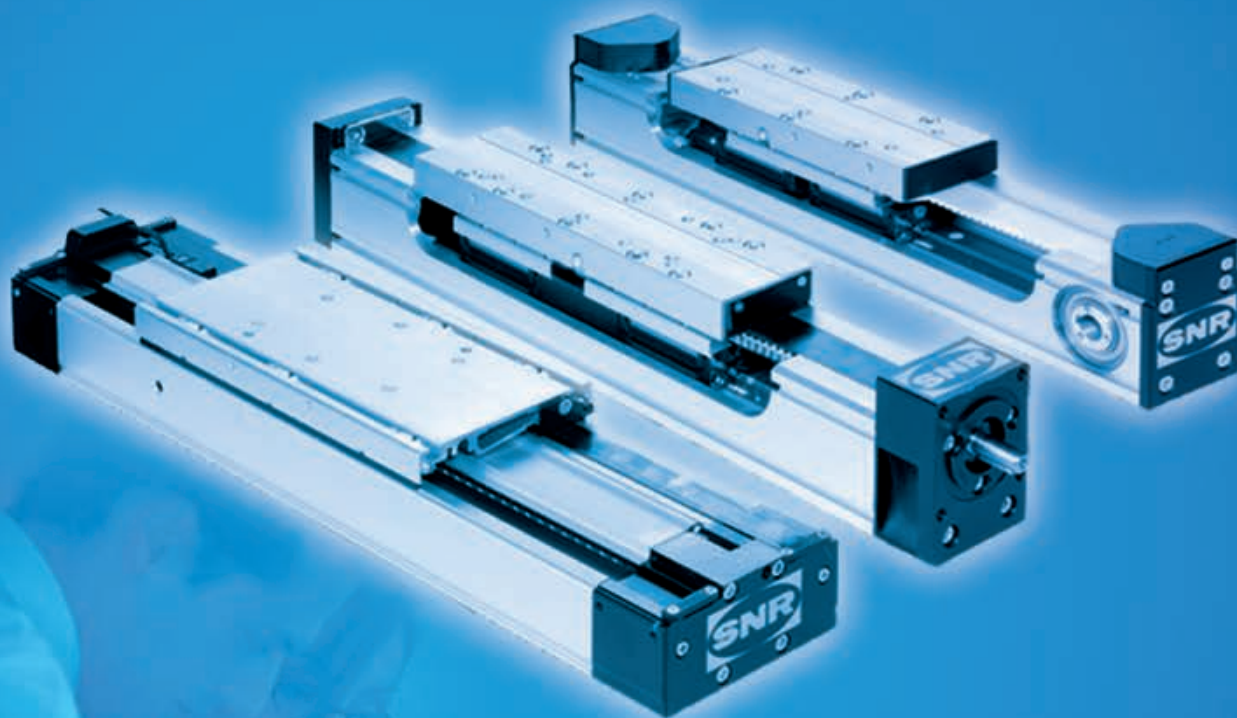


Operating Manual Series AXC/AXLT/AXS/AXDL



Manufacturer

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Product overview

AXC, AXDL and AXLT series compact programme

Profile Type	cross section [mm]	Drive element	Ball rail system	Roller guide
AXC40Z	40 x 40	Toothed belt		•
AXC60Z	60 x 60		•	•
AXC80Z	80 x 80		•	•
AXC100Z	100x100		•	•
AXC120Z	120 x 120		•	•
AXDL110Z	110 x 50		•	•
AXDL160Z	160 x 66		•	•
AXDL240Z	240 x 100		•	•
AXC60A	60 x 60		•	•
AXC80A	80 x 80		•	•
AXC120A	120 x 120		•	
AXDL160A	160 x 66		•	•
AXDL240A	240 x 100		•	•
AXC40S	40 x 40	Screw-type drive	•	
AXC60S	60 x 60		•	•
AXC80S	80 x 80		•	
AXC100S	100x100		•	
AXC120S	120 x 120		•	•
AXDL110S	110 x 50		•	
AXDL160S	160 x 66		•	
AXDL240S	240 x 100		•	
AXLT155	155 x 33		•	
AXLT225	225 x 40		•	
AXLT325	325 x 50		•	
AXLT455	455 x 70		•	
AXC40T	40 x 40	Trapezoidal thread	•	
AXC60T	60 x 60		•	•
AXC80T	80 x 80		•	•
AXC100T	100x100		•	•
AXC120T	120 x 120		•	•
AXDL110T	110 x 50		•	
AXDL160T	160 x 66		•	
AXDL240T	240 x 100		•	
AXLT155T	155 x 33		•	
AXLT225T	225 x 40		•	
AXLT325T	325 x 50		•	
AXLT455T	455 x 70		•	

NTN-SNR compact axes from the AXC, AXDL and AXLT series are available in a range of profiles, drive and linear guidance systems. Most are delivered assembled and ready for installation.

For exact data and dimensions, please refer to the NTN-SNR linear axes catalogue.

System range AXS

Type	Profile cross section [mm]	Drive element	Pulley feed [mm/Umdr.]
AXS120T	120 x 120	Timing belt	500
		Timing belt	280
AXS240T	240 x 100	Timing belt	500
		Timing belt	
AXS200M	200 x 100	Rack and pinion	250
			200
AXS230M	230 x 160		320
AXS280M	280 x 170		400
			200
AXS460M	400 x 300		250
AXS280Z	280 x 170	Timing belt	480

NTN-SNR system axes from the AXS series are available in various profiles and with an adjustable drive system. The guidance system always consists of linear ball rail systems. In addition, the AXS120T and AXS240T series provide a telescopic axis for vertical and horizontal use. Most linear axes are supplied fully assembled and ready for installation.

For exact data and dimensions, please refer to the NTN-SNR linear axes catalogue.

Safety

I General safety instructions



The device is built according to current state-of-the-art technology and applicable regulations. The device complies with the EU machinery directive, harmonised standards, European standards or the applicable national standards. This is confirmed with a manufacturer's declaration.

Relevant accident prevention regulations, generally accepted safety-related rules, EU guidelines, other applicable standards and country-specific regulations are also applicable.

Because linear units can be used in such a wide range of applications, the ultimate responsibility and liability for appropriate use lies with the end user.

This device creates an unavoidable residual risk for personal injury and material damage. For this reason, every individual who works on this device associated with the transport, assembly, operating, maintenance and repair of the device, must receive instruction and understand the potential dangers. The operating instructions must be understood and observed.

In addition, actuating equipment poses a risk of injury due to rotating or otherwise moving components. Due to moving carriages, operational linear axes particularly pose an increased crushing hazard, especially in connection with end position dampers and limit switches. The user must make these residual risks known with signs or written codes of conduct. Alternately, the user can eliminate or exclude these residual risks to the greatest extent possible by employing appropriate constructive measures.

The noise level can increase at high speeds, special applications and at accumulation of more noise sources. The user must take the appropriate protective measures.

Linear unit start-up is prohibited until it can be established that the machine or system in which it is mounted conforms to EU machinery directives, harmonised standards, European standards or applicable national standards.

I Intended use

NTN-SNR linear axes and NTN-SNR linear tables are fundamentally designated for linear movement as occurs during positioning, synchronisation, transport, palletising, loading, unloading, clamping, tightening, testing, measuring, handling and manipulating components or tools. Type-specific load data from the relevant SNR catalogue documentation and/or SNR supplementary technical calculations must be observed. Furthermore, an operating temperature between -10°C to $+40^{\circ}\text{C}$ must be adhered to.

Alternative or excessive use is considered improper use. The manufacturer assumes no liability for resulting damages. The user bears sole responsibility for all risks.

The linear axis may only be operated and serviced by individuals familiar with the axis and who have been instructed in the dangers.

Special provisions can be made for applications (as example food industry, clean room etc.) which deviate from the standard modifications.

Transport und storage

I Transport and storage


NTN-SNR linear axes are high-precision devices. Heavy impact can damage linear axis mechanisms and impair performance. To avoid damage during transport and storage, the following should be observed:

- Protection against vigorous vibration and/or impact, corrosive substances, moisture and soiling
 - Packaging in a suitably large box or crate with secured and padded to ensure against movement.
- Special care should be observed to protecting the corners and exposed elements such as switches

Assembly instruction and start-up

The assembly of linear axis (partly completed machinery) must contain a description of the conditions, which must be met with a view to correct incorporation in the final machinery, so as not to compromise safety and health.

