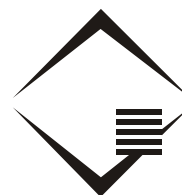
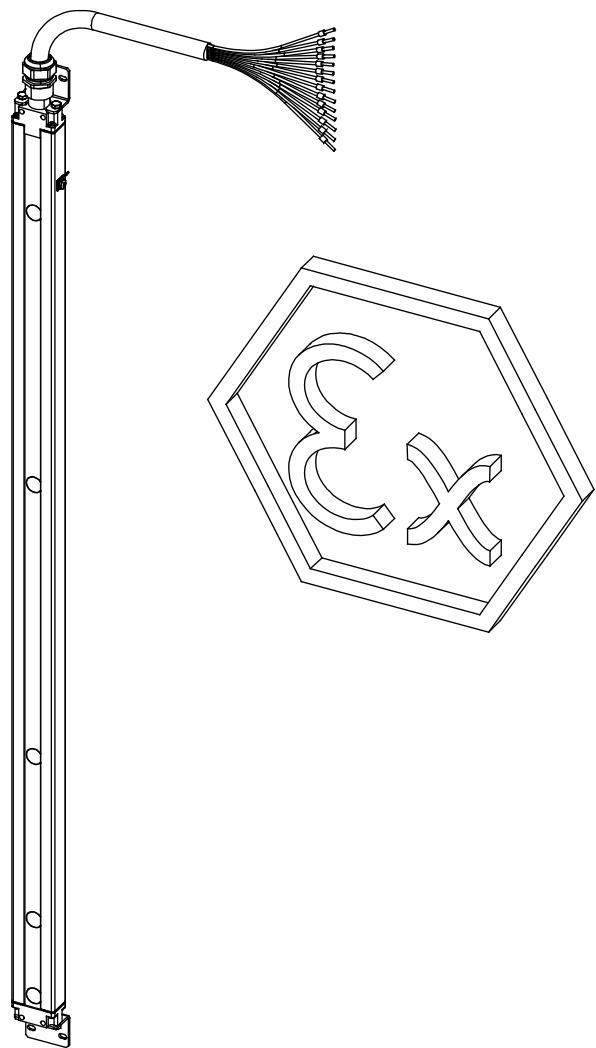


Operating Manual

Ex-LTÜ²

**Safety Light Curtain for Freight Lifts
in Explosion Hazard Areas**

Status: 10.6.2026



STRACK
LIFT AUTOMATION

Important note:

The data and information in this documentation have been compiled with greatest care. Although everything has been done to make the information contained in this document up to date and correct at the time of publication, no guarantee can be given that it is completely without any errors.

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1 Safety instructions

1.1 Understanding of symbols and meaning and safety instructions

The symbols and their meaning listed in the following apply to the document on hand.

Symbols and
meaning

Fond/symbol	Meaning
 Note	Includes special information and useful tips concerning the work with the Ex-LTÜ ²
 Important	Danger warnings are designated with this danger sign. It points out existing danger of accident entailing personal injury or property damage if the corresponding safety instructions are not complied with.

1.2 Product liability and Warranty

STRACK LIFT AUTOMATION GmbH reserves the right to revise and modify the product from time to time without prior notice. The operation of this product is not permitted in the USA and countries with similar legal provisions. Otherwise the General Terms and Conditions of Trade and Delivery of STRACK LIFT AUTOMATION GmbH apply.

1.3 Assembly and operating personnel

All chapters of this operating manual include important information for the intended use of the product. These chapters are intended for technically authorised personnel, specially trained to install, repair and commission of lift systems, installed according to the relevant lift directives. It must be ensured that all activities are carried out according to the respective statutory provisions of industrial safety. During installation comply with the relevant accident prevention precautions as well as the provisions concerning safety measures while installing and maintaining lift systems.

Please observe also the assembly provisions for electrical equipment in explosion hazard areas of the EU country where the system is installed.

The installation requires two persons (technician /assistant).

1.4 Risk evaluation

The knowledge and technical realisation of the safety instructions included in this documentation is a prerequisite for a defect-free product. However, this documentation cannot take into account all details of any possible case occurring during the installation. Therefore an element of risk of human failure remains as in any other case. This documentation is intended to limit this residual risk to a minimum.

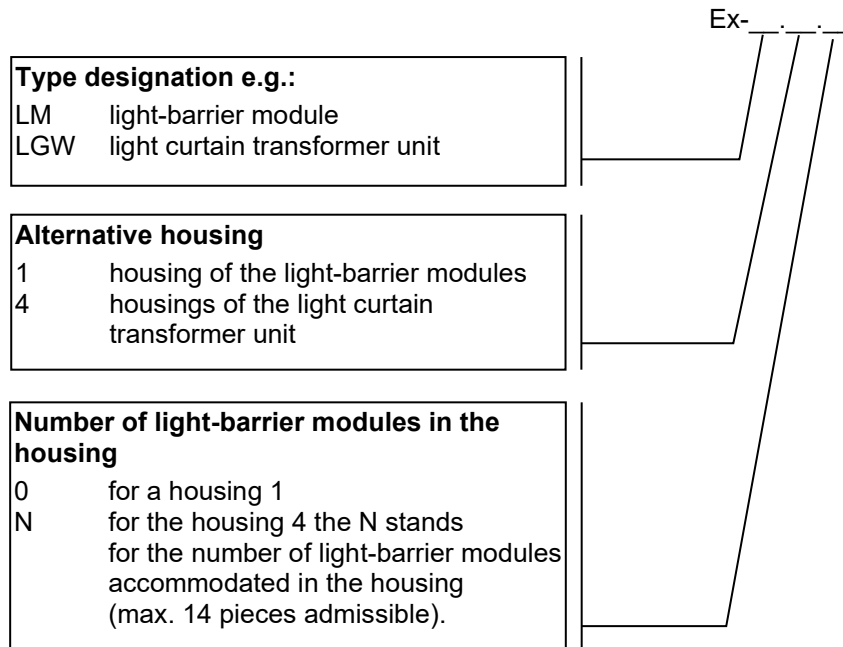
1.5 Operational safety

In order to ensure a trouble-free operation of the system the instructions contained in the diagrams and plans supplied with the system and the notes on electro-magnetic compatibility in these operating instructions must be observed.

2 Intended use

2.1 Numeric code of the individual Ex components

Rating plates as defined by the ATEX directive are attached to the individual Ex components Ex-LM (light-barrier modules) and Ex-LGW (light curtain transformer unit). The type designation included here is structured as follows:



2.2 Identifications according to ATEX

The following identifications are used:

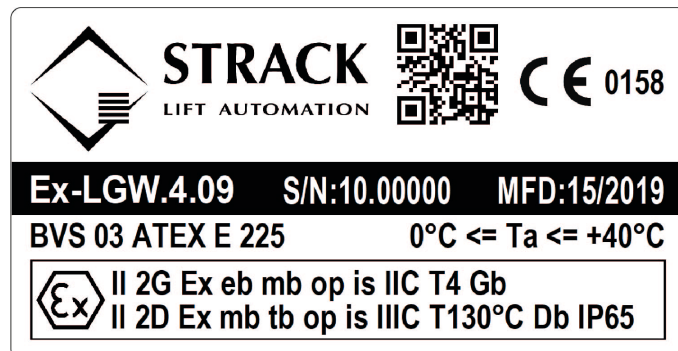
Light-barrier module Ex-LM

The modules of the individual light-barriers may only be operated within the Ex area, if they are accommodated in the transformer unit Ex-LGW because they are not resistant against all environmental influences (impact, oil, ...) in themselves.



Light curtain transformer unit Ex-LGW

The rating plate is located on the outer side wall of the unit. A unit with the following rating plate must always be operated within an Ex area:



2.3 Environmental influences

The Ex-LTÜ² is designed for use in a standard industrial environment. In case corrosive atmospheres or high humidity are to be expected, it must be clarified prior to the installation, if the operation of the Ex-LTÜ² is possible. It is known that the operation can be impaired in manufacturing plants in which plasticizing agents are manufactured.

2.4 Ex-LTÜ², all versions

The safety light curtain Ex-LTÜ² serves as a replacement for car doors of freight lifts with a travelling speed of no more than 0.85 m/s. Basis for this is the resolution of the German Lift Committee (Deutscher Aufzugausschuss - DAA) no. 6/34 of 22 Nov. 1990, which is fully met.

All parts of the Ex-LTÜ² to be attached to the car can be used in the **Ex zones 1, 2, 21 and 22**.

The Ex-LTÜ² carries the CE emblem and thus may be used in all membership states of the European Union (note that the installation provisions for electrical equipment in explosion hazard areas still partially differ in individual states).

The Ex-LTÜ² can be integrated into any Ex lift system (observe Ex classification!). The integration into the respective control system is largely identical, since only signals are used which are available in all control systems. The Ex-LTÜ² is completely set up as a safety circuit within the meaning of the Lift directive and was EC type-examination tested. Not only the light curtain but also all internal functions as well as the signals to and from the lift control are monitored for their correct function.

For lifts with accesses on both ends the connection of the light curtains is also identical. Only one control unit is required here.

As the EN 81-1/-2/-20 do not know any lifts without lift car doors, local experts demand various broader requirements on the lift depending on the field of application when safety light curtains are integrated. These can be e.g. a restriction of the travelling speed, the user group, or the type of use of the lift. The TÜV Rheinland for example prepared a sample risk evaluation of the shearing and compression points of freight lifts without a car seal. Before remodelling the lift system, ask your responsible expert.

2.5 Ex-LTÜ² without edge prevention (simple version)

The Ex-LTÜ² without edge prevention can be used in cases in which the lift is already provided with a safety circuit or a safety switch monitoring the interlocking release zone of the door, i.e. this includes all hydraulic lifts and lifts with the function "doors opening early" (see next Section).

2.6 Ex-LTÜ² with edge prevention (full version)

According to the DAA the light curtain must prevent edges. I.e. if the light curtain is interrupted shortly before reaching the target stop and within the interlocking release zone of the door the lift must not stop but continue the last centimeters of its travel so the lift car comes to a flush level stop. This prevents the development of a dangerous edge (stumbling edge).

For this purpose the Ex-LTÜ² with integrated edge prevention is provided with a safety circuit monitoring the interlocking release zone of the door and, in connection with other signals of the control system and the light curtain, preventing the development of an edge. With regard to technology and mode of operation the Ex-LTÜ² exceeds the requirements of the DAA. Provided are standard outputs such as "Holding magnetic interlocking device", "Permit re-levelling", "Reverse shaft door" and "Load control" (see Functional description).

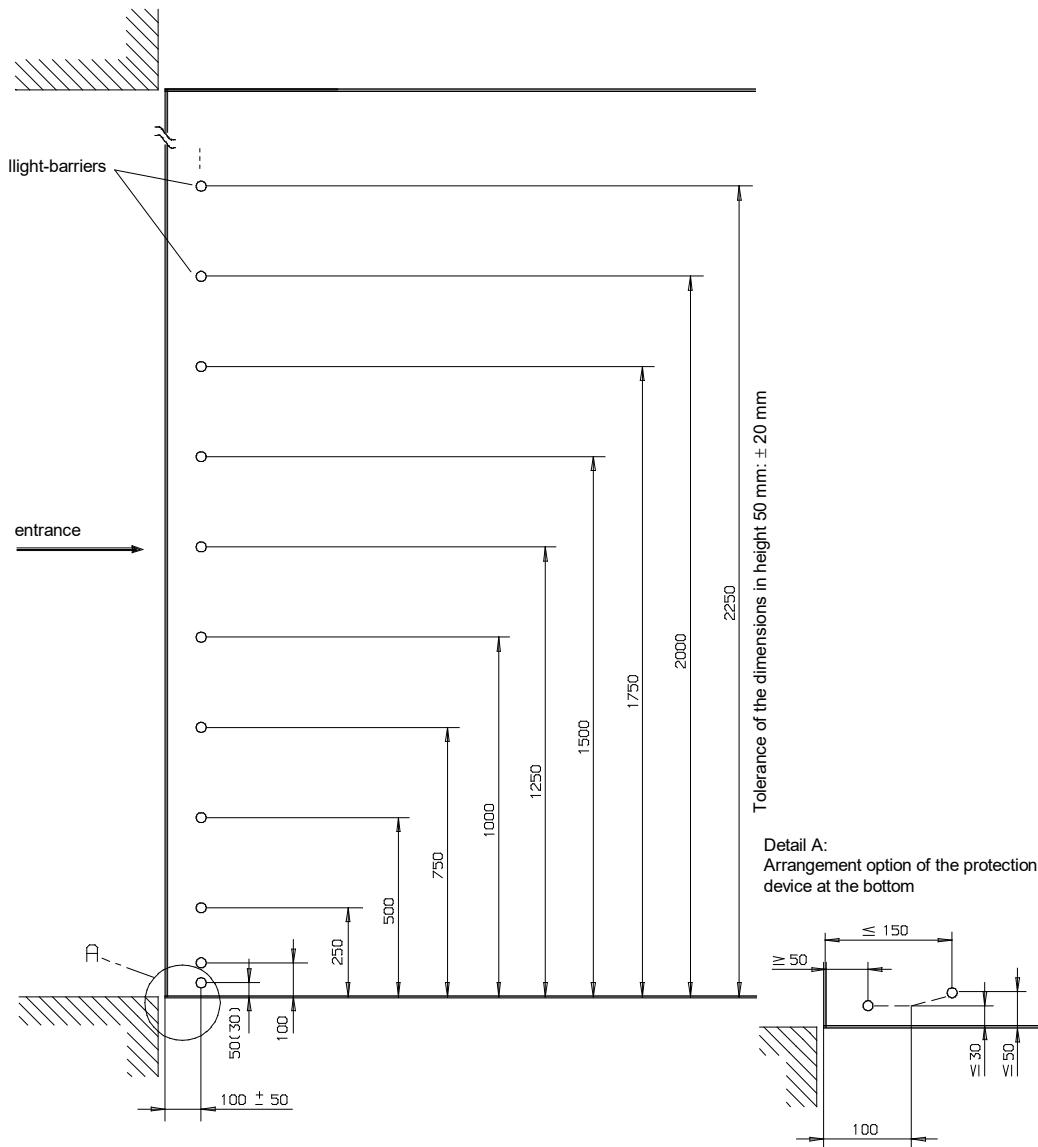
The signals can be easily integrated in lifts of all kind with all types of control systems.

2.7 Arrangement options of the light beams according to the DAA resolution



According to the DAA resolution the space between the centre of the light beam and the edge of the car threshold must be 50 - 100 mm. Note: Exceeding 100 (to 150) is **not** admissible here since the bottom light beam of the Ex-LTÜ² is fixed at a height of 30 mm. According to DAA, however, the bottom light beam must be variable, see the following figure:

Arrangement
option
of the safety
system (light
beams)
according to the
DAA resolution
no. 6/34



It is also **not admissible** to place the sensor strips between the front edge of the car and the shaft wall since the safety clearance to the shaft wall is too narrow.

