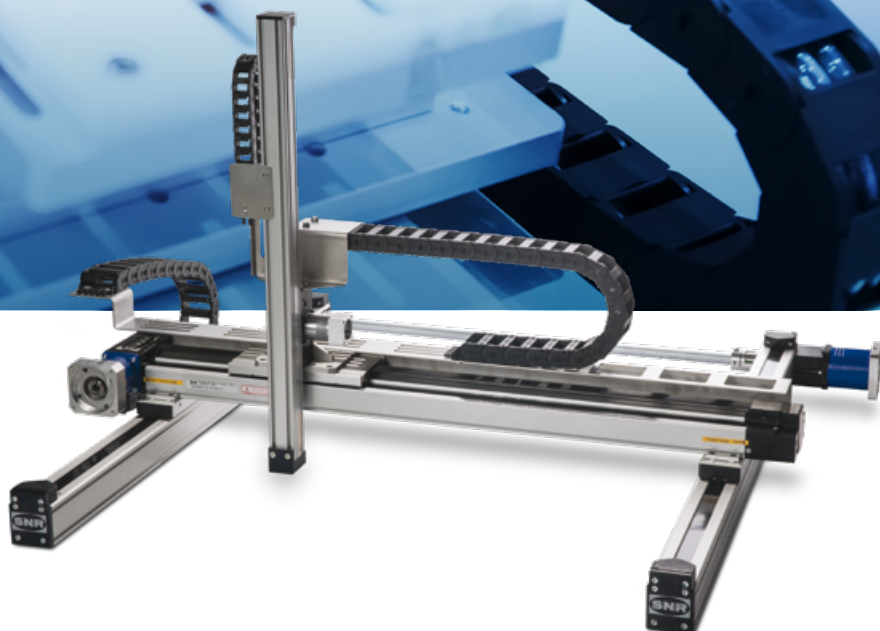# LINEAR MOTION
Linear Axis

INNOVATION DRIVING YOUR PRODUCTION

Movement. It is constantly changing. It is analysed, brought under control, guided and mastered with the aim of deriving maximum benefit. It is more than merely a concept. It is the very essence of our commitment, namely designing and innovating to deliver the perfect solutions to the issues and constraints of today and tomorrow.

There are thousands of us around the world masterminding and developing solutions to raise the bar on your production performance. Our world-leading brands (NTN, BCA, BOWER and SNR) are marketed worldwide and deliver the best-fit solutions for working together and building a more environmentally-friendly society. Follow our lead and use interaction, anticipation and adaptation as the keys to guiding and shaping the future of the manufacturing, automotive and aviation markets.

€ 5.5 BILLION
turnover*

23,000
employees*

The local service of an international partner

118
Sales offices

73
Production sites

15
R&D centres

* as of March 2023

2

LINEAR TECHNOLOGY

German production facility in Bielefeld

We are one of the largest bearing manufacturers in the world in conjunction with the Japanese company NTN.

SNR, one of NTN Europe's brand, has been established in the linear technology market since 1985 and strives to offer a complete and competitive product range. This position allows us to provide our customers with a high level of added value regarding service, quality and product variety.

Our sales support and application engineers are always on hand to offer you optimal support.

The consulting and planning service is based on many years of interdisciplinary experience.

That means less design effort and costs on the part of the users.

Our sales and application engineers will gladly help you with their expertise. We are looking forward to your enquiries. Our goal is to achieve joint, constructive solutions.

Product quality, economic efficiency and high user benefits are the basis of a strategic partnership between

**NTN** and **you – our customer.**

ADVANTAGES:

- Complete program of linear products
- Production facilities in Europe and Asia
- Optimal support by our technical sales and our application engineers near you – worldwide
- State of the art technology (patented solutions)
- State of the art production methods to ensure highest product quality

- Well organized logistic network to ensure on time delivery
- Customized solutions as "genetic code" in our daily business
- Finding out of the most economical solutions together with our valued customers

WE LEAD YOU TOWARDS RELIABILITY AND PERFORMANCE.

SNR
Brand of NTN Group

SNR Linear Axis are universally applicable modules that accommodate the steadily growing requirements for the automation of installation and manufacturing processes. We produce one of the widest ranges of Linear Axis in the market.

The SNR Linear Axis are used in many different applications, such as:

- Machine tool manufacture
- Packaging and printing machines
- Special and general engineering
- Aircraft construction
- Automation and assembly lines
- Wood and paper industry
- Semiconductor industry
- Medical engineering
- and much more
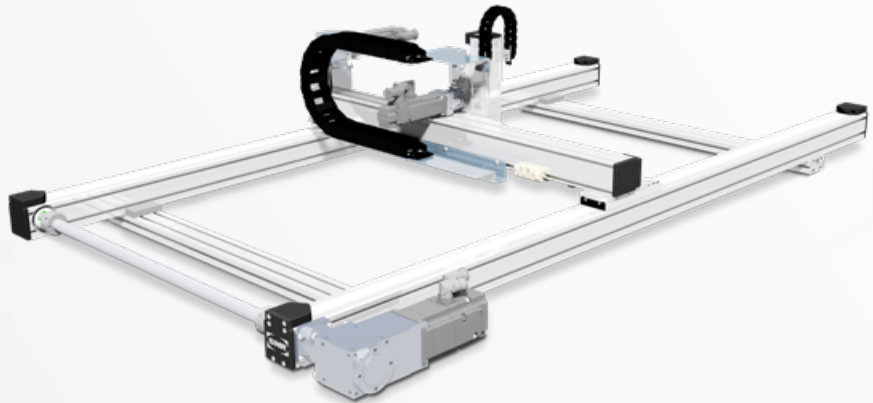
The different series are designed according to a modular principal.

ADVANTAGES:

- Customized solutions according the specific customer request.
- SNR Linear Axis can be nearly arbitrary combined within one series and between different series.
- The Linear Axis can be connected with sliding blocks or special connecting elements.
- Multi axis systems can be equipped with gearboxes, couplings, coupling cones, switches and additional with energy chains.
- Depending on the task, SNR Linear Axis offer not only flexible driving and guiding systems but also allow adequate freedom for customized solutions.
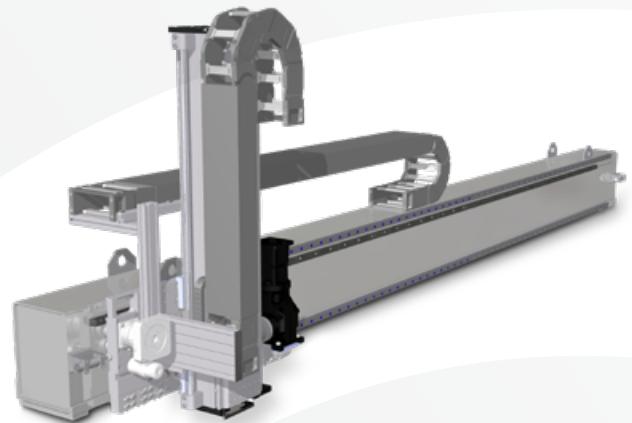
This technical catalogue provides an overview of our Linear Axis range and forms the basis of our discussions with you – our customer.

SNR
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TABLE OF CONTENTS

1.   Technical basics Linear Axis

1.1   Product features

SNR Linear Axis are compact components which contain a combination of guiding and driving elements. The modular design and the ability to combine Linear Axis within a product line and various product lines allow the user to design a simple, time-saving and economical solution for linear movements. The use of high quality components guarantees a high quality and reliability of Linear Axis.

The figures 1.1 to 1.4 show the basic structure of all SNR Linear Axis and their main components:
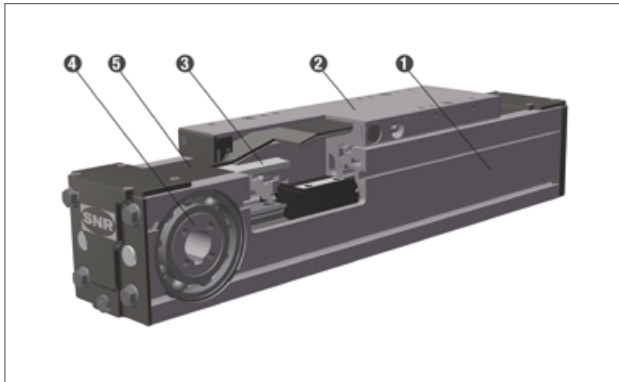
Figure 1.1 — Structure toothed belt axis
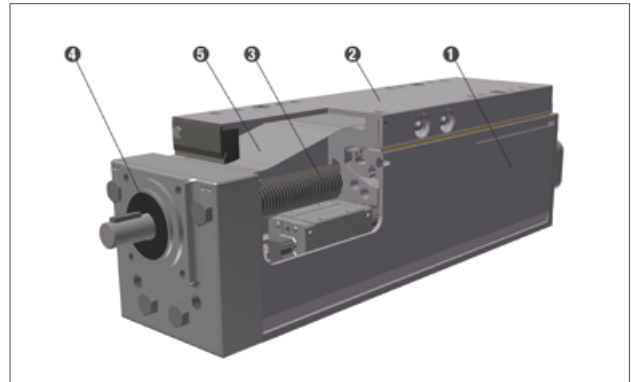
Figure 1.2 — Structure screw drive axis
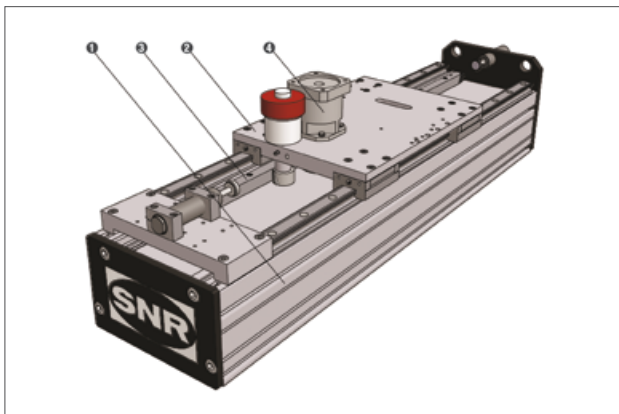
Figure 1.3 — Structure rack-and-pinion axis
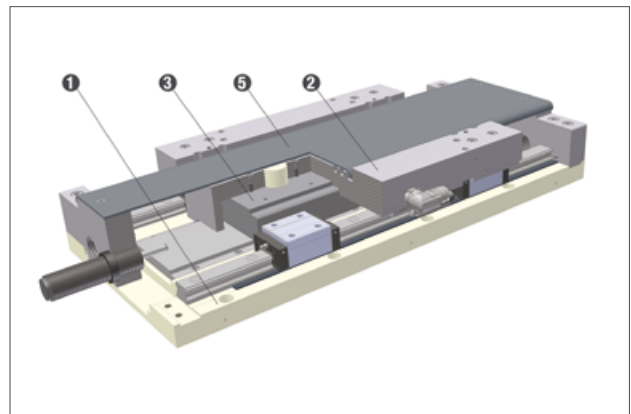
Figure 1.4 — Structure linear motor axis

❶ Base profile
❷ Slider unit with carriages or track rollers
❸ Drive element
❹ Drive unit or drive bearing unit
❺ Cover strip or protection elements (optional)

The base profile holds the guiding rails in case of linear guides or steel shafts in case of track roller guides. The guiding rails are screwed to the profile (Figure 1.5), the steel shafts are pressed into in the profile (Figure 1.6). The base profile is, with few exceptions (AXBG series, AXS from sizee 300 and AXLT), an anodized aluminum profile. The Linear Axis of the AXBG series and special designs of AXS from size 300 and AXLT series are based on steel profiles. The base profile largely determines the stiffness of a Linear Axis.
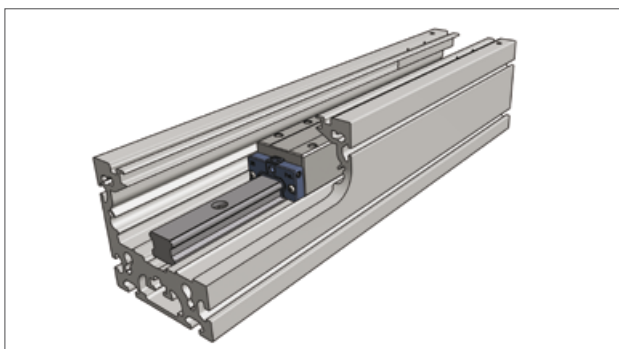
Figure 1.5 — Profile with guiding rails
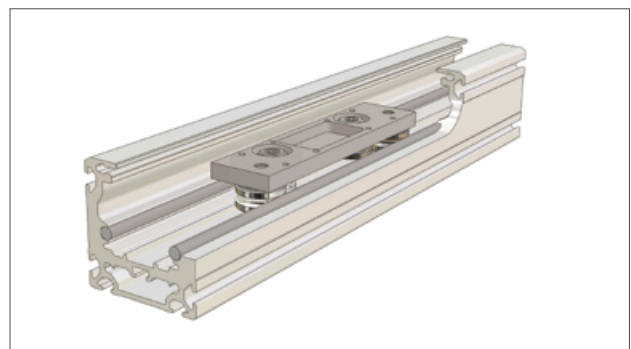
Figure 1.6 — Profile with steel shafts

The slider unit is a complex assembly group which is usually made of an aluminum profile or consists of aluminum components. The carriages or track rollers are mounted to the slider unit. The slider unit also connects the drive elements with the guiding elements of a Linear Axis. At the top side of the slider unit are threaded holes (Figure 1.7) or profile grooves (Figure 1.8) to secure the customer's extensions.
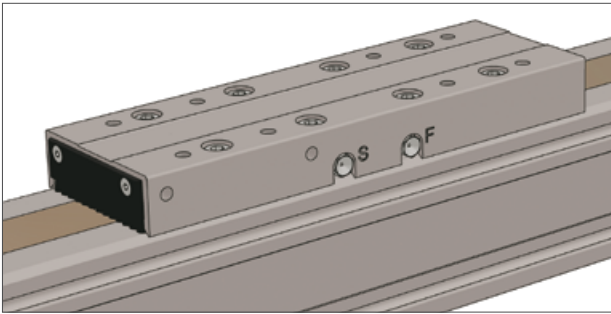
Figure 1.7 — Slider unit with threaded holes
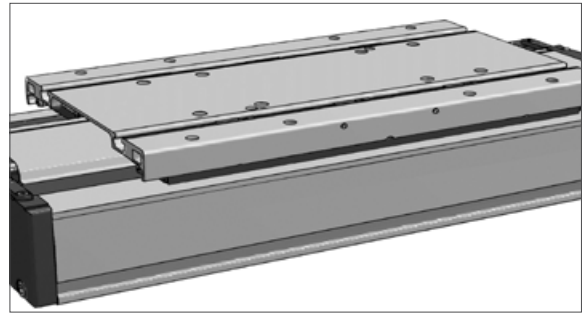
Figure 1.8 — Slider unit with profile grooves

Depending on the series, various sealing elements (Figures 1.9 and 1.10) and the deflection system for cover strips can be integrated into the slider unit (Figure 1.11).
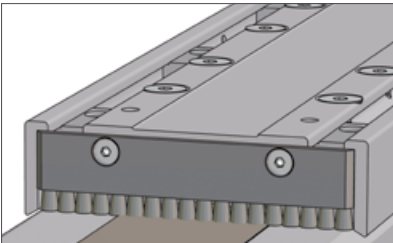
Figure 1.9 — Slider unit with brush wipers
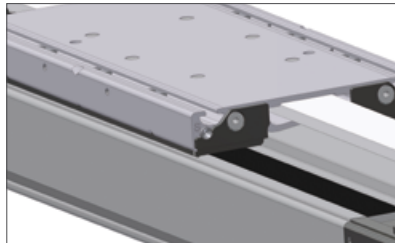
Figure 1.10 — Slider unit with side seals
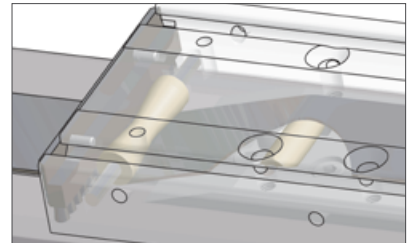
Figure 1.11 — Cover strip deflection in the slider unit

The slider unit also contains the easily accessible service points for the lubrication of the guiding system and the drive elements (Figures 1.12 and 1.13).

Figure 1.12 — Slider unit with laterally placed grease nipples
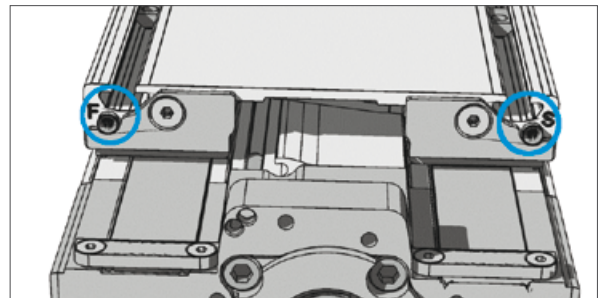
Figure 1.13 — Slider unit with grease nipples on the front side

THE PRODUCT RANGE OF SNR LINEAR AXIS PROVIDES A VARIETY OF BENEFITS:

- Versatile applications by a complete product range from miniature to heavy load axis in almost all industrial sectors
- Different driving and guiding systems combinable
- High load capacity
- High velocity
- Optimized aluminum profiles in popular dimensions
- Standard grooves for sliding blocks
- Exclusive use of high quality components

- Flexible combination of Linear Axis including all connecting elements
- Wide range of accessories for the drive assembly
- Delivery of pre-finished units and complete assembled multi-axis-systems
- In addition, the compact design and the clear forms fulfill the technical criteria as well as providing high reliability
- Wide range of connecting elements and accessories

1.2 Driving systems

Depending on the series, SNR Linear Axis, can be be produced with toothed belt drive, screw drive, rack and pinion drive or linear motor drive.

TOOTHED BELT DRIVE

Linear Axis with toothed belt drive are suitable for fast handling and positioning applications. All axis are equipped with AT or STD toothed belt. These are extruded polyurethane belts with integrated steel cords. The AT toothed belts are carried out in the zero-gap shape. The use of black toothed belts prevents discoloration of the toothed belts under UV - radiation. These toothed belts are also characterized by the following properties:

- Low wear
- Maintenance free
- High tensile strength and low elongation
- High precision – Pitch error ± 0,2mm/m
- UV – resistant
- Temperature range -10°C to +75°C
- Low noise level
- Versions with approval for the food industry

The special design of the toothed belt clamping via toothed segments (Figure 1.14) allows an unweakened clamping of the belt.
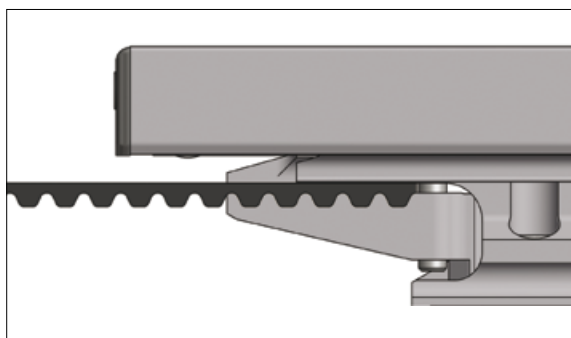
Figure 1.14 — Toothed belt clamping

The adjustment of the toothed belt tension for SNR Linear Axis is done by a radially moveable deflecting pulley (Figure 1.15).
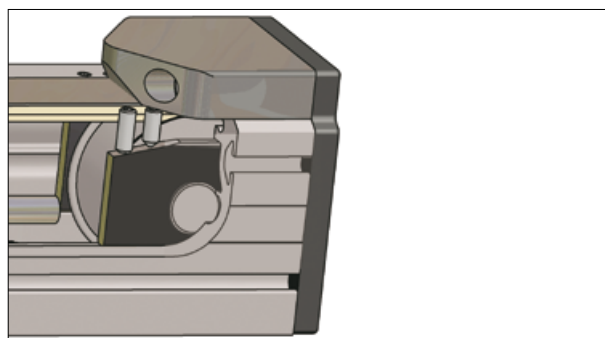
Figure 1.15 — Toothed belt tension

The setting of the correct toothed belt tension is made by a SNR measuring device with which the exact tension will be adjusted with the help of a force sensor (Figure 1.16).

Thus, there is no risk of overloading of the toothed belt or the failure of the pulley bearing due to excessive toothed belt tension. Furthermore, optimum driving characteristics by a centered alignment and low wear are ensured.

Advantages of toothed belt axis

- High dynamic
- Great lengths realisable
- Cost efficient
- Maintenance free drive element
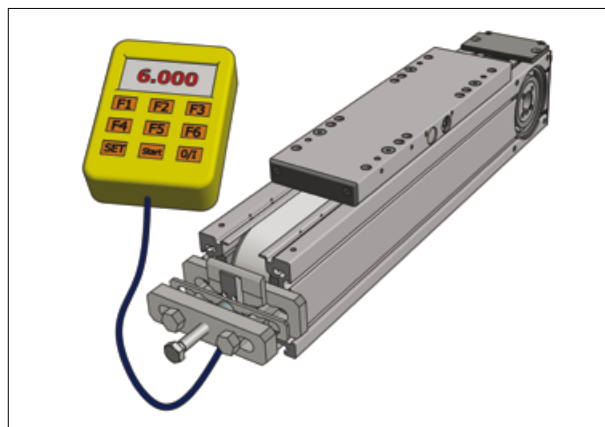
Figure 1.16 — Measuring device for the toothed belt tension

SCREW DRIVE

Linear Axis with screw drive can be equipped with ball screws (Figure 1.17) and with trapezoidal screws. Screw drives are especially suitable for high requirements for positioning accuracy and repeatability in combination with high rigidity of the driving element. The drive adaptation can be done directly by coupling and coupling cone or with a deflection belt drive.
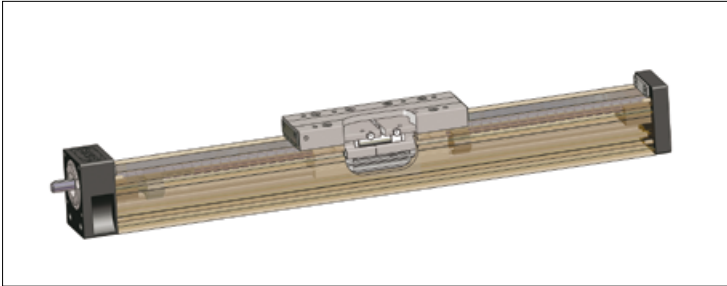
Figure 1.17 — Linear Axis with screw drive

In order to achieve a high velocity even at longer lengths, it is possible to equip the Linear Axis of the AXC and AXDL series with one or more sets of screw drive support units (Figure 1.18).
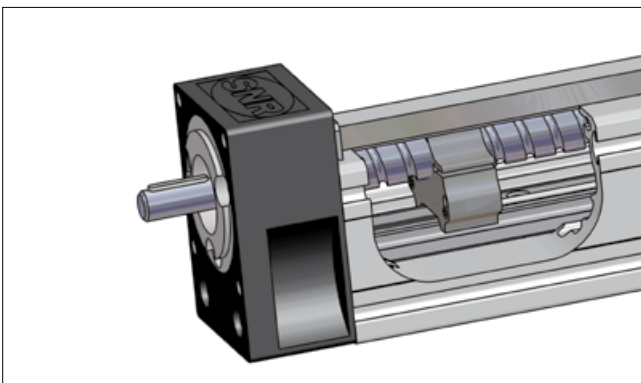
Figure 1.18 — Support unit

Advantages of screw drive axis

- Long strokes with high position accuracy
- Long strokes with high velocity by the optional use of screw drive support units
- A choice of various pitches
- Self-locking when using trapezoidal screws
- High feeding forces
- High rigidity of the drive element
- Usually no gearbox necessary

RACK AND PINION DRIVE

Linear Axis with rack and pinion drive are characterised by a very high reliability and are therefore particularly suitable for vertical applications. It is possible to line up any number of rack segments (Figure 1.19). The inductive hardened racks and pinions (Figure 1.20) ensure a very long service life.
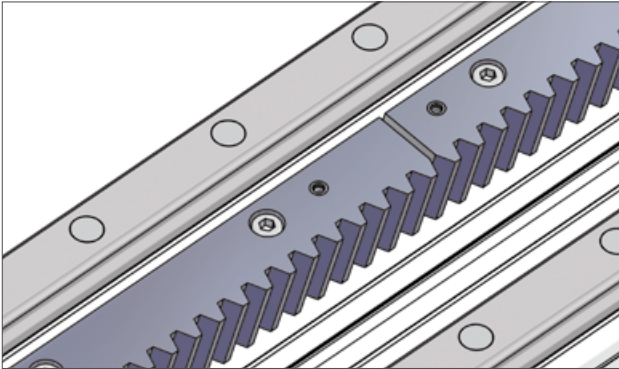
Figure 1.19 — Rack segments
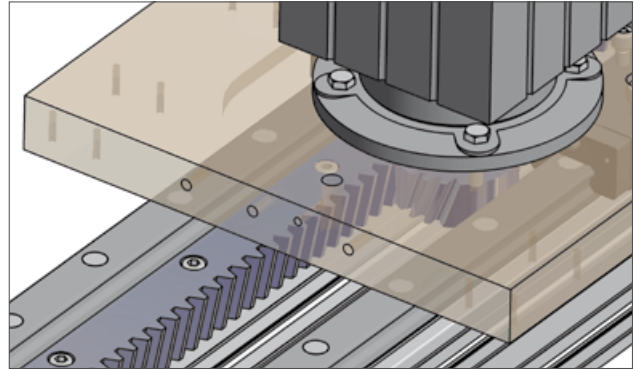
Figure 1.20 — Rack and pinion

Advantages of linear motor axis

- Theoretically unlimited length possible
- Several drive units possible
- High feeding forces
- Highest rigidity of the drive element even with high loads

LINEAR MOTOR DRIVE

For Linear Axis with linear motor drive there is no mechanical conversion of a rotary into a translatory movement necessary. For this reason, a linear motor is described as linear direct drive. The driving force is directly generated by a motor integrated in the slider unit (Figure 1.21).
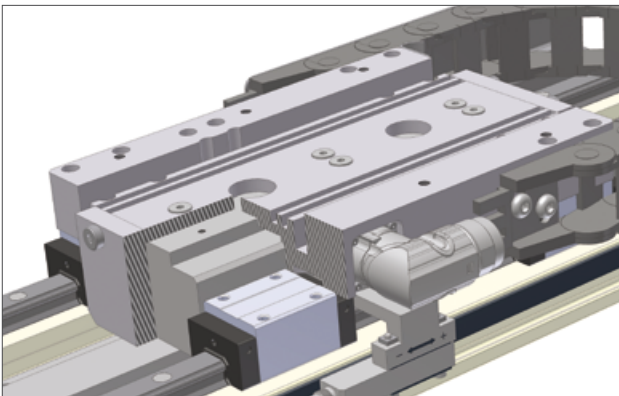
Figure 1.21 — Linear motor

Advantages of linear motor axis

- Theoretically unlimited length possible
- Several drive units possible
- Highest position accuracy and repeatability
- Very high velocity and acceleration
- Maintenance and wear free drive element
- Very low noise level

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1.3   Guiding systems

SNR Linear Axis can, depending on the series, be equipped with linear guides or various kinds of track roller guides.
These selection possibilities allow an extremely flexible reaction to the requirements of the application and the environmental conditions and to choose the optimal configuration of the Linear Axis. If Linear Axis are used as a pure driving element, a version without guiding elements is possible.

LINEAR GUIDES

SNR Linear Axis of all series are equipped with linear guides with ball chain technology (Figure 1.22). By the arrangement of raceways at a 45° angle, the SNR Linear guides can be used universally and have equal load ratings in all main load directions.

Among the special features of SNR Linear guides with ball chain have integrated lubricant reservoirs. Usage of these linear guides has the following advantages:

- High load ratings
- High service life lime
- Long-term maintenance free
- Low temperature generation
- High tolerance compensation capacity and error compensation by DB Configuration of the raceways
- Low noise level
- High running smoothness
- High velocity up to 5 m/s
- High acceleration up to 50 m/s^2
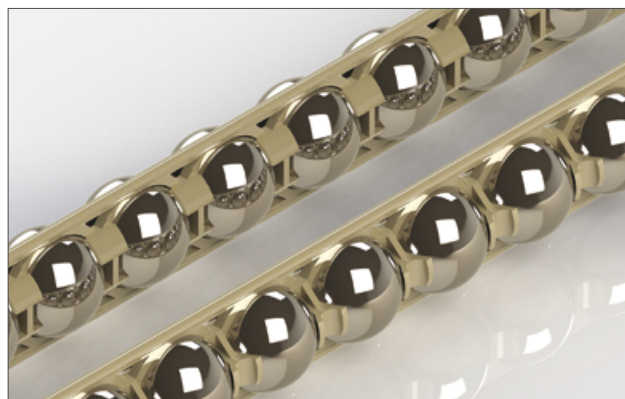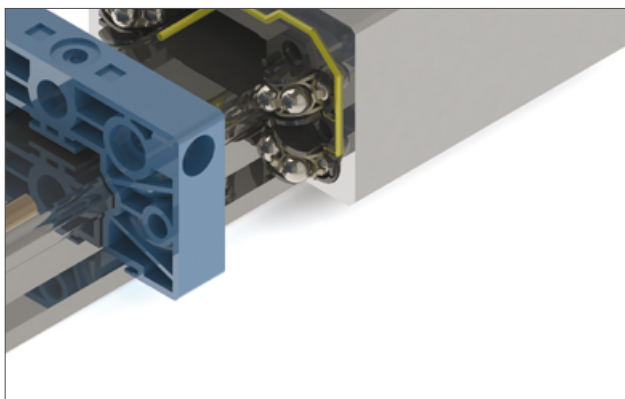
Figure 1.22 — SNR Linear guides with ball chain

TRACK ROLLER GUIDES

As track roller guides, various types of rollers can be used, depending on the series.

All sizes of AXC and AXDL series are available with track roller guides in steel design (Figure 1.23).

This system consists of track rollers which are running on hardened, ground steel shafts which are pressed into the aluminum profile. The steel shafts are permanently re-lubricated from outside with lubricating oil from a refillable oil reservoir. The track rollers are dustproofed two-row angular contact ball bearing with profiled outer ring.

Through an eccentric mounting of the half of the track rollers, the guiding system can be settled exactly, and gets always the right preload or zero backlashes from our production.

This technology ensures an excellent running performance and offers the following advantages:

- Very cost efficient guiding system, especially for long strokes
- Long service life time by the use of dustproofed and pre-lubricated track rollers placed inside the profile
- Very high velocity up to 15 m/s
- High acceleration up to 50 m/s^2

Figure 1.23 — SNR Linear Axis with track roller guide

Linear Axis of the AXF series can be equipped optionally with polymer track rollers (Figure 1.24) as guiding system. In this variant, the rollers are running directly on the surfaces of the aluminum profile. The adjustment of the preload is realised via a spring element in the two-part slider unit during the assembly process.
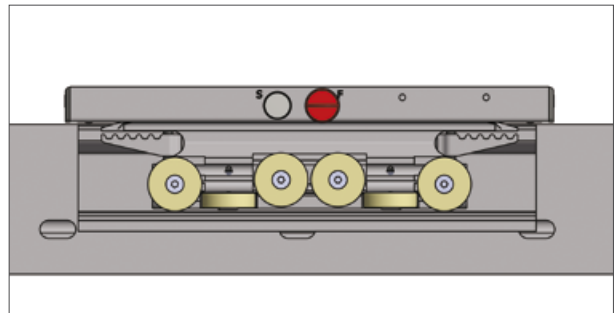
Figure 1.24 — SNR Linear Axis with polymer track roller guide

The polymer track rollers are connected with the slider unit by sliding bearings. Linear Axis with this guiding system can be used even in wet areas, in areas with heavy contamination or in contact with aggressive media.

This guiding system is characterised by the following features:

- Very high chemical resistance
- Maintenance free and dirt resistant track rollers
- Good mechanical dumping performance
- Inside of the profile arranged track roller system
- Very high velocity up to 7 m/s
- High acceleration up to 30 m/s^2

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1.4   Selection criteria

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│              Description of the application                   │◄──┐
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┌─────────────────────────────────────────────────────────────┐   │
│              Selection of the drive element                   │   │
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        │           │              │               │               │
┌──────────┐  ┌──────────┐  ┌──────────────┐  ┌──────────────┐    │
│Toothed belt│ │Screw drive│  │Rack and pinion│  │ Linear motor │   │
└──────────┘  └──────────┘  └──────────────┘  └──────────────┘    │
     │           │               │               │                 │
┌─────────────────────────┐      │               │                 │
│  Selection of the series │      │               │                 │
└─────────────────────────┘      │               │                 │
            │                     │               │                 │
┌─────────────────────────────────────────────────────────────┐   │
│            Preliminary selection of the size                  │◄──┤
└─────────────────────────────────────────────────────────────┘   │
                            │                                      │
┌─────────────────────────────────────────────────────────────┐   │
│  Description of the static load of the guiding and drive system│  │
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                            │                                      │
┌─────────────────────────────────────────────────────────────┐   │
│  Determining of the equivalent static load of the guiding and │   │
│                       drive system                             │  │
└─────────────────────────────────────────────────────────────┘   │
                            │                                      │
┌─────────────────────────────────────────────────────────────┐   │
│  Check-up of the static load capacity of the guiding and drive │──┘
│                       system                                   │
└─────────────────────────────────────────────────────────────┘
                            │
┌─────────────────────────────────────────────────────────────┐
│  Description of the dynamic load of the guiding and drive system│
└─────────────────────────────────────────────────────────────┘
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┌─────────────────────────────────────────────────────────────┐
│  Determining of the equivalent dynamic load of the guiding and │
│                       drive system                             │
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│  Check-up of the dynamic load capacity / life time of the      │
│               guiding and drive system                         │
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│        Description of the maximum system deformation           │
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│          Determining of the system deformation                 │
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│          Check-up of the system deformation                    │
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│        Description of the enviromental conditions              │
└─────────────────────────────────────────────────────────────┘
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┌─────────────────────────────────────────────────────────────┐
│  Selection of the configuration versions, safety options,      │
│            accessories and lubricant                           │
└─────────────────────────────────────────────────────────────┘
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┌─────────────────────────────────────────────────────────────┐
│        Determining of the maintenance interval                 │
└─────────────────────────────────────────────────────────────┘
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┌─────────────────────────────────────────────────────────────┐
│            Determining of the type code                        │
└─────────────────────────────────────────────────────────────┘
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2. System technology

2.1 Definition

Linear Axis are pre-finished units with a combination of precise guiding and driving elements. Thereby Linear Axis with their variations are cost efficient and extremely compact components for machines and systems which could be mounted and placed into operation within a short time.

The selection of Linear Axis could be based on following criteria:

POSITIONING REPEATABILITY	When positioning repeatability, an arbitrary point is approached several times in one direction from the same starting point and the deviation to the target value can be measured. The process is repeated for different points. ± 50% of the difference between maximum and minimum deviation is given as positioning repeatability.
POSITION ACCURACY	When measuring the positioning accuracy several points are approached in one direction and the difference between target travel distance and actual travelled distance measured. The position accuracy is the absolute maximum difference.
RUNNING PARALLELISM	The dial gauge is centrally mounted on the carriage and moved over the complete stroke. The running parallelism is the maximum difference between the measured values.
BACKLASH OF BALL SCREWS	The slider unit is moved by the ball screw against a dial gauge as a reference point. Then, the carriage will be loaded in the same direction by an external force and then unloaded. The backlash is the maximum difference between the reference point and the position after loading and unloading.
STARTING TORQUE	The starting torque is the drive torque which is necessary to overcome the static friction of the system and to start the motion.

For the selection of SNR Linear Axis, our sales and application engineers with years of experience are also available.

2.2 Declaration of incorporation for partly completed machinery (Machinery directive 2006/42/EG)

The manufacturer NTN WAELZLAGER GMBH, Friedrich-Hagemann-Straße 66, D-33719 Bielefeld, Germany hereby declares that the components of the partly completed machinery from the series "Linear Axis AX" and "Linear Axis Systems AS":

- 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 transwith in case of a reasoned request by the national authorities the relevant technical documentation in accordance with part B of Annex VII.

- The above mentioned relevant technical documentations can be obtained from The QC Department, NTN WAELZLAGER GMBH, Friedrich-Hagemann-Straße 66, D-33719 Bielefeld, Germany.

- The conformity is in accordance with the EN ISO 12100 2010 "Safety of machinery - General principles for design - Risk assessment and risk reduction".

- Commissioning is prohibited until it has been determined that the machine in which the Linear Axis or the Linear Axis system is to be installed complies with the provisions of the machinery directive 2006/42/EG.

Ulrich Gimpel
(General Manager Lead Center Linear Motion)
Bielefeld, Germany

2.3 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, harmonized 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 information about mounting, start-up, maintenance and lubrication must be understood and observed.

In addition, operating equipment poses a risk of injury due to rotating or otherwise moving components. Due to moving carriages, operational Linear Axis particularly poses an increased crushing hazard, especially in connection with end position dampers and limit switches. The user must carry out a detailed machinery risk assessment to identify hazards to all operators with signs or written codes of conduct which are compliant with any local regulations. Alternatively, the user may 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 Axis start-up is prohibited until it can be established that the machine or system in which it is mounted conforms to EU machinery directives, harmonized standards, European standards or applicable national standards.

2.4 Intended use

SNR Linear Axis and SNR Linear tables are fundamentally designated for linear movement as occurs during positioning, synchronization, transport, palletizing, loading, unloading, clamping, tightening, testing, measuring, handling and manipulating components or tools. Type-specific load data from our relevant catalogue documentation and/or our supplementary technical calculations must be observed.

Furthermore, an operating temperature between –10°C to +75°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.

2.5 Coordinate system

The Linear Axis can be loaded by forces or torques. The coordinate system (Figure 2.1) shows the forces acting in the main load directions, the torques as well as the six degrees of freedom.

Forces in the main load directions:
Fx Movement force (X-direction)
Fy Tangential load (Y-direction)
Fz Radial load (Z-direction)

Moments:
Mx Torque in roll direction (rotation around the X-axis)
My Torque in pitch direction (rotation around the Y-axis)
Mz Torque in yaw direction (rotation around the Z-axis)
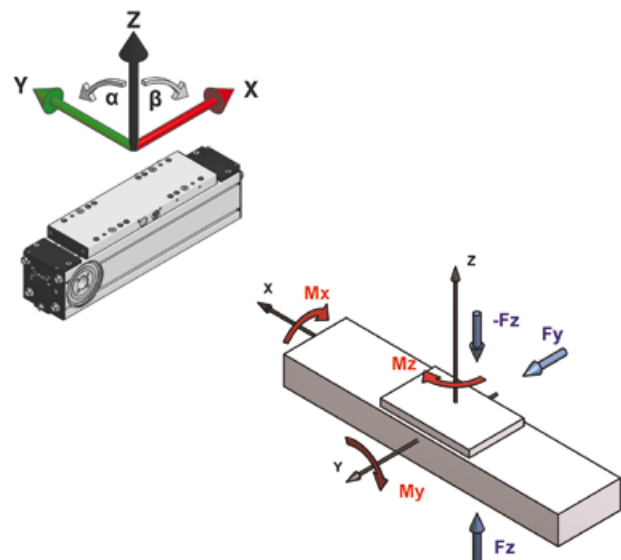
Figure 2.1 Coordinate system

2.6 Static load capacity

The values of the static load capacity given in the data tables of the Linear Axis (except AXBG) represent the maximum load that can be applied.

The loads (radial and tangential) and moments can act simultaneously from different directions on the Linear Axis (Figure 2.2).
In this case, a maximum equivalent load, consisting of radial, tangential and other loads, used for verification. For this, the position must be located within the movement cycle in which the combination of all loads has the maximum value.
For complex loads, we recommend to contact our application engineers.
A minimum safety factor for static load capacity is not given here.

The static load capacity should not be mixed up with the static load rating that is specified in calculation of linear guides. Only for the axis of the series AXBG the static safety is to be determined because the loads affect here on the carriages directly.

The static load capacity of a Linear Axis results from the maximum load capacity of all related components in their interaction and is lower than the static load rating of the guiding system.

An additional check of the static safety of the guiding system is not necessary.

If a Linear Axis is subjected in static alternating loads use, the values of the dynamic load capacity shall be recognized as the maximum values.

$$F_E = |F_Y| + |F_Z|$$
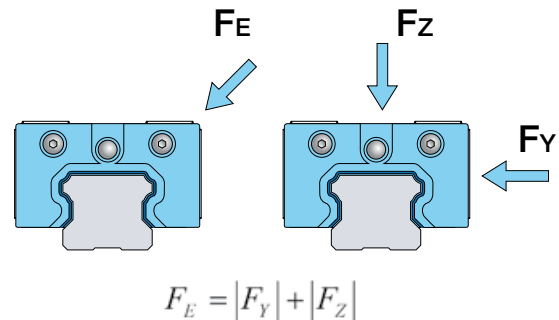
Figure 2.2 — Equivalent load

2.7 Life time

2.7.1 Dynamic load capacity / Nominal life time

The catalogue data to the dynamic load capacity of the Linear Axis (except AXBG) based on the nominal life time of 50,000 km for toothed belt axis, of 25,000 km for screw drive axis and of 10,000 km for Linear Axis with polymer track roller guides. The change of the nominal lifetime depending on the load is shown in Figure 2.3.
If the loads are lower than the described limits, no further investigation is necessary.
If the nominal life time of the Linear Axis should be calculated, the calculation basics for linear guides, ball screws, racks and track rollers, which are described in the relevant catalogue, must be applied.
For Linear Axis of the AXBG series this calculation rules are always applicable.
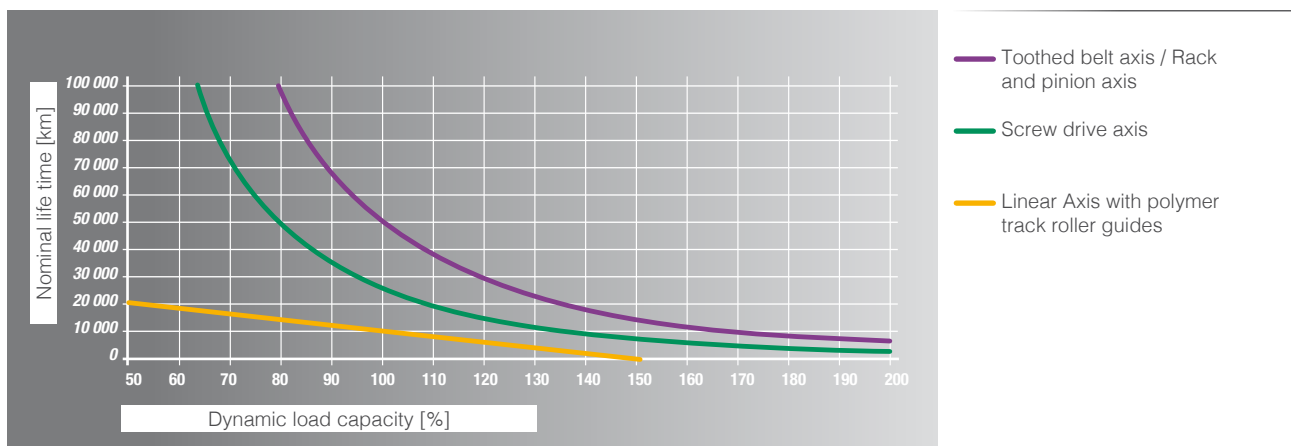
Figure 2.3 — Nominal life time

In case of higher dynamic loads, please contact our application engineers or use for complex loads our calculation service.

2.7.2 Influence factors

For a calculation of the nominal life, it is often very difficult, to determine the real acting loads exactly.

- Linear Axis are usually subject to oscillations or vibrations caused by the process or driving forces.
- Linear Axis are to be dimensioned so that the load peaks of shocks do not exceed the maximum permissible loads. This applies to the dynamic and the static state of the system.

2.8 Rigidity

The rigidity of a Linear Axis is specified by the corelation between the external load and the resulting elastic deformation in the load direction.
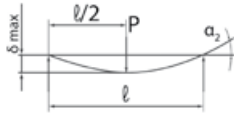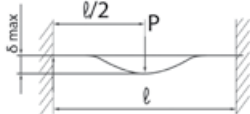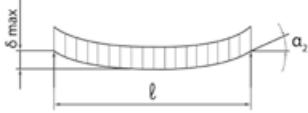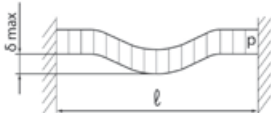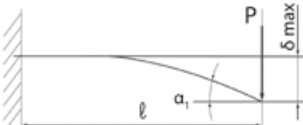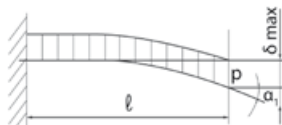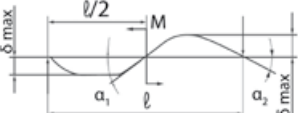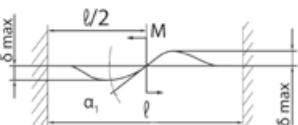
The rigidity is an important parameter for the selection of the Linear Axis because the rigidity values are changing depending on the type and version of the SNR Linear Axis. Essentially, the rigidity of the Linear Axis is determined by the rigidity of the aluminum profile.

The total deformation of a system still depends on the following external factors:

- Kind of the loads (point loads, line loads or moment loads)
- Kind of the fixation of the Linear Axis
- Length of the Linear Axis
- Distance of the fastening points

Some examples of calculation of the bending of the Linear Axis are shown in Table 2.1.

Table 2.1 — Bending of Linear Axis

Kind of bearing	Kind of load	Specification	Bending	Bending angle
Support - Support	Point load		$\delta_{max} = \dfrac{Pl^3}{48EI}$	$\alpha_1 = 0$ $\tan\alpha_2 = \dfrac{Pl^2}{16EI}$
Fixed - Fixed	Point load		$\delta_{max} = \dfrac{Pl^3}{192EI}$	$\alpha_1 = 0$ $\alpha_2 = 0$
Support - Support	Line load		$\delta_{max} = \dfrac{5pl^4}{384EI}$	$\tan\alpha_2 = \dfrac{pl^3}{24EI}$
Fixed - Fixed	Line load		$\delta_{max} = \dfrac{pl^4}{384EI}$	$\alpha_2 = 0$
Fixed - Free	Point load		$\delta_{max} = \dfrac{Pl^3}{3EI}$	$\tan\alpha_1 = \dfrac{Pl^2}{2EI}$ $\alpha_2 = 0$
Fixed - Free	Line load		$\delta_{max} = \dfrac{pl^4}{8EI}$	$\tan\alpha_1 = \dfrac{pl^3}{6EI}$ $\alpha_2 = 0$
Support - Support	Moment load		$\delta_{max} = \dfrac{\sqrt{3}Ml^2}{216EI}$	$\tan\alpha_1 = \dfrac{Ml}{12EI}$ $\tan\alpha_2 = \dfrac{Ml}{24EI}$
Fixed - Fixed	Moment load		$\delta_{max} = \dfrac{Ml^2}{216EI}$	$\tan\alpha_1 = \dfrac{Ml}{16EI}$ $\tan\alpha_2 = 0$

2.9 Dynamic operating load

The existing dynamic operating load must be determined and compared with the permissible dynamic operation load for Linear Axis with toothed belt drive.

The dynamic operating load is calculated by the formula [2.2].

$$F_{z\,dyn} = \frac{T_0 * 2\pi}{P} + m*a + m*g*\sin\alpha$$ [2.2]

$F_{z\,dyn}$	Existing dynamic operating load [N]
T_0	Idling speed torque [Nm]
P	Feed constant [m]
m	Moved mass [kg]
a	Acceleration [ms^{-2}]
g	Gravity constant [9,81 ms^{-2}]
$\propto$	Assembling position [°]

$$F_{z\,dyn\,0} \geq F_{z\,dyn}$$ [2.3]

$F_{z\,dyn\,0}$	Permissible dynamic operation [N]
$F_{z\,dyn}$	Existing dynamic operation [N]

2.10 Precision

The running parallelism of Linear Axis is mainly determined by the tolerances of the used aluminum profiles. The profiles used by us meet or exceed the requirements of EN12020-2 for precision profiles.

Linear Axis with toothed belt / Ω - drive of the series AXDL_A and lifting axis of the series AXS, which usually unsupported used, are produced with improved straightness in limited length. The maximum length therefore are specified in the data tables. By the profile machining a straightness of 0.1 mm / m is achieved in this Linear Axis.

The most common requirement in applications of Linear Axis is the repeatability. These values are in the data tables for all SNR Linear Axis specified. More details are only available in the data tables for the SNR precision axis AXBG made on steel base.

For more information please contact our application engineers.

2.11 Gearbox selection

For the selection of the gearbox for a Linear Axis the following should be considered:

- Maximum operating speed
- Maximum acceleration torque
- Nominal torque on the drive

These parameters are manufacturer information which take into account the mechanical and thermal limits of the gearbox and that are not allowed to be exceeded.

2.11.1 MAXIMUM OPERATION SPEED

$$n = \frac{v * 60}{P}$$

[2.4]

n	Existing operation speed [min^{-1}]
v	Velocity [ms^{-1}]
P	Feed constant [m]

$$n_{max} \geq n$$

[2.5]

n$_{max}$	Maximum permissible operation speed [min^{-1}]
n	Existing operation speed [min^{-1}]

2.11.2 MAXIMUM ACCELERATION TORQUE

$$T_{max} = T_0 + \frac{m * a * P}{2\pi} + \frac{m * g * \sin \alpha * P}{2\pi}$$

[2.6]

T$_{max}$	Existing acceleration speed [Nm]
T$_0$	Idling speed torque [Nm]
P	Feed constant [m]
m	Moved mass [kg]
a	Acceleration [ms^{-2}]
g	Gravity constant [9,81 ms^{-2}]
$\propto$	Assembling position [°]

$$T_{a\,max} \geq T_{max}$$

[2.7]

T$_{a\,max}$	Maximum permissible acceleration torque [Nm]
T$_{max}$	Existing acceleration torque [Nm]

2.11.3 NOMINAL TORQUE ON THE DRIVE

$$T = T_0 + \frac{m * g * \sin \alpha * P}{2\pi}$$

[2.8]

T	Excisting torque on the drive [Nm]
T$_0$	Idling speed torque [Nm]
P	Feed constant [m]
m	Moved mass [kg]
g	Gravity constant [9,81 ms^{-2}]
$\propto$	Assembling position [°]

$$T_a \geq T$$

[2.9]

T$_a$	Permissible nominal torque on the drive [Nm]
T	Existing torque on the drive [Nm]

2.12 Drive calculation

- We provide, as a customer service, the assembling of drives provided by the customer.
- We assume no warranty for the calculation of the provided drive.
- Calculations of drives are carried out exclusively by the respective drive manufacturer.
- The reason for this is that we do not have all necessary calculation tools and basic data of these drives.

2.13 Selection of Linear Axis with toothed belt drive for 90 ° tilt mounting (wall mounting)

For Linear Axis with a toothed belt drive in a 90 ° tilted arrangement (wall mounting), the toothed belt can be displaced downwards during operation by the gravity force to the flanged pulley. For this reason, we recommend not to exceed the stroke limit length specified in Table 2.2.

Table 2.2 — Stroke limit length for Linear Axis with toothed belt drive

Series	Type	Stroke limit length [mm]
AXC	AXC40Z	1500
	AXC60Z	2000
	AXC80Z	2500
	AXC100Z	3000
	AXC120Z	3000
AXDL	AXDL110Z	2000
	AXDL160Z	2500
	AXDL240Z	3000
AXF	AXF100Z	3000
AXS	AXS280Z	3000

If the mounting of the Linear Axis is provided in this position, this information is required in the order description.

During operation, the centered run of the toothed belt must be checked together with the maintenance of the Linear Axis specified in Chapter 4.7.

3. Mounting and Start-up

3.1 Transportation and storage

SNR Linear Axis are high-precision components. Heavy shocks could damage the mechanics of the Linear Axis and impair its function. To avoid damage during transportation and storage, the following points should be observed:

- Protection against strong vibrations or shocks, aggressive substances, moisture and contamination.
- Using of a sufficiently large packaging and prevent them against slipping during transportation.
- Linear Axis can have lager weights and sharp edges. The transportation must be carried out by qualified staff with appropriate personal protective equipment (safety shoes, gloves, ...).
- Linear Axis and packagings with Linear Axis can have great length. To prevent excessive bending during transportation, the Linear Axis and their packaging must be supported at least two points, for lengths from more than 3 m at three points.

3.2 Design of the mounting surfaces / mounting tolerances

Any deviation of the flatness, straightness and parallelism of Linear Axis or mounted axis systems leads to tensions that cause additional loads of the guiding elements and reduce the life time. In general, the higher load and kilometerage, the higher the requirements for the mounting and alignment of the Linear Axis or the axis system.

For a safer function of single axis or axis systems their straightness in the longitudinal direction by the alignment of the individual axis must be guaranteed according to Table 3.1:

Table 3.1 — Straightness tolerance for the mounting of Linear Axis

Size	Straightness tolerance after mounting / per meter [mm]
all	0,5

For parallel Linear Axis is the permissible tolerance in the flatness (twisting) and the bending in the longitudinal direction also influenced by the torsional rigidity of the cross traverse. The resulting moment loads (My) shall not exceed the catalog values (less load moment).

It must be noted that simultaneous variations in straightness (Table 3.1), flatness, bending and parallelism (tolerance e_0 and e_1 Table 3.2) result in an addition of the loads on the guiding system and must be taken into account pro rata.

Additional requirements for the quality of the mounting surfaces must be considered when the tables of parallel installed Linear Axis are rigidly connected.

For a parallel installation, the Linear Axis of the AXC and AXF series are mainly suitable.

If the parallel installation of Linear Axis from other series is necessary, please contact for the selection process our application engineers.

The mounting surfaces of the Linear Axis, as well as for the cross traverse should be machined in the assembly area in a single setup or should be adjustable. It should be aimed for the straightness transverse to the moving direction (Figure 3.1) of the mounting surfaces base tolerances e_0 and the parallelism tolerances e_1 of the Linear Axis from Table 3.2.
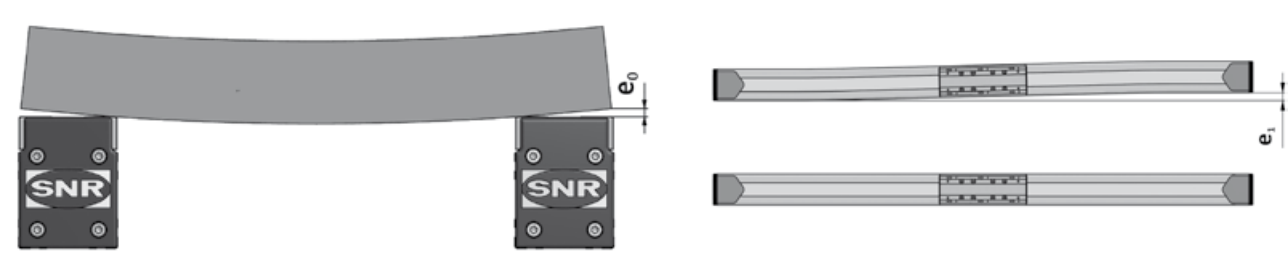
Figure 3.1 — Tolerances of parallel Linear Axis

Table 3.2 — Mounting tolerances of parallel Linear Axis

Type	Base tolerance e_0 [mm]	Parallelism tolerance e_1 [mm]
AXC60	0,010	0,018
AXC80	0,010	0,020
AXC100 / AXF100	0,020	0,022
AXC120	0,020	0,030

If a machining of the mounting surfaces to above-mentioned requirement are not provided or this value is exceeded by the deflection of the cross traverse, a control of parallelism must be made and, if necessary a correction must be made.

The diagram in Figure 3.2 shows the relationship between mounting tolerances and possible dynamic load capacity.
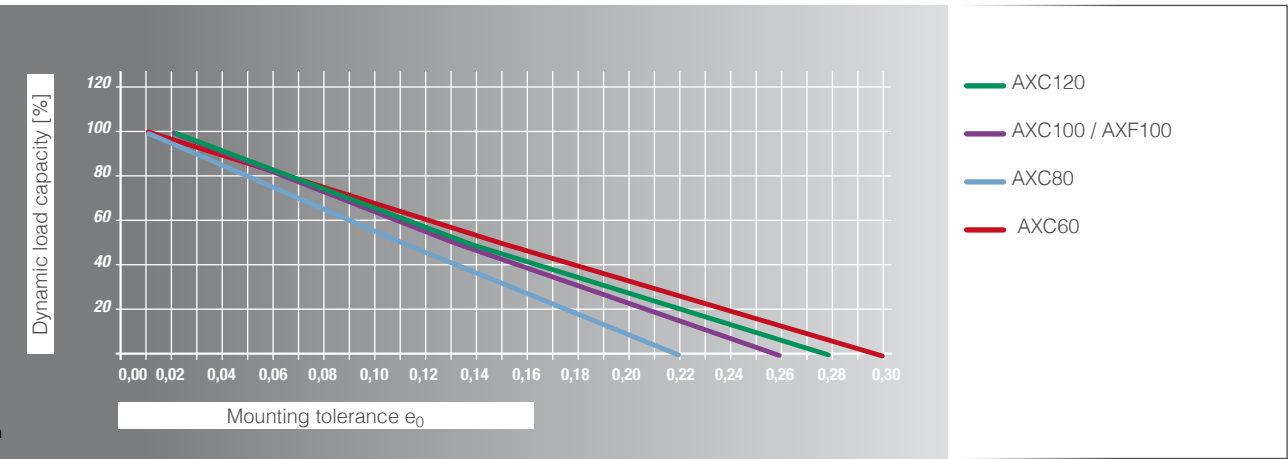
Figure 3.2 — Dynamic load capacity of Linear Axis related to the monting tolerances

3.3 Mounting instruction

When mounting the Linear Axis (incomplete machine) listed below conditions must be fulfilled so that they can be assembled correctly and without affecting the health and safety of staff with other parts to form a complete machine.

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

The Linear Axis should be installed so that the structure-borne noise is minimized. Other machine parts should be designed so that they do not lie in the resonance range of the Linear Axis.

SNR Linear Axis of the AXC and AXDL series can be fastened by sliding blocks or mounting strips at plane surfaces or other Linear Axis from the SNR product range. The number of mounting points must be matched to the application. With punctual support of the Linear Axis, the resulting bending does not impair the function nor impair the required accuracy. The mounting strips are laterally hooked on the Linear Axis profile and, thanks to its special design are easy to assemble by screwing them from above (Figure 3.3).

They can be positioned anywhere within the entire profile length.
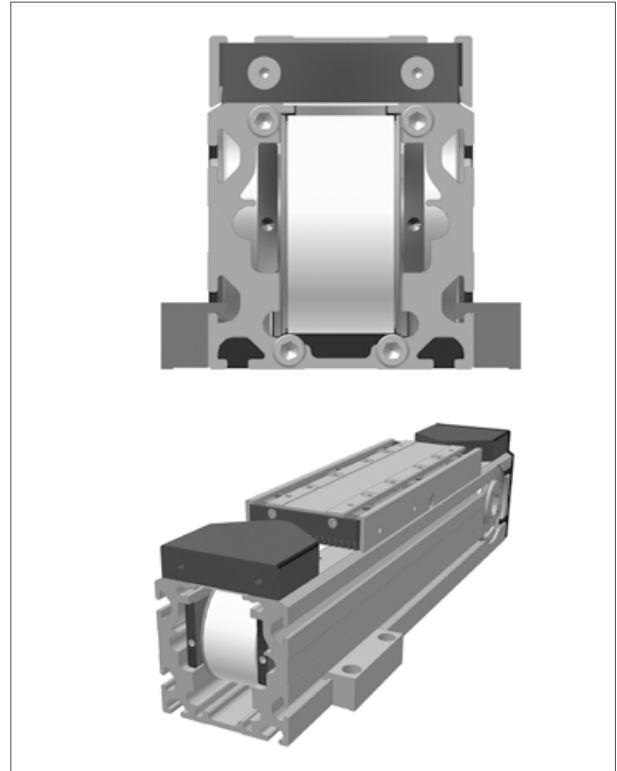
Figure 3.3 — Fastening strips AXC / AXDL

Alternatively, all Linear Axis can also be mounted on swivel-sliding blocks, which can also be freely positioned along the entire length (Figure 3.4).
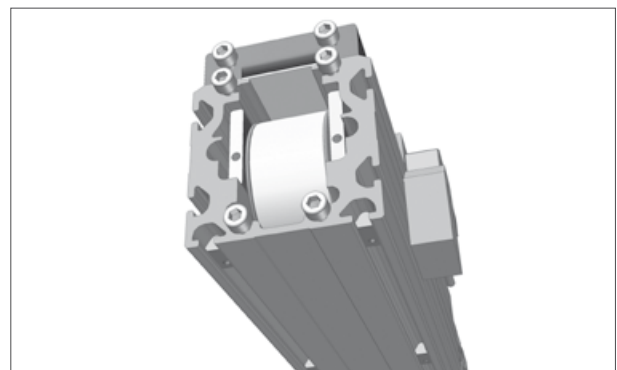
Figure 3.4 — Sliding blocks AXC / AXDL

For Linear Axis of the AXLT and AXLM series are also two mounting options available, either through a direct screw from the top or by swivel-sliding blocks for the grooves on the underside of the base plate.

The sliding blocks can be freely positioned along the entire length (Figure 3.5).
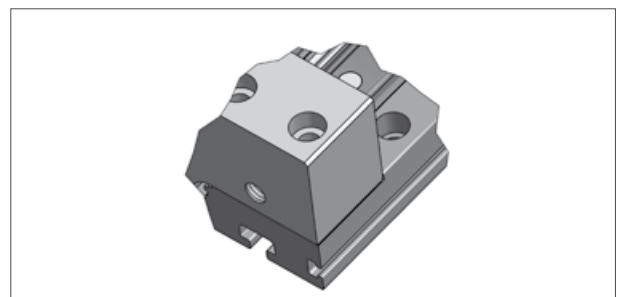
Figure 3.5 — Sliding blocks AXLT / AXLM

Linear Axis of the AXBG series can be screwed from above through the U - shaped rail profile (Figure 3.6).
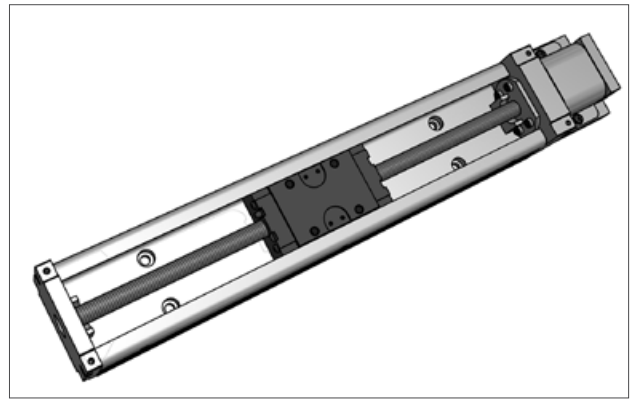
Figure 3.6 — Mounting AXBG

The Linear Axis of the AXF series can be mounted at plane surfaces or other Linear Axis by usage of fastening elements (Figure 3.7) or hammer screws or hammer nuts (Figure 3.8).

In this series all profile grooves are closed and must be opened at the necessary fixing points.
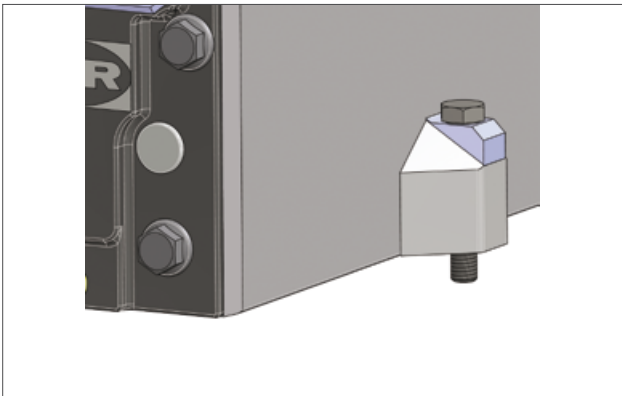
Figure 3.7 — Fastening element AXF

Figure 3.8 — Hammer screw AXF

Generally, the number of mounting points must be matched to the application in all types of fastening. With punctual support of the Linear Axis, the resulting bending does not impair the function nor impair the required accuracy.

3.4 Mounting of parallel Linear Axis

Generally, we recommend the alignment of parallel Linear Axis with an assembled crossbar. This is the only safe method to reduce tensioning and thus interference of the life time to a minimum. When using gantry support legs, they must first be aligned and fastened. The mounting has be carried out according to the following steps:

1. Align the first Linear Axis (drive axis) straight and assemble it completely.
2. Align the second Linear Axis parallel and tighten only slightly.
3. Move the tables in one end position.
4. Place the traverse (or crossbar).
5. If a relevant deflection is to be expected, apply the load or simulate it.
6. Check the parallelism with the feeler gauge. If necessary insert foil sheets or correct angular position of the Linear Axis.
7. Alingn traverse (or crossbar) and fix it.
8. Loosen the mounting screws of the parallel Linear Axis, so that a slight displacement is possible.
9. Move the table to the respective mounting position and tighten the screws. Start with the end position.
10. Finally, loosen the connection to the tables completely and tighten it again.

3.5 Start-up of Linear Axis

Linear Axis can travel at high velocity with a large degree of force. Slider 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 slider fittings are securely fastened. It should also be ensured that the maximum possible travel distance is not exceeded. If travel distance 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 precautions according to EN ISO 13849-1.

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

Table 3.3 — Tightening torque of the screws from the coupling hub

Type	Tightening torque	
	Clamping hub [Nm]	Tension ring hub [Nm]
AXBG15S AXBG20S	0,43	-
AXBG26S AXBG33S	0,85	-
AXC40S/T	1,34	-
AXC40A/Z	1,34	1,34
AXBG46S AXBG55S	4,50	-
AXC60A/Z	10,5	3,00
AXC60S/T AXC80S/T AXC100S/T AXF100S/G/T AXC120S/T AXDL110S/T AXDL160S/T AXDL240S/T AXLT155S/T AXLT225S/T AXLT325S/T	10,5	-

Type	Tightening torque	
	Clamping hub [Nm]	Tension ring hub [Nm]
AXC80A/Z AXDL110Z	10,5	6,00
AXC100Z AXF100Z AXS110TA AXC120A/Z AXDL160A/Z AXDL240A/Z AXLT455S/T	25,0	6,00

3.6 Assembly of couplings on Linear Axis with toothed belt drive

The assembling of couplings on Linear Axis with toothed belt drive is carried out according to the following steps (Figure 3.9):

1. The coupling hub with feather key ❶ is already screwed in the hollow shaft of the Linear Axis by the fastening screws ❷ and equipped with the elastomeric gear rim ❸ on delivery.

2. The axis side coupling hub will be optionally combined with clamping hub ❹ and clamping screw ❺ for drives with feather key or with tension ring hub ❻.
   The screws must be installed with the tightening torque from Chapter 3.5, Table 3.3.

3. For parallel Linear Axis with connecting shaft, a half-shell clamping hub ❼ is used. These allow a later mounting and dismounting of the connection shaft.
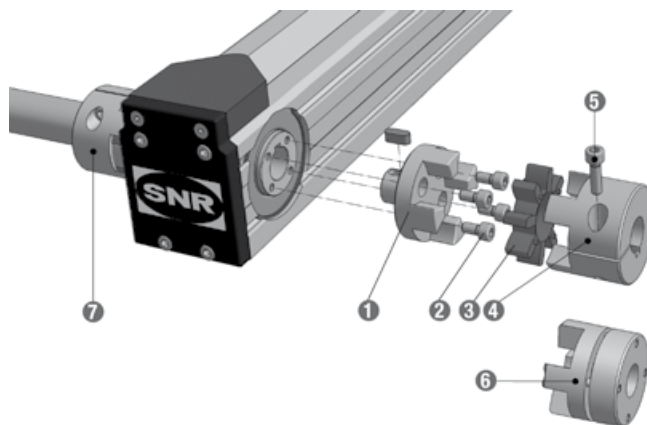
Figure 3.9 — Mounting of couplings on Linear Axis with toothed belt drive

3.7 Drive assembly

3.7.1 Drive assembly on Linear Axis with toothed belt drive and coupling cone

The assembling of drives on Linear Axis with toothed belt drive and coupling cone is carried out according to the following steps (Figure 3.10):

1. The axis side coupling hub with the elastomeric gear rim ❷ is always assembled on the Linear Axis on delivery.

2. Insert the coupling hub ❸ on the drive or gearbox shaft ❺. The mounting dimension LK (Figure 3.11) from Table 6.23 in Chapter 6.2.4.1 must be taken into account.

3. Tighten the clamping screw ❹ with the required tightening torque according to Chapter 3.5, Table 3.3.

4. Insert the drive with the coupling hub ❸ into the coupling hub with the elastomeric gear rim ❷ and screw it to the coupling cone ❶ .
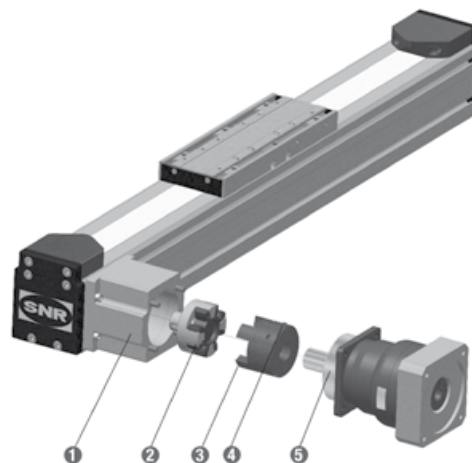
Figure 3.10 — Drive assembly on Linear Axis with toothed belt drive and coupling cone
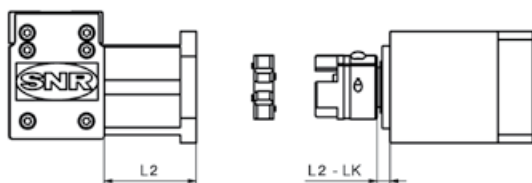
Figure 3.11 — Mounting dimension

3.7.2 Drive assembly on Linear Axis with toothed belt drive and planetary gearbox

The assembling of drives on Linear Axis with toothed belt drive and planetary gearbox is carried out according to the following steps (Figure 3.12):

1. Place the Linear Axis ❶ laterally so that the mounting flange of the drive ❷ faces upwards.

2. Lubricate the drive shaft, bore of the hollow shaft and bolt spacer.

3. Move the slider ❸ until the clamping screw is visible in the access hole ❹.

4. Check for AXC60 that the slot in the bolt spacer is 90 ° turned to the clamping screw.

5. Insert drive ❺.

6. Tighten the clamping screw with the required tightening torque according to Table 3.4. With two clamping screws, tighten the clamping screws slightly and then tighten alternately until the required tightening torque according to Table 3.4.

7. Insert and tight the fastening screws.

8. Close the access hole in the mounting flange of the drive ❷ with the supplied plug.
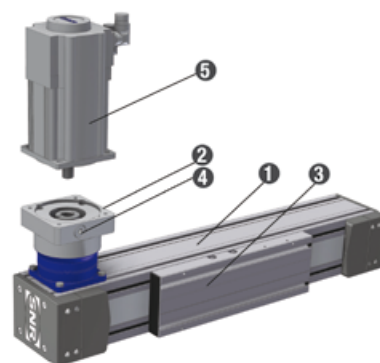
Figure 3.12 — Drive assembly on Linear Axis with planetary gearbox

Table 3.4 — Tightening torque oft he clamping screws

Wrench size [mm]	Tightening torque [Nm][1]		
	Gearbox version E / P	AXC60Z / A Gearbox version E / P	Gearbox version S
3	4,1	5,0	6,0
4	9,5	9,0	14
5	14	11	29
6	35		52
8	79		

[1] For all other versions and deviations, the assembly instructions of the gearbox manufacturer apply

Tabelle 3.5 — Motor mounting on Linear Axis with spindle drive

Type	Elastomeric gear rim is drilled for motor shaft diameter[1] [mm]	Monting dimension A [mm]	Tightening torque clamping screw [Nm]
AXC40S/T	-	7	1,34
AXC60S/T AXC80S/T AXC100S AXDL160S/T AXLT225S/T	19	3	10,5
AXC120S/T AXDL240S/T AXLT325S/T	24	3	10,5
AXLT155	-	7	1,34
AXLT455	-	8	25,0

[1] For motors with feather key, the delivery contains a shorter feather key to exchange

3.7.3 Drive assembly on Linear Axis and Linear Tables with screw drive

The assembling of drives on Linear Axis and Linear Tables with screw drive and coupling cone is carried out according to the following steps (Figure 3.13):

1. Insert the coupling hub ❷ on the drive or gearbox shaft. The dimension A (Figure 3.14) from Table 6.24 in Chapter 6.2.4.2 and dimension B when using an optional intermediante flange ❺, should be considered.

2. Tighten the clamping screw ❸ with the required tightening torque according to Chapter 3.5 Table 3.3.

3. Insert elastomeric gear rim ❹. For drives with feather key and shaft diameter 19 and 24 mm the elastomeric gear rim is drilled through. A shorter feather key for excchange is delivered as well.

4. Insert the drive with the coupling hub ❷ and mounted elastic gear rim ❹ in the coupling hub from the Linear Axis and screw it with the coupling cone ❶.
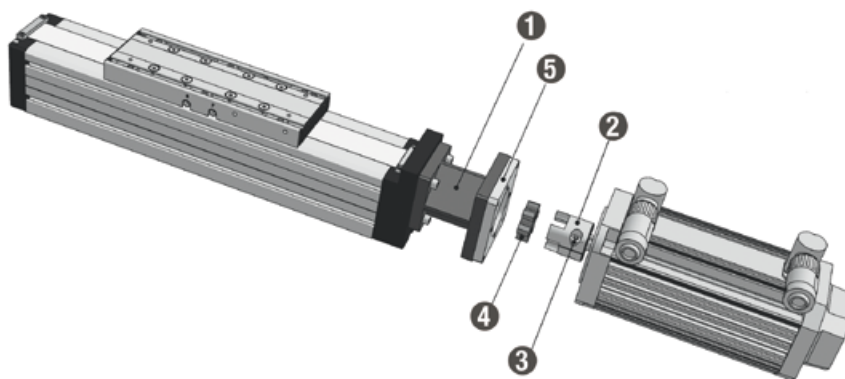
Figure 3.13 — Drive assembly on Linear Axis with screw drive and coupling cone
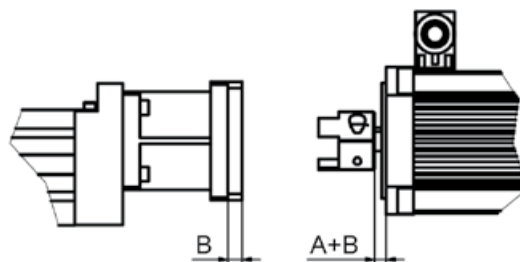
Figure 3.14 — Mounting dimension

3.8 Assembly of a deflection belt drive on Linear Axis and Linear Tables with screw drive

For the assembling of a deflection belt drive on Linear Axis with screw drive of the series AXC, AXF, AXDL and AXLT, the following steps in accordance to Figure 3.15 must be observed:

1. Mount the housing for the deflection belt drive ❶ in the desired position on the Linear Axis with the fastening screws ❷.

2. Insert the toothed belt disc ❹ with the clamping hub ❸ on the shaft of the Linear Axis and tight the screws with the required tightening torque from Table 3.7.

3. Insert the toothed belt disc ❾ with the clamping hub ❸ on the shaft of the drive and tight the screws with the required tightening torque from Table 3.7.

4. Fasten the drive ❻ with the screws ❼ on the drive adapter ❿.

5. Insert in the housing ❶ and tighten the fastening screws ⓫ of the drive adapter ❿ with light clearance (so that a smooth movement is possible).

6. Insert toothed belt ❺.

7. Toothed belt tension (Consider the permissible load capacity of the drive shaft, if necessary reduce the toothed belt tension and proportionally the drive torque):

   a. By the torque
   Fasten the tensioning plate with the oiled tensioning screw ⓬ on the drive adapter ❿. Tight the tensioning screw ⓬ with the required tightening torque from Table 3.6.

   b. By a frequency measuring device TOOLSPBELTPRO-SW (ID Number 372992)
   Fasten the tensioning plate with the oiled tensioning screw ⓬ on the drive adapter ❿. Tight the tensioning screw ⓬. Attach the toothed belt with a metal pin and measure the eigenfrequency with a frequency measuring device (take into account the user manual). When the values from Table 3.5 are reached, the correct toothed belt tension is achived.

   c. By the SNR measuring device for the toothed belt tension
   Assemble the measuring device on the drive adapter❿. Tighten the tensioning screw until the value from Table 3.5 is reached.

8. Tight the fastening screws ⓫ of the drive adapter ❿ with the required tightening torque (when using the SNR measuring device, remove these and close the deflection belt drive with the tensioning plate and the tensioning screw).

9. Close the deflection belt drive with the cover ⓭.
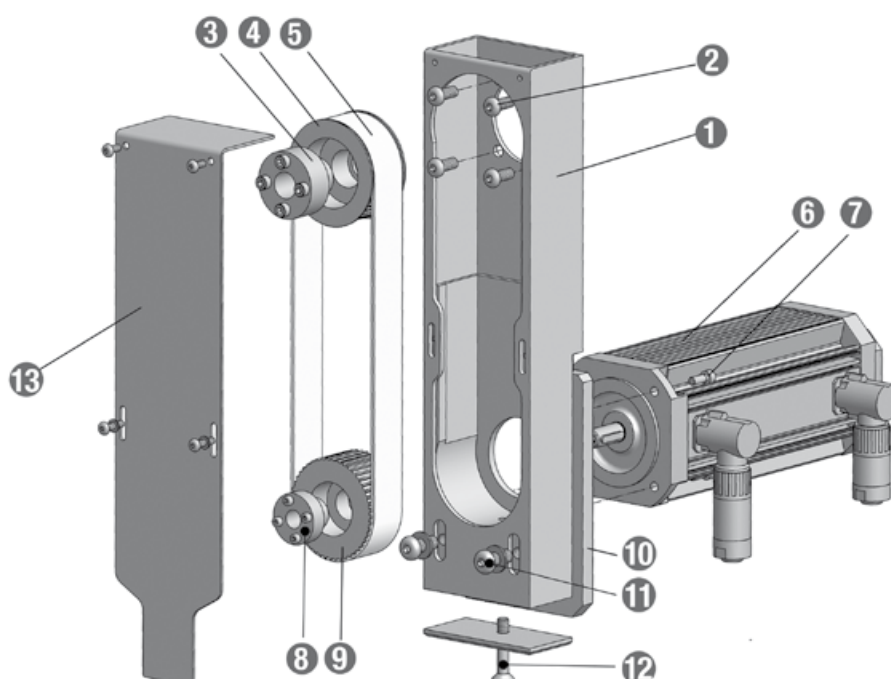
Figure 3.15 — Assembly deflection belt drive

Table 3.6 — Parameter deflection belt drives

Series	Type	Version	Pretension force on the measuring device [N] [1]	Pretension force on the toothed belt [N]	Eigenfrequency [Hz] [2]	Torque tensioning screw [Nm] [3]	Distance motor flange - center toothed belt discdrive [mm]	Maximum permissible drive torque (permanent torque) [Nm] [4]
AXC	AXC60	SN1605	100	50	149	0,2	18	1,8
		SV1605	130	65	170	0,3		2,6
		SN1610	170	85	194	0,4		3,5
		SV1610	250	125	236	0,5		5,3
		SN1616	270	135	245	0,6		5,6
		TN1604	140	70	176	0,3		3,0
		TN1608	210	105	216	0,5		4,5
	AXC80	SN2005	100	50	68	0,2	21	2,1
		SV2005	160	80	85	0,3		3,7
		SN2020	350	175	126	0,8		8,3
		SV2020	630	315	170	1,4		15,0 (11,0)
		SN2050	630	315	170	1,4		15,0
		TN2004	190	95	93	0,4		4,3
		TN2008	260	130	109	0,6		6,0
	AXC100	SV2505	210	105	98	0,5	21	4,8
		SV2510	400	200	135	0,9		9,5
		SV2525	630	315	170	1,4		15,0 (11,0)
		SV2550	630	315	170	1,4		15,0
		TV2405	420	210	138	0,9		10,0
		TV2410	590	295	164	1,3		14,0
	AXC120	SV3205	150	75	54	0,4	30	5,6
		SV3210	290	145	74	0,9		11,0
		SV3220	580	290	105	1,7		22,0
		SV3232	630	315	110	1,9		24,0
		TV3606	630	315	98	1,5		19,0
		TV3612	500	250	110	1,9		24,0
AXF	AXF100_-D	SV2505	210	105	98	0,5	21	4,8
		SV2510	400	200	135	0,9		9,5
		SV2525	630	315	170	1,4		15,0 (11,0)
		SV2550	630	315	170	1,4		15,0
		TV2405	420	210	138	0,9		10,0
	AXF100_-P	TV2405	190	95	93	0,4	21	4,3
		GV2020	240	120	105	0,5		5,7
		GV2060	550	275	158	1,2		13,0
		GV2090	630	315	170	1,4		15,0
AXDL	AXDL110	SV1605	100	50	149	0,2	18	1,1
		SV1610	110	55	156	0,2		2,3
		SV1616	170	85	194	0,4		3,6
		TV1604	100	50	149	0,2		1,9
		TV1608	140	70	176	0,3		2,9
	AXDL160	SV2505	110	55	71	0,2	21	2,5
		SV2510	210	105	98	0,5		4,9
		SV2525	510	255	153	1,1		12,0 (11,0)
		SV2550	630	315	170	1,4		15,0
		TV2405	260	130	109	0,6		6,0
		TV2410	380	190	132	0,8		9,0
	AXDL240	SV3205	170	85	57	0,5	30	6,4
		SV3210	350	175	82	1,0		13,0
		SV3220	630	315	110	1,9		24,0
		SV3232	630	315	110	1,9		24,0
		TV3606	580	290	105	1,7		22,0
		TV3612	630	315	110	1,9		24,0
AXLT	AXLT155	SV2005	210	105	163	0,5	21	4,3
		SV2020	460	230	241	1,0		10,0
		TV2004	330	165	204	0,7		7,0
		TV2008	460	230	241	1,0		9,8
	AXLT225	SV2505	230	115	102	0,5	21	5,4
		SV2510	470	235	146	1,0		11,0
		SV2525	630	315	170	1,4		15,0 (11,0)
		SV2550	630	315	170	1,4		15,0
		TV2405	420	210	138	0,9		10,0
		TV2410	590	295	164	1,3		14,0
	AXLT325	SV3205	290	145	74	0,9	30	11,0
		SV3210	550	275	103	1,6		21,0
		SV3220	630	315	110	1,9		24,0
		SV3232	630	315	110	1,9		24,0
		TV3606	630	315	110	1,9		24,0
		TV3612	630	315	110	1,9		24,0
	AXLT455	SV4005	260	130	30	0,8	45	16,0
		SV4010	600	300	45	1,8		38,0
		SV4020	1 200	600	64	3,6		76,0
		SV4040	1 650	825	75	4,9		105,0
		TV4007	700	350	49	2,1		44,0

[1] SNR measuring device for the toothed belt tensioning
[2] Toothed belt tensioning by a frequency measunring device
[3] Value results in a toothed belt tensioning force with 25% safety
[4] Maximum permittet drive torque = Table value / ratio

Table 3.7 — Tightening torques clamping hub

Diameter drive shaft	[mm]	≤ 6	≤ 14	> 14
Fastening torque clamping ring	[Nm]	2	5	10

SNR
Brand of NTN Group

3.9 Mounting of Beam Axis for parallel use with rack and pinion drive

The Linear Axis AXS120M_ and AXS300MP with guiding system B are specifically designed for parallel use of Linear Axis, mounted in large distance. For these operating conditions, a compensation system for misalignment, thermal expansion and synchronism error is mounted on the slider unit.

A special version of the Compact Linear Axis AXC100Z and 120Z can also be equipped with this compensation system.

During assembly, the Linear Axis must be aligned in parallel and finally fastened. To activate the compensation system, the cylinder bolt ❶ (Figure 3.16) must then be removed.

The cylinder bolt is located on only one of the two parallel Linear Axis (only for AXS). The Linear Axis with the activatable compensation system is marked in the type code with the configuration version H. With in y direction fixed (AXS) or centered (AXC) compensation system, it is the configuration version G.

Normally, the cylinder bolt is mounted on the Linear Axis, which is not equipped with the limit switches and initiators.

The carriages ❷ and the rack and pinion drive ❸ of the Linear Axis AXS120M_ and AXS300MP are equipped with lubrication connections for central lubrication systems. The position of the lubrication connections are shown in Figure 3.16.
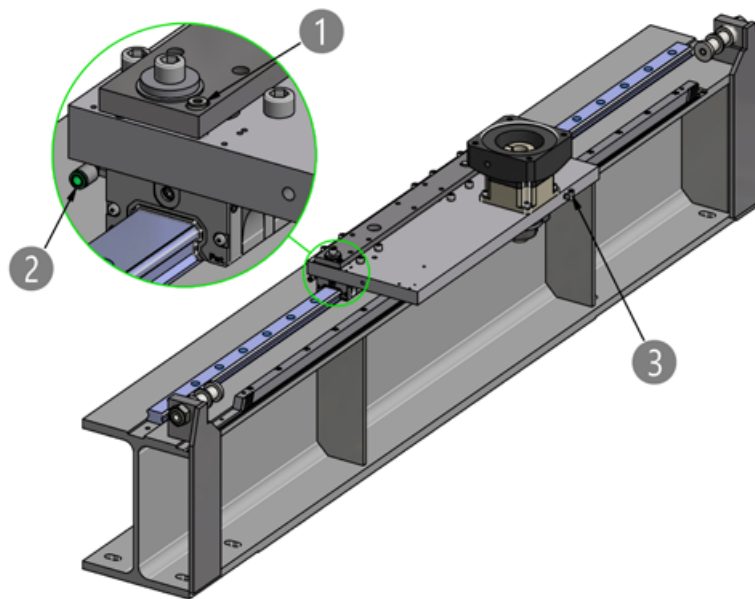
Figure 3.16 — Position of the cylinder bolt and the lubrication connections of Beam Axis for parallel use

Optionally, lubrication systems or lubricators and grease nipples can be installed by SNR.
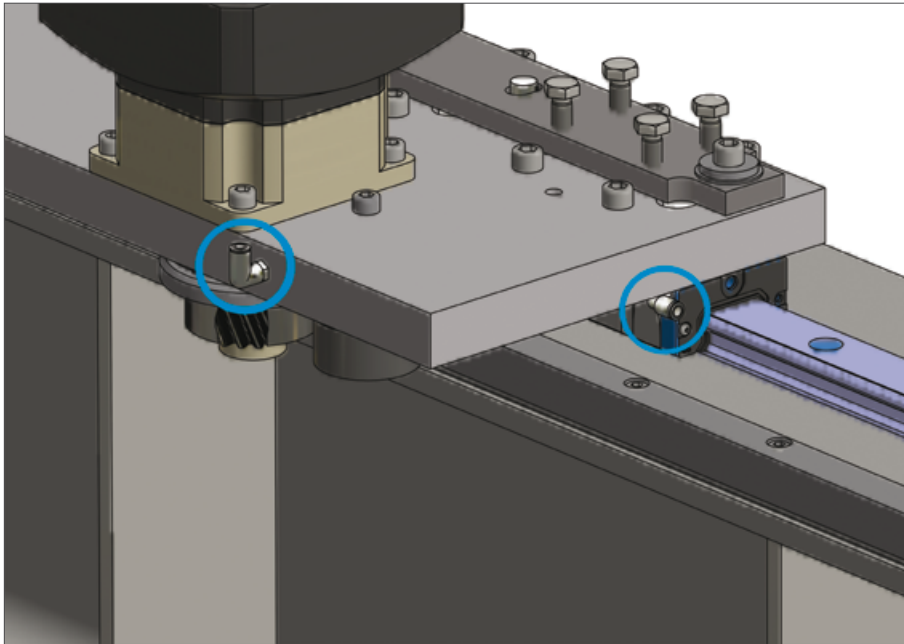
Bild 3.17 — Lubrication connection for automatic lubrication systems

4. Maintenance and lubrication

4.1 General information

Caution!

All maintenance and service works must be carried out in power off and secured stage.

The motor housing can reach high temperatures during operation.

4.2 Lubrication

For the reliable operation of the Linear Axis, a sufficient lubrication is essential.

The lubrication should ensure a lubricant film (oil film) between rolling elements and raceways of the guiding and drive elements to prevent wear and premature fatigue of the components.
In addition, the metallic surfaces are protected against corrosion. Furthermore, the lubricant film allows a smooth sliding of the seals on the surfaces and reduces also the wear of them.
Insufficient lubrication not only increases the wear, it reduces also significantly the life time.
An optimal selection of the lubricant has a decisive influence on the function and life time of the Linear Axis. In order for the function of the system to be not affected and remain over a long period lubricated according to the environmental conditions; specific requirements should be defined.
Such environmental conditions and factors may be for example:

- High or low temperature
- Condensation and splash water effects
- Radiation exposure
- High vibration stress
- Use under vacuum conditions and/or in clean rooms
- Applying of special substances (for example, vapors, acids, etc.)
- High acceleration and velocity
- Continually short stroke movement (< 2 x carriage length)
- Dirt and dust

4.3 Lubricants

There are several types of situational lubricants for the different guiding and drive systems of the Linear Axis.

The lubricants have the following functions:

- Reduction of the friction
- Reduction of the starting moment
- Protection against wear
- Corrosion protection
- Noise reduction

LINEAR GUIDES AND BALL SCREWS

Lithium soap greases with the marking KP2-K according to DIN 51825 and NLGI class 2 according to DIN 51818 with EP additives are to be used under normal conditions.
Specific requirements under special environmental conditions require the selection of a corresponding suitable grease.
SNR LUB HEAVY DUTY is used as standard grease.
In general the compatibility of the lubricants must be checked with each other or with the corrosion protection oil.
Table 4.1 provides an overview of the lubricants used by SNR for linear guides and ball screws. The use of greases containing solid additives (for example, graphite or MoS_2) is not allowed.

Table 4.1 — Lubricants for linear guides and ball screws

Description	Base oil / Type of soap	NLGI-classe DIN51818	Worked penetration DIN ISO 2137 at 25°C [0,1mm]	Basic oil viscosity DIN 51562 at 40°C [mm²/s]	Density [mg/cm³]	Propertie	Application area
SNR LUB HEAVY DUTY	Mineral oil / Lithium with EP additives	2	265...295	ca. 115	890	• very high protection against wear and corrosion	• high temperature range • high loads
SNR LUB HIGH SPEED+	Esther, SHC / Lithium, Calcium	2	265...295	25	900	• very good adhesion properties • very good water resistance	• high velocity • low temperature
SNR LUB HIGH TEMP	semi-synthetic oil / Polyurea	2	265...295	160	900	• high temperature resistance • good corrosion protection • high oxydation resistance	• high temperature range
SNR LUB FOOD AL	Paraffinic mineral oil, PAO / Aluminum complex	2	265...295	248	877	• good corrosion protection • very good adhesion properties • high water resistance • NSF H1 registered*	• food processing industry
Microlube GL261	Mineral oil / special lithium-calcium soap	1	310...340	280	890	• good wear protection • particulary pressure resistance • additive against tribocorrosion	• high temperature range • high loads • short-stroke application • vibrations
Klübersynth BEM34-32	Synthetic hydrocarbon oil / special calcium soap	2	265...295	ca. 30	890	• particulary pressure resistance • good wear protection • good aging resistance • low starting torque	• clean room application
Klübersynth UH1 14-151	Synthetic hydrocarbon oil / ester oil Aluminum complex soap	1	310...340	ca.150	920	• good corrosion protection • good aging resistance • high water resistance • NSF H1 registered*	• food processing industry • pharmaceutical industry

* This lubricant has been registered as an 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 appropriate applications in the pharmaceutical and cosmetic industry when the conditions in the product information are adhered to. However, no specific test results that might be required for applications in the pharmaceutical industry, e.g. bio-compatibility, are available. The systems manufacturer and operator should therefore perform appropriate risk analyses before applications in this area. Measures to exclude health risks and injuries have to be taken, where required. (Source: Klüber Lubrication)

TRACK ROLLER GUIDES

The hardened steel shafts and the rollers of the track roller guides are oil lubricated under normal conditions. The lubricating oils have to correspond to the specification ISO VG460. We use as standard oil Shell Omala 460. Table 4.2 provides an overview of the lubricanting oils used by us for track roller guides.

Table 4.2 — Lubricating oils for track roller guides

Description	Type of oil	Kinematic viscosity DIN51562 at 40°C [mm²/s]	Density [g/cm³]	Temperature range [°C]	Properties	Application range
Shell Omala 460	Mineral oils and additives.	460	904	-10…+90°C	• good aging resistance • good tempetature stability • good corrosion protection	General machine construction
Klüberoil 4 UH1-460N	Polyalphaolefin film	460	860	-30…+120°C	• good aging resistance • good wear protection • NSF H1 registered*	Pharmaceutical industry, food industry

TRAPEZOIDAL SCREW

For trapezoidal screws is the use of the same lubricants as for linear guides and ball screws possible. Greases containing solid additives (for example, graphite or MoS2) can be used in the series AXC, AXF and AXLT. The ingress of these lubricants into the carriages is to be prevented.

RACK AND PINION DRIVE

The rack and pinion drive is optimally supplied with lubricant by a permanent lubrication system in combination with a felt rack-wheel. The system is filled with the lubricant SNR LUB HEAVY DUTY. It can also be used for special versions with different lubricants.

4.4   Lubrication methods

SNR Linear Axis can be supplied with lubricant by manual grease gun, automatic lubricators or central lubrication systems.

4.4.1 Manual grease guns

When using manual grease guns (Figure 4.1), the guiding and drive elements of the Linear Axis are lubricated by the mounted grease nipple.

Figure 4.1 — SNR Manual grease gun

4.4.2 Automatic electro-mechanical lubricator DRIVE BOOSTER

An automatic lubricator allows constant and regular lubrication of the drive elements of the Linear Axis. Automatic electro-mechanical lubricators are at SNR Linear Axis suitable and in use only for the lubrication of the rack and pinion drive. The lubricator type DRIVE BOOSTER 120 (Figure 4.2) is used here. The lubricators can be supplied with different kinds of grease or oil and are available for selection in addition to the standard grease SNR LUB HEAVY DUTY with the grease SNR LUB FOOD and the oil SNR FOOD CHAIN OIL.

Figure 4.2 — Automatic electro-mechanical lubricator DRIVE BOOSTER 120

On request the automatic electro-mechanical lubricator DRIVE BOOSTER can also be delivered with the filling quantities 60cc and 250 cc.

For more information please contact our application engineers.

4.4.3 Central lubrication system

SNR Linear Axis can be supplied on request with a connection for a central lubrication system.

A suitable central lubrication system is the CONTROL BOOSTER (Figure 4.3). The CONTROL BOOSTER has six connectors for lubricant lines, which can configured individually and can optionally be equipped with 250 cc and 500 cc volume of lubricant in the CONTROL REFILL unit. The CONTROL REFILL unit can be after emptying replaced or be factory-provided refilled.

Figure 4.3 — CONTROL BOOSTER

For more information please contact our application engineers.

4.5 Lubrication points

SNR Linear Axis has depending on the series a different number of lubrication points in different positions.

AXC / AXF Series

The Linear Axis of the AXC and AXF series are equipped on both sides with grease nipples to guarantee the best possible access. This means that per lubrication interval, the amounts of the lubricant indicated in Chapter 4.6 may be introduced only on one side of the axis in the appropriate grease nipple. The lubrication points (Figure 4.4) are marked with «**F**» for the linear or track roller guide and «**S**» for the screw. As grease nipples are depending on the size cup head or hydraulic type grease nipple mounted. For the toothed belt axis the lubrication point and their marking «**S**» is omitted. For Linear Axis of the AXF series with the guiding system P and the drive version Z or GN are the guiding system and the drive maintenance-free and does not have a mounted lubrication connection.
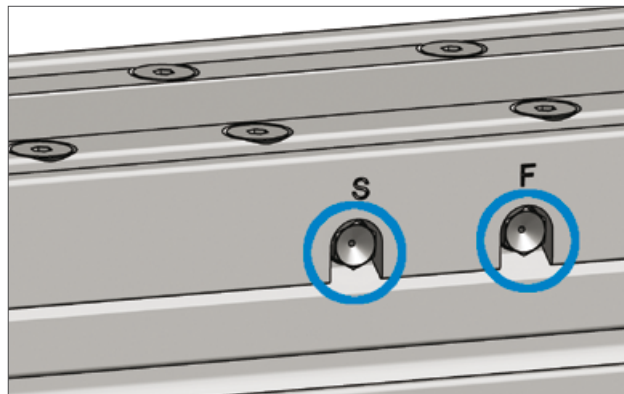
Figure 4.4 — Lubrication points AXC / AXF

AXDL Series

Linear Axis of AXDL series are equipped at both front sides of the slider unit with grease nipples, to guarantee the best possible access. This means that per lubrication interval, the amounts of the lubricant indicated in Chapter 4.6 may be introduced only on one front side of the axis in the appropriate grease nipple. For Linear Axis with screw drive the lubrication points (Figure 4.5) are marked with «**F**» for the linear or track roller guide on this side and with «**S**» for the screw drive and the linear or track roller guide on the other side. The lubrication points for Linear Axis with toothed belt drive have no marking. As grease nipples are cup head grease nipples mounted.
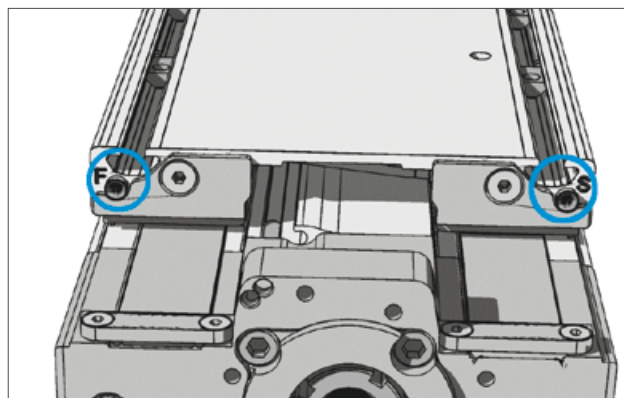
Figure 4.5 — Lubrication poinrs AXDL

AXBG Series

Linear Axis of the series AXBG have per carriage one grease nipple (Figure 4.6). By this grease nipple, the guiding system is supplied with lubricant. For lubrication of the ball screw with the lubricant is applied directly to the ball screw. The amounts of the lubricant are specified in Chapter 4.6. For the versions with one carriage, the grease nipple is mounted as standard on the floating bearing side, but can also be exchanged on the fixed bearing side. For versions with two carriages the grease nipples are arranged respectively on the bearing side. Depending on the size, ball type or hydraulic type grease nipple can be mounted.
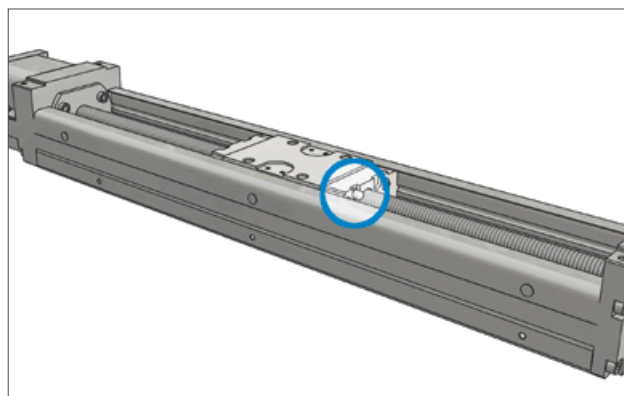
Figure 4.6 — Lubrication point AXBG

AXLT Series

The Linear Axis of the AXLT series have separate lubrication points for each carriage and for the screw drive. These are arranged on both sides of the slider unit (Figure 4.7). The lubrication points are marked with "F" for the linear guide and "S" for the screw drive. Per lubrication interval the amounts of the lubricant indicated in Chapter 4.6 have to be introduced in each of the four carriages and in the screw drive individually.
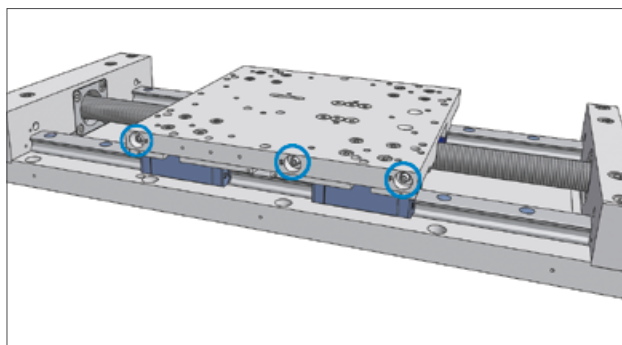
Figure 4.7 — Lubrication points AXLT

AXS Series (Lifting and Gantry Axis)

For Lifting and Gantry Axis of the series AXS the amounts of the lubricant per lubrication interval indicated in Chapter 4.6 and have to be indicated in each of the four carriages (Figure 4.8). Linear Axis with rack and pinion drive are equipped with automatic lubricators for the toothed rack, which must be activated during start-up. In multi-axis systems, the lubrication points of the lifting and gantry axis can be centrally placed in an easily accessible location (Figure 4.9).
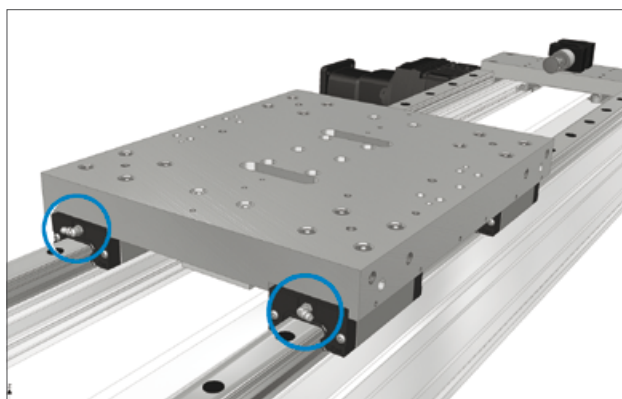
Figure 4.8 — Lubrication points for AXS Lifting and Gantry axis

AXS Series (Telescopic axis)

For Telescopic Axis of the AXS series (Figure 4.9) the different guiding levels must be considered separately. In the first guiding level, the amounts of lubricant specified in Chapter 4.6 are per lubrication interval indicated individually to each of the four carriages. In the second guiding level the amounts of lubricant specified in the maintenance manual are to be indicated only on one side of the table into the two existing lubrication points. An exception is the AXS280T, where all four carriages in the second guiding level have to be relubricated individually. The rack drive is equipped with an automatic lubricator, which must be activated during start-up.
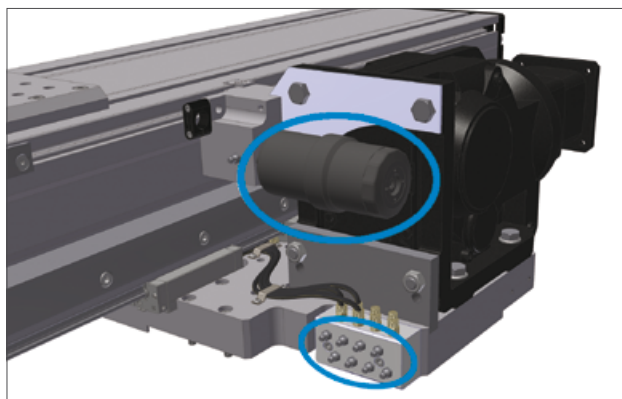
Figure 4.9 — Lubrication points and automatic lubricator for AXS Teleskopic axis

AXLM Series

The Linear Axis of the AXLM series have separate lubrication points for each carriage. These are arranged on front sides or lateral of the end plate from the carriages (Figure 4.10).
Per lubrication interval the amounts of the lubricant indicated in Chapter 4.6 have to be introduced in each of the carriages individually.
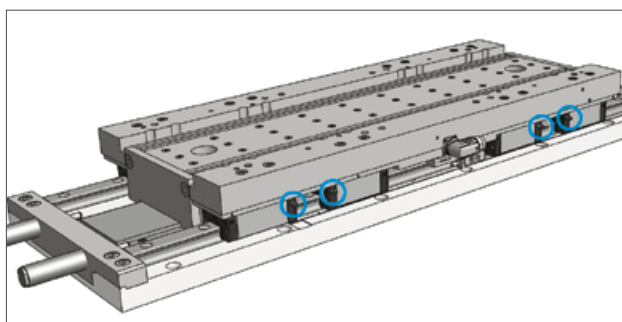
Figure 4.10 — Lubrication points AXLM

4.6 Amounts of lubricant

Linear guides, track roller guides, ball screws and trapezoidal screws require different lubricants (Chapter 4.3) and amounts of lubricant.

