

General technical data:

- 1.) Anodised aluminium housing with a connecting rod made of aluminium (in the case of motor types G..B, G..C, G..D and G..E, the connecting rod is Ø18, for all other motor types it is Ø22)
- 2.) Radio interference suppression according to EN55011
- 3.) Cut-out in both limit positions by internal end switch
- 4.) Electronic emergency overload cut-out
- 5.) Electrical parallel connection is possible (NOTE: synchronising circuit is not possible)
- 6.) Eye bolt Ø6, Ø8 (standard) or Ø10mm
- 7.) Standard strokes 350, 550 and 750mm; special lengths available upon request
- 8.) Light grey silicone connecting cable standard length 2,5m; other lengths available upon request
  - > for standard design: 2x0.75qmm / sheathing Ø ca. 6mm
  - > with Option E: 2x2.5qmm / 3x1.5qmm / sheathing Ø ca. 11mm
  - > with Option TH: 2x2.5qmm / 5x1.5qmm / sheathing Ø ca. 11mm
  - > with Option SY: 2x2.5qmm / 5x1.5qmm / sheathing Ø ca. 11mm

Possible options:

- 1.) OPTION Diverse ground designs:  
Motor design also provides for ground suspensions (please refer to options page "suspension variants".
- 2.) OPTION Diverse cardan shaft suspensions:  
It is also possible to design motors with diverse cardan shaft suspensions (please refer to options page "Cardan shaft suspension variants".
- 3.) OPTION RAL... (available upon request):  
The motor housing can be painted in an RAL colour. For instance, if option "RAL3000" is specified, the motor housing will be painted in RAL3000 (RED).
- 4.) OPTION E:  
Internal potential-free end switches (Option E=opener) for both limit positions; current carrying capacity 24VDC/1A (e.g. for position indicator)
- 5.) OPTION TH... (available upon request):  
Installed thermal contact that responds if a specified temperature has been exceeded. The following designs can be delivered:  
TH70Ö ... response temperature 70°C - contact opens when actuated  
TH70S ... response temperature 70°C - contact closes when actuated  
TH93Ö ... response temperature 93°C - contact opens when actuated  
TH93S ... response temperature 93°C - contact closes when actuated  
Option TH... is NOT possible in connection with option SY. As this option is not possible in connection with all ground suspension variants, option TH is only possible available upon request.
- 6.) OPTION SY (available upon request):  
See datasheets G08X-...-SY to G26X-...-SY
- 7.) 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!)

Ordering designation:

