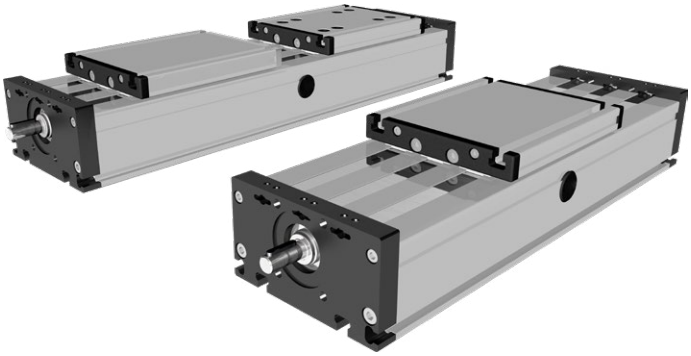
Instruction Manual / Maintenance Instructions for linear axis with spindle drive

Series DLT (RL)
Series DLK (RL)
Series DLT-P
Series DLK-P



Manufacturer Bahr Modultechnik GmbH
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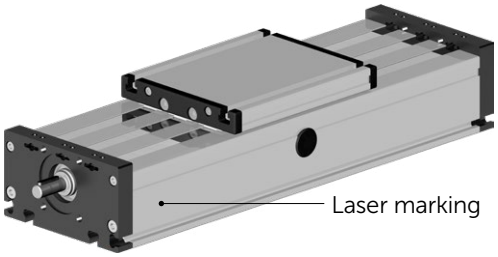
DE-Luhden.Info@imi-precision.com

Product information

After receipt, check this linear system for any damage and missing components. Please report any defects you detect immediately. The linear systems are individually manufactured to your specifications. The width and height of this linear system are determined by the size and design selected. When making a service enquiry, please always quote the ID number (laser marking on linear axis) and, if applicable, the quantity. Position of laser marking (see picture)



DLK 120 Id No.: 1912244-10-1
Made in Germany

	Year	Month	Consecutive number	Position in order	System No. 1
DLK 120 Id No.:	**19**	**12**	**244**	**-10**	**-1**

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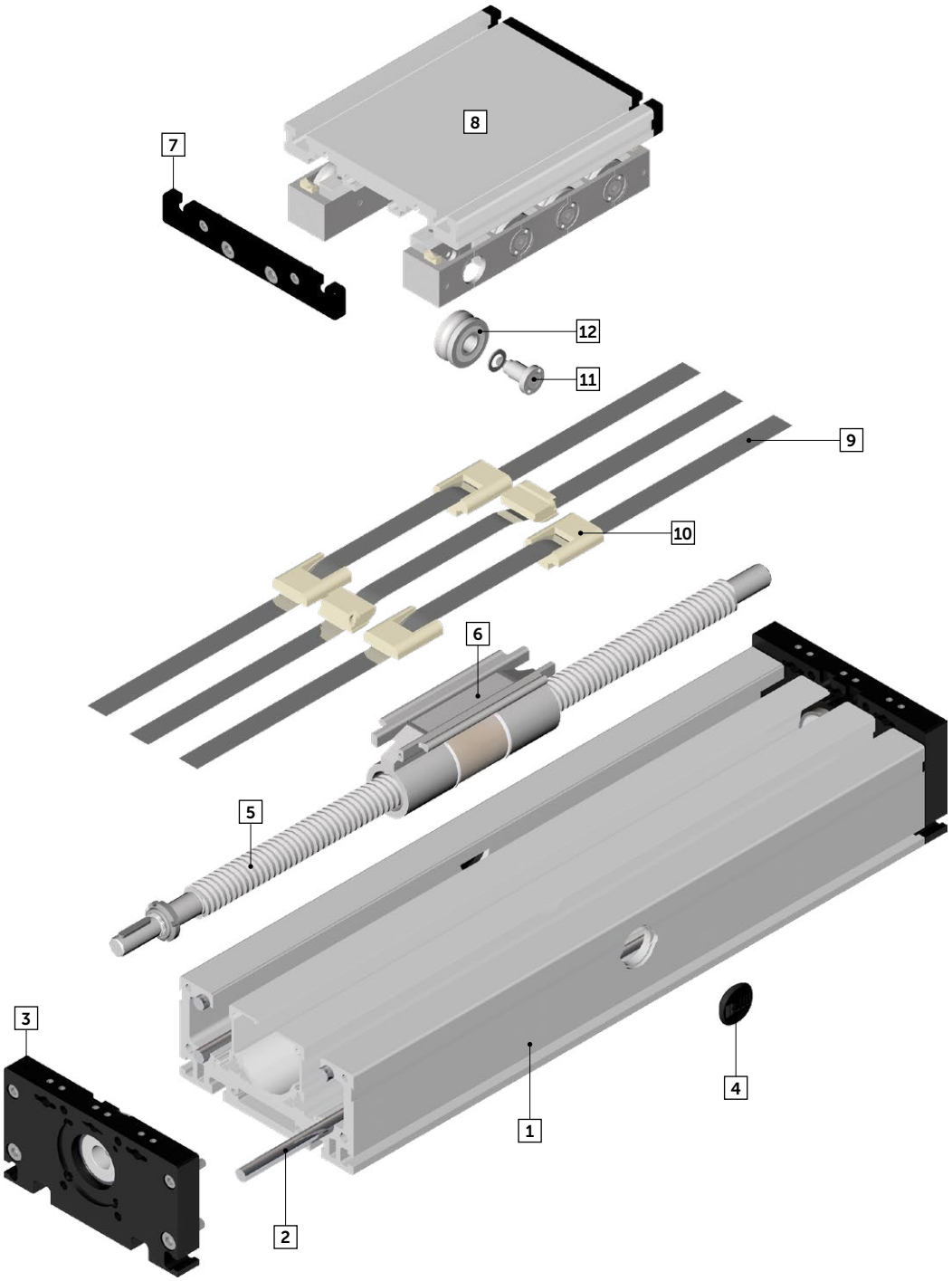
1 Overview



