



EC type-examination certificate

Certificate no.: ABV 844
Notified body: TÜV SÜD Industrie Service GmbH
 Westendstr. 199
 80686 München - Germany
**Applicant/
 Certificate holder:** WARNER Electric Europe
 7, rue de Champfleu
 BP 20095
 49124 St. Barthélemy D'Anjou - France
Date of application: 2010-01-04
Manufacturer of the test sample: WARNER Electric Europe
 7, rue de Champfleu
 BP 20095
 49124 St. Barthélemy D'Anjou - France
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
Type: ERS VAR07 SZ600/___
Test laboratory: TÜV SÜD Industrie Service GmbH
 Prüflaboratorium für Produkte der Fördertechnik
 Prüfbereich Aufzüge und Sicherheitsbauteile
 Westendstr. 199
 80686 München - Germany
**Date and
 number of test report:** 2010-03-12
 ABV 844
EC-directive: 95 / 16 / EC
Result: The safety component conforms to the essential safety
 requirements of the Directive for the respective scope of
 application stated on page 1 and 2 of the annex to this
 EC type-examination certificate.
Date of issue: 2010-03-15

Certification body for lifts and safety components
 Identification number: 0036

C. Rührmeyer
 p. p. Christian Rührmeyer





Industrie Service

**Enclosure to the EC type-examination certificate
No. ABV 844 dated 2010-03-15**

Authorised manufacturer – Production sites (Stated: 2010-03-15):

WARNER Electric Europe

7, rue de Champfleur
BP 20095
49124 St. Barthelemy D'Anjou - France

Altra Industrial Motion Shenzhen Co. Ltd.

Dabo Industry Zone
18 Huanzhen Road
Bogang County, Shajing Town
Baoan District, Shenzhen City
518104 Guangdong province - China (PRC)

- END OF DOCUMENT -

Annex to the EC type-examination certificate no. ABV 844 dated 2010-03-15

1 Scope of Application

1.1 Permissible brake moment when the braking device acts on the shaft of the traction sheave while the car is moving upward 811 - 1688 Nm

1.2 Maximum tripping speed of the overspeed governor and maximum rated speed

The maximum tripping speed and the maximum rated speed must be calculated on the basis of the traction sheave's maximum tripping rotary speed and maximum rated rotary speed as outlined in sections 1.2.1 and 1.2.2 taking into account traction sheave diameter and car suspension.

$$v = \frac{D \times \Pi \times n}{60 \times i}$$

v = speed (m/s)
 D = Diameter of the traction sheave from rope's center to rope's center (m)
 Π = 3,14
 n = Rotary speed (min^{-1})
 i = Ratio of the car suspension

1.2.1 Maximum tripping rotary speed of the traction sheave 600 min^{-1}

1.2.2 Maximum rated rotary speed of the traction sheave 522 min^{-1}

2 Conditions

2.1 Since the braking device represents only a part of the protection device against overspeed for the car moving in upwards direction an overspeed governor as per EN 81-1, paragraph 9.9 must be used to monitor the upward speed and the braking device must be triggered (engaged) via the overspeed governor's electric safety device.

Alternatively, the speed may also be monitored and the braking device engaged by a device other than an overspeed governor as per paragraph 9.9 if the device shows the same safety characteristics and has been type tested.

2.2 The movement of each brake circuit (each anchor) is to be monitored separately and directly (e.g. by micro switches). If a brake circuit fails to engage (close) while the lift machine is at standstill, next movement of the lift must be prevented.

2.3 In cases where the lift machine moves despite the brake being engaged (closed), the lift machine must be stopped at the next operating sequence at the latest and the next movement of the lift must be prevented (The car may, for example, be prevented from travelling by querying the position of the micro switch which is used to monitor the mechanical movement of the brake circuits, should both brake circuits fail to open).



Industrie Service

- 2.4 According to EN 81-1, paragraph 9.10.4 d a braking device must act directly on the traction sheave or on the same shaft on which the traction sheave is situated in the immediate vicinity thereof.

If the braking device does not act in the immediate vicinity of the traction sheave on the same shaft on which the traction sheave is situated, the standard is not complied with. In cases involving shaft failure between the traction sheave and the braking device, safety would no longer be ensured by the latter if the lift car made an uncontrolled upward movement.

Shaft failure in this area must therefore be ruled out by appropriate design and sufficient dimensioning. In order to eliminate or reduce influencing factors which may lead to failure wherever possible, the following requirements must be satisfied:

- Minimization of bending length between traction sheave and braking device or traction sheave and the next bearing (the next bearing must form part of the drive unit)
 - As far as possible, prevention of a reduction in load-bearing capacity in the area of reversed bending stress (reduction in load-bearing capacity caused, for example, by stress concentration and cross-sectional reductions)
 - Between traction sheave and braking device the shaft must be continuous (made from one piece)
 - Cross-sectional influences on the shaft are only permitted if they act on the following connections: traction sheave – shaft, braking device – shaft, torque of the transmitting component – shaft (situated between traction sheave and braking device).
- 2.5 The manufacturer of the drive unit must provide calculation evidence that the connection braking device – shaft, traction sheave - shaft and the shaft itself is sufficiently safe. The calculation evidence must be enclosed with the technical documentation of the lift.

3 Remarks

- 3.1 The brake moment effectively adjusted of one brake circuit will be marked at the blank after the type designation ERS VAR07 SZ600/___.
- 3.2 The permissible braking moments must be applied to the lift system in such a manner that they do not decelerate more than $1 g_n$, if the empty car is moving upwards.
- 3.3 In the scope of this EC 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.

This EC type-examination only refers to the requirements pertaining to brake devices as per EN 81-1, paragraph 9.10. Checking whether the requirements as per paragraph 12.4 have been complied with is not part of this EC type-examination.