3 Scope of services

3.1 Ex-LTÜ² without edge prevention (simple version)

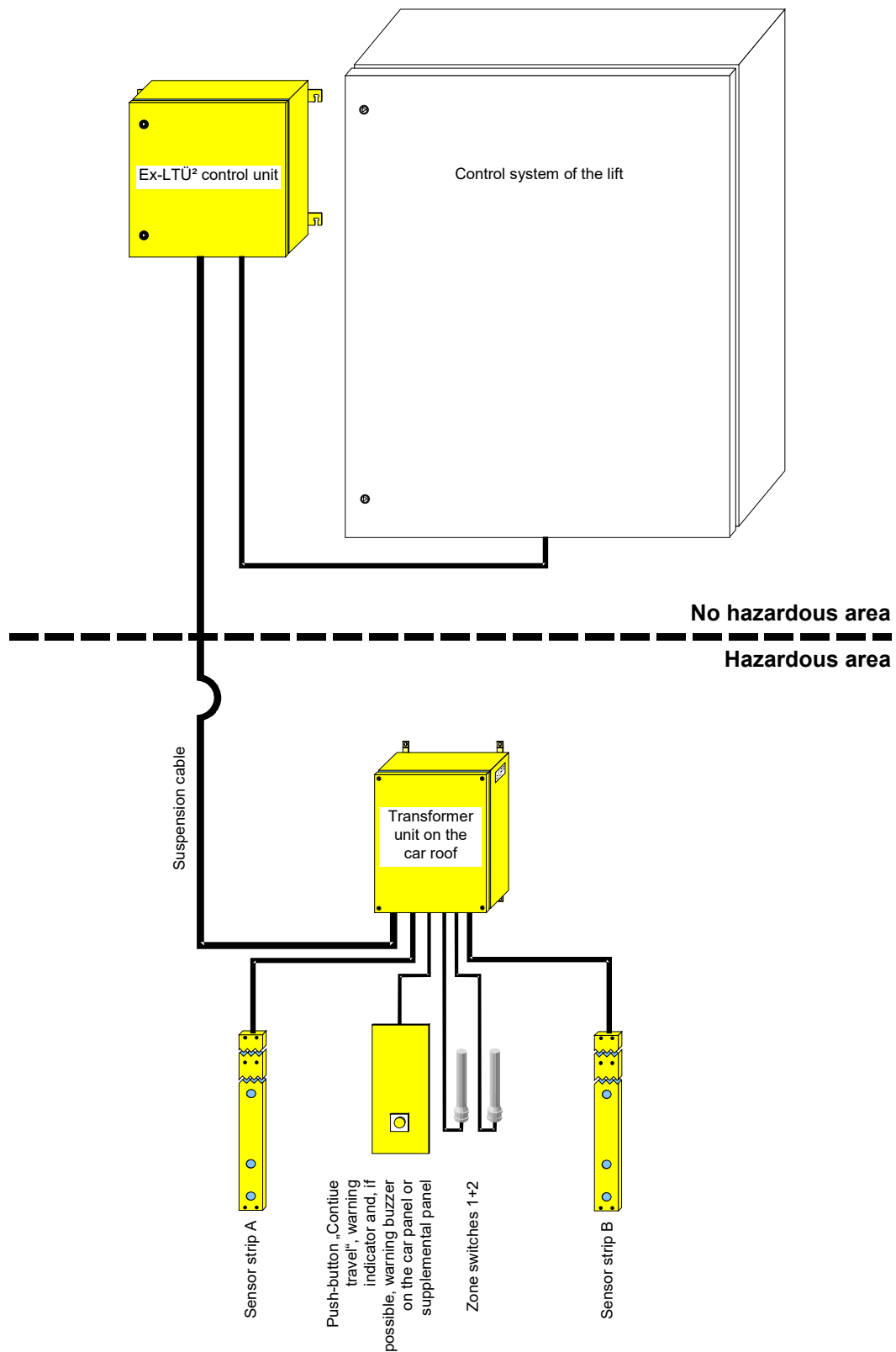
- corresponds fully to the DAA resolution 6/34
- resistant to exterior light up to 80000 Lux constant light
- completely pluggable with plug-and-socket connectors immune to vibration
- each individual light beam is controllable without auxiliary aid
- the emergency operation in case of failed light beams can be activated by technician
- monitoring of the full car height up to 3.27 meter with 14 light beams
- assembly kits for a quick installation and adjustment of the sensor strips (optional)
- drilling template
- manual testing device "OptoControl" as an adjustment aid (optional)
- visible red light beams in darkened rooms
- scratch-resistant antistatic lenses thus less soiling of the lenses
- potential-free "Reverse door" outputs for automatic shaft doors
- outputs for red-green lamps in the car as a load control device
- 5 meters connection cables of the sensor strips
- patented Ex technology with light, narrow sensor strips
- economical due to high reliability and quick installation

3.2 Ex-LTÜ² with edge prevention (full version), in addition:

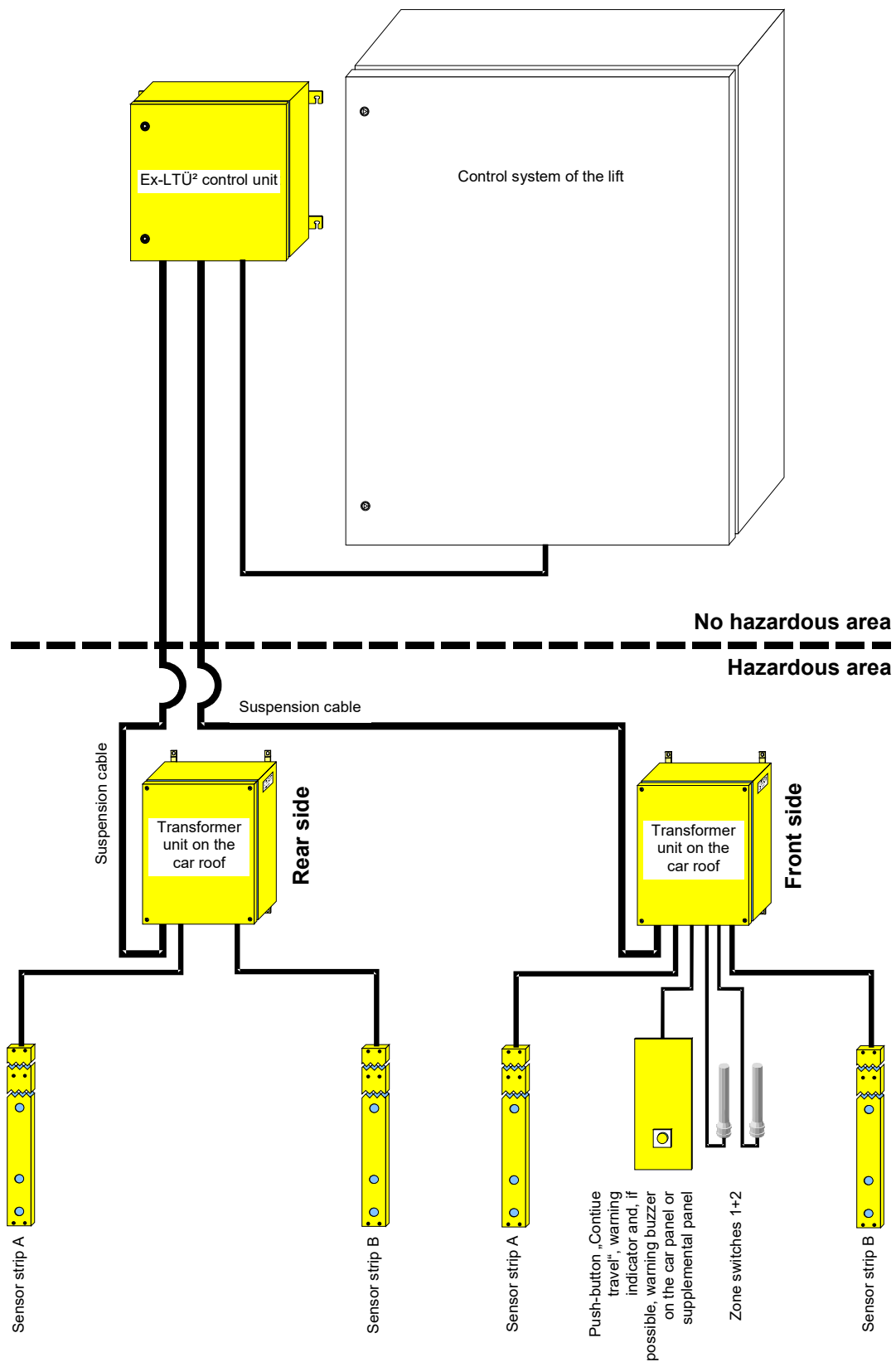
- automatic edge prevention
- detection of the wrong interlocking release zone
- blocking of the shaft doors after an interruption of the light curtain
- blocking of "Levelling flush again (re-levelling)" after an interruption of the light curtain

4 Installation

Overview
Ex-LTÜ²
for one
access side



Overview
Ex-LTÜ² for lifts
with accesses
on both ends



4.1 Special notes



- Do not expose the transformer unit and the light-barrier modules to direct sunlight or place them next to heavy-duty heaters since this can trigger internal overtemperature safeguards starting at about 70 °C. The modules are then irreparably destroyed!
- Protect the apertures of the transmission diodes and receiving transistors at the light-barrier modules from soiling. At the time of the delivery short fibre optic cable (FOC) pieces are plugged into the apertures which should only be removed immediately before connecting the sensor strips.
- Protect the FOC ends of the sensor from damage and soiling. Remove membrane put over the ends at the time of the delivery only when the FOC bundle has been inserted through the heavy-gauge conduit thread screwed connection size 16 into the transformer unit and is about to be connected.
- Do not bend FOC bundles sharply or intensely! Min. bending radius 10 cm! Do not step on FOC bundles or squeeze them.
- Do not shorten FOC bundles. In case a shortening is unavoidable take a razor blade and make a clean and straight cut through the individual FOCs (this may reduce the range of transmission).
- Push the FOCs firmly into the apertures of the transmission diodes or the receiving transistors since otherwise the optical connection is too weak.
- **Do not tighten the cap nuts** of the transmission diodes or the receiving transistors **too much**. A torn thread means a light-barrier module that can no longer be repaired.
- Close heavy-gauge conduit thread screwed connections with the plugs included in the delivery.

4.2 Operational earthing



Important the operating voltage 12 VDC is earthed on a single side and secured separately in order to detect defective ground-faults and to prevent an uncontrolled start-up of consumers. Terminal x1.3 must be connected to the protective earth of the lift system as shown in the wiring diagrams included in the delivery.

4.3 Required tools

- hand drill with a size 13 drill chuck (bendable shaft possibly required)
- set of metal drills, possibly step drills or cone center bits (depending on the assembly kit 16mm holes may have to be drilled into the car wall)
- folding rule
- voltage testing device
- set of screw drivers
- set of socket spanners
- set of screw spanners (open-jawed, ring)
- possibly welding apparatus
- if necessary, testing device OptoControl for red light (see Section 4.9)

4.4 Required supplementary material

- screws M8 / M5 with nuts, toothed lock washers and washers
- possibly flat bar to mount control unit and sensor strips
- various cables for the additional button "Continue travel" on the car panel, etc.

- Ex approved (NOT type of protection "intrinsically safe (!)")* additional button for the car panel, if the internal commands from the control of the continued travel are not picked up after the "Emergency stop by Ex-LTÜ²"
- Two Ex approved (NOT type of protection "intrinsically safe (!)")* Zone switch (e.g. totally pressure-proof enclosed solenoid switch), if the already available zone switches cannot be picked up by the control system. This solenoid switch incl. all add-on pieces can be delivered by STRACK.



*) **Important** No intrinsically safe electric circuits may be connected to the transformer unit because the spaces to the not intrinsically safe electric circuits cannot be met. However, also intrinsically safe units can be connected to the Ex-LTÜ² control unit, if the electric circuits are laid separately from the appropriate "safety barriers" of the Ex-LTÜ.

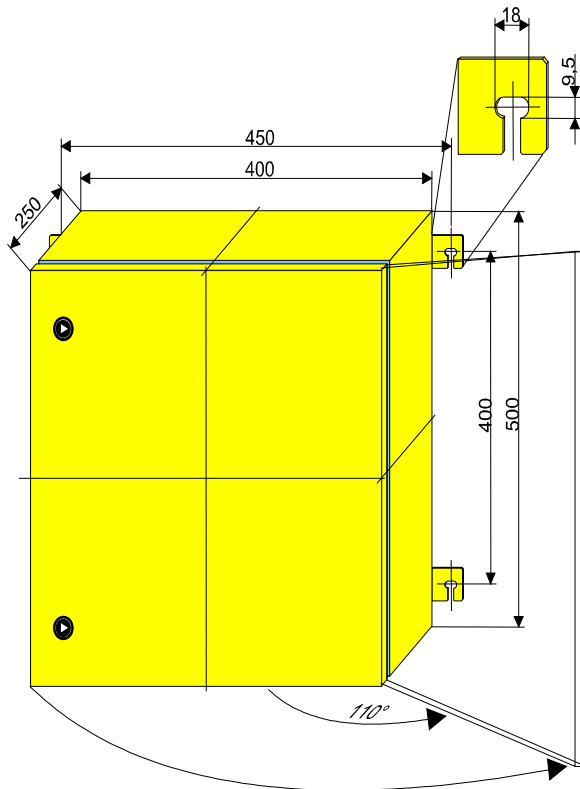
4.5 Control unit

The dimensions of the control units are the same for all Ex-LTÜ² versions. Lifts with accesses on both ends only require one control unit.



Important the control unit is hung up with screws (preferable M8 thread) to one wall on the four fastening bars **outside the Ex area** and preferably next to the lift control system.

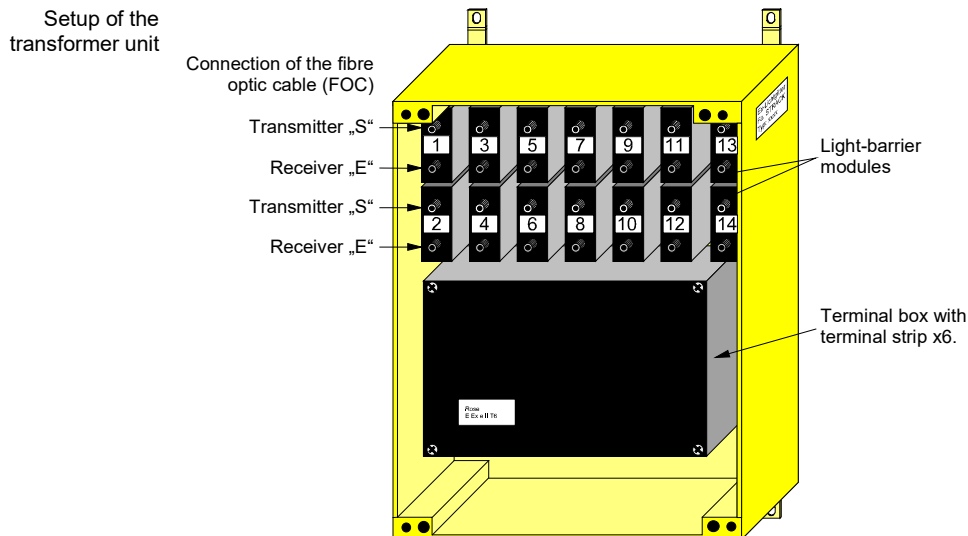
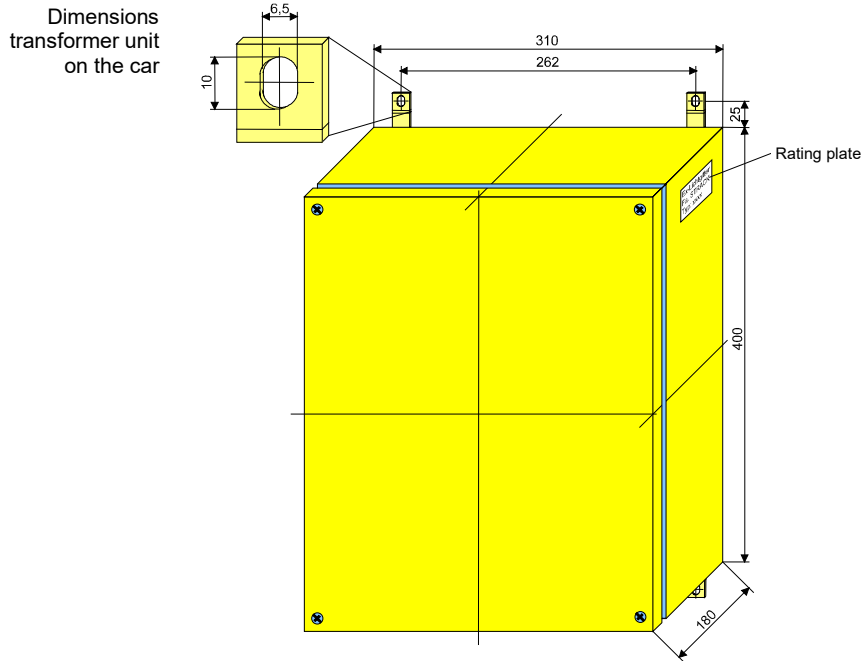
Dimensions
control unit in
the engine room



Door opening to the right
door attachable to either side

4.6 Transformer unit

The transformer unit is Ex protected and mounted onto the car roof. The dimensions of the transformer unit are the same for all Ex-LTÜ² versions. For lifts with accesses on both ends two transformer units are required. A specific mounting position is not specified.



