

General technical data:

- 1) Anodised aluminium enclosure with a push rod of aluminium Ø22.
- 2) Internal interference suppression to EN55011
- 3) Disconnection at either end position by integrated limit switches
- 4) Electronic "emergency stop" on overload
- 5) Allows electric parallel actuator cut-off control (IMPORTANT: no synchronism)
- 6) Eyebolt Ø 6, Ø 8 (standard) or Ø 10mm
- 7) Standard strokes 350, 550 and 750mm; special lengths on request
- 8) Light grey silicone supply lead, standard length 2.5m; other lengths on request
 - > for standard version 2x2.5sq.mm / sheathing Ø approx. 9mm
 - > with option E and ES: 2x2.5sq.mm / 3x1.5sq.mm / sheathing Ø approx. 11mm
 - > with option TH: 2x2.5sq.mm / 5x1.5sq.mm / sheathing Ø approx. 11mm
 - > with option SY: 2x2.5sq.mm / 5x1.5sq.mm / sheathing Ø approx. 11mm

Possible Options:

- 1) OPTION KU, KS, KO and KM:

Cable connection at enclosure (see dimensional drawing). If this option is not specified, standard version KU will be executed.
Option KU is not possible with all types of lower end configuration (cf. table under item "2 Option: Various configurations of lower end")

- 2) OPTION Various configuration of lower end:

Actuators can also be arranged with lower end mounting (cf. option sheet "mounting variants").
Please refer to the following table to establish the possibilities of combining lower end configuration and variant of cable connection:

	Option KU	Option KS	Option KM	Option KO
Standard version:	●			
Option D (cap without cable outlet)		●	●	●
Option UØ6.1 (lower end borehole Ø6.1)	●	●	●	●
Option U M8 (thread M8 in lower end)	●	●	●	●
Option U Ø10.2 (lower end borehole Ø10.2)		●	●	●
Option UF Ø8.2 (mounting at lower end Ø8.2)		●	●	●

- 3) OPTION Various push rod mountings:

Please refer to option sheet "Variants of push rod mounting"

- 4) OPTION RAL... (on request):

Actuator enclosure can be painted to RAL colour code. Example: if "RAL 3000" is specified as an option, the actuator enclosure will have a red finish to RAL 3000.

- 5) OPTION E and ES:

Internal potential-free limit switches (option E=NC contact / option ES=NO contact) for either end position; load rating 24VDC / 1A (e.g. for indication of position)

- 6) OPTION TH... (on request):

Integrated thermal contact which responds as soon as a certain temperature is exceeded.

The following versions are available:

TH70Ö ... response temperature 70°C - contact opens at response

TH70S ... response temperature 70°C - contact closes at response

TH93Ö ... response temperature 93°C - contact opens at response

TH93S ... response temperature 93°C - contact closes at response

Option TH... CANNOT be combined with option SY. As option cannot be combined with all variants of lower end mounting, please inquire for option TH.

- 7) OPTION SY (on request):

While the standard actuators can be electrically connected in parallel, there may be differences in stroke while operating due to various factors (such as different loads, voltage drop in supply lead etc.), PREVENTING the actuators from running in synchronism. To ensure synchronised operation, select option SY in conjunction with a synchronising control.

- 8) OPTION sealing variants:

D05/D07 system of protection IP54

IP42 system of protection IP42 (Caution: The overall length of the actuator is extended by 4mm!)

Order reference:

G(type) - (stroke) - (Eyebolt) - (cable length) - (options)

Legend:

Type: Actuator type selected from list of drives

Stroke: Actuator stroke in mm

Eyebolt: Eye diameter of eyebolt in mm. Instead of eyebolt, another type of push rod mounting may be specified (see sheet of options "variants of push rod mounting")

