to Directive 95/16/EC

Dear Sirs,

For the products listed below were issued (EC) type-examination certificates according to Directive 95/16/EC. Test basis was the harmonized standard EN 81-1. In the meantime EU type-examination certificates according to Directive 2014/33/EU were issued for the tested products. So far as relevant, additional requirements of the harmonized standard EN 81-20:2014 (D) were taken into consideration.

Type:	(EC) type-examination certificate	EU type-examination certificate
ERS VAR08 Size: SZ600/____, SZ1050/____, SZ1700/____	ABV 590/3, ESV 590/5 ABV 818/1, ESV 818/2 ABV 880, ESV 880	EU-BD 590
ERS VAR09 Size: SZ200/____, SZ800/____, SZ1700/____	ABV 817/1, ESV 817 ABV 729/2, ESV 729/1 ABV 591/5, ESV 591/8 ABV 591/6, ESV 591/9	EU-BD 591

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ERS VAR09 Size: SZ200/____, SZ600/____, SZ600/____ FZ, SZ800/____, SZ1000/____, SZ1700/____, SZ1700/1200 CH	ABV 817/1, ESV 817 ABV 809/3, NL 11-400-1002-153-01 (R2) ABV 809/2, NL 11-400-1002-153-01 (R1) ABV 729/2, ESV 729/1 ABV 811/2, NL 11-400-1002-153-02 (R2) ABV 591/5, ESV 591/8 ABV 591/6, ESV 591/9 ABV 591/4, ESV 591/6	EU-BD 591/1
ERS VAR10 Size: SZ1010/____, SZ2500/____, SZ5000/____	ABV 592/3, ESV 592/2 ABV 604/3, ESV 604/3 ABV 829/1, ESV 829/1	EU-BD 592
ERS VAR15-02 Size: FT2110/____, FT2110/____ SY	ABV 777/5, ESV 777/5 ABV 777/3, ESV 777/3	EU-BD 777
ERS VAR07 Size: SZ300/____, SZ420/____, SZ600/____, SZ800/____	ABV 819/2, ESV 819/1 ABV 826/2, ESV 826/1 ABV 843/1; ESV 843/1 ABV 844/1, ESV 844/1	EU-BD 819
ERS VAR07 Size: SZ300/____, SZ420/____, SZ420/____ SY, SZ600/____, SZ600/____ SY, SZ800/____, SZ800/____ AZ	ABV 819/2, ESV 819/1 ABV 826/2, ESV 826/1 ABV 843, ESV 843 ABV 843/1; ESV 843/1 ABV 844, ESV 844 ABV 844/1, ESV 844/1	EU-BD 819/1
ERS FENIX 08 Size: 06-____, 10-____	ASBV 905/1 ASBV972	EU-BD 905
ERS FENIX 09 Size: 06-____, 10-____	ASBV 906/1 ASBV 973	EU-BD 906
ERS FENIX 10 Size: 12-____, 20-____	ASBV 907/1 ASBV 974	EU-BD 907

According to the new standard EN 81-50:2014 (D) there are new requirements for the type-examination of the braking devices as part of the ascending car overspeed protection means (ACOP) and against unintended car movement (UCM) respectively the requirements have changed. But these requirements already have been considered in the past. For this reason additional tests were not necessary. The content of the EC type examination certificates was formally adapted. The safety components mentioned above fulfill the requirements of the harmonized standard EN 81-50:2014 (D) already.

For the function as safety component as part of the ascending car overspeed protection means (ACOP) the transitional regulation according to Article 44 of the Directive 2014/33/EU is fully applicable.

In the future protecting devices against unintended car movement (UCM) will be safety components according to Annex III of the Directive 2014/33/EU.

Furthermore according to Article 44 of the Directive 2014/33/EU the making available on the market of safety components for lifts covered by Directive 95/16/EC which are in conformity with that Directive and which were placed on the market before 20 April 2016 shall not be impeded. To avoid problems in the meantime with document NB-L/2015-061 of 2015-07-06 Notified Bodies Lift (NB-Lift) suggested to apply Article 44 for components of protecting devices against unintended car movement (UCM) analogously. A definitive statement of NB-Lift respectively the European Commission is planned, but is pending. After




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consideration a transformation of the existing type-examination certificates in EU type-examination certificates is possible.

