

**Technical description:**

- 1) Anodised aluminium housing with a pushrod made of aluminium or steel
- 2) Internal interference suppression according to EN55011
- 3) Disconnection in both end positions through internal limit switches
- 4) Electronic overload emergency disconnection
- 5) Electric parallel connection possible (NOTE: but no synchronized operation)
- 6) Eye bolt Ø6, Ø8 (standard) or Ø10mm
- 7) Clevis Ø6, Ø8 or Ø10mm
- 8) Light grey silicone connection cable - standard length 2,5m; other lengths on request  
--> with standard version: 2x2.5qmm / cable jacket Ø approx. 9mm  
--> with option E: 2x2.5qmm / 3x1.5qmm / cable jacket Ø approx. 11mm

**Possible options:**

- 1) Various versions with bottom mountings:  
It is also possible to design actuators with bottom mountings (see data sheet 07.021.DAT.01.xx).
- 2) Various push rod suspensions:  
See the data sheet 07.021.DAT.02.xx.
- 3) RAL colour.... (on request):  
The actuator housing can be provided in various shades of RAL colours. For example, if option "RAL3000" is indicated, the housing will be painted in RAL3000 (red)
- 4) Option E:  
Internal floating limit switch (Option E=opener) for both end positions;  
load capacity 24VDC/1A (e.g. for position indication)

**Ordering designation:**

SG(typ)/(pushrod) - (stroke) - (pushrod mounting) - (cable length) - (options)

**Legend:**

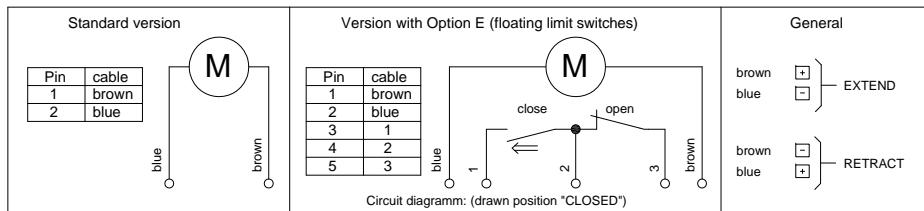
- type: actuator type to be selected from the list
- push rod: depending on type (see table, Ø25A/Ø25: aluminum, Ø25S: steel)
- stroke: stroke [mm]
- Push rod ending: - eye bolt (standard): bore hole of the eye bolt [mm].  
- clevis: bore hole and length of slot of the clevis [mm].
- cable length: length of connection cable [m]
- protection class: protection class according to DIN EN 60 529
- options: list of all desired options

Ordering example: SG40P/25 - 750 - 8 - 2,5 - RAL 3000

**General technical data:**

sealing version	standard
rated voltage	24VDC
no load current	0,8A
permissible ambient temperature	-25°C - +60°C
max. permissible temperature to EN 12101-2 attachment G	300° - 30min
protection type according to DIN EN 60 529	IP 54

**Connection diagramms:**



Diese Zeichnung ist Eigentum der Fa. Grasl GmbH A-3454 Reidling, EuropastraÙ 1 Die Weiterverwendung oder Vervielfältigung ohne unser schriftliches Einverständnis ist verboten!