- 3.4 In order to provide identification and information about the design and its functioning drawing No. 1 12 107273, dated 04 January 2010 is to be enclosed with the EC type-examination certificate and the Annex thereto. The installation conditions and connection requirements are presented or described in separate documents.
- 3.5 The EC type-examination certificate may only be used in connection with the pertinent annex and the list of the authorized manufacturers (according to enclosure). This enclosure shall be updated and re-edited following information of the certificate holder.

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

Les cotes sans indication de tolérances sont des cotes nominales.
 Untoleranced dimensions are nominal dimensions.

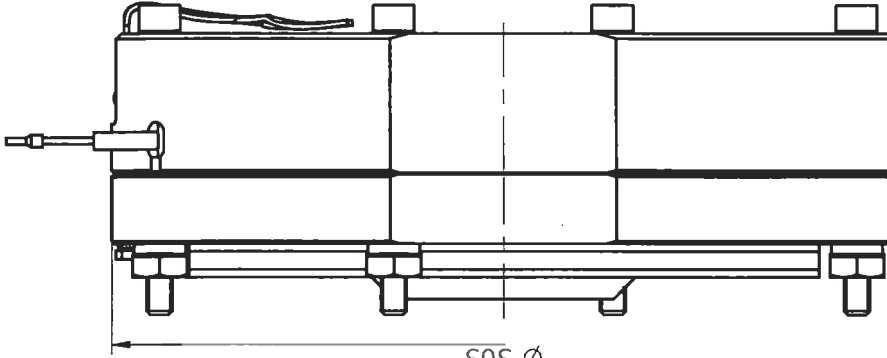
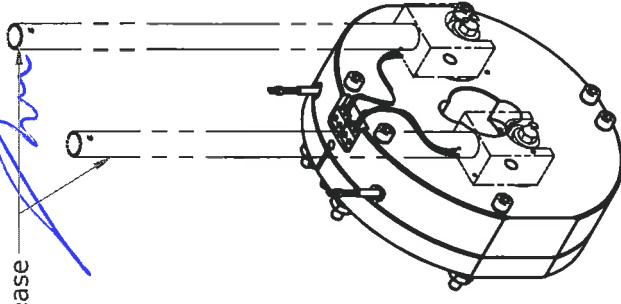
NOTES

15. März 2010

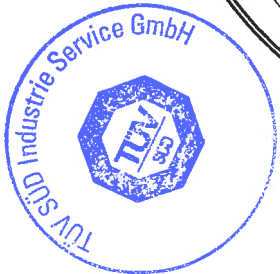
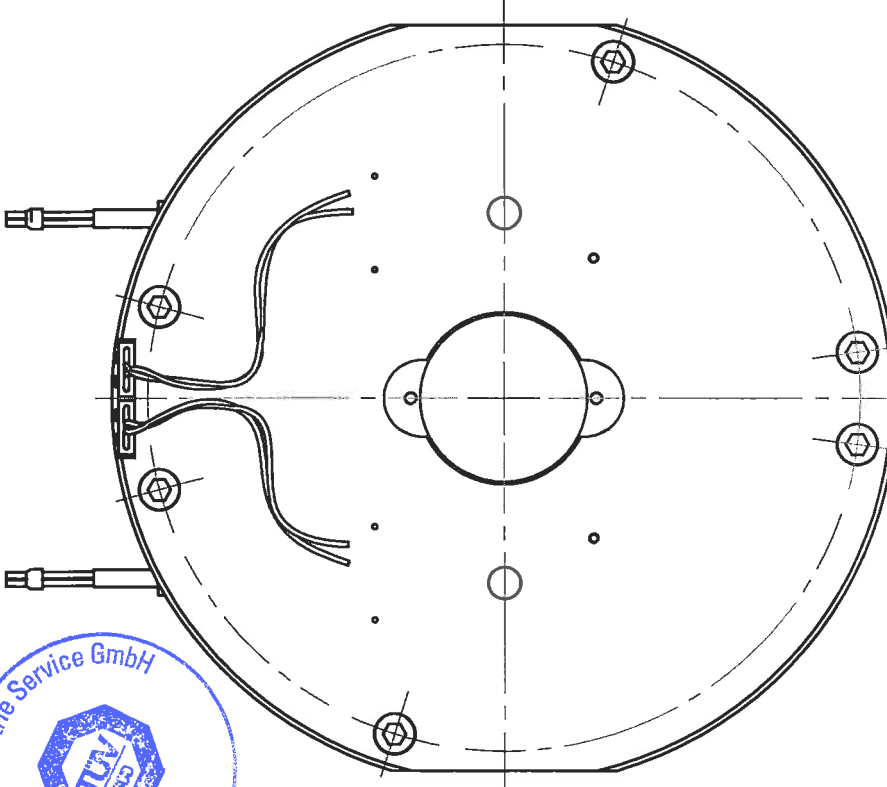
- GEPRÜFT -

TÜV SÜD Industrie Service GmbH
 Zentralbereich Förder-Technik-Sonderbauten
 Abteilung Aufzüge und Sicherheitsbauteile
 Weetendstr. 169, D-80336 München
 Der Sachverständige

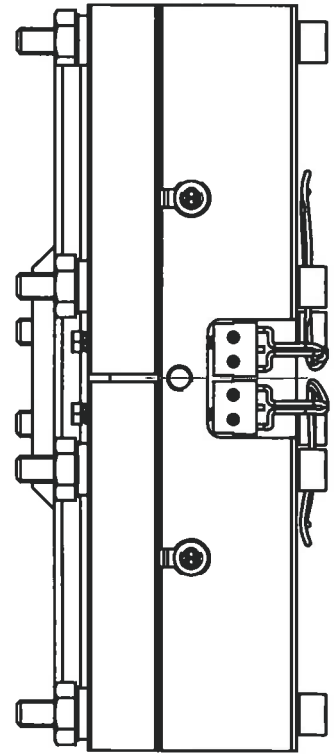
Hand release
 (option)