The following tables contain the information to the corresponding amounts of lubricant for re-lubrication with the standard lubricant for the respective guiding and drive elements.

The amounts of the lubricant for for the re-lubrication of Linear Axis with Linear guides are summarized in Table 4.3.

Guiding system of the Linear Axis from the series AXC, AXF, AXDL, AXLT, AXLM and AXS with linear guides (Guiding system A, B, C, D, E, G, R, S, T and U)

Table 4.3 — Lubrication amount of the linear guides (Lubrication points without marking or with marking „F")

Type		Lubrication amount per lubrication point [cm³]				
		A	B, J, K	C	D, R, S, T, U	E, G
AXC						
AXC40			0,05			
AXC60			0,6			
AXC80		0,6	0,8	0,8		
AXC100			1,2	1,2	0,8	
AXC120			3,2	3,6		
AXF						
AXF100			1,2		0,8	
AXDL						
AXDL110					0,2	0,6
AXDL160					0,8	
AXDL240					2,4	2,8
AXLT						
AXLT155					0,3	0,3
AXLT225					0,4	0,4
AXLT325					1,6	1,6
AXLT455					2,0	
AXLM						
AXLM155					0,2	0,3
AXLM225					0,4	0,5
AXLM325					1,6	1,8
AXS (without Telescopic Axis)						
AXS120			1,6	1,6		
AXS200					1,6	1,6
AXS230					1,6	1,6
AXS280					2,3	2,3
AXS300			2,8			
AXS460					2,3	2,3
AXS500					2,8	2,8
AXS Telescopic axis						
AXS110TA	Guiding level 1				0,3	
	Guiding level 2				0,4	
AXS120T_	Guiding level 1				1,2	
	Guiding level 2				3,2	
AXS200T_	Guiding level 1				0,4	
	Guiding level 2				1,6	
AXS240T_	Guiding level 1				1,6	1,8
	Guiding level 2				4,8	4,8
AXS280TH	Guiding level 1				2,3	
	Guiding level 2				6,4	
AXS280TV	Guiding level 1				1,8	
	Guiding level 2				4,8	

Guiding system of the Linear Axis from the series AXC and AXDL with Track roller guides (Guiding system L and M)

For Linear Axis of the AXC series in tilted position, the lubrication amount increases by a factor specified in Table 4.4. In the overhead position, this factor is to be applied only for the first re-lubrication.

For Linear Axis of the AXDL series, the factor is only to be applied for the first re-lubrication in tilted and overhead position.

Table 4.4 — Lubrication amount of the track roller guides (Lubrication points without marking or with marking "F")

Type	Factor	Lubrication amount per lubrication point [cm³]	
		L	M
AXC			
AXC40	3	0.4	0.4
AXC60	5	0,4	0,4
AXC80	2	2,0	2,0
AXC100	3	2,0	2,0
AXC120	3	2,0	2,0
AXDL			
AXDL110	3	1,0	1,0
AXDL160	4	1,5	1,5
AXDL240	5	2,8	2,8

Guiding system of the Linear Axis from the series AXF with polymer track roller guide (Guiding system P)

The guiding system of this Linear Axis is maintenance free.

Guiding system and ball screw drive of the Linear Axis from the series AXBG

For Linear Axis of the AXBG series, the lubrication of the guiding system is supplied via grease nipples. The lubrication is to be carried out on each carriage.

For re-lubrication of the ball screw drive the lubricant must be applied directly onto the screw drive over the entire length.

Table 4.5 — Lubrication amount of the Linear Axis AXBG

Type	Lubrication amount per lubrication point [cm³]				Lubrication amount ball screw
	A	B	C	D	[cm³/100mm]
AXBG					
AXBG15	0,5	0,5			0,5
AXBG20	0,5	0,5			0,5
AXBG26	1,0	1,0			1,0
AXBG33	2,0	2,0	1,5	1,5	2,0
AXBG46	5,0	5,0	3,5	3,5	3,0
AXBG55	7,0	7,0			4,0

Ball screws of the Linear Axis from the series AXC, AXF, AXDL and AXLT
(Drive version SN and SV)

The necessary lubrication amount of the ball screw drives depends on diameter and pitch.

Table 4.6 — Lubrication amount of the ball screw drives (Lubrication points with the marking „S")

Type	Lubrication amount per lubrication point [cm³]							
	S__05	S__10	S__16	S__20	S__25	S__32	S__40	S__50
AXC								
AXC40	1,0	1,5						
AXC60	1,5	1,7	2,0					
AXC80	2,0			3,0				
AXC100	2,5	3,0			4,0			
AXC120	3,5	4,0		5,0		6,0		
AXF								
AXF100	2,5	3,0			4,0			
AXDL								
AXDL110	2,0	2,2	2,5					
AXDL160	5,0	6,0			6,0			6,5
AXDL240	6,5	7,0		8,0		9,0		
AXLT								
AXLT115	2,0			3,0				
AXLT225	2,5	3,0			4,0			
AXLT325	3,5	4,0		5,0		6,0		
AXLT455	4,0	5,0		6,0			14,0	

Rack and pinion drive of the Linear Axis from the series Baureihen AXS
(Drive version M, TH and TV)

The rack and pinion drive is optimally supplied with lubricant by an automatic lubricator in combination with a felt gear wheel.
No additional maintenance is required.

Sliding screws of the Linear Axis from the series AXF
(Drive version GV)

The sliding screws of this Linear Axis are maintenance free.

Trapezoidal screws of the Linear Axis from the series AXC, AXF, AXDL and AXLT
(Drive version TN and TV)

Trapezoidal screws are open drive units without sealing elements which retain the lubricant in the system.
The necessary lubrication amount of the trapezoidal screw drives depends on diameter and pitch.

Table 4.7 — Lubrication amount of the trapezoidal screw drives (Lubrication points with the marking „S")

Type	Lubrication amount per lubrication point [cm³]							
	T__03	T__04	T__05	T__06	T__07	T__08	T__10	T__12
AXC								
AXC40	2,0							
AXC60		2,5				2,5		
AXC80		3,0				3,0		
AXC100			4,0				4,0	
AXC120				5,5				5,5
AXF								
AXF100			4,0				4,0	
AXDL								
AXDL110		2,5				2,5		
AXDL160			4,0				4,0	
AXDL240				5,5				5,5
AXLT								
AXLT115		3,0				3,0		
AXLT225			4,0				4,0	
AXLT325				5,5				5,5
AXLT455					6,0			

4.7 Lubrication intervals

DELIVERY CONDITION

SNR Linear Axis have already an initial lubrication on delivery. After assembly, the Linear Axis should be lubricated by the in the operating manual described lubrication points with the indicated amounts. For an optimal grease distribution in the system, this process should take place in two to three steps with intermediate movement over a longer stroke.

When restarting a system after a prolonged shutdown, a relubrication with the double amount of lubricant which is specified in Chapter 4.6 is recommended.

When the lubricant is changed at any time during the operation of the system, the miscibility of the lubricants must be absolutely tested.

INFLUENCE FACTORS

The lubrication intervals are influenced by many factors (Chapter 4.2). The biggest influence usually has the load and the existing contamination. The information given here is only a guideline. The exact lubrication intervals can only be determined after testing under real operating conditions and assessment over a sufficiently long period for the specific application.

SPECIAL APPLICATION CONDITIONS

For special applications (for example, food industry) other lubricants can be required.

LINEAR GUIDES FOR THE SERIES AXC, AXF, AXDL, AXLT, AXLM AND AXS

The lubrication intervals of the linear guides are shown in the diagram in Figure 4.11, depending on the contamination. For Linear Axis with inside placed guiding systems the lubrication intervals form one degree of pollution lower could be applied. In Table 4.8 the corresponding protection options are summarized for the different degrees of pollution.

Table 4.8 — Degrees of pollution for Linear axis

Degree of pollution	Application area	Possible protection option	
Without pollution	- Clean rooms - Laboratories - very clean working areas	Cover strip	
Low level of pollution	- Assembling areas with very low occurence of dust and dirt	Without	
Medium level of pollution	- Assembling areas with higher occurence of dirt - Production halls	- Cover strip - Bellow	- Cover plate
Strong pollution	- Production areas with massive exposure to dust, chips, cooling lubricant…	- Cover strip - Sealing air connection	- Side seals - Felt wiper

As the lubricant manufacturers give no general guarantee for the service life time of their products, we recommend at low kilometerages a regreasing interval of at least once a year.
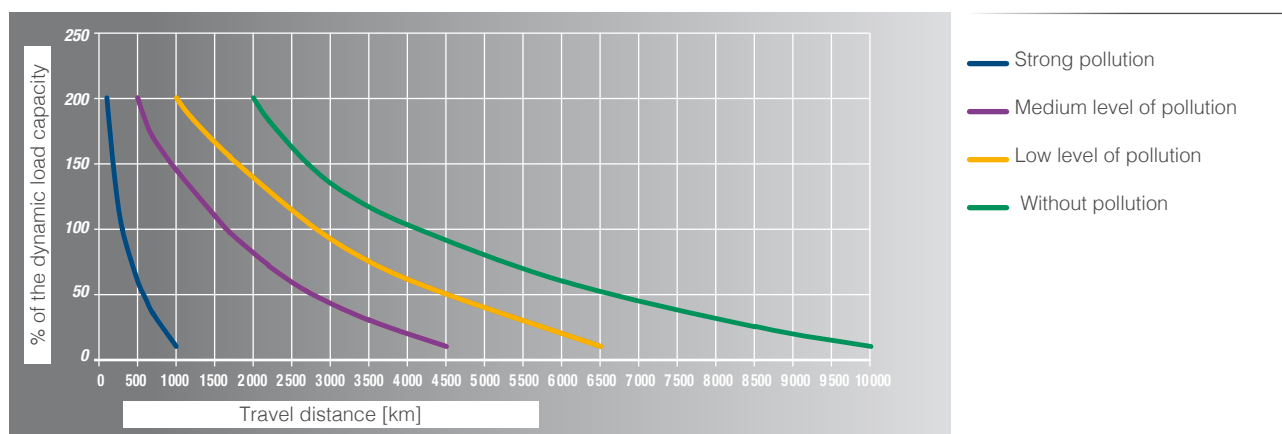
Figure 4.11 — Re-lubrication interval of linear guides

If necessary, longer lubrication intervals are possible, after consultation with the lubricant manufacturer for a defined application. For re-lubrication, mineral oil-based lithium soap greases KP2-K according to DIN 51825 and NLGI class 2 are to be used, otherwise the compatibility must be checked.
Greases containing solid additives (for example, graphite or MoS_2) shall not be used.

TRACK ROLLER GUIDES OF THE SERIES AXC AND AXDL

We recommend a re-lubrication interval of 5,000 km or once a year. An oil with a kinematic viscosity of 460 mm² / s according to DIN51562 at 40 ° C is to be used for re-lubrication.

BALL SCREWS OF THE SERIES AXC, AXF, AXDL AND AXLT

Ball screws have the advantage of long travel distances without being re-lubricated. This means that a re-lubrication system can be omitted in many cases.

To reach the longest possible re-lubrication interval, greases K2K according DIN 51825 and with higher loads KP2K with NLGI class 2 according DIN 51818 are prefered.

Greases containing solid additives (for example, graphite or MoS$_2$) shall not be used.

However, since the lubricant manufacturers give no general guarantee for the service life time of their products, we recommend a re-greasing interval depending on the screw pitch even shown in Table 4.9 or annually.

The recommendations are applicable under the following conditions:

- Load ≤ 0,2 C
- Minimum number of revolutions 100 min-1
- Permanent temperature on the nut of the ball screw up to 60°C
- Maximum temperature on the nut of the ball screw 80°C

Table 4.9 — Re-greasing intervals of ball screws

Pitch [mm]	5	10	16	20	25	32	40	50
Re-greasing interval [km]	250	500	800	1000	1250	1600	2000	2000

TRAPEZOIDAL SCREWS OF THE SERIES AXC, AXF, AXDL AND AXLT

For trapezoidal screws, we recommend re-lubrication intervals of 10... 20 km. For the re- lubrication are mineral oil-based lithium soap greases KP2-K according to DIN 51825 and NLGI class. 2 to use.

Greases containing solid additives (for example, graphite or MoS$_2$) can be used for trapezoidal screws.

TOOTHED RACK OF THE SERIES AXS

The rack and pinion drive is optimally supplied with lubricant by an automatic lubricator DRIVE BOOSTER 120 in combination with a felt rack-wheel. The system is filled with the grease SNR LUB HEAVY DUTY. On delivery the emptying time of 12 months is settled. Only if the specified kilometerage of Table 4.10 of one year is exceeded, an emptying time of 6 months is to set. After this time, the lubricant tank and the battery must be replaced.

In special circumstances the equipping of the Linear Axis with greasing systems integrated in the machine control, different lubricants or lubricant tank volumes are possible. In these cases, the lubricant tank is according to a sample or to the serial number and the battery set (not applicable for externally driven systems) to specify.

For the determination of maintenance intervals, please contact our application engineers.

Table 4.10 — Re-greasing intervals for toothed racks

Type	Guiding system	Module	km / 100cm³
AXS120TH	D	2	80 000
AXS120TV	D	2	80 000
AXS120M_	B, C	2	40 000
AXS200ME	D, E, G	3	32 000
AXS200MP	D, R	2	40 000
AXS200TH	D	2	80 000
AXS200TV	D	3	64 000
AXS230MB	D, E, G	4	24 000
AXS240TH	D, E	3	64 000
AXS280MB	D	5	24 000
AXS280MP	D, R, S, T, U	2	40 000
AXS280TH	D	3	64 000
AXS280TV	D, E, G, H	4	48 000
AXS300MP	B	3	32 000
AXS460MP	R, S, T	3	32 000
AXS500MP	R, T	3	32 000

4.8 Brush wiper replacement

Linear Axis of the series AXC can be equipped with brush wipers. To replace the brush wipers, remove the fastening screws ❶, replace the brush wipers ❷ and fix them with the fastening screws ❶ again (Figure 4.12).
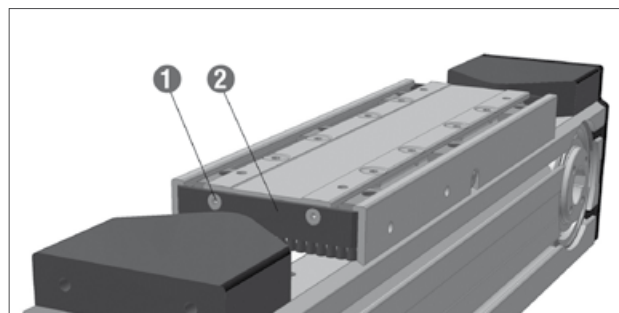
Figure 4.12 — Fastening of the brush wipers

The brush wipers are included in the wear part sets (Chapter 4.10, Table 4.11) of the respective Linear Axis.

4.9 Cover strip replacement

4.9.1 Cover strip replacement for Linear Axis of the series AXC

For the replacement of the cover strip for Linear Axis of the series AXC, the following steps in accordance to Figures 4.13 up to 4.17 must be observed:

1. Disassemble the screws ❶ and remove the slider plate ❷ (Figure 4.13) (omitted for AXC100).
2. For Linear Axis with screw drive (Figure 4.14), disassemble the screws of the cover strip clamping ❸ and ❺ and remove the clamping plates ❹ and ❻ . For Linear Axis with toothed belt drive (Figure 4.15), disassemble the fastening screws of the end position dampers ❽ and remove the end position dampers ❾.
3. Remove the cover strip ❼.
4. Make sure that the guiding roller ❿ in the table unit and the pressure roller ⓫ in the slider plate can be easily moved and are free from wear, if applicable and clean or replace them (Figure 4.16). In the case of wear-related replacement of the cover strip, we always recommend replacing the guiding and pressure rollers as well (wear parts sets see Chapter 4.16).
5. Insert new cover strip. The cover strip has a trapezoidal cross-section. When fitting the new cover strip, make sure that the wide area is below (Figure 4.17). Under moderate pressure with the hand or a smooth, not sharp-edged tool, the cover strip snaps into the groove and flushes to the upper profile edge.
6. To fasten, tighten the cover slightly and follow the steps 1 and 2 in reverse order.
7. Check the cover strip tension (it may not grind on the inside of the slider plate) and cut off the overlaying cover strip. Finally assemble the brush wipers.
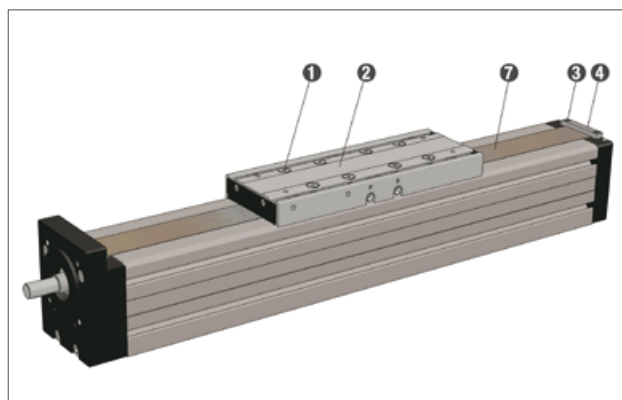
Figure 4.13 — Cover strip replacement
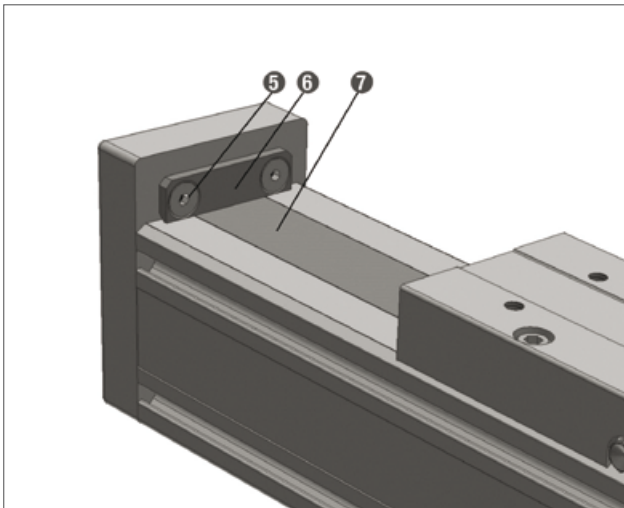
Figure 4.14 — Cover strip fastening for screw drive axis
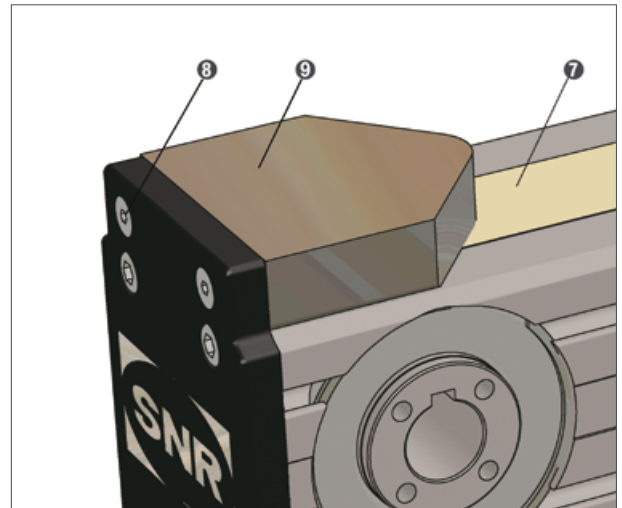
Figure 4.15 — Cover strip fastening fortoothed belt axis
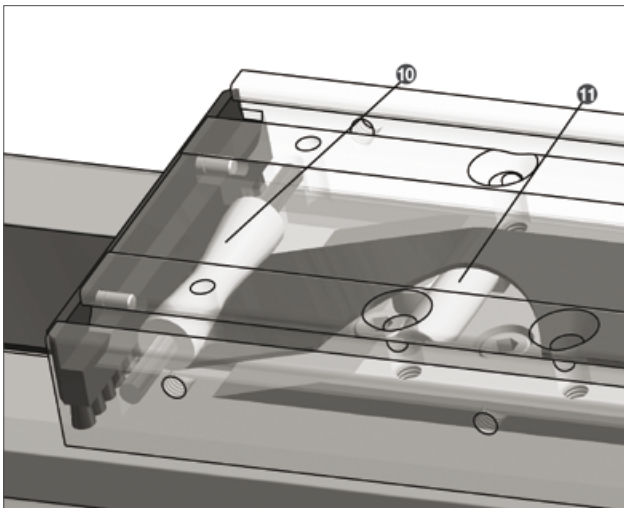
Figure 4.16 — Cover strip deflection
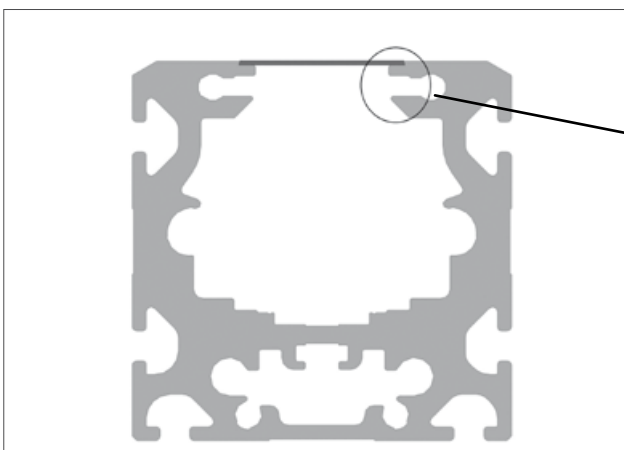
Figure 4.17 — Cover strip cross section

To perform these maintenance corresponding wear part sets (Chapter 4.10 Table 4.11) can be ordered. The wear part sets contain the brush wipers including the fastening screws and the guiding and pressure rollers with the shafts.

4.9.2 Cover strip replacement for Linear Axis of the series AXDL

For the replacement of the cover strip for Linear Axis of the series AXDL, the following steps in accordance to Figure 4.18 must be observed:

1. Disassemble grease nipple ❶. Remove the disc ❷ and the cover strip deflection ❸.
2. Disassemble the fastening screws ❹ and remove the clamping plates ❺.
3. Pull the cover strip ❻ out and replace it by a new one.
4. To fasten, tighten the cover slightly and follow the steps 1 and 2 in reverse order. Here the cover strip should not rub against the table. This can be checked by inspection holes in the base of the table grooves (closed with plastic caps).
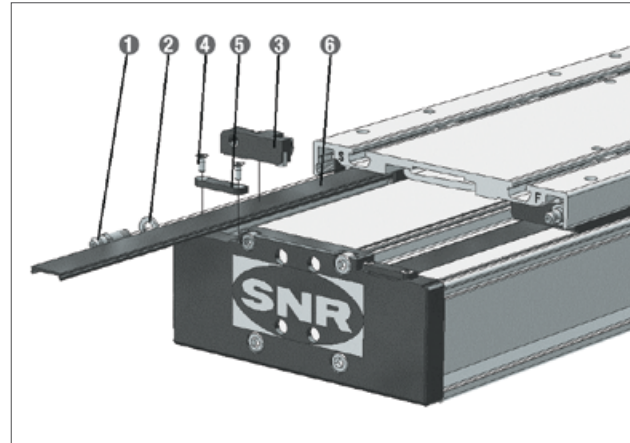
Figure 4.18 — Cover strip replacement

4.10 Wear part sets

For Linear Axis of the series AXC and AXDL are wear parts sets and sealing kits available. Table 4.11 summarizes the wear parts sets and the coverstrips including the ID numbers.

To achieve an optimal sealing effect, the cover strip for Linear Axis of the series AXC (except AXC100) is cut precisely to the respective profile. For an order, the serial number of the Linear Axis is required, to cut the exact width of the cover strip.
The length of the cover strip is specified in meters. To mount the cover strip ensure the ordered length should be about 200 to 300 mm longer than the Linear Axis.
The cover strips for Linear Axis of the series AXDL and AXC100 can be used universally.
The order length of cover strip is rounded up to the next meter.

Table 4.11 — Wear part sets sealing kits and cover strips

Type	Remark	Configuration version	Type code Wear part set	ID Number	Type code Cover strip	Configuration version	Type code Side seals	ID Number
AXC40	up to ID number 636999	A	AXC-SP-40-A-WPS	401040	AX-SP-CST-40-[width]-[length][1]			
		Q, U	AXC-SP-40-Q/U-WPS	461385				
		R	AXC-SP-40-R-WPS	461386				
	from ID number 637000	A	AXC-SP-40-A-WPS2	on request	AX-SP-CST-U-19-[length]			
		Q, U	AXC-SP-40-Q/U-WPS2	on request				
		R	AXC-SP-40-R-WPS2	on request				
AXC60	up to ID number 681999	A	AXC-SP-60-A-WPS	258120	AX-SP-CST-60-[width]-[length][1]			
		D	AXC-SP-60-D-WPS	461387				
		Q, U	AXC-SP-60-Q/U-WPS	461388				
		R	AXC-SP-60-R-WPS	461389				
	from ID number 682000	A	AXC-SP-60-A-WPS2	on request	AX-SP-CST-60-24-[length]			
		D	AXC-SP-60-D-WPS2	on request				
		Q, U	AXC-SP-60-Q/U-WPS2	on request				
		R	AXC-SP-60-R-WPS2	on request				
AXC80	up to ID number 681999	A	AXC-SP-80-A-WPS	254152	AX-SP-CST-80-[width]-[length][1]			
		K	AXC-SP-80-K-WPS	461390				
		Q, U	AXC-SP-80-Q/U-WPS	461391				
	from ID number 682000	A	AXC-SP-80-A-WPS2	on request	AX-SP-CST-80-31-[length]			
		K	AXC-SP-80-K-WPS2	on request				
		Q, U	AXC-SP-80-Q/U-WPS2	on request				
AXC100		A	AXC-SP-100-A-WPS	461377	AX-SP-CST-100-65-[length]			
		D	AXC-SP-100-D-WPS	461379				
		Q, U	AXC-SP-100-Q/U-WPS	461381				
		B, M	AXC-SP-100-B/M-WPS	461378				
AXF100		A	AXF-SP-100-A-WPS	461392	AX-SP-CST-100-65-[length]			
		Q	AXF-SP-100-Q-WPS	461394				
		R, S	AXF-SP-100-R/S-WPS	461396				
		U	AXF-SP-100-U-WPS	461398				
		B, M	AXF-SP-100-B/M-WPS	461393				
AXC120		A	AXC-SP-120-A-WPS	257256	AX-SP-CST-120-[width]-[length][1]			
		K	AXC-SP-120-K-WPS	461382				
		Q, U	AXC-SP-120-Q/U-WPS	461383				
			AXC-SP-120-R-WPS	461384				
AXDL110		alle	AX-SP-110-A-WPS	268344	AX-SP-CST-U-19-[length]	D, K	AX-SP-110-KIT-S215	203547
AXDL160		A	AX-SP-160-A-WPS	268345	AX-SP-CST-U-19-[length]	D, K	AX-SP-160-KIT-S240[2]	202918
							AX-SP-160-KIT-S280[3]	203039
AXDL240		A	AX-SP-240-A-WPS	268346	AX-SP-CST-U-19-[length]	D, K	AX-SP-240-KIT-S330[4]	203255
							AX-SP-240-KIT-S500[5]	288999

[1] Indication of the serial number of the Linear Axis for the cutting of the cover strip necessary, ID number depends on length
[2] Table length 240 mm   [3] Table length 280 mm
[4] Table length 330 mm   [5] Table length 500 mm

5. SNR Linear Axis
5.1 General view

5.1.1 Series

We offer one of the widest product ranges on Linear Axis on the market. The Linear Axis combine user-oriented product development and high quality standards.
The user, through arising individual configurability, obtains optimal solutions for requirements from all sectors of industry.
Following are the most significant features of the series summarized.

Compact Axis AXC

- Universal, as single axis or in combination with other axis usable Compact Axis
- Various combinations possible within AXC - series as well as with the other series by standard connecting elements
- Light and highly rigid aluminum profile as base material
- 5 standard sizes from 40 mm up to 120 mm profile wide
- Variable guiding system with linear guides or track roller guides
- Optimal length ratio stroke / total length
- 3 drive versions – toothed belt drive, screw drive or toothed belt / Ω - drive (Figures 5.1 up to 5.3)
- With the pulley screw coupling for frictional connected torque transmission for the highest dynamic (permanent clearance and wear-free connection)
- Optimal protection of the inside placed guiding and drive elements by the optional use of cover strips and brush resp. felt wipers
- Service friendly design with access to all lubrication points on both sides of the sliders
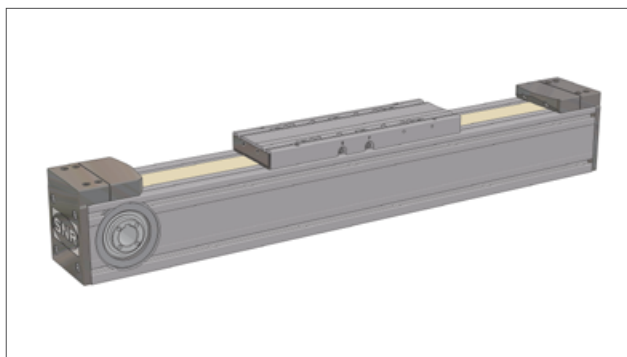
Figure 5.1 — AXC with toothed belt drive
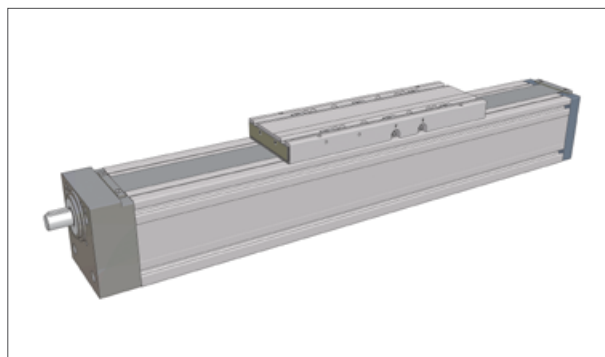
Figure 5.2 — AXC with screw drive
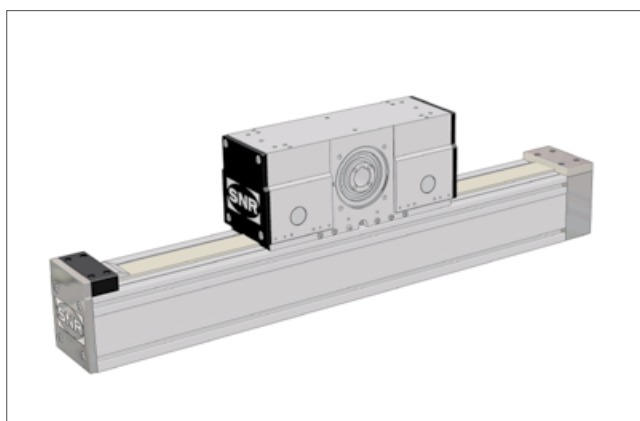
Figure 5.3 — AXC with toothed belt / Ω - drive

Compact Axis AXF

- Specially optimized design for applications in the food, pharmaceutical and semiconductor industry
- Smooth surfaces for optimal cleaning and prevent deposits and residues on profile
- Light and highly rigid aluminum profile as base material
- 1 Standard size with 104 mm profile wide
- Variable guiding system with linear guides or track roller guides
- 2 drive versions – toothed belt drive or screw drive (Figures 5.4 and 5.5)
- With the pulley screw coupling for frictional connected torque transmission for the highest dynamic (permanent clearance and wear-free connection)
- Optimal protection of the inside placed guiding and drive elements by the optional use of plastic and stainless steel cover strips
- Service friendly design with access to all lubrication points on both sides of the sliders
- Maintenance-free version with polymer track roller guide and sliding screw drive for applications in wet areas
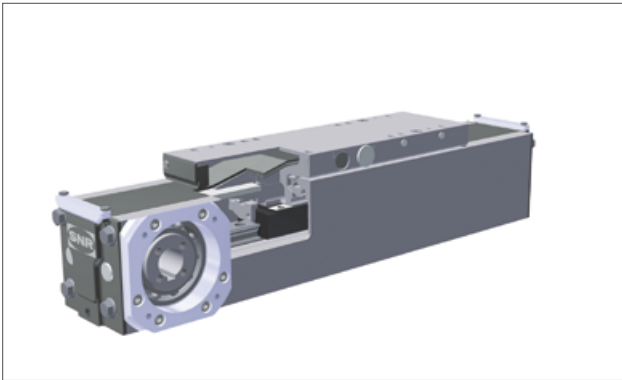
Figure 5.4 — AXF with toothed belt drive
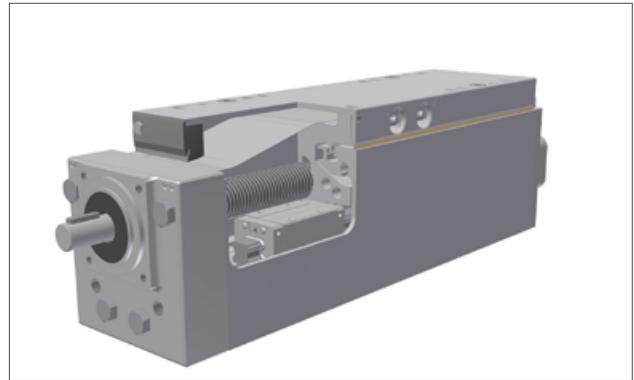
Figure 5.5 — AXF with screw drive

Parallel Axis AXDL

- Parallel Axis designed for use as a stiff single axis
- Various combinations possible within AXDL - series as well as with the other series by standard connecting elements
- Light and highly rigid aluminum profile as base material
- 3 standard sizes from 110 mm up to 240 mm profile wide
- Variable guiding system with linear guides or track roller guides
- 3 drive versions – toothed belt drive, screw drive or toothed belt / Ω - drive (Figures 5.6 up to 5.8)
- Optimal stroke length – ratio
- With the pulley screw coupling for frictional connected torque transmission for the highest dynamic (permanent clearance and wear-free connection)
- Optimal protection of the inside placed guiding and drive elements, use of cover strips and optional use of side seals and felt wiper with inner seal
- Service friendly design with access to all lubrication points on both front sides of the sliders
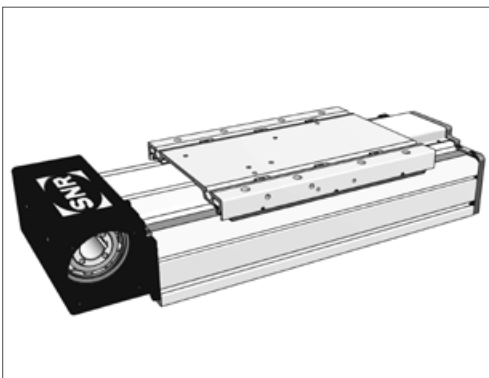
Figure 5.6 — AXDL with toothed belt drive
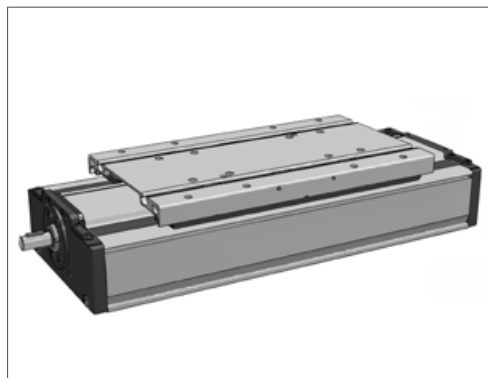
Figure 5.7 — AXDL with screw drive
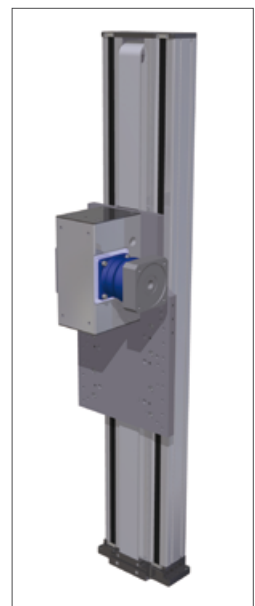
Figure 5.8 — AXDL with toothed belt/Ω- drive

Linear Table Axis AXLT

- Linear Tables for high loads in moment direction
- Various combinations possible within AXLT - series by standard connecting elements
- Aluminum profile with profile grooves or aluminum plates as base material
- Steel made as special version possible
- 4 standard sizes from 155 mm up to 455 mm profile wide
- 2 parallel linear guides as guiding system
- Ball screw or trapezoidal screw as drive element
- Optional inside placed inductive switches (Figure 5.9)
- Optimal protection of the inside placed guiding and drive elements as well as the inductive switches by the optional use of bellows (Figure 5.10)
- Service friendly design with access to all lubrication points on the side of the tables
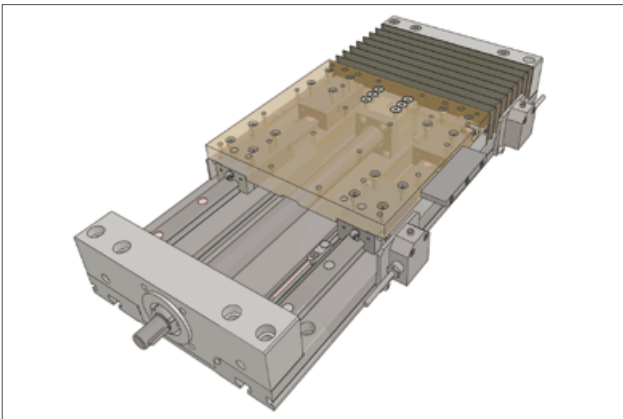
Figure 5.9 — AXLT with switches

Figure 5.10 — AXLT with bellows

Precision Axis AXBG

- Precision Axis for applications with high demands on positioning accuracy and repeatability
- U - shaped steel profiles as base material with internal carriages (Figure 5.11)
- 6 standard sizes from 15 mm up to 55 mm system height
- 2 precision classes
- Ball screw as drive element
- Optimal protection of the inside placed guiding and drive elements by the optional use of cover plates (Figure 5.12)
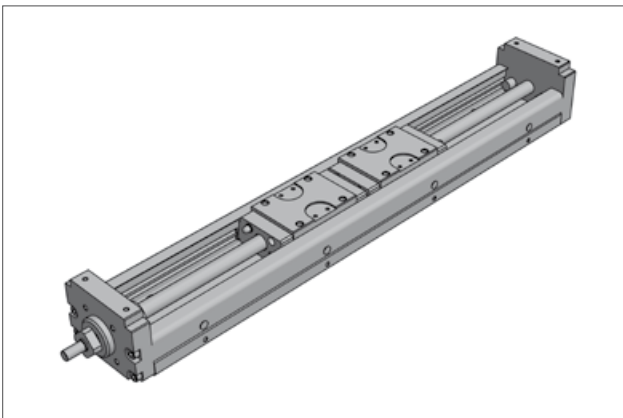
Figure 5.11 — AXBG – profile with carriages
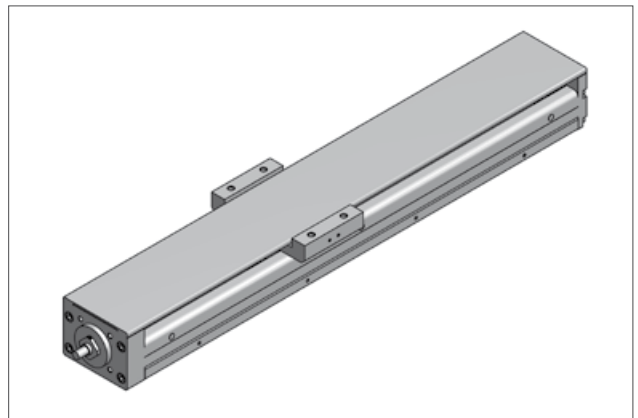
Figure 5.12 — AXBG with cover plate

Linear Motor Axis AXLM

- Linear Motor Axis for high loads in moment direction as well as the highest demands on positioning accuracy, repeatability and dynamics
- Aluminum profile with profile grooves or aluminum plates as base material
- 3 standard sizes from 155 mm up to 325 mm table wide
- 2 parallel linear guides as guiding system
- Linear motors with different feeding forces selectable
- Linear motors optional with air or water cooling
- Optimal protection of the inside placed guiding and drive elements by the optional use of bellows or cover plates (Figures 5.13 and 5.14)
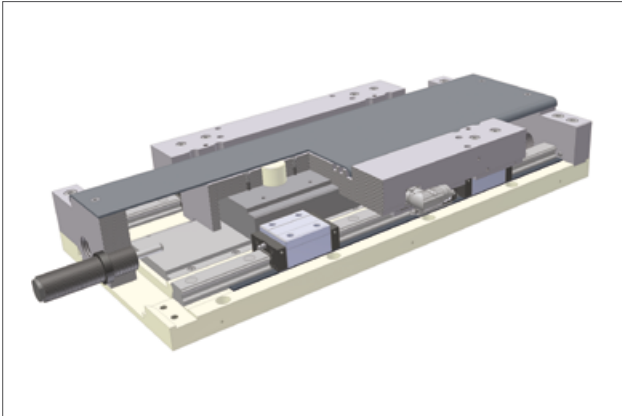
Figure 5.13 — AXLM with cover plate
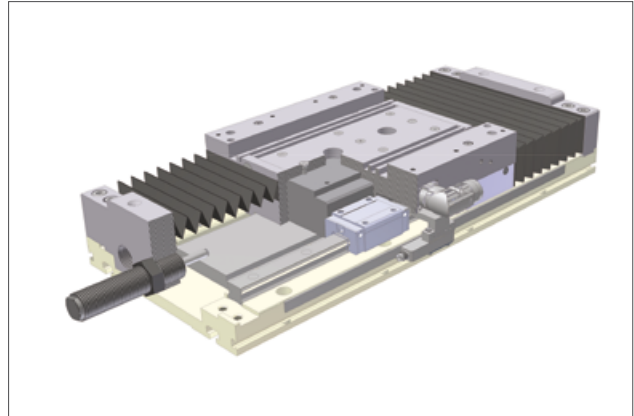
Figure 5.14 — AXLM with bellows

System Program Axis AXS

- System Program Axis for highest loads
- Variants as telescopic, lifting, gantry and beam axis
- High rigid aluminum or steel profile as base material
- Standard sizes up to 500 mm profile wide
- 2 parallel linear guides as guiding system
- Toothed belt or rack and pinion as drive element
- Telescopic Axis for horizontal and vertical use (Figures 5.15 up to 5.17)
- Lifting Axis for moving to loads in excess of 1000 kg (Figure 5.18)
- Gantry Axis in one-piece length from 12 m (Figures 5.19)
- Beam Axis for parallel use (Figure 5.20)
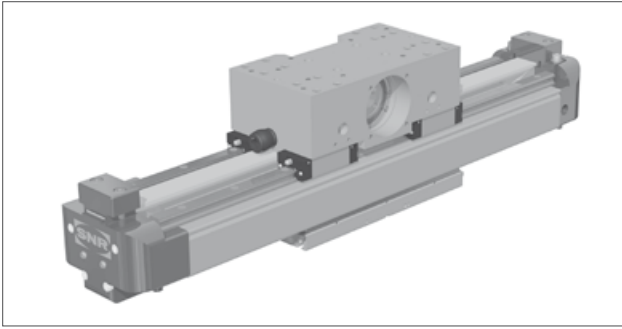
Figure 5.15 — AXS Telescopic Axis, horizontal with
toothed belt / Ω - drive
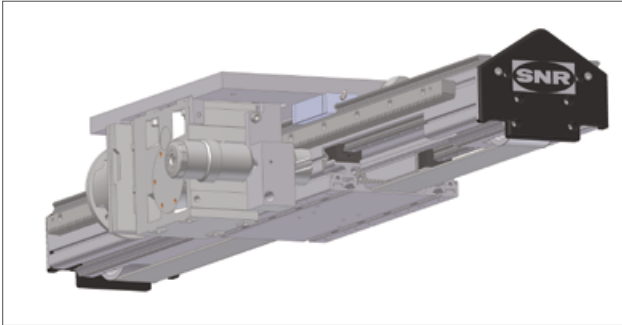
Figure 5.16 — AXS Telescopic Axis, horizontal with
rack and pinion drive / toothed belt drive

Figure 5.17 — AXS Telescopic Axis, vertical with
rack and pinion drive / toothed belt drive
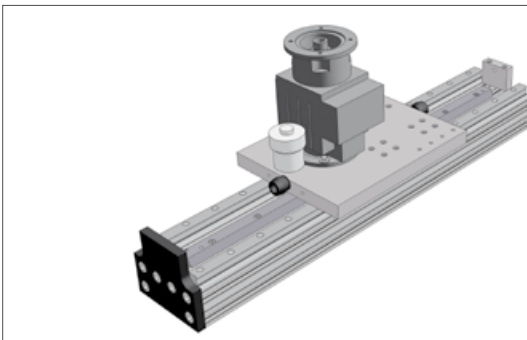
Figure 5.18 — AXS Lifting Axis with rack and pinion drive
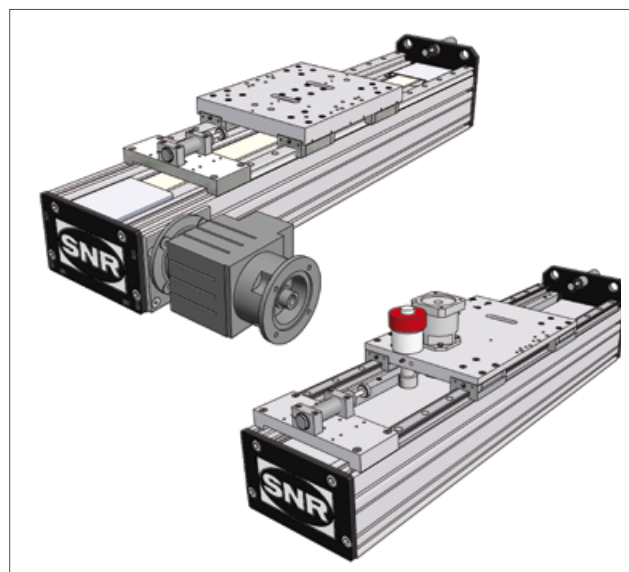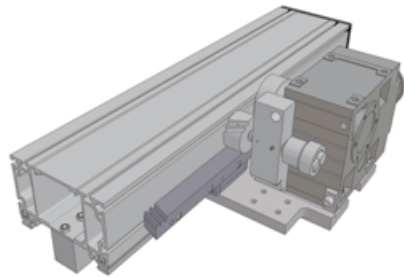
Figure 5.19 — AXS Gantry Axis
with toothed belt drive or rack and pinion drive
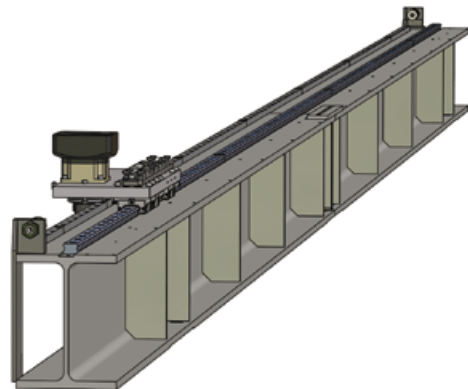
Figure 5.20 — AXS Beam Axis
with rack and pinion drive for parallel use

5.1.2 Main parameters

Linear Axis with toothed belt drive

Table 5.1 — Main parameters Linear Axis toothed belt drive

Type	Axis cross section [mm]	Feed constant [mm/rev.]	Allowable dynamic operating load [N]	Guiding system	Maximum velocity [m/s]	Maximum total length [m]	Maximum dynamic load capacity [N]		Maximum dynamic load moments [Nm]		
							Fy	Fz	M_x	M_y	M_z
AXC40Z	40 x 53	75	210	L	15	6,0	310	170	2,4	3,9	7,0
AXC60Z	60 x 80	150	560	B	5	8,0	2 800	2 800	19	100	100
				L	15	6,0	840	500	10	27	41
AXC80Z	80 x 100	200	870	B	5	8,0	4 650	4 650	43	235	235
				C	5	8,0	4 650	4 650	43	350	350
				J	5	8,0	3 600	3 600	34	205	205
				K	5	8,0	3 600	3 600	34	310	310
				L	15	8,0	3 400	2 300	60	110	170
AXC100Z	100 x 125 / 104 x 125 / 100 x 125	264	2 200	B	5	6,0	5 000	5 000	52	275	275
				C	5	6,0	5 000	5 000	52	630	630
				D	5	6,0	7 000	7 000	200	325	325
				L	15	6,0	3 400	2 300	87	120	180
AXC120Z	120 x 150	320	2 500	B	5	10,0	9 650	9 650	120	875	875
				C	5	10,0	10 500	10 500	140	2 150	2 150
				L	15	10,0	5 100	3 400	110	260	390
				M	15	10,0	6 800	4 500	150	530	790
AXF100Z	104 x 125	264	1 800	B	5	6,0	5 000	5 000	52	275	275
				C	5	6,0	5 000	5 000	52	630	630
				D	5	6,0	7 000	7 000	200	325	325
				P	7	6,0	120	240	9	13	6,5
AXDL110Z	110 x 65	170	980	D	5	6,1	2 300	2 300	80	110	110
AXDL160Z	160 x 83	216	1 830	D	5	6,1	9 000	9 000	475	475	475
				L	15	6,1	1 200	1 200	62	84	84
AXDL240Z	240 x 120	264	5 000	D	5	6,35	12 500	12 500	1 050	1 200	1 200
				E	5	6,35	12 500	12 500	1 050	2 250	2 250
				L	15	6,35	2 600	2 600	220	210	210
AXS200Y[1]	200 x 120	200	2 200	D	5,0	8,0	19 000	19 000	1 450	1 700	1 700
				R	5,0	8,0	19 000	19 000	1 450	2 100	2 100
AXS280Y[1]	280 x 340	264	5 000	D	5	10,0	26 000	26 000	3 200	3 700	3 700
				E	5	10,0	26 000	26 000	3 200	6 250	6 250
				R	5	10,0	26 000	26 000	3 200	3 700	3 700
				S	5	10,0	26 000	26 000	3 200	4 000	4 000
				T	5	10,0	26 000	26 000	3 200	4 800	4 800
				U	5	10,0	26 000	26 000	3 200	4 000	4 000
AXS280Z[1]	280 x 250	480	4 000	D	5	10,0	26 000	26 000	3 200	3 700	3 700
				E	5	10,0	26 000	26 000	3 200	6 250	6 250

[1] Linear Axis are contained additionally in Table 5.5 "Gantry Axis"

Linear Axis with toothed belt / Ω - drive

Table 5.2 — Main parameters Linear Axis toothed belt- Ω - drive

Type	Axis cross section (without operating head) [mm]	Feed constant [mm/rev.]	Allowable dynamic operating load [N]	Guiding system	Maximum velocity [m/s]	Maximum total length [m]	Maximum dynamic load capacity [N]		Maximum dynamic load moments [Nm]		
							F_y	F_z	M_x	M_y	M_z
AXC40A	40 x 55,8	75	210	B	5	6	500	500	2,4	20	20
AXC60A	60 x 72,7	150	560	B	5	8	2 800	2 800	19	100	100
				L	15	6	840	500	10	27	41
AXC80A	80 x 89,3	200	870	B	5	8	4 650	4 650	235	235	205
				L	15	8	3 400	2 300	60	110	170
AXC120A	120 x 133,5	320	2 500	B	5	8	9 500	9 500	120	925	925
				L	15	8	5 100	3 400	110	260	390
AXDL160A	196 x 103	210	1 960	D	5	8	9 000	9 000	475	475	475
				L	15	8	1 200	1 200	62	84	84
AXDL240A	280 x 145	272	5 000	D	5	8	12 500	12 500	1 050	1 200	1 200
				L	15	8	2 600	2 600	220	210	210

Linear Axis with screw drive

Table 5.3 — Main parameters Linear Axis screw drive

Type	Axis cross section [mm]	Ball screw drive Pitch [mm]	Ball screw drive Maximum total length [m]	Trapezoidal screw drive Pitch [mm]	Trapezoidal screw drive Maximum total length [m]	Sliding screw drive Pitch [mm]	Sliding screw drive Maximum total length [m]	Guiding system	F_y	F_z	M_x	M_y	M_z
AXC40	40x53	5/10	2,5	3	3,0			B	675	675	3,2	22	22
AXC60	60x80	5/10/16	3,5	4/8	3,0			B	1 400	1 450	10	70	70
								C	3 550	3 550	24	220	220
AXC80	80x100	5/20/50	5,5	4/8	6,0			A	4 500	4 500	42	270	270
								B	5 850	5 850	55	500	500
AXC100	104x125	5/10/25/50	5,5	5/10	6,0			D	5 850	5 850	170	600	600
AXC120	120x150	5/10/20/32	5,5	6/12	6,0			B	12 000	12 000	160	1 150	1 150
								C	12 000	12 000	160	2 600	2 600
AXF100	104x125	5/10/25/50	5,5	5	6,0	20/60/90	3,0	D	5 850	5 850	170	600	600
								P	120	240	9	13	6,5
AXDL110	110x65	5/10/16	3,5	4/8	3,0			D	2 900	2 900	100	140	140
								E	7 100	7 100	250	470	470
AXDL160	160x83	5/10/25/50	5,5	5/10	3,5			D	11 500	11 500	575	800	800
AXDL240	240x120	5/10/20/32	5,5	6/12	6,0			D	16 000	16 000	1 350	1 500	1 500
								E	18 000	18 000	1 500	3 100	3 100
AXLT155	155x60	5/20	3,5	4/8	3,5			D	7 000	7 000	375	300	300
								E	7 000	7 000	375	425	425
AXLT225	225x75	5/10/25/50	3,5	5/10	3,5			D	11 500	11 500	925	800	800
								E	11 500	11 500	925	1 050	1 050
AXLT325	325x90	5/10/20/32	3,2	6/12	3,2			D	24 000	24 000	2 750	2 450	2 450
								E	24 000	24 000	2 750	3 400	3 400
AXLT455	455x120	5/10/20/40	3,2	7	3,2			D	33 000	33 000	5 000	4 700	4 700

Maximum dynamic load capacity [N]: F_y, F_z. Maximum dynamic load moments [Nm]: M_x, M_y, M_z.

Lifting Axis with rack and pinion drive

Table 5.4 — Main parameters Lifting Axis rack and pinion drive

Type	Axis profile cross section [mm]	Feed constant [mm/rev.]	Allowable dynamic operating load [N]	Guiding system	Maximum velocity [m/s]	Maximum total length [m]	F_y	F_z	M_x	M_y	M_z
AXS200ME	200 x 100	200	4 400	D	3,4	6,0	14 700	14 700	1 100	1 400	1 400
				E	3,4	6,0	14 700	14 700	1 100	2 750	2 750
				G	3,4	6,0	14 700	14 700	1 100	1 400	1 400
AXS230MB	230 x 160	320	10 750	D	2,5	10,0	19 000	19 000	1 400	2 150	2 150
				E	2,5	10,0	19 000	19 000	1 400	4 000	4 000
				G	2,5	10,0	19 000	19 000	1 400	3 200	3 200
AXS280MB	280 x 170	400	16 240	D	3,3	10,0	29 000	29 000	3 500	5 250	5 250

Maximum dynamic load capacity [N]: F_y, F_z. Maximum dynamic load moments [Nm]: M_x, M_y, M_z.

Gantry Axis with toothed belt and rack and pinion drive

Table 5.5 — Main parameters Gantry Axis toothed belt and rack and pinion drive

Type	Axis profile cross section [mm]	Feed constant [mm/rev.]	Allowable dynamic operating load [N]	Guiding system	Maximum velocity [m/s]	Maximum total length [m]	F_y	F_z	M_x	M_y	M_z
AXS200MP	200 x 120	166,67	3 500	D	5,0	8,0	19 000	19 000	1 400	1 900	1 900
				R	5,0	8,0	19 000	19 000	1 400	2 100	2 100
AXS200Y[1]	200 x 120	200	2 200	D	5,0	8,0	19 000	19 000	1 450	1 700	1 700
				R	5,0	8,0	19 000	19 000	1 450	2 100	2 100
AXS280P	280 x 170	200	3 190	D	3,3	10,0	26 500	26 500	3 200	4 500	4 500
				R	3,3	10,0	26 500	26 500	3 200	5 900	5 900
				S	3,3	10,0	26 500	26 500	3 200	5 900	5 900
				T	3,3	10,0	26 500	26 500	3 200	5 900	5 900
				U	3,3	10,0	26 500	26 500	3 200	5 900	5 900
AXS280Y[1]	280 x 340	264	5 000	D	5,0	10,0	26 000	26 000	3 200	3 700	3 700
				E	5,0	10,0	26 000	26 000	3 200	6 250	6 250
				R	5,0	10,0	26 000	26 000	3 200	3 700	3 700
				S	5,0	10,0	26 000	26 000	3 200	4 000	4 000
				T	5,0	10,0	26 000	26 000	3 200	4 800	4 800
				U	5,0	10,0	26 000	26 000	3 200	4 000	4 000
AXS280Z[1]	280 x 250	480	4 000	D	5,0	10,0	26 000	26 000	3 200	3 700	3 700
				E	5,0	10,0	26 000	26 000	3 200	6 250	6 250
				R	5,0	10,0	26 000	26 000	3 200	3 700	3 700
				S	5,0	10,0	26 000	26 000	3 200	4 000	4 000
				T	5,0	10,0	26 000	26 000	3 200	4 800	4 800
AXS460P	400 X 300	250	5 860	U	5,0	10,0	26 000	26 000	3 200	4 000	4 000
				R	5,0	10,0	29 000	29 000	5 500	7 500	7 500
				S	5,0	10,0	29 000	29 000	5 500	7 500	7 500
AXS500P	310 x 500	250	6 000	R	5,0	12,0	50 500	50 500	10 000	12 000	12 000
				T	5,0	12,0	50 500	50 500	10 000	12 000	12 000

Maximum dynamic load capacity [N]: F_y, F_z. Maximum dynamic load moments [Nm]: M_x, M_y, M_z.

[1] Linear Axis are contained additionally in Table 5.1 "Linear Axis toothed belt drive"

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Beam Axis for parallel use with rack and pinion drive

Table 5.6 — Main parameters Beam Axis

Type	Axis cross section (without gearbox) [mm]	Feed constant [mm/rev.]	Allowable dynamic operating load [N]	Guiding system	Maximum velocity [m/s]	Maximum total length[1] [m]	Maximum dynamic load capacity [N]		Maximum dynamic load moments [Nm]		
							F_y	F_z	M_x	M_y	M_z
AXS120M_	120 x 200	200	3 700	B	5,0	8,0	9 270[2]	18 500	290[3]	3 700	not applicable
				C	5,0	8,0	13 900[2]	27 700	440[3]	5 500	not applicable
AXS300MP	300 x 400	250	6 000	B	5,0	10,0	38 000[2]	38 000	800[3]	7 600	not applicable

[1] Per section length
[2] For a complete system consisting of two Linear Axis
[3] Applies only to the moment resulting from the mass of the drive

Table 5.7 — Main parameters Telescopic Axis

Type	Level	Axis cross section (without gearbox) [mm]	Mounting position	Drive system	Feed constant [mm/rev.]	Allowable dynamic operating load [N]	Guiding system	Maximum velocity [m/s]	Maximum total length [m]	Maximum dynamic load capacity [N]		Maximum dynamic load moments [Nm]		
										F_y	F_z	M_x	M_y	M_z
AXS110TA	Guiding level 1	110 x 103	horizontal	Toothed Belt	350	980	D	10	6,0	7 000	7 000	240	500	500
	Guiding level 2			Toothed Belt		210				2 900	2 900	100	140	140
AXS120TH	Guiding level 1	118 x 216	horizontal	Toothed Rack	280	2 880	D	10	3,0	16 000	16 000	650	2 650	2 650
	Guiding level 2			Toothed Belt		2 500				12 000	12 000	155	1 100	1 100
AXS120TV	Guiding level 1	120 x 296	vertical	Toothed Rack	500	5 860	D	3,6	3,0	16 000	16 000	650	2 650	2 650
	Guiding level 2			Toothed Belt		2 500				12 000	12 000	155	1 100	1 100
AXS200TH	Guiding level 1	210 x 227,5	horizontal	Toothed Rack	360	5 800	D	10	3,0	27 000	27 000	2 000	7 700	7700
	Guiding level 2			Toothed Belt		2 500				12 500	12500	950	2 500	2500
AXS200TV	Guiding level 1	241 x 261	vertical	Toothed Rack	500	5 860	D	10	3,0	24 300	24 300	1 800	2 950	2 950
	Guiding level 2			Toothed Belt		2 500				7 100	7 100	240	1 050	1 050
AXS240TH	Guiding level 1	238 x 227	horizontal	Toothed Rack	500	5 000	D	10	6,0	24 000	24 000	2 400	3 500	3 500
	Guiding level 2			Toothed Belt		4 900				16 000	16 000	1 350	1 500	1 500
	Guiding level 1			Toothed Rack		5 000	E	10	6,0	27 000	27 000	2 700	5 300	5 300
	Guiding level 2			Toothed Belt		4 900				16 000	16 000	1 350	2 850	2 850
AXS280TH	Guiding level 1	280 x 325	horizontal	Toothed Rack	700	15 000	D	10	6,0	36 500	36 500	4 400	7 250	7 250
	Guiding level 2			Toothed Belt		5 000				24 000	24 000	2 300	3 500	3 500
AXS280TV	Guiding level 1	280 x 269,2	vertical	Toothed Rack	560	8 940	D and H	10	6,0	27 000	27 000	3 200	3 000	3 000
	Guiding level 2			Toothed Belt		5 000				16 000	16 000	800	2 300	2 300
	Guiding level 1			Toothed Rack		8 940	E			27 000	27 000	3 200	5 000	5 000
	Guiding level 2			Toothed Belt		5 000				16 000	16 000	800	3 500	3 500
	Guiding level 1			Toothed Rack		8 940	G			27 000	27 000	3 200	5 500	5 500
	Guiding level 2			Toothed Belt		5 000				16 000	16 000	800	3 900	3 900

Linear Motor Axis

Table 5.8 — Main parameters Linear Motor Axis

Type	Axis profile cross section [mm]	Maximum feeding force [N]	Maximum dynamic load capacity [N]			Maximum dynamic load moments [Nm]		
			F_y	F_z	$-F_z$	M_x	M_y	M_z
AXLM155E	155 x 81,5	330	4 490	5 240	3 740	190	280	280
		400	4 490	5 390	3 590	180	270	270
		650	4 490	5 950	3 030	150	500	500
		800	4 490	6 240	2 740	140	450	450
		980	6 730	8 480	4 580	230	770	770
		1 200	6 730	9 310	4 150	210	690	690
AXLM225E	225 x 90	650	6 900	8 380	5 420	400	380	380
		1 000	6 900	9 100	4 700	350	330	330
		1 300	6 900	9 780	4 020	300	590	590
		1 950	13 430	17 730	9 130	680	1 420	1 420
		2 000	8 950	13 270	4 630	340	680	680
		2 600	13 430	19 130	7 730	570	1 650	1 650
		3 000	13 430	19 860	7 000	520	1 100	1 100
		4 000	17 900	26 440	9 360	690	1 650	1 650
		5 000	22 380	33 030	11 730	860	2 400	2 400
AXLM325E	325 x 115	2 650	14 310	20 070	8 550	880	1 320	1 320
		3 970	18 530	27 100	9 960	1 020	2 350	2 350
		5 300	27 800	39 180	16 420	1 680	3 540	3 540
		6 600	37 070	51 270	22 870	2 350	5 220	5 220

5.2 AXC Compact Axis

5.2.1 AXC_Z Compact Axis with toothed belt drive

5.2.1.1 Structure
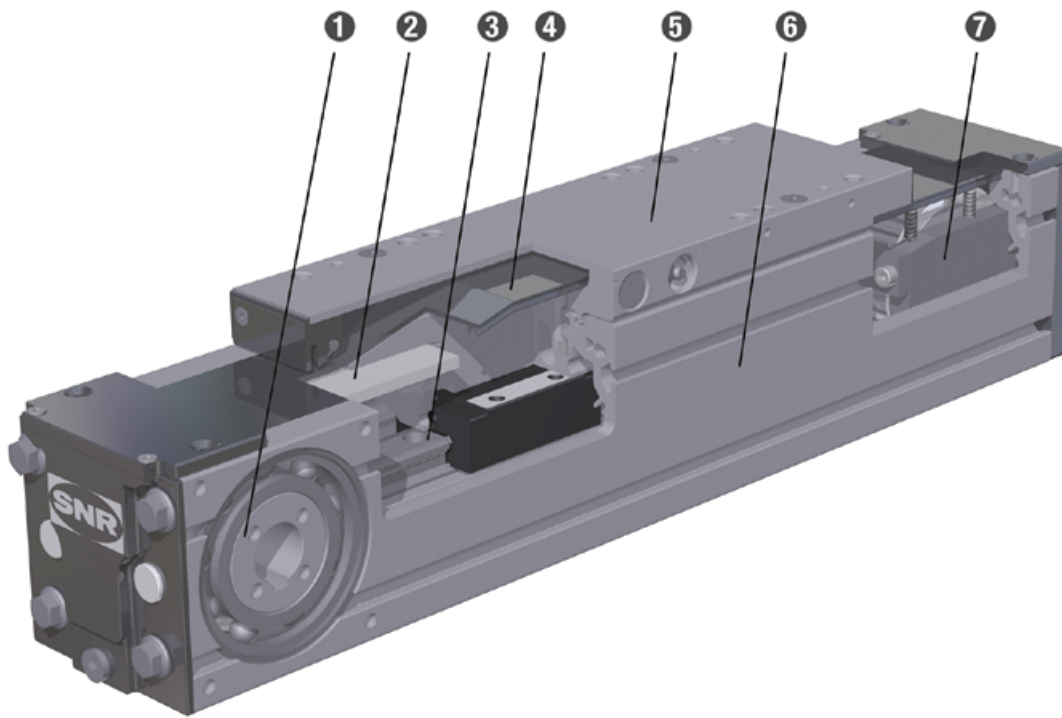
Figure 5.21 — Structure AXC_Z

1 Drive unit

2 Toothed belt

3 Guiding system

4 Cover strip (optional)

5 Slider unit

6 Profile

7 Deflection pulley

5.2.1.2   Dimensions / Technical data

AXC40Z
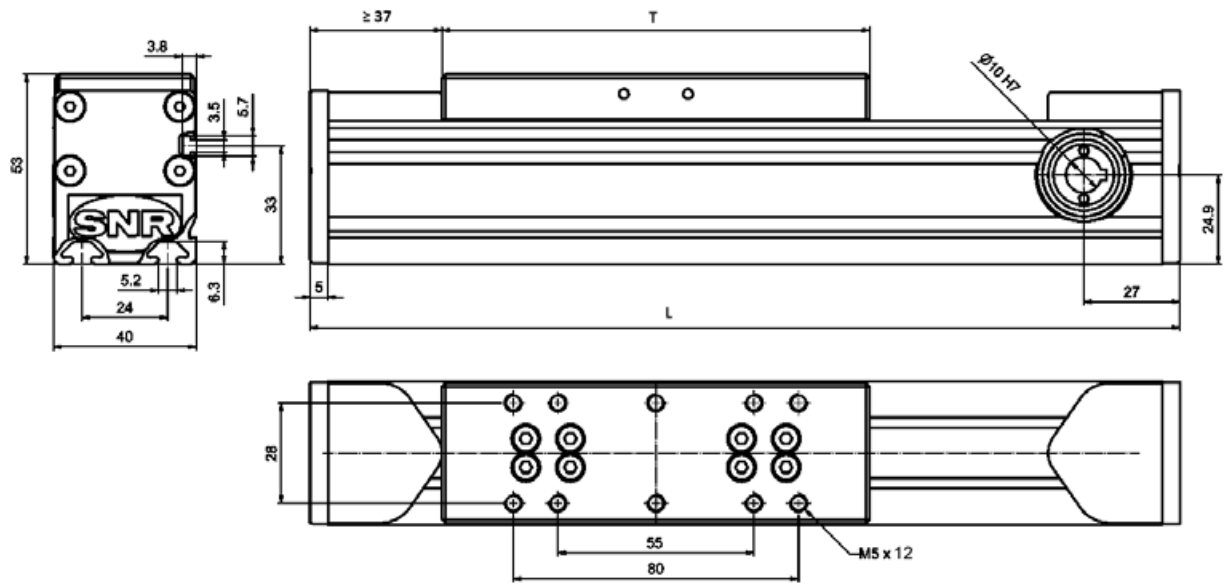
T = Table length   **S** = Travel range   **L** = T + S + 74 mm

Technical data

Guiding system		Track roller guide L
Table length T	mm	120
Drive element		Toothed belt 16AT3
Maximum velocity	m/min	900
Allowable dynamic operation load F_x	N	210
Stroke per revolution	mm	$75^{+0,1}$
Idling speed torque	Nm	0,16
Maximum drive torque	Nm	2,5
Moment of inertia[1]	Kgcm^2	0,033
Geometrical moment of inertia (profile) I_y	cm^4	9,521
Geometrical moment of inertia (profile) I_z	cm^4	12,14
Maximum total length	m	6,0
Repeatability	mm	0,08

[1] - *Moment of inertia without gearbox*

Mass

Guiding system		Track roller guide L
Basic mass (including slider mass)	kg	1,0
Mass per 100 mm stroke	kg	0,2
Slider mass	kg	0,4

AXC60Z
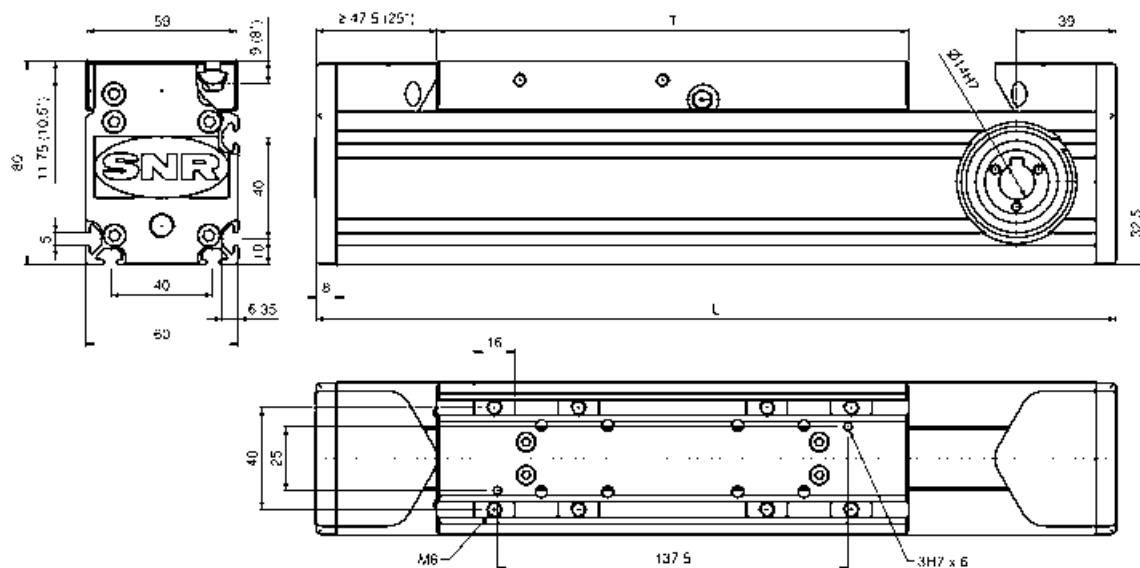
T* = Table length   **S** = Travel range   **L** = S + 280

1 Re-greasing possibility on both sides

Technical data

Guiding system		Linear guide B	Track roller guide L
Table length T	mm	185 (* 230 with cover strip at the configuration versions A up to U)	
Drive element		Toothed belt 25AT5	
Maximum velocity	m/min	300	900
Allowable dynamic operation load F_x	N	560	
Stroke per revolution	mm	$150^{+0,3}$	
Idling speed torque	Nm	0,8	
Maximum drive torque	Nm	13,4	
Moment of inertia[1]	Kgcm²	0,74	
Geometrical moment of inertia (profile) I_y	cm⁴	40,04	
Geometrical moment of inertia (profile) I_z	cm⁴	60,64	
Maximum total length	m	6,0	6,0
Repeatability	mm	0,05	

[1] - *Moment of inertia without gearbox*

Mass

Guiding system		Linear guide B	Track roller guide L
Basic mass (including slider mass)	kg	2,9	2,6
Mass per 100 mm stroke	kg	0,5	0,4
Slider mass	kg	1,1	1,0

AXC80Z
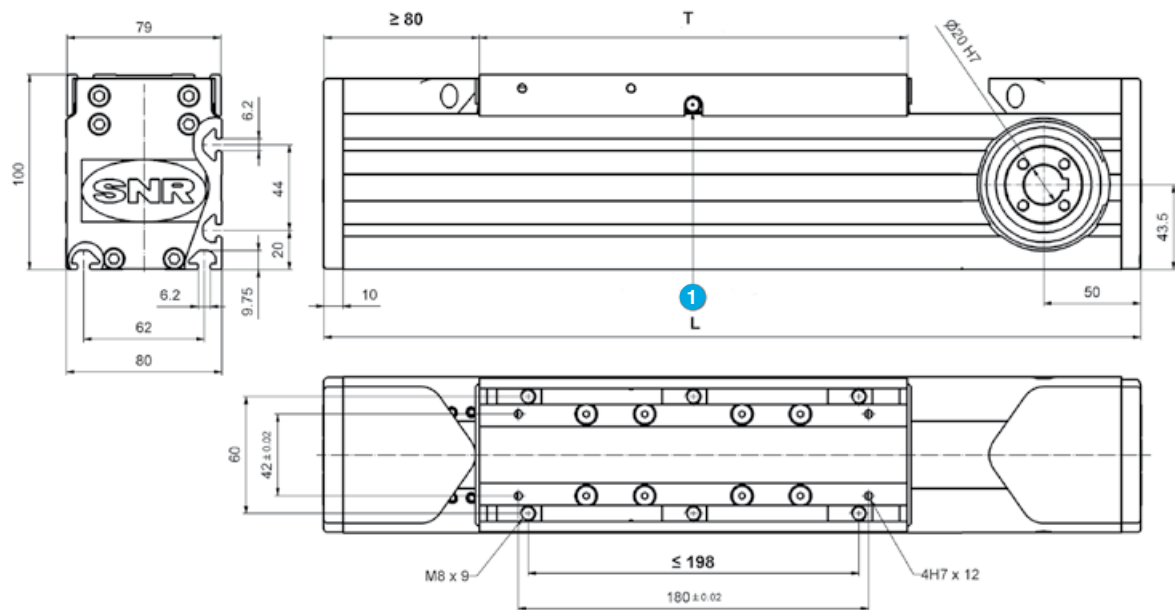
T = Table length   **S** = Travel range   **L** = T + S + 160 mm

1 Re-greasing possibility on both sides

Technical data

Guiding system		Linear guide B	Linear guide J	Linear guide C	Linear guide K	Track roller guide L
Table length T	mm	220		280		220
Drive element		Toothed belt 32AT5				
Maximum velocity	m/min	300				900
Allowable dynamic operation load F_x	N	870				
Stroke per revolution	mm	$200^{+0,4}$				
Idling speed torque	Nm	1,6				
Maximum drive torque	Nm	27,7				
Moment of inertia[1]	Kgcm²	3,68				
Geometrical moment of inertia (profile) I_y	cm⁴	146,9				
Geometrical moment of inertia (profile) I_z	cm⁴	199,2				
Maximum total length[2]	m	8,0				
Repeatability	mm	0,05				

[1] - Moment of inertia without gearbox
[2] - Greater length on request

Mass

Guiding system		Linear guide B	Linear guide J	Linear guide C	Linear guide K	Track roller guide L
Basic mass (including slider mass)	kg	6,4		7,3		6,0
Mass per 100 mm stroke	kg	0,94		0,94		0,79
Slider mass	kg	1,9		2,2		2,0

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AXC100Z
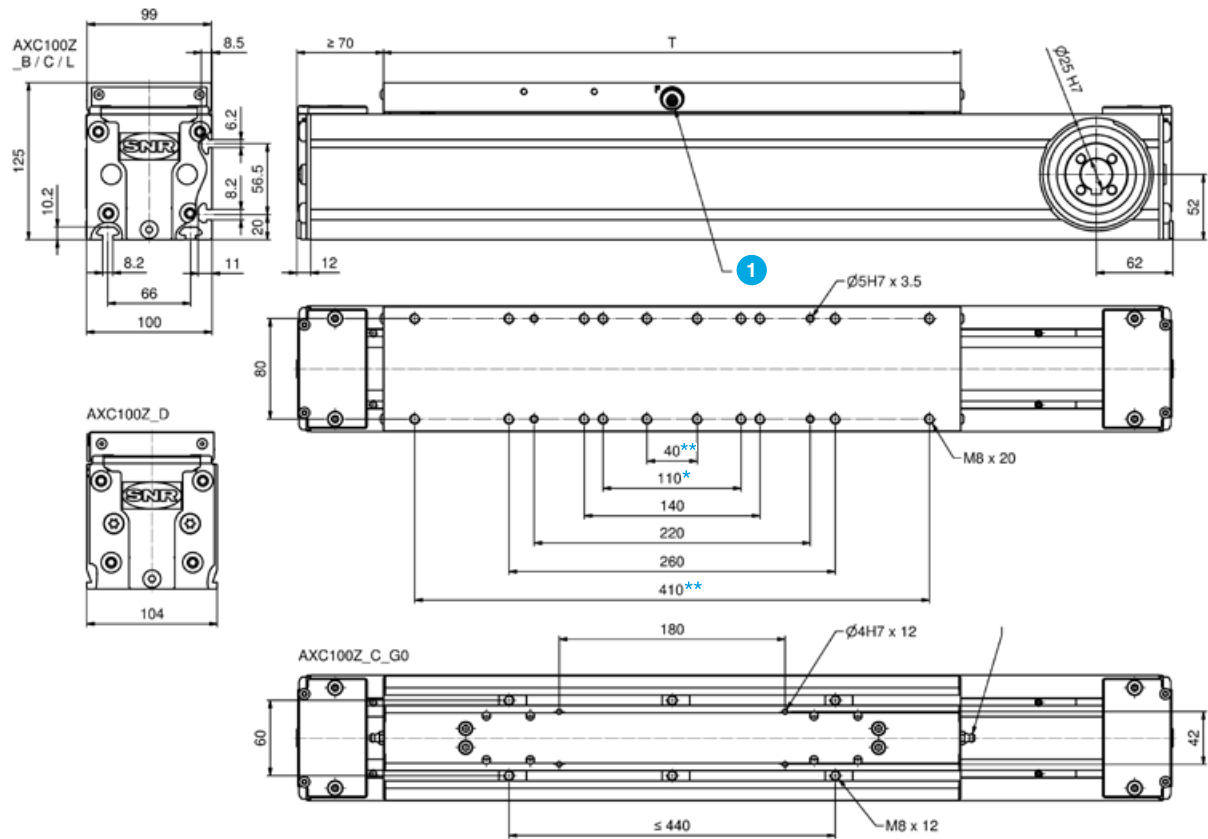
T = Table length   **S** = Travel range   L = T + S + 140 mm

1 Re-greasing possibility on both sides

* Guiding system B, D, L
** Guiding system C

Technical data

Guiding system		Linear guide B	Linear guide C	Linear guide D	Track roller guide L
Table length T	mm	320	460	320	
Drive element		Toothed belt 40STD8			
Maximum velocity	m/min	300			900
Allowable dynamic operation load F_x	N	2 200			
Stroke per revolution	mm	$264^{+0,5}$			
Idling speed torque	Nm	3,1			
Maximum drive torque	Nm	92,6			
Moment of inertia[1]	Kgcm^2	14,3			
Geometrical moment of inertia (profile) I_y	cm^4	366,7		377,1	366,7
Geometrical moment of inertia (profile) I_z	cm^4	482,8		500,4	482,8
Maximum total length	m	8,0		6,0	8,0
Repeatability	mm	0,05			

[1] - *Moment of inertia without gearbox*

Mass

Guiding system		Linear guide B	Linear guide C	Linear guide D	Track roller guide L
Basic mass (including slider mass)	kg	11,1	12,4	11,7	11,9
Mass per 100 mm stroke	kg	1,2	1,2	1,1	1,1
Slider mass	kg	2,6	3,9	3,2	2,6

AXC120Z
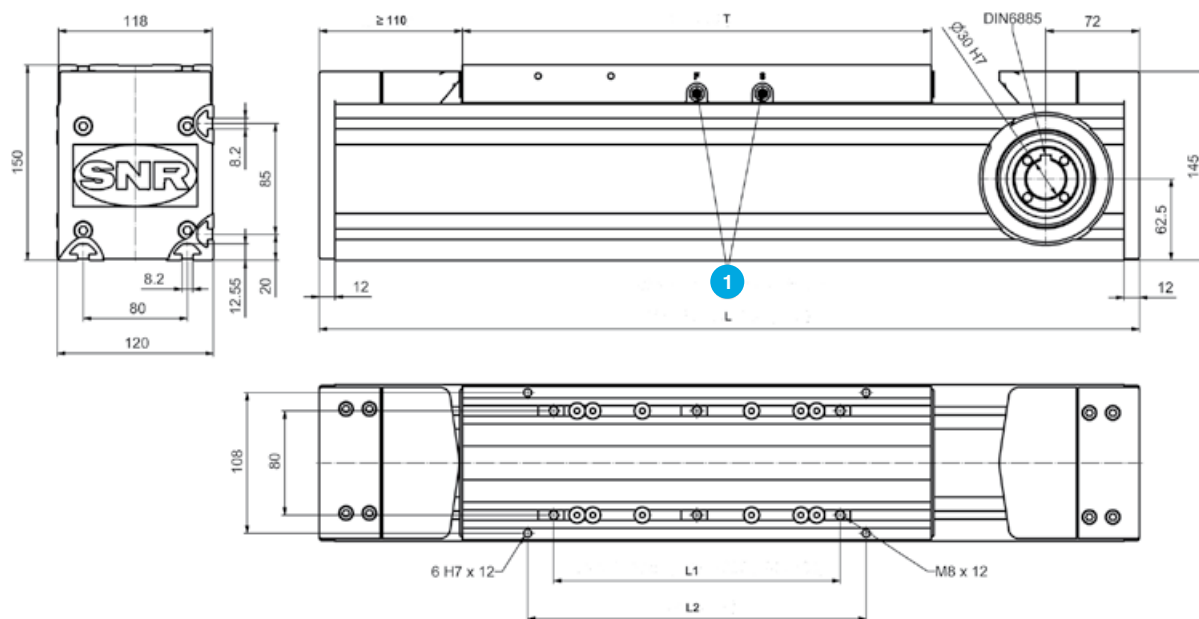
T = Table length   **S** = Travel range   **L** = T + S + 220 mm

1 Re-greasing possibility on both sides

Technical data

Guiding system		Linear guide B	Linear guide C	Track roller guide L	Track roller guide M
Table length T	mm	360	600	360	600
Distance of the sliding blocks L1		≤ 340 mm (recommended 220 mm)	≤ 580 mm (recommended 380 mm)	≤ 340 mm (recommended 220 mm)	≤ 580 mm (recommended 380 mm)
Distance of the fitting bores L2	mm	260	380	260	380
Drive element		Toothed belt 50AT10			
Maximum velocity	m/min	300		900	
Allowable dynamic operation load F_x	N	2 500			
Stroke per revolution	mm	$320^{+0,5}$			
Idling speed torque	Nm	4,0			
Maximum drive torque	Nm	127			
Moment of inertia[1]	Kgcm^2	29,9			
Geometrical moment of inertia (profile) Iy	cm^4	661,1			
Geometrical moment of inertia (profile) I_z	cm^4	938,6			
Maximum total length[2]	m	10,0 (one-piece)			
Repeatability	mm	0,05			

[1] - Moment of inertia without gearbox
[2] - Greater length on request

Mass

Guiding system		Linear guide B	Linear guide C	Track roller guide L	Track roller guide M
Basic mass (including slider mass)	kg	21,6	30,0	20,1	28,5
Mass per 100 mm stroke	kg	2,1	2,1	1,4	1,4
Slider mass	kg	6,4	9,8	6,2	11,3

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5.2.1.3 Maximum static load capacity

Type	Guiding system	Load [N]		Load moment [Nm]		
		F_y	F_z	M_x	M_y	M_z
AXC40Z	L	330	300	2,8	4,5	7,4
AXC60Z	B	4 800	9 650	66	350	180
	L	840	550	10	27	41
AXC80Z	B	7 900	16 000	150	800	400
	C	7 900	16 000	150	1 200	590
	J	7 900	12 400	115	700	400
	K	7 900	12 400	115	1 080	630
	L	3 400	2 300	60	110	170
AXC100Z	B	11 000	16 500	175	900	560
	C	11 000	16 500	175	2 100	1 260
	C[1]	1 500	16 500	not applicable	2 100	not applicable
	D	23 750	23 750	680	1 100	1 100
	L	3 400	2 300	87	120	180
AXC120Z	B	18 800	28 500	365	2 600	1 730
	C	18 800	35 250	450	7 000	3 770
	C[1]	2 900	35 250	not applicable	6 900	not applicable
	L	5 100	3 400	110	260	390
	M	6 800	4 500	150	530	790

[1] with configuration version G

5.2.1.4 Dynamic load capacity

The dynamic load capacities of the guiding systems are based on a nominal life time of 50 000 km.

Type	Guiding system	Load [N]		Load moment [Nm]		
		Fy	Fz	Mx	My	Mz
AXC40Z	L	310	170	2,4	3,9	7
AXC60Z	B	2 800	2 800	19	100	100
	L	840	500	10	27	41
AXC80Z	B	4 650	4 650	43	235	235
	C	4 650	4 650	43	350	350
	J	3 600	3 600	34	205	205
	K	3 600	3 600	34	310	310
	L	3 400	2 300	60	110	170
AXC100Z	B	5 000	5 000	52	275	275
	C	5 000	5 000	52	630	630
	C[1]	1 500	5 000	not applicable	630	not applicable
	D	7 000	7 000	200	325	325
	L	3 400	2 300	87	120	180
AXC120Z	B	9 650	9 650	120	875	875
	C	10 500	10 500	140	2 150	2 150
	C[1]	2 900	10 500	not applicable	1 000	not applicable
	L	5 100	3 400	110	260	390
	M	6 800	4 500	150	530	790

[1] with configuration version G
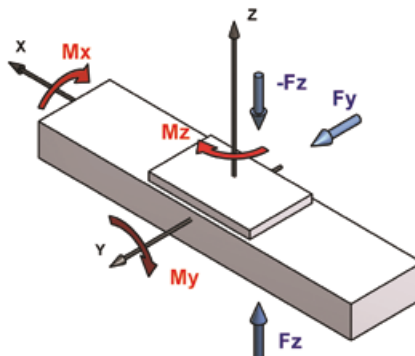
5.2.2 AXC_S / T Compact Axis with screw drive

5.2.2.1 Structure
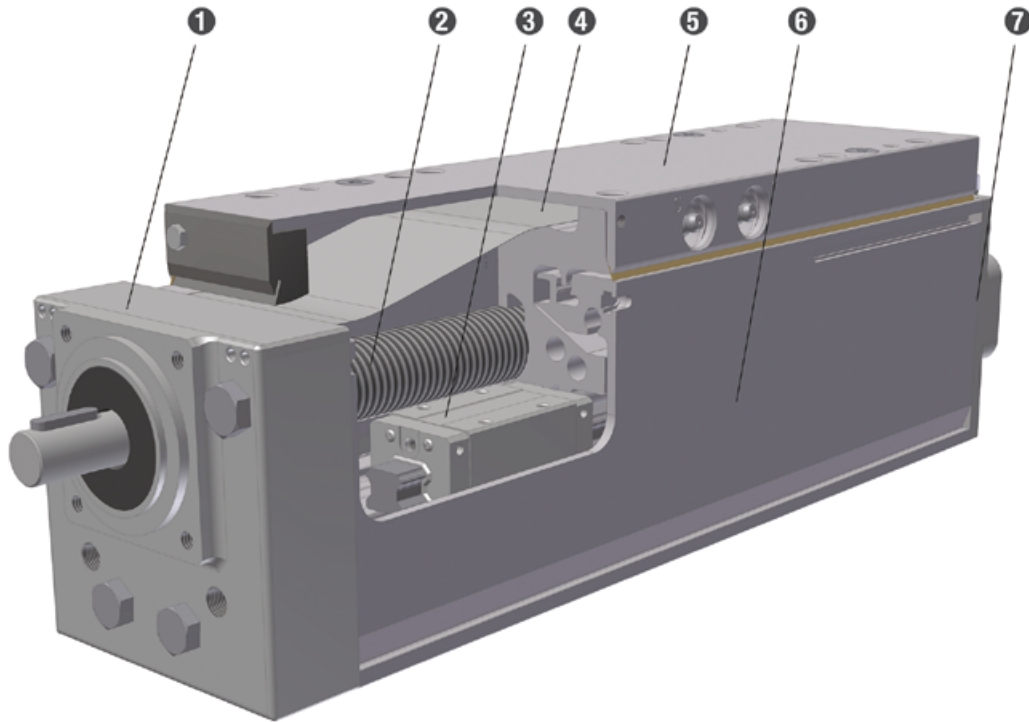
Figure 5.22 — Structure AXC_S / AXC_T

1 Fixed bearing unit

2 Screw drive

3 Guiding system

4 Cover strip (optional)

5 Slider unit

6 Profile

7 Floating bearing unit

5.2.2.2   Dimensions / Technical data

AXC40S / AXC40T

T = Table length   **S** = Travel range   **n x SA** = Number of screw drive support units

L = T + S + 30 mm (+ n x SA x 30 mm)

1 Re-greasing possibility on both sides

Technical data

Type		SN1205	SN1210	TN1203
Guiding system		Linear guide B		
Table length T	mm	130		
Drive element		Ball screw		Trapezoidal screw
Screw diameter	mm	12		
Pitch / Pitch direction	mm	5 / right	10 / right	3 / right
Maximum velocity	m/min	30	60	5,5
Pitch accuracy	µm/300mm	52		200
Dynamic load rating of the ball screw	N	3 600	2 500	-
Idling speed torque	Nm	0,3		
Maximum drive torque	Nm	0,80	1,60	1,00
Maximum axial operating load	N	980	980	1 000
Moment of inertia	Kgcm^2/m	0,11		0,10
Geometrical moment of inertia (profile) I_y	cm^4	9,521		
Geometrical moment of inertia (profile) I_z	cm^4	12,14		
Maximum total length	m	2,5		3,0
Repeatability	mm	0,03	0,07	
Efficiency		0,98	0,98	0,46

Mass

Guiding system		Linear guide B		
Basic mass (including slider mass)	kg	1,00		
Mass per 100 mm stroke	kg	0,30		
Slider mass	kg	0,40		

Allowable rotational speed of the ball screw
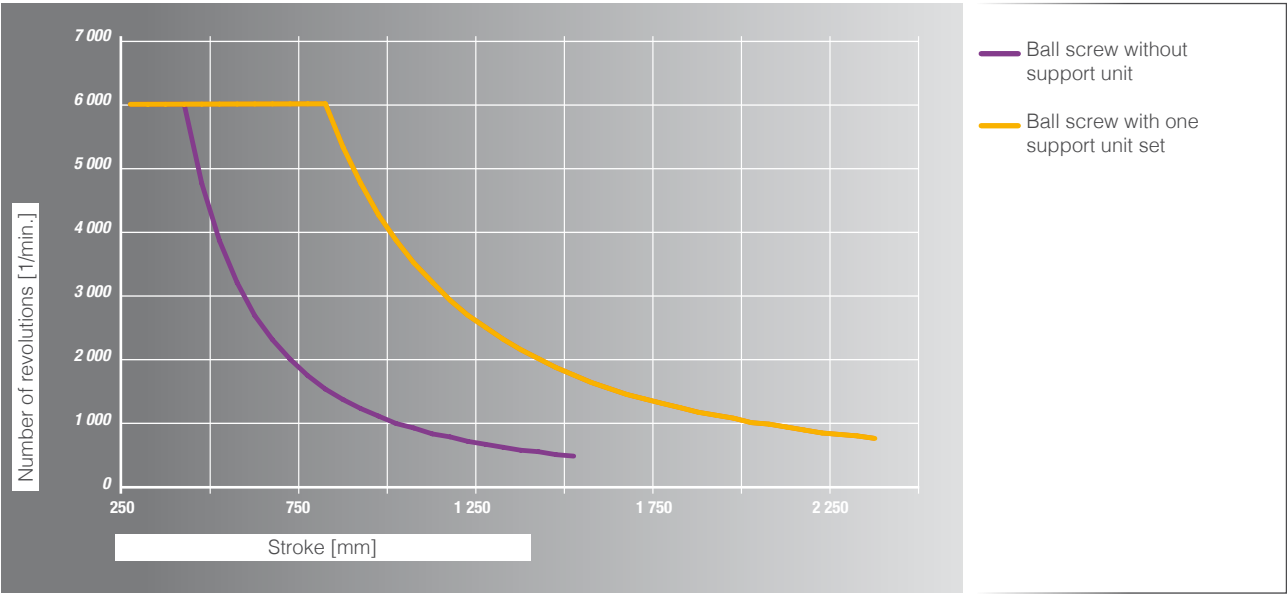
Legend:
- Ball screw without support unit
- Ball screw with one support unit set

X-axis: Stroke [mm]
Y-axis: Number of revolutions [1/min.]

Allowable rotational speed of the trapezoidal screw

Legend:
- Trapezoidal screw without support unit
- Trapezoidal screw with one support unit set

X-axis: Stroke [mm]
Y-axis: Number of revolutions [1/min.]