I Linear axes assembly instruction and mounting

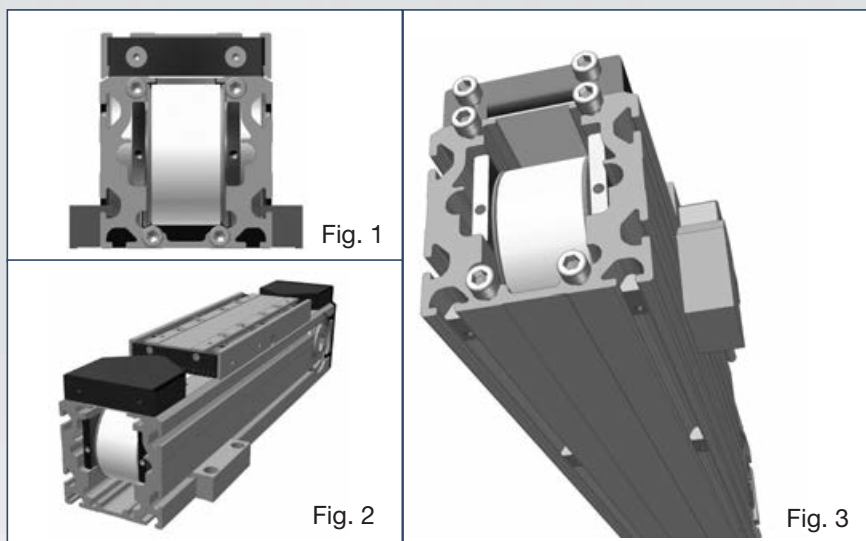
 **Caution!** The motor housing can reach high temperatures during operation.

The linear axes have to be positioned, so that the transfer of noise is minimized. Other parts of the machinery should be planned in a way that they are not in the resonance range of the linear axis.

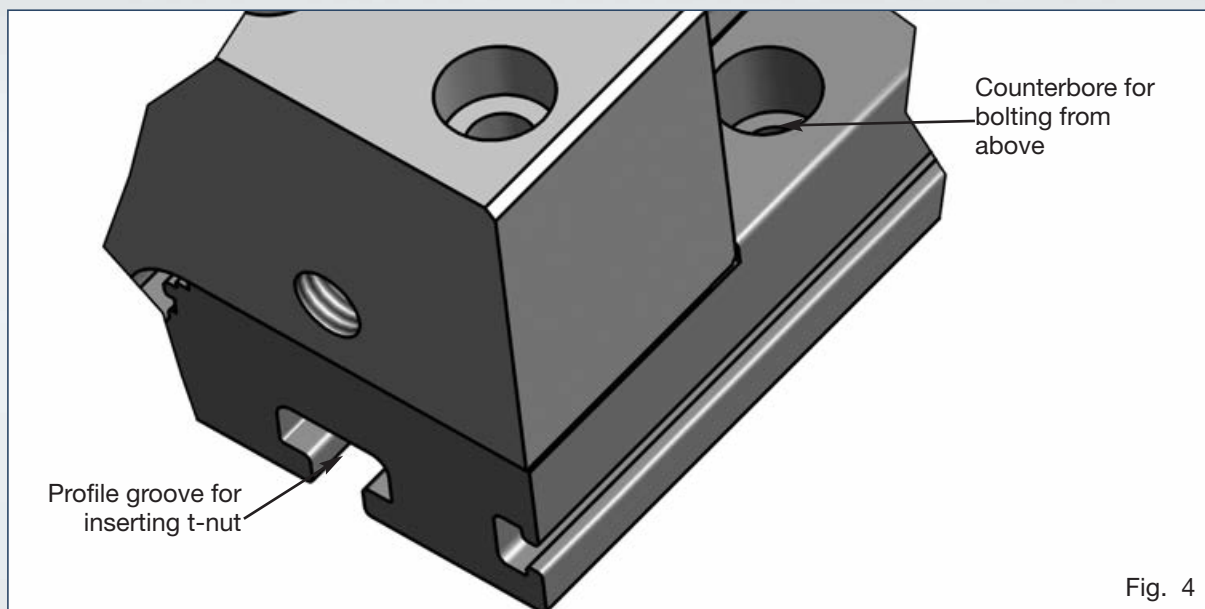
NTN-SNR linear axes from the AXC and AXDL series can be mounted on level surfaces or other linear axes from the NTN-SNR catalogue using T-nuts or fixing strips. The number of mounting points must be verified for the application. It must be ensured that any resulting deflection of the profile or system neither impedes performance and/or required accuracy.

The fixing strips are hooked to the linear axis profile sides; their special shape allows for simple mounting by bolting from above (fig. 1 and 2). They may be freely positioned along the entire profile length.

Alternately, all linear axes may be mounted via pivoting sliding blocks that may also be freely positioned along the entire length (fig. 3).



Two mounting options are available for AXLT linear tables: either through direct bolting from above or with pivoting T-nuts from the bottom of the table which may be freely positioned along the entire length (fig. 4).



AXS series linear axes can also be affixed using T-nuts as well as with (custom made) adapter plates if required to level surfaces or other NTN-SNR linear axes.

The number of fastening points should be verified in terms of application for all mounting types. It must be ensured that any resulting deflection of the profile or system neither impedes performance and/or required accuracy.

I Notice for linear axis start-up

Linear axes can travel at high speeds with a large degree of force. Carriage fittings can lead to bodily injury or material damage upon collision. Start-up should thus be performed with the utmost caution.

Furthermore, it should be ensured upon start-up that the permissible loads are not exceeded and the carriage fittings are securely fastened. It should also be ensured that the maximum possible travel is not exceeded. If travel is limited with limit switches, they should be previously tested in terms of performance and correct positioning.

Hazards can arise through unintentional descending of vertical linear axis. The end user must take the necessary precautions. We recommend to use the Fachausschuss information sheet Nr. 005 „Gravity-loaded axes (Vertical axes)” issue 02/2004 from Fachausschuss Maschinenbau, Fertigungssysteme, Stahlbau (Germany).

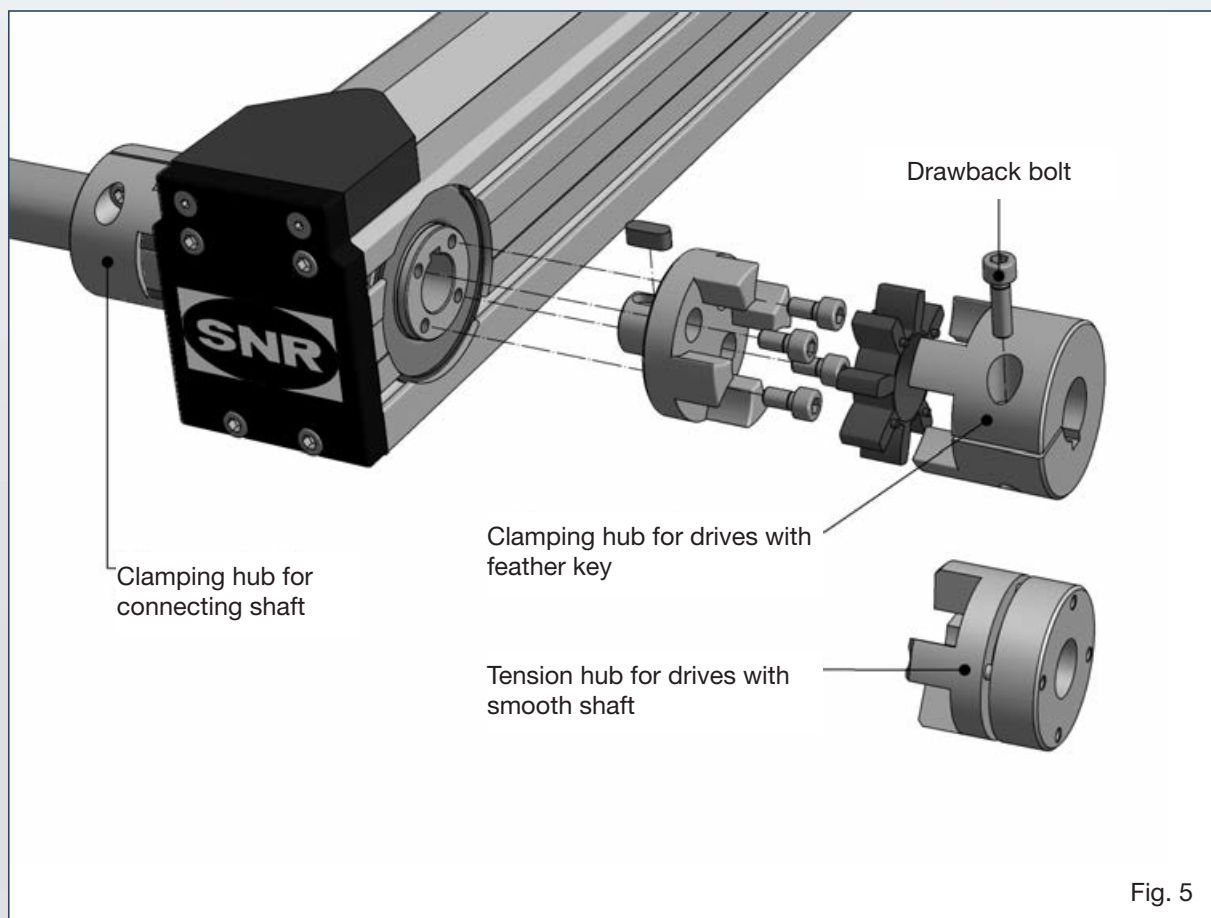


The manufacturer is not liable for damages resulting from non-observance of these start-up instructions. The user bears sole responsibility for all risks.