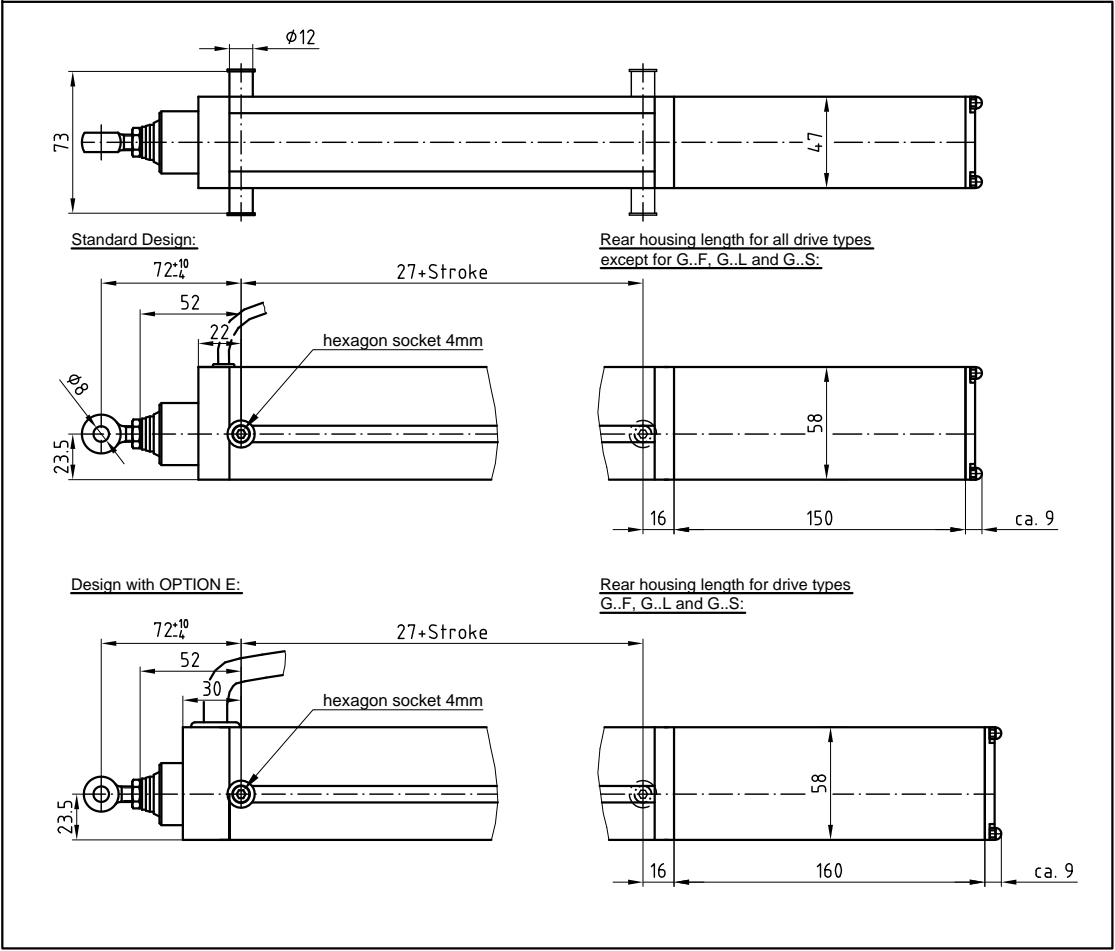
G(Type) - (Stroke) - (Eye bolt) - (Cable length) - (Options)

Legend:

Type: Drive type as selected from list of drives  
Stroke: Driving stroke in [mm]  
Eye bolt: Bore diameter of eye bolt in [mm]. Instead of the eye bolt, it is also possible to specify a different cardan shaft suspension (see options page "Cardan shaft suspension variants")  
Cable length: Connecting cable length in [m]  
Options: List of all requested options

Ordering example: G20B - 750 - 8 - 2.5 - E - RAL3000

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gung ohne unser schriftliches Einver-  
st ndnis ist verboten!



GRASL Pneumatic-Mechanik GmbH A-3454 Reidling Europastraße 1				Freimaßtoleranz nach DIN 7168:		Maßstab: 1:1		Werkstoff:		
						ID - Nr.:				
				Datum		Name		Bezeichnung:  <b>Data sheet</b> Electro-linear-actuator Type: G16x, G20x and G26x		
				Bear. 26.11.2009		Simetzberger				
				Gepr. 25.07.2011		GH				
				Norm						
				Type:		Baureihe G		Zeichnung Nr.:		Blatt
02 Polnisch 25.07.2011 SA				07.009.DAT.03.02-E						
01 Text 12.04.2010 SA										
Zus. Änderung		Datum	Name	(Urspr.)		(Ers.f.) 07.009.DAT.03.01		(Ers.d.)		

General technical data:

Seal variation	Standard:	Option D05/D07	Option IP4.2	unit
Rated current	24			VDC
No-load current	0.3			A
Permissible ambient temperature	-25 - +60			°C
Max. permissible temperature to EN1201-2 attachment G	300° - 30min			°C
System of protection according to DIN EN 60 529	IP 4.0 1)	IP 5.4	IP 4.2	

Technical data for drive types G16X:

Designation	G16B	G16C	G16D	G16E	G16G	G16H	G16J	G16K	G16M	G16N	G16P	G16R	unit
Transverse and tensile forces (full load)	1240	880	670	470	940	670	510	360	1110	790	600	420	N
Current at full load	1.6												A
Velocity (no-load)	8.1	11.5	14.3	19.5	10.8	15.3	19.1	26.0	8.1	11.5	14.3	19.5	mm/s
Velocity at full load	6.5	9.3	11.6	16.1	8.7	12.4	15.5	21.5	6.5	9.3	11.6	16.1	mm/s
Maximum stroke at full load	2) 4.6	530	607	725	1095	1297	1487	1770	807	956	1097	1312	mm
Class of rating for peak load according to DIN VDE 0530 Part 1 (at 25°C ambient temperature)	S2 4min.												
Class of rating for continuous load according to DIN VDE 0530 Part 1 (at 40°C ambient temperature)	S3 21% 4) (Maximum time of operation in one direction: 4min)												
Stability (locking force)	3)	3500 5)											N