**Technical data of actuator types SG40x:**

Designation	SG40A	SG40B	SG40C	SG40D	SG40E	SG40F	SG40G	SG40H	SG40J	SG40L	SG40M	SG40N	SG40P	SG40R	SG40S	SG40T	SG40U	SG40V	SG40W	Unit	
Pushing and pulling force (full load)	3850	2490	1800	1400	1010	2610	1690	1220	950	4850	3330	2600	1660	1300	3290	2250	1760	1130	880	N	
Current with full load	4,0																				A
Speed (no load)	6.7	12.2	17.0	21.9	30.2	10.1	18.4	25.5	32.8	6.1	9.6	12.2	19.1	24.5	9.2	14.3	18.4	28.7	36.7	mm/s	
Speed at full load	5.3	9.7	13.5	17.4	24.1	8.0	14.6	20.3	26.1	4.9	7.6	9.7	15.2	19.5	7.3	11.4	14.6	22.8	29.2	mm/s	
Maximum stroke at full load ×1)	529	657	774	878	1032	1112	1382	1629	1847	471	569	644	805	910	991	1197	1354	1693	1915	mm	
Operating mode for peak load according DIN VDE 0530 part 1 (with 25°C ambient temperature)	S2 4min.																				
Operating mode for continuous load according DIN VDE 0530 part 1 (with 40°C ambient temperature)	S3 20% 3) (Maximum time of operation in one direction: 4min)																				
Stability (locking force) ×2)	6400 (with standard bearing pins LB18-2-SL13)																				N
Possible pushrod versions	Ø25A, Ø25, Ø25S					Ø25, Ø25S					Ø25A, Ø25, Ø25S					Ø25, Ø25S					mm
Standard bearing pin diameter	Ø18																				mm
Dimensions (see dimensional drawing):	Figure 2	Figure 1				Figure 2	Figure 1				Figure 3	Figure 2				Figure 3	Figure 2				