Drive adaption

Assembly from coupling to linear axes with timing belt drive

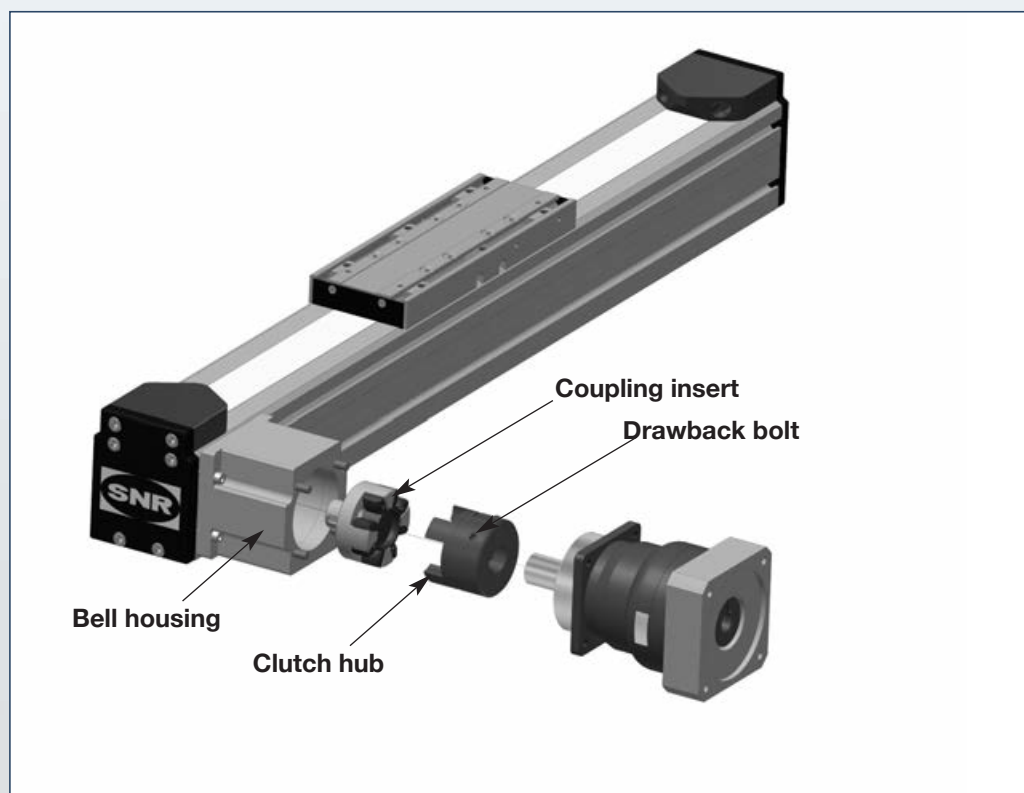
Linear axis	Fastening torque [Nm]	
	Clamping hub	Tension hub
AXC40	1,34	1,34
AXC60	10,5	3
AXC80	10,5	6
AXDL110		
AXC100	25	6
AXC120		
AXDL160		
AXDL240		



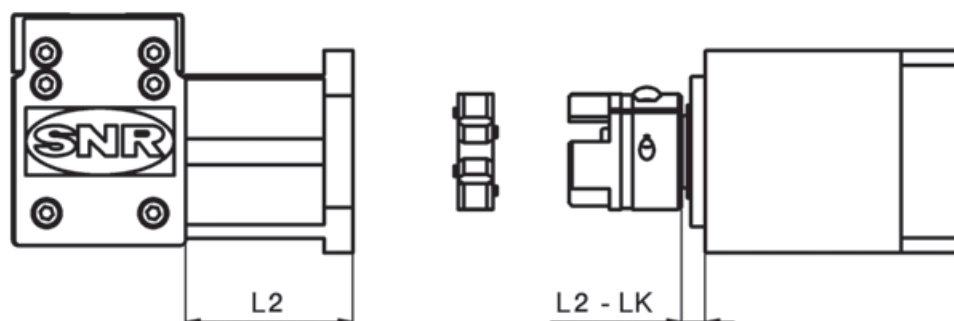
Motor mounting

Motor mounting to linear axes with timing belt drive and bell housing

Linear axis	Mounting dimension PC	TA fastening torque [Nm]	
		Clamping hub	Tension hub
AXC40-ZK	31	1,34	-
	38	-	1,34
AXC60-_K	50	10,5	3
AXC80-_K	59	10,5	6
AXC120-_K	65	25	6
AXDL110	32,5	10,5	6
AXDL160	22,5	25	6
AXDL240	10	25	6




L2: Dimensions s. catalog, linear axis - chapter drive adaption



Motor mounting to linear axes with timing belt drive and planetary gearbox

Linear axis	Width across flats	Shaft diameter [mm]		Drawback bolt fastening torque [Nm]
AXC40ZP	3	all		5,6
AXC60ZP/AP	3	1- level	bis 14	4,5
	4		19	9
	3	2- level	bis 14	4,5
AXDL110ZP	3	1- level	11	4,1
	4		14	9,5
	5		19	14
	3	2- level	11	4,1
	4		14	9,5
AXC80ZP/AP AXDL160ZP/AP	4	1- level	14	9,5
	5		19	14
	6		24	35
	3	2- level	11	4,1
	4		14	9,5
	5		19	14
AXC100ZP AXC120ZP/AP AXDL240ZP/AP	5	1- level	19	14
	6		24	35
	8		24/ 38	79
	4	2- level	14	9,5
	5		19	14
	6		24	35

1. Lay linear axis sideways so that the motor mounting flange faces upward
2. Degrease drive shaft, hollow shaft bore and bolt spacer
3. Adjust carriage until the drawback bolt in the access bore becomes visible
4. For AXC60, ensure that the slot in the bolt spacer is turned 90° to the drawback bolt
5. Insert engine
6. For AXC80 + 120 and AXDL160 + 240 with two drawback bolts: manually tighten drawback bolts applying gentle, even pressure. Tighten drawback bolts with torque key; for two drawback bolts, in alternating increments.
7. Screw in cap screws
8. Close bore in engine mounting flange with enclosed plugs

 Please read the documentation of supplied motor.

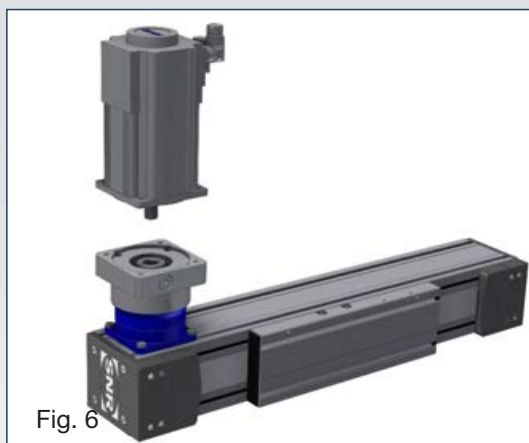


Fig. 6

Motor mounting to linear axes and linear tables with screw-type drive

Linear axis	Toothed ring drilled through for engine shaft *	Mounting dimension A [mm]	Drawback bolt fastening torque [Nm]
AXC40S	-	7	1,34
AXC60S AXC80S AXC100S AXDL110S AXDL160S AXLT225	19	3	10,5
AXC120S AXDL240S AXLT325	24	3	10,5
AXLT155	-	7	1,34
AXLT455	-	8	25

* For motors with feather key, a shorter feather key for replacement will be included with specified shaft diameter

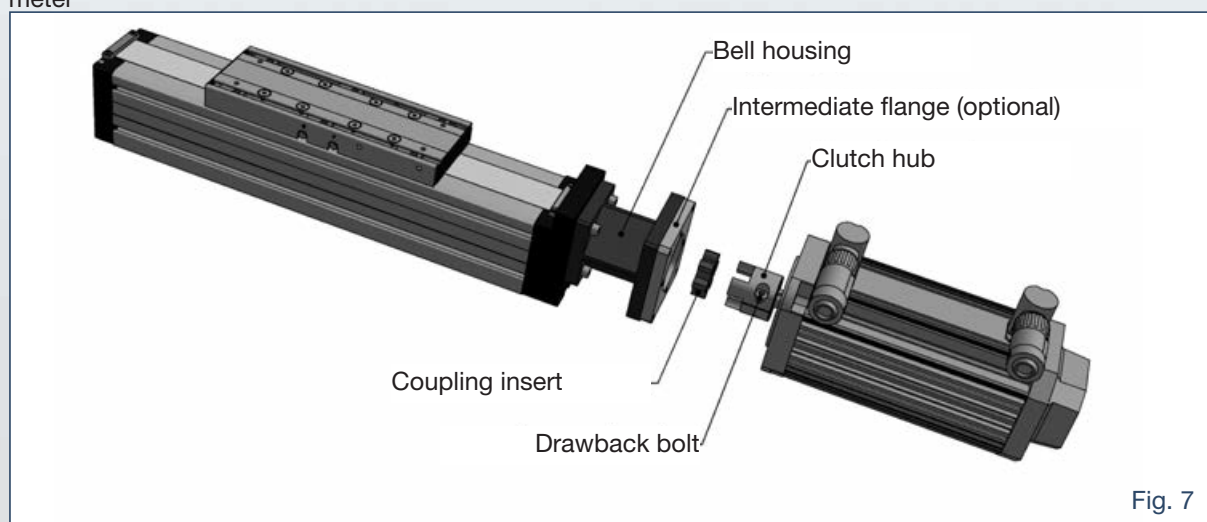


Fig. 7

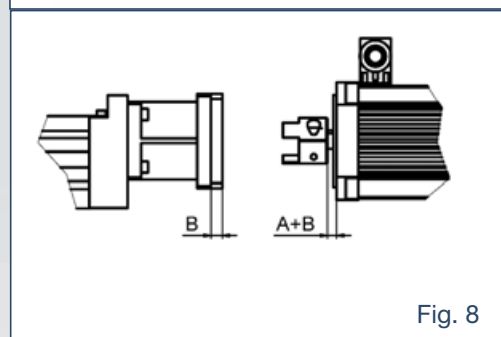



Fig. 8

Please note:

A + B = Coupling mounting dimension

 **Please read the documentation of supplied motor.**

I Motor mounting to belt drive

	KGT pitch (ball screw drive)	Prestressing force on display unit [N] ²⁾	Prestressing force at the timing belt [N] ³⁾	Torque draw-back (clamping) bolt [Nm] ⁴⁾	Interval force application from motor flange [mm]	Max. permissible torque on Ball Screw [Nm] ⁵⁾
AXC60 AXDL110	5	100	50	0,2	18	1,2
	5 ¹⁾	150	75	0,3	18	3,2
	10	220	110	0,5	18	4,6
	16	195	98	0,4	18	4,2
AXC80	5	100	50	0,2	21	1,3
	5 ¹⁾	180	90	0,4	21	4,3
	20	340	170	0,7	21	8,0
	20 ¹⁾	445	223	1,0	21	10,6
	50	625	313	1,4	21	14,9
AXC120 AXDL240 AXLT325	5	140	70	0,4	30	5,2
	10 ⁶⁾	220	110	0,7	30	8,2
	10 ¹⁾	405	203	1,2	30	15,3
	20	500	250	1,5	30	19,0
	32	630	315	1,9	30	24,1
AXDL160	5	165	83	0,4	21	3,8
	10	320	160	0,7	21	7,6
	20	370	185	0,8	21	8,8
	50	625	313	1,4	21	14,9
AXLT155	5	200	100	0,4	18	4,3
	20	290	145	0,6	18	6,2
AXC100 AXLT225	5	165	83	0,4	21	3,8
	10	320	160	0,7	21	7,6
	25	450	225	1,0	21	10,7
AXLT455	5	115	58	0,3	45	7,0
	10	380	190	1,1	45	24,1
	20	575	288	1,7	45	36,6
	40	1650	825	4,9	45	104,8

¹⁾ AXC reinforced mounting (standard with AXDL and AXLT)

²⁾ NTN-SNR timing belt tensioning device

³⁾ E.g. frequency meter

⁴⁾ Drawback bolt prior to mounting on head and thread lubricated

⁵⁾ Max. permissible motor torque = tabular value / ratio

⁶⁾ AXC standard mounting

CAUTION:

Observe permissible motor shaft capacity; reduce pre-load and torque, if necessary. Allow for 25% safety for pre-load via drawback (clamping) bolt.

Motor shaft diameter [mm]	6	8 to 14	ex 15
Fastening torque clamp ring [Nm]	2	5	10

Please note:

Drawback bolt must be lubricated prior to mounting.

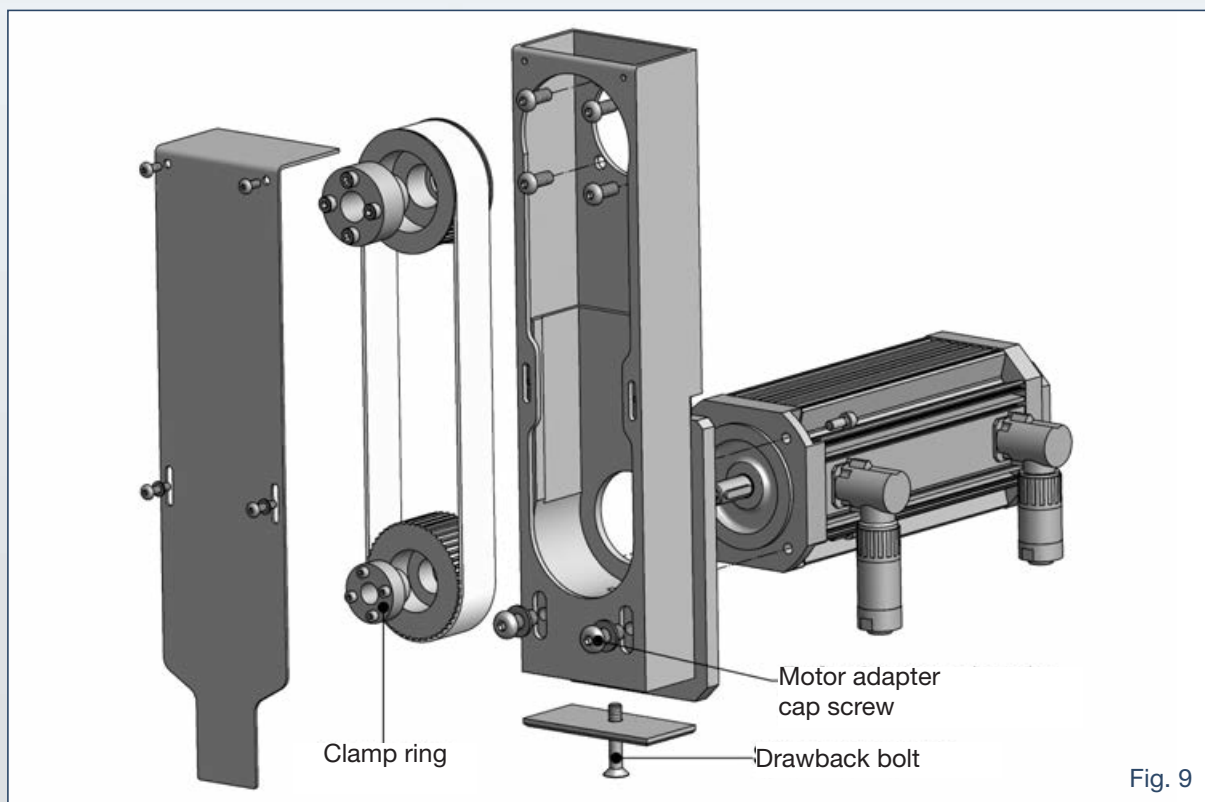


Fig. 9



Please read the documentation of supplied motor.

I Maximum driving torques

Item description according to type label	Driving element	Incline and/or feeder constant [mm/rotation]	Max. driving torque (Emergency Stop) [Nm] ¹⁾
AXC40Z	Timing belt	75	2,5
AXC60Z		150	13,4
AXC80Z		200	27,7
AXC100Z		264	122
AXC120Z		320	127
AXDL110Z		175	27,3
AXDL160Z		224	65,2
AXDL240Z		272	216
AXC60A		150	13,4
AXC80A		200	27,7
AXC120A		320	127
AXDL160A		210	65,5
AXDL240A		272	216
AXC40S_1205	Ball bearing drive	5	0,9
AXC40S_1210		10	1,1
AXC60S_1605		5	3,2
AXC60S_1610		10	4,6
AXC60S_1616		16	5,7
AXC80S_2005		5	4,3
AXC80S_2020		20	15
AXC80S_2050		50	30
AXC100S_2505		5	5,2
AXC100S_2510		10	10
AXC100S_2525		25	27
AXC120S_3205		5	7,1
AXC120S_3210		10	19
AXC120S_3220		20	27
AXC120S_3232		32	43
AXDL110S_1605		5	3,2
AXDL110S_1610		10	4,6
AXDL110S_1616		16	7,1
AXDL160S_2505		5	3,8
AXDL160S_2510		10	7,6
AXDL160S_2020		20	9,6
AXDL160S_2050		50	38
AXDL240S_3205		5	6,4
AXDL240S_3210		10	15
AXDL240S_3220		20	27
AXDL240S_3232		32	43
AXLT155S_2005		5	4,3
AXLT155S_2020		20	17
AXLT225S_2505		5	5,4
AXLT225S_2510		10	11
AXLT225S_2525		25	23
AXLT325S_3205		5	8,0
AXLT325S_3210		10	23
AXLT325S_3220		20	27
AXLT325S_3232		32	43
AXLT455S_4005		5	13
AXLT455S_4010		10	34
AXLT455S_4020		20	50
AXLT455S_4040		40	105

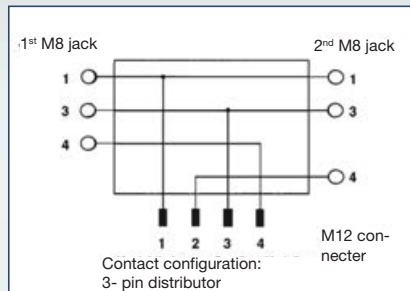
Item description according to type label	Driving element	Incline and/or feeder constant [mm/rotation]	Max. driving torque (Emergency Stop) [Nm] ¹⁾
AXC40T_1203	Trapezoidal thread drive	3	0,55
AXC60T_1604		4	1,6
AXC60T_1608		8	3,1
AXC80T_2004		4	2,0
AXC80T_2008		8	4,0
AXC100T_2405		5	4,1
AXC100T_2410		10	8,3
AXC120T_3606		6	10
AXC120T_3612		12	20
AXDL110T_1604		4	1,6
AXDL110T_1608		8	3,1
AXDL160T_2405		5	4,1
AXDL160T_2410		10	8,3
AXDL240T_3606		6	10
AXDL240T_3612		12	20
AXLT155T_2004		4	2,8
AXLT155T_2008		8	5,5
AXLT225T_2405		5	4,1
AXLT225T_2410		10	8,3
AXLT325T_3606		6	10
AXLT325T_3612		12	20
AXLT455T_4007		7	16
AXS120TM280	Gear rack + timing belt	280	64
AXS120TM500		500	233
AXS240TM500		500	233
AXS200M250	Gear rack	250	233
AXS200M200		200	195
AXS230M320		320	547
AXS280M200		200	102
AXS280M400		400	1034
AXS460M250		250	233
AXS280Z	Toothed belt	480	306