For this reason, additional formal requirements and due to the validity of the new Lift Directive 2014/33/EU from 2016-04-20, EU type-examination certificates already may be issued, but they are valid from 2016-04-20 only.

Best regards


Achim Janocha
Leiter der Zertifizierungsstelle
für Produkte der Fördertechnik


Christian Rührmeyer
Niederlassung München
Abteilung Fördertechnik

9.7.1 Statement concerning ESV-type-examination

The manufacturer confirms according to paragraph 2.6 of the type-examination certificate the compliance of the part with the examined brakes. The nominal brake torque is stated on the name plate. The response times are assigned to the brake torque in the type-examination certificate. The increase of the indices (added with "/") of ABV or ESV certificates serves only the purpose of technical improvement and has been granted by the notified body under this condition. ABV and ESV numbers are (except for the indices) always identical for the same kind of brake and the use of the ABV number always includes the ESV number, which is also assigned by the documentation.

9.8 Calculation of tripping speed

- DTS = diameter of the traction sheave (table contains typical traction sheave diameters, other diameters can be recalculated linear)
- Nbn = maximum nominal speed of the brake rotor
- Nbmax = maximum trip torque of the brake rotor
- Vn = maximum rated speed of the elevator
- Vmax = maximum tripping speed of the elevator

Type	DTS	Nbn	Nbmax	Vn (1:1)	Vmax (1:1)	Vn (2:1)	Vmax (2:1)
	[mm]	[min ⁻¹]	[min ⁻¹]	[m/s]	[m/s]	[m/s]	[m/s]
SM160A/B	160	384	441	3.22	3.69	1.61	1.85
SM160A/B	200	384	441	4.02	4.62	2.01	2.31
SM160A/B	210	384	441	4.22	4.85	2.11	2.42
SM160A/B	240	384	441	4.83	5.54	2.41	2.77
SM190	200	300	345	3.14	3.61	1.57	1.81
SM190	240	300	345	3.77	4.34	1.88	2.17
SM200C	160	300	345	2.51	2.89	1.26	1.45
SM200C	210	300	345	3.30	3.79	1.65	1.90
SM200C	240	300	345	3.77	4.34	1.88	2.17
SM200C	320	300	345	5.03	5.78	2.51	2.89
SM200C	400	300	345	6.28	7.23	3.14	3.61
SM200C	450	300	345	7.07	8.13	3.53	4.06
SM200C	500	300	345	7.85	9.03	3.93	4.52
SM225(B)	320	217	250	3.64	4.19	1.82	2.09
SM225(B)	400	217	250	4.54	5.24	2.27	2.62
SM225(B)	500	217	250	5.68	6.54	2.84	3.27
SM225(B)	600	217	250	6.82	7.85	3.41	3.93
SM225C	240	400	460	5.03	5.78	2.51	2.89
SM225C	320	400	460	6.70	7.71	3.35	3.85
SM225C	400	400	460	8.83	9.63	4.19	4.82
SM250.60B	320	400	460	6.70	7.71	3.35	3.85
SM250.60B	400	400	460	8.83	9.63	4.19	4.82
SM250.60B	500	400	460	10.47	12.04	5.24	6.02
SM250.60B	600	400	460	12.57	14.45	6.28	7.23
SM250D	440	400	460	9.22	10.60	4.61	5.30
SM250C	450	400	460	9.42	10.84	4.71	5.42
SM250C	500	400	460	10.47	12.04	5.24	6.02
SM250C/D	520	400	460	10.89	12.52	5.45	6.26

9.9 Shaft calculation



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Certificate

about the verification of the calculation of a traction sheave shaft including Shaft / Hub connections

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Type of the gearless machine: SM 200.40C

