

# Instructions

TSG car door locking device

FKTV

**Documentation history**

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8	1.5	08.11.22	FH
9	1.6	13.11.23	FH
10	1.7	08.10.24	FH



Fordern Sie die Umbauanleitung auf **Deutsch** an, indem Sie den QR Code einscannen.



Demandez les instructions d'instruction de montage en **français**, en scannant le code QR.

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## Contents

1	Basic information	4
1.1	Copyright	4
1.2	Notes in the manual	4
1.3	Informal measures by the installer	4
1.4	Requirements for installation personnel	4
1.5	Explanation of symbols	4
2	General	5
3	Functional description	5
4	Scope of delivery	6
5	System design	7
5.1	Mechanical assembly of the safety switch	7
5.1.1	Installation with a centrally opening car door	8
5.1.2	Assembly with telescopic car door	8
5.1.3	Emergency release via Bowden cable	9
5.2	Electrical connection	10
5.2.1	Overview of cabling	10
5.2.2	Safety switch connection	11
5.3	Determination of the unlocking zone	14
5.3.1	Unlocking zone description	14
5.3.2	Unlocking zone via sensor kit	15
5.4	Bolt signal connection	18
6	Configuration of the FKTV module	20
6.1	Additional modules	20
6.2	Holding time in the unlocking zone	21
7	Schematic representation	22
8	Behaviour and functions	23
8.1	Description of the display in the event of an error	23
8.2	Automatic opening of the car door in the event of a power failure	24
8.2.1	Setting of parameter A3	24
8.2.2	Behaviour when parameter A3 is activated	25
8.3	Behaviour of the car door locking device in the unlocking zone	26
8.3.1	Behaviour in normal operation	26
8.3.2	Behaviour in case of power failure	27
8.4	Emergency rescue according to EN81-20	27
8.5	Additional instructions for the system documentation	28
8.5.1	Supplement for emergency evacuation	28
8.5.2	Supplement for commissioning the system	28
8.5.3	Supplement for decommissioning the system	28
9	LED statuses and meanings	29
9.1	LED status - sensor B121 and B122	29
9.2	LED status - safety switches B123 and B124	29
9.3	Status - bolt signal	30
9.4	Flashing behaviour of check and error LEDs	30
9.4.1	Description - blink code	30
9.4.2	Blinking behaviour in the event of errors	30
10	Maintenance and repair	31
10.1	Checking the battery pack	31
10.2	Exchanging the battery pack	31
11	Technical data	32
12	Contact	33

# 1 Basic information

## 1.1 Copyright

We reserve all rights to this document. Without our prior consent is not permitted to copy it, make it available to third parties or otherwise use it without authorisation. Changes require our express prior written consent.

## 1.2 Notes in the manual

All notes in the instructions must be observed.

## 1.3 Informal measures by the installer

The installer of the system must ensure that he himself attends a training course. He must immediately inform the manufacturer/supplier of missing or defective parts.

## 1.4 Requirements for installation personnel

Persons responsible for installation and maintenance should be informed about the generally applicable safety and occupational hygiene regulations. They should be familiar with Langer&Laumann products. The installation tools should be functional and the measuring instruments should be checked continuously.

## 1.5 Explanation of symbols



**WARNING:**

You are advised of a possible impending danger that can lead to serious physical injuries or death.



**CAUTION:**

You are warned of a possible impending danger that can lead to minor physical injuries. You will also find this signal for warnings of property damage.



**NOTE:**

You will be informed about applications and other useful information.

## 2 General

The TSG car door locking device is an extension of the TSG door drive that locks a car door outside the unlocking zone, so that the car door cannot be opened from inside the car.

By using the TSG car door locking device, the TSG door drive can be used as a **car door locking device according to DIN EN 81-20 (see 5.3.9.2)** with the addition of mechanical components.

The TSG car door locking device consists of an expansion board, one or two safety switches and a sensor kit for detecting the unlocking zone.



**CAUTION:**

Before the system is put into operation, a testing organisation must check that all of the locking components work together correctly.



**NOTE:**

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

## 3 Functional description

The TSG car door locking module (FKTV module) is an expansion board that is screwed onto the main board of the TSG V4 electronics by the manufacturer.

The FKTV module ensures that the unlocking zone and optionally the bolt signal are retrieved and the safety switch(es) are activated. Up to two safety switches can be connected to the FKTV module, for example to separately lock the door leaves of a centrally opening car door.

The FKTV module releases the car door in the unlocking zone of the floor, then the TSG door drive can move the car door.

The unlocking zone is recognised by using the sensor kit.

The unlocking of the car door is disabled when the car exceeds a selected speed through the unlocking zone.










The existing safety circuit for the lift control is routed through the door contact provided by the site and additionally via the contact of the safety switch(es).

In the event of a power failure, the main board of the TSG V4 electronics is supplied by the batteries so that an emergency evacuation can be carried out.

## 4 Scope of delivery

The package contains:

**Table 1: Scope of delivery**

Item number	Name	Note	Illustration
8.20.00301.04	TSG V4 Lift Door Operator - Electronic extern - 230[VAC]/50-60[Hz] + NSV + FKTx		
8.20.00302.04 <sup>1</sup>	TSG V4 Lift Door Operator - Electronic extern - 230[VAC]/50-60[Hz] + NSV + FKTx + extension for TSG Sinus Drive		
8.20.34020	Basic kit car door locking device with safety switch and actuator suitable for FKTV, with holder		
8.20.34021 <sup>1</sup>	Basic kit car door locking device with safety switch and actuator suitable for FKTV		
8.20.34200 <sup>2</sup>	Installation kit for FKTx on TSG drive (see also: 1.20.92650 Installation instructions for FKTx)		
8.20.34210 <sup>2</sup>	Installation kit for FKTx lateral to door machine (see also: 1.20.92650 Installation instructions for FKTx)		
8.20.34110	Emergency release kit with bowden cable 2.0m		
8.20.34050	Sensors technology kit for FKTx, construction on cabin (see also 1.20.92640 Installation instructions for sensors technology kit and mounting kit for zone per floor for FKTx)		
8.20.34310	Extension kit for zone per floor, for FKTx (see also 1.20.92640 Installation instructions for sensor kit and mounting kit for zone per floor for FKTx)	1x kit per floor	

<sup>1</sup> alternative

<sup>2</sup> optional

## 5 System design

The TSG car door locking system is divided into two parts.

The first part consists of installing the safety switch on the car door and connecting it to the FKTV module of the TSG V4 electronics.

The second part consists of determining the unlocking zone. To do this, it is necessary to install the sensors to detect the unlocking zones in the shaft.