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AXC60S / AXC60T
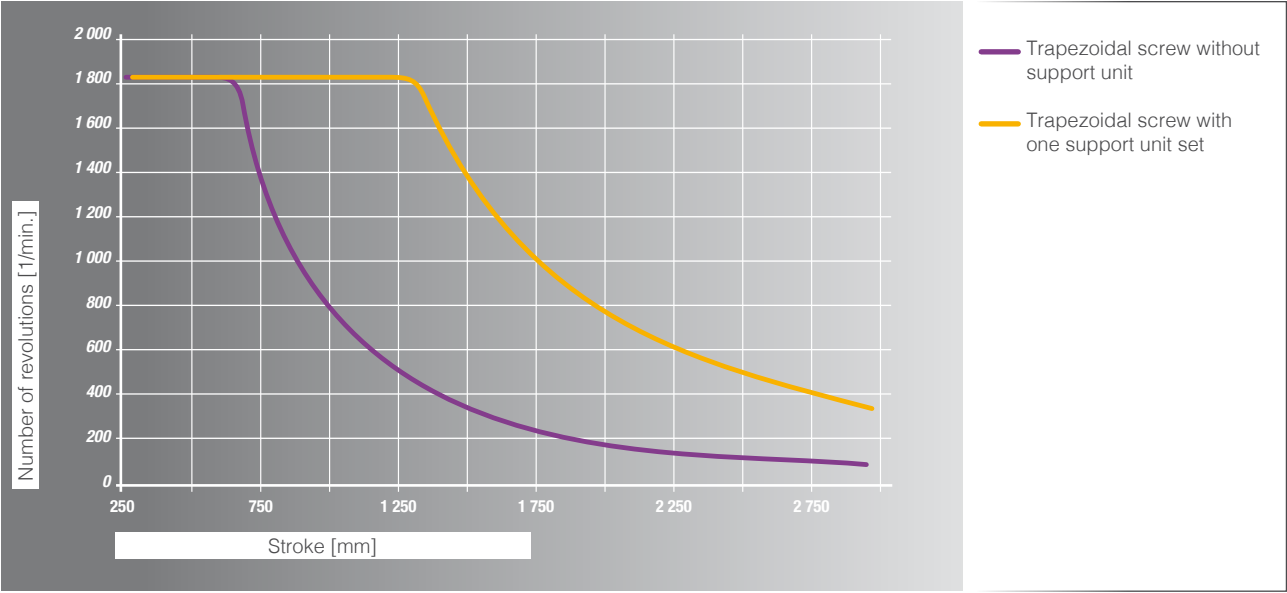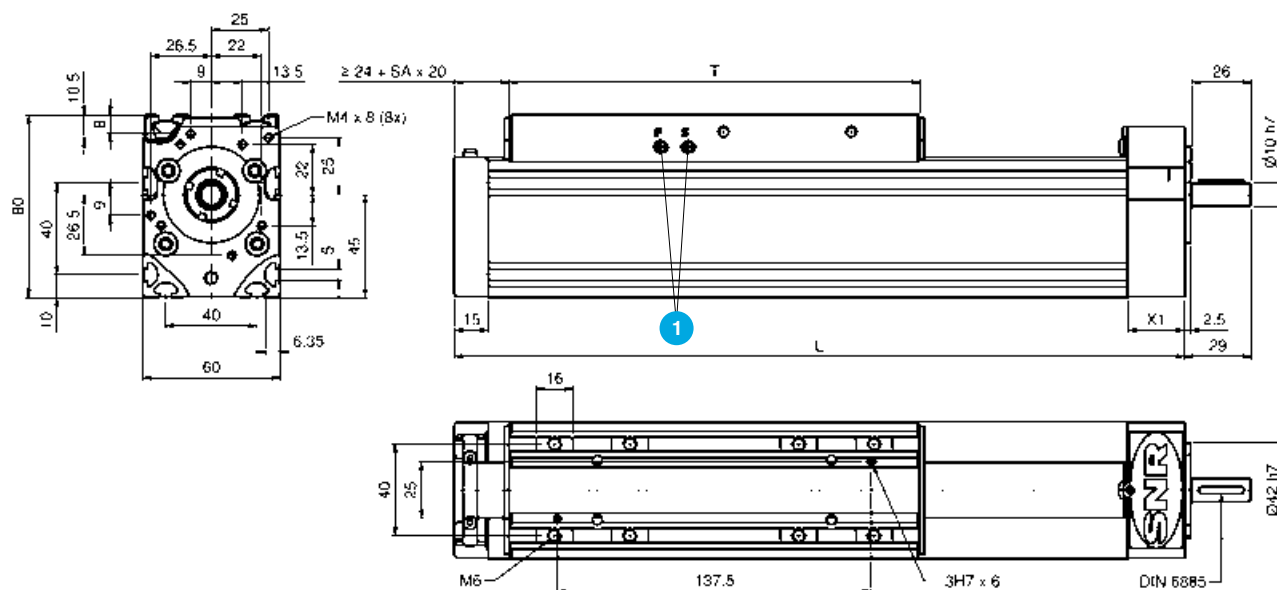
T = Table length   S = Travel range   n x SA = Number of screw drive support units

L = T + S + 60 mm (SN) / 73 mm (SV) (+ n x SA x 40 mm)

X1: SN = 25 mm, SV = 38 mm

1 Re-greasing possibility on both sides

Technical data

Type		SN/SV1605	SN/SV1610	SN1616	TN1604	TN1608
Guiding system		Linear guide B and C				
Table length T	mm	Guiding system B: 180 / Guiding system C: 230				
Drive element		Ball screw			Trapezoidal screw	
Screw diameter	mm	16				
Pitch / Pitch direction	mm	5 / right, left	10 / right	16 / right	4 / right, left	8 / right
Maximum velocity	m/min	25	50	80	5,5	10,9
Pitch accuracy	µm/300mm	23			50	100
Dynamic load rating of the drive component	N	7 280 (16 100*)	7 380 (8 240*)	5 410	-	
Idling speed torque	Nm	0,4				
Maximum drive torque	Nm	1,8 (2,6*)	3,5 (5,3*)	5,6	3,0	4,5
Maximum axial operating load	N	2 200 (3 300*)		2 200	2 200	
Moment of inertia	Kgcm²/m	0,31		0,34	0,3	
Geometrical moment of inertia (profile) I_y	cm⁴	40,04				
Geometrical moment of inertia (profile) I_z	cm⁴	60,64				
Maximum total length	m	3,5			3,0	
Repeatability	mm	0,03			0,07	
Efficiency		0,97	0,98		0,46	0,62

For drive type SV

Mass

Guiding system			Linear guide B	Linear guide C
Basic mass (including slider mass)	kg		2,70	3,40
Mass per 100 mm stroke	kg		0,61	0,61
Slider mass	kg		0,80	1,20

Allowable rotational speed of the ball screw
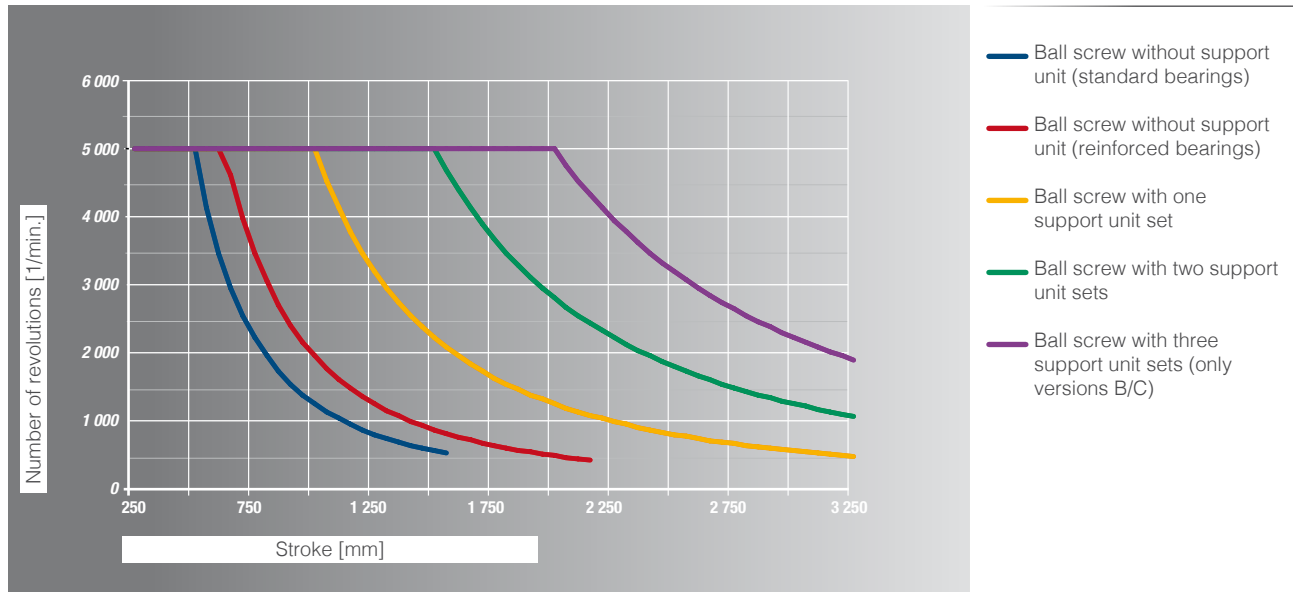
- Ball screw without support unit (standard bearings)
- Ball screw without support unit (reinforced bearings)
- Ball screw with one support unit set
- Ball screw with two support unit sets
- Ball screw with three support unit sets (only versions B/C)

Allowable rotational speed of the trapezoidal screw

- Trapezoidal screw without support unit
- Trapezoidal screw with one support unit set
- Trapezoidal screw with two support unit sets

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AXC80S / AXC80T
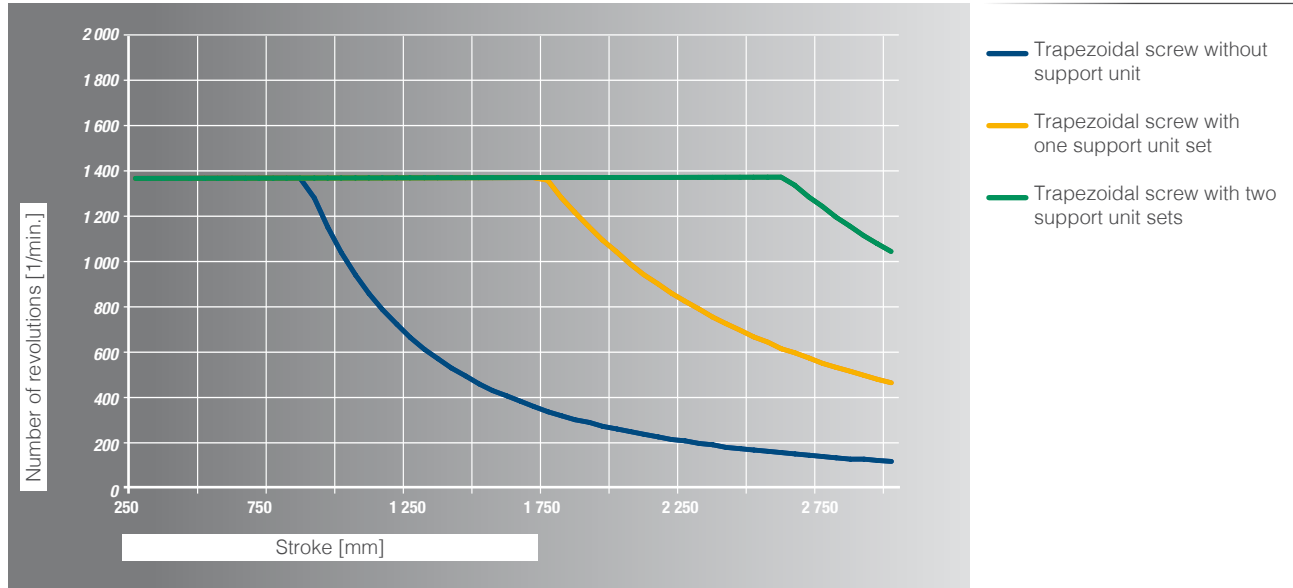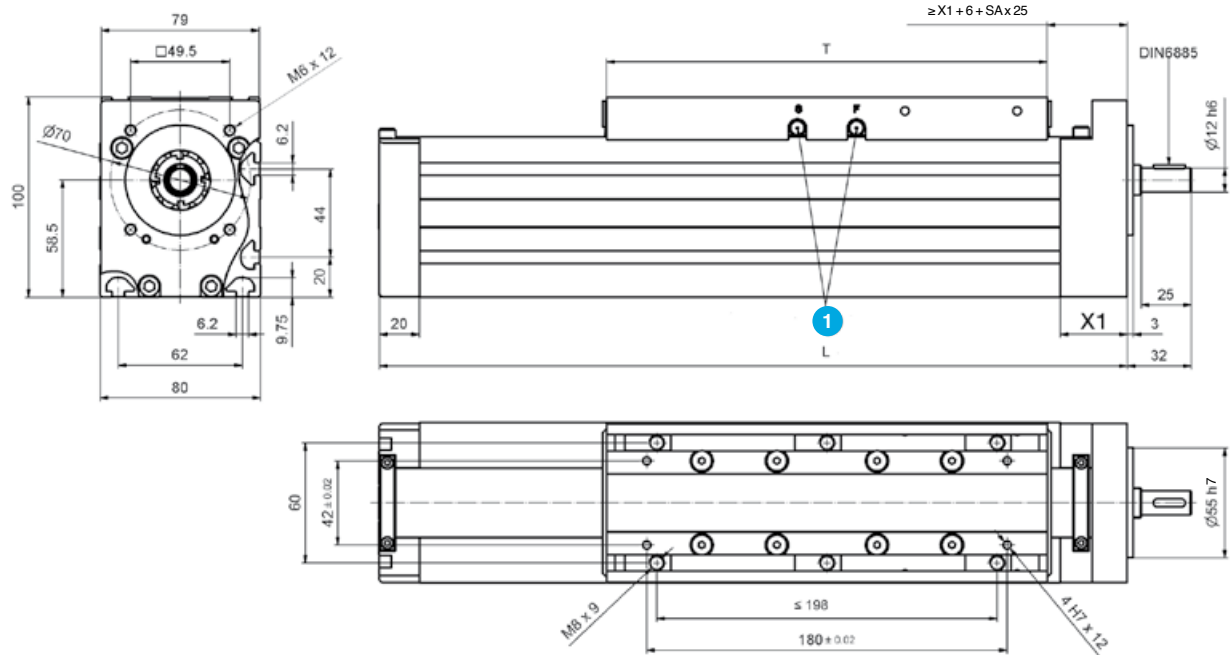
T = Table length   S = Travel range   n x SA = Number of screw drive support units

L = T + S + 26 mm + X1 (+ n x SA x 50 mm)   X1: SN = 24 mm; SV = 34 mm

1 Re-greasing possibility on both sides

Technical data

Type		SN/SV2005	SN/SV2020**	SN2050**	TN2004	TN2008
Guiding system		Linear guide A and B				
Table length T	mm	Guiding system B: 280 / Guiding system A: 220				
Screw element		Ball screw			Trapezoidal screw	
Screw diameter	mm	20				
Pitch / Pitch direction	mm	5 / right, left	20 / right	50 / right	4 / right, left	8 / right
Maximum velocity	m/min	20	80	150	4,2	8,5
Pitch accuracy	µm/300mm	23		52	50	100
Dynamic load rating of the drive component	N	8 090 (14 000*)	8 090 (10 900*)	7 900	-	
Idling speed torque	Nm	0,4…0,6				
Maximum drive torque	Nm	2,1 (3,7*)	8,3 (15,0*)	21,0	4,3	6,0
Maximum axial operating load	N	2 600 (4 700*)		2 600	2 700	
Moment of inertia	Kgcm²/m	0,84	0,81	0,79	0,81	
Geometrical moment of inertia (profile) I_y	cm⁴	146,9				
Geometrical moment of inertia (profile) I_z	cm⁴	199,2				
Maximum total length	m	5,5			6,0	
Repeatability	mm	0,03			0,07	
Efficiency		0,95	0,98		0,40	0,57

For drive type SV and not for guiding system A
** not for guiding system A

Mass

Guiding system		Linear guide A	Linear guide B
Basic mass (including slider mass)	kg	6,3	6,8
Mass per 100 mm stroke	kg	1,1	1,1
Slider mass	kg	1,7	2,2

Allowable rotational speed of the ball screw

Legend:
- Ball screw without support unit (standard bearings)
- Ball screw without support unit (reinforced bearings)
- Ball screw with one support unit set
- Ball screw with two support unit sets
- Ball screw with three support unit sets
- Ball screw with four support unit sets (only versons B)
- rpm limit SN2050

Axes: Number of revolutions [1/min.] vs Stroke [mm]

Allowable rotational speed of the trapezoidal screw

Legend:
- Trapezoidal screw without support unit
- Trapezoidal screw with one support unit set
- Trapezoidal screw with two support unit sets
- Trapezoidal screw with three support unit sets

Axes: Number of revolutions [1/min.] vs Stroke [mm]

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AXC100S / AXC100T

T = Table length   **S** = Travel range   **n x SA** = Number of screw drive support units

L = T + S + 80 mm (+ n x SA x 50 mm)

1 Re-greasing possibility on both sides

Technical data

Type		SV2505	SV2510	SV2525	SV2550	TV2405	TV2410
Guiding system		Linear guide D					
Table length T	mm	320					
Drive element		Ball screw				Trapezoidal screw	
Screw diameter	mm	25				24	
Diameter shaft end d	mm	15h7				12h7	
Pitch / Pitch direction	mmn	5 / right	10 / right	25 / right	50 / right	5 / right, left	10 / right
Maximum velocity	m/min	18	36	90	180	4,4	8,9
Pitch accuracy	µm/300mm	23			52	50	100
Dynamic load rating of the drive component	N	19 800	16 100	12 100	15 400		
Idling speed torque	Nm	0,3…2,0					
Maximum drive torque	Nm	4,8	9,5	24,0	48,0	10,0	14,0
Maximum axial operating load	N	6 000				5 200	
Moment of inertia	Kgcm^2/m	2,62	2,82	2,62	2,25	1,50	
Geometrical moment of inertia (profile) I_y	cm^4	377,1					
Geometrical moment of inertia (profile) I_z	cm^4	500,4					
Maximum total length	m	5,8		5,5		6,0	
Repeatability	mm	0,03				0,07	
Efficiency		0,93		0,98		0,41	0,58

Mass

Guiding system		Linear guide D		
Basic mass (including slider mass)	kg	12,0		
Mass per 100 mm stroke	kg	1,6		
Slider mass	kg	2,7		

Allowable rotational speed of the ball screw

Ball screw without support unit

Ball screw with one support unit set

Ball screw with two support unit sets

Ball screw with three support unit sets

Ball screw with four support unit sets

Allowable rotational speed of the trapezoidal screw

Trapezoidal screw without support unit

Trapezoidal screw with one support unit set

Trapezoidal screw with two support unit sets

Trapezoidal screw with three support unit sets

Trapezoidal screw with four support unit sets

SNR
Brand of NTN Group

AXC120S / AXC120T

T = Table length   **S** = Travel range   **n x SA** = Number of screw drive support units

$$L = T + S + 100 \text{ mm } (+ n \times SA \times 60 \text{ mm})$$

1 Re-greasing possibility on both sides

Technical data

Type		SV3205	SV3210	SV3220	SV3232	TV3606	TV3612
Guiding system		Linear guide B and C					
Table length T	mm	Guiding system B: 360 mm / Guiding system C: 600 mm					
Distance of the sliding blocks L1		Guiding system B: ≤ 340 mm (recommended 220 mm) Guiding system C: 580 mm (recommended ≤460 mm)					
Drive element		Ball screw				Trapezoidal screw	
Screw diameter	mm	32				36	
Pitch / Pitch direction	mm	5 / right, left	10 / right	20 / right	32 / right	6 / right, left	12 / right
Maximum velocity	m/min	12,5	25	50	80	3,5	6,9
Pitch accuracy	µm/300mm	23				50	200
Dynamic load rating of the drive component	N	25 900	26 000	18 700	18 800	-	
Idling speed torque	Nm	1,0…1,3					
Maximum drive torque	Nm	5,6	11,0	22,0	36,0	19,0	26,0
Maximum axial operating load	N	7 000					
Moment of inertia	Kgcm²/m	6,05	6,40	6,39	6,17	9,00	
Geometrical moment of inertia (profile) I_y	cm⁴	661,1					
Geometrical moment of inertia (profile) I_z	cm⁴	938,6					
Maximum total length	m	5,5		5,0		6,0	
Repeatability	mm	0,03				0,07	
Efficiency		0,91	0,97	0,98		0,35	0,52

Mass

Guiding system		Linear guide B	Linear guide C
Basic mass (including slider mass)	kg	20,5	28,5
Mass per 100 mm stroke	kg	2,4	2,4
Slider mass	kg	7,2	8,4

Allowable rotational speed of the ball screw
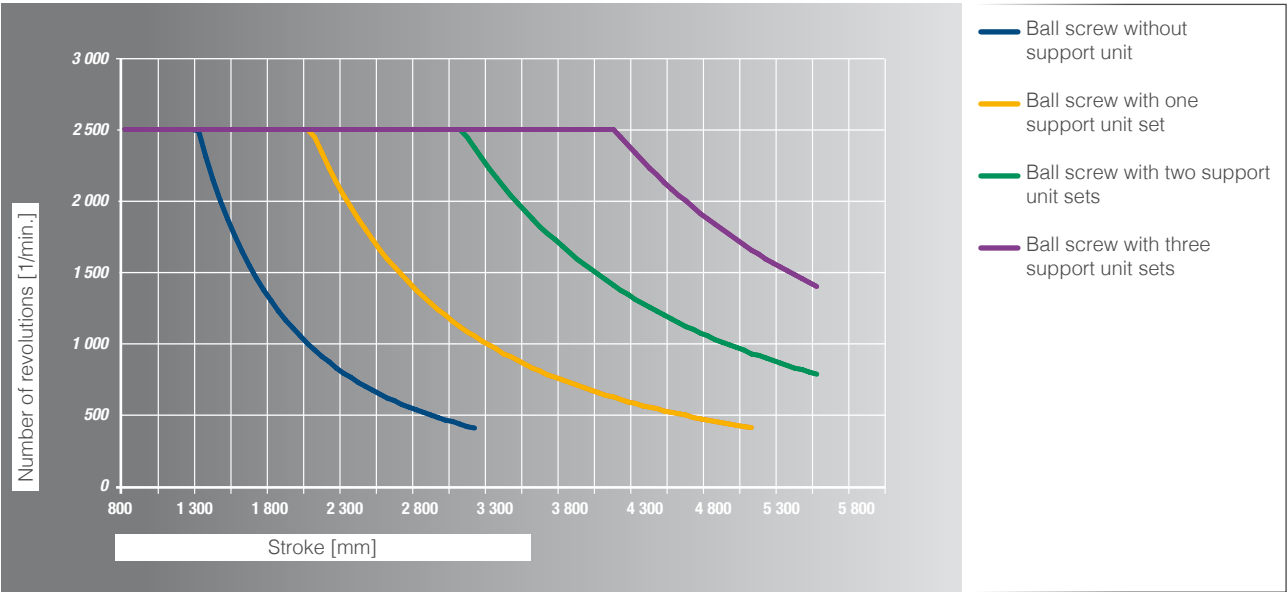
The version AXC120SN3205 is not available with spindle supports units

Allowable rotational speed of the trapezoidal screw
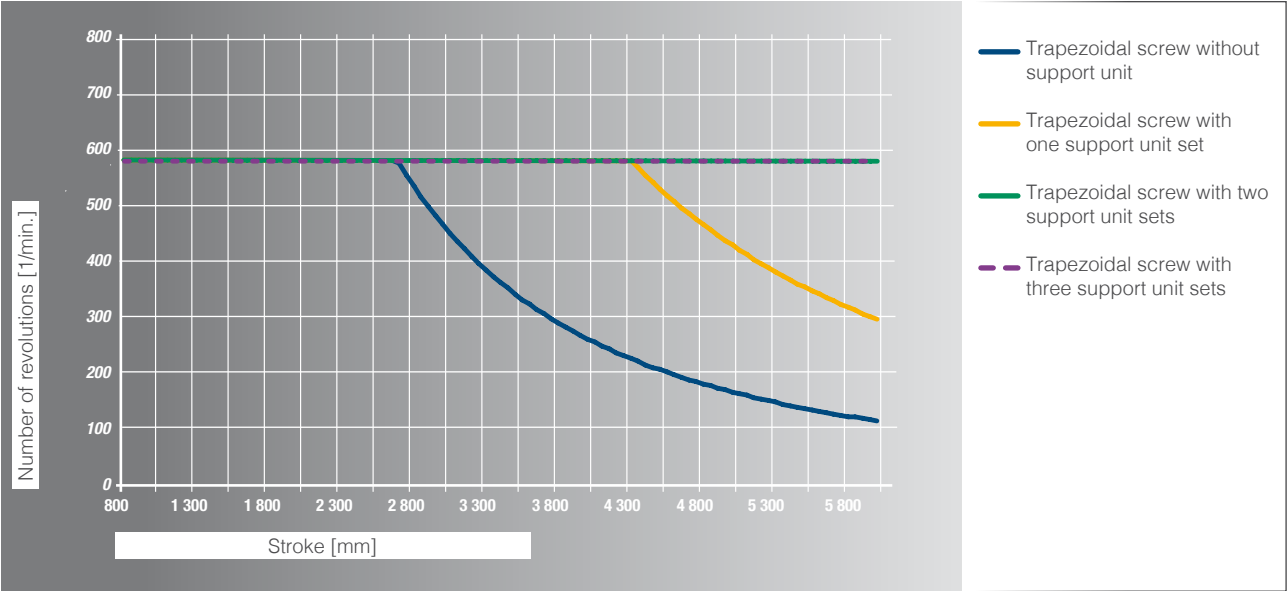
5.2.2.3 Maximum static load capacity

| Type	Guiding system	Load [N]		Load moment [Nm]		
		F_y	F_z	M_x	M_y	M_z
AXC40S/T	B	900	900	4,4	30	30
AXC60S/T	B	2 400	3 950	27	200	116
	C	4 850	9 650	66	600	306
AXC80S/T	A	7 900	12 400	116	740	430
	B	7 900	16 000	150	1 350	670
AXC100S/T	D	15 900	15 900	450	1 600	1 600
AXC120S/T	B	18 500	28 750	365	2 750	1 820
	C	18 500	28 750	365	6 200	4 000

5.2.2.4 Dynamic load capacity

The dynamic load capacities of the guiding systems are based on a nominal life time of 25 000 km.

Type	Guiding system	Load [N]		Load moment [Nm]		
		F_y	F_z	M_x	M_y	M_z
AXC40S/T	B	675	675	3,2	22	22
AXC60S/T	B	1 450	1 450	10	70	70
	C	3 550	3 550	24	220	220
AXC80S/T	A	4 500	4 500	42	270	270
	B	5 850	5 850	55	500	500
AXC100S/T	D	5 850	5 850	170	600	600
AXC120S/T	B	12 000	12 000	160	1 150	1 150
	C	12 000	12 000	160	2 600	2 600
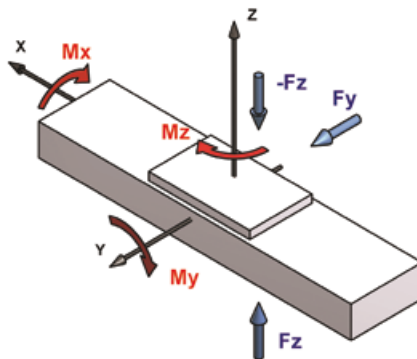
5.2.3 AXC_A Compact Axis with toothed belt / Ω - drive

5.2.3.1 Structure
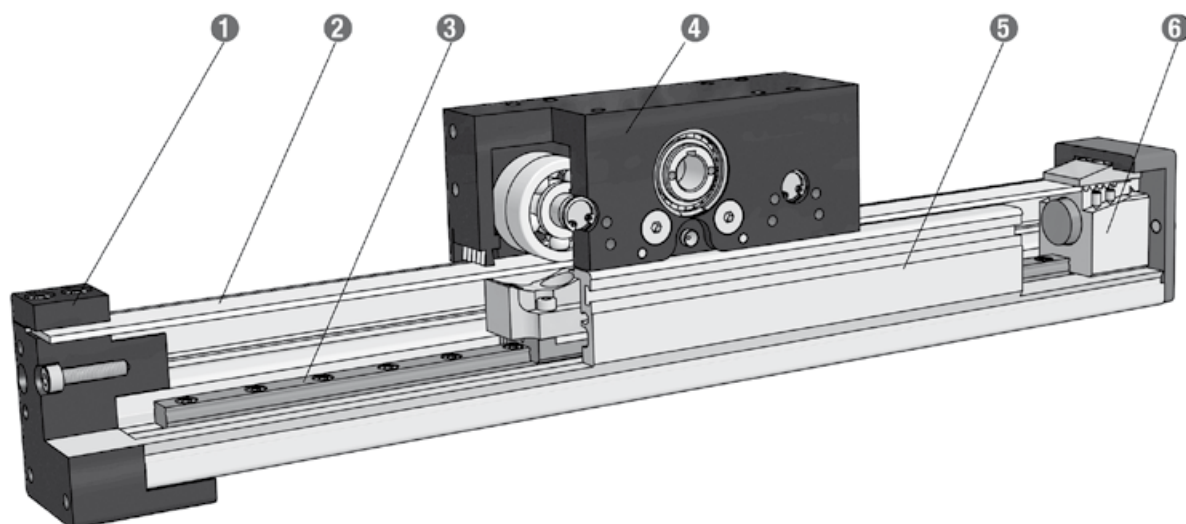
Figure 5.23 — Structure AXC_A

1 Toothed belt clamping

2 Toothed belt

3 Guiding system

4 Operating head

5 Profile

6 Toothed belt tension unit

5.2.3.2   Dimensions / Technical data

AXC40A
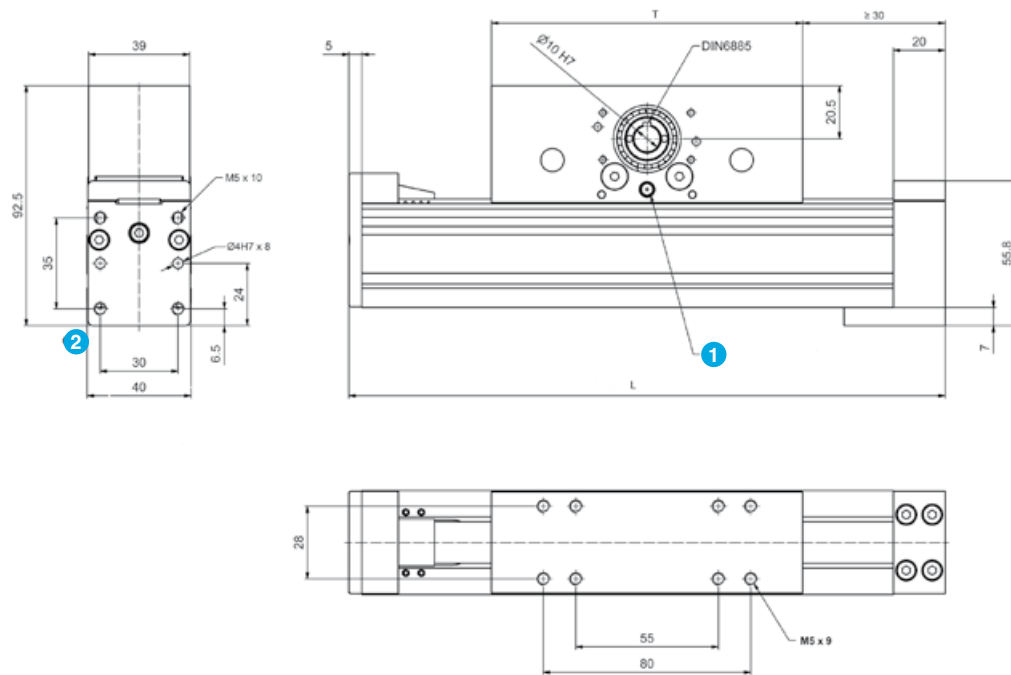
T = Table length   **S** = Travel range   **L** = T + S + 60 mm

❶ Re-greasing possibility on both sides

❷ Groove dimension as AXC40Z

Technical data

Guiding system		Linear guide B
Table length T	mm	120
Drive element		Toothed belt 16AT3
Maximum velocity	m /min	300
Allowable dynamic operation load F_x	N	210
Stroke per revolution	mm	$75^{+0,1}$
Idling speed torque	Nm	0,2
Maximum drive torque	Nm	2,5
Moment of inertia [1]	Kgcm^2	0,16
Geometrical moment of inertia (profile) I_y	cm^4	9,521
Geometrical moment of inertia (profile) I_z	cm^4	12,14
Maximum total length	m	6,0
Repeatability	mm	0,08

[1] - Moment of inertia without gearbox

Mass

Guiding system		Linear guide B
Basic mass (including slider mass)	kg	1,3
Mass per 100 mm stroke	kg	0,22
Slider mass	kg	0,9

AXC60A
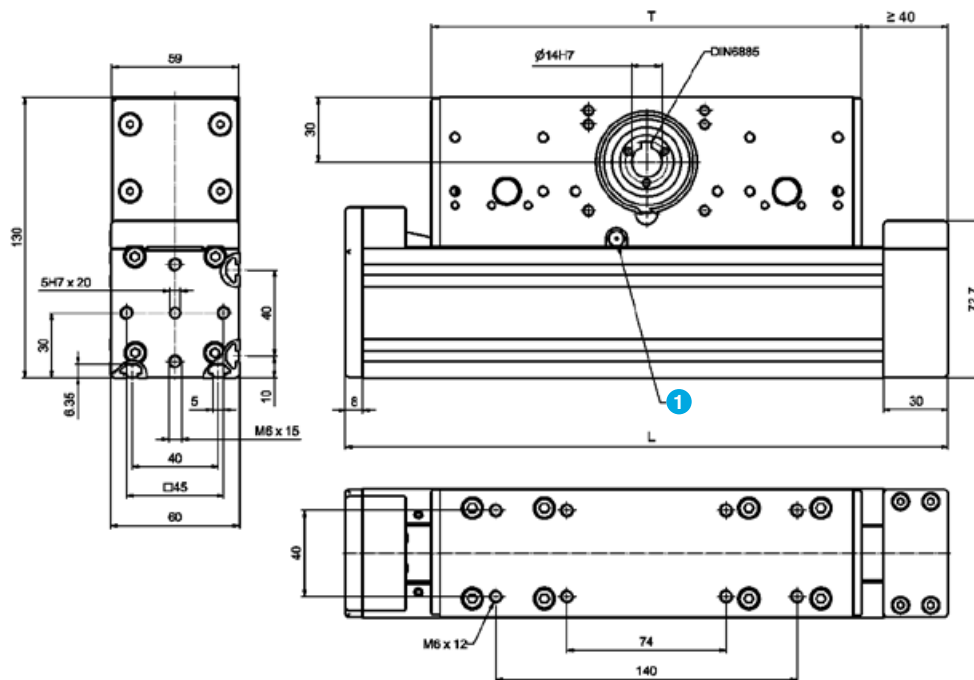
T = Table length   **S** = Travel range   **L** = T + S + 80 mm

1 Re-greasing possibility on both sides

Technical data

Guiding system		Linear guide B	Track roller guide L
Table length T	mm	200	
Drive element		Toothed belt 25AT5	
Maximum velocity	m /min	300	900
Allowable dynamic operation load F_x	N	560	
Stroke per revolution	mm	$150^{+0,3}$	
Idling speed torque	Nm	0,8	
Maximum drive torque	Nm	13,4	
Moment of inertia [1]	Kgcm^2	1,07	
Geometrical moment of inertia (profile) I_y	cm^4	40,04	
Geometrical moment of inertia (profile) I_z	cm^4	60,64	
Maximum total length	m	8,0 [2]	6,0
Repeatability	mm	0,05	

[1] - Moment of inertia without gearbox
[2] - Greater length on request

Mass

Guiding system		Linear guide B	Track roller guide L
Basic mass (including slider mass)	kg	4,6	4,3
Mass per 100 mm stroke	kg	0,5	0,4
Slider mass	kg	2,7	2,6

AXC80A
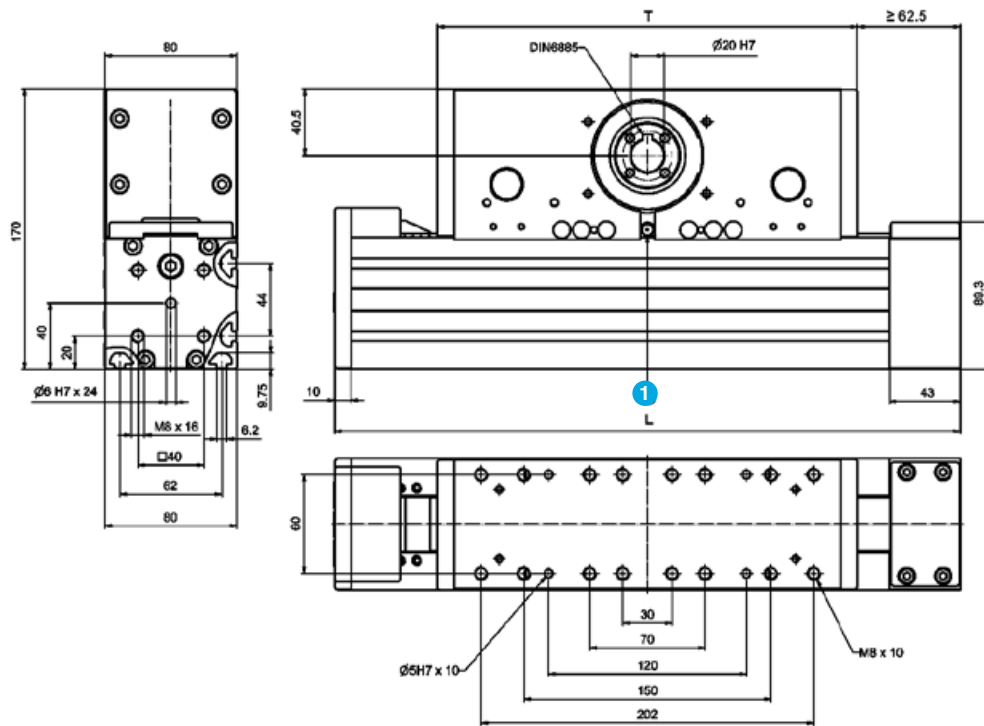
T = Table length   **S** = Travel range   **L** = T + S + 125 mm

① Re-greasing possibility on both sides

Technical data

Guiding system		Linear guide B	Track roller guide L
Table length T	mm	255	
Drive element		Toothed belt 32AT5	
Maximum velocity	m /min	300	900
Allowable dynamic operation load F_x	N	870	
Stroke per revolution	mm	$200^{+0,4}$	
Idling speed torque	Nm	1,6	
Maximum drive torque	Nm	27,7	
Moment of inertia [1]	Kgcm²	5,0	
Geometrical moment of inertia (profile) I_y	cm⁴	149,9	
Geometrical moment of inertia (profile) I_z	cm⁴	199,2	
Maximum total length [2]	m	8,0 (one-piece)	
Repeatability	mm	0,05	

[1] - Moment of inertia without gearbox
[2] - Greater length on request

Mass

Guiding system		Linear guide B	Track roller guide L
Basic mass (including slider mass)	kg	10,6	10,0
Mass per 100 mm stroke	kg	0,8	0,7
Slider mass	kg	5,9	5,5

AXC120A
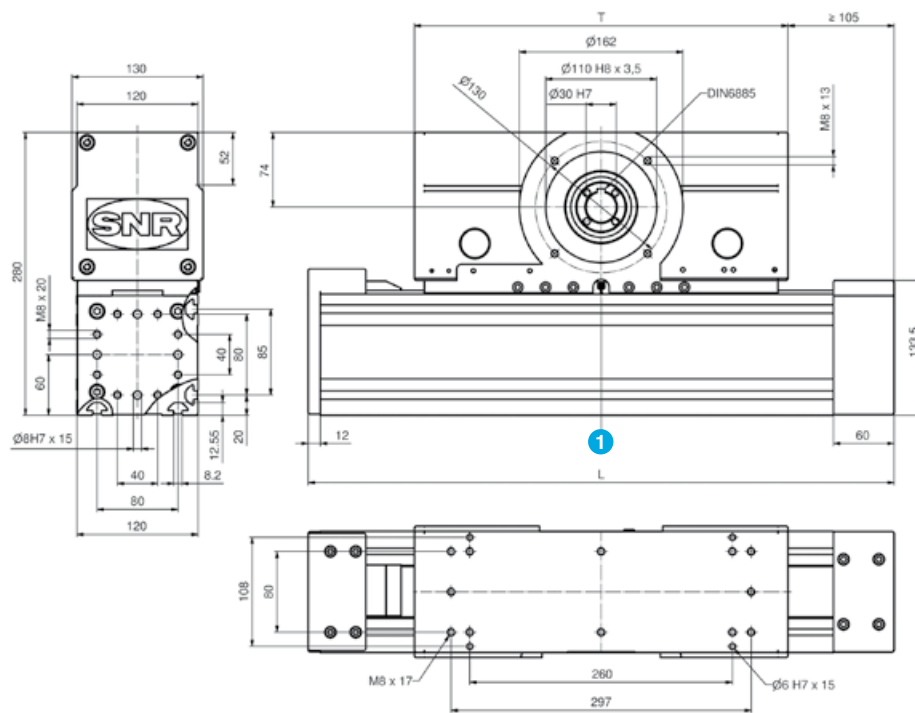
T = Table length   **S** = Travel range   **L** = T + S + 210 mm

1 Re-greasing possibility on both sides

Technical data

Guiding system		Linear guide B	Track roller guide L
Table length T	mm	370	
Drive element		Toothed belt 50AT10	
Maximum velocity	m /min	300	900
Allowable dynamic operation load F_x	N	2 500	
Stroke per revolution	mm	$320^{+0,5}$	
Idling speed torque	Nm	4,0	
Maximum drive torque	Nm	127	
Moment of inertia [1]	Kgcm^2	73,7	
Geometrical moment of inertia (profile) I_y	cm^4	661,7	
Geometrical moment of inertia (profile) I_z	cm^4	938,6	
Maximum total length [2]	m	8,0 (one-piece)	
Repeatability	mm	0,05	

[1] - Moment of inertia without gearbox
[2] - Greater length on request

Mass

Guiding system		Linear guide B	Track roller guide L
Basic mass (including slider mass)	kg	24,9	23,4
Mass per 100 mm stroke	kg	2,1	1,4
Slider mass	kg	13,0	12,8

5.2.3.3   Maximum static load capacity

Type	Guiding system	Load [N]		Load moment [Nm]		
		F_y	F_z	M_x	M_y	M_z
AXC40A	B	1 300	1 300	5,9	45	36
AXC60A	B	4 800	9 650	66	350	350
	L	840	550	10	27	41
AXC80A	B	7 900	16 000	150	800	800
	L	3 400	3 400	60	110	110
AXC120A	B	18 500	28 500	365	2 750	2 750
	L	5 100	5 100	110	260	390

5.2.3.4   Dynamic load capacity

The dynamic load capacities of the guiding systems are based on a nominal life time of 50 000 km.

Type	Guiding system	Load [N]		Load moment [Nm]		
		F_y	F_z	M_x	M_y	M_z
AXC40A	B	850	850	4,0	30	30
AXC60A	B	2 800	2 800	19	100	100
	L	840	500	10	27	41
AXC80A	B	4 650	4 650	43	235	235
	L	3 400	2 300	60	110	170
AXC120A	B	9 500	9 500	120	925	925
	L	5 100	3 400	110	260	390
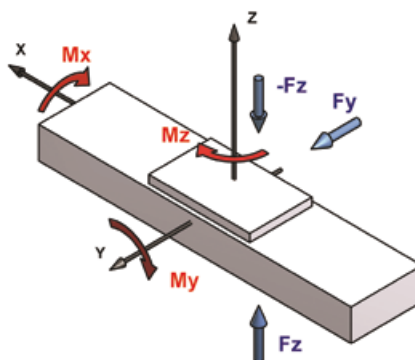
5.3 AXF Compact Axis

5.3.1 AXF_Z Compact Axis with toothed belt drive

5.3.1.1 Structure
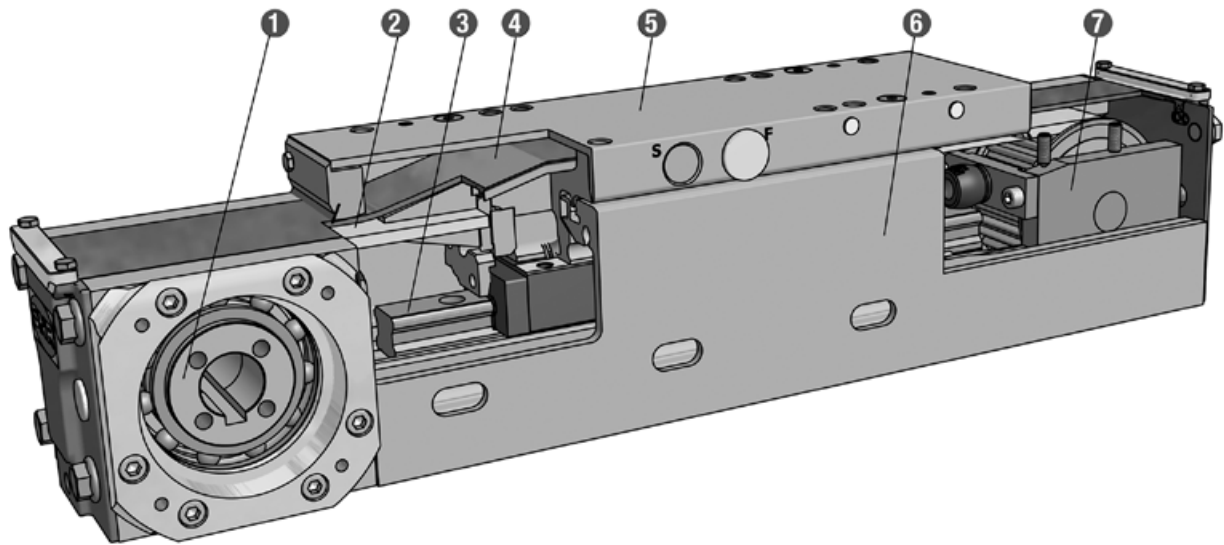
Figure 5.24 — Structure AXF_Z

❶ Drive unit

❷ Toothed belt

❸ Guiding system

❹ Cover strip (optional)

❺ Slider unit

❻ Profile

❼ Deflection pulley

5.3.1.2 Dimensions / Technical data

AXF100Z

T = Table length   **S** = Travel range   **L** = T + S + 140 mm

❶ Re-greasing possibility on both sides

*Guiding system B, D, P
**Guiding systemC
***Optional, measures to specify as special option

Technical data

Type		Linear guide B	Linear guide C	Linear guide D	Polymer - Track roller guide P
Table length T	mm	320	460	320	
Drive element		Toothed belt 40STD8			
Maximum velocity	m /min	300			420
Allowable dynamic operation load F_x	N	1 800			
Stroke per revolution	mm	$264^{+0,5}$			
Idling speed torque	Nm	3,1			
Maximum drive torque	Nm	75,7			
Moment of inertia [1]	Kgcm^2	14,3			
Geometrical moment of inertia (profile) I_y	cm^4	381,3			
Geometrical moment of inertia (profile) I_z	cm^4	514,0			
Maximum total length [2]	m	6,0			
Repeatability	mm	0,05			

[1] - Moment of inertia without gearbox
[2] - Greater length on request

Mass

Guiding system		Linear guide B	Linear guide C	Linear guide D	Polymer - Track roller guide P
Basic mass (including slider mass)	kg	11,1	12,4	11,7	10,8
Mass per 100 mm stroke	kg	1,2	1,2	1,1	1,1
Slider mass	kg	2,6	3,9	3,2	2,6

5.3.1.3 Maximum static load capacity

Type	Guiding system	Load [N]		Load moment [Nm]		
		F_y	F_z	M_x	M_y	M_z
AXF100Z	B	16 500	16 500	175	900	560
	C	16 500	16 500	175	2 100	1 260
	D	23 750	23 750	680	1 100	1 100
	P	180	360	13,5	19,5	10,0

5.3.1.4 Dynamic load capacity

The dynamic load capacities of the guiding systems are based on a nominal life time of 50 000 km for he guiding systems B, C and D and 10 000 km for the guiding system P.

Type	Guiding system	Load [N]		Load moment [Nm]		
		F_y	F_z	M_x	M_y	M_z
AXF100Z	B	5 000	5 000	52	275	275
	C	5 000	5 000	52	630	630
	D	7 000	7 000	200	325	325
	P	120	240	9,0	13,0	6,5
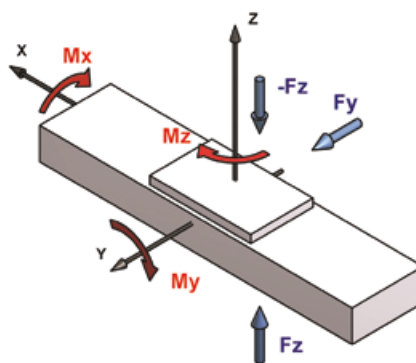
5.3.2 AXF_S / AXF_T / AXF_G Compact Axis with screw drive

5.3.2.1 Structure
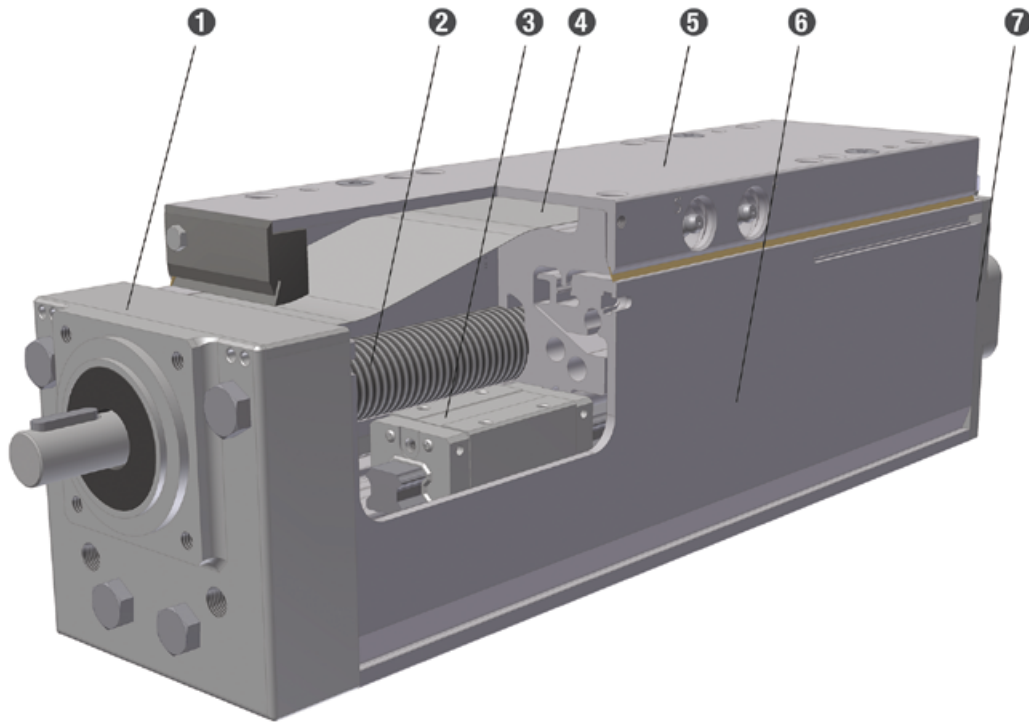
Figure 5.25 — Structure AXF_S / AXF_T / AXF_G

❶ Fixed bearing unit

❷ Screw drive

❸ Guiding system

❹ Cover strip (optional)

❺ Slider unit

❻ Profile

❼ Floating bearing unit
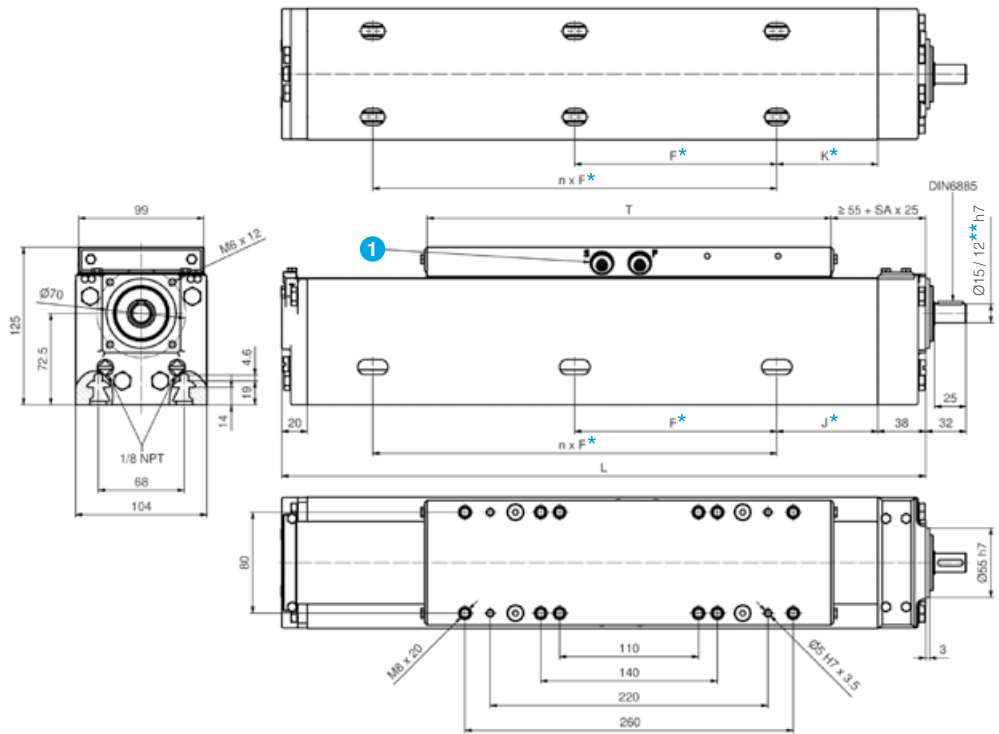
AXF100S / AXF100T / AXF100G

T = Table length   S = Travel range   **n x SA** = Number of screw drive support units

L = T + S + 80 mm (+ n x SA x 50 mm)

① Re-greasing possibility on both sides

*Optional, measures to specify as special option
**For drive element G and T*

Technical data

Type		SV2505	SV2510	SV2525	SV2550
Guiding system		Linear guide D			
Table length T	mm	320			
Drive element		Ball screw			
Screw diameter	mm	25			
Pitch / Pitch direction	mm	5 / right	10 / right	25 / right	50 / right
Maximum velocity	m/min	18	36	90	180
Pitch accuracy	µm/300mm	23			52
Dynamic load rating of the drive component	N	19 800	16 100	12 100	15 400
Idling speed torque	Nm	0,3…2,0			
Maximum drive torque	Nm	5,2	10,0	27,0	50,0
Maximum axial operating load	N	6 000			
Moment of inertia	Kgcm²/m	2,62	2,82	2,62	2,25
Geometrical moment of inertia (profile) I_y	cm⁴	338,7			
Geometrical moment of inertia (profile) I_z	cm⁴	411,8			
Maximum total length	m	5,8		6,0	
Repeatability	mm	0,03			
Efficiency		0,93	0,98		

Type		TV2405	GV2030	GV2060	GV2090
Guiding system		Linear guide D	Polymer - Track roller guide P		
Table length T	mm	320			
Drive element		Trapezoidal screw	Sliding screw		
Screw diameter	mm	24	20		
Pitch / Pitch direction	mm	5 / right	30 / right	60 / right	90 / right
Maximum velocity	m /min	8,9	41	120	180
Pitch accuracy	μm/300mm	50	100		
Idling speed torque	Nm	0,3…2,0			
Maximum drive torque	Nm	4,3	5,7	13,0	19,0
Maximum axial operating load	N	5 200	2 400	1 600	1 600
Maximum dynamic load	Nm/min	2 000	6 900	13 900	20 900
Moment of inertia	Kgcm^2/m	1,5	0,35		
Geometrical moment of inertia (profile) I$_y$	cm^4	338,7			
Geometrical moment of inertia (profile) I$_z$	cm^4	411,8			
Maximum total length	m	6,0	3,0		
Repeatability	mm	0,03			
Efficiency		0,41	0,73	0,81	0,79

Mass

Guiding system		Linear guide D	Polymer – Track roller guide P
Basic mass (including slider mass)	kg	12,0	9,3
Mass per 100 mm stroke	kg	1,6	13,3
Slider mass	kg	2,7	2,5

Allowable rotational speed of the ball screw
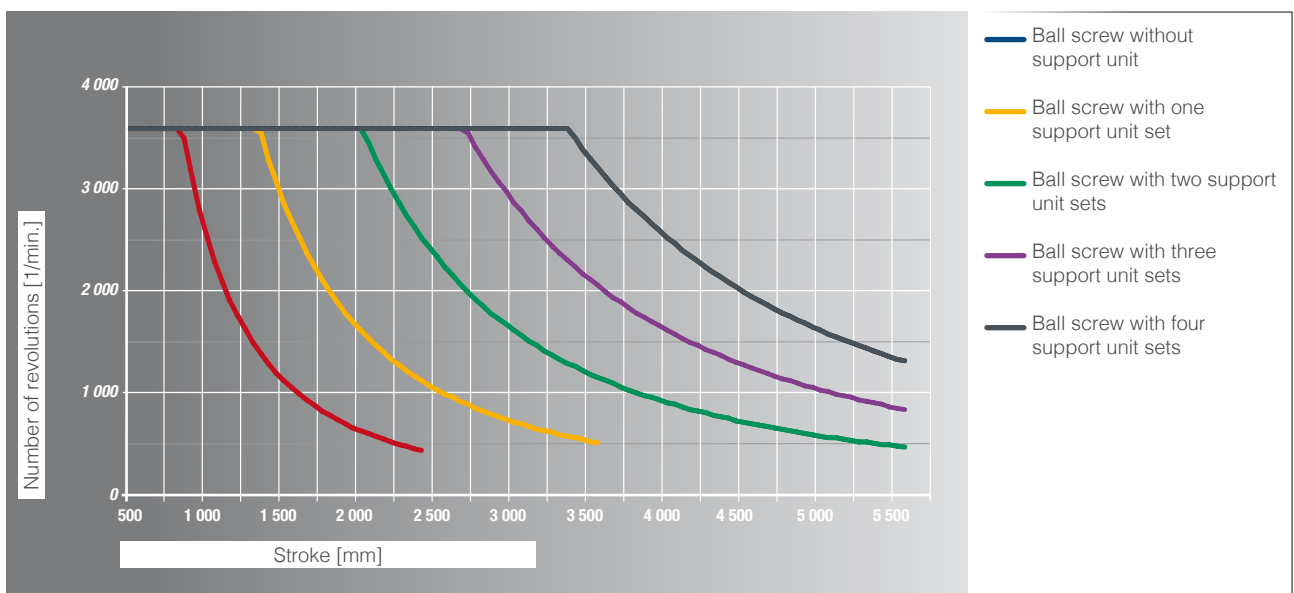
Allowable rotational speed of the trapezoidal screw

Legend:
- Trapezoidal screw without support unit
- Trapezoidal screw with one support unit set
- Trapezoidal screw with two support unit sets
- Trapezoidal screw with three support unit sets
- Trapezoidal screw with four support unit sets

Y-axis: Number of revolutions [1/min.]
X-axis: Stroke [mm]

Allowable rotational speed of the trapezoidal screw

Legend:
- Sliding screw without support unit

Y-axis: Number of revolutions [1/min.]
X-axis: Stroke [mm]
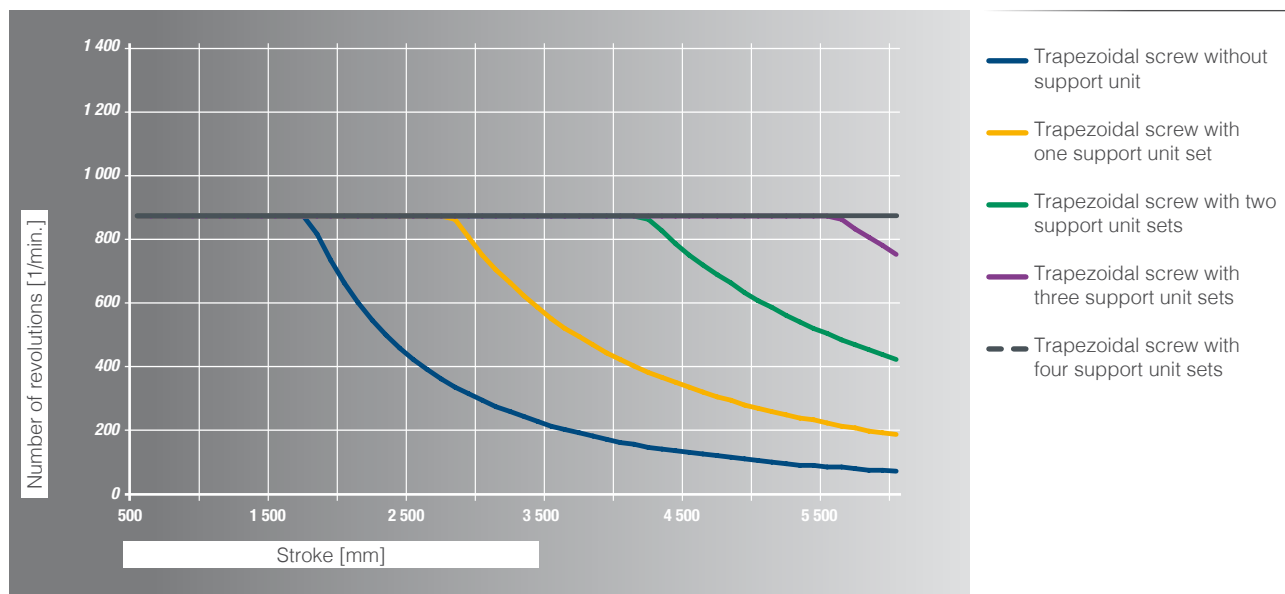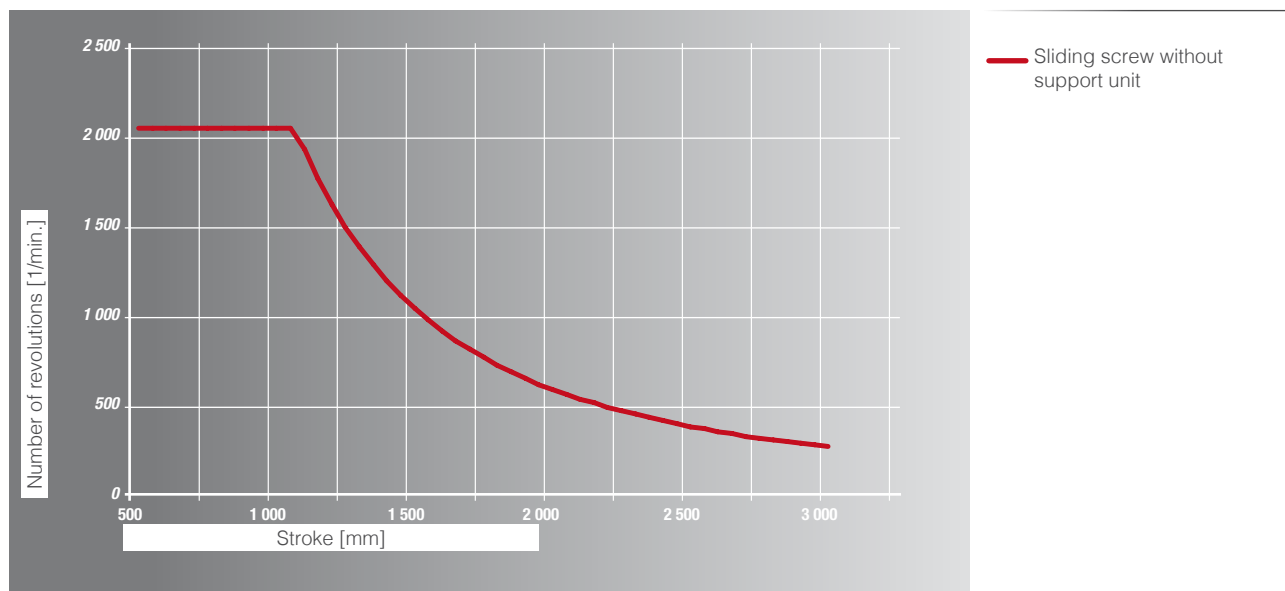
5.3.2.3 Maximum static load capacity

Type	Guiding system	Load [N]		Load moment [Nm]		
		F_y	F_z	M_x	M_y	M_z
AXF100S/T/G	D	15 900	15 900	450	1 600	1 600
	P	180	360	13,5	19,5	10,0
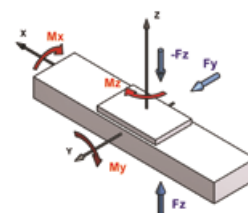
5.3.2.4 Dynamic load capacity

The dynamic load capacities of the guiding systems are based on a nominal life time of 25 000 km for the guiding systems B, C and D and 10 000 km for the guiding systems P.

Type	Guiding system	Load [N]		Load moment [Nm]		
		F_y	F_z	M_x	M_y	M_z
AXF100S/T/G	D	5 850	5 850	170	600	600
	P	120	240	9,0	13,0	6,5

5.4 AXDL Parallel Axis

5.4.1 AXDL_Z Parallel Axis with toothed belt drive

5.4.1.1 Structure
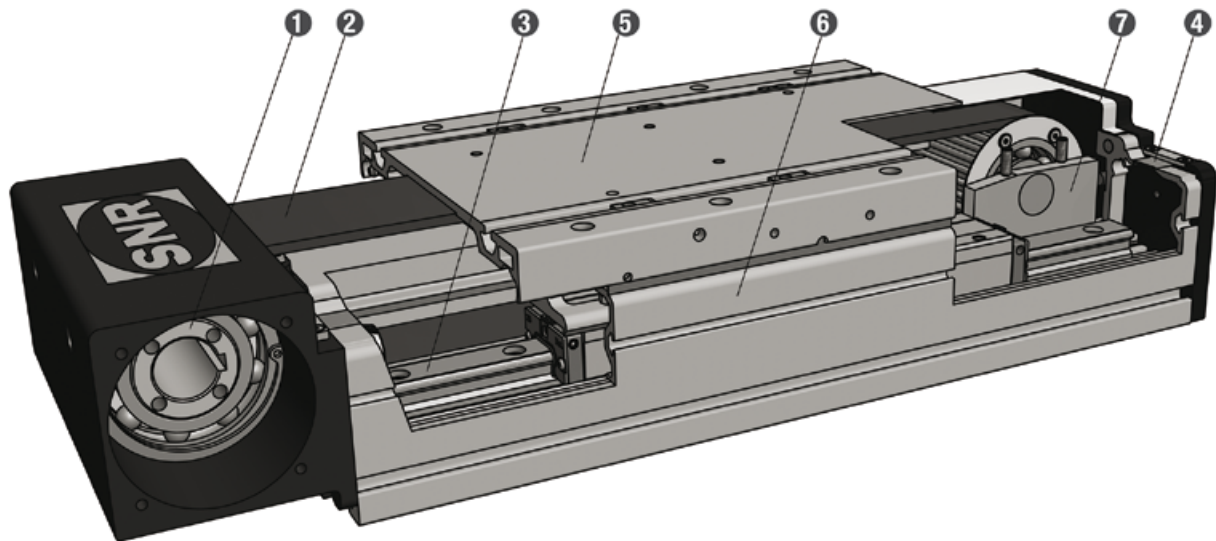
Figure 5.26 — Structure AXDL_Z

❶ Drive unit

❷ Toothed belt

❸ Guiding system

❹ Cover strip

❺ Slider unit

❻ Profile

❼ Deflection pulley (AXDL110Z with defection pulley head)

5.4.1.2   Dimensions / Technical data

AXDL110Z
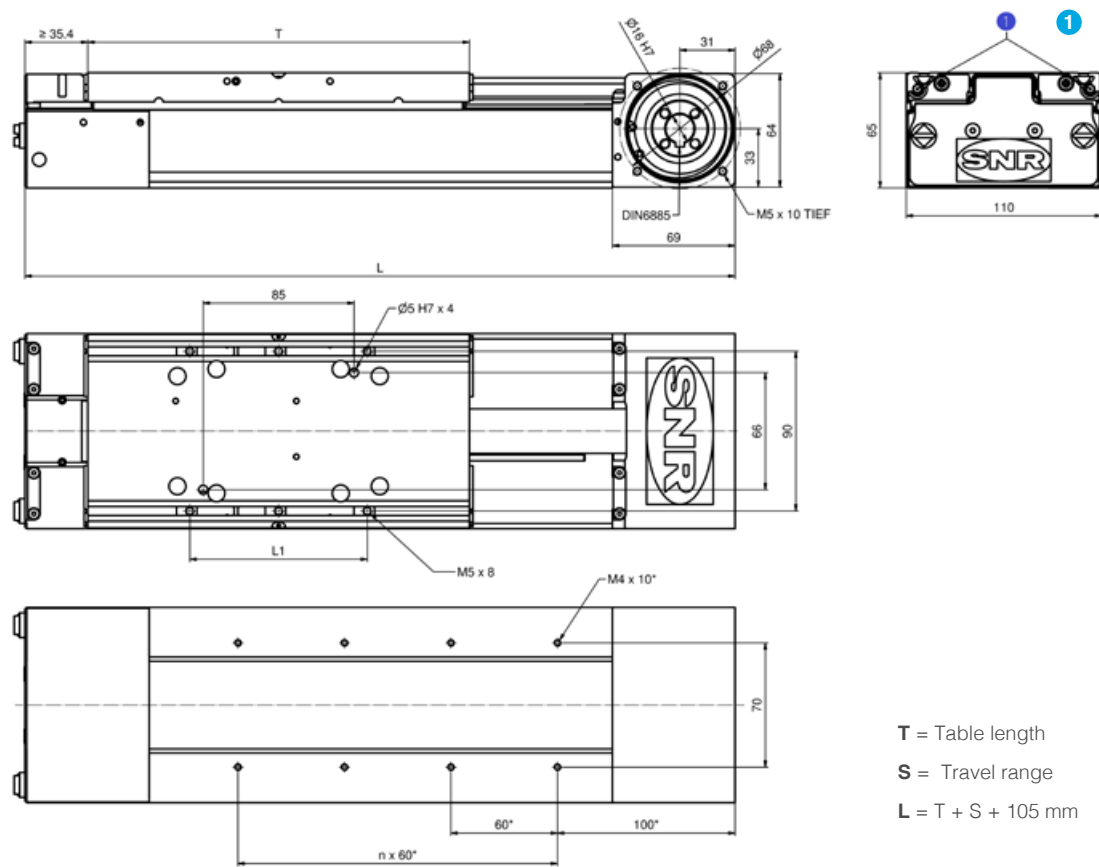
T = Table length

S = Travel range

L = T + S + 105 mm

❶ Re-greasing possibility on both sides

* Optional, note dimensions as a special specification

Technical data

Guiding system		Linear guide D
Table length T	mm	215
Distance of the sliding blocks L1		≤ 200 mm (recommended 100 mm)
Drive element		Toothed belt 25STD5
Maximum velocity	m /min	300
Allowable dynamic operation load F_x	N	980
Stroke per revolution	mm	$170^{+0,5}$
Idling speed torque	Nm	1,7
Maximum drive torque	Nm	26,5
Moment of inertia [1]	$Kgcm^2$	1,4
Geometrical moment of inertia (profile) I_y	cm^4	37,45
Geometrical moment of inertia (profile) I_z	cm^4	138,31
Maximum total length	m	6,1
Repeatability	mm	0,05

[1] - *Moment of inertia without gearbox*

Mass

Guiding system		Linear guide D
Basic mass (including slider mass)	kg	3,8
Mass per 100 mm stroke	kg	0,7
Slider mass	kg	0,9

AXDL160Z

T = Table length   **S** = Travel range   **L** = T + S + 100 mm
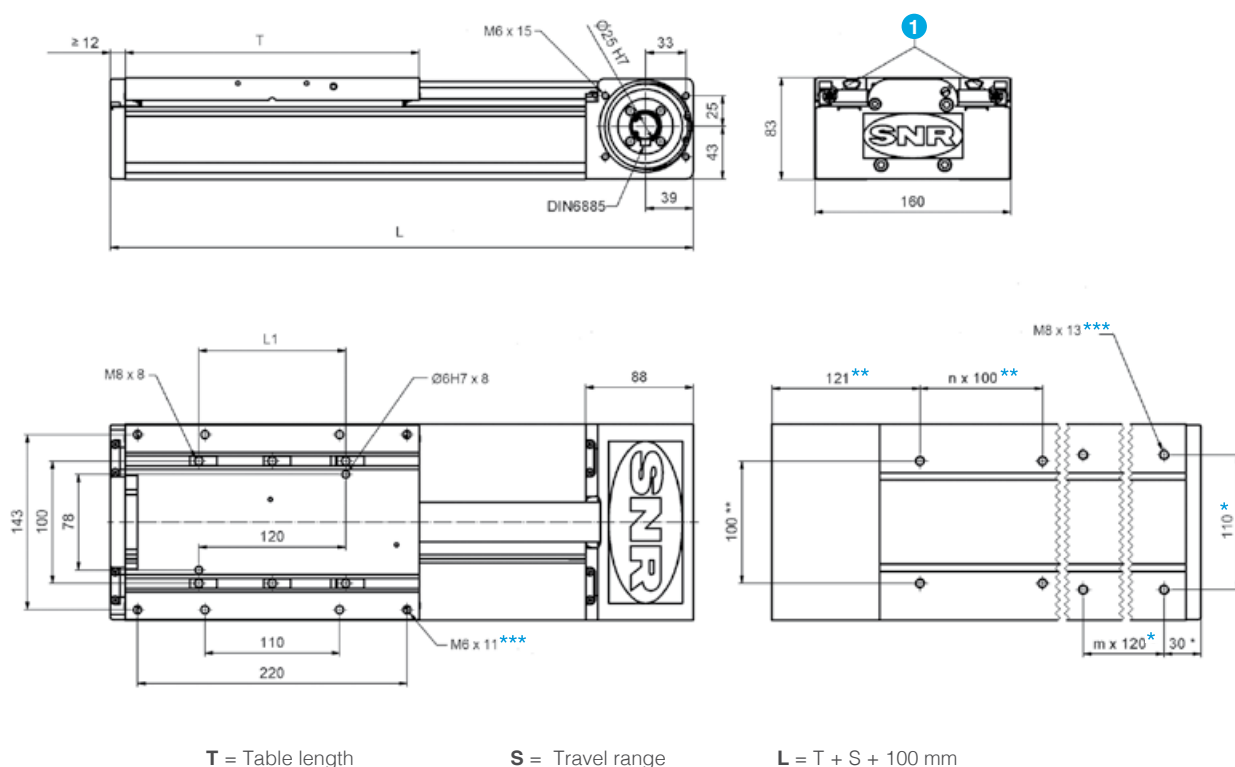
❶ Re-greasing possibility on both sides

Guiding system D:optional hole pattern, note dimensions as a special specification
** *Guiding system L: optional hole pattern, note dimensions as a special specification*
*** *Threaded hole optional*

Technical data

Guiding system		Linear guide D	Track roller guide L
Table length T	mm	240	280
Distance of the sliding blocks L1 (optional M6 threaded plate as special specification possible)		≤ 220 mm (recommended 120 mm)	≤ 280 mm (recommended 120 mm)
Drive element		Toothed belt 32STD8	
Maximum velocity	m /min	300	900
Allowable dynamic operation load F_x	N	1 830	
Stroke per revolution	mm	$216^{+0,5}$	
Idling speed torque	Nm	3,6	
Maximum drive torque	Nm	62,9	
Moment of inertia [1]	Kgcm^2	5,8	
Geometrical moment of inertia (profile) I_y	cm^4	140,3	
Geometrical moment of inertia (profile) I_z	cm^4	666,8	
Maximum total length	m	6,1	
Repeatability	mm	0,05	

[1] - *Moment of inertia without gearbox*

Mass

Guiding system		Linear guide D	Track roller guide L
Basic mass (including slider mass)	kg	11,9	11,7
Mass per 100 mm stroke	kg	1,3	0,9
Slider mass	kg	3,6	3,6

AXDL240Z

T = Table length   **S** = Travel range   **L** = T + S + 120 mm
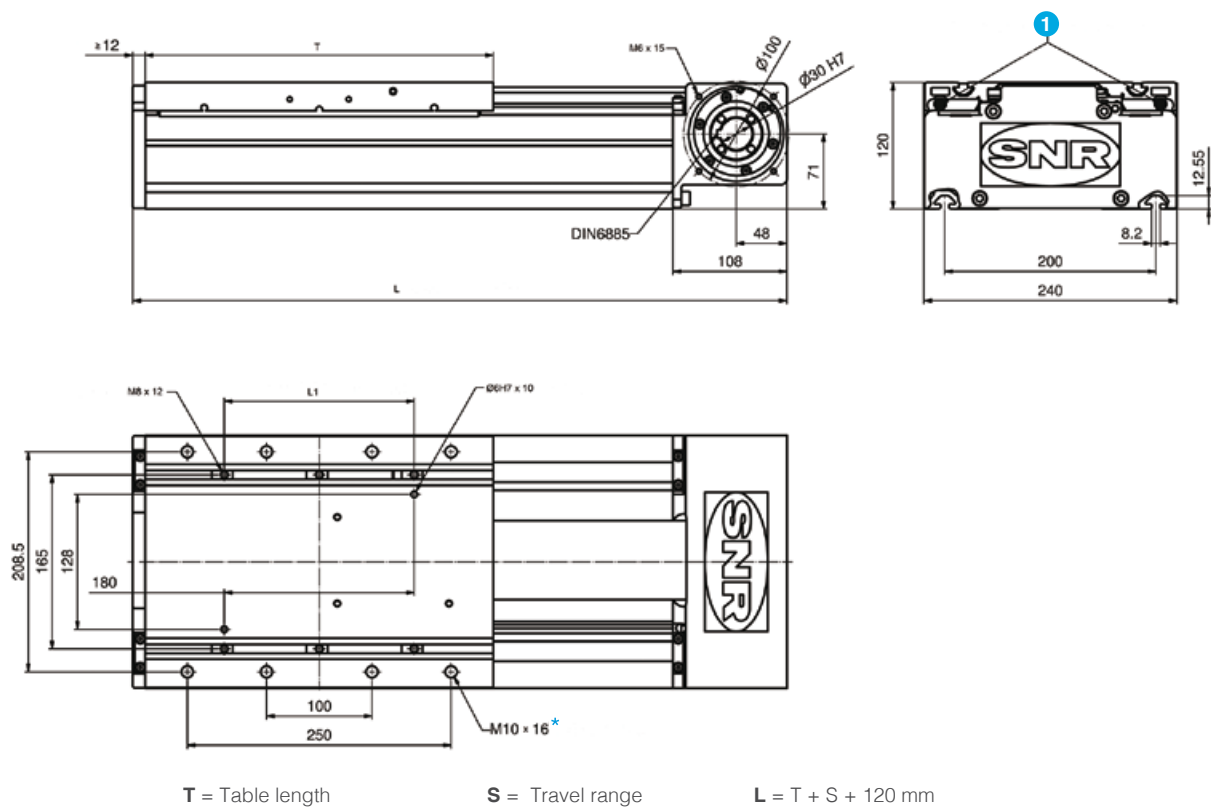
❶ Re-greasing possibility on both sides   ** Threaded hole optional*

Technical data

Guiding system		Linear guide D	Linear guide E	Track roller guide L
Table length T	mm	330	500	330
Distance of the sliding blocks L1 (optional M10 threaded plate as special specification possible)		≤ 310 mm (recommended 180 mm)	≤ 480 mm (recommended 350 mm)	≤ 310 mm (recommended 180 mm)
Drive element		Toothed belt 75STD8		
Maximum velocity	m /min	300		900
Allowable dynamic operation load F_x	N	5 000		
Stroke per revolution	mm	$264^{+0,5}$		
Idling speed torque	Nm	6,5		
Maximum drive torque	Nm	210,0		
Moment of inertia [1]	Kgcm²	24,3		
Geometrical moment of inertia (profile) I_y	cm⁴	751,7		
Geometrical moment of inertia (profile) I_z	cm⁴	3 956,0		
Maximum total length	m	6,35		
Repeatability	mm	0,05		

[1] - Moment of inertia without gearbox

Mass

Guiding system		Linear guide D	Linear guide E	Track roller guide L
Basic mass (including slider mass)	kg	24,9	28,0	24,3
Mass per 100 mm stroke	kg	2,7	2,7	2,2
Slider mass	kg	5,7	8,8	6,6

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5.4.1.3   Maximum static load capacity

Type	Guiding system	Load [N]		Load moment [Nm]		
		F_y	F_z	M_x	M_y	M_z
AXDL110Z	D	7 900	7 900	275	390	390
AXDL160Z	D	32 000	32 000	1 600	1 650	1 650
	L	1 200	1 200	62	84	84
AXDL240Z	D	42 500	42 500	3 550	3 900	3 900
	E	42 500	42 500	3 550	8 750	8 750
	L	2 600	2 600	220	210	210

5.4.1.4   Dynamic load capacity

The dynamic load capacities of the guiding systems are based on a nominal life time of 50 000 km.

Type	Guiding system	Load [N]		Load moment [Nm]		
		F_y	F_z	M_x	M_y	M_z
AXDL110Z	D	2 300	2 300	80	110	110
AXDL160Z	D	9 000	9 000	475	475	475
	L	1 200	1 200	62	84	84
AXDL240Z	D	12 500	12 500	1 050	1 200	1 200
	E	12 500	12 500	1 200	2 500	2 500
	L	2 600	2 600	220	210	210
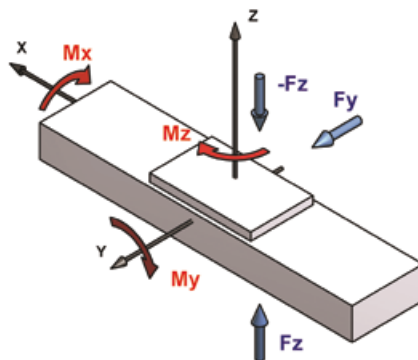
5.4.2 AXDL_S / T Parallel Axis with screw drive

5.4.2.1   Struture
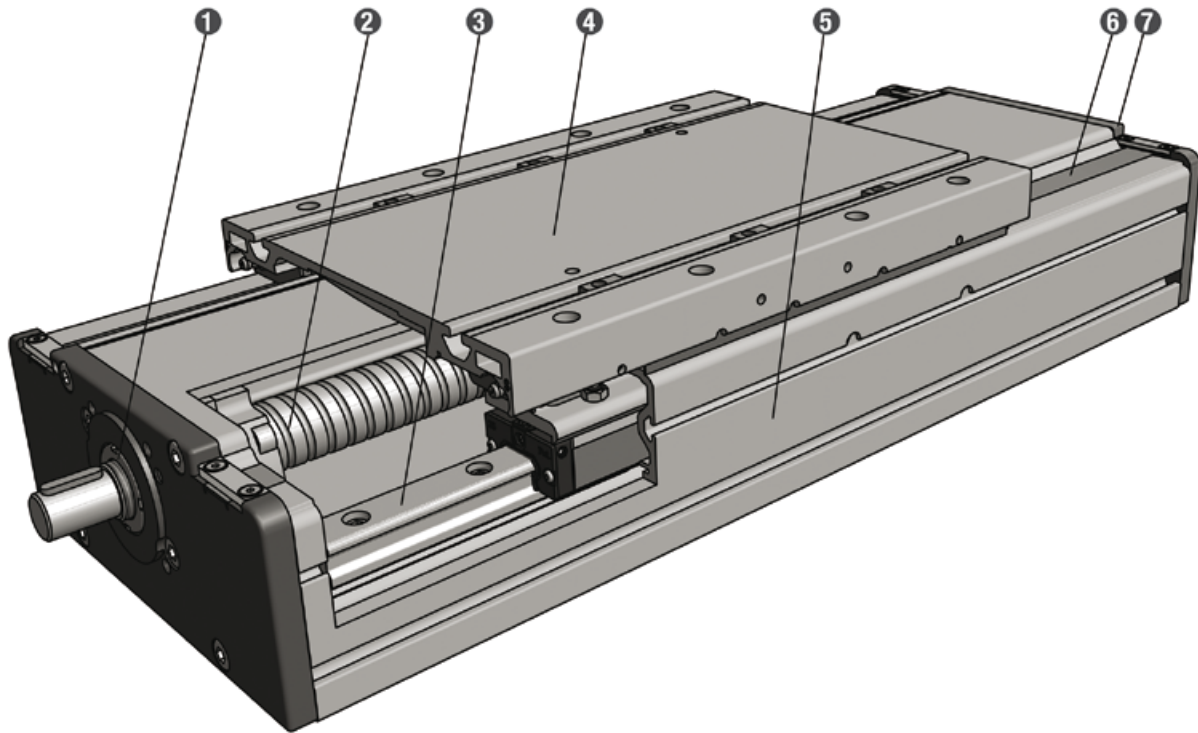
Figure 5.27 — Structure AXDL_S / AXDL_T

1 Fixed bearing unit

2 Screw drive

3 Guiding system

4 Slider unit

5 Profile

6 Cover strip

7 Floating bearing unit

5.4.2.2 Dimensions / Technical data

AXDL110S / AXDL110T
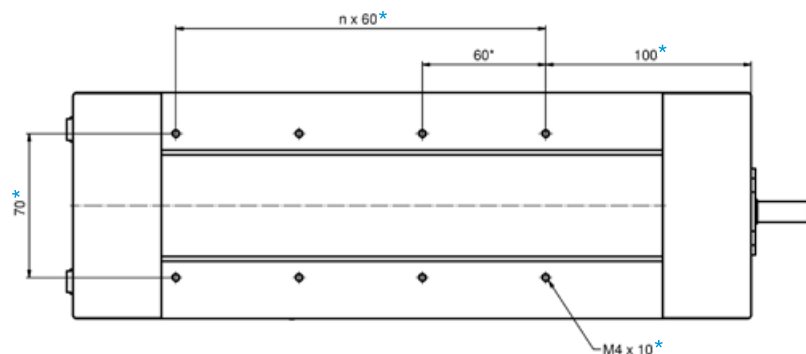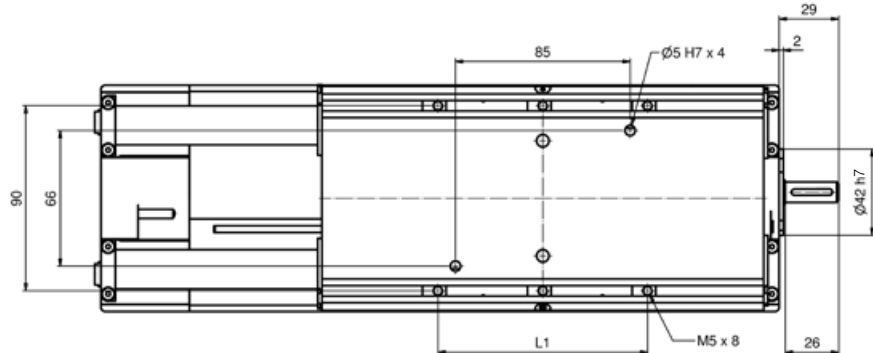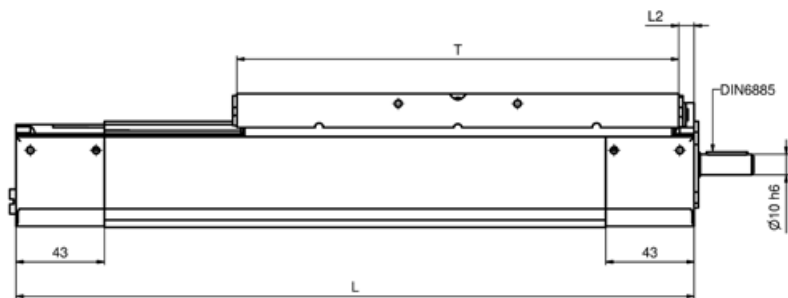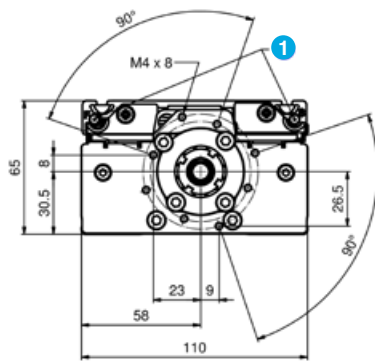
T = Table length

S = Travel range

n x SA = Number of screw drive support units

L = T + S + 15 mm
(+ 44 mm with 3 x SA / + 88 mm with 4 x SA)

❶ Re-greasing possibility on both front sides

* Optional, note dimensions as a special specification

Technical data

Type		SV1605	SV1610	SV1616	TV1604	TV1608
Guiding system		Linear guide D and E				
Table length T	mm	Linear guide D: 215 / Linear guide E: 275				
Distance of the sliding blocks L1	mm	≤ 200 mm (recommended 120 mm)				
Length of the floating bearing L2	mm	≥ 7,5 mm + 22mm with 3 x SA / + 54 mm with 4 x SA				
Drive element		Ball screw			Trapezoidal screw	
Screw diameter	mm	16				
Pitch / Pitch direction	mm	5 / right, left	10 / right	16 / right	4 / right, left	8 / right
Maximum velocity	m /min	25	50	80	5,5	10,9
Pitch accuracy	µm/300mm	23			50	100
Dynamic load rating of the drive component	N	16 100	8 230	5 400	-	
Idling speed torque	Nm	0,8				
Maximum drive torque	Nm	1,1	2,2	3,6	1,9	2,9
Maximum axial operating load	N	1 400				
Moment of inertia	Kgcm²/m	0,31		0,34	0,3	
Geometrical moment of inertia (profile) I_y	cm^4	37,45				
Geometrical moment of inertia (profile) I_z	cm^4	138,31				
Maximum total length	m	4,5			3,0	
Repeatability	mm	0,03			0,07	
Efficiency		0,91	0,97	0,98	0,35	0,52

Mass

Guiding system		Linear guide D	Linear guide E
Basic mass (including slider mass)	kg	3,8	5,0
Mass per 100 mm stroke	kg	0,7	0,7
Slider mass	kg	0,9	1,7

Allowable rotational speed of the ball screw

Legend:
- Ball screw without support unit
- Ball screw with one support unit set
- Ball screw with two support unit sets
- Ball screw with three support unit sets
- Ball screw with four support unit sets

Y-axis: Number of revolutions [1/min.]
X-axis: Stroke [mm]

Allowable rotational speed of the trapezoidal screw

Legend:
- Trapezoidal screw without support unit

Y-axis: Number of revolutions [1/min.]
X-axis: Stroke [mm]

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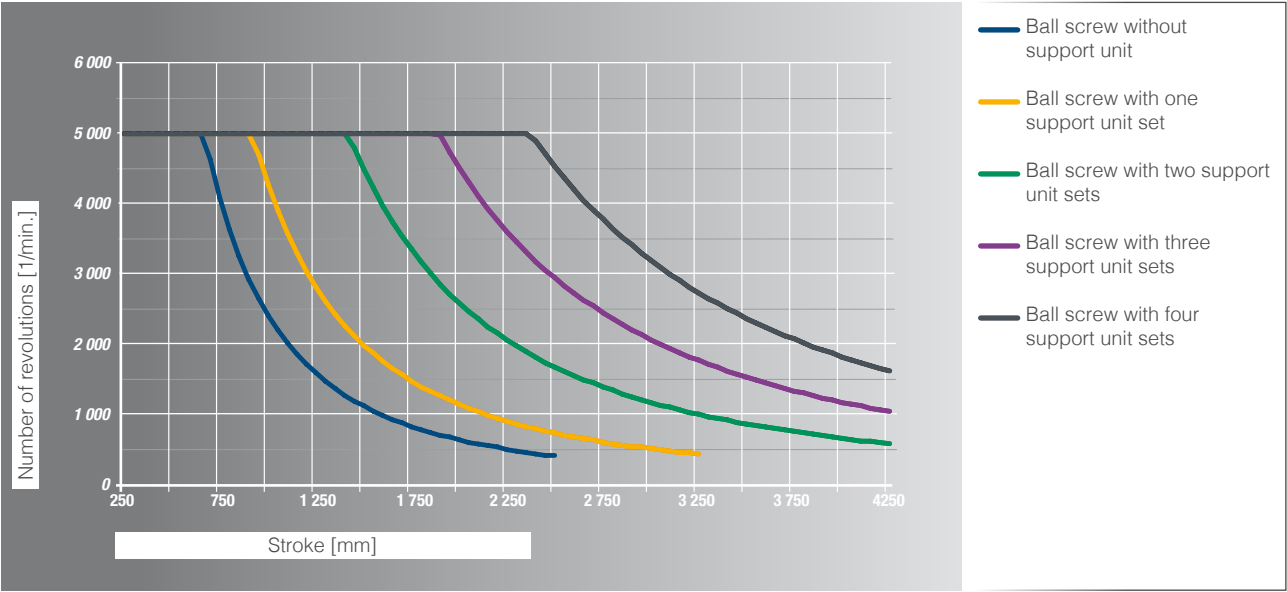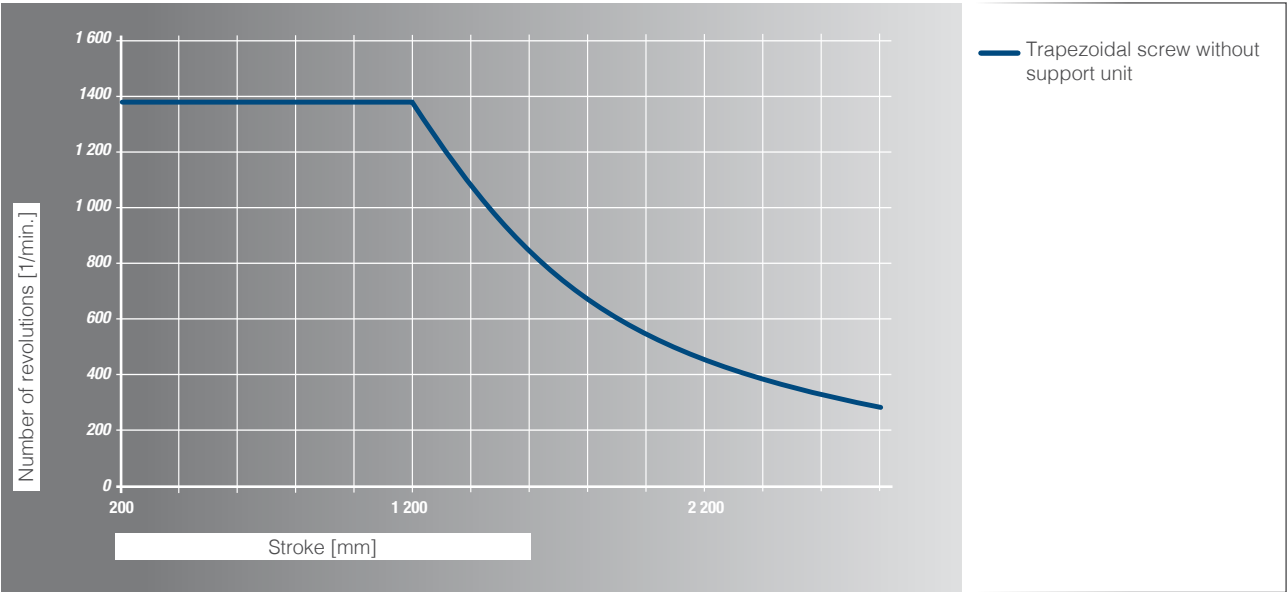
AXDL160S / AXDL160T
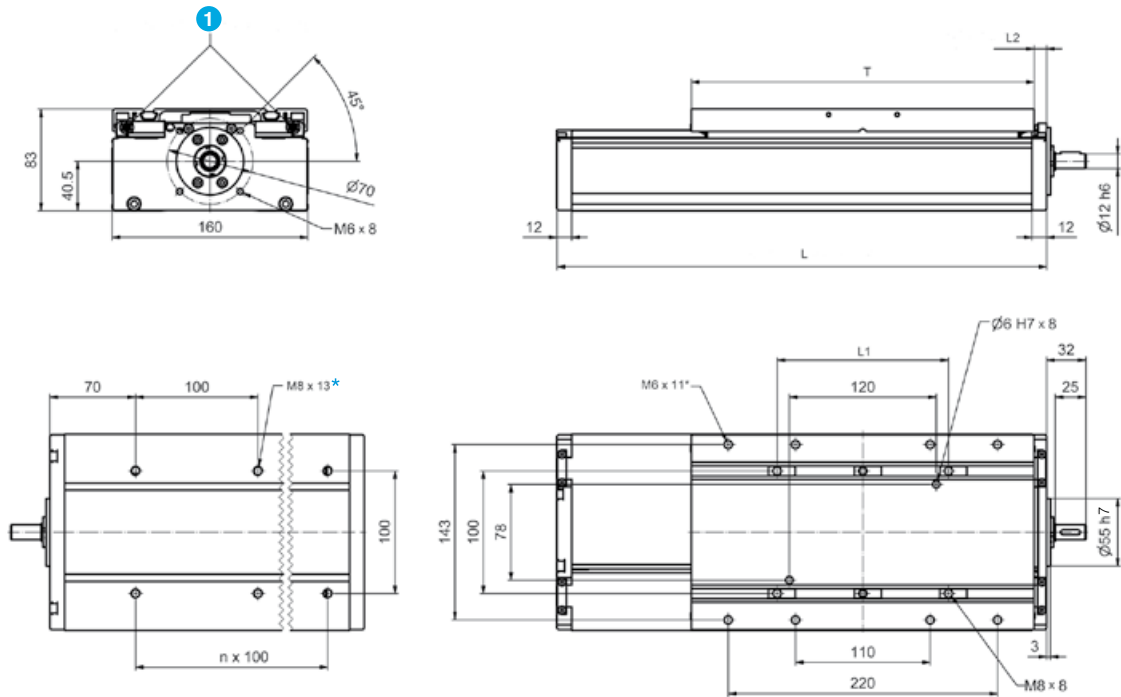
T = Table length   **S** = Travel range   **n x SA** = Number of screw drive support units

L = T + S + 20 mm (+ 65 mm with 2 x SA / + 165 mm with 3 x SA / + 265 mm with 4 x SA)

❶ Re-greasing possibility on both front sides

* Threaded hole optional

Technical data

Type		SV2505	SV2510	SV2525	SV2550	TV2405	TV2410
Guiding system		Linear guide D					
Table length T	mm	280					
Distance of the sliding blocks L1 [1]		≤ 250 mm (recommended 140 mm)					
Length of the floating bearing L2	mm	≥10 mm +25 mm with 2 x SA /+75 mm with 3 x SA /+125 mm with 4 x SA					
Drive element		Ball screw				Trapezoidal screw	
Screw diameter	mm					24	
Pitch / Pitch direction	mm	5 / right	10 / right	25 / right	50 / right	5 / right, left	10 / right
Maximum velocity	m /min	18	36	90	180	4,4	8,9
Pitch accuracy	µm/300mm			52		50	200
Dynamic load rating of the drive component	N	19 800	16 100	12 100	15 400	-	
Idling speed torque	Nm	0,3…2,0					
Maximum drive torque	Nm	2,5	4,9	12,0	25,0	6,0	9,0
Maximum axial operating load	N	3 100					
Moment of inertia	Kgcm^2/m	2,62	2,82	2,62	2,25	1,5	
Geometrical moment of inertia (profile) I_y	cm^4	140,3					
Geometrical moment of inertia (profile) I_z	cm^4	666,8					
Maximum total length	m	5,8				3,5	
Repeatability	mm	0,03				0,07	
Efficiency		0,98				0,41	0,58

[1] - *Optional M6 threaded plate as special specification possible*

Mass

Guiding system		Linear guide D
Basic mass (including slider mass)	kg	9,7
Mass per 100 mm stroke	kg	1,4
Slider mass	kg	4,2

Allowable rotational speed of the ball screw
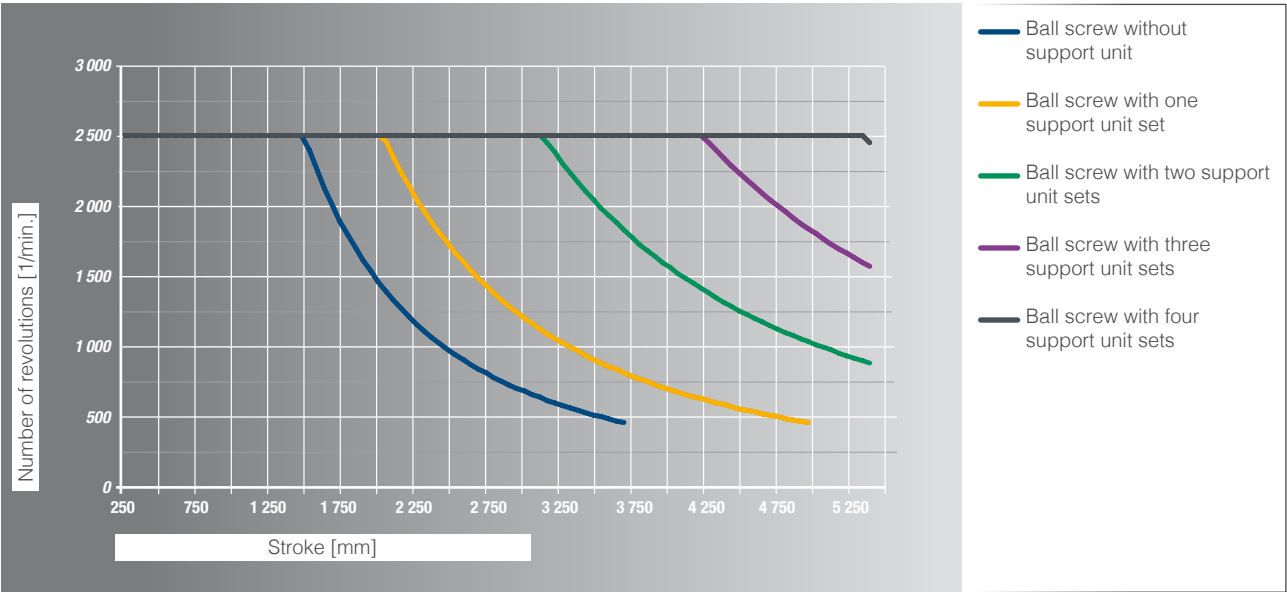
Ball screw without support unit

Ball screw with one support unit set

Ball screw with two support unit sets

Ball screw with three support unit sets

Ball screw with four support unit sets

Number of revolutions [1/min.]

Stroke [mm]

Allowable rotational speed of the trapezoidal screw

Trapezoidal screw without support unit

Number of revolutions [1/min.]

Stroke [mm]

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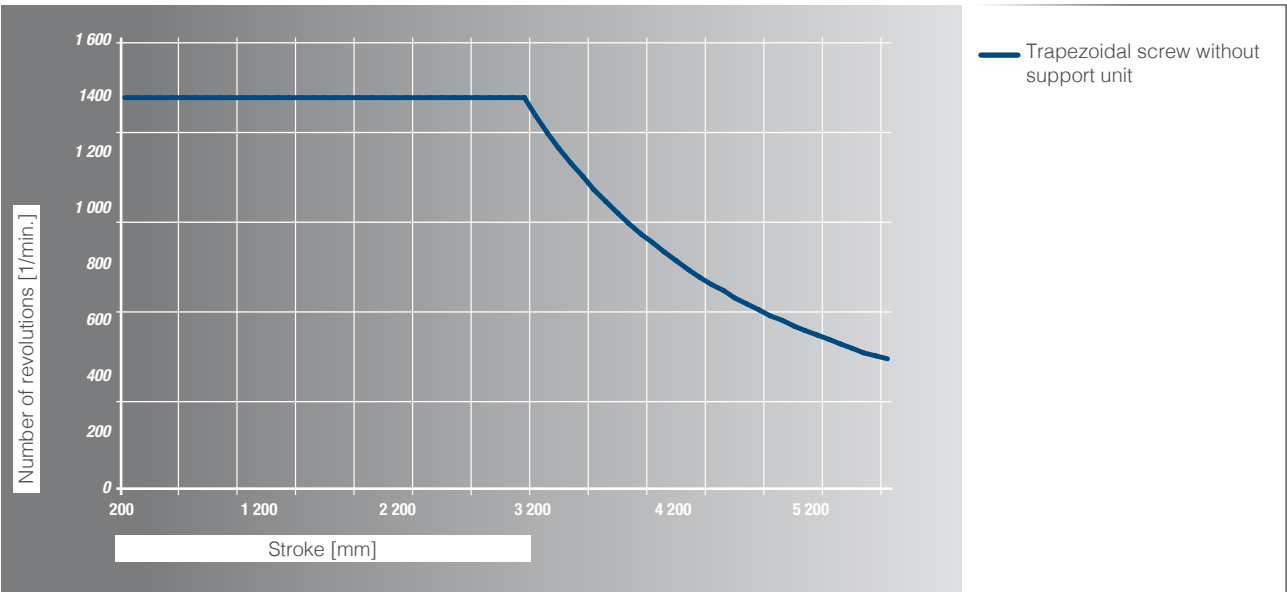
AXDL240S / AXDL240T
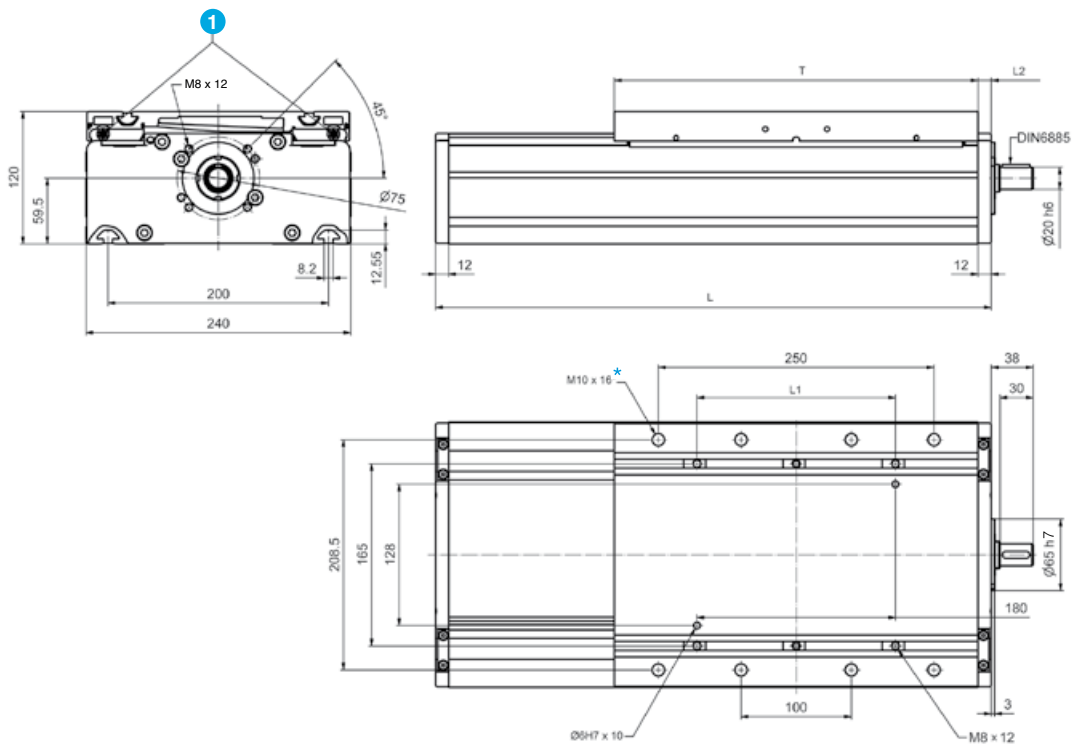
T = Table length **S** = Travel range **n x SA** = Number of screw drive support units

Guiding system D: L = T + S + 24 mm (+ 50 mm with 2 x SA / + 150 mm with 3 x SA / + 250 mm with 4 x SA)

Guiding system E: L = T + S + 24 mm (+ 70 mm with 4 SA)

1 Re-greasing possibility on both front sides

* Threaded hole optional

Technical data

Type		SV3205	SV3210	SV3220	SV3232	TV3606	TV3612
Guiding system		Linear guide D and E					
Table length T	mm	Linear guide D: 330 / Linear guide E: 500					
Distance of the sliding blocks L1 [1]		≤ 310 mm (recommended 180 mm)					
Length of the floating bearing L2	mm	Guiding system D: ≥12 mm + 50 mm with 3 x SA /+ 100 mm with 4 x SA Guiding system E: ≥ 12 mm + 35 mm with 4 SA					
Drive element		Ball screw				Trapezoidal screw	
Screw diameter	mm	32				36	
Pitch / Pitch direction	mm	5 / right	10 / right	20 / right	32 / right	6 / right, left	12 / right
Maximum velocity	m /min	12,5	25	50	80	3,5	6,9
Pitch accuracy	µm/300mm	52				50	200
Dynamic load rating of the drive component	N	25 900	29 500	18 700	18 800	-	
Idling speed torque	Nm	1,5…2,0					
Maximum drive torque	Nm	6,4	13,0	26,0	41,0	22,0	30,0
Maximum axial operating load	N	8 100					
Moment of inertia	Kgcm²/m	6,05	6,40	6,39	6,17	9,00	
Geometrical moment of inertia (profile) I_y	cm⁴	761,7					
Geometrical moment of inertia (profile) I_z	cm⁴	3 956,0					
Maximum total length	m	5,5			5,0	6,0	
Repeatability	mm	0,03				0,07	
Efficiency		0,91	0,97	0,98		0,35	0,52

[1] - *Optional M10 threaded plate as special specification possible*

Mass

Guiding system		Linear guide D	Linear guide E
Basic mass (including slider mass)	kg	22,1	29,0
Mass per 100 mm stroke	kg	3,1	3,1
Slider mass	kg	6,4	8,2

Allowable rotational speed of the ball screw
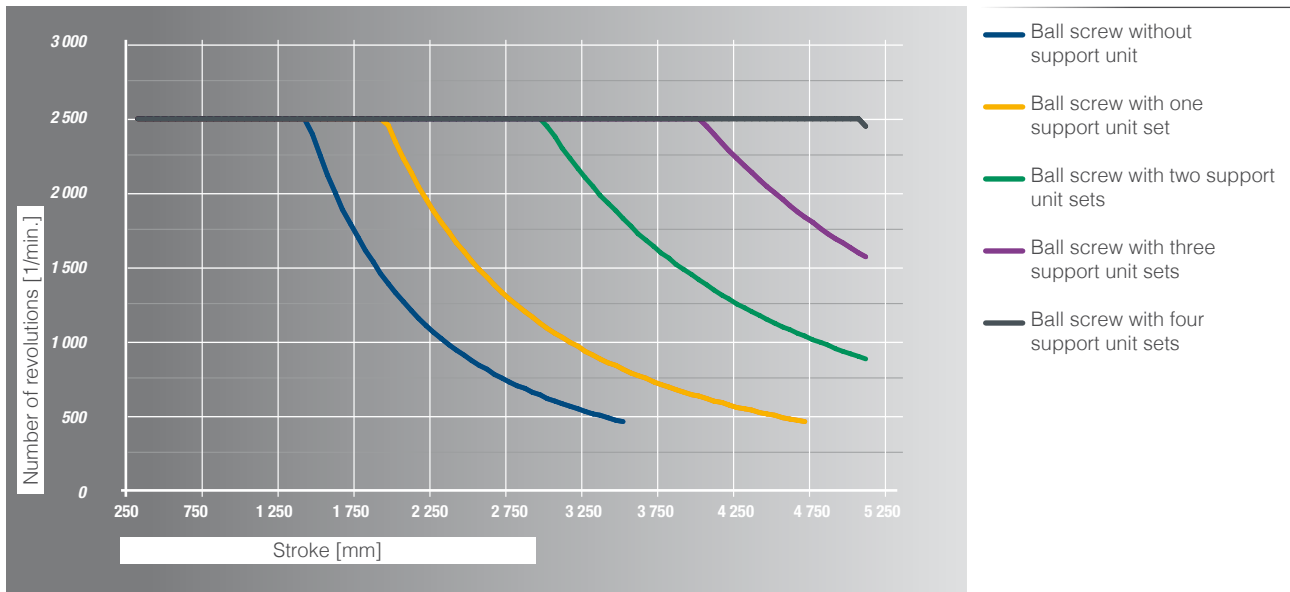
The version AXDL240SN3205 is not available with spindle supports units.

