

***Nidec***  
All for dreams



*Installation and maintenance*

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***GEARLESS XAF***

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*A.C. Drive for lifts*

Part number: 4317 en - 2017.08 / g

**LEROY-SOMER™**

These symbols    appear in this document whenever it is important to take special precautions during installation, operation, maintenance or servicing of the motors.

It is essential that electric motors are installed by experienced, qualified and authorised personnel.

In accordance with the main requirements of EEC Directives, the safety of people, animals and property should be ensured when fitting the motors into machines.

Particular attention must be given to equipotential ground or earthing connections.

**The following preliminary precautions must be taken before working on any stationary device:**

- Mains voltage disconnected and no residual voltage present
- Careful examination of the causes of the stoppage (jammed transmission - loss of phase - cut-out due to thermal protection - lack of lubrication, etc)



Even when not supplied with power, there is voltage at the terminals of a rotating synchronous motor with magnets.

Accordingly, before carrying out any work check carefully that the motor is not rotating.



**For dismantling the XAF motor only**

Assembly or maintenance of the rotor must not be carried out by people with pacemakers or any other implanted medical electronic device.

The motor rotor contains a powerful magnetic field. When the rotor is separated from the motor, its field may affect pacemakers or disturb digital devices such as watches, mobile phones, etc.

Dear Customer,

You have just acquired a LEROY-SOMER motor.

This motor benefits from the experience of one of the largest manufacturers in the world, using state-of-the-art technologies – automation, specially selected materials and rigorous quality control. As a result, the regulatory authorities have awarded our motor factories **ISO 9001, Edition 2000 international certification from the DNV**. Similarly, our environmental approach has enabled us to obtain **ISO 14001: 2004**.

Products for particular applications or those designed to operate in specific environments are also approved or certified by the following organisations: **CETIM, LCIE, DNV, ISSEP, INERIS, CTICM, UL, BSRIA, TUV, CCC and GOST**, which check their technical performance against the various standards or recommendations.


We thank you for making this choice, and would ask you to read the contents of this manual.

By observing a few essential rules, you will ensure problem-free operation for many years.

LEROY-SOMER MOTORS

### CE conformity

Our motors conform to standard EN 60034 (IEC 34), and therefore to the Low Voltage Directive 73/23/EEC modified by Directive 93/68, which is demonstrated by their marking with the symbol **CE**



**MOTEURS LEROY-SOMER**  
USINE

**DECLARATION OF CONFORMITY AND INCORPORATION**

LEROY-SOMER MOTORS declares that the components :

conform to the harmonized standard EN 60 034 (IEC 34) and thus meet the essential requirements of Low Voltage Directive 73-23 EEC of 19th February 1973 modified by Directive 93-68 EEC of 22nd July 1993.


The components thus defined also meet the essential requirements of the Electromagnetic Compatibility Directive 89-336 EEC of 3rd May 1989 modified by Directives 92-31 EEC of 28th April 1992 and 93-68 EEC of 22nd July 1993, if they are used within certain voltage limits (IEC 34).

By reason of such conformity, these component ranges may be used in machines governed by the Machinery Directive 98/37/CE, provided that the method of integration or incorporation and/or assembly conforms to at least the regulations in standard EN 60204 "Electrical Equipment for Machinery" and our installation manual.

The components defined above must not be installed unless the machine in which they are incorporated has been declared as conforming to the relevant directives.

N.B. : When components are powered by specially adapted electronic converters and/or servo-controlled by electronic control-command devices, they must be installed by a professional person. This person must take responsibility for complying with the regulations concerning electromagnetic compatibility in the country where the machine is used.

Declaration made by	At
	On
Quality Director	
MOTEURS LEROY-SOMER	Signature



MOTEURS LEROY-SOMER (SEGE SOCIAL 80 MARCELLIN LEROY - 1615 ANGOULEME CEDEX) SOCIETE ANONYME AU CAPITAL DE 411 800 000 F - RCS ANGOULEME B 339 507 236 - SIRET 339 507 236 0001

#### NOTE:

LEROY-SOMER reserves the right to modify the characteristics of its products at any time in order to incorporate the latest technological developments. The information contained in this document may therefore be changed without notice.

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It may not be reproduced in any form without prior authorization.

All brands and models have been registered and patents applied for.

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To ensure that the LEROY-SOMER Gearless XAF motor you have just purchased is entirely satisfactory, it is essential to adhere to the following instructions.

**⚠ Contact with energised or rotating parts may cause injury. Do not touch the housing of a motor during operation, as it can reach high temperatures.**

**REMINDER: Installation, servicing and maintenance must only be carried out by qualified personnel. Failure to follow the instructions in this document, or to apply them correctly, releases the manufacturer from liability.**

**The product is covered by the warranty during the guarantee period as long as any partial or total dismantling has only been performed with the assistance of LEROY-SOMER (or its approval).**

**⚠ Check that the lift car has been immobilised before performing any work on the motor or the brakes.**

## 1 - RECEIPT

Checks:

- As soon as you receive the machine, check that the nameplate on the machine conforms to your order.
- Inspect the machine as soon as it is received. If there is any damage that has been caused by transportation, contact the carrier in the usual way.

## 2 - STORAGE

### 2.1 - Storage location

This location must be dry and protected from harsh weather conditions, cold (temperature above -15°C), frequent temperature variations (to prevent the risk of condensation), and free from vibration, dust and corrosive gases.

If there is any vibration in the storage area, it is advisable to rotate the driving sheave at least twice a month (Supply power to the brakes in order to be able to turn the sheave).

In certain transport conditions the grooves of the driving sheave are protected by a special varnish. This varnish must not be removed during storage.

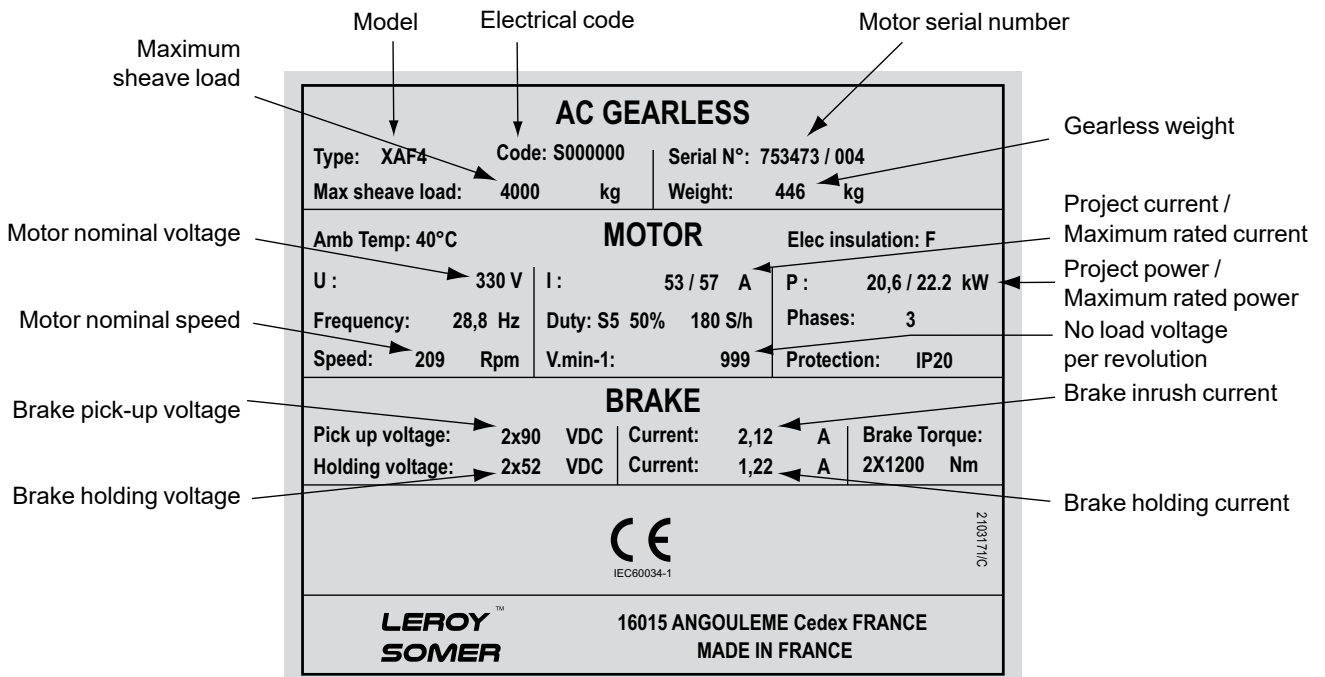


Fig. 1: Nameplate

## 2.2 - Prolonged storage (> 3 months)

Place the machine in a sealed waterproof enclosure with a dehydrating sachet inside corresponding to the volume to be protected and the degree of humidity of the location.

### Greasing

#### - Bearings which cannot be regreased

Maximum storage: 3 years. After this time, replace the bearings.

#### - Regreaseable bearings

Storage period	Less than 6 months	The motor can be commissioned without regreasing
	More than 6 months Less than 1 year	Regrease before commissioning, as described in section 5.3
	More than 1 year Less than 5 years	Replace the grease completely

## 3 - ENVIRONMENT

The rated characteristics are given for operation in a standard environment (see IEC 60034-5):


- altitude less than 1000 m
- maximum humidity: 95%
- temperature between 0 and 40°C

Derating may be provided for if special conditions are indicated at the time the equipment is ordered.

## 4 - COMMISSIONING

### BEFORE INSTALLATION

If the equipment has been stored for several months, it is essential to check the correct insulation between the phases and the earth terminal on the motor (minimum 100 MΩ at 500 V D.C. for 60 seconds) after having disconnected all the electronic circuits if necessary.

 Do not apply the megohmmeter to the terminals of the thermal sensors as this may damage them. If the required value is not reached, dry the motor using internal or external heating.

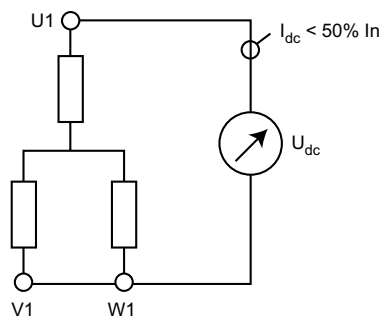


Fig. 2


Winding connections for drying using internal reheating

### Drying using external heating

- Place the motor in an oven at 70°C for at least 24 hours until the correct insulation is obtained (100 MΩ).
- Take care to increase the temperature gradually to clear the condensation.
- After drying at ambient temperature during the cooling phase, check the insulation value regularly, as it will initially tend to fall then rise.

### Drying using internal heating (Fig 2)

- Connect motor windings V1 and W1 in parallel in relation to U1.
- Read off the resistance between U and V//W.
- Apply a low voltage D.C. current to them (to obtain 10% of the rated current calculated using the winding resistances), then increase the voltage until 50% of the rated current is reached
- Maintain the power for 4 hours. The temperature of the motor should increase slightly.

 If the brakes are released, the sheave will move slightly on power-up (angular setting of the rotor in relation to the stator).

## 4.1 - Mechanical installation

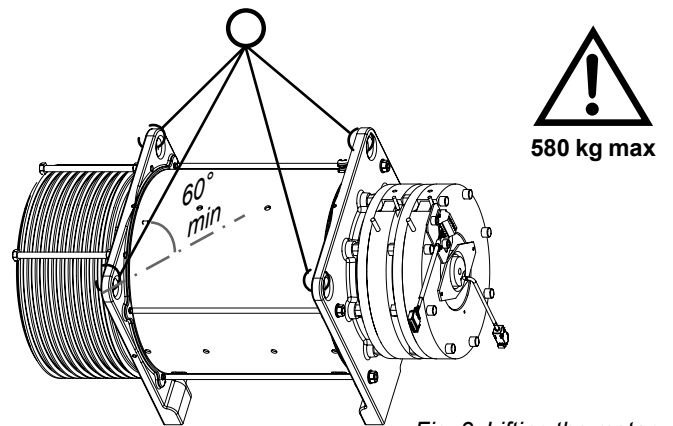
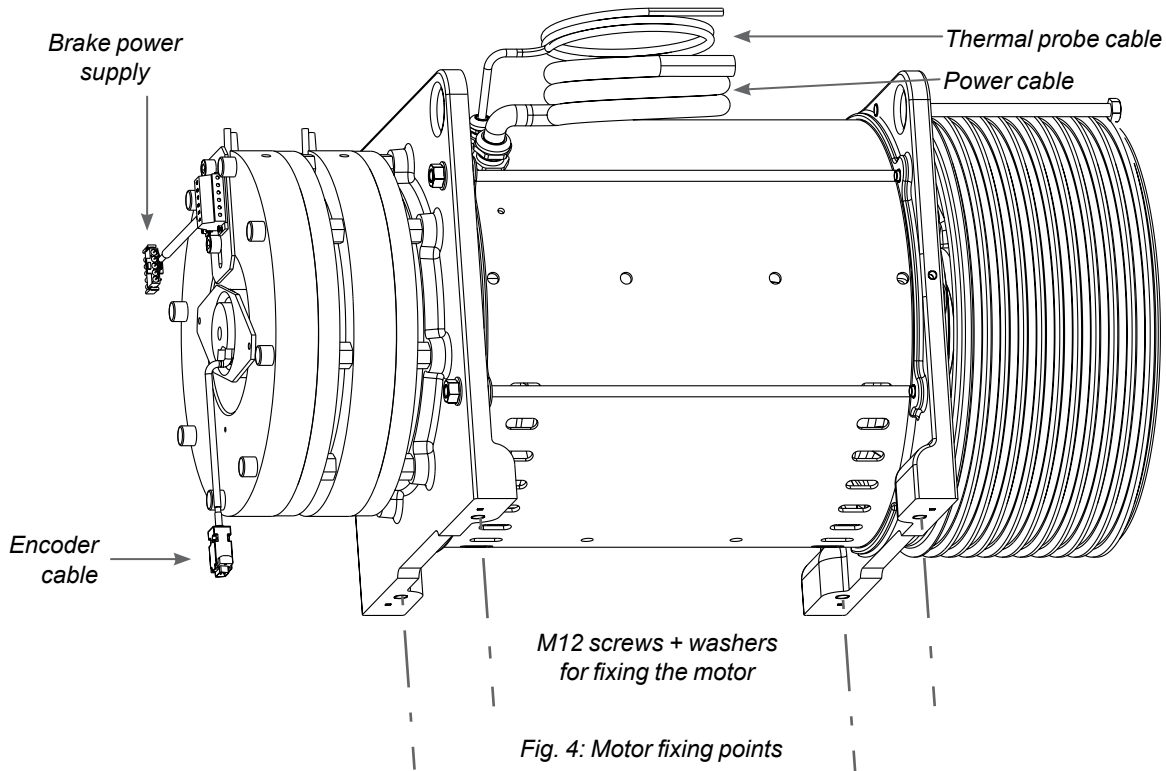


