

Operating Manual



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Revision: 06





VITTENSTEIN

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electronics



motion control



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1.1 Service contact

Please contact our Customer Service if you have any technical questions: **WITTENSTEIN alpha GmbH** Customer Service Walter-Wittenstein-Str. 1 D-97999 Igersheim Tel.: +49 (0) 79 31 / 493-12900 Fax: +49 (0) 79 31 / 493-10903 E-Mail: service-alpha@wittenstein.de







2 General Information

2.1 <u>Description, Designations</u>

The ECD 100/300/300A planetary lift machine (from now on only referred to as lift machine) is designed for driving a passenger lift or freight lift.

2.2 Whom does this manual concern?

This manual concerns all persons who install, operate, or maintain this lift machine. They may only carry out work on the lift machine, if they have read and understood this operating manual. Please pass the safety instructions on to other persons as well.

2.3 <u>Which signs and symbols are referred to in this manual?</u>

• An "action instruction", which requires you to carry out an action.

- ∇ With a "check" you can specify whether the device is ready for the next work stage.
- A "usage tip" shows you an option of facilitating or improving operations.

The safety instructions symbols are described in section 3 "Safety".

2.4 Exclusion of liability

The manufacturer does not accept liability for damage or injury ensuing from improper handling of the lift machine.

If the installed wear monitor of the brake is not used or connected, then

WITTENSTEIN alpha GmbH will not accept liability for damages or injuries resulting from wear and tear of the brake.

2.5 Modifications, reconstructions

Modifications or reconstructions of the lift machine may only be carried out with the express written authorisation of **WITTENSTEIN alpha GmbH**.

Use only original parts when you maintain or retrofit the lift machine (e.g. hand wheel). **WITTENSTEIN alpha GmbH** does not accept any liability for damage or injury resulting from the use of third-party parts.

Driving wheel

Use only driving wheels that have been recommended by **WITTENSTEIN alpha GmbH**. The monitoring of wear is the responsibility of the operator or the authorised regulatory agency.

Auxiliary brake on the driving wheel

WITTENSTEIN alpha GmbH accepts no liability for the function of an auxiliary brake attached later to the driving wheel.

2.6 EC Lifts Directive

Within terms of the EC lifts directive 95/16/EC, the lift machine is not considered an autonomous lift, but as a component to install in lifts.

Operation is prohibited within the area of validity of the EC directive, until it has been determined that the lift, in which this product is installed, corresponds to the regulations within this directive.



2.7 Technical Modifications

WITTENSTEIN alpha GmbH reserves the right of carrying out technical modifications to improve the product.

2.8 Copyright

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3 <u>Safety</u>

3.1 Intended use

The lift machine is designed to drive a passenger lift according to DIN EN 81-1 and DIN EN 81-1/A1.

According to this standard the passenger lift must have a safety gear for downward motion and a safety device against overspeeding (upwards). These devices may **under no circumstances** affect deceleration greater than $1 \ge 9.81 \text{ m/s}^2$.

Please refer to the calculation log attached to the order confirmation for the maximum permissible loads. Furthermore, all specifications in the calculation log must be complied with in the design of the whole installation.

3.2 Improper use

Every usage exceeding the restrictions mentioned above (especially higher loads) is not compliant with the regulations, and is thus prohibited.

Under no circumstances may the emergency-off torque be exceeded. To prevent excessive forces in case of an emergency-stop, both the cabin as well as the counterweight need to be suspended with springs.

The loading case "springing counterweight" is prohibited!

Please contact our customer service department if you have any technical questions (see 1.1).

It is forbidden to operate the lift machine when:

- it has not been mounted according to regulations (e.g., securing the driving wheel),
- it has not been installed according to regulations (e.g., fastening bolts),
- the brake has not been inspected according to chapter 8.3.4,
- the lift machine is heavily soiled (e.g. mortar, cement), or
- it is operated without lubricant.

3.3 Safety Instructions

The following symbols are used in this manual to warn you of hazards:

DANGER!

This symbol warns you of danger of injury to yourself and others.



Attention This symbol warns you of the risk of damage to the lift machine.

Environment

This symbol warns of environmental pollution risk.



3.3.1 General safety instructions

Working on the lift machine



DANGER! Improperly executed work can lead to injury and damage.

Make sure that the lift machine drive is only installed, maintained, and dismantled by trained technicians. The contractor responsible for constructing the installation must select, instruct and commission these technicians for these tasks. Work on the electrical system may only be performed by trained electricians or specially instructed personnel under the supervision of a trained electrician.



DANGER!

- Debris flung through the air can cause grave injury.
 - Before putting the lift machine into operation, check that there are no impurities or tools near the lift machine.



Attention

- Loose or overloaded screw connections can cause damage.
 - Always use a calibrated torque wrench to tighten and check all screw connections for which a tightening torque has been specified.



Operation

DANGER! Touching hot surfaces can cause burns.

Do not touch the lift machine if its operating temperature is too high, or use suitable safety equipment (e.g. gloves).



DANGER!

Rotating machinery can lead to injuries. There is danger of being trapped or pulled in!
Keep a sufficient distance to rotating machinery.



<u>Maintenance</u>

DANGER!

An unintentional start of the machine during maintenance work can lead to serious accidents.
 Ensure that no one can start the machine while you are working on it.



DANGER!

Even only briefly running the machine during maintenance work can lead to accidents if the safety devices have been put out of function.

Check that all safety devices are mounted and activated.



Attention

Exceeding the permitted emergency-off moments can cause damages.

- Maintain the permitted moments even while inspecting the safety devices (e.g. safety gear).
- Avoid the loading case "springing counterweight".



Lubricants

DANGER!

Extended, intensive contact with synthetic oils can lead to skin irritations.
Avoid extended contact with oil, and clean oil off skin thoroughly.



DANGER!

Hot oil may cause scalding.
 When changing oil, protect yourself against contacting hot oil.

Attention

Mixing different lubricants can impair the lubricant properties. This can destroy the gear reducer.

- Only re-fill with the lubricant type that is in the gear reducer.
- If you wish to use another lubricant, carry out a complete oil change (with flushing).



Environment

Lubricants (oils and greases) are hazardous substances, which can contaminate soil and water.

 Collect drained lubricant into suitable receptacles and dispose of it according to the valid national guidelines.

3.4 In case of fire

The lift machine itself is not combustible. However, it usually contains a synthetic gear oil (polyglycol).

Please observe the following instructions, if the gear reducer is situated in a burning environment.

3.4.1 Suitable extinguishing agents, Protective equipment

Carbon dioxide, powder, foam, fog

DANGER!

High temperatures produce irritating steam.
Use a protective breathing apparatus.

3.4.2 Unsuitable extinguishing agents

Do not spray with water!

3.4.3 Additional Information



Environment

Prevent the penetration of the lubricant in drains, sewers, and water resources. For additional information on RENOLIN PG 220 gear reducer oil, refer to: FUCHS MINERALOELWERKE GmbH, Mannheim Tel.: +49 (0) 621 / 3701-333 ECD



Technical Specifications 4

4.1 <u>Design</u>



The most important components or parts of the lift machine are:

- Brushless servo-drive А В
 - Low-backlash planetary gear reducer
- Hollow shaft resolver С
 - Brake

Е

F G G Н 360 Ø 33,5 96

Lift machine with the handwheel for stationary installation (option):

- Handwheel
 - (only for emergency operation)
 - Safety switch (mounted on machine)
 - Hand lever

Dimensions	L1 [mm]	L2 [mm]	L3 [mm]	L4 [mm]	L5 [mm]	L6 [mm]	D1 [mm]
ECD 100	435,5	213	36	186,5	150	1,5	366
ECD 300	466	216	36	214	155	22,5	486
ECD 300A	523	272	36	215	155	22,5	486

Fig 4.2

Table 4.1

4.1.1 Low-backlash planetary gear reducer

Using the planetary gear reducer produces the following advantages:

- High transmission torques •
- Very stiff output bearings •
- Especially stable against emergency-off shocks •
- Reduced mass / mass moment of inertia
- High efficiency •
- Low weight per unit of power •
- Use of a space-saving brake •
- Possibility of actuating with a hand wheel



Fig. 4.3

4.1.2 Resolver

The hollow shaft resolver consists of two transformers connected in series. A corresponding evaluation circuit uses this to generate an incremental signal with 1024 impulses.