Allowable rotational speed of the trapezoidal screw
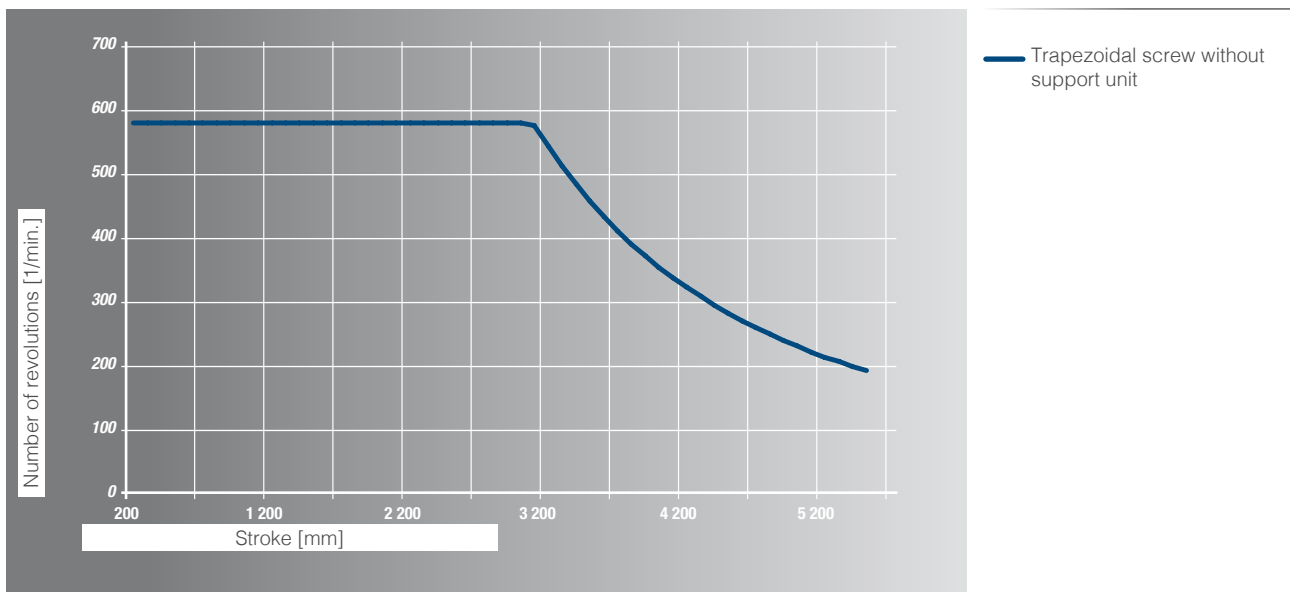
5.4.2.3 Maximum static load capacity

Type	Guiding system	Load [N]		Load moment [Nm]		
		F_y	F_z	M_x	M_y	M_z
AXDL110S/T	D	7 900	7 900	275	390	390
	E	19 200	19 200	670	1 250	1 250
AXDL160S/T	D	32 000	32 000	1 600	2 200	2 200
AXDL240S/T	D	42 500	42 500	3 550	3 950	3 950
	E	51 000	51 000	4 300	8 750	8 750

5.4.2.4 Dynamic load capacity

The dynamic load capacities of the guiding systems are based on a nominal life time of 25 000 km.

Type	Guiding system	Load [N]		Load moment [Nm]		
		F_y	F_z	M_x	M_y	M_z
AXDL110S/T	D	2 900	2 900	100	140	140
	E	7 100	7 100	250	470	470
AXDL160S/T	D	11 500	11 500	575	800	800
AXDL240S/T	D	16 000	16 000	1 350	1 500	1 500
	E	18 000	18 000	1 500	3 100	3 100
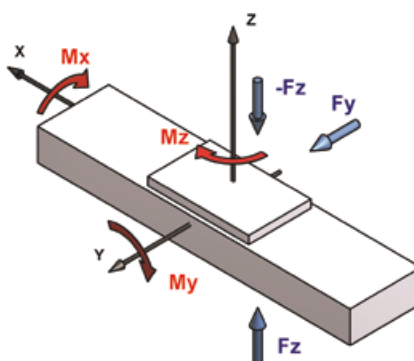
5.4.3 AXDL_A Parallel Axis with toot belt - Ω - drive

5.4.3.1   Structure
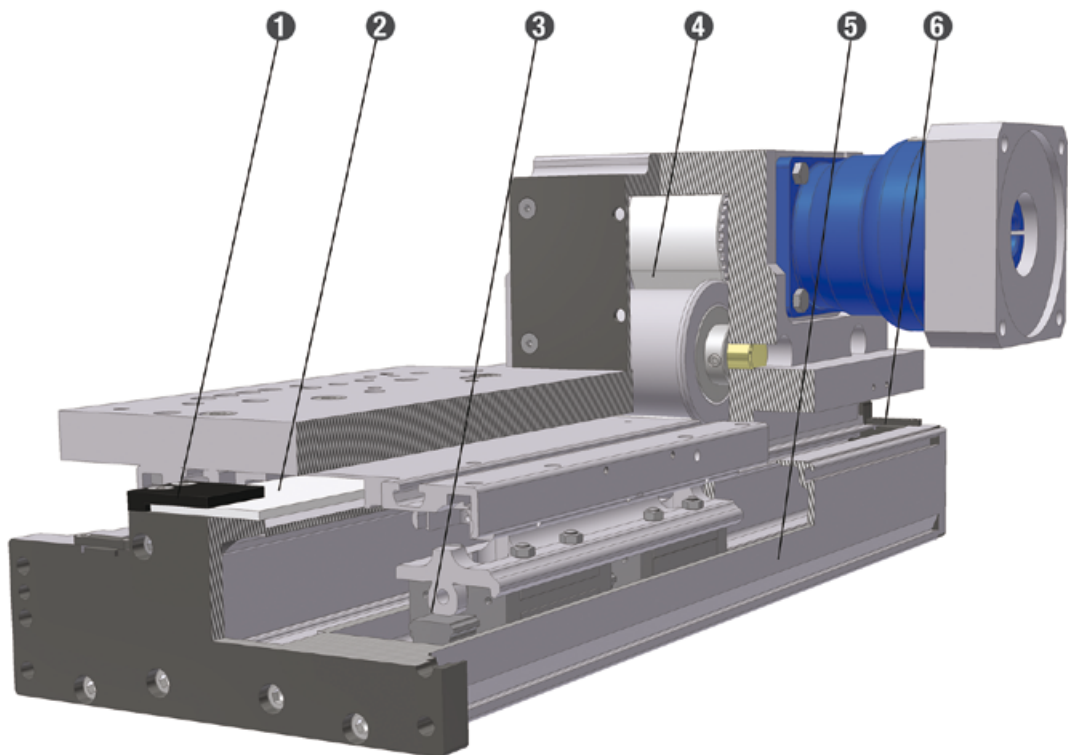
Figure 5.28 — Structure AXDL_A

1 Toothed belt clamping

2 Toothed belt

3 Guiding system

4 Operating head

5 Profile

6 Toothed belt tension unit

5.4.3.2 Dimensions / Technical data

AXDL160A
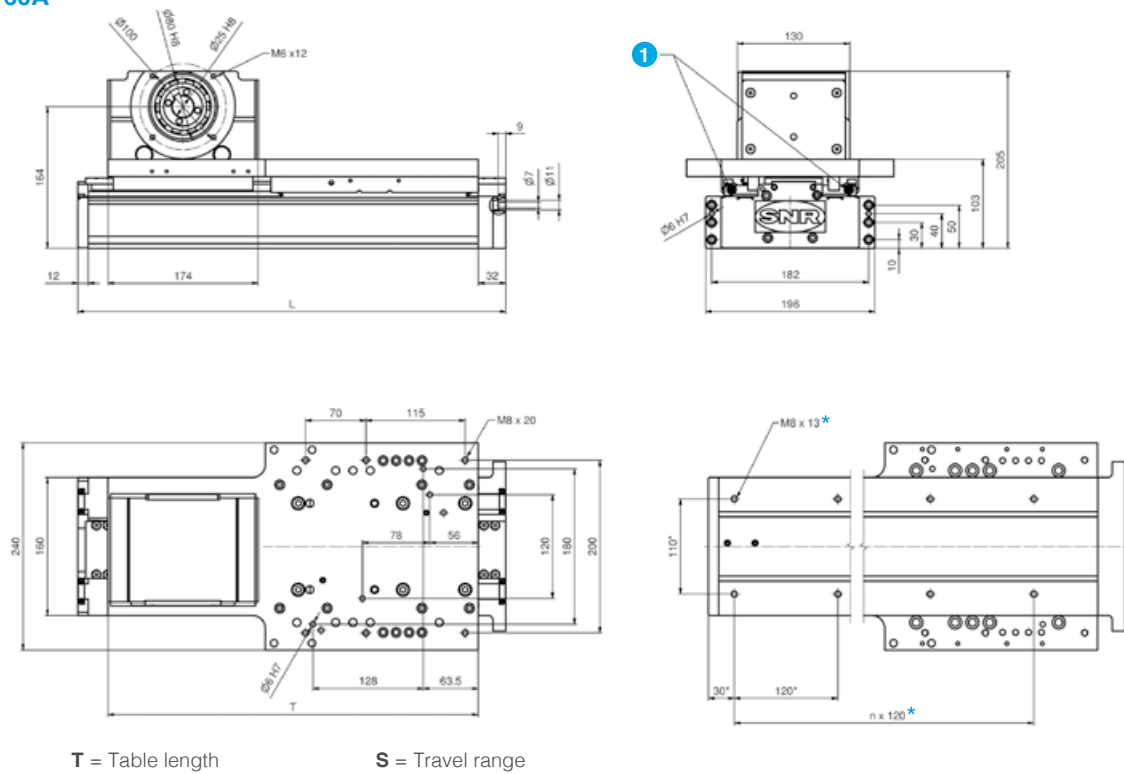
T = Table length   **S** = Travel range

Guiding system **D**: L = T + S + 67 mm - Guiding system **L**: L = T + S + 87 mm

❶ Re-greasing possibility on both sides

* Optional, note dimensions as a special specification

Technical data

Guiding system		Linear guide D	Track roller guide L
Table length T	mm	429	
Drive element		Toothed belt 50STD5	
Maximum velocity	m /min	300	900
Allowable dynamic operation load F_x	N	1 960	
Stroke per revolution	mm	$210^{+0,6}$	
Idling speed torque	Nm	3,6	
Maximum drive torque	Nm	65,5	
Moment of inertia [1]	Kgcm^2	11,6	
Geometrical moment of inertia (profile) I_y	cm^4	140,3	
Geometrical moment of inertia (profile) I_z	cm^4	666,8	
Maximum total length [2]	m	6,04 (1,2 [2])	
Repeatability	mm	0,05	

[1] - Moment of inertia without gearbox
[2] - Maximum length with improved straightness according Chapter **2.10**

Mass

Guiding system		Linear guide D	Track roller guide L
Basic mass (including slider mass)	kg	29,2	18,1
Mass per 100 mm stroke	kg	1,3	0,9
Slider mass	kg	12,3	12,3

AXDL240A
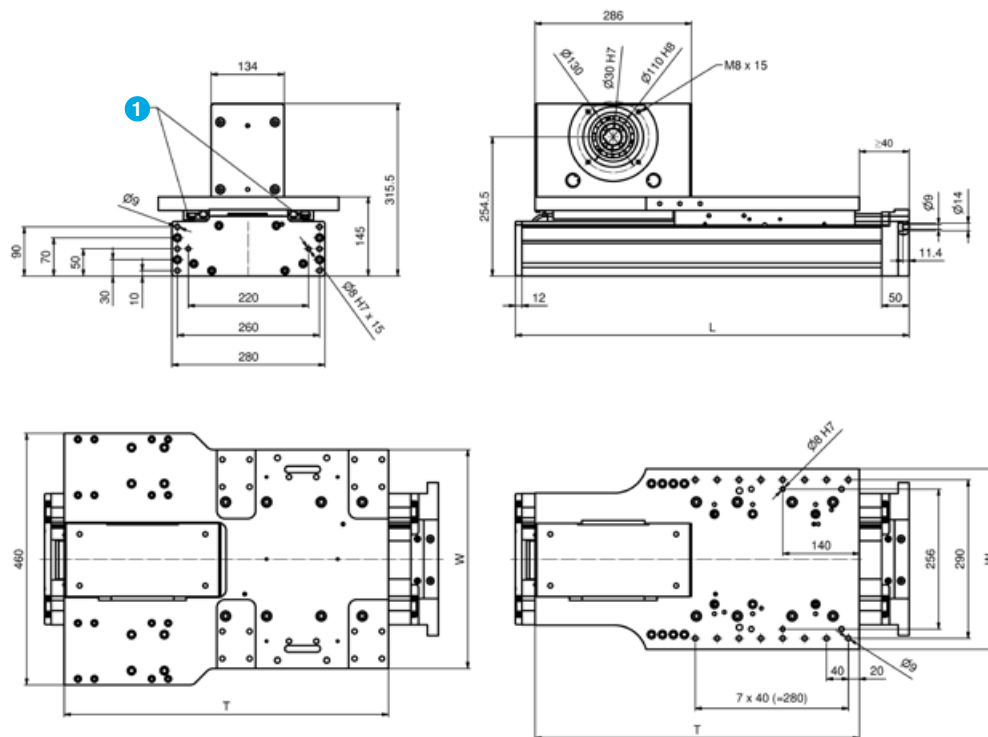
Adaptation to AXS280Y / AXS280Z *Adaptation to AXDL240S/Z*

T = Table length   **S** = Travel range   **L** = T + S + 27 mm

1 Re-greasing possibility on both sides

Technical data

Guiding system		Linear guide D	Track roller guide L
Table length T	mm	593	
Table width W	mm	330 at adaptation to AXDL240Z / 400 at adaptation to AXS280	
Drive element		Toothed belt 70STD8	
Maximum velocity	m /min	300	900
Allowable dynamic operation load	N	4 000	
Stroke per revolution	mm	$264^{+0,5}$	
Idling speed torque	Nm	6,5	
Maximum drive torque	Nm	168,0	
Moment of inertia [1]	Kgcm²	34,8	
Geometrical moment of inertia (profile) $_{Iy}$	cm⁴	751,7	
Geometrical moment of inertia (profile) I_z	cm⁴	3 956,0	
Maximum total length	m	6,28 (1,6 [2])	
Repeatability	mm	0,05	

[1] - Moment of inertia without gearbox
[2] - Maximum length with improved straightness according Chapter **2.10**

Mass

Guiding system		Linear guide D	Track roller guide L
Basic mass (including slider mass)	kg	54,1	53,9
Mass per 100 mm stroke	kg	2,7	2,2
Slider mass	kg	36,3	37,9

5.4.3.3   Maximum static load capacity

Type	Guiding system	Load [N]		Load moment [Nm]		
		F_y	F_z	M_x	M_y	M_z
AXDL160A	D	32 000	32 000	1 600	1 650	1 650
	L	1 200	1 200	62	84	84
AXDL240A	D	42 500	42 500	3 550	3 900	3 900
	L	2 600	2 600	220	210	210

5.4.3.4   Dynamic load capacity

The dynamic load capacities of the guiding systems are based on a nominal life time of 50 000 km.

Type	Guiding system	Load [N]		Load moment [Nm]		
		F_y	F_z	M_x	M_y	M_z
AXDL160A	D	9 000	9 000	475	475	475
	L	1 200	1 200	62	84	84
AXDL240A	D	12 500	12 500	1 050	1 200	1 200
	L	2 600	2 600	220	210	210
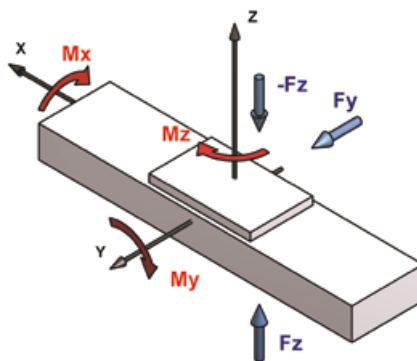
5.5 AXLT Linear Table Axis

5.5.1 AXLT_S / T Linear Table Axis with screw drive

5.5.1.1 Structure
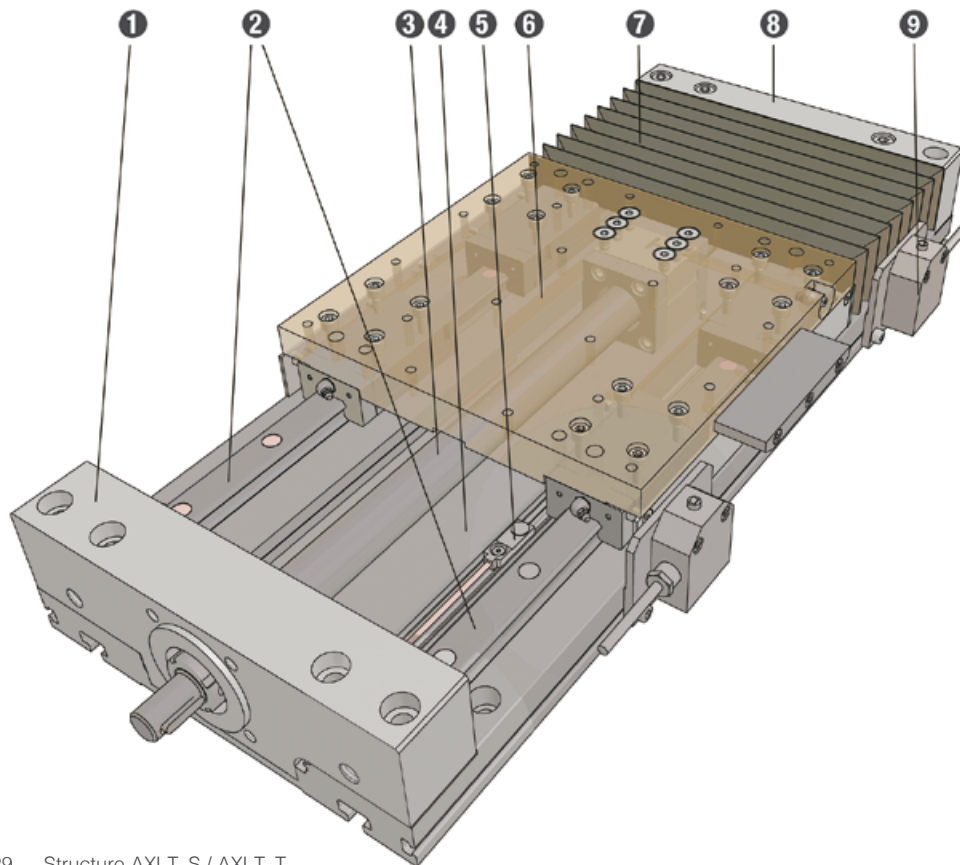
Figure 5.29 — Structure AXLT_S / AXLT_T

❶ Fixed bearing unit

❷ Guiding system

❸ Spindle

❹ Base plate

❺ Inductive switch, inside placed (optional)

❻ Table unit

❼ Bellow (optional)

❽ Floating bearing unit

❾ Mechanical switch, outside placed (optional)

AXLT155S / AXLT155T

T = Table length   S = Travel range   B = Bellow block dimension

$$L = T + S + 58 \text{ mm} + 2 \times B$$

❶ Separate lubrication connections for the carriages on both sides

❷ Lubrication connections for the screw drive

* omitted for steel version

Calculation bellow block dimension B:
Number of folds = round up (S / 16.5)
B = Number of folds x 3 + 5 mm

Technical data

Type		SV2005	SV2020	TV2004	TV2008
Guiding system		Linear guide D and E			
Table length T	mm	Guiding system D: 150 / Guiding system E: 220			
Drive element		Ball screw		Trapezoidal screw	
Screw diameter	mm	20			
Pitch / Pitch direction	mm	5 / right, left	20 / right	4 / right, left	8 / right
Maximum velocity	m /min	20	80	4,2	8,5
Pitch accuracy	µm/300mm	23		50	100
Dynamic load rating of the drive component	N	17 800	11 000	-	
Idling speed torque	Nm	0,6…0,8			
Maximum drive torque	Nm	4,3	17,0	7,0	9,8
Maximum axial operating load	N	5 400		4 400	
Moment of inertia	Kgcm²/m	0,84		0,81	
Geometrical moment of inertia (profile) I_y	cm⁴	54,09			
Geometrical moment of inertia (profile) I_z	cm⁴	996,3			
Maximum total length	m	3,5			
Repeatability	mm	0,03		0,07	
Efficiency		0,95	0,98	0,40	0,57

Mass

Guiding system		Linear guide D	Linear guide E
Basic mass (including slider mass)	kg	5,5	6,2
Mass per 100 mm stroke	kg	1,2	1,2
Slider mass	kg	2,0	2,3

Allowable rotational speed of the ball screw

Allowable rotational speed of the trapezoidal screw

AXLT225S / AXLT225T

T = Table length **S** = Travel range **B** = Bellow block dimension

L = T + S + 70 mm + 2 x B

1 Separate lubrication connections for the carriages on both sides

2 Lubrication connections for the screw drive

* omitted for steel version

Calculation bellow block dimension B:
Number of folds = round up (S / 27)
B = Number of folds x 3 + 5 mm

Technical data

Type		SV2505	SV2510	SV2525	SV2550	TV2405	TV2410
Guiding system		Linear guide D and E					
Table length T	mm	Guiding system D: 220 / Guiding system E: 320					
Drive element		Ball screw				Trapezoidal screw	
Screw diameter	mm	25				24	
Pitch / Pitch direction	mm	5 / right	10 / right	25 / right	50 / right	5 / right, left	10 / right
Maximum velocity	m /min	18	36	90	180	4,4	8,9
Pitch accuracy	µm/300mm	23			52	50	100
Dynamic load rating of the drive component	N	19 800	16 100	12 100	15 400	-	
Idling speed torque	Nm	0,7…1,2					
Maximum drive torque	Nm	5,4	11,0	27,0	54,0	10,0	14,0
Maximum axial operating load	N	6 800		6 040	6 800	5 200	
Moment of inertia	Kgcm^2/m	2,62	2,82	2,62	2,25	1,50	
Geometrical moment of inertia (profile) I_y	cm^4	93,46					
Geometrical moment of inertia (profile) I_z	cm^4	3 417					
Maximum total length	m	3,5				3,5	
Repeatability	mm	0,03				0,07	
Efficiency		0,98				0,41	0,58

Mass

Guiding system		Linear guide D	Linear guide E
Basic mass (including slider mass)	kg	13,0	15,8
Mass per 100 mm stroke	kg	1,8	1,8
Slider mass	kg	5,0	6,0

Allowable rotational speed of the ball screw

Number of revolutions [1/min.] — Stroke [mm]

Ball screw without support unit

Allowable rotational speed of the trapezoidal screw

Number of revolutions [1/min.] — Stroke [mm]

Trapezoidal screw without support unit
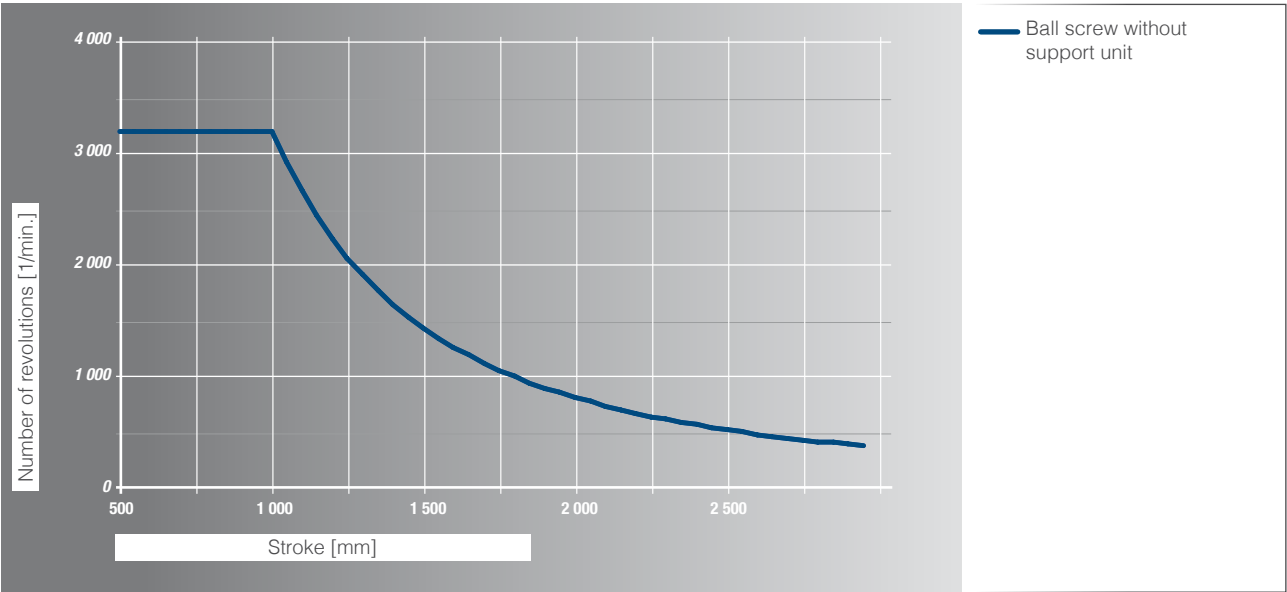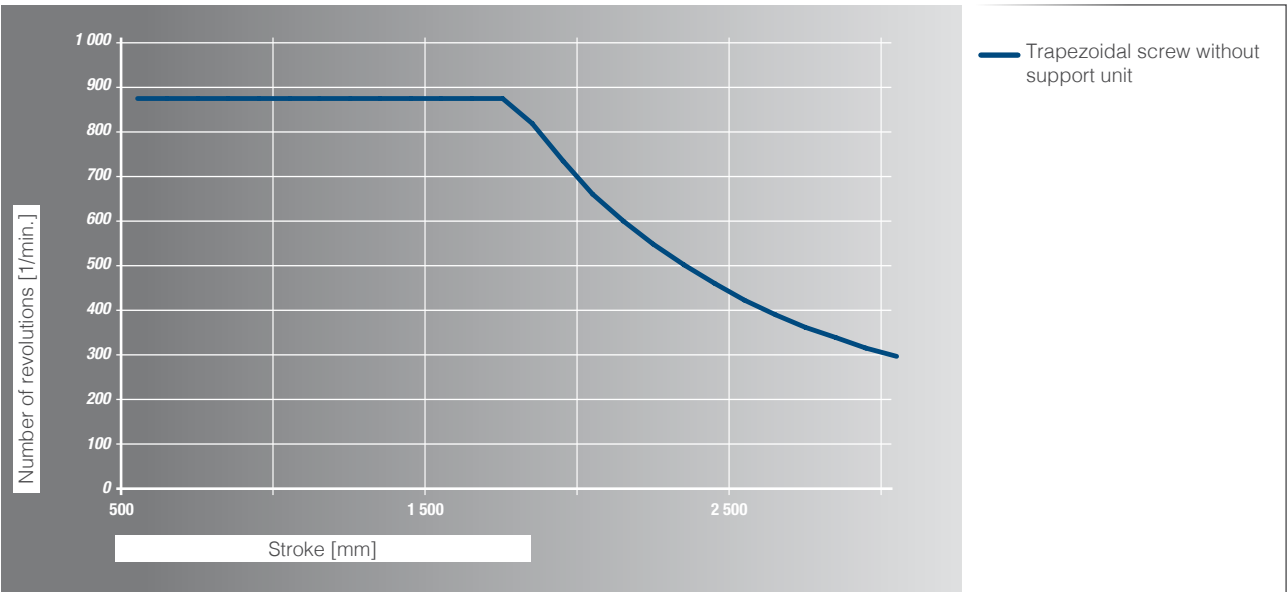
AXLT325S / AXLT325T

T = Table length   S = Travel range   B = Bellow block dimension

L = T + S + 90 mm + 2 x B

1 Separate lubrication connections for the carriages on both sides

2 Lubrication connections for the screw drive

Calculation bellow block dimension B:
Number of folds = round up (S / 27)
B = Number of folds x 3 + 5 mm

Technical data

Type		SV3205	SV3210	SV3220	SV3232	TV3606	TV3612
Guiding system		Linear guide D and E					
Table length T	mm	Guiding system D: 320 / Guiding system E: 450					
Drive element		Ball screw				Trapezoidal screw	
Screw diameter	mm	32				36	
Pitch / Pitch direction	mm	5 / right, left	10 / right	20 / right	32 / right	6 / right, left	12 / right
Maximum velocity	m /min	12,5	25	50	80	3,5	6,9
Pitch accuracy	µm/300mm	23				50	200
Dynamic load rating of the drive component	N	26 000	34 700	24 300	18 000	-	
Idling speed torque	Nm	1,1…1,5					
Maximum drive torque	Nm	11,0	21,0	42,0	55,0	29,0	39,0
Maximum axial operating load	N	13 000	13 300	12 150	9 000	10 700	
Moment of inertia	Kgcm²/m	6,05	6,40	6,39	6,17	9,00	
Geometrical moment of inertia (profile) I_y	cm⁴	214,6					
Geometrical moment of inertia (profile) I_z	cm⁴	12 359					
Maximum total length	m	3,2					
Repeatability	mm	0,03				0,07	
Efficiency		0,91	0,97	0,98		0,35	0,52

Mass

Guiding system		Linear guide D	Linear guide E
Basic mass (including slider mass)	kg	31,5	38,7
Mass per 100 mm stroke	kg	3,5	3,5
Slider mass	kg	12,0	14,6

Allowable rotational speed of the ball screw

Number of revolutions [1/min.]

Stroke [mm]

Ball screw without support unit

Allowable rotational speed of the trapezoidal screw

Number of revolutions [1/min.]

Stroke [mm]

Trapezoidal screw without support unit

SNR
Brand of NTN Group
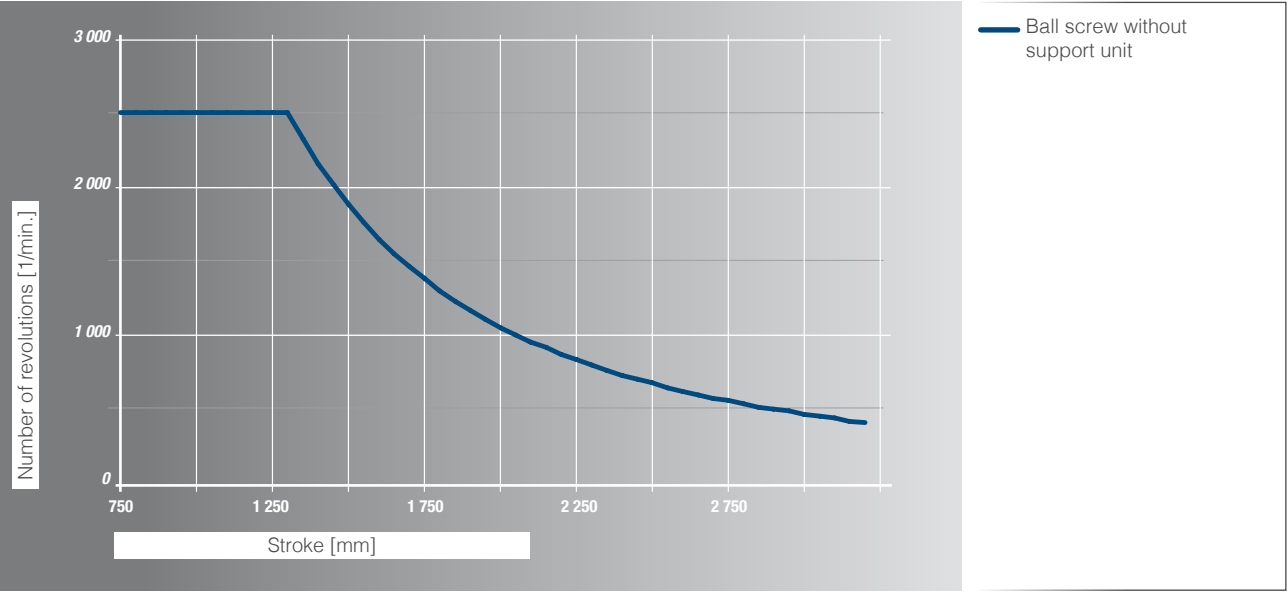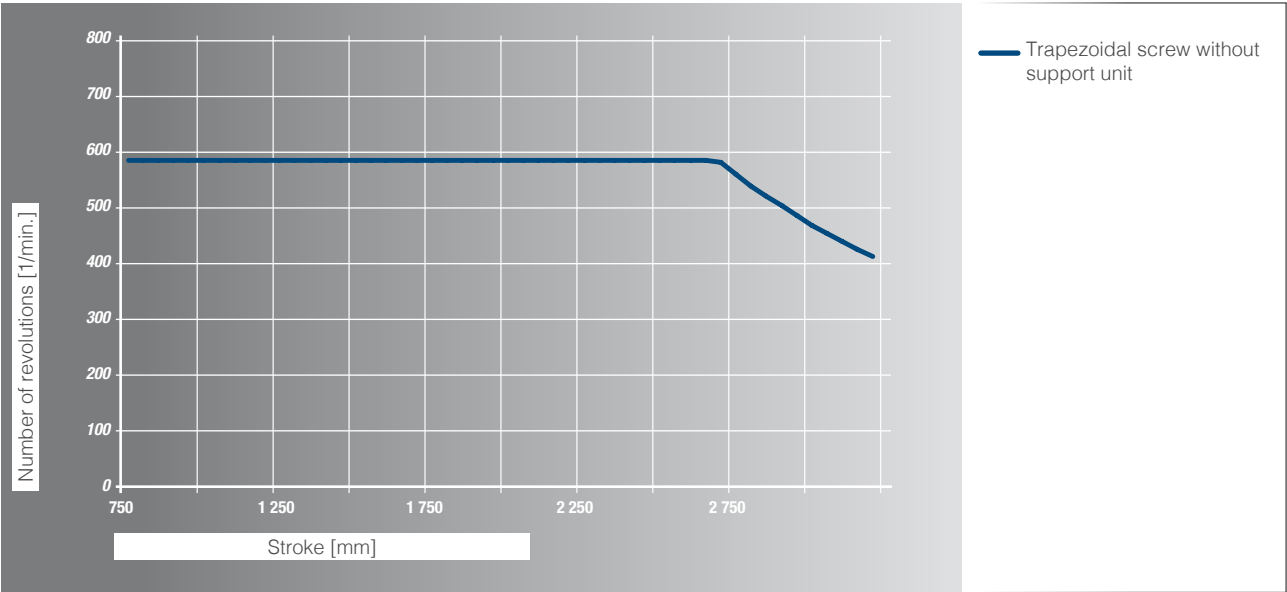
AXLT455S / AXLT455T
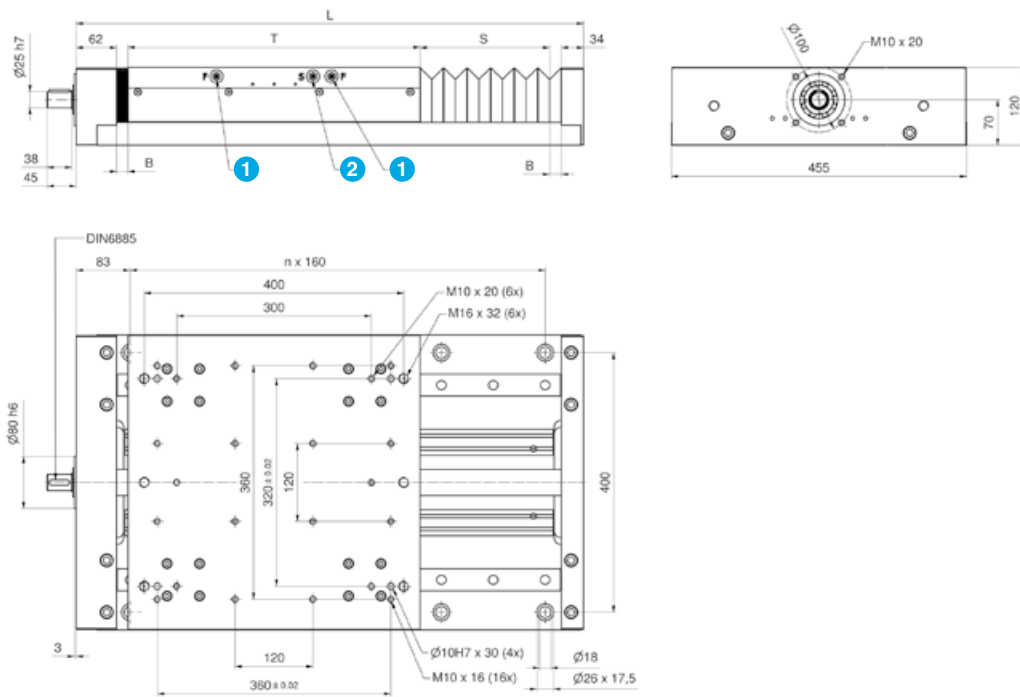
T = Table length   **S** = Travel range   **B** = Bellow block dimension

L = T + S + 96 mm + 2 x B

❶ Separate lubrication connections for the carriages on both sides

❷ Lubrication connections for the screw drive

Calculation bellow block dimension B:
Number of folds = round up (S / 34.5)
B = Number of folds x 3 + 5 mm

Technical data

Type		SV4005	SV4010	SV4020	SV4040	TV4007
Guiding system		Linear guide D				
Table length T	mm	Guiding system D: 450				
Drive element		Ball screw				Trapezoidal screw
Screw diameter	mm	40				
Pitch / Pitch direction	mm	5 / right, left	10 / right	20 / right	40 / right	7 / right, left
Maximum velocity	m /min	10	20	40	80	3,7
Pitch accuracy	µm/300mm	23				80
Dynamic load rating of the drive component	N	19 800	49 400	38 800	37 100	-
Idling speed torque	Nm	1,7…2,8				
Maximum drive torque	Nm	16	38	76	105	44
Maximum axial operating load	N	9 900	24 000	19 400	16 500	14 700
Moment of inertia	Kgcm²/m	15,64	13,55	13,52	13,42	13,0
Geometrical moment of inertia (profile) I_y	cm⁴	442,6				
Geometrical moment of inertia (profile) I_z	cm⁴	37 625				
Maximum total length	m	3,5				
Repeatability	mm	0,03				0,07
Efficiency		0,89	0,95	0,98		0,37

Mass

Guiding system		Linear guide D
Basic mass (including slider mass)	kg	74,0
Mass per 100 mm stroke	kg	6,3
Slider mass	kg	29,0

Allowable rotational speed of the ball screw
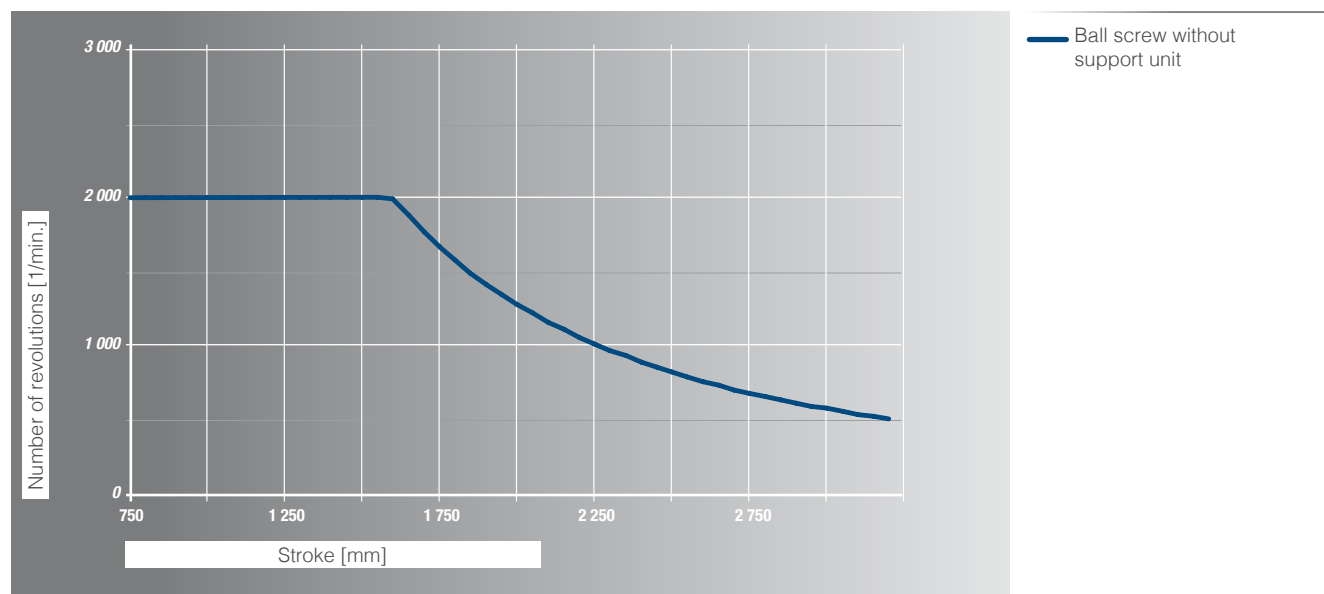
Allowable rotational speed of the trapezoidal screw
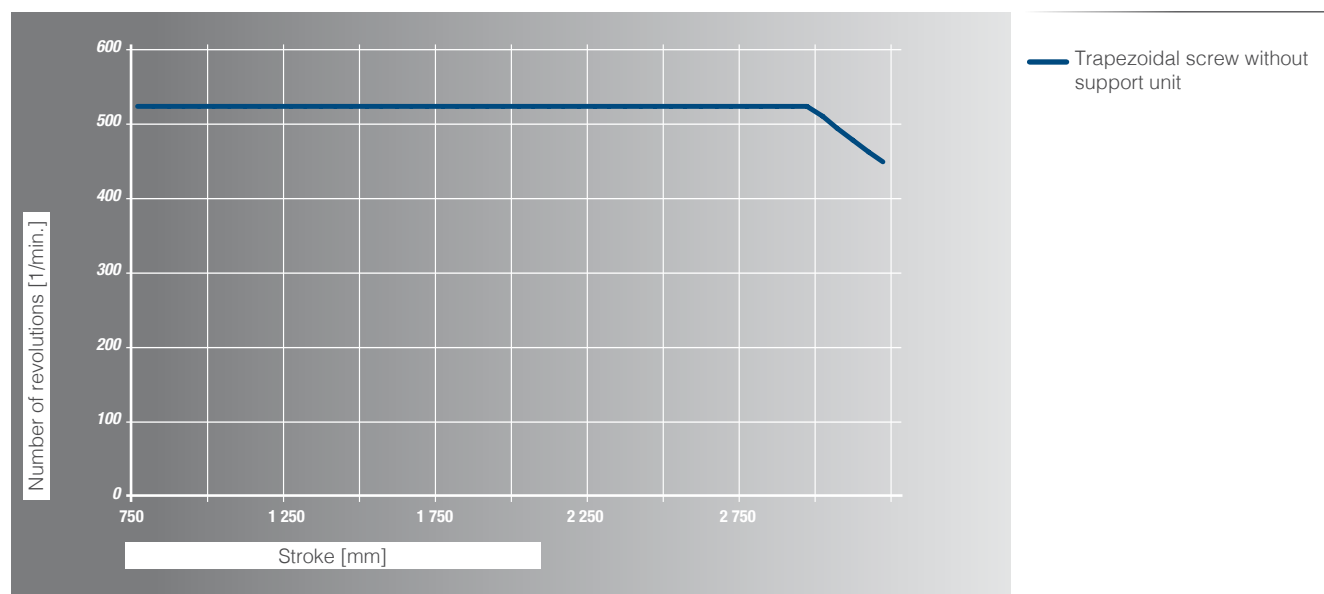
5.5.1.3 Maximum static load capacity

Type	Guiding system	Load [N]		Load moment [Nm]		
		F_y	F_z	M_x	M_y	M_z
AXLT155S/T	D	19 000	19 000	1 000	800	800
	E	19 000	19 000	1 000	1 150	1 150
AXLT225S/T	D	32 000	32 000	2 500	2 250	2 250
	E	32 000	32 000	2 500	3 000	3 000
AXLT325S/T	D	57 000	57 000	6 500	5 850	5 850
	E	57 000	57 000	6 500	8 000	8 000
AXLT455S/T	D	82 000	82 000	12 000	11 500	11 500

5.5.1.4 Dynamic load capacity

The dynamic load capacities of the guiding systems are based on a nominal life time of 25 000 km.

Type	Guiding system	Load [N]		Load moment [Nm]		
		F_y	F_z	M_x	M_y	M_z
AXLT155S/T	D	7 000	7 000	375	300	300
	E	7 000	7 000	375	425	425
AXLT225S/T	D	11 500	11 500	925	800	800
	E	11 500	11 500	925	1 050	1 050
AXLT325S/T	D	24 000	24 000	2 750	2 450	2 450
	E	24 000	24 000	2 750	3 400	3 400
AXLT455S/T	D	33 000	33 000	5 000	4 700	4 700
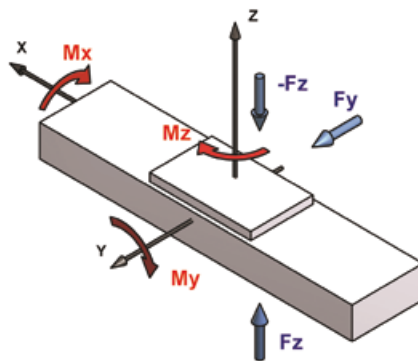
5.6 AXBG Precision Axis

5.6.1 AXBG Precision Axis with screw drive

5.6.1.1 Structure
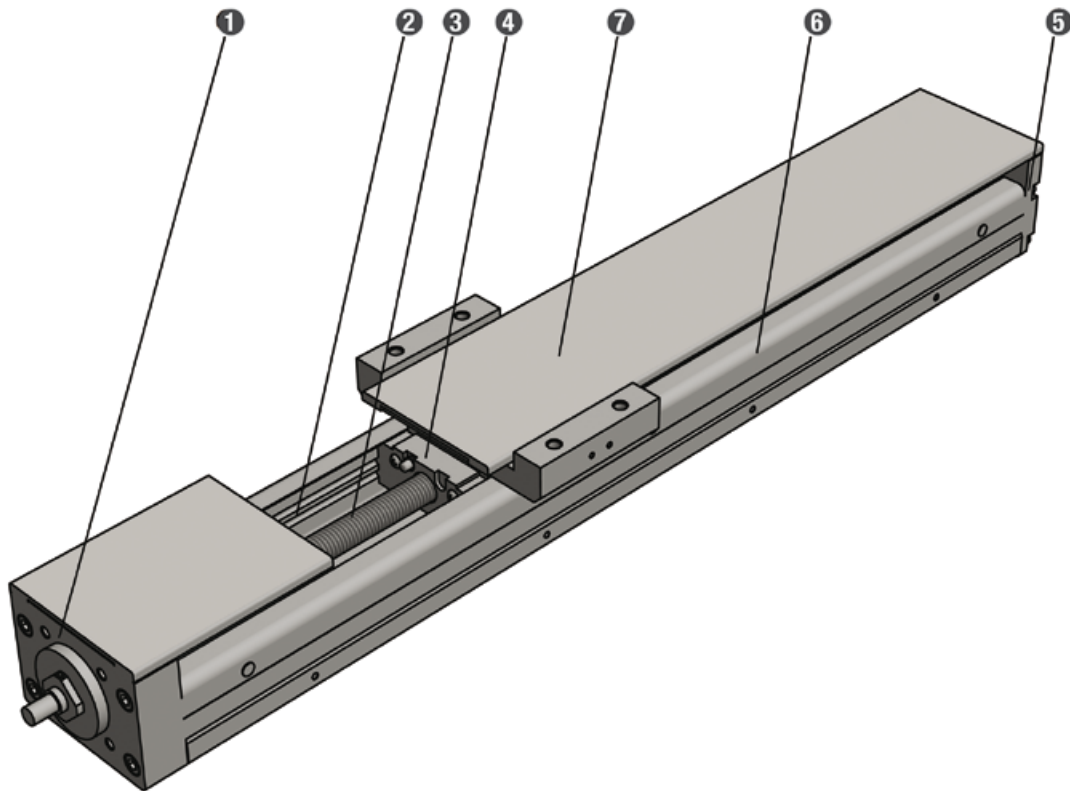
Figure 5.30 — Structure AXBG_S

❶ Fixed bearing unit

❷ Guiding rail

❸ Screw drive

❹ Carriage

❺ Floating bearing unit

❻ Dust cover

❼ Cover plate (optional)

5.6.1.2   Dimensions / Technical data

AXBG15 ☐ A / AXBG15 ☐ B

*On both sides
**Lubrication hole
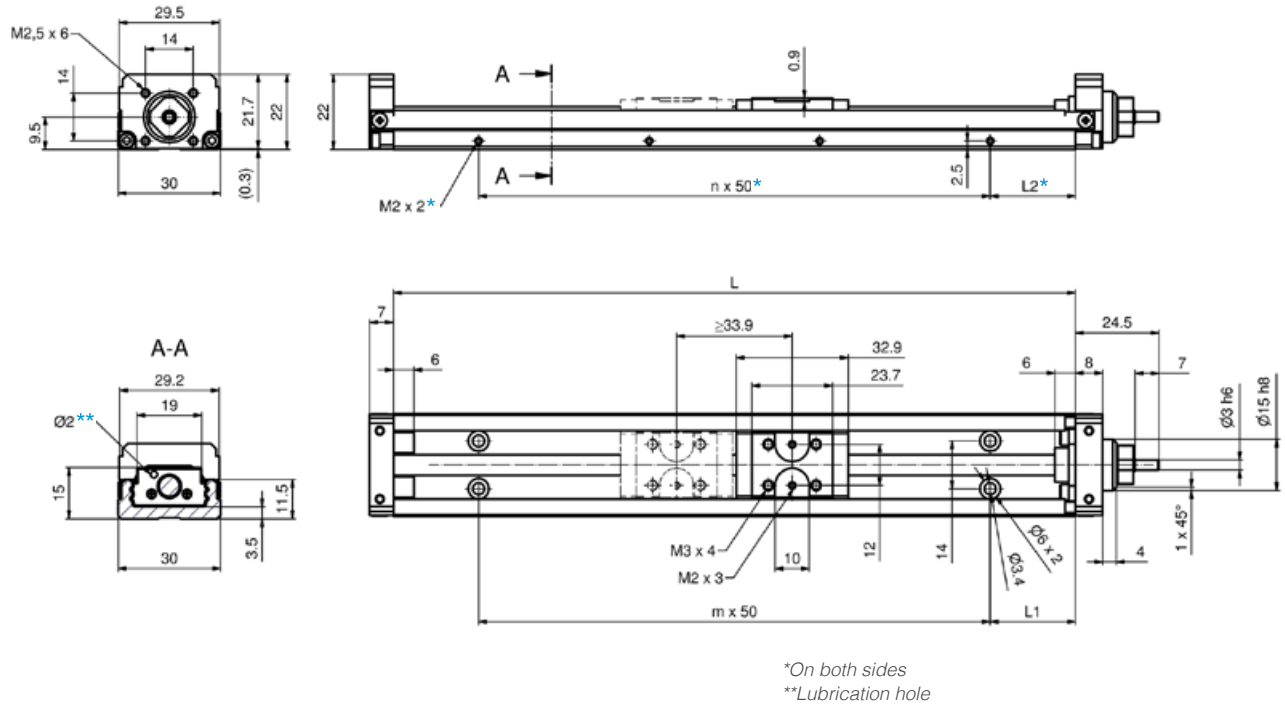
AXBG15__A / AXBG15__B with cover plate

*On both sides
**Lubrication hole
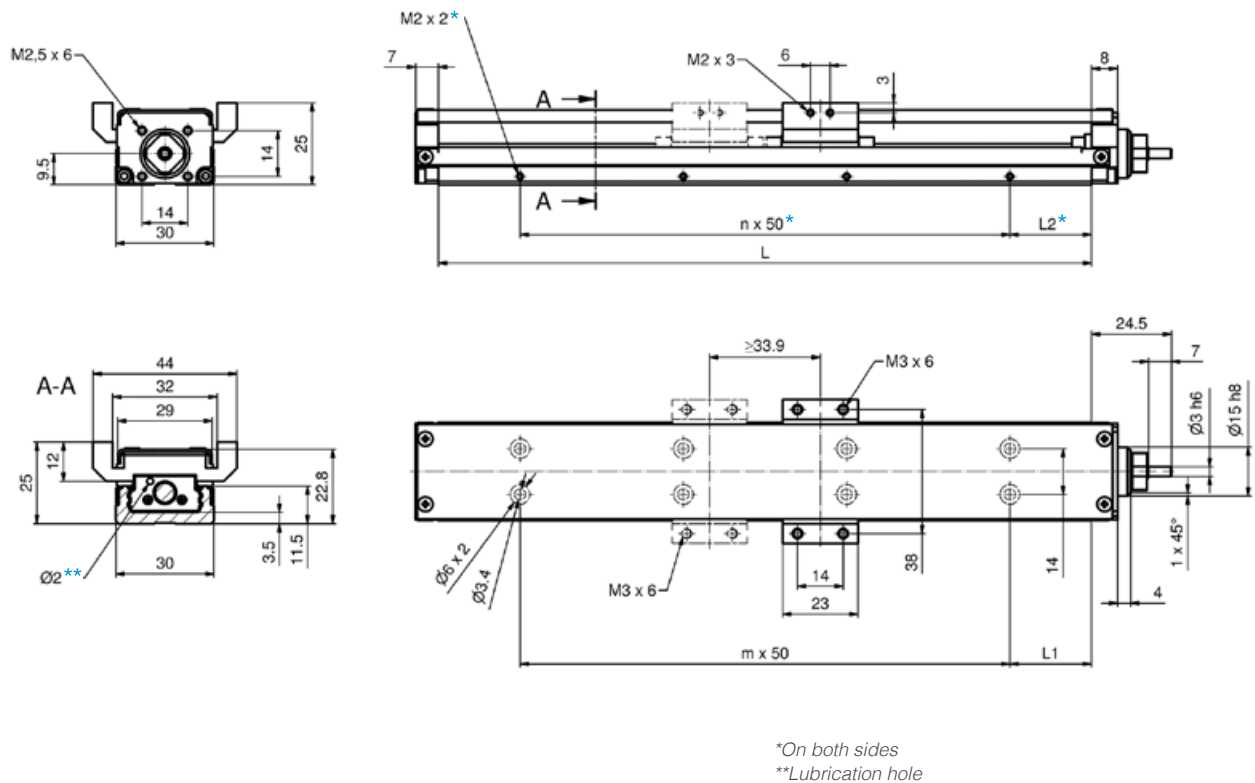
Technical data

Type		SN0601	SN0602
Drive element		Ball screw	
Screw diameter	mm	6	
Pitch / Pitch direction	mm	1 / right	2 / right
Maximum velocity	m /min	11,1	22,2
Maximum drive torque	Nm	0,016	0,064
Maximum axial operating load	N	100	200
Moment of inertia	Kgcm²/m	0,00083	
Geometrical moment of inertia (profile) I_y	cm⁴	0,12	
Geometrical moment of inertia (profile) I_z	cm⁴	1,56	
Maximum profile length	mm	200	

Dimension and mass

Profile length L	Dimension [mm]		Index		Guiding system Without cover plate [kg]		Guiding system With cover plate [kg]	
	L1	L2	m	n	A	B	A	B
75	12,5	12,5	1	1	0,21	-	0,24	-
100	25,0	25,0	1	1	0,25	-	0,28	-
125	12,5	12,5	2	2	0,28	0,32	0,31	0,37
150	25,0	25,0	2	2	0,32	0,35	0,35	0,40
175	12,5	12,5	3	3	0,35	0,39	0,39	0,44
200	25,0	25,0	3	3	0,39	0,42	0,42	0,48

Allowable rotational speed of the ball screw
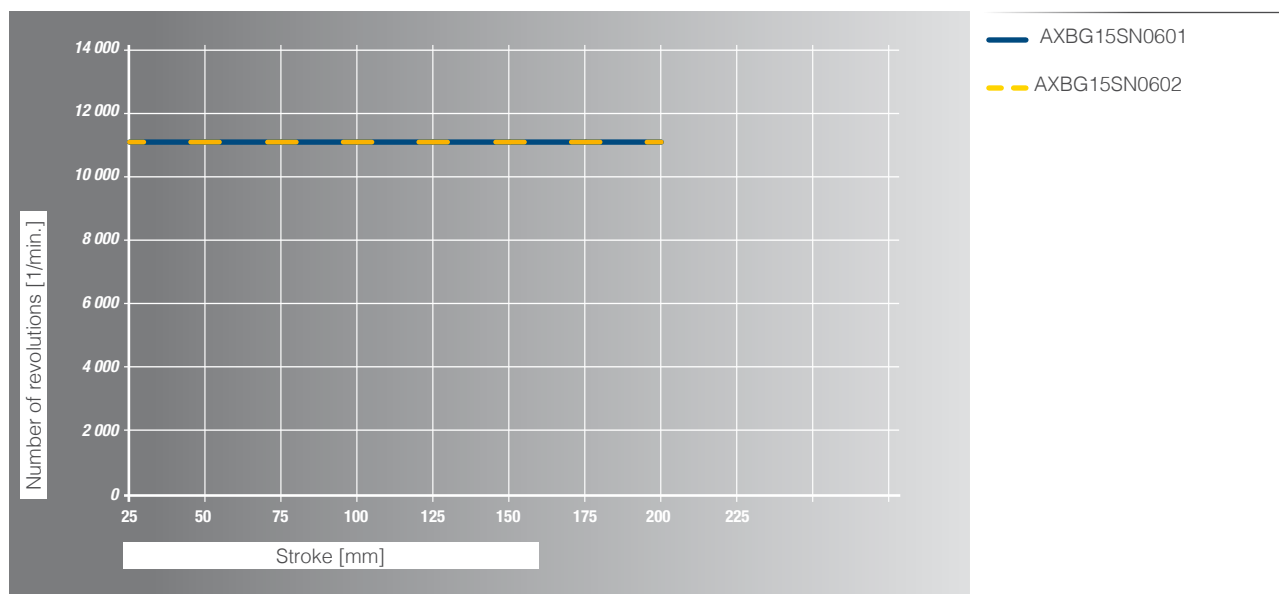
AXBG20__A / AXBG20__B
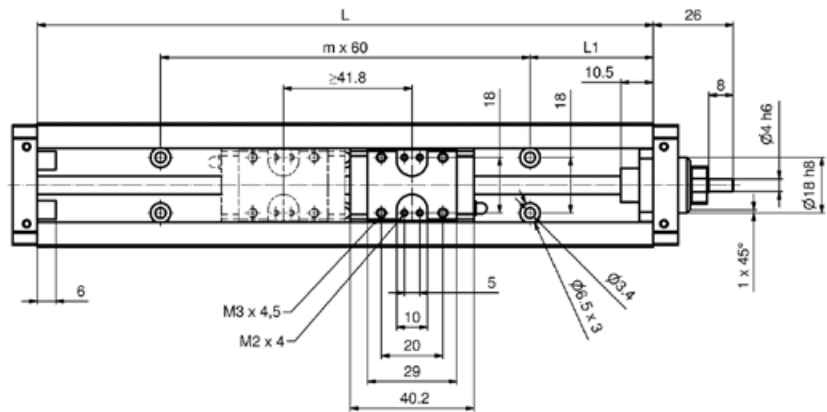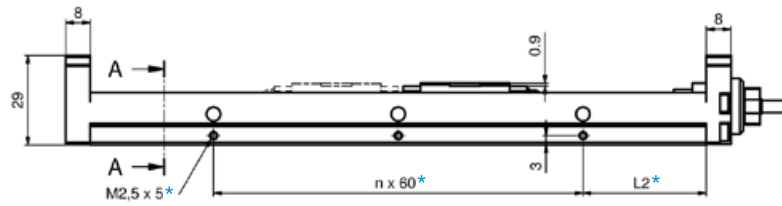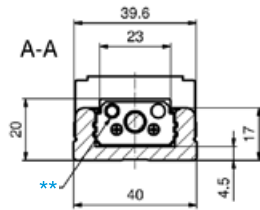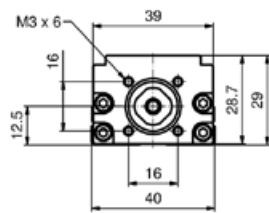
*On both sides
**Grease nipple

AXBG20__A / AXBG20__B with cover plate
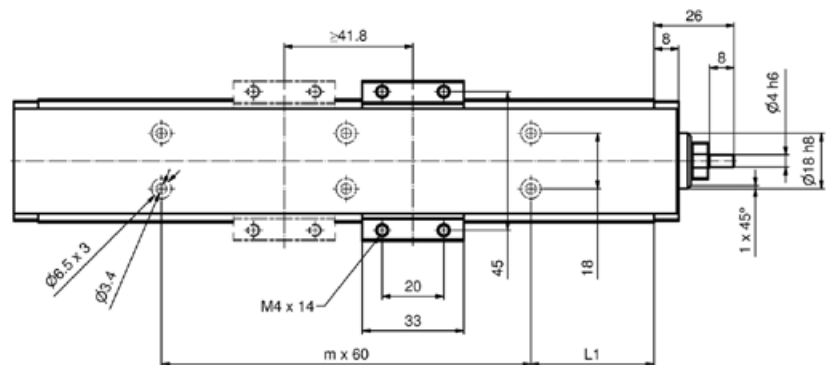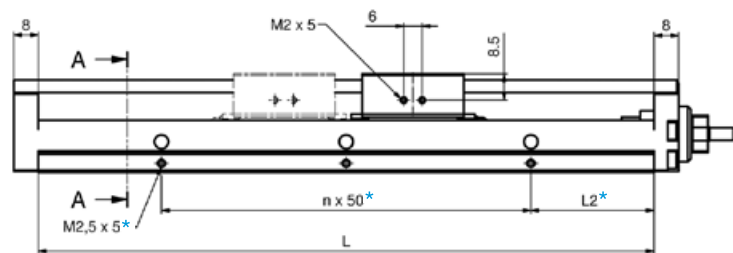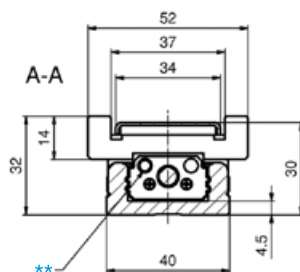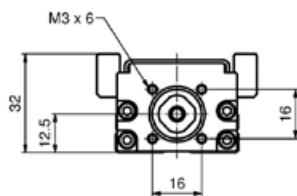
*On both sides
**Lubrication hole

Technical data

Type		SN0601	SN0605
Drive element		Ball screw	
Screw diameter	mm	6	
Pitch / Pitch direction	mm	1 / right	5 / right
Maximum velocity	m /min	11,2	55,5
Maximum drive torque	Nm	0,05	0,16
Maximum axial operating load	N	265	200
Moment of inertia	Kgcm²/m	0,00083	
Geometrical moment of inertia (profile) I_y	cm⁴	0,65	
Geometrical moment of inertia (profile) I_z	cm⁴	6,00	
Maximum profile length	mm	200	

Dimension and mass

Profile length L	Dimension [mm]		Index		Guiding system Without cover plate [kg]		Guiding system With cover plate [kg]	
	L1	L2	m	n	A	B	A	B
100	20	20	1	1	0,45	-	0,50	-
150	15	15	2	2	0,58	0,65	0,63	0,74
200	40	40	2	2	0,71	0,78	0,77	0,88

Allowable rotational speed of the ball screw

AXBG26__A / AXBG26__B

*On both sides
**Grease nipple

AXBG26__A / AXBG26__B with cover plate

*On both sides
**Grease nipple
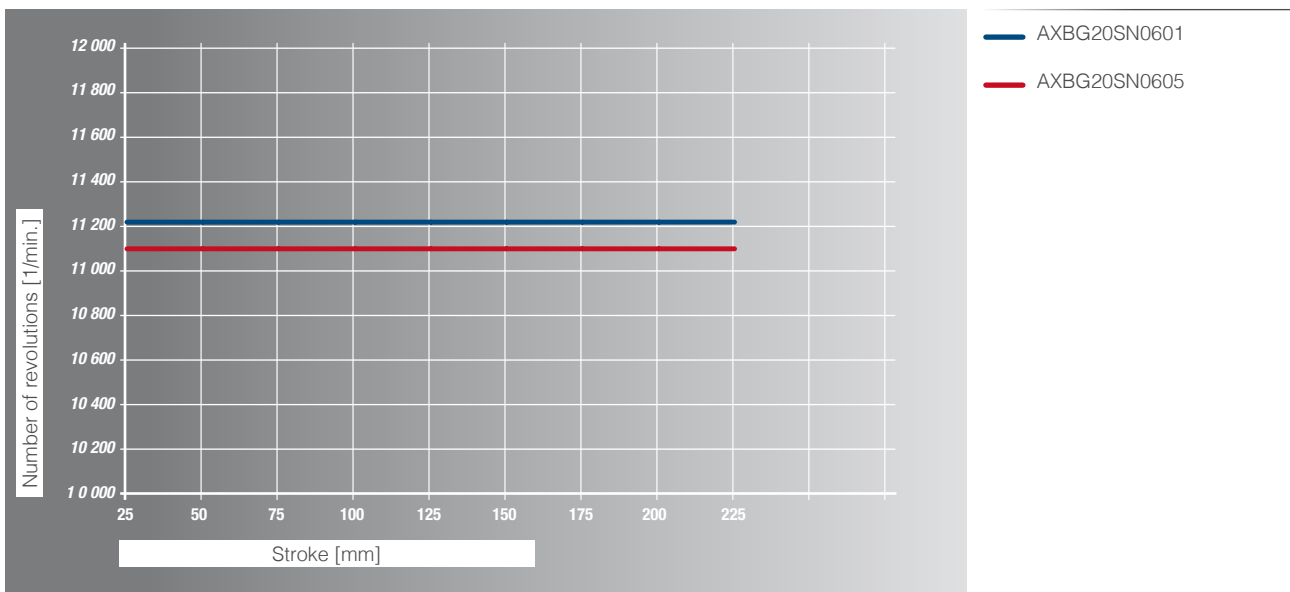
Technical data

Type		SN0802	SN0805
Drive element		Ball screw	
Screw diameter	mm	8	
Pitch / Pitch direction	mm	2 / right	5 / right
Maximum velocity	m /min	16,8	41,6
Maximum drive torque	Nm	0,16	0,40
Maximum axial operating load	N	500	500
Moment of inertia	Kgcm^2/m	0,0271	
Geometrical moment of inertia (profile) I_y	cm^4	1,69	
Geometrical moment of inertia (profile) I_z	cm^4	14,70	
Maximum profile length	mm	300	

Dimension and mass

Profile length L	Dimension [mm]		Index		Guiding system Without cover plate [kg]		Guiding system With cover plate [kg]	
	L1	L2	m	n	A	B	A	B
150	35	35	1	1	0,93	-	1,07	-
200	20	20	2	2	1,14	1,31	1,30	1,54
250	45	45	2	2	1,36	1,53	1,53	1,78
300	30	30	3	3	1,57	1,74	1,76	2,01

Allowable rotational speed of the ball screw

AXBG26SN0802
AXBG26SN0805
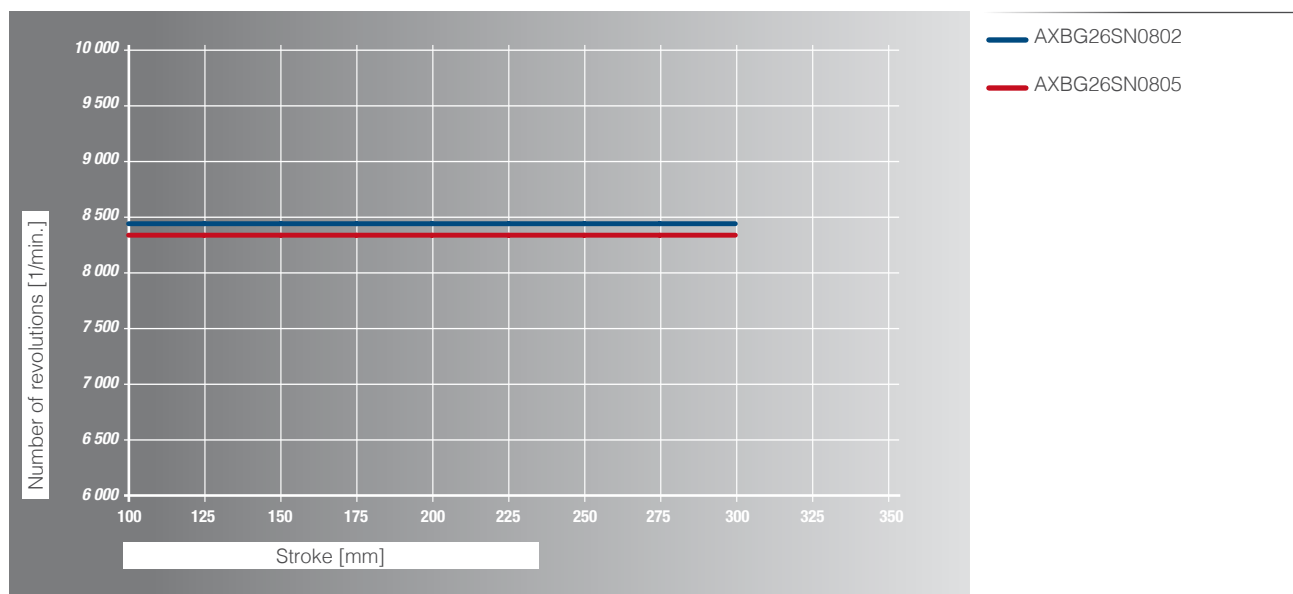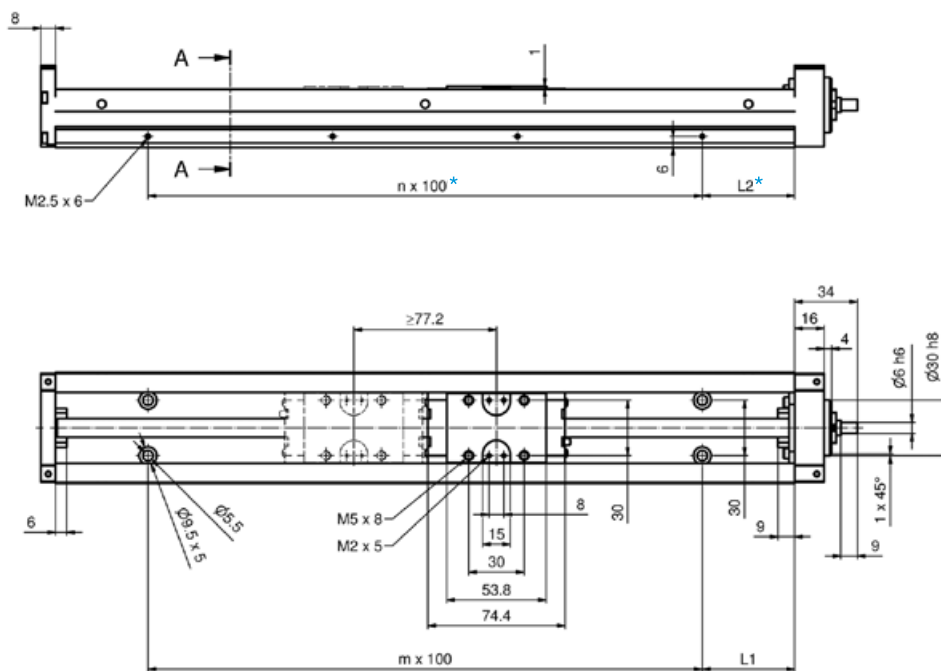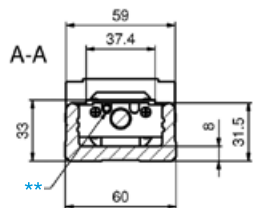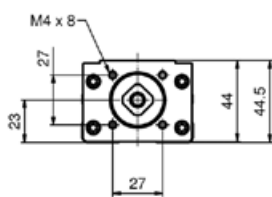
AXBG33__A / AXBG33__B

*On both sides
**Grease nipple

AXBG33__A / AXBG33__B with cover plate
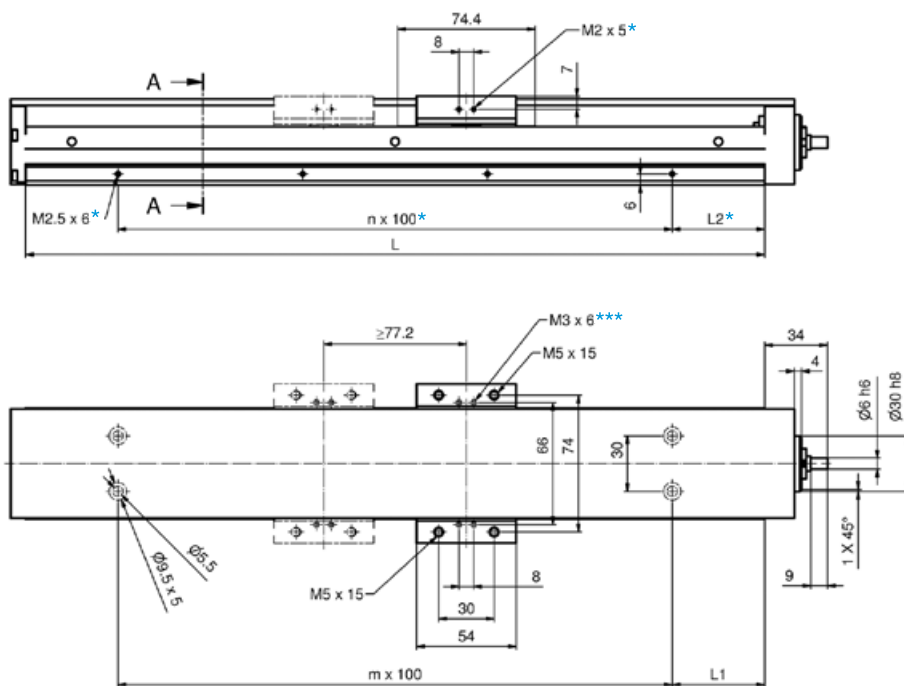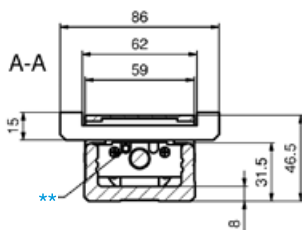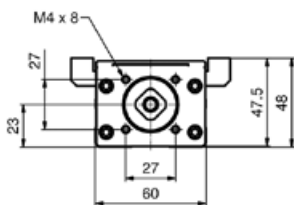
*On both sides
**Grease nipple
***Bore holes from the bottom side

AXBG33__C / AXBG33_ D

M4 x 8
27
23
44
44.5
27
8
1
A
A
M2.5 x 6*
n x 100*
6
L2*
L

A-A
59
37.4
33
8
31.5
**
60
6
51.9
48.9
≥51.9
M5 x 8
M2 x 5
34
16
4
Ø6 h6
Ø30 h8
Ø9.5 x 5
Ø5.5
2.5
5
10
30
30
9
1 x 45°
9
28.5
m x 100
L1
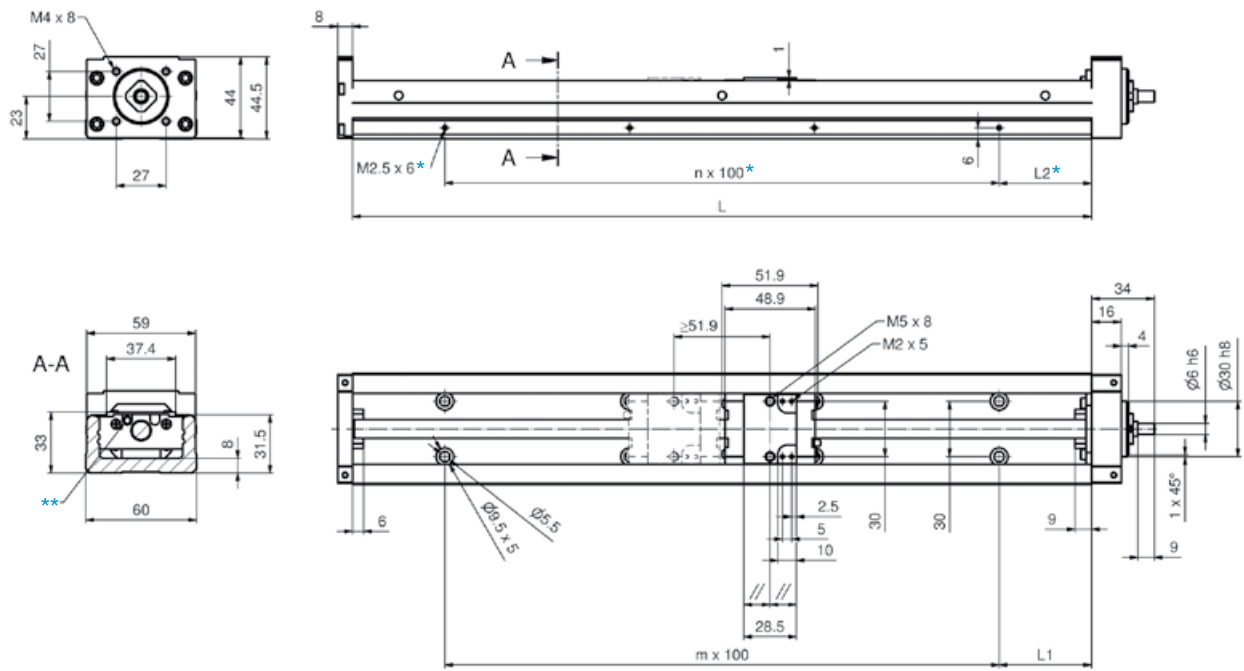
*On both sides
**Grease nipple

AXBG33__C / AXBG33__D with cover plate

M4 x 8
27
23
47.5
48
27
60
8
A
48.9
5
7
2.5
M2 x 5*
16
A
M2.5 x 6*
n x 100*
6
L2*
L

A-A
86
62
59
15
31.5
46.5
8
**
≥51.9
M5 x 15
M2 x 5***
34
4
Ø6 h6
Ø30 h8
Ø9.5 x 5
Ø5.5
66
74
30
2.5
5
9
1 x 45°
28.5
m x 100
L1

*On both sides
**Grease nipple
***Bore holes from the bottom side

127
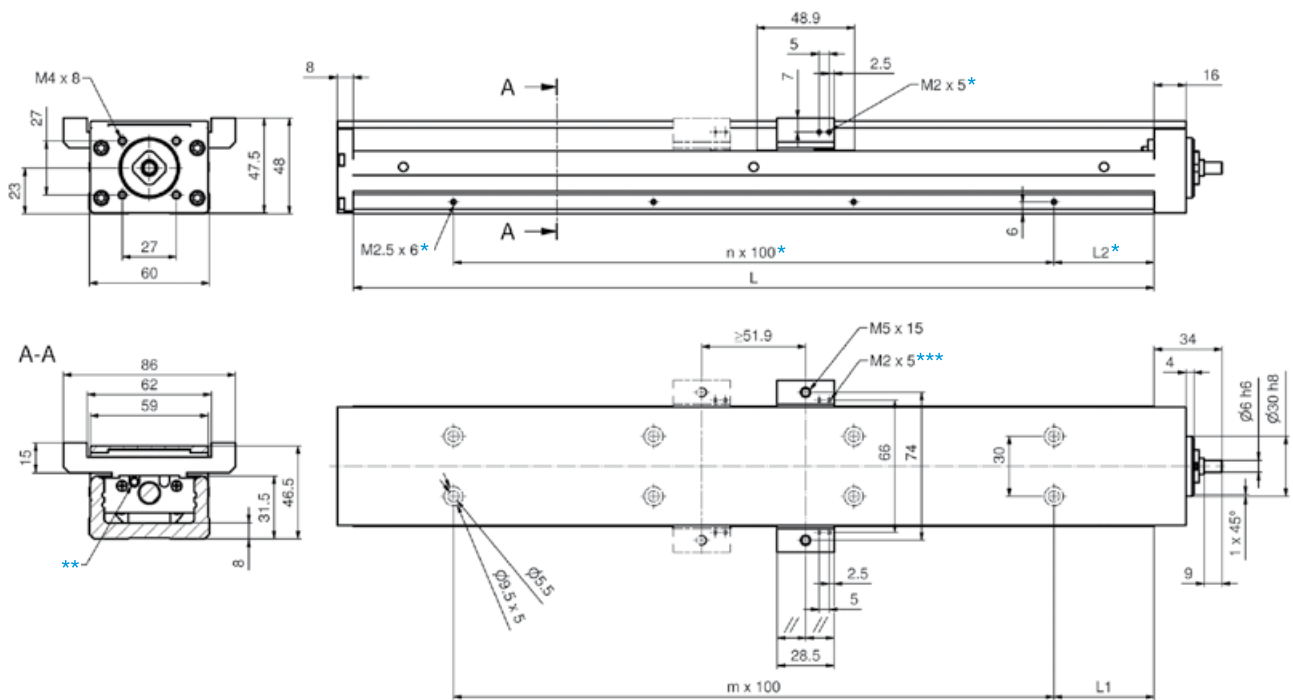
Technical data

Type		SN1005	SN1010	SN1220
Drive element		Ball screw		
Screw diameter	mm	10		12
Pitch / Pitch direction	mm	5 / right	10 / right	20 / right
Maximum velocity	m /min	33	66	90
Maximum drive torque	Nm	0,8 (0,6*)	1,3 (0,6*)	3,2 (1,6*)
Maximum axial operating load	N	1 000 (700*)	800 (400*)	1 000 (500*)
Moment of inertia	Kgcm²/m	0,0653		0,0764
Geometrical moment of inertia (profile) I_y	cm⁴	5,1		
Geometrical moment of inertia (profile) I_z	cm⁴	34,2		
Maximum profile length	mm	600		

*For P precision

Dimension and mass

Profile length L	Dimension [mm]		Index		Guiding system Without cover plate [kg]				Guiding system With cover plate [kg]			
	L1	L2	m	n	A	B	C	D	A	B	C	D
150	25	25	1	1	1,60	-	1,50	1,70	1,80	-	1,60	1,90
200	50	50	1	1	2,00	-	1,80	2,00	2,10	-	2,00	2,20
300	50	50	2	2	2,60	2,90	2,50	2,70	2,80	3,20	2,60	2,90
400	50	50	3	3	3,20	3,60	3,10	3,30	3,50	3,90	3,30	3,50
500	50	50	4	4	3,90	4,20	3,80	3,90	4,20	4,60	4,00	4,20
600	50	50	5	5	4,60	4,90	4,40	4,60	4,90	5,30	4,70	4,90

Allowable rotational speed of the ball screw

AXBG46__A / AXBG46__B

*On both sides
**Grease nipple
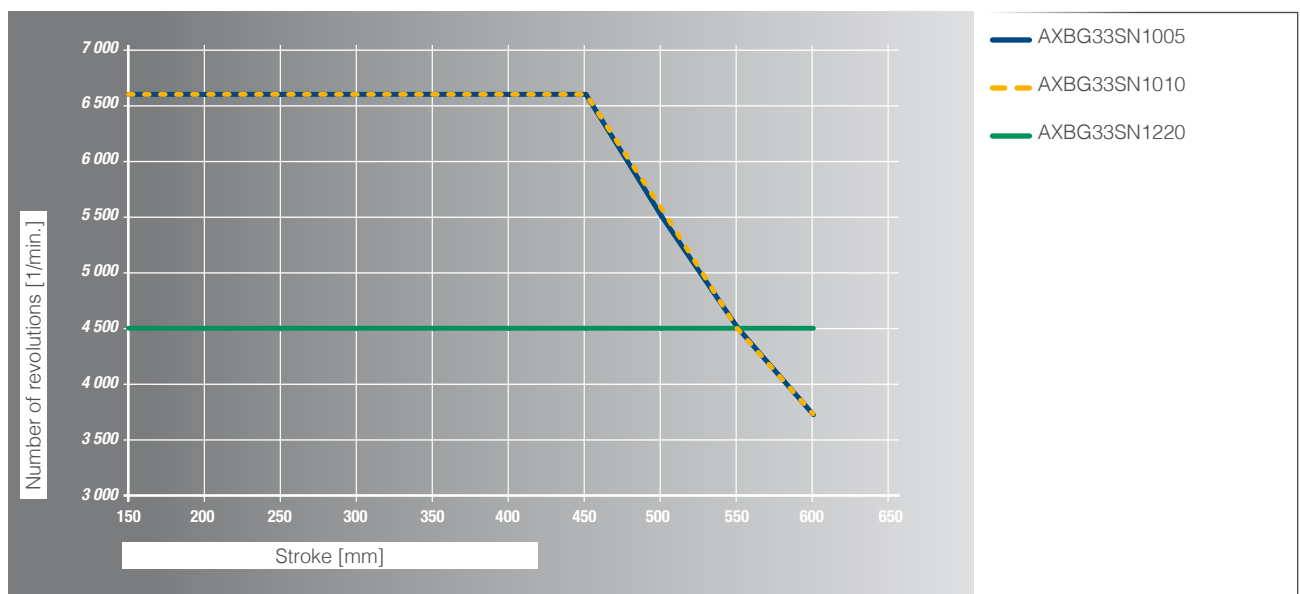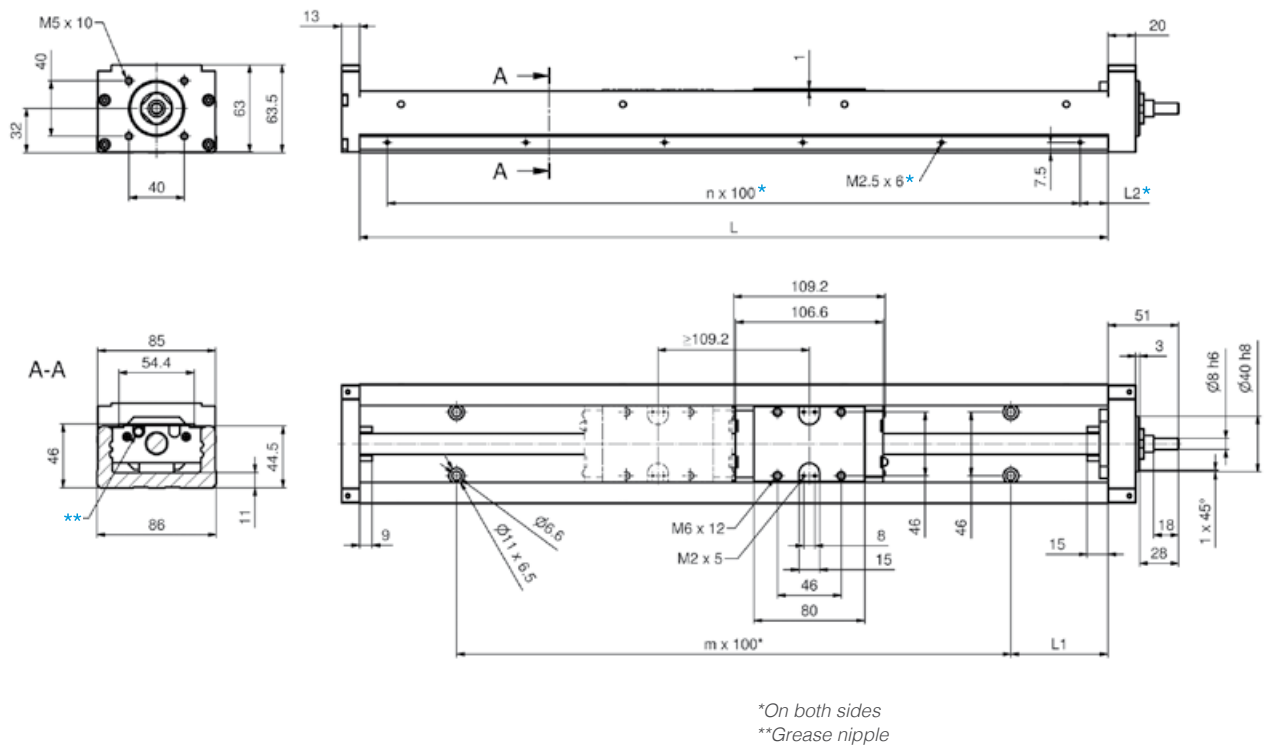
AXBG46__A / AXBG46__B with cover plate

*On both sides
**Grease nipple
***Bore holes from the bottom side

SNR
Brand of NTN Group

AXBG46__C / AXBG46__D

*On both sides
**Grease nipple
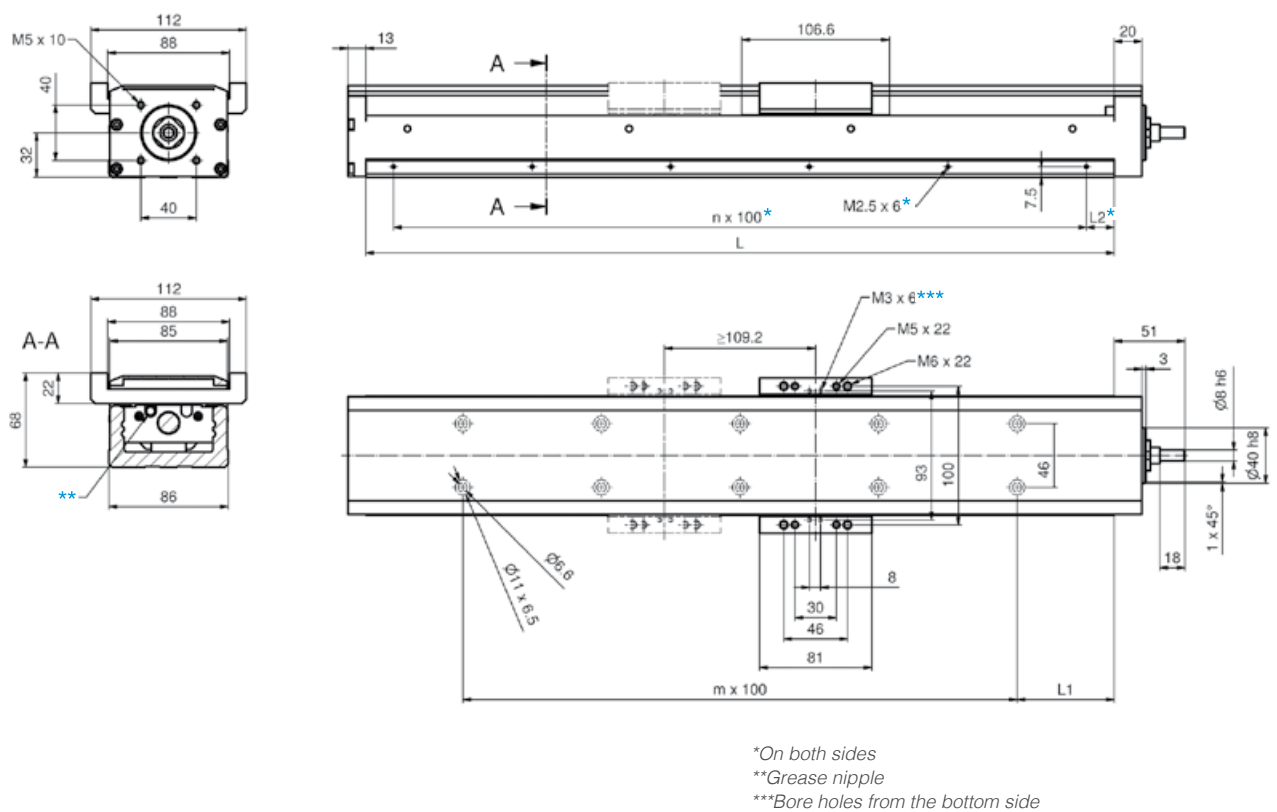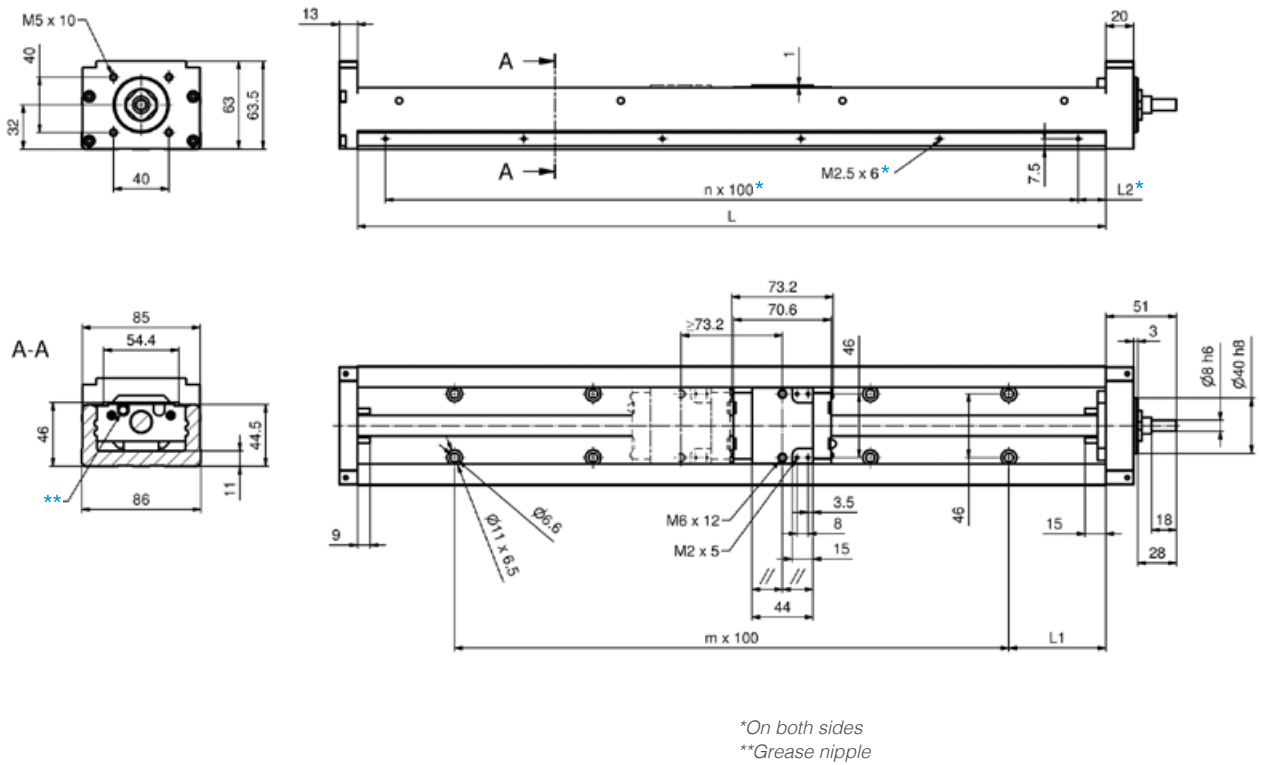
AXBG46__C / AXBG46__D with cover plate

*On both sides
**Grease nipple
***Bore holes from the bottom side
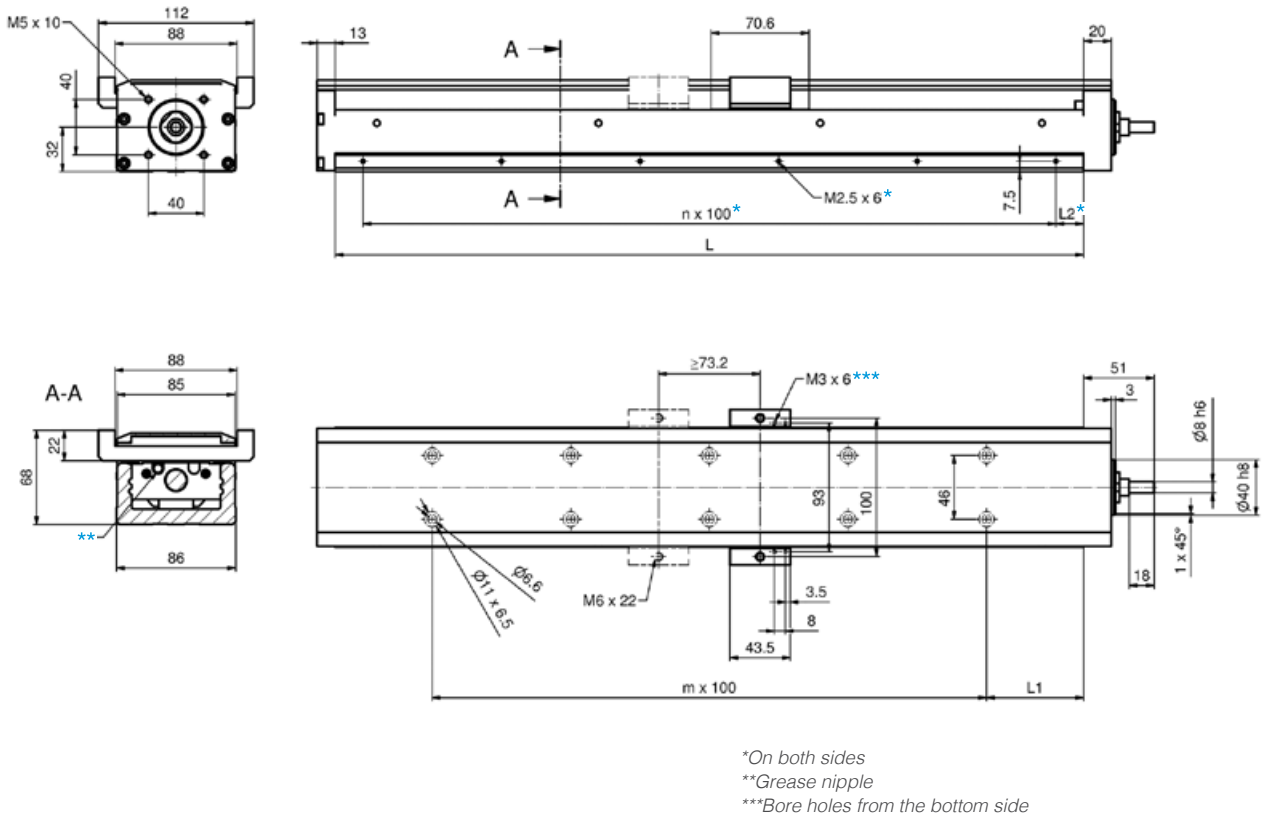
Technical data

Type		SN1510	SN1520
Drive element		Ball screw	
Screw diameter	mm	15	
Pitch / Pitch direction	mm	10 / right	20 / right
Maximum velocity	m /min	44,4	88,8
Maximum drive torque	Nm	2,9 (1,4*)	5,7 (4,1*)
Maximum axial operating load	N	1 800 (900*)	1 800 (1 300*)
Moment of inertia	Kgcm^2/m	0,39	
Geometrical moment of inertia (profile) I$_y$	cm^4	24,2	
Geometrical moment of inertia (profile) I$_z$	cm^4	149,0	
Maximum profile length	mm	1 240	

*For P precision

Dimension and mass

Profile length L	Dimension [mm]		Index		Guiding system Without cover plate [kg]				Guiding system With cover plate [kg]			
	L1	L2	m	n	A	B	C	D	A	B	C	D
340	70	20	2	3	6,50	7,50	6,00	6,50	7,00	8,00	6,50	7,00
440	70	20	3	4	8,00	8,50	7,50	8,00	8,50	9,50	8,00	8,50
540	70	20	4	5	9,00	10,00	8,50	9,50	10,00	11,00	9,50	10,00
640	70	20	5	6	10,50	11,50	10,00	10,50	11,00	12,50	10,50	11,50
740	70	20	6	7	12,00	13,00	11,50	12,00	12,50	14,00	12,00	13,00
840	70	20	7	8	13,00	14,00	13,00	13,50	14,00	15,50	13,50	14,00
940	70	20	8	9	14,50	15,50	14,00	14,50	15,50	16,50	15,00	15,50
1 040	70	20	9	10	16,00	17,00	15,50	16,00	17,00	18,00	16,50	17,00
1 140	70	20	10	11	17,50	18,00	17,00	17,50	18,50	19,50	18,00	18,50
1 240	70	20	11	12	18,50	19,50	18,50	19,00	19,50	21,00	19,00	20,00