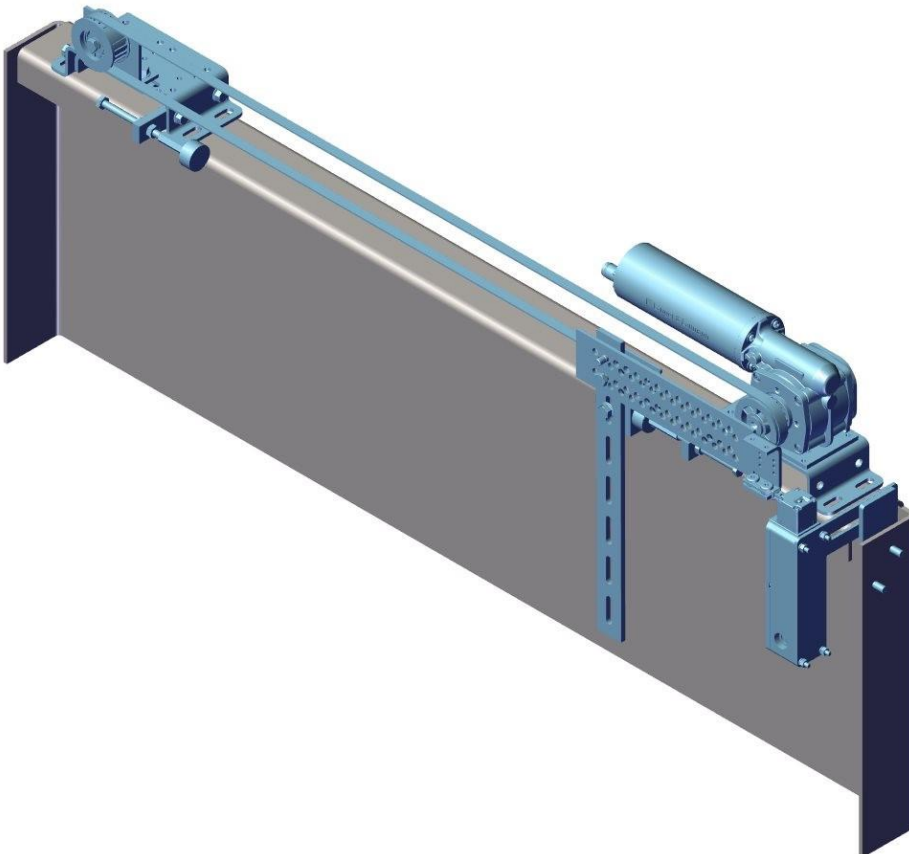


**CAUTION:**

Before the system is put into operation, a testing organisation must check that all of the locking components work together correctly.

### 5.1 Mechanical assembly of the safety switch

The safety switch must be installed in such a way that the car door can be opened max. 50mm from the closed position when the power is off. It must not be possible to open the car door any further. When the safety switch(es) is/are activated by the TSG V4 electronics, the car door is released and the car door can be moved freely.



**Fig. 1: Assembly example**



**NOTE:**

For installation of the safety switch, see instructions:  
1.20.92650 Installation instructions for car door locking



**NOTE:**

The attached warning notice **1.20.11030 Sticker warning TSG with NSV “Unexpected movement”** must be attached to the door machine in a clearly visible way.

### 5.1.1 Installation with a centrally opening car door

When installing the safety switch on a centrally opening car door, make sure that both door leaves (the fast door leaf in each case) are locked in the closed position. It must not be possible to slide the slow door leaf open without actuating the safety switch.

1. Mount safety switch.
2. Close the car door.
3. Insert the actuator into the safety switches so that they are blocked.
4. Fasten the actuator to the car door.



**NOTE:**

In the locked state, the two lugs of the actuator must rest on the insertion funnel of the safety switch.  
Buffers for the end stop must be set appropriately.

### 5.1.2 Assembly with telescopic car door

With a telescopic car door, the fast door leaf must be locked in the closed position using the safety switch. It must not be possible to slide the slow door leaf open without actuating the safety switch.



### 5.1.3 Emergency release via Bowden cable

The emergency release set is optionally available and is attached to the safety switch. It enables simple handling in the event of an emergency evacuation. For this purpose, the Bowden cable must be attached to the cabin or cabin door in such a way that it is easily accessible for the installer in the emergency evacuation zone.

1. Unlocking:  
Pull the Bowden cable as far as it will go.  
The safety switch is unlocked. The cabin door can be pushed open.
2. Locking:  
Self-resetting by internal spring.  
The safety switch is locked. As soon as the door is in the closed position, it is locked.



**NOTE:**

An unlocking stroke of 17mm is required.

The reset function must not be obstructed by improper installation. It is essential to **check the function after installation**.

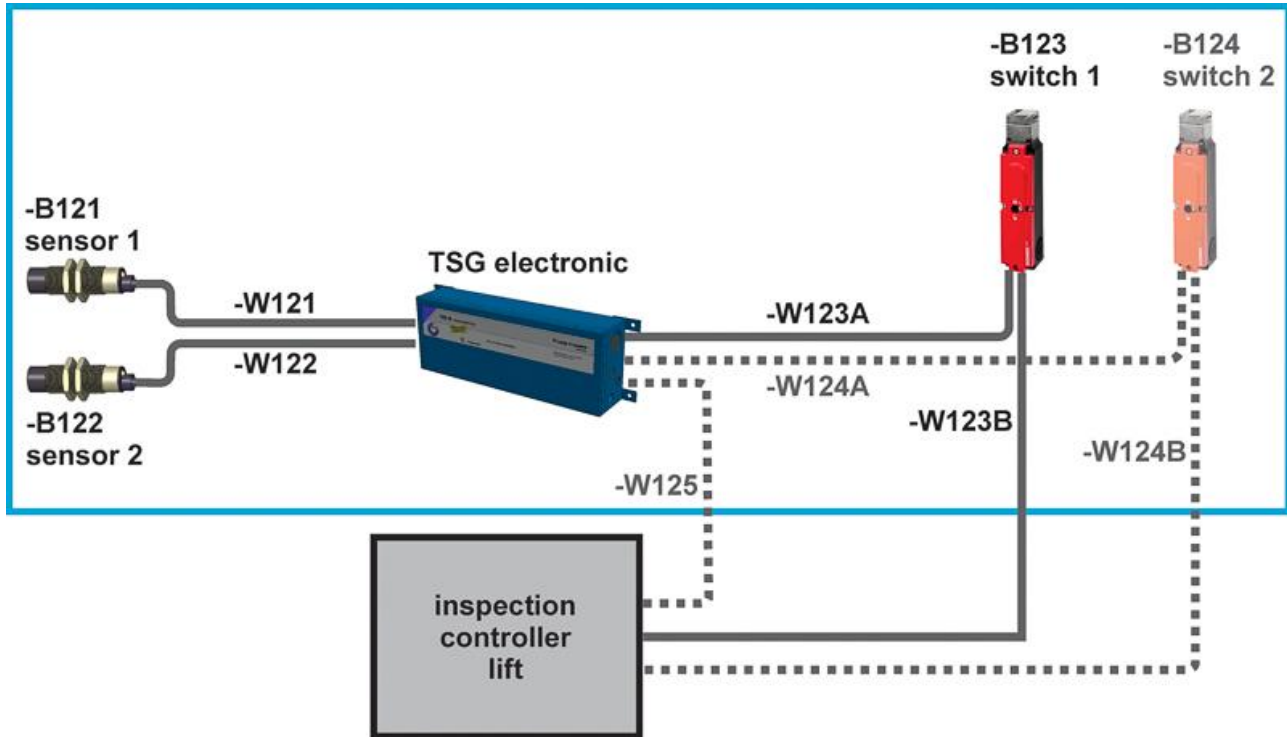


**NOTE:**

When installing the Bowden cable, the **minimum bending radius** of the hose line **of 100mm** must be observed. The Bowden cable is **not suitable for drag chains**.

