User Manual

for

QKS6 L&L door operator conversion

document history

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2	1.1	07.04.15	RAU
3	1.2	26.11.15	JE
4	1.3	01.08.16	CSA
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Langer & Laumann Ing.-Büro GmbH
Wilmsberger Weg 8
48565 Steinfurt
Germany

Phone: +49 (2552) 92 7 91 0

Email info@LuL-Ing.de
Web: www.lul-ing.de

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1 Basic Instructions

1.1 Status of the Installation Instructions

Product installation instructions are enclosed by the manufacturer or supplier in order to provide the customer or fitter with the essential knowledge necessary for correct and safe installation. These brief installation instructions are intended to clarify basic mechanical installation steps and to illustrate the principal differences between the door operator versions for telescopic 2 panel, central 2 panel and central 4 panel. Electrical connection, commissioning and adjustment of the door control unit are expressly not components of these instructions.

1.2 Copyright

1.3 Instructions in the Installation Manual

All instructions in the installation manual absolutely must be adhered to.

1.4 Informal Measures by the Fitter

The fitter installing the system is him/herself responsible for participating in training. He/she must immediately inform the manufacturer/supplier of missing or damaged delivered parts.

1.5 Requirements of Installation Personnel

Persons responsible for installation and maintenance should be familiar with the generally applicable safety and work-hygiene regulations. They should be familiar with Langer & Laumann products. Installation tools are to be properly functional and measuring instruments must be subject to continuous checks.

1.6 Description of Symbols

WARNING:
This sign is to indicate a possible impeding danger of serious physical damage or death.

CAUTION:
This sign is to indicate a possible impending danger of light physical damage. This sign is also to warn you of material damage.

NOTE:
You will be informed of various possible applications and will receive further useful suggestions.

