



## Operating instructions

Sectional Door - ELEKTROMATEN® SE

TSE 5.24 WS - Serie KG50

integrated Hold to run control T800



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## GENERAL DIRECTIONS

This Sectionaldoor-ELEKTROMAT® is designed to be used only for driving fully balanced sectional doors with build- in mechanical end stops in the construction. All other applications of the ELEKTROMATEN® need to be approved by the manufacturer. Where changes are made to the ELEKTROMATEN® (e.g. re-wiring), the manufacturer's declaration of incorporation cease to apply.

# SAFETY DIRECTIONS

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## Basic Directions

This drive has been built and tested in accordance with **DIN EN 12453 Industrial, commercial and garage doors and gates - Safety in use of power operated doors - Requirements** and **DIN EN 12604 Industrial, commercial and garage doors and gates - Mechanical aspects - Requirements** and left the factory in perfect condition from the point of view of safety. To maintain this condition and to ensure safe operation, the user must observe all the directions and warnings contained in these operating instructions.

In principle, only trained electrical craftsmen should work on electrical equipment. They must assess the work which has been assigned to them, identify potential danger sources and take suitable safety precautions.

Reconstruction of or changes to ELEKTROMATEN® are only permissible with the approval of the manufacturer. Original replacement parts and accessories authorised by the manufacturer guarantee safety. Liability ceases to apply if other parts are used.

The operational safety of an ELEKTROMATEN® is only guaranteed if it is used in accordance with the regulations. The limiting values stated in the technical data should not be exceeded under any circumstances (see corresponding sections of the operating instructions).

## Safety Regulations

During the installation, initial operation, maintenance and testing of the ELEKTROMATEN®, it is necessary to observe the safety and accident-prevention regulations valid for the specific application.

In particular, you should observe the following regulations (this list is not exhaustive):

European normative

- DIN EN 12453  
Safety in use of power operated doors - Requirements
- DIN EN 12604  
Industrial, commercial and garage doors and gates - Mechanical aspects - Requirements

Please check normative's bellow.

VDE-regulations

- VDE 0100  
Regulations regarding the construction of power installations with a nominal voltage of up to 1000 V
- VDE 0105  
Operation of power installations
- DIN EN 60204-1 / VDE 0113-1  
Safety of machinery - Electrical equipment of machines - Part 1:  
General requirements
- DIN EN 60335-1 / VDE 0700-1  
Safety of household and similar electrical appliances - Part 1:  
General requirements



Regulations

- Please ensure that the local regulations relating to the Safety of Operations of Doors are followed

# SAFETY DIRECTIONS

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## Explanation of warnings

These operating instructions contain directions which are important for using the ELEKTROMATEN® appropriately and safely.

The individual directions have the following meaning:



### **DANGER**

This indicates danger to the life and health of the user if the appropriate precautions are not taken.



### **CAUTION**

This warns that the ELEKTROMATEN® or other materials may be damaged if the appropriate precautions are not taken.

## General warnings and safety precautions

The following warnings are to be understood as a general guideline for working with the ELEKTROMATEN® in conjunction with other devices. These directions must be observed strictly during installation and operation.



- Please observe the safety and accident prevention regulations valid for the specific application. The installation of the ELEKTROMATEN®, the opening of covers or lids and electrical connection must be carried out when the supply is switched off.
- The ELEKTROMATEN® must be installed with the authorised coverings and protective devices. Care should be taken that any seals are fitted correctly and screw couplings are tightened correctly.
- In the case of ELEKTROMATEN® with a permanent mains connection, an all-pole main switch with appropriate back-up fuse must be provided.
- Check live cables and conductors regularly for insulation faults or breakages. When a fault is detected in the cabling, the defective cabling should be replaced after immediately switching off the mains supply.
- Before starting operation, check whether the permissible mains voltage range of the devices corresponds to the local mains voltage.
- Emergency stop devices in accordance with VDE 0113 should remain operational in all operating modes of the control. Releasing the emergency stop device should not cause any uncontrolled or undefined restart.