## 5.2 Electrical connection

### 5.2.1 Overview of cabling



**Table 2: Names of components**

Name	Description	Comment
B121	Sensor 1 for detecting the unlocking zone (see chap. 5.3.2 Unlocking zone via sensor kit / page 15)	
W121	Connection cable sensor 1 and TSG V4 electronics	
B122	Sensor 2 for detecting the unlocking zone (see chap. 5.3.2 Unlocking zone via sensor kit / page 15)	
W122	Connection cable sensor 2 and TSG V4 electronics	
B123	Safety switch 1 (see chap. 5.2.2 Safety switch connection / page 11)	
W123A	Connection cable safety switch 1 and TSG V4 electronics	
W123B	Connection cable safety switch 1 and inspection control	
B124	Safety switch 2 (see chap. 5.2.2 Safety switch connection / page 11)	used optionally
W124A	Connection cable safety switch 2 and TSG V4 electronics	used optionally
W124B	Connection cable safety switch 2 and inspection control	used optionally
W125	Connection cable TSG V4 electronics and inspection control for bolt signal (see chap. 5.4 Bolt signal connection / page 18)	used optionally, provided by customer

## 5.2.2 Safety switch connection

Up to two safety switches (B123, B124) can be connected to plugs X123 and X124 on the FKTV module.

**Table 3: Connection designation - safety switch**

Slot	Pin number	Cable	Sensor	Sensor connection	Signal	Description
X123	1	W123A	B123	E1	U_FKTV1	Control
	2			E2	GND_FKTV1	Ground
	3			33	In_H1_FKTV1	Voltage auxiliary contact
	4			34	OUT_H1_FKTV1	Out auxiliary contact
	5					
X124	1	W124A	B124	E1	U_FKTV2	Control
	2			E2	GND_FKTV2	Ground
	3			33	In_H1_FKTV2	Voltage auxiliary contact
	4			34	OUT_H1_FKTV2	Out auxiliary contact
	5					



**Fig. 2: Plug connection safety switch**



**NOTE:**

When the safety switch is activated, LED123 and LED124 are active.



**NOTE:**

The connection cables W123A and W124A (ÖLFLEX CLASSIC FD810 5GX0,5) and W123B and W124B (ÖLFLEX CLASSIC FD810 3GX1.5) of the safety switches **are drag chain compatible**. In compliance with the minimum bending radius of at least 12.5\*6.8mm = 85mm (for W123A, W124A) and 12.5\*7.4mm=92.5mm (for W123B, W124B) and a maximum travel of 10m, 7 million bending cycles are possible

### 5.2.2.1 Use of one safety switch

When only one car door locking device is used, it can be connected to X123 or X124. It is important then that one **bridge** is set between contacts X123.5 and X124.5.

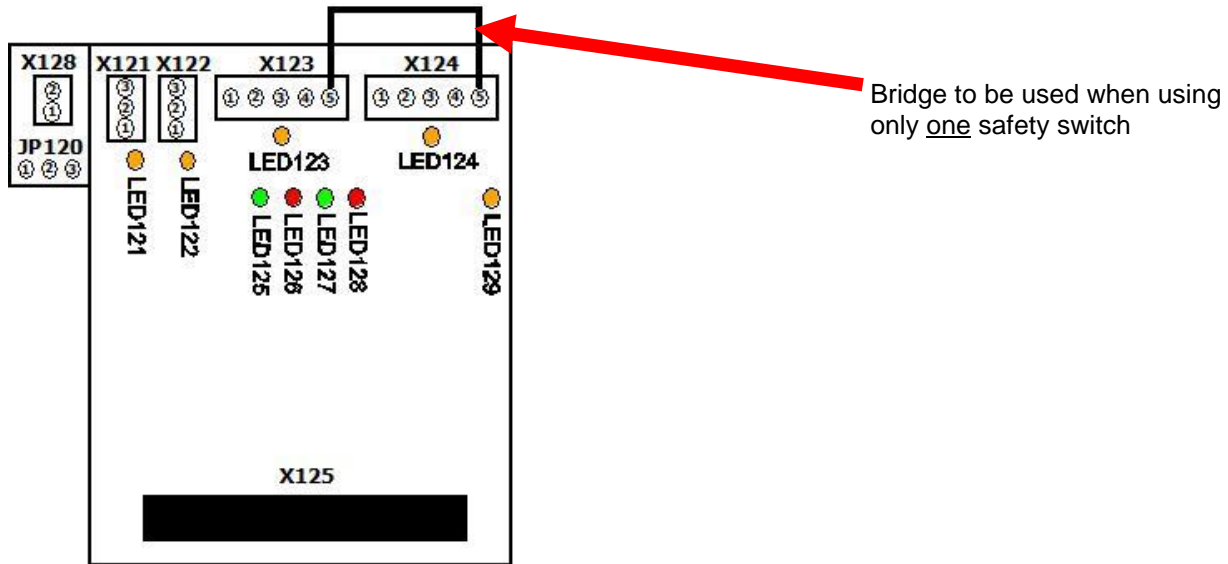


Fig. 3: Connection when constructing with one safety switch: Bridge must be used.

### 5.2.2.2 Use of two safety switches

If two safety switches are installed, these must be connected to X123 and X124. The connection terminals X123.5 and X124.5 must remain free.