**Technical data of actuator types SG60x:**

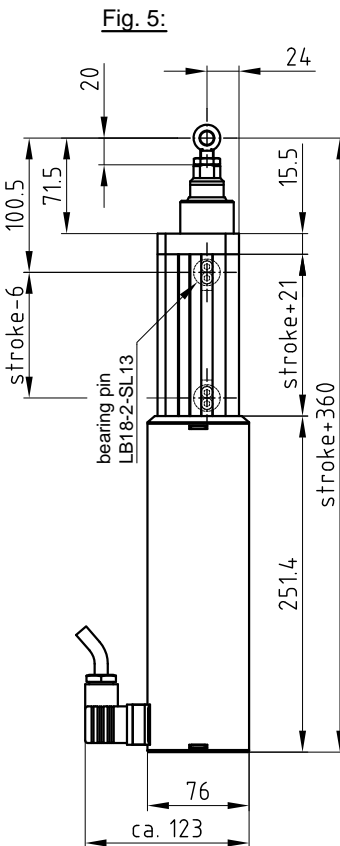
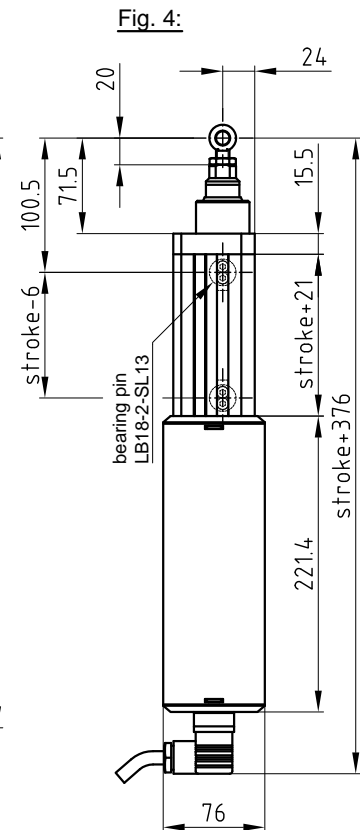
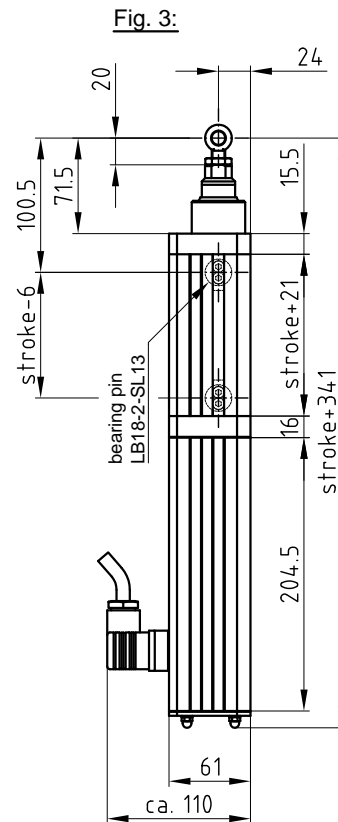
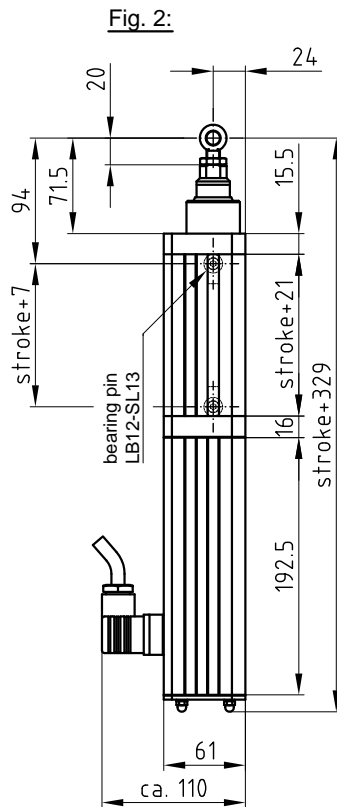
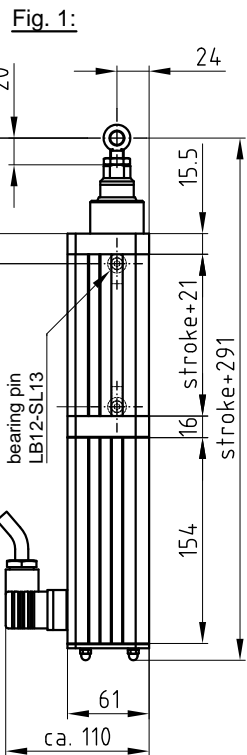
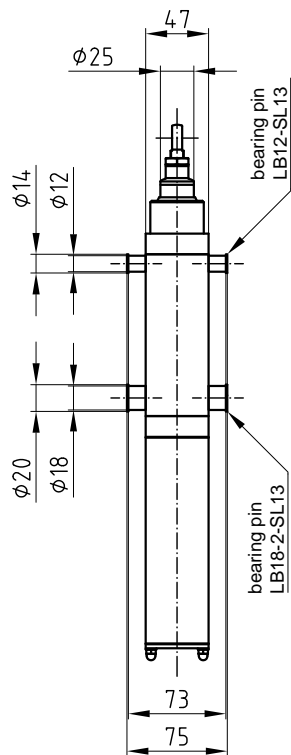
Designation	SG60D	SG60E	SG60F	SG60J	SG60M	SG60N	SG60P	SG60R	SG60S	SG60T	SG60U	SG60V	SG60W	Unit	
Pushing and pulling force (full load)	2220	1600	4140	1500	5280	4130	2640	2060	5220	3580	2800	1790	1400	N	
Current with full load	6,0													A	
Speed (no load)	21.9	30.3	10.1	32.8	9.6	12.3	19.2	24.5	9.2	14.4	18.4	28.7	36.8	mm/s	
Speed at full load	15.2	21.0	7.0	22.8	6.7	8.5	13.3	17.0	6.4	10.0	12.8	20.0	25.6	mm/s	
Maximum stroke at full load ×1)	702	826	890	1478	455	515	644	728	793	958	1083	1354	1532	mm	
Operating mode for peak load according DIN VDE 0530 part 1 (with 25°C ambient temperature)	S2 2min.														
Operating mode for continuous load according DIN VDE 0530 part 1 (with 40°C ambient temperature)	S3 10% 3) (Maximum time of operation in one direction: 2min)														
Stability (locking force) ×2)	6400 (with standard bearing pins LB18-2-SL13)														N
Possible pushrod versions	Ø25A, Ø25, Ø25S		Ø25, Ø25S		Ø25A, Ø25, Ø25S				Ø25, Ø25S						mm
Standard bearing pin diameter	Ø18														mm
Dimensions (see dimensional drawing):	Figure 1	Figure 2	Figure 1	Figure 2				Figure 3	Figure 2						