# TECHNICAL DATA

Size		TSE 5.24 WS Single phase
Hollow shaft diameter	mm	25,4
output torque	Nm	50
static stability	Nm	200
door weight up to approx. (observe permissible cable forces for balanced doors with 1-2 counterbalancing springs on a drum of ø160 mm)	N	2000
output revolutions	min <sup>-1</sup>	24
motor performance	kW	0,37
operational voltage	V	1 x 230
frequency	Hz	50
nominal motor current	A	3,5
motor duty cycle	ED	S3 - 40%
power supply / fusing on attachment side		3 x 1,5 <sup>2</sup> / 10A
limit switch range, max. revolutions of the hollow shaft		20
permissible temperature range (in the case of deviation, please check)		-5°C / +40°C
permanent sound emission	dB(A)	< 70
class of protection	IP	54
ELEKTROMATEN® weight	kg	15

In the case of structurally similar ELEKTROMATEN® or special sizes, deviations are possible, in particular in the output torque, output revolutions and the motor data. In each case, the details on the nameplate apply.



**STATIC STABILITY:** Counterbalanced door leaves are prevented from falling down if the drive is capable, when the spring breaks, of holding the weight of the leaf, even under these conditions. This prerequisite is made by the rule BGR 232. The static stability is the permissible load bearing of the gear construction which can occur when the spring breaks.

The static stability  $M_{stat}$  is calculated as follows:

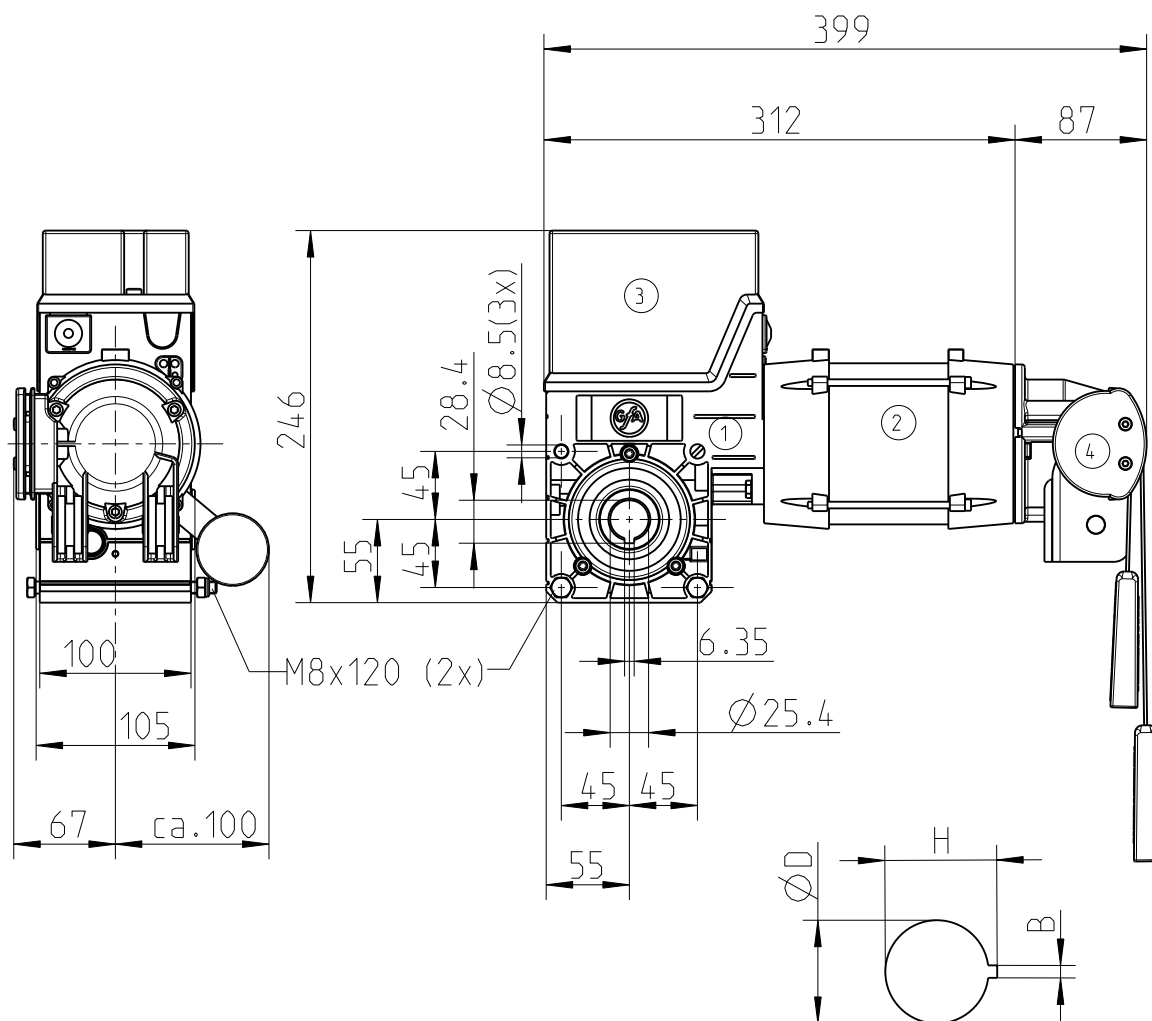
$$M_{stat} [Nm] = \text{leaf weight [N]} \times \text{radius of the cable drum [m]}$$