Technical data for drive types G20X:

Designation	G20B	G20C	G20D	G20E	G20G	G20H	G20J	G20K	G20M	G20N	G20P	G20R	unit
Transverse and tensile forces (full load)	1630	1150	880	610	1240	870	670	460	1460	1030	790	550	N
Current at full load	2.0												A
Velocity (no-load)	8.1	11.5	14.3	19.5	10.8	15.3	19.1	26.0	8.1	11.5	14.3	19.5	mm/s
Velocity at full load	6.0	8.7	10.8	15.0	8.0	11.6	14.4	20.0	6.0	8.7	10.8	15.0	mm/s
Maximum stroke at full load	2) 389	464	530	636	954	1138	1297	1566	703	838	956	1146	mm
Class of rating for peak load according to DIN VDE 0530 Part 1 (at 25°C ambient temperature)	S2 2.5min.												
Class of rating for continuous load according to DIN VDE 0530 Part 1 (at 40°C ambient temperature)	S3 13% 4) (Maximum time of operation in one direction: 2.5min)												
Stability (locking force)	3)	3500 5)											N

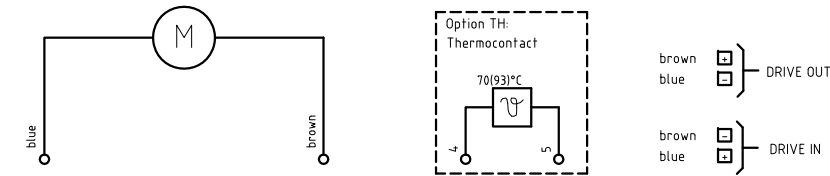
Technical data for drive types G26X:

Designation	G26B	G26C	G26D	G26E	G26G	G26H	G26J	G26K	G26M	G26N	G26P	G26R	unit
Transverse and tensile forces (full load)	2200	1550	1190	830	1670	1180	900	630	1970	1390	1070	750	N
Current at full load	2.6												A
Velocity (no-load)	8.1	11.5	14.3	19.5	10.8	15.3	19.1	26.0	8.1	11.5	14.3	19.5	mm/s
Velocity at full load	5.3	7.7	9.6	13.4	7.1	10.3	12.8	17.9	5.3	7.7	9.6	13.4	mm/s
Maximum stroke at full load	2) 335	399	456	546	822	977	1119	1338	606	721	822	982	mm
Class of rating for peak load according to DIN VDE 0530 Part 1 (at 25°C ambient temperature)	S2 1.5min.												
Class of rating for continuous load according to DIN VDE 0530 Part 1 (at 40°C ambient temperature)	S3 8% 4) (Maximum time of operation in one direction: 1.5min)												
Stability (locking force)	3)	3500 5)											N

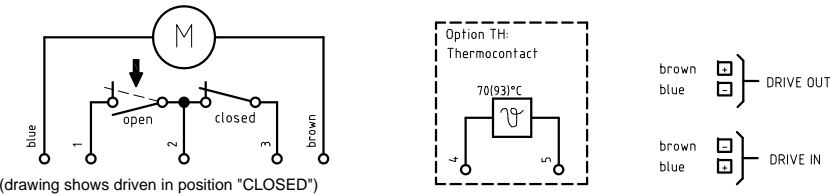
- 1) CAUTION: Not suitable for the use in damp locations or outside!
- 2) The maximum stroke at full load is the stroke that the drive can travel at full load without buckling of the spindle!  
The transverse force must be reduced for larger strokes. We can supply the corresponding force-stroke diagrams upon request.
- 3) The stability is the maximum tensile force that may occur at the retracted cardan shaft. (locking force = locking pressure)
- 4) Either under load extending and load supporting retracting or under load retracting and load supporting extending.
- 5) If a bottom suspension (ground suspension)is used, stability is reduced to 2500N!