2 General

2.1 Summary Sketch

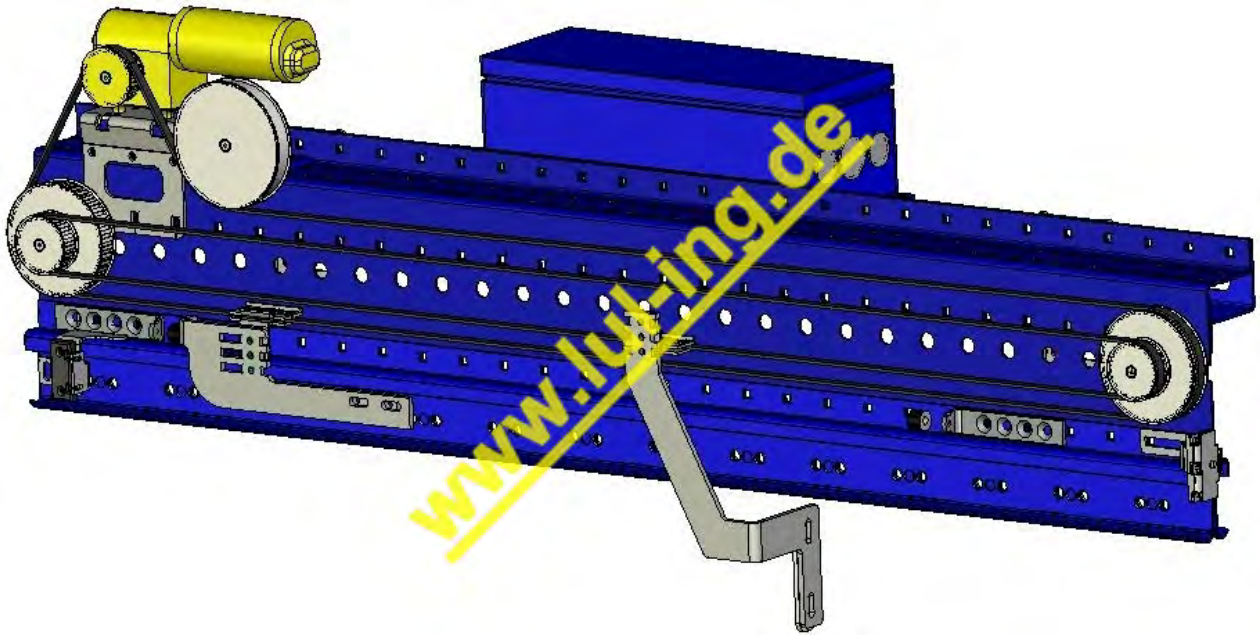


Abb. 1: QKS6 L&L door operator telescoping right

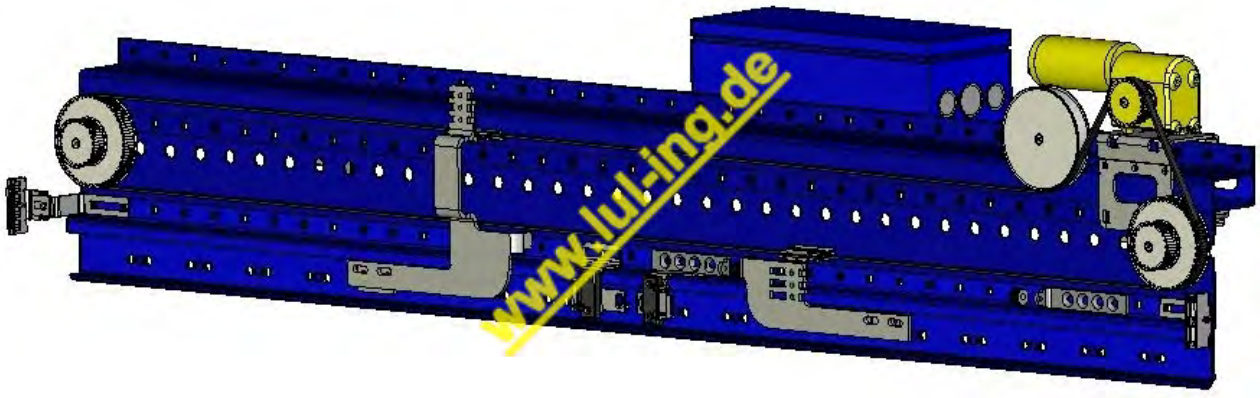


Abb. 2: QKS6 L&L door operator centre

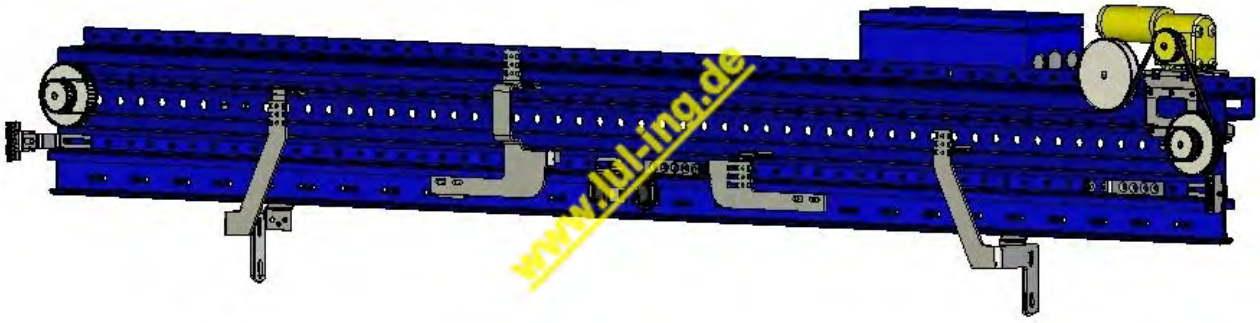


Abb. 3: QKS6 L&L door operator centre telescoping

2.2 Variant of QKS6

Following the variants of QKS6:

Table 1: variants

Door width (configuration)	2 panel telescoping left	2 panel telescoping right	2 panel telescoping centre	4 panel telescoping centre
0700	X	X	X	-
0800	X	X	X	-
0900	X	X	X	-
1000	X	X	X	-
1100	X	X	X	-
1200	X	X	X	X
1300	X	X	X	X
1400	X	X	X	X
1500	-	-	-	X
1600	-	-	-	X
1700	-	-	-	X
1800	-	-	-	X
1900	-	-	-	X
2000	-	-	-	X
2100	-	-	-	X
2200	-	-	-	X

(X) = existing, (-) = not existing

2.3 Scope of Delivery

Pos.	article number		quantity
1	(depend on door operator)	QKS6 L&L door operator (completely assembled incl. cogs, belt, drive, buffer)	1
2		Sinus Drive for shaft door actuator	1 / 2
3		accessories	
4		bolts, washers)	
5		TSG electronic in closed housing	1
6	1.31.20191	Manual QKS6 conversion to L&L	1
8	1.20.91000	Manual TSG	1

CAUTION:
Shafts and their bearings as well as the encoder must not be damaged by pumping!

2.4 Description of Product Functions

All the door drives operate according to the same function principle. The doors are activated by a DC motor using toothed belts and two or more pusher dogs.
The DC motor drives a toothed belt, which runs over double toothed belt pulleys. The pusher dogs are fastened to the toothed belts by means of a catch. The car doors are firmly interconnected with the pusher dogs. The height of the toothed belts can be adjusted by adjusting the double toothed belt pulleys (eccentric).

3 Assembly Instructions for Mechanical Part

3.1 Fundamental Info

In principle, the door frame is pre-commissioned for all types of doors and are pre-assembled as much as possible at the factory.

However, there are a few items that still have to be assembled on the cabin doors and adapted on site. Likewise, adjustments are required on the pulleys, the limit switches as well as the door pusher dogs.
The existing shaft door actuator for shaft opening remains intact in principle, but requires an additional actuator.

As all the assembly steps for the 2 panel telescopic, 2 panel central and 4 piece central door models are all similar in principle, the following description deals with all three door types at the same time. Wherever there are distinct differences, these will be explained explicitly.

WARNING:
For safety reasons all nuts and bolts, which are already tightened upon delivery, must be re-tightened on-site.