Since it is possible for 2 counterbalancing springs to fail simultaneously, the technical committee Structural Equipment recommends that the drive be dimensioned such that it can support

- the entire leaf weight where there are one or two counterbalancing springs
- 2/3 of the leaf weight where there are three counterbalancing springs
- 1/2 of the leaf weight where there are four counterbalancing springs

According to the above guidelines, the substantially higher breaking load of the gear construction should not be taken into account when dimensioning the drive. The greatest winding diameter should be taken into account in the case of tapered cable drums. The permissible cable forces must be observed.

# DIMENSIONS



## Model SK (Execution NHK without Fig.)

- ① Hollow shaft / worm gear
- ② Electric motor
- ③ Limits and integrated hold to run control T800
- ④ Emergency manual operation

Hollow shaft diameter D [mm]	B [mm]	H [mm]
25,4	6,35	28,4

- Subject to dimensional and structural changes
- deviations in the overall length and the motor diameter are possible in special sizes

# INSTALLATION INSTRUCTIONS

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After assembling and counterbalancing the in accordance with the manufacturer's instructions, the door should be balanced in every position. The correct counterbalancing is controlled by opening and closing the door by hand. In the case of ELEKTROMATEN® which have already been installed, the correct counterbalancing is controlled with the emergency manual operation. The operating force should be equal in both directions.

## Top-mounted drive (Fig. 1)

The ELEKTROMATEN® is pushed gently onto the spring shaft, which is lubricated in the drive region. In a continuous shaft groove, the key (1) is secured against displacement with 2 screws on both sides of the gear hollow shaft.

When mounting the drive unit 2 delivered screws M 8x120 (2) and nuts shall be used (3) screws must be guided into the hole (4). The tightening torque required for the fixings is 20 Nm.

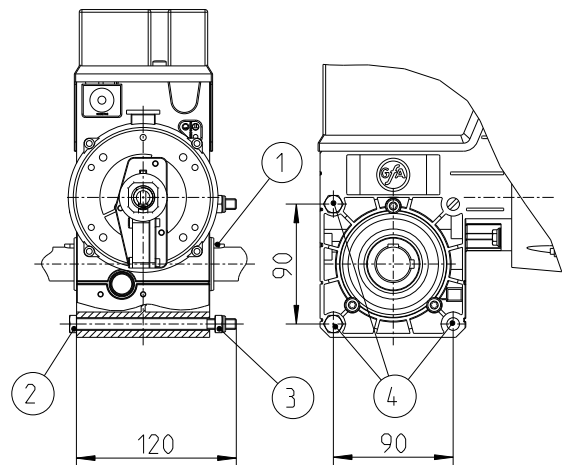
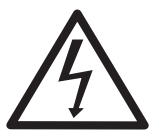


Fig. 1: Top-mounted drive



# EMERGENCY MANUAL OPERATION

The emergency manual operation is provided in order to open or close the door without an electrical supply.



## Warning! Danger of injury through improper operation!

- Before using the emergency manual operation, the main switch should be switched off.
- The emergency manual operation should only be carried out when the motor is stationary.
- A secure position should be adopted to operate the equipment manually.
- In the case of ELEKTROMATEN® with a spring-operated brake, the door should be opened or closed with the brakes on.
- For safety reasons, the brakes should only be lifted for inspection.
- Precautions must be taken on the construction site to prevent the brake from being lifted unintentionally.