4.1.3 Brake

The brake is designed as a holding brake: its use as a deceleration brake is therefore **not permitted** in normal operation.



<u>Design</u>

The most important components of the brake are the rotors with friction pads (A), the anchor disc (B), the coil frame (C) and the compression springs (D).

Mode of operation

The brake is released when the magnet coil is supplied with current. In this case, the coil frame (C) and anchor disc (B) magnetically attract each other and the rotors (A) with friction pads are free.

The brake engages when the magnet coil receives no current. The compression springs (D) push the coil frame (C) and anchor disc (B) apart. Both rotors (A) with friction pads are braked.

Fig. 4.4





4.1.4 Frequency converter

With current lift technology, it is hard to imagine driving-wheel lifts without the servo controller.

In particular, the VVVF controller ("variable voltage variable frequency", current-controlled field-oriented control) finds its rightful application here.

The control property of the VVVF controller of tuning the stator current-vector so that it is perpendicular to the rotor field-vector, optimally converts the current into motor output torque. In other words, it produces optimum efficiency and almost completely eliminates reactive power.

This control process requires an exact return signal of the rotor position in relation to the stator position. The resolver mounted to the motor shaft serves this purpose.

4.2 Weight

The weight of the lift machine with driving wheel is between 130 kg and 225 kg.
The Table 5.1 in Chapter 5.2 help you in a more exact specification of the weights.

4.3 Lubricant quantities and types

Please heed the instructions in chapter 3.3.1 "General safety instructions". The gear reducer is filled with synthetic gear oil of viscosity class ISO VG 220 (Fuchs, Renolin PG 220) by the manufacturer. The amount of added oil for:

	,	
ECD 100	=	400 cm ³
ECD 300	=	800 cm ³
ECD 300A	=	800 cm ³

The table below shows all permissible oils. You can find additional information from the manufacturer at the specified Internet addresses.

Manu- facturer	Lubricant	Internet address
Aral	Degol GS 220	www.aral.de
BP	Energol SG-XP 220	www.bp.com
DEA	Polydea CLP 220	www.dea.de
Fuchs	Renolin PG 220	www.fuchs-oil.de
Klüber	Klübersynth GH 6-220	www.klueber.com
	Syntheso HT 220/	-
	Syntheso D 220 EP	
Mobil	Glygoyle 30 /	www.mobil.com
	Glygoyle HE220	
Molyduval	Syntholube G 220 EP	www.molyduval.com
Optimol	Optiflex 220	www.optimol.com
Shell	Tivela Oil WB (PG 220)	www.shell.com
Tribol	800/220	www.castrol-industrie.com/

Table 4.2

The filled lubricant and the required lubricant quantities are specified on the type plate. The ambient temperature may not be under -10 °C and not over +40 °C. Operating temperature may not exceed +90 °C.

Divergent operating conditions may make different lubricant quantities and different lubricants necessary.

• In these cases, please consult **WITTENSTEIN alpha GmbH**.

4.4 Specification overview

	ECD 100	ECD 300	ECD 300A
Motor			
Terminal voltage	560 V	560 V	560 V
Ambient temperature	-10 bis +45 °C	-10 bis +45 °C	-10 bis +45 °C
Maximum torque	93,9 Nm	108,7 Nm	164,6 Nm
No-load spood	approx.	approx.	approx.
	1600 1/min	2200 1/min	2226 1/min
Nominal torque	37,4 Nm	32 Nm	45,1 Nm
Nominal speed	1275 1/min	1812 1/min	1850 1/min
Power-on time	40 %	40 %	40 %
Gear reducer			
Gear reducer	TP 110	TP 300	TP 300
Ratio	17	31	21
Maximum starting torque	1500 Nm	2800 Nm	2600 Nm
Emergency-off torque *)	3840 Nm	7000 Nm	6500 Nm
Max. drive speed	1400 1/min	1800 1/min	1850 1/min
Max. radial force	28 kN	55 kN	55 kN
Torsional backlash	< 5 arcmin	< 5 arcmin	< 5 arcmin
Efficiency	> 98 %	> 98 %	> 98 %
Lubrication	synth. oil	synth. oil	synth. oil
Motor – gear reducer system			
Mass moment of inertia with-			
out driving wheel (relating to	211 kgcm ²	183 kgcm ²	277 kgcm ²
motor shaft)			
Mass moment of inertia with			
driving wheel (relating to mo-	244 kgcm ²	215 kgcm ²	346 kgcm ²
tor shaft)			
Overall efficiency	> 90 %	> 90 %	> 90 %
Brake mayr [®] ROBA-stop [®]			
Dual circuit fail safe brake	Z125	Z125	Z250
Braking torque	max. 2 x 65 Nm	max. 2 x 65 Nm	max. 2 x 65 Nm

Table 4.3

*) in the service life of the lift machine the emergency-stop moment may occur at most 1000 times!

The performance data are individually co-ordinated for each order and a specifications sheet is provided with the order confirmation.

The specifications must be complied with during the construction of the overall system.

5 Delivery Status, Transport, Storage

5.1 Delivery Status

For transport, the lift machines are mounted on pallets and treated with an anti-corrosion agent. They are then wrapped in film (PE).

The lift machines are additionally packed in crates for deliveries overseas. Please dispose of packing material according to the valid national regulations.

As a rule, all lift machines are filled with synthetic gear oil in the factory.



5.2 Transport

There are no special transport requirements concerning direction or positioning of the lift machine. However, the electrical components must be protected against damage.

Weight [kg]			
	ECD 100	ECD 300	ECD 300A
Lift machine with driving wheel (standard):	130	205	225
Lift machine without driving wheel:	~ 90	~ 125	~ 145
Driving wheel with fastening bolts:	~ 40	~ 80	~ 80
			Table E 1

Table 5.1



Attention

The attached hand-wheel (option) can damage the resolver during transport.
Remove the hand-wheel on the lifting machine before transport.

5.2.1 Transport using hoisting equipment



DANGER!

- Falling loads or breakage of sling equipment can cause injury.Do not stand under suspended loads.
- Bo not stand under suspended loads.
 Keep as safe a distance as possible from sling equipment.



Attention

The lift machine may be damaged if it falls or is set down too quickly.

- Only use hoisting and sling equipment which is permitted for the size / weight of your lift machine.
- When transporting the lift machine, mount an eye bolt (A) (M12 DIN 580-C15) in the bore provided for this (Fig. 5.1). It is also permissible to sling a belt through the opening in the driving wheel.
- Under no circumstances should you use the brake as an attachment point.
- Ensure that the load is slowly and carefully handled and placed.
- Never set the load down on electrical components (e.g. terminal box).
- Note that the centre of gravity can move depending on the state of assembly (with/without driving wheel).
- If you want to transport a driving wheel, sling a belt through one of the openings.



Fig. 5.1



6 Mounting, Putting into Operation

Please observe the instructions in the "General safety instructions" in 3 section 3.3.1.

Preparation 6.1



0 Remove all traces of the anti-corrosion agent before mounting the lift machine.

Attention Pressurised air can damage the gear reducer seals, and thus lead to leakage. 9 Do not blow out the flanges with pressurised air when cleaning.

The lift machines are delivered either complete or with the driving wheel separate. If required, Chapter 6.1.1 describes how to mount the driving wheel. The following table shows the materials you require to fasten the lift machine.

ECD				
Quantity	Name	Tightening torque [Nm]		
12	DIN 912 or DIN 933- M16x70-10.9 bolts	265		
12	DIN 934-M16-10 nuts	265		
24	DIN 6796-16 clamping washers	-		
		Table 6.1		

Mounting the driving wheel 6.1.1

The lift machines are delivered either complete or with the driving wheel separate. If you have to attach the driving wheel, please follow these instructions.