Fig. 3: Lifting the motor (Lifting diagram for illustration only)

The installation must comply with the motor characteristics indicated on the nameplate (see section 1). It must include electrical safety devices. Check that the handling equipment (slings, etc.) is suitable for the weight of the machine. Use the attachment points provided on the machine. Check that the cables are correctly positioned so that they are not damaged. Provide the necessary mechanical protection devices to prevent people working on the machine becoming caught or trapped by the sheave and/or the cables. The motors must be installed in such a way that the cooling air (not too damp, dust-free, and containing no corrosive gases or vapours) circulates freely.



#### 4.1.1 - Cleaning

- Release the brake by supplying it with power (section 4.2.2)
- Remove the protective varnish from the sheave grooves

**!** Do not use abrasive equipment. Use only a cloth soaked in alcohol. Care must be taken not to get any alcohol or grease on the brake disc.

**WARNING:** Use the alcohol in a well-ventilated area.

#### 4.1.2 - Mechanical installation

- The GEARLESS machine must be installed on a chassis that is not subject to vibration and must be secured using 4 M12 screws cl. 8.8 and washers, tightened to a torque of 83 Nm.
- Check that the cables are of the correct type for the sheave.

**!** If there are less ropes than grooves on the sheave, install the ropes on the end-shield side.

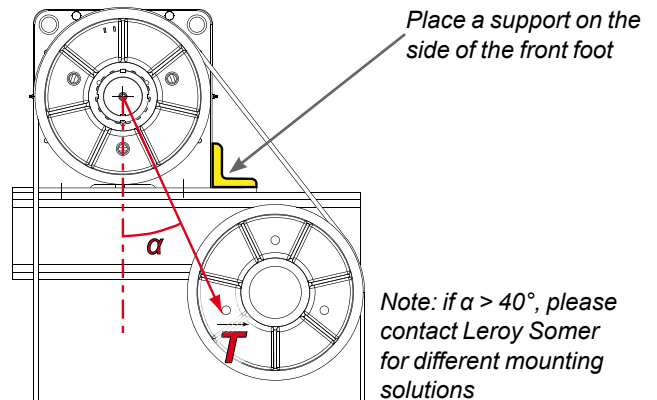
- When the cables have been installed, refit then tighten the guards.

**!** There is a high risk of jamming your fingers between the cables and the sheave.

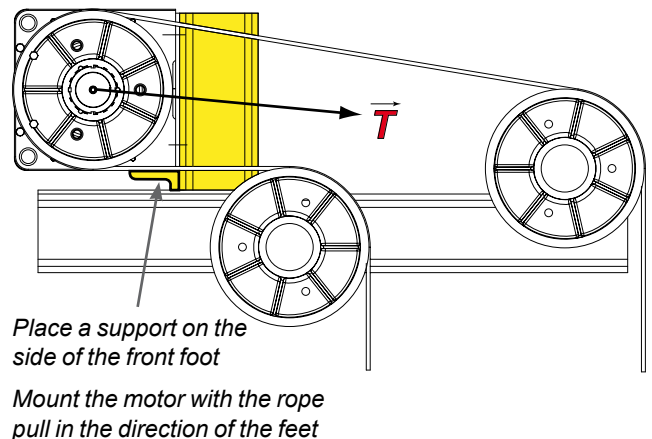
#### 4.1.3 - With deflection sheave

If deflection sheaves are used, the motor needs to be mounted as shown below ( $\vec{T}$  is the resulting force of the rope pull on the sheave)

#### Regular deflection



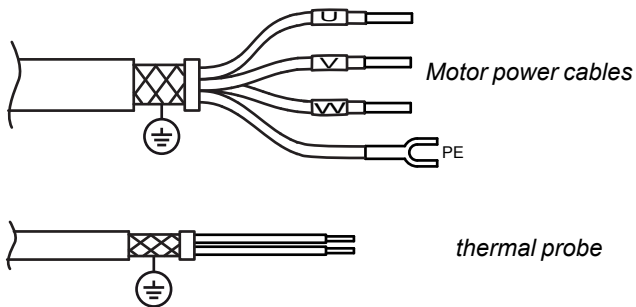
#### Double deflection



## 4.2 - Electrical installation

### 4.2.1 - Wiring the motor and the thermal probe

The cable shielding must be connected to earth. The cables exit by means of cable glands.



Connect the motor using cables of the correct cross-section (the cables and tags must be sized according to the current: see the table below).

Nominal I (A) per phase	9.5	12	16	25	34	40	46
Min cable section (mm <sup>2</sup> )	1.5	1.5	2.5	4	6	10	10

**!** It is the responsibility of the user to connect the motor in accordance with the current legislation and regulations in the country of use. This is particularly important as regards the size of the cables, the type and size of fuses, the earth or ground connection, powering down, acknowledging insulation faults and protection against overcurrents.

This table is given for information only, and must under no circumstances be used in place of the current standards.

The recommended cross-sections are given for a single-wire cable, with a maximum length of 10 m. Above this, line drops due to the cable length must be taken into account.

Particular care must be taken to tighten the nuts on the terminals. (Incorrect tightening may lead to the connections being damaged by overheating: see diagram Fig. 6)

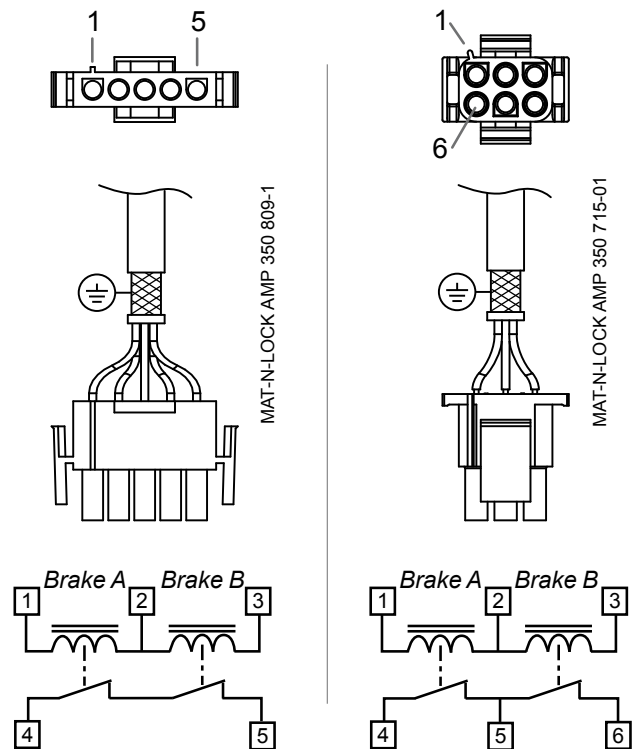
- Connect the power cables to terminals U1, V1 and W1, in accordance with IEC 600034-1.
- Connect the thermal probe to the drive.
- Connect the motor ground to earth.

### 4.2.2 - Wiring the brakes and microswitches

The brake microswitches are «NC» type. If using an optional CDF power supply, please refer to the card manual.

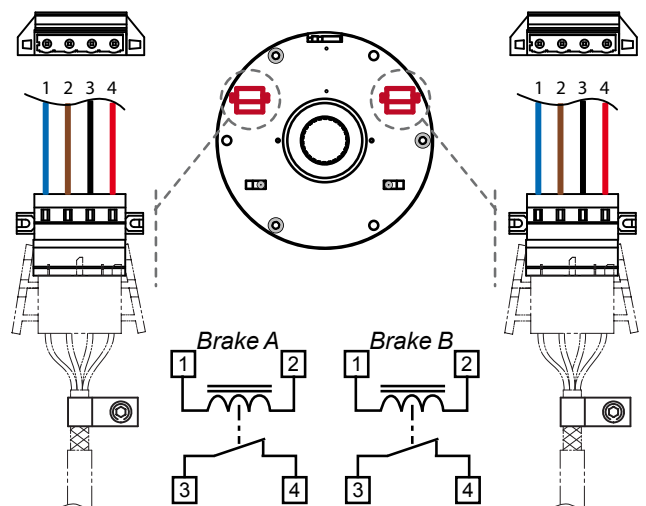
3 connections possibilities are available on the XAF range (except terminal box option) :

#### Cable with 5 pin or 6 pin connector :



#### 4 pin connector installed on the brake :

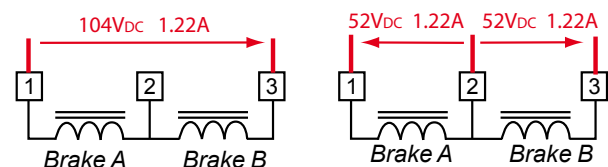
2 WAGO 731-604/019-000 connectors are located on the motor back face (brake). Shield cable fixation bracket is located downside each connector.



#### Brake electrical connection :

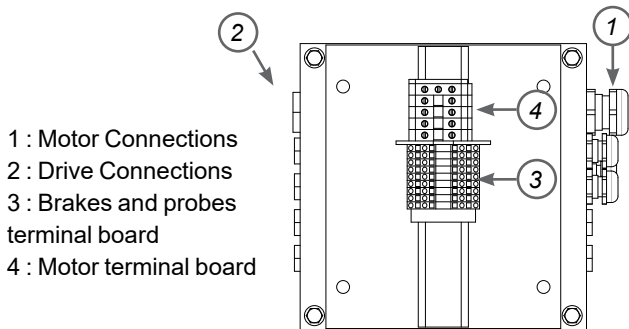
Brake inductor voltage and current values on nameplate are given for each brake device.

Example : Holding Voltage : 52V<sub>DC</sub> / Current : 1.22A





### 4.2.3 - Wiring the motor with «external connection box» option



A terminal connection diagram is included in the in the cover of the terminal box

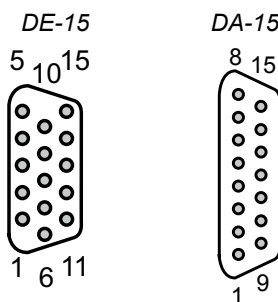
### 4.2.4 - Encoder wiring

Identify the encoder by means of the reference indicated on the encoder label (Fig. 7)  
 Connect the encoder to the drive with the HD15 socket.

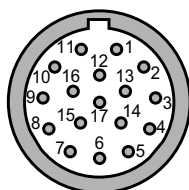
**ECN 413 encoder:** SinCos encoder with EnDat link  
**ERN 426 encoder:** incremental encoder

CONNECTOR			ENCODER TYPE	
SUB-D DE-15	SUB-D DA-15	M23 17p	ECN 413	ERN 426
1	1	15	Cos	A
2	9	16	CosRef	A/
3	3	12	Sin	B
4	11	13	SinRef	B/
5	5	14	Data	-
6	13	17	Data \	-
7	-	-	-	U
8	-	-	-	U/
9	-	-	-	V
10	-	-	-	V/
11	8	8	Clock <sub>out</sub>	W
12	15	9	Clock <sub>out</sub> \	W/
13	4 & 12	1 & 7	+ 5V	+ 5V
14	2 & 10	4 & 10	0V	0V
15		11	-	-

HD15 male connector



M23 17p male connector



### 4.3 - Commissioning

Check that the electrical equipment is correctly earthed before starting work.