Allowable rotational speed of the ball screw

131
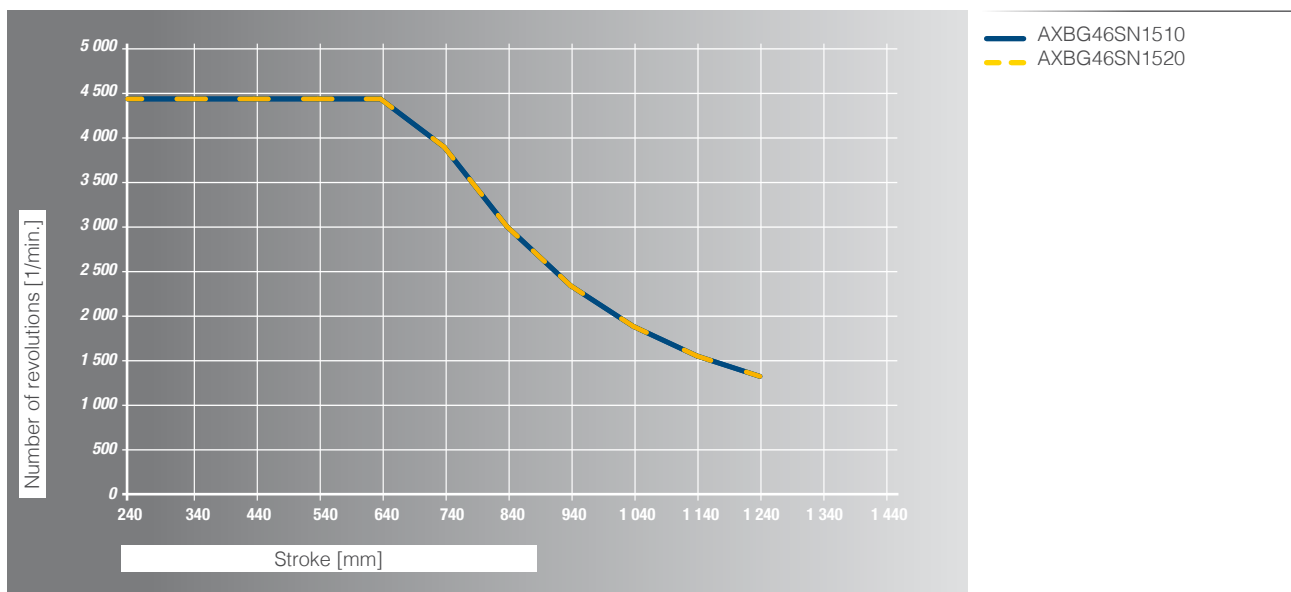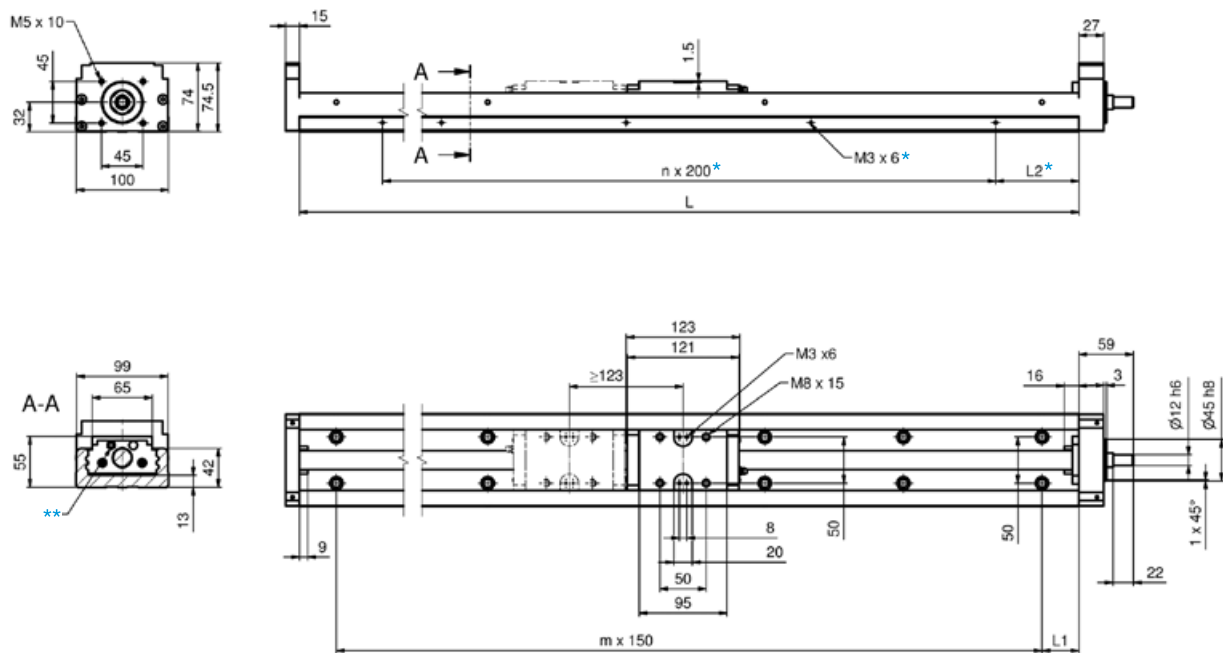
AXBG55__A / AXBG55__B

*On both sides
**Grease nipple

AXBG55__A / AXBG55__B with cover plate
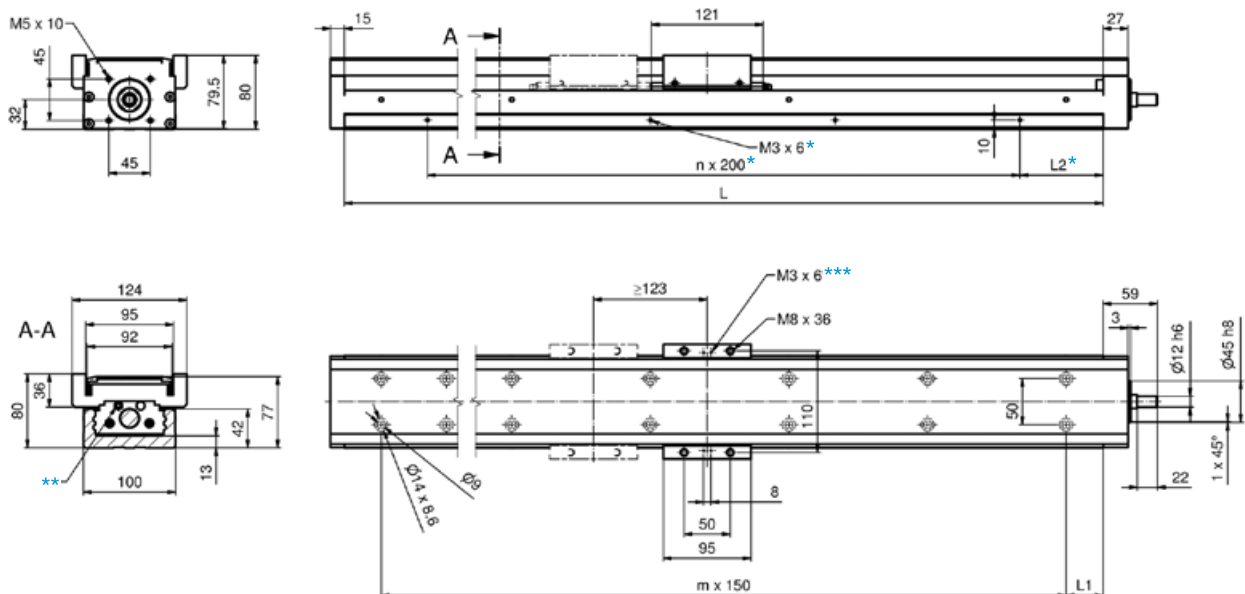
*On both sides
**Grease nipple
***Bore holes from the bottom side

Technical data

Type		SN2020
Drive element		Ball screw
Spindle diameter	mm	20
Pitch / Pitch direction	mm	20 / right
Maximum velocity	m /min	67,2
Maximum drive torque	Nm	7,3 (5,4*)
Maximum axial operating load	N	2 300 (1 700*)
Moment of inertia	Kgcm^2/m	1,12
Geometrical moment of inertia (profile) I_y	cm^4	22,9
Geometrical moment of inertia (profile) I_z	cm^4	228,0
Maximum profile length	mm	1 380

*For P precision

Dimension and mass

Profile length L	Dimension [mm]		Index		Guiding system Without cover plate [kg]		Guiding system With cover plate [kg]	
	L1	L2	m	n	A	B	A	B
980	40	90	6	4	20,00	22,00	21,00	24,00
1 080	15	40	7	5	22,00	24,00	23,00	26,00
1 180	65	90	7	5	23,00	25,00	25,00	27,00
1 280	40	40	8	6	25,00	27,00	27,00	29,00
1 380	15	90	9	6	27,00	29,00	29,00	31,00

Allowable rotational speed of the ball screw
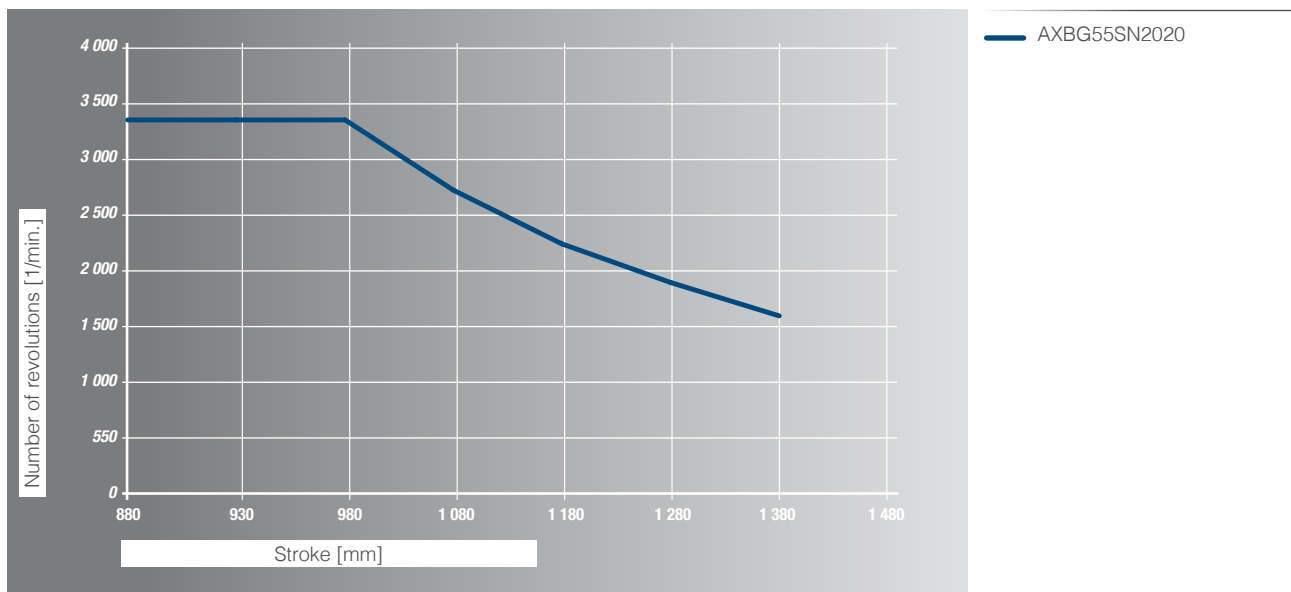
5.6.1.3   Load ratings

Guiding system
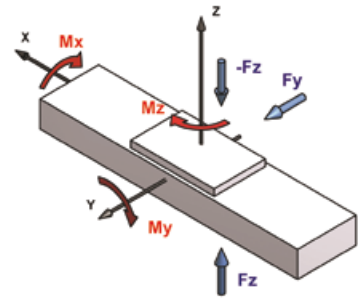
Type	Dynamic load rating	Static load rating	Permissible static moments				
	C [kN]	C [kN]	M_x [kNm]	M_y [kNm]	M_{2y} [kNm]	M_z [kNm]	M_{2z} [kNm]
AXBG15_A	2,42	4,76	0,051	0,017	0,092	0,020	0,110
AXBG20_A	4,27	7,89	0,101	0,035	0,199	0,042	0,237
AXBG26_A	7,87	14,98	0,255	0,099	0,550	0,118	0,656
AXBG33_A	12,60	22,70	0,500	0,181	1,035	0,215	1,233
AXBG33_C	7,80	11,40	0,250	0,049	0,368	0,059	0,439
AXBG46_A	29,80	51,20	1,612	0,610	3,285	0,727	3,914
AXBG46_C	19,90	28,80	0,907	0,207	1,336	0,246	1,593
AXBG55_A	43,20	74,00	2,701	1,088	5,465	1,297	6,513

Ball screw

Type	Normal precision		P precision	
	Dynamic load rating C_a [kN]	Static load rating C_{0a} [kN]	Dynamic load rating C_a [kNm]	Static load rating C_{0a} [kNm]
AXBG15SN0601	0,39	0,54	0,39	0,54
AXBG15SN0602	0,77	0,75	0,77	0,75
AXBG20SN0601	0,63	1,34	0,63	1,34
AXBG20SN0605	0,65	0,92	0,65	0,92
AXBG26SN0802	2,60	3,64	2,60	3,64
AXBG26SN0805	2,35	3,30	2,35	3,30
AXBG33SN1005	3,35	5,90	2,11	2,95
AXBG33SN1010	2,20	3,50	1,39	1,75
AXBG33SN1220	2,32	4,05	1,46	2,02
AXBG46SN1510	4,40	7,90	2,77	3,95
AXBG46SN1520	4,40	7,90	3,36	5,27
AXBG55SN2020	5,40	10,50	4,12	7,00

Fixed bearing unit

Type	Dynamic load rating C_b [kN]	Static load rating C_{0b} [kN]
AXBG15	1,21	1,08
AXBG20	1,31	1,25
AXBG26	1,79	1,76
AXBG33	4,40	4,36
AXBG46	6,77	7,45
AXBG55	7,74	9,50

5.6.1.4　Maximum stroke length

Coded in [mm]

Type	Profile length L	Guiding system			
		A	B*	C	D*
AXBG15	75	30	-	-	-
	100	55	-	-	-
	125	80	46	-	-
	150	105	71	-	-
	175	130	96	-	-
	200	155	121	-	-
AXBG20	100	43	-	-	-
	150	93	51	-	-
	200	143	101	-	-
AXBG26	150	73	-	-	-
	200	123	61	-	-
	250	173	111	-	-
	300	223	161	-	-
AXBG33	150	60	-	85	34
	200	110	-	135	84
	300	210	133	235	184
	400	310	233	335	284
	500	410	333	435	384
	600	510	433	535	484
AXBG46	340	209	100	245	172
	440	309	200	345	272
	540	409	300	445	372
	640	509	400	545	472
	740	609	500	645	572
	840	709	600	745	672
	940	809	700	845	772
	1 040	909	800	945	872
	1 140	1 009	900	1 045	972
	1 240	1 109	1 000	1 145	1 072
AXBG55	980	834	711	-	-
	1 080	934	811	-	-
	1 180	1 034	911	-	-
	1 280	1 134	1 011	-	-
		1 234	1 111	-	-

*Stroke lengths for two carriages with direct contact

5.6.1.5 Precision classes

Type	Profile Length L	Repeatability N [µm]	Repeatability P [µm]	Position accuracy N [µm]	Position accuracy P [µm]	Running parallelism N [µm]	Running parallelism P [µm]	Backlash N [µm]	Backlash P [µm]	Starting moment N [Nm]	Starting moment P [Nm]
AXBG15	75	±3	±1	40	20	20	10	5	2	0,01	0,012
	100										
	125										
	150										
	175										
	200										
AXBG20	100	±3	±1	50	20	25	10	5	2	0,01	0,012
	150										
	200										
AXBG26	150	±3	±1	50	20	25	10	5	2	0,015	0,04
	200										
	250										
	300										
AXBG33	150	±3	±1	30	15	25	10	5	2	0,07	0,15
	200										
	300			35	20						
	400										
	500			40	25	35	15				
	600		-	70	-	-	-		-		-
AXBG46	340	±3	±1	35	20	35	15	5	2	0,1	0,15
	440										
	540			40	25						
	640										0,17
	740			50	30	40	20				
	840		-	80	-	50	-		-		-
	940										
	1 040										
	1 140			100							
	1 240										
AXBG55	980	±3	±1	80	35	50	25	5	2	0,12	0,17
	1 080										
	1 180				40		30				0,20
	1 280		-	100	-		-		-		-
	1 380										

5.7 AXS System Program Axis

5.7.1 AXS_TA Telescopic Axis with toothed belt / Ω - drive

5.7.1.1 Structure
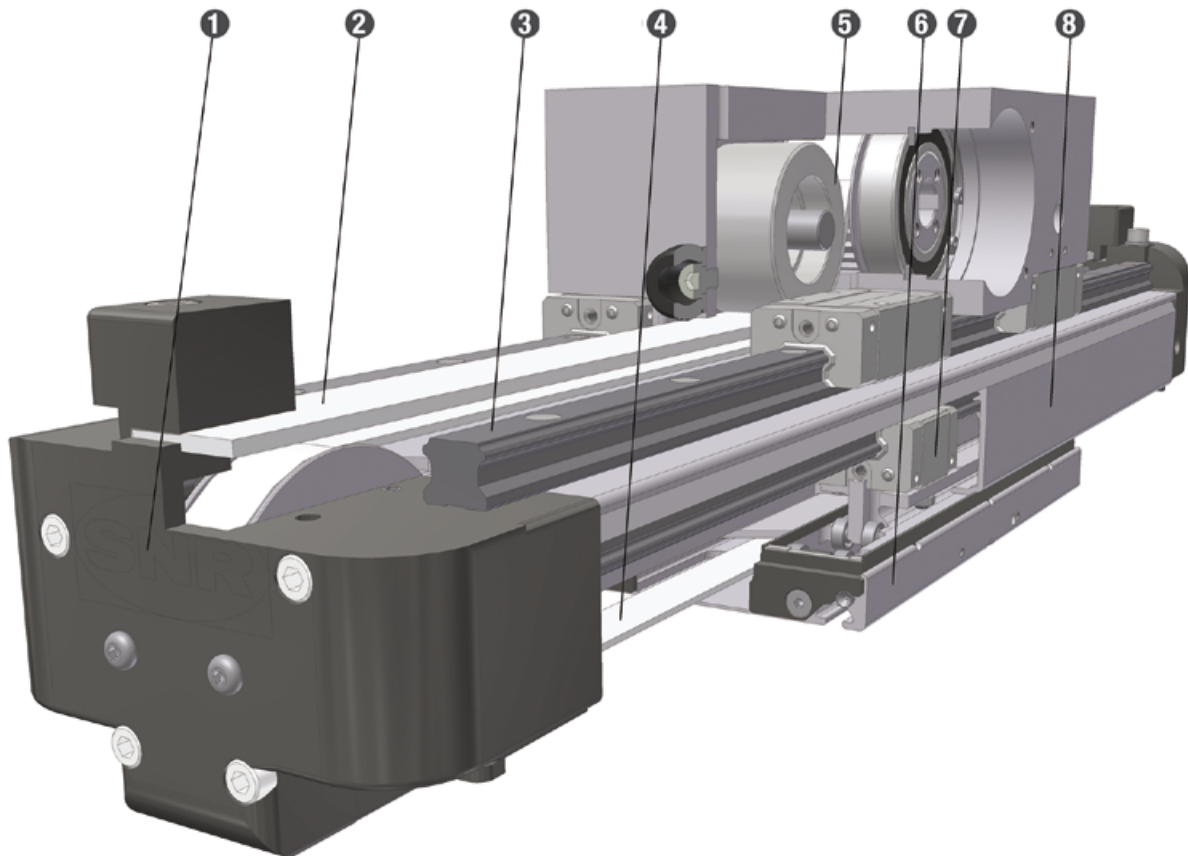
Figure 5.31 — Structure AXS_TA

1 Deflection unit
2 Toothed belt 1
3 Guiding level 1
4 Toothed belt 2
5 Operating head
6 Slider unit
7 Guiding level 2
8 Profile

5.7.1.2   Dimensions / Technical data

AXS110TA
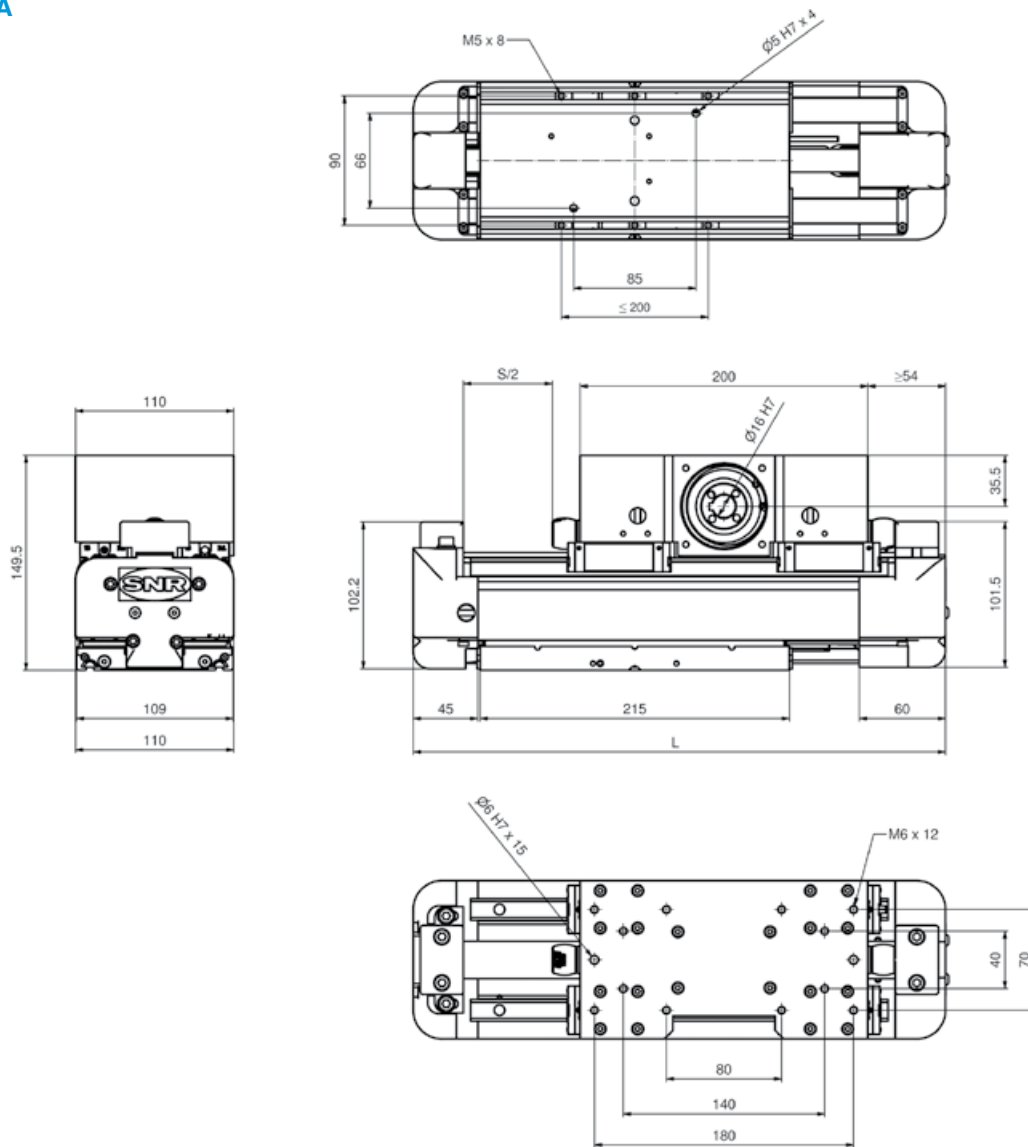
S = Travel range   **L** = S/2 + 310 mm

Technical data

Guiding system		Guiding level 1	Guiding level 2
		Linear guide D	
Drive element		Toothed belt 25STD5	Toothed belt 16AT3
Maximum velocity	m /min	300	600
Allowable dynamic operation load F_x	N	980	350
Stroke per revolution	mm	340[+1]	
Idling speed torque	Nm	3,2	
Maximum drive torque	Nm	26,5	
Maximum energy absorbtion from the shock absorber	Nm	21	
Moment of inertia[1]	Kgcm^2	2,83	
Geometrical moment of inertia (profile) I_y	cm^4	79,7	
Geometrical moment of inertia (profile) I_z	cm^4	384,6	
Maximum total length	m	6,0	
Repeatability	mm	0,05	

[1] - Moment of inertia without gearbox

Mass

Guiding system		Linear guide D	
		Guiding level 1	Guiding level 2
Basic mass (including slider mass)	kg	9,0	5,5
Mass per 100 mm stroke	kg		0,4
Slider mass	kg	0,9	

5.7.1.3 Maximum static load capacity

Type	Guiding system	Load [N]		Load moment [Nm]		
		F_y	F_z	M_x	M_y	M_z
AXS110TA	1	42 500	42 500	1 700	7 000	7 000
	2	28 500	28 500	370	2 600	2 600

5.7.1.4 Dynamic load capacity

The dynamic load capacities of the guiding systems are based on a nominal life time of 50 000 km.

Type	Guiding system	Load [N]		Load moment [Nm]		
		F_y	F_z	M_x	M_y	M_z
AXS110TA	1	7 000	7 000	240	500	500
	2	2 900	2 900	100	140	140
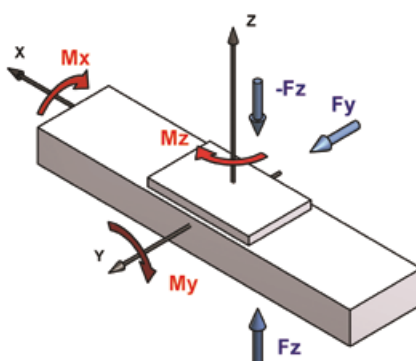
5.7.2 AXS_M Lifting Axis with rack and pinion drive

5.7.2.1 Structure

Lifting Axis
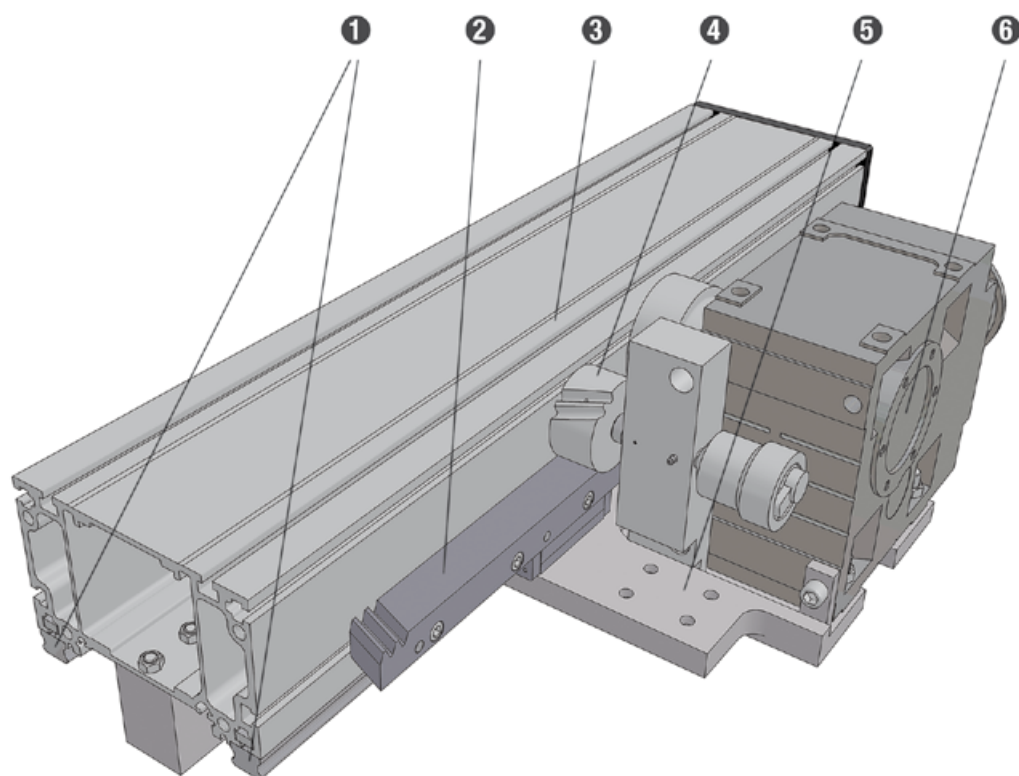
Figure 5.32 — Structure AXS_M Lifting Axis

❶ Guiding system

❷ Toothed rack

❸ Profile

❹ Lubrication pinion

❺ Slider unit

❻ Gearbox

AXS200ME Lifting Axis (for combination with Gantry Axis AXS280_)

S = Travel range   L = S + T + 90 mm + X (n x 100)

(X ≤ 600 mm)

Dimensions L6 and L7 from Chapter **7.3**, Table **7.2**
Gearbox dimension from Chapter **6.2.1**, Table **6.17**

* can be omitted if stop is realised by customer
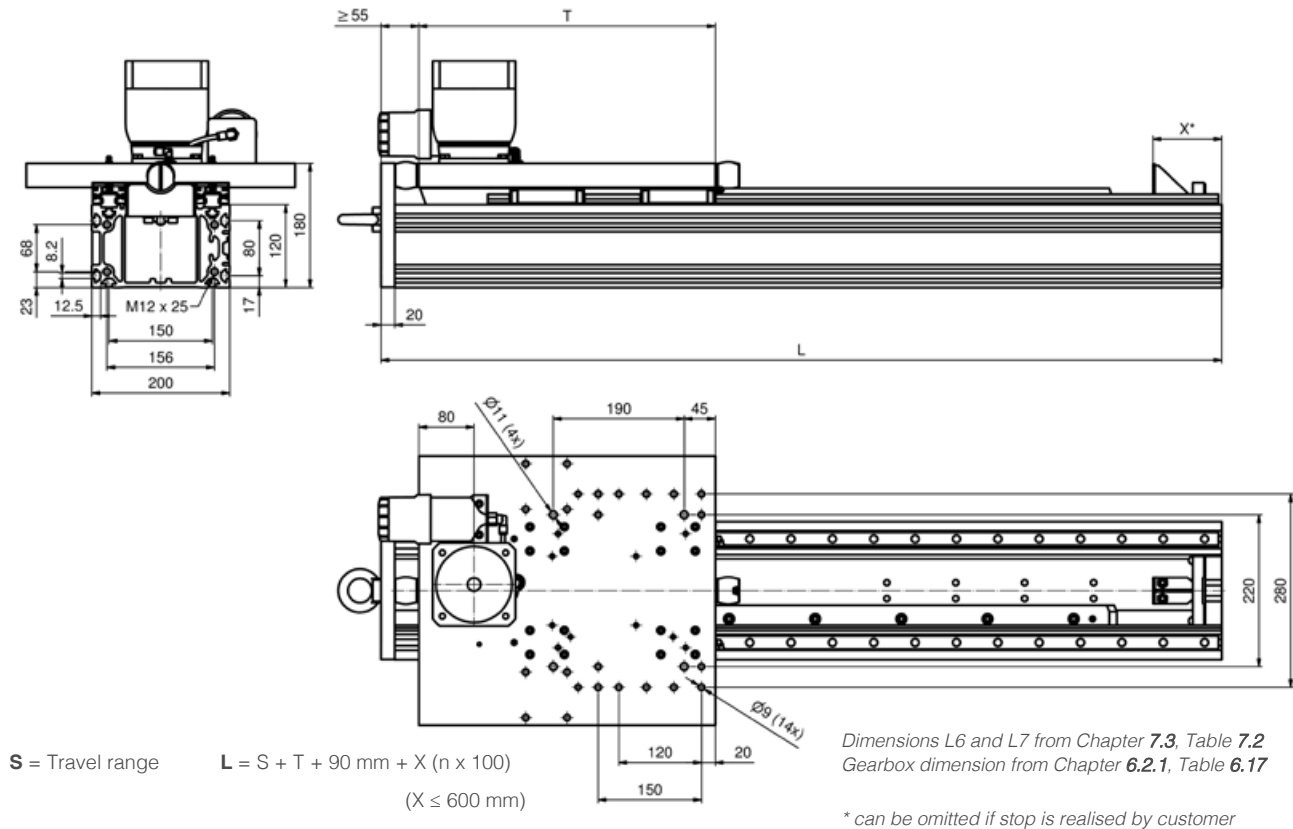
Technical data

Guiding system			Linear guide D	Linear guide E	Linear guide G
Table length T	mm		340	610	610
				top table for direct combination with	
				AXS280Y_R	AXS280MP_-R
Drive element			Toothed rack, module 3		
Maximum velocity	m /min		300		
Allowable dynamic operation load	N		4 400		
Stroke per revolution	mm		200		
Idling speed torque	Nm		1,7		
Maximum drive torque at the gearbox output (emergency stop)	Nm		220		
Maximum energy absorption of the shock absorber	Nm		130		
Moment of inertia [1]	Kgcm^2		22,7		
Geometrical moment of inertia (profile) I_y	cm^4		2 380		
Geometrical moment of inertia (profile) I_z	cm^4		4 810		
Maximum total length	m		6,0 (2,0 [2])		
Repeatability	mm		0,05		

[1] - Moment of inertia without gearbox
[2] - Maximum length with improved straightness according Chapter 2.10

Mass

Guiding system		Linear guide D	Linear guide E	Linear guide G
Basic mass (including slider mass)	kg	37,5	46,5	37,5
Mass per 100 mm stroke	kg	3,15	3,15	3,15
Slider mass	kg	16,0	25,0	16,0

Masses without gearbox

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AXS230MB Lifting Axis (for combination with Gantry Axis AXS280MP and AXS460MP)
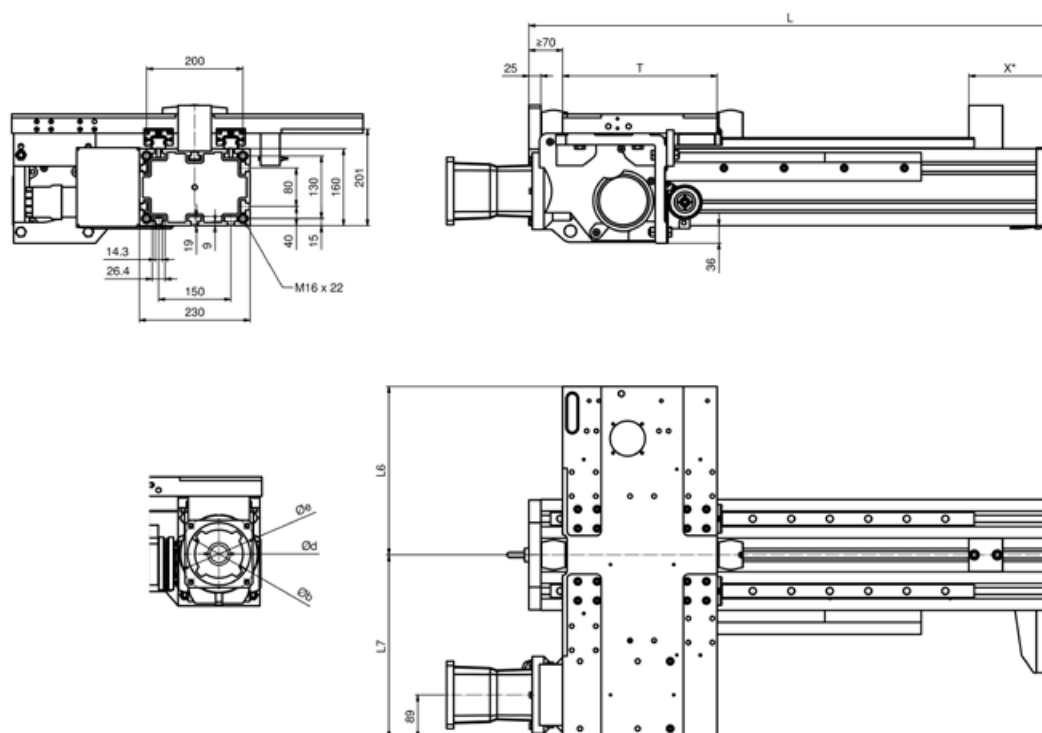
S = Travel range   **L** = S + T + X + 124mm

Dimensions L6 and L7 from Chapter 7.3, Table 7.2
Gearbox dimension from Chapter 6.2.1, Table 6.17

* can be omitted if stop is realised by customer

Technical data

Guiding system			Linear guide D	Linear guide E
Table length T	mm		321	450
Drive element			Toothed rack, module 4	
Maximum velocity	m /min		180	
Allowable dynamic operation load	N		7 650 - 10 000[3]	
Stroke per revolution	mm		280	
Idling speed torque	Nm		3,6	
Maximum drive torque at the gearbox output (emergency stop)	Nm		340 - 1 110[3]	
Maximum energy absorption of the shock absorber	Nm		280	
Moment of inertia[1]	Kgcm^2		49,2	
Geometrical moment of inertia (profile) I_y	cm^4		8 850	
Geometrical moment of inertia (profile) I_z	cm^4		6 780	
Maximum total length	m		10,0 (2,0[2])	
Repeatability	mm		0,05	

[1] - Moment of inertia without gearbox
[2] - Maximum length with improved straightness according Chapter 2.10
[3] - Depending on gearbox version - use our calculation service

Mass

Guiding system			Linear guide D	Linear guide E
Basic mass (including slider mass)	kg		56,0	65,3
Mass per 100 mm stroke	kg		4,4	4,4
Slider mass	kg		30,5	40,5

AXS280MB Lifting Axis (for combination with Gantry Axis AXS460MP and AXS500MP)
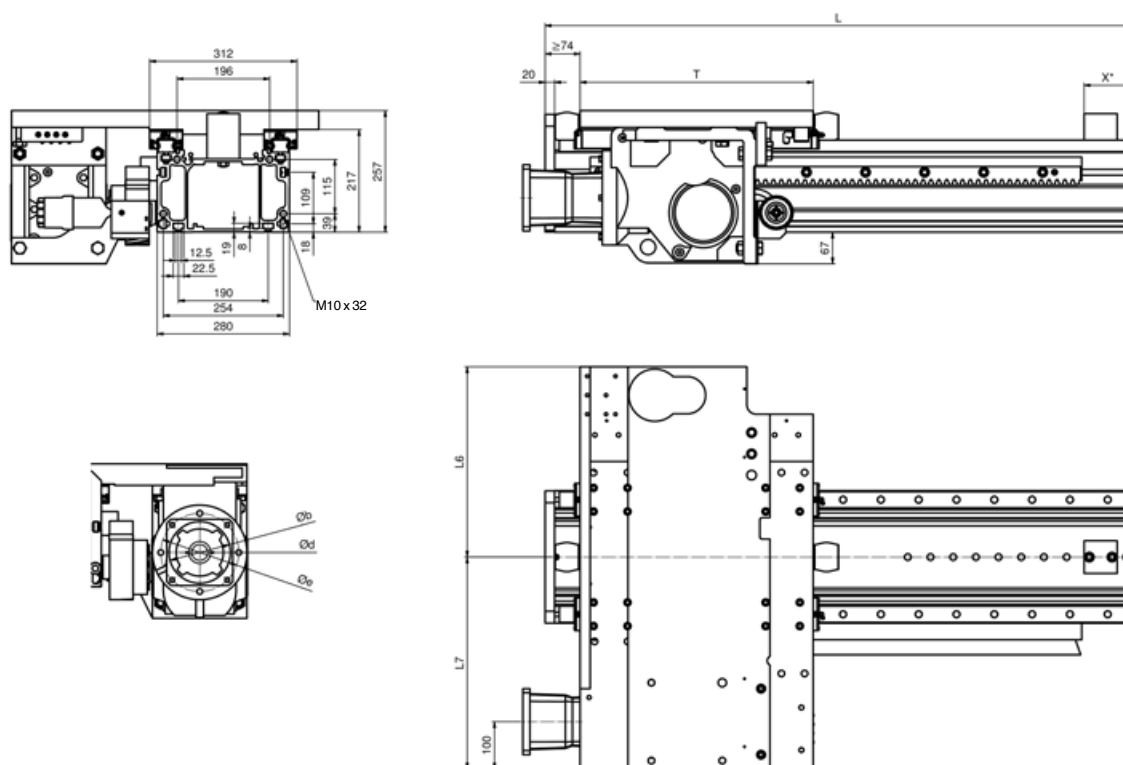
S = Travel range   **L** = S + T + 128 + X (n x 50)

(X ≤ 600 mm)

Dimensions L6 and L7 from Chapter 7.3, Table 7.2
Gearbox dimension from Chapter 6.2.1, Table 6.17

* can be omitted if stop is realised by customer

Technical data

Guiding system		Linear guide D
Table length T	mm	492
Drive element		Toothed rack, module 5
Maximum velocity	m /min	198
Allowable dynamic operation load	N	12 630 - 18 000[3]
Stroke per revolution	mm	400
Idling speed torque	Nm	6,6
Maximum drive torque at the gearbox output (emergency stop)	Nm	800 - 2 865[3]
Maximum energy absorption of the shock absorber	Nm	280
Moment of inertia[1]	Kgcm^2	139
Geometrical moment of inertia (profile) I_y	cm^4	14 645
Geometrical moment of inertia (profile) I_z	cm^4	7 958
Maximum total length	m	10,0 (3,0^2)
Repeatability	mm	0,05

[1] - Moment of inertia without gearbox
[2] - Maximum length with improved straightness according Chapter 2.10
[3] -Depending on gearbox version - use our calculation service

Mass

Guiding system		Linear guide D
Basic mass (including slider mass)	kg	96,0
Mass per 100 mm stroke	kg	5,9
Slider mass	kg	54,5

Masses without gearbox

5.7.2.3 Maximum static load capacity

Type	Guiding system	Load [N]		Load moment [Nm]		
		F_y	F_z	M_x	M_y	M_z
AXS200ME	D	51 400	51 400	3 850	4 850	4 850
	E	51 400	51 400	3 850	9 500	9 500
	G	51 400	51 400	3 850	4 850	4 850
AXS230MB	D	57 000	57 000	4 300	6 900	6 900
	E	57 000	57 000	4 300	12 000	12 000
	G	57 000	57 000	4 300	9 500	9 500
AXS280MB	D	100 000	100 000	12 250	18 500	18 500

5.7.2.4 Dynamic load capacity

The dynamic load capacities of the guiding systems are based on a nominal life time of 50 000 km.

Type	Guiding system	Load [N]		Load moment [Nm]		
		F_y	F_z	M_x	M_y	M_z
AXS200ME	D	14 700	14 700	1 100	1 400	1 400
	E	14 700	14 700	1 100	2 750	2 750
	G	14 700	14 700	1 100	1 400	1 400
AXS230MB	D	19 000	19 000	1 400	2 150	2 150
	E	19 000	19 000	1 400	4 000	4 000
	G	19 000	19 000	1 400	3 200	3 200
AXS280MB	D	29 000	29 000	3 500	5 250	5 250
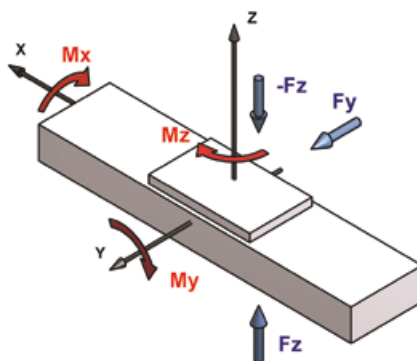
5.7.3 AXS_M Gantry Axis with rack and pinion drive

5.7.3 .1 Structure

Lifting Axis
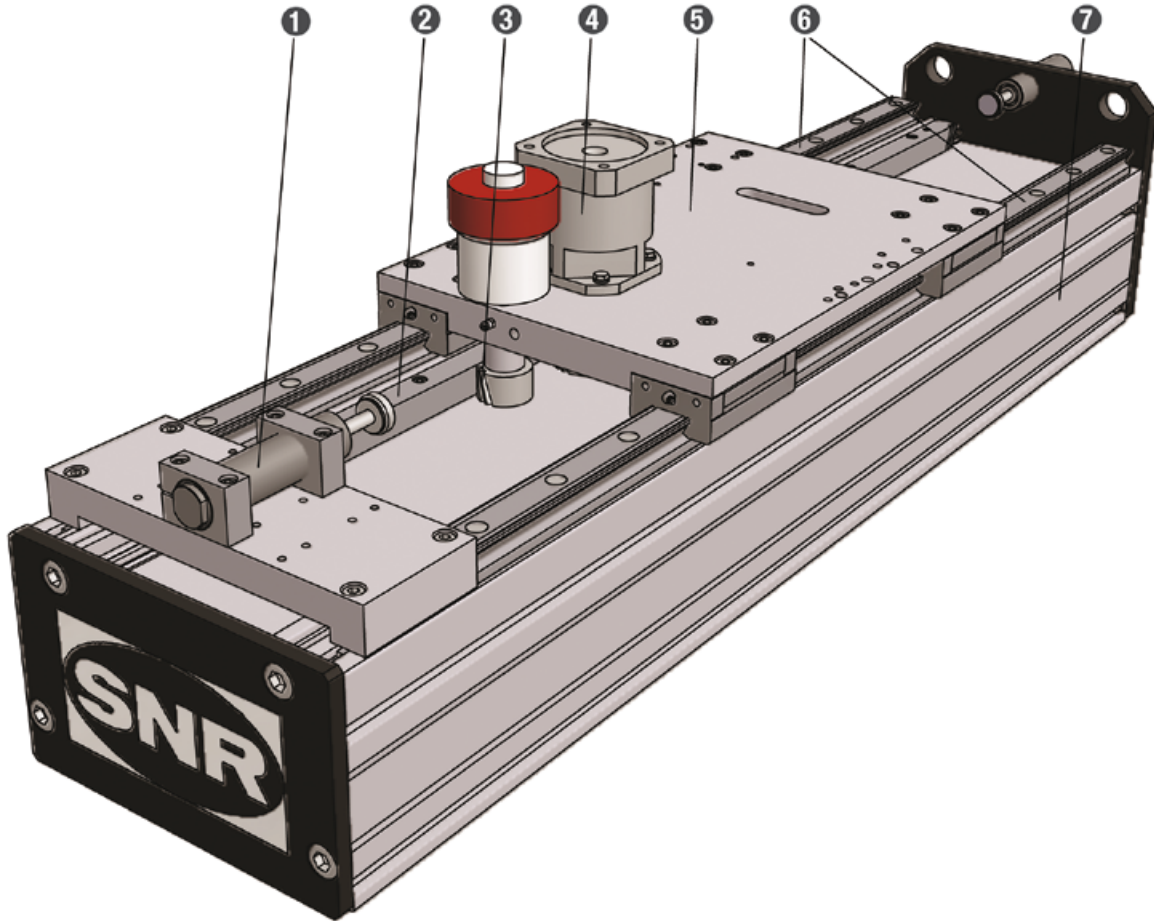
Figure 5.33 — Structure AXS_M Gantry Axis with rack and pinion drive

❶ Shock absorber

❷ Toothed rack

❸ Pinion

❹ Gearbox

❺ Slider unit

❻ Guiding system

❼ Profile

5.7.3.2   Dimensions / Technical data

AXS200MP Gantry Axis

*Gearbox dimensions from Chapter **6.2.1**, Table **6.17***

S = Travel range   **A** = Axis distance of the X-Axis

L = S + T + 212mm (+ 10mm*)   **A** = L - 45mm

* Linear Axis with integrated gantry connections (dimensions in Chapter 6.1.6, Table 6.9)

Technical data

Guiding system			Linear guide D	Linear guide R
Table length T	mm		430	440 without top table for direct combination with AXDL160A
Drive element			Toothed rack, module 2	
Maximum velocity	m /min		300	
Allowable dynamic operation load	N		3 500	
Stroke per revolution	mm		166,67	
Idling speed torque	Nm		1,7	
Maximum drive torque at the gearbox output (emergency stop)	Nm		100	
Maximum energy absorption of the shock absorber	Nm		92	
Moment of inertia[1]	Kgcm^2		1,6	
Geometrical moment of inertia (profile) I_y	cm^4		5 280	
Geometrical moment of inertia (profile) I_z	cm^4		2 220	
Maximum total length[2]	m		8,0	
Repeatability	mm		0,05	

[1] - Moment of inertia without gearbox
[2] - one-piece, larger lengths consisting of segments possible

Mass

Guiding system		Linear guide D	Linear guide R
Basic mass (including slider mass)	kg	33,4	25,9
Mass per 100 mm stroke	kg	3,4	3,4
Slider mass	kg	11,3	3,8

Masses without gearbox

AXS280MP Gantry Axis

S = Travel range

A = Axis distance of the X-Axis

$L = S + T + X_1 + X_2$

$A = L - 37mm$

$E = m/2 * v^2$

m = moved mass

v = velocity

Gearbox dimension from Chapter 6.2.1, Table 6.17
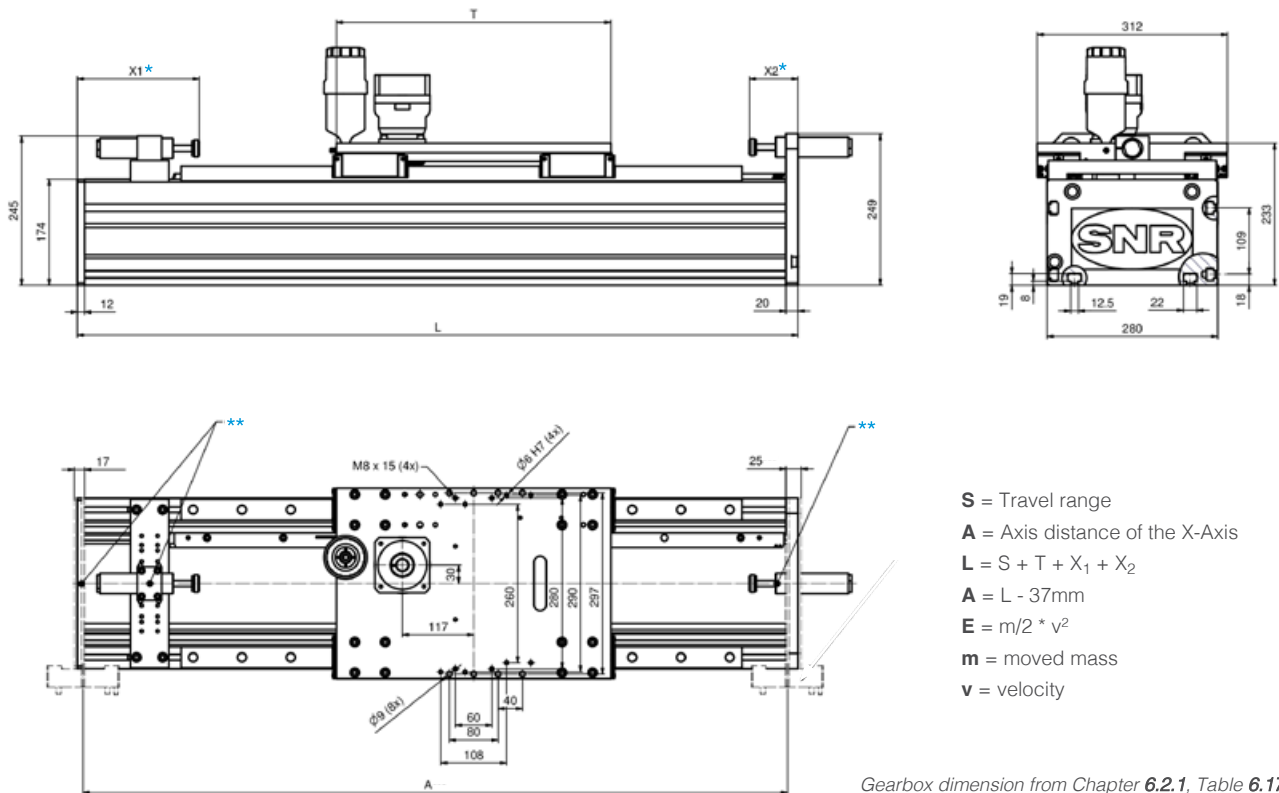
* X_1 and X_2 must be specified

** Shock absorber fixation optional in the end plate (X_1, X_2 = 80mm...165mm) or in a traverse (X_1, X_2 > 165 mm)

*** Linear Axis with integrated gantry connections (dimensions in Chapter 6.1.6, Table 6.9)

Technical data

Guiding system		Linear guide D	Linear guide R	Linear guide S	Linear guide T	Linear guide U
Table length T	mm	450	550	730	875	528
			without top table for direct combination with			
			AXS200ME	AXS230MB	AXC280TV	AXDL240A
Drive element		Toothed rack, module 2				
Maximum velocity	m /min	198				
Allowable dynamic operation load	N	3 080				
Stroke per revolution	mm	200				
Idling speed torque	Nm	2,9				
Maximum drive torque at the gearbox output (emergency stop)	Nm	100				
Maximum energy absorption of the shock absorber E	Nm	1,8...3,5 m/s: A: 500Nm C: 185Nm F: 1 100Nm G: 1 400 J: 2 600Nm 0,8...2,2 m/s: B: 650Nm D: 180Nm				
Moment of inertia[1]	Kgcm^2	76,4				
Geometrical moment of inertia (profile) I_y	cm^4	14 645				
Geometrical moment of inertia (profile) I_z	cm^4	7 958				
Maximum total length[2]	m	10,0				
Repeatability	mm	0,05				

[1] - Moment of inertia without gearbox

[2] - one-piece, larger lengths consisting of segments possible

Mass

Guiding system		Linear guide D	Linear guide R	Linear guide S	Linear guide T	Linear guide U
Basic mass (including slider mass)	kg	52,0	41,1	49,9	58,0	49,5
Mass per 100 mm stroke	kg	4,9	4,9	4,9	4,9	4,9
if X_1 > 165 mm mass for profile extension	Kg	((X_1-65)/100)*4,9	((X_1-65)/100)*4,9	((X_1-65)/100)*4,9	((X_1-65)/100)*4,9	((X_1-65)/100)*4,9
if X_2 > 165 mm mass for profile extension	kg	((X_2-65)/100)*4,9	((X_2-65)/100)*4,9	((X_2-65)/100)*4,9	((X_2-65)/100)*4,9	((X_2-65)/100)*4,9
Slider mass	kg	16,5	8,4	8,4	8,4	8,4

Masses without gearbox

AXS460MP Gantry Axis
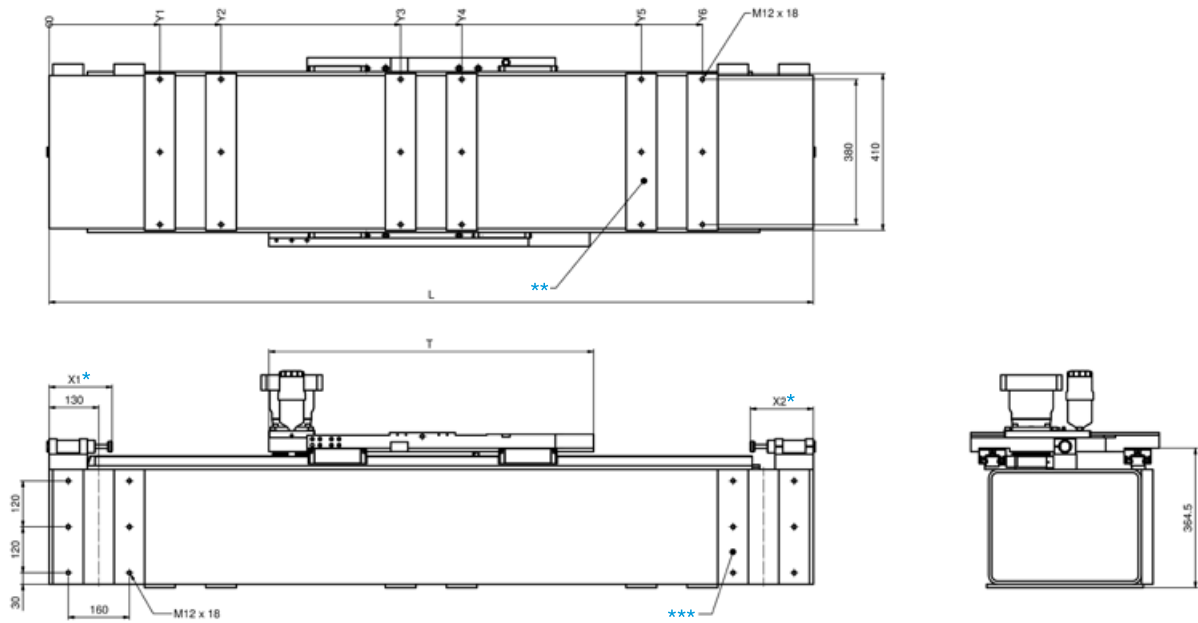
Gearbox dimension from Chapter 6.2.1, Table 6.17

S = Travel range
L = S + T + X$_1$ + X$_2$
E = m/2 * v^2

A = Axis distance of the X-Axis
A = L - 8mm
m = moved mass   **v** = velocity

* X$_1$ and X$_2$ must be specified (≥ 110 mm)
** Mounting surface for fastening on a wall (flat fitting) Y1...Y6 must be spezified
***Mounting surface for fastening on gantry support legs

Technical data

Guiding system		Linear guide R	Linear guide S	Linear guide T
Table length T	mm	720	840	875
		without top table for direct combination with		
		AXS230MB	AXS280MB	AXS280TV
Drive element		Toothed rack, module 3		
Maximum velocity	m /min	300		
Allowable dynamic operation load	N	6 000		
Stroke per revolution	mm	250		
Idling speed torque	Nm	4,1		
Maximum drive torque at the gearbox output (emergency stop)	Nm	300		
Maximum energy absorption of the shock absorber E	Nm	1,8...3,5 m/s: A: 500Nm C: 185Nm F: 1 100Nm G: 1 400 J: 2 600Nm 0,8...2,2 m/s: B: 650Nm D: 180Nm		
Moment of inertia[1]	Kgcm^2	23,6		
Geometrical moment of inertia (profile) I$_y$	cm^4	35 484		
Geometrical moment of inertia (profile) I$_z$	cm^4	22 770		
Maximum total length[2]	m	10,0		
Repeatability	mm	0,05		

[1] - Moment of inertia without gearbox
[2] - one-piece, larger lengths consisting of segments possible

Mass

Guiding system		Linear guide R	Linear guide S	Linear guide T
Basic mass (including slider mass)	kg	101,0	111,0	126,0
Mass per 100 mm stroke	kg	8,9	8,9	8,9
if X$_1$ > 165 mm mass for profile extension	Kg	((X$_1$-45)/100)*8,9	((X$_1$-45)/100)*8,9	((X$_1$-45)/100)*8,9
if X$_2$ > 165 mm mass for profile extension	kg	((X$_2$-45)/100)*8,9	((X$_2$-45)/100)*8,9	((X$_2$-65)/100)*8,9
Slider mass	kg	8,0	8,0	8,0

Masses without gearbox

AXS500MP Gantry Axis
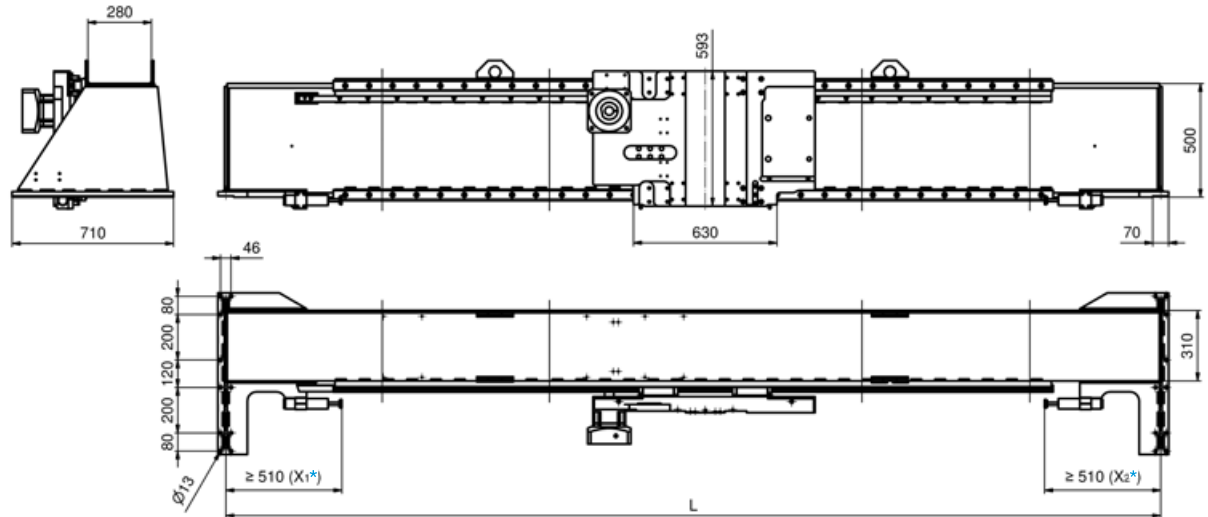
*Gearbox dimension from Chapter **6.2.1**, Table **6.17***

S = Travel range   **L** = S + T + X$_1$ + X$_2$

E = m/2 * v^2 **m** = moved mass   **v** = velocity

* X$_1$ and X$_2$ must be specified

Technical data

Guiding system		Linear guide R	Linear guide T
Table length T	mm	975	875
		without top table for direct combination with	
		AXS280MB	AXS280TV
Drive element		Toothed rack, module 3	
Maximum velocity	m /min	300	
Allowable dynamic operation load	N	6 000	
Stroke per revolution	mm	250	
Idling speed torque	Nm	4,8	
Maximum drive torque at the gearbox output (emergency stop)	Nm	450	
Maximum energy absorption of the shock absorber E	Nm	1,8...3,5 m/s: G: 1 400 Nm J: 2 600 Nm 0,8...2,2 m/s: K: 1 500 Nm	
Moment of inertia[1]	Kgcm^2	23,6	
Geometrical moment of inertia (profile) I$_y$	cm^4	119 500	
Geometrical moment of inertia (profile) I$_z$	cm^4	45 000	
Maximum total length[2]	m	12,0	
Repeatability	mm	0,05	

[1] - Moment of inertia without gearbox
[2] - one-piece, larger lengths consisting of segments possible

Mass

Guiding system		Linear guide R	Linear guide T
Basic mass (including slider mass)	kg	285,2	263,4
Mass per 100 mm stroke	kg	21,8	21,8
if X$_1$ > 510 mm mass for profile extension	Kg	((X$_1$-510)/100)*21,8	((X$_1$-510)/100)*21,8
if X$_1$ > 510 mm mass for profile extension	kg	((X$_2$-510)/100)*21,8	((X$_2$-510)/100)*21,8
Slider mass	kg	12,3	12,3

Masses without gearbox

SNR
Brand of NTN Group

5.7.3.3 Maximum static load capacity

Type	Guiding system	Load [N]		Load moment [Nm]		
		F_y	F_z	M_x	M_y	M_z
AXS200MP	D	57 000	57 000	4 300	5 750	5 750
	R	57 000	57 000	4 300	6 300	6 300
AXS280MP	D	82 000	82 000	9 900	14 000	14 000
	R	82 000	82 000	9 900	14 000	14 000
	S	82 000	82 000	9 900	12 500	12 500
	T	82 000	82 000	9 900	15 000	15 000
	U	82 000	82 000	9 900	12 800	12 800
AXS460MP	R	100 000	100 000	19 000	26 500	26 500
	S	100 000	100 000	19 000	26 500	26 500
	T	100 000	100 000	19 000	26 500	26 500
AXS500MP	R	133 000	133 000	27 500	32 000	32 000
	T	133 000	133 000	27 500	32 000	32 000

5.7.3.4 Dynamic load capacity

The dynamic load capacities of the guiding systems are based on a nominal life time of 50 000 km.

Type	Guiding system	Load [N]		Load moment [Nm]		
		F_y	F_z	M_x	M_y	M_z
AXS200MP	D	19 000	19 000	1 400	1 900	1 900
	R	19 000	19 000	1 400	1 900	1 900
AXS280MP	D	26 500	26 500	3 200	4 500	4 500
	R	26 500	26 500	3 200	4 500	4 500
	S	26 500	26 500	3 200	4 000	4 000
	T	26 500	26 500	3 200	4 800	4 800
	U	26 500	26 500	3 200	4 100	4 100
AXS460MP	R	29 000	29 000	5 500	7 500	7 500
	S	29 000	29 000	5 500	7 500	7 500
	T	29 000	29 000	5 500	7 500	7 500
AXS500MP	R	50 500	50 500	10 000	12 000	12 000
	T	50 500	50 500	10 000	12 000	12 000
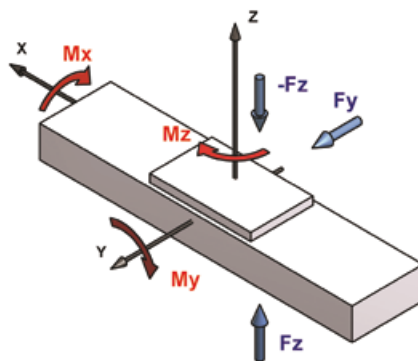
5.7.4 AXS_T Horizontal and vertical Telescopic Axis with rack and pinion drive / toothed belt drive

5.7.4.1 Structure

Horizontal Telescopic Axis
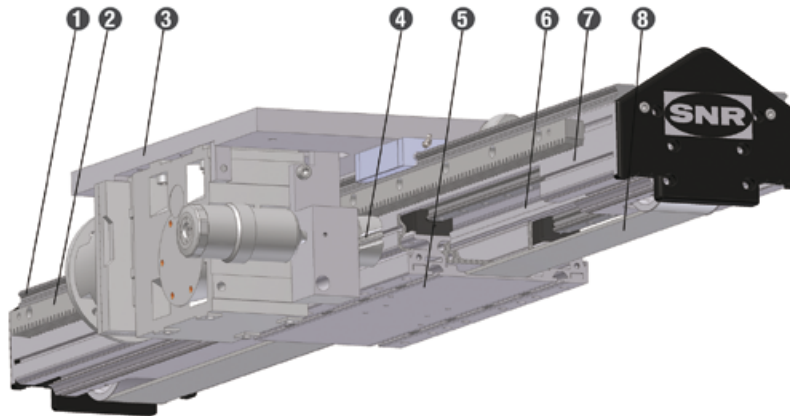
Figure 5.34 — Structure AXS_TH Horizontal Telescopic Axis

1. Guiding level 1
2. Toothed rack
3. Base plate
4. Pinion
5. Slider unit
6. Guiding level 2
7. Profile
8. Toothed belt

Vertical Telescopic Axis
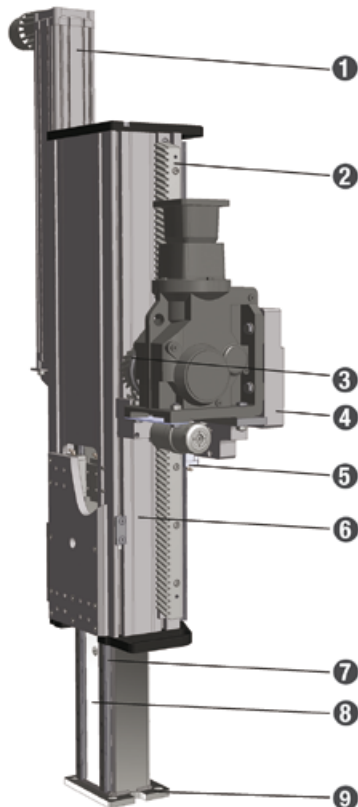
1. Balance cylinder (optional)
2. Toothed rack
3. Pinion
4. Base plate
5. Guiding level 1
6. Outer profile
7. Guiding level 2 (load level)
8. Inner profile
9. Load pick-up

Figure 5.35 — Structure AXS_TV Vertical Telescopic Axis

5.7.4.2 Dimensions / Technical data

AXS120TH Horizontal Telescopic Axis
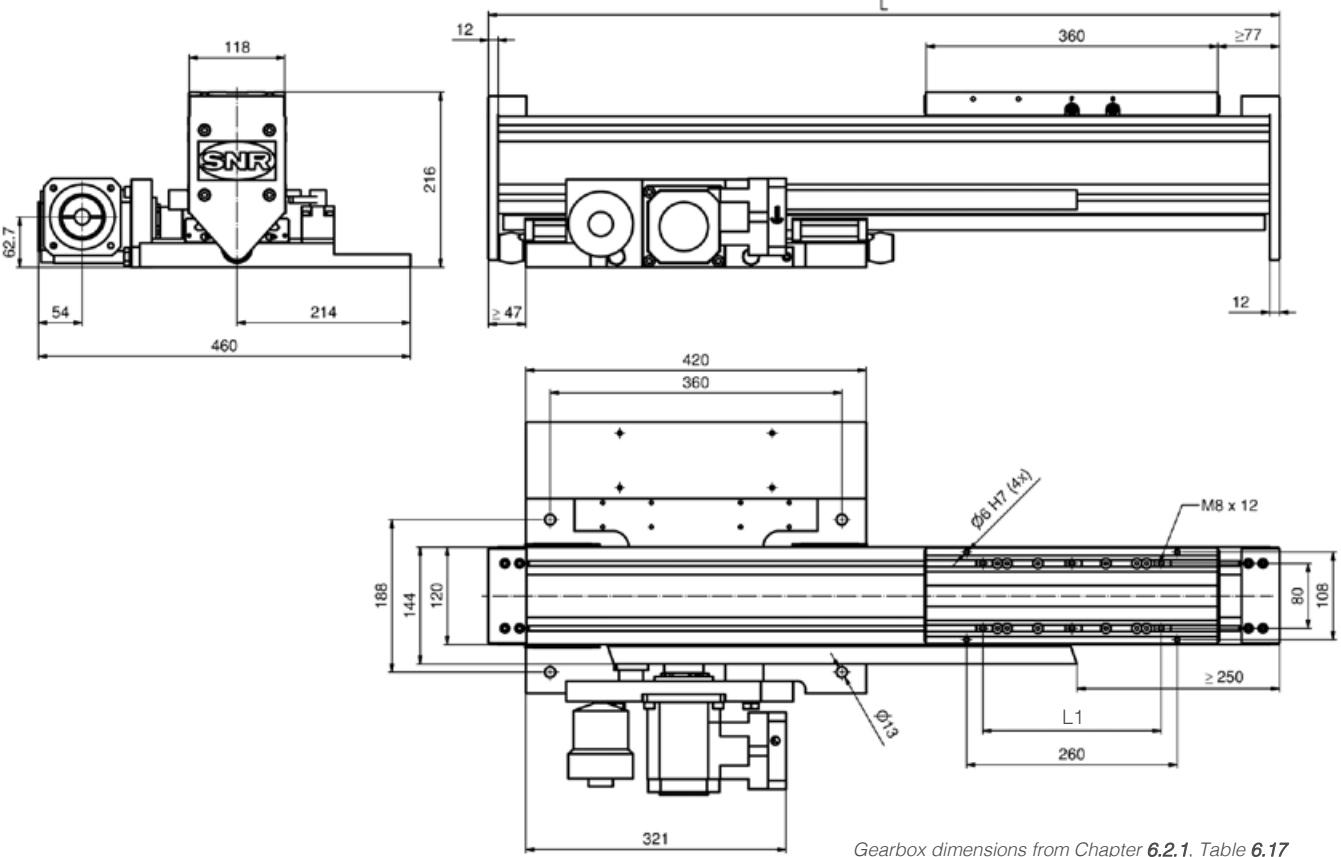
*Gearbox dimensions from Chapter **6.2.1**, Table **6.17***

S = Travel range   **L** = S/2 + 514 mm   L1 ≤ 340 mm (recommended 220 mm)

Technical data

Guiding system		Guiding level 1	Guiding level 2
		Linear guide D	
Drive element		Toothed rack, module 2	Toothed belt 50AT10
Maximum velocity	m /min	600	
Allowable dynamic operation load F_x	N	2 880	2 500
Stroke per revolution	mm	280	
Idling speed torque	Nm	2,8	
Maximum drive torque at the gearbox output (emergency stop)	Nm	64	
Maximum energy absorbtion from the shock absorber	Nm	65	
Moment of inertia[1]	Kgcm²	7,4	
Geometrical moment of inertia (profile) I_y	cm⁴	661,1	
Geometrical moment of inertia (profile) I_z	cm⁴	938,6	
Maximum total length	m	3,0	
Repeatability	mm	0,05	

[1] - Moment of inertia without gearbox

Mass

Guiding system		Linear guide D	
		Guiding level 1	Guiding level 2
Basic value	kg	14,5	5,9
Mass per 100 mm stroke	kg	3,9	
Basic mass incl. basic value, without gearbox	kg	41,3	

AXS120TV Vertical Telescopic Axis
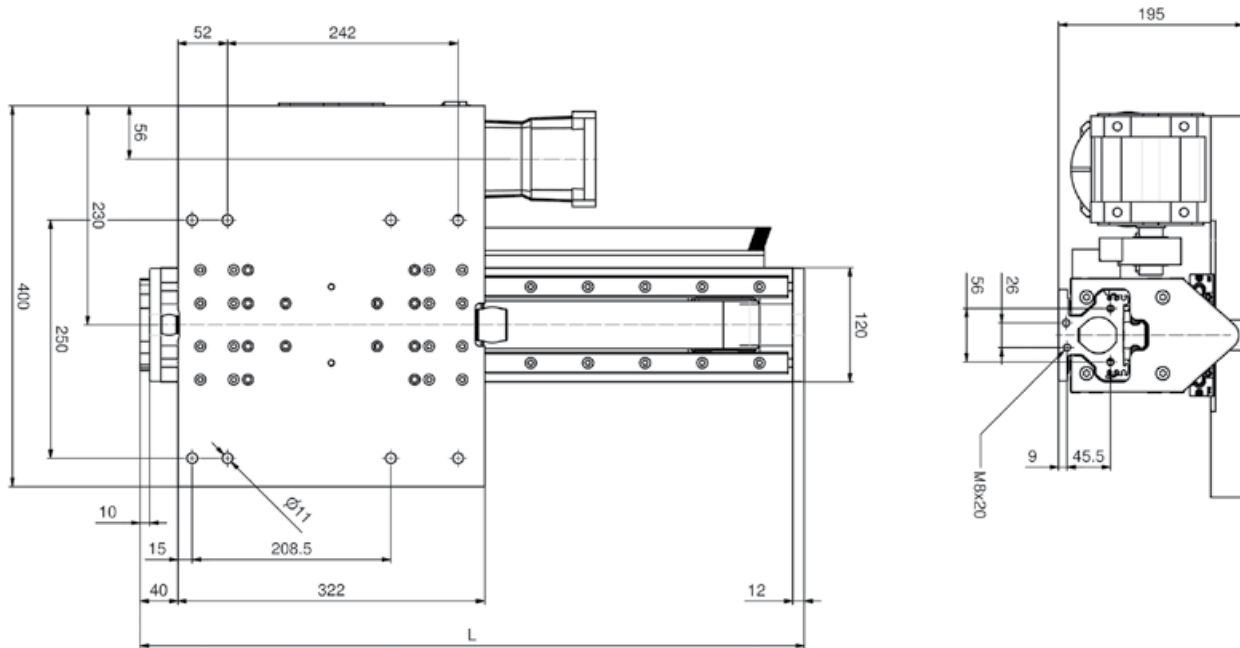
Gearbox dimensions from Chapter 6.2.1, Table 6.17

S = Travel range   **L** = S/2 + 397 mm

Technical data

Guiding system		Guiding level 1	Guiding level 2
		Linear guide D	
Drive element		Toothed rack, module 2	Toothed belt 50AT10
Maximum velocity	m/min	300	
Maximum acceleration	m/s^2	8	
Allowable dynamic operation load F_x	N	1 500 (up to 2 000 mm stroke) / 900 (> 2 000 mm up to 4 000 mm stroke)	
Stroke per revolution	mm	400	
Idling speed torque	Nm	3,3	
Maximum drive torque at the gearbox output (emergency stop)	Nm	150	
Maximum energy absorbtion of the shock absorber	Nm	65 (below) / 21 (above)	
Moment of inertia[1]	Kgcm^2	4,5	
Geometrical moment of inertia (profile) I_y	cm^4	661,1	661,1
Geometrical moment of inertia (profile) I_z	cm^4	938,6	938,6
Maximum total length	m	4,0	
Repeatability	mm	0,05	

[1] - Moment of inertia without gearbox

Mass

Guiding system		Linear guide D	
		Guiding level 1	Guiding level 2
Basic value	kg	7,8	4,4
Mass per 100 mm stroke	kg	0,53	0,74
Basic mass incl. basic value, without gearbox	kg	37,0	

AXS200TH Horizontal Telescopic Axis
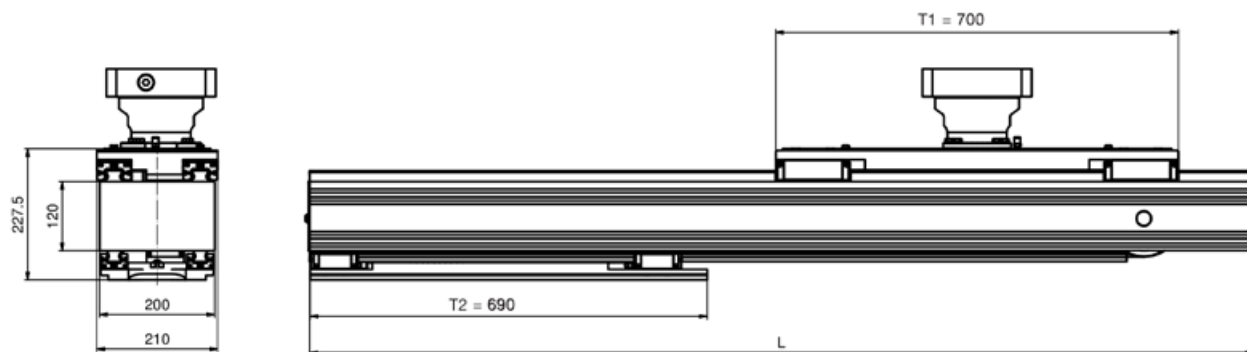
Gearbox dimensions from Chapter 6.2.1, Table 6.17

S = Travel range   **L** = S/2 + 830 mm

Technical data

Guiding system		Guiding level 1	Guiding level 2
		Linear guide D	
Drive element		Toothed rack, module 2	Toothed belt 50AT10
Maximum velocity	m /min	600	
Allowable dynamic operation load F_x	N	5 800	2 500
Stroke per revolution	mm	360	
Idling speed torque	Nm	4,3	
Maximum drive torque at the gearbox output (emergency stop)	Nm	310	
Maximum energy absorbtion from the shock absorber	Nm	65	
Moment of inertia[1]	Kgcm^2	40	
Geometrical moment of inertia (profile) I_y	cm^4	4 480	
Geometrical moment of inertia (profile) I_z	cm^4	6 950	
Maximum total length	m	4,0	
Repeatability	mm	0,05	

[1] - Moment of inertia without gearbox

Mass

Guiding system		Linear guide D	
		Guiding level 1	Guiding level 2
Basic value	kg	58,8	1,9 + 0,013 * T2
Mass per 100 mm stroke	kg	2,0	
Basic mass incl. basic value, without gearbox	kg	90	

Masses without gearbox

AXS200TV Vertical Telescopic Axis
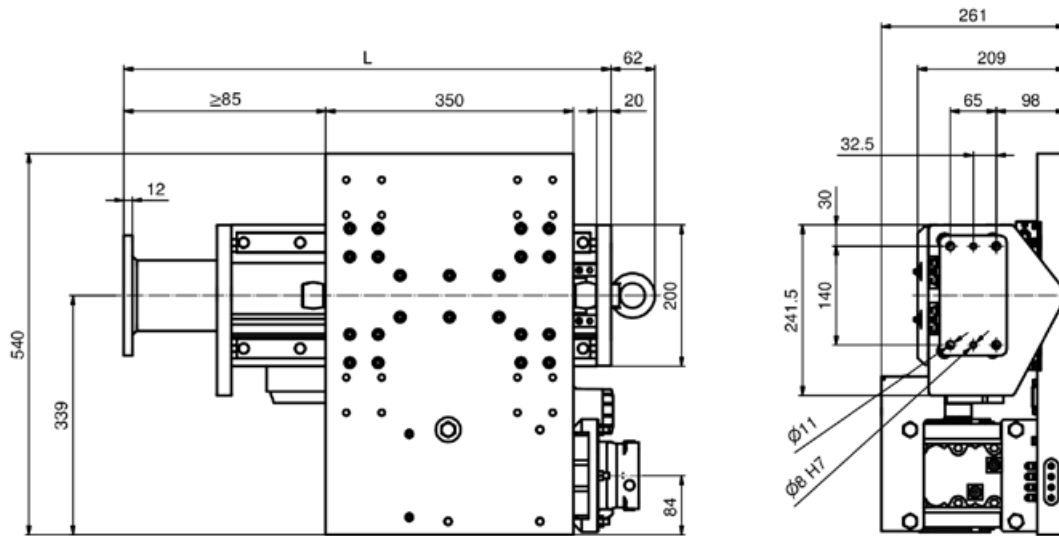
Gearbox dimensions from Chapter 6.2.1, Table 6.17

S = Travel range   **L** = S/2 +488 mm

Technical data

Guiding system		Guiding level 1	Guiding level 2
		Linear guide D	
Drive element		Toothed rack module 3	Toothed belt 50AT10
Maximum velocity	m /min	300	
Allowable dynamic operation load F_x	N	6 200	2 900
Stroke per revolution	mm	500	
Idling speed torque	Nm	2,3	
Maximum drive torque at the gearbox output (emergency stop)	Nm	617	
Maximum energy absorbtion from the shock absorber	Nm	130	
Moment of inertia[1]	Kgcm²	22,7	
Geometrical moment of inertia (profile) I_y	cm⁴	2 380[2]	
Geometrical moment of inertia (profile) I_z	cm⁴	4 810[2]	
Maximum total length	m	3,0	
Repeatability	mm	0,05	

[1] - Moment of inertia without gearbox
[2] - Guiding level 1

Mass

Guiding system		Linear guide D	
			Guiding level 1
Basic value	kg	24,3	6,63
Mass per 100 mm stroke	kg	1,75	0,8
Basic mass incl. basic value, without gearbox	kg	57,3	

Masses without gearbox

AXS240TH Horizontal Telescopic Axis
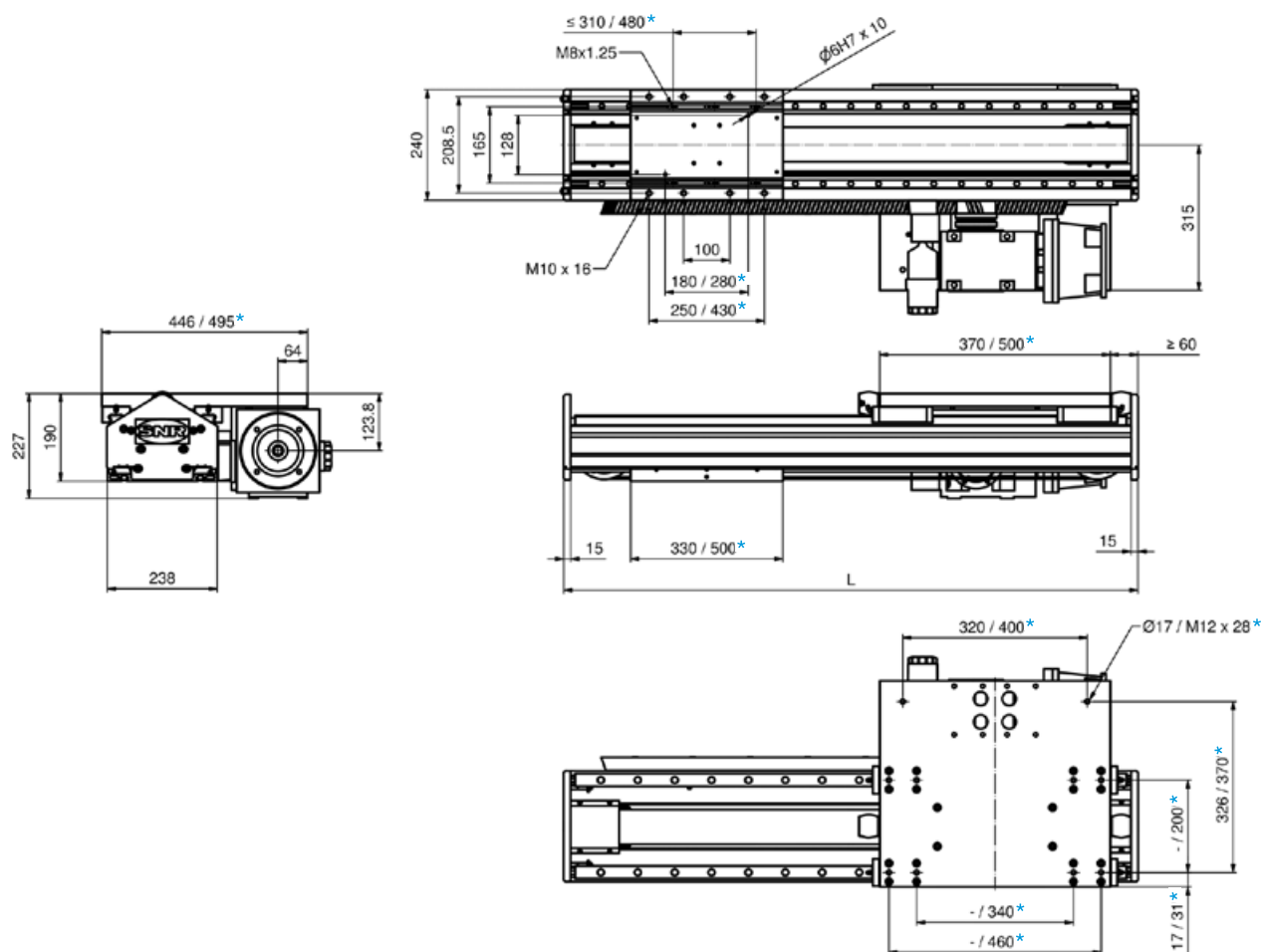
Guiding system E
Gearbox dimensions from Chapter **6.2.1**, Table **6.17**

S = Travel range   Guiding system D: **L** = S/2 + 490 mm
                              Guiding system E: **L** = S/2 + 620 mm

Technical data

Guiding system		Guiding level 1	Guiding level 2
		Linear guide D and E	
Drive element		Toothed rack, module 3	Toothed belt 75AT10
Maximum velocity	m /min	600	
Allowable dynamic operation load F_x	N	5 600	5 000
Stroke per revolution	mm	500	
Idling speed torque	Nm	6,0	
Maximum drive torque at the gearbox output (emergency stop)	Nm	233	
Maximum energy absorbtion from the shock absorber	Nm	223	
Moment of inertia[1]	Kgcm²	51,0	
Geometrical moment of inertia (profile) I_y	cm⁴	1 439	
Geometrical moment of inertia (profile) I_z	cm⁴	9 030	
Maximum total length	m	6,0	
Repeatability	mm	0,05	

[1] - Moment of inertia without gearbox

Mass

Guiding system		Linear guide D		Linear guide E	
		Guiding level 1	Guiding level 2	Guiding level 1	Guiding level 2
Basic value	kg	32,5	6,6	38,5	9,1
Mass per 100 mm stroke	kg	3,6		3,6	
Basic mass incl. basic value, without gearbox	kg	48,3		59,3	

AXS280TH Horizontal Telescopic Axis
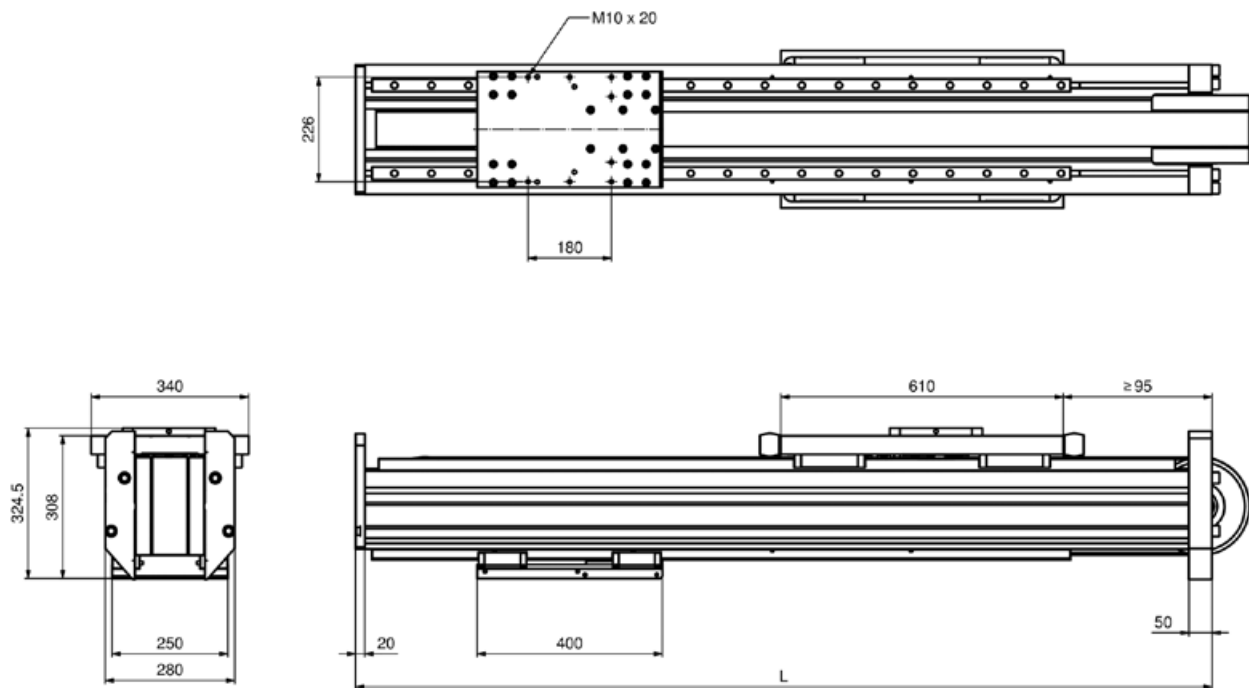
*Gearbox dimensions from Chapter **6.2.1**, Table **6.17***

S = Travel range   **L** = S/2 + 770 mm

Technical data

Guiding system		Guiding level 1	Guiding level 2
		Linear guide D	
Drive element		Toothed rack, module 3	Toothed belt 75AT10
Maximum velocity	m /min	600	
Allowable dynamic operation load F_x	N	15 000	5 000
Stroke per revolution	mm	700	
Idling speed torque	Nm	11,0	
Maximum drive torque at the gearbox output (emergency stop)	Nm	835	
Maximum energy absorbtion from the shock absorber	Nm	446	
Moment of inertia[1]	Kgcm^2	137	
Geometrical moment of inertia (profile) I_y	cm^4	11 690	
Geometrical moment of inertia (profile) I_z	cm^4	21 340	
Maximum total length	m	6,0	
Repeatability	mm	0,05	

[1] - Moment of inertia without gearbox

Mass

Guiding system		Linear guide D	
		Guiding level 1	Guiding level 2
Basic value	kg	61,7	12,3
Mass per 100 mm stroke	kg	2,7	
Basic mass incl. basic value, without gearbox	kg	106,2	

AXS280TV Vertical Telescopic Axis
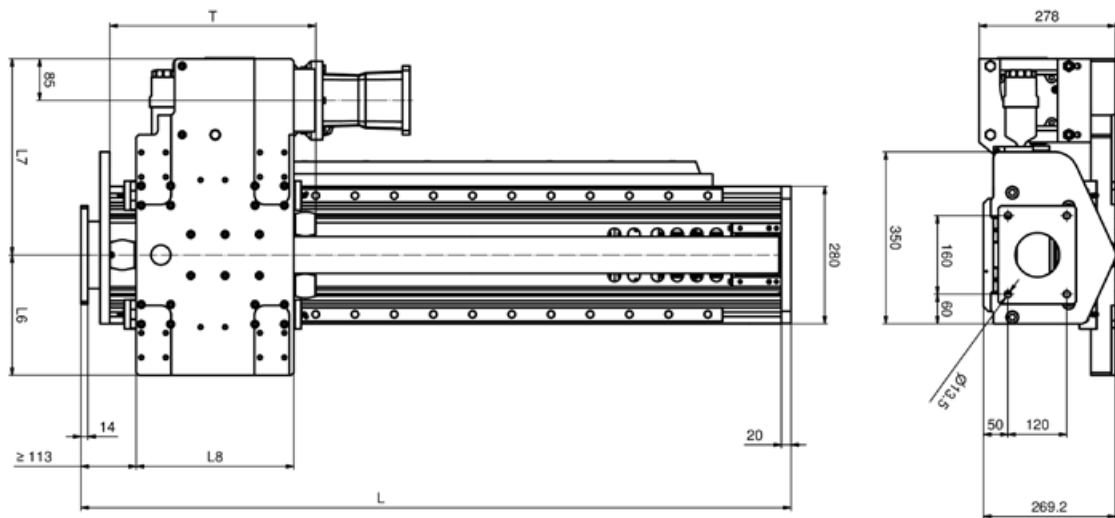
*Gearbox dimensions from Chapter **6.2.1**, Table **6.17***

S = Travel range   **L** = S/2 + T + 80 mm

*Dimensions L6, L7 and L8 from Chapter **7.3**, Table **7.3***

Technical data

Guiding system		D	E	G	H
		Top table for direct combination with			
		AXS280Y	AXS460MP	AXS500MP	AXS280MP
Table length T	mm	420	560	692	420

Guiding system		Guiding level 1	Guiding level 2
		Linear guide D, E, G and H	
Drive element		Toothed rack, module 4	Toothed belt 75AT10
Maximum velocity	m/min	360	
Maximum acceleration	m/s²	8	
Allowable dynamic operation load F_x	N	7 650 - 10 000[3]	5 000
Stroke per revolution	mm	560	
Idling speed torque	Nm	6,0	
Maximum drive torque at the gearbox output (emergency stop)	Nm	340 - 1 1003	
Maximum energy absorbtion of the shock absorber	Nm	446	
Moment of inertia[1]	Kgcm²	55	
Geometrical moment of inertia (profile) I_y	cm⁴	7 958[2]	
Geometrical moment of inertia (profile) I_z	cm⁴	14 654[2]	
Maximum stroke length	m	3,0	
Repeatability	mm	0,05	

[1] - Moment of inertia without gearbox
[2] - Guiding level 1
[3] -Depending on gearbox version - use our calculation service

Mass

Guiding system		Linear guide D		Linear guide E		Linear guide G		Linear guide H	
		Guiding level 1	Guiding level 2	Guiding level 1	Guiding level 2	Guiding level 1	Guiding level 2	Guiding level 1	Guiding level 2
Basic value	kg	33,0	15,8	36,1	17,1	37,3	17,5	33,0	15,8
Mass per 100 mm stroke	kg	2,3	0,91	2,3	0,91	2,3	0,91	2,3	0,91
Basic mass including basic value, without gear box	kg	90,4		113,8		110,0		89,6	

5.7.4.3 Maximum static load capacity

Type	Guiding system	Guiding level	Load [N]		Load moment [Nm]		
			F_y	F_z	M_x	M_y	M_z
AXS120TH	D	1	42 500	42 500	1700	7 000	7 000
		2	28 500	28 500	370	2 600	2 600
AXS120TV	D	1	32 000	32 000	3 800	3 700	3 700
		2	32 000	32 000	1 600	4 700	4 700
AXS200TH	D	1	70 000	70 000	5 250	20 000	20 000
		2	33 000	33 000	2 500	9 300	9 300
AXS200TV	D	1	57 500	57 500	4 300	6 900	6 900
		2	19 200	19 200	650	2 800	2 800
AXS240TH	D	1	57 000	57 000	5 700	8 300	8 300
		2	42 500	42 500	3 550	3 950	3 950
	E	1	70 000	70 000	7 000	14 000	14 000
		2	42 500	42 500	3 550	7 500	7 500
AXS280TH	D	1	100 000	100 000	12 000	20 000	20 000
		2	57 000	57 000	5 400	8 300	8 300
AXS280TV	D and H	1	70 000	70 000	8 500	8 000	8 000
		2	42 000	42 000	2 100	6 200	6 200
	E	1	70 000	70 000	8 500	13 000	13 000
		2	42 000	42 000	2 100	9 200	9 200
	G	1	70 000	70 000	8 500	14 500	14 500
		2	42 000	42 000	2 100	10 300	10 300

5.7.3.4 Dynamic load capacity

The dynamic load capacities of the guiding systems are based on a nominal life time of 50 000 km.

Type	Guiding system	Guiding level	Load [N]		Load moment [Nm]		
			F_y	F_z	M_x	M_y	M_z
AXS120TH	D	1	16 000	16 000	650	2 650	2 650
		2	12 000	12 000	155	1 100	1 100
AXS120TV	D	1	11 500	11 500	1 400	1 350	1 350
		2	11 500	11 500	600	1 700	1 700
AXS200TH	D	1	27 000	27 000	2 000	7 700	7 700
		2	12 500	12 500	950	3 500	3 500
AXS200TV	D	1	24 300	24 300	1 800	6 900	6 900
		2	7 100	7 100	240	1 050	1 050
AXS240TH	D	1	24 000	24 000	2 400	3 500	3 500
		2	16 000	16 000	1 350	1 500	1 500
	E	1	27 000	27 000	2 700	5 300	5 300
		2	16 000	16 000	1 350	2 850	2 850
AXS280TH	D	1	36 500	36 500	4 400	7 250	7 250
		2	24 000	24 000	2 300	3 500	3 500
AXS280TV	D and H	1	27 000	27 000	3 200	3 000	3 000
		2	16 000	16 000	800	2 300	2 300
	E	1	27 000	27 000	3 200	5 000	5 000
		2	16 000	16 000	800	3 500	3 500
	G	1	27 000	27 000	3 200	5 500	5 500
		2	16 000	16 000	800	3 900	3 900
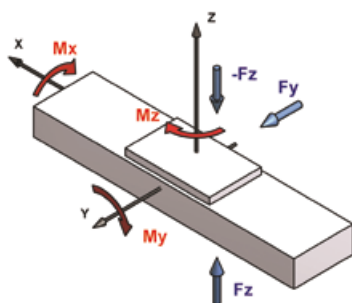
5.7.5   AXS_Y Gantry Axis with lateral toothed belt drive

5.7.5.1   Structure
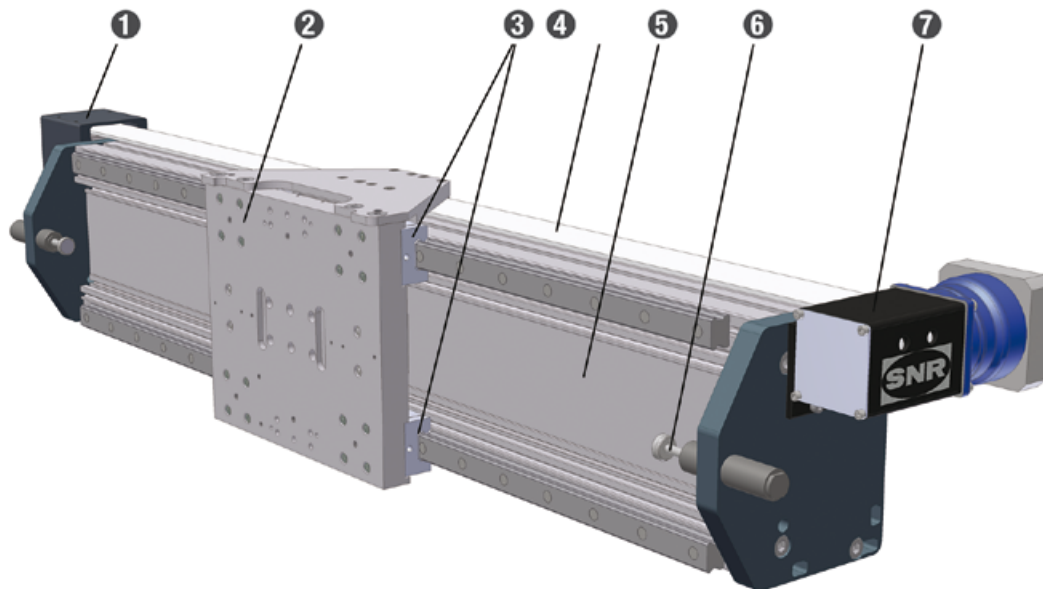
Figure 5.36 — Structure AXS_Y

1 Deflection unit

2 Slider unit

3 Guiding system

4 Toothed belt

5 Profile

6 Shock absorber

7 Drive unit

5.7.5.2 Dimensions / Technical data

AXS200Y
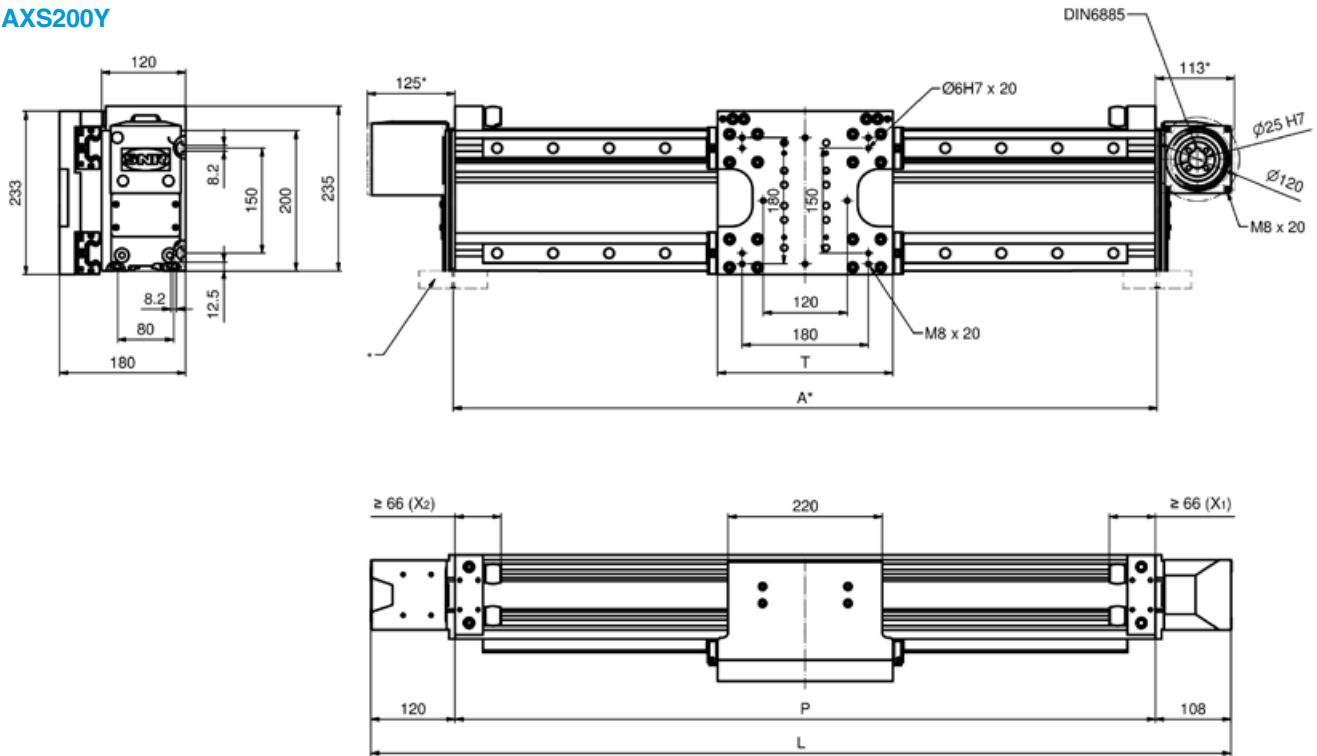
Gearbox dimensions from Chapter 6.2.1, Table 6.17

S = Travel range   **P** = Profile length   **A** = Axis distance of the X-Axis

L = **S** + **X**$_1$ + **X**$_2$ + 448 mm   **A** = L - 233mm   **P** = A - 5mm

X$_1$ and X$_2$ must be specified

* Linear Axis with integrated gantry connections (dimensions in Chapter 6.1.6, Table 6.9)

Technical data

Guiding system		Linear guide D	Linear guide R
Table length T	mm	250	320 without toptable for direct combination with AXDL160A
Drive element		Toothed belt 40 STD8	
Maximum velocity	m /min	300	
Allowable dynamic operation load F$_x$	N	2 200	
Stroke per revolution	mm	264$^{+0,5}$	
Idling speed torque	Nm	7,0	
Maximum drive torque	Nm	92,6	
Maximum energy absorbtion of the shock absorber	Nm	92	
Moment of inertia[1]	Kgcm^2	24,3	
Geometrical moment of inertia (profile) I$_y$	cm^4	5 280	
Geometrical moment of inertia (profile) I$_z$	cm^4	2 220	
Maximum total length[2]	m	8,0	
Repeatability	mm	0,05	

[1] - Moment of inertia without gearbox
[2] - one-piece, larger lengths consisting of segments on request possible

Mass

Guiding system		Linear guide D	Linear guide R
Basic mass (including slider mass)	kg	21,7	16,4
Mass per 100 mm stroke	kg	3,0	3,0
if X$_1$ / X$_2$ > 66 mm mass for profile extension	kg	((X$_1$+ X$_2$ - 132)/100)*3,0	
Slider mass	kg	10,2	1,6

Masses without gearbox

AXS280Y
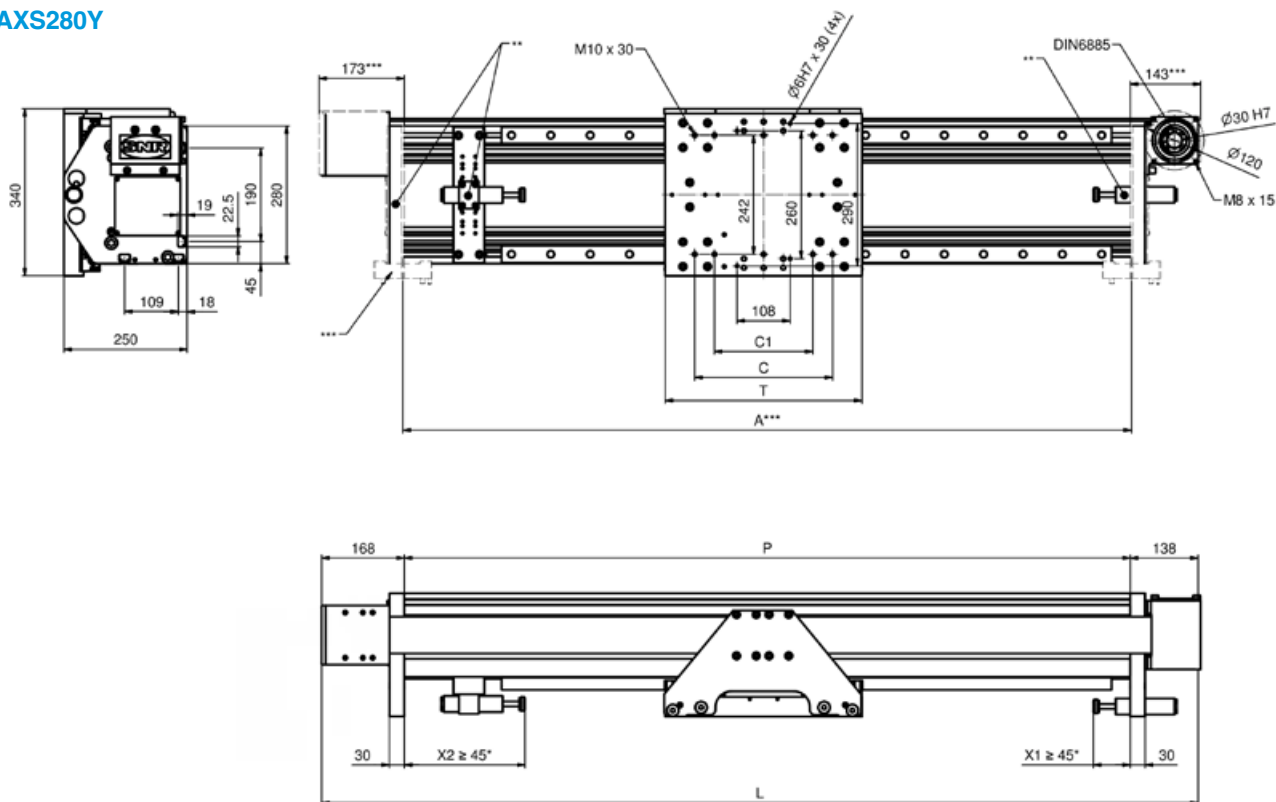
S = Travel range   P = Profile length   A = Axis distance of the X-Axis

$L = S + T + X_1 + X_2 + 306$ mm (+ 10 mm***)   A = L - 311mm   P = A - 5mm

$E = m/2 * v^2$ m = moved mass   v = velocity   P = Profile length

* X_1 and X_2 must be specified (X_1 always on the drive side)
**Shock absorber fixation in the end plate (X_1 / X_2 = 45...135 mm) or in a traverse (X_1 / X_2 > 135 mm)
*** Linear Axis with integrated gantry connections (dimensions in Chapter 6.1.6, Table 6.9)

Technical data

Guiding system		Linear guide D	Linear guide E	Linear guide R	Linear guide S	Linear guide T	Linear guide U
Table length T	mm	400	600	400	730	750	400
				without toptable for direct combination with			
				AXS200ME	AXS230MB	AXS280TV	AXDL240A
Hole separation C	mm	280	280	-	-	-	-
Hole separation C1	mm	-	150	-	-	-	-
Drive element		Toothed belt 50STD8					
Maximum velocity	m /min	300					
Allowable dynamic operation load F_x	N	5 000					
Stroke per revolution	mm	$264^{+0,5}$					
Idling speed torque	Nm	7,0					
Maximum drive torque	Nm	210					
Maximum energy absorbtion of the shock absorber E	Nm	1,8...3,5 m/s: A: 500Nm 0,8...2,2 m/s: B: 650Nm		C: 180Nm D: 180Nm	F: 1 100Nm	G: 1 400	J: 2 600Nm
Moment of inertia[1]	Kgcm^2	24,3					
Geometrical moment of inertia (profile) I_y	cm^4	14 650					
Geometrical moment of inertia (profile) I_z	cm^4	7 958					
Maximum total length[2]	m	10,0					
Repeatability	mm	0,05					

[1] - Moment of inertia without gearbox
[2] - one-piece, larger lengths consisting of segments on request possible

Mass

Guiding system		Linear guide D	Linear guide E	Linear guide R	Linear guide S	Linear guide T	Linear guide U
Basic mass (including slider mass)	kg	55,3	70,5	44,7	44,7	66,6	68,9
Mass per 100 mm stroke	kg	4,6	4,6	4,6	4,6	4,6	4,6
if X_1 / X_2 > 45 mm Mass for profile extensio	kg	$(X_1 + X_2$ -90) /100 * 4,6					
Slider mass		16,3	22,3	5,7	5,7	5,7	5,7

5.7.5.3   Maximum static load capacity

Type	Guiding system	Load [N]		Load moment [Nm]		
		F_y	F_z	M_x	M_y	M_z
AXS200Y	D	57 000	57 000	4 300	5 000	5 000
	R	57 000	57 000	4 300	6 300	6 300
AXS280Y	D	82 000	82 000	9 900	11 000	11 000
	E	82 000	82 000	9 900	19 000	19 000
	R	82 000	82 000	9 900	11 000	11 000
	S	82 000	82 000	9 900	12 500	12 500
	T	82 000	82 000	9 900	15 000	15 000
	U	82 000	82 000	9 900	12 500	12 500

5.7.5.4   Dynamic load capacity

The dynamic load capacities of the guiding systems are based on a nominal life time of 50 000 km.