Check whether the bolts for mounting the driving wheel listed in the table are enclosed.

•

Lift machine	Bolts	Tightening torque [Nm]
ECD 100	12 pc. DIN 912-M10x30- 10.9, corrosion-protected	62,7
ECD 300 ECD 300A	12 pc. DIN 912-M16x30- 10.9, corrosion-protected	265
	· · · · ·	Table 6.2



Fig. 6.1

Follow the instructions in the Chap-

ter 5.2 "Transport" before you move the driving wheel with hoisting equipment.

- Thoroughly clean the fitting surfaces on the output flange (A) and driving wheel (Fig. 6.1).
- Position the driving wheel so that both oil bores are visible and insert the fastening bolts.
- 0 Alternately tighten the bolts crossways in at least two steps (tightening torques according to Table 6.2).

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6.1.2 Mounting the complete lift machine

DANGER!

- **WITTENSTEIN alpha GmbH** does not accept any liability for damage or injury resulting from the use of non-approved car frames.
- Only use car frames designed for this application and which have been expressly approved in writing by WITTENSTEIN alpha GmbH.



- Please observe the notes in chapter
 5.2 "Transport" before you move the lift machine using hoisting equipment.
- Ensure that there is vibration insulation between the car frame and cabin.
- Mount the lift machine directly to the car frame.
- Position the lift machine so that the brake stirrup faces upwards.
- Mount all fastening bolts, clamping washers and nuts.
- Alternately tighten the bolts crossways in at least two steps (tightening torques according to Table 6.2).



DANGER!

The lift cables may not be lubricated under any circumstances.
Never grease the ropes.

The brake is factory-set to the prescribed torque (Table 6.2). Therefore a setting of the brake is not required. You can lower the braking torque to suit the requirements of the lift system.

You can find the instruction sheet(chapter 10.1) of the standard brake in the appendix of the operational manual.



Attention

DANGER!

An increase of braking torque is not allowed.

6.2 Installing the electrical equipment



9

Electrocution!

Only work on the wiring when the power is disconnected.

6.2.1 Lift machine wiring diagram



Fig. 6.3



6.3 Putting into operation

- Please observe the instructions in the "General safety instructions" in section 3.3.1.
- ∇ Thoroughly check the whole elevator drive for visible signs of external damage or loss of oil.
- ∇ Check the tightening torques as described in chapter 8.3.2.
- ∇ Check the lubricant as described in chapter 8.3.3.



DANGER!

The brake is a safety device. If it fails, serious injury and damage can occur.
Perform a functional test before starting operation.

Do not put the lift machine into operation before it has been determined that the brake functions perfectly.

7 Operation, Emergency Operation

7.1 Operation conditions

Please observe the instructions in the "General safety instructions" in section 3.3.1.

The lift machine must be installed in a clean and dry environment. Coarse dust and liquids of all kinds impair its function.

The ambient temperature should be between -10 °C and +45 °C. The gear reducer temperature may not exceed +90 °C.

The lift machine is designed for a power-on time of 40% as occurs in normal operation. This corresponds to 240 trips per hour.

The brake is a statical holding brake, therefore its use as a deceleration brake during normal operation is not permitted. The braking torque is factory pre-set and must be checked prior to putting into operation and at every maintenance interval.

The braking torque is designed so that if a component of the brake fails, adequate braking power remains assured.



7.2 Emergency Operation

7.2.1 Hand-powered emergency operation

This chapter is only for lifts with direct access to the drive (stationary assembly).



DANGER!

The brake is a safety component. Brake failure could lead to serious injuries and damage. Only use the hand lever in emergencies.

• Only move the elevator cage at low speeds.



DANGER!

Due to the low friction in the transmission unit, the elevator cage may start moving as soon as the hand lever is released.

- Use a mode switching device to cut the servo controller off from the motor and short-out the motor windings U, V and W. The motor then functions as a regenerative brake.
- Always carry out these safety measures before using the hand lever.
- Make sure there is an indicator mark to show whether the elevator cage is present in a door-opening zone.

If the machine is equipped with a handwheel the elevator cage can also be moved manually after releasing the hand lever.

Operation with the handwheel (option)



- Fit the handwheel (A) and secure with a screw-bolt.
- Hold the hand wheel securely to prevent unintentional motion when the brake is released.
- Pull the hand lever (B) (e.g. via remote control) and hold to release the brake.
- Make sure that the elevator cage is only moved slowly. To brake, let go of the hand lever.
- Once the elevator cage has reached a standstill with released brake, it can be moved in the required direction with the hand wheel on the motor.
- Stop the elevator cage at a door-opening zone.



Attention

Do not fix on the handwheel during normal operation – this could damage the elevator drive.
 Always remove the handwheel after emergency operation.

- Cancel the motor short circuit switch after emergency operation.
- The short-circuit wiring should be integrated into the elevator system safety circuit.



7.2.2 Electrically-powered emergency operation

This chapter is only for lifts without direct access to the drive.

The electric emergency operation can be activated via a control cabinet situated at one of the floors.

DANGER!

Set the selector (A) to emergency operation "I".

Press the button (B) in the switchboard cabinet only in jog

Immediately stop the cabin if the floor level indicator (D)

Set the selector switch (A) for normal operation again to

Evacuate the passengers at this stop by opening the doors. Travelling past a stopping point (recognizable by the extinguished light of the level indicator) is prohibited.



During emergency operation, no high speeds may be used.

- Release the brake only in short intervals (jog mode).
 - You can interrupt the electric control of the brake any time by pressing the key (B).

The brake is opened for short intervals by a timing relay. The pre-set time is 2 sec.

mode.

lights up.

position "0".



Fig. 7.2

7.2.3 Automatic Evacuation System (AES)

WITTENSTEIN alpha GmbH provides battery-powered remote control operation with the aid of an AES auxiliary controller, for roomless elevators with no direct access to the drive unit.

0 Please refer to the separate instruction manual for information about operation of the AES.

8 Maintenance

8.1 Shutdown, preparation

- Please observe the instructions in the "General safety instructions" in section 3.3.1.
- Shut the lift machine down prior to beginning any maintenance work.

Oil change and flushing of the gear reducer do not comprise standard maintenance work. The machine has to be running to perform both these tasks.

ECD

8.2 Inspection Schedule

Maintenance work / see	Maintenance per	riods		
Chapter	At start-up	After 500 operat-	Every 3	Yearly
		months	months	
Visual Inspection / 8.3.1	X	X	X	
Checking the Tighten- ing Torques / 8.3.2	Х	X		X
Lubricant inspection / 8.3.3	х	X		x
Brake Inspection / 8.3.4	х	X	x	
Checking the electrical contacts / 8.3.5				x
Inspecting the driving wheel for signs of				x
wear / 0.3.0				Table 8.1

8.3 Maintenance Work

8.3.1 Visual Inspection

- Check the entire lift machine by carrying out a thorough visual inspection for exterior damage
- The radial shaft seals are wear parts. Thus check the gear reducer also for oil leakage at every visual inspection.
- Solution For general information about radial shaft seals please contact our associate partner www.simrit.de.
- If you have any questions about maintenance please consult our Customer Service (see 1.1).

8.3.2 Checking the Tightening Torques



- Check the tightening torque of the twelve fastening bolts (A) of the driving wheel (Fig. 8.1).
- You can find the prescribed tightening torques in the Table 6.2 in Chapter 6.1.1.
- Check the tightening torque of the twelve bolts (B) of the machine fastenings.
- You can find the prescribed tightening torques in the Table 6.1 in Chapter 6.1
 Image: State of the state of

Fig. 8.1



8.3.3 Lubricant

Please observe the instructions in the "General safety instructions" in secti-3 on 3.3.1.

Under normal circumstances, the lubricant filling is designed for the service life of the gear reducer. Inspection of the fill level is done to discover hidden damage. You can find a list of permitted lubricants in Chapter 4.3.