Ø 303



TUV DIFFUSION



| | | | |
|------------------|--|--|-----------|
| Client/customer: | | Customer ref.: | |
| Ms (Nm) : | | Dimensions | In mm |
| Md (Nm) : | | Manual/Notice : | SM |
| n Md (min-1) : | | Mass : | Scale : / |
| n max (min-1) : | | Insulation class (°C) : | |
| U (Vdc) : | | Ce plan est la propriété de Warner Electric Europe. Il ne peut être divulgué ni reproduit entièrement ou partiellement, sans autorisation écrite. | |
| P20°C (W) : | | This document is the property of Warner Electric Europe. It is not to be disclosed or reproduced totally or partially, without written permission. | |

Warner
 Electric
 Europe

| | | | | | |
|---|----|----------|--------------------|----------------|-----|
| FM | LT | REVISION | DATE | By | Ch. |
| | | | Drawn : G. Ferrand | Date: 04.01.10 | |
| | | | Checked: JcJ | Date: 04.01.10 | |
| Design: Frein électromagnétique Electromagnetic brake | | | | | |
| Type: ERS VAR07 SZ600/--- | | | | | |
| N° 1 12 107273 | | | | | |
| A3 | | | | | |



Type-examination certificate

Certificate no.: ESV 844

Certification office: TÜV SÜD Industrie Service GmbH
Westendstr. 199
80686 München - Germany

**Applicant/
certificate holder:** WARNER Electric Europe
7, rue de Champfleür
BP 20095
49124 St. Barthélemy D'Anjou - France

Date of application: 2011-06-22

Manufacturer of the test sample: WARNER Electric Europe
7, rue de Champfleür
BP 20095
49124 St. Barthélemy D'Anjou - France

Product: Braking element acting on the shaft of the traction sheave, as a part of the protection device against unintended car movement

Type: ERS VAR07 SZ600/_ _ _

Test laboratory: TÜV SÜD Industrie Service GmbH
Prüflaboratorium für Produkte der Fördertechnik
Prüfbereich Aufzüge und Sicherheitsbauteile
Westendstr. 199
80686 München - Germany

**Date and
number of the test report:** 2011-07-11
ESV 844

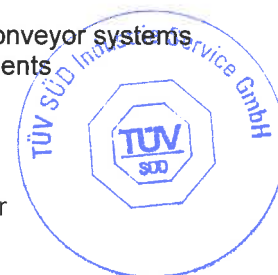
Examination basis: EN 81-1:1998 + A3:2009 (D), issue December 2009

Result: The safety component conforms to the requirements of examination basis for the respective scope of application stated on page 1 - 2 of the annex to this type-examination certificate.

Date of issue: 2011-07-12

Certification office for products of conveyor systems
Lifts and safety components

C. Rührmeyer
Christian Rührmeyer



Annex to the type-examination certificate no. ESV 844 dated 2011-07-12

1 Scope of application

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

| Minimum nominal brake torque* [Nm] | Maximum nominal brake torque* [Nm] | Maximum Response times** [ms] | | |
|---------------------------------------|---------------------------------------|----------------------------------|-----------------|-----------------|
| | | t ₁₀ | t ₅₀ | t ₉₀ |
| 2 x 550 = 1100 | | 80 | 108 | 135 |

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, t₅₀ optionally calculated $t_{50} = (t_{10} + t_{90})/2$ or value taken from the examination recording

1.2 Assigned execution features

- Type of powering / deactivation Continuous current / continuous current end
- Brake control Serial or parallel
- Maximum air gap 0.65 mm
- Damping elements YES
- Overexcitation YES
- Maximum tripping speed 600 rpm

2 Conditions

- 2.1 The above mentioned safety component represents only part of a protective equipment against unintended movement of the elevator car. Only in combination with a detecting and triggering component (two separate components also possible), which must be subjected to an own type examination, can the system created fulfil the requirements for a safety component in accordance with Annex F.8, EN 81-1:1998 + A3:2009 (D).
- 2.2 The safety component is used in combination with the brake device as part of the ascending car over-speed protection means and as a drive brake.
- 2.3 The installer of a lift must create an examination instruction in accordance with D.2 p) of EN 81-1:1998 + A3:2009 (D) for lift(s) 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).
- 2.4 The dimension configuration of the lift system must be designed as regards the brake torques in such a way that the permissible value of deceleration does not exceed 1 g_n in either direction. Excluded are decelerations, which are caused by an instantaneous roller safety gear up to a rated speed of the lift system of 0.63 m/s for instance.

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



- 2.5 The traction and its variance must be taken into account as regards its braking distance (transferable power / torque) and included in the calculation.
- 2.6 For installer of a lift, the compliance of the component with the type examined component and the assured nominal brake torques and response times must be confirmed in writing (e. g., type plate and/or supplement in the conformity declaration).
- 2.7 The information evaluation for self-monitoring must prevent an operational starting of the lift in the event of a fault.
- 2.8 According to the norm requirements, the brake element of the protective device must impact directly on the traction sheave or on the same shaft in the immediate vicinity of the traction sheave.