Type	Guiding system	Load [N]		Load moment [Nm]		
		F_y	F_z	M_x	M_y	M_z
AXS200Y	D	19 000	19 000	1 450	1 700	1 700
	R	19 000	19 000	1 450	2 100	2 100
AXS280Y	D	26 000	26 000	3 200	3 700	3 700
	E	26 000	26 000	3 200	6 250	6 250
	R	26 000	26 000	3 200	3 700	3 700
	S	26 000	26 000	3 200	4 000	4 000
	T	26 000	26 000	3 200	4 800	4 800
	U	26 000	26 000	3 200	4 000	4 000
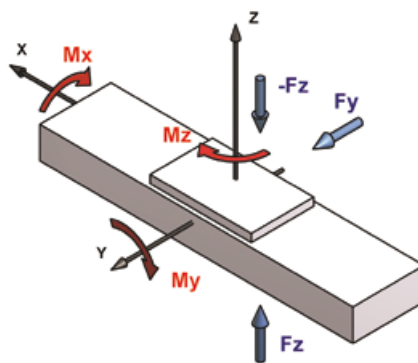
5.7.6 AXS_Z Gantry Axis with toothed belt drive

5.7.6.1 Structure
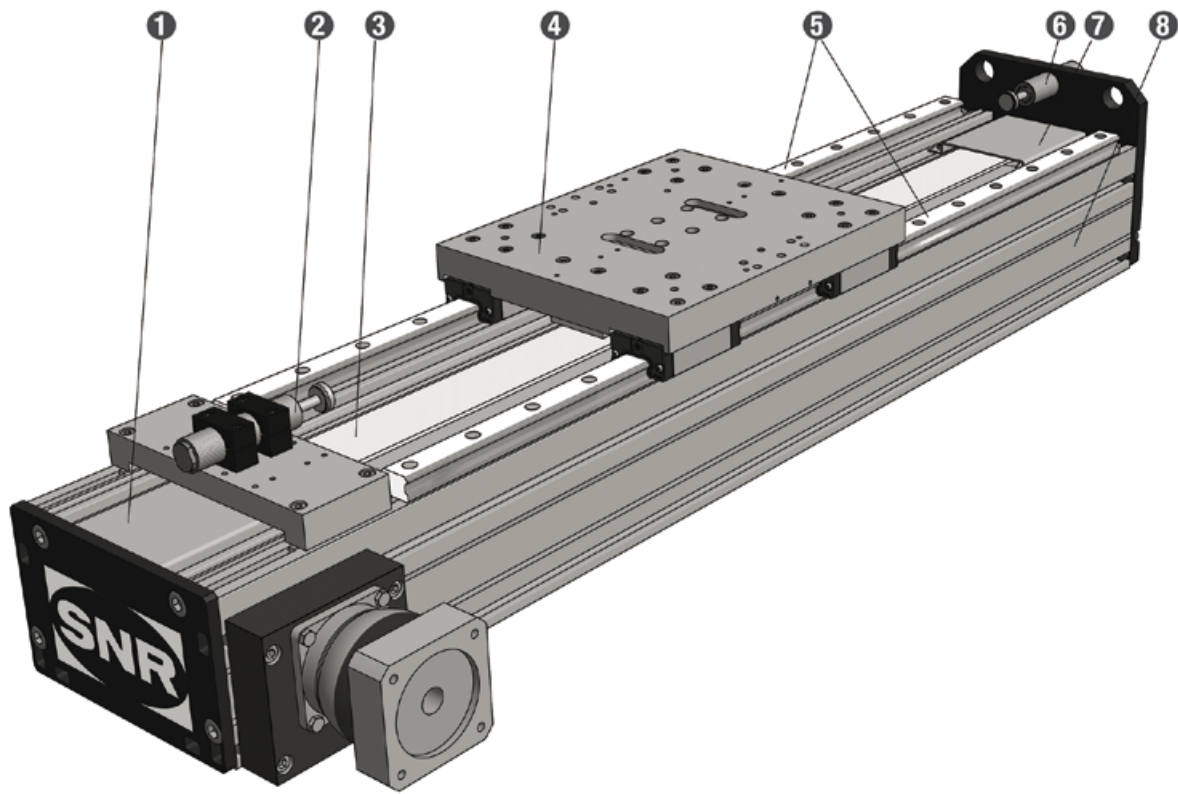
Figure 5.37 — Structure AXS_Z

1 Drive unit

2 Shock absorber assembled in a traverse

3 Toothed belt

4 Slider unit

2 Guiding system

6 Shock absorber assembled in the end plate

7 Deflection unit

8 Profile

5.7.6.2   Dimensions / Technical data

AXS280Z
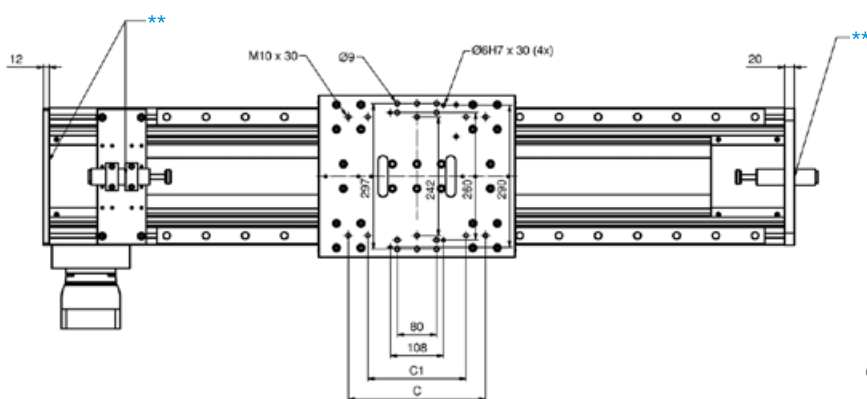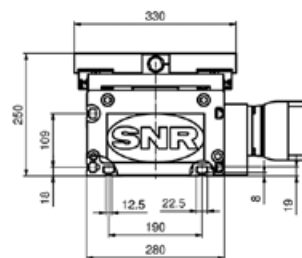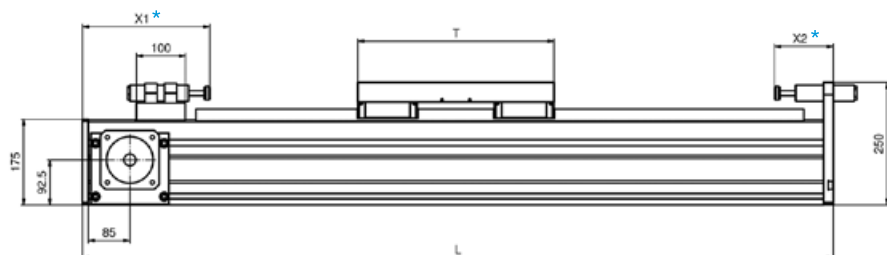
*Gearbox dimensions from Chapter **6.2.1**, Table **6.17***

S = Travel range $L = S + T + X_1 + X_2$

$E = m/2 * v^2$ m = moved mass v = velocity

* X1 and X2 must be specified
** Shock absorber fixation in the end plate (X1, X2 = 80mm...165mm) or in a traverse ($X_1, X_2 \geq 165$ mm)

Technical data

Guiding system		Linear guide D	Linear guide E
Table length T	mm	400	600
Hole separation C	mm	280	280
Hole separation C1	mm	-	150
Drive element		Toothed belt 75AT10	
Maximum velocity	m /min	300	
Allowable dynamic operation load F_x	N	4 000	
Stroke per revolution	mm	$480^{+0,8}$	
Idling speed torque	Nm	9,0	
Maximum drive torque	Nm	306	
Maximum energy absorbtion of the shock absorber E	Nm	1,8...3,5 m/s: A: 500Nm C: 185Nm F: 1 100Nm G: 1 400 J: 2 600Nm 0,8...2,2 m/s: B: 650Nm D: 180Nm	
Moment of inertia[1]	Kgcm^2	227,6	
Geometrical moment of inertia (profile) I_y	cm^4	14 645	
Geometrical moment of inertia (profile) I_z	cm^4	7 958	
Maximum total length[2]	m	10,0	
Repeatability	mm	0,03	

[1]- Moment of inertia without gearbox
[2]- one-piece, larger lengths consisting of segments on request possible

Mass

Guiding system		Linear guide D	Linear guide E
Basic mass (including slider mass)	kg	78,0	96,4
Mass per 100 mm stroke	kg	4,6	4,6
if X_1 > 165 mm Mass for profile extension	kg	((X_1-165)/100)*4,6	((X_1-165)/100)*4,6
if X_2 > 165 mm Mass for profile extension		((X_2-165)/100)*4,6	((X_2-165)/100)*4,6
Slider mass		19,0	28,2

5.7.6.3 Maximum static load capacity

Type	Guiding system	Load [N]		Load moment [Nm]		
		F_y	F_z	M_x	M_y	M_z
AXS280Z	D	82 000	82 000	9 900	11 000	11 000
	E	102 000	102 000	12 000	24 000	24 000

5.7.6.4 Dynamic load capacity

The dynamic load capacities of the guiding systems are based on a nominal life time of 50 000 km.

Type	Guiding system	Load [N]		Load moment [Nm]		
		F_y	F_z	M_x	M_y	M_z
AXS280Z	D	26 000	26 000	3 200	3 700	3 700
	E	29 000	29 000	3 500	7 000	7 000
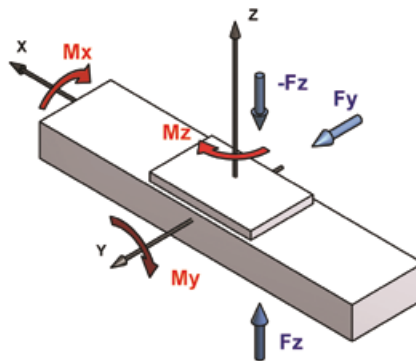
5.7.7 AXS_M Beam Axis for parallel use with rack and pinion drive

5.7.7.1 Structure
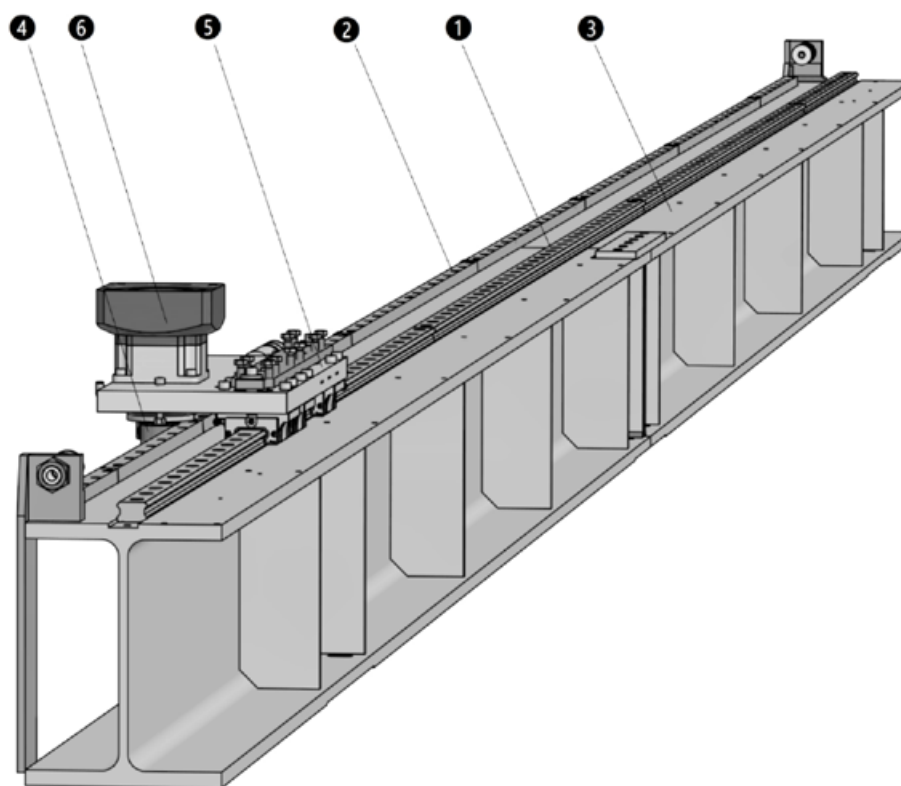
Figure 5.38 — Structure AXS_M Beam Axis for parallel use with rack and pinion drive

1 Guiding system

2 Toothed rack

3 Profile

4 Pinion

5 Slider unit with compensation system

6 Gearbox

5.7.7.2 Dimensions / Technical data

AXS120M_
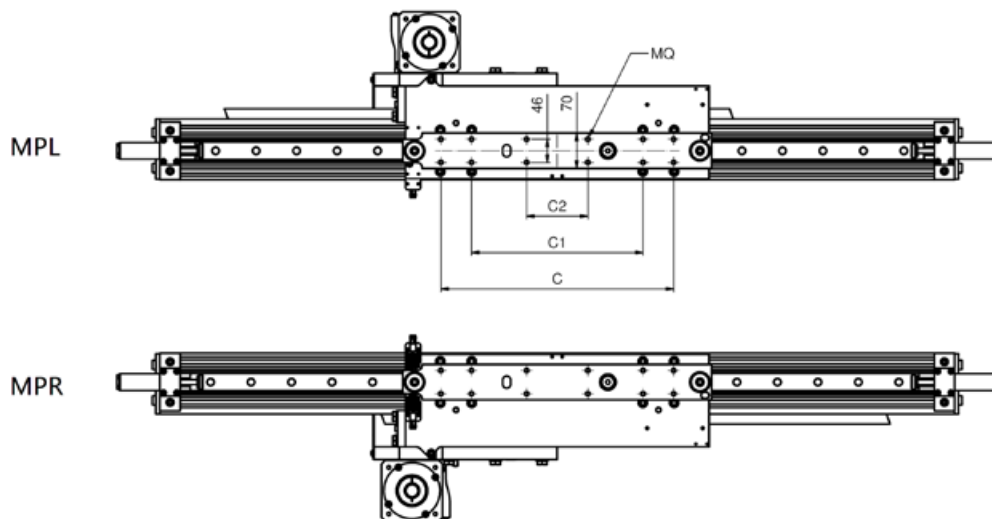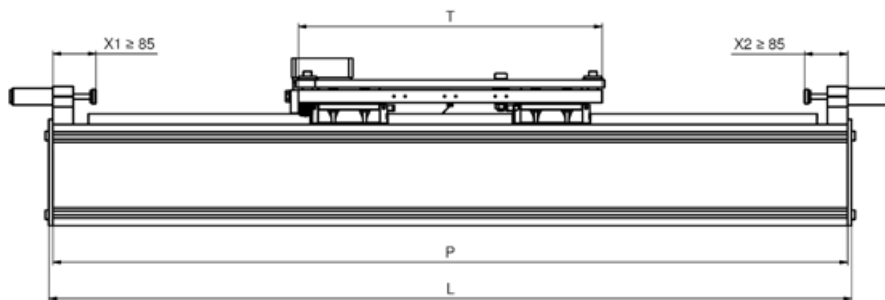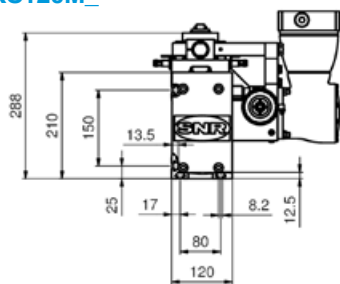
Gearbox dimensions from Chapter 6.2.1, Table 6.17

S = Travel range $\quad$ **L** = S + T + 16 mm + X_1 + X_2 mm $\quad$ **E** = m/2 * v^2

$\quad\quad\quad\quad\quad\quad\quad\quad\quad$ **P** = L - 16 mm

Technical data

Guiding system			Linear guide B		Linear guide C
Table length T	mm		600		800
Hole separation C	mm		460		680
Hole separation C1	mm		339		520
Hole separation C2	mm		121		120
Thread MQ			M10		M12
Drive element			Toothed rack, module 2		
Maximum velocity	m /min		300		
Allowable dynamic operation load	N		3700		
Stroke per revolution	mm		200		
Idling speed torque	Nm		1,5		2,2
Maximum drive torque at the gearbox output	Nm		190		
Maximum energy absorption of the shock absorber E	Nm		1,8…3,5 m/s: A: 500 Nm 0,8…2,2 m/s: B: 650 Nm		C: 185 Nm D: 180 Nm
Moment of inertia[1]	kgcm^2		22,7		
Geometrical moment of inertia (profile) I_y	cm^4		5 220		
Geometrical moment of inertia (profile) I_z	cm^4		2 050		
Maximum total length[2]	m		8,0		
Repeatability	mm		0,05		

[1] - Moment of inertia without gearbox

[2] - one-piece, larger lengths consisting of segments on request possible

Mass

Guiding system			Linear guide B		Linear guide C
Basic mass (including slider mass)	kg		46,7		58,3
Mass per 100 mm stroke	kg		3,1		
If X_1 / X_2 > 85 mm $\quad$ Mass for profile extension	kg		(X_1 + X_2 - 170) / 100 * 1,85		
Slider mass	kg		24,0		30,9

Masses without gearbox

AXS300MP
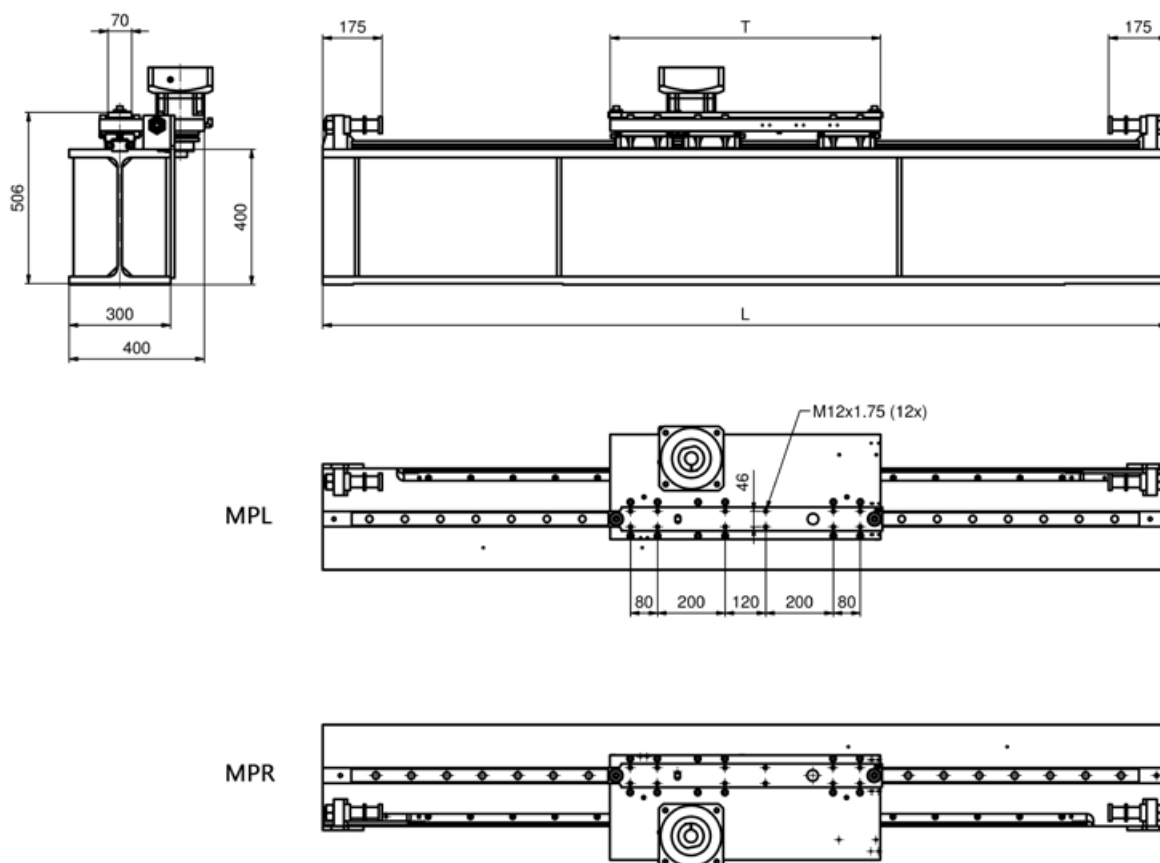
*Gearbox dimensions from Chapter **6.2.1,** Table **6.20***

S = Travel range   **L** = S + T + 350 mm

Technical data

Guiding system		Linear guide B
Table length T	mm	800
Drive element		Toothed rack, module 3
Maximum velocity	m /min	300
Allowable dynamic operation load	N	6 000
Stroke per revolution	mm	250
Idling speed torque	Nm	3,6
Maximum drive torque at the gearbox output (emergency stop)	Nm	470
Maximum energy absorption of the shock absorber	Nm	4 510 (irreversible)
Moment of inertia[1]	Kgcm^2	23,6
Geometrical moment of inertia (profile) I_y	cm^4	57 680
Geometrical moment of inertia (profile) I_z	cm^4	10 820
Maximum total length[2]	m	10
Repeatability	mm	0,05

[1] - Moment of inertia without gearbox
[2] - one-piece, larger lengths consisting of segments on request possible

Mass

Guiding system		Linear guide B
Basic mass (including slider mass)	kg	240
Mass per 100 mm stroke	kg	17
Slider mass	kg	47

Masses without gearbox

5.7.7.3   Maximum static load capacity

Type	Guiding system	Load [N]		Load moment [Nm]		
		F_y	F_z	M_x	M_y	M_z
AXS120M_	B	51 000[1]	12 700	not applicable	10 200	not applicable
	C	76 000[1]	19 200	not applicable	15 000	not applicable
AXS300MP	B	100 000[1]	100 000	not applicable	20 000	not applicable

[1] - *For a complete system consisting of two Linear Axis*

5.7.7.4   Dynamic load capacity

The dynamic load capacities of the guiding systems are based on a nominal life time of 50 000 km.

Type	Guiding system	Load [N]		Load moment [Nm]		
		F_y	F_z	M_x	M_y	M_z
AXS120M_	B	9 270[1]	18 500	290[2]	3 700	not applicable
	C	13 900[1]	27 700	440[2]	5 500	not applicable
AXS300MP	B	38 000[1]	38 000	800[2]	7 600	not applicable

[1] - *For a complete system consisting of two Linear Axis*
[2] - *Applies only to the moment resulting from the mass of the drive*
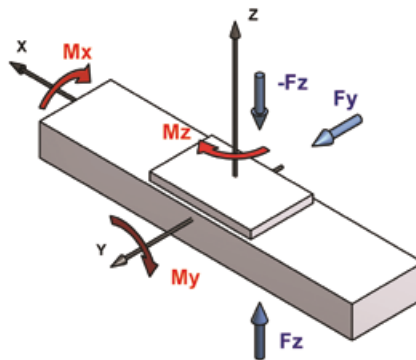
5.8 AXLM Linear Motor Axis

5.8.1 AXLM_EA / AXLM_EW

5.8.1.1 Structure
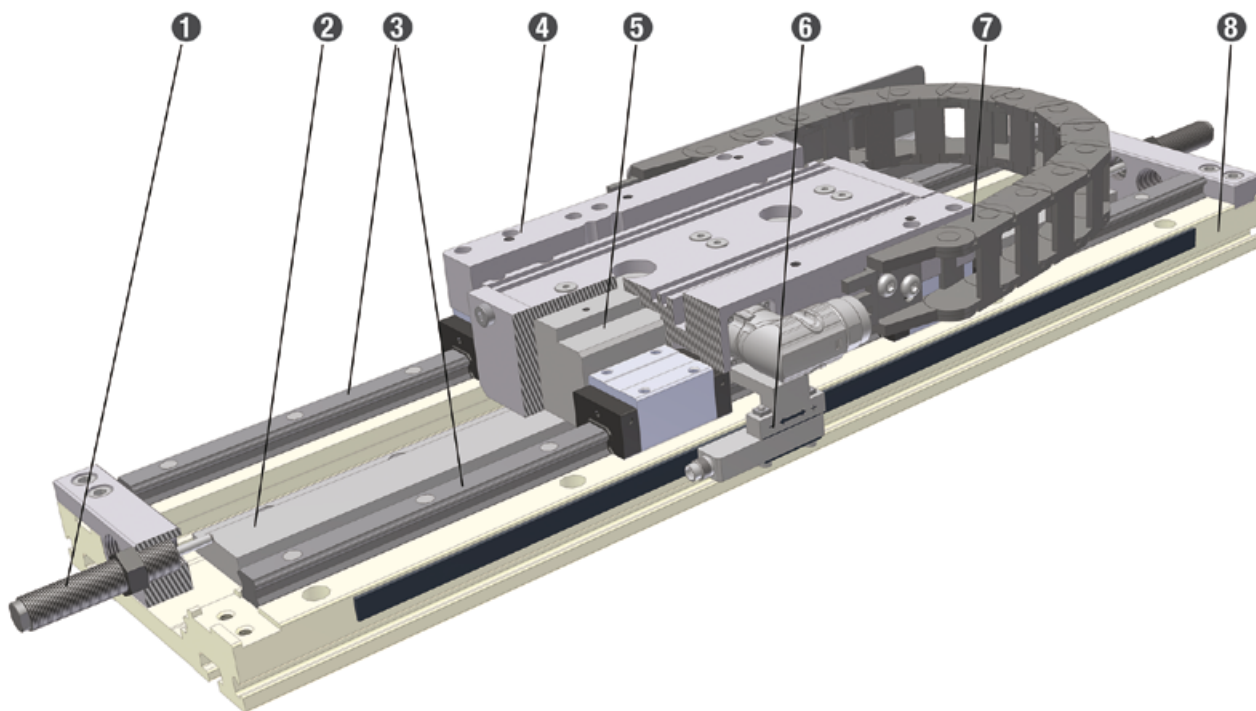
Figure 5.39 — Structure AXLM_EA / AXLM_EW

❶ Shock absorber

❷ Secondary component

❸ Guiding system

❹ Slider unit

❺ Primary component

❻ Measuring system

❼ Energy chain

❽ Base profile

5.8.1.2   Dimensions / Technical data

AXLM155EA/AXLM155EW
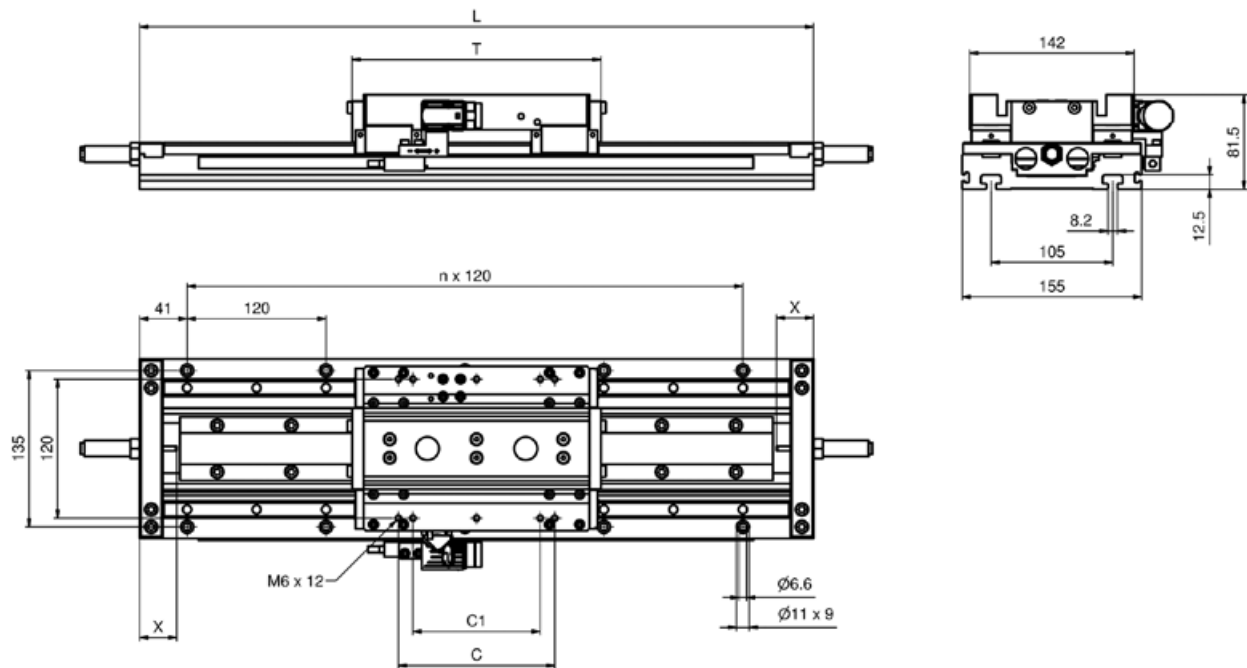
T = Table length
L = S + T + 2xX (+ 2xB)*
* For configuration version F (bellow)

S = Travel range
Maximum length (one-piece): 6 000 mm
B = Bellow block dimension

Calculation bellow block dimension **B:**   Number of folds* x 3 + 5 mm
*Number of folds = round up (S / 16.5)

Type	T [mm]	X [mm]	C [mm]	C1 [mm]
AXLM155E_0330	215	66	135	-
AXLM155E_0400	215	66	135	-
AXLM155E_0650	391	72	275	135
AXLM155E_0800	391	72	275	135
AXLM155E_0980	567	72	450	180
AXLM155E_1200	567	72	450	180

Mass

Guiding system	Basic mass (including slider mass) [kg]	Mass per 100 mm stroke [kg]	Slider mass [kg]
AXLM155E_0330	3,8		3,1
AXLM155E_0400	4,7		4,0
AXLM155E_0650	6,9	15	5,9
AXLM155E_0800	8,5		7,5
AXLM155E_0980	9,9		8,6
AXLM155E_1200	12,4		11,1

AXLM225EA / AXLM225EW
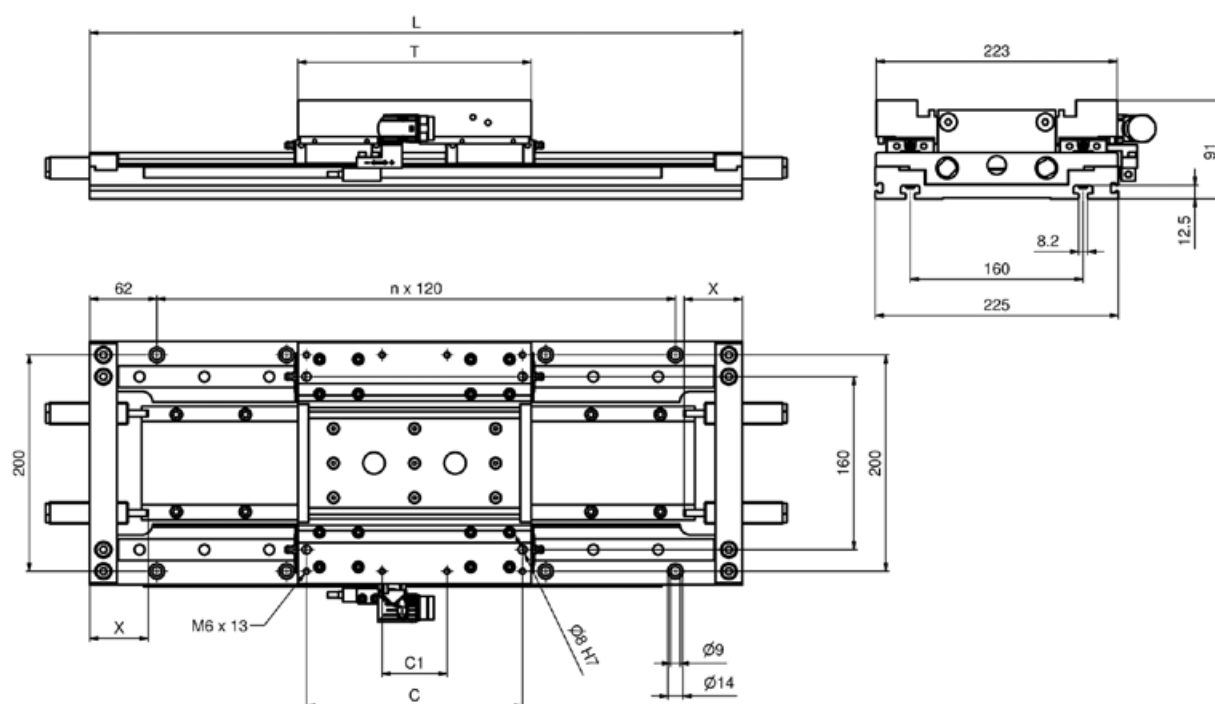
T = Table length
L = S + T + 2xX (+ 2xB)*
* For configuration version F (bellow)

S = Travel range
Maximum length (one-piece): 6 000 mm
B = Bellow block dimension

Calculation bellow block dimension B: Number of folds = round up (S / 27)
B = Number of folds x 3 + 5 mm

Type	T [mm]	X [mm]	C [mm]	C1 [mm]
AXLM225E_0650	216	82	200	60
AXLM225E_1000	216	82	200	60
AXLM225E_1300	392	82	300	160
AXLM225E_1950	568	82	470	250
AXLM225E_2000	392	82	300	160
AXLM225E_2600	744	82	650	430
AXLM225E_3000	568	82	470	250
AXLM225E_4000	744	82	650	430
AXLM225E_5000	920	82	830	610

Mass

Guiding system	Basic mass (including slider mass) [kg]	Mass per 100 mm stroke [kg]	Slider mass [kg]
AXLM225E_0650	9,5	2,2	8,4
AXLM225E_1000	10,9	2,5	9,8
AXLM225E_1300	15,6	2,2	14,1
AXLM225E_1950	22,9	2,2	21,0
AXLM225E_2000	17,7	2,5	16,1
AXLM225E_2600	29,4	2,2	27,1
AXLM225E_3000	26,2	2,5	24,2
AXLM225E_4000	34,7	2,5	32,2
AXLM225E_5000	43,0	2,5	40,1

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AXLM325EA / AXLM325EW
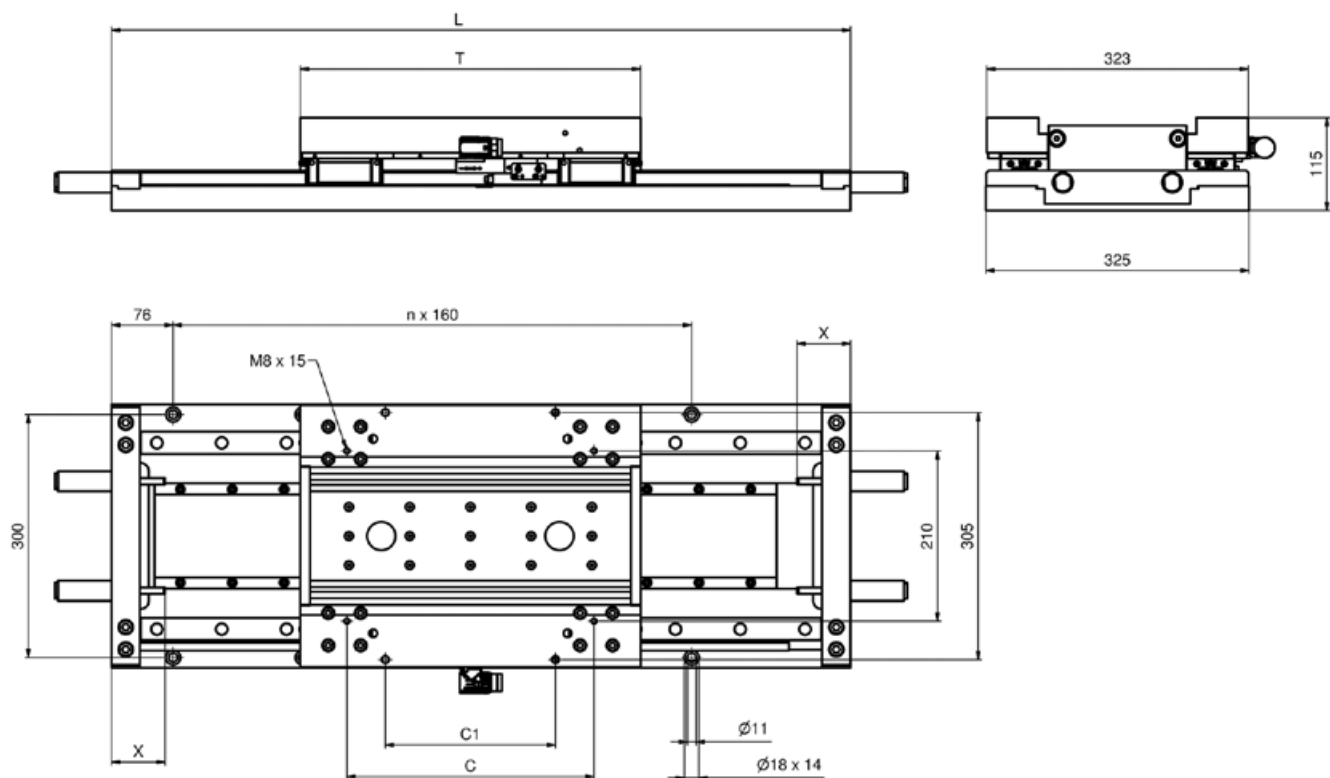
T = Table length
L = S + T + 2xX (+ 2xB)*
For configuration version F (bellow)

S = Travel range
Maximum length (one-piece): 6 000 mm
B = Bellow block dimension

Calculation bellow block dimension B: Number of folds = round up (S / 27)
B = Number of folds x 3 + 5 mm

Type	T	X	C	C1
	[mm]	[mm]	[mm]	[mm]
AXLM325E_2650	394		305	-
AXLM325E_3970	572	122	470	305
AXLM325E_5300	748		650	430
AXLM325E_6600	924		830	650

Mass

Guiding system	Basic mass (including slider mass)	Mass per 100 mm stroke	Slider mass
	[kg]	[kg]	[kg]
AXLM325E_2650	32,2		28,9
AXLM325E_3970	44,2	4,3	40,1
AXLM325E_5300	58,5		53,7
AXLM325E_6600	73,0		67,4

5.8.1.3 Maximum static load capacity

Type	Guiding system	Load [N]			Load moment [Nm]		
		F_y	F_z	$-F_z$	M_x	M_y	M_z
AXLM155E_0330	D	15 700	16 450	14 950	750	1 130	1 130
AXLM155E_0400	D	15 700	16 600	14 800	740	1 120	1 120
AXLM155E_0650	D	15 700	17 150	14 240	710	2 330	2 330
AXLM155E_0800	D	15 700	17 450	13 950	700	2 290	2 290
AXLM155E_0980	E	23 540	25 690	21 390	1 070	3 590	3 590
AXLM155E_1200	E	23 540	26 120	20 960	1 050	3 520	3 520
AXLM225E_0650	D	24 400	25 880	22 920	1 700	1 600	1 600
AXLM225E_1000	D	24 400	26 600	22 200	1 650	1 550	1 550
AXLM225E_1300	D	24 400	27 280	21 520	1 550	3 100	3 100
AXLM225E_1950	E	47 420	51 720	43 120	3 150	6 700	6 700
AXLM225E_2000	E	31 620	35 940	27 300	2 000	3 950	3 950
AXLM225E_2600	E	47 420	53 120	41 720	3 080	8 950	8 950
AXLM225E_3000	E	47 420	53 850	40 990	3 000	6 400	6 400
AXLM225E_4000	E	63 230	71 770	54 690	4 050	9 750	9 750
AXLM225E_5000	E	79 040	89 690	68 390	5 000	14 000	14 000
AXLM325E_2650	D	43 660	49 420	37 900	3 900	5 900	5 900
AXLM325E_3970	E	56 540	65 110	47 970	4 950	11 320	11 320
AXLM325E_5300	E	84 820	96 200	73 440	7 580	15 850	15 850
AXLM325E_6600	E	113 090	127 290	98 690	10 200	22 600	22 600

5.8.1.4 Dynamic load capacity

The dynamic load capacities of the guiding systems are based on a nominal life time of 50 000 km.

Type	Guiding system	Load [N]			Load moment [Nm]		
		F_y	F_z	$-F_z$	M_x	M_y	M_z
AXLM155E_0330	D	4 490	5 240	3 740	190	280	280
AXLM155E_0400	D	4 490	5 390	3 590	180	270	270
AXLM155E_0650	D	4 490	5 950	3 030	150	500	500
AXLM155E_0800	D	4 490	6 240	2 740	140	450	450
AXLM155E_0980	E	6 730	8 480	4 580	230	770	770
AXLM155E_1200	E	6 730	9 310	4 150	210	690	690
AXLM225E_0650	D	6 900	8 380	5 420	400	380	380
AXLM225E_1000	D	6 900	9 100	4 700	350	330	330
AXLM225E_1300	D	6 900	9 780	4 020	300	590	590
AXLM225E_1950	E	13 430	17 730	9 130	680	1 420	1 420
AXLM225E_2000	E	8 950	13 270	4 630	340	680	680
AXLM225E_2600	E	13 430	19 130	7 730	570	1 650	1 650
AXLM225E_3000	E	13 430	19 860	7 000	520	1 100	1 100
AXLM225E_4000	E	17 900	26 440	9 360	690	1 650	1 650
AXLM225E_5000	E	22 380	33 030	11 730	860	2 400	2 400
AXLM325E_2650	D	14 310	20 070	8 550	880	1 320	1 320
AXLM325E_3970	E	18 530	27 100	9 960	1 020	2 350	2 350
AXLM325E_5300	E	27 800	39 180	16 420	1 680	3 540	3 540
AXLM325E_6600	E	37 070	51 270	22 870	2 350	5 220	5 220
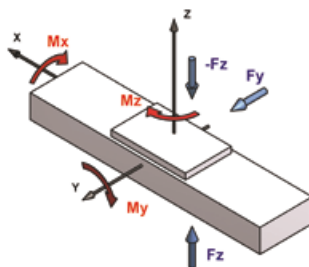
5.8.1.5   Feeding force

Feeding force AXLM155E

Type	Permissible peak force F_{max} [N]	Permanent force F_n [N]	Velocity by F_n [m/s]
AXLM155EA0330	330	125	5,0*
AXLM155EW0330		240	
AXLM155EA0400	400	150	
AXLM155EW0400		300	
AXLM155EA0650	650	240	
AXLM155EW0650		470	
AXLM155EA0800	800	300	
AXLM155EW0800		600	
AXLM155EA0980	980	360	
AXLM155EW0980		700	
AXLM155EA1200	1 200	450	
AXLM155EW1200		900	

Maximum velocity with bellows 2 m/s

Feeding force AXLM225E

Type	Permissible peak force F_{max} [N]	Permanent force F_n [N]	Velocity by F_n [m/s]
AXLM225EA0650	650	280	4,6
AXLM225EW0650		500	4,7
AXLM225EA1000	1 000	440	3,7
AXLM225EW1000		750	3,1
AXLM225EA1300	1 300	560	4,6
AXLM225EW1300		1 000	4,7
AXLM225EA1950	1 950	840	4,6
AXLM225EW1950		1 500	4,7
AXLM225EA2000	2 000	880	3,7
AXLM225EW2000		1 500	3,1
AXLM225EA2600	2 600	1 120	4,6
AXLM225EW2600		2 000	4,7
AXLM225EA3000	3 000	1 320	3,7
AXLM225EW3000		2 250	3,1
AXLM225EA4000	4 000	1 760	3,7
AXLM225EW4000		3 000	3,1
AXLM225EA5000	5 000	2 200	3,7
AXLM225EW5000		3 750	3,1

Maximum velocity with bellows 2 m/s

Feeding force AXLM325E

Type	Permissible peak force F_{max} [N]	Permanent force F_n [N]	Velocity by F_n [m/s]
AXLM325EA2650	2 650	1 200	2,0
AXLM325EW2650		2 000	1,9
AXLM325EA3970	3 970	1 800	2,0
AXLM325EW3970		3 000	1,9
AXLM325EA5300	5 300	2 400	2,0
AXLM325EW5300		4 000	1,9
AXLM325EA6600	6 600	3 000	2,0
AXLM325EW6600		5 000	1,9

5.8.1.6   Force - Velocity - Characteristic

F_{max}	Permissible motor peak force
F_{nA}	Permanent force of the motor with air cooling (130° winding temperature)
F_{nW}	Permanent force of the motor with water cooling (130° winding temperature)
V_1	Maximum velocity with F_{max}
V_{nA}	Nominal velocity with F_{nA}
V_{nW}	Nominal velocity with F_{nW}

❶ Overload operation

❷ Continuous operation area with water cooling

❸ Continuous operation area with air cooling

Figure 5.39 — Force –Velocity – Characteristic AXLM_EA / AXLM_EW

A short term operation in the overload range is in principle for linear motors allowed as well as rotary servo motors.

The linear motor can be overloaded in the "overload operation" for a maximum of 5 s, for example, during acceleration.

However, the effective force must be in the range "continuous operation".

5.8.1.7 Current consumption

The following values are based on a standard winding with a direct current link voltage of $U_{DC} = 560V$. Deviating windings for other direct current link voltage are available on request.

I_{max}	=	Peak current at the peak force F_{max}
I_n	=	Continuous current / rated current at permanent force F_n
I_{ULT}	=	Value of the feeding current, if exceeded the magnets will be demagentized
P_V	=	Power dissipation at permanent force F_n
F_A	=	Magnetic pull between primary and secondary components

Current consumption AXLM155

Type	I_{max} [A]	I_n [A]	I_{ULT} [A]	P_V [W]	F_A [N]
AXLM155EA0330	6,0	1,9	8,0	74	750
AXLM155EW0330	6,0	4,2	8,0	329	750
AXLM155EA0400	8,0	2,6	10,0	80	900
AXLM155EW0400	8,9	6,4	11,0	410	900
AXLM155EA0650	11,8	3,6	15,0	137	1 458
AXLM155EW0650	11,8	8,2	15,0	632	1 458
AXLM155EA0800	16,0	5,2	20,0	150	1 750
AXLM155EW0800	17,7	12,7	22,0	820	1 750
AXLM155EA0980	17,8	5,5	22,0	206	2 150
AXLM155EW0980	17,8	12,2	22,0	934	2 150
AXLM155EA1200	25,0	7,8	30,0	230	2 580
AXLM155EW1200	26,6	19,1	33,0	1 230	2 580

Current consumption AXLM225

Type	I_{max} [A]	I_n [A]	I_{ULT} [A]	P_V [W]	F_A [N]
AXLM225EA0650	7,8	2,9	10,0	130	1 480
AXLM225EW0650	8,6	6,4	11,0	550	1 480
AXLM225EA1000	8,0	3,1	10,0	190	2 200
AXLM225EW1000	8,9	6,4	11,0	730	2 200
AXLM225EA1300	15,6	5,8	20,0	260	2 880
AXLM225EW1300	17,2	12,8	22,0	1 100	2 880
AXLM225EA1950	23,5	8,8	30,0	390	4 300
AXLM225EW1950	25,8	19,2	33,0	1 660	4 300
AXLM225EA2000	16,0	6,2	20,0	380	4 320
AXLM225EW2000	17,7	12,8	22,0	1 460	4 320
AXLM225EA2600	31,2	11,5	40,0	520	5 700
AXLM225EW2600	34,4	25,6	44,0	2 210	5 700
AXLM225EA3000	24,0	9,3	30,0	570	6 430
AXLM225EW3000	26,6	19,2	33,0	2 190	6 430
AXLM225EA4000	32,0	12,3	40,0	760	8 540
AXLM225EW4000	35,4	25,6	44,0	2 920	8 540
AXLM225EA5000	41,0	15,6	50,0	950	10 650
AXLM225EW5000	44,3	32,0	55,0	3 650	10 650

Current consumption AXLM325

Type	I_{max} [A]	I_n [A]	I_{ULT} [A]	P_V [W]	F_A [N]
AXLM325EA2650	14,2	5,6	18,0	490	5 760
AXLM325EW2650	17,6	12,8	22,0	1 820	5 760
AXLM325EA3970	21,3	8,4	27,0	740	8 570
AXLM325EW3970	26,4	19,2	33,0	2 730	8 570
AXLM325EA5300	28,4	11,2	35,0	980	11 380
AXLM325EW5300	35,2	25,6	44,0	3 640	11 380
AXLM325EA6600	35,5	14,0	45,0	1 230	14 200
AXLM325EW6600	44,0	32,0	55,0	4 560	14 200

5.8.1.8   Motor Interface

The interface between motor and controler is via a plug mounted on the side of the slider of the AXLM Axis. It is up to a peak current Imax of 30A a built-in boxes M23x1 for circular connectors. With a peak current Imax over 30A built-in boxes M40x1.5 for circular connectors are used.

The built-in boxes have a 8-pin design with below shown pin configuration.

Circular connector

Pin	Function	Color
1	U	BLACK 1
⏚	GND	YELLOW - GREEN
3	V	BLACK 2
4	W	BLACK 3
A	Thermo switch	WHITE
B	Thermo switch	BROWN
C	not configurated	
D	not configurated	

Circular connector
M23 x 1

Circular connector
M40 x 1,5
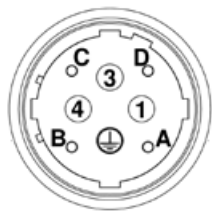
We can supply the AXLM Axis with pre-assembled motor connection cables on request.

For more information please contact our application engineers.

6. Accessories

6.1 Fastening and connecting elements

For the assembly of SNR Linear Axis is a perfectly matched range of fastening elemets available. Sliding blocks, fastening strips and an extensive range of connecting elements offer manifold possibilities to fix the axis on mounting surfaces or to combine axis.

As fastening and connecting elements the following components are available:

- Fastening strips and fastening elements
- Sliding blocks
- Hammer screws
- Direct connections
- Cross connections
- Gantry connections
- A –Standard connections
- Angle connections

6.1.1 Fastening strips / fastening elements

Fastening strips and fastening elements (Figures 6.1 and 6.3) are available for Linear Axis of the series AXC, AXDL and AXF.

The distance between the fastening points should be selected depending on the load and the required straightness and the rigidity.

The dimensions and type codes, including the ID - Numbers are shown for Linear Axis of the series AXC and AXDL in Figure 6.2 and Table 6.1 and for Linear Axis of the AXF series in Figure 6.4 and Table 6.2. For Linear Axis of the AXF series, the dimensions J and F (Chapter 5.3.1.2 and 5.3.2.2) as well as the number of fastening elements must be specified.
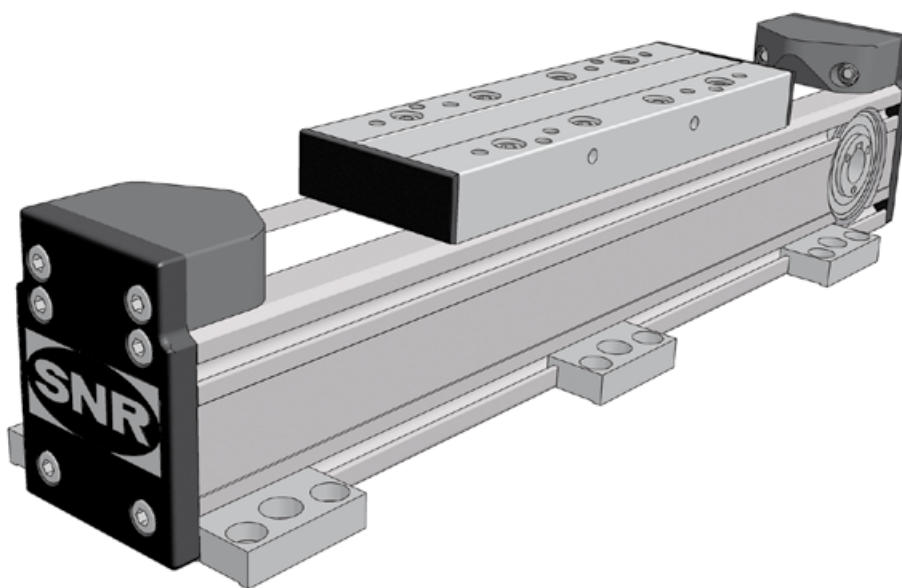
Figure 6.1 — Linear Axis AXC fastening strips
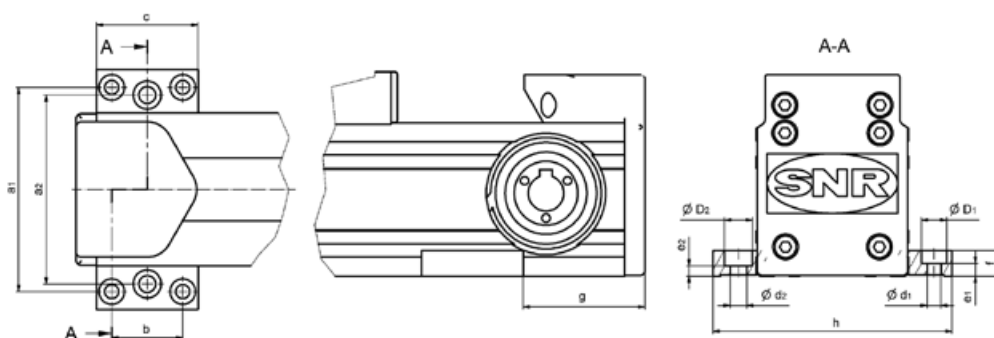
Figure 6.2 — Dimensions fastening strips AXC / AXDL

Table 6.1 — Fastening strips AXC / AXDL

Type	Designation	ID number	a1 [mm]	a2 [mm]	b [mm]	c [mm]	d1 [mm]	D1 [mm]	e1 [mm]	d2 [mm]	D2 [mm]	e2 [mm]	f [mm]	g[1] [mm]	h [mm]
AXC40	AX-AC-FST-40x13-2	108663	55		28	40	5,5	10	7,0				13	38[2]	66
AXC60[3]	AX-AC-FST-40x10-3	108579	80	74	28	40	5,5	10	5,0	6,6	11	4	10	48	94
AXC80	AX-AC-FST-70x20-2	108075	94		50	70	6,6	11	14,0				20	76	108
AXC100Z_B	AX-AC-FST-78x22-2	571025	116		60	78	9,0	15	11,5				22	108	140
AXC100Z_C	AX-AC-FST-80x22-2	104481	120		40	80	9,0	15	13,0				22	108	140
AXC100Z_L	AX-AC-FST-120x22-3	111181	120	120	80	120	9,0	15	13,0	9	15	13	22	108	140
AXC100_D	AX-AC-FST-68x9-2	465044	118		50	68	6,5	11	3,5				9	88	128
AXC120[4]	AX-AC-FST-78x22-2	571025	136		60	78	9,0	15	11,5				22	108	160
	AX-AC-FST-80x22-2	104481	140		40	80	9,0	15	13,0				22	108	160
	AX-AC-FST-120x22-3	111181	140	140	80	120	9,0	15	13,0	9	15	13	22	108	160
AXDL110	AX-AC-FST-47x7-2	465040	126		30	47	5,5	9	3,5				7	69	140
AXDL160	AX-AC-FST-68x9-2	465044	174		50	68	6,5	11	3,5				9	88	188
AXDL240[4]	AX-AC-FST-78x22-2	571025	256		60	78	9,0	15	11,5				22	108	280
	AX-AC-FST-80x22-2	104481	260		40	80	9,0	15	13,0				22	108	280
	AX-AC-FST-120x22-3	111181	260	260	80	120	9,0	15	13,0	9	15	13	22	108	280

[1] - For toothed belt axis measure k2 of drive adapter or gearbox Chapter 6.2.4.1, Table 6.23, but ≥ dimension a of the machining on the drive-side Chapter 6.2.1, Table 6.15

[2] - For toothed belt axis with assembled coupling

[3] - Also suitable for standard machine construction profiles spacing 20

[4] - Also suitable for standard machine construction profiles spacing 40
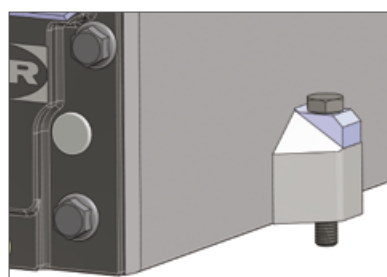
Figure 6.3 — Linear Axis AXF with fastening element
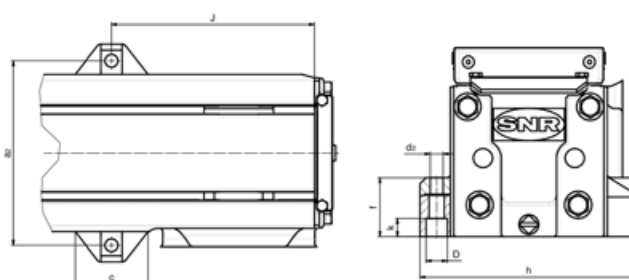
Figure 6.4 — Dimensions fastening element AXF

Table 6.2 — Fastening element AXF

Type	Designation	ID number	a2 [mm]	c [mm]	D [mm]	d2 [mm]	f [mm]	J min [mm]	h [mm]	k [mm]
AXF100Z								134[1]		
AXF100S	AX-AC-FEL-48x39-1	371439	122	48	12 H8	8,5	39	30	144	12
AXF100T										
AXF100G										

[1] - Drive side, see dimension Chapter 5.3.1.2

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6.1.2 Sliding blocks

Sliding blocks (Figure 6.5) are available for Linear Axis of the series AXC, AXDL, AXLT and AXS.

The distance between the sliding blocks should be selected depending on the load and the required straightness and the rigidity.

Four different designs of sliding blocks are available. The dimensions and type codes, including the ID - Numbers of the sliding blocks are shown in Figure 6.6 and Table 6.3.

Design type E / F

- Standard sliding block
- Steel galvanized (partly stainless steel A2 possible)
- Can be swiveled into any position
- Fixation via spring-loaded ball

Design type R

- For effective component mounting
- Zinc diecasting
- Is pre-assembled on the component and can be inserted in any position
- Locking by tightening the screw
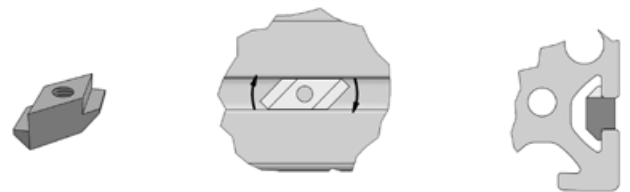
Design type S

- Heavy load sliding block
- Steel galvanized (partly stainless steel A2 possible)
- Pushed in from the profile end
- For groove width 8 fixation via spring-loaded ball
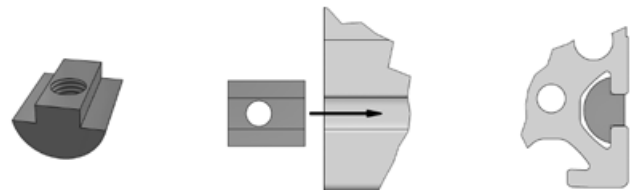
Figure 6.5 — Sliding block designs
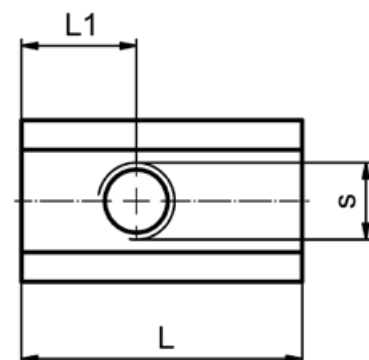
Figure 6.6 — Sliding block dimensions

Table 6.3 — Sliding blocks

Type	Designation	ID number	Design type	S	L[1] [mm]	L1[1] [mm]	TA[2] [Nm]	max. tensil force [N]
AXC40 AXC60	AX-AC-SBL-5ST-M3-E	109066	E	M3	12	3,0	1,5	500
	AX-AC-SBL-5ST-M4-E	109073	E	M4	12	4,0	3,0	500
	AX-AC-SBL-5ST-M4-E-A2	289073	E	M4	12	4,0	3,0	500
	AX-AC-SBL-5ST-M5-E	109070	E	M5	12	4,0	4,5	500
	AX-AC-SBL-5ST-M5-E-A2	139275	E	M5	12	4,0	4,5	500
	AX-AC-SBL-5-M3-R-Zi	103758	R	M3	5	2,5	1,0	50
AXC80	AX-AC-SBL-6ST-M4-E	109094	E	M4	17	5,0	4,0	1 750
	AX-AC-SBL-6ST-M5-E	109093	E	M5	17	5,0	8,0[3]	1 750
	AX-AC-SBL-6ST-M6-E	109091	E	M6	17	5,5	14,0[3]	1 750
	AX-AC-SBL-6ST-M6-E-A2	203392	E	M6	17	5,5	14,0[3]	1 750
	AX-AC-SBL-6-M4-R-Zi	103759	R	M4	15	7,5	1,5	150
AXC100Z (groove laterally above)	AX-AC-SBL-6-ST-M4-F	255069	F	M4	16	8,0	4,0[3]	1 750
	AX-AC-SBL-6-ST-M5-F	353280	F	M5	16	8,0	8,0[3]	1 750
	AX-AC-SBL-6-ST-M6-F	255070	F	M6	16	8,0	14,0[3]	1 750
AXC100Z (groove below and laterally below)	AX-AC-SBL-8-ST-M5-F	258785	F	M5	22	7,0	8,0[3]	2 500
	AX-AC-SBL-8-ST-M6-F	183942	F	M6	22	7,0	14,0[3]	2 500
	AX-AC-SBL-8-ST-M8-F	149812	F	M8	22	7,0	25,0	2 500
AXC120 AXLT155 AXLT225 AXS120T AXS200 AXDL240	AX-AC-SBL-8ST-M4-E	103763	E	M4	22	9,0	4,0	2 500
	AX-AC-SBL-8ST-M6-E	108963	E	M6	22	9,0	14,0[3]	3 500
	AX-AC-SBL-8ST-M8-E	108962	E	M8	22	9,0	25,0	5 000
	AX-AC-SBL-8-M4-R-Zi	109090	R	M4	19	9,5	1,5	250
	AX-AC-SBL-8-M5-R-Zi	103761	R	M5	19	9,5	1,5	250
	AX-AC-SBL-8ST-M5-S	103753	S	M5	22	9,0	8,0[3]	2 500
	AX-AC-SBL-8ST-M6-S	103755	S	M6	22	7,0	14,0[3]	3 500
	AX-AC-SBL-8ST-M8-S	108961	S	M8	20	7,0	34,0[3]	5 000
	AX-AC-SBL-8ST-M8-S-A2	203213	S	M8	20	7,0	34,0[3]	5 000
AXS280	AX-AC-SBL-12ST-M6-S	410647	S	M6	35	11,5	14,0[3]	6 000
	AX-AC-SBL-12ST-M8-S	109067	S	M8	35	11,5	34,0[3]	3 500
	AX-AC-SBL-12ST-M10-S	103760	S	M10	35	11,5	46,0	10 000
	AX-AC-SBL-12ST-M12-S	147263	S	M12	35	11,5	80,0	10 000
AXS230 AXS460	AX-AC-SBL-DIN508-14-M8-S	103764	S	M8	22	11,0	34,0[3]	6 000
	AX-AC-SBL-DIN508-14-M12-S	103749	S	M12	22	11,0	85,0	10 000

[1] - Maximum value, deviating dimension possible
[2] - Maximum tightening torque
[3] - Maximum tightening torque only applies to screws of property class 10.9

6.1.3 Hammer screws

Hammer screws (Figure 6.7) and hammer nuts are used for mounting the Linear Axis of the AXF series. For this purpose the closed profile grooves must be opened at positions defined by the user.

Figure 6.7 — Linear Axis AXF with hammer screws

Hammer screws and hammer nuts are available in different sizes and lengths. The dimensions and the type code, including the ID number of the hammer screws and hammer nuts are shown in Figure 6.8 and Table 6.4.
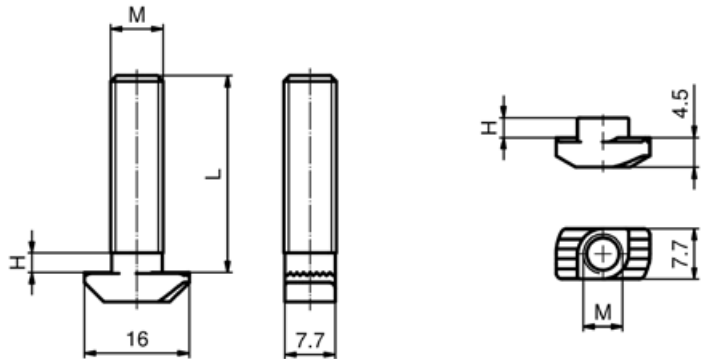
Figure 6.8 — Dimensions hammer screws and hammer nuts AXF

Table 6.4 — Hammer screws and hammer nuts AXF

Type	Designation	ID number	Design type	H [mm]	L [mm]	M	Material
AXF100	AX-AC-HNU-8M6	396378	R	3,0		M6	galvanized steel
	AX-AC-HSC-8M8x30	328149	R	3,0	30	M8	
	AX-AC-HSC-8M8x40	372088	R	3,0	40	M8	

6.1.4 Direct connection

Direct connections (Figures 6.9 and 6.10) are connecting sets which contain all the essential connecting elements such as adapter plates, fastening strips, screws.
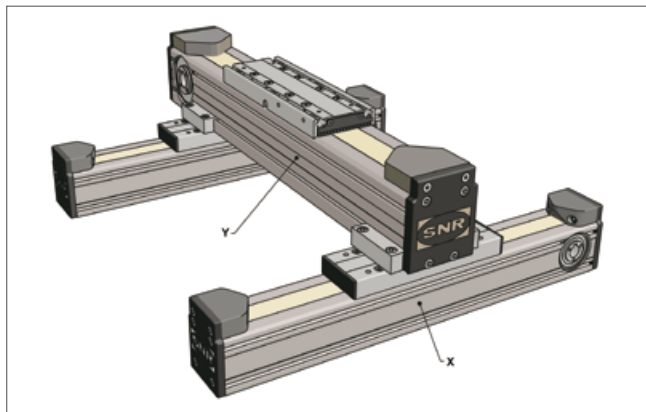
Figure 6.9 — Direct connection AXC / AXC
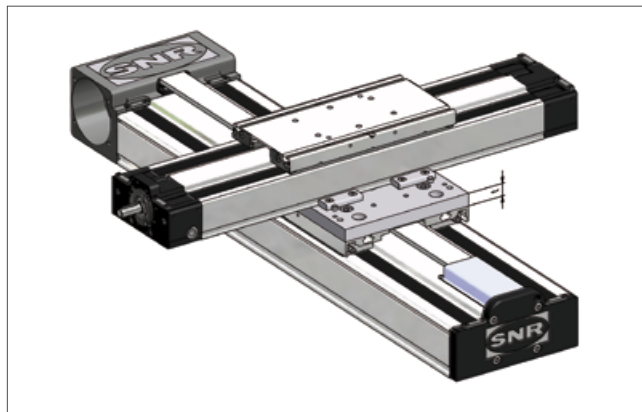
Figure 6.10 — Direct connection AXDL / AXDL

The type codes and ID number of direct connections are shown in Table 6.5.

Table 6.5 — Direct connection AXC / AXDL

<table>
<tr><td colspan="2"></td><td colspan="9" align="center">Y - Axis</td></tr>
<tr>
<td colspan="2"></td>
<td>AXC40</td>
<td>AXC60</td>
<td>AXC80</td>
<td>AXC100Z_B
AXC100Z_C
AXC100Z_L</td>
<td>AXC100_D</td>
<td>AXC120</td>
<td>AXDL110</td>
<td>AXDL160</td>
<td>AXDL240</td>
</tr>
<tr>
<td rowspan="10">X - Axis</td>
<td>AXC40</td>
<td>AX-AC-DCU-40-40 (ID 250762)</td>
<td>AX-AC-DCU-40-60 (ID 382286)</td>
<td></td><td></td><td></td><td></td><td></td><td></td><td></td>
</tr>
<tr>
<td>AXC60</td>
<td></td>
<td>2x AX-AC-DCU-60-60 (ID 230147)</td>
<td></td><td></td><td></td>
<td>AX-AC-DCU-60-120 (ID 382283)</td>
<td>AX-AC-DCU-60-110-1 (ID677674) or AX-AC-DCU-60-110-E[4] (ID459273)</td>
<td></td><td></td>
</tr>
<tr>
<td>AXC80</td>
<td></td><td></td><td></td>
<td>AX-AC-DCU-80-120 (ID 207896)</td>
<td>AX-AC-DCU-80-160 (ID 167332)</td>
<td>AX-AC-DCU-80-120 (ID 207896)</td>
<td></td>
<td>AX-AC-DCU-80-160 (ID 167332)</td>
<td>AX-AC-DCU-80-120[5] (ID 207896)</td>
</tr>
<tr>
<td>AXC100
AXF100</td>
<td></td><td></td><td></td><td></td><td></td>
<td>AX-AC-DCU-120-120 (ID 170469)</td>
<td></td><td></td>
<td>AX-AC-DCU-120-120 (ID 170469)</td>
</tr>
<tr>
<td>AXC120</td>
<td></td><td></td><td></td>
<td>AX-AC-DCU-120-120 (ID 170469)</td>
<td></td>
<td>AX-AC-DCU-120-120 (ID 170469)</td>
<td></td><td></td><td></td>
</tr>
<tr>
<td>MB profile raster 40</td>
<td></td>
<td>AX-AC-DCU-60-60 (ID 230147) + 2x AX-AC-FST-80-22-2 (ID 104481) + 4x M8x25 DIN912 (ID 113509) + 4x AX-AC-SBL-8ST-M6-E (ID 108963)</td>
<td></td>
<td>2x AX-AC-FST-80-22-2 (ID 104481) + 4x M8x25 DIN912 (ID 113509) + 4x AX-AC-SBL-8ST-M6-E (ID 108963) or 2x AX-AC-FST-120-22-3 (ID 111181) + 6x M8x25 DIN912 (ID 113509) + 6x AX-AC-SBL-8ST-M6-E (ID 108963)</td>
<td></td>
<td>2x AX-AC-FST-80-22-2 (ID 104481) + 4x M8x25 DIN912 (ID 113509) + 4x AX-AC-SBL-8ST-M8-E (ID 108962) or 2x AX-AC-FST-120-22-3 (ID 111181) + 6x M8x25 DIN912 (ID 113509) + 6x AX-AC-SBL-8ST-M8-E (ID 108962)</td>
<td></td><td></td>
<td>2x AX-AC-FST-80-22-2 (ID 104481) or 2x AX-AC-FST-120-22-3 (ID 111181)</td>
</tr>
<tr>
<td>MB profile raster 50</td>
<td></td><td></td>
<td>AX-AC-DCU-60-80 (ID 205685) + 4x AX-AC-SBL-8ST-M6-E (ID 108963)</td>
<td></td><td></td><td></td><td></td>
<td>2 x AX-AC-FST-68-9-2 (ID 150999)</td>
<td></td>
</tr>
<tr>
<td>AXDL110</td>
<td>AX-AC-DCU-110-40[1] (ID 382287)</td>
<td>AX-AC-DCU-110-60[1] (ID 281274)</td>
<td></td><td></td><td></td><td></td>
<td>AX-AC-DCU-110-110 (ID 207936)</td>
<td></td><td></td>
</tr>
<tr>
<td>AXDL160[2]</td>
<td></td>
<td>AX-AC-DCU-160-60 (ID 382288)</td>
<td>AX-AC-DCU-160-80 (ID 288848)</td>
<td></td><td></td><td></td>
<td>AX-AC-DCU-160-110 (ID 357642)</td>
<td>AX-AC-DCU-160-160 (ID 308879)</td>
<td></td>
</tr>
<tr>
<td>AXDL240[3]</td>
<td></td><td></td><td></td><td></td><td></td>
<td>AX-AC-DCU-240-120 (ID 288945)</td>
<td></td>
<td>AX-AC-DCU-240-160 (ID 248768)</td>
<td>AX-AC-DCU-240-240 (ID 187412)</td>
</tr>
</table>

[1] - Distance plate t = 12 mm
[2] - Distance plate t = 15 mm
[3] - Distance plate t = 20 mm
[4] - Distance plate t = 6 mm with tolerance compensation system
[5] - Only for AXC80 with guiding system C possible

SNR
Brand of NTN Group

The linear tables of the AXLT series are designed so that they can be combined in the simplest way to cross tables (Figure 6.10). Depending on the size, an adapter is not necessary.

In cross tables with the arrangement base plate on tabletop either linear tables of the same size or the next smaller size can be mounted on the tabletop. An adapter plate is not necessary in both cases.
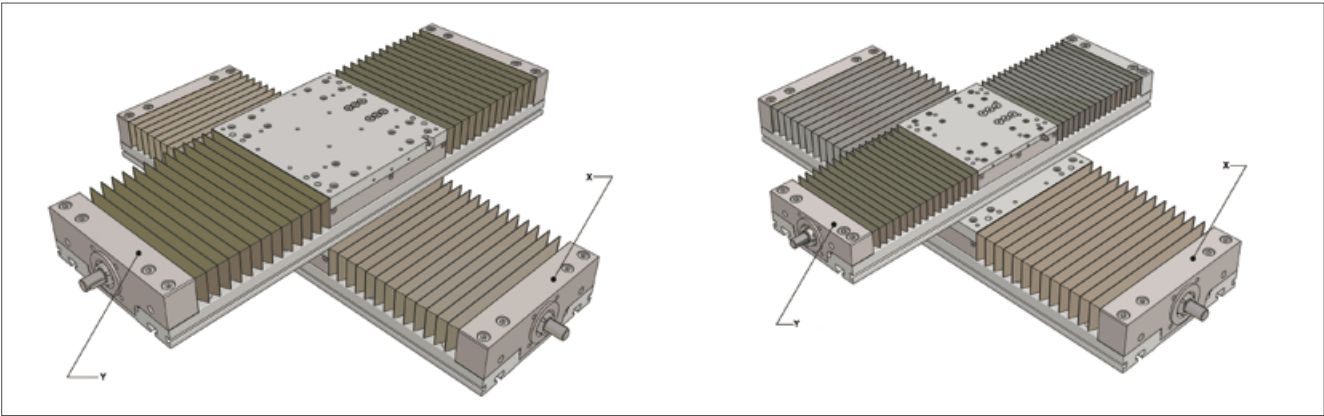
Figure 6.10 — Direct connection AXLT

The type codes and ID number of direct connections are shown in Table 6.6.

Table 6.6 — Direct connection AXLT

		Y - Axis			
		AXLT155	AXLT225	AXLT325	AXLT455
X - Axis	AXLT155	AX-AC-DCU-155-155 (ID 261642)			
	AXLT225	AX-AC-DCU-225-155 (ID 352103)	AX-AC-DCU-225-225 (ID 315714)		
	AXLT325		AX-AC-DCU-325-225 (ID 382274)	AX-AC-DCU-325-325 (ID 290188)	
	AXLT455			AX-AC-DCU-455-325 (ID 245182)	AX-AC-DCU-455-455 (ID 382275)

6.1.5 Cross connection

Cross connections (Figure 6.11) are connecting elements for the mounting of 2 – axis systems in which the tabletops of the respective axis are assembled together. The cross connections include all necessary connecting elements inclusive the screws.
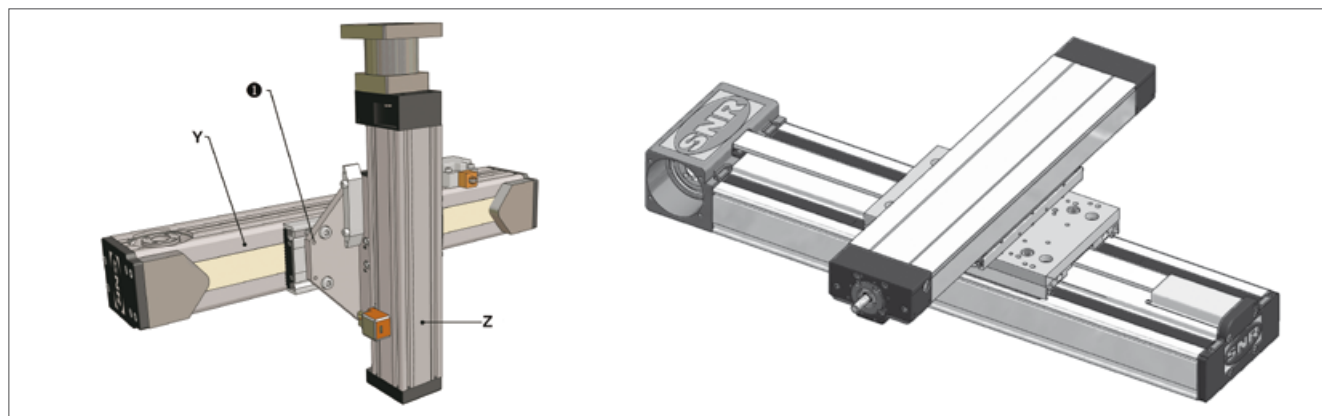
Figure 6.11 — Cross connection AXC / AXC and AXC / AXDL

❶ Alignment by cylindrical pin or Mounting edge

The type codes and dimensions including ID number of the cross connections are shown in Figure 6.12 and Table 6.7.
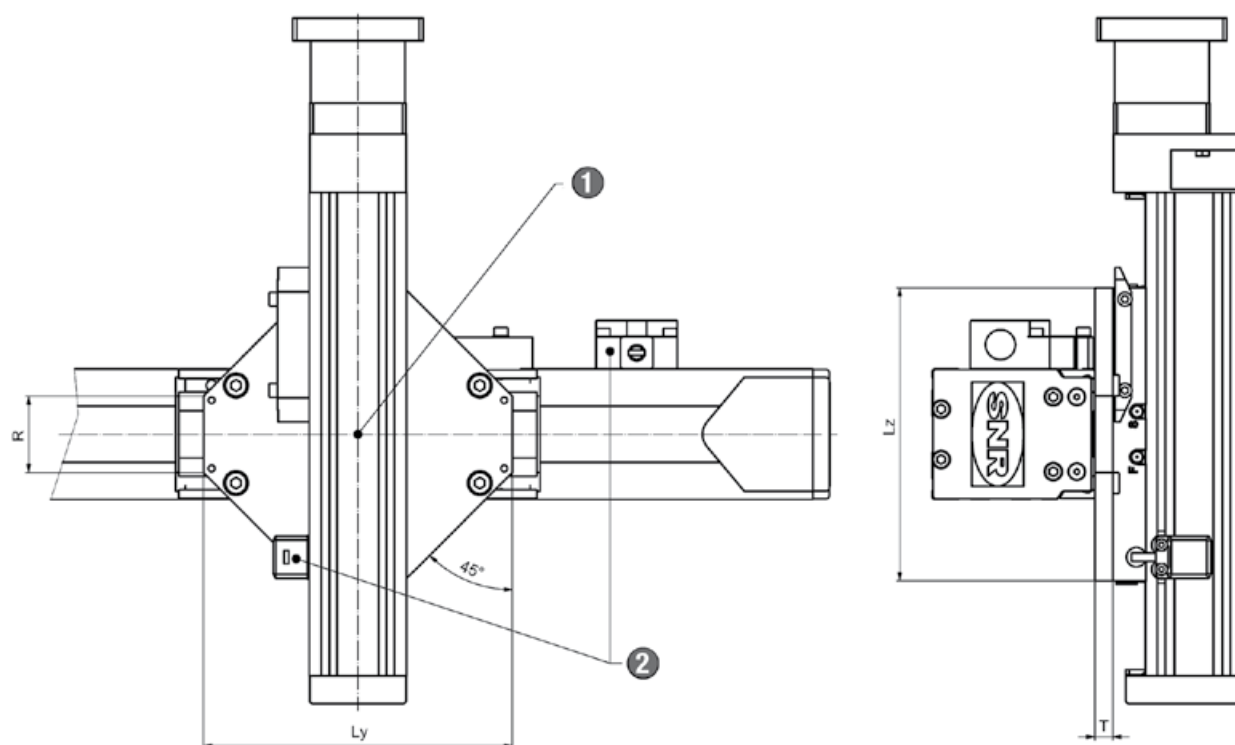
❶ Centerline of the Axis = middle slider plate

❷ Note the installation side oft he switches for die Y – axis with Typ AXC60

Figure 6.12 — AX – Cross connection

Table 6.7 — Cross connection AXC / AXDL

Y - Axis	Z - Axis	Type code	ID number	L$_y$	L$_z$ [mm]	R [mm]	T [mm]
AXC60	AXC40	AX-AC-CCU-60-40	382276	90	90	58	10
AXC60	AXC60	AX-AC-CCU-60-60	160635	90	90	58	12
AXC80	AXC60	AX-AC-CCU-80-60	158840	190	180	47	11
AXC80	AXC80	AX-AC-CCU-80-80	253556	220	220	77	15
AXC100	AXC80	AX-AC-CCU-120-80	187419	280	220	116	20
AXC120	AXC80	AX-AC-CCU-120-80	187419	280	220	116	20
AXC120	AXC120	AX-AC-CCU-120-120	311633	280	280	116	20
AXDL110	AXC40	AX-AC-CCU-110-40	382278	215	120		12
AXDL110	AXC60	AX-AC-CCU-110-60	252539	150	120		12
AXDL160	AXC60	AX-AC-CCU-160-60	265455	240	160		15
AXDL160	AXC80	AX-AC-CCU-160-80	169160	220	200		20
AXDL240	AXC80	AX-AC-CCU-240-80	382279	330	240		20
AXDL240	AXC100	AX-AC-CCU-240-100	382280	330	325		20
AXDL240	AXC120	AX-AC-CCU-240-120	172533	330	325		20
AXDL110	AXDL110	AX-AC-CCU-110-110	259405	150	120		12
AXDL160	AXDL110	AX-AC-CCU-160-110	351593	240	160		15
AXDL160	AXDL160Z/S	AX-AC-CCU-160-160	264974	240	160		15
AXDL240	AXDL160Z/S	AX-AC-CCU-240-160	329494	330	240		20
AXDL240	AXDL240Z/S	AX-AC-CCU-240-240	163391	330	240		20

In the cross tables of the AXLT series with the arrangement tabletop to tabletop either linear tables of the same size or the next smaller size can be mounted (Figure 6.13). A distance plate is not necessary beginning with size AXLT325.
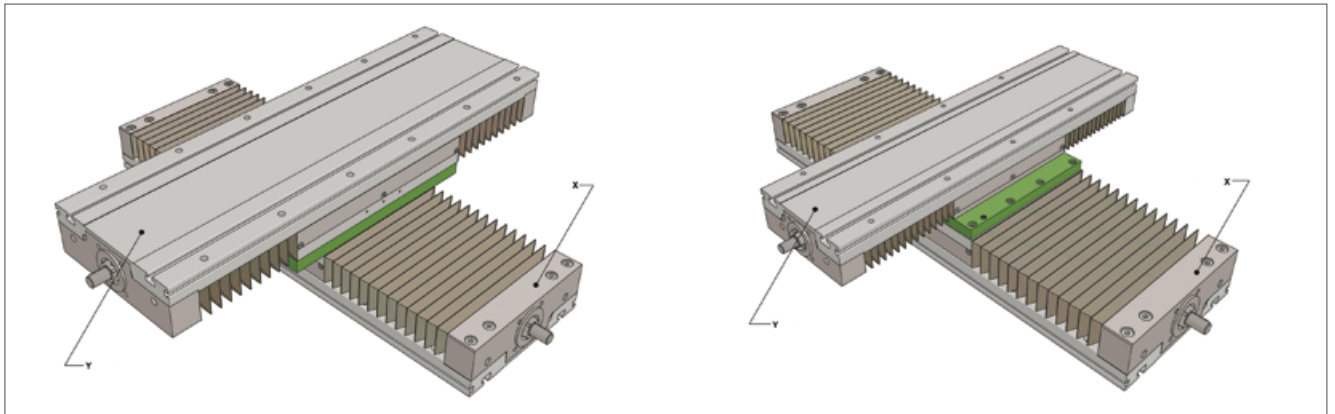
Figure 6.13 — Cross connection AXLT

The type codes and including ID number of the cross-connections are shown in Table 6.8.

Table 6.8 — Direct connection AXLT

		Y - Axis			
		AXLT155 (Guiding system E)	AXLT225 (Guiding system E)	AXLT325 (Guiding system E)	AXLT455
X - Axis	AXLT155	AX-AC-CCU-155-155 (ID 186015)			
	AXLT225	AX-AC-CCU-225-155 (ID 262080)	AX-AC-CCU-225-225 (ID 382281)		
	AXLT325		AX-AC-CCU-325-225 (ID 262991)	AX-AC-CCU-325-325 (ID 382282)	
	AXLT455			AX-AC-CCU-455-325 (ID 382284)	AX-AC-CCU-455-455 (ID 382285)

6.1.6 Gantry connection

Gantry connections (Figure 6.14) are connecting elements for the mounting of X – Y -axis systems in where the Y – axis will be assembled in 90° position.

Gantry connections contain all the essential connecting elements including screws.
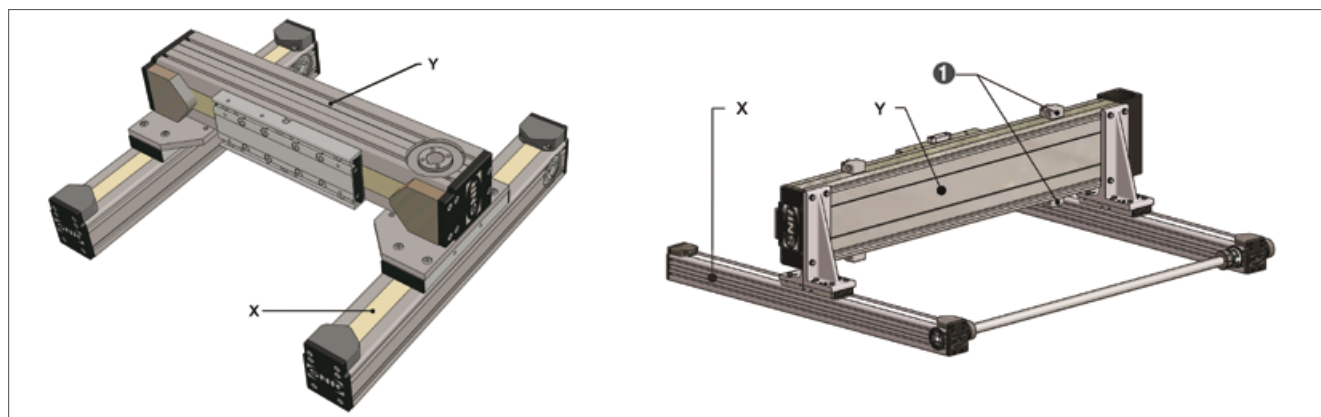
Figure 6.14 — Gantry connection AXC / AXC and AXC / AXDL

❶ Switches available on both sides

The type codes and dimensions including ID number of the gantry connections are shown in Figure 6.15 and Table 6.9.

Figure 6.15 — Gantry connection AXC - AXC
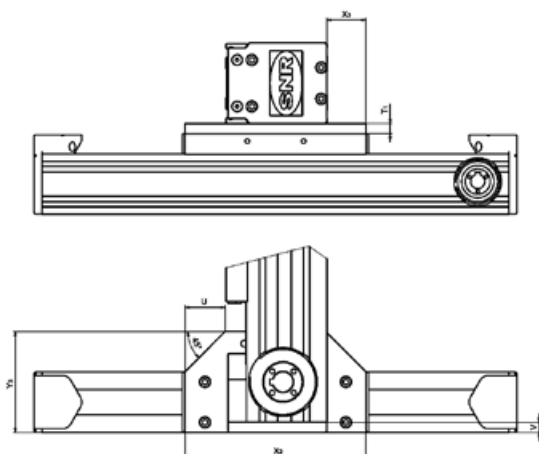
Figure 6.16 — Gantry connection AXC - AXDL
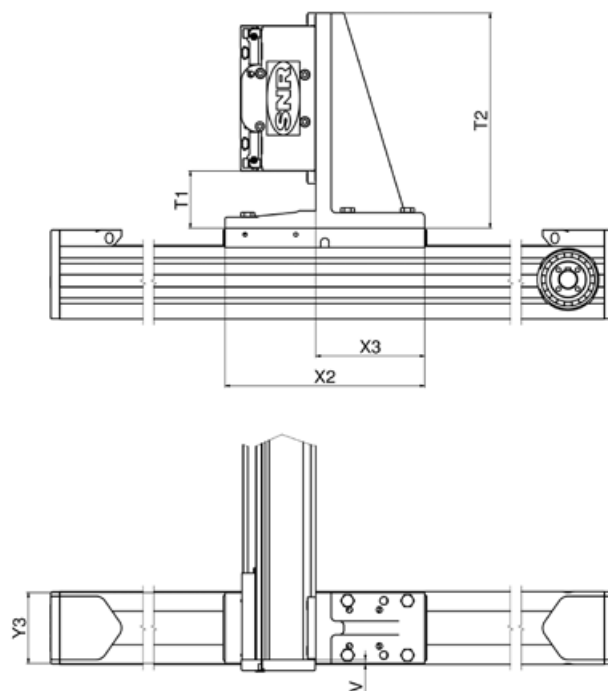
Table 6.9 — Gantry connection AXC / AXDL

X - Axis	Y - Axis	Type code	ID number	T1 [mm]	T2 [mm]	U [mm]	V [mm]	X2 [mm]	X3 [mm]	Y3 [mm]
AXC40	AXC60	AX-AC-GCU-40-60	305211	8		10	11,0	98	19,0	59,0
AXC60	AXC60	AX-AC-GCU-60-60	190012	12		16	15,5	130	30,0	74,5
	AXC80Z	AX-AC-GCU-60-80	160364	10		40	10,0	180	39,0	100,0
	AXC80S/T/A						22,0			
	AXDL110	AX-AC-GCU-60-110	230361	49	174		5,5	160	90,0	58,0
	AXDL160	AX-AC-GCU-60-160	265454	63	237		5,0	220	120,0	78,0
AXC80	AXC80Z	AX-AC-GCU-80-80	146277	146277			0,0	155	19,0[1]	80,0
	AXC80S/T/A						10,0			
	AXC120Z	AX-AC-GCU-80-120	173183	15		6	20,0 / 10,0	194	16,0[1]	140,0
	AXC120S/T/A						20,0 / 25,0			
	AXDL160	AX-AC-GCU-80-160	169154	63	237		5,0	220	120,0	78,0
	AXDL240	AX-AC-GCU-80-240	253949	49	287		11,0	220	120,0	100,0
AXC100_B	AXDL240	AX-AC-GCU-120-240	172106	49	287		11,0	220	137,0	100,0
AXC100_C	AXDL240								132,0	
AXC100_C[2]	AXS200M_1[3] AXS200Y_1[3]	integrated in the Y-axis		25			52,5	457	79,5[1]	99,0
	AXS280M_1[3] AXS280Y_1[3]	integrated in the Y-axis							75,0[1]	
AXC120_B/C/L	AXDL240	AX-AC-GCU-120-240	172106	49	287		11,0	220	120,0[1]	100,0
	AXS280	AX-AC-GCU-120-280	164317	30			-40,0	170	30,0[1]	200,0
AXC120Z_C[2]	AXS280M_2[3] AXS280Y_2[3]	integrated in the Y-axis		30			62,5	525	72,5[1]	118,0
AXS120M_B[2]	AXS280M_3[3] AXS280Y_3[3]	integrated in the Y-axis		30			62,5	525	112,5	118,0
AXS120M_C[2]	AXS460M_4[3]	integrated in the Y-axis								

[1] - Fixation of the position on the X – axis by cylindrical pin

[2] - in the type code position 9 : G resp. H for configuration version with tolerance compensation element

[3] - in the type code position 9: code number 1...3 for integrated gantry connection

6.1.7 A – Standard connection

A - Standard connections are connecting elements for the combination from Linear Axis of the series AXC and AXDL with axis with toothed belt - Ω – drive of the series AXC and AXDL (Figure 6.17).

The A – standard connections contain all the essential connecting elements including screws.
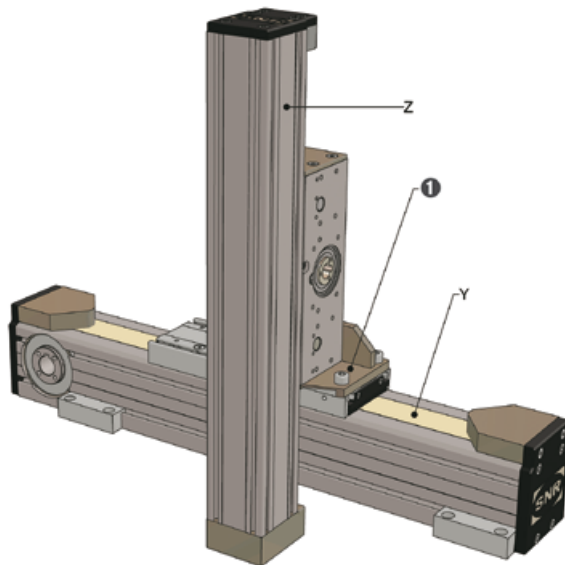
❶ Optional fixation of the position adapted for the assembling as a 3 – axis – system with direct connection to the X – axis

Figure 6.17 — A – Standard connection AXC / AXDL

The type codes and dimensions including ID number of the A - standard connections are shown in Figure 6.18 and Table 6.10.

1 Adaptor set pre-assembled on the Z – axis
2 Upper end position
3 Fixed position
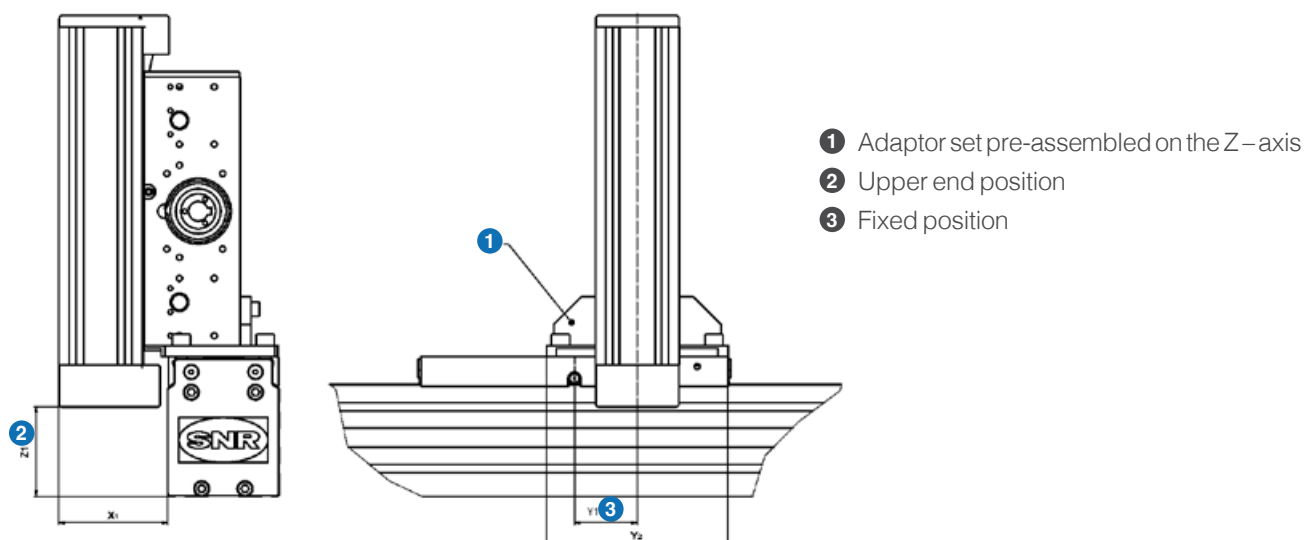
Figure 6.18 — A – Standard connection AXC / AXDL

Table 6.10 — A – Standard connection AXC / AXDL

Y - Axis	Z - Axis	Code number [1]	X1 [mm]	Y1 [mm]	Y2 [mm]	Z1 [mm]
AXC60	AXC40A	A	61	0	120	60,0
AXC80	AXC60A	B	78	45	130	64,0
AXC80A				20		114,0
AXC100_B AXC100_C AXC100_L	AXC80A	C	102	0	150	62,5
AXC100_D			100			
AXC120			92	59	150	87,5
AXC120A				0 / 55		157,5
AXDL110	AXC40A	D	61	0	132	43,0
	AXC60A	E	90	0 / 18	130	29,0
AXDL160	AXC60A	F	75	0	150	51
	AXC80A	G	110	0	150	22,5
AXDL240	AXC120A	H	140	0	200	20,0

[1] - A-Standard connection is installed at the factory, insert the code number in the type code at position 10 (additional option)

6.1.8   Angle connection

Angle connections provides a variety of possibilities for the combination of Linear Axis of the AXDL series to 2 – axis – systems in X – Y or Y – Z arrangement (Figures 6.19 up to 6.22). Combinations of Linear Axis with the same size and with a different of one size are possible. The connecting elements are produced from aluminum sand cast (EN AC-AlSi7Mg0,3 ST6). The angle connections contain all the essential connecting elements including screws.

The type codes and dimensions including ID number of the angle connections are shown in Figures 6.19 up to 6.22 and Tables 6.11 up to Table 22.