3.2 Safety Equipment

CAUTION:
All the safety regulations listed in EN81 must still be observed after modifying the new door machine.

In the case of a telescopic lift door, it should be noted that the door panel has a door interlock.
Extract from EN81-1:
Ch. 8.10 Lift-compartment sliding doors with several mechanically linked door panels
8.10.1 In the case of lift-compartment sliding doors with several directly mechanically interlinked door panels, it is permissible,

a) to attach the installation as per 8.9.2
   1. either only on one door panel (the fastest one in the case of telescopic doors)
   2. or on the door drive, as long as there is a form-fitting link between the drive element and the door panels,,

   and
b) in the event of locking only one door panel and in accordance with the conditions as per 11.2.1 c, if this one interlock prevents the opening of the other door panels due to their intermeshing with each other in the closed position.

When attaching and commissioning the TSG in/on a lift cabin, it must be ensured that the maximum permitted total weight of the lift cabin is not exceeded under maximum rated load.

In the event of an emergency stop or shut-down of the lift, it must be ensured that the TSG door-control unit does not cause any unintentional, dangerous or uncontrolled door movements.

CAUTION:
The simulated limit switch for “Door open”, “Door closed” and “Door blocked” on the controller for the door and locking bar drive must not be used as safety equipment with any safety relevance.

3.3 Car door lock

WARNING:
The Schindler QKS6/9 car door lock **is not** compatible with the Langer & Laumann modernization packages and **is not** supported!

3.4 Assembly door frame on the car roof

NOTE:
The sequence of the assembly specified here shows only a recommendation. There is not a requirement on completeness.

3.4.1 Before disassembly the old door operator

Before the disassembly of the old door operator must be taken up the following mass.

1. Height of track of car roof (car internal height)
   upper edge of track to car roof.
2. Track:
   - closing edge extremely needed measure consider (pay attention to lines and other obstacles of shaft wall by passage),
   - opening edge extremely needed measure consider (pay attention to lines and other obstacles of shaft wall by passage),
3. depth of installation of the track (back of track to car),

NOTE:
The new track has the same length and mass as the old one.

3.4.2 Disassembly the old door operator

The old door drive must be dismantled completely. The clamping plates at the old door drive must be unscrewed, since they are again used.

3.4.3 Door operator on car

Put the new door operator on car (provisional attachment by fighter mounting plate e.g. by fastening clamps).

The height, lateral position and the depth of the door operator depends on the track. The mass, which were taken up before the disassembly of the old door operator, are to be kept with the new track.

NOTE:
Build door operator horizontally and in the plumb!
For security an inspection drive should be accomplished, in order to recognize possible obstacles and to correct the position of the door operator. It makes certain that also the supernatant double toothed belt disks do not affect the shaft wall or obstacles at the shaft wall

3.4.4 Adaptation on car

Fastening the door frame occurs as with the old QKS 6 design, depending on the cab (PK9), either on the top on the cab roof, or on the right or left side on the exterior wall of the cab. With both types of fasteners, the mountings have been pre-assembled on the frame; their respective spacing can be moved horizontally and is infinitely variable.