**Technical data of actuator types SG80x:**

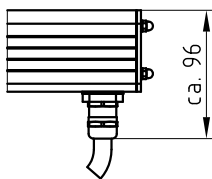
Designation	SG80E	SG80N	SG80P	SG80R	SG80T	SG80U	SG80V	SG80W	Unit	
Pushing and pulling force (full load)	2200	5660	3620	2830	4900	3830	2450	1920	N	
Current with full load	8,0								A	
Speed (no load)	30.3	12.3	19.2	24.5	14.4	18.4	28.7	36.8	mm/s	
Speed at full load	18.1	7.3	11.5	14.7	8.6	11.0	17.2	22.0	mm/s	
Maximum stroke at full load ×1)	708	442	552	625	821	929	1161	1314	mm	
Operating mode for peak load according DIN VDE 0530 part 1 (with 25°C ambient temperature)	S2 1min.									
Operating mode for continuous load according DIN VDE 0530 part 1 (with 40°C ambient temperature)	S3 5% 3) (Maximum time of operation in one direction: 1min)									
Stability (locking force) ×2)	6400 (with standard bearing pins LB18-2-SL13)									N
Possible pushrod versions	Ø25A, Ø25, Ø25S			Ø25, Ø25S						mm
Standard bearing pin diameter	Ø18									mm
Dimensions (see dimensional drawing):	Figure 1				Figure 2					

- 1) The maximum stroke with full load is the stroke which the drive is able to extend with full load without articulating the spindle. For greater strokes the pushing force must be reduced. Corresponding force-stroke diagrams are supplied by us on request.
- 2) The stability is the maximum pulling force that may occur on the retracted pushrod. (locking force = holding force.)
- 3) Either under load extending and load supporting retracting or under load retracting and load supporting extending.

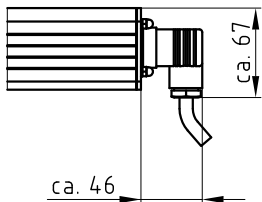
GRASL Pneumatic-Mechanik GmbH A-3454 Reidling Europastraße 1		Freimaßtoleranz nach DIN 7168:		Maßstab: 1:1		Werkstoff:	
		Datum		Name		ID - Nr.:	
		23.09.2009		Simefzberger		Bezeichnung:	
06		Engl., Tsche., SG40RL		20.07.2017		SA	
05		Zul. Umgebungstemp.		24.07.2012		SA	
04		SG40RL erwehert		25.10.2011		GS	
03		Polnisch		11.08.2011		SA	
02		Tabelle		21.09.2010		SA	
01		Tabelle		22.12.2009		SA	
Zus.		Änderung		Datum		Name (Urspr.)	
						SG	
						07.021.DAT.05.06-E	
						Blatt	
						BL.	
						07.021.DAT.05.05	
						(Ers.d.)	
						fachlich geprüft am 29.5.2002 KW	



**Option PG, option E:**  
(with cable screw connection MS-M20x1,5)



**Option KU:**  
(with connector on housing bottom)



**Eye bolt:**

M10x40 Ø8 or Ø10: +10mm/-4mm setting range  
Thread in the tube plug: M10x29

**Bearing pin:**

- SG08x - SG26x (Fig. 1-2): LB12-SL13 (Ø12, shaft length 13mm)
  - SG40x - SG120x (Fig. 2-5): LB18-2-SL13 (Ø18, shaft length 13mm)
- On request, the actuators SG08x - SG26x can also be supplied with LB18-2-SL13.





Tolerance	Scale	1:4	Material
Created <b>Simetzberger</b>	Sheet 1/2	Format A3	Title <b>Overview of housing dimensions</b> Electro-linear-actuator SG
Approved HA	Issue Date 27.09.2017		
Grasl Pneumatic Mechanik GmbH			
			Document Style <b>Data sheet</b>
			Document State <b>Valid</b>
			Document Number <b>07.021.DAT.00.03-E</b>

# Technical Instructions

## Spindle drives type S, G, SG

Please read through these technical instructions carefully and fully. Work on these devices must only be carried out by qualified personnel.