X – Y – Axis – System, profile assembly
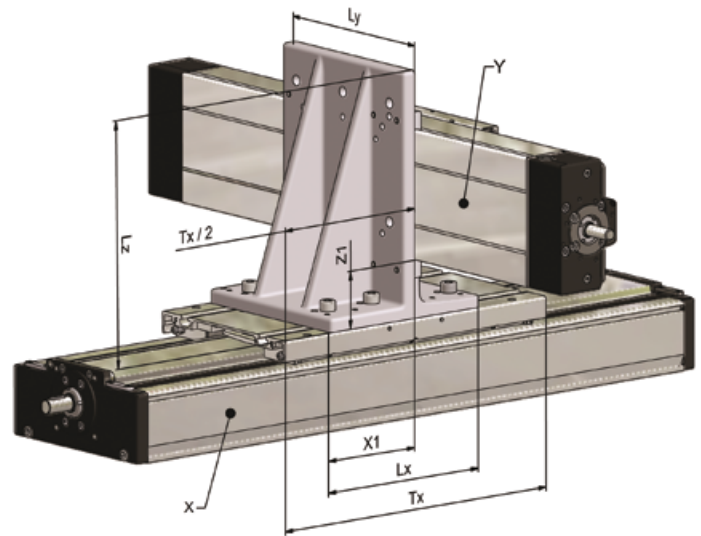
Figure 6.19 —
Angle connection X – Y – Axis – System, profile assembly

Table 6.11 — Angle connection X – Y – Axis – System, profile assembly

X - Axis	Y - Axis	Designation	ID number	Lx [mm]	X1 [mm]	Ly [mm]	Z1 [mm]	Lz [mm]
AXDL110	AXDL110	AX-AC-ACU-X110-Y110	459876	160	90	156	49,0	209
AXDL160	AXDL110	AX-AC-ACU-X160-Y110P	286227	160	90	156	49,0	209
AXDL160	AXDL160	AX-AC-ACU-X160-Y160	306559	220	120	236	63,0	287
AXDL240	AXDL160	AX-AC-ACU-X240-Y160P	256449	220	120	236	63,0	287
AXDL240	AXDL240	AX-AC-ACU-X240-Y240	262988	220	120	236	49,0	287

X – Y – Axis – System, table assembly
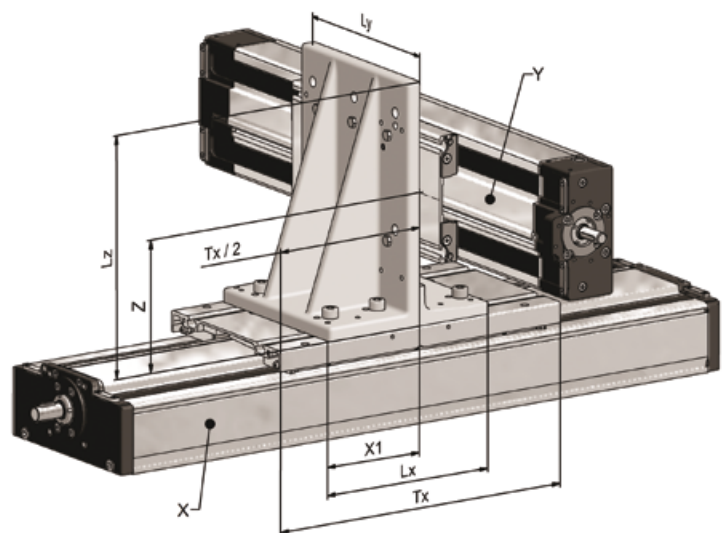
Figure 6.20 —
Angle connection X – Y – Axis – System, tabletop assembly

Table 6.12 — Angle connection X – Y – Axis – System, tabletop assembly

X - Axis	Y - Axis	Designation	ID number	Lx [mm]	X1 [mm]	Ly [mm]	Z [mm]	Lz [mm]
AXDL110	AXDL110	AX-AC-ACU-110-110	382293	160	90	156	114,0	209
AXDL160	AXDL110	AX-AC-ACU-X160-Y110T	382295	160	90	156	114,0	209
AXDL160	AXDL160	AX-AC-ACU-160-160-2	306666	220	120	236	144,0	287
AXDL240	AXDL160	AX-AC-ACU-X240-Y160T	382295	220	120	236	144,0	287
AXDL240	AXDL240	AX-AC-ACU-240-240	270252	220	120	236	176,5	287

Y – Z – Axis – System, profile assembly
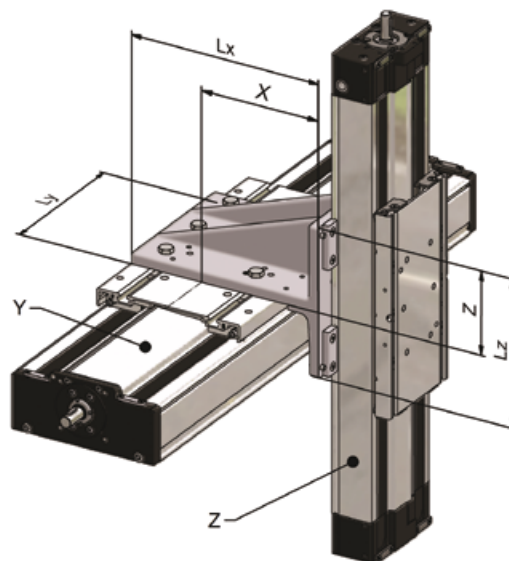
Figure 6.21 —
Angle connection Y – Z – Axis – System, profile assembly

Table 6.13 ___ Angle connection Y – Z – Axis – System, profile assembly

Y - Axis	Z - Axis	Designation	ID number	L_x [mm]	X [mm]	L_y [mm]	L_z [mm]	Z [mm]
AXDL110	AXDL110	AX-AC-ACU-Y110-Z110	363425	209	114	156	160,0	90
AXDL160	AXDL110	AX-AC-ACU-Y160-Z110P	269049	209	130	156	160,0	90
AXDL160	AXDL160	AX-AC-ACU-Y160-Z160	373108	287	144	236	220,0	120
AXDL240	AXDL160	AX-AC-ACU-Y240-Z160P	256449	287	177	236	220,0	120
AXDL240	AXDL240	AX-AC-ACU-Y240-Z240	382303	287	177	236	220,0	120

Y – Z – Axis – System, table assembly
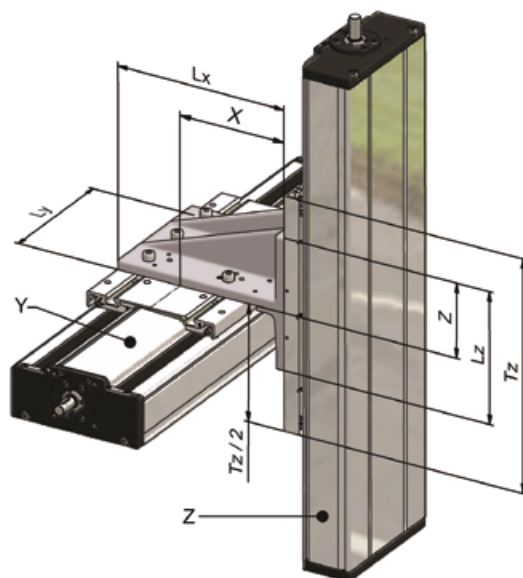
Figure 6.22 —
Angle connection Y – Z – Axis – System, tabletop assembly

Table 6.14 — Angle connection Y – Z – Axis – System, tabletop assembly

Y - Axis	Z - Axis	Designation	ID number	L_x [mm]	X [mm]	L_y [mm]	L_z [mm]	Z [mm]
AXDL110	AXDL110	AX-AC-ACU-110-110	382293	209	114	156	160,0	90
AXDL160	AXDL110	AX-AC-ACU-Y160-Z110T	267710	209	130	156	160,0	90
AXDL160	AXDL160	AX-AC-ACU-160-160-2	306666	287	144	236	220,0	120
AXDL240	AXDL160	AX-AC-ACU-Y240-Z160T	382306	287	177	236	220,0	120
AXDL240	AXDL240	AX-AC-ACU-240-240	270252	287	177	236	220,0	120

6.2 Drive options

6.2.1 Plug-in shaft

Plug-in shafts are common variants of the form-fitting drive adaptation (Figure 6.23), which is available for Linear Axis of the AXC_Z, AXC_A, AXDL_Z and AXDL_A series.

For optimal alignment of the fastening elements for the drive, it is necessary to specify the mounting side for the machining of the profile. The delivery includes the corresponding sliding blocks for the drive fixing. The dimensions are shown in Figure 6.24 and Table 6.15. For applications with higher dynamics, we recommend force and form-fitting drive adaptations with integrated couplings as described in chapter 6.2.2 or 6.2.4.
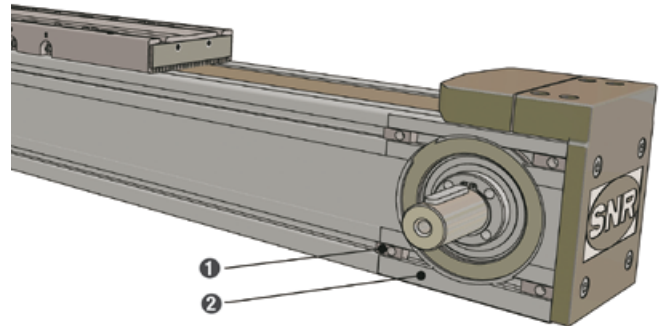
Figure 6.23 __ Plug-in shaft

❶ sliding block / Threaded hole
❷ machined mounting surface for the drive adaptation

The dimensions of the plug-in shafts are shown in Figure 6.24 and Table 6.15
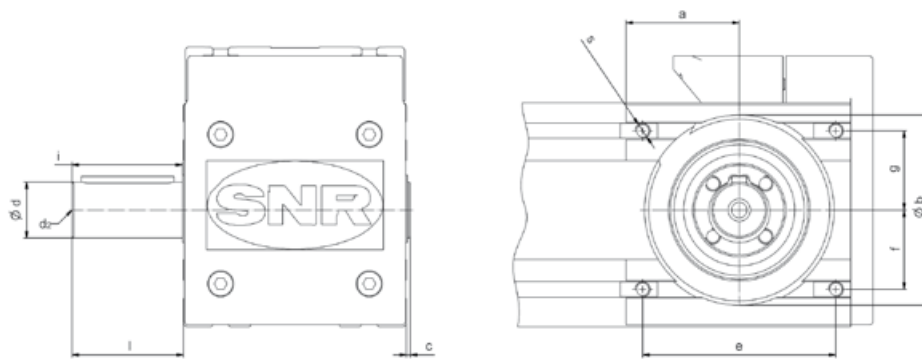
Figure 6.24 — Dimensions plug-in shaft and mounting dimensions

Table 6.15 — Dimensions plug-in shaft

Type	a [mm]	b [mm]	c[1] [mm]	d h6 [mm]	d2	e [mm]	f [mm]	g [mm]	i [mm]	l [mm]	s
AXC40Z AXC40A	23	26H7x1	1	10	M4x7	34,0	9,90	8,10	29,5	30	M3x5
AXC60Z AXC60A	34	47H7x1	1	14	M5x8	54,0	22,50	17,50	30,0	30	M5x6
AXC80Z AXC80A	42	68H7x2	2	20	M6x10	72,0	23,50	20,50	39,3	40	M5x9
AXC100Z	53	90H8x2		25	M10x17	85,0	42,50	42,50	53,5	50	M8x12
AXC120Z	61	102H8x2	2	30	M10x17	104,0	42,50	42,50	59,5	60	M8x12
AXC120A	61 (Ø162)[2]	102H8x2 (110H8x3,5)[2]	2	30	M10x17	104 (91,9)[2]	42,50 (45,95)[2]	42,50 (45,95)[2]	59,5	60	M8x12 (M8x13)[2]
AXDL110Z		60H8x19		16	M5x8	48,1	24,05	24,05	55,5	30	M5x10
AXDL160Z		75H8x41		25	M10x17	66,0	25,00	25,00	92,3	50	M6x15
AXDL160A		80H8x3		--	--	70,7	35,35	35,35	--	--	M6x12
AXDL240Z		90H8x53		30	M10x17	70,7	35,35	35,35	113,5	60	M6x18
AXDL240A		110H8x3,5		30	M10x17	91,9	45,95	45,95	113,5	60	M8x15,5

[1] - Not applicable for drive adaptation WD
[2] - Dimension of the machined surface from the opposite side

6.2.2 Couplings and connecting shafts

Parallel arranged Linear Axis can be linked via a connecting shaft (Figure 6.25). The necessary drive torque is distributed evenly across all axis. As connecting shafts galvanized hollow shafts are used. The use of couplings with clampimg hub on the connecting shaft allows precise adjustment of the Linear Axis. In addition a later installation and removal assembly is possible with Linear Axis of the AXC series. A complete axis connection consists of a coupling kit (Table 6.16) and the connecting shaft with flexible selectable length.

For the adaptation of drives are couplings with clamping hub for drives with feather key shaft and couplings with clamping ring hub for drives with smooth shaft available.

❶ Connecting shaft

❷ Coupling with half-shell clamping hub

❸ Coupling with clamping hub fordrives with feather key shaft (drive abaption code F, position 13 in the type code)

❹ Coupling with clamping ring hub for drives with smooth shaft (drive abaption code S, position 13 in the type code)
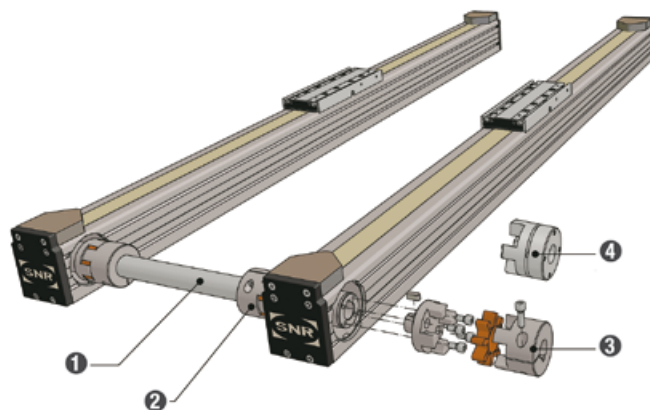
Figure 6.25 — Arrangement couplings and connecting shaft

The dimensions of the couplimgs and connecting shafts are shown in Figure 6.26 and Table 6.16.
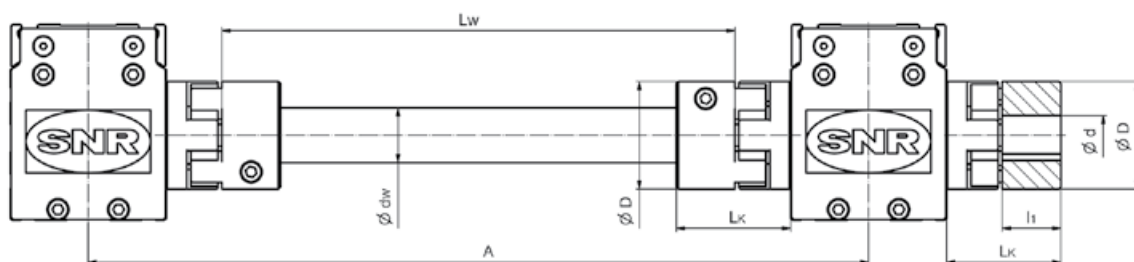
Figure 6.26 — Dimensions couplings and connecting shaft

Table 6.16 — Dimensions connecting shaft

Type	D	LK	l^1	Clamping hub (F)			Tension ring hub (S)			Connecting shaft						
				$d_{min.}$	$d_{max.}$	TA^2	$d_{min.}$	$d_{max.}$	TA^2	Type code	ID number	dw	(wall thickness)	Lw	$A_{min.}^1$	TA^2
										Coupling kit						
		[mm]	[mm]	[mm]	[mm]	[Nm]	[mm]	[mm]	[Nm]			[mm]	[mm]	[mm]	[mm]	[Nm]
AXC40_K	30	31,0	11,0	8	16	1,34				AX-AC-40Z-COU-CHS-14	156301	14	2,0	A - 79	125	1,34
		38,0	19,0				10	14	1,34							
AXC60_K	40	50,0	25,0	12	24	10,0	10	20	3,00	AX-AC-60Z-COU-CHS-22	292876	22	2,0	A - 125	160	6,00
AXC80_K	55	59,0	30,0	12	25	10,0	15	28	6,00	AX-AC-80Z-COU-CHS-28	239998	28	2,5	A - 153	198	10,0
AXC100_K-B AXC100_K-C AXC100_K-L	65	61,0	35,0	20	38	25,0	18,0	38,0	6,00	AX-AC-100Z-COU-CHS-38	156303	38	4,0	A - 172	222	25,0
AXC100_K-D		59,0														
AXC100_P_K-B AXC100_P_K-C AXC100_P_K-L		55,0												A - 166	216	
AXC120_K	65	65,0	35,0	20	38	25,0	18	38	6,00	AX-AC-120Z-COU-CHS-38	156303	38	4,0	A - 200	250	
AXC120_P_K		25,0												A - 160	210	
AXDL110	55	32,5	30,0	12	25	10,0	15	28	6,00	not applicable						
AXDL160	65	22,5	35,0	20	38	25,0	18	38	6,00	not applicable						
AXDL240	65	10,0	35,0	20	38	25,0	18	38	6,00	not applicable						

[1] - Minimum dimension, which allows the removal assembly without disassembly of the Linear Axis
[2] - Tightening torque

Example type code of a connecting shaft:

AX – AC-CHS – 22 – 1000 - 0

Shaft diameter dw   Shaft length Lw

Special version
0 : Standard
A… Z : According to drawing or text description
(Index (A... Z) is given from us)

In application with high velocity and great length of the connecting shaft, the critical speed is taken into account. The diagram in Figure 6.27 shows the maximum speed depending on the center distance of the Linear Axis. The basis of the limits here are 50% of the critical speed. If there are higher requirements, please contact our application engineers.
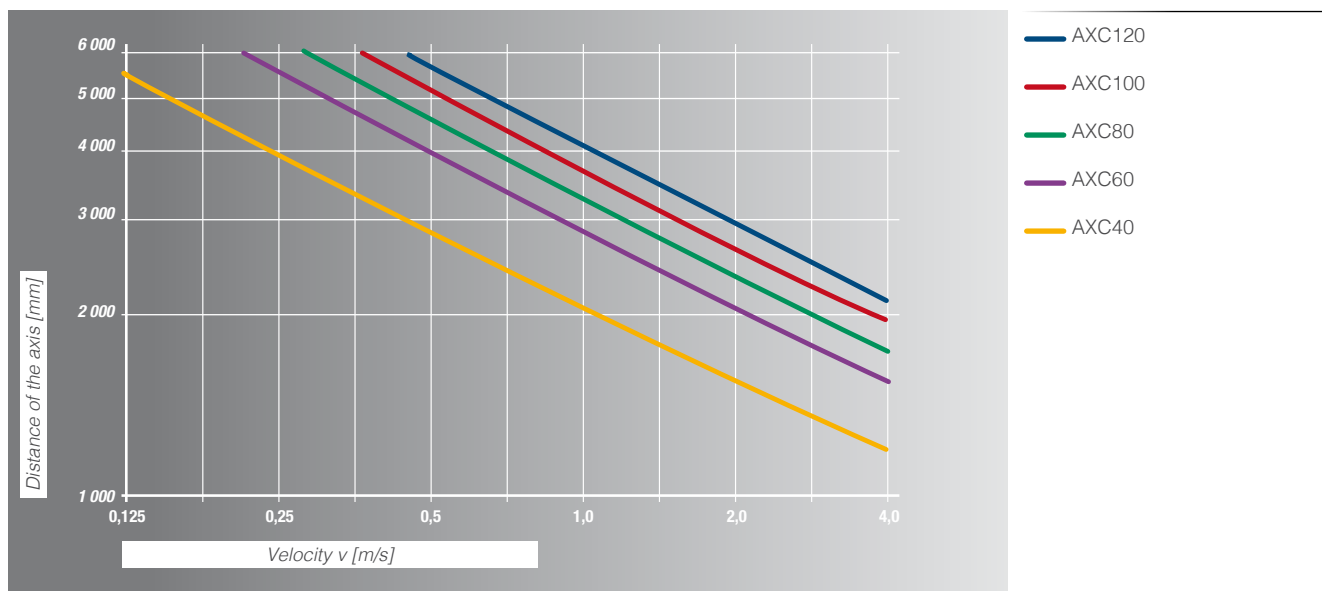
Figure 6.27 — Dynamic limits for connecting shafts

6.2.3 Gearboxes

Table 6.17 — Code numbers of the motor adaptation

Code number	C	D	E	F	G	B	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	Y
Centering b [mm]	40	50	50	60	60	60	60	60	70	80	80	95	95	95	95	110	110	110	110	110	110	130	130
Pitch circle e [mm]	63	70	95	75	75	75	90	90	90	100	100	115	115	130	130	130	130	145	145	165	165	165	165
Thread	M4	M4	M6	M5	M5	M6	M5	M5	M5	M6	M6	M8	M8	M8	M8	M8	M8	M8	M8	M10	M10	M10	M10
Shaft diameter d [mm]	9	14	14	11	14	14	11	14	14	14	19	19	24	19	24	19	24	19	24	19	24	24	32

Code number X: Special dimensions

Table 6.17 contains technical data and dimensions (Figure 6.28) of the gearbox versions.
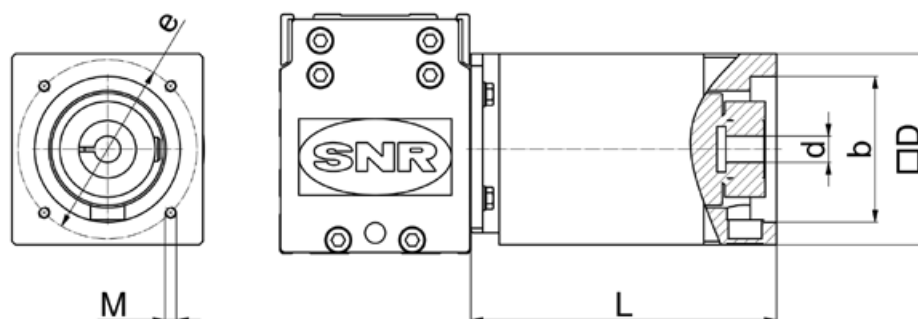
Figure 6.28 — Dimensions AXC with plug-in planetary gearbox version ZS.

6.2.3.1 Version ZS – Plug-in planetary gearbox

The version ZS represent the simplest versions of the mounting of a planetary gearbox at SNR Linear Axis with toothed belt drive of the series AXC. Here, the gearbox shaft with feather key is form-fitted inserted positively into the hollow shaft of the drive pulley. This version is suitable for applications with low dynamics and low alternating loads such as for vertical applications. By the direct mounting account coupling cone, plug-in shaft and coupling, thus resulting in extremely compact dimensions and in addition in a reduction of the moment of inertia and thus in a reduction of the drive torque.

Table 6.18 contains the code numbers for the type code and the dimensions of the adaptations of the planetary gearboxes.

Table 6.18 — Technical data for plug-in planetary gearbox version ZS

Type	Gear ratio i	Gearbox version	Nominal torque at the drive [Nm]	Maximum acceleration moment [Nm][1]	Permissible input speed [min⁻¹]	Maximum input speed [min⁻¹]	Backlash [arcmin]	Mass [kg]	Maximum diameter of the drive shaft [mm]	Mass moment of inertia [kgcm²] at d	Maximum length L[2] [mm] at d	Flange dimension D [mm]
AXC40	4	Single-stage	5,6	11	3800	9000	≤ 15	0,5	11	0,04	64	min. 40
	5			14								
	7		7,0	14	4300							
	10			13						0,03		
	16	Two-stage	5,6	11	3800		≤ 18	0,7		0,04	79	
	20											
	28											
	40											
	70		7,0	14	4300					0,04		
	100			13								
AXC60	3	Single-stage	18	35	3300	4000	≤ 15	1,4	14	0,11	85,5	min. 60
	4		25	40	3500	5000				0,08		
	5									0,07		
	7		18	35	4000	6000				0,06		
	10									0,05		
	16	Two-stage	30	45	3500	5000	≤ 15	1,8		0,08	102	
	20									0,07		
	28				4000	6000				0,06		
	40									0,05		
	70									0,05		
	100		18	35						0,05		
AXC80	3	Single-stage	37	80	2900	3500	≤ 15	2,9	19	0,66	129,5	min. 80
	4				3100	4500				0,53		
	5		50							0,48		
	7				3600	6000				0,43		
	10		40							0,40		
	16	Two-stage	50	95	3100	4500	≤ 15	3,7		0,98	154	
	20									1,1		
	28									1,2		
	40					6000				1,4		
	70				3600					0,7		
	100		40	80						0,5		
AXC100 AXC120	3	Single-stage	90	175	2300	5500	≤ 15	7,5	24	2,6	147 139	min. 120
	4			255						1,9		
	5			250						1,7		
	7				2800					1,5		
	10			220						1,4		
	16	Two-stage	90		2300		≤ 15	9,6		2,3	179,5 171,5	
	20									2,3		
	28			255						2,4		
	40									2,6		
	70				2800					1,9		
	100			220						1,7		

[1] - Consider permissible dynamic operating load of the axis
[2] - Length L depends on the length of the drive shaft

6.2.3.2 Version ZE and ZP - Integrated planetary gearbox

SNR Linear Axis of the series AXC, AXF (Figure 6.29), AXDL (Figure 6.30) and AXS280Y could be equiped with an integrated planetary gearbox. By the direct mounting account coupling cone, plug-in shaft and coupling, thus resulting in extremely compact dimensions. The use of integrated planetary gearboxes results in addition in a reuction of the moment of inertia and thus in a reduction of the drive torque.
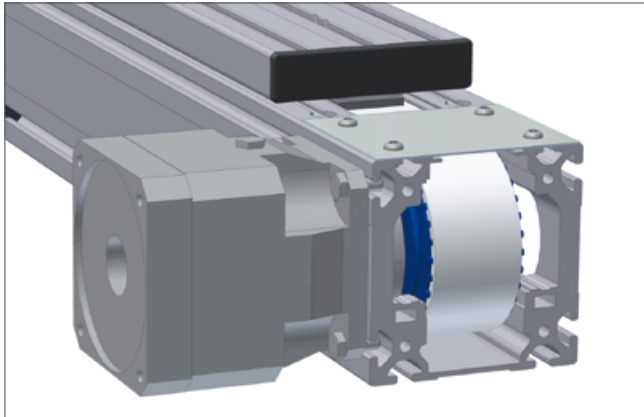
Figure 6.29 — AXC with integrated planetary gearbox
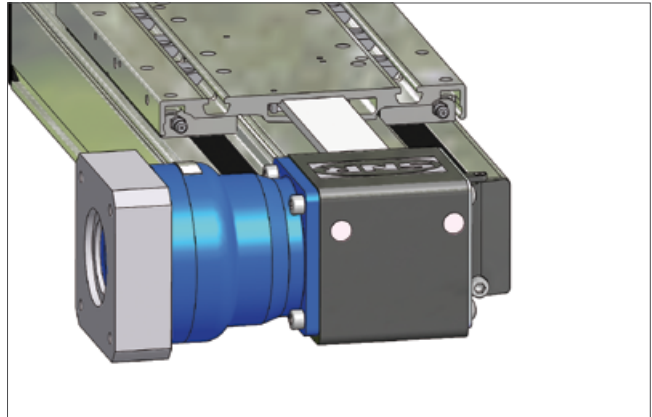
Figure 6.30 — AXDL with integrated planetary gearbox

Depending on series and size different versions of integrated planetary gearboxes are available.

Version ZE

In the version ZE drive pulley is force-fitted mounted by clamping ring hub on the smooth motor shaft, which ensures a backlash-free torque transmission. In use are spur-toothed planetary gearboxes with low backlash. This version represents a cost effective solution, which is particularly suitable for applications with high demands on the dynamics. It is to be taken into account that the noise emission of these gearbox versions is approx. 6 dB higher than the ZP version.

Version ZP

The version ZP has an identical configuration to the version ZE. In use here are planetary gearbox with helical gearing and reduced backlash. This variant is particularly suitable for applications with highest demands on noise emissions, dynamics, drive torque and precision.

Table 6.18 in Chapter 6.2.3.1 contains the code numbers for the type code and the dimensions of the adaptations of the planetary gearboxes.

Tables 6.19 and 6.20 contain technical datas and dimensions (Figure 6.31 and 6.32) of the gearbox versions.
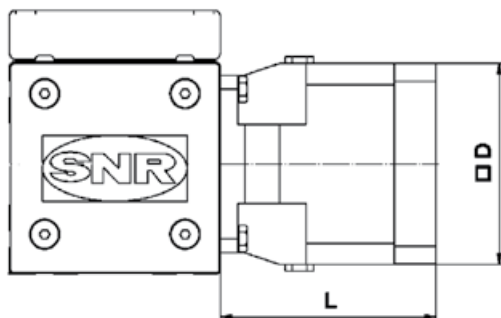
Figure 6.31 — Dimensions AXC with integated planetary gearbox version ZP and ZE

AXDL110: 110
AXDL160: 77
AXDL240: 140
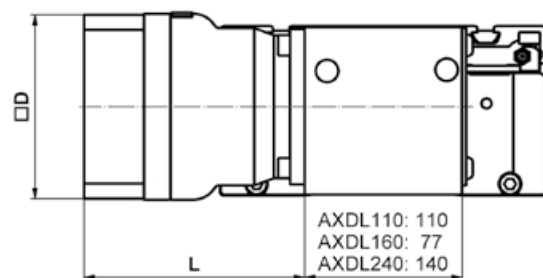
Figure 6.32 — Dimensions AXDL with integated planetary gearbox version ZP and ZE

Table 6.19 — Technical data integrated planetary gearbox version ZE

Type	Gear ratio i	Gearbox version	Nominal torque at the drive [Nm]	Maximum acceleration moment [Nm]¹	Permissible input speed [min⁻¹]	Maximum input speed [min⁻¹]	Backlash [arcmin]	Mass [kg]	Maximum diameter of the drive shaft³ [mm]	Mass moment of inertia³ [kgcm²] at d	Length L²,³ [mm] at d	Flange dimension³ D [mm]
AXC60	3	single-stage	16	29	4 500	8 000	≤ 8	0,6	8 11	0,1 0,16	71,5 75,5	min. 58 min. 60
	4		16	29								
	5		15	27								
	7		12	22								
	10		10	18								
	15	two-stage	15	27	4 500	8 000	≤ 10	0,7	8 11	0,1 0,16	86,5 90,5	min. 58 min. 60
	16		16	29								
	20		16	29								
	25		15	27								
	30		15	27								
	35		12	22								
	40		16	29								
	50		15	27								
	70		12	22								
	100		10	18								
AXDL110 AXS110TA	3	single-stage	17	27	2 900	7 000	≤ 8	1,8…3,0	14 19	0,13…0,55	89,1 97,1	min. 70 min. 90
	4		19									
	5		21									
	7		21									
	8		19		3 600							
	10		19									
	16	two-stage	19		3 800	10 000	≤ 10	1,9…2,9	11 14	0,02…0,14	97,4 104,5	min. 50 min. 70
	20		19									
	25											
	35		21		4300							
	50		21									
	70											
	100		19									
AXC80 AXDL160	3	single-stage	43	66	2 700	7 000	≤ 8	2,7…5,9	19 24	0,2…0,57	123,15 131,15	min. 70 min. 90
	4		51									
	5		53									
	7		53		2 900							
	8		48									
	10		48									
	16	two-stage	51	66	3 300	7 000	≤ 10	3,4…5,9	14 19	0,87…8,3	124,6 134,6	min. 120 min. 150
	20		51									
	25		53									
	32		51		4 000							
	40		51									
	64		48									
AXC100 AXF100 AXDL240A	3	single-stage	107	185	2 000	6 000	≤ 8	8,4…14,3	28 38	0,87…8,3	124,6 134,6	min. 120 min. 150
	4		136									
	5		133									
	7		133									
	8		117		2 500							
	10		117									
	16	two-stage	136	185	2 700	7 000	≤ 10	8,8…13,9	19 28	0,29…2,1	139,1 151,1	min. 90 min. 120
	20		136									
	25		133									
	32		136		3 600							
	40		136									
	64		117									
AXC120	3	single-stage	115	184	2 150	6 500	≤ 7	6,8	24 35	1,39…2,49	121,5 137,0	min. 115
	4		155	248	2 400							
	5		195	312	2 600							
	7		135	216								
	8		120	192	3 500							
	10		95	152								
	16	two-stage	260	416	3 500	6 500	≤ 9	8,8	24	1,38…2,33	149	min 115
	20		260	416								
	25		230	368								
	32		260	416								
	40		230	368								

¹ - Consider permissible dynamic operating load of the axis
² - Length L depends on the length of the drive shaft
³ - Values depending on the version of the clamping hub, smaller diameters with distance tube

Table 6.20 — Technical data integrated planetary gearbox version ZP

Type	Gear ratio i	Gearbox version	Nominal torque at the drive [Nm]	Maximum acceleration moment [Nm][1]	Permissible input speed [min⁻¹]	Maximum input speed [min⁻¹]	Backlash [arcmin]	Mass [kg]	Diameter of the drive shaft[3] [mm]	Mass moment of inertia[3] [kgcm²] at d	Length L [2,3,4] [mm] at d	Flange dimension[3] D [mm]
AXC60	3	single-stage	20	36								
	4		19	34								
	5		22	40	5 000	10 000	≤ 8	0,6	11	0,03	66,5	
	7		19	34								
	10		14	25								
	15	two-stage	20	36								min. 48
	20		19	34								
	25		22	40								
	30		20	36								
	35		19	34	5 000	10 000	≤ 12	0,9	11	0,03	93,5	
	40		17	31								
	50		22	40								
	70		19	34								
	100		14	25								
AXDL110	3	single-stage	17	30	3 300					0,21 / 0,28 / 0,61		min. 70
	4									0,15 / 0,22 / 0,55		min. 70
	5		26	42	6 000	≤ 4	1,90	9 / 11 / 14	0,12 / 0,20 / 0,52	89,6 / 94,0 / 106,0	min. 90	
	7				4 000					0,10 / 0,18 / 0,50		
	10		17	32						0,09 / 0,17 / 0,49		
	16	two-stage								0,077 / 0,170		
	20				4 400					0,069 / 0,160		
	25									0,068 / 0,160		
	28									0,061 / 0,160	108,0 / 116,0	min. 60
	35		26	42	6 000	≤ 6	2,00	11 / 14	0,061 / 0,160		min. 70	
	40									0,057 / 0,150		
	50				4 800							
	70				5 500					0,056 / 0,150		
	100		17	32								
"AXC80 AXDL160"	3	single-stage	47	85	2 900					0,86 / 1,03 / 2,40		min. 90
	4									0,61 / 0, 78 / 2,15		min. 90
	5		75	110	6 000	≤ 4	3,90	14 / 19 / 24	0,51 / 0,68 / 2,05	107,8 / 111,5 / 129,5	min. 120	
	7				3 100					0,42 / 0,59 / 1,96		
	10		52	95						0,38 / 0,54 / 1,91		
	16	two-stage								0,16 / 0,23 / 0,55		
	20				3 500					0,13 / 0,20 / 0,53		
	25									0,13 / 0,20 / 0,52		
	28									0,10 / 0,18 / 0,50	119,0 / 123,4 / 136,0	min. 70
	35		75	110	6 000	≤ 6	3,60	11 / 14 / 19			min. 70	
	40				3 800					0,091 / 0,17 / 0,49		min. 90
	50									0,090 / 0,16 / 0,49		
	70				4 500					0,089 / 0,16 / 0,49		
	100		52	90								
"AXC100 AXC120 AXDL240 AXS280Y AXS280Z"	3	single-stage	120	235	2 500					3,29 / 3,99 / 3,59 / 11,10		min. 120
	4		180							2,35 / 3,04 / 2,65 / 10,10		min. 120
	5		175	315	4 500	≤ 3	7,70	19 / 24 / 28 / 38	1,92 / 2,61 / 2,22 / 9,68	122,0 / 129,0 / 129,0 / 156,0	min 120	
	7		170		2 800					1,60 / 2,29 / 1,90 / 9,36		min 150
	10		120	235						1,38 / 2,07 / 1,68 / 9,14		
	16	two-stage	180							0,64 / 0,81 / 2,18 / 1,98		
	20									0,54 / 0,70 / 2,07 / 1,90		
	25		175		3 100					0,52 / 0,69 / 2,05 / 1,88		
	28		180							0,43 / 0,60 / 1,97 / 1,81		
	35		175	315	6 000	≤ 5	7,90	14 / 19 / 24 / 28	0,43 / 0,59 / 1,96 / 1,80	142,0 / 146,0 / 164,0 / 164,0	min. 90	
	40		180							0,38 / 0,55 / 1,92 / 1,76		min. 90
	50		175		3 500					0,38 / 0,54 / 1,91 / 1,75		min. 120
	70		170									min. 120
	100		120	235	4 200					0,37 / 0,54 / 1,91 / 1,75		

[1] - Consider permissible dynamic operating load of the axis
[2] - Length L depends on the length of the drive shaft
[3] - Values depending on the version of the clamping hub, smaller diameters with distance tube

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6.2.3.3   Mounted gearboxes

Linear Axis of the AXS series are normally delivered with mounted gearboxes. For Linear Axis with rack and pinion drive and telescopic axis is the pinion directly mounted on the gearbox shaft and exactly aligned to the rack during assembly.

The Linear Axis AXS280Y is produced with integrated planetary gearbox in the version ZP. The data of these version are described in chapter 6.2.3.

In the Linear Axis AXS280Z the gearbox is mounted by a coupling. The specifications of this are described in chapter 6.2.4.

Depending on the type different gearbox types (Table 6.21) can be used with a variety of gear ratios. The gearbox is configured for the respective application. For more information please contact our application engineers.

Table 6.21 — Gearboxes for Linear Axis AXS with rack and pinion drive and telescopic axis

Type	Axis version	Gearbox version	Gear ratio i
AXS110TA	Telescopic Axis	Planetary gearbox	3…100
AXS120M_	Beam Axis	Planetary gearbox	3…100
AXS120TH	Telescopic Axis	Bevel gearbox	3…10
AXS120TV	Telescopic Axis	Bevel gearbox	3,19…54,89
AXS200ME	Lifting axis	Spur gearbox	3,83…176,88
AXS200MP	Gantry Axis	Planetary gearbox	3…100
AXS200TH	Telescopic Axis	Planetary gearbox	3…100
AXS200TV	Telescopic Axis	Bevel gearbox	5,20…144,79
AXS230MB	Lifting axis	Bevel gearbox	5,20…144,79
AXS240TH	Telescopic Axis	Bevel gearbox	4,64…131,87
AXS280MB	Lifting axis	Bevel gearbox	7,24…192,18
AXS280P	Gantry Axis	Planetary gearbox	3…100
AXS280TH	Telescopic Axis	Planetary gearbox	3…100
AXS280TV	Telescopic Axis	Bevel gearbox	5,20…144,79
AXS300P	Beam Axis	Planetary gearbox	3…100
AXS460P	Gantry Axis	Planetary gearbox	3…100
AXS500P	Gantry Axis	Planetary gearbox	3…100

6.2.4   Adapters / Coupling cones

6.2.4.1   Linear Axis toothed belt drive

The simplest way to connect a gearbox or drive with the Linear Axis is the direct insertion of the drive shaft into the hollow shaft of the drive pulley. The drive is screwed via a flat adapter plate with the Linear Axis. The power transmission is form-fitted by a feather key. The only prerequisite is that the diameter of the drive shaft corresponding to the respective hollow shaft diameter of the Linear Axis. In Table 6.22 the code numbers and dimensions for each Linear Axis are summarized and the dimensions are shown in Figure 6.33.

Table 6.22 — Code numbers and dimensions for form-fitted drive adaptations

Type	Code number	Design type	e2 [mm]	a [°]	s1	b2 [mm]	d [mm]	i2$_{max.}$ [mm]	i2$_{max.}$-l [mm]	k2 [mm]	a2 [mm]	L2 [mm]
AXC40ZF AXC40AF	A	VC065-E0[1]	54	0	4 x Ø 6,5	44	12	-	20,0	-	64,5	20,5
	C	B14 C40	34	45	4 x Ø 4,3	26	10	31	4,0	-	-	3,1
AXC60ZF AXC60AF	A	B14 C60	52	45	4 x Ø 5,5	40	14	47	5,0	60	-	5,0
	B	VC065-E01	54	0	4 x Ø 6,5	44	12	-	18,0	70	80	18,0
	C	B5 C120	100	45	4 x M6 x 8	80	14	50	8,0	100	120	8,0
AXC80ZF AXC80AF	A	B14 C80	70	45	4 x Ø 6,5	60	20	71	12,0	82	-	12,0
	E	B5 C120	100	45	4 x M6 x 12	80	20	72	12,5	-	120	12,5
AXC100Z	A	B5 C120	100	45	4 x M6 x 12	80	25	82	17,0	103	120	12,0
	B	B14 C120	100	45	4 x Ø 6,5	80	25	82	17,0	100	115	12,0
	C	B5 C160	130	45	4 x M8 x 12	110	25	82	17,0	115	145	12,0
AXF100ZF	A	B5 C120	100	45	4 x M6 x 12	80	25	82	17,0	103	120	12,0
AXC120ZF AXC120AF	A	B5 C120	100	45	4 x M6 x 12	80	30	107	13,0	120	-	13,0
	C	B5 C200	165	45	4 x M10 x 20	130	30	119	25,0	-	200	25,0
	F	B5 C115	100	45	4 x Ø 11	80	25	113	7,0	120	-	9,0

[1] - Design type E0 contains the delivery of a special plug-in shaft with Ød
X: Code number for special adapters

Linear axis with toothed belt drive and coupling (ZK_) can be equipped with different coupling versions. The following code numbers can be selected as drive adaptations:

- S = Clamping ring hub for smooth shaft
- F = Clamping hub with feather key groove
- T = Clamping hub without feather key groove (only for AXBG)
- C = Coupling for connecting shaft

A universal version is an adaptation via integrated coupling in combination with a coupling cone. Here, the coupling half on the axis side is screwed to the drive pulley and offers by the force-fitted torque transmission even under high dynamic optimal reliability. For usual market drives with a standard B5 flange is a wide range of coupling cones available. Clamping hubs with groove are used as standard for driving shafts with feather key. Also available as a special design are clamping ring hubs for smooth shafts. In Table 6.23 the code numbers and dimensions for each Linear Axis are summarized and in the dimensions are shown in Figure 6.34.

Table 6.23 — Code numbers and dimensions for force-fitted drive adaptations via coupling and couplig cone

Type	Code number with feather key	Code number without feather key	Design type	e2 [mm]	α [°]	s1	b2 [mm]	$d_{min.}$ [mm]	$d_{max.}$ [mm]	$i2_{max.}$ [mm]	$i2_{max.}$-l [mm]	k2 [mm]	a2 [mm]	L2 [mm]	LK[1] [mm]
AXC40ZG AXC40AG	A	K	B5 TK63	63	45	4 x M4 x 8	40	6	10	23,0	7,0	54,0	72	37,0	31,0 / 38,0[2]
AXC60ZG AXC60AG	A	K	NP015	62	0	4 x Ø 5,5	52	16	16	36,0	8,0	70	80	58,0	50,0
	E	P	B5 C120	100	45	4 x M6 x 12	80	19	20	40,0	15,0	96	120	65,0	
	H	R	PSF12	62 / 63	45	4 x M5 x 12	50	12	14	48,0	17,0	-	80	67,0	
	I	T	B14 C60	52	45	4 x Ø 5,5	40	14	14	38,0	6,5	64	80	56,5	
AXC80ZG AXC80AG	A	K	B5 C160	130	45	4 x M8 x 16	110	19	25	52,0	15,0	120	150	74,0	59,0
	B	L	B5 C120	100	45	4 x M6 x 12	80	25	25	50,0	12,0	90	110	71,0	
	C	N	B5 C120	100	45	4 x M6 x 15	80	14	20	41,0	4,0	83	110	62,0	
	D	O	NP015	62	0	4 x Ø 5,5	52	16	16	36,0	8,0	82	100	66,0	
	E	P	NP025	80	0	4 x Ø 6,5	68	22	25	52,0	22,0	80	90	81,0	
	F	Q	B14 C80	70	45	4 x Ø 6,5	60	19	20	40,0	11,0	80	110	70,0	
AXC100ZG	A	K	B5 C120	100	45	4 x M6 x 15	80	19	20	47,0	4,0	100	112	65,0	61,0
	A	K	B14 C120	100	45	4 x Ø 10,5 x 14	80	24	25	58,0	15,0	100	116	76,0	
	B	L	B5 C160	130	45	4 x M8 x 20	110	19	30	60,0	17,0	115	145	78,0	
	C	N	NP025	80	0	4 x Ø 6,6	68	22	22	67,0	24,0	100	130	85,0	
AXC100ZG_-D AXF100ZG AXS200Y AXS280Y	A	K	B5/B14 C120	100	45	4 x Ø 10,5 x 10	80	19	25	58,0	15,0	90	116	76,0	59,0
	B	L	B5 C160	130	45	4 x M8 x 15	110	19	30	60,0	17,0	120	160	78,0	
	C	N	NP025	80	0	4 x Ø 6,6	68	20	25	53,0	10,0	100	135	71,0	
AXC120ZG AXC120AG AXDL240AG	A	K	B5 C120	100	45	4 x M6 x 18	80	19	25	50,0	7,0	120	150	72,0	65,0
	B	L	B5 C160	130	45	4 x M8 x 18	110	24	30	60,0	18,0	-	160	83,0	
	C	N	B5 C200	165	45	4 x M10 x 20	130	25	35	61,0	26,0	-	200	91,0	
AXDL110Z	A	K	B5 C120	100	45	4 x M6 x 10	80	14	20	47,5	10,0	82	110	42,5	32,5
	C	N	NP015	62	0	4 x Ø 5,5	52	14	20	45,5	8,0	80	110	40,5	
	E	P	CP060	52	45	4 x Ø 5,5	40	14	20	45,5	8,0	80	110	40,5	
	F	Q	B14 C80	70	45	4 x Ø 6,6	60	20	25	59,5	22,0	82	110	54,5	
AXDL160Z	A	K	B5 C120	100	45	4 x M6 x 15	80	14	20	43,0	0,0	86	120	22,5	22,5
	B	L	NP015	62	0	4 x Ø 5,5	52	14	25	51,5	8,5	78	106	31,0	
	C	N	NP025	80	0	4 x Ø 6,6	68	14	25	54,0	11,0	100	135	33,5	
	D	O	B14 C80	70	45	4 x Ø 6,6	60	14	20	49,0	6,0	86	120	28,5	
	E	P	B5 C160	130	45	4 x M8 x 18	110	19	30	60,0	17,0	120	150	39,5	
AXDL160A	A	K	B5 C120	100	45	4 x M6 x 10	80	14	25	50,0	7,5	100	115	74,5	67,0
	C	N	NP025	80	0	4 x Ø 6,6	68	20	25	54,0	11,0	100	130	78,0	
AXDL240Z	A	K	B5 C120	100	45	4 x M6 x 29	80	14	20	43,0	1,0	96	120	11,0	10,0
	B	L	B5 C120	100	45	4 x M6 [3]	80	25	25	53,0	11,0	96	120	21,0	
	E	P	B5 C160	130	45	4 x M8 x 18	110	25	30	62,0	20,0	115	150	30,0	
AXS280Z	A	K	P	120	45	4 x M8 x 15	90	32	32	88	52			48	-4
	B	L	B5 C160	130	45	4 x M8 x 10	110	25	30	62	14			10	1
	C	N	NP035	108	0	4 x Ø 9 x 16	90	32	32	77	24			25	-4

[1] - Graphic account of the dimension in Chapter 3.7.1 Figure 3.11
[2] - Clamping hub / Tension ring hub
[3] - Stud bolt
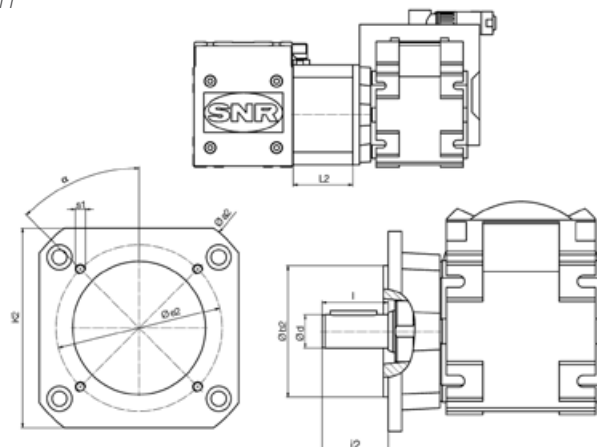X: Code number for special adapters

Figure 6.33 — Dimensions drive adaptations

6.2.4.2   Linear Axis with screw drive, coupling and coupling cone

For Linear Axis with screw drive, the drive is normally connected via a coupling and coupling cone with the Linear Axis (Figure 6.34).
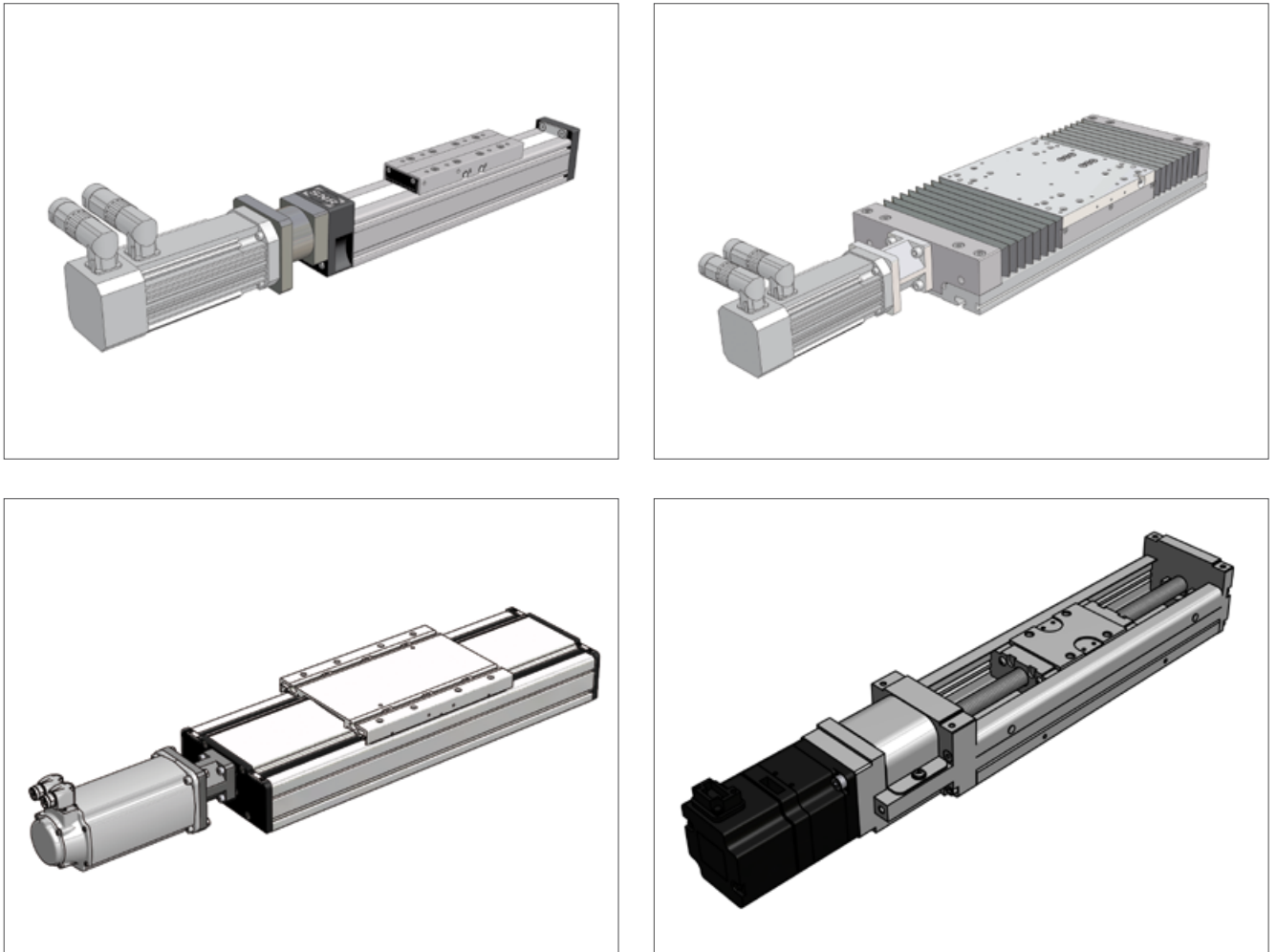

Figure 6.34 — Drive adaptation via coupling and coupling cone with screw drive axis

Power is transmitted via pluggable elastomer coupling. It is possible to use drives with smooth shaft (force-fitted connection) as well as drives with shafts with feather key (force- and form-fitted connection).

Table 6.24 contains the limit sizes for the drives of the respective axis of the series AXC, AXF, AXDL and AXLT which are characterized in Figure 6.35. The code numbers of the each possible coupling cone are summarized in Table 6.25.

Table 6.24 — EN Code numbers of the drive adaptation for AX_S_G and AX_S_U

Type	Design type	$e1_{min.}$	$e1_{max.}$	$b1_{min.}$	$b1_{max.}$	$d_{min.}$	$d_{max.}$	$i2_{max.}$	$i2_{max.}$-[3]	k	L1	Maximum drive torque
		[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[Nm]
AXC40S/T	B5 / B14	45	63	35[1]	50	5	14	30	7	55	47,0	7,5
AXC60S/T	B5	63	100	40[1]	80	9	19[2]	40	3	82	71,0	10,0
	B 14	75	100	50[1]	80	9	19[2]	40	3	82	71,0	10,0
	B5	115	130	95	95	19	20	40	15	110	84,0	10,0
		130	130	110	110	24	24	50	25	120	93,0	10,0
AXDL110S/T	B5	50	75	40	60	9	19[2]	40	3	60	72,0	10,0
	B 14	70	75	40	60	9	19[2]	40	3	60	72,0	10,0
AXLT155S/T	B5 / B14	55	100	34[1]	80	5	14	30	7	85	71,0	10,0
AXC80S/T AXC100S/T AXF100G/S/T AXDL160S/T AXLT225S/T	B5 / B14	63	100	50[1]	80	9	19[2]	40	3	82	76,0	17,0
	B5	115	130	95	110	19	20	40	15	110	88,0	17,0
		130	130	110	110	24	24	50	25	120	98,0	17,0
AXC120S/T AXDL240S/T AXLT325S/T	B5 / B14	75	130	60[1]	110	14	24[2]	50	3	112	89,0	60,0
		165	165	130	130	32	32	60	28	155	130,5	60,0
AXLT455S/T	B5 / B14	100	165	80[1]	130	19	25	50	8	140	105,0	160,0
			165	110	130	28	32	60	23	155	120,0	160,0
		215	215	180	180	38	38	80	45	192	142,0	160,0

[1]- If using drives with smaller centering, the centering is done by the coupling
[2]- For drives with feather key and maximum shaft length, the delivery includes a shorter feather key for exchanging
[3]- Maximum value, dimensional representation in Chapter 3.7.3, Figure 3.14
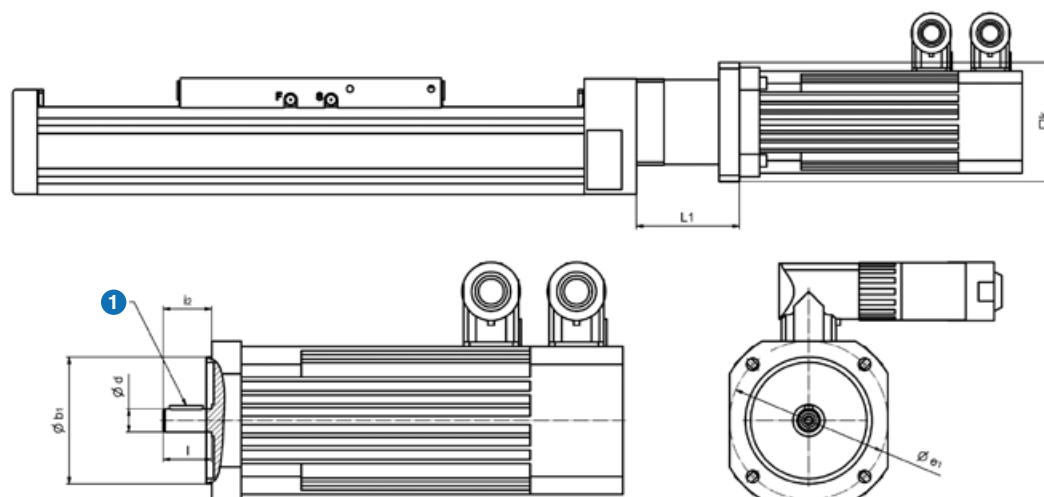
❶ Optional feather key

Figure 6.35 — Code numbers of coupling cones for AXC_S_G, AXF_S_G, AXDL_S_G, AXLT_S_G

Table 6.25 — EN Limit sizes of coupling cones for AXC_S_G, AXF_S_G, AXDL_S_G, AXLT_S_G

Centering b [mm]		35	40	50	60		70		80		95		110		130		180		
Shaft diameter d [mm]		8	9	14	11	14	14	16	14	19	19	24	19	24	24	32	24	28	38
Code number	Shaft without feather key	A	C	E	G	I	K	--	N	P	R	T	V	Y	A	C	E	G	I
	Shaft with feather key	B	D	F	H	J	L	M	O	Q	S	U	W	Z	B	D	F	H	J
When using a deflection belt drive [1]	Pitch circle e1 [mm]	46	63	70 / 95	75		90		100		115		130		130		165		
	Thread	M4	M4	M4 / M6	M5		M5		M6		M8		M8				M10		

[1]- note limit sizes of Chapter 6.2.5
X: Code number for special version according drawing

The coupling cone is no separate componet for Linear Axis of the series AXBG. The fixed bearing of the ball screw and the coupling cone are here one part. The dimensions according Figure 6.35 for this series are summarized in Table 6.26. The dimensions of the associated couplings are shown in Table 6.27 and Figure 6.36 and can be ordered as a separate part.

Table 6.26 — Dimensions of coupling cones for AXBG_S_G

Type	Code number	e1 [mm]	Thread	L1 [mm]	b1 [mm]	$d_{min.}$ [mm]	$d_{max.}$ [mm]	k [mm]	Nominal torque [Nm]
AXBG15S	A	25 x 8	4 x Ø 2,4	42,0	20	3	7	29,5 x 22	0,5
AXBG20S	A	29	4 x M3 x 6	49,0	20	3	7	40 x 29	1,0
AXBG26S	A	33	4 x M3 x 6	52,0	24	3	8	50 x 37	1,5
AXBG33S	A	37	4 x M3 x 8	59,0	28	3	8	50 x 44,5	1,5
	A	40	4 x M4 x 8	59,0	28			50 x 44,5	
	B	70	4 x M5 x 10	69,0	50			60 x 60	
	C	70	4 x M4 x 10	69,0	50			60 x 60	
AXBG46S	A	60	8 x M4 x 8	85,5	50	5	24	63 x 63,5	10,0
	B	70	4 x M4 x 8	93,5	50			62 x 62	
	C	90	4 x M5 x 10	100,5	70			80 x 80	
	D		4 x M6 x 12	105,5	70			80 x 80	
AXBG55S	A	70	4 x M5 x 10	94,0	50	5	24	89 x 74,5	10,0
	B	90	4 x M6 x 12	106,0	70			80 x 80	
	C	90	4 x M5 x 12	106,0	70			80 x 80	
	D	100	4 x M6 x 12	106,0	80			86 x 86	
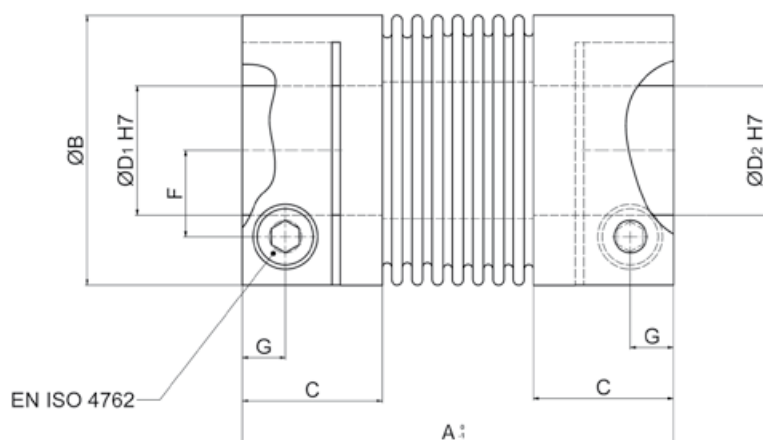
Figure 6.36 — Dimensions of the coupling for AXBG_S_G

Table 6.27 — Dimensions of the coupling for AXBG_S_G

Type	Coupling designation	A	B	C	D_1	D_{2min}	D_{2max}	F	G	H	E	Torsional rigidity	Moment of inertia	Nominal torque	Mass
		[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]		[Nm/rad]	[gcm²]	[Nm]	[g]
AXBG15S	AX-AC-MK2-5-25-3-(D_2)	25	15	9	3,0	3,0	7,0	4,5	3,0	12,0	M2	280	2,6	0,5	9,0
AXBG20S	AX-AC-MK2-10-30-4-(D_2)	30	15	9	4,0	3,0	7,0	4,5	3,0	17,0	M2	380	3,4	1,0	10,0
AXBG26S	AX-AC-MK2-15-30-5-(D_2)	30	19	11	5,0	3,0	8,0	6,0	3,5	14,5	M2,5	380	3,4	1,5	10,0
AXBG33S	AX-AC-MK2-15-30-6-(D_2)	30	19	11	6,0	3,0	8,0	6,0	3,5	14,5	M2,5	750	8,5	1,5	22,0
AXBG46S	AX-AC-MK2-100-50-8-(D_2)	50	40	16	8,0	5,0	14,0	15,0	5,0	27,5	M4	9 050	160,0	10,0	120,0
AXBG55S	AX-AC-MK2-100-50-12-(D_2)	50	40	16	12,0	5,0	24,0	15,0	5,0	27,5	M4	9 050	160,0	10,0	120,0

Example type code of a coupling for AXBG_S_G:

AX - AC - MK2 - 15 - 30 - 6 - 8

Design size | Coupling length | Shaft diameter AXBG | Shaft diameter drive
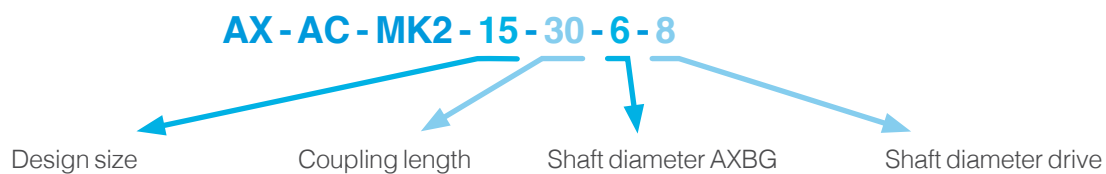
6.2.5 Deflection belt drive

The use of a deflection belt drive allows the reducing of the total length from Linear Axis with screw drive significantly. This gives the possibility of using in restricted spaces and an optimal utilization of the available installation space. Deflection belt drives are available for Linear Axis oft he series AXC, AXF, AXDL, AXLT and AXBG (Figure 6.38).

Figure 6.38 — Linear Axis with deflection belt drive

The installation position can be made with 90 ° offset (Figure 6.39).

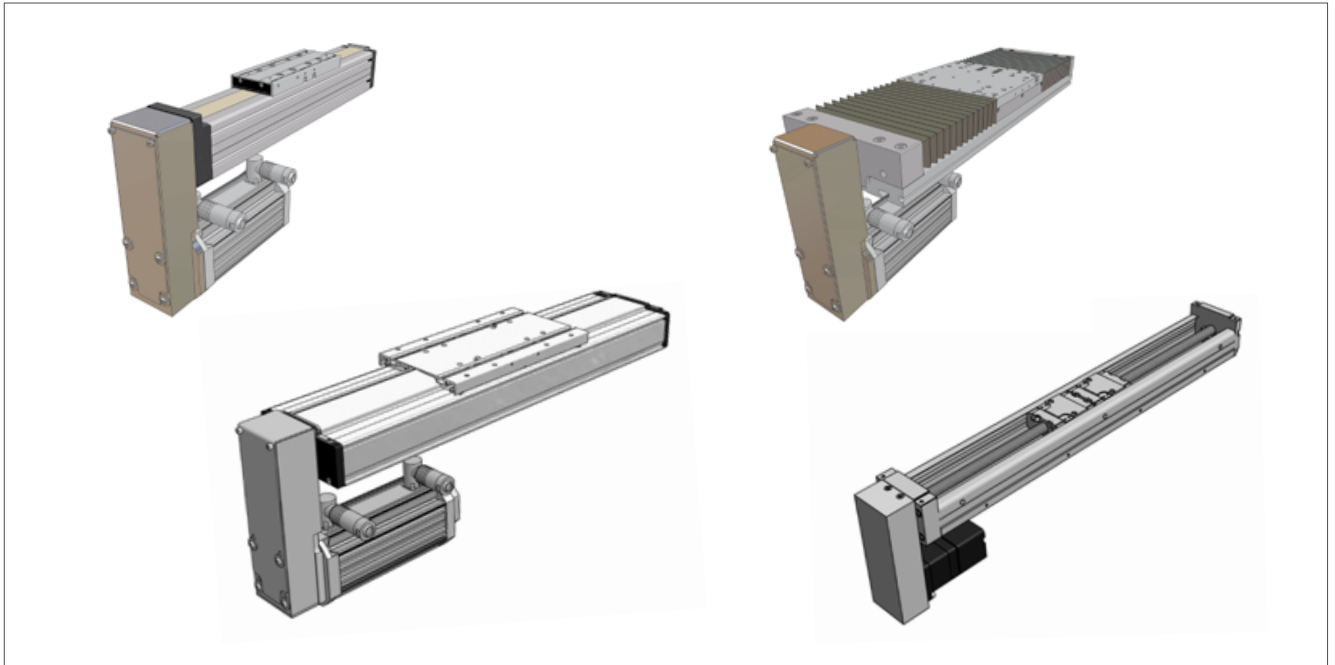X = 0° (above)

X = 180° (below)
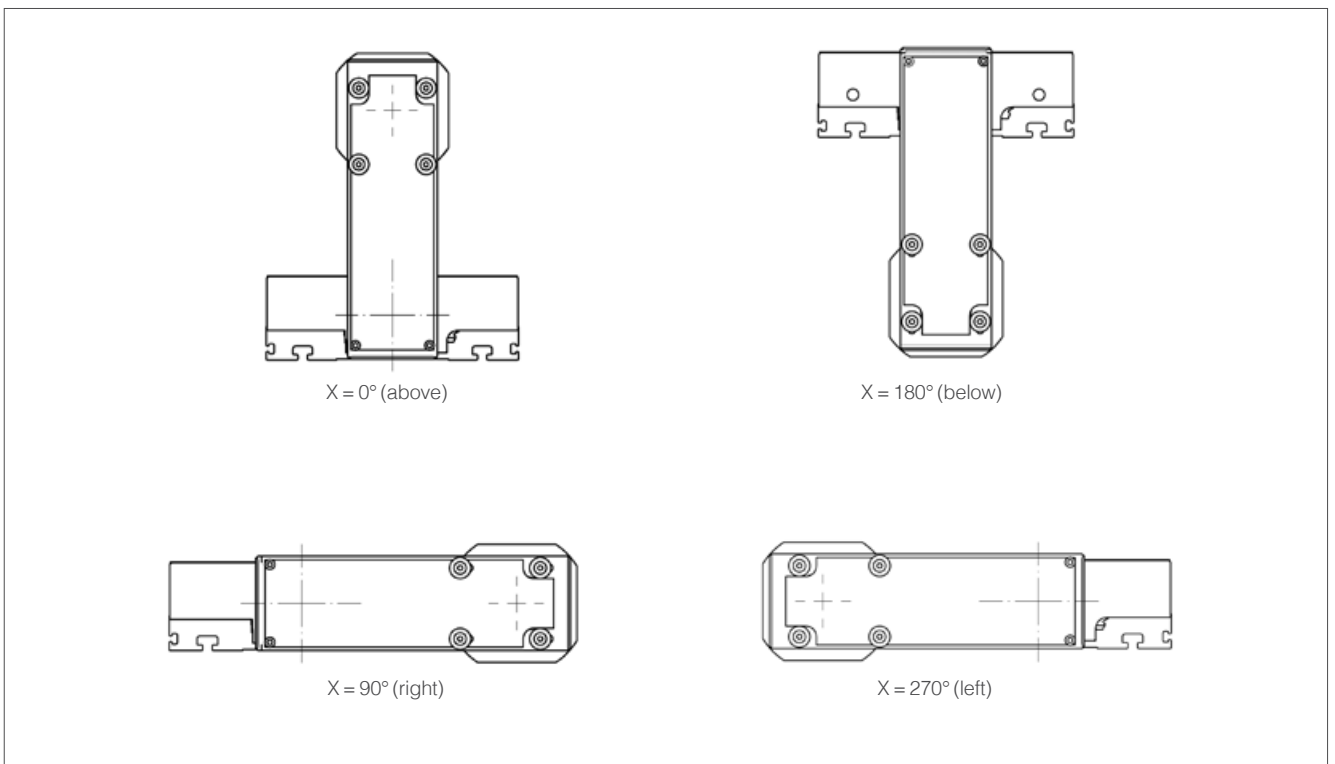
X = 90° (right)

X = 270° (left)

Figure 6.39 — Installation positions of deflection belt drives

Depending on the series and the ratio of the deflection belt drive is it possible to use drives with a smooth shaft or with feather key, which requires different maximum shaft diameter.

In Table 6.29 the maximum drive shaft diameter of the different versions are summarized.

Table 6.29 — Maximum drive shaft diameters for deflection belt drives

Type	Fixation with clamping set Ratio						Fixation with feather key Ratio										Fixation with glue connection Ratio										
	1,00	1,25	1,50	1,60	1,80	2,00	1,00	1,25	1,50	1,60	1,80	2,00	2,25	2,40	2,50	3,20	1,00	1,25	1,50	1,60	1,80	2,00	2,25	2,40	2,50	3,20	4,00
AXBG33	8						8																				
AXBG46	11						11																				
AXC40	9						14		9								14	11									
AXC60 AXDL110 AXLT155	14								14		11	9							14	14		9					
AXC80 AXC100 AXF100 AXDL160 AXLT225	16	14	14				24	19	16		12					9	24	24	19		14			11			
AXC120 AXDL240 AXLT325	24			14		10				24	19		14			11				24			24		24	14	11
AXLT455	28	28		28		19					28											28					

The dimensions of the deflection belt drives are shown in Figure 6.40 and Table 6.30.

1 Drive assembly by us

2 Individual drive adapter, code number see Chapter 6.2.4.2 Linear Axis with screw drive

3 optional feather key
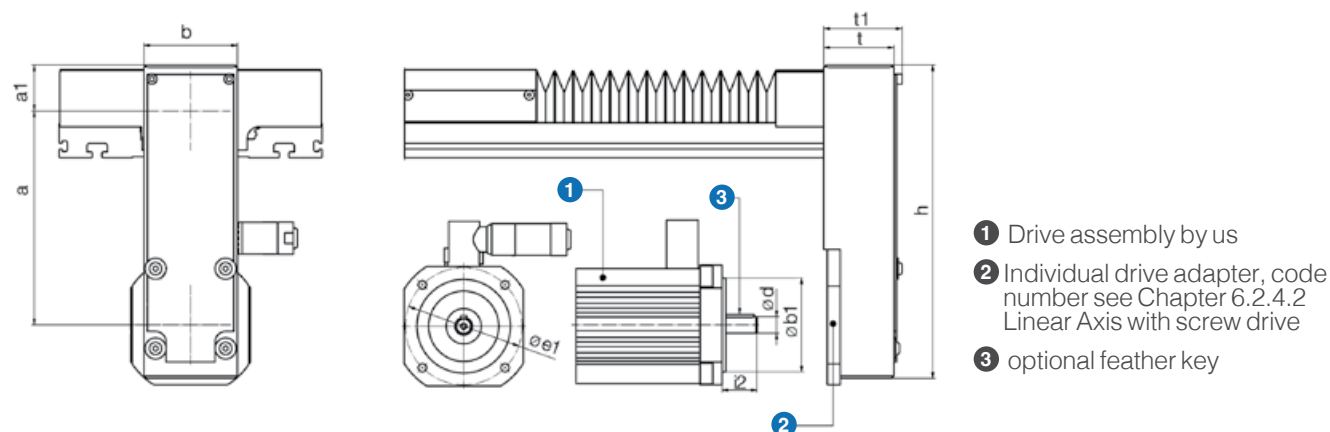
Figure 6.40 — Dimensions of deflection belt drives

Table 6.30 — Dimensions of deflection belt drives

Type	Ø b1 [mm]		Ø e1 [mm]		i2 [mm]		Desing type	a [mm]	a1 [mm]	b [mm]	h [mm]	t [mm]	t1 [mm]
	min.	max.	min.	max.	min.	max.							
AXBG33	30		46		25			72 ± 2,5	21,0	42	117	28	--
AXBG46	50		70		30			102 ± 2,5	31,0	62	167	24	--
AXC40	40	50	63	70	20	30	B5	67,5 + 8	23,6	50	128	41	44
AXC60 AXDL110 AXLT155	40[1]	60	63	75	20	30	B5	140,5 ± 2	31,5	60	216	40	45
AXC80 AXC100 AXF100 AXDL160 AXLT225	50[1]	80	63	100	20	50	B5	185 ± 2,5	39,0	80	267	60	67
AXC120 AXDL240 AXLT325	60[1]	110	75	130	30	50	B5 / B14	249,5 ± 5,5	57,0	100	407	60	67
AXLT455	80[1]	130	100	165	30	60	B5 / B14	354 ± 5	89,0	180	565	80	89

[1]- For drives with smaller centering, the centering by the drive adapter omitted

SNR
Brand of NTN Group

6.3 Switches

6.3.1 Switch versions

For position detection, depending on the requirement, mechanical switches in different protection classes as well as inductive proximity switches Figure 6.41 with the usual output circuits are available.
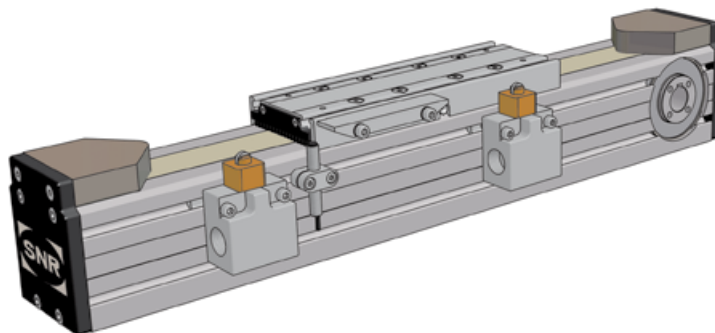
Figure 6.41 — Linear Axis with a set of mechanical limit switches and inductive proximity switch

For the emergency shutdown of the drives before the mechanical end position damper be achieved, mechanically actuated switches are usually used. A combination with outside placed inductive proximity switches to set additional switching points for example for reference movements is possible. A mechanical limit switch set consists of two switches with fasteners and cam switch.

An extremely compact version for Linear Axis of the AXC series are the inductive proximity switches for installation in the profile grooves (Figure 6.42). They are flush with the surface of the aluminum profile of the axis and have almost no interference contour. In this case a groove insert (Chapter 6.6) will be mounted in addition to assured positioning of the cable in the groove.

Figure 6.42 — Inductive proximity switches installlation in the profile groove

The inductive proximity switches are available in the versions PNP-NC (opener), PNP-NO (closer) and NPN-NC (opener). An inductive proximity switches set consists of two switches with fasteners and cam switch.

All switches are installed factory-provided.

6.3.2 Cable guiding

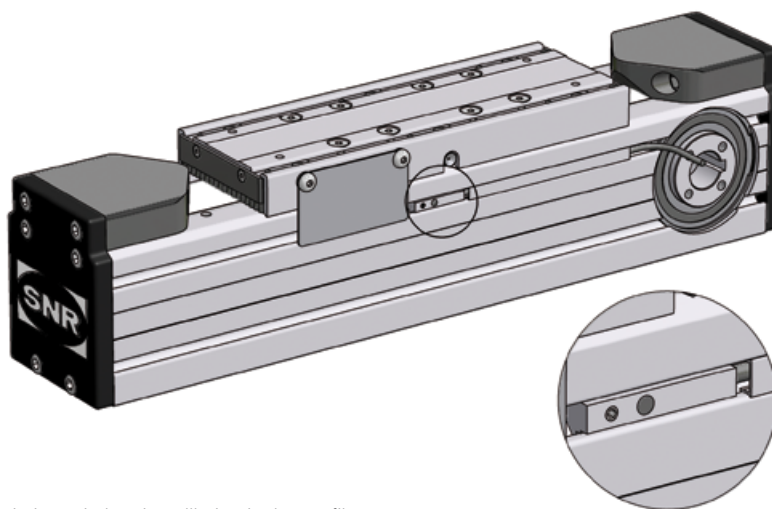The cable of the inductive proximity switches for the AXC series are laid in a groove to the drive. The cable guiding is chosen such that at least 0.5 m free cable length remains. If this is not possible with the available cable length, the cable is led out on the opposite side. Only two inductive proximity switches per side can be used for the type AXC60.
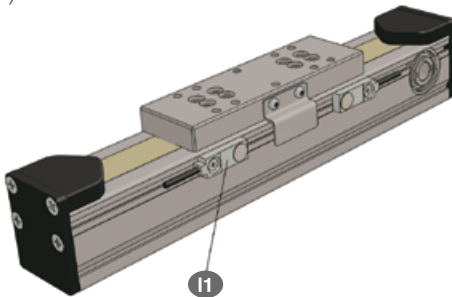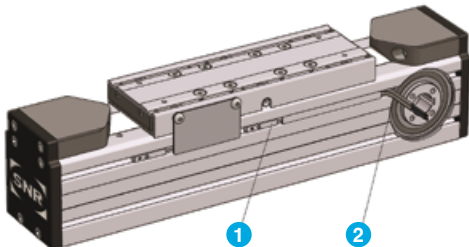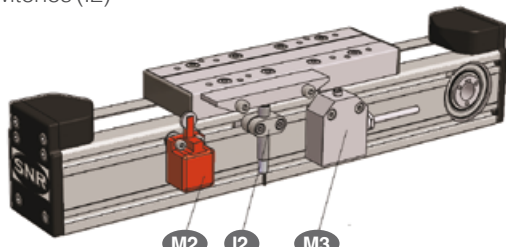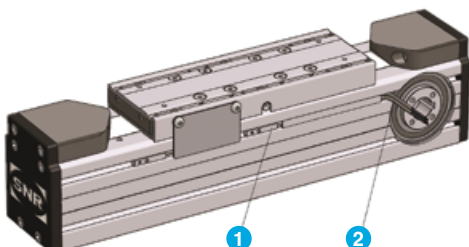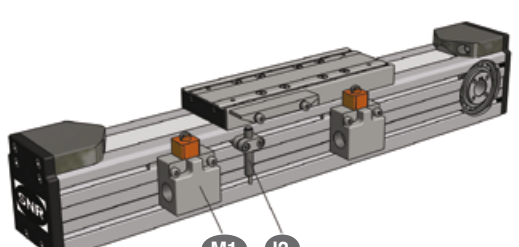
The cable of the inductive proximity switches I2 are laid in a groove to the drive except for AXC40. The cable length is chosen such that at least 0.5 m free cable length remains. If this is not possible with the maximum available cable length, the cable is led out on the opposite side. For the type AXDL 110 Z the cables are always laid out to the deflection pulley side. For the types AXDL160Z and AXDL240Z the cables are always laid out to the pulley side.
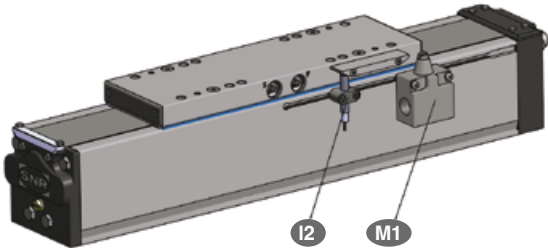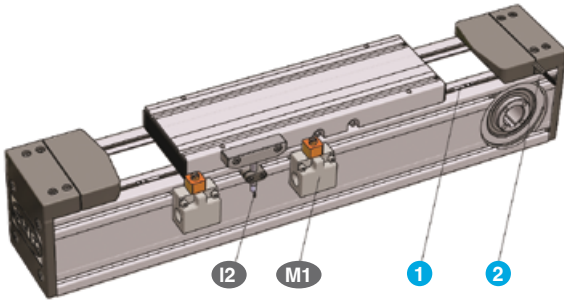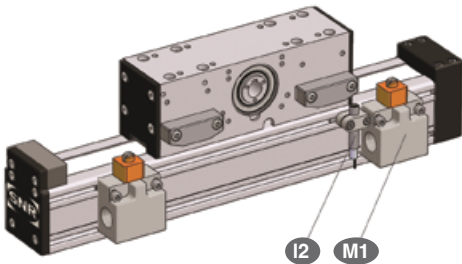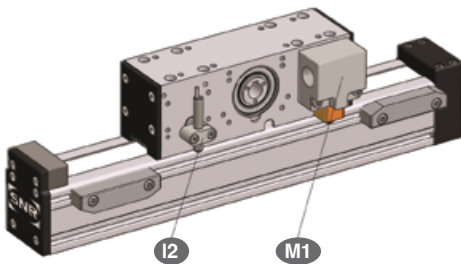
6.3.3 Mounting options

Depending on series and size a variety combination and assembly options of limit switches are possible, which are summarized in Table 6.31. The most common combinations can be encoded on the type code.
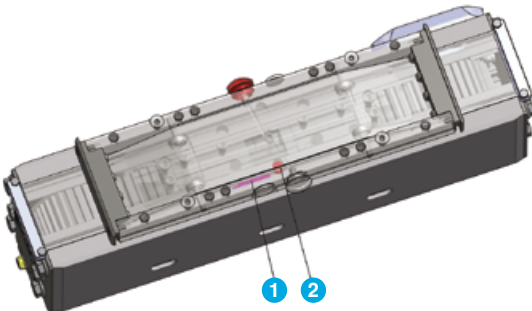
An overview of these options contains Table 6.37 in Chapters 6.3.7.

Table 6.31 — Switch mounting on SNR Linear Axis

AXC	
AXC40Z AXC40S AXC40T	Inductive proximity switches (I1)
AXC60Z AXC60S AXC60T	Inductive proximity switches (AXC Initiator) ❶ AXC – Initiator ❷ Cable guide	Mechanical (M2,M3) and inductive proximity switches (I2)
AXC80Z AXC80S AXC80T AXC100Z_B AXC100Z_C AXC100Z_L	Inductive proximity switches (AXC Initiator) ❶ AXC – Initiator ❷ Cable guide	Mechanical (M1) and inductive proximity switches (I2)

AXC100Z_D AXC100S_D	Mechanical (M1) and inductive proximity switches (I2) I2 M1
AXC120Z AXC120S AXC120T	Mechanical (M1), AXC initiator and inductive proximity switches (I2) ❶ AXC – Initiator ❷ Cable guide I2 M1 ❶ ❷

	Slider moved	Profile moved
AXC_A	Mechanical (M1)* and inductive proximity switches (I2) I2 M1 *M2 for AXC40A	Mechanical (M1)* and inductive proximity switches (I2) I2 M1 *M2 for AXC40A

AXF

AXF100Z AXF100S AXF100T AXF100G	Magnetic field switch ❶ ❷ ❶ Magnetic field switch ❷ Switching magnet

AXDL

Mechanical (M2) and inductive proximity switches (I1)

AXDL110Z
AXDL100S
AXDL110T

I1 M2
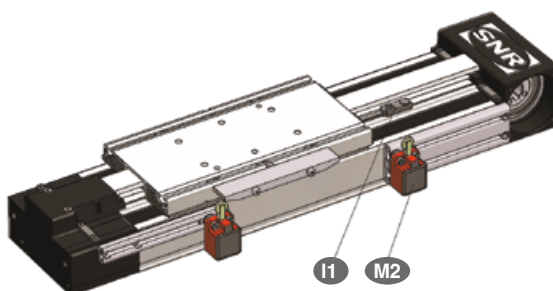
Mechanical (M1) and inductive proximity switches (I1)

AXDL160Z
AXDL160S
AXDL160T
AXDL240Z
AXDL240S
AXDL240T

I1 M1
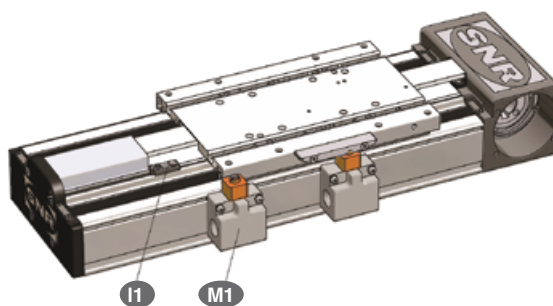
Mechanical (M1) and inductive proximity switches (I2)

AXDL160A
AXDL240A

M1 I2
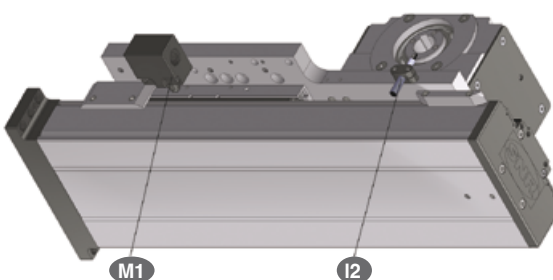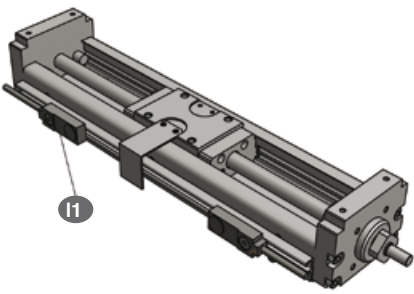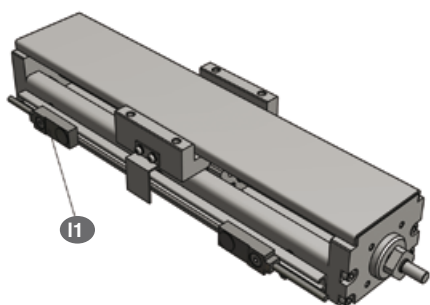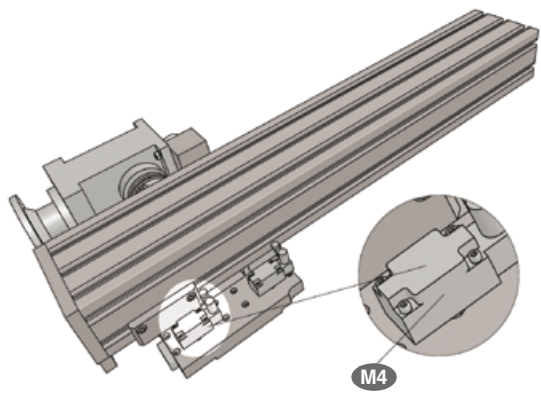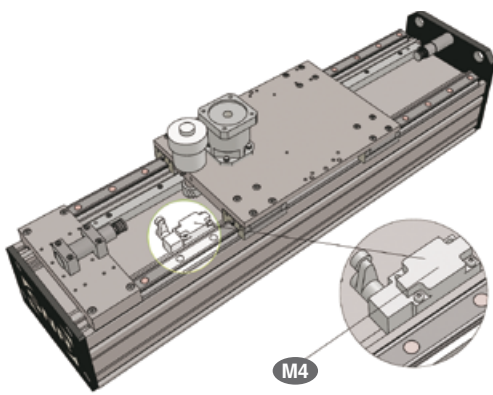
AXLT

Mechanical (M3) and inductive proximity switches (I1, I3)

AXLT_S
AXLT_T

❶ M1 only for AXLT455

I1 M3

SNR
Brand of NTN Group
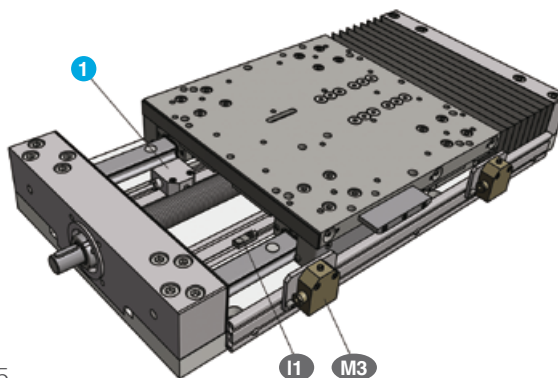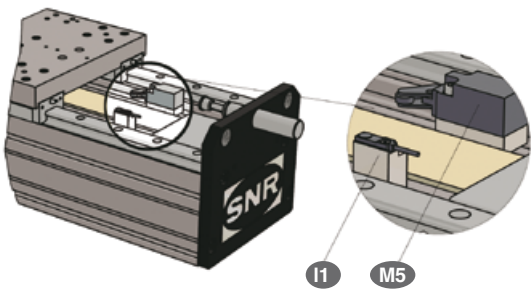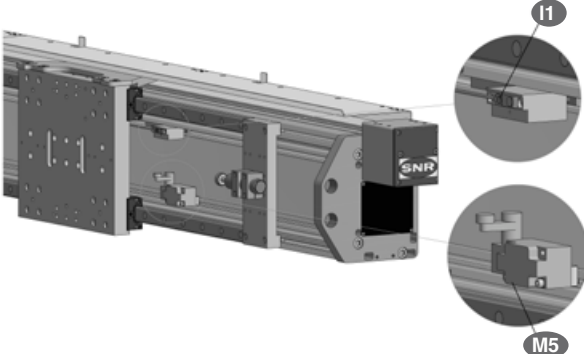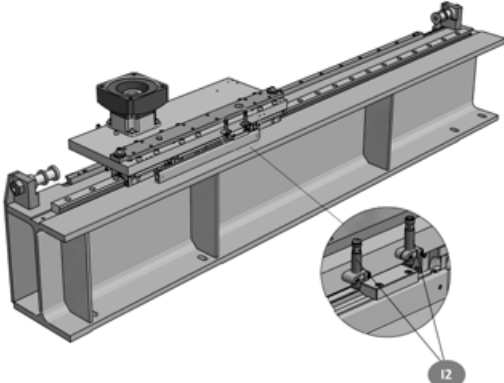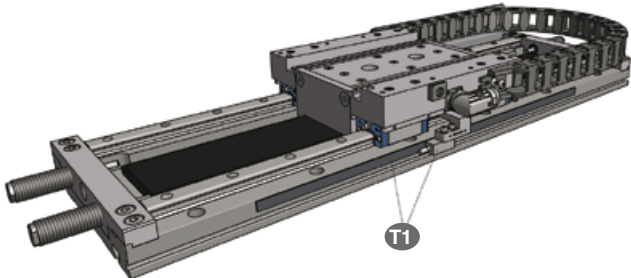
AXBG	
AXBG_S	Inductive proximity switches (I1)
	Inductive proximity switches (I1)

AXS	
AXS200M_ AXS230MB AXS280MB AXS110TA AXS120TH AXS120TV AXS240TH AXS280TH AXS280TV	Mechanical switches (M4)
AXS280MP AXS460MP AXS500MP	Mechanical switches (M4)

AXS200Y AXS280Z	Mechanical (M5) and inductive proximity switches (I1)
AXS_Y	Mechanical (M5) and inductive proximity switches (I1)
AXS300MP	Inductive proximity switches (I2)

AXLM

AXLM	Magnetic encoded position measuring system (T1…T4)

6.3.4 Dimensions

For the assembly of limit switches consist of Linear Axis of the series AXC, AXDL, AXLT, AXBG and AXLM depending on size, different mounting versions (Figure 6.43) and from this resulting interference contours.

MOUNTING VERSION 1

MOUNTING VERSION 2

MOUNTING VERSION 3

MOUNTING VERSION 4
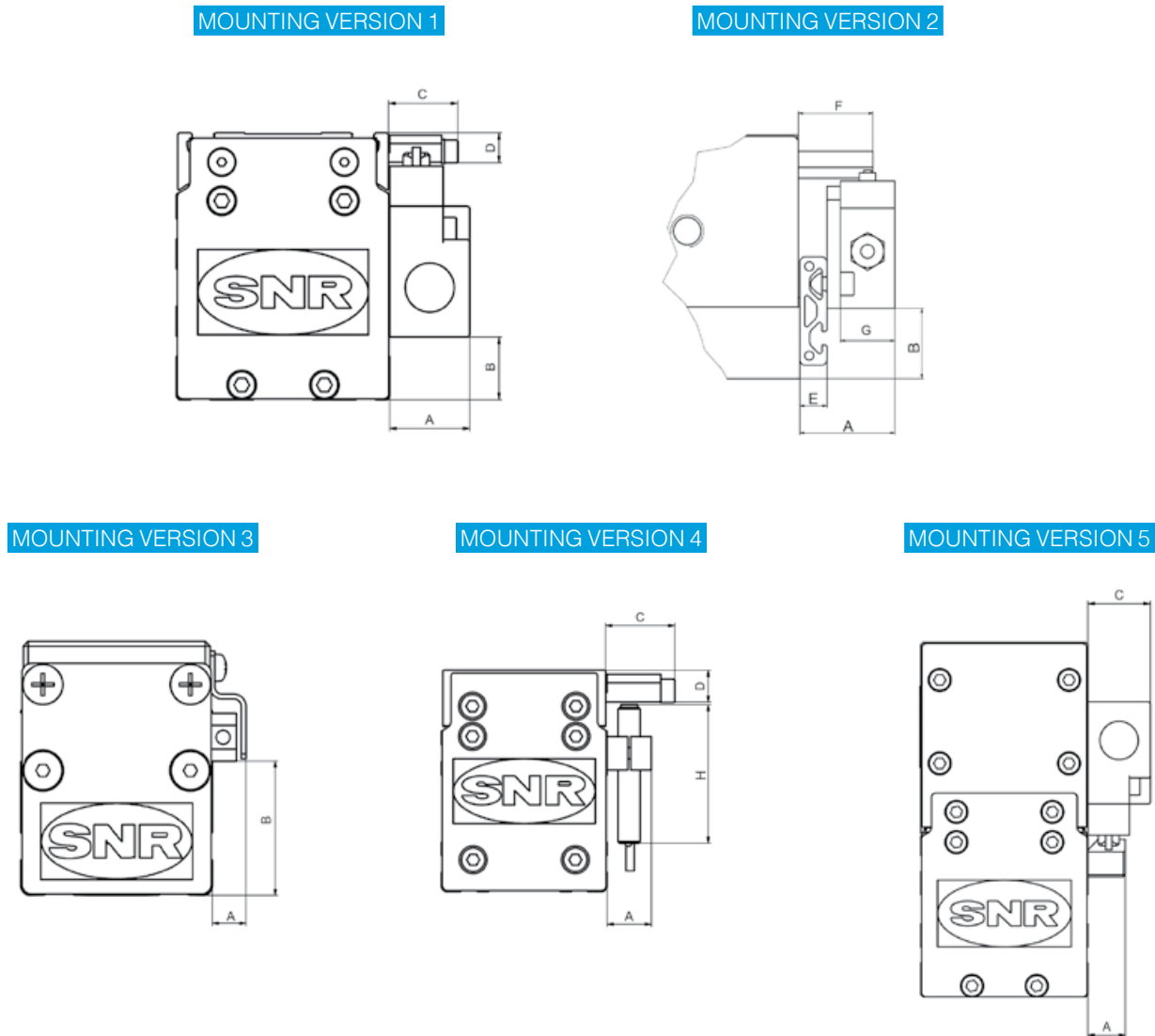
MOUNTING VERSION 5

Figure 6.43 — Mounting versions of limit swiches

The dimensions are shown in Table 6.32.

Table 6.32 — Dimensions for the limit switch monting

Type		Switch	Mounting version	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	F [mm]	G [mm]	H [mm]	L[1] [mm]
AXC40Z AXC40S AXC40T		I1	3	7,0	28,0							30
AXC40A	Slider moved	I1	3	7,0	28,0							58
	Profile moved	M2	5	18,0		21,00						58
		I2	5	18,0		16,00						58
AXC60Z AXC60S AXC60T		M2	1	22,0	19,5	25	11,5					95
		M3	1	20,0	12,5	18	19,0					80
		I2	4	16,0		as with M2 / M3					50	95
AXC60A	Slider moved	M1	1	30,0	9,5	18	55,0					80
		I2	4	16,0		15,0	50,0					55
	Profile moved	M1	5	18,0		30,0						80
		I2	5	18,0		16,00						80
AXC80Z AXC80S AXC80T		M1	1	30,0	25,5	26	11,0					95
		I2	4	16,0		26	11,0				50	95
AXC80A	Slider moved	M1	1	30,0	9,5	18	55,0					55
		I2	4	16,0		16,0	80,5					55
	Profile moved	M1	5	18,0		30,0						80
		I2	5	18,0		16,00						80
AXC100Z_ AXC100Z_C AXC100Z_L		M1	1	30,0	22,5	15	23,5					80
		I2	4	16,0		15	23,5				50	80
AXC100S_D AXC100Z_D		M1	1	30,0	22,5	15	11,0					85
		I2	4	16,0		15	11,0				50	85
AXC120Z AXC120S AXC120T		M1	1	30,0	64,5	26	20,0					80
		I2	4	16,0		26	11,0				50	80
AXC120A	Slider moved	M1	1	30,0	9,5	18	55,0					80
		I2	4	16,0		12,8	150,0				50	80
	Profile moved	M1	5	18,0		30,0						80
		I2	5	18,0		16,00						80
AXDL110Z AXDL110S AXDL110T		M2	2	31,0	7,0	24	9,3	10	27,5	20		120
AXDL160Z AXDL160S AXDL160T		M1	1	30,0	9,5	15	8,5					85
AXDL160A		M1	5	8,0		33,00						80
		I2	5	15,5		16,00						85
AXDL240Z AXDL240S AXDL240T		M1	1	30,0	22,0	15	33,0					80
AXDL240A		M1	5	8,0		29,00						80
AXLT155S AXLT155T		M3	2	25,0	1,0				27,5	20		54
AXLT225S AXLT225T		M3	2	25,0	11,0				27,5	20		54
AXLT325S AXLT325T		M3	2	35,0	26,0				27,5	20		90
AXLT455S AXLT455T		M3	2	34,0	39,5				27,5	20		90
AXBG15S		I1	3	12,7	4,8							10
AXBG20S		I1	3	13,0	6,0							10
AXBG26S		I1	3	13,0	7,0							15
AXBG33S		I1	3	13,0	9,0							15
AXBG46S		I1	3	13,0	10,5							15
AXBG55S		I1	3	13,5	13,0							20
AXLM155		T_	5	1,7		17,50						
AXLM225		T_	5	1,7		18,50						
AXLM325		T_	2									

[1]- Length of the cam switch
[2]- Switch internally placed, no interference contour

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6.3.5 Line splitter

For the field installation of the inductive switches, Linear Axis of the AXC, AXDL and AXLT series can be equipped with line splitters. Depending on the number of required switches, Y line splitter for two or sensor boxes for four switches are available.

Line splitters have to be specified as special options of the Linear Axis and will be delivered with fully wired limit switches. For the connection to the signal processing controler, fixed cables, connectors as well as fieldbus and IO-Link are available.

6.3.6 Technical data

The technical data of the available switches and position measuring systems are contained in the Tables 6.33 to 6.36.

Table 6.33 — Mechanical safety limit switches

Switch	Life time	Housing material	Cable gland	Conductor cross-section	Protection class
M1	30×10^6 switching operations	Plastic	M20 x 1,5	0,5…2,5 mm²	IP67
M2	30×10^6 switching operations	Plastic	Screwed connection 4 x M3,5	0,5…1,5 mm²	IP30
M3	10×10^6 switching operations	Metal	Screwed connection	max. 1,5 mm²	IP67
M4	30×10^6 switching operations	Plastic	M20 x 1,5	0,5…2,5 mm²	IP67
M5	30×10^6 switching operations	Plastic	M20 x 1,5	0,5…2,5 mm²	IP67

Switching segment: Snap-action switch (force disconnection) each case 1 x opener and 1 x closer

Table 6.34 — Inductive proximity switches

Switch	Connection voltage	Max. load current	Switching accuracy	Cable length	Protection class
AXC-Initiator	10…30 V DC	100 mA	≤ 2% of the reacting distance	10 m	IP67
I1	10…30 V DC	100 mA	≤ 10% of the reacting distance	5 m	IP67
I2	12…30 V DC	100 mA	≤ 5% of the reacting distance	2 m	IP67
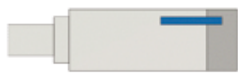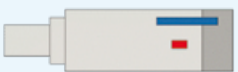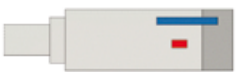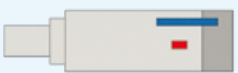
The magnetic field switch detects the magnetic field of the in the slider integrated magnet. Due to the contactless position detection is the function of the magnetic field switches reliable and without wear.

Table 6.35 — AXF – Magnetic field switch

Switch	Connection voltage	Rated operational current	Rated switching field intensity	Cable length	Protection class
AXF Magnetic field switch	10…30 V DC	200 mA	1,2 kA/m	5 m	IP67

The magnet encoded position measuring system is a contactless incremental measuring system, consisting of sensor head and magnetic tape, which is available in several versions. All functions are realized via magnetic sensing.