Before commissioning the machine, check that all the fixings and electrical connections are correctly tightened.

After commissioning, check for noise, vibration, operation of the buttons/switches and also check the current and voltage on the machine while it is operating with the rated load.

### 4.4 - Maximum rated power

This XAF motor has been calculated on the basis of the information supplied for the project. this operating point is indicated on the nameplate (project current & power).

For information, the values “maximum rated current” and “maximum rated power” are indicated on the nameplate.

During commissioning, if the measured current is higher than the one defined for the project, the technician must make sure it does not exceed the maximum rated current.

## 5 - MAINTENANCE/SERVICING

### 5.1 - After one month's operation

- Check that the screws and electrical connections are correctly tightened.
- Check the vibration. Check that there is no abnormal noise.
- If the brake wear needs to be checked: measure the brake air gap to check that it conforms to the dimension stated in table 1 of appendix 1.

### 5.2 - Every year

Same as section 5.1.

### 5.3 - Every 3 years

XAF 4 and XAF 6 are fitted with grease nipples on DE side, regrease the bearings in accordance with the information on the nameplate.

For the first regreasing, increase the quantities by 15g.


Motor Bearings		
2103202.A	DE	NDE
Type :	21320E	6217 2RS C0
Grease :	MOBILITH SHC220	
	60 g	
Regreasing interval	3 YEARS	

## 6 - BRAKE AND MICROSWITCH ADJUSTMENT PROCEDURE

Correspondence between type of motor/type of brake:

Motor model	Brake model
XAF 2 S	VAR07 SZ 300/300
XAF 2 M	VAR09 SZ 600/500
XAF 2 L	VAR09 SZ 600/600
XAF 3	VAR09 SZ 1000/800
XAF 4	VAR09 SZ 1700/1200
XAF 6	VAR09 SZ 1700/1700

### 6.1 - Brake adjustment


 This operation must be made by an agreed Leroy-Somer Service Center.

### 6.2 - Microswitch adjustment

see appendix 1 §3.1

## 7 - REPLACING THE ENCODER AND THE SHEAVE

### 7.1 - Replacing the encoder

 Secure the load before any work is carried out on the motor. Check that no torque is applied to the rotor.

- Disconnect the encoder.
- Disconnect the brake connector(s).
- Check that the encoder supplied is identical to the one on the motor.

**IMPORTANT:** Do not dismantle the encoder support piece (Ref. 2 fig. 7) fixed on the brake. It is centred in the factory to the nearest 0.1 mm using a special tool.

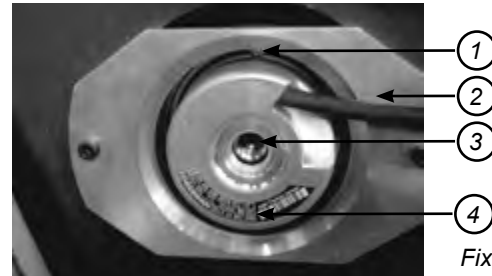


Fig. 7:  
Fixing the encoder

#### 7.1.1 - Dismantling the encoder

- Undo (2 turns with a SW2 spanner) the fixing screw on the encoder casing (Ref. 1 fig. 7) in the support piece.
- Undo the encoder plug (SW4 spanner or screwdriver).
- Undo (SW4 spanner) the central encoder fixing screw (Ref. 3 fig. 7) on the motor shaft.
- Remove the encoder from its support (depending on the model).

#### 7.1.2 - Reassembling the encoder

- Place the encoder support washer (Ref. 1 fig. 9) on the motor shaft extension. Make sure that it is firmly in place by hitting it gently with a drift and a hammer.
- Undo the new encoder plug (SW4 spanner or screwdriver).
- Insert the encoder in the support piece (Ref. 2 fig. 9) fixed on the brake, then tighten the M5 X 50 chc central screw (SW4 torque wrench) to tightening torque 5 Nm 0/+0.5 Nm. Screw with removable threadlocker to be used a maximum of 3 times.

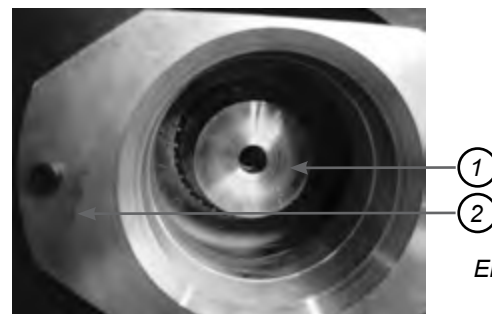


Fig. 9:  
Encoder supports

- Tighten the small M2.5 chc screw (Ref. 1 fig. 7) (SW2 torque wrench or screwdriver) on the encoder casing to a torque of 1.25 Nm 0/-0.2 Nm.
- Retighten the encoder plug (SW4 spanner or screwdriver).
- If necessary, phase the encoder (see drive manual)

## 7.2 - Replacing the sheave

### 7.2.1 - Removing the sheave

**!** Secure the load before any work is carried out on the motor. Check that no torque is applied to the rotor.

- Loosen the SKF nut
- Remove the SKF nut
- An extracting plate is to be manufactured according to the here-below drawing (measure the diameters on the sheave). Insert 3 screws, 3 nuts on the extraction plate (Fig. 10)
- Remove the sheave. **WARNING**, the sheave may fall.

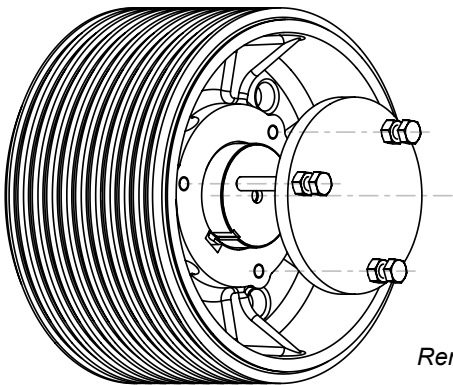


Fig. 10:  
Removing the sheave

### 7.2.2 - Refitting the sheave

- Clean all the parts and check they are in good condition.
- Place the key on the shaft
- Bring the sheave close to the cone
- Fit a spacer washer (2mm thickness)
- Tighten the SKF brake nut according to the here-below table (step 1)
- remove the nut and the spacer washer
- Fit the SKF lock washer
- Tighten the SKF brake nut according to the here-below table (step 2)
- Lock the lock nut with the washer.

XAF	Step 1 (Nm ± 10%)	Step 2 (Nm ± 10%)	Nut Size	Socket Size
2	370	95	KM 14	TMFS 14
3	640	160	KM 18	TMFS 18
4	860	215	KM 18	TMFS 18
6	1120	280	KM 18	TMFS 18

## 8 - REPLACING THE BRAKE AND MICROSWITCHES

**!** This operation must be made by an agreed Leroy-Somer Service Center.

## 9 - ORDERING SPARE PARTS

To ensure optimum after-sales service, the following information must be provided with each spare parts order:

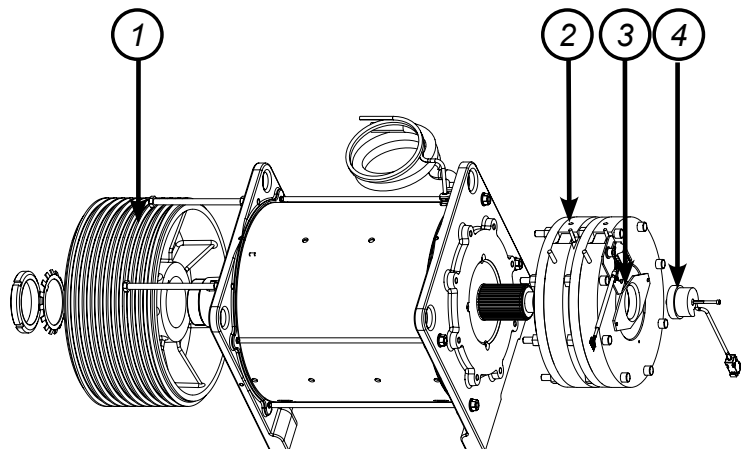
- Type and serial number of the motor
- Name and (or) reference number of the part
- Quantity ordered.

For instant identification, please give the reference of the document used for the order (drawing or manual number). The type and serial number can be found on the nameplate of the motor.

**!** Shields and brake must only be dismantled by an establishment approved by Leroy-Somer.

Part names:

Reference	Name
1	Sheave
2	Complete brake
3	Encoder support
4	Encoder kit
Option	CDF brake motor power supply



**SM411gb - rev 09/12**

## **Electrically Released Brakes**

**ERS VAR07 SZ 300/300**

**ERS VAR09 SZ 600/500**

**ERS VAR09 SZ 600/600**

**ERS VAR09 SZ 1000/800**

**ERS VAR09 SZ 1700/1200**



**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 needs 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.

## SOMMAIRE



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# 1 Technical specifications