Lubricant inspection



- 9 Turn the driving wheel so that one of the plugs (A) is in a horizontal position and the second (B) lies above it (Fig. 8.2).
- 0 Open the control plug (A).
- If no lubricant flows out, the fill level is too low. Please refer to Fill level too low!
- 3 If a small amount of oil runs out, the fill level is correct and you may refit the plug as described below:

Fig. 8.2

- 0 De-grease the plug, and coat this with a bonding agent (e.g. Loctite 573).
- 0 Fit the plug with a tightening torgue of 12 Nm.

Fill level too low!

- Open the plug of the control bore (A) as described in the section Lubricant inspecti-• on.
- Only re-fill with the lubricant type that is in the gear reducer. 3
- Open the top plug (B) (Fig. 8.2) and fill with lubricant. 9
- Use a funnel and a hose to facilitate filling. \odot
- ∇ The correct fill level is achieved when lubricant emerges from the control bore (A) (Fig. 8.2).
- 0 De-grease the plug, and coat this with a bonding agent (e.g. Loctite 573).
- Fit the plugs with a tightening torque of 12 Nm.



Oil Change

If you wish to use another lubricant, carry out a complete oil change (with flushing):

- Heat up the gear reducer to operating temperature.
- Turn the driving wheel so that one of the plugs is in the lowest position.
- Drain the lubricant off through the lowest plug.
- Open the plug situated at top so that the gear reducer is ventilated.
- There is now only residual oil and dirt in the gear reducer. We recommend that these be flushed out:
 - Screw in the bottom plug, fill with lubricant and screw in the top plug.
 - Let the lift machine run briefly, and drain the lubricant off again.
- Turn the driving wheel so that one of the plugs (A) is in a horizontal position and the second (B) lies above it (Fig. 8.2).
- Open the plug (B) (Fig. 8.2) as described in the section Lubricant inspection.
- Fill with the correct quantity of lubricant and check the fill level at the control bore (A).
- $ECD 100 = 400 \text{ cm}^3$
- $ECD 300 = 800 \text{ cm}^3$

ECD 300A = 800 cm³

The correct fill level is achieved when lubricant emerges from the control bore (A).

- De-grease the plug, and coat this with a bonding agent (e.g. Loctite 573).
- Fit the plugs with a tightening torque of 12 Nm.

8.3.4 Brake Inspection

• Check the brake type plate for which type has been installed in the lift machine.

mayr[®] ROBA-stop[®] Z125 / Z250

As a standard, the lift machines are equipped with the following brakes:

- ECD 100 / ECD 300.....brake size 125 and
- ECD 300A.....brake size 250

The nominal clearance is:

- for the brake size 1250,5^{+0,25} mm and
- for the brake size 250**0,6**^{+0,25} mm
- Exchange the rotors immediately if the borderline clearance of:
- 1,2 mm for the brake size 125 or
- **1,4 mm** for the brake size 250, is reached.

The brake torque must be in accordance to the identification plate (tolerance: +40%/-20%).

O You can find the instruction sheet (chapter 10.1) of the standard brake in the appendix of the operational manual.

8.3.5 Checking the electrical contacts

• Check the electrical contacts for technically flawless functioning.



8.3.6 Inspecting the driving wheel for signs of wear

- Inspect the driving wheel for visible signs of wear.
- Have worn driving wheels immediately replaced.
- Observe the instructions in the Chapter 5.2 "Transport" before you move the driving wheel with hoisting equipment.

Dismantling



- Bring the lift system to a standstill. Make sure that the lift machine or components thereof can be disassembled without endangering the entire system.
- ∇ Check whether the driving wheel can be taken off without having to remove the lift machine from the car frame.
- If necessary, disassemble the lift machine.
- Remove the twelve fastening bolts and take the driving wheel off of the output flange. (Fig. 8.3)

Fig. 8.3

Assembly

Use only driving wheels that have been recommended by **WITTENSTEIN alpha GmbH**. The monitoring of wear is the responsibility of the operator or the authorised regulatory agency.

- Perform the assembly according to the description in Chapter 6.1.1.
- If you must remove the lift machine from the car frame, perform the assembly according to the description in Chapter 6.1.2.

8.4 Start-up after maintenance work

- Clean the outside of the lift machine.
- Assemble all safety devices.
- Do a test run, before re-releasing the machine for operation.



8.5 Malfunction list (troubleshooting)

Seek an immediate solution if you notice lubricant loss, increased noise during operation, or increased operating temperatures.

Error	Possible cause	Solution
Increased operating	Selected construction too weak	Check the technical specifications
temperature	for task nominal operating ex-	Check the technical specifications.
temperature	ceeded	
	Motor is heating the gearhead	Check the controller's settings
	Ambient temperature too high	Ensure adequate cooling.
	Demograd hearings	Diagon consult our technical convice
increased noise dur-	Damaged pearings	department
ing operation		
	Server of the motor apple im	Chook the motor line
	Screen of the motor cable im-	Check the motor line
Loop of lubricant	property laid.	Wine off discharged lubricent and
LUSS OF IUDITCATI	Lubricant quantity too high	continue to watch the gearboad. Lu-
		bricant discharge should stop after a
		short time
		Short time.
	Seals not tight	Please consult our technical service
	J	department.
Motor does not start	Power supply interrupted	Check the connections
	Wiring of motor and/or encoder	Check the wiring of the motor
	or resolver not correct	phases and the motor encoder or
		resolver
	Incorrect controller parameters	Check that the motor parameters are
		suitable for the implemented gear
		drive.
Wrong direction of	Incorrect controller parameters	Check the control parameters.
rotation		
Motor is droning and	Wiring faulty	Check the wiring
has a high power	Drive is blocked	Check the drive
consumption.	Error in the encoder line	Check the encoder line
	Incorrect controller parameters	Check that the motor parameters are
		suitable for the implemented gear
	Ducha da cara tanta cara	drive.
	Brake does not release	(see error "Brake does not release")
Brake does not re-	Incorrect brake connection	Check the connection for correct
lease		polarity and voltage
	Short circuit in the coll or at body	Please consult our tecnnical service
Holding broke aline	OI DIAKE COII	department.
Holding brake slips	exceeded	
Inaccurate position-	The lifting capacity is not given.	Please consult our technical service
ing of the cabin		department.
	Brake acts too soon.	Check the brake's settings.
Jerky starts and	Erroneous settings of the brake	Check the settings of the brake
stops	times.	times.

Table 8.2

ECD



9 Supplementary information

If you should need supplementary information (e.g. disassembly, or disposal), please contact our Customer Service (Chapter 1.1).

10 Appendix

10.1 Operating Manual for Brake

Installation and Operating Instructions for ROBA-stop[®]-Z Dual Circuit Fail Safe Brake Type 892.10_.0 Sizes 60 – 2000

(B.8.2.0.GB)

Please read and observe this Operating Instruction carefully!

A possible malfunction or failure of the brake and any damage may be caused by not observing it.

Table of contents:

- Page 1: Table of contents - Manufacturer's declaration
- Page 2: Safety regulations
- Page 3: Safety regulations
- Page 4: Brake views - Parts list
- Page 5: Application
 - Table 1: Friction power
 - Assembly conditions
 - Assembly
 - Table 2: Brake torques and tightening torques

Page 6: - Noise damping

- Temperature sensor
- Electric connection of the brake
 - ON-switching of the brake
 - OFF-switching of the brake

Page 7: - Brake inspection

- Inspection dual circuit function
- Bake torque adjustment
- Table 3: Brake torque adjustment and rotor thickness new

- Page 8: Release monitoring
 - Wiring diagram
 - Function
 - Assembly
 - Adjustment and functional inspection of the micro switch
 - Table 4: Feeler gauges
 - Illustration release monitoring
 - Table 5: Maximum/minimum switch capacity
- Page 9: Wear monitoring
 - Wear monitoring
 - Wiring diagram
 - Assembly
 - Adjustment and inspection of the micro switch
 - Functional inspection with feeler gauge
 - Illustration wear monitoring sizes 60 125
 - Illustration wear monitoring sizes 250 2000

Page 10: - Table 6: Maximum/minimum switch capacity wear monitoring sizes 60 - 125

- Table 7: Maximum/minimum switch capacity wear monitoring sizes 250 - 2000
- Table 8: Measuring strip thickness and number of spacer sleeves
- Maintenance
- Breakdowns

Manufacturer's declaration

The product is to be seen as an option or component for installation into machines or equipment according to the machinery directive 98/37/EC. The machinery (product) must not be put into service until the machinery into which it is to be incorporated has been declared in conformity with the provisions of the applicable EC-directives.