The door should not be moved beyond the normal end positions by the emergency manual operation, since this will operate the safety limit switch. Electrical operation of the door is then no longer possible.

## Emergency manual operation by the manual hand crank (NHK) (Fig. 1)

- The manual crank must be inserted into the manual switch receptacle and is turned whilst pressing gently until it engages, on that way the control circuit would be interrupted. It is no longer possible to operate the door electrically.
- The door can be opened and closed by turning the manual crank
- After pulling out the manual crank, electrical operation is once possible.

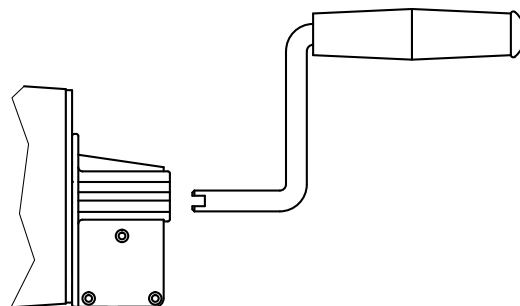


Fig. 1: Emergency manual operation by the manual hand crank

# EMERGENCY MANUAL OPERATION

Execution: **SK** "Rapid hand chain operator" (Fig. 1)

Execution: **KNH** "Chain operator" (without Fig.)

## Emergency manual operation

"Rapid hand chain operator" (Fig. 1)

- The red handle of the engaging and disengaging mechanism is first pulled lightly until it stops (max. operating force 50N), the control circuit is now interrupted, it is no longer possible to operate the door electrically.
- The door can be opened and closed by pulling the chain (2).
- By lightly pulling the engaging and disengaging mechanism by the green handle until it stops (3) (max. operating force 50N), the control circuit is re-made and the door is electrically operational.

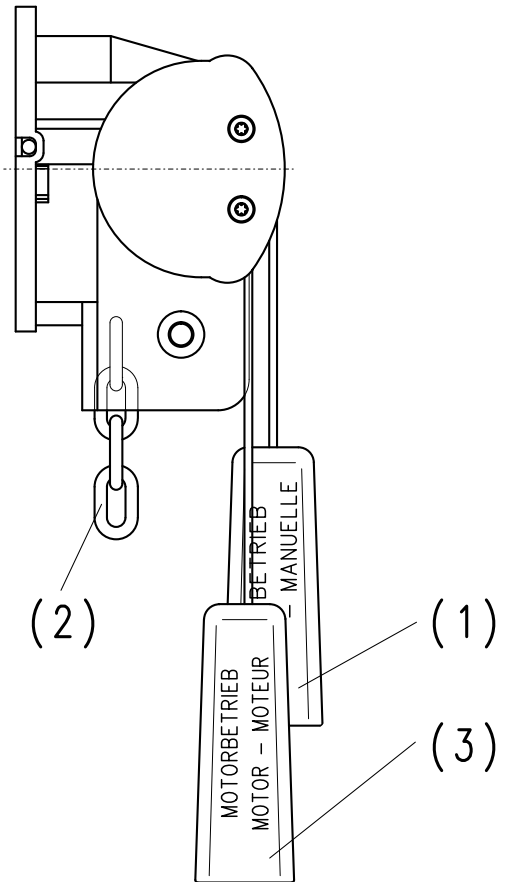


Fig. 1: Emergency manual operation "Rapid hand chain operator"

## Variation of the hand chain length (Fig. 2)

- The hand chain can be opened at the connection point and can be lengthened or shortened with connecting links.
- The connecting links should be bent together carefully.
- When changing the chain length, care should be taken that the chain is cross - assembled (Fig. 2).

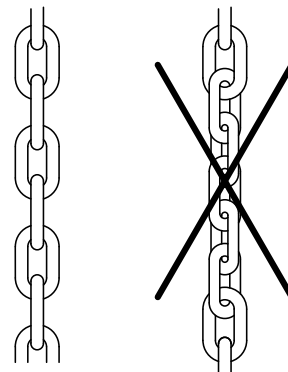


Fig. 2: Variation of the hand chain length

# ELECTRICAL CONNECTION

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## **Warning! Danger to life through electric shock**

Before starting assembly, disconnect the cables from the electricity supply and check that they are dead.