¹⁾ Maximum motor torque to be set = table value / gear ratio

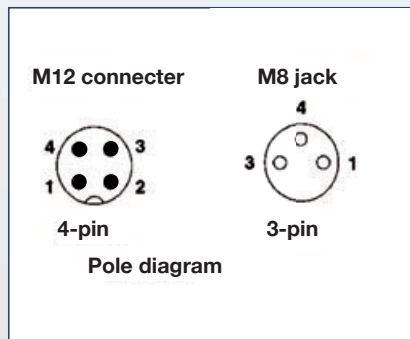
Switches

I Circuit diagrams

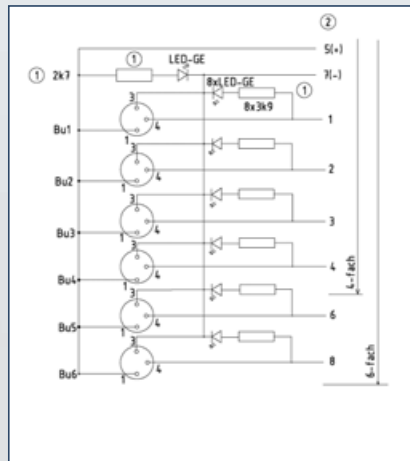
Mechanical switches or inductive proximity switches are available for position detection depending on requirements. Professional wiring is possible due to standard two-way distributor and sensor boxes.



Two-way distributor



Two-way distributor



Sensor box with M12 plug connection for 4 or 6 circuit breaker

Rated voltage	32 V DC
Supply voltage	10 V DC ... 30 V DC
Max. carrying capacity per E/A signal	1 A
Max. carrying capacity per slot	2 A
Max. current sum	3 A
Degree of soiling	3
Protection type	IP 68
Ambient temperature range	-25°C ... 80°C
Contact holder	PBT (UL 94 V0)
Contact basis material	CuZn, nickel sublayer and gold-plated
Tapped bushing	CuZn, nickel-plated
Flammability class acc. to UL94	V-0

Maintenance and lubrication

I General maintenance and care instructions



All maintenance and service works must be carried out in power off and secured stage.
Caution! The motor housing can reach high temperatures during operation.

Drive systems

The timing belt does not generally require maintenance work and will be set to the correct tension during manufacture. Retightening is not necessary during service life with intended use. For servicing the ball screw drive, please observe the information in the maintenance intervals and lubricant quantities section.

Please note:

In a system that utilises two axes connected with a shaft the timing belts in both axes should be replaced.

Guiding systems

Because the rollers in the roller guides are equipped with lifelong lubrication, they do not need to be serviced. Guiding system prestressing is performed during manufacture. Readjustment is unnecessary during service life with intended use. Roller guide shafts are supplied with oil via lubricating felt located in the carriage. Please observe the information in the maintenance intervals and lubricant quantities section.

For ball rail system maintenance, please observe the information in the *maintenance intervals* and *lubricant quantities* section.

To ensure long term performance of the linear axis, it is necessary to perform periodic inspections for external damage and contamination. In harsh ambient conditions with intensified contamination, the inspection period should be adjusted accordingly to perform necessary cleaning and relubrication. Following longer periods of linear axis use, it may be necessary to replace brush scrapers and/or sealing strip in the course of cleaning. Please observe the following mounting instructions.

I Brush scraper replacement – AXC series

To take out the brush scraper and replace it with a new one (fig. 10), loosen and remove the screws. Terms for spare parts orders can be found in the accompanying assembly drawing.

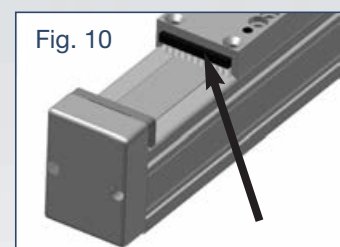
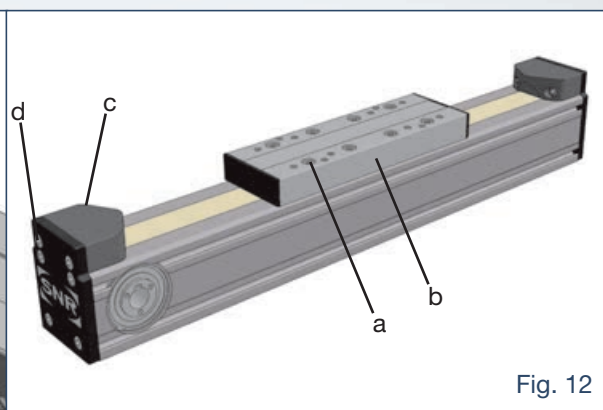
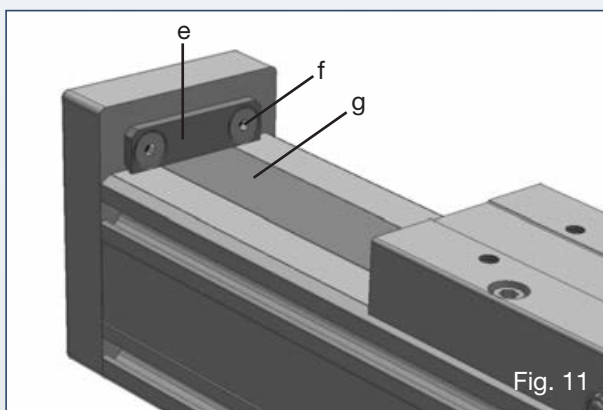


Fig. 10

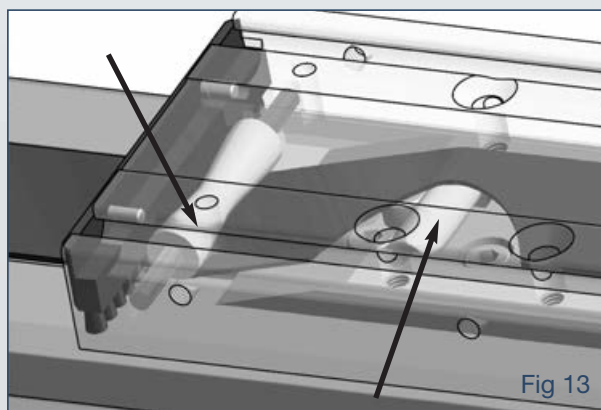
I Sealing strip replacement – AXC series

First loosen and remove the screws (a) in the carriage to remove the slide plate (b). The belt clamping on the axis ends can then be loosened. With toothed-belt axes, the sealing strip is clamped by the end position damper (c) and loosened by removing the cap screw (d) (fig. 12). Ball screw drive linear axes feature a belt clamping through a sheet (e) that can be removed by unscrewing the retaining screws (f) (fig. 11). The old sealing strip (g) can then be removed and replaced with a new one.

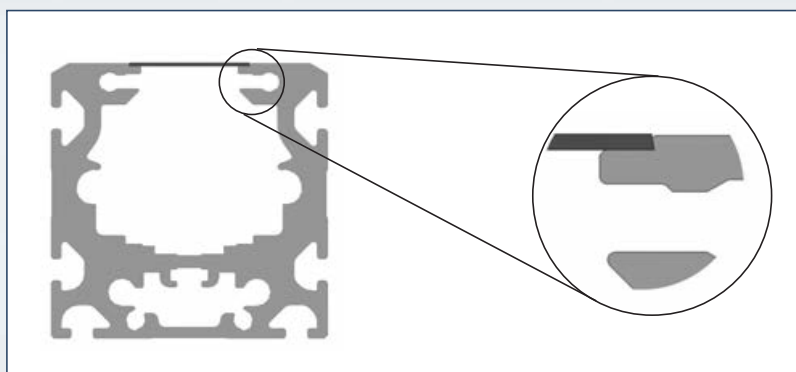
Please always indicate the linear axis serial number when ordering a replacement sealing strip so it can be cut to the exact length of the respective profile to achieve an optimum sealing.



Prior to mounting the new masking belt, it must be ensured that the pressure roller in the slide plate and the guide rollers in the carriage section can be slightly turned on the steel pins. The pins should be cleaned or replaced, if necessary (fig. 13).



The sealing strip has a trapezoidal cross section. When applying the new sealing strip, it must be ensured that the broadest surface is on the bottom. Applying gentle pressure by hand or with a smooth object free of sharp edges, latch the belt into place in the intended slot so that it is flush with the upper profile edge. Mounting can also be performed in the reverse of disassembly order.