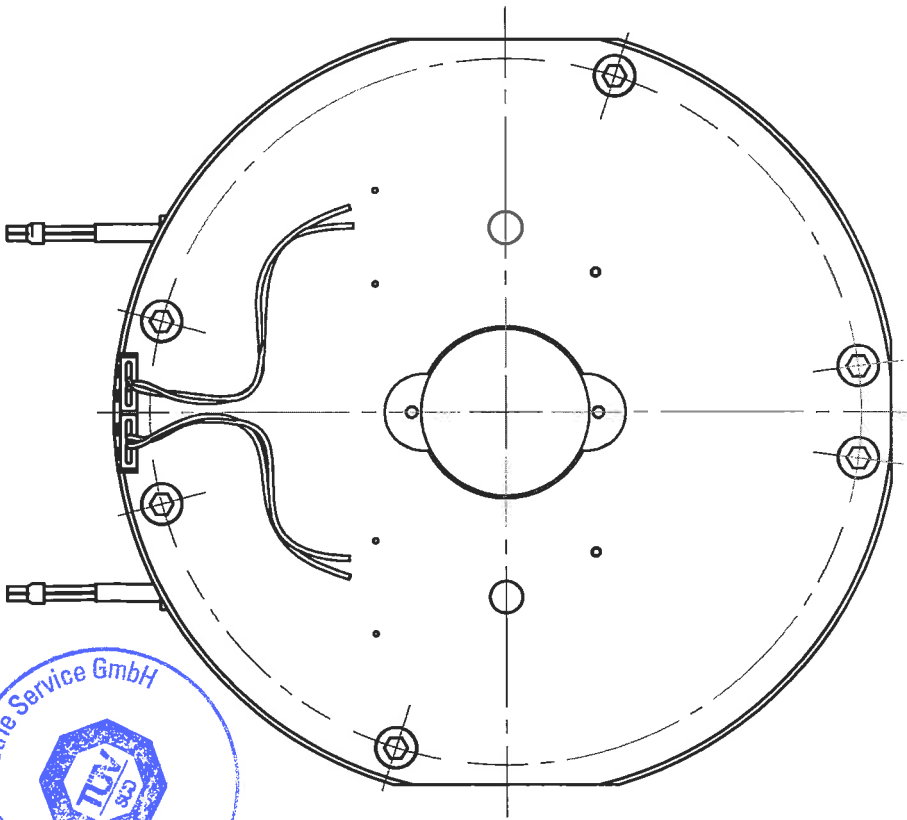
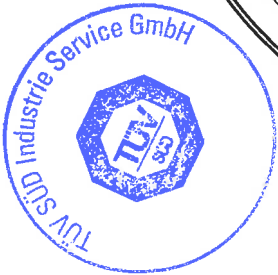
If the brake element does not impact in the immediate vicinity of the traction sheave on the same shaft, on which the traction sheave is also arranged, a deviation from the norm exists. A failure of the shaft in the area between the traction sheave and the brake element must be ruled out using corresponding construction designs and sufficient measurements. The manufacturer of the entire drive must prove the sufficient safety of the connection brake element – shaft and traction sheave – shaft as well as the shaft itself in calculations. This proof must be added to the technical documentation of the lift.

3 Remarks

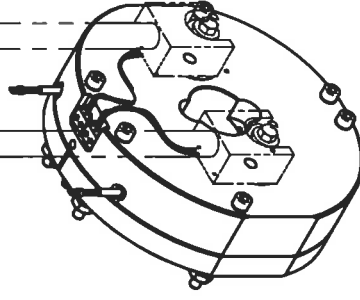
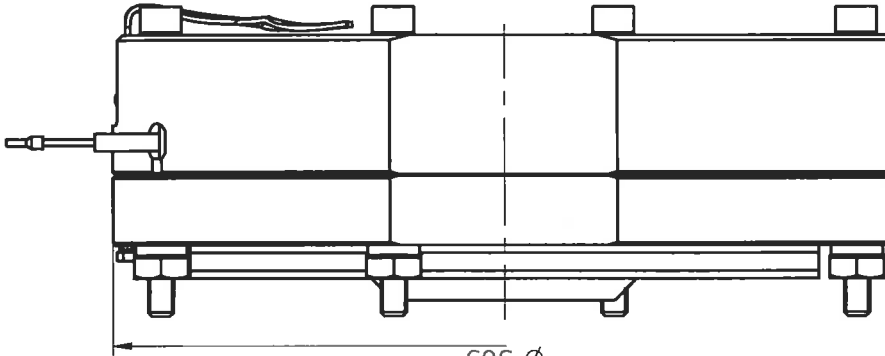
- 3.1 As part of the type examination, it was detected that the brake element has a redundant design and that the correct function is monitored by sensors.

The examination of compliance with all requirements under Section 12.4 [EN 81-1:1998 + A3:2009 (D)], deterioration of the brake torques/breaking forces due to wear and tear and the operation-related change of the drive capability are not part of this type examination.

This type-examination refers to the partial requirements for the protective equipment against unintended movements of the elevator cabin only under EN 81-1:1998 + A3:2009 (D), Section 9.11.
- 3.2 In order to provide identification, information about the basic design and functioning and to show the environmental conditions and connection requirements, drawing with the relevant latest identification from the associated EC type-examination certification ABV 844/X is to be enclosed with the type-examination certificate and the annex thereto.
- 3.3 The EC type-examination certificate may only be used in connection with the pertinent annex and the list of the authorized manufacturers (according to enclosure of the corresponding EC type-examination certification no. ABV 844/X).