Only trained electrical craftsmen should work on electrical equipment. They must assess the work which has been assigned to them, identify potential danger sources and take suitable safety precautions.

The following tools are recommended for the appropriate electrical connection of the ELEKTROMAT®:

- Multimeter (for alternating current up to at least 750 VAC)
- Electrically insulated screw driver
- Cable stripper
- Diagonal cutter
- Piercing tool to open the cable ducts
- Wire end ferrules with associated pinching tongs when using flexible cables

If the cover is dismantled hold to run control and terminals are accessible.



## **Attention**

The drive is designed to be used only with doors that have a build-in mechanical end stops in the construction.

## **Pass-door switch / slack-rope contact onto the shutter panel**

If fitted, the control T800 is able to evaluate pass-door and slake-rope contact with a 5V safety control voltage circuit. The 2-pole terminal X2 can be used to connect a prepared spiral cable.

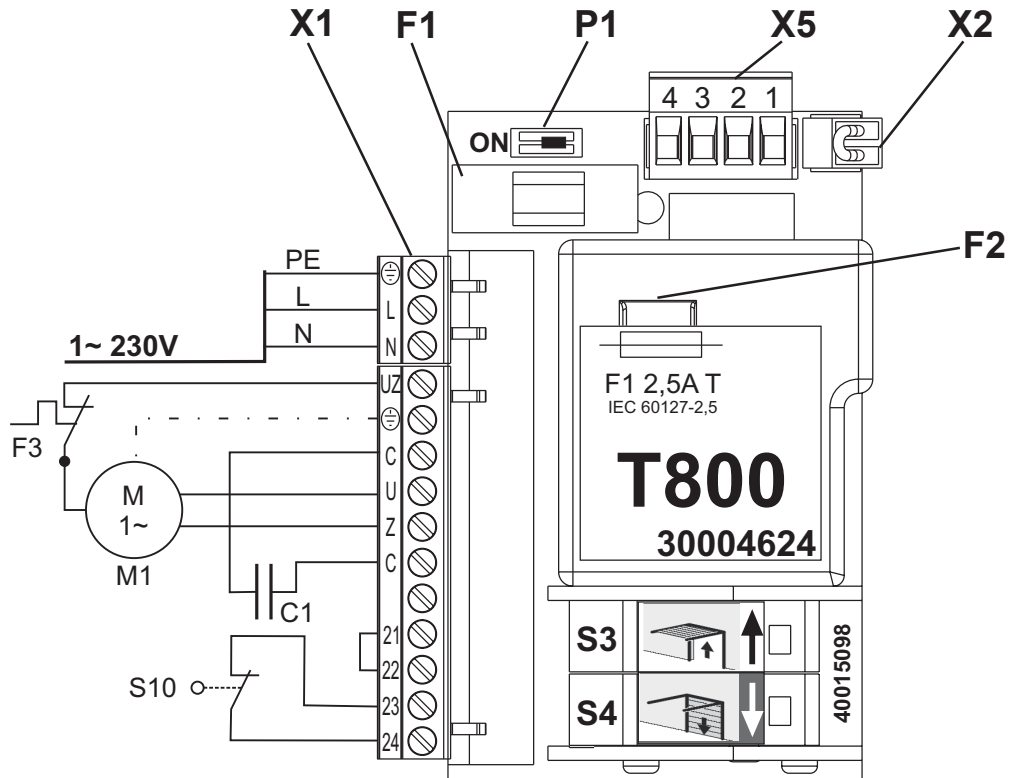
## **Safety control voltage circuit**

The terminals X1/ 21 - 24 are reserved only for safety control voltage circuit. An interruption of the safety circuit causes the control current to be interrupted. Electrical operation is then no longer possible.

The terminals are connected to the safety switch of the emergency manual operation and/or the thermal protection of the motor. If additional safety switches required the switches shall be connected in-line with the existing switches and additional terminals.