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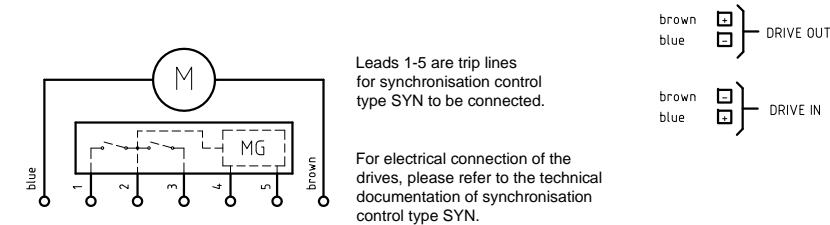
Connection diagram for standard design (with/without option TH)  
OPTION TH: thermal contact integrated in the drive



Connection diagram with option E (with/without option TH)  
OPTION E: drive with potential-free opener contacts for both limit positions  
OPTION TH: thermal contact integrated in the drive



Connection diagram with option SY  
OPTION SY: drive with trip lines for synchronisation control type SYN







GRASL Pneumatic-Mechanik GmbH A-3454 Reidling Europastraße 1				Freimaßtoleranz nach DIN 7168:				Maßstab: 1:1		Werkstoff:	
								ID - Nr.:			
					Datum	Name		Bezeichnung:  <b>Technical Data G16x, G20x and G26x</b>  Electro-linear-actuator			
				Bear.	26.11.2009	Simetzberger					
				Gepr.	24.07.2012	HA					
05	Zul. Umgebungstemp.	24.07.2012	SA	Norm							
04	Spindel Tr12x6 hinaus	13.06.2012	SA								
03	zusätz. Antriebstopen	12.06.2012	SA	Type:	Baureihe G		Zeichnung Nr.:		Blatt		
02	Polnisch	25.07.2011	SA				07.009.DAT.04.05-E				
01	Text Mercor	30.05.2011	SA								
Zus.	Änderung	Datum	Name	(Urspr.)			(Ers.f.): 07.009.DAT.04.04		(Ers.d.):		
									BL.		

# 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.

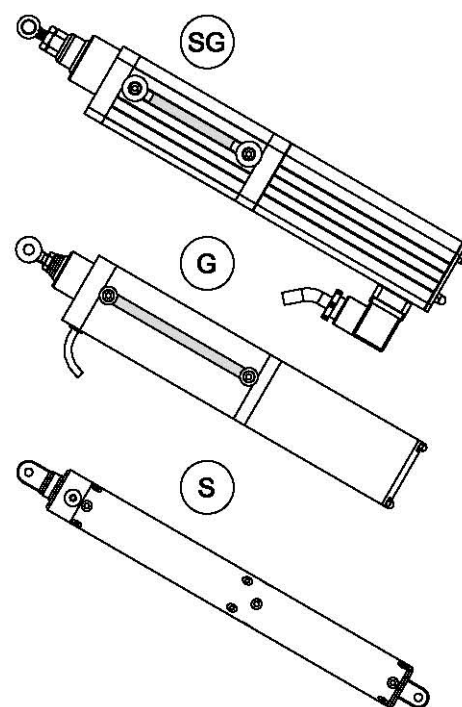
### Meaning of the symbols

-  **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.

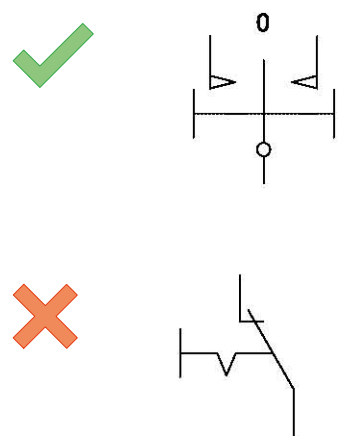
### Correct and proper use

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, SO<sub>2</sub>-, 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).