4.7 Sensor strips

The sensor strips are inherently stable. They should be hung up as freely as possible, i.e. if possible not mounted directly onto a wall. Walls which are not exactly straight can bend the sensor strips which may then lead to a malfunctioning operation.

The main attachment points are located at the ends of the sensor strips (two through holes of 6.0 mm diameter each). With light curtains of 11 to 14 beams an additional attachment option is available at a height of 1350 mm to prevent a possible mechanical inherent instability of these long sensor strips during the travel. Since the sensor strips need a slight adjustment at a later date it is helpful to use M4 screws so the strips still have room to move. With an accurate installation also M5 screws can be used.

The installation and adjustment is easier when different assembly kits are used which are described in the following chapters.



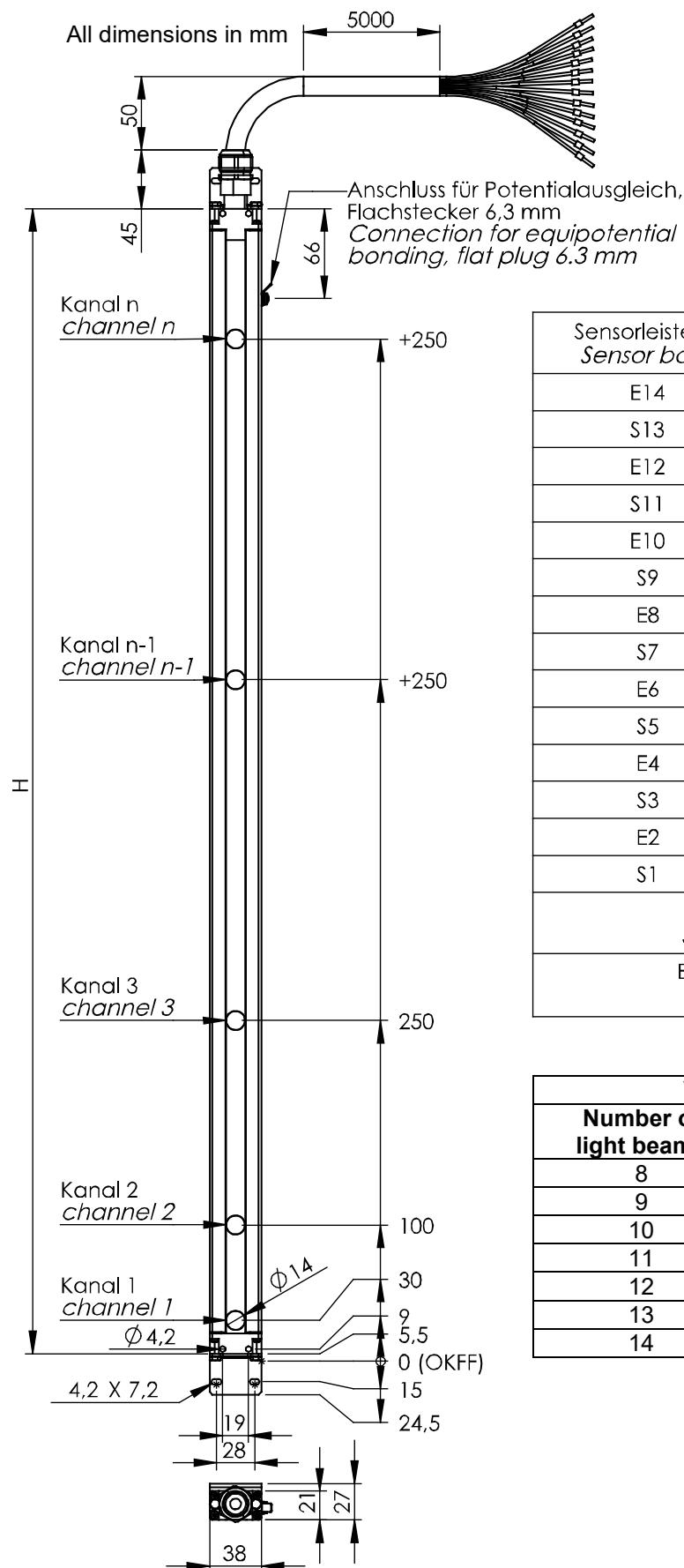
Important It is not admissible to modify the sensor strips mechanically! This includes a possible reborring of the mounting holes. Such modifications can restrict the safety of the light curtain and ends any warranty or liability of the manufacturer.



NOTE:

The installation and adjustment is easier when using the assembly kits AWAMON and HWAMON0 described in the following chapters.

Dimensions
and connection
of the
sensor strips



Sensorleiste A Sensor bar A	Sensorleiste B Sensor bar B
E14	S14
S13	E13
E12	S12
S11	E11
E10	S10
S9	E9
E8	S8
S7	E7
E6	S6
S5	E5
E4	S4
S3	E3
E2	S2
S1	E1
S = Sender S = transmitter	
E = Empfänger E = receiver	

Versions	
Number of light beams	Length H
8	1590
9	1840
10	2090
11	2340
12	2590
13	2840
14	3090

4.7.1 Behind the wall installation without assembly kit

Generally, it can be said that the optoelectronic units monitoring lift access have to be mounted in a protected location. This especially applies to freight lifts since in the usually rough operational daily routine little consideration is shown for the car. As a result, the sensor strips of the Ex-LTÜ's should be mounted behind the side wall of the car (behind the wall installation).

Holes with a diameter of at least 13 mm (better 16 mm) have to be drilled into the car wall. The drilling template included in the delivery can be used. A light curtain with eight light beams is always assumed as a drilling template. For all other standard versions, the template has to be moved longitudinally so all holes can be marked. Since the template may have more holes than necessary please ensure prior to drilling that the dimensions correspond to those of the sensor strips to be installed!



IMPORTANT It is **not admissible** to place the sensor strips between the front edge of the car and the shaft wall since the safety clearance to the shaft wall is too narrow.

4.7.2 Behind the wall installation with the assembly kit "HWAMON"

HWAMON provides a very simple and therefore quick, cost-effective installation option of the Ex-LTÜ²-sensor strips. HWAMON serves to mount the Ex-LTÜ²-sensor strips behind the car wall. It consists of 2 or 3 terminal holders for each sensor strip which can be almost randomly moved in height. The adjustment of the sensor strips at a later date can be simply carried out from the inside of the car by means of spring adjustment screws.

Advantages

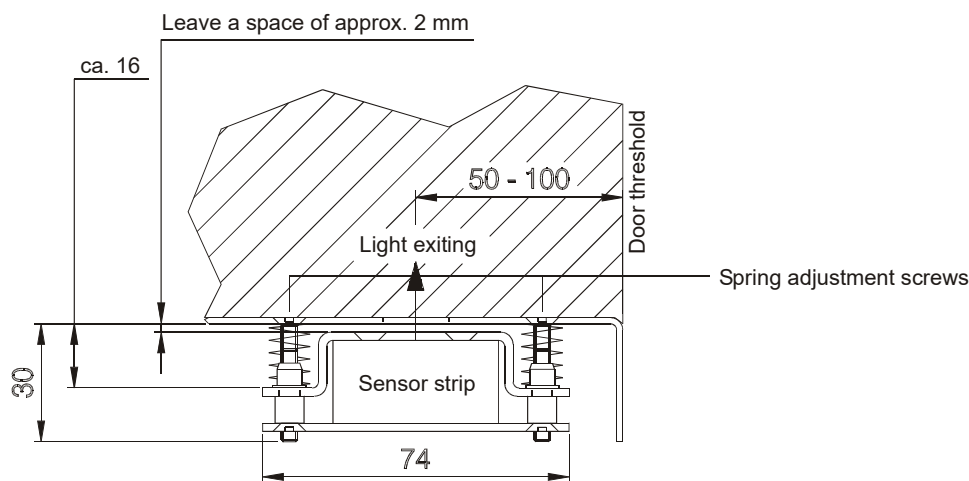
Space of the light beams to the car threshold: 50 mm (possible) up to 100 mm (admissible)
No narrowing of the car access and best protection of the sensor strips due to the installation behind the wall

The sensor strips are resiliently bolted to the car wall so with the correct installation they are not in direct contact with the car wall. This increases the insensitivity of the construction considerably.

The terminal holders are vertically adjustable, i.e. the bore holes of the car wall can be adjusted to prevent complications with the car floor or the built-in parts of the wall such as an impact protection

The adjustment of the sensor strips at a later date can be simply carried out from the inside of the car by means of spring adjustment screws

Dimensions of the completely assembled sensor strips



2.

Now drill the holes for the lenses in the car wall according to the drilling template of the Ex-LTÜ²-sensor strips included in the delivery.

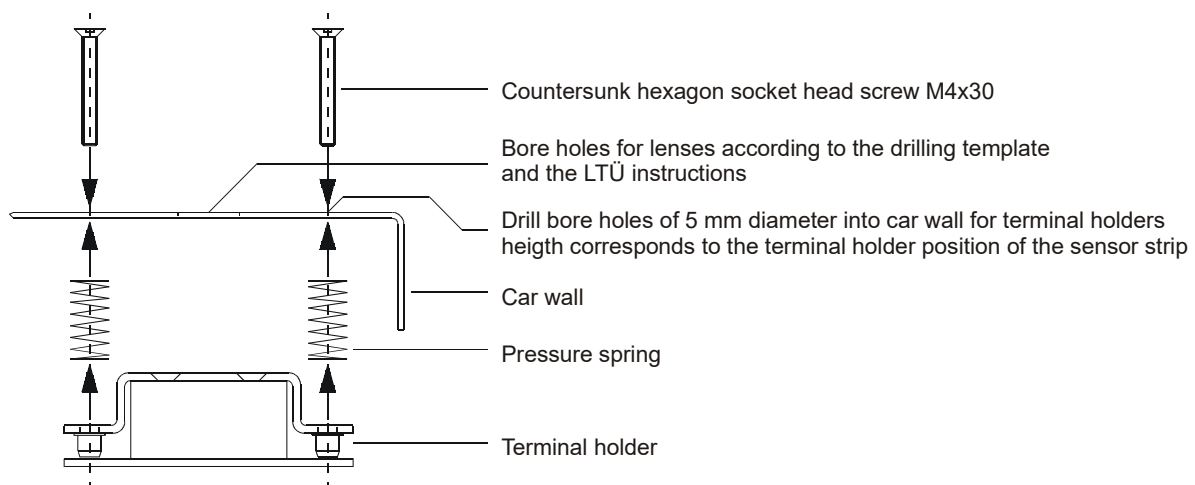


NOTE: Do not drill the small holes for the mounting of the sensor strips shown on the drilling template. These are not required for the HWAMON.

The two 5 mm holes for each terminal holder must now be drilled at the height of the car wall in which you have mounted the terminal holders. Countersink the 5 mm bore holes for M4 countersunk head screws (not too deep so that the sensor strips are still sufficiently supported by the thin car walls).

3.

Move the lift to the bottom level so that you are able to reach the outside of the car walls from the shaft pit. Now one person climbs into the shaft pit and one person enters the car.



Push the countersunk hexagon socket head screws M4x30 through the wall from the car to the outside and push the pressure spring from the outside onto these screws. The Ex-LTÜ² sensor strip is also carefully pushed onto the screws. Now the Person in the car tightens all screws until the spring is compressed to a space of approx. 16 mm to the car.

IMPORTANT: The screws must not be tightened, they should only compress the springs to about 29 mm so that the play of terminal holders to the car wall is 2-5 mm! Longer screws M4x45 and 40 mm springs are provided, if a larger distance to the car wall is required.

4.

After all wall mounts are attached the light curtain can be completely commissioned. By turning the spring adjustment screws the sensor strip is rotated in its vertical axis so that the transmitter and the receiver meet. Start the adjustment at the bottom. When the bottom 3 channels are able to "see each other", adjust the centre holder (if available) and finally the top holder (see also Chapter Commissioning).

4.7.3 AWAMON on the wall assembly kit



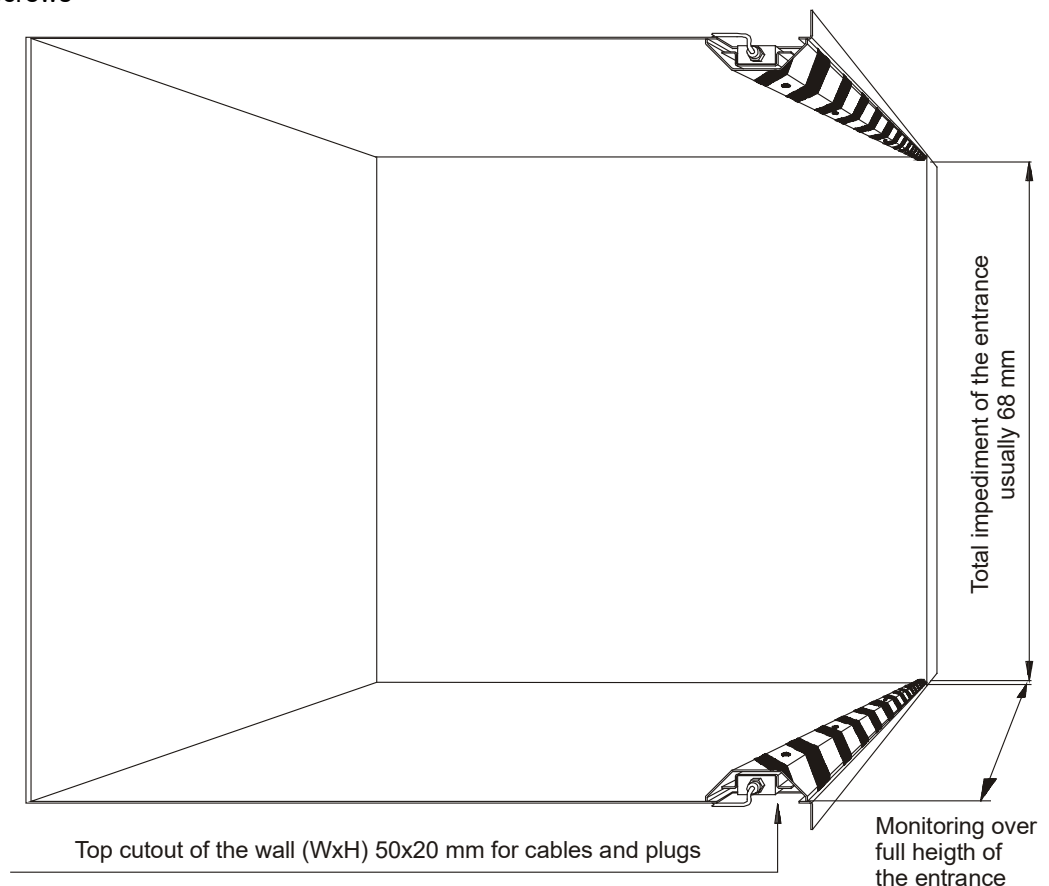
An on the wall installation may be faster and more cost-effective than the installation behind the wall but it should not be executed in freight lifts for heavy-duty operation. Damage to the sensor strips by heavy lift trucks or forklifts cannot be excluded during the daily routine later on.

AWAMON provides a very simple and therefore quick and cost-effective installation option of the Ex-LTÜ²-sensor strips. AWAMON is simply screwed onto the car wall from the inside. Within the top area there must be a cutout placed in the car wall enabling a penetration of the connection cable incl. plug. For this an edge protection section is included in the delivery. Required screws are also included in the delivery.

Advantages:

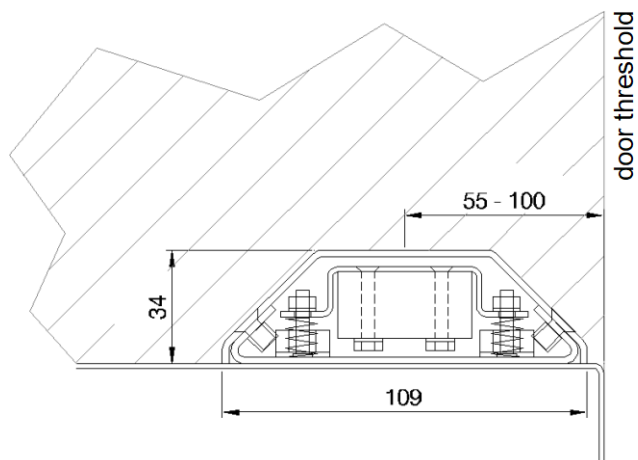
- Possible spacing between the light beams and the car threshold: 55 to 100 mm
- Each impact protection bar only adds 34 mm to the car wall
- The keep-off section is screwed onto the wall mount with 8 screws and inclined by 45° consists of 2.0 mm steel with yellow-black signalling paint via a self-sticking, already completely applied PVC foil
- The sensor strips are „floatingly“ bolted to the wall mounts and are not in direct contact with the keep-off section. This space of approx. 2 mm to all sides increases the insensitivity of the construction
- Except for the initial installation of the wall mounts the remaining installation as well as the adjustment of the sensor strips is comfortably carried out from the inside of the car
- The adjustment of the sensor strips is easily carried out via the spring adjustment screws

AWAMON
overview



AWAMON Dimensions

Dimensions of the completely mounted section:



Installation procedure

1.