## ERS VAR07 SZ 300/300

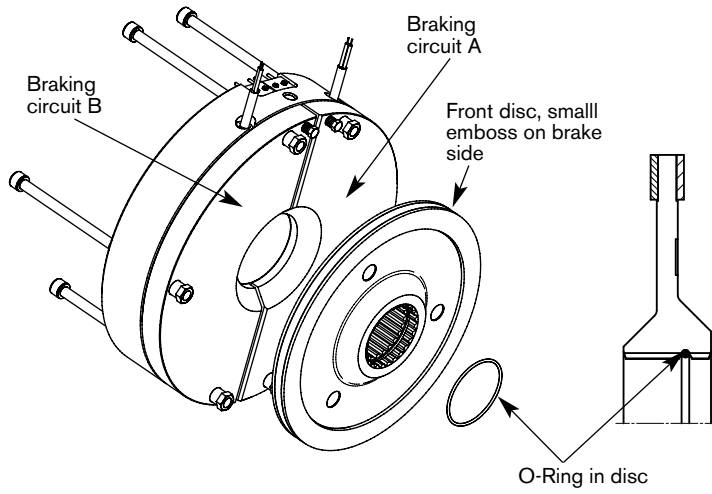


Fig. 1a

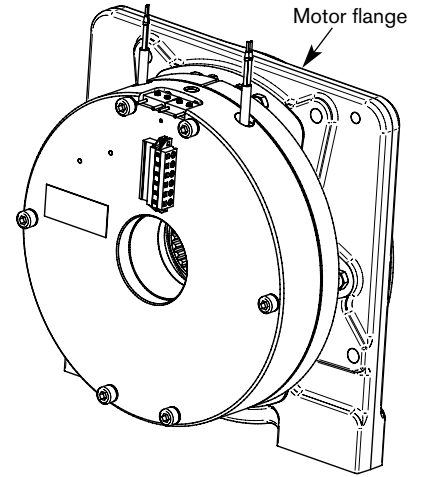


Fig. 2a

## ERS VAR09 SZ 600/500, SZ 600/600

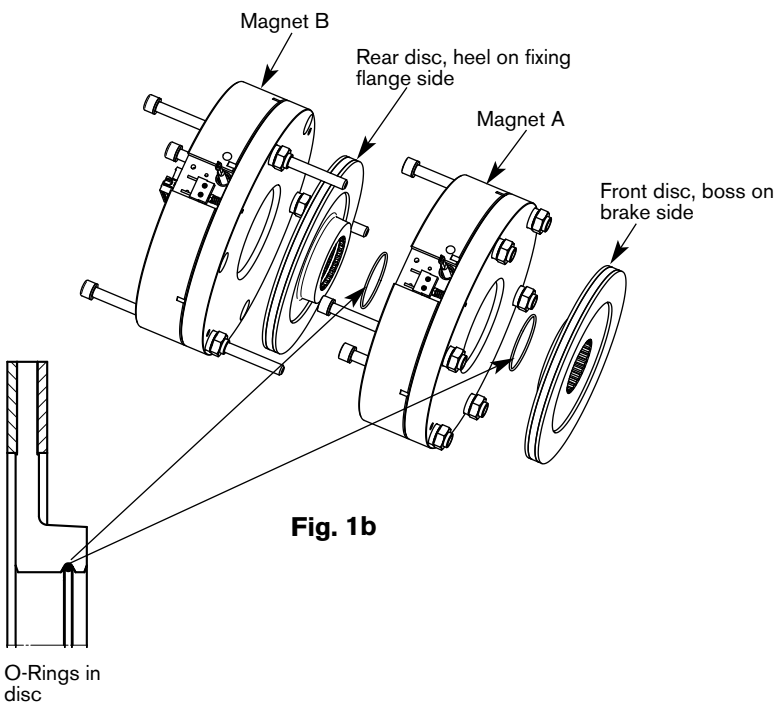


Fig. 1b

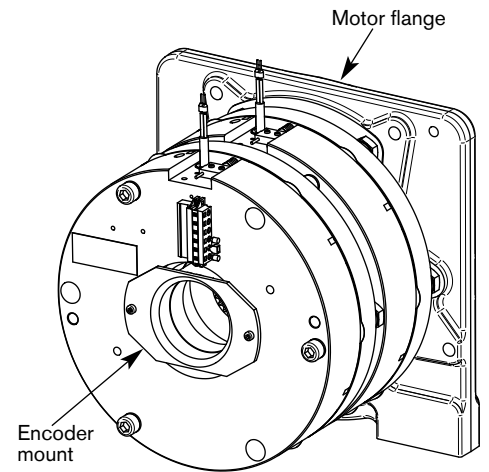
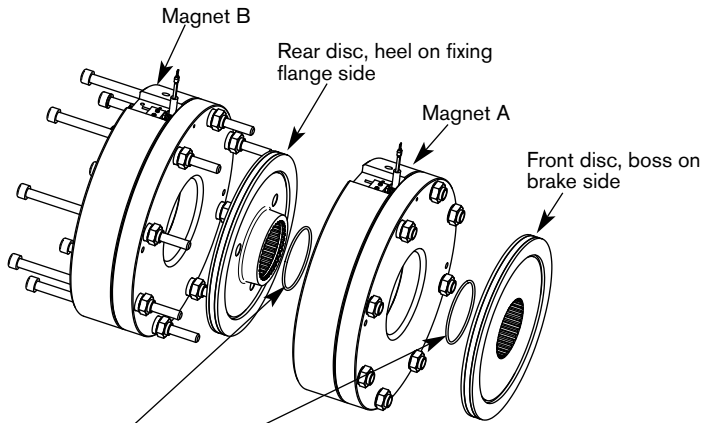
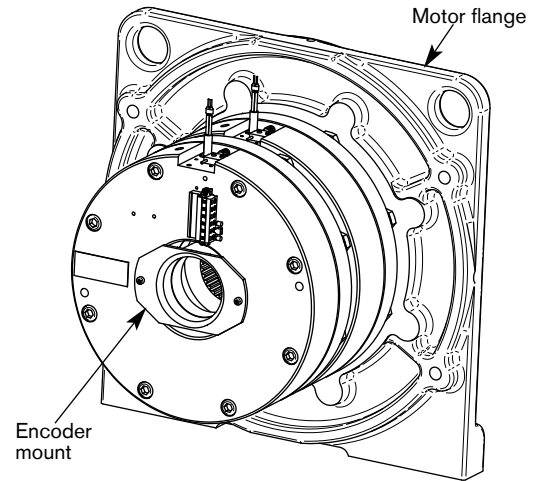


Fig. 2b

**ERS VAR09 SZ 1000/800**

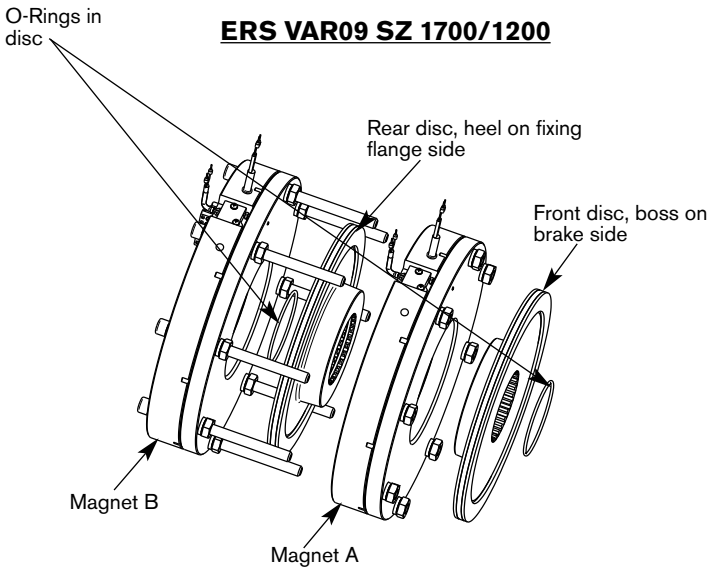


**Fig. 1c**

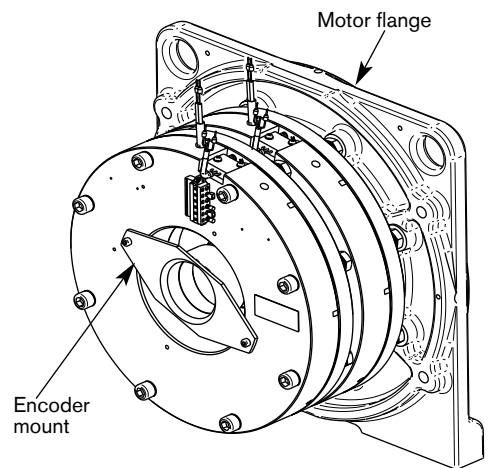


**Fig. 2c**

**ERS VAR09 SZ 1700/1200**






**Fig. 1d**





**Fig. 2d**

**Table 1**



Size		<b>ERS VAR07 SZ 300/300</b>						
 Certification 95/16/EC EN81-1+A3 (UCMP)		ABV819/1 (TÜV) ESV819 (TÜV)						
Leroy Somer Part Number		GAF300FD012	GAF300FD013	GAF300FD011	GAF300FD015	GAF300FD016	GAF300FD017	
Flange Part Number		/			LSY160-4-77			
Warner Electric Part Number		1 12 107308	1 12 107309	1 12 107310	1 12 107311	1 12 107312	121 107313	
Nominal torque Nm		2 x 300						
		Unit with overexcitation						
Per magnet	Voltage (inrush) (1 sec.) +5%/-10%	VDC	48	103,5 (*)	207	48	103,5 (*)	207
	Voltage (holding) +5%/-10%	VDC	24	52	103,5	24	52	103,5
	Power (inrush)	Watt	199	217	207	199	217	207
	Power (holding)	Watt	50	55	52	55	55	52
Maximum speed		min <sup>-1</sup>	400					
Nominal airgap		mm	0,35+0,1/0					
Maximum airgap (after wear)		mm	0,6					
Cyclic duration factor		ED	50%					
Weight		kg	25			37,6		



Size		<b>ERS VAR09 SZ 600/500</b>						
  Certification 95/16/EC EN81-1+A3 (UCMP)		ABV809/2 (TÜV) NL 11-400-1002-153-01 Rev1 (LIFTINSTITUUT)						
Leroy Somer Part Number		/	GAF500FD016	GAF500FD017	/	GAF500FD020	GAF500FD021	
Flange Part Number		/			LSY160-4-72			
Warner Electric Part Number		1 12 107556	1 12 107558	1 12 107560	1 12 107563	1 12 107564	121 107565	
Nominal torque Nm		2 x 500						
		Unit with overexcitation						
Per magnet	Voltage (inrush) (1 sec.) +5%/-10%	VDC	48	103,5 (*)	207	48	103,5 (*)	207
	Voltage (holding) +5%/-10%	VDC	24	52	103,5	24	52	103,5
	Power (inrush)	Watt	/	205	239	/	205	239
	Power (holding)	Watt	/	52	60	/	52	60
Maximum speed		min <sup>-1</sup>	400					
Nominal airgap		mm	0,35+0,1/0					
Maximum airgap (after wear)		mm	0,6					
Cyclic duration factor		ED	50%					
Weight		kg	47			58		


Size		<b>ERS VAR09 SZ 600/600</b>						
  Certification 95/16/EC EN81-1+A3 (UCMP)		ABV809/2 (TÜV) NL 11-400-1002-153-01 Rev1 (LIFTINSTITUUT)						
Leroy Somer Part Number		GAF600FD016	GAF600FD012	GAF600FD013	GAF600FD018	GAF600FD014	GAF600FD015	
Flange Part Number		/			LSY180-4-32			
Warner Electric Part Number		1 12 107582	1 12 107577	1 12 107580	1 12 107581	1 12 107578	112 107579	
Nominal torque Nm		2 x 600						
		Unit with overexcitation						
Per magnet	Voltage (inrush) (1 sec.) +5%/-10%	VDC	48	103,5 (*)	207	48	103,5 (*)	207
	Voltage (holding) +5%/-10%	VDC	24	52	103,5	24	52	103,5
	Power (inrush)	Watt	233	205	239	233	205	239
	Power (holding)	Watt	58	52	60	58	52	60
Maximum speed		min <sup>-1</sup>	400					
Nominal airgap		mm	0,35+0,1/0					
Maximum airgap (after wear)		mm	0,6					
Cyclic duration factor		ED	50%					
Weight		kg	47			58		

(\*) Suitable for 90V nominal




Size		<b>ERS VAR09 SZ 600/600 (2 connecteurs)</b>						
  Certification 95/16/EC EN81-1+A3 (UCMP)		ABV809/2 (TÜV) NL 11-400-1002-153-01 Rev1 (LIFTINSTITUUT)						
Leroy Somer Part Number		/	GAF600FD017	/	/	GAF600FD019	/	
Flange Part Number		/			LSY180-4-32			
Warner Electric Part Number		/	1 12 107590	/	/	1 12 107589	/	
Nominal torque Nm		2 x 600						
		Unit with overexcitation						
Per magnet	Voltage (inrush) (1 sec.) +5%/-10%	VDC	48	103,5 (*)	207	48	103,5 (*)	207
	Voltage (holding) +5%/-10%	VDC	24	52	103,5	24	52	103,5
	Power (inrush)	Watt	/	141	/	/	141	/
	Power (holding)	Watt	/	47	/	/	47	/
Maximum speed		min <sup>-1</sup>	400					
Nominal airgap		mm	0,35+0,1/0					
Maximum airgap (after wear)		mm	0,7					
Cyclic duration factor		ED	50%					
Weight		kg	47			58		

Size		<b>ERS VAR09 SZ 1000/800</b>						
  Certification 95/16/EC EN81-1+A3 (UCMP)		ABV811/1 (TÜV) NL 11-400-1002-153-02 Rev1 (LIFTINSTITUUT)						
Leroy Somer Part Number		/	GAF800FD009	GAF800FD010	/	GAF800FD011	GAF800FD012	
Flange Part Number		/			LSY200-4-43			
Warner Electric Part Number		1 12 107567	1 12 107569	1 12 107571	1 12 107568	1 12 107570	1 12 107572	
Nominal torque Nm		2 x 800						
		Unit with overexcitation						
Per magnet	Voltage (inrush) (1 sec.) +5%/-10%	VDC	48	103,5 (*)	207	48	103,5 (*)	207
	Voltage (holding) +5%/-10%	VDC	24	52	103,5	24	52	103,5
	Power (inrush)	Watt	/	257	325	/	257	325
	Power (holding)	Watt	/	65	81,3	/	65	81,3
Maximum speed		min <sup>-1</sup>	400					
Nominal airgap		mm	0,35+0,1/0					
Maximum airgap (after wear)		mm	0,6					
Cyclic duration factor		ED	50%					
Weight		kg	61			83		

Size		<b>ERS VAR09 SZ 1700/1200</b>						
 Certification 95/16/EC EN81-1+A3 (UCMP)		ABV591/2 (TÜV) ESV591/7 (TÜV)						
Leroy Somer Part Number		/	GAF999FD025	GAF999FD026	/	GAF999FD027	GAF999FD028	
Flange Part Number		/			LSY200-4-44			
Warner Electric Part Number		1 12 107552	1 12 107609	1 12 107611	1 12 107553	1 12 107610	1 12 107612	
Nominal torque Nm		2 x 1200						
		Unit with overexcitation						
Per magnet	Voltage (inrush) (1 sec.) +5%/-10%	VDC	48	103,5 (*)	207	48	103,5 (*)	207
	Voltage (holding) +5%/-10%	VDC	24	52	103,5	24	52	103,5
	Power (inrush)	Watt	/	293	377	/	293	377
	Power (holding)	Watt	/	74	94,2	/	74	94,2
Maximum speed		min <sup>-1</sup>	400					
Nominal airgap		mm	0,35+0,1/-0,1					
Maximum airgap (after wear)		mm	0,6					
Cyclic duration factor		ED	50%					
Weight		kg	66			93,7		

\*) Suitable for 90V nominal

Size		<b>ERS VAR09 SZ 1700/1200 (2 connecteurs)</b>						
 Certification 95/16/EC EN81-1+A3 (UCMP)		ABV591/2 (TÜV) ESV591/7 (TÜV)						
Leroy Somer Part Number		/	GAF999FD030	/	/	GAF999FD029	/	
Flange Part Number		/			LSY200-4-44			
Warner Electric Part Number		/	1 12 107607	/	/	1 12 107606	/	
Nominal torque		Nm						
		2 x 1200						
		Unit with overexcitation						
Per magnet	Voltage (inrush) (1 sec.) +5%/-10%	VDC	48	103,5 (*)	207	48	103,5 (*)	207
	Voltage (holding) +5%/-10%	VDC	24	52	103,5	24	52	103,5
	Power (inrush)	Watt	/	293	/	/	293	/
	Power (holding)	Watt	/	74	/	/	74	/
Maximum speed		min <sup>-1</sup>	400					
Nominal airgap		mm	0,35 <sup>+0,1/-0,1</sup>					
Maximum airgap (after wear)		mm	0,6					
Cyclic duration factor		ED	50%					
Weight		kg	66			93,7		

(\*) Suitable for 90V nominal



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, as stated in the EC type-examination certificate from TÜV SÜD Industrie Service (ABV number in Table 1). These brakes can in no way replace the system against the overspeed of the cabin downwards.
- These brakes are 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 necessary protection to prevent pollution of the friction surfaces and to ensure that the motor flange is thoroughly degreased and clean before mounting the brake.
- Torque subject to decrease in case of water contamination. Use of both brake circuits mandatory.  
**Warning :** the brake must be replaced 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
- 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.
- In the frame of the EC Type Certification, the response time specified are measured on new brakes and are in some cases influenced by the dampening system. During standard periodical inspection, a response time check will have to be performed in order to ensure the conformity of the overall elevator system. In case the measured response time is not appropriate for the system, then the replacement of the brake might have to be considered.