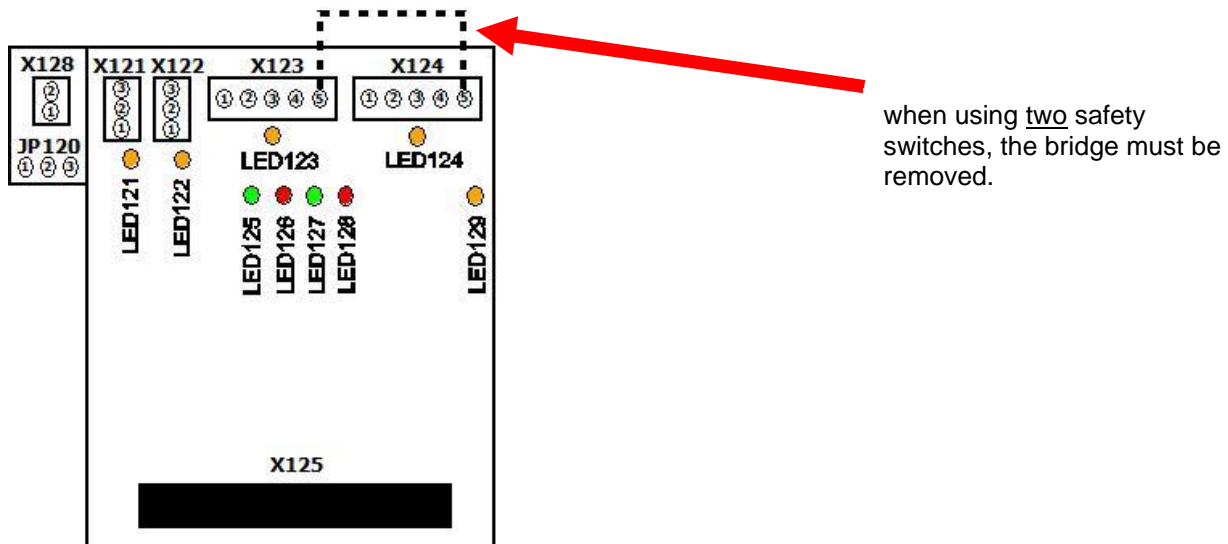


Fig. 4: Connection when using two safety switches: Bridge must be removed.

### 5.2.2.3 Integration of the safety switch in the safety circuit

The safety switch must be integrated into the safety circuit of the lift system in addition to the door contact for "monitoring the closed position".

**Table 4: Connection of the safety switch to the safety circuit**

Cable	Safety switch	Switch connection	Description
W123B	B123	21	Opener contact
		22	
W124B	B124	21	Opener contact
		22	



**WARNING:**

The door contact for "monitoring the closed position" **must be retained. Under no circumstances** may this be **replaced** or **bridged** by the contact of the safety switch!



**NOTE:**

The connection cables W123B and W124B (ÖLFLEX CLASSIC 108 3G1.0) of the safety switches are **not drag chain compatible**.

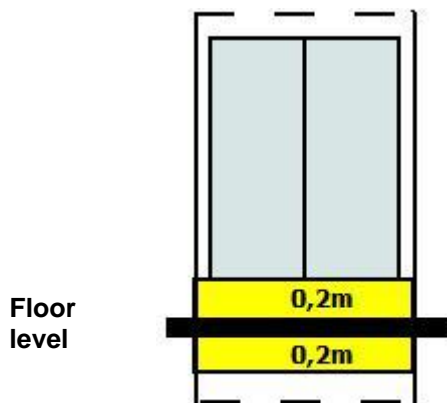
### 5.3 Determination of the unlocking zone

The TSG V4 electronics must ensure that the car is in the unlocking zone so that the car door is opened at the floor in response to the signal from the lift control.

The L&L sensors are used to determine the unlocking zone. Assembly is described in 5.3.2 Unlocking zone via sensor kit / page 15.

#### 5.3.1 Unlocking zone description

A detector for the unlocking zone must be set up at each floor so that the FKTV module can release the car door in this area as soon as there is a door-open command on the TSG V4 electronics. The unlocking zone may not be more than 0.2 m below to 0.2 m above floor level.



**Fig. 5: Schematic representation of the unlocking zone**

### 5.3.2 Unlocking zone via sensor kit

The sensor kit for detecting the unlocking zone consists of two sensors (B121, B122), which are attached to the car with a bracket. The corresponding release plates are installed in the respective unlocking zones of the floors.

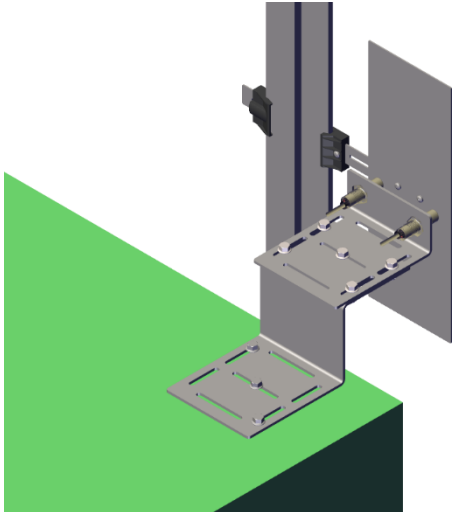


Fig. 6: Sensor kit and release plate when installed on the car

#### 5.3.2.1 Sensor kit bracket

The bracket for the sensor kit with the two sensors is attached to the car near the guide rail. The sensors are designed with an external thread so that they can be positioned as close as possible to the release plate (distance between sensor and release plate  $\leq 15\text{mm}$ ). It is imperative that both sensors in the unlocking zone detect the release plate at the same time.

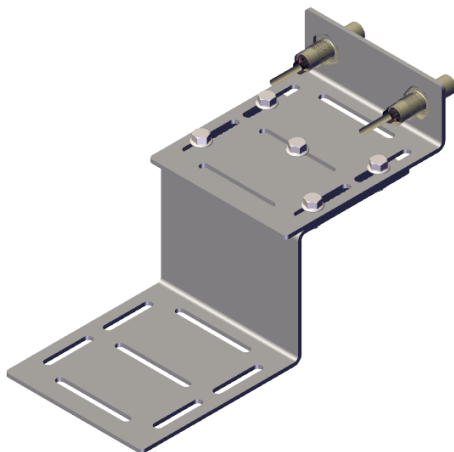


Fig. 7: Sensor kit



**NOTE:**

For installation of the sensor kit see instructions:  
1.20.92640 Installation instructions for sensor kit, mounting kit

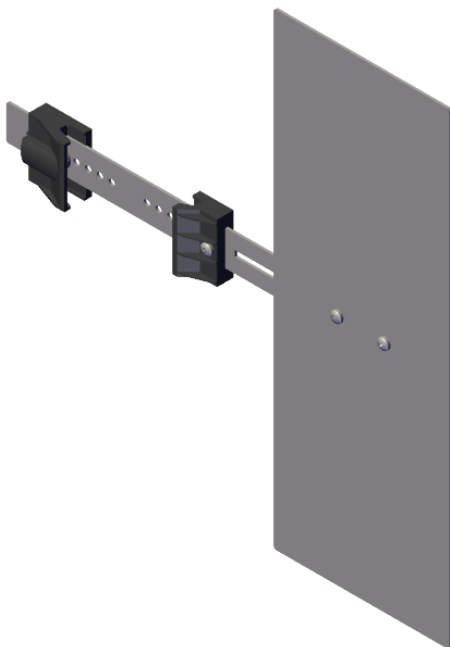


**NOTE:**

After installing the sensor kit, check that there is no interfering metal in the path of the sensors.