Cable length: Length of connecting cable in mm

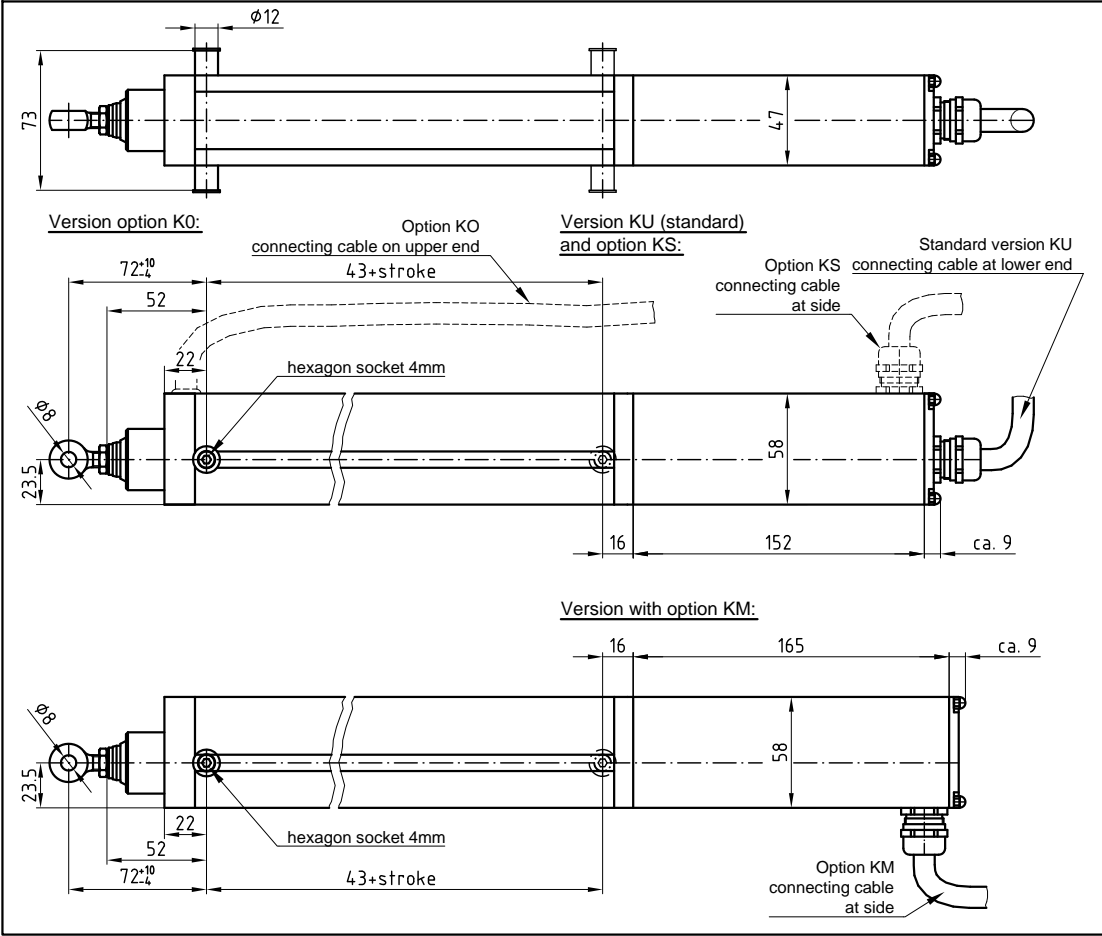
Options: List of all desired options

Ordering example: G40P - 750 - 8 - 2,5 - KS - E - RAL 3000

erstellt am
28.5.2002 ER

formell geprüft am
29.5.2002 KW

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GRASL Pneumatic-Mechanik GmbH A-3454 Reidling Europastraße 1				Freimaßtoleranz nach DIN 7168:		Maßstab: 1:1		Werkstoff:		
						ID - Nr.:				
					Datum	Name				
				Bear.	27.11.2009	Simetzberger				
				Gepr.	14.07.2017	GH				
				Norm						
						Bezeichnung: Data sheet Electro-linear-actuator Type: G40x, G60x and G80x				
03	Allg. Techn. Dat. P. 8)	14.07.2017	SA	Type:	Baureihe G					
02	Polnisch	25.07.2011	SA							
01	Text	12.04.2010	SA							
						Zeichnung Nr.:			Blatt	
						07.009.DAT.06.03-E			BL.	
Zus.	Änderung	Datum	Name	(Urspr.)		(Ers.f.)		07.009.DAT.06.02	(Ers.d.)	

fachlich geprüft am
29.5.2002 KW

General technical data:

Seal variation	Standard:	Option D05/D07	Option IP42	unit
Rated voltage	24			VDC
No-load current	0.8			A
Admissible ambient temperature	-25 - +60			°C
Max. permissible temperature to EN12101-2 attachment G	300° - 30min			°C
Protective standard DIN EN 60 529	IP 40 1)	IP 54	IP 42	

Technical data of drive system G40X:

Description	G40G	G40H	G40J	G40K	G40N	G40P	G40R	unit	
Push/pull force (full load)	2500	1600	1330	880	1890	1570	1040	N	
Current at full load	4.0							A	
No-load speed	11.4	16.5	21.0	28.5	12.4	15.8	21.4	mm/s	
Speed at full load	9.4	13.4	17.3	23.6	10.1	13.0	17.7	mm/s	
Max. stroke at full load	2)	672	839	921	1132	618	678	834	mm
Duty cycle (DIN VDE 0530 part 1) at 25° ambient temperature	S2 4min.								
Class of rating for continuous load according to DIN VDE 0530 Part 1 (at 40°C ambient temperature)	S3 20% 4) (Maximum time of operation in one direction: 4min)								
Stability (locking force)	3)	3500 5)						N	

Technical data of drive system G60X:

Description	G60J	G60K	G60P	G60R	unit
Push/pull force (full load)	2160	1440	2560	1710	N
Current at full load	6.0				A
No-load speed	21.0	28.5	15.8	21.4	mm/s
Speed at full load	15.0	20.5	11.3	15.4	mm/s
Max. stroke at full load 2)	722	885	531	650	mm
Duty cycle (DIN VDE 0530 part 1) at 25° ambient temperature	S2 2min.				
Class of rating for continuous load according to DIN VDE 0530 Part 1 (at 40°C ambient temperature)	S3 10% 4) (Maximum time of operation in one direction: 2,5min)				
Stability (locking force) 3)	3500 5)				N

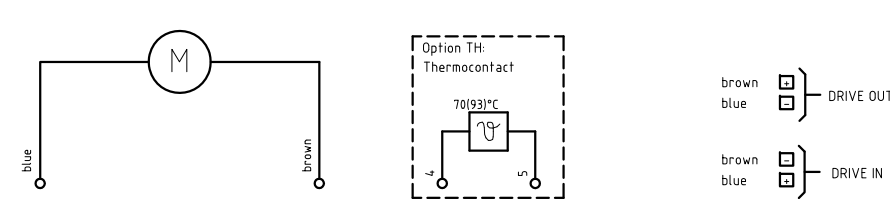
Technical data of drive system G80X:

Description	G80K	G80R	unit
Push/pull force (full load)	2000	2370	N
Current at full load	8.0		A
No-load speed	28.5	21.4	mm/s
Speed at full load	17.4	13.1	mm/s
Max. stroke at full load 2)	751	552	mm
Duty cycle (DIN VDE 0530 part 1) at 25° ambient temperature	S2 1min.		
Class of rating for continuous load according to DIN VDE 0530 Part 1 (at 40°C ambient temperature)	S3 5% 4) (Maximum time of operation in one direction: 1,5min)		
Stability (locking force) 3)	3500 5)		N

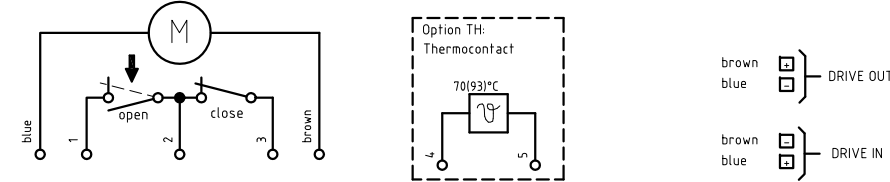
- 1) CAUTION: not suitable for use in moist rooms!
- 2) Maximum stroke at full load is the stroke performed by the actuator at full load without deflection of the spindle!
For longer strokes pushing force must be reduced. Appropriate force/stroke diagram swill be made available on request.
- 3) Stability is the maximum pulling force allowed to act on the push rod when retracted. (Locking force = closing force)
- 4) Either under load extending and load supporting retracting or under load retracting and load supporting extending.
- 5) In the case of mounting at lower end, stability will decrease to 2,500N!

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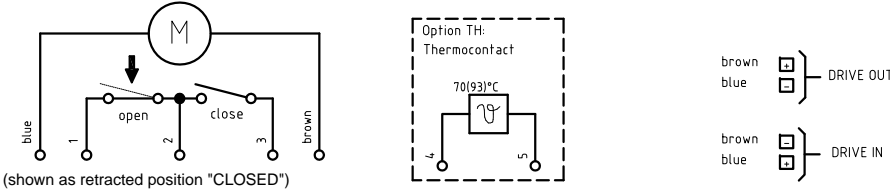
Terminal diagram standard version (with/without option TH)
OPTION TH: thermal contact integrated in drive