## 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. 2, thread M10).

### 3.3 Mounting

Specifications for the customer's friction face:

Material: Steel (150 to 250 HV) or Lamellar graphite cast iron

Roughness  $\leq Ra 3,2$

Protection: Phosphatizing dry or nitriding

#### Geometrical tolerances:

	0,1	Customer's shaft axis
	0,1	

The brakes are delivered pre-assembled with pre-set micro-switches and airgaps. Fixing screws are supplied separately.

#### **ERS VAR07 SZ300/300** (Fig. 1a)

- Put the O-ring into the disc.
- Slide the disc (small emboss on brake side)
- Engage magnet, energize magnet.

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

- Put in position and tighten the fixing screws of magnet, (star sequence tightening, first to initial torque, final setting torque after, see Table 2). The supply of current to the brake should be switched on throughout this operation.
- Make all electrical connections permanent.

#### **ERS VAR09 SZ600/500, SZ600/600 et SZ1000/800** (Fig. 1b and Fig. 1c)

- Put the O-rings into the discs.
- Engage the front disc on the customer's shaft, the boss on the brake side.
- Engage magnet A, energize magnet A.

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

- Put in position and tighten the fixing screws of magnet A, (star sequence tightening, first to initial torque, final setting torque after, see Table 2). The supply of current to the brake should be switched on throughout this operation.
- Engage the rear disc on the customer's shaft, with the boss on the customer fixing flange side.
- Engage magnet B, energize magnet B.

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

- Put in position and tighten the fixing screws of magnet B, (star sequence tightening, first to initial torque, final setting torque after, see Table 2). The supply of current to the brake should be switched on throughout this operation.

- Make all electrical connections permanent.

#### **VAR09 SZ1700/1200** (Fig. 1d)

- Put the O-rings into the discs.
- Engage the front disc on the customer's shaft as illustrated in Fig. 1, the boss on the brake side.
- Engager l'inducteur A.
- Engage the rear disc on the customer's shaft as illustrated, with the boss on the customer fixing flange side.
- Engage magnet B, repositioning magnet A using the fixing screws.
- Switch on the current to magnets A and B.
- Line the brake up with the customer fixing flange, using the fixing screws.

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

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

Taille	300	500	600	800	1200
Vis fixation	6xM8	6xM10	6xM10	8xM10	8xM12
Cs approche (Nm)	9	30	30	30	50
Cs $\pm 10\%$ (Nm)	22	64	64	64	111
Hexagone de manoeuvre des vis de réglage (mm)	13	21	21	21	21

**Tableau 2**

### 3.4 Demounting

#### **ERS VAR07 SZ300/300**

- The car must be stopped by another system than the brake.
- Do not energise the brake.
- Untight the fixing screws (star sequence, several turns, the brake must stay straight).
- Unmount the magnet.
- Remove the disc.
- Change the fixing screws.

## ERS VAR09

- The car must be stopped by another system than the brake.
- Do not energise the brake.
- Untight the fixing screws of the magnet B (star sequence, several turns, the brake must stay straight).
- Unmount the magnet B.
- Remove the rear disc.
- Untight the fixing screws of the magnet A (star sequence, several turns, the brake must stay straight).
- Unmount the magnet A.
- Remove the front disc.
- Change the fixing screws.

## 4 Maintenance

### 4.1 Adjusting the airgap

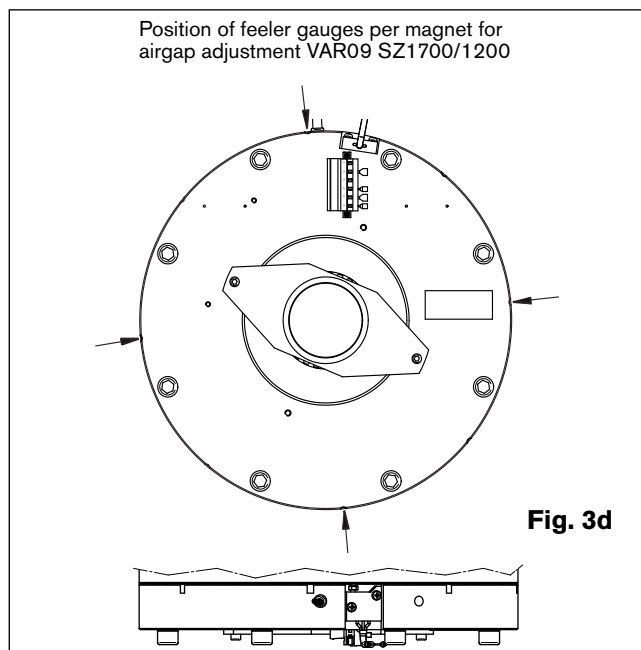
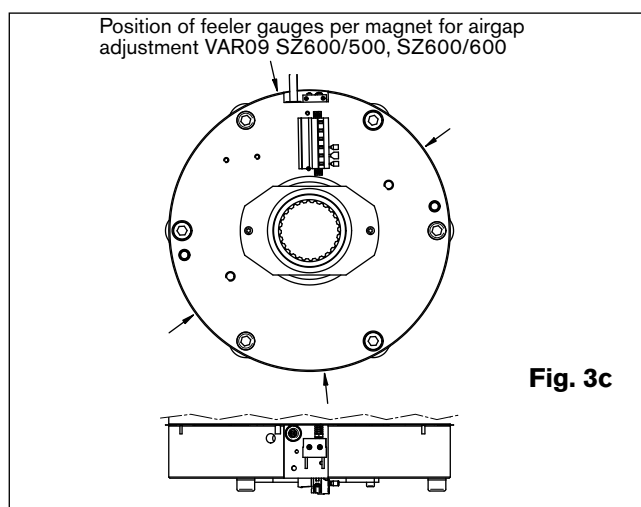
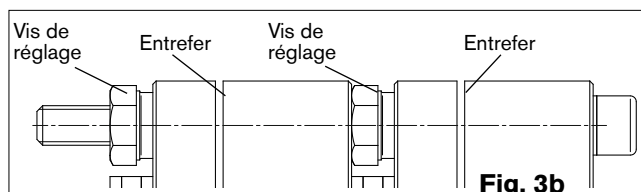
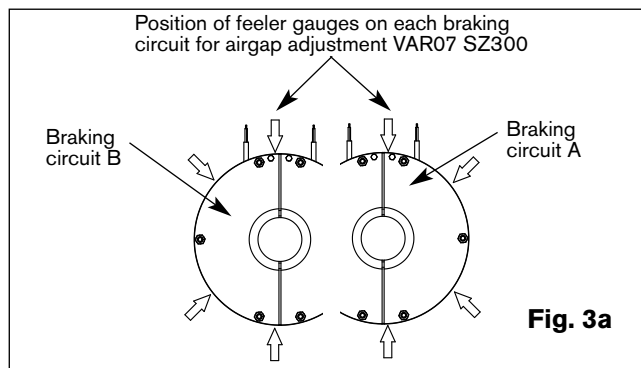


Check the airgap at each maintenance inspection.



**Reminder:** Normal use will not lead to any noticeable wear on the lining. Any dynamic braking is restricted to emergency and test braking. If, for any reason, it should be necessary to adjust the airgap, proceed as follows:

- Loosen the fixing screws slightly.
- Slide into the airgap 4 feeler gauges 0,35 mm thick, or according Fig. 3a (VAR07) and, Fig. 3c (VAR09 SZ600/500, SZ600/600) and Fig. 3d (VAR09 SZ1700/1200) (put the feeler gauges near the marks on the magnet).
- Set the fixation screws to contact.
- Adjust the adjusting screws.
- Remove the 4 feeler gauges.
- Tighten the screws (refer to note point 3.3 Installation).
- Carry out a few successive energising and releases.
- Check the airgap at several points.
- Repeat the process if necessary.
- Repeat the entire process for the second braking circuit (VAR07) / Magnet (VAR09).



### Nota :

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

## 4.2 Adjusting the microswitch

Slide a shim thickness 0,20mm, near screw in the corresponding airgap. Switch on the current and tighten (the M4 adjusting screw 7 A/F for ERS VAR09 or the M5 adjusting screw 8 A/F for ERS VAR07) in contact with the microswitch until you reach the actuation point. Then turn the screw in the opposite direction until the microswitch does not actuate. Check, by 3 successive energisings of the brake, that the microswitch does not actuate with the shim thickness of 0.20mm.

Then slide a shim thickness 0.178mm or 0.007" and check that the adjustment is stable (the microswitch actuates), by 3 successive energizings of the brake, see Fig. 5a for VAR07 and Fig. 5b or Fig. 5c for VAR09.

### ERS VAR07 SZ 300/300

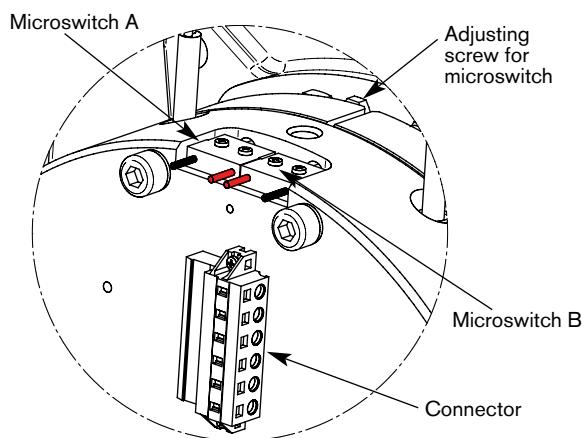


Fig. 5a

### ERS VAR09 SZ600/500, SZ600/600 et SZ1000/800

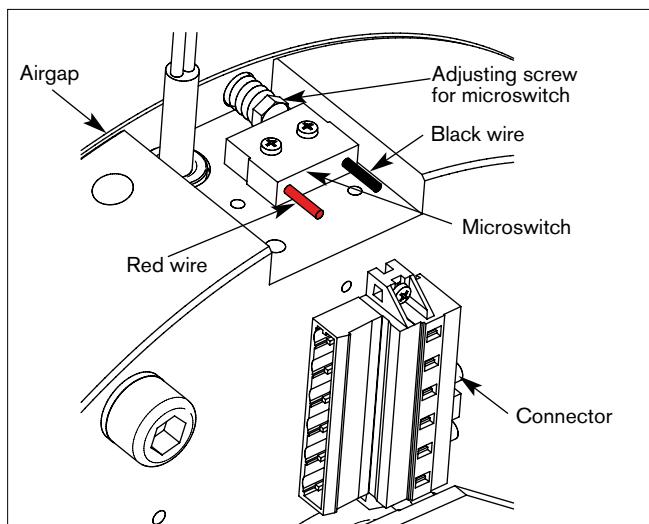


Fig. 5b

### ERS VAR09 SZ 1700/1200

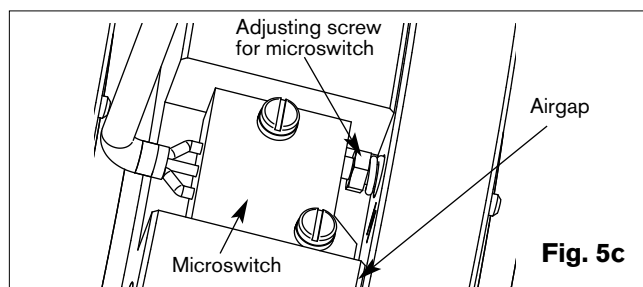
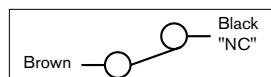


Fig. 5c

### 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.

### Microswitches connection


Serial connections of the microswitches, using NC output, connected on the junction block on brake side, see Fig. 2a, 2b ou 2c.


When there is no current in the coils (customer's shaft-braked), the microswitch contacts are in closed position.


## 5 Electrical connection


Brakes **ERS VAR07** and **ERS VAR09** operate on a direct current supply.