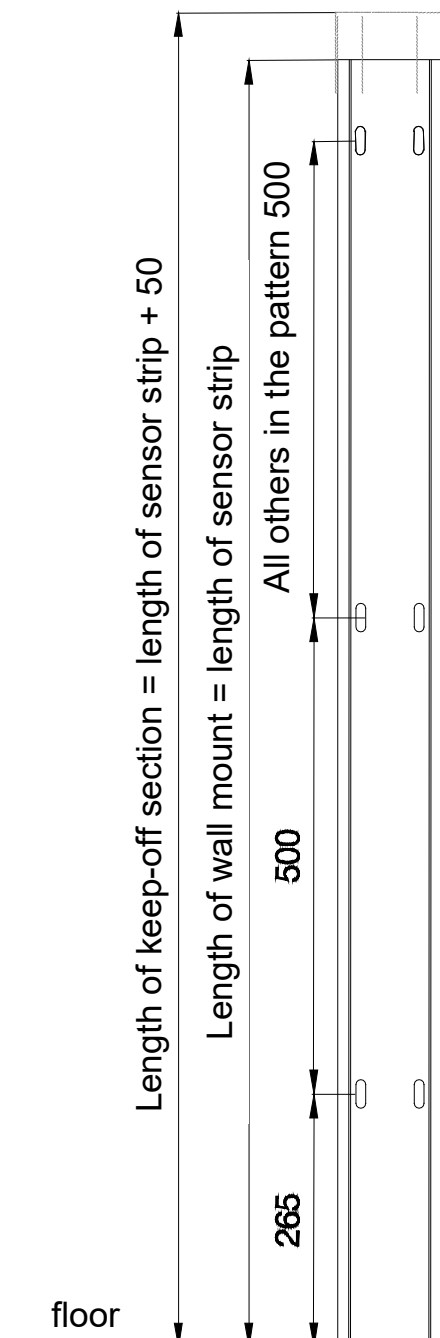
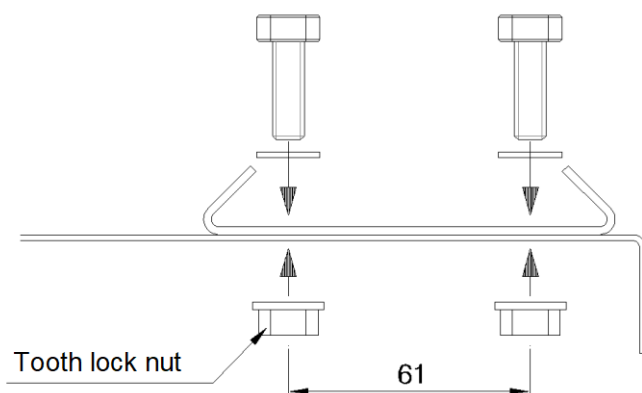
The wall mount section must stand on the floor and as far as even possible to the outside, i.e. it must be mounted close to the door threshold. Take care that the wall mounts of the left and right side of the access face each other as much as possible.

Hold wall mounts to the flat wall and mark oblong holes. Above the wall mount a hole must be sawn into the wall where the connection cable of the fibre optic cable (FOC) can be pushed through later.

Always make sure that the edge liner included in the delivery is pushed on so that the Ex-LTÜ² cable will not be damaged during the operation. Since these are fibre optic cables (FOC) take special care of the minimum bending radius of the cable!

The wall mounts are bolted to the wall with M6x25 screws.

AWAMON installation step 1

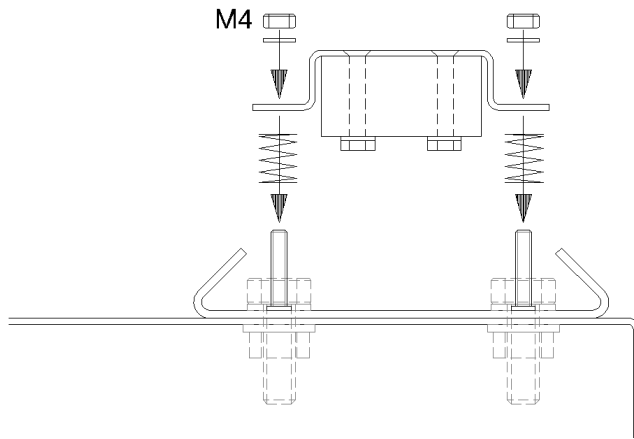


2.

Screw light curtain sensor strips at the top and bottom to the small sensor strip holders. The strips pre-assembled like this are placed on the welded M4 bolts so that they compress the springs.

The M4 nuts must not be tightened. They should compress the springs only about 12 mm so that the sensor strips still have 5-6 mm play to the surface of the wall mounts.

AWAMON
installation
step 2



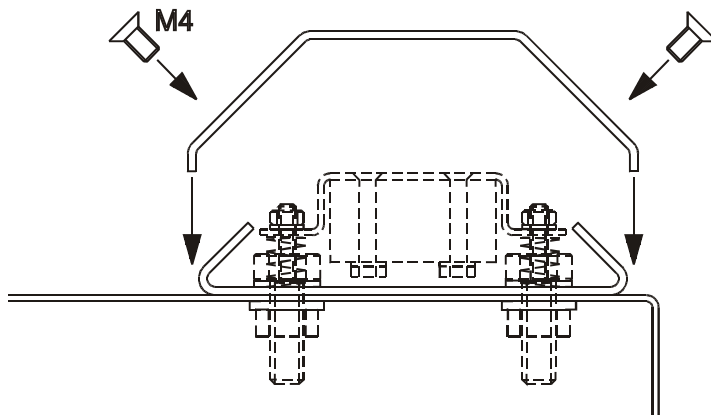
The connection cable can now be fed through the hole in the wall and plugged into the control unit. After all wall mounts are attached the light curtain can be completely commissioned. By turning the adjustment screws the sensor strip is adjusted in its vertical axis so that the transmitter and the receiver meet. Start the adjustment at the bottom. When the bottom 3 channels are able to "see each other", adjust the centre holder (if available) and finally the top holder (see also Chapter Commissioning).

3.

Finally, the keep-off section is installed and screwed onto the wall mounts by means of the 8 M4 countersunk head screws.

ATTENTION: Always make sure that the keep-off section does not press onto the sensor strip holder. If you observed the 5-6 mm space between the surface of the wall mounts and the sensor strip in step 1 this requirement should have been met.

AWAMON
installation
step 3



4.8 Ex zone switch assembly kit

If zone switches are required (e.g. in case the full version is used) the STRACK zone switch add-on kit can be used. The standard Ex zone switch add-ons are known for their flexibility and very small type of construction. Moreover, the solenoid switches are quickly replaceable. The flange hangers (caddy clamps) with the pre-assembled solenoids are mounted to the rear of the car rail. The switch panel is mounted to the car at the car guide.



- With regard to the topic Zone switches please read Section 5.3 "Solutions for problems with zone switches"
- Solenoid switches must be treated carefully. If solenoid switches have been subjected to a strong impact, e.g. by dropping them during the installation, please replace the switch module as a precaution! Otherwise the function can be impaired later on.
- Only use original solenoids.
- Only mount solenoids with non-magnetic screws, e.g. brass.
- Mount solenoids on exactly the same height. Both zone switches must be switched on and off simultaneously, if possible.

Zone switches and holders

Ex-MKR13		
Ex (zone length ± 50 to ± 250 mm)		Enclosed: 1x spacer to bridge a rail joint up to 300 mm
	• lateral track displacement of the magnet to switch max. ± 15 mm • operating distance of the magnet to the switch 5-20 mm • EEx m II T6 • protection class IP 68 • switching voltage max. 250 VAC/DC ohmic! • switching current max. 1A ohmic! • switching capacity max. 120 VA/W	

4.9 Adjustment and testing device OptoControl

The testing device OptoControl is an adjustment and testing aid for the Ex-LTÜ² sensor strips. The red light impinging on the sensor is reinforced and shown on the LED display as the relative luminosity. Thus, it is possible to collect and optimise the diameter, the location and the intensity of the light beams impinging on the sensor. So, the Ex-LTÜ² can function perfectly a luminosity corresponding to two or three LEDs is required. However, it is possible to light up all the LEDs with the appropriate adjustment.

The voltage is supplied by a 9V monobloc battery. The device is switched on with the push-button "On". An automatic mode still keeps the device operating for approx. 45 seconds after the push-button is released so that also difficult adjustment work can be performed without outside help.

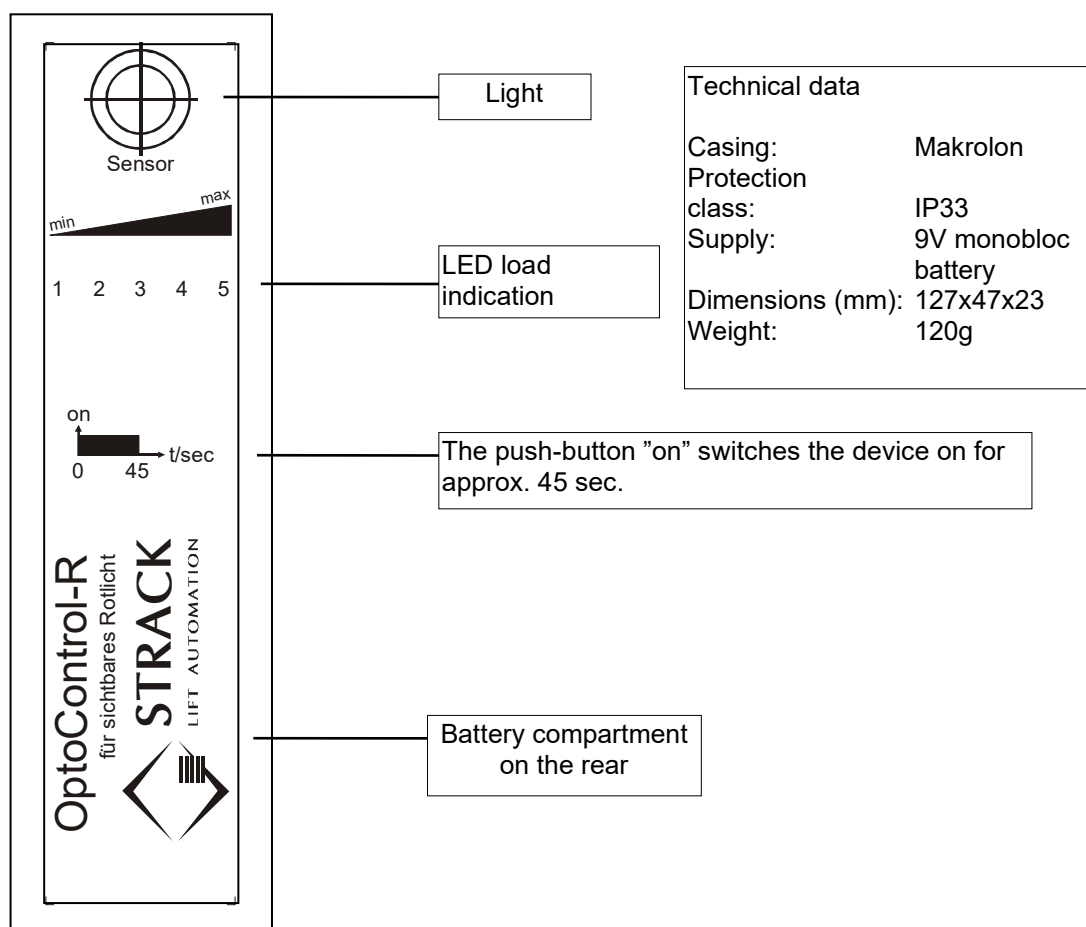


Important! The device is not Ex protected.



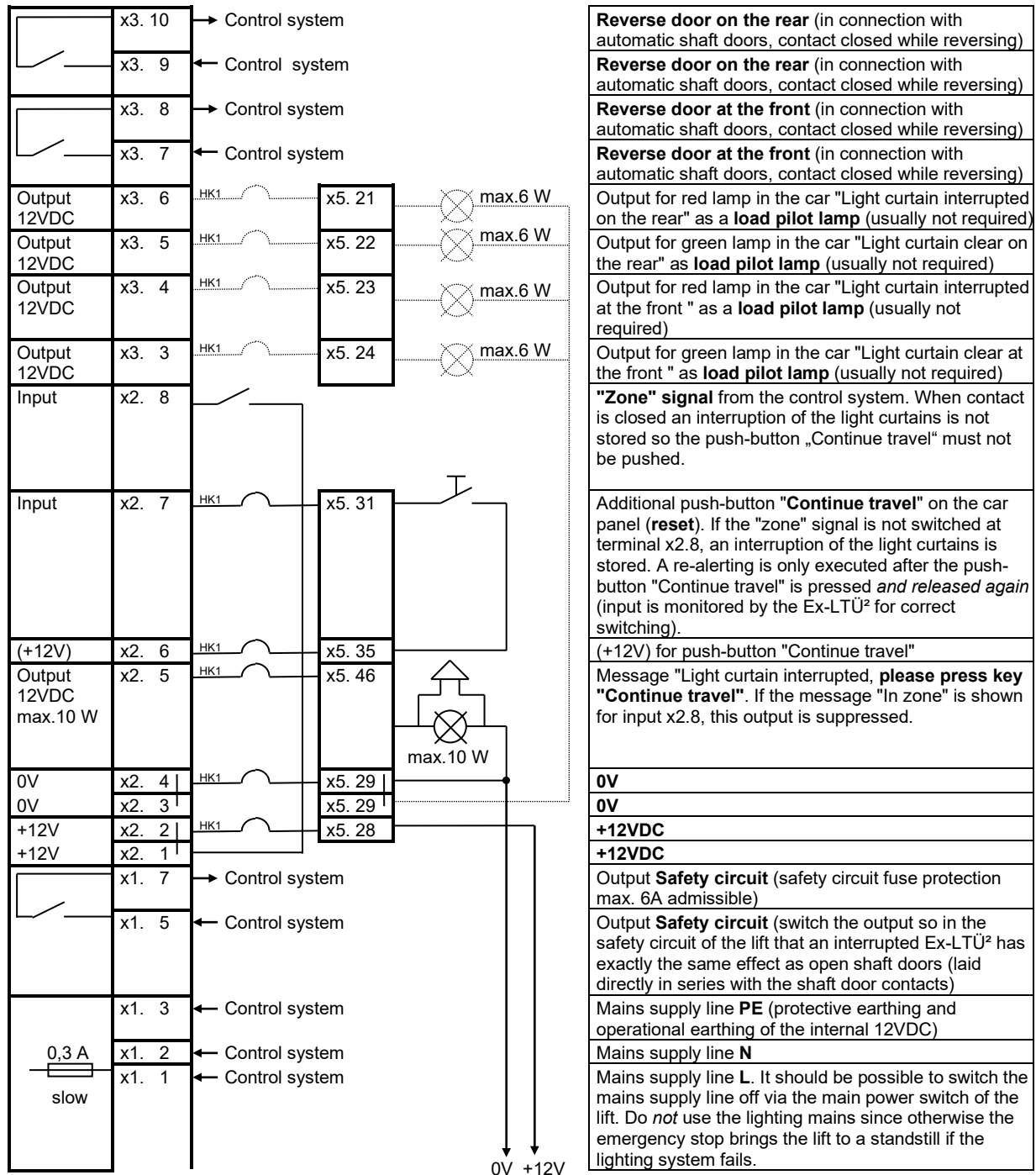
The maximum range is 2.5 m.