1	Guide body profile
2	Guide rod
3	Bearing block
4	Cover cap
5	Spindle
6	Leading nut receiver
7	Wiper end plate
8	Carriage
9	Coverband
10	Slider
11	Excentric
12	Roller

DLT/K-P additionally with cover plate

2 Notes

2.1 Safety symbols

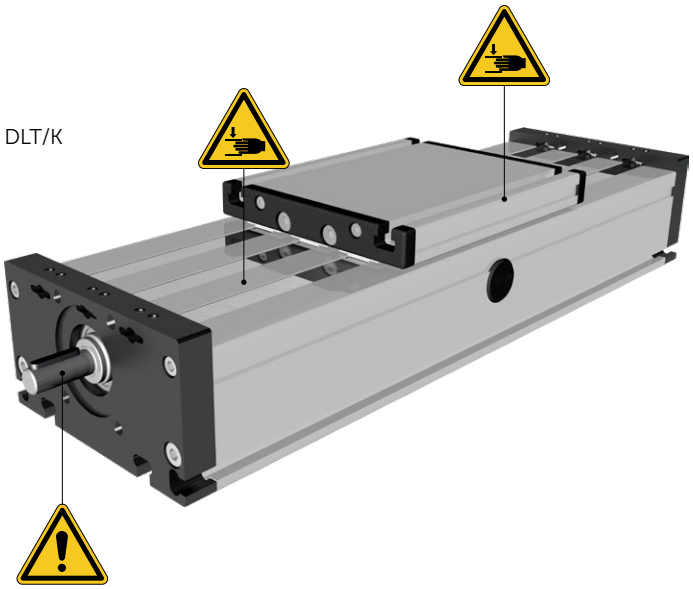
Some or all of the following hazard symbols and warning notices may appear in the operating manual or on the equipment.

It is essential to observe the following signs:

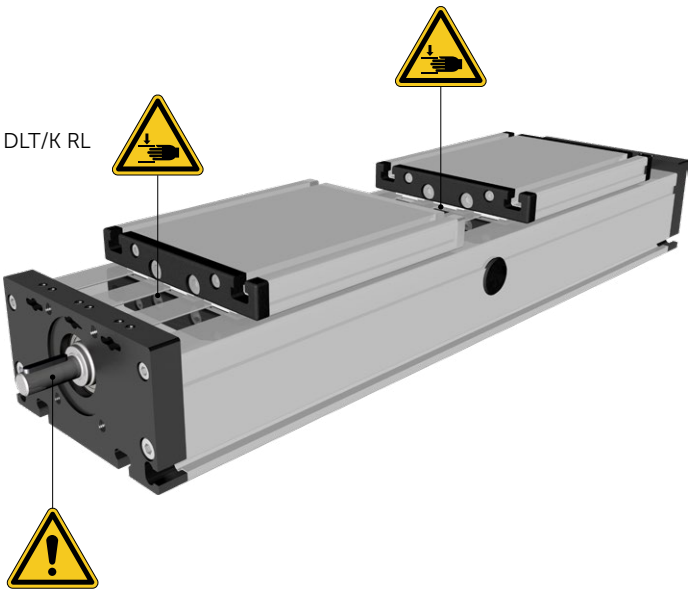
Note	Disconnect before carrying out maintenance or repair
General warning sign	Warning of cutting injuries
Warning crushing of hands	Warning of the risk of being drawn in