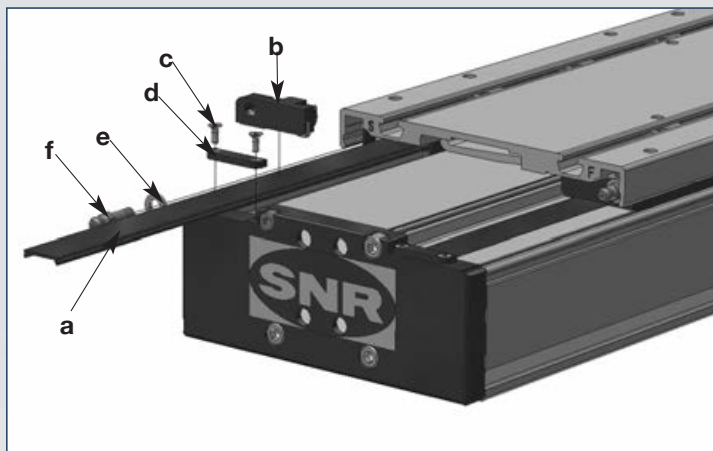


I Masking belt replacement – AXDL series

First loosen and remove the belt deflection (b) together with the lubricating nipple (f) and the disc (e). The attachment rail (d) can then be removed by unscrewing the retaining screws (c). The old masking belt (a) can now be removed and replaced with a new one.

Mounting can also be performed in the reverse of disassembly order.

Important note: The new sealing strip should be tightened in a way that it does not drag on the table (not sure what this means)!!!. This can be checked with inspection bore holes in the slot bottom (sealed with plastic plugs).



I Maintenance intervals and lubricant quantities

Linear ball rail system

With various test conditions, it was established that the calculated life span can be achieved with initial greasing.

Because the lubricant manufacturer does not guarantee a general service life for its products, we recommend a relubrication interval of 10,000 km of linear travel or once per year.

Longer relubrication intervals are possible after consulting the lubricant manufacturer for a defined application, if necessary. A petroleum-based lithium soap roller bearing lubricant should be used for relubrication; otherwise, the compatibility must be reviewed.

Lubricants with a solid lubricant percentage (e.g. graphite or MoS₂) may not be used.

Other lubricants can also be specified for special applications (as example food industry). Because relubrication interval depends on several factors, e.g. degree of soiling, operational temperature, load, etc., the information stated here should only serve as a guideline.

Roller bearing

We recommend a lubrication interval of 5,000 km or once a year. Oil to be used: ISO- VG460.

Ball screw drive

Standard lubrication requirements for rolling bearings apply for ball screw drives. Lubrication loss is greater than with conventional rolling bearings due to axial movement between the shaft and the screw nut. Grease-lubricated ball screw drives have the advantage of only needing relubrication after long travel, meaning that a relubrication device can be omitted in many cases. The lubrication amount should be measured to ensure that hollow spaces are approximately halfway filled. All high-quality roller bearing lubricants are suitable for use. Please observe lubricant manufacturer guidelines!

Lubricants with a solid lubricant percentage (e.g. graphite or MoS₂) may not be used.

If you wish to achieve as long of a relubrication interval as possible, greases pursuant to DIN 51825 K2K and pursuant to DIN 51818 for higher loads KP2K of NLGI class 2 should be favoured

Relubrication intervals for NLGI 2 lubricants:

d _{nenn}	Travel (km) with pitch P=						
	5	10	16	20	25	32	40
≤ 40 mm	250	500	800	1000	1250	1600	2000

Boundary conditions

Load ≤ 0,2 C

N_{min} = 100 min⁻¹

Temp_{max.screwnut} = 80° C

Temp_{Cont.screwnut} = 60° C

Because relubrication interval depends on several factors, e.g. degree of soiling, operational temperature, load, etc., the information stated here should only serve as a guideline.

Trapezoidal thread

Lubrication interval 10 to 20 km.

Lubricant as for linear axis. For AXC, a special lubricant with MoS₂, or PTFE may also be used, but these may not get into the lubrication connection "F" for the linear axis.

Recommended relubrication quantities [cm³] – AXC series

Linear axes with ball screw drive: **lubricating point S**

Axis	Incline						
	S_5	S_10	S_16	S_20	S_25	S_32	S_50
AXC40	0,35	0,35					
AXC60	0,65	0,9	1,0				
AXC80	1,1			2,5			4,6
AXC100	1,6	1,9			3,5		
AXC120	2,2	3,1		3,6		5,5	

Linear axes with ball screw drive: **lubrication point F**

Axis	B/C
AXC40	0,3
AXC60	1
AXC80	2
AXC100	3
AXC120	4

Linear axes with timing belt drive generally only have one lubrication point for linear guide lubrication.

Quantities listed in the tables are based on the relubrication amount per lubricating point.

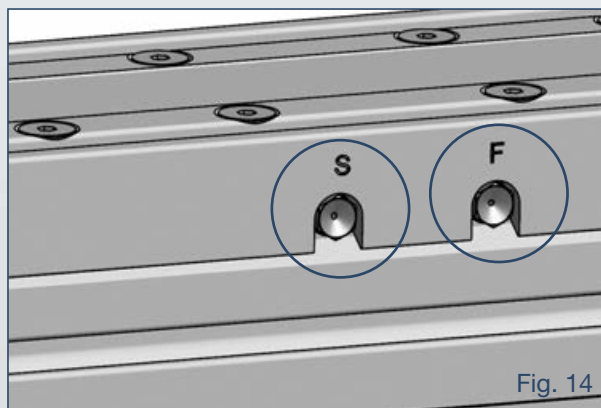


Fig. 14

AXC series linear axes feature lubricating nipples on both sides to achieve the highest possible level of accessibility. This means that the quantities listed above may only be applied into the respective lubricating nipple on one side of the axis per lubrication interval.

Recommended relubrication quantities [cm³] – AXDL series

Linear axes with timing belt drive: **both lubricating points**

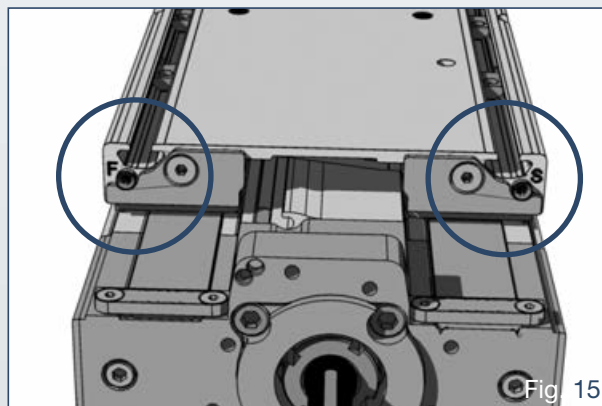
Linear axes with ball screw drive: **lubricating point F**

Axis	B/C
AXDL110	0,6
AXDL160	1,6
AXDL240	3

Linear axes with ball screw drive: **lubricating point S**

Axis	Incline					
	S_5	S_10	S_16	S_20	S_32	S_50
AXDL110	2,25	2,5	2,6			
AXDL160	4,0	4,3		4,9		7,0
AXDL240	8,2	9,1		9,6	11,5	

Quantities listed in the tables are based on the relubrication quantity per lubricating point.



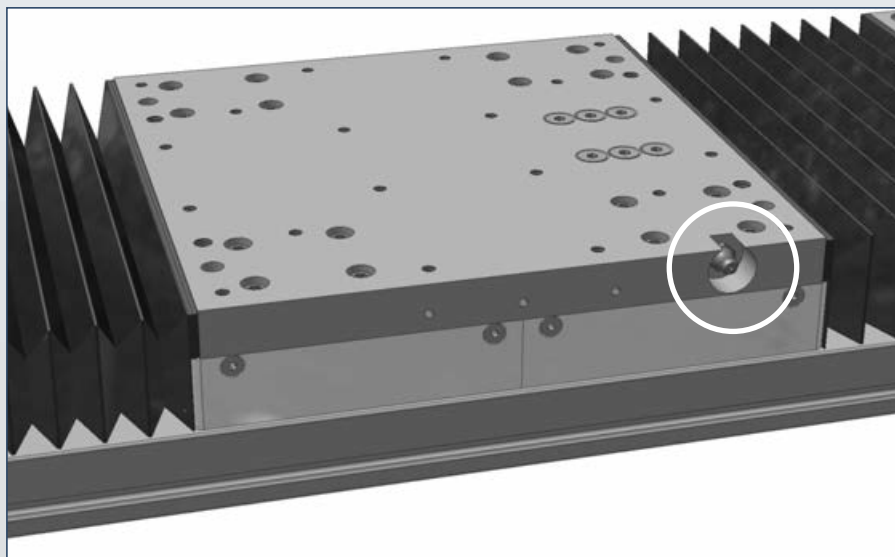
Linear axes from the AXDL series feature lubricating nipples on both front sides of the table to achieve the highest possible level of accessibility. This means that the quantities listed above may only be applied into the respective lubricating nipple on one side of the axis per lubrication interval.