The product corresponds to the low voltage directives 73/23/EEC.

The product corresponds to the elevator directives 95/16/EC.

The observance of the relevant EMV-guideline 89/336/EEC is to be guaranteed.

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Installation and Operating Instructions for ROBA-stop[®]-Z Dual Circuit Fail Safe Brake Type 892.10_.0 Sizes 60 - 2000 (B.8.2.0.GB)

With this safety regulations no claim on completeness is raised!



Attention! Hazardous conditions when contacting hot connections and components.

Only qualified and well-trained specialists should work on the units to avoid any personal injury or damage to machinery.

Danger!

If the electromagnetic brake is used in an improper way.

If the electromagnetic brake has been modified or reconverted. If the relevant standards of the safety or installation conditions are not observed.



Attention!

The installation and operating instructions must be read carefully and all safety regulations observed before installation and initial operation as danger to personnel and damage to machinery may be caused.

The electromagnetic brakes are developed and manufactured in conformance with the temporally known rules of the technology and they are basically considered as fail-safe at the time of the delivery.

Attention:

Based on the guideline 94/9/EC (ATEX-guideline) this product is not suitable for the application in potential explosive areas without evaluation of the conformity.

Observe!

- Only qualified and well trained specialists who are familiar with the transport, installation, initial start-up, maintenance and operation of the units as well as with the relevant standards may carry out the corresponding works.
- Technical data and indications (Type tag and documentation) are to be kept absolutely.
- Connection of the supply voltage according to the Type tag.
- Supply connections must not be released and assembly, maintenance or repair must not be made when the unit is eneraized.
- Electrical leads must not be under tension when connected.
- Check current carrying components regarding damage before installation. Current carrying components must not be in contact with water or other liquids.
- The braking torque does not exist any more, if the friction lining and/or friction surface come into contact with oil or grease.

Intended use

mayr[®]-brakes are determined for the use in machines and equipment and may only be used for the ordered and confirmed purpose.

The use beyond of the corresponding technical indications is considered as incorrect.

Notes to the electromagnetic compatibility (EMV)



There are no emissions from the listed single components within the meaning of the EMVguideline 89/336/EEC, however, increased interference levels can occur when working components are operated outside their specification limits as for example, energising the brake with rectifiers, phase demodulators or ROBA®-switch in the line side.

Therefore, the installation and operating instructions must be read carefully the EMV-guidelines are to be observed

Conditions of the unit



> The catalogue values are reference values, which can deviate in some cases. When selecting the brake, site of installation, braking fluctuations, permissible friction work, behaviour during run-in, wear and ambient conditions are to be carefully checked and agreed with the unit manufacturer.

Observe!

- П The mounting and connecting dimensions at the site of installation must match to the size of the brake.
- The brakes are designed for a relative switch on period of 100 %.
- The brakes are designed for a dry running only. Should oil, grease, water or similar materials come in contact with the friction surfaces the braking torque could be reduced.
- The braking torque depends on the corresponding running-in condition of the brake.
- The metallic surface of the brake is protected against corrosion arranged by the factory.

Protection class I

The protection is not only based on the basis isolation, but that all conductive components must be connected with the protective conductor (PE) of the fixed installation. In case the basis isolation fails, no contact voltage can remain existing. (VDE 0580).

Protection (mechanically) IP 10:

Protection against large body surfaces, against large foreign matters >50 mm diameter. No water protection.

Protection (electrically) IP 54:

Dust-tight and protection against contact as well as protection against spraying water from all directions.

Ambient temperature −20 °C up to +40 °C

Attention!

The torque could be severely reduced in case of temperatures over or under the freezing point due to dewing. The user must provide corresponding counter measures.

Thermal class F (+155 ℃)

The magnetic coil as well as the casting compound is designed for a max. operating temperature of +155 °C.

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Installation and Operating Instructions for ROBA-stop[®]-Z Dual Circuit Fail Safe Brake Type 892.10_.0 Sizes 60 – 2000 (B.8.2.0.GB)

With this safety regulations no claim on completeness is raised!

Necessary protective measures to be undertaken by the user:

Cover all moving parts to prevent personnel injury as squeezing and seizing and catapulting.

Cover dangerously hot magnetic parts to prevent contact. Attach a conductive connection between magnetic part and electrical conductor (PE) of the fixed installation

(protection class I) to prevent electrical shock and inspection conforming to standards of the unified protective connection to all contactable metal components.

Protection against high inductive cut-off peaks according to VDE 0580/2000-07, par. 4.6 by fitting varistors, spark quenching units or similar, in order to prevent damage of coil insulations or the burn-off of the switching contact (this protection is included in the $mayr^{\mathbb{P}}$ -rectifiers).

Provide additional necessary safety measures against corrosion of the brake, if they are used in extreme ambient conditions or in the open with direct atmospheric influences.

Measures against freezing from armature disc and rotor with high humidity and deep temperatures.

Following directives have been used:

98/37/EC	Machinery directive
73/23/EEC	Low-voltage directive
89/336/EEC	EMV-guideline
95/16/EC	Elevator guideline
EN 81-1	Safety regulations for the construction and installation of passenger lifts and goods elevators
BGV C1	(up to now VGB 70) Safety regulations for theatre and stage applications
DIN VDE 0580	Electromagnetic units and components, general regulations

Following standards are to be observed:

EN292-1 and 2	Security of machines
DIN EN61000-6-4	Noise emission
EN12016	Interference resistance (for elevators, escalators, moving walkways)
EN60204	Electrical equipment of machines

Liability

□ The information, notes and technical data indicated in the documentation were at the time of printing on the latest state.

Claims on brakes already supplied cannot be made valid from it.

- □ Liability for damages and breakdowns is not taken over, with
 - ignoring the installation and operating instructions,
 - improper use of the brakes,
 - arbitrary modification of the brakes,
 - inappropriate working at the brakes,
 - handling or operating errors.

Guarantee

- □ The warranty conditions correspond to the sales and supply conditions of Chr. Mayr GmbH + Co. KG.
- □ Defects are to be advised immediately after detection to $mayr^{@}$.

Test mark

CE corresponding to the low voltage directive 73/23/EEC.

Marking

 $mayr^{\mathcal{P}}$ -components are clearly identified by means of the content of the Type tags:



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Installation and Operating Instructions for ROBA-stop[®]-Z Dual Circuit Fail Safe Brake Type 892.10_.0 Sizes 60 - 2000 (B.8.2.0.GB)



Fig. 1

Fig. 2

Fig. 3

Parts List

(Only mayr[®] original parts are to be used)

1 Gear hub (assembly)

- 1.1 O-ring 1
- O-ring 2 1.2
- Brake body (assembly) 2
- Magnetic coil 2.1
- Double end stud 3
- 4 Hexagon nut (Quality- 10)
- Rotor 1 5
- Rotor 2 6
- 7 **Distance sleeve**
- 8 Thrust spring
- Cable 4-leads 9 Connection coil blue/brown Connection PTC temperature sensor 90°C grey/grey
- 10 Reference gauge (2x)
- Release monitoring, co (opt. dependent on Fig. 6) 11
- **Micro switch** 11.1
- Hexagon head cap screw 11.2
- 11.3 Hexagon nut
- 11.4 Spring washer
- 11.5 Cap screw
- 11.6 Adapter plate
- Cap screw 11.7

Subject to technical alterations!