2.2 General hazard areas

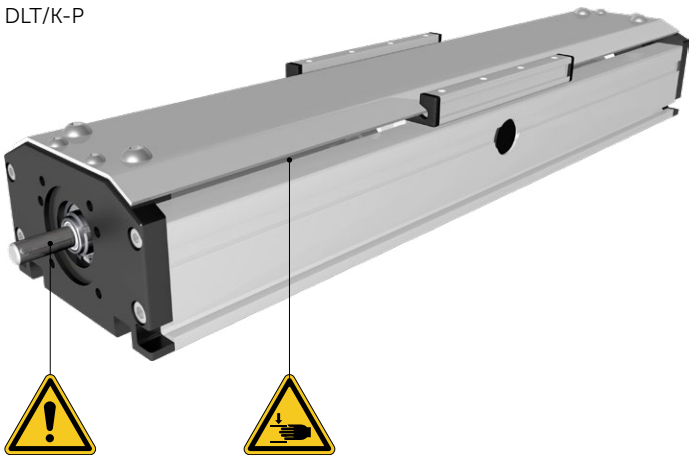
DLT/K



DLT/K RL



DLT/K-P



2.3 Safety instructions

- Any work with the linear system must be carried out in compliance with the current instructions.
- The system may be opened by authorized skilled personnel only. In case of a defect we recommend contacting the manufacturer or returning this linear system for repair.
- Connecting the linear system to an electric power system may be carried out by qualifi ed personnel only; any local connection conditions and regulations (e. g. DIN, VDE) must be observed in this respect.
- The appropriate personal protection equipment (PPE) must be worn during all work.
- Unauthorized modifi cations of the linear system are prohibited due to safety reasons.
- In case of a diagonal or vertical mounting position of the linear system, the carriage must always be secured against fall down (e. g. during mounting, dismantling, maintenance and repair work).
- The transverse forces, torques and speeds determined by Bahr Modultechnik GmbH for this linear system must not be exceeded.
- Following an impact, the toothed belt, the ball rail guide and the runner block must be exchanged - even if there are no visible damages. For information regarding spare parts please see the spare parts list for the corresponding type of linear system.
- The rating plate must always be maintained in a legible condition. The data must be easily retrievable at any time.
- Danger zones are marked by danger symbols for your safety.
- Safety-relevant devices must be inspected with regard to their function, integrity and completeness at regular intervals, at least once a year.

2.4 Storage

The following environmental conditions are prescribed for storing the linear unit:

- no oil contaminated air
- contact with solvent-based lacquers must be prevented
- lowest/highest ambient temperature: 0°C/+60°C
- humidity during storage: storage below dew point is inadmissible
- Supporting the complete surface of the profile body or an appropriate number of support points along the length of the guide profile will prevent the linear unit from deforming.
- Any environmental conditions deviating from the requirements described above will have to be approved by Bahr Modultechnik GmbH.

2.5 Decommissioning/Disassembly

Before starting any work, ensure that the electric drives used are secured against being switched on.

In case of a diagonal or vertical mounting position of the linear system, the carriage must always be secured against fall down (e. g. during mounting, dismantling, maintenance and repair work).Following an impact, the toothed belt, the ball rail guide and the runner block must be exchanged - even if there are no visible damages. For information regarding spare parts please see the spare parts list for the corresponding type of linear system.

2.6 Disposal and return

The linear unit must either be disposed of in an environmentally friendly way according to the applicable directives and regulations, or returned to the manufacturer. The manufacturer reserves the right to charge a fee for the disposal of this linear unit.