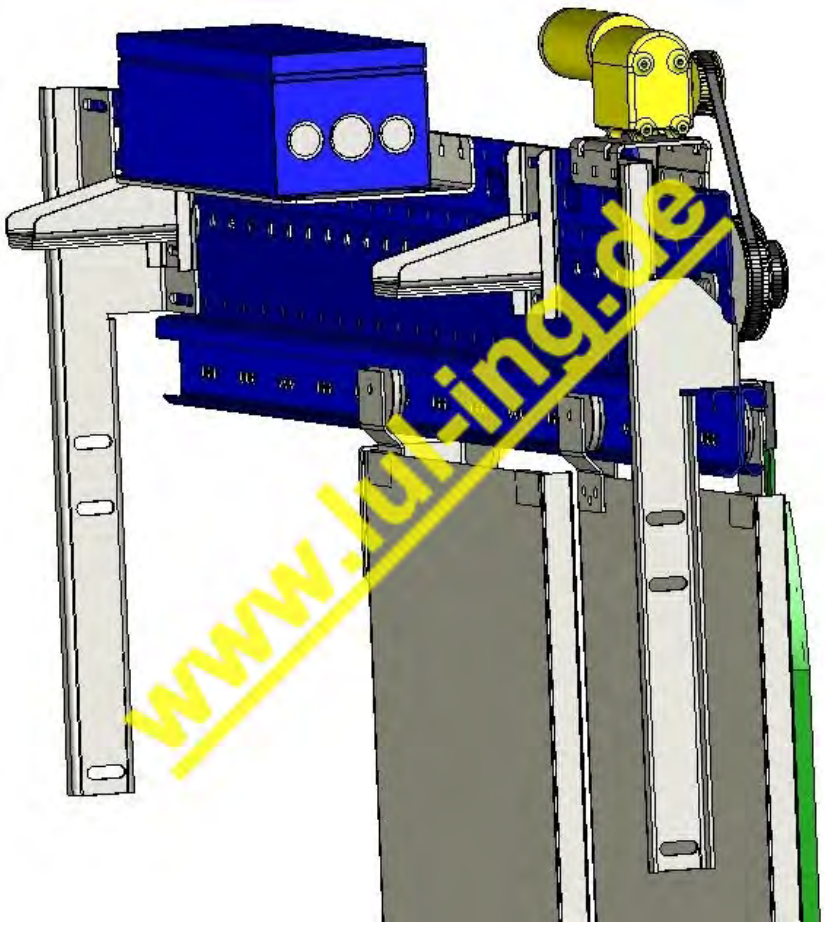


Abb. 4: View from side QKS6 L&L

NOTE:
It is not necessary to use both brackets (upper and lateral) for fixing the door operator. Under normal circumstances it is enough to use one of them.

3.4.5 Hang up the panel

The fast panel hang up with the help of the door roller (supports).

3.4.6 Safety contact

Control the safety contact at door operator and fix the actuator for safety contact on door roller.

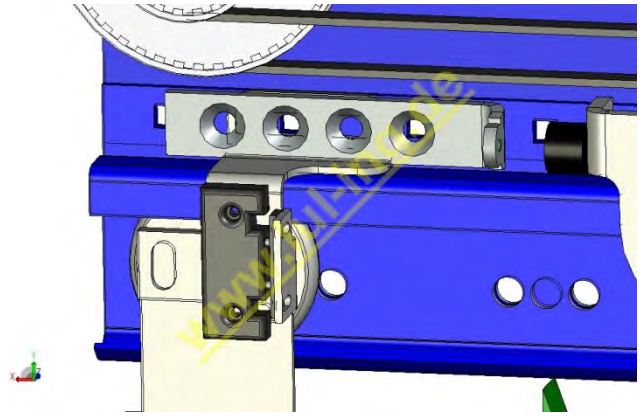


Abb. 5: safety contact by QKS6 L&L telescoping right

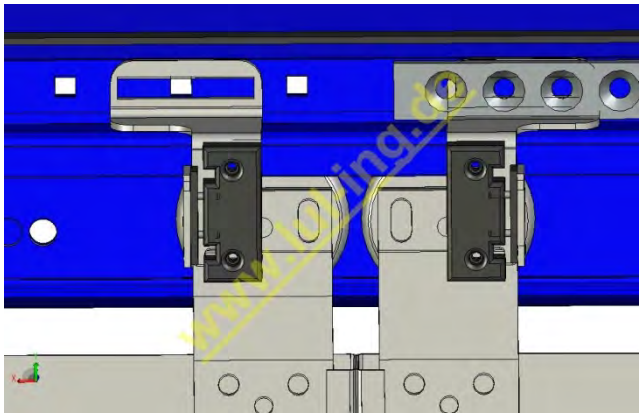


Abb. 6: safety contact by QKS6 L&L centre / centre telescoping

3.4.7 Limit stop / buffer

The TSG has to use in every floor the same limit stop. Therefore, on the door operator QKS6 L&L there are two limit stop with puffer. The fasten coupler serves as a stop and stops the panel in open and close direction. Control the limit stop / buffer in closed and opened position.

3.4.8 Slow panel

The slow panel hang up with the help of the door roller (supports).

3.4.9 Emergency coupler

In case of a break of the toothed belt, please install the attached coupler on the panels.

Abb. 7: Emergency coupler on TL

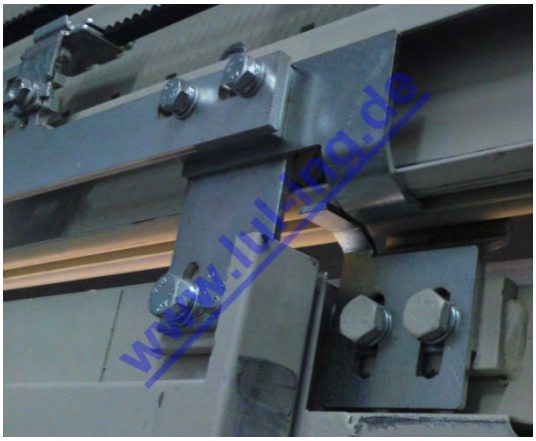


Abb. 8: Emergency coupler on TR

3.4.10 Mounting shaft door actuator

The old shaft door actuator is replaced with a new electric shaft door actuator.

- Dismantle the old shaft door actuator.
- Dismantle old lever.
- Clean and fit to handle the new shaft door actuator.
- Drill holes for the safety contact bridge.
- Install the new shaft door actuator at the panel.
- Connect contact safety circuit.
- Connect Sinus drive with the TSG electronic.

NOTE:
The levers are taken from the original shaft door actuator!