### 5.3.2.2 Release plates (per floor)

The release plates are 400mm long and indicate the unlocking zone at the respective floor. They are attached to the guide rail of the car with the bracket, so that both sensors detect the release plate at the same time.



**Fig. 8: Release plate**



**NOTE:**

To assemble the release plate, see instructions:  
1.20.92640 Installation instructions for sensor kit, mounting kit



**NOTE:**

After installing the release plate, check that there is no interfering metal in the path of the sensors.



### 5.3.2.3 Electrical connection sensors

The two sensors (B121, B122) are connected to the FKTV module to detect the unlocking zone.

**Table 5: Connection designation - Sensors**

Slot	Pin number	Cable	Sensor	Wire colour	Signal	Description
X121	1	W121	B121	Brown	B121_VDD	Power supply
	2			Blue	B121_GND	Ground
	3			Black	B121_Output	Output
X122	1	W122	B122	Brown	B122_VDD	Power supply
	2			Blue	B122_GND	Ground
	3			Black	B122_Output	Output



**Fig. 9: Plug connection - Sensor (B121, B122)**



**NOTE:**

LED121 and LED122 light up in yellow when the sensors B121 and B122 are active and the car is in the unlocking zone (see Table 12: Plug and LED designations / page 22).

## 5.4 Bolt signal connection

The bolt signal of the lift control can be connected to the FKTV module. If there is a bolt signal and the car is in the unlocking zone, the safety switch is automatically unlocked and the car door remains closed.

An external voltage (24VDC) is connected to terminal X128 on the FKTV module via the bolt contact. As soon as the bolt signal is applied, the 24VDC are switched through, LED 129 is switched off.



**NOTE:**

The connection cable W125 between TSG V4 electronics and inspection control for the bolt signal must be provided by the customer.

There are three options for control:

**Table 6: Control options by bolt signal**

Possibility		Description	Jumper JP120
1.	The bolt signal is applied while the car is moving through the shaft <sup>3</sup> .	<ol style="list-style-type: none"> <li>The car door is unlocked and the safety circuit is interrupted as soon as the bolt signal has dropped out or there is a door-open command and the car is in the unlocking zone.</li> <li>The car door is locked and the safety circuit is closed as soon as the car door is closed and there is a bolt signal.</li> </ol>	Pin1 and Pin2
2.	There is a bolt signal when the car is in the un-bolt zone and the car door is to be opened <sup>3</sup> .	<ol style="list-style-type: none"> <li>The car door is unlocked and the safety circuit is interrupted as soon as the bolt signal or there is a door-open command.</li> <li>The car door is locked and the safety circuit is closed as soon as the car door is closed and the bolt signal drops out.</li> </ol>	Pin2 and Pin3
3.	The bolt signal is not available.	<ol style="list-style-type: none"> <li>The car door is unlocked and the safety circuit is interrupted as soon as there is a door-open command and the car is in the unlocking zone.</li> <li>The car door is locked and the safety circuit is closed as soon as the car door is closed.</li> </ol>	Pin2 and Pin3

<sup>3</sup> Opening the car door according to EN81-20, Chapter 5.3.15.1b

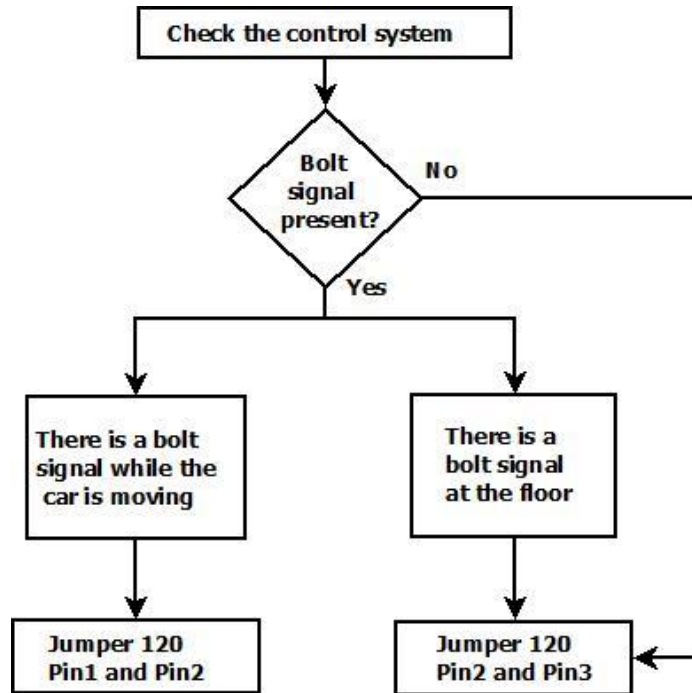


Fig. 10: Flow chart for checking the bolt signal and setting jumper 120



**NOTE:**

If the bolt signal is not to be integrated, terminals X128.1 and X128.2 must remain free. **Jumper JP120** must be set between **Pin2 and Pin3**. LED 129 lights up continuously.

Table 7: Bolt contact connection

Slot	Pin number	Cable	Signal	Description
X128	1	W125	Bolt Anode/cathode	Bolt signal 24VDC / 0VDC (external voltage)
	2		Bolt Cathode/anode	Bolt signal 0VDC / 24VDC (external voltage)

Table 8: Bolt connection – connection data

X128 bolt signal (2-pin push-in spring-connection connector)	
Conductor cross-section rigid/flexible (min./max.) (Insulation stripping length: 10[mm])	0.2 / 1.5 [mm <sup>2</sup> ]
Flexible conductor cross-section with end sleeve with/without plastic sleeve (min./max.)	0.25 / 1.5 [mm <sup>2</sup> ]
Conductor cross-section AWG (min./max.)	24 / 16
Flexible conductor cross-section with end sleeve without plastic sleeve (min./max.)	0.25 / 1.5 [mm <sup>2</sup> ]
Flexible conductor cross-section with end sleeve with plastic sleeve (min./max.)	0.25 / 0.75 [mm <sup>2</sup> ]

## 6 Configuration of the FKTV module

During commissioning, parameters must be set in the TSG V4 electronics.

### 6.1 Additional modules

In order for the FKTV module to be recognised by the TSG V4 electronics, the parameter must be set depending on the application.

**Table 9: Parameter hA, for setting the TSG extensions used**

Parameter setting hA	Function
19	Control of the <b>FKTV module</b> .
20	Control of the <b>FKTV module</b> <b>and</b> <b>TSG Sinus drive</b> .
21	Control of the <b>FKTV module</b> <b>and</b> <b>TSG Sinus drive for the shaft swing door</b> .
22	Control of the <b>FKTV module</b> <b>and</b> Control of the TSG V4 electronics via <b>CANopenLift</b> .
23	Control of the <b>FKTV module</b> <b>and</b> <b>TSG sine drive</b> <b>and</b> control of the TSG V4 electronics via <b>CANopenLift</b> .
24	Control of the TSG <b>FKTV module</b> <b>and</b> <b>TSG sine drive for the shaft swing door</b> <b>and</b> control of the TSG V4 electronics via <b>CANopenLift</b> .
29	Control of the <b>FKTV module</b> <b>and</b> Control of the TSG V4 electronics via <b>Otis extension cards</b> .