Ø 303



Hand release
(option)

Der Sachverständige

15. März 2010

- GEPRÜFT -

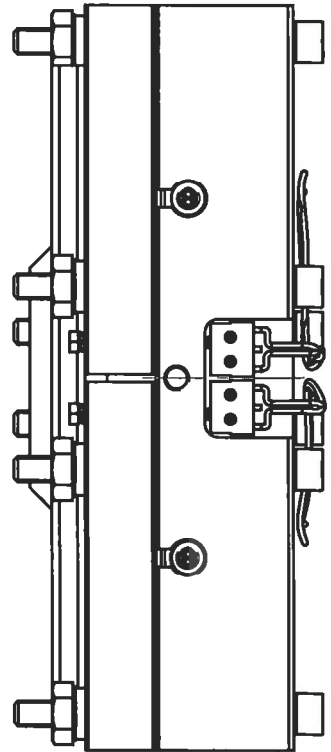
TÜV SÜD Industrie Service GmbH
Zentralbereich Fördertechnik-Sonderbauten
Abteilung Aufzüge und Sicherheitsbauteile
Westendstr. 169, D-60508 München

NOTES

Les cotes sans indication de tolérances sont des cotes nominales.

Untoleranced dimensions are nominal dimensions.

TUV DIFFUSION



| | | | |
|------------------|--|--|----|
| Client/customer: | | Customer ref : | |
| Ms (Nm) : | | Dimensions in mm : | |
| Md (Nm) : | | Manual/Notice : | SM |
| n (min-1) : | | Mass : | |
| n max (min-1) : | | Scale : | / |
| U (Vdc) : | | Insulation class (°C): | |
| P20°C (W) : | | Ce plan est la propriété de Warner Electric Europe, il ne peut être divulgué ni reproduit entièrement ou partiellement, sans autorisation écrite. | |
| | | This document is the property of Warner Electric Europe. It is not to be disclosed or reproduced totally or partially, without written permission. | |

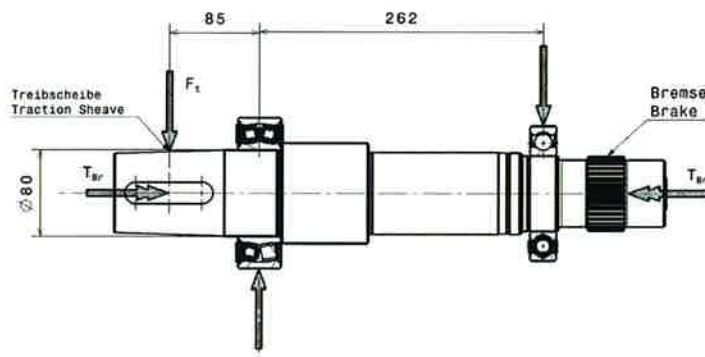
Warner
Electric
Europe

| | | | | | |
|----|----|--|------------|-------|----------|
| FM | LT | REVISION | DATE | By | Ch. |
| | | | | | |
| | | Drawn : | G. Ferrand | Date: | 04.01.10 |
| | | Checked: | lcj | Date: | 04.01.10 |
| | | Design: Frein électromagnétique | | | |
| | | Electromagnetic brake | | | |
| | | Type: ERS VAR07 SZ600/--- | | | |
| | | N° 1 12 107273 | | | |
| | | A3 | | | |

ThyssenKrupp Aufzugswerke
Certificate concerning the examination of traction sheave shaft calculation including shaft to collar connections

Neuhausen / September 26, 2011

Lift machine type: **PMC145 L2**
Brake type : **ERS VAR07 SZ600**
 according to EC type-examination ABV 844
Manufacturer: ThyssenKrupp Aufzugswerke GmbH
 Bernhäuser Str.45, 73765 Neuhausen a.d.F.
Object examined: Calculation of traction sheave shaft including shaft to collar connections
Examination basis: DIN743, Roloff / Matek 1994 (DIN254)



Design drawing: 6251 000 0252 of 30.03.2011
Material: C45R +N (1.1201)

Belastungsdaten :

| Machine | Max. Shaft load F_t | Nominal torque T_{Nenn} | Nominal brake torque T_{Br} | Max. brake torque $1,6 \times T_{Br}$ |
|------------------|--------------------------|------------------------------|----------------------------------|--|
| | (kN) | (Nm) | (Nm) | (Nm) |
| PMC145 L2 | 32 | 423 | 2 x 550 | 1760 |

Examination result:

For the examination calculations were carried out based on the examination basis.
 The result was that the traction sheave shaft and the shaft to collar connections were designed according the maximum load data.
 The remarks in the maintenance instructions are to be observed.

The conditions mentioned in annex 2.5 of the EC type-examination certificate no. ABV844 are herewith fulfilled.

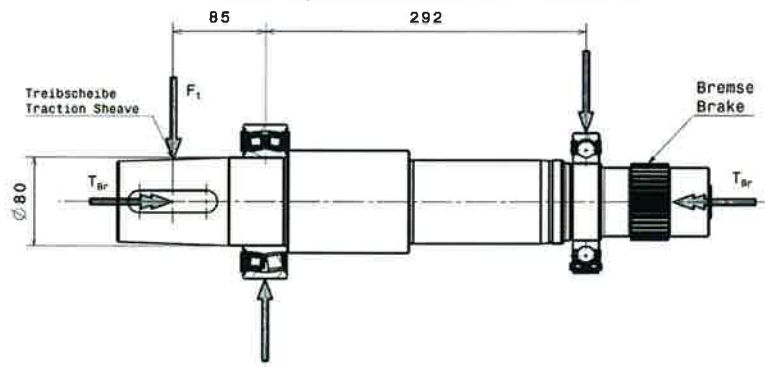

 (Executive board)


 (Head of Development of Drive Systems)

ThyssenKrupp Aufzugswerke
Certificate concerning the examination of traction sheave shaft calculation including shaft to collar connections