# ELECTRICAL CONNECTION

## Hardware - overview



### Discription Print:

**C1** Capacitor

**F1** Fuse

**F2** Replacement fuse

**F3** Thermal protection

**M1** Motor

**S3** Limit switch OPEN

**S4** Limit switch CLOSE

**S10** Emergency operator

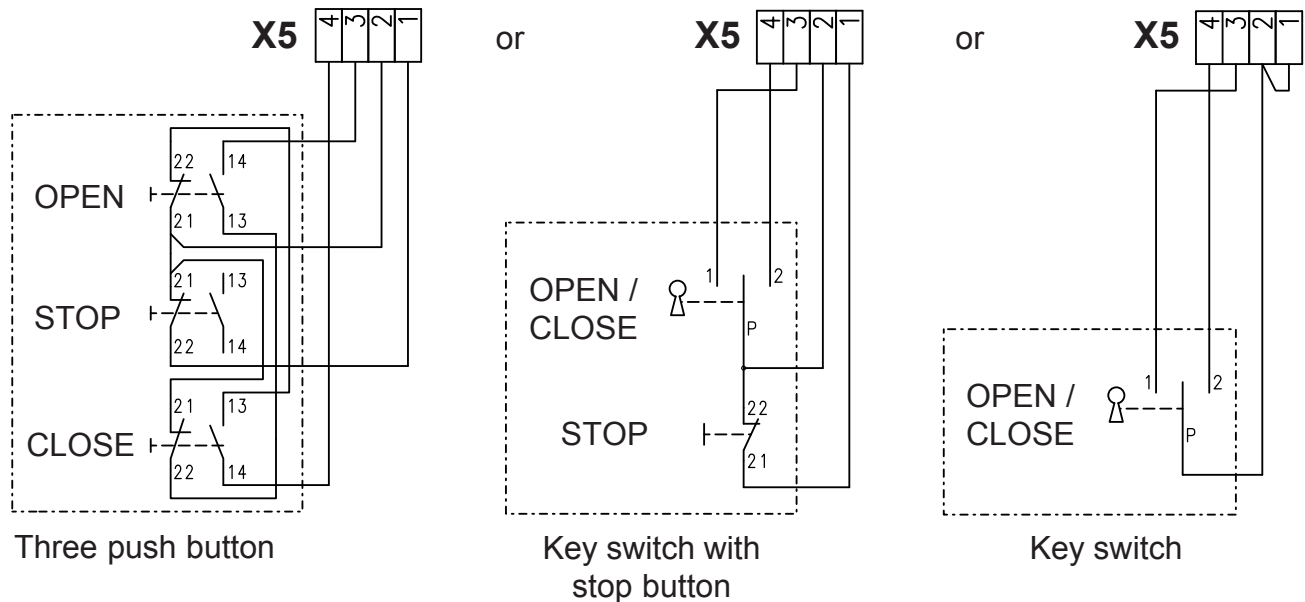
**X1** Mains supply

**X2** Slack-rope switch

**X5** Three push button / Key switch

**P1** Plunger: Hold to run OPEN / self hold OPEN

## Push button



# ADJUSTMENT

## Working limits OPEN / CLOSE

The limit adjustment position determines the upper-and lower end position of the door. The limit adjustment is only possible if the ELEKTROMATEN® has an electrical supply and a connected push button.



**Attention**  
Check before setting the limits that the plunger is switched to the position hold to run mode.  
(See fig. 2)

In order to adjust the limit switch for the upper stopping position of the door, the following steps should be carried out:

### Upper stopping position

- Rotate switching cam (1) of the S3 limit switch „OPEN“ to the middle of the switching cam (2) and tighten the coarse adjustment screw with the hexagonal socket screw key.
- Close door, until limit switch switches again
- Open door again to final upper stopping position
- Correct upper stopping position, possibly by turning the fine adjustment screw (4)

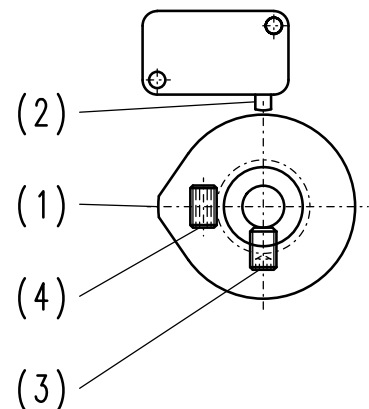


Fig. 1: Limit switch cam

### Advice!

The fine adjustment screw can be moved from both sides with the hexagonal socket screw key

### Lower stopping position

After closing the door the CLOSE limit switch S4 can be adjusted similarly to the upper stopping position.