### Meaning of the symbols

-  **Safety instructions** must be observed!  
The disregarding of these instructions can lead to personal injury and / or material damage.
-  **Advice**, the non-compliance with these instructions or the technical data shall lead to the loss of rights under guarantee.
-  **Correct**,  
This is how it should be done.
-  **Incorrect**,  
This is how it should not be done.

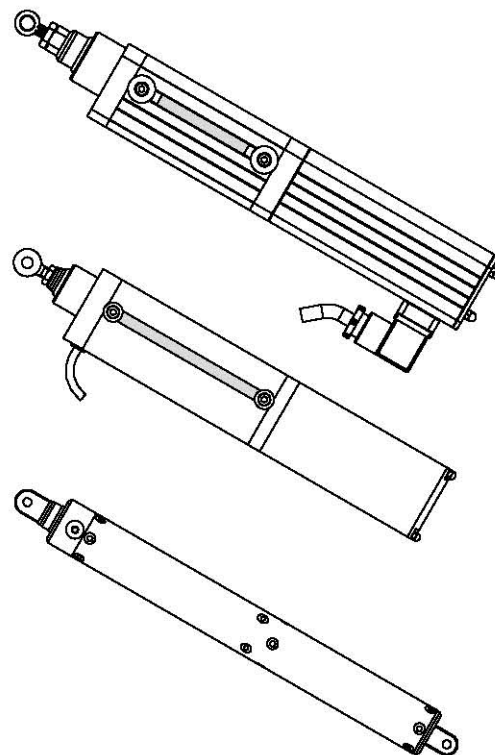
### Correct and proper use

The drives serve the purpose of opening and closing windows, blinds and vents in the roof area (no free access for system-external persons). On the application of voltage, a movement command is activated.

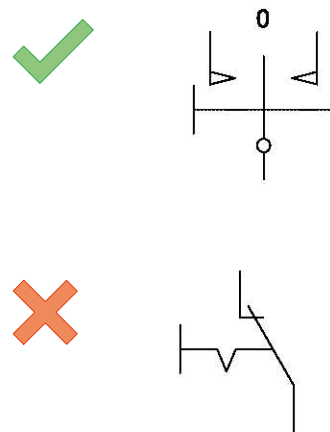
If the drives are installed below an installation height of 2,5m, appropriate devices must be fitted so that people are not endangered (crushing and trapping hazards). Apply the Directives, Rules and Standards intended for this purpose, such as, for example, BGR 232 Power-operated Windows, Doors and Gates (Trade Association Regulations), DIN EN 12453 Safety in Use of Power Operated Doors - Requirements and EN 60335-2-103:2003.

### Technical details/control

The drives are suitable for connection to K+G/Grasl - control centres. With control via other control centres or other power supplies, the compatibility must be checked. As the drive housings are not earthed, it must be ensured via the controller that no voltages are routed to the drives over the protective low voltage (keyword, galvanic isolation on the transformer, etc.).



picture 1: spindle drives



picture 2: ventilation buttons

With a fault on the internal drive overload cut-off device in the event of a short circuit or overcurrent, the upstream controller as a second safety circuit must disconnect the defective drive via a fuse or similar.

**i** The dimensioning must be carried out and / or be checked by a qualified electrical company. In doing so, in addition to the nominal values the maximum start-up current of the drives must be taken into account.

**!** The cross section of the cable between the junction box and the control centre must be so dimensioned that even at full load the voltage drop between the control centre and the drive does not exceed 1V (see the control centre documentation).

The drives must only be operated with a nominal voltage of 24VDC and with a tolerance of +30/-20% and a residual ripple <5%. Only with these limits can the trouble-free functioning of the motor electronics be guaranteed.

For the control of the drives, only use mutually mechanically interlocked ventilation buttons with contactless centre positions, "no changeover switch", with independent return from the two switching positions (see picture 2). The direct switching of the direction of movement while the drive is running is not permitted and can lead to defects (approx. 2s pause required).

After full extension or retraction, the opposite direction must be travelled for approx. 1s before the previous direction can be travelled again (type series S).

## Installation

**!** Handle the drive only wearing safety gloves and suitable work clothes.

**!** So design the installation area of the drive that there is no risk of crushing injuries (for example, provide protective covers).