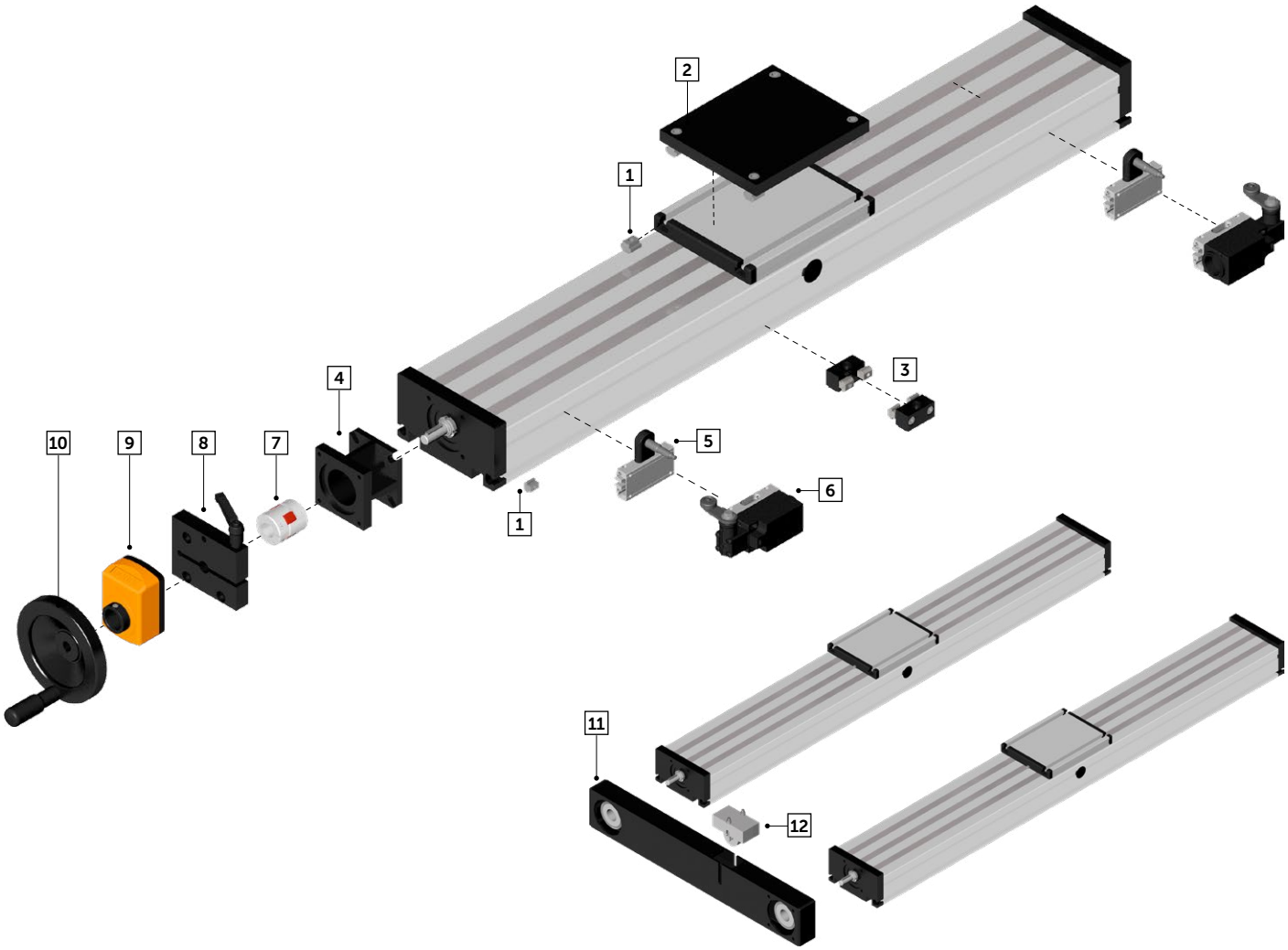
2.7 Responsibility/Warranty

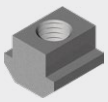
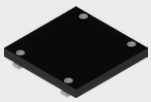
Bahr Modultechnik GmbH does not accept any liability for damages or impairments which occur as a result of modifications of the construction of this linear system by third parties or modifications of protection devices.

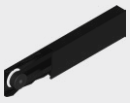
- Only original spare parts may be used for repairs and maintenance.
- Bahr Modultechnik GmbH does not accept liability for spare parts which it has not inspected and approved.
- Safety-relevant devices must be inspected with regard to their function, integrity and completeness at regular intervals, at least once a year.
- We reserve the right to make technical changes to the linear system and to modify or amend these Installations Instructions.
- Requests to Bahr Modultechnik GmbH regarding the availability of earlier versions or adaptations to the current version of the linear system will not be accepted.

2.8 Copyright

3 Overview of accessories/Synchronised Linear Axis



Size	 1 T-nut	 2 Mounting flange	 3 Mounting block	 4 Motor adapter	 5 Limit switch**	 6 Proximity switch**	 7 Coupling
120	*	00966	03001	01561	01101	*	*
160	*	00986	03002	01581	01101	*	*
200	*	00916	03003	01511	01101	*	*

Size	 8 Spindle clamp	 9 Positional indicator	 10 Handwheel	 11 Parallel transfer	 12 Tension device
120	00283	00966	00100	T13061	*
160	00284	00986	00160	T13081	*
200	00285	00916	00222	-	*

* = various versions possible ** = various base holders (switch holders) possible

4 Locking torques

Locking torque guidance values for metric cylinder head screws ISO 4762 with 90% utilisation of the 0.2% yield strength, for a friction coefficient of 0,14.

Dimensions	**Strength 8.8** Locking torques M_A (Nm)	**Strength 10.9** Locking torques M_A (Nm)	**Strength 12.9** Locking torques M_A (Nm)
M4	3,0	4,4	5,1
M5	5,9	8,7	10
M6	10	15	18
M8	25	36	43
M10	49	72	84

5 Mounting optional accessories

5.1 Mechanical or inductive limit switches

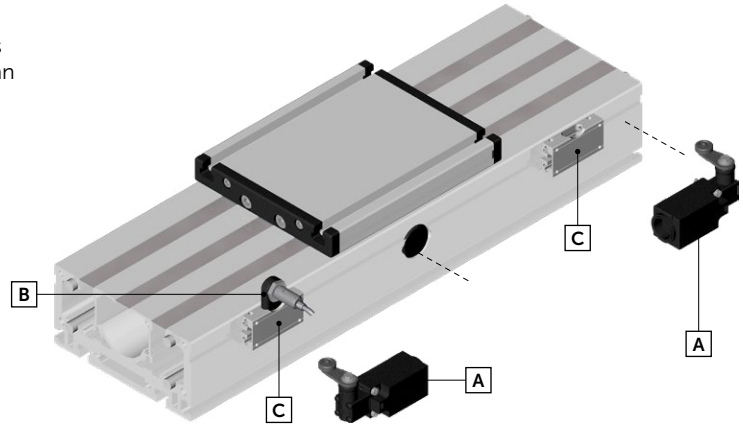
For details regarding the technical characteristics of the limit switches please see the catalogue. Ensure that the cable is laid in a safe way. Avoid damages to the cable e. g. due to small radiuses; this may lead to failure of the system. The cable must not enter the travelling path of the linear system.

A Mechanical limit switch

B inductive limit switch

The switch is installed by means of a connection component which is mounted onto the guide body profile. The connection component can be moved along the guide profile and fixed in the desired position.