### 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.

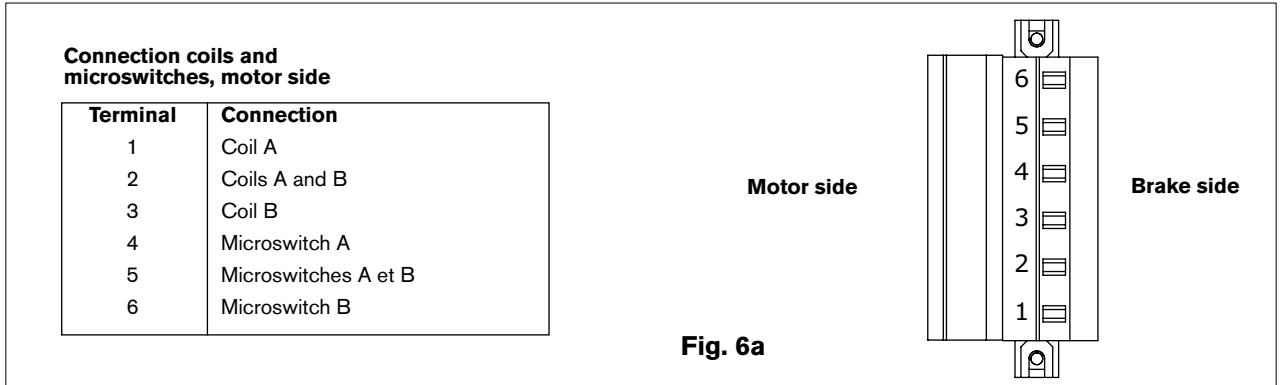
Length of cable	0 - 10 m	from 10 to 20 m
Cross section	1,5 mm <sup>2</sup>	2,5 mm <sup>2</sup>

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

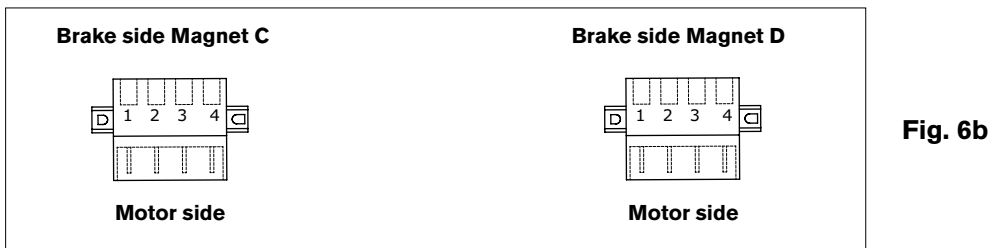
## 5.2 Electric connection

The brakes are equipped with a plug connector WAGO (fig. 6a) or with two plug connectors WAGO (fig. 6b).

### Connector WAGO réf.: 731-606/019-000



### Two connectors WAGO réf.: 731-604/019-000



#### Connection coils and microswitches, Brake side magnet C

Terminal	Connection
1	Coil C
2	Coil C
3	Microswitch C (fil brown SZ1200) Microswitch C (fil black SZ600)
4	Microswitch C (fil black SZ1200) Microswitch C (fil red SZ600)

#### Connection coils and microswitches, Brake side magnet D

Terminal	Connection
1	Coil D
2	Coil D
3	Microswitch D (fil brown SZ1200) Microswitch D (fil black SZ600)
4	Microswitch D (fil black SZ1200) Microswitch D (fil red SZ600)

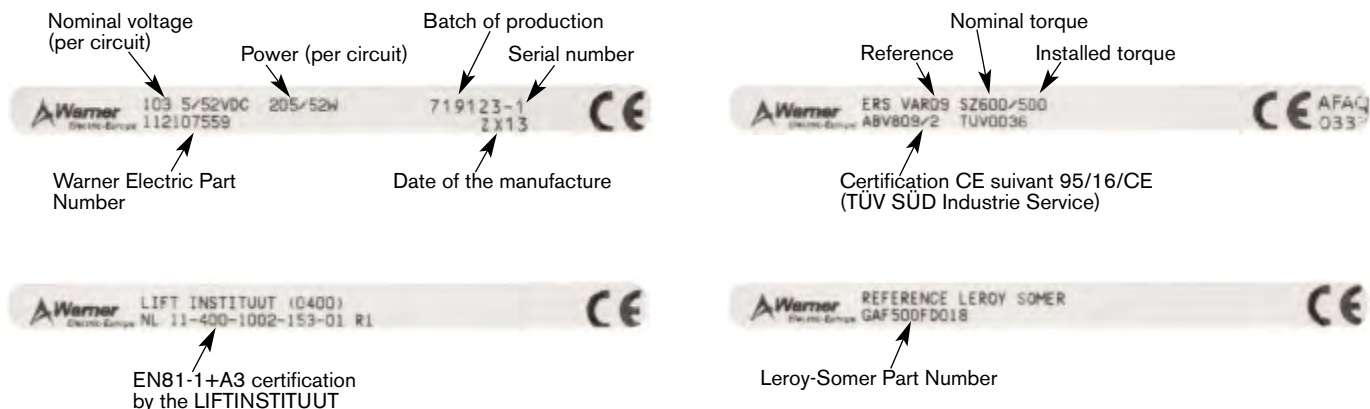
**WARNING:** in the event of connection in series of the magnets, the values of tension to be applied between terminals 1 and 3 with motor side, must be adapted.

Per magnet	In serie (terminals 1 and 3)
103,5 / 52 VDC	207 / 103,5 VDC
48 / 24 VDC	96 / 48 VDC

## 6 Spare parts

Part
Friction disc
Microswitch
O-ring in the disc

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	Function
Airgap adjustment shims	Airgap and microswitch adjustment
Open jawed spanner 13 mm A/F (VAR07) and 21 mm A/F (VAR09)	Airgap adjustment
Torque wrench (measurement range > 140 Nm) with hexagonal socket 6/flat (M8 VAR07 SZ300) 8/flat (M10 BVAR09 SZ600 et SZ 1000) 10/flat (M12 VAR09 SZ1700)	Airgap adjustment
Open jawed spanner 7 mm A/F	Microswitch adjustment
Multimeter	Voltage checking

## 8 Troubleshooting and fault elimination

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

Subject to alteration without prior notice





## EC type-examination certificate

**Certificate no.:** ABV 819

**Notified body:** TÜV SÜD Industrie Service GmbH  
Zertifizierungsstelle für Aufzüge und Sicherheitsbauteile  
Westendstraße 199  
80686 München - Germany

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

**Date of application:** 2009-04-21

**Manufacturer:** WARNER Electric Europe  
7, rue de Champfleür  
BP 20095  
49124 St. Barthelemy 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 SZ 300/ \_ \_ \_

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

**Date and  
number of test report:** 2009-06-29  
819

**EC-directive:** 95 / 16 / EC

**Result:** The safety component conforms to the directive's  
essential safety requirements for the respective scope of  
application stated on page 1 - 2 of the annex to this EC  
type-examination certificate.

**Date of issue:** 2009-07-01

Certification body for lifts and safety components  
Identification number: 0036

*D. Roas*  
p. p. Dieter Roas



**Annex to the EC type-examination certificate  
no. ABV 819 dated 2009-07-01**

**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 447 - 642 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)

$\pi$  = 3,14

n = Rotary speed (min<sup>-1</sup>)

i = Ratio of the car suspension

1.2.1 Maximum tripping rotary speed of the traction sheave 500 min<sup>-1</sup>

1.2.2 Maximum rated rotary speed of the traction sheave 435 min<sup>-1</sup>

**2. Conditions**

2.1 Since the braking device represents only a part off 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).

- 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.

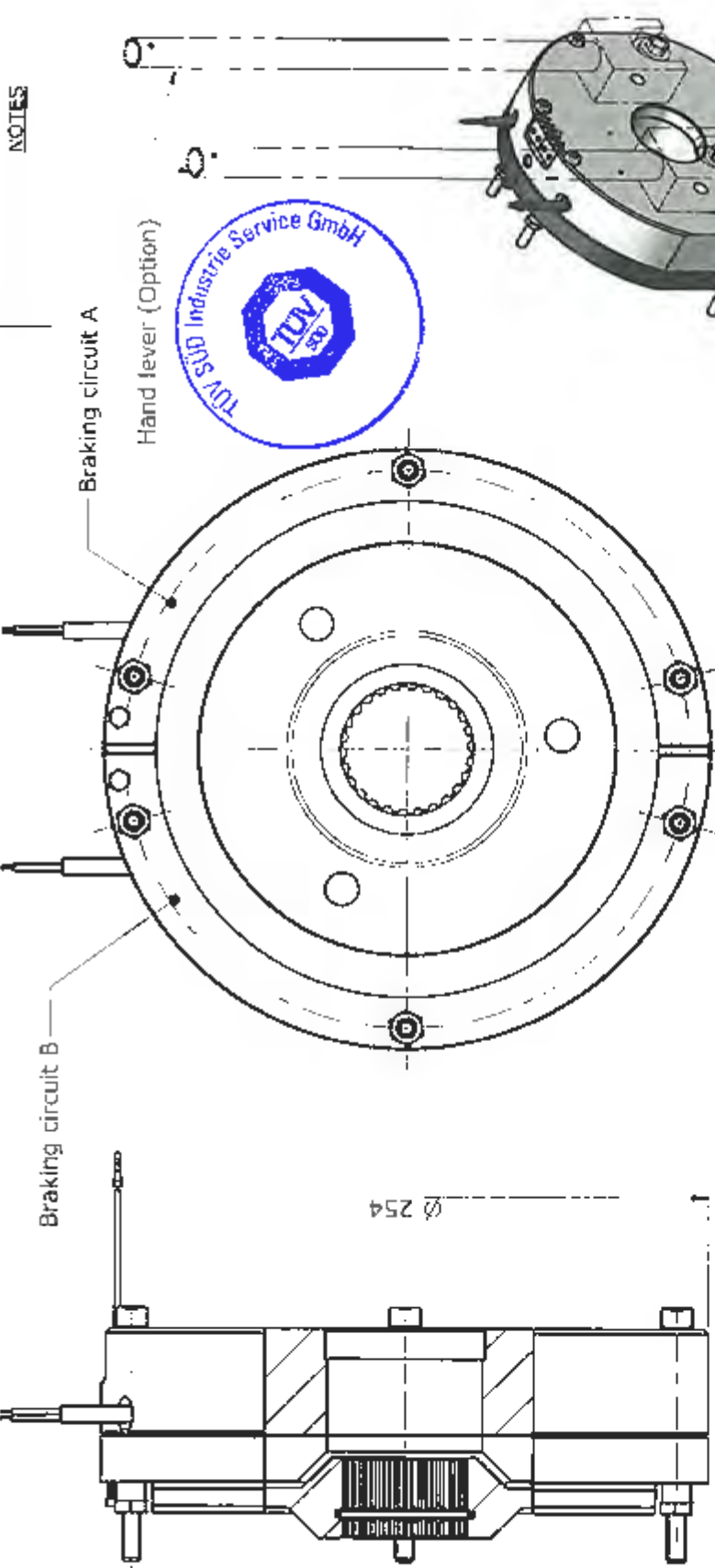
Shaft failure in this area must therefore be ruled out by appropriate design and sufficient dimensioning. In order to eliminate or reduce influencing factors which may lead to failure wherever possible, the following requirements must be satisfied:

- 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 ÈRS VAR07 SZ 300/ \_ \_ \_ .
- 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 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 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 type examination.
- 3.4 In order to provide identification and information about the design and its functioning drawing No. 1 12 107185, dated 21 April 2009 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.

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



NOTES

Braking circuit A  
 Hand lever (Option)



1. Juli 2009

- GEPRÜFT -

TUV SUD Industrie Service GmbH  
 Zentralbereich Fördertechnik-Sonderbauten  
 Abteilung Aufzüge und Sicherheitsbauteile  
 Westendstr. 199, D-80699 München  
 Der Sachverständige

Alternative shape (option)



TUV DIFFUSION

Customer no.:	
Dimensions in mm:	
Material/Process:	
SM	
Mass	
Insulator class (°C):	1:1:1
<p>Ca. per scritto provided da Warner Electric          per il controllo di qualità. Il prodotto è          conforme con la direttiva CE, CEI          armonizzato ecc. etc.</p> <p>This document is the property of Warner          Electric Europe. It is not to be reproduced          in any form without the prior written          consent of Warner Electric Europe.</p>	
Customer no.:	
Dimensions in mm:	
Material/Process:	
SM	
Mass	
Insulator class (°C):	1:1:1
<p>Ca. per escrito provided da Warner Electric          per il controllo di qualità. Il prodotto è          conforme con la direttiva CE, CEI          armonizzato ecc. etc.</p> <p>This document is the property of Warner          Electric Europe. It is not to be reproduced          in any form without the prior written          consent of Warner Electric Europe.</p>	
Customer no.:	
Dimensions in mm:	
Material/Process:	
SM	
Mass	
Insulator class (°C):	1:1:1
<p>Ca. per escrito provided da Warner Electric          per il controllo di qualità. Il prodotto è          conforme con la direttiva CE, CEI          armonizzato ecc. etc.</p> <p>This document is the property of Warner          Electric Europe. It is not to be reproduced          in any form without the prior written          consent of Warner Electric Europe.</p>	

**Warner**  
 Electric  
 Europe

Design: Frein électromagnétique  
 Electromagnetic brake  
 Type: ERS VAR07 5Z300/300

N° 1 12 107185



## EC type-examination certificate

**Certificate no.:** ABV 809

**Notified body:** TÜV SÜD Industrie Service GmbH  
Zertifizierungsstelle für Aufzüge und Sicherheitsbauteile  
Westendstrasse 199  
80686 München - Germany

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

**Date of submission:** 2008-11-18

**Manufacturer:** WARNER Electric Europe  
7, rue de Champfleür  
BP 20095  
49124 St. Barthelemy D'Anjou – France  
  
Altra Industrial Motion (Shenzhen)  
Songshan Industry Zone  
12 Songshan Western Road  
Bogang county, Shajing town  
Baoan district, Shenzhen city  
518104 Guandong Province - China (PRC)

**Product:** Braking device acting on the traction sheave, as part of the protection device against overspeed for the car moving in upwards direction

**Type:** ERS VAR 09 SZ 600/\_\_\_

**Test laboratory:** TÜV SÜD Industrie Service GmbH  
Abteilung Aufzüge und Sicherheitsbauteile  
Westendstrasse 199  
80686 München - Germany

**Date and number  
of test report:** 2009-02-06  
809

**EC-Directive:** 95 / 16 / EC

**Statement:** The safety component conforms to the directive's essential safety requirements for the respective scope of application stated on page 1 - 2 of the annex to this EC type-examination certificate.