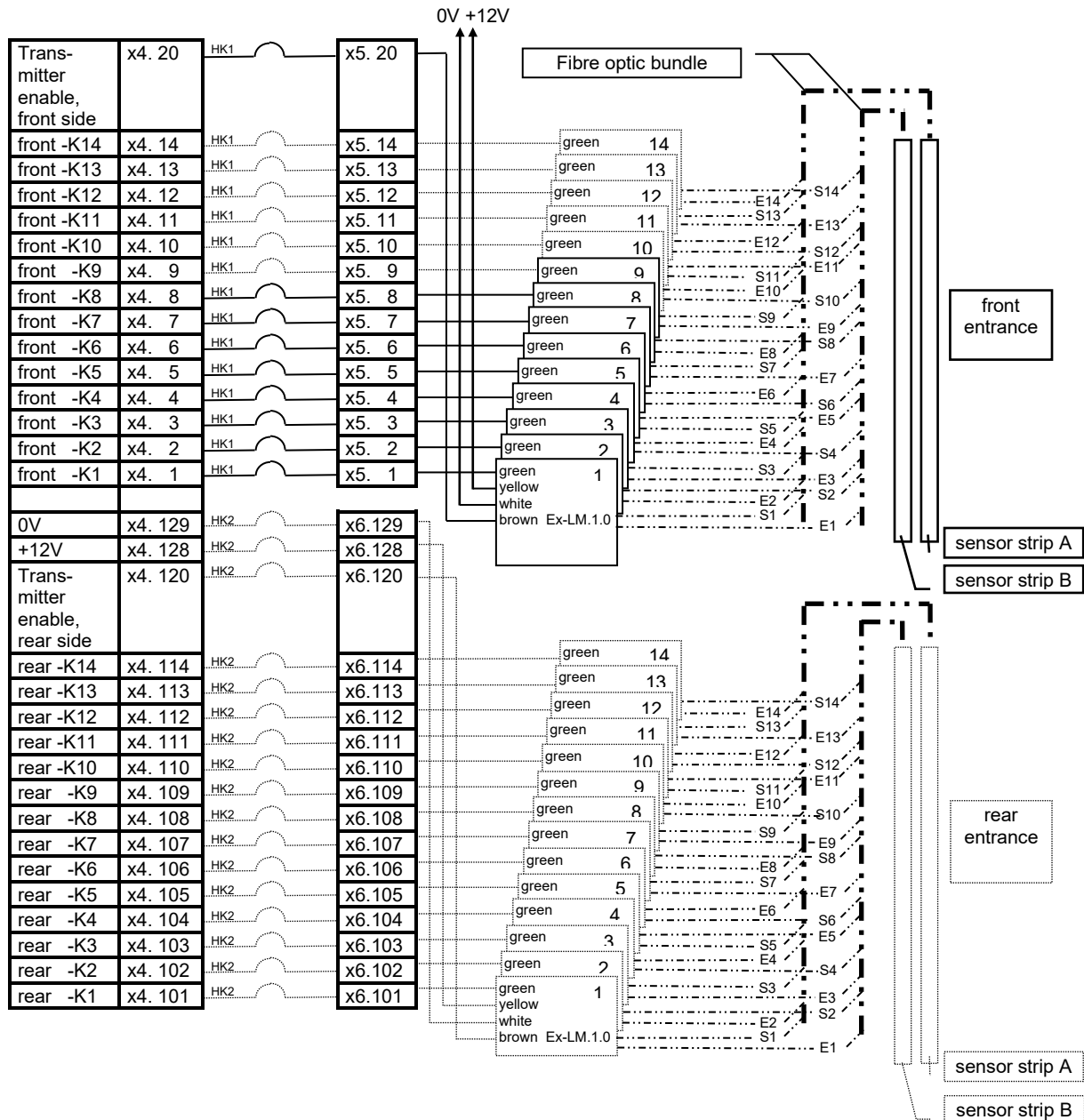
OptoControl
adjustment and
testing device



5 Electrical connection

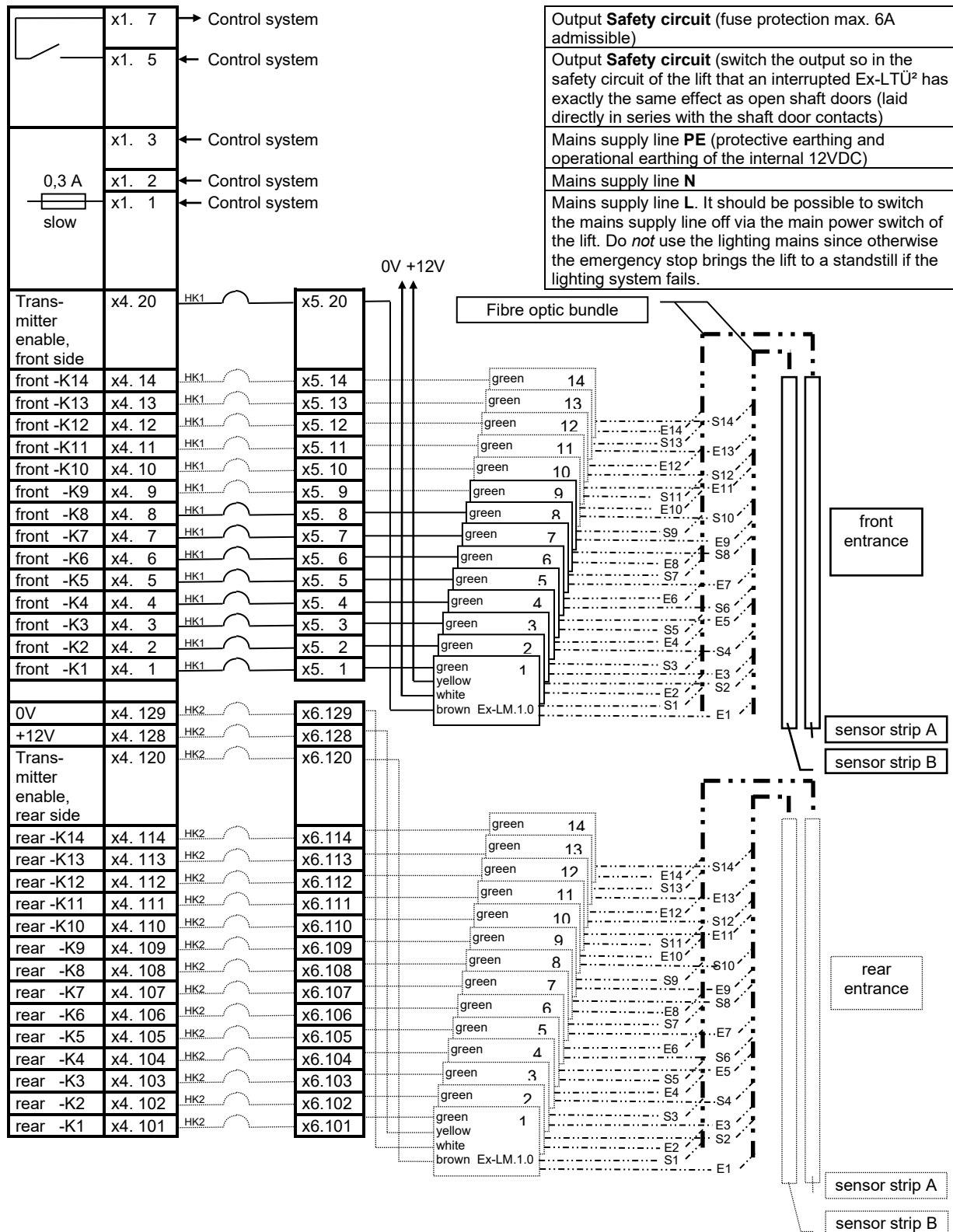
5.1 Ex-LTÜ² without edge prevention (simple version)





Note:

1. Use suspension cable HK1 and HK2 only for Ex-LTÜ²
2. The potential equalization for the sensor strips must be established, e.g. by connecting the 6.3mm flat plugs on the side to earth using a 4mm² conductor



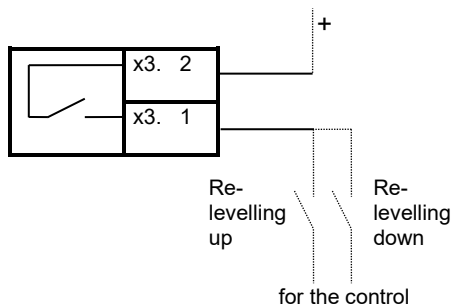
Note:

1. Use suspension cable HK1 and HK2 only for Ex-LTÜ²
2. The potential equalization for the sensor strips must be established, e.g. by connecting the 6.3mm flat plugs on the side to earth using a 4mm² conductor

5.2.2 Connection examples for the full version

A

Connection
examples
full version:
re-levelling



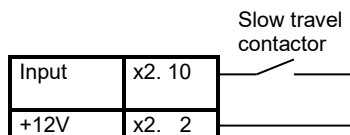
Permit output re-levelling

For lifts with the function "Re-levelling" the re-levelling can be prevented via this output.

The contact is only closed when the lift is at the target stop. If the light curtain is interrupted during a travel and the lift accidentally comes to a standstill within the interlock release range of the door of an intermediate stop (i.e. other than the target stop) this contact is opened. This ensures that during a possible accident situation the lift does not even re-adjust at an intermediate stop and thus increases possible injuries. The output contact is only closed again when the additional push-button "Continue travel" is pressed within the zone or the lift enters a zone.

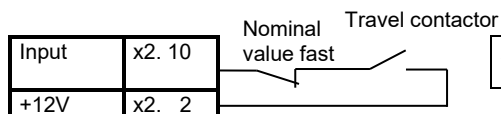
B

Connection
examples
full version:
Approach
signal



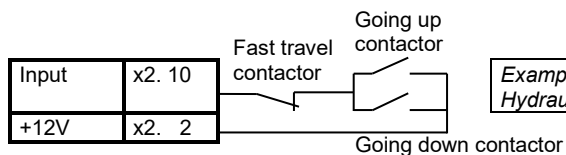
Example

Cable lift pole-changeable uncontrolled



Example

Cable lift controlled



Example

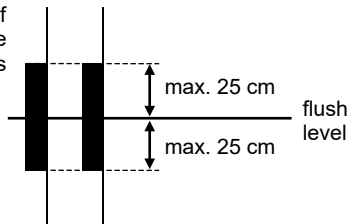
Hydraulic lift



Please observe Section 5.3 "Solutions for problems with zone switches"

C

Arrangement of the zone switches



The two transmitters (e.g. solenoid switches) must be mounted so that they do not affect each other.

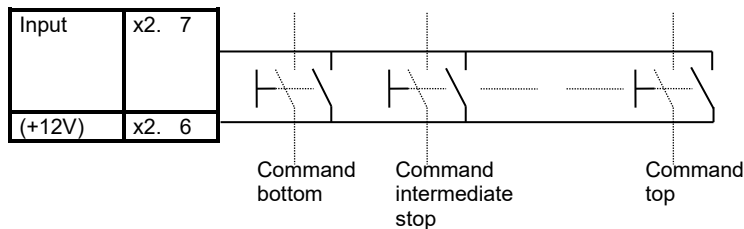
If solenoid switches are used the solenoids must be screwed on or permanently glued on.



Please observe Section 5.3 "Solutions for problems with zone switches"

D

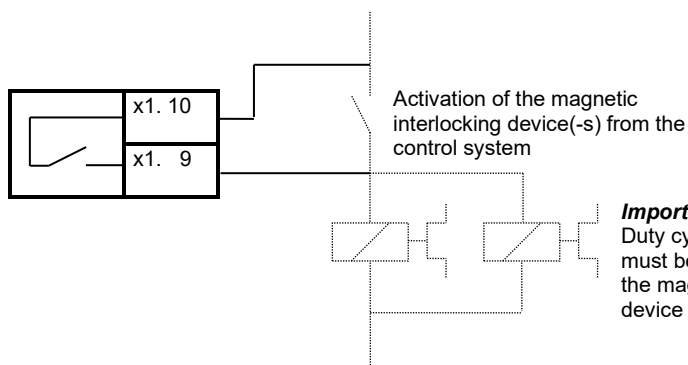
Connection examples full version: Continue travel input



Instead of the additional push-button "Continue travel" the available internal command push-buttons can also be used

E

Connection examples full version: Holding magnetic interlocking device



Important!

Duty cycle of the magnetic interlocking device must be specified with 100% because otherwise the magnet coils of the magnetic interlocking device can melt.

Output "Holding magnetic interlocking device"

If the light curtain is interrupted during a travel and the lift accidentally comes to a standstill within the interlock release range of the door of an intermediate stop (i.e. other than the target stop) this contact remains closed. This ensures that the shaft door cannot be opened and thus an incorrect behaviour of the passengers cannot shut-down the lift drive. The output contact is only opened when the additional push-button "Continue travel" is pressed.

Operationally (without interruption of the light curtain) the output contact opens the output contact only upon reaching the interlocking release zone of the target stop. After leaving the interlocking release zone and during the continued travel the contact closes.

5.3 Solutions for problems with zone switches

5.3.1 General

Always where several sensors (zone switches) are monitored for switching in the same or in opposite directions by a multi-, mostly two-channel safety circuit located downstream problems can arise in the fringe area. This fringe area is the on and off switching point of every sensor.

After a safety light curtain is retrofitted to a lift system with a lot of traffic carrying persons possibly also, in addition, a small car depending on the type of use, emergency stops due to interruptions of the light curtains are very common mostly during the first weeks. Also "old" habits of the users reaching already for the door during the approach interrupts the light curtain involuntarily. Due to frequent emergency stops it can happen that the lift comes to a standstill near the switching on point of both zone switches.

Possible errors	Effects
The lift comes to a standstill exactly on the switching point of both zone switches. At standstill one zone switch is switched while the other is not switched.	The safety circuit in the LTÜ ² detects one zone error.
With a brief mechanical rocking one or both zone switches are briefly switched back and forth.	When the new printed circuit board of the zone ZONE_D or ZONE_E is installed the rebounding fades out within no more than 1.5 seconds. I.e. the light curtain is not blocked by it. (Older printed circuit boards of the zones can cause blocking).



IMPORTANT: In case of a zone error the LTÜ² blocks the lift. Persons and material inside the lift are then often locked in!

The blocking can be caused by the built-in safety circuit within the LTÜ² but also by the lift control system which up to this point might have always worked correctly (because the lift made far less emergency stops when pulling into the target stop).

Solution:

Only sensors of the same type should be used, e.g. solenoid switches of the same type.

The solenoid switches should only have slight circuit inaccuracies. The best are key-operated control switches or forked light-barriers.

The sensors must be adjusted as precise as possible so that both switch simultaneously, if possible.

6 Commissioning

After the sensor strips have been loosely mounted and the electrical connection carried out the safety light curtain Ex-LTÜ² can be commissioned.



Important Ensure that the Ex-LTÜ² is not permanently operated with an open transformer unit on the car roof.

6.1 Adjusting the sensor strips

1. Switching on the voltage
2. Position lift between the floors and switch on inspection
3. (not for assembly kits included in the delivery) loosen the first sensor strip **at all mounting points** until the strip can be easily turned 1-2 mm.
4. Switch on the test and adjustment switch of the control unit at the front panel of the printed circuit board of the light curtain evaluation.
5. Turn sensor strip slightly until all channels are just switched off (find the switching limit). When using the assembly kits "Ex-A(H)WAMON" included in the delivery this can happen at the spring adjustment screw. The circuit state is indicated by the yellow relay on the printed circuit board of the light curtain. The bottom relay (-K1) represents the bottom light barrier of the sensor strips, the relay (-K2) above the second light barrier from the bottom, etc.
6. Remember the position of the sensor strip
7. Turn back the sensor strip. At least every second of the yellow relays should pick up. Turn on until all channels are off again.
8. Remember the position of the sensor strip
9. Now turn the sensor strip back to the centre position of both positions. This now represents the ideal switching point. Remember exactly the position and tighten the screws in exactly this position (without using the assembly kits maybe washers have to be used).
10. For lifts with accesses on both ends repeat the sequence for the opposite sensor strip.
11. Switch off the test and adjustment switches again.