Neuhausen / September 26, 2011

Lift machine type: **PMC145 XL2**
Brake type : **ERS VAR07 SZ600**
 according to EC type-examination ABV 844
Manufacturer: ThyssenKrupp Aufzugswerke GmbH
 Bernhäuser Str.45, 73765 Neuhausen a.d.F.
Object examined: Calculation of traction sheave shaft including shaft to collar connections
Examination basis: DIN743, Roloff / Matek 1994 (DIN254)



Design drawing: 6251 000 0251 of 30.03.2011
Material: C45R +N (1.1201)

Load data :

| Maschine | Max. Shaft load F_t | Nominal torque T_{Nenn} | Nominal brake torque T_{Br} | Max. brake torque $1,6 \times T_{Br}$ |
|-------------------|--------------------------|------------------------------|----------------------------------|--|
| | (kN) | (Nm) | (Nm) | (Nm) |
| PMC145 XL2 | 30 | 423 | 2 x 550 | 1760 |

Examination result:

For the examination calculations were carried out based on the examination basis.
 The result was that the traction sheave shaft and the shaft to collar connections were designed according to the maximum load data.

The remarks in the maintenance instructions are to be observed.

The conditions mentioned in annex 2.5 of the EC type-examination certificate no. ABV844 are herewith fulfilled.



.....
(Executive board)



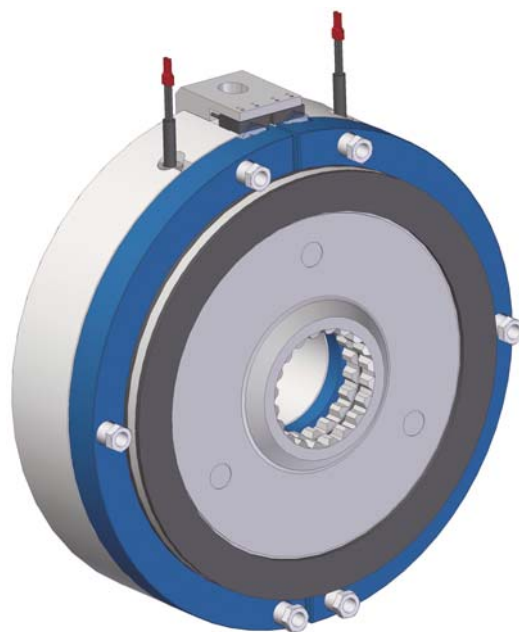
.....
(Head of Development of Drive Systems)

SM431gb - rev 02/11

Electrically Released Brake

ERS VAR07 SZ 420/350

ERS VAR07 SZ 600/550



Declaration of conformity:

During the design of this product, the EU directives applicables were taken into account.

An attestation of conformity is available on request.

For Incorporating the product, the manufacturer of a machine or system need to take into account the EU directives applicables.

Summary of the directives and standards used:**Directives:**

2006/95/EC Low voltage equipment directive 95/16/EC Lifts directive

2004/108/EC Electromagnetic compatibility directive

Standards:

DIN VDE 0580 Electromagnetic devices and components, General requirements

EN 81-1 Safety rules for the construction and installation of lifts - Part 1: Electric lifts

NFC 79300 Industrial electrical apparatus. Electromagnetic apparatus for mechanical applications. Requirements.

CONTENTS



| | | |
|-----|-------------------------------------|-----|
| 1 | Technical specifications | 3 |
| 2 | Precautions and restrictions on use | 4 |
| 2.1 | Restrictions on use | 4 |
| 2.2 | Precautions and safety measures | 4 |
| 3 | Installation | 4 |
| 3.1 | Transport - storage | 4 |
| 3.2 | Handling | 4 |
| 3.3 | Installation | 4-5 |
| 4 | Maintenance | 5 |
| 4.1 | Checking the airgap | 5 |
| 4.2 | Disc exchange | 5 |
| 4.3 | Adjusting the microswitch | 6 |
| 4.4 | Microswitch exchange | 6 |
| 5 | Electrical connection | 6 |
| 5.1 | Important recommendations | 6 |
| 5.2 | Connectors wiring | 6 |
| 6 | Spare parts | 7 |
| 7 | Tools | 7 |
| 8 | Troubleshooting | 7 |