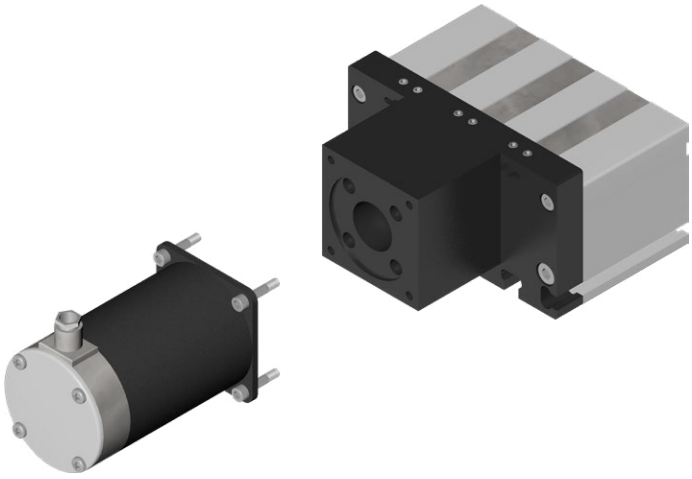
Application example:
Switches and connection components

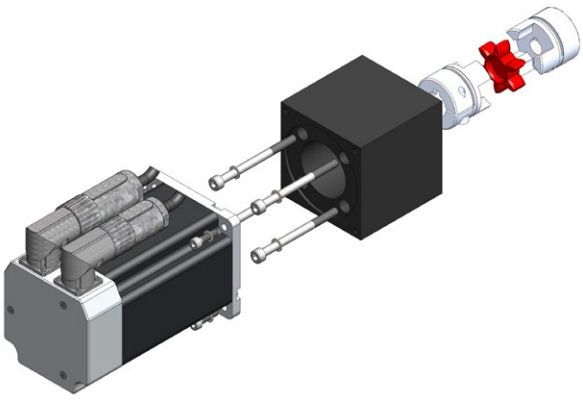


5.2 Mounting Coupling/Adapter/Motor

The motor can be installed on the pulley with or without gears. To ensure that this linear system does not cause a risk, the drive must be designed correctly. The design and manufacture of the motor adapter must ensure that no axial, radial or angular misalignment can occur.

The installation of the motor follows a logical sequence:
One coupling half is mounted on the pivot of the linear system. The second coupling half is mounted on the drive and pushed through the installed motor adapter on the linear system which has been prior equipped with the other coupling half.





5.3 Mounting coupling

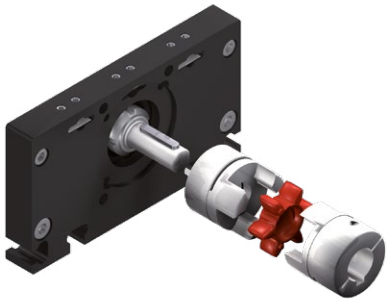
There are two methods to install the motor, either without gears or with a planetary gear. The manufacturing tolerance are very low, therefore we recommend buying the adapter directly from Bahr Modultechnik. Angular misalignments and misalignments with respect to the centre of the adapter can lead to serious damages at the coupling and the bearings. Another source of defect is the possibility that the coupling knobs might hit each other.

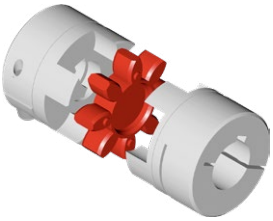
Before installing the motor, the safety distances of 1 mm must be checked.

Installation of coupling and motor - pivot variant with/without feather key

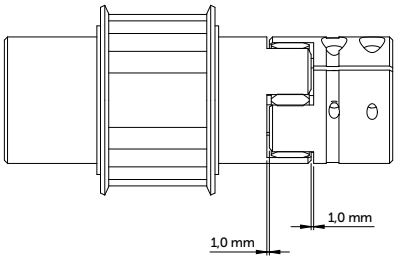
- Clean the pivot and coupling clamping area using solvent
- If necessary, slightly push the coupling hub apart with the help of a screw driver

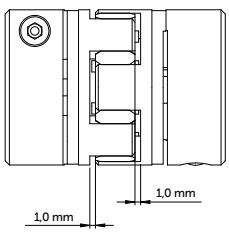
- Push the coupling onto the pivot with the whole hub length and tighten with the permitted torques





- Check the safety distances of the coupling knobs (min. 1 mm)





- Push the motor into the adapter and fix it

6 Maintenance

Before starting any work, ensure that the electric drives used are secured against being switched on.

6.1 Lubrication/Lubricants

All linear systems are delivered EX Works with standard lubrication. Subsequent lubrication intervals are dependent on hours run, degree of loading and environmental factors (wide temperature ranges, high humidity, aggressive environment etc.) and the mileage. The lubricants listed below are used for production and mounting of our linear components. To achieve perfect operation and a useful, prolonged life, we recommend the following products:

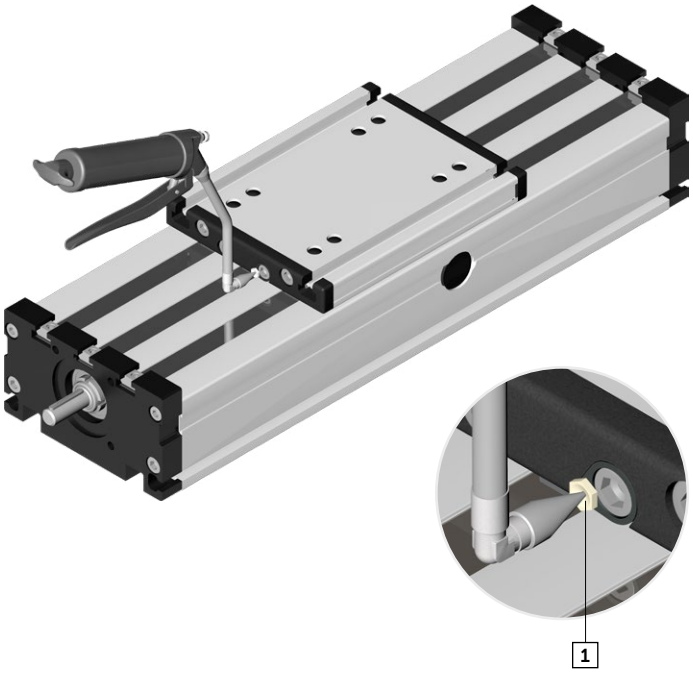
Spindles

Grease LGMT 2 Code-No.: 09002

Guide rods

Paraffin oil Soraja GAM 220 Code-No.: 09001

6.2 Lubrication leading-nut



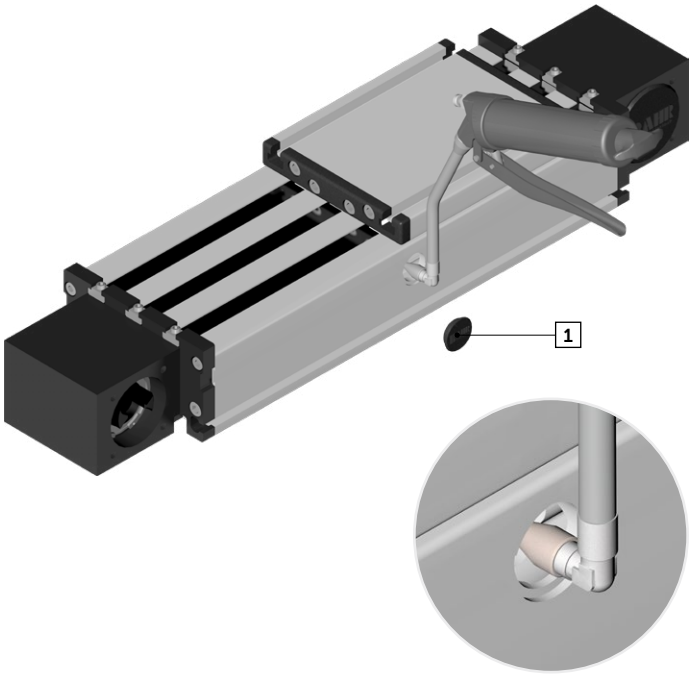
Applies to all linear systems from 2017; maintenance instructions for older systems are available on request.

- The leading-nut can be relubricated through a lubricating nipple (1) in the carriage.
- Regrease with a grease gun.

For the quantity of grease see table below. Spindle greasing every 500 - 1000 working hours.

Size	Pitch	Quantity (g)	Size	Pitch	Quantity (g)
120	Kg 16 x 5	1,33	**120/160**	Kg 25 x 25	3
120	Kg 16 x 10	0,84	**200**	Kg 32 x 5	3
120	Kg 16 x 16	1	**200**	Kg 32 x 10	4
120/160	Kg 20 x 20	3	**200**	Kg 32 x 20	4
120/160	Kg 25 x 5	2	**200**	Kg 32 x 32	4
120/160	Kg 25 x 10	3			

6.3 Lubrication guiding rods



Lubrication is effected by an oiled felt insert. The felt can be re-oiled through lubrication nipples attached laterally to the ends of the roller packs.

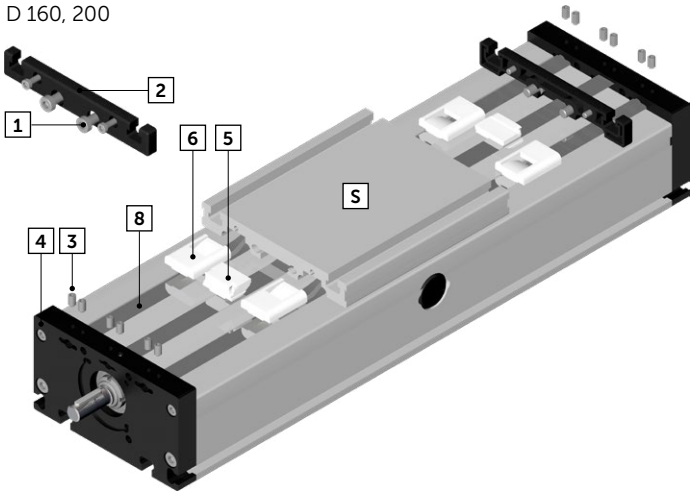
- Dismount cover cap (1).
- Drive the carriage through the service position until you can see the first lubricating nipple in the lubrication hole.
- Re-oiled felt now with an oil gun.
- Move the carriage to the second lubricating nipple and re-oiled here as well.