6.2 Commissioning the Ex-LTÜ² without edge prevention

1. For lifts with accesses on both ends the following steps must each be carried out twice, i.e. for each access separately.
2. Adjust sensor strips (see above)
3. Lift stops between floors. Switch off light curtain (usually main power switch of lift).
4. Wait one second
5. Switch voltage back on
6. After no more than one second the light curtain must switch to alert (indicated by the green LED at the front of the printed circuit board of the light curtain)
7. Switch off inspection
8. Let lift pull flush level into a stop
9. Interrupt light curtain $\Rightarrow$ the green LED on the printed circuit board of the light curtain goes off and the red LED lights up $\Rightarrow$ the lamp and/or the buzzer on the car panel (message "Continue travel") must stay off

10. Release light curtain again $\Rightarrow$ the light curtain must automatically switch to alert after the release (indicated by the green LED at the front of the printed circuit board of the light curtain)
11. Interrupt light curtain, close shaft doors and give command
12. The lift must not start moving
13. Release light curtain $\Rightarrow$ lift moves
14. Outside the interlock release range of the door and during fast travel interrupt light curtain $\Rightarrow$ the Ex-LTÜ² must interrupt the safety circuit and the lift must stop immediately. The lamp "Continue travel" must light and a possibly available buzzer must sound.
15. Release light curtain again $\Rightarrow$ if an additional push-button "Continue travel" has been included in the panel the lift must neither continue its travel with an internal command nor with an external request. $\Rightarrow$ If the internal command push-buttons has been switched to release the light curtains, the lift may not start moving at an external request. Only when an internal command has been pushed the lift may continue its travel.
16. Lift moves level into the target stop.
17. Give internal command for a new stop, and interrupt the light curtain when pulling into the target stop **but** interrupt the light curtain **before the interlock release range of the door** $\Rightarrow$ same performance characteristics as under items 14. to 16. must follow. But usually an internal command for the same stop as should have been approached before will not be accepted any more (depending on control). Then another stop must be selected.
18. Give internal command for a new stop, and interrupt the light curtain while pulling into the target stop **but now within the interlock release range of the door briefly before the final stop** $\Rightarrow$ lift does not stop but continues its travel until levelling the car flush, in order to prevent the development of an edge. This function must be provided by the lift control system.

6.3 Commissioning Ex-LTÜ² with edge prevention

1. For lifts with accesses on both ends the following steps must each be carried out twice, i.e. for each access separately.
2. Adjust sensor strips (see above)
3. Lift stops between floors. Switch off light curtain (usually main power switch of lift).
4. Wait one second
5. Switch voltage back on
6. After no more than one second the light curtain must switch to alert (indicated by the green LED at the front of the printed circuit board of the light curtain)
7. Switch off inspection
8. Let lift pull flush level into a stop. While pulling in the approach signal of the Ex-LTÜ² must be activated.
9. The two zone switches must be switched on within the interlock release range of the door. The printed circuit board of the zone evaluation (right printed circuit board) must switch to alert (indicated by the green LED at the front of the printed circuit board of the zone evaluation).
10. Interrupt light curtain $\Rightarrow$ the green LED on the printed circuit board of the light curtain goes off and the red LED lights up $\Rightarrow$ the lamp and/or the buzzer on the car panel (message "Continue travel") must stay off
11. Release light curtain again $\Rightarrow$ the light curtain must automatically switch to alert after the release (indicated by the green LED at the front of the printed circuit board of the light curtain)

12. Interrupt light curtain, close shaft doors and give command
13. The lift must not start moving
14. Release light curtain $\Rightarrow$ lift moves
15. Interrupt light curtain during the fast travel outside an interlock release range of a door $\Rightarrow$ the Ex-LTÜ² must interrupt the safety circuit and the lift must stop immediately. The lamp „Continue travel“ must light and the possibly available buzzer must sound. The magnetic interlocking device must not drop off (optional, since not required by DAA) because it is held by the Ex-LTÜ².
16. Release light curtain again $\Rightarrow$ if an additional push-button "Continue travel" has been included in the panel the lift must neither continue its travel with an internal command nor with an external request. Only when the additional push-button has been pressed a new travel may start. $\Rightarrow$ If the internal command push-buttons has been switched to release the light curtains, the lift may not start moving at an external request. Only when an internal command has been pushed the lift may continue its travel.
17. Lift moves level into the target stop.
18. Give internal command for a new stop, and interrupt the light curtain while pulling into the target stop **but** interrupt the light curtain **before the interlock release range of the door** $\Rightarrow$ same performance characteristics as under items 15. to 17. must follow. But usually an internal command for the same stop as should have been approached before will not be accepted any more (depending on control). Then another stop must be selected.
19. Give internal command for a new stop, and interrupt the light curtain while pulling into the target stop **but now within the interlock release range of the door briefly before the final stop** $\Rightarrow$ lift does not stop but continues its travel until levelling the car flush, in order to prevent the development of an edge.
20. Interrupt the Ex-LTÜ² **within the interlock release range of the door** during the fast travel to a stop that has not been selected. I.e. the lift now stops almost level at a stop that has not been selected. $\Rightarrow$ The lamp "Continue travel" must light and a possibly available buzzer must sound. The magnetic interlocking device must not drop out because it is held by the Ex-LTÜ². If the lift is equipped with a re-levelling device ("Go flush level"), it may **not** re-adjust now (optional, since not requested by DAA) because this is blocked by the Ex-LTÜ². Only when the additional push-button (or if the push-button is missing another internal command) has been pressed the lift can re-adjust and the magnetic interlocking device is released again by the Ex-LTÜ².

6.3.1 Test instruction Zone evaluation (only with the full version)

The printed circuit board for the zone evaluation (right printed circuit board) evaluates two independent signals for even switching. The two signals can be generated e.g. by solenoid switches or initiators. When both channels have switched and the circuit does not show internal errors an output is switched with which the safety devices (e.g. the safety light curtain Ex-LTÜ²) may be bypassed. Further outputs of the circuit serve as a connection to the higher-ranking light curtain and to detect abnormal behaviour.

6.3.1.1 Trouble-free operation

When the input x2.10 ("Pulling into target stop") is energized and the zone switch 1 and 2 do not give a signal, relay -K3 is tripped. Thus relay -K1 can be tripped when zone switch 1 is activated and relay -K2 when zone switch 2 is activated. When zone switch 1 is activated relay -K1 locks in. When zone switch 2 is activated, relay -K2 locks also in. -K3 is energized via one normally-closed contact of -K1 and -K2. Now the zone circuit is switched to alert and the green LED at the front lights up. If the zone circuit is not switched to alert, the red LED lights.

The circuit is reset by switching off zone switch 1 and zone switch 2.

6.3.1.2 Switching error of a zone switch

Both channels must always switch simultaneously. Here the channels should switch as simultaneously as possible. If the zone switches are switched unevenly, switching to alert again is blocked when the light curtain is interrupted. Rebounding zone switches (e.g. with an emergency stop directly at the switching on point of the zone switches) do not cause the error, if the rebounding lasts for no more than 1.5 sec. After these 1.5 sec both switches must have the same status otherwise the error is stored and the Ex-LTÜ² blocks.

6.3.1.3 Testing zone switch 1

1. The lift is level, zone switch 1 and 2 are closed
2. Insert bridge between terminals x2.2 and x2.8 (error simulation of zone switch 1)
3. Send lift to the next stop
4. When levelled flush at the target stop interrupt the light curtain and release it again
5. The light curtain must not switch to alert again ⇒ the next travel remains blocked
6. Remove bridge, switch Ex-LTÜ² off and on again
7. The light curtain switches to alert, the next travel is normal

6.3.1.4 Testing zone switch 2

1. The lift is level, zone switch 1 and 2 are closed
2. Insert bridge between terminals x2.2 and x2.9 (error simulation of zone switch 2)
3. Send lift to the next stop
4. When levelled flush at the target stop interrupt the light curtain and release it again
5. The light curtain must not switch to alert again ⇒ the next travel remains blocked
6. Remove bridge, switch Ex-LTÜ² off and on again
7. The light curtain switches to alert, the next travel is normal

6.4 The most common problems

6.4.1 Ex-LTÜ² (all versions)

Symptom	Light curtain interrupts off and on during travel
Possible cause	Adjustment is "marginal" 1. The sensor strips have not been adjusted 100%. 2. If the car is loaded unevenly, the car will twist for other reasons during travel or the sensor strips will start slight oscillation, this can lead to an unintended interruption. The sensor strips were mounted with direct normally-closed contact to the car wall. The car wall has been battered (e.g. by a forklift)
Solution	Check adjustment, if possible with the testing device type "OptoControl" (Caution: the "OptoControl" is not Ex protected).

Symptom	The yellow relays of the printed circuit board LTUE associated with the individual light beams have all picked up but the printed circuit board does not switch to alert. Relays -K17 to -K19 have dropped out.
Possible cause	Switch "Test / adjustment" is not switched off.
Solution	Deactivate switch

Symptom	The printed circuit board LTUE has only picked up every second yellow relay.
Possible cause	One of the two sensor strips is twisted
Solution	If the relays -K1, -K3, -K5... have picked up, check the adjustment of sensor strip B. If the relays -K1, -K3, -K5... have picked up, check the adjustment of sensor strip A.

6.4.2 Only Ex-LTÜ² edge prevention

Symptom	With levelling the car flush and interrupting the light curtains it does not automatically switch to alert. The indicator lamp on the push-button "Continue travel" lights up and the buzzer on the car panel sounds. The push-button "Continue travel" must be pressed.
Possible cause	Zone evaluation (printed circuit board ZONE) has not switched to alert because: 1. Signal "Pulling in" at terminal x2.10 has not been switched while pulling into the stop The zone switches have not both been switched on. One of the zone switches has briefly been switched off and on again while pulling into the stop
Solution	Check the three issues

Symptom	The lift seizes off and on. The spacing to the stop is always the same approx. 10 - 20 cm above or under the flush level. Relays -K1 and -K2 of the printed circuit board ZONE have been switched to non-equivalent in this condition.
Possible cause	Due to the light curtain the emergency stop is in such an unfavourable position that the car comes to a standstill at a point at which one zone switch is switched while the other is not switched.
Solution	1. Check zone switches, adjust switching points as accurate as possible Set Ex-LTÜ ² zone for as long as possible (max. ± 25 cm) If also the lift control system is provided with separate

	zone switches it is of great advantage, if the Ex-LTÜ ² zone is as long as possible and the zone for the lift control system is set as small as even possible. Please observe Section 5.3 (Solutions for problems with zone switches)
--	---

Symptom	The lift seizes during levelling the car flush. At least one side of the light curtain has been interrupted. On the corresponding printed circuit board LTUE no relay has picked up.
Possible cause	1. The zone circuit (printed circuit board ZONE) has detected an error. Relays -K1 and -K2 of the printed circuit board ZONE have been switched to non-equivalent in this condition 2. The signal "Pulling into target stop" is also switched on at standstill of the lift 3. Input push-button "Continue travel" is constantly activated 4. The sensor strips have not been adjusted 100%. Adjustment is "marginal" 5. Lenses of the sensor strips are heavily soiled or scratched
Solution	re. 1. Check switching distance of the solenoids to the solenoid switches. Pay attention to the clearance within the car guides. Check solenoid switches. The signal must only be activated when pulling in. At standstill and in fast travel it must be switched off. It is possible that the push-button "Continue travel" is stuck. If the push-button is pressed after an interrupted light curtain relay -K19 of the printed circuit board LTUE picks up. Only when the push-button is released the light curtain switches to alert again. Check adjustment, if possible with the testing device type "OptoControl" (Caution: the "OptoControl" is not Ex protected). Clean the sensor stipes.

Symptom	The Ex-LTÜ ² is not bypassed when pulling into the zone area. A small stumbling edge develops
Possible cause	Zone circuit (printed circuit board ZONE) is not switched to alert
Solution	Check signal "Pulling into target stop" at terminal x2.10 and zone switch an terminals x2.8 and x2.9.

Symptom	Shaft door is constantly locked by the Ex-LTÜ ²
Possible cause	Zone circuit (printed circuit board ZONE) is not switched to alert
Solution	Check signal "Pulling into target stop" at terminal x2.10 and zone switch an terminals x2.8 and x2.9.

Symptom	When leaving the stop the lift with a light curtain-emergency stop stops after approx. 30cm. The buzzer sounds and the indication Continue travel lights up. The Continue travel push-button is not working.
Possible cause	The approach signal has not been switched off at the stop at standstill and when leaving.
Solution	Check approach signal at terminal x2.10

6.4.3 Only Ex-LTÜ² without edge prevention

Symptom	With levelling the car flush and interrupting the light curtains it does not automatically switch to alert. The indicator lamp on the push-button "Continue travel" lights up and the buzzer on the car panel sounds. The push-button "Continue travel" must be pressed.
Possible cause	The signal "Levelled flush" at terminal x2.8 is not available.
Solution	Check connection

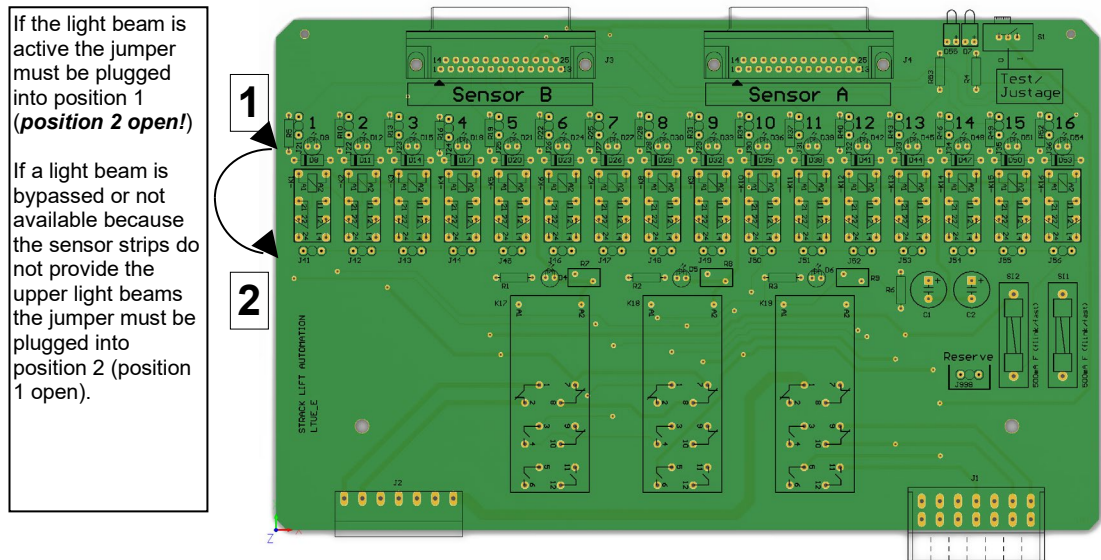
Symptom	The lift seizes during levelling the car flush. At least one side of the light curtain has been interrupted. On the corresponding printed circuit board LTUE no relay has picked up.
Possible cause	Input push-button "Continue travel" is constantly activated The sensor strips have not been adjusted 100%. Adjustment is "marginal" Lenses of the sensor strips are heavily soiled or scratched
Solution	re 1: It is possible that the push-button "Continue travel" is stuck. If the push-button is pressed after an interrupted light curtain relay -K19 of the printed circuit board LTUE picks up. Only when the push-button is released the light curtain switches to alert again. re 2: Check adjustment, if possible with the testing device type "OptoControl" (Caution: the "OptoControl" is not Ex protected). re 3: Clean the sensor stipes.

Symptom	The Ex-LTÜ ² is not bypassed when pulling into the zone area of the control system. A small stumbling edge develops
Possible cause	The light curtain is not appropriately bridged by the control system.
Solution	Check connection at the safety circuit of the lift.