1 Technical specifications

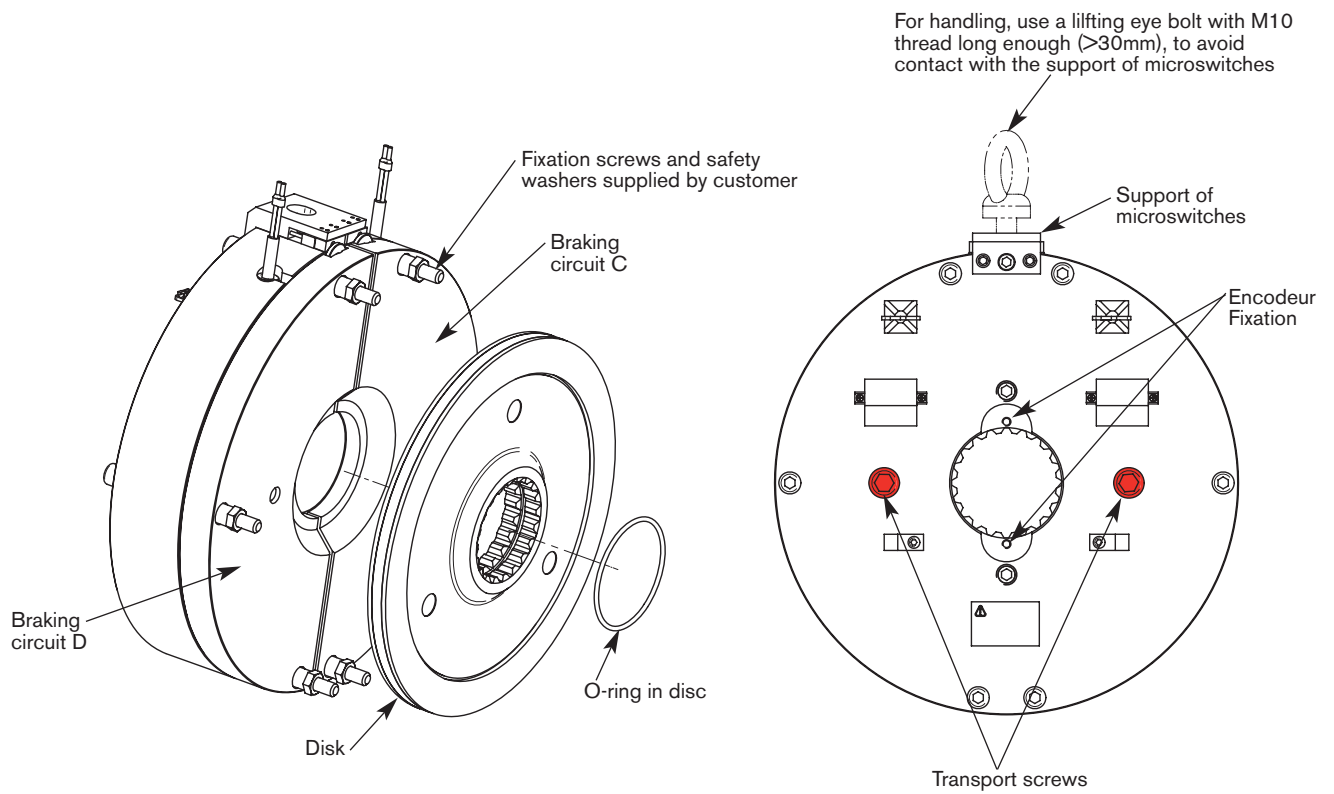



Fig. 1

| Tableau 1 | | | ERS VAR07 | |
|--|------------------------------------|-------------|-------------|--------|
|  EC Type Certificate in accordance with directive 95/16/CE: | | | ABV843 | ABV844 |
| | | | Size | |
| Thyssen Part number | | 99000009967 | 99000009968 | |
| Warner Electric Part Number | | 112107260 | 112107261 | |
| Nominal torque | Nm | 2 x 350 | 2 x 550 | |
| Warning: use a power supply with overexcitation | | | | |
| Per magnet | Voltage (inrush) (1 sec.) +5%/-10% | VDC | 103 | 103 |
| | Voltage (holding) +5%/-10% | VDC | 72 | 72 |
| | Power (inrush) | Watt | 132,4 | 156 |
| | Power (holding) | Watt | 64,8 | 74 |
| Maximum speed | min ⁻¹ | 279 | 279 | |
| Nominal airgap | mm | 0,4 | 0,4 | |
| Maximum airgap (after wear) | mm | 0,6 | 0,6 | |
| Cyclic duration factor | ED | 50% | 50% | |
| Weight | kg | 32 | 42 | |



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

- 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



These devices are delivered in a package guaranteeing the preservation of the product providing it is by surface transportation.

In case of a specific request (air or sea transport, long-term storage, etc) contact our factory.

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 M10).

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 and safety washers are supplied by Thyssen.

- 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.

NOTE: Secure the fixing screws using the safety washer.

- 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.
- Remove the transport screws.
- Make all electrical connections permanent.

| Size | SZ420/350 | SZ600/550 |
|---|-----------|-----------|
| Fixing screws | 6xM8 | 6xM10 |
| Cs initial torque (Nm) | 11 | 22 |
| Cs \pm 10 % (Nm) | 22 | 44 |
| Hexagonal head dim. of adjusting screw (mm) | 13 | 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. 3). If the maximum value of the airgap is exceeded for one of the two circuits, change the disc and the O-ring.

Position of the measuring shims by circuit:

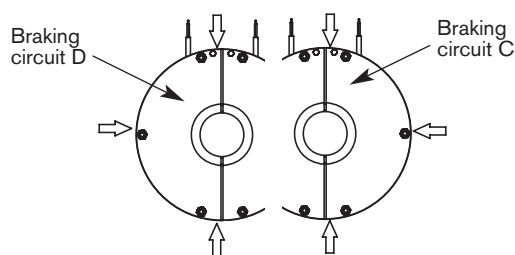


Fig. 3

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.



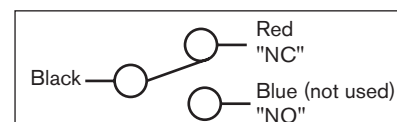
This brake is designed to work in dry conditions. Friction faces must be kept completely clean of any oil, grease or abrasive dust.

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

4.3 Adjusting the microswitch

Slide a shim 0,15 mm thick close to the screw in the corresponding airgap. Switch on the current and tighten the adjusting hexagon screw (4/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. 4a).

Fit again a 0,15 mm thick gauge and check if the adjustment is stable. Fit a 0,20 mm thick gauge and check that the microswitch is not actuated.



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.