Oils with a viscosity of approx. 200 mm^2/s at T=40°C are recommended. The required regreasing intervals depend on environmental conditions and the mileage, the standard recommendation is once per month. To ensure a sufficient lubrication, the minimum stroke must equal the carriage length, so that sufficient greasing is achieved also in the final positions.

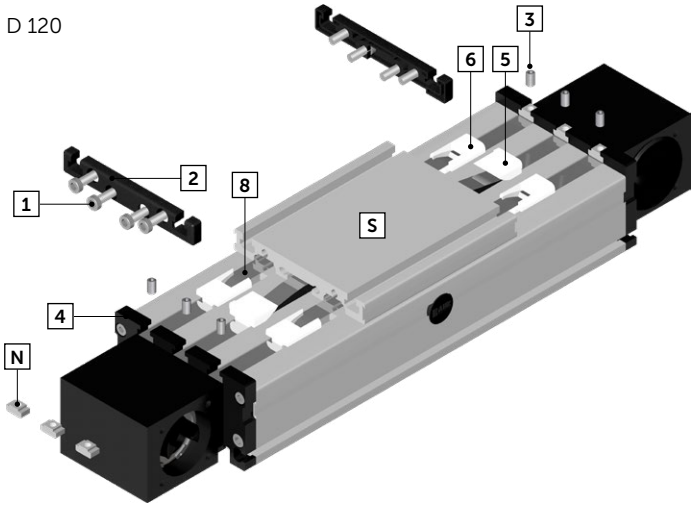
6.4 Changing cover band

YouTube Video

D 160, 200



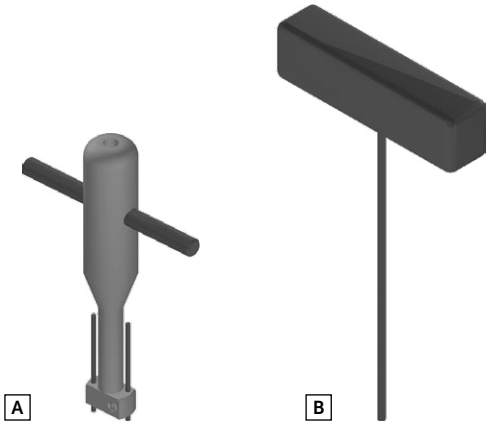
D 120



- Move the carriage (S) to the centre of the unit.
- Remove the cylinder screws (1) of the wiper end plates (2) on both sides of the carriage (S).
- For sizes 160 and 200, loosen the grub screws (3) on both bearing blocks (4).
  For size 120, loosen the tgrub screws and remove with T-nuts (N).
- Pull out the coverbands (8) and the sliders (5) (6).
- Insert the new coverbands (8) into the carriage (S).
- Cut the new coverbands (8) to size and bend them as the other ones.
- Thread the lateral sliders (6) onto the cover strip (8) and insert them into the carriage (S) with the middle sliders (5).
- Tighten the coverbands (8) on one side of the bearing block with the grub screws (3).
- Reinstall the wiper end plates (2) on both sides of the carriage (S).
- On the other side of the bearing block, tighten the coverbands (8) with a pointed pliers and fix them with the grub screws (3).

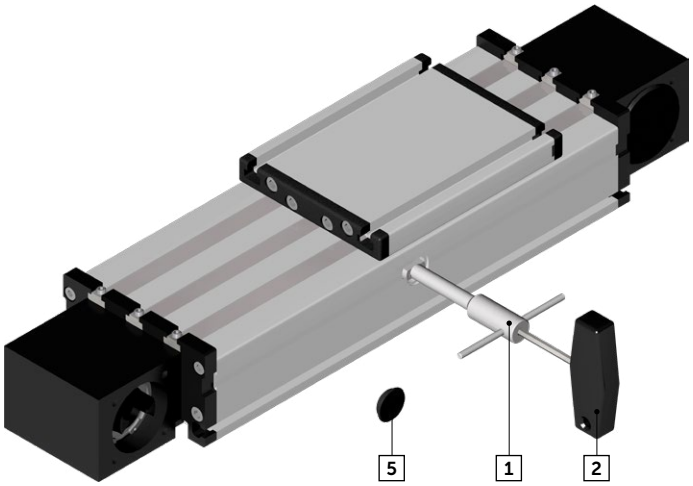
6.5 Tools for adjusting the rollers

	A Eccentric key		B Counter tool
Size	Size	Code-No.	Size
DL 120	LK 10,5 Ø 1,3	09025	SW 3
DL 160	LK 15 Ø 2	09021	SW 4
DL 200	LK 20 Ø 2	09023	SW 6

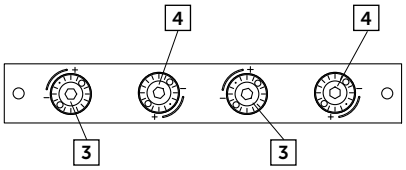


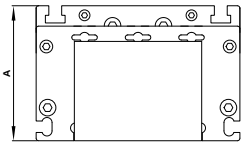
6.6 Adjusting the rollers

YouTube Video



- Dismount cover cap (5) from servicing hole.
- Fasten eccentric bolt with eccentric key (1).
- Release screws with counter tool (2) until the eccentric bolt can be turned.
- Adjust the gap dimension (A) between top of the carriage and body ground of guiding profile by turning the eccentric bolts (3). Turning towards + will increase the dimension A.
  DL 120: A=79 mm; DL 160: A=106 mm; DL 200: A=129 mm
- Turn the eccentric bolts (4) to adjust the carriage free of play by the touch (without initial tension).
- Ensure that the eccentric bolts are adjusted to the right.