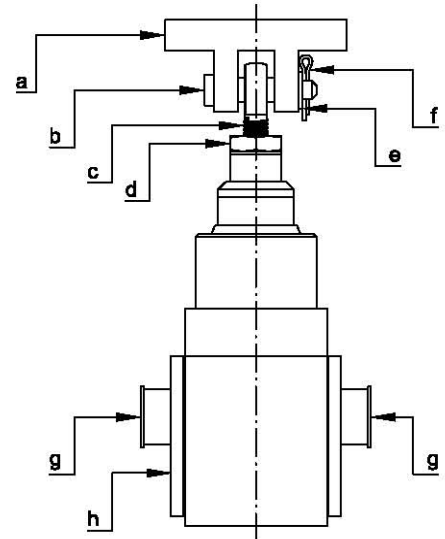
After full extension or retraction, the opposite direction must be travelled for approx. 1s before the previous direction can be travelled again (type series S).

Sound pressure level: L<sub>PA</sub> ≤ 70dB(A) (test distance 1m)

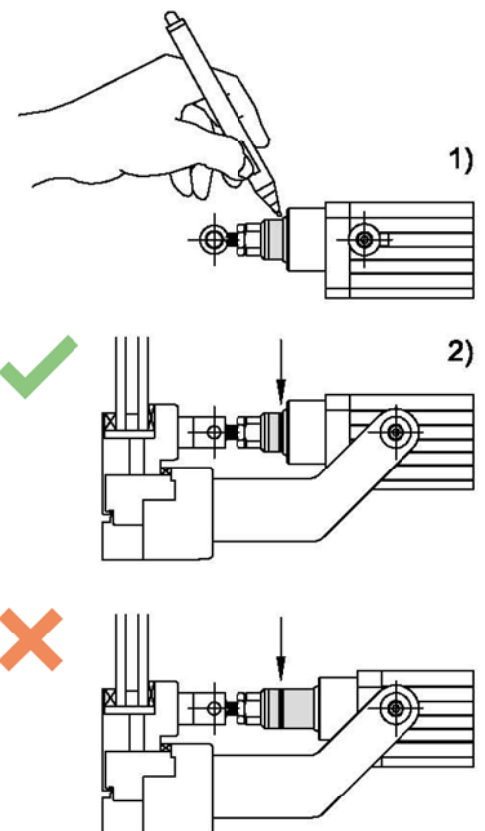
## Installation

**!** 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).

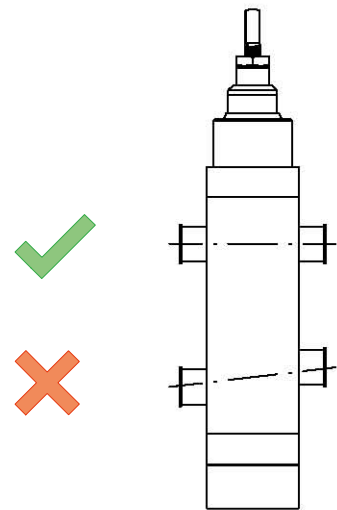
 It must be ensured that the drives can always reach their end positions as otherwise the internal end cut-off is not guaranteed. Use the eyebolt (adjustment range) and bearing pins for adjustment. Continuous operation over the load cut-off is not permitted. Check the setting in the retracted condition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

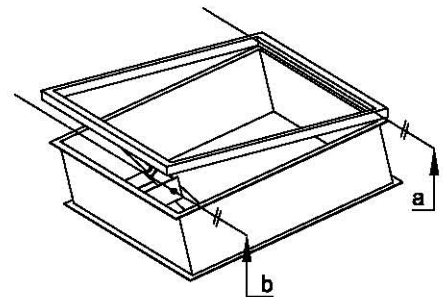
- Drives with variable mountings (lateral guide slots or clamping rings): by pulling the drives, for example, with a spring balance, and then tightening the bearing pins / plugs. During the setting, the bearing pins / plugs must be loosened so far so that the movement of the drive along the drive axis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

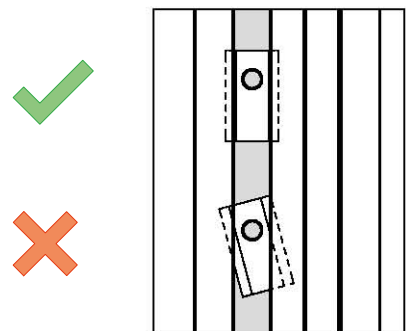


picture 5: bearing pin position

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 = 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.

## 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 and 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.