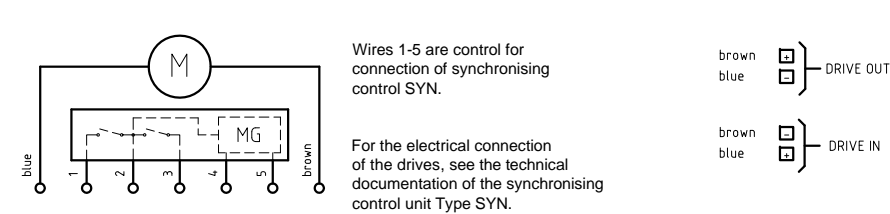
Terminal diagram with option E (with/without option TH)
Option E: drive with potential-free opening contacts for both end positions
OPTION TH: thermal contact integrated in drive



Terminal diagram with option ES (with/without option TH)
Option E: drive with potential-free closing contacts for both end positions
OPTION TH: thermal contact integrated in drive



Terminal diagram with option SY
OPTION SY: drive with control lines for synchronising control unit Type SYN







GRASL Pneumatic-Mechanik GmbH A-3454 Reidling Europastraße 1	Freimaßtoleranz nach DIN 7168:		Maßstab: 1:1		Werkstoff:
			ID - Nr.:		
				Bezeichnung:	
				Technical data G40x, G60x and G80x Electro-linear-actuator	
05	Zul. Umgebungstemp.	24.07.2012	SA	Type:	
04	Spindel Tr12x6 hinaus	13.06.2012	SA		
03	zusätz. Antriebstopen	12.06.2012	SA	Baureihe G	
02	Polnisch	25.07.2011	SA		
01	Text Mercor	30.05.2011	SA		
Zus.	Änderung	Datum	Name	(Urspr.)	
				(Ers.f.)	07.009.DAT.07.04
				(Ers.d.)	

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.

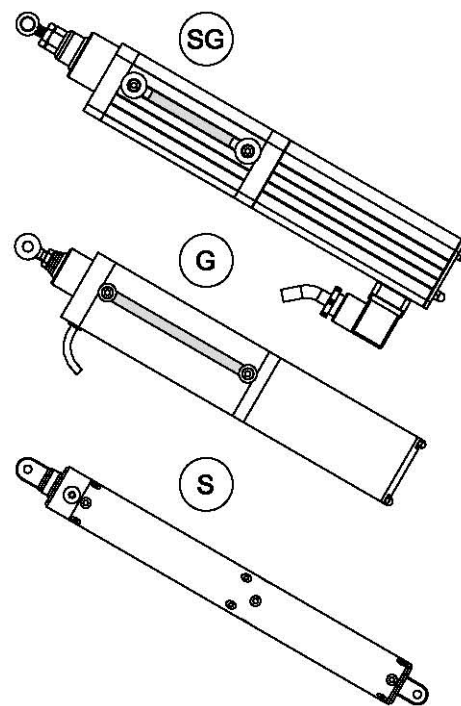
Meaning of the symbols

-  **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.

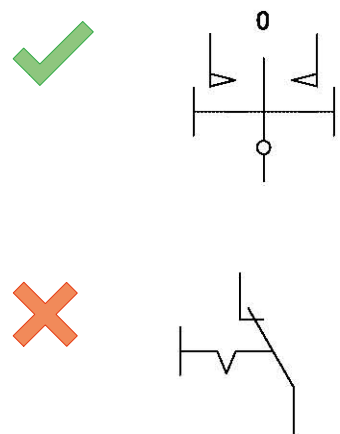
Correct and proper use

The drives serve the purpose of opening and closing NSHEV's, such as windows, blinds and vents in the roof area (no free access for system-external persons). The producer of the NSHEV is responsible for the implementation of EN 12101. For all other applications the compatibility and thus the security can not be guaranteed. On the application of voltage, a movement command is activated.

If the drives are installed below an installation height of 2,5m to the floor, or to the next access level, 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, EN 14351, DIN EN 60335-2-103:2003 and ASR A1.6. Do not allow children to play with the device or its control and / or control devices, including window controls.



picture 1: spindle drives



picture 2: ventilation buttons

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.).

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 according to drive data sheet 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.

The drives must only be used in normal atmospheric conditions. In the case of atypical ambient atmosphere (for example, SO₂-, saline atmosphere), please consult.

i The drives are not allowed to be loaded beyond their technical datas. The technical data must be adhered to.

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).