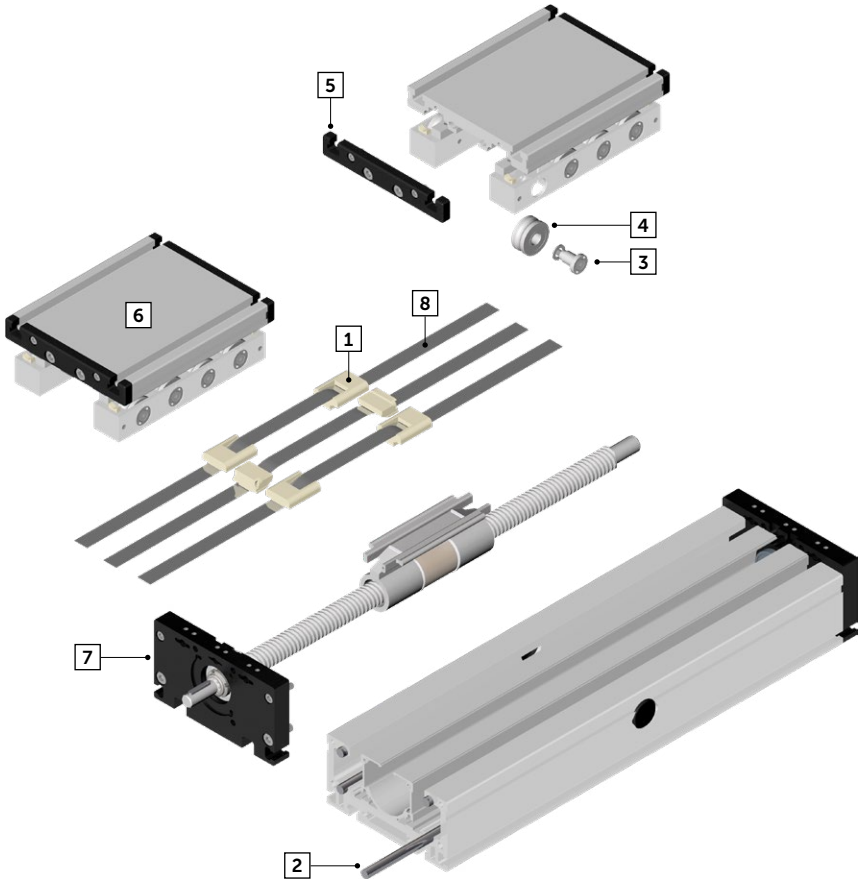
6.7 Replacement spindle insert

YouTube Video

7 Spare part kits

Refer to this overview for the standardized naming of the components and their installation position in the linear axis. Technical deviations are possible and depend on the size and design of the linear axis. When ordering, please always state the ID number (laser marking on linear axis) and, if applicable, the quantity.

1	Gleiter (Satz)
2	Guide rod
3	Excentric
4	Roller
5	Wiper end plate complete
6	Carriage complete
7	Spindle insert
8	Coverband



If necessary, please contact our technical customer service, stating the order number or ID number, in order to rule out errors when ordering spare parts. (The standard version is illustrated)

Size	1	2	3	4	5	6	8
DLT/DLK 120	*	04141	04057	04001	04211	045700	01021
DLT/DLK 160	*	04161	04058	04002	04212	045710	01026
DLT/DLK 200	*	04161	04059	04039	04213	045720	01022
DLT-P/DLK-P 120	-	04141	04057	04001	042110	045731	-
DLT-P/DLK-P 160	-	04161	04058	04002	042120	045733	-
DLT-P/DLK-P 200	-	04161	04059	04039	042130	045735	-

* = various versions possible

7 Spindle insert	
DLK 120	440120-1D
DLK 120 GS	440120-3D
DLK 120-P	440120-4D
DLK 120 R/L	440120-2D
DLK 160	440160-1D
DLK 160 GS	440160-3D
DLK 160-P	440160-4D
DLK 160 R/L	440160-2D
DLK 200	440200-1D
DLK 200 GS	440200-3D
DLK 200-P	440200-4D
DLK 200 R/L	440200-2D

7 Spindle insert	
DLT 120	440120-6D
DLT 120 GS	440120-8D
DLT 120-P	440120-9D
DLT 120 R/L	440120-7D
DLT 160	440160-6D
DLT 160 GS	440160-8D
DLT 160-P	440160-9D
DLT 160 R/L	440160-7D
DLT 200	440200-6D
DLT 200 GS	440200-8D
DLT 200-P	440200-9D
DLT 200 R/L	440200-7D

GS = divided spindle R/L = right/left