## 7 Schematic representation

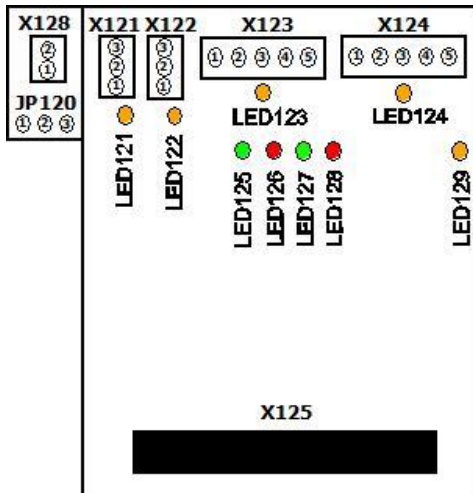











Fig. 11: FKTV module

Table 12: Plug and LED designations

Name	Symbol	Description
X121		Connection - sensor B121
X122		Connection - sensor B122
X123		Connection - safety switch B123
X124		Connection - safety switch B124 (optional)
X125		Connection - TSG web interface
X128		Connection – bolt signal
LED121		Status - sensor B121
LED122		Status - sensor B122
LED123		Status - safety switch B123
LED124		Status - safety switch B124
LED125		K2 check
LED126		K2 error
LED127		K1 check
LED128		K1 error
LED129		Status - bolt signal

## 8 Behaviour and functions

This chapter describes the possible errors, their causes and remedial actions, as well as the behaviour of the car door locking device in the unlocking zone. Furthermore, emergency rescue according to EN81-20 is explained and additional instructions for the documentation are given.

### 8.1 Description of the display in the event of an error

Table 13: Description of the display in the event of an error

Display - TSG	Description of condition	Possible causes	Actions
----	No errors present	----	----
Eu	Communication failure	<ul style="list-style-type: none"> <li>- Flat cable connection to TSG V4 electronics faulty.</li> <li>- incorrect parametrisation of TSG V4 electronics</li> <li>- FKTV module defective</li> </ul>	<ul style="list-style-type: none"> <li>- Check the flat cable connection</li> <li>- Adjust parameter hA (See chapter 6.1 Additional modules / page20).</li> <li>- Restart TSG V4 electronics</li> <li>- Exchange of the TSG V4 electronics</li> </ul>
F1, F2, F3, F7	Internal errors	<ul style="list-style-type: none"> <li>- FKTV module defective</li> </ul>	<ul style="list-style-type: none"> <li>- Restart TSG V4 electronics</li> <li>- Exchange of the TSG V4 electronics</li> </ul>
F4, F5	Power failure	<ul style="list-style-type: none"> <li>- Flat cable connection from FKTV module to TSG V4 electronics faulty.</li> <li>- FKTV module defective.</li> </ul>	<ul style="list-style-type: none"> <li>- Check the flat cable connection</li> <li>- Restart TSG V4 electronics</li> <li>- Exchange of the TSG V4 electronics</li> </ul>
F6	Power failure	<ul style="list-style-type: none"> <li>- 24V not available, connection to/from the DCDC converter faulty.</li> </ul>	<ul style="list-style-type: none"> <li>- Check the connection to the DCDC converter</li> <li>- Exchange of the TSG V4 electronics</li> </ul>
F8	Sensors do not switch at the same time	<ul style="list-style-type: none"> <li>- Sensors do not reach the release plate at the same time.</li> <li>- The distance between the sensors and the release plate is different.</li> <li>- At least one sensor is defective.</li> </ul>	<ul style="list-style-type: none"> <li>- Realign the bracket or plate.</li> <li>- Realign the sensors</li> <li>- Replace sensor(s)</li> </ul>
F9	Sensor cross-circuit	<ul style="list-style-type: none"> <li>- FKTV module is dirty.</li> <li>- Sensor cables damaged.</li> <li>- FKTV module defective.</li> </ul>	<ul style="list-style-type: none"> <li>- Clean the FKTV module</li> <li>- Replace the sensor cable</li> <li>- Exchange of the TSG V4 electronics</li> </ul>
FA	Safety switch remains locked	<ul style="list-style-type: none"> <li>- The car door cannot be opened by the TSG door drive because the safety switch does not unlock mechanically.</li> <li>- The car door does not open directly because the hold time in the unlocking zone is set too long</li> </ul>	<ul style="list-style-type: none"> <li>- The car is outside the unlocking zone.</li> <li>- Check mechanics (actuator).</li> <li>- Check terminals X123 and X124.</li> <li>- Check the contacts of the car door locking device.</li> <li>- Check cable connection between FKTV and safety switch</li> <li>- Adjusting the parameter A2 (view chapter 6.2 Holding time in the unlocking zone / page 21)</li> </ul>
Fb	It is not possible to lock the safety switch.	<ul style="list-style-type: none"> <li>- The car door was closed by the TSG door drive but could not be locked.</li> </ul>	<ul style="list-style-type: none"> <li>- Check mechanics (actuator).</li> <li>- Check terminals X123 and X124</li> <li>- Check the contacts of the safety switch.</li> <li>- Auxiliary release on the safety switch opened</li> <li>- Check cable connection between FKTV and safety switch</li> </ul>

## 8.2 Automatic opening of the car door in the event of a power failure

In the event of a power failure, the car door is automatically unlocked after 5 seconds as soon as the car is in the unlocking zone.

In addition, the TSG door drive can automatically open the car door by an adjustable distance after unlocking.

### 8.2.1 Setting of parameter A3

If parameter A3=00, the automatic door opening function is deactivated.

If the parameter A3 is set to >00, the automatic door opening function is activated. The set value corresponds to the opening width in cm.

**Table 14: Parameter A3 for setting the opening width of the car door in the unlocking zone in the event of a power failure**

Pa-rameters	Meaning	Value in cm
A3	Setting the opening width of the car door in the unlocking zone in the event of a power failure	Range of values adjustable in 1cm steps: Minimum: <b>00</b> = Car door remains closed Standard: <b>05</b> = Car door opens 5cm wide Maximum: <b>99</b> = Car door opens completely



**NOTE:**

If the measured door width (see also parameters r6, r7, r8) is smaller than the value set in parameter A3, the car door opens completely.



### 8.2.2 Behaviour when parameter A3 is activated

If the car is **within the unlocking zone** if there is a mains voltage failure, the safety switch is unlocked after 5 seconds and the car door opens directly by the value set in parameter A3.