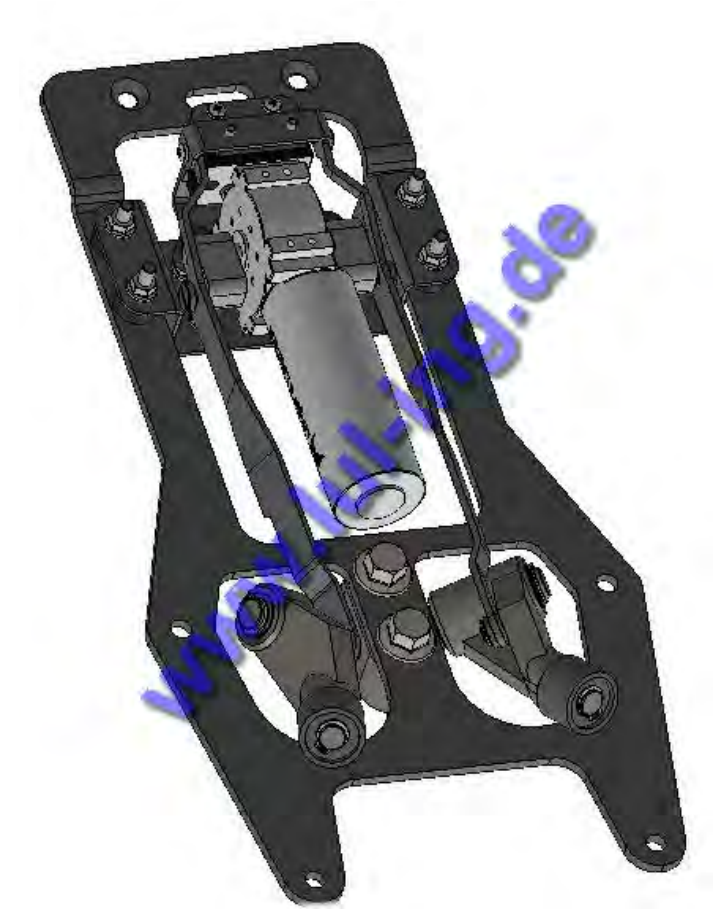


Abb. 9: new electrical shaft door actuator

NOTE:
Before mounting the shaft door actuator must be 2 holes in the door be drilled. A matching template is included.