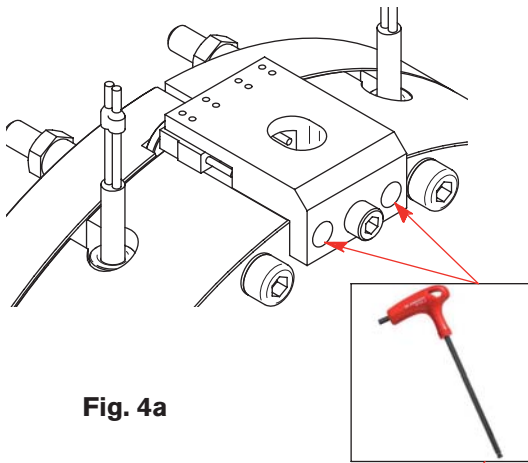


Fig. 4a

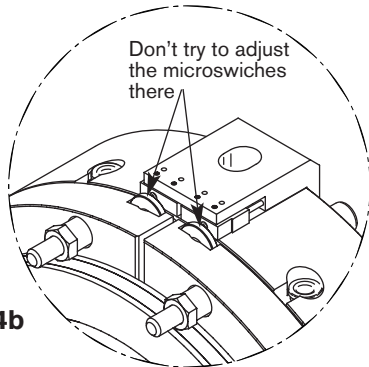
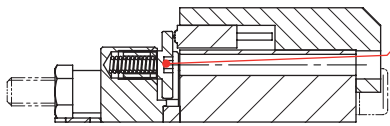


Fig. 4b

4.4 Microswitch exchange

Make sure that the support is correctly in contact with the top of the brake, before tightening the screw.

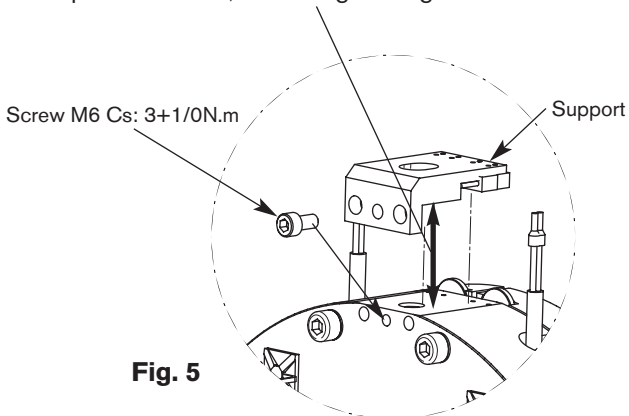






Fig. 5

5 Electrical connection

Brakes **ERS VAR07** operate on a direct current supply, respect to polarity (see chapter 5.2).

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.

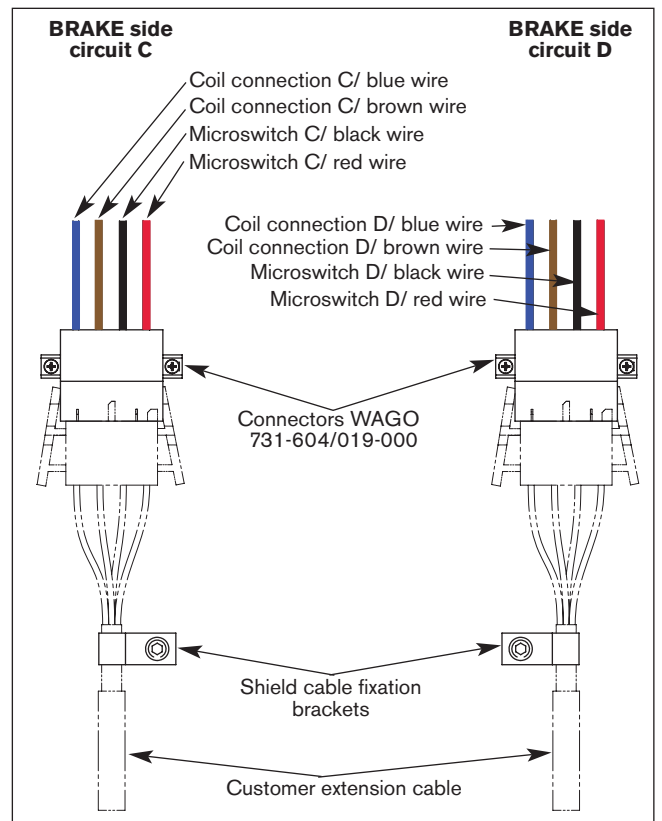
Service braking : for service braking, the switching OFF and the switching ON must be connected on AC current side, in order to obtain silent switching.

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

| Length of cable | 0 to 10 m | From 10 to 20 m |
|-----------------|---------------------|---------------------|
| Cross section | 1,5 mm ² | 2,5 mm ² |

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

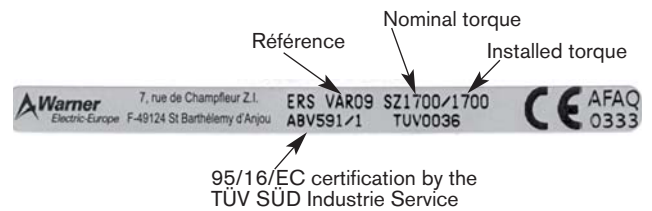
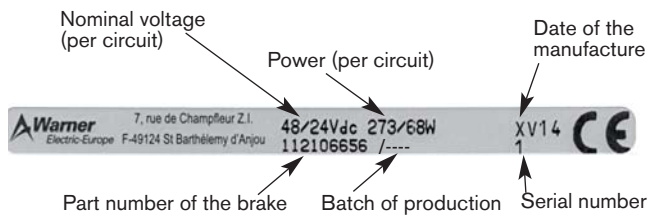
5.2 Connectors wiring



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 (see example below).



7 Tools

| Tools | Fonction |
|---|-----------------------------------|
| Airgap adjustment shims | Airgap and microswitch adjustment |
| Open jawed spanner 13 mm A/F (SZ420/350) and 21 mm A/F (SZ600/550) | Airgap adjustment |
| Torque wrench (measurement range > 120 Nm) with hexagonal socket insert 10 mm A/F | Airgap adjustment |
| Metric hexagon key with spherical head 4 A/F | Microswitch adjustment |
| Multimeter | Voltage checking |
| Metric hexagon key with spherical head 5 A/F | Microswitch exchange |

8 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