- Flange plate (option dependent on type) 12 or machine wall (custome made)
- 12.1 Cap screw
- 13 Armature disk
- Cap screw 14
- Hexagon nut 15
- 16 Brake plate
- Noise damping (assembly) 17
- Hand release (assembly) 18
- 18.1 Hand release bracket
- Hand release lever 18.2
- 18.3 Hexagon nut
- Wear monitoring (assembly) 19 (option dependent on Type Figs. 7 / 8)
- 19.1 Micro switch
- 19.2 Hexagon head cap screw
- 19.3 Hexagon nut
- 19.4 Spring washer
- 19.5 Cap screw
- 19.6 Adapter plate (only for sizes 60 - 125)
- 19.7 Cap screw (only for sizes 60 - 125)
- Type tag 20



Installation and Operating Instructions for ROBA-stop[®]-Z Dual Circuit Fail Safe Brake Type 892.10_.0 Sizes 60 – 2000

Usage

As a holding brake with Emergency-stop braking actions (max. 10 per day).

- In enclosed buildings (in tropical area, in case of high humidity with long downtimes and sea climate only with special arrangements).
- □ In a dry running environment.
- Mounting position horizontal (vertical on request).
- In a clean environmental area (coarse dust as well as liquids of all kinds impair the brake function, => attach cover).

Table 1

Size	Max. friction power [J]	With speed n [rpm]
60	20000	1500
125	30000	1500
250	50000	1500
500	80000	1500
1000	100000	750
2000	120000	750

Assembly conditions

- □ The eccentricity of the shaft end relative to the fixing hole P.C.D. must not exceed 0,2 mm.
- □ The positioning tolerance of the threads for the double end stud (3) must not exceed 0,2 mm.
- □ The deviation In the true running of the screw-on surface to the shaft must not exceed the permissible true running tolerance acc. to DIN 42955 R: for sizes 60 500: 0,05 mm, for sizes 1000 2000: 0,063 mm

Reference diameter is the pitch circle diameter for brake attachment.

Larger deviations can cause a drop of the torque, continuous wear of the rotor and overheating.

□ The hub and shaft fits are to be selected so that the hub teeth do not distort. It can clamp the rotor onto the hub causing a problem with the brake, (recommended hub-shaft fit H7/k6).

□ The dimension "A" (Fig. 3 and Table 2) is to be maintained.

Rotors and braking surfaces must be free of oil and grease. There has to be a suitable counter friction face (steel or cast iron). Sharp-edged interruptions of the friction face have to be avoided.

Recommended surface quality in the range of the friction surface Ra = 1,6 μ m.

Especially mounting areas made of cast iron arranged by the customer are additionally to be drawn off with a fine abrasive paper (granulation ≈ 400)

Brake must be checked as to supply condition (complete brake) according to type indication.

Assembly (Figs. 1 - 3)

- Mount gear hub, compl. (1) to the shaft acc. to Fig. 3, observe dim. "A" acc. to Table 2 and Fig. 3, observe the complete supporting length of the keyway, and lock it axially (e.g. with a retaining ring).
- If necessary, assemble flange plate (12) using the cap screws (12.1) (observe tightening torque acc. to Table 2).
- Push rotor 1 (5) manually with a slight pressure via O-rings (1.1 and 1.2) onto the gear hub (1) (rotor hub nose away from machine wall/flange plate). Rotor must slide smoothly over hub. No damage of the O-rings.
- Manually turn double end stud (3) with coated side of thread until coating (screw in limitation) into the tapped holes of the brake screw-on surface (machine wall) or with flange plate until contact (secure it with LOCTITE 243).
- 5. Push brake body (2) over double end studs (3).

 Push rotor 2 (6) manually with a slight pressure (via O-ring) (1.2) onto the gear hub (1). (Rotor collar shows in direction of flange plate/machine wall). Rotor must slide smoothly over hub. No damage to the O-ring.

- 7. Push brake plate (16) over double end studs (3).
- 8. Uniformly attach the brake using the hexagon nuts (4). (Tighten hexagon nuts with a torque wrench) Observe tightening torque according to Table 2.
- 9. Check air gap "a" acc. to Table 2. Nominal air gap must be given.
- 10. Check air gap single circuit "b" at the rotors 1 and 2. The corresponding air gap according Table 2 must be given.

Brake size	Brake torque ^{.+40% / -20%} / Max. speed Type 892.100 M [Nm] n [rpm]		Dim. "A" [mm]	Tightening torque hexagon nut (Pos. 4) [Nm]	Tightening torque cap screw (Pos.12.1) [Nm]	Nom- air gap "a" complete (braked) [mm]	Limit air gap [mm]	Inspection air gap "b" released single circuit [mm]
60	70 (2x 35)	3000	3	12	9	0,45 ^{+0,25}	1,0	min. 0,15
125	140 (2x 70)	3000	3	29	21	0,50 ^{+0,25}	1,2	min. 0,15
250	280 (2x 140)	3000	3	58	42	0,60 ^{+0,25}	1,4	min. 0,2
500	540 (2x 270)	1500	3	98	75	0,7 ^{+0,3}	1,6	min. 0,2
1000	1100 (2x 550)	750	6	250	180	0,8 ^{+0,3}	1,8	min. 0,25
2000	2380 (2x 1190)	750	7	650	550	1,1 ^{+0,4}	2,0	min. 0,3

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Table 2:

Installation and Operating Instructions for ROBA-stop[®]-Z Dual Circuit Fail Safe Brake Type 892.10_.0 Sizes 60 – 2000

Noise damping (17)



Attention! The noise damping is adjusted at the factory. An adjustment is only possible by specialists.

Temperature sensor (9)

ROBA-stop[®]- dual circuit fail safe brakes are supplied with a PTC sensor (DIN 44081/44082).

The temperature monitoring or signal evaluation is made via a posistor tripping device attached by the customer.

(Connection: brake cable leads grey/grey).

If the brake is used as part of the protective device for the ascending elevator cage against an overspeed (inspected design ABV 547/1) or as brake for theatre and stage applications, an evaluation of the PTC-sensor in the elevator range must be made by the customer. For the theatre and stage applications the signal must only be evaluated, if the starting torque of the drive motor is bigger than the complete torque of the brake.

Electric connection of the brake

In safety-relevant applications the regulations for a risk reduction and error prevention (e. g. redundancy, diversification, monitoring etc.) are to be observed with an electrical control.

Operating voltage of the coil:

The D.C. current with a tolerance of \pm 10 % according to DIN IEC 60038 is indicated on Type tag. Additionally it is stamped on the brake body (2).

This current can be generated via rectifiers (half-wave or bridge rectifiers) as well as D.C. supply units.

The connection is made via a four-conductor cable.

Four conductor cable connection

Wires: blue and brown Coil connection (operating voltage).

Wires: grey and grey

Connection of the fitted posistor.



Attention!

Do not apply any coil voltage! \Rightarrow Damage of PTC sensor and coil.

Earthing:

The dual circuit brake is designed for protection class I, i.e. a well conductive connection of all conductive elements is to be arranged with the earthed conductor.

The earth connection (marked) is attached on the brake body (2) which must be made via an M4-cap screw. It has to be observed that all contact faces are bare and well conductive.

An inspection conforming to standards of the through-going protective connection to all metal components is to be carried out.

ON/OFF – switching of the brake Important!

The operating performance of the brake depends on the used kind of wiring. Therefore the following kind of wirings must be observed.

Switching-ON

Switching-ON is either made on the AC current side with the switch S3 and a bridge via the terminals 3 and 4 (in this case there are no switches S1 and S2)

or

on the AC and DC current sides with the switches S1 and S2 (in this case there is no switch S3).

ROBA[®]-switch fast actring rectifiers with overexcitation voltage for example can be used to achieve fast release times (disconnection times). In this case the brake is energised within an adjustable overexcitation time (up to max. 2 secs.) with a higher operating voltage allowing a faster release of the brake. As soon as the overexcitation time has passed the brake is energised with the coil voltage.

Switching-OFF

On the AC current side with the switch S3 and a bridge over the terminals 3 and 4.

Observe!

Application for standard operation of the elevator.

Silent switching, but longer engaging time of the brake (approx. 6-8 times longer than with switching-OFF on the DC current side).