7 Ex-LTÜ² internal

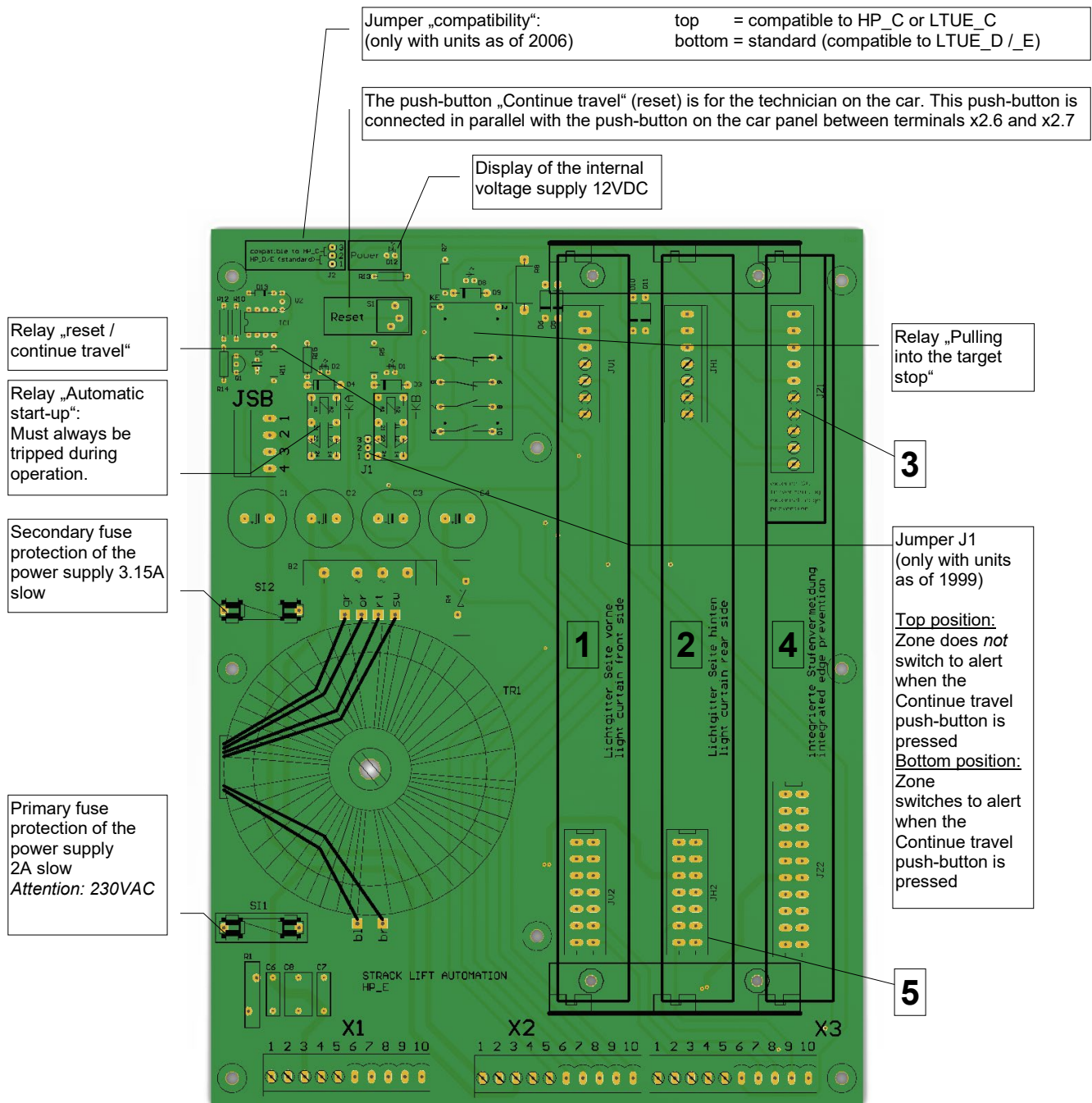
7.1 Number of light beams and emergency operation

The printed circuit boards type LTUE for the light curtain evaluation must always correspond to the number of light beams of the connected sensor strips. There is one red jumper (short-circuiting link) per light beam on the printed circuit boards. Depending on the position it is plugged in the light beam is active or inactive.



Important If a light beam failed it can be deactivated by plugging the jumper from position 1 in position 2. The lift continues its travel in the "Emergency operation". However, the actual error (pair of sensor strips is defective, out of alignment, contaminated, etc.) should be rectified as quickly as possible since an inactive light beam certainly presents a monitoring gap and increases the risk of an accident.

7.2 Printed circuit board "Main printed circuit board HP_E"



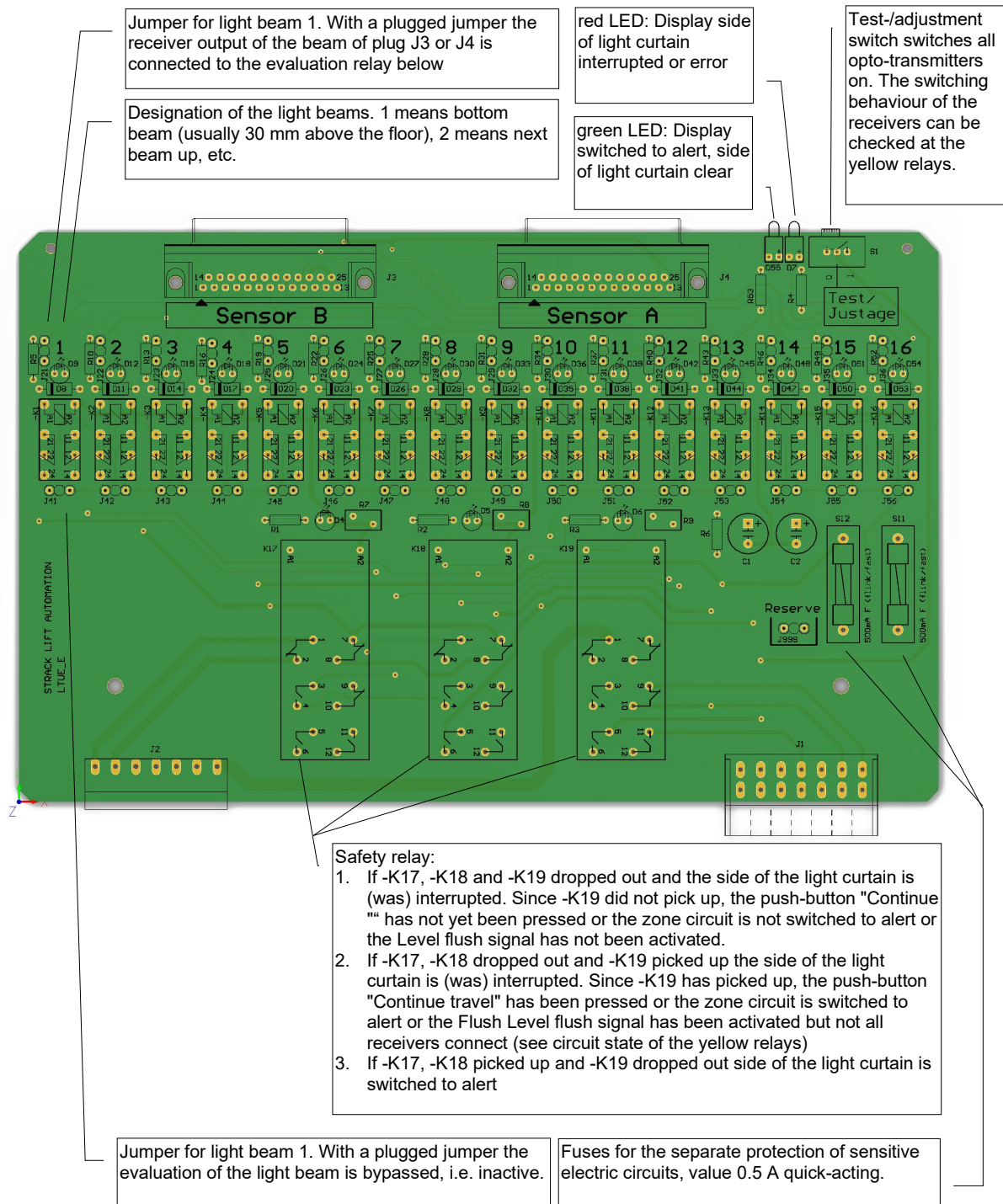
- | | |
|--|---|
| <p>1 = slot 1 for printed circuit board light curtain evaluation type LTÜ²</p> <p>2 = slot 2 for printed circuit board light curtain evaluation type LTÜ²</p> <p>3 = slot 3 for printed circuit board Light curtain evaluation type DUM ZONE (only with simple version)</p> | <p>4 = slot 4 for printed circuit board light curtain evaluation type ZONE (only with full version)</p> <p>5 = slot 5 for plug bridge with lifts with only one access</p> |
|--|---|

7.3 Printed circuit board "Light curtain evaluation LTUE_E "

The printed circuit board includes the evaluation of a pair of sensor strips. Thus, lifts with accesses on both ends are equipped with two pieces. On the board the red jumpers (short-circuiting links) have to be adjusted to the respective number of available light beams of the sensor strips.

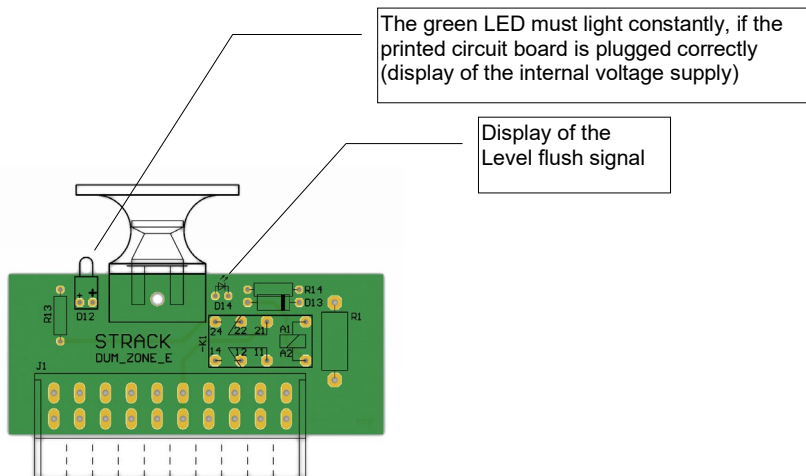


Important Incorrectly plugged jumpers can switch individual light beams or even the whole side of the light curtain inactive! Be careful and responsible when handling jumpers. After replugging check each light beam for correct function. For this interrupt each light beam individually to set the lift flush level. The light curtain must interrupt each time (red LED lights up) and switch back to alert after being released (green LED lights up).



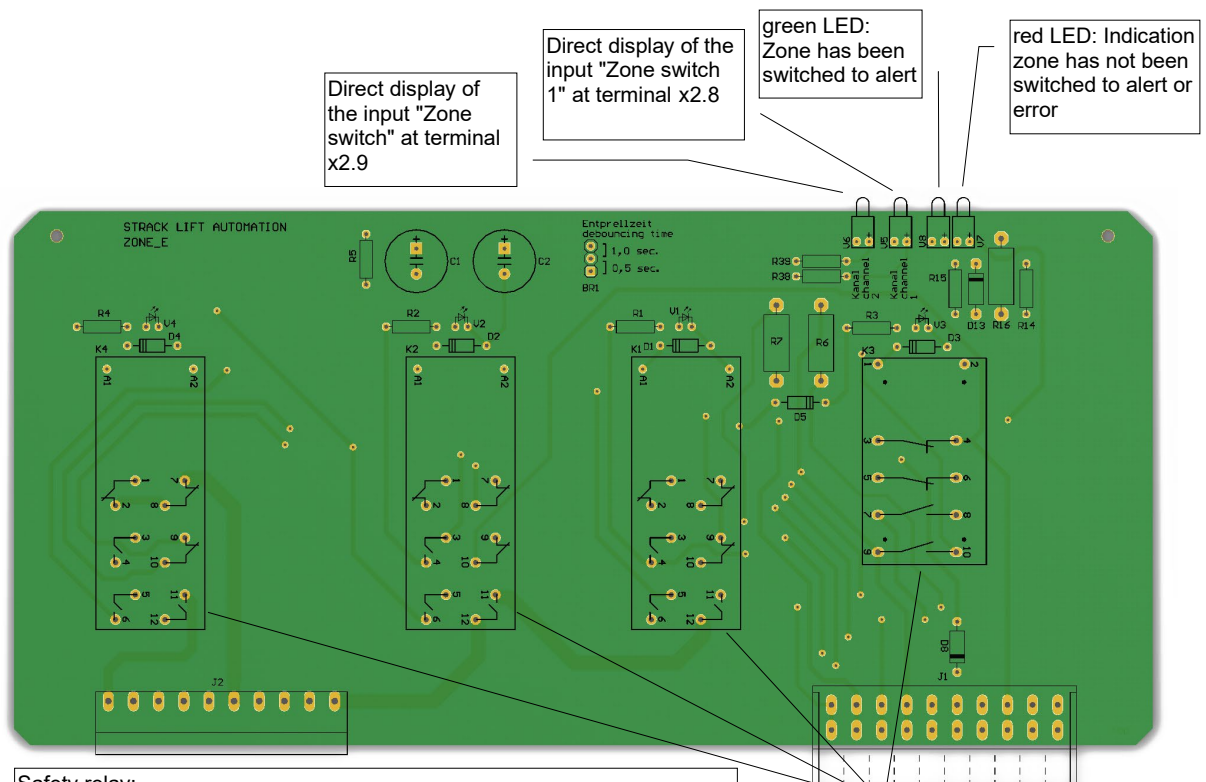
7.4 Printed circuit board "Auxilliary zone DUM_ZONE_E "

This printed circuit board is only used with units without an integrated circuit preventing edges (simple version). The printed circuit board serves to evaluation the level flush signal.



7.5 Printed circuit board "Zone evaluation ZONE_E "

This printed circuit board is only used with units with an integrated circuit preventing edges (full version). It serves to evaluate the interlocking release zone of the door.



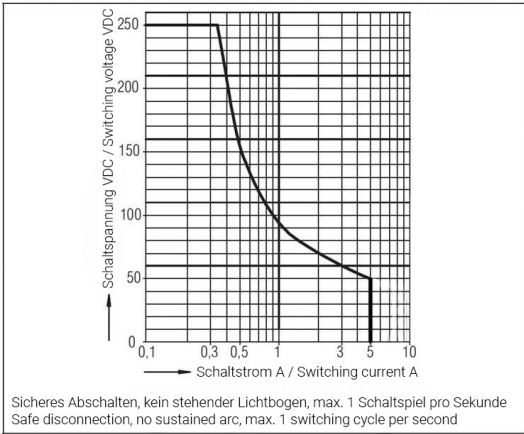
Safety relay:

1. If -K1, -K2 and -K3 dropped out the zone has not been switched to alert. Since -K3 has not picked up, the push-button "Continue travel" has not yet been pressed or the signal "Pulling into target stop" has not been switched on.
2. If -K1, -K2 dropped out and -K3 picked up the zone has not been switched to alert. Since -K3 has picked up, the push-button "Continue travel" has already been pressed or the signal "Pulling into the target stop" has been switched on. But not both zone switches are switched on.
3. If -K1, -K2 picked up and -K3 dropped out the zone has been switched to alert.
4. -K4 picked up when -K1 and -K2 picked up, so when the zone has been switched to alert.

8 Technical data

Total system		
Supply voltage	V	230 +5/-10% 50Hz / N / PE
Current consumption type.	A	0.1 (0.18 for lifts with accesses on both ends)
Prim. fuse protection of power supply	AT	2
Internal signal voltage	V	12 DC
Sec. fuse protection of power supply	AT	3.15
Ambient temperature	°C	0 to +40

Control unit		
Protection class acc. to EN 60529		IP 54 (not Ex protected)
Ambient temperature	°C	0 to +40
Casing		Steel plate painted
Dimensions housing (HxBxT)	mm	500x400x250 (without fastening bars)
Power dissipation	W	30 max.
Weight	kg	10
Connection of all external units		screwless terminal strips
Connectable core cross-section	mm²	0.08 – 2.5

Output for safety circuit (terminal x1.5 / x1.7)		
Switching voltage, max.	V	250
Starting / continuous current / current on breaking	A max.	20 / 6 / 6
Switching capacity AC12 / AC15	VA max	1250 / 500
Switching capacity max. DC		
Series fuse max.	A	the output circuit must be protected with max. 6 A

Transformer unit on the car roof		
Protection class acc. to EN 60529		IP 65
Ex protection	gas	II 2G Ex eb mb op is IIC T4 Gb
Ex protection	dust	II 2D Ex mb tb op is IIIC T130°C Db IP65

Light-barrier modules		
Protection class acc. to EN 60529		IP 65
Ex protection		Type of protection m (must only be operated built-into the transformer housing)
Supply voltage	V	12 ±5%
Nominal current consumption	mA	12
Output voltage	V	12.6 max.
Output current	mA	30 max.