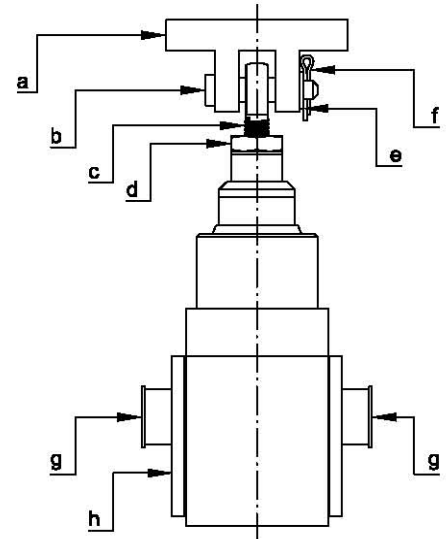
After full extension or retraction, the opposite direction must be travelled for approx. 1s before the previous direction can be travelled again (type series S).

Sound pressure level: L_{PA} ≤ 70dB(A) (test distance 1m)

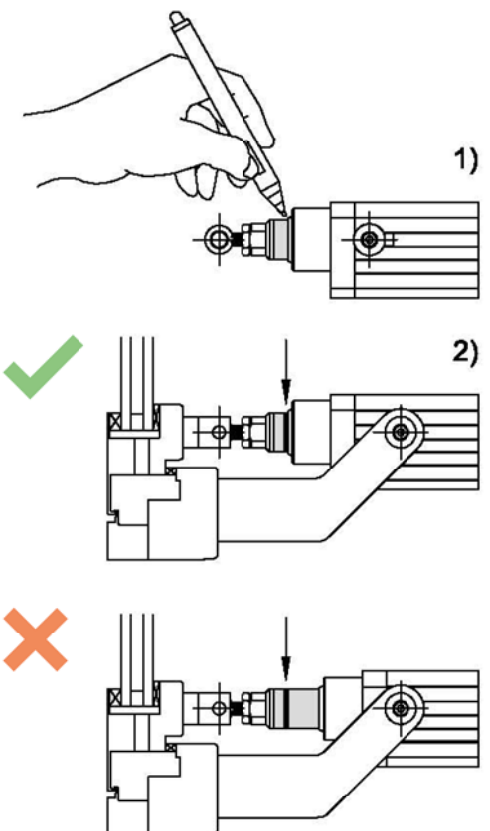
Installation

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


- 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

 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:


 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).

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).

 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).

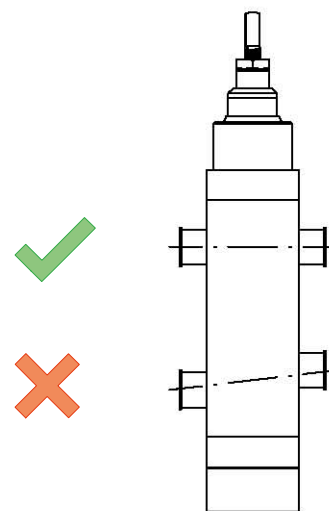
 It must be ensured that the drives can always reach their end positions as otherwise the internal end cut-off is not guaranteed. Use the eyebolt (adjustment range) and bearing pins for adjustment. Continuous operation over the load cut-off is not permitted. Check the setting in the retracted condition 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).

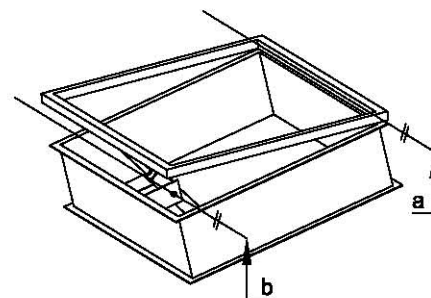
- Drives with variable mountings (lateral guide slots or clamping rings): by pulling the drives, for example, with a spring balance, and then tightening the bearing pins / plugs. During the setting, the bearing pins / plugs must be loosened so far so that the movement of the drive along the drive axis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

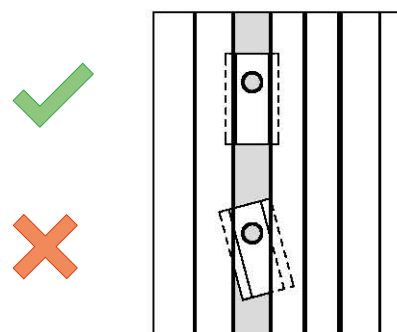


picture 5: bearing pin position

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



picture 6: installation






picture 7: sliding block

ture 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 $M5 = 10\text{Nm}$).

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.

Maintenance/dismantling/fault finding

-  Disconnect the drives to avoid unwanted movements due to external control and drive commands.
-  Make sure that the working area is clear of obstacles and that there are no persons in the danger zone.
-  When re-connect, observe possible movements by pending travel commands.





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.
- The equipment should be checked for imbalance, signs of wear or damage to cables, springs and fasteners.
- Perform a manual functional test.

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.

Normal operation

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

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.