Switching-OFF

On the DC current side with the switches S1 and S2

Observe!

- Noisy switching but short engaging time of the brake.
- Application for emergency-stop operation!

Important!

In case of switching-OFF on the D.C. current side the coil must be protected against transient overvoltages by means of suitable protective wiring according to VDE 0580. (included in $mayr^{\mathcal{P}}$ -rectifiers).

Fuse protection of the unit F1

A miniature fuse for protection against short circuits must be provided in the supply mains by the customer.

Switching example (Fig. 4) Notice!

The half-wave rectifier shown on Fig. 4 can be taken as switching example and can be replaced by others, as for example bridge rectifiers, ROBA[®]-switch fast acting rectifier, powr supply units. The fuse size must be adapted to the corresponding brake size.



(Example) Fig. 4

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Installation and Operating Instructions for ROBA-stop[®]-Z Dual Circuit Fail Safe Brake Type 892.10 .0 Sizes 60 - 2000

Brake inspection (Figs. 1 - 3)

(Before initial start of the brake).

Inspection of the complete air gap (nominal air gap "a") braked

(several times at the brake circumference) acc. to Table 2

- Inspection of air gap, single circuit ("b" released) brake circuit 1 internal and brake circuit 2 external (several times at the brake circumference) according to Table 2.
- Inspection of the hand release function By deflection of the hand release (18) via a manual force linings are unloaded. The brake is free up to a residual torque of approx. max. 5 %.

Indication:

When the hand release is actuated a switch signal of the release monitoring system is not guaranteed.

Brake inspection (dual circuit braking function) The ROBA-stop[®] - Z brake has a double safe (redundant) brake system. If one brake circuit fails 50% of the braking torque, however, maintains. The single brake circuit is inspected by means of an included reference gauge (10).



Attention! Should the elevator move after tilting the reference gauges (10) or not decelerate sensibly during the braking process, immediately reverse rotate the reference gauges and remove it. The dual circuit braking function is not guaranteed. Stop elevator.

Disassemble brake and check it.

Take reference gauges (attached to motor or gear box respectively)

Inspection: reference gauges are marked Size of gauge must correspond with brake size. (Exception: brake size 2000 = reference gauge size 1000)

Inspection brake circuit I (mounting side Fig. 2): a.) Push both reference gauges, displaced 180° to each other, with the flattened surfaces between brake body (2) and mounting area (12). Rotate reference gauges 90° and hold in this position (no spring force on rotor 1 (5)). b.) Release emergency braking (with max. load and max.

speed) and check stopping distance acc. to specifications for passenger lifts.

c.) Turn reference gauges to the flattened surface and remove from the brake.

Table 3:

Size	Braking torque adjustment "M" [Nm] and dimension "X" [mm] Type 892.100							Rotor thickness "new"					
	M [Nm]	"X" [mm]	M [Nm]	"X" [mm]	M [Nm]	"X" [mm]	M [Nm]	"X" [mm]	M [Nm]	"X" [mm]	M [Nm]	"X" [mm]	[mm]
60	35	2,2	40	3,3	50	5,1	60	7,0	65	7,9	70	8,7	9,4 _{-0,05}
125	70	1	85	2,2	100	3,5	115	4,7	130	5,9	140	6,5	10,5 _{-0,05}
250	140	1,5	170	3,0	200	4,5	230	6,0	260	7,5	280	8,5	12,5 _{-0,05}
500	270	6,7	325	8,6	385	10,6	440	12,5	500	14,6	540	16,0	15,45 _{-0,05}
1000	550	13,4	700	16,1	800	17,8	900	19,6	1000	21,4	1100	23,5	18,5 _{-0,05}
2000	1190	16	1425	18,5	1665	21,5	1885	24,5	2125	27,5	2380	30,5	18,5-0,05

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Inspection brake circuit II (brake flange side Fig. 2):

a.) Push both reference gauges, displaced 180° to each other, with the flattened surface between armature disc (13) and braking plate (16). Rotate reference gauge by 90° and hold in this position (no spring force on rotor 2 (6)). b.) Release emergency braking (with max. load and max.

speed) and check stopping distance acc. to specifications for passenger lifts.

c.) Turn reference gauge to the flattened surface and remove from the brake.

Attach references gauges to the motor or gear box again.

Braking torgue adjustment (Fig. 5 and Table 2)

ROBA-stop[®] – Z brakes are adjusted to the nominal torque or braking torque requested in the order at the factory.

The braking torque can be reduced continuously up to 50 % via two cap screws (14) (size 2000: 4 pcs.) together with the hexagon nuts (15) by the aid of the dimension "X" (Fig. 5 and Table 3). It has to be observed that both screws are adjusted uniformly and the hexagon nuts are locked again.



Installation and Operating Instructions for ROBA-stop[®]-Z Dual Circuit Fail Safe Brake Type 892.10_.0 Sizes 60 – 2000 (B.8.2.0.GB)

Release monitoring (11) Fig. 6

ROBA-stop[®] – Z brakes are supplied with adjusted release monitoring (adjustment acc. to type).

If the brake is used as part of the protective device for the ascending elevator cage against an overspeed (inspected design ABV 547/1) or as brake for theatre and stage applications, a release monitoring is prescribed.

A micro switch (11.1) gives signal: <u>"brake opened or brake closed</u>" for every change of the brake condition.

An evaluation of the signal of both conditions must be made by the customer.

From the time when the brake is energised a period of three times the separation time must be passed, before the micro switch signal of the release monitoring system is evaluated.



Function

When the magnetic coil is energised (2.1) in the brake body (2) the armature disc (13) is attracted to the brake body (2), a micro switch (11.1) gives signal, the brake is released.

Note:

When the hand release (18) is actuated a switch signal of the release monitoring system (11) is not guaranteed.

Assembly (at the factory Fig. 6)

Attention:

Brake attached at the assembly device or mounting face-brake, mounting position horizontally, fastened with nominal tightening torque and <u>de-energised</u>.

- Put LOCTITE 243 on hexagon head cap screw (11.2) at the beginning of the thread and screw it into the armature disc (13) until contact of the screw head. Head of screw shows in direction of the brake body (2).
- 2. Locate hexagon nut (11.3) with spring washer (11.4).
- Screw micro switch (11.1) with cap screws (11.7) to the adapter plate (11.6) (M= 0,2Nm). Put UHU endfest 300 between micro switch and adapter plate. (Secure cap screws with UHU endfest 300)
- Screw adapter plate (11.6) with two cap screws (11.5) (M4x8 – DIN912) to the brake body (2) on the side of the release monitoring (Fig. 6) (lock it with LOCTITE 243).
- 5. Screw brake at the machine wall (12) or assembly device with nominal tightening torque.

Adjustment and inspection of the micro switch ((pos. 11.1) Fig. 6 at the factory):

- Attention!! Brake must not be connected to supply voltage. 1. Connect inspection lamp or measuring unit (diode inspection) at
- the micro switch (11.1) (make contact = blue and black).
- 2. Turn hexagon head cap screw (11.2) in direction of the micro switch (11.1) until contact of the micro switch tappet.
- Tighten hexagon nut (11.3) so far that the hexagon head cap screw (11.2) is put under pretension of the spring washer (11.4).
- Push feeler gauge (loose feeler sheet) dimension "c" (Table 4) between switch tappet and hexagon head cap screw (11.2).

- Turn hexagon head cap screw (11.2) in direction of the micro switch (11.1), until signal "ON", turn it back until signal "OFF". Lock hexagon head cap screw (11.2) with hexagon nut (11.3).
- Cycle 2x; if necessary re-adjust it according to item 5. energised ⇒ signal "ON", de-energised ⇒ signal "OFF",
- Add additional feeler gauge (loose feeler sheet) 0,1mm to the dimension "c" => cycle 1 x, de-energised ⇒ signal "ON". Remove feeler gauge.
- Put feeler gauge dimension "d" between brake body (2) and armature disc (13) in the range of the micro switch. energised ⇒ signal "ON", de-energised ⇒ signal "OFF",

Table 4

	Dimension Feeler gauge [mm]				
Size	c	d			
Z60	0,15	0,2			
Z125	0,2	0,2			
Z250	0,2	0,25			
Z500	0,25	0,3			
Z1000	0,3	0,4			
Z2000	0,3	0,4			



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<u>3 leads: length 500mm</u> grey = break contact blue = make contact black = input

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Mark hex. head cap screw (11.2) hexagon nut (11.3) and cap screws (11.5) with securing lacquer.