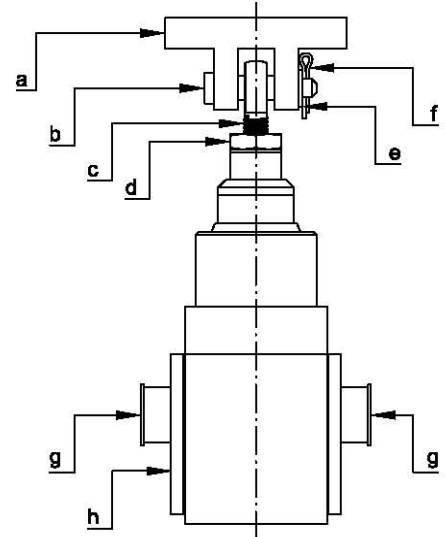
Before the installation, the following must be observed:

**i** Check the completeness of the scope of supply. Inspect the drive for transport damage.

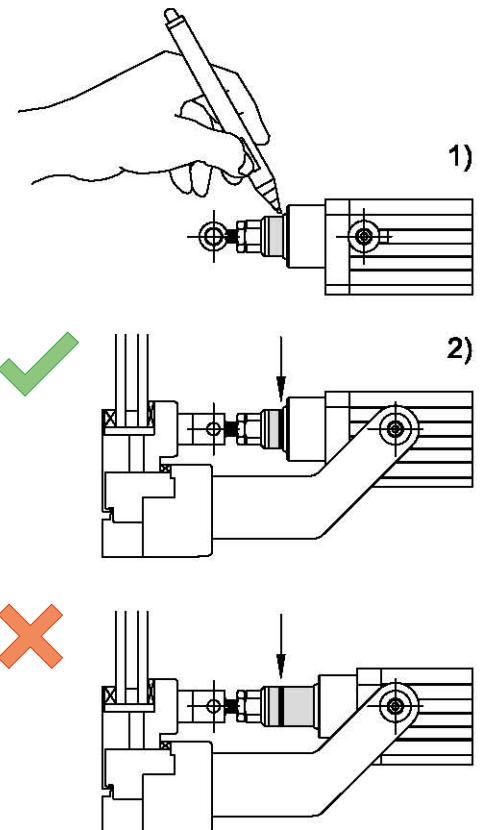
Connect the drive via a customer-provided junction box with strain relief. When selecting the cable length, take into account the positioning of the box and the pivoting range of the drive.

Ensure that the drives can freely pivot in the whole of the stroke range and cannot come into contact with parts of the building (see the data sheets for the cable outlets of the drives).

- a ... coupling bracket
- b ... coupling bracket bolts
- c ... eyebolt
- d ... lock nut
- e ... washer
- f ... split pin
- g ... bearing pins
- h ... mounting bracket



picture 3: fixing elements



picture 4: end position

Before fixing the drives to the coupling bracket, mounting brackets or other fixing elements, the possible installation dimensions of the relevant drive designs must be taken from the data sheets.

Mount the drives on the appropriate fixing elements. It must be ensured that the mountings are secured by means of appropriate safety devices (see picture 3).

**i** In order to prevent the screwing out of the eyebolt, the lock nut must be tightened (see picture 3).

Pay attention to the aligned installation of coupling brackets, mounting brackets or other fixing elements. Lateral forces must be avoided (see picture 3).

**!** It must be ensured that the drives can always reach their end positions as otherwise the internal end cut-off is not guaranteed. Use the eyebolt (adjustment range) and bearing pins for adjustment. Continuous operation over the load cut-off is not permitted. Check the setting in the retracted condition by means of marking on the pushrod end (see picture 4).