Connection sensor strips		
Type of connection		Individual optical fibre plugged directly
Length of the connection cable	m	5 (cannot be extended later!)

Optical data of the sensor strips		
Surface the lenses		Silicate glass
Insensitive against ambient light	Lux	80000 (constant light)
Range	m	0 - 4
Arrangement of the light beams		Parallel, transmitter/receiver alternating
Size of light spot with 4 meters	mm	200
Type of light		Impulse-commutated red light

9 Maintenance

9.1 SAFETY INSTRUCTIONS



The safety light curtain Ex-LTÜ² can only be used in technically perfect condition. Especially malfunctions affecting the safety have to be rectified immediately. Keep all documentation included in the delivery such as manuals and circuit diagrams ready at hand and constantly at the site of operation of the Ex-LTÜ². Keep the documentation always current. This especially applies to modifications of the higher-ranking lift control system carried out later. Please observe all safety and danger notes of the system and always keep them legible.

If there are changes to the environmental influences such as temperature, humidity or a potentially explosive atmosphere during the operating time of the lift or storage period of the Ex-LTÜ² the manufacturer (STRACK must be notified to adjust the system if necessary, to the new circumstances.

Only the manufacturer's original spare parts (STRACK) must be used.

Do not perform repairs on control units or sensor strips independently! These may only be performed by STRACK specialists from STRACK!

If a fuse was tripped the correct function of the Ex-LTÜ² must be checked again.

A failure to comply with these instructions or changes to the Ex-LTÜ² can cause additional danger excluding the liability of the manufacturer for damages resulting from this.

Please observe the provisions concerning work in Ex areas. The terminal box in the transformer unit on the roof of the car may only be opened when either the system is de-energised or you ensured that no explosive atmosphere exists.

9.2 General maintenance intervals

The safety light curtain Ex-LTÜ² is designed and constructed to function largely trouble-free and with low maintenance. However, it is specified to check the functions of the Ex-LTÜ² in connection with the lift control system no later than with each maintenance of the lift and recurring inspections by experts.

Here the following should be specifically checked:

- Light curtain and lift function according to Section 6 "Commissioning"
- The holding brake of the lift must be maintained according to the manufacturer's instructions. No extended length of the brake path may result compared to the path determined during the first inspection of the lift by the expert. Special care must be taken that no lubricating film is deposited on the brake, the brake levers are not misadjusted or the brake lining is worn.

9.3 Cleaning the sensor strips

According to the degree to which the system is soiled the lenses of the sensor strips must be cleaned. The surfaces of the lenses consist of silicate glass which is very resistant against scratching and chemical compounds. However, only clean the lenses with a moist cloth, if necessary, with a small amount of detergent. Do not use scouring agents and substances corrosive to glass.

10 Storage

Only store the units at a temperature of 0 to +40 °C under normal broader storage conditions for electrical appliances.

Do not expose the transformer unit and the light-barrier modules to direct sunlight or place them next to heavy-duty heaters since this can trigger internal overtemperature safeguards starting at about 70 °C. The modules are then irreparably destroyed!

Protect the apertures of the transmission diodes and receiving transistors at the light-barrier modules from soiling. At the time of the delivery short fibre optic cable (FOC) pieces are plugged into the apertures which should only be removed immediately before connecting the sensor strips.

Protect the FOC ends of the sensor from damage and soiling. Do not remove the membrane put over at the time of the delivery.

Do not bend FOC bundles sharply or intensely! Min. bending radius 10 cm! Do not step on FOC bundles or squeeze them.

Check the condition of the units when removing them from storage. They must not show heavy soiling, etc.

As a precaution the solenoids for solenoid switches possibly included in the delivery should not be brought near pacemakers or similar medical devices (distance < 30 cm) since their function may be impaired.

11 Packing and disposal

Please make the packing available for recycling. Larger quantities of packing can also be returned to STRACK.

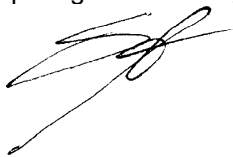
Electronic parts are hazardous waste. STRACK accepts old STRACK units and disposes of them for you competently.

12 EU Declaration of conformity

We hereby declare that the units listed below fully comply with the relevant essential protection requirements of the listed directives with regard to their design and components as well as in the version marketed by us in compliance with our circuit and assembly suggestions. The units complying with this declaration are provided with CE emblem. This declaration becomes invalid should the unit be modified without our approval.

Type designation	Ex-LTÜ ² -... incl. controller unit with PCB of version E incl. transformer unit Ex-LGW... with modules Ex-LM.1.0
Manufacturing date	2026 / 2027 / 2028 / 2029 / 2030
Short description	Safety light curtain as a substitution for the car door of freight lifts with an operational speed up to 0.85 m/s
Basis are the following directives	Lift directive 2014/33/EU ATEX directive 2014/34/EU EMC directive 2014/30/EU
Applied standards	EN 81-1:1998 + A3:2009 EN 81-2:1998 + A3:2009 EN 81-20:2020 EN IEC 60079-0:2018 EN IEC 60079-7:2015 + A1:2018 EN 60079-18:2015 + A1:2017 EN 60079-28:2015
	

This explanation is issued by the responsible manufacturer
STRACK LIFT AUTOMATION GmbH
on 10.6.2026
by
Dipl.-Ing. Dirk Strack, Managing Director



Note

The aforementioned STRACK products are exclusively intended for the installation in lifts or the assembly with other lift parts. The commissioning or distribution within the European Union is only admissible, if the conformity of the finished product corresponds with the relevant harmonised directives of the EU.

13 Certificates

Zertifikat



Nr.: 968/A 129.02/24

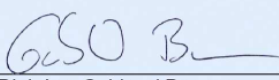
Prüfgegenstand	Sicherheitsschaltungen als Teilbereiche der Leiterplatten LTUE_E und ZONE_E	Zertifikatsinhaber	STRACK LIFT AUTOMATION GmbH Lise-Meitner-Straße 2 42489 Wülfrath Germany
Typbezeichnung	LTÜ ² , basierend auf den Leiterplatten LTUE_E, ZONE_E, HP_E und optional DUM_ZONE_E		
Prüfgrundlagen	EN 81-20:2020, 5.11.2.3	EN 81-50:2020, 5.15	
Bestimmungsgemäße Verwendung	Ersatz von zwangsläufigen Sicherheitsschaltern durch eine Sicherheitsschaltung.		
Besondere Bedingungen	Die Hinweise in der zugehörigen Betriebs- und Wartungsanleitung sowie dem Anhang zu diesem Zertifikat sind zu beachten.		
Gültig bis 03.05.2029			

Der Ausstellung dieses Zertifikates liegt eine Evaluierung entsprechend dem Zertifizierungsprogramm CERT FSP5 V3.0:2020 in der aktuellen Version zugrunde, deren Ergebnisse im Bericht Nr. 968/A 129.02/24 vom 17.04.2024 dokumentiert sind. Dieses Zertifikat ist nur gültig für Erzeugnisse, die mit dem Prüfgegenstand übereinstimmen. Ausgestellt von der durch die DAkkS nach DIN EN ISO/IEC 17065 akkreditierte Zertifizierungsstelle. Die Akkreditierung gilt nur für den in der Urkundenanlage D-ZE-11052-02-00 aufgeführten Akkreditierungsumfang.

TÜV Rheinland Industrie Service GmbH
Bereich Automation
Funktionale Sicherheit
Am Grauen Stein, 51105 Köln

Köln, 03.05.2024

Zertifizierungsstelle Safety & Security for Automation & Grid



Dipl.-Ing. Gebhard Bouwer

222 12, 12 E A4 © TÜV, TÜV and TÜV are registered trademarks. Utilisation and application requires prior approval.

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www.fs-products.com
www.tuv.com

 **TÜVRheinland®**
Precisely Right.

17.04.2024

Anlage zum Zertifikat Reg.-Nr. 968/A 129.02/24

1. Komponente	LTÜ ² basierend auf den Leiterplatten ZONE_E, LTUE_E, HP_E und optional DUM_ZONE_E
2. Hersteller	STRACK LIFT AUTOMATION GmbH Lise-Meitner-Straße 2 42489 Wülfrath
3. Baugruppen	Sicherheitsschaltungen als Teilbereiche der Leiterplatten LTUE_E und ZONE_E (aufgesteckt auf der Leiterplatte HP_E) der Komponente LTÜ ² und optional DUM_ZONE_E als Dummy Ersatz für ZONE_E
4. ID-Nr. / Kennzeichnung auf den Baugruppen	ZONE_E, LTUE_E, HP_E, DUM_ZONE_E
5. Bisherige Prüfgrundlagen	EN 81-20:2014, 5.11.2.3 / EN 81-50:2014, 5.15
6. Anwendungsbereich	Aufzüge für den Personen- und Gütertransport
7. Bestimmungsgemäßer Gebrauch / Bestimmungsgemäße Verwendung	Ersatz von zwangsläufigen Sicherheitsschaltern durch eine Sicherheitsschaltung
8. Nenndaten	Versorgungsspannung: 230 V AC +5% / -10%, 50 Hz L Klemme X1.1 N Klemme X1.2 PE Klemme X1.3
	<u>Sicherheitskreis</u> Klemme X1.5 - X1.7 Ausgangsspannung: max. 250 V AC / 24 V DC Ausgangsstrom: max. 6 A Schaltvermögen: AC15: 250 V 5 A DC13: 24 V 4 A
	<u>Zonenschalter</u> Eingangsspannung: 24 V DC Zonensignal 1 Klemme X2.8 Zonensignal 2 Klemme X2.9 Bezugspotential Klemme X2.2 24 V DC
	Schutzgrad ¹ : IP54
	Betriebstemperatur: 0...+40°C
	Weitere technische Daten zu den Sicherheitsschaltungen siehe Betriebs- und Wartungshandbuch der Baugruppe LTÜ ² der Fa. STRACK LIFT AUTOMATION GmbH.
9. Installation	- Die Vorgaben im Betriebs- und Wartungshandbuch für die Installation, die Inbetriebnahme sowie den Betrieb der Sicherheitsschaltungen sind zu beachten. Des Weiteren sind die relevanten nationalen Vorschriften und die EN 81-20 bei der Installation einzuhalten und es ist eine EMV-gerechte Verdrahtung zu gewährleisten. - Die Zuleitungen zu den Zonenschaltern sowie der Ausgangskreis (Anschluss an den Sicherheitskreis) sind kurzschlussicher auszuführen.

¹ Durch Gehäuseschutzgrad / Einbauraum zu gewährleisten.

17.04.2024



Anlage zum Zertifikat Reg.-Nr. 968/A 129.02/24

9. Installation (fortgesetzt)	- Durch die Wahl eines geeigneten Einbauorts muss sichergestellt sein, dass Umwelteinflüsse keine negativen Auswirkungen auf die Funktion der Sicherheitsschaltung haben.
10. Wartung	Die korrekte Installation ist regelmäßig zu überprüfen.
11. Besondere Bedingungen	Im Rahmen der Erstinbetriebnahme und der wiederkehrenden Prüfungen des Aufzugs sind folgende Überprüfungen durchzuführen: - Prüfung der korrekten Installation, - Prüfung der Hardwareversion, - Prüfung der Sicherheitsfunktion (Zonenschalter) gemäß Kap. 6.3.1 in der Betriebs- und Wartungsanleitung.

1 2 3 4 5 6 7 8 9 10 11 12	Translation EU-Type Examination Certificate Supplement 1 Change to Directive 2014/34/EU Equipment intended for use in potentially explosive atmospheres Directive 2014/34/EU EU-Type Examination Certificate Number: BVS 03 ATEX E 225 Product: Light barrier module type Ex-LM.1.0 with light grid converter type Ex-LGW.4.* Manufacturer: STRACK LIFT AUTOMATION GmbH Address: Lise Meitner-Straße 2, 42489 Wülfrath, Germany This supplementary certificate extends EC-Type Examination Certificate No. BVS 03 ATEX E 225 to apply to products designed and constructed in accordance with the specification set out in the appendix of the said certificate but having any acceptable variations specified in the appendix to this certificate and the documents referred to therein. The certification body of DEKRA Testing and Certification GmbH, Notified Body number 0158, in accordance with Article 17 of Directive 2014/34/EU of the European Parliament and of the Council, dated 26 February 2014, certifies that this product has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of products intended for use in potentially explosive atmospheres given in Annex II to the Directive. The examination and test results are recorded in the confidential Report No. BVS PP 03.2165 EU. The Essential Health and Safety Requirements are assured in consideration of: <table border="0"><tr><td>EN 60079-0:2012 + A11:2013</td><td>General requirements</td></tr><tr><td>EN 60079-7:2015</td><td>Increased Safety "e"</td></tr><tr><td>EN 60079-18:2015</td><td>Encapsulation "m"</td></tr><tr><td>EN 60079-28:2015</td><td>Optical Radiation "op is/pr/sh"</td></tr></table> If the sign "X" is placed after the certificate number, it indicates that the product is subject to the Special Conditions for Use specified in the appendix to this certificate. This EU-Type Examination Certificate relates only to the design and construction of the specified product. Further requirements of the Directive apply to the manufacturing process and supply of this product. These are not covered by this certificate. The marking of the product shall include the following:  II 2G Ex eb mb op is IIC T4 Gb II 2D Ex mb tb op is IIIC T130°C Db DEKRA Testing and Certification GmbH Bochum, 14-06-2019 signed: Jörg-Timm Kilisch _____ Managing Director	EN 60079-0:2012 + A11:2013	General requirements	EN 60079-7:2015	Increased Safety "e"	EN 60079-18:2015	Encapsulation "m"	EN 60079-28:2015	Optical Radiation "op is/pr/sh"
EN 60079-0:2012 + A11:2013	General requirements								
EN 60079-7:2015	Increased Safety "e"								
EN 60079-18:2015	Encapsulation "m"								
EN 60079-28:2015	Optical Radiation "op is/pr/sh"								

Page 1 of 3 of BVS 03 ATEX E 225 / N1
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 **DAkkS**
Deutsche
Akreditierungsstelle
D-76174 802 00

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Certification body: Dinnendahlstr. 9, 44809 Bochum, Germany
Phone +49.234.3696-400, Fax +49.234.3696-401, E-mail DTC-Certification-body@dekra.com



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Appendix

EU-Type Examination Certificate

BVS 03 ATEX E 225
Supplement 1

Product description

Subject and type

Light barrier module type Ex-LM.1.0
with light grid converter type Ex-LGW.4.*

The asterisk is replaced by the number of light barrier modules installed inside an enclosure.

Description

The light barrier module type Ex-LM.1.0 with light grid converter type Ex-LGW.4.* is used for monitoring tasks in explosive atmospheres. Up to 14 light barrier modules of the type of protection Encapsulation m and a separately certified junction and terminal box type 06.162609 (PTB 00 ATEX 1002) of the type of protection Increased Safety e are installed in a metal enclosure and together form the light grid converter.

Reason for the supplement:

- change to Directive 2014/34/EU
- modification to comply with current version of standards and addition of EN 60079-28 (optical radiation)
- types Ex-RFX.* and Ex-HSTG.* have been ceased, type names have been modified
- group III has been added

Parameters

Supply circuit			
Rated voltage		DC	12 V ± 5%
Rated current			12 mA
Output circuit			
Output voltage	up to	DC	12.6 V
Output circuit	up to		30 mA

Report Number

BVS PP 03.2165 EU, as of 2019-06-14

14460

Page 2 of 3 of BVS 03 ATEX E 225 / N1
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Certification body: Dinnendahlstr. 9, 44809 Bochum, Germany
Phone +49.234.3696-400, Fax +49.234.3696-401, E-mail DTC-Certification-body@dekra.com

17	Special Conditions for Use None
18	Essential Health and Safety Requirements The Essential Health and Safety Requirements are covered by the standards listed under item 9.
19	Drawings and Documents Drawings and documents are listed in the confidential report.

We confirm the correctness of the translation from the German original.
In the case of arbitration only the German wording shall be valid and binding.

DEKRA Testing and Certification GmbH
Bochum, 2020-08-19
BVS-Hk/Ar E 9680/20



Managing Director

Page 3 of 3 of BVS 03 ATEX E 225 / N1
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 **DAkkS**
Deutscher
Zertifizierungsinstitut
D-26135 Bielefeld

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