**Certificate date:** 2009-02-10

Zertifizierungsstelle für Aufzüge und Sicherheitsbauteile  
EC-Identification number: 0036

*S. Melzer*

Siegfried Melzer



**Annex to the EC type-examination certificate  
no. ABV 809 dated 2009-02-10**

**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 841 - 1529 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)  
 $\pi$  = 3,14  
 $n$  = Rotary speed (min<sup>-1</sup>)  
 $i$  = Ratio of the car suspension

1.2.1 Maximum tripping rotary speed of the traction sheave 400 min<sup>-1</sup>

1.2.2 Maximum rated rotary speed of the traction sheave 348 min<sup>-1</sup>

**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).

- 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

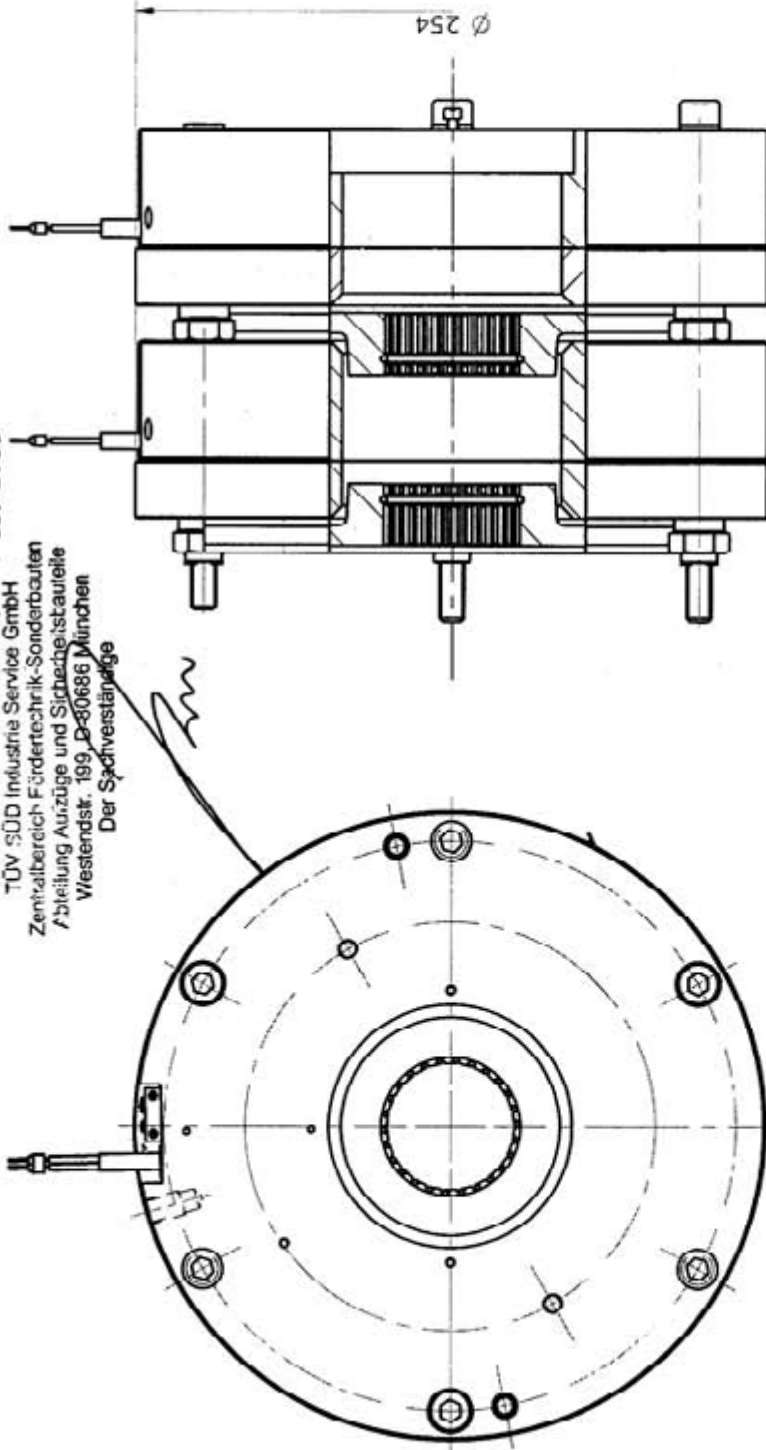
- 3.1 The brake moment effectively adjusted of one brake circuit will be marked at the blank after the type designation ÈRS VAR 09 SZ 600/\_\_\_ .
- 3.2 The permissible braking moments must be applied to the lift system in such a manner that they do not decelerate more than  $1 g_n$ , if the empty car is moving upwards.
- 3.3 In the scope of this 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 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 type examination.
- 3.4 In order to provide identification and information about the design and its functioning drawing No. 1 12 107132, dated 07 November 2008 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.

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

NOTES

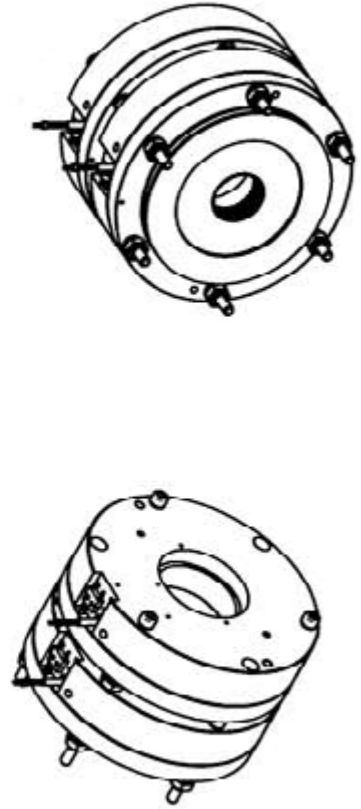
**-GEPÜFT - 10. Feb. 2009**

TUV SÜD Industrie Service GmbH  
 Zentralbereich Fördertechnik-Sonderbauten  
 Abteilung Anzüge und Sicherungsbauteile  
 Westendstr. 199, D-80686 München  
 Der Sachverständige



**1-9 NOV. 2008**

Client/customer:	Customer ref:	PM	LT	REVISION	DATE	By	Ch.
Mt (Nm) :							
Mt (Nm) :							
n HD (mm-1) :							
n max (mm-1) :							
U (Vdc) :							
P2P-C (W) :							
Insulation class (°C):							
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<p><b>Warner</b>          Electric          Europe</p>		<p>Design: <b>Frein électromagnétique</b>          Electromagnetic brake</p>		<p>Drawn : G. Ferrand Date: 07.11.08          Checked: MP Date: 18.11.08</p>		<p>Type: <b>ERS VAR09 5Z600 / ---</b></p>	
				<p><b>N° 1 12 107132</b></p>			







Industrie Service

## EC type-examination certificate

**Certificate no.:** ABV 811

**Notified body:** TÜV SÜD Industrie Service GmbH  
Zertifizierungsstelle für Aufzüge und Sicherheitsbauteile  
Westendstrasse 199  
80686 München - Germany

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

**Date of submission:** 2009-01-12

**Manufacturer:** WARNER Electric Europe  
7, rue de Champfleür  
BP 20095  
49124 St. Barthelemy D'Anjou - France  
  
Altra Industrial Motion (Shenzhen)  
Songshan Industry Zone  
12 Songshan Western Road  
Bogang county, Shajing town  
Baoan district, Shenzhen city  
518104 Guangdong Province - China (PRC)

**Product:** Braking device acting on the traction sheave, as part of the protection device against overspeed for the car moving in upwards direction

**Type:** ERS VAR 09 SZ 1000/ \_ \_ \_

**Test laboratory:** TÜV SÜD Industrie Service GmbH  
Abteilung Aufzüge und Sicherheitsbauteile  
Westendstrasse 199  
80686 München - Germany

**Date and number  
of test report:** 2009-02-06  
811

**EC-Directive:** 95 / 16 / EC

**Statement:** The safety component conforms to the directive's essential safety requirements for the respective scope of application stated on page 1 - 2 of the annex to this EC type-examination certificate.

**Certificate date:** 2009-02-10

Zertifizierungsstelle für Aufzüge und Sicherheitsbauteile  
EC-Identification number: 0036

*S. Meizer*

Siegfried Meizer





## Annex to the EC type-examination certificate no. ABV 811 dated 2009-02-10

### 1. Scope of Application

- 1.1 Permissible brake moment when the braking device acts on the brake disk while the car is moving upward, depends on the maximum tripping rotary speed

Max. tripping rotary speed [rpm]	Brake Moment [Nm]
300	1231 – 2081
400	1164 - 1991

- 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)  
 $\pi = 3,14$   
n = Rotary speed (min<sup>-1</sup>)  
i = Ratio of the car suspension

- |   |               |
|---|---------------|
| 1.2.1 Maximum tripping rotary speeds of the traction sheave | 300 / 400 rpm |
| 1.2.2 Maximum rated rotary speeds of the traction sheave    | 261 / 348 rpm |

### 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).

- 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 ÉRS VAR 09 SZ 1000/\_\_\_ .
- 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 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 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 type examination.
- 3.4 In order to provide identification and information about the design and its functioning drawing No. I-1 12 107136, dated 12 January 2009 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.

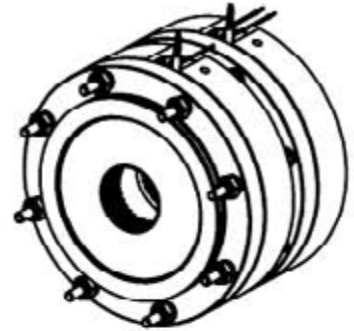
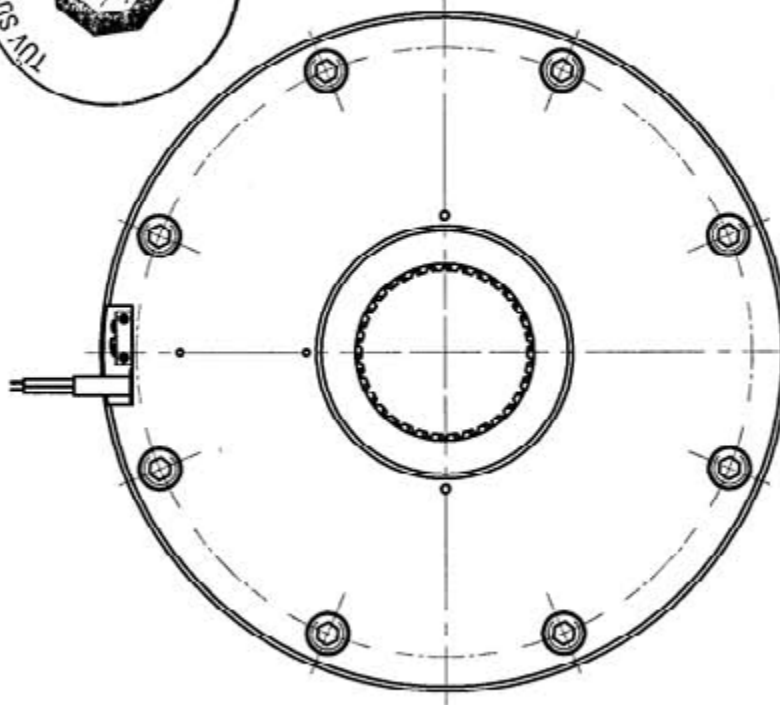
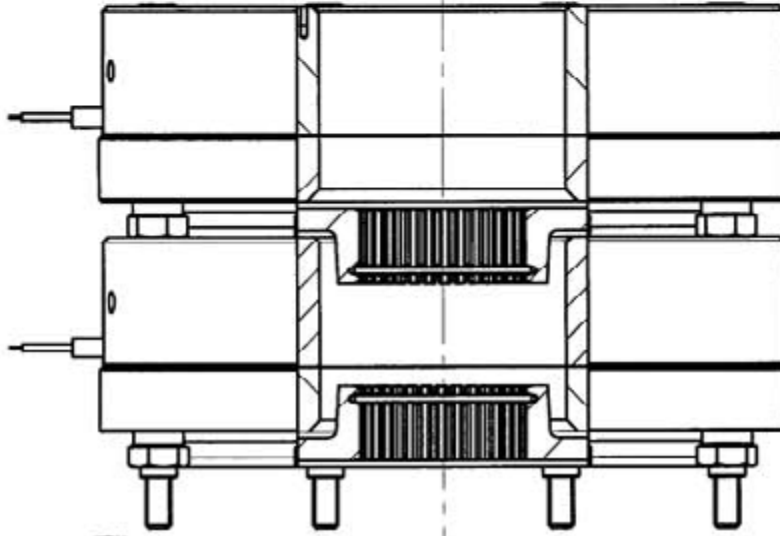
Les cotes sans indication de tolérances sont des cotes nominales.  
 Untoleranced dimensions are nominal dimensions.