Setting the closing force with which the NSHEV is driven into the seal (NSHEV must be tightly closed all around):

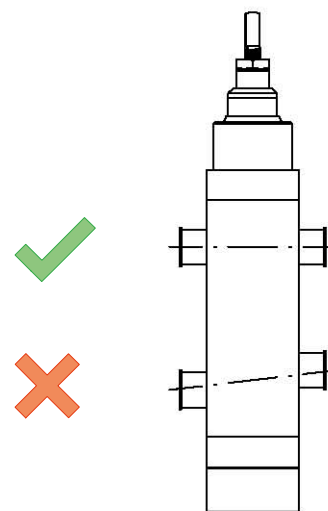
**!** In the process, the maximum pushing / pulling force of the drive must not be exceeded (see the data sheets) as otherwise it cannot travel fully in (internal limit switches are then not activated).

- Drives with variable mountings (lateral guide slots or clamping rings): by pulling the drives, for example, with a spring balance, and then tightening the bearing pins / plugs. During the setting, the bearing pins / plugs must be loosened so far so that the movement of the drive along the drive axis is possible.
- Drives with fixed mountings: by adjusting the eyebolt or other pushrod mountings.

With drives with variable mountings (lateral guide slots) it must be ensured that the bearing plugs / pins lie on the same axis (see picture 5) and that this is parallel to the hinge axis. In addition, when fitting the mounting bracket, it must be ensured that the pivot axis of the drives is parallel to the hinge axis (see picture 6).

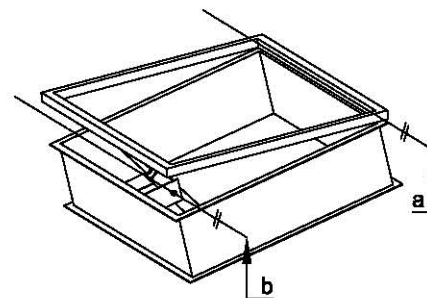
It must also be ensured that the sliding blocks are inserted parallel to the slot. In order to prevent twisting during fitting, the fixing screws should first be carefully hand-tightened so that the sliding blocks are correctly clamped against the profile (see picture 7). Then secure them with sufficient tightening torque (max. tightening torque  $M5 = 10Nm$ ).

Due to their low cut resistance, handle the connecting cables of the drives with great care. Be careful with sharp-edged materials. Use rubber grommets, cable glands, etc.

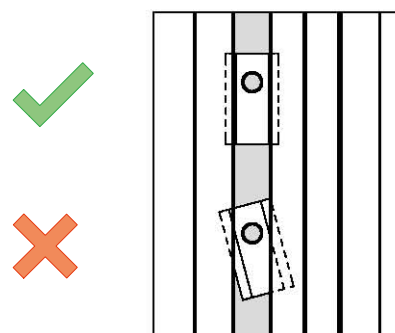


picture 5: bearing pin position

a ...hinge axis  
b ...pivot axis



picture 6: installation






picture 7: sliding block

## Commissioning

When commissioning (test run, installation or maintenance work), for example, with accumulators it is absolutely necessary to fit a fuse of the same value as the nominal current of the drive in the supply line of the drive. In doing so, the drives must not be connected to the drive output of a control centre / controller at the same time. Otherwise it can lead to faults on the power output of the control centre / controller. During test runs, the complete NSHEV mechanical systems must be observed.



## Maintenance/dismantling/fault finding

-  The maintenance must be carried out once per year by a specialist trained for the purpose.
-  The drive must not be opened. The unauthorized opening of the drive shall lead to the exclusion of liability and loss of warranty. After opening the housing, the drive is no longer safe to operate and must not be used anymore.
-  Through external controls (for example, automatic command devices outside the field of vision) non-foreseeable control commands can occur which can result in movements of the opening construction.

The following points must be checked:


- During the course of the annual maintenance, an inspection of the mechanical fixings must be carried out. Where necessary, these must be re-tightened using customary tools.
- Inspection of the pushrod for damage and cleanliness (clean where necessary).
- Inspection of the pushrod wiper for wear.
- Inspection for freeness from dust (clean where necessary).
- Inspection of the structural conditions for changes with regard to the requirements listed in the point, Installation.

## Normal operation

-  The drive has no internal protection against crushing injuries.
-  The static self-locking effect can be lost due to external influences.

## Disposal

The drive consists of electronic parts, wires, steel, non-ferrous metal and plastic.

-  The drive must be disposed of in accordance with national regulations.