If the car is outside the unlocking zone when there is a power failure, the safety switch remains locked and the car door remains closed.

If the car is moved into the unlocking zone, the safety switch is unlocked and the car door opens automatically after another **30 seconds** by the value set in parameter A3.

The car door can be pushed open manually beyond the set opening width. If the car door is closed, it opens automatically by the value set in parameter A3.



**NOTE:**

If there is an “Open door” control signal, the car door opens completely.  
If there is a “Close door” control signal, the car door will not move.



**NOTE:**

If the unlocking zone signal fails briefly in the event of a power failure, the car door only opens after 30 seconds, even if the car is within the unlocking zone.

## 8.3 Behaviour of the car door locking device in the unlocking zone

The behaviour of the car door locking system is described below, taking into account the connection options for controlling the bolt signal explained in chapter 5.4 Bolt signal connection / page 18.

### 8.3.1 Behaviour in normal operation

Requirement: There is mains voltage.

#### 8.3.1.1 The bolt signal is activated while the car is moving through the shaft (high).

1. When the car has reached its target level, the bolt signal is set inactive (LED129 OFF).
2. When the unlocking zone has been detected, the safety switch is unlocked. The safety circuit is interrupted (LED123 and LED124 are ON).
3. When there is an "Open door" control signal, the car door opens.
4. When there is a "Close door" control signal, the car door closes.
5. If the car door is in the closed position, the safety switch remains unlocked<sup>4</sup> until the bolt signal becomes active (LED129 lights up). The car door is locked (LED123 and LED124 do not light up).
6. The car can be moved.

#### 8.3.1.2 The bolt signal is deactivated while the car is moving through the shaft (low).

1. When the car has reached its target floor, the bolt signal is activated (LED129 is OFF).
2. When the unlocking zone is detected, the safety switch is directly unlocked. The safety circuit is interrupted (LED123 and LED124 are ON).
3. When there is an "Open door" control signal, the car door opens.
4. When there is a "Close door" control signal, the car door closes.
5. When the car door is in the closed position, the safety switch remains unlocked<sup>4</sup> until the bolt signal is deactivated (LED129 is ON). The car door is locked (LED123 and LED124 are OFF).
6. The car can be moved.

#### 8.3.1.3 The bolt signal is not available.

1. LED129 lights up continuously (ON).
2. When the car has reached its target floor and the unlocking zone has been detected, the safety switch remains locked.
3. When there is an "Open door" control signal, the safety switch is unlocked and the car door is opened. The safety circuit is interrupted (LED123 and LED124 are ON).
4. When there is a "Close door" control signal, the car door closes.
5. When the car door is in the closed position, the safety switch is locked (LED123 and LED124 are OFF), the car door is locked.
6. The car can be moved.

---

<sup>4</sup> Opening the car door according to EN81-20, Chapter 5.3.15.1b

### 8.3.2 Behaviour in case of power failure

The behaviour of the car door locking device in the event of a power failure depends on the position of the car.

1. **Car in the unlocking zone (LED121 and LED122 are ON)**
  - For this see chap. 8.2 Automatic opening of the car door in the event of a power failure / page 24
2. **Car outside the unlocking zone (LED121 and LED122 are OFF)**
  - The safety switch remains locked (LED123 and LED124 are OFF).
  - The "Open door" control signal is not executed.
  - It is not possible to push the car door open by hand.

### 8.4 Emergency rescue according to EN81-20

At the beginning of each emergency rescue, the position of the car must be determined.

1. **Car is more than 1.2m above / below the floor.<sup>5</sup>**
  - a. Car door remains locked
    - Car must be lowered/raised slowly until a floor is reached.
    - Continue with point 2. or 3.
2. **Car is > 0.2m and <1.2m above / below the floor<sup>5</sup>**
  - a. Car door remains locked
    - Unlock the car door:
      1. using a slotted screwdriver directly at the safety switch
      - or*
      2. Unlock using a Bowden cable (if this was installed as an option)
3. **Car is in the unlocking zone**
  - a. There is mains voltage:
    - The car door can be opened using the "Open door" control signal.
    - When the bolt signal is used, the car door can be pushed open by hand.
  - b. Mains voltage not available (battery operation active):
    - The car door is automatically unlocked and
      1. is opened after 30 seconds by the value set in parameter A3 (see chapter 8.2.1 Setting of parameter A3 / page 24)
      - or*
      2. can be pushed open by hand.



**NOTE:**

For lifts without a machine room an emergency rescue at the top floor is to be avoided. In the event of a power failure, it must be possible to access the car roof or at least to slide open the door on the top floor, since the car door is not automatically unlocked if the battery pack malfunctions and must be unlocked manually (using a flat-head screwdriver or Bowden cable).



**NOTE:**

After each emergency release, **the entire system must be checked for function**. It must be ensured that the safety switch still functions properly. Emergency release can cause damage that is not visible from the outside.

<sup>5</sup> Specified distances according to EN81-20, chapter 5.6.7.5

## 8.5 Additional instructions for the system documentation

The respective protocols and instructions of the lift system must be extended by the following additions.

### 8.5.1 Supplement for emergency evacuation

A distinction must be made whether parameter A3 is active or inactive (see chapter 8.2.1 Setting of parameter A3 / page 24).

#### 8.5.1.1 Parameter A3 active

1. Car is located within the unlocking zone

In the event of a power failure, the car door is automatically unlocked and opened by the value set in parameter A3.

- The car door can then be opened completely by hand.

2. Car is located outside the unlocking zone

- In the event of a power failure, the car door remains locked.

- The car must be brought to the nearest floor.

**CAUTION: Emergency evacuation is only permitted at the nearest floor!**

- When the unlocking zone is reached, the car door automatically unlocks.

- The car door opens automatically after 30 seconds by the value set in parameter A3.
- The car door can then be opened completely by hand.

#### 8.5.1.2 Parameter A3 not active

1. Car is located within the unlocking zone

In the event of a power failure, the car door is automatically unlocked.

- The car door can be opened completely by hand.

2. Car is located outside the unlocking zone

- In the event of a power failure, the car door remains locked.

- The car must be brought to the nearest floor.

**CAUTION: Emergency evacuation is only permitted at the nearest floor!**

- When the unlocking zone is reached, the car door automatically unlocks.

- The car door can then be opened completely by hand.

### 8.5.2 Supplement for commissioning the system

1. Clamp both batteries onto the TSG V4 electronics.
2. Switch system on

### 8.5.3 Supplement for decommissioning the system

1. Disconnect both batteries from the TSG V4 electronics.
2. Disconnect the system from the power supply.

## 9 LED statuses and meanings

There are nine LEDs on the TSG FKTV module (see Fig. 11: FKTV module / page 22)

### 9.1 LED status - sensor B121 and B122

The status of sensor B121 is shown via **LED121** and the status of sensor B122 is displayed via **LED122**.