Fig. 6 (Sizes 60 - 2000)

Table 5:Maximum switch capacityMicro switch (Pos.11.1)

AC sv	vitch capacity	DC switch capacity		
Voltage [VAC]	Resistance load [A/R _{Last}]	Voltage [VAC]	Resistance load [A/R _{Last}]	
125	5	bis 30	5	
250	5	125	0,5	
	-	250	0,25	

Minimum switch capacity: 0,12VA (> 12V, > 10mA) Contact material: silver

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Installation and Operating Instructions for ROBA-stop[®]-Z Dual Circuit Fail Safe Brake Type 892.10_.0 Sizes 60 – 2000

Wear monitoring (19) Figs. 7 and 8

ROBA-stop® - Z brakes (depending on type) are supplied with factory adjusted wear monitoring.

A wear monitoring is recommended with reduced braking torques and/or and operation with fast acting rectifiers (overexcitation) due to the increased drawing behaviour of the brake.

Function

The air gap "a" between brake body (2) and armature disc (13) is increased due the wear of the rotors (5 and 6).

If the limiting air gap (acc. to Table 2 is achieved the contact of the micro switch (19.1) switches over and gives signal. The rotors (5+6) must be exchanged.

The customer must evaluate the signal.



Before exchange of the rotors (pos. 5 and 6)

- Clean brake, remove abrasive dust with the aid of air pressure.
- Check rotor thickness "new" (acc. to Table 3).

Attention!

Exchange of the rotors (pos. 5 and 6) The exchange of the rotors is made in the opposite sequence of the

brake assembly.



In case of hoisting drives the drive-brake must be free of load.

Otherwise there is the risk of the load falling!

Assembly (at the factory Figs. 7 and 8) Attention! Brake must not be connected to supply voltage

Sizes 60 - 125

- 1. Put LOCTITE 243 on hexagon head cap screw (19.2) at the beginning of the thread and screw it into the armature disc (13) until contact of the screw head. Head of screw shows in direction of the brake body (2).
- 2. Locate hexagon nut (19.3) with spring washer (19.4).
- 3. Screw micro switch (19.1) with cap screws (19.7) to the adapter plate (19.6) (M= 0,2Nm). Put UHU endfest 300 between micro switch and adapter plate. (Secure cap screws with UHU endfest 300)
- 4. Screw adapter plate (19.6) with two cap screws (19.5) (M4x8 - DIN912) to the brake body (2) on the side of the release monitoring (Fig. 7) (lock it with LOCTITE 243).
- 5. Screw brake to the machine wall (12) or assembly device with nominal tightening torque, put measuring strip "Z" between all distance sleeves (7) and machine wall (12) or assembly device according to Table 8.

Sizes 250 - 2000:

- 1. Screw hexagon head cap screw (19.2) into the armature disc (13) until contact of the screw head. (head of screws shows in direction of the brake body (2)).
- 2. Slightly locate hexagon nut (19.3).
- Screw micro switch (19.1) using cap screws (19.5) to the brake body (2) at the wear monitoring side (Fig. 8) (secure cap screws (19.5) with LOCTITE 243).
- 4. Screw brake to the machine wall (12) or assembly device with nominal tightening torque, put measuring strip "Z" between all distance sleeves (7) and machine wall (12) or assembly device according to Table 8.

Adjustment and inspection of the micro switch

((pos. 19.1) Figs. 7 and 8 at the factory):

Attention!! Brake must not be connected to supply voltage

- Connect signal lamp or inspection unit (adjustment diode inspection at the micro switch (pos. 19.1). (Break contact: leads grey and black)
- Turn hexagon head cap screw (pos. 19.2) in direction of the 2 micro switch (pos. 19.1) until this switches.
- Turn hexagon head cap screw (pos. 19.2) back again until 3. contact of the micro switch (pos. 19.1) switches over again.
- Lock hexagon head cap screw (pos. 19.2) by the aid of the 4 hexagon nut (pos. 19.3) (secure it with LOCTITE 243).

Operational check

with feeler gauge (Figs. 7 and 8) at the factory:

- Push feeler gauge dim. = 0,1mm between switch tappet and hexagon head cap screw (Pos.19.2) (observe straight position of the switch tappet). Signal lamp must signal "OFF".
- Release brake, remove measuring stripe. 2.
- Brake can be assembled with wear monitoring system. 3.
- 4. Attach indication label wear monitoring system.



Mark hexagon head cap screw (19.2) with securing lacquer





Mark hexagon head cap screw (19.2) hexagon nut (19.3) and cap screws (19.5) with securing lacquer

Fig. 8 (Size 250 - 2000)

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Installation and Operating Instructions for ROBA-stop[®]-Z Dual Circuit Fail Safe Brake Type 892.10_.0 Sizes 60 – 2000

Table 6: Maximum switch capacity micro switch sizes 60 - 125

AC sw	vitch capacity	DC switch capacity		
Voltage [VAC]	Resistance load [A/R _{load}]	Voltage [VDC]	Resistance load [A/R _{load}]	
125	5	up to 30	5	
250	5	125	0,5	
	-	250	0,25	

Minimum switch capacity: 0,12 VA (>12V, >10mA) Contact material: silver

Table 7: Maximum switch capacity micro switch sizes 250 - 2000

Wechselstr	omschaltleistung	Gleichstromschaltleistung			
Spannung [VAC]	Widerstandslast [A/R _{Last}]	Spannung [VDC]	Widerstandslast [A/R _{Last}]		
220	000 1 E		0,5		
230 1,5	24	2			

Minimum switch capacity: 0,12 VA (>12V, >10mA) Contact material: silver

Table 8: Measuring stripe "Z" and number of distance sleeves

Brake size	Dim. "Z" [mm]	Number of distance sleeves (Pos.7)
60	0,4	3
125	0,4	3
250	0,5	3
500	0,5	3
1000	0,6	3
2000	0,6	3

Breakdowns:

Failures **Possible reasons** Remove Brake does not release False voltage measured at the rectifier Apply correct voltage Exchange ROBA[®]-switch fast acting rectifier ROBA[®]-switch fast acting rectifier failed Air gap too big (rotor worn down) Exchange lining carrier Coil interrupted Exchange brake Brake engages with delay in Switch to DC side Brake is switched to AC side case of Emergency stop.

Maintenance

ROBA-stop[®]- Z brakes are virtually maintenance free. The friction lining is robust and wear resistant ensuring that a long service life of the brake is obtained.

The friction lining, however, is a wearing item, and in the case of emergency OFF braking actions, the <u>following inspections</u> <u>should be made at regular periods as below:</u>

- Inspection of the braking torque or deceleration (inspection brake circuit separately (Fig. 2 and Table 2)).
- □ Inspection of the nominal air gap or limiting air gap respectively (Fig. 3 and Table 2).

The intervals for inspection are to be determined according to the application by the customer, or to be carried out with the TÜV inspection the latest.. The inspection of the wearing condition of the rotors 1 and 2 (pos. 5+6) is made by checking the air gap "a" (Fig. 3 and Table 2). Immediately after reaction of the wear monitoring or when the limit air gap is achieved the rotors are to be exchanged.

Before exchanging the rotors (pos. 5and 6)

- Clean brake, remove abrasive dust with the aid of air pressure.
- Check thickness of rotor "new", (acc. to Table 3). Exchange of the rotors (pos. 5 and 6)

The exchange of the rotors is made in the opposite sequence of the brake assembly.



Attention!

In case of hoisting drives the drive brake must be free of any load. Otherwise there is the risk of the load falling!

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