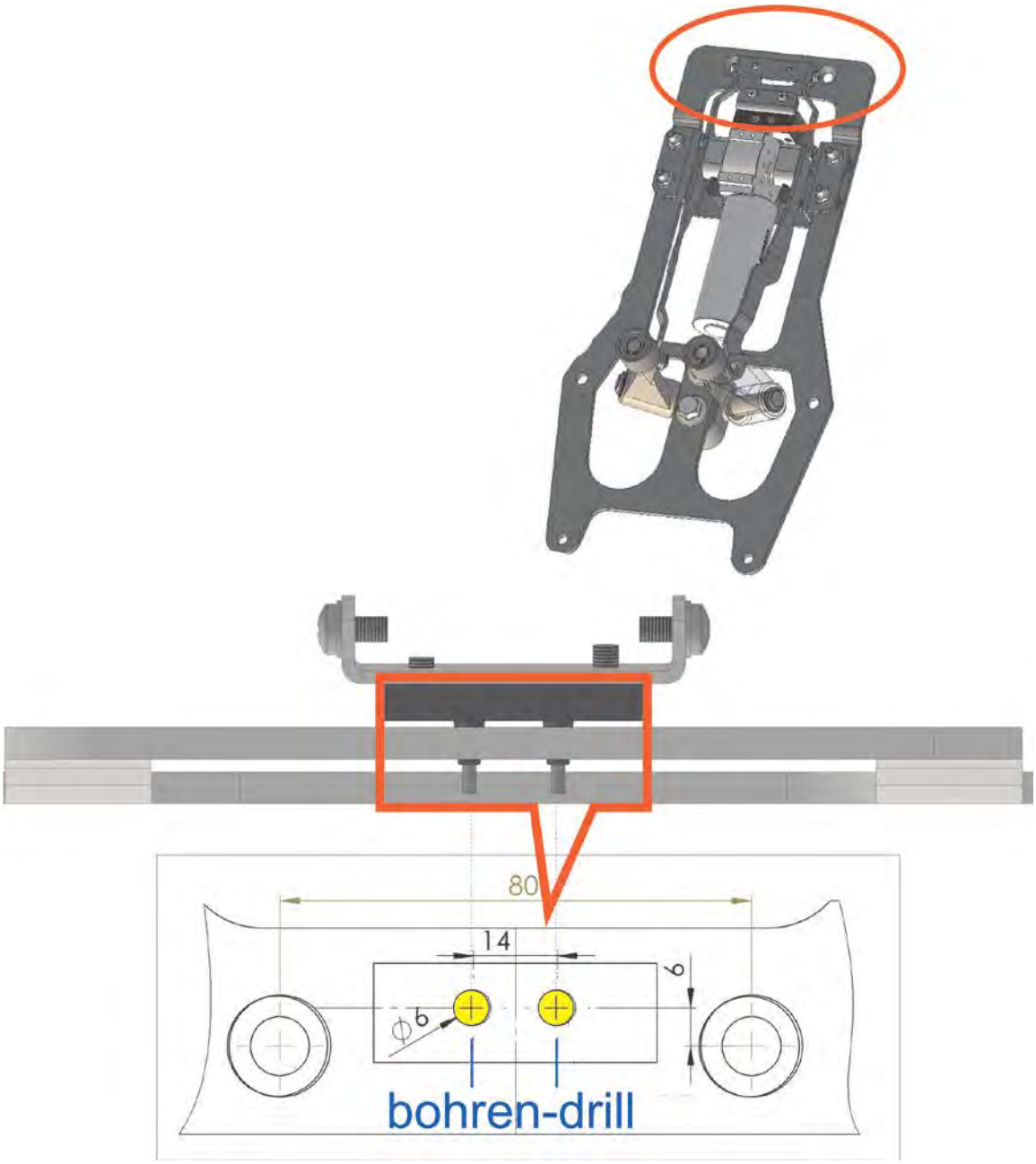


Abb. 10: Processing door (drilling pattern)