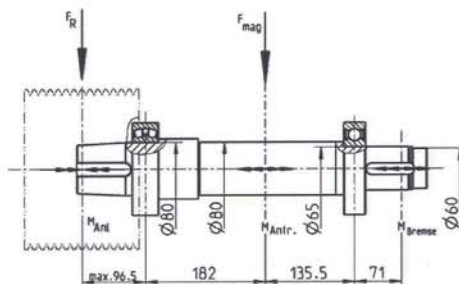
Manufacturer: Ziehl-Abegg AG, Heinz-Ziehl-Strasse
 74653 Künzelsau - Germany

Examination number: G 536

Tested product: Traction sheave shaft including Shaft / Hub connections
 Test Report of IFF ENGINEERING & CONSULTING GmbH
 No. 9.0.541.3 dated 2009-10-22 (Page 1 – 17)

Basis of examination: DIN 743 (10/2000), calculation of the safe working load of shafts and axis in connections with KTA 3902 (06/1999)

DIN 6892 (11/98), fitting key springs, calculation and design
 Niemann, machine elements 1981, Volume no. 1



Date: 2010-04-19

Our reference:
 IS-FSA-STG/No

Document: BS_G536_en.docx

This Document consists of
 2 Pages.
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The test results refer exclusively to the units under test.

Construction drawing: A-20-121-0015, dated 2009-07-07

Material: Steel EN 10083-3 (01/2007) – 42CrMo4+QT (1.7225+QT)
 Steel EN 10083-3 (01/2007) – 42CrMoS4+QT (1.7227+QT)
 Steel EN 10083-3 (01/2007) – 50CrMo4+QT (1.7228+QT)

Minimum permissible surface pressure according to DIN 6892, paragraph 5.1.2 for the material of the hub connections of the **traction sheave** (Material EN-GJL-300, DIN EN 1561, as stated by the manufacturer):

$$p_{zul} = f_s * f_H * R_e \text{ respectively } p_{zul} = f_s * f_H * R_{P0,2} \text{ or } p_{zul} = f_s * R_m$$

(f_s ; f_H Table B1) $p_{zul} \geq 450 \text{ N/mm}^2$

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 Deutschland

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 Our reference/Date: IS-FSA-STG/No / 2010-04-19
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Minimum permissible surface pressure according to DIN 6892, paragraph 5.1.2 for the material of the hub connections of the **brake rotor** (Material C60, DIN EN 10083-2 (10/2006), as stated by the manufacturer):

$$p_{zul} = f_s \cdot f_H \cdot R_e \text{ respectively } p_{zul} = f_s \cdot f_H \cdot R_{p0,2} \text{ or } p_{zul} = f_s \cdot R_m$$

(f_s ; f_H Table B1) $p_{zul} \geq 510 \text{ N/mm}^2$

Details for the calculation, applicable to the event of load

Maximum permissible static load	F_R	32.373 kN
Maximum torque of the installation	M_{inst}	710 Nm
Maximum starting-up torque	M_{Max}	1200 Nm
Magnetic force	$F_{magnetic}$	8.844 kN
Rated braking torque	$M_{braking}$	1600 Nm (2 x 800 Nm)
Maximum braking torque	$1.5 \times M_{braking}$	2400 Nm
Maximum nominal speed of rotation		300 min^{-1}

Test result

We carried out the verification of the shaft calculation including the Shaft / Hub connections by means of a comparative calculation. The test proved that the traction sheave shafts are dimensioned in accordance with the details of maximum load according to the requirements of the basis of examination.

An installation free of stresses and a unmoveable mounting of the supports in each direction is presupposed. The machine frame and the points of force introduction have to be designed regarding construction and strength appropriate to the forces imposed on the supports.

Notice: This certificate only refers to the sufficient calculation of the traction sheave shaft and hub/shaft connections but not to the sufficient dimensioning of the brake.

Prüflaboratorium für Produkte der Fördertechnik
 Prüfbereich Aufzüge und Sicherheitsbauteile

The expert


 Klaus Lederle


 Dr. Björn Otte

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