Recommended relubrication quantities [cm³] – AXLT series

Axis	Incline						
	S_5	S_10	S_20	S_25	S_32	S_40	S_50
AXLT155	1,1		2,5				4,6
AXLT225	1,6	1,9		3,5			
AXLT325	2,2	3,1	3,6		5,5		
AXLT455	3,0	6,7	8,7			14,3	

Note: The capacity of a standard grease gun conform to DIN1283 (with 400 g cartridges) is 2 cm³ per stroke.

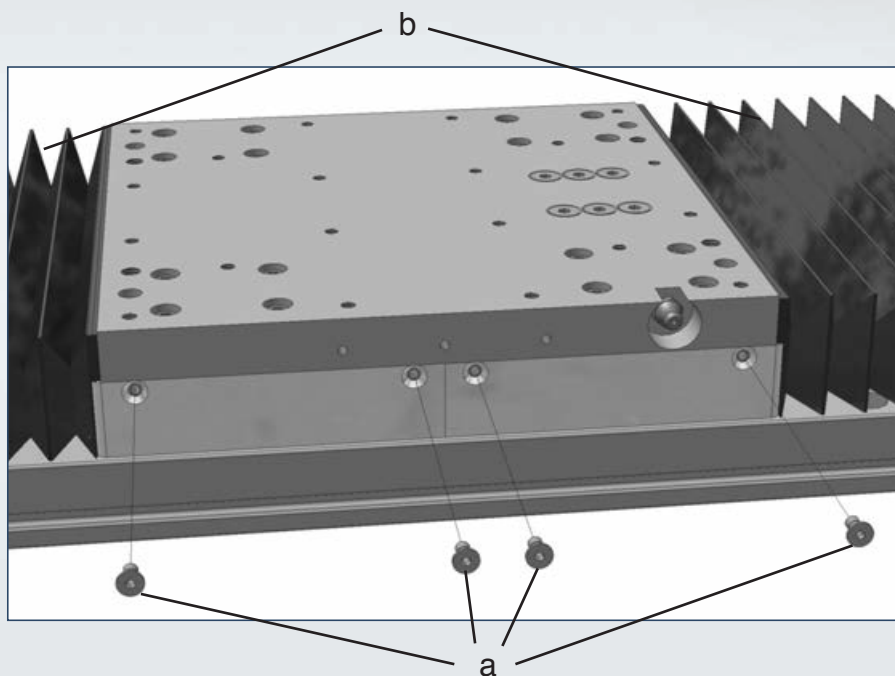
Ball screw drive relubrication point



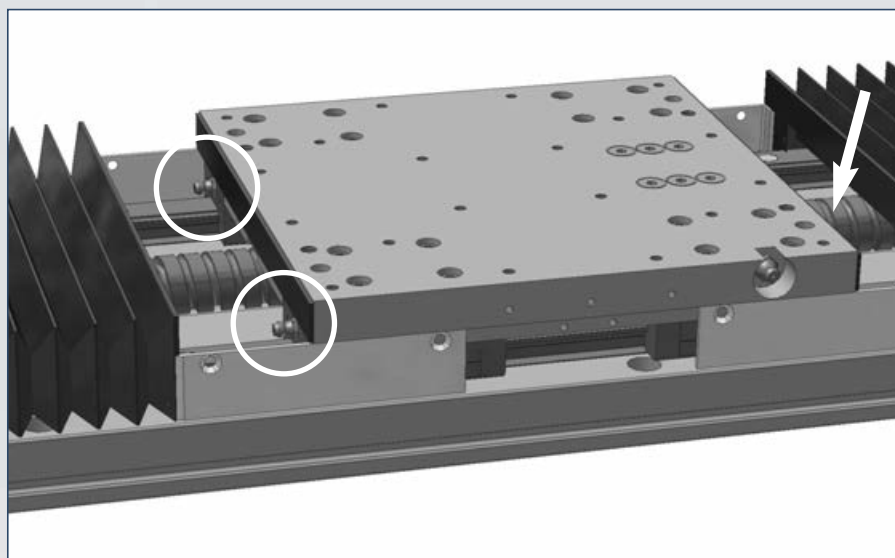
Lubrication instructions for NTN-SNR linear guide (four lubrication points)

Axis	B/C	B
AXLT155	0,6	-
AXLT225	1,2	-
AXLT325	3	-
AXLT455	-	3,4

First loosen the cap screws (a) and push back the bellows (b).



Each carriage is individually lubricated via lubricating nipples (4 pcs.) accessible at this point.

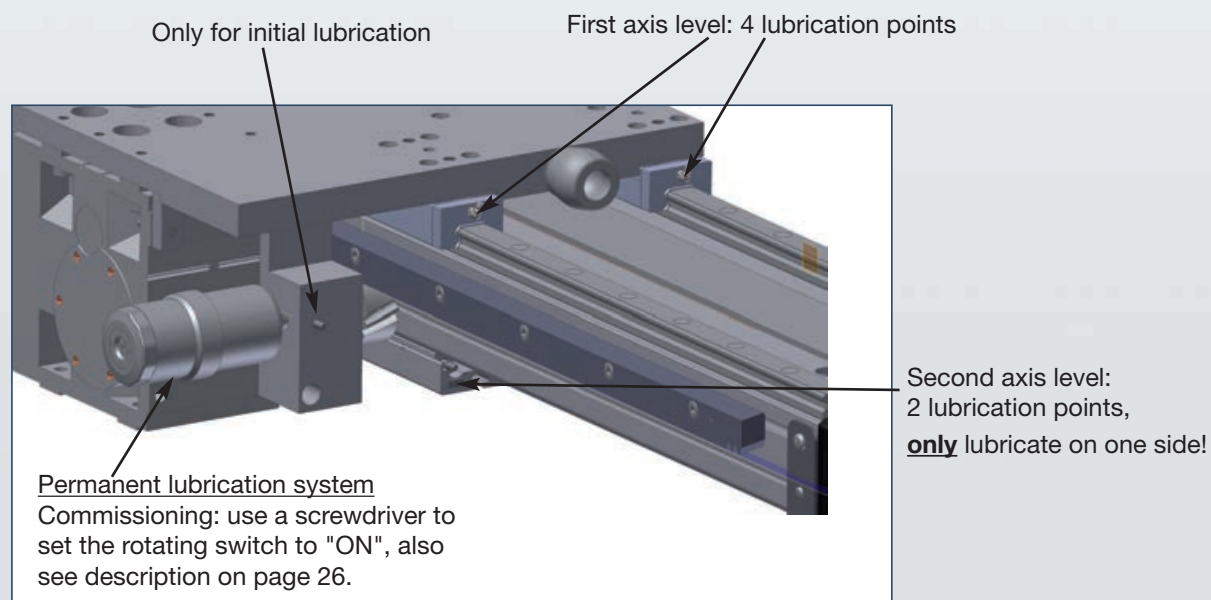


Recommended relubrication quantities [cm³] – AXS series

Axis	B/C
AXS200M200	3,0
AXS200M250	3,0
AXS230M320	3,0
AXS280M400	3,4
AXS280Z	3,4
AXS280M200	3,4
AXS460M250	3,4
AXS120T Slide plate lubrication point	7,6
AXS120T Basic axis	2,0
AXS240TM500 1. Axis level	3,0
AXS240TM500 2. Axis level	4,0

Quantities listed in the tables are based on relubrication quantities per carriage. Lubrication takes place directly underneath the carriage lubrication nipple.

Only the carriages in the second telescopic axis guide level are supplied via the lubrication point in the slide plate.



Recommended oiling relubrication quantity [cm³] for roller guides:

Axis type	Relubrication amount [cm ³]	Factor
AXC40	0,4	3
AXC60	0,4	5
AXC80	2,0	2
AXC120	2,0	3
AXDL110	1,0	3
AXDL160	1,5	4
AXDL240	2,8	5

AXC linear axes feature lubricating nipples on both sides to guarantee the highest possible level of accessibility. AXDL linear axes feature lubricating nipples on both front sides of the table. This means that the quantities listed above may only be applied into the respective lubricating nipple on one side of the axis per lubrication interval.

Relubrication option for linear axes with timing belt drive. Lubrication point F for axis type AXC120 with ball screw drive and roller guide.

The given factor is to be applied as follows:

AXC series: For incline mounting position and initial relubrication overhead mounting.

AXDL series: For overhead and incline mounting position for initial relubrication.

We recommend a relubrication interval of 5,000 km or once per year.

Oil to use: ISO- VG 460.

I Lubricants for screw drive and/or profiled rail bearings

The lubricant SNR LUB EP is used under normal conditions. Special requirements and unusual environmental conditions require the use of a suitable lubricant. When relubricating with other lubricants, the compatibility of the lubricants is to be tested.