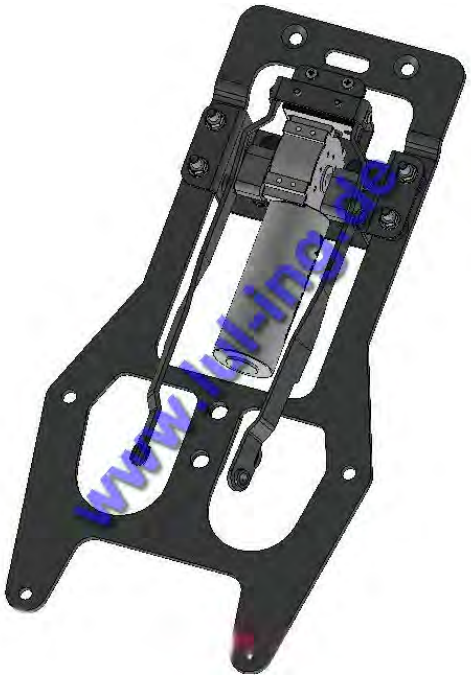


Abb. 11: Lever installed in new shaft door actuator

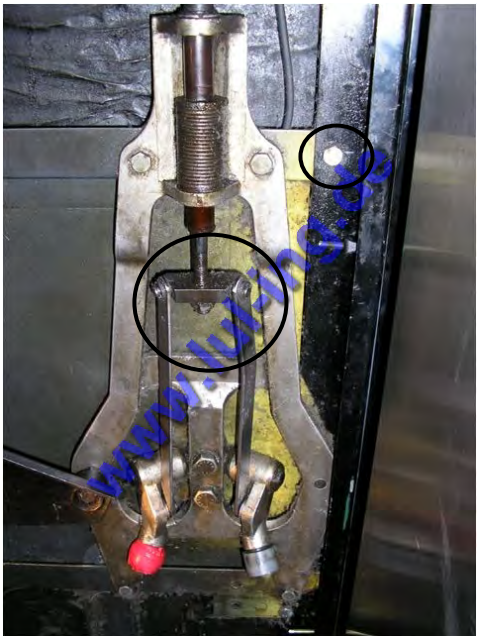


Abb. 12: old shaft door actuator mounted

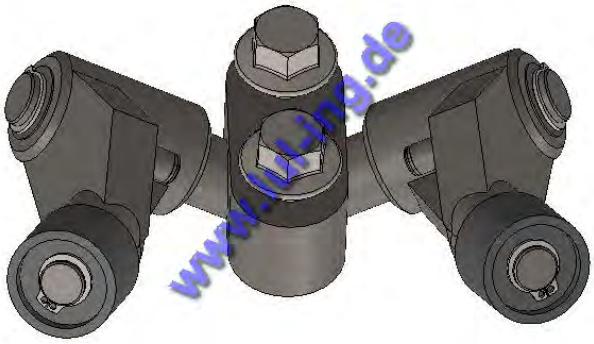


Abb. 13: Removed from the old lever shear

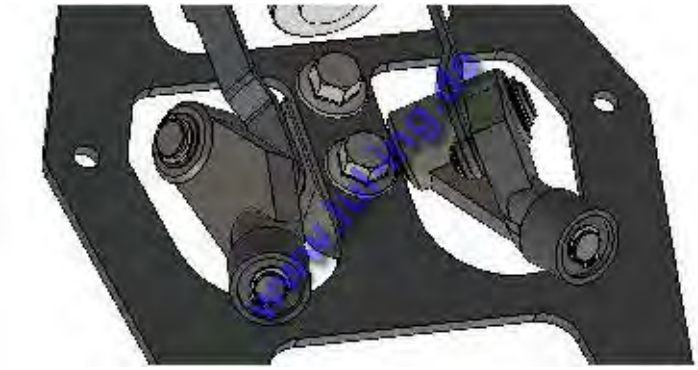


Abb. 14: Delivery condition shaft door actuator

Abb. 15: safety contacts on the new shaft door actuator

3.4.10.1 User setting - h parameters

Table 2: h parameters

Parameter	Function		Min. value	Default value	Max. value	Factor	Unit
hA	Activation Additional drive	Only for use with optional add on boards (valid from version TSG V4). 00: Opportunity to move to the intermediate position and Ready For Operation (usable with add on board 4E/4A relais or 4E/4A electronic) **01: interlock or skate drive (e.g. QKS6, usable with add on board additional drive)** 02: retiring cam magnet (e.g. KONE ADC, usable with add on board additional drive) 03: interlock with emergency power supply (e.g. Koch, usable with add on board additional drive) 04: enabling mode (usable with add on board 4E/4A electronic) 05: external sensor, two channel (usable with add on board 4E/4A electronic) 06: interlock drive for shaft hinged doors (usable with add on board additional drive)	00	00	18		
hb	Closing time of the skate	Only with additional board that can be optionally fitted and hA=01, hA=03 or hA=06. **Caution:** If the value of h7 = 00, then the value of hb is for opening and closing time of the skate.	00	50	80		[1/100 seconds]
hC	Time delay between opening of the drive and opening of the door	Only with additional board that can be optionally fitted and hA=01, hA=03 or hA=06.	01	50	99		[1/100 seconds]
h7	Opening time of the skate	Only with additional board that can be optionally fitted and hA=01 or hA=03 **Caution:** If the value of h7 = 00, then the value of hb is for opening and closing time of the skate.	00	00	80		[1/100 seconds]

3.4.10.2 Short description

The TSG extension board for drive is able to activate and move at least two additional drives. It is connected with the control section of the TSG main board for this purpose. Parameters can be adjusted in the TSG main board for activating the function (hA), changing the opening and closing time of the drive (h7, hb) and setting the time delay between the opening of the drive and the opening of the door (hC).

3.4.10.3 Activation of the function

To be able to use the TSG drive expansion board function, activation must be set to **01** with parameter **hA**.

NOTE:
For additional information on parameter settings, see the TSG door control device manual.

3.4.10.4 Opening and closing time of Sinus Drive

The opening and closing time of the Sinus Drive can be adjusted with parameter **h7 and hb**.
Values can be changed in increments of 0.01 seconds. A time of 0.5 seconds can be applied as the default value for both the in and out travel of the drive. However, this value must be monitored and adjusted to specific local conditions as appropriate.

CAUTION:
The values must not be set larger than the time actually required to move the drive in or out. Otherwise the drive could fail!

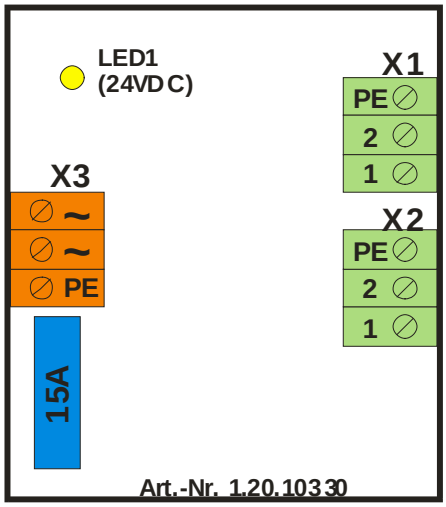
NOTE:
When a value is changed and confirmed, it is permanently stored. This means that the modified value is still available even after a power failure.

3.4.10.5 Time delay between door drive and drive

A setting can be made so that when an open command is sent from the elevator controller to the door control device, the drive first moves the shaft door actuator apart and then the door moves up. Parameter **hC** can be adjusted for this purpose.

3.4.11 Technical data for TSG electronics

3.4.11.1 Overview of TSG drive expansion board



X1: Connection for drive 1

X2: Connection for drive 2

X3: Alternating voltage connection

LED 1: 24[VDC] ok

3.4.11.2 Terminal assignment for TSG drive expansion board

Table 3: TSG expansion board X1 – drive 1

X1 drive 1 (3-pin screw connector)**:**		
1	Connection 1	
2	Connection 2	
PE	PE	

Table 4: TSG expansion board X2 – drive 2

X2 drive 2 (3-pin screw connector)**:**		
1	Connection 1	
2	Connection 2	
PE	PE	

Table 5: TSG expansion board X3 – mains power connection

X2 drive 2 (3-pin screw connector)**:**		
~	Connection 1	
~	Connection 2	
PE	PE	

3.4.12 Mounting the ribbon cable

The voltage to the shaft door actuator is supplied via a flexible ribbon cable. The ribbon cable holder is used for fastening purposes:

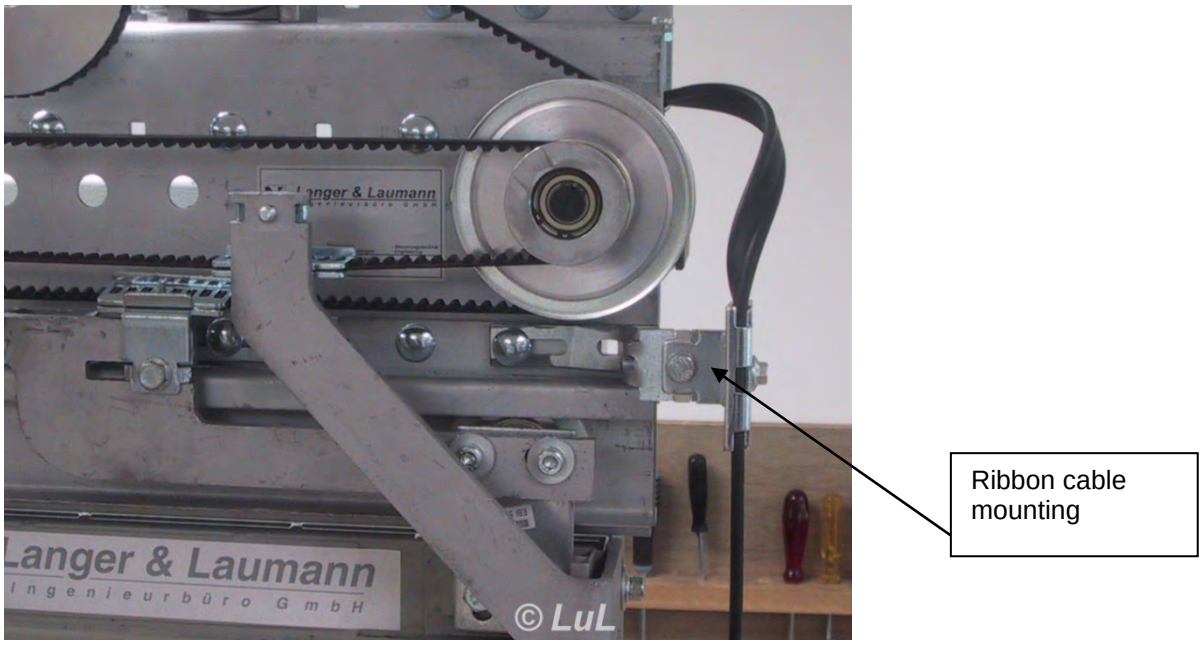


Abb. 16: QKS6 L&L with ribbon cable

3.4.13 Console for housing

You can fit the TSG electronic (board plus IP54 housing) with the console on the back of the door operator (see Abb. 17: console for housing).

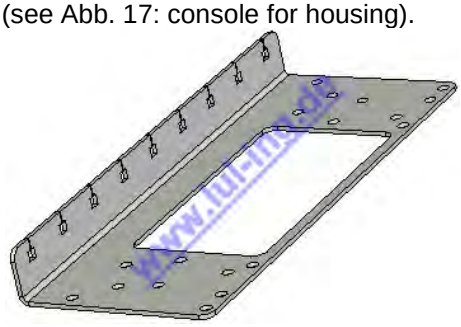


Abb. 17: console for housing

3.4.14 Conclusion

At the end of assembly fix the whole door operator at the car and control all adjustments.

4 Assembly Instructions for Electrical Part

Following the installation of the mechanical components on the cab and the mounting of the cab doors, the door must be calibrated once. The following conditions must absolutely be observed:

- Any existing shaft locking weight must not bounce
- The cab doors and all the shaft doors must move easily.
- The toothed belts must be taut (one should only be able to depress it in the centre by two fingers).
- The connector rail X1 (inputs) and X2 (outputs) must be stripped temporarily for calibration purposes.

NOTE:
We refer to the further calibration of the door contained in the enclosed Operating Instructions for the door control unit and the manual for TSG electronic for sinus drive at this time.

5 Maintenance

The maintenance of L&L door operators is by their constructive approach to a minimum. Components, which are subject to an operational wear, are in regular maintenance involved.

WARNING:
During the maintenance work is essential to ensure that the drive cannot be turned on and that no parts exposed inadvertently come under electric voltage. After end of these measures available protective facilities and security facilities in the door operator are to be installed again.

5.1 Maintenance Sinus Drive

A service should be done at approximately 1,000,000 cycles. One cycle corresponds to one extension movement plus one retraction movement of the Sinus Drive (a high-performance lift can be presumed to complete approx. 800,000 cycles per year).

As part of servicing operations the Sinus Drive is to be subjected to a visual inspection for impurities and damage. Any impurities and/or damage are to be rectified before greasing. If major deficiencies or soiling is discovered, then appropriate countermeasures are to be taken.

6 Waste disposal

With the disposal the appropriate regulations are to be followed:

- oil according to waste oil order (e.g.. no mixture of solvent, cold cleaner or varnish remains)
- components for utilization distinguish between:
    - iron scrap
    - electronic scrap
    - aluminum
    - multicolored metal (worm gear, drive winding)

7 Contact

You can reach us at the following address with any questions or queries:

Langer & Laumann Ing.-Büro GmbH
Wilmsberger Weg 8
48565 Steinfurt
Germany

Phone: +49 (2552) 92 7 91 0

Email info@LuL-Ing.de
Web: www.lul-ing.de