**NOTES**

10. Feb. 2009

**- GEPRÜFT -**  
 TÜV SÜD Industrie Service GmbH  
 Zentrale Bereich: Fertigkeitech.-Sonderbauten  
 Abteilung: Auszüge und Sicherheitsbauteile  
 Westendstr. 199, D-80636 München  
 Der Sachverständige

Ø 273



Client/customer:		Customer ref. :	
M <sub>3</sub> (Nm) :		Dimensions	
M <sub>4</sub> (Nm) :		in mm	
n Hd (min-1) :		Manual/Notice :	
n max (min-1) :		SM	
U /Vdc) :		Mass :	
P20°C (W) :		Scale:	1:2
Insulation class (°C):		<b>Warner Electric Europe</b> Ce produit 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.	

FR	LT	REVISION	DATE	By	Ch.
			Draws : G. Ferrand Date: 12.01.2009 Checked: JcJ Date: 13.01.2009		
Design: <b>Frein électromagnétique</b> Electromagnetic brake					
Type: <b>ERS VAR09 SZ1000/800</b>					
N° <b>I-1 12 107136</b>					



## EC type-examination certificate

**Certificate no.:** ABV 591/1

**Notified body:** TÜV SÜD Industrie Service GmbH  
Zertifizierungsstelle für Aufzüge und Sicherheitsbauteile  
Westendstraße 199, 80686 München - Germany

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

**Date of submission:** 2007-10-31

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

**Product:** Braking device acting on the traction sheave, as part of  
the protection device against overspeed for the car  
moving in upwards direction

**Type:** ERS VAR 09 SZ 1700/ \_ \_ \_

**Test laboratory:** TÜV SÜD Industrie Service GmbH  
Abteilung Aufzüge und Sicherheitsbauteile  
Westendstraße 199, 80686 München - Germany

**Date and number  
of test report:** 2007-11-15  
591/1

**EC-Directive:** 95 / 16 / EC

**Statement:** The safety component conforms to the directive's  
essential safety requirements for the respective scope of  
application stated on page 1 - 2 of the annex to this EC  
type-examination certificate.

**Certificate date:** 2007-11-19

Zertifizierungsstelle für Aufzüge und Sicherheitsbauteile  
EC-Identification number: 0036

*D. Roas*  
Dieter Roas





### Annex to the EC type-examination certificate no. ABV 591/1 dated 2007-11-19

#### 1. Scope of Application

1.1 Permissible brake moment when the braking device acts on the brake disk while the car is moving upward, depends on the maximum tripping rotary speed

Max. tripping rotary speed [rpm]	Brake Moment [Nm]
250	1445 – 3980
400	1390 - 3114

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 sheaves 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)  
 $\pi = 3,14$   
n = Rotary speed (min<sup>-1</sup>)  
i = Ratio of the car suspension

- 1.2.1 Maximum tripping rotary speeds of the traction sheave 250 / 400 rpm
- 1.2.2 Maximum rated rotary speeds of the traction sheave 217 / 348 rpm

#### 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).

- 2.4 The braking device must act on the shaft of the traction sheave in the immediate vicinity of the traction sheave. 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.
- 2.5 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 requirements outlined below must be satisfied to ensure safe operation:

- The braking device must be positioned directly at the side of the motor opposite the traction sheave (joint bearing with motor).
- The traction sheave must be placed in the direct vicinity of the motor (bending length minimized, no bearings or other components between traction sheave and motor).
- The joint shaft must be continuous and made from one piece. It may only be affected by cross-sectional influences acting on the connection to the traction sheave, motor and brake (it may not be affected, however, by a reduction in the load bearing capacity caused by stress concentration and cross-sectional reductions in the region exposed to reversed bending stress).

If the above requirements are satisfied, it can be assumed that the stress acting on the (traction-sheave) shaft is more favourable than if the overspeed protection device is placed in the direct vicinity of the traction sheave or between traction sheave and motor.

### 3. Remarks

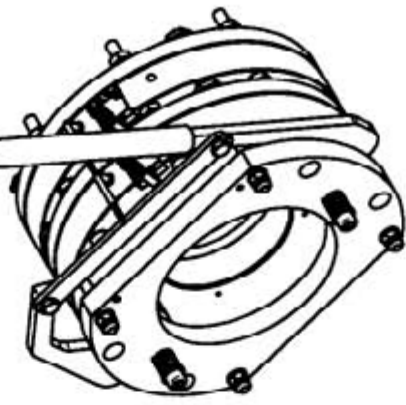
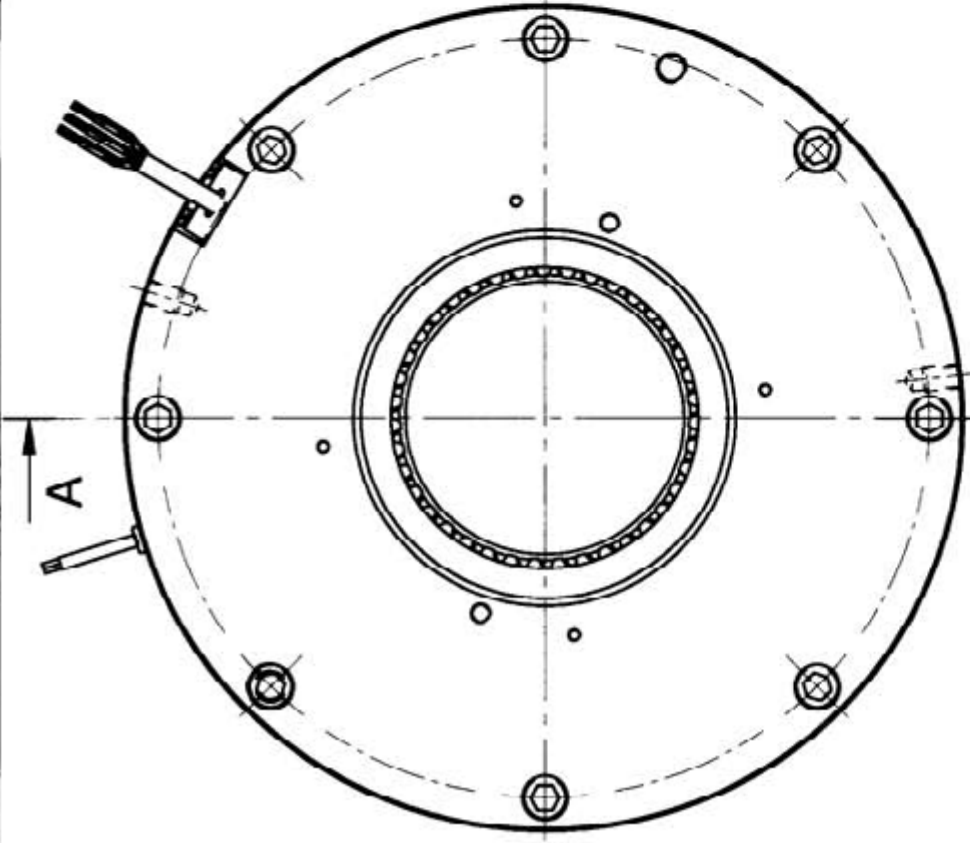
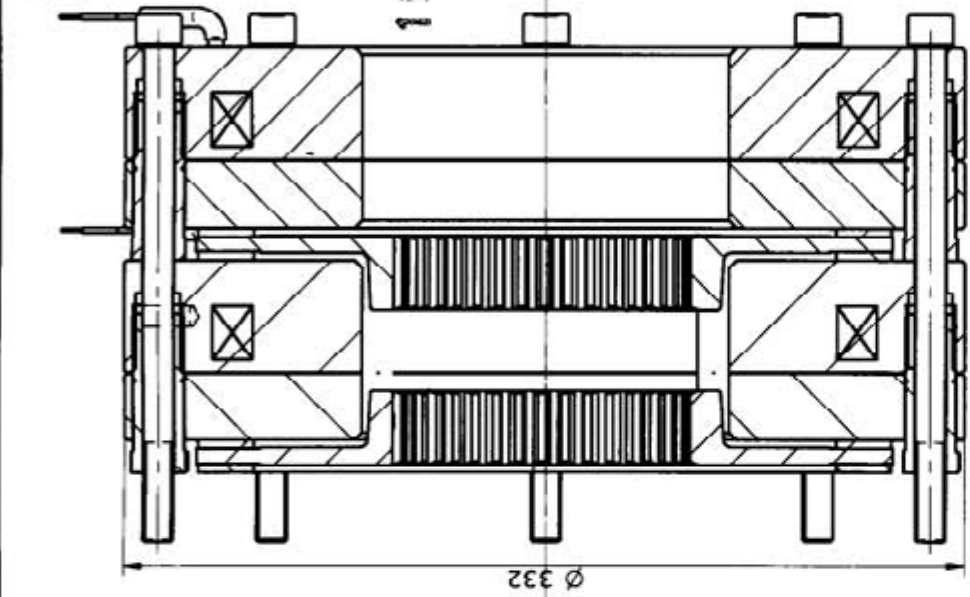
- 3.1 The brake moment effectively adjusted of one brake circuit will be marked at the blank after the type designation ÈRS VAR 09 SZ 1700/\_\_\_ .
- 3.2 The permissible braking moments must be applied to the lift system in such a manner that they do not decelerate more than  $1 g_n$  if the empty car is moving upwards.
- 3.3 In the scope of this 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 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 type examination.
- 3.4 In order to provide identification and information about the design and its functioning drawing no. 1 12 106581, dated 12 July 2001 with last modification dated 17 November 2007 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 (e. g. operating instructions).
- 3.5 The EC type-examination certificate may only be used in connection with the pertinent Annex.

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

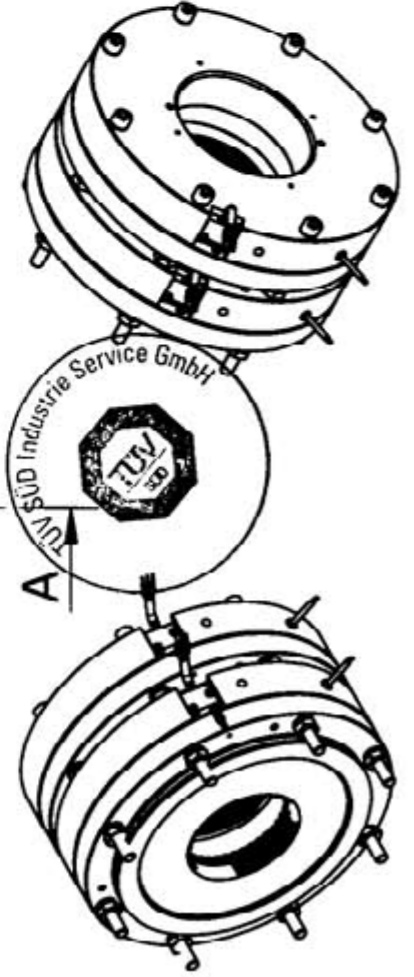
**NOTES**

**- GEPRÜFT -**

TUV SUD Industrie Service GmbH  
 Zentralforschung Elektrotechnik-Condorbräuken  
 Abteilung Aufzüge und Schicht-eisbauteile  
 Wiesenstr. 109, D-80658 München  
 Der Sachverständige  
 Hand lever (option)



A-A



Customer ref :		Up to date		14.11.07		GFE	
Dimensions in mm		REVISION		DATE		By Ch.	
Manual/notice :		FM		LT		Drawn : M. Peiraud Date: 12.07.01	
Mass :		Scale :		Checked: B. Pito		Date: 12.07.01	
Insulation class (°C):		Design: Frein électromagnétique					
Ce plan est la propriété de Warner Electric Europe, il ne peut être divulgué ni reproduit entièrement ou partiellement, sans autorisation écrite.		Type: ERS VAR09 SZ1700/-----					
This document is the property of Warner Electric Europe, it is not to be disclosed or reproduced totally or partially, without written permission.		N° 1 12 106581					









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