Description	Type of oil, Consistency builder	NLGI class DIN 51818	Walk penetration DIN ISO 2137 at 25°C [0,1 mm]	Basic oil viscosity DIN5156 2 at 40°C [mm²/s]	Density [kg/m³]	Temperature range [°C]	Properties	Applications
LUB HEAVY DUTY GREASE	Mineral oil, High-pressure additive lithium soap	2		150	900	-30...+110	Normal conditions, standard lubrication	General machine construction
LUB FOOD GREASE	Paraffin mineral oil / aluminium - complex soap	2	265... 295	ca. 240	920	-30...+110	Good corrosion protection, very good adhesion, high water-resistance, NSF H1-registered*	Food industry
Klübersynth BEM34-32	Synthetic hydrocarbons - Oil / special - calcium soap	2	265... 295	ca. 30	890	-30...+140	Specially pressure-resistant, good wearing protection, good ageing resistance, low starting torque	Clean room applications
Klübersynth UH1 14-151	Synthetic hydrocarbons - oil / ester oil / aluminium - complex soap	1	310... 340	ca. 150	920	-45...+120	Good corrosion protection, age-resistant, water-resistant, NSF H1-registered*	Pharmaceutical industry / food industry

* This lubricant has been registered as a H1 product, i.e. it was developed for occasional, technically unavoidable contact with food. Experience has shown that the lubricant can also be used for corresponding applications in the pharmaceutical and cosmetics industry under the conditions as specified in the product information. However, there are no specific test results, e.g. with regard to bio-compatibility, as may be required for pharmaceutical applications. Thus corresponding risk analyses in this field are to be carried out by the plant manufacturer and operator before application. Where necessary, steps are to be taken to exclude any risks to health or injuries. (Source: Klüber Lubrication)

I Lubricants for roller bearings

The tempered steel shafts of the roller bearings are usually lubricated with Shell Omala 460.

De- scription	Type of oil	Kinematic viscosity DIN51562 at 40°C [mm²/s]	Den- sity [g/cm³]	Tempera- ture range [°C]	Properties	Application range
Shell Omala 460	Mineral oils and additives.	460	904	-10...+90°C	Good ageing and temperature stability, good corrosion protection properties	General machine construction
Klüberoil 4 UH1-460N	Polyal- phaolefin film	460	860	-30...+120°C	Good ageing and wear protection, NSF H1 registered*	Pharmaceutical industry, food industry

I Automatic lubricant dispenser

Automatic lubrication will ensure the permanent and regular lubrication of the bearing and driving elements of the linear axes. The lubrication process can be optimised with the aid of the automatic lubricant dispenser, without making changes to your system. The lubricant dispensers are connected to the lubrication connection of the linear axis. It should be taken into account that every lubrication point requires a separate lubricant dispenser. The lubrication dispensers can be provided with various lubrication or oil types. SNR offers various types of lubricant dispensers.



Experts
& Tools

NTN SNR

Our SNR application engineers are available to answer any further questions you might have.

I Central lubrication connection

SNR linear axes can be supplied with a connection for a central lubrication system on request. Our SNR application engineers are available to answer any further questions you might have.

I Lubricating the gear racks

The gear rack drive is optimally supplied with lubricant, using a permanent lubrication system in combination with a felt cog wheel. The system has been filled with the lubricant UNIVERSAL+. An emptying time of 12 months has been pre-set at the factory. This should be adjusted to an emptying time of 6 months if the operating time specified in the table has been exceeded in any given year. After this time, the lubricant tank and the battery must be exchanged. Order description: LUBER DRIVE REFILL 120 UNIVERSAL+. Systems connected to the machine controls, other lubricants or container volumes can also be used as special equipment. In this case you should order the lubricant tank from the catalogue or stating the serial number and battery set (not required for externally controlled systems).

Axis	Modul	km / 120cm ³
AXS120TM280	2	80000
AXS120TM500	3	64000
AXS155TM400	2	80000
AXS240TM500	3	64000
AXS280M200	2	40000
AXS200M200	3	32000
AXS200M250	3	32000
AXS460M250	3	32000
AXS230M320	4	29000
AXS280M400	5	24000

Setting the driving system

The permanent lubrication system is delivered in a switched-off state. Before starting permanent operation, the system is to be commissioned in accordance with the following description:

Function display

The DRIVE BOOSTER has been equipped with a red and a green LED. The LEDs on the control board may be viewed through the transparent cover (see Fig. 1). These LEDs inform the operator about the following operating states and/or faults:

LED	Signal	Signal duration	Operating state
green	flashing	every 15 seconds	Operation (OK)
red	flashing	every 8 seconds	Fault / interrupt
green and red	flashing	every 3 seconds	LC unit empty
red	intermittent	continuous	DRIVE BOOSTER dispensing

Setting options

Setting the operating time

The control board has a quad switch for coding.

Switches 1+2 with the description "TIME" can be used to set the operating time until the LC unit is emptied, while Switches 3+4 with the description "VOL" are used to adjust the size of the LC unit.

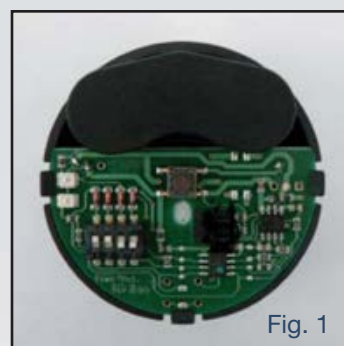
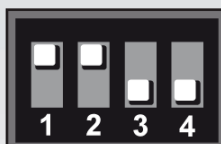


Fig. 1

Setting the 1+2 "TIME" switch

A small screwdriver or the fingers may be used to set or adjust the switches.

The operating time to emptying that has been set can be indicated on the operating system, using the adhesive dots included.

The adhesive dots come in different colours and the operating time in months is printed on them.



Setting of 1+2 "TIME" switches of the quad switch for coding the four different operating times

Setting the 3+4 "VOL" switch

A small screwdriver or the fingers may be used to set or adjust the switches.

Where the position of the 3+4 "VOL" switch of the quad switch for coding does not correspond to the size of the LC unit, this will result in a wrong signal being sent and in over- or under-lubrication.

Setting of the 3+4 "VOL" switch of the quad switch for coding the two sizes of the LC unit



Switching on the lubricant dispenser

To switch on the lubricant dispenser, set the rotating switch on the cover of the driving system (Fig. 16) from the "OFF" position to the "ON" position, using a screwdriver. This will immediately start a dispensing process. To switch off the lubricant dispenser, change the setting from "ON" to "OFF".



fig. 16

Changing the settings

The operating time and the size of the LC unit can only be adjusted when a new LC unit is being used.

Where the settings have been changed during operation and/or after commissioning, a new, fully filled LC unit and a new set of batteries needs to be used.

If the settings are changed during operation, this will result in a fault in the controls and the electronic monitoring system. Thus NTN-SNR cannot accept any liability for precise lubrication.

Each time the settings have been changed, use a new, fully filled LC unit and a new set of batteries.

Never use an LC unit that is already partially empty!

Declaration of incorporation for partly completed machinery

(Machinery directive 2006/42/EG)

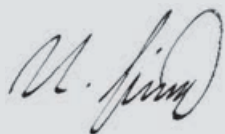
The manufacturer

SNR WÄLZLAGER GMBH, Friedrich-Hagemann-Strasse 66, 33719 Bielefeld, Germany

hereby declare that the components listed below are partly completed machinery.

Linear axis ____ Serial number ____

- Following essential health and safety requirements in accordance to Annex I of machinery directive 2006/42/EG are applied and fulfilled:
 - General principles
 - 1.1. General remarks
 - 1.3. Protection against mechanical hazards
 - 1.5. Risks due to other hazard
 - 1.6. Maintenance
 - 1.7. Information
- The relevant technical documentations are compiled in accordance with part B of Annex VII
- We will transmit in case of a reasoned request by the national authorities the relevant technical documentations in accordance with part B of Annex VII.
- The above mentioned relevant technical documentations can be obtained from Mr. Volker Thomas, QC Department, SNR WÄLZLAGER GMBH, Friedrich-Hagemann-Strasse 66, 33719 Bielefeld, Germany
- The conformity is in accordance with the following EG directives:
 - DIN EN ISO 12100-1:2003 Safety of machinery - Basic concepts, general principles for design - Part 1: Basic terminology, methodology (ISO 12100-1:2003)
 - DIN EN ISO 12100-2:2003 Safety of machinery - Basic concepts, general principles for design - Part 2: Technical principles (ISO 12100-2:2003)
- The partly completed machinery must not be put into service, until the final machinery, into which it is to be incorporated, has been declared in conformity with the provisions of machinery directive 2006/42/EG, if required.



i.V. Ulrich Gimpel

(Industry Engineering Division Head)

SNR WÄLZLAGER GMBH

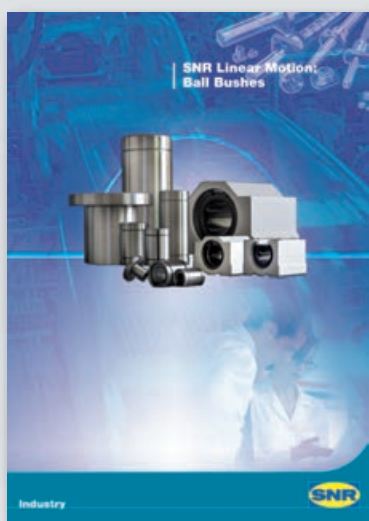
Friedrich-Hagemann-Straße 66 D-33719 Bielefeld Germany

Bielefeld, Dezember 2009

Additional catalogue documentation

You will find more information about NTN-SNR products in the linear motion range in our other catalogues or on our homepage at:

www.ntn-snr.com/products/Linear Motion



Assembly drawing with parts list

[illegible]



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