### Plunger P1: Hold to run OPEN / self hold CLOSE

When switching the plunger P1 self hold OPEN can be adjusted. If an open impulse was given the door travel to final OPEN position. Plunger position supplied is Hold to run position.

Plunger position **on** = Self hold OPEN (see fig.2)

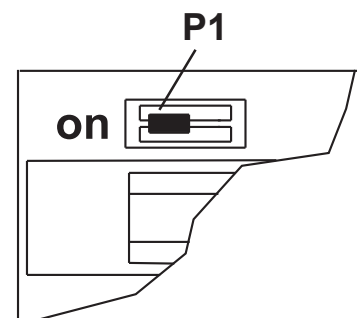


Fig. 2: Plunger P1

# ANNUAL INSPECTION

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The maintenance of power-assisted windows, doors and gates should only be carried out by persons authorized by the employer and who are familiar with the respective maintenance work.

## Directions for the inspector

### Gearbox:

The gear construction is maintenance-free and has lifetime lubrication. The output shaft should be kept rust-free.

### Attachments:

All attachment screws should be inspected to make sure they are fitted securely and are in perfect condition.

### Counter-balancing of sectional doors:

According to the regulations regarding counterbalancing, the door should be balanced in every position (cf. Installation instructions).

### Brake (if fitted)

The correct function of the brake should be checked during the annual inspection.

Where there is increased wear, the brake lining or - once the rectifier has been disconnected - the entire brake can be exchanged.

## **TRANSPORT / STORAGE / DISPOSAL**

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The ELEKTROMATEN® is assembled completely and is wired ready for connection. Transport and any storage should be carried out in the provided (or equivalent) packaging to avoid damage.

On disposal the ELEKTROMATEN®,

- metals
- plastic parts
- electric parts
- lubricants

must be separated.

## **SERVICE / REPLACEMENT PARTS / ACCESSORIES**

Please note that replacement parts and accessories which have not been supplied by us have also not been tested and released by us.

Fitting and / or using such products can therefore negatively affect the above properties of the ELEKTROMATEN® and thus reduce its safety.

GfA accepts no liability for nor provides any guarantee against damage caused by using non-original replacement parts and accessories.

Faults which the users cannot rectify themselves should only be corrected by the manufacturer of the door equipment or another specialist firm. Replacement parts can also be requested from such firms.

# DECLARATION OF INCORPORATION

according to  
EC Guidelines 98/37/EC  
Low voltage guideline 73/23/EEC  
with amendments  
Electromagnetic compatibility 89/336/EEC  
with amendments



**ELEKTROMATEN®**

GfA - Gesellschaft für Antriebstechnik  
Dr.-Ing. Hammann GmbH & Co. KG  
Wiesenstr. 81

**40 549 Düsseldorf (Heerdt)**

We, the  
**GfA - Gesellschaft für Antriebstechnik**  
**Wiesenstr. 81, 40549 Düsseldorf (Heerdt), Germany**  
here by declare that the following products are conform with the  
above EC Guidelines and are only intended for installation in door equipment.

Product description:   Hollow-shaft ELEKTROMATEN®   "The Safedrive compact"  
"The Safedrive"  
"The Rapid Safedrive"  
"The Rapid Safedrive RAS-F"

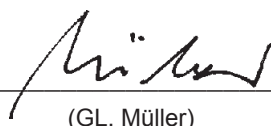
Sectional door   ELEKTROMATEN®  
Chain drive   ELEKTROMATEN®  
Sliding door   ELEKTROMATEN®  
Swing door   ELEKTROMATEN®  
Cable drum   ELEKTROMATEN®  
Folding door   ELEKTROMATEN®  
Rapid handchain   ELEKTROMATEN®

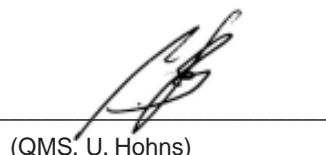
Harmonised norms applied

- **DIN EN 12543**  
Safety in use of power operated doors  
- Requirements
- **DIN EN 12604**  
Industrial, commercial and garage doors and gates - Mechanical aspects  
- Requirements

The machinery to which this Declaration of Incorporation relates must not be put in to service until the relevant machinery into which is to be incorporated has been declared in conformity with the provisions of the Machinery Directive.

Düsseldorf, 14th May 2001

  
(GL, Müller)

  
(QMS, U. Hohns)