**Table 15: LED status - sensor B121 and B122**

Status	Description of condition	Possible causes	Actions
OFF	<ul style="list-style-type: none"> <li>- There is no voltage</li>   <li>- Sensor not active</li> </ul>	<ul style="list-style-type: none"> <li>- Connector not connected</li>   <li>- Connector not connected</li>   <li>- The car is outside the unlocking zone</li>   <li>- Faulty sensor</li> </ul>	<ul style="list-style-type: none"> <li>- Check the plug connections:               <ol style="list-style-type: none"> <li>1. Flat cable connection to TSG V4 electronics (X126)</li> <li>2. Check mains voltage supply on TSG V4 electronics.</li> </ol> </li>   <li>- Check the plug connections Sensors (X121, X122)</li>   <li>- Drive the car into the unlocking zone</li>   <li>- Replace sensor</li> </ul>
ON	Sensor active	<ul style="list-style-type: none"> <li>- Unlocking zone was recognised.</li> </ul>	No actions required

### 9.2 LED status - safety switches B123 and B124

The status of the safety switch B123 is displayed via LED123 and the status of safety switch B124 is displayed via LED124 (if only one safety switch is installed, LED123 and LED124 indicate the status of safety switch B123).

**Table 16: LED status - safety switches B123 and B124**

Status	Description of condition	Possible causes	Actions
OFF	Safety switch is not activated	<ul style="list-style-type: none"> <li>- Connector not connected</li>   <li>- The car is outside the unlocking zone</li>   <li>- The car door is in the Closed position.</li> </ul>	<ul style="list-style-type: none"> <li>- Check the plug connections:               <ol style="list-style-type: none"> <li>1. Safety switch (X123, X124)</li> <li>2. Flat cable connection to TSG V4 electronics (X126)</li> <li>3. Mains power supply for the TSG V4 electronics</li> </ol> </li>   <li>- Drive the car into the unlocking zone</li>   <li>- The safety switch can remain activated if the bolt contact is used (see chapter 5.4 Bolt signal connection18)</li> </ul>
ON	Safety switch is activated	<ul style="list-style-type: none"> <li>- The safety switch is activated in the unlocking zone.</li> </ul>	No actions required

### 9.3 Status - bolt signal

Table 17: 8.2 Status - LED129 bolt signal

Status	Description of condition	Possible causes	Actions
OFF	There is a bolt signal	There is a bolt signal	No actions required
ON	There is no bolt signal	There is no bolt signal	No actions required

### 9.4 Flashing behaviour of check and error LEDs

#### 9.4.1 Description - blink code

The check LED and error LED can not only be switched on and off, they can also show a defined flashing behaviour:

Table 18: Description - blink code

	ON	OFF	Flickering (10Hz)	Blink / !Blink (1Hz)	Short / !Short	Long / !Long
<b>ON</b>	100%	0	50%	50%	20%	80%
<b>OFF</b>	0	0	50%	50%	80%	20%



**NOTE:**





If the status description has an ! (exclamation mark), the behaviour of the LED is inverted.

Example: K1\_Error = Blink, K2\_Error = !Blink

→ The two LEDs light up inverted to each other.

#### 9.4.2 Blinking behaviour in the event of errors

Table 19: Blinking behaviour in the event of errors

Display - TSG	K1_Run LED127 	K2_Run LED125 	K1_Error LED128 	K2_Error LED126 	Meaning
----	Blinks	Blinks	OFF	OFF	No errors present
F0, Eu	OFF	OFF	ON	ON	Communication failure
	OFF	OFF	ON	OFF	
	OFF	ON	ON	OFF	
	OFF	OFF	OFF	ON	
	ON	OFF	OFF	ON	
F1	Blinks	OFF	ON	ON	Internal error
F2	OFF	OFF	Flickers	Flickers	Internal error
F3	OFF	OFF	Short	Short	Internal error
F3	OFF	OFF	Long	!Long	Internal error
F4	ON	ON	OFF	Blinks	Voltage error 3.3V
F5	ON	ON	Blinks	Blinks	Voltage error 12V
F6	ON	ON	Blinks	!Blinks	Voltage error 24V
F7	Blinks	OFF	Blinks	Blinks	Internal error
F8	Blinks	OFF	Blinks	!Blinks	Sensors do not switch at the same time
F9	Blinks	OFF	Blinks	ON	Sensor cross-circuit

## 10 Maintenance and repair

Maintenance of the TSG car door locking device is limited to a minimum due to its structural design. Components that are subject to operational wear and tear are to be included in regular maintenance and repair activities.



**WARNING:**

During maintenance work, it is essential to ensure that the drive cannot be switched on and that no exposed parts can inadvertently be subject to electrical power. After completing these measures, the existing protective and safety devices must be reinstalled on the drive.

Regular checks are essential for the operation of the TSG car door locking device, but at least every 12 months. At a minimum the following points must be checked:

- Check the functions of the system (safety devices, inputs, outputs, etc.)
- Check the mechanical function of the car door locking device
- The TSG battery pack must be checked for operation.
- The TSG battery pack must be replaced within a maximum 2 years (see also the note on the TSG V4 electronics housing cover).



**CAUTION:**

If damage and/or defects are found on the system, it must be shut down immediately. The damage and/or defects must be remedied before starting up again.



**NOTE:**

The TSG battery pack can be ordered from Langer & Laumann Ingenieurbüro GmbH:  
8.20.10109 TSG battery set for TSG V4 electronics

### 10.1 *Checking the battery pack*

An emergency rescue is required so that the function of the battery pack can be checked (see chapter 8.4 Emergency rescue according to EN81-20 / page 27, paragraph 3.b Mains voltage not available (battery operation active): / page 27). If the car door can be slid open, the battery pack is operational.

### 10.2 *Exchanging the battery pack*

1. Close the car door.
2. Disconnect the TSG V4 electronics from the mains
3. Disconnect each battery plug from TSG V4 electronics
4. Remove the old battery pack
5. Install new battery pack
6. Connect the battery plug to the TSG V4 electronics
7. Switch on TSG V4 electronics
8. Replace the sticker on the housing cover.

# 11 Technical data

**Table 20: Technical data**

<b>Technical data for the FKTV module</b>	
Bolt signal connection X128	12..32[VDC] / 3..9[mA]
Permissible storage/transport temperature	0 [°C]...60[°C]; maximum change: 20[K/h]
Permissible mean ambient operating temperature	5 [°C]...40[°C] at rated values, no direct sunlight.
Installation height	Up to 1,000[m] above sea level without restriction; 1,000 to 2,000[m] above sea level with service reduction
Protection class	Splash-proof housing: IP54
Environment	Overvoltage category III, contamination level 2
Atmospheric humidity	Relative humidity 10% to 90%, not condensing



## 12 Contact

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