Table 6.36 — Magnetic encoded position measuring system

Switch	Output signal	Reference point signal	Operating voltage	Total system accuracy	Output voltage (A/B/Z)	Maximum velocity	Protection class	Sensor head	Magnetic tape
T1	Sinusoidal analog signals Sin/Cos	without	5 V ± 5%	± 10µm	1 Vss	5 m/s	IP67		with alternating north and south poles
T2	Sinusoidal analog signals Sin/Cos	1 Reference point signal	5 V ± 5%	± 10µm	1 Vss	5 m/s	IP67		with one reference point signal
T3	Sinusoidal analog signals Sin/Cos	Distance-coded reference point signals	5 V ± 5%	± 10µm	1 Vss	5 m/s	IP67		with reference point signals according mathematical algorithm
T4	Sinusoidal analog signals Sin/Cos	fix periodic reference point signals	5 V ± 5%	± 10µm	1 Vss	5 m/s	IP67		with several reference point signals at the same distance

6.3.7 Possible switch combinations

Table 6.37 — Possible switch combination

Code number	Mechanical switches					Inductive proximity switches												AXC															
Code number	M1	M2	M3	M4	M5	AXC-Initiator PNP-NC	AXC-Initiator PNP-NO	AXC-Initiator NPN-NC	AXF - Magentic field switch PNP-NC	AXF - Magentic field switch PNP-NO	AXF - Magentic field switch NPN-NC	I1 PNP-NC	I1 PNP-NO	I1 NPN-NO	I2 PNP-NC	I2 PNP-NO	I2 NPN-NO	AXC40...Z/S/T...	AXC40A Slider moved	AXC40A Profile moved	AXC60...Z/S/T...	AXC60A Slider moved	AXC60A Profile moved	AXC80...Z/S/T...	AXC80A Slider moved	AXC80A Profile moved	AXC100Z..B / C / L...	AXC100Z...D...**	AXC100...S / T...	AXC120...Z / S / T...	AXC120A Slider moved	AXC120A Profile moved
00																		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
01	1																		x			x	x		x	x	x	x	x	x	x	
		1																			x											
02	2																		x			x	x		x	x	x	x	x	x	x	
		2																			x											
03	2																1			x			x	x		x	x	x	x	x	x	x	
		2															1					x											
04	2																	1		x			x	x		x	x	x	x	x	x	x	
		2																1				x											
05			1																			x											
06			2																			x											
07			2														1					x											
08			2															1				x											
09	1																							x			x						x
10	2																							x1			x						x
11	1																1							x									
12						1													x	x		x	x		x			x			x		
														1								x											x
13						2													x	x		x	x		x			x			x		
														2								x											x
14						3													x	x		x	x		x			x			x		
15		1																				x											
16		2																				x											
18									1										x	x		x	x		x			x			x		
														1								x											x
19									2										x	x		x	x		x			x			x		
														2								x											x
20									3										x	x		x	x		x			x			x		
21										1									x	x		x	x		x			x			x		
																	1					x											x
22										2									x	x		x	x		x			x			x		
																	2					x											x
23										3									x	x		x	x		x			x			x		
25						2	1																			x	x	x				x	
26												1						x	x														
													1								x		x			x	x	x	x	x	x	x
27												2						x	x														
													2								x		x			x	x	x	x	x	x	x
28												3						x	x														
													3								x		x			x	x	x	x	x	x	x
29													1					x	x														
														1							x		x			x	x	x	x	x	x	x
30													2					x	x														
														2							x		x			x	x	x	x	x	x	x
31													3					x	x														
														3							x		x			x	x	x	x	x	x	x
32														1				x	x														
																	1			x		x			x	x	x	x	x	x	x
33														2				x	x														
																	2			x		x			x	x	x	x	x	x	x
34														3				x	x														
																	3			x		x			x	x	x	x	x	x	x
35												2	1					x	x														
														2	1				x		x			x	x	x	x	x	x	x

* RP = Reference point signal   **only on the drive side possible

[1] not in combination with A – Standard connections possible. Choose in this case code number 01 on both sides (combinations 01 + 26 / 29 / 32 also possible)

x Option possible

Code number	Mechanical switches														Magnetic encoded position measuring system				AXF	AXDL				AXLT		AXBG	AXS				AXLM
	M1	M2	M3	M4	M5	AXF PNP-NC	AXF PNP-NO	AXF NPN-NC	I1 PNP-NC	I1 PNP-NO	I1 NPN-NO	I2 PNP-NC	I2 PNP-NO	I2 NPN-NO	T1 (without RP*)	T2 (1 RP*)	T3 (distance-coded RP*)	T4 (fix periodic RP*)	AXF100...Z / SN / T / G...	AXDL110Z / S / T...	AXDL160Z / S	AXDL240Z / S	AXDL..A	AXLT...155/225...	AXLT...325/455...	all	AXS...M	AXS280Y	AXS200Y - AXS280Z	AXS...T	all
00																			x	x	x	x	x	x	x	x	x	x	x	x	x	
01	1																			x	x	x										
01				1																							x	x		x	
01					1																								x		
01		1																	x													
02	2																			x	x	x										
02			2																								x	x		x	
02				2																									x		
02		2																	x													
03			2							1																		x				
03				2						1																		x				
03	2												1						x	x	x											
03		2								1									x													
04			2								1																	x				
04				2							1																	x				
04	2													1				x	x	x												
04		2									1							x														
05			1																					x	x							
06			2																				x	x								
07			2							1													x									
07			2									1												x								
08			2								1												x									
08			2										1										x									
12				1															x													
13				2															x													
18							1												x													
19							2												x													
21									1										x													
22									2										x													
26									1											x[2]	x[2]	x[2]		x[3]	x[3]	x		x	x		
26												1											x								
27									2											x[2]	x[2]	x[2]		x[3]	x[3]	x		x	x		
27												2											x								
28									3											x[2]	x[2]	x[2]		x[3]	x[3]	x		x	x		
28												3																			
29										1									x[2]	x[2]	x[2]		x[3]	x[3]	x		x	x			
29													1										x								
30										2									x[2]	x[2]	x[2]		x[3]	x[3]	x		x	x			
30													2										x								
31										3									x[2]	x[2]	x[2]		x[3]	x[3]	x		x	x			
31													3																		
32									1											x[2]	x[2]	x[2]		x[3]	x[3]	x		x	x		
32													1										x								
33									2											x[2]	x[2]	x[2]		x[3]	x[3]	x		x	x		
33													2										x								
34									3											x[2]	x[2]	x[2]		x[3]	x[3]	x		x	x		
34													3																		
35									2	1									x[2]	x[2]	x[2]		x[3]	x[3]	x		x	x			
35													2	1								x									
50															1																x
51																1															x
52																	1														x
53																		1													x

* RP = Reference point signal   **only on the drive side possible

[1] - not in combination with A – Standard connections possible
   Choose in this case code number 01 on both sides (combinations 01 + 26 / 29 / 32 also possible)

[2] - Initiator mounted on the right side on the top; define in the type code on position 11

[3] - Initiator on the left side inside placed; define in the type code on position 11

x: Option possible

Other switch combinations are marked in type code with "XX" and described in plain text.

6.4 Energy chains

Our complete Linear Axis systems can be offered including assembled energy chains.

Depending on the type, size and requirements are different types of energy chains available (Table 6.38). The versions differ in the number of separating strips, which are included in every second chain link. The connecting elements of the energy chains (except for type 390 and 410) are prepared for the attachment of cables and wires with cable ties. For types 390 and 410 are C - rails mounted.

Table 6.38 — Energy chains

Type	Number of separating strips	Mean radius [mm]	Open inside	Open outside	Inner dimension Width [mm]	Inner dimension Hight [mm]	Max. horizontal self-supported stroke [mm]	Filling mass for max. horizontal stroke [kg/m]	X AXC40	X AXC60	X AXC80	X AXC100	X AXC120	X AXS120TH	X AXS240TH	X AXS280TH	Y AXC60	Y AXC80	Y AXC100	Y AXC120	Y AXDL110	Y AXDL160	Y AXDL240	Y AXS280	Y AXS460	Y AXS500	Z AXC40A	Z AXC60A	Z AXC80A	Z AXC120A	Z AXDL160A	Z AXDL240A	Z AXS110T	Z AXS120TV	Z AXS280TV	Z AXS200M	Z AXS230M	Z AXS280M	AXLM155E	AXLM225E	AXLM325E
B15i.038.075	1	75	x		38	17	1 500	1,0																			x	x													
B15.5.110	1	110		x	63	17	1 500	1,0	x								x	x		x																					
B15i.5.110	1	110	x		63	17	1 500	1,0																					x												
B15.025.075	1	75		x	25	17	1 500	1,0																																x[1]	
B15.025.125	1	125		x	25	17	1 500	1,0																																	x[1]
1400.050.075	1	75	x		50	21	2000	2,0															x																		
2400.07.75	1	75	x		77	25	3 000	2,0							x																										
2400.07.100	1	100	x		77	25	3 000	2,0							x																										
2400.07.125	1	125	x		77	25	3 000	2,0							x															x		x	x			x	x	x			
2500.07.125	1	125		x	77	25	3 000	2,0		x	x	x	x								x	x	x	x									x								
2400.10.125	2	125	x		103	25	3 000	2,0							x															x		x	x	x	x	x	x			
2500.10.125	2	125		x	103	25	3000	2,0			x	x	x							x																					
2500.03.175	1	175		x	38	25	3 000	2,0																																	x[1]
2500.12.125	2	125		x	125	25	3 000	2,0				x	x							x		x	x																	
2700.12.175	2	175		x	125	32	3 500	3,0				x	x										x																		
2600.12.125	2	125	x		125	32	3 500	3,0							x														x							x	x			
2600.12.200	2	200	x		125	32	3 500	3,0																														x			
3500.125.125	2	125		x	125	45	4 000	4,0				x	x									x	x																	
390.12.150	2	150	x	x	125	38	5 000	6,0					x									x	x																	
410.11.135	2	135	x	x	112	50	7 000	12,0					x										x																	
E4.32.10.250	3	250	x	x	100	32	4 000	4,0							x	x																								
E4.42.10.150	2	150	x	x	100	42	6 000	1,5					x										x							x					x		x	x	x			
E4.42.12.150	2	150	x	x	125	42	6 000	1,5					x		x								x							x					x		x	x	x			
E4.42.20.150	2	150	x	x	200	42	6 000	1,5																		x											x				
E4.56.10.150	2	150	x	x	134	56	7 000	4,0																			x	x	x												
E4.56.10.250	2	200	x	x	134	56	7 000	4																			x	x	x												

1 - *The energy chains can not be used in the standard configuration for versions with bellow or cover plate. Here are individually adapted special c design solutions for connecting the energy chain necessary.*

6.5 Gantry support legs

For the assembling of Linear Axis systems are gantry support legs in different sizes and designs available (Figure 6.44). The length and the color of the gantry support legs can be set individually.

Figure 6.44 — SNR Linear Axis system with gantry support legs

Table 6.39 shows the dimensions of the gantry support legs and the different versions. The limit dimensions and combination possibilities are included in Table 6.40.
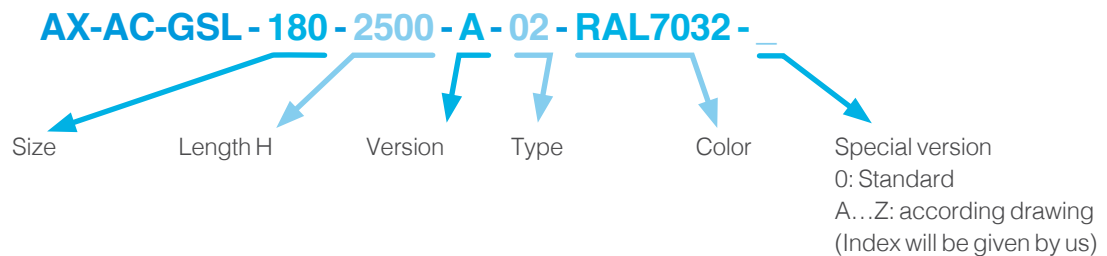
Table 6.39 — Dimensions and versions of gantry support legs

AX-AC-GSL-180 -…	
Version A	Version B

Type 01	Type 02	Type 01	Type 02

Type 03	Type 04	Type 03	Type 04

AX-AXC-GSL-300-…-01…	
Version L	Version M

SNR
Brand of NTN Group

Table 6.40 — Limit dimensions and combination possibilities of gantry support legs

Type	H_min. [mm]	H_max.[1] [mm]	AXC120	AXS200M_B	AXDL240	AXS280MP	AXS280Y	AXS280Z	AXS300MP_B	AXS460MP	AXS500MP
AX-AC-GSL-180-_-…	800	4 000	x	x	x[2]	x	x	x			
AX-AC-GSL-300-L-…	1 800	5 000							x	x	x
AX-AC-GSL-300-M-…	1 400	5 000							x	x	x

[1] - maximum recommended length, please contact us for longer gantry support legs

[2] - Assembly via AX-Portal connection-120-240

Example type code of a gantry support leg:

AX-AC-GSL - 180 - 2500 - A - 02 - RAL7032 - _

Size   Length H   Version   Type   Color   Special version
0: Standard
A…Z: according drawing
(Index will be given by us)

6.6 Groove inserts

At environments with heavy dirt, the profile grooves can be closed with groove inserts (Figure 6.45 and 6.46), to avoid deposits in the profile grooves from the Linear Axis. The cleaning of these systems will be facilitated considerably.

Figure 6.45 — Aluminum groove insert

Figure 6.46 — Plastic groove insert

For Linear Axis, which are equipped with inductive proximity switches (Chapter 6.3), the grooves containing the cable guides are always closed with groove inserts.

Table 6.41 — contains the list of available groove inserts

Table 6.41 — Groove inserts

Type	Type code	ID number	Mounting possibility	Material	Color	Length [mm]
AXC40	AX-AC-GIN-5-2000-PP	101842	Profile bottom side	Polypropylen	black	2 000
AXC60	AX-AC-GIN-5-2000-PP	101842	all grooves	Polypropylen	black	2 000
AXC80	AX-AC-GIN-6-2000-PP	101832	all grooves	Polypropylen	black	2 000
	AX-AC-GIN-6-2000-AL	101841		Aluminum anodized	natural	2 000
AXC100	AX-AC-GIN-6-2000-PP	101832	lateral groove above	Polypropylen	black	2 000
	AX-AC-GIN-6-2000-AL	101841		Aluminum anodized	natural	2 000
	AX-AC-GIN-8-2000-PP	101632	lateral groove below	Polypropylen	black	2 000
	AX-AC-GIN-8-3000-AL	101822		Aluminum anodized	natural	3 000
AXC120	AX-AC-GIN-6-2000-PP	101832	Profile top side	Polypropylen	black	2 000
	AX-AC-GIN-6-2000-AL	101841		Aluminum anodized	natural	2 000
	AX-AC-GIN-8-2000-PP	101632	Profile bottom side, lateral grooves	Polypropylen	black	2 000
	AX-AC-GIN-8-3000-AL	101822		Aluminum anodized	natural	3 000
all AXDL	AX-AC-GIN-10-2000-AL	173218	Profile top side	Aluminum anodized	natural	2 000
AXDL240	AX-AC-GIN-5-2000-PP	101842	lateral groove above	Polypropylen	black	2 000
	AX-AC-GIN-8-2000-PP	101632	Profile bottom side, lateral groove below	Polypropylen	black	2 000
	AX-AC-GIN-8-3000-AL	101822		Aluminum anodized	natural	3 000

6.7 Connection for sealing air or air suction

SNR Linear Axis of the AXC and AXDL series are equipped with a connection for sealing air or for air suction.

The description and dimensions of these connections are summarized in Figure 6.47 and Table 6.42. The configuration version and the associated specification of the Linear Axis in which the connection is useful are described in Chapter 8.3.1.
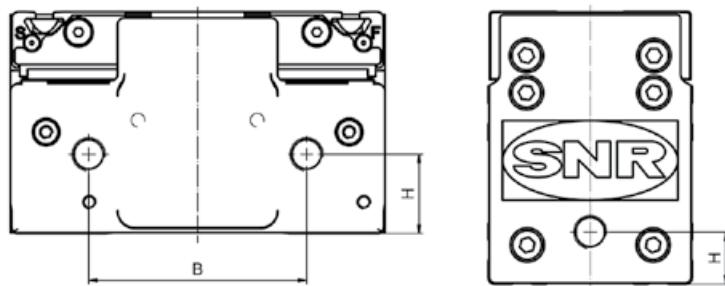

Figure 6.47 __ Connection for sealing air or air suction

Table 6.42 — Dimensions

Type	H [mm]	B [mm]	Thread	Connection position
AXC40 SN / TN	9,5		G1/8"	End plate, floating bearing side
AXC60 S_ / TN	20,0		G1/8"	End plate, floating bearing side
AXC60 Z / NZ	15,0		G1/8"	both end plates
AXC80S_ / TN	10 11		G1/8" G1/8"	End plate, fixed bearing side End plate, floating bearing side
AXC80: Z / NZ	8,5		G1/8"	both end plates
AXC100 SV / TV	29,4 57,0	32	G1/8" G1/8"	End plate, fixed bearing side End plate, floating bearing side
AXC100 Z / NZ	10,2		G1/8"	both end plates
AXC120 SV / TV	25,0		G1/8"	both end plates
AXC120 Z / NZ	30,0		G1/8"	both end plates
AXF100 SV / TV / GV	29,4 57,0	32	G1/8" G1/8"	End plate, fixed bearing side End plate, floating bearing side
AXF100 Z / NZ	10,2		G1/8"	both end plates
AXDL110 SV / TV	12,0	74	G1/8"	End plate, floating bearing side
AXDL110 Z / NZ	30,0	90	G1/8"	Deflection side
AXDL160 SV / TV	25,0	105	G1/8"	both end plates
AXDL160 Z / NZ	25,0	123	G1/8"	Deflection side
AXDL240: SV / TV	46,0	145	G1/8"	both end plates
AXDL240 Z / NZ	46,0	145	G1/8"	Deflection side

6.8 Balance cylinder

At high vertical moving masses, the Linear Axis AXC120A, ADL240A, AXS230M, AXS280M and AXS280TV can be equipped to relieve the toothed belt with a balance cylinder (Figure 6.48).

Figure 6.48 — AXS280TV with balance cylinder
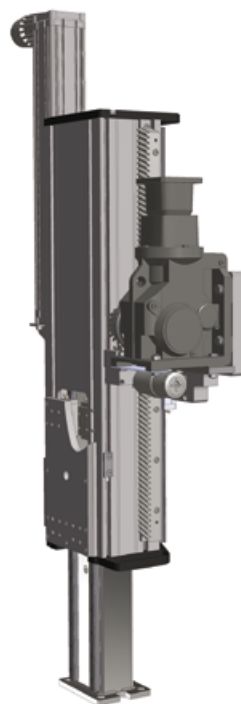
The dimensions of the possible versions are shown in Figure 6.49 and Table 6.43.
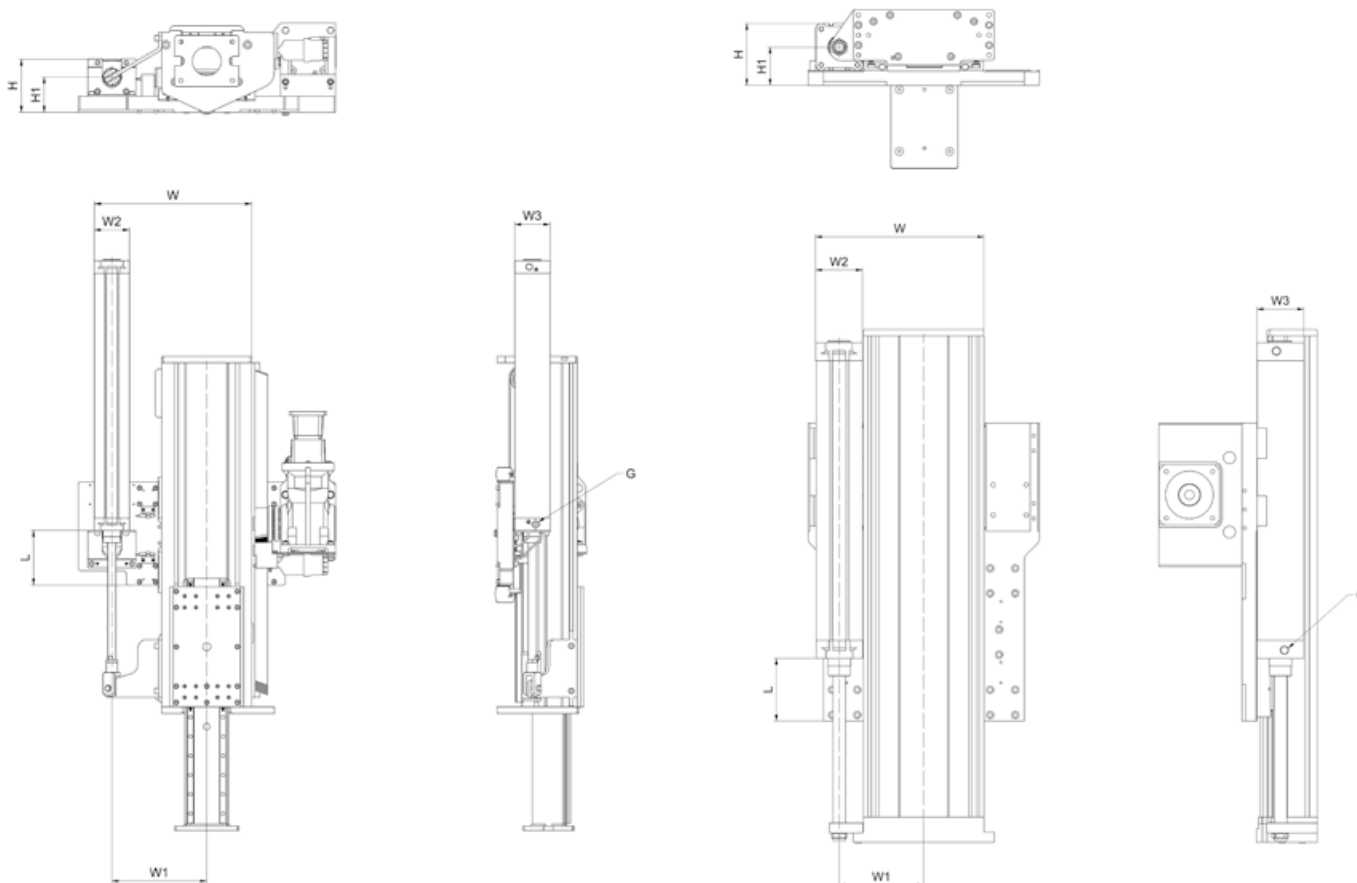
Figure 6.49 — AXDL240A and AXS280TV with balance cylinder

Table 6.43 — Dimensions axis with balace cylinder

Type	Cylinder	Piston - Ø [mm]	L [mm]	W [mm]	H [mm]	H1 [mm]	W1 [mm]	W2 [mm]	W3 [mm]	G
AXC120A	on request									
AXDL240A	DNC80	80	variably adjustable	335	123	168	76	93	93	G3/8"
AXS280TV	DNC100	100	170	490	165	110	295	110	110	G1/2"
AXS230MB	on request									
AXS280MB	DSBG160	160	265	474	251	158	241	186	186	G3/4"

6.9 Safety brakes

Lifting axis, designed for higher loads, can optionally be equipped with a safety brake as a safety option (Chapter 8.3.2).

The safety brakes have the following characteristics:

- Operating pressure 4…6 bar
- Pressureless active
- 2 000 breaking cycles respectively 5 000 000 clamping cycles life time
- Reaction time <30ms
- Optional with initiator to scan the actuating situation

Table 6.44 — Dimensions axis with safety brake

Type	Brake type	Shaft - Ø [mm]	Holding force [N]	W [mm]	H [mm]	H1 [mm]	W1 [mm]	G
AXC120A	RBPS2000	20	10 000	294,0	246,0	191,0	125,0	G1/8"
AXDL160A	RBPS1000	10	3 500	217,5	119,0	73,0	110,0	M5
AXDL240A	RBPS2000	20	10 000	340,5	153,0	103,5	171,0	G1/8"
AXS200ME	RBPS2000	20	10 000	300,5	168,0	111,0	151,0	G1/8"
AXS230MB	RBPS2000	20	10 000	388,0	219,0	169,0	166,0	G1/8"
AXS280TV	RBPS2000	20	10 000	425,0	194,7	145,2	191,0	G1/8"
AXS280MB	RBPS2800	28	18 000	420,0	163,0	95,5	212,5	G1/8"
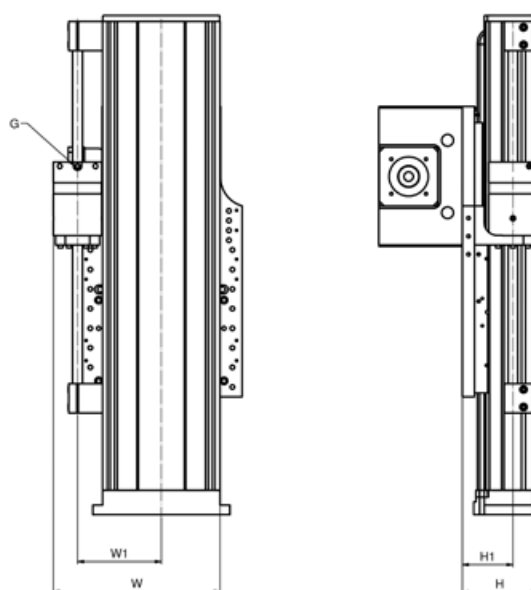
Figure 6.50 — Axis with safety brake

6.10 Lubrication connections

The existing grease nipple of the linear axis of the AXC, AXDL, AXLT and AXS280Z series can be replaced if necessary by different types of grease nipples or by push-in fittings in accordance with the Tables 6.45 and 6.46.

Table 6.45 — Dimensions of the lubrication connections
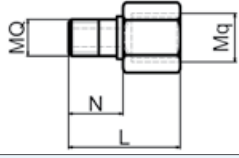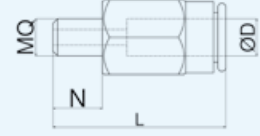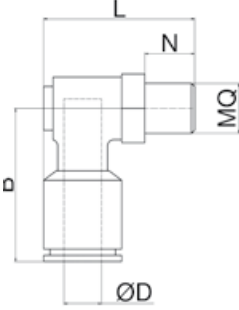
Type		Designation	ID Number	MQ	D / Mq [mm]	B [mm]	N [mm]	L [mm]
Type 1 Extension		LE-M6-M6x22,4	250159	M6	M6		13,0	22,4
Type 2 Tube connection straight		PUSH-IN STR M5 D4_0910101	330240	M5	4		4,0	20,0
		Tube connection LH-M6x5A-4	244379	M6			5,0	16,0
		Tube connection LH-M6x8A-4	391765	M6			8,0	19,0
		Tube connection LH-M6x5A-6	244380	M6	6		5,0	17,0
		Tube connection LH-M6x8A-6	391763	M6			8,0	26,0
		Push-in fitting-M8x1-D6-straight	295839	M8x1			6,0	24,3
		PUSH IN-STRAIGHT CONN1/8D6_3084578	306696	G1/8			8,0	28,0
Type 3 Tube connection angulate		PUSH-IN 90 M5 D4_0911095	352749	M5	4	17,5	4,0	21,0
		Push-in fitting-L M5-D6	327405		6	20,8	4,0	22,5
		Tube connection LH-M6x5S-4	270991	M6	4	18,0	5,0	22,5
		Tube connection LH-M6x8S-4	391762	M6		18,2	8,0	25,2
		Tube connection LH-M6x5S-6	262033	M6	6	21,0	5,0	22,0
		Tube connection LH-M6x8S-6	391759	M6		21,0	8,0	26,1

Table 6.46 — Correlation of the lubrication connections

Linear Axis	Design type standard grease nipple	Lubrication point	MQ	Type 1	Type 2					Type 3			
				LE-MQ-M6x22,4	PUSH-IN STR M5 D4_0910101	LH-M6x5A-_	LH-M6x8A-_	LH-M8x1x6A-6	PUSH IN-STRAIGHT CONN1/8D6_3084578	PUSH-IN 90 M5 D4_0911095	LH-M5x4S-6	LH-M6x5S-_	LH-M6x8S-4
AXC40A	Cup head grease nipple DIN 3405-A	all	M5		x								
AXC60A	Cup head grease nipple DIN 3405-A		M6			x							x
AXC60Z / S / T	Cup head grease nipple DIN 3405-A		M6			x							x
AXC80A	Cup head grease nipple DIN 3405-A		M6		(x)							(x)	
AXC80Z / S / T	Cup head grease nipple DIN 3405-A		M6		(x)							(x)	
AXC100	Hydraulic type grease nipple DIN 71412-A		M6			x							
AXC120	Hydraulic type grease nipple DIN 71412-A		M6			x							
AXDL110	Hydraulic type grease nipple DIN 71412-A		M5	x						x	x		
AXDL160	Hydraulic type grease nipple DIN 71412-A		M6	x		x[1]						x[1]	
AXDL240	Hydraulic type grease nipple DIN 71412-A		M6	x		x[1]						x[1]	
AXLT155	Hydraulic type grease nipple DIN 71412-A		M5	x						x	x		
AXLT225	Hydraulic type grease nipple DIN 71412-A	S	M8x1					x					
		F	M5	x						x	x		
AXLT325	Hydraulic type grease nipple DIN 71412-A		G1/8						x				
AXLT455	Hydraulic type grease nipple DIN 71412-A	all	G1/8						x				
AXS280Z	Hydraulic type grease nipple DIN 71412		M6				x						x

x   montiable
(x) factory-provided montable (specify position)
x[1] only in connection with extension possible

7. Multi – Axis - Systems

SNR standard axis systems allow the user to create modular two and three axis systems with very small design effort. Various combinations of the Linear Axis of the AXC, AXDL and AXS series to standard axis systems are possible.

All complete systems are pre-assembled ready for installation with switches, energy chains, gearboxes and necessary connecting and fastening elements.

If no energy chain is desired, the deliveries include the single components together with the necessary connecting and fastening elements.

The descriptions of the direct, gantry, cross, A - standard connections and their combination possibilities, the drive adaptations as well as other accessories are contained in Chapter 6 "Accessories".

The figures in the following chapters show examples of standard combinations of SNR Linear Axis.

7.1 Standard combinations AXC - AXDL
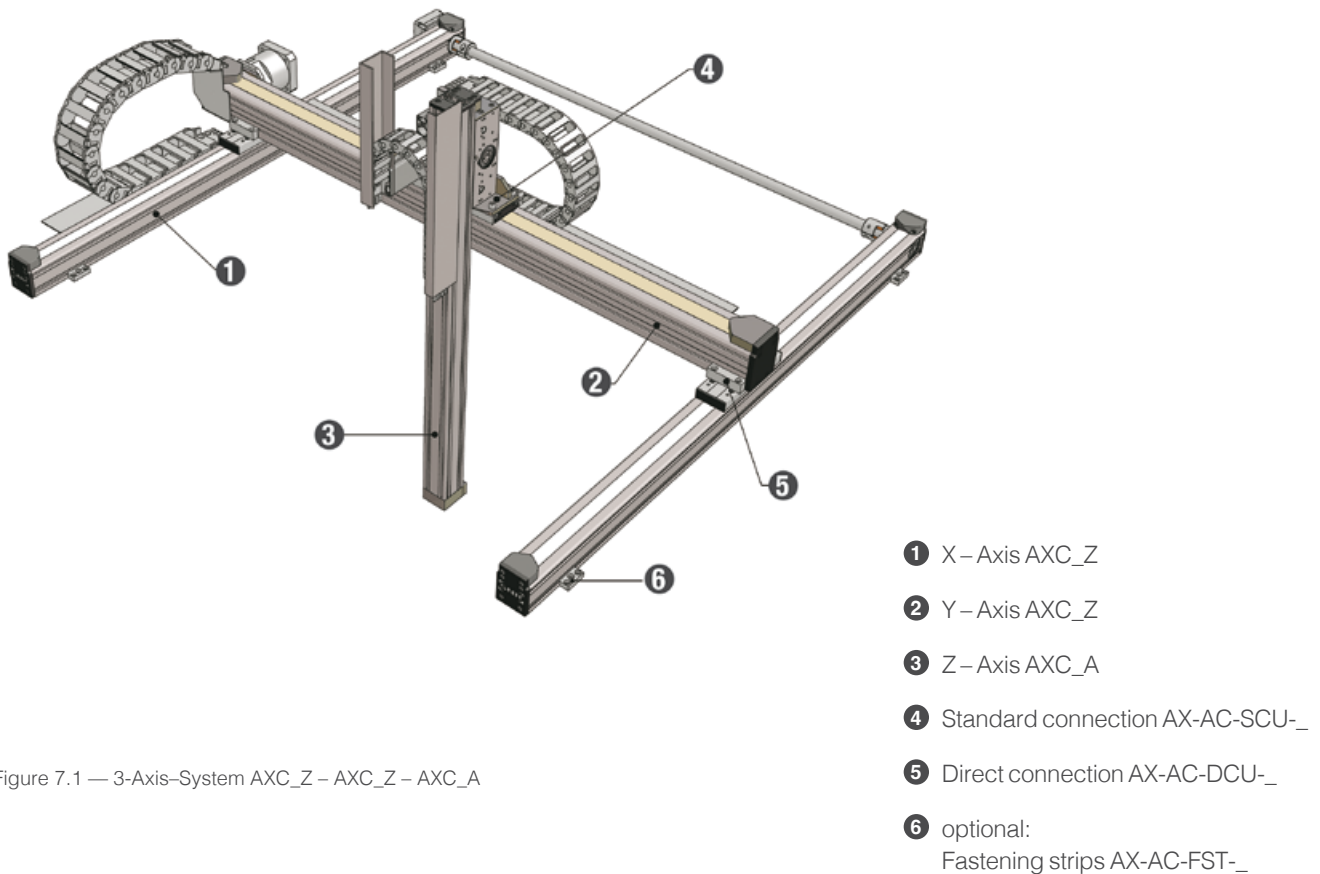
Figure 7.1 — 3-Axis–System AXC_Z – AXC_Z – AXC_A

❶ X – Axis AXC_Z

❷ Y – Axis AXC_Z

❸ Z – Axis AXC_A

❹ Standard connection AX-AC-SCU-_

❺ Direct connection AX-AC-DCU-_

❻ optional:
Fastening strips AX-AC-FST-_

Figure 7.2 — 3-Axis–System AXC_Z – AXC_Z – AXC_S
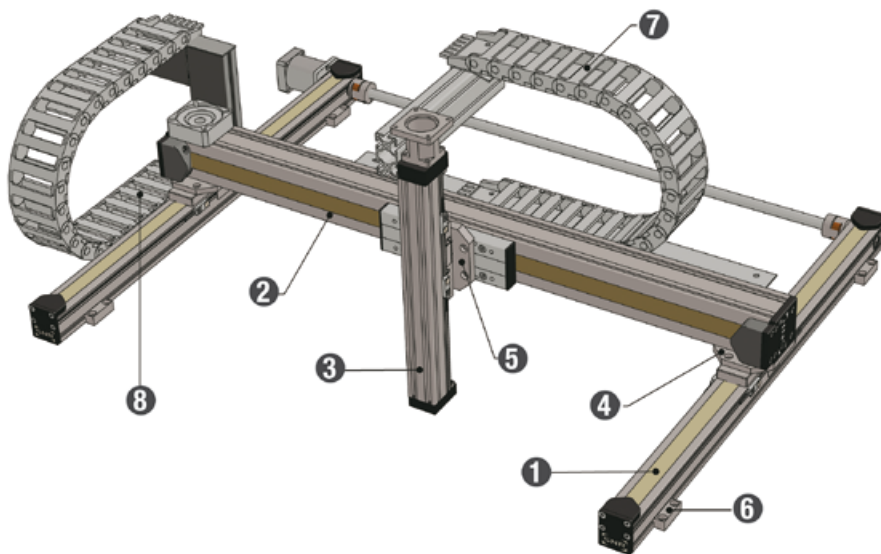
❶ X – Axis AXC_Z

❷ Y – Axis AXC_Z

❸ Z – Axis AXC_S

❹ AXC – Gantry connection AX-AC-GCU-_

❺ Cross connection AX-AC-CCU-_

❻ optional:
Fastening strips AX-AC-FST-_

❼ Energy chain direct to the Z-Axis

❽ Energy chain X-Axis
(for AXC40 mounting direct on the
machine frame)

Figure 7.3 — 3-Axis–System AXC_Z – AXDL_Z – AXC_A
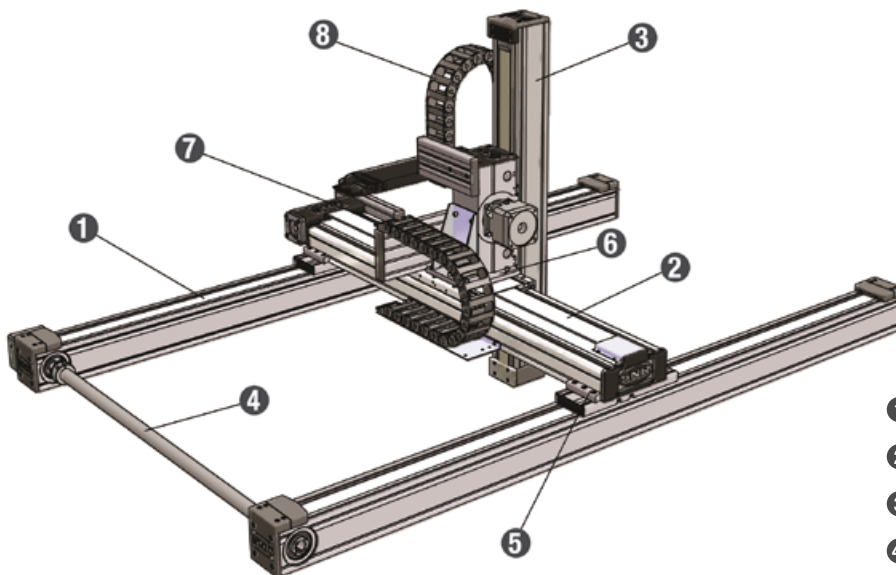
❶ X – Axis AXC_Z

❷ Y – Axis AXDL_Z

❸ Z – Axis AXC_A

❹ Connecting shaft AX-AC-CHS-_

❺ Direct connection AX-AC-DCU-_

❻ Standard connection AX-AC-SCU-_

❼ Energy chain Y-Axis

❽ Energy chain Z-Axis

7.2   Standard combinations AXS – AXC - AXDL
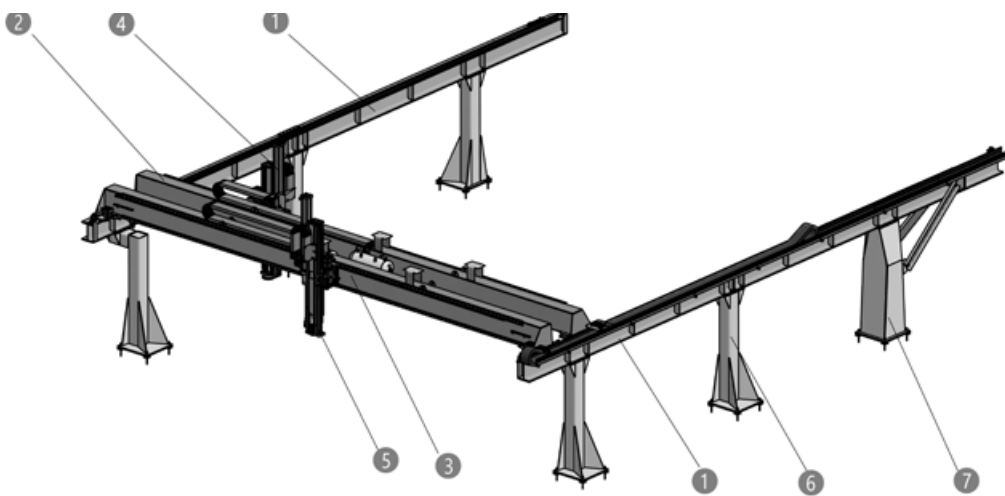
Figure 7.4 — 3-Axis-System AXS300M - AXS500M - AXS280B

❶ X – Axis AXS300MP

❷ Y – Axis 1 AXS500MP

❸ Y – Axis 2 AXS500MP

❹ Z – Axis 1 AXS280MB

❺ Z – Axis 2 AXS280MB

❻ Gantry support leg AX-AC-GSL-300

❼ Special gantry support leg AX-AC-GSL-500

❶ X – Axis AXC_Z

❷ Y – Axis AXDL_Z

❸ Z – Axis AXDL_Z

❹ Gantry connection AX-AC-GCU-_

❺ Angle connection AX-AC-ACU-_
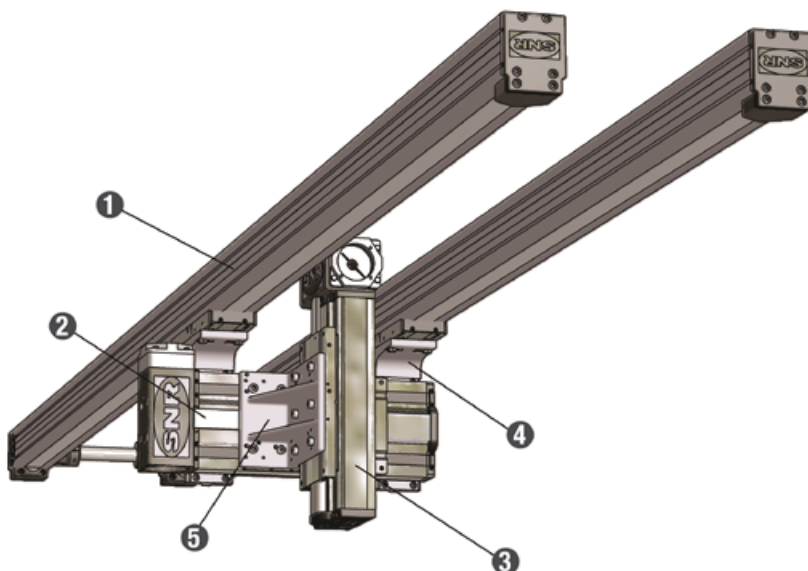
Figure 7.5 — 3-Axis–System AXC_Z – AXDL_Z - AXDL_Z
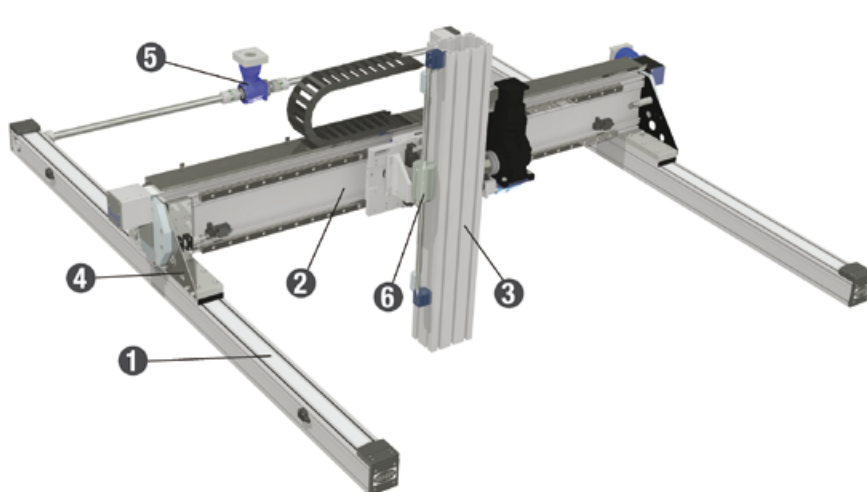
1 X – Axis AXC120Z*

2 Y – Axis AXS280Y

3 Z – Axis AXS200M

4 Gantry connection
AX-AC-GCU-120C-280

5 optional: Angular gearbox
for wider spacings of the axis

6 optional: Safety break

*AXC_A for very large travel ranges
• if several carriages should moved
  independently
• if connecting shaft at the end of the axis not
  possible

Figure 7.6 — 3-Axis–System AXC120Z(A) – AXS280Y – AXS200M
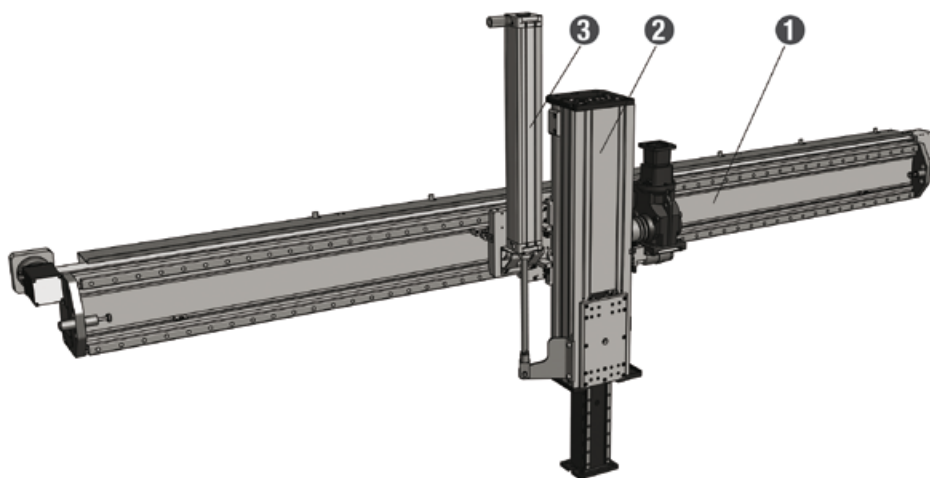
1 Y – Axis AXS280Y

2 Z – Axis AXS280TV

3 Balance cylinder

Figure 7.7 — 2-Axis–System AXS280Y – AXS280TV

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7.3 Standard combinations AXC - AXDL - AXS
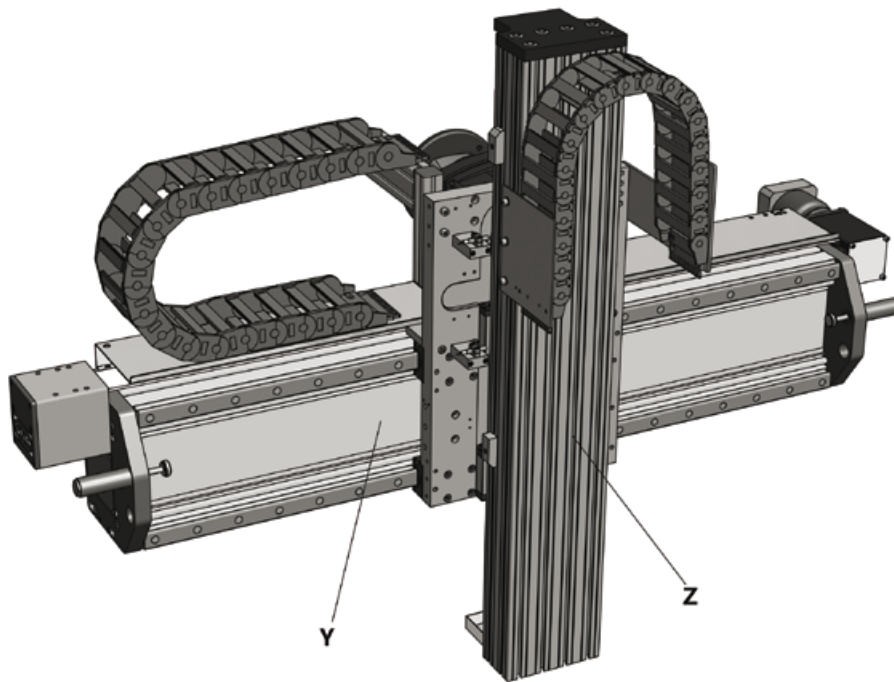
Figure 7.8 — Standard combination AXS – Lifting Axis with AXS – Gantry Axis with toothed belt drive
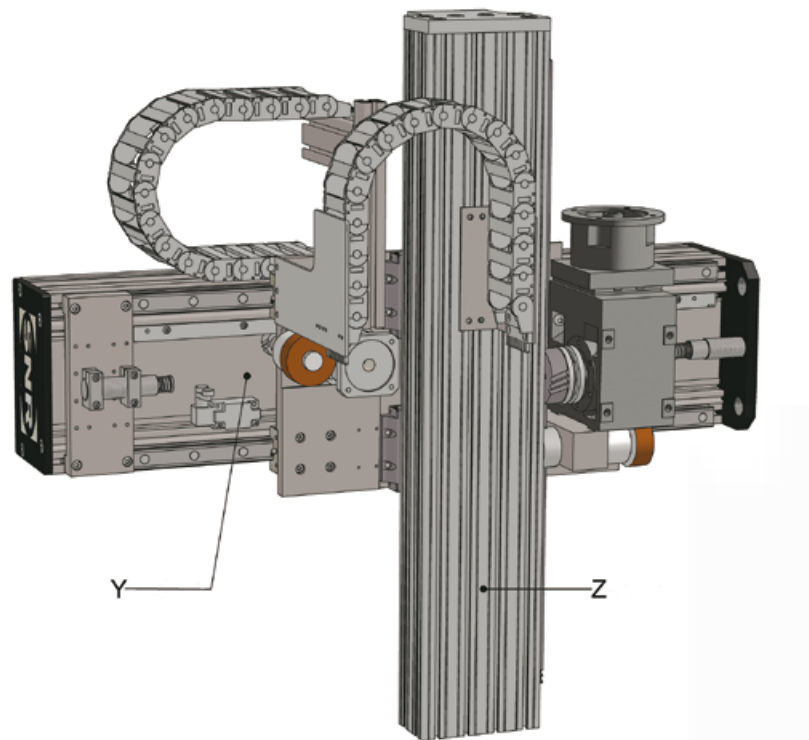
Figure 7.9 — Standard combination AXS – Lifting Axis with AXS – Gantry Axis with rack and pinion drive

Table 7.1 — shows the possible standard combinations for AXC, AXDL and AXS Linear Axis.

Table 7.1 — AXC, AXDL and AXS – Standard combinations

			Y - Axis					
			Toothed belt drive		Rack and pinion drive			
			AXS200Y___	AXS280Y___	AXS200MP__	AXS280MP__	AXS460MP__	AXS500MP__
Z Axis	Toothed belt / Ω - Axis	AXDL160A__	x		x			
		AXDL240A__		x		x		
		AXC120A_	x	x	x	x		
	Lifting Axis	AXS200ME__		x		x		
		AXS230MB__		x		x	x	
		AXS280MB__					x	x
	Telescopic Axis	AXS200TV__	x		x	x		
		AXS280TV__		x		x	x	x
	Spindle Axis	AXC100S__	x		x			
		AXC120S_	x	x	x	x		
		AXDL160S__	x		x			

Table 7.2 contains the AXC, AXDL and AXS standard combinations in which the table tops of the linear axis can be mounted on table top of one another. Figure 7.10 and Table 7.3 show the dimensions of the AXDL and AXS standard combinations with a common table top.

Table 7.2 — AXC, AXDL and AXS - Standard combinations in which the table tops of the linear axis can be mounted on table top of one another

Y Axis	Z Axis	Code number [1]	Version Z Axis
AXDL160Z / S	AXDL160A_-D_A	A	Parallel Axis with toothed belt / Ω drive
AXDL240Z / S	AXDL160A_-D_A	A	Parallel Axis with toothed belt / Ω drive
	AXDL240A_-D_A	A	Parallel Axis with toothed belt / Ω drive
AXS200MP____-D	AXC100S_-D	0[2]	Spindle Axis
	AXC120A_-B	0	Parallel Axis with toothed belt / Ω drive
	AXC120S_-B	0[2]	Spindle Axis
	AXDL160S_-D	0[2]	Spindle Axis
AXS200Y____-D	AXC100S_-D	0[2]	Spindle Axis
	AXC120S_-B	0	Spindle Axis
	AXDL160S_-D	0[2]	Spindle Axis
AXS280Y____-D	AXC120A_-B	0	Parallel Axis with toothed belt / Ω drive
	AXDL120S_-B	0[2]	Spindle Axis
AXS280MP__-D	AXC120A_-B	0	Parallel Axis with toothed belt / Ω drive
	AXDL120S_-B	0[2]	Spindle Axis

[1] - Insert the code number in the type code of the Z-axis at position 10 (additional options)
[2] - For spindle axis with support units, specify the number of support units

Table 7.3 — Dimensions AXDL and AXS – Standard combinations with common top table

Y - Axis	Z - Axis	Z - Axis version	Code number [1]	K	L1	L2	L3	L4	L6	L7	L8
AXS200Y____-R	AXDL160A_-D	Parallel Axis with toothed belt / Ω drive	B	496	429	-	20	253	165	165	429
	AXS200TV__-D	Telescopic Axis	0	in preparation							
AXS200MP____-R	AXDL160A_-D	Parallel Axis with toothed belt / Ω drive	C	522	455	-	10	256	275	165	455
	AXS200TV__-D	Telescopic Axis	0	in preparation							
AXS280Y____-R	AXS200TV__-E	Telescopic Axis	0	in preparation							
	AXS200ME__-E	Lifting Axis	0	700	680	215	51	382	200	200	610
	AXDL240A_-D	Parallel Axis with toothed belt / Ω drive	B	620	593	215	18	361	200	200	593
AXS280Y____-S	AXS230MB__-D	Lifting Axis	0	383	420	215	26	406	350	380	322
AXS280Y____-T	AXS280TV__-D	Telescopic Axis	0	524	420	215	70	442	400	400	321
AXS280MP__-R	AXS200ME__-G	Lifting Axis	0	700	680	215	51	382	350	200	610
	AXS200TV__-E	Telescopic Axis	0	in preparation							
AXS280MP__-S	AXS230MB__-D	Lifting Axis	0	449	420	215	70	442	350	380	321
AXS280MP__-T	AXS280TV__-D	Telescopic Axis	0	500	420	215	70	480	475	400	321
AXS280MP__-U	AXDL240A_-D	Parallel Axis with toothed belt / Ω drive	C	620	593	215	18	361	328	200	593
AXS460MP__-R	AXS230MB__-E	Lifting Axis	0	578	558	210	49	578	345	375	450
AXS460MP__-S	AXS280MB__-D	Lifting Axis	0	620	600	210	70	614	392	448	493
AXS460MP__-T	AXS280TV__-E	Telescopic Axis	0	672	592	210	51	625	500	400	461
AXS500MP__-R	AXS280MB__-D	Lifting Axis	0	720	700	-	100	743	492	483	593
AXS500MP__-T	AXS280TV__-G[2]	Telescopic Axis	0	772	692	-	100	754	475	400	593

[1] - insert the code number in the type code of the Z-axis at position 10 (additional options)
[2] - on request
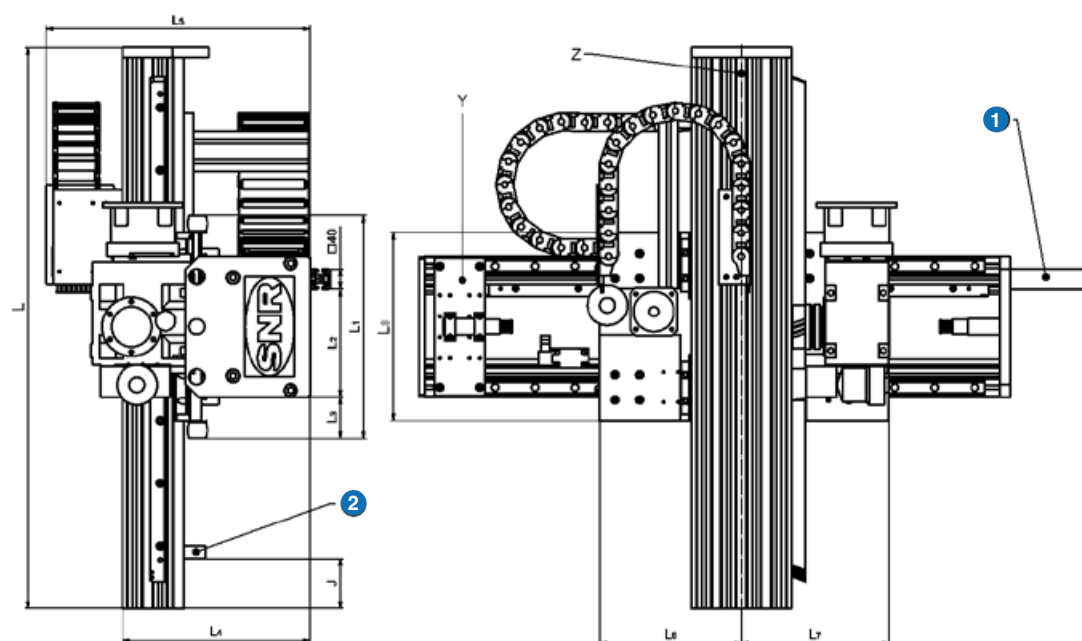
S = Travel range   L = S + J + K for Lifting Axis   L = S/2 + J + K for Telescopic Axis

❶ Driver for energy chain X - Axis

❷ Limit stop can be omitted, if the function is given by the customer application (J=0)

Figure 7.10 — Dimensions AXS – Standard combinations

8. Systematic

8.1 Type code single axis

```
AXC  80  SN  G  2005  -  B  -  1000  -  1440  -  A  2  -  00  00  -  A  -  A
  1    2   3  4   5       6     7         8        9 10      11  12     13   14
```

1	AXC	Series
2	80	Size
3	SN	**Drive type** **A:** Toothed belt / Ω - drive **E:** Linear motor drive **GV:** Sliding screw drive, reinforced bearings **M:** Rack and pinion drive **NZ:** without drive, toothed belt base **SC:** Ball screw drive, right-left-hand helix with two tables **SN:** Ball screw drive **SV:** Ball screw drive, reinforced bearings **TA:** Telescopic Axis, toothed belt drive in the first drive level **TC:** Trapezodial screw drive, right-left-hand helix with two tables **TH:** Telescopic Axis, horizontal, rack and pinion drive in the first drive level **TN:** Trapezodial screw drive **TV:** for AXC: Trapezodial screw drive, reinforced bearings **TV:** for AXS: Telescopic Axis, vertical, rack and pinion drive in the first drive level **Y:** Toothed belt drive, lateral **Z:** Toothed belt drive

		Drive version for screw drives **C:** Coupling cone **G:** Cupling cone + coupling (not for AXBG) **U:** Deflection belt drive
		Drive version for rack and pinion drives **B:** with bevel gearbox **N:** without mounted gearbox **E, P:** with planetary gearbox **PL (PR):** with planetary gearbox left (right) for AXS with guiding system B, C (see Chapter 5.7.7) **S:** with spur gearbox
		Drive version for linear motor drives **A:** Motor with air cooling **W:** Motor with water cooling
4	**G**	**Drive version for toothed belt drives** **EL (ER):** Integrated planetary gearbox left (right) (not for AXS_Y) **ELK (ERK):** Integrated planetary gearbox left (right) + integrated coupling for connecting shaft right (left) (not for AXS_Y) **FL (FR):** Drive adapter flange (direct connection drive shaft / hollow shaft) left (right) **FLK (FRK):** Drive adapter flange (direct connection drive shaft / hollow shaft) left (right) + integrated coupling for connecting shaft right (left) **GL (GR):** Coupling and coupling cone left (right) **GLK (GRK):** Coupling and coupling cone left (right) + integrated coupling for connecting shaft right (left) **GBL (GBR):** Coupling and coupling cone, back side left (right) (only for AXS_Y) **GFL (GFR):** Coupling and coupling cone, front side left (right) (only for AXS_Y) **HL (HR):** Machining of the mounting surface for the drive adaptation for hollow shaft version left (right) **HW:** Hollow shaft (not for AXF_Z) **KL (KR):** Integrated coupling for main drive pinion side, left (right) **KLK (KRK):** Integrated coupling for main drive pinion side, left (right) + integrated coupling for connecting shaft right (left) **PL (PR):** Integrated planetary gearbox with low-backlash left (right) (not for AXS_Y) **PLK (PRK):** Integrated planetary gearbox with low-backlash left (right) + integrated coupling for connecting shaft right (left) (not for AXS_Y) **PBL (PBR):** Integrated planetary gearbox with low-backlash, rear sideleft (right) (only for AXS_Y) **PFL (PFR):** Integrated planetary gearbox with low-backlash, front side left (right) (only for AXS_Y) **TL (TR):** Plug-in planetary gearbox left (right) **TLK (TRK):** Plug-in planetary gearbox left (right) + integrated coupling for connecting shaft right (left) **WL (WR):** Free drive shaft left (right) **WD:** Free drive shaft, on both sides
5	**2005**	**Size index for toothed belt drive** Drive version **F** and **H**… shaft or hollow shaft diemeter Drive version **K** and **G**… inner diameter of the coupling for the main drive pinion side Drive version **E**, **P** and **S**… gear ratio (for the versions **_LK** and **_RK** is also to indicate the gear ratio and not the diameter of the coupling)
		Size index for screw drive Screw diameter + pitch [mm]
		Size index for rack and pinion drive Gear ratio
		Size index for linear motor drive Peak force of the linear motor [N]

6	B	**Guiding system (not for AXBG)** **A:** Linear guide, short table **B, J:** Linear guide, standard table **C, K:** Linear guide, long table **D:** Two parallel linear guides, standard table **E:** Two parallel linear guides, long table **G:** Two parallel linear guides, extra long table **H:** Two parallel linear guides, wide table **L:** Track roller guide, standard table **M:** Track roller guide, long table **P:** Polymer track roller guide, standard table **R…U:** Two parallel Linear Guides, without top table for direct combination with a table of an additional Linear Axis **Guiding system AXBG** **A:** One carriage, long **B:** Two carriages, long **C:** One carriage, short **D:** Two carriages, short
7	1000	**Travel range** [mm]
8	1440	**Total length** [mm] Travel range + additional length according catalogue description (for AXBG profile length)
9	A	**Configuration versions / Protection against pollution** **0:** Without options **A…Z:** see Chapter 8.3.1
10	2	**Additional options** **AXC, AXF, AXDL with screw drive:** **0:** Without screw drive support units **1…4:** Number of screw drive support units **AXC, AXDL with toothed belt / Ω drive:** **A…H:** Index for mounted A - Standard connection (Chapter 7.3, Table 7.2 and 7.3 and Chapter 6.1.7 Table 6.10) **AXS with hydraulic shock absorber:** **A…J:** Index for shock absorber version **AXBG** **N:** Normal precision **P:** P precision
11	00	**Switch combination left** See Chapter 6.3
12	00	**Switch combination right** See Chapter 6.3
13	0	**Drive adaptation** **0:** no drive adaptation **A…Z:** see Chapter 6.2.3, 6.2.4
14	0	**Special version** **0:** without special options **A…Z:** According to drawing or text description (Index (A... Z) is given from us)

X: Index for special options at all positions in the type code

8.2 Type code axis systems

AS - 80 Z - 120 Z - 80 A - X 1000 - Y 800 - Z 400 - 0
1   2 3   4   5   6 7   8   9   10 11   12 13   14

Consisting of: 15

X – Axis 1
1 x AXC80ZP_K_-…
Planetary gearbox……

X – Axis 2
1 x AXC80ZK_28_-…
Coupling……

Connecting shaft
1 x AX – VBW – 28 -…

Y – Axis
1 x AXC120ZP__-…
Planetary gearbox……

Direct connection
2 x AXC – Direct connection – 80 -200

Z – Axis
1 x AXC80AP__-…
Planetary gearbox……

A-Standard connection
AX-A-Standard connection-120-80

1	AS	Axis system[1]
2	80	Size of the first axis
3	Z	Drive version of the first axis
4	120	Size of the second axis
5	Z	Drive version of the second axis
6	80	Size of the third axis
7	A	Drive version of the third axis
8	X	Designation of the first axis
9	1000	Travel range of the first axis
10	Y	Designation of the second axis
11	800	Travel range of the second axis
12	Z	Designation of the third axis
13	400	Travel range of the third axis
14	0	**Special version** **0:** without special options **A…Z:** According to drawing or text description (Index (A…Z) is given from us)
15	…..	List of type code of all components and the description of all single components

[1]Axis systems contain all spezified Linear Axis and accessories.
 An Linear Axis system is not necessarily a completely assembled system due to the dimensions.

8.3 Options

8.3.1 Configuration versions

For SNR Linear Axis are a variety of configuration versions (Table 8.1) available, which can be specified by the type code.

Table 8.1 — Configuration versions

Configuration versions adapted to the conditions of use			
Index	Appication conditions	Operational area	Configuration version
0	Low level of pollution	General engineering	Without
A	Slight pollution, grit	General engineering	Plastic cover strip and additional AXF: lip wiper AXDL: side and inner seal
B	Radiant heat, optical reason	Thermal processes, medical engineering, soldering installation, oven areas	Metal cover strip, lip wiper
C	Slight pollution	General engineering	Cover plate
D	Dust, cooling lubricant, chips	Immediate environment of processing machines	Plastic cover strip, felt wiper
F	Strong pollution	Wood and metal processing machines	Bellow
G	Very high assembling tolerances	General engineering	With tolerance compensation element, fixed or centered in y-direction
H	Very high assembling tolerances	General engineering	With tolerance compensation element, compensation in y-direction can be activated after mounting
K	Strong pollution	Wood and metal processing machines, building materials industry	Plastic cover strip (cover strip guiding by bearings with seals), side seal, felt wiper (AXDL additional with inner seal)
M	Radiant heat, strong pollution, hot chips, spatter	Inside of matal processing machines, welding machines	Metal cover strip, lip wiper, side seal
Q	Clean environmental conditions, low corrosion protection against surface rust	Laboratory environment, medical engineering, food packaging	Plastic cover strip (cover strip guiding by bearings with shields), outside placed steel parts with coating or stainless
R	Humid environmental conditions, corrosion protection necessary	Food production, paper industry, application with strong temperature variation and condensation, application with base or acids	Plastic cover strip, felt wiper (AX_100 lip wiper), side seal, external and internal steel parts incl. gearbox with coating or made of stainless steel, guiding elements and bearings made of stainless steel or coated.
S	Wash down version	Cleaning or production with aqueous solutions under high pressure, media can pass into the interior region, application in the outdoor area	Plastic cover strip, lip wipeer, side seal, outside placed steel parts incl. gearbox stainless, stainless bearings with seals, inside placed steel parts stainless or nitro-carburized, polymer track roller guide, sliding screw, maintenance free
U	Clean room	Semiconductor and electronic industry	Plastic cover strip, outside placed steel parts with coating or stainless.
X			Special version

AXS configuration versions for axis with integrated connecting elements	
Index	Configuration version
0	Standard
1	Integrated gantry connection for mounting AXS200Y, AXC200MP, AXS280MP and AXS28Y on AXC100_C with tolerance compensation element
2	Integrated gantry connection for mounting AXS280MP and AXS280Y on AXC120_C
3	Integrated gantry connection for mounting AXS280MP and AXS280Y on AXS120M_B
4	Integrated gantry connection for mounting AXS460MP on AXS120M_C
5	Profile machining at the ends for mounting of AXS200MP, AXS200Y, AXS280MP, AXS280Y and AXS460MP on SNR gantry support legs AX-AC-GSL-_
6	Profile machining of AXS460MP for wall mounting, dimensions Y1… Y6 must be specified
7	Machining of mounting surfaces on the profile according to the drawing AXS200MP, AXS200Y, AXS280MP, AXS280Y and AXS460MP

The possible configuration versions of the Linear Axis are depending on series, size, driving and guiding system. In the Tables 8.2 to 8.4 are the possible versions summarized.

The standard versions marked with "**S**" are the basic versions and must be specified in the type code of the respective Linear Axis.

Table 8.2 — Configuration versions AXC / AXF

Type	Drive system	Guiding system	0	A	B	C	D	F	G	K	M	Q	R	S	U
AXC40	A	B	S	-	-	-	-	-	-	-	-	-	-	-	-
	S	B	x	S	-	-	x	-	-	x	-	x	-	-	-
	T	B	x	S	-	-	x	-	-	x	-	x	-	-	-
	Z	L	S	-	-	-	-	-	-	-	-	-	-	-	-
AXC60	A	B	S	-	-	-	-	-	-	-	-	-	-	-	-
	A	L	S	-	-	-	-	-	-	-	-	-	-	-	-
	S	B, C	x	S	-	-	x	-	-	x	-	x	-	-	x
	T	B, C	x	S	-	-	x	-	-	x	-	x	-	-	-
	Z	B	S	x	-	-	x	-	-	x	-	x	-	-	x
	Z	L	S	x	-	-	x	-	-	x	-	x	-	-	-
AXC80	A	B	S	-	-	-	-	-	-	-	-	-	-	-	-
	A	L	S	-	-	-	-	-	-	-	-	-	-	-	-
	S	A, B	x	S	-	-	x	-	-	x	-	x	-	-	x
	T	B	x	S	-	-	x	-	-	x	-	x	-	-	-
	Z	B, C	S	x	-	-	x	-	-	x	-	x	-	-	x
	Z	J,K	S	-	-	-	-	-	-	-	-	-	-	-	-
	Z	L	S	x	-	-	x	-	-	x	-	x	x	-	-
AXC100	S	D	x	S	x	-	x	-	-	x	x	x	x	-	x
	T	D	x	S	x	-	x	-	-	x	x	x	x	-	-
	Z	B,D	S	x	x	-	x	-	-	x	x	x	x	-	x
	Z	C	S	x	x	-	x	-	x	x	x	x	x	-	x
	Z	L	S	x	x	-	x	-	-	x	x	x	x	-	-
AXC120	A	B	S	-	-	-	-	-	-	-	-	-	-	-	-
	A	L	S	-	-	-	-	-	-	-	-	-	-	-	-
	S	B, C	x	S	-	-	-	-	-	x	-	x	-	-	x
	T	B	x	S	-	-	-	-	-	x	-	x	-	-	-
	Z	B	S	x	-	-	-	-	-	x	-	x	-	-	x
	Z	C	S	x	-	-	-	-	x	x	-	x	-	-	x
	Z	L, M	S	x	-	-	-	-	-	x	-	x	-	-	-
AXF100	G	P	-	S	x	-	x	-	-	x	x	x	x	x	-
	S	D	x	S	x	-	x	-	-	x	x	x	x	-	x
	T	D	x	S	x	-	x	-	-	x	x	x	x	-	-
	T	P	-	S	x	-	x	-	-	x	x	x	x	x	-
	Z	B,C,D	x	S	x	-	x	-	-	x	x	x	x	-	x
	Z	P	-	S	x	-	x	-	-	x	x	x	x	x	-

S: Standard version
x: Special option possibe
-: Option not possible

Table 8.3 — Configuration versions AXDL

Type	Drive system	Guiding system	0	A	B	C	D	F	K	M	Q	R	S	U
AXDL110	S	D	x	S	-	-	x	-	x	-	x	x	-	x
	T	D	x	S	-	-	x	-	x	-	x	x	-	-
	Z	D	x	S	-	-	x	-	x	-	x	x	-	x
AXDL160	A	D	S	-	-	-	-	-	-	-	-	-	-	-
	A	L	S	-	-	-	-	-	-	-	-	-	-	-
	S	D	x	S	-	-	x	-	x	-	x	x	-	x
	T	D	x	S	-	-	x	-	x	-	x	x	-	-
	Z	D	x	S	-	-	x	-	x	-	x	x	-	x
	Z	L	x	S	-	-	x	-	x	-	x	x	-	-
AXDL240	A	D	S	-	-	-	-	-	-	-	-	-	-	-
	A	L	S	-	-	-	-	-	-	-	-	-	-	-
	S	D, E	x	S	-	-	x	-	x	-	x	x	-	x
	T	D, E	x	S	-	-	x	-	x	-	x	x	-	-
	Z	D, E	x	S	-	-	x	-	x	-	x	x	-	x
	Z	L	x	S	-	-	x	-	x	-	x	x	-	-

S: Standard version
x: Special option possibe
-: Option not possible

Table 8.4 — Configuration versions AXLT / AXBG / AXLM / AXS

Type	Drive system	Guiding system	0	A	B	C	D	F	G	H	K	M	Q	R	S	U
AXLT155	T	D, E	S	-	-	-	-	x	-	-	-	-	x^1	-	-	-
	S	D, E	S	-	-	-	-	x	-	-	-	-	x^1	-	-	(x)
AXLT225	T	D, E	S	-	-	-	-	x	-	-	-	-	x^1	-	-	-
	S	D, E	S	-	-	-	-	x	-	-	-	-	x^1	-	-	(x)
AXLT325	T	D, E	S	-	-	-	-	x	-	-	-	-	x^1	-	-	-
	S	D	S	-	-	-	-	x	-	-	-	-	x^1	-	-	(x)
AXLT455	T	D	S	-	-	-	-	x	-	-	-	-	x^1	-	-	-
	S	A, B	S	-	-	x	-	(x)	-	-	-	-	x^1	-	-	(x)
AXBG15	S	A, B	S	-	-	x	-	(x)	-	-	-	-	x^1	-	-	(x)
AXBG20	S	A, B	S	-	-	x	-	(x)	-	-	-	-	x^1	-	-	(x)
AXBG26	S	A, B, C, D	S	-	-	x	-	(x)	-	-	-	-	x^1	-	-	(x)
AXBG33	S	A, B, C, D	S	-	-	x	-	(x)	-	-	-	-	x^1	-	-	(x)
AXBG46	S	A, B	S	-	-	x	-	(x)	-	-	-	-	x^1	-	-	(x)
AXBG55	E	D, E	S	-	-	x	-	x	-	-	-	-	x^1	-	-	(x)
AXLM155	E	D, E	S	-	-	x	-	x	-	-	-	-	x^1	-	-	(x)
AXLM225	E	D, E	S	-	-	x	-	x	-	-	-	-	x^1	-	-	(x)
AXLM325	E	D, E	S	-	-	x	-	x	-	-	-	-	x^1	-	-	(x)
AXS110	TA	D	S	-	-	-	-	-	-	-	-	-	x^1	-	-	-
AXS120	M	B, C	-	-	-	-	-	-	S	S	-	-	-	-	-	-
AXS300	M	B	-	-	-	-	-	-	S	S	-	-	-	-	-	-

S: Standard version
x: Special option possible
(x): Option conditionally possible, please contact us
-: Option not possible

^{1} *without cover strip*

8.3.2 Safety options

Depending on series, size and drive type it is possible to equip the Linear Axis with additional safety options. The possible options are not always useful and available for all sizes of a series.

As safety options the following versions are possible:

- Safety nut for vertical axis with ball screw drive
- Safety break (Chapter 6.9) for vertical axis (Figure 8.1)
- Collision protection for vertical axis with ball screw drive
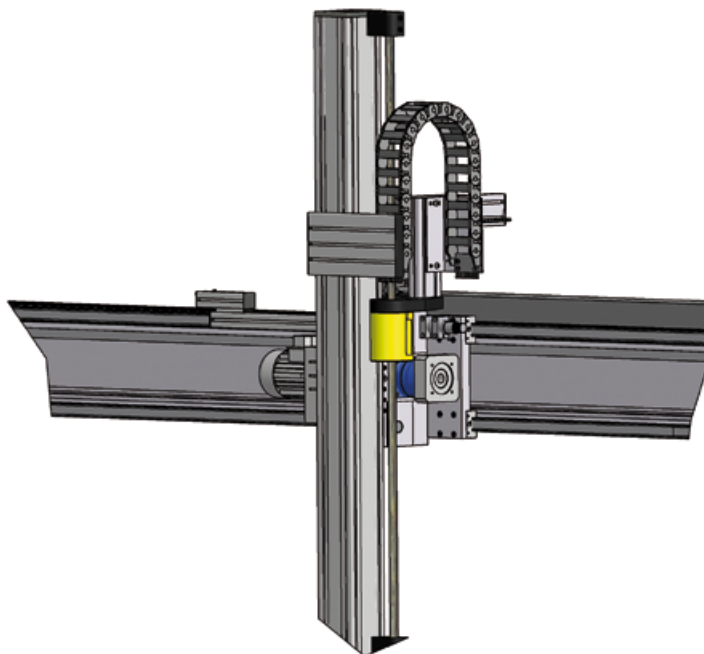
Figure 8.1 — Lifting - Axis with safety break

These options can only be selected after consultation from one of our application engineers.

9.   Special solutions

In addition to the standard program, a varity customized special solutions could be realised with the SNR Linear Axis. Our application and design engineers develop together with the customers high quality solutions with high efficiency and high user benefits.

For more information please contact our application engineers.

Below are presented some examples of typical special solutions.

Linear Axis with several sliders (Figure 8.2 and 8.3)

Figure 8.2 — AXC_Z with several sliders
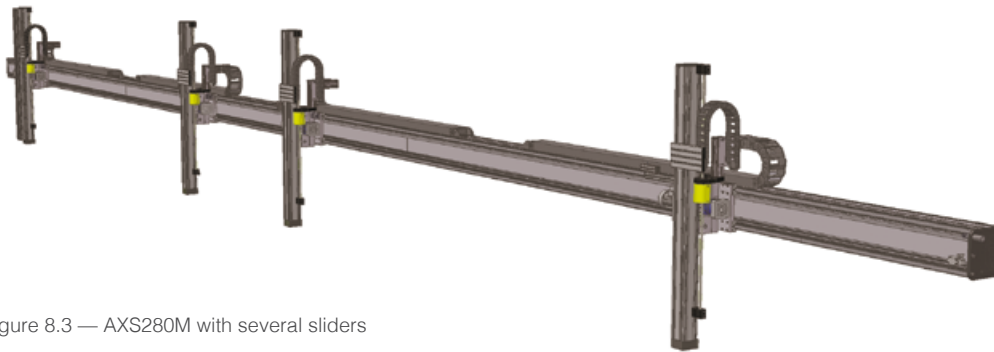
Figure 8.3 — AXS280M with several sliders

Depending on the type of Linear Axis different solutions can be implemented here.

AXC and AXLT with screw drive
- One mechanical powered slider, arbitary sliders without powering
- Several mechanical powered slider
- Two sliders moving in the oposite direction, powered by a right hand – left hand screw drive

AXDL with toothed belt drive
- One mechanical powered slider, arbitary sliders without powering

AXC and AXS with toothed belt drive
- Several sliders with fixed distances

AXC with Toothed belt / Ω - drive, AXS with rack and pinion drive, AXLM
- Several independent moving sliders

Linear Axis with in the opposite direction moving sliders (Figure 8.4)
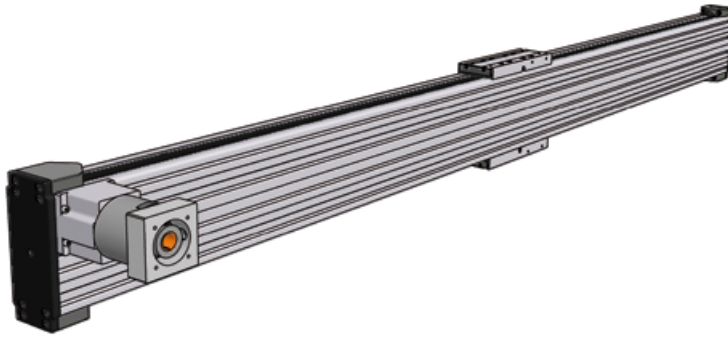
Figure 8.4 — AXC_Z with in the opposite direction moving sliders

With this solution it is possible to move and position two sliders in opposite directions by one toothed belt. The solution is suitable for example for loading and unloading of two parallel conveyor belts.

Linear Axis AXC40Z with sliding guide (Figure 8.5)
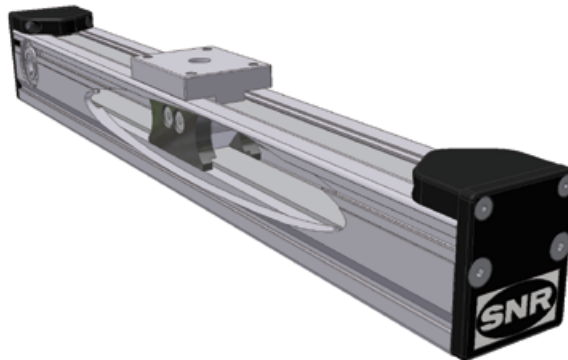
Figure 8.5 — AXC40Z with sliding guide

A cost-effective alternative to standard Linear Axis is a version of the Linear Axis with toothed belt drive and sliding guide. This robust and compact version is characterized by lower own weight. Other advantages, such as maintenance friendly, minimal operating noise and smooth running without lubricant allow the use linear axis in various applications.

Linear Axis with ball bushings (Figure 8.6 and 8.7)
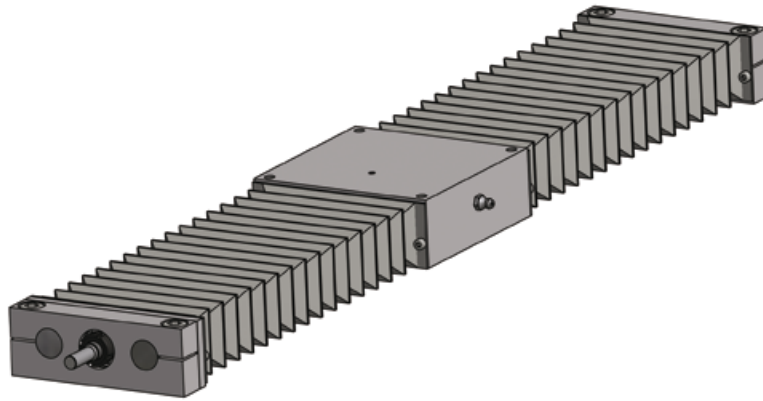
Figure 8.6 — AXLB_T Ball bushing table with trapezoidal screw drive

At low loads ball bushings tables are a cost-efficient alternative to linear tables. As drive element is the use of ball screws or trapezoidal screws possible.
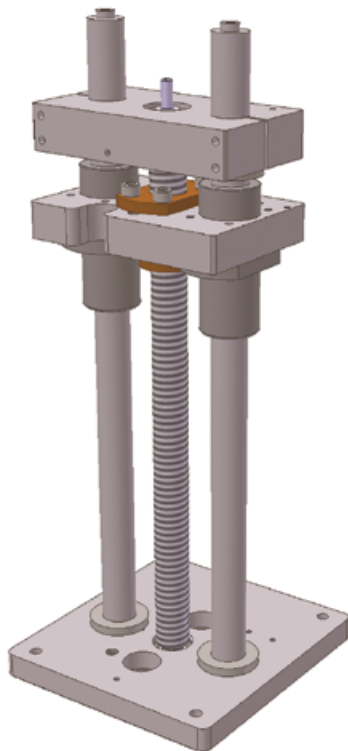
Here is shown a ball bushing table as a special design according to customer specifications. The guiding is realised by two shafts with middle flange ball bushings. Drive element is a trapezodial screw. The bearing units of the screw drive and the housing of the nut are simultaneous considerate function elements of the customer application.

This results in a cost-effective solution with minimized moving masses.

Figure 8.7 — AXLX_T Ball bushing table - Special design with trapezoidal screw drive

10. Type list / ID number list

Table 10.1 — Type list

Type code	Designation	Page
AX-AC-ACU-…	Angle connection	192, 193
AX-AC-CCU-…	Cross connection	187, 188
AX-AC-CHS-…	Connecting shaft	195, 196
AX-AC-DCU-…	Direct connection	185, 186
AX-AC-FEL-…	Fastening element for AXF	181
AX-AC-FST-…	Fastening strip	180, 181
AX-AC-GCU-…	Gantry connection	189, 190
AX-AC-GIN-…	Groove insert	224
AX-AC-GIN-…-AL	Aluminum groove insert	224
AX-AC-GIN-…-PP	Plastic groove insert	224
AX-AC-GSL-…	Gantry support leg	222 - 224
AX-AC-HNU-…	Hammer nut	184
AX-AC-HSC-…	Hammer screw	184
AX-AC-SBL-….	Sliding block	182, 183
AX-AC-SCU-…	A - Standard connection	190, 191
AXBG…	Precision Axis	119 - 136
AXBG…S	Precision Axis with ball screw drive	119 - 136
AXC…	Compact Axis	60 - 84
AXC…A	Compact Axis with toothed belt / Ω - drive	79 - 84
AXC…S	Compact Axis with ball screw drive	67 - 78
AXC…T	Compact Axis with trapezodial screw drive	67 - 78
AXC…Z	Compact Axis toothed belt drive	60 - 66
AXC-SP-…-WPS	Wear Part Set	51
AXDL…	Parallel Axis	92 - 108
AXDL…A	Parallel Axis with toothed belt / Ω - drive	105 - 108
AXDL…S	Parallel Axis with ball screw drive	97 - 104
AXDL…T	Parallel Axis with trapezodial screw drive	97 - 104
AXDL…Z	Parallel Axis with toothed belt drive	92 - 96
AXF…	Compact Axis	85 - 91
AXF…G	Compact Axis with sliding screw	88 - 91
AXF…S	Compact Axis with ball screw drive	88 - 91
AXF…T	Compact Axis with trapezodial screw drive	88 - 91
AXF…Z	Compact Axis toothed belt drive	85 - 87
AXLM…	Linear Motor Axis	171 - 179
AXLM…E	Linear Motor Axis	171 - 179
AXLT…	Linear Table Axis	109 - 118
AXLT…S	Linear Table Axis with ball screw drive	109 - 118
AXLT…T	Linear Table Axis with trapezodial screw	109 - 118
AXS…	System Program Axis	137 - 170
AXS…M	Lifting Axis with rack and pinion drive	140 - 144
AXS…M	Gantry Axis with rack and pinion drive	144 - 150
AXS…M	System Program Axis for parallel use with rack and pinion drive	167 - 170
AXS…TA	Telescopic Axis with toothed belt Ω drive	137 - 139
AXS…TH	Telescopic Axis with rack and pinion drive / toothed belt drive, horizontal	151 - 159
AXS…TV	Telescopic Axis with rack and pinion drive / toothed belt drive, vertical	151 - 159
AXS…Y	System Program Axis with lateral toothed belt drive	160 - 163
AXS…Z	System Program Axis with toothed belt drive	164 - 166
AX-SP-CST-…	Cover Strip (Spare Part)	51
AX-SP-…-KIT-S…	Sealing kit (Spare Part)	51

SNR
Brand of NTN Group

Table 10.2 — ID - Number list

ID number	Type code	Designation	Chapter
101632	AX-AC-GIN-8-2000-PP	Groove insert, plastic	6.6
101822	AX-AC-GIN-8-3000L-AL	Groove insert, aluminum	6.6
101832	AX-AC-GIN-6-2000L-PP	Groove insert, plastic	6.6
101841	AX-AC-GIN-6-2000-AL	Groove insert, aluminum	6.6
101842	AX-AC-GIN-5-2000-PP	Groove insert, plastic	6.6
103749	AX-AC-SBL-DIN508-14-M12-S	Sliding block, design type S	6.1.2
103753	AX-AC-SBL-8ST-M5-S	Sliding block, design type S	6.1.2
103755	AX-AC-SBL-8ST-M6-S	Sliding block, design type S	6.1.2
103758	AX-AC-SBL-5-M3-R-Zi	Sliding block, design type R	6.1.2
103759	AX-AC-SBL-6-M4-R-Zi	Sliding block, design type R	6.1.2
103760	AX-AC-SBL-12ST-M10-S	Sliding block, design type S	6.1.2
103761	AX-AC-SBL-8-M5-R-Zi	Sliding block, design type R	6.1.2
103763	AX-AC-SBL-8ST-M4-E	Sliding block, design type E	6.1.2
103764	AX-AC-SBL-DIN508-14-M8-S	Sliding block, design type S	6.1.2
104481	AX-AC-FST-80x22-2	Fastening strip	6.1.1
104481	AX-AC-FST-80x22-2	Fastening strip	6.1.1
104481	AX-AC-FST-80x22-2	Fastening strip	6.1.1
108075	AX-AC-FST-70x20-2	Fastening strip	6.1.1
108579	AX-AC-FST-40x10-3	Fastening strip	6.1.1
108663	AX-AC-FST-40x13-2	Fastening strip	6.1.1
108961	AX-AC-SBL-8ST-M8-S	Sliding block, design type S	6.1.2
108962	AX-AC-SBL-8ST-M8-E	Sliding block, design type E	6.1.2
108963	AX-AC-SBL-8ST-M6-E	Sliding block, design type E	6.1.2
109066	AX-AC-SBL-5ST-M3-E	Sliding block, design type E	6.1.2
109067	AX-AC-SBL-12ST-M8-S	Sliding block, design type S	6.1.2
109070	AX-AC-SBL-5ST-M5-E	Sliding block, design type E	6.1.2
109073	AX-AC-SBL-5ST-M4-E	Sliding block, design type E	6.1.2
109090	AX-AC-SBL-8-M4-R-Zi	Sliding block, design type R	6.1.2
109091	AX-AC-SBL-6ST-M6-E	Sliding block, design type E	6.1.2
109093	AX-AC-SBL-6ST-M5-E	Sliding block, design type E	6.1.2
109094	AX-AC-SBL-6ST-M4-E	Sliding block, design type E	6.1.2
110236	AX-AC-FST-78x22-2	Fastening strip	6.1.1
110236	AX-AC-FST-78x22-2	Fastening strip	6.1.1
111181	AX-AC-FST-120x22-3	Fastening strip	6.1.1
111181	AX-AC-FST-120x22-3	Fastening strip	6.1.1
111181	AX-AC-FST-120x22-3	Fastening strip	6.1.1
139275	AX-AC-SBL-5ST-M5-E-A2	Sliding block, design type E	6.1.2
146277	AX-AC-GCU-80-80	Gantry connection	6.1.6
149812	AX-AC-SBL-8-ST-M8-F	Sliding block, design type F	6.1.2
150999	AX-AC-FST-68x9-2	Fastening strip	6.1.1
152388	AX-AC-SCU-120-80	A Standard connection	6.1.7
153844	AX-AC-80Z-COU-CHS-28	Coupling set for connecting shaft	6.2.2
156300	AX-AC-SCU-80-60	A Standard connection	6.1.7
156301	AX-AC-40Z-COU-CHS-14	Coupling set for connecting shaft	6.2.2
156303	AX-AC-120Z-COU-CHS-38	Coupling set for connecting shaft	6.2.2
158840	AX-AC-CCU-80-60	Cross connection	6.1.5
160364	AX-AC-GCU-60-80	Gantry connection	6.1.6
160635	AX-AC-CCU-60-60	Cross connection	6.1.5

ID number	Type code	Designation	Chapter
163391	AX-AC-CCU-240-240	Cross connection	6.1.5
164317	AX-AC-GCU-120-280	Gantry connection	6.1.6
167332	AX-AC-DCU-80-160	Direct connection	6.1.4
169154	AX-AC-GCU-80-160	Gantry connection	6.1.6
169160	AX-AC-CCU-160-80	Cross connection	6.1.5
170469	AX-AC-DCU-120-120	Direct connection	6.1.4
172106	AX-AC-GCU-120-240	Gantry connection	6.1.6
172533	AX-AC-CCU-240-120	Cross connection	6.1.5
173183	AX-AC-GCU-80-120	Gantry connection	6.1.6
173218	AX-AC-GIN-10-2000-AL	Groove insert, aluminum	6.6
173421*	AX-AC-DCU-60-110	Direct connection	6.1.4
183942	AX-AC-SBL-8-ST-M6-F	Sliding block, design type F	6.1.2
186015	AX-AC-CCU-155-155	Cross connection	6.1.5
187412	AX-AC-DCU-240-240	Direct connection	6.1.4
187419	AX-AC-CCU-120-80	Cross connection	6.1.5
190012	AX-AC-GCU-60-60	Gantry connection	6.1.6
190214	AX-AC-SCU-160-80	A Standard connection	6.1.7
202918	AXC-SP-160-KIT-S240	Sealing kit	4.10
203039	AXC-SP-160-KIT-S280	Sealing kit	4.10
203213	AX-AC-SBL-8ST-M8-S-A2	Sliding block, design type S	6.1.2
203255	AXC-SP-240-KIT-S330	Sealing kit	4.10
203392	AX-AC-SBL-6ST-M6-E-A2	Sliding block, design type E	6.1.2
203549	AXC-SP-110-KIT-S215	Sealing kit	4.10
205685*	AX-AC-DCU-60-80	Direct connection	6.1.4
207896	AX-AC-DCU-80-120	Direct connection	6.1.4
207936	AX-AC-DCU-110-110	Direct connection	6.1.4
230147	AX-AC-DCU-60-60	Direct connection	6.1.4
230361	AX-AC-GCU-60-110	Gantry connection	6.1.6
244721	AX-AC-SCU-240-120	A Standard connection	6.1.7
245182	AX-AC-DCU-455-325	Direct connection	6.1.4
248768	AX-AC-DCU-240-160	Direct connection	6.1.4
250762	AX-AC-DCU-40-40	Direct connection	6.1.4
252537	AX-AC-CCU-110-60	Cross connection	6.1.5
253556	AX-AC-CCU-80-80	Cross connection	6.1.5
253949	AX-AC-GCU-80-240	Gantry connection	6.1.6
254152	AXC-SP-80-A-WPS	Wear part set for configuration version A	4.10
255069	AX-AC-SBL-6-ST-M4-F	Sliding block, design type F	6.1.2
255070	AX-AC-SBL-6-ST-M6-F	Sliding block, design type F	6.1.2
256449	AX-AC-ACU-Y240-Z160P	Angle connection	6.1.8
257256	AXC-SP-120-A-WPS	Wear part set for configuration version A	4.10
258120	AXC-SP-60-A-WPS	Wear part set for configuration version A	4.10
258785	AX-AC-SBL-8-ST-M5-F	Sliding block, design type F	6.1.2
259405	AX-AC-CCU-110-110	Cross connection	6.1.5
259861	AX-AC-GCU-120C-280	Gantry connection	6.1.6
261642	AX-AC-DCU-155-155	Direct connection	6.1.4
262080	AX-AC-CCU-225-155	Cross connection	6.1.5
262988	AX-AC-ACU-X240-Y240	Angle connection	6.1.8
262991	AX-AC-CCU-325-225	Cross connection	6.1.5

only for Linear Axis up to production year 2021

ID number	Type code	Designation	Chapter
264974	AX-AC-CCU-160-160	Cross connection	6.1.5
265454	AX-AC-GCU-60-160	Gantry connection	6.1.6
265455	AX-AC-CCU-160-60	Cross connection	6.1.5
267710	AX-AC-ACU-Y160-Z110T	Angle connection	6.1.8
268344	AX-SP-110-A-WPS	Wear part set for configuration version A	4.10
268345	AX-SP-160-A-WPS	Wear part set for configuration version A	4.10
268346	AX-SP-240-A-WPS	Wear part set for configuration version A	4.10
268606	AX-AC-SCU-110-60	A Standard connection	6.1.7
269049	AX-AC-ACU-Y160-Z110P	Angle connection	6.1.8
270252	AX-AC-ACU-240-240	Angle connection	6.1.8
281274	AX-AC-DCU-110-60	Direct connection	6.1.4
284121	AX-AC-100Z-COU-CHS-38	Coupling set for connecting shaft	6.2.2
286227	AX-AC-ACU-X160-Y110P	Angle connection	6.1.8
288848	AX-AC-DCU-160-80	Direct connection	6.1.4
288945	AX-AC-DCU-240-120	Direct connection	6.1.4
288999	AXC-SP-240-KIT-S500	Sealing kit	4.10
289073	AX-AC-SBL-5ST-M4-E-A2	Sliding block, design type R	6.1.2
290188	AX-AC-DCU-325-325	Direct connection	6.1.4
292876	AX-AC-60Z-COU-CHS-22	Coupling set for connecting shaft	6.2.2
299881	AX-AC-SCU-60-40	A Standard connection	6.1.7
305211	AX-AC-GCU-40-60	Gantry connection	6.1.6
306559	AX-AC-ACU-X160-Y160	Angle connection	6.1.8
306666	AX-AC-ACU-160-160-2	Angle connection	6.1.8
308879	AX-AC-DCU-160-160	Direct connection	6.1.4
311633	AX-AC-CCU-120-120	Cross connection	6.1.5
315714	AX-AC-DCU-225-225	Direct connection	6.1.4
327403	AX-AC-SCU-110-40	A Standard connection	6.1.7
328149	AX-AC-HSC-8M8x30	Hammer screw	6.1.3
329494	AX-AC-CCU-240-160	Cross connection	6.1.5
351593	AX-AC-CCU-160-110	Cross connection	6.1.5
352103	AX-AC-DCU-225-155	Direct connection	6.1.4
353280	AX-AC-SBL-6-ST-M5-F	Sliding block, design type F	6.1.2
357642	AX-AC-DCU-160-110	Direct connection	6.1.4
363425	AX-AC-ACU-Y110-Z110	Angle connection	6.1.8
371439	AX-AC-FEL-48x39-1	Fastening element	6.1.1
372088	AX-AC-HSC-8M8x40	Hammer screw	6.1.3
373054	AX-AC-ACU-X160-Y110T	Angle connection	6.1.8
382274	AX-AC-DCU-325-225	Direct connection	6.1.4
382275	AX-AC-DCU-455-455	Direct connection	6.1.4
382276	AX-AC-CCU-60-40	Cross connection	6.1.5
382278	AX-AC-CCU-110-40	Cross connection	6.1.5
382279	AX-AC-CCU-240-80	Cross connection	6.1.5
382280	AX-AC-CCU-240-100	Cross connection	6.1.5
382281	AX-AC-CCU-225-225	Cross connection	6.1.5
382282	AX-AC-CCU-325-325	Cross connection	6.1.5
382283	AX-AC-DCU-60-120	Direct connection	6.1.4
382284	AX-AC-CCU-455-325	Cross connection	6.1.5
382285	AX-AC-CCU-455-455	Cross connection	6.1.5

ID number	Type code	Designation	Chapter
382286	AX-AC-DCU-40-60	Direct connection	6.1.4
382287	AX-AC-DCU-110-40	Direct connection	6.1.4
382288	AX-AC-DCU-160-60	Direct connection	6.1.4
382292	AX-AC-ACU-X240-Y160P	Angle connection	6.1.8
382293	AX-AC-ACU-110-110	Angle connection	6.1.8
382301	AX-AC-ACU-Y160-Z160	Angle connection	6.1.8
382303	AX-AC-ACU-Y240-Z240	Angle connection	6.1.8
382306	AX-AC-ACU-Y240-Z160T	Angle connection	6.1.8
396378	AX-AC-HNU-8M6	Hammer nut	6.1.3
401040	AXC-SP-40-A-WPS	Wear part set for configuration version A	4.10
410647	AX-AC-SBL-12ST-M6-S	Sliding block, design type S	6.1.2
458059	AX-AC-SCU-160-60	A Standard connection	6.1.7
459273**	AX-AC-DCU-60-110-E	Direct connection	6.1.4
459876	AX-AC-ACU-X110-Y110	Angle connection	6.1.8
461377	AXC-SP-100-A-WPS	Wear part set for configuration version A	4.10
461378	AXC-SP-100-B/M-WPS	Wear part set for configuration version B and M	4.10
461379	AXC-SP-100-D-WPS	Wear part set for configuration version D	4.10
461381	AXC-SP-100-Q/U-WPS	Wear part set for configuration version Q and U	4.10
461382	AXC-SP-120-K-WPS	Wear part set for configuration version K	4.10
461383	AXC-SP-120-Q/U-WPS	Wear part set for configuration version Q and U	4.10
461384	AXC-SP-120-R-WPS	Wear part set for configuration version R	4.10
461385	AXC-SP-40-Q/U-WPS	Wear part set for configuration version Q and U	4.10
461386	AXC-SP-40-R-WPS	Wear part set for configuration version R	4.10
461387	AXC-SP-60-D-WPS	Wear part set for configuration version D	4.10
461388	AXC-SP-60-Q/U-WPS	Wear part set for configuration version Q and U	4.10
461389	AXC-SP-60-R-WPS	Wear part set for configuration version R	4.10
461390	AXC-SP-80-K-WPS	Wear part set for configuration version K	4.10
461391	AXC-SP-80-Q/U-WPS	Wear part set for configuration version Q and U	4.10
461392	AXF-SP-100-A-WPS	Wear part set for configuration version A	4.10
461393	AXF-SP-100-B/M-WPS	Wear part set for configuration version B and M	4.10
461394	AXF-SP-100-Q-WPS	Wear part set for configuration version Q	4.10
461396	AXF-SP-100-R/S-WPS	Wear part set for configuration version R and S	4.10
461398	AXF-SP-100-U-WPS	Wear part set for configuration version U	4.10
465040	AX-AC-FST-47x7-2	Fastening strip	6.1.1
465044	AX-AC-FST-68x9-2	Fastening strip	6.1.1
571025	AX-AC-FST-78x22-2	Fastening strip	6.1.1

only for Linear Axis from production year 2022

11. Fits

Shaft tolerance [μm]

over	up to	d9	e8	f7	f6	f5	g6	g5	h5	h6	h7	h8	h9	h10
-	3	-20	-14	-6	-6	-6	-2	-2	0	0	0	0	0	0
		-45	-28	-16	-12	-10	-8	-6	-4	-6	-10	-14	-25	-40
3	6	-30	-20	-10	-10	-10	-4	-4	0	0	0	0	0	0
		-60	-38	-22	-18	-15	-12	-9	-5	-8	-12	-18	-30	-48
6	10	-40	-25	-13	-13	-13	-5	-5	0	0	0	0	0	0
		-76	-47	-28	-22	-19	-14	-11	-6	-9	-15	-22	-36	-58
10	18	-50	-32	-16	-16	-16	-6	-6	0	0	0	0	0	0
		-93	-59	-34	-27	-24	-17	-14	-8	-11	-18	-27	-43	-70
18	30	-65	-40	-20	-20	-20	-7	-7	0	0	0	0	0	0
		-117	-73	-41	-33	-29	-20	-16	-9	-13	-21	-33	-52	-84
30	50	-80	-50	-25	-25	-25	-9	-9	0	0	0	0	0	0
		-142	-89	-50	-41	-36	-25	-20	-11	-16	-25	-39	-62	-100
50	80	-100	-60	-30	-30	-30	-10	-10	0	0	0	0	0	0
		-174	-106	-60	-49	-43	-29	-23	-13	-19	-30	-46	-74	-120
80	120	-120	-72	-36	-36	-36	-12	-12	0	0	0	0	0	0
		-207	-126	-71	-58	-51	-34	-27	-15	-22	-35	-54	-87	-140
120	180	-145	-85	-43	-43	-43	-14	-14	0	0	0	0	0	0
		-245	-148	-83	-68	-61	-39	-32	-18	-25	-40	-63	-100	-160
180	250	-170	-100	-50	-50	-50	-15	-15	0	0	0	0	0	0
		-285	-172	-96	-79	-70	-44	-35	-20	-29	-46	-72	-115	-185
250	315	-190	-110	-56	-56	-56	-17	-17	0	0	0	0	0	0
		-320	-191	-108	-88	-79	-49	-40	-23	-32	-52	-81	-130	-210
315	400	-210	-125	-62	-62	-62	-18	-18	0	0	0	0	0	0
		-214	-119	-98	-87	-54	-43	-25	-36	-57	-89	-140	-230	

Bore tolerance [μm]

over	up to	D10	E9	F6	F7	F8	G6	G7	H5	H6	H7	H8	H9	H10
-	3	+60	+39	+12	+16	+20	+8	+12	+4	+6	+10	+14	+25	+40
		+20	+14	+6	+6	+10	+2	+2	0	0	0	0	0	0
3	6	+78	+50	+18	+22	+28	+12	+16	+5	+8	+12	+18	+30	+48
		+30	+20	+10	+10	+10	+4	+4	0	0	0	0	0	0
6	10	+98	+61	+22	+28	+35	+14	+20	+6	+9	+15	+22	+36	+58
		+40	+25	+13	+13	+13	+5	+5	0	0	0	0	0	0
10	18	+120	+75	+27	+34	+43	+17	+24	+8	+11	+18	+27	+43	+70
		+50	+32	+16	+16	+16	+6	+6	0	0	0	0	0	0
18	30	+149	+92	+33	+41	+53	+20	+28	+9	+13	+21	+33	+52	+84
		+65	+40	+20	+20	+20	+7	+7	0	0	0	0	0	0
30	50	+180	+112	+41	+50	+64	+25	+34	+11	+16	+25	+39	+62	+100
		+80	+50	+25	+25	+25	+9	+9	0	0	0	0	0	0
50	80	+220	+134	+49	+60	+76	+29	+40	+13	+19	+30	+46	+74	+120
		+100	+60	+30	+30	+30	+10	+10	0	0	0	0	0	0
80	120	+260	+159	+58	+71	+90	+34	+47	+15	+22	+35	+54	+87	+140
		+120	+72	+36	+36	+36	+12	+12	0	0	0	0	0	0
120	180	+305	+185	+68	+83	+106	+39	+54	+18	+25	+40	+63	+100	+160
		+145	+85	+43	+43	+43	+14	+14	0	0	0	0	0	0
180	250	+335	+215	+79	+96	+122	+44	+61	+20	+29	+46	+72	+115	+185
		+170	+110	+50	+50	+50	+15	+15	0	0	0	0	0	0
250	315	+400	+240	+88	+108	+137	+49	+69	+23	+32	+52	+81	+130	+210
		+190	+110	+56	+56	+56	+17	+17	0	0	0	0	0	0
315	400	+440	+265	+98	+119	+151	+54	+75	+25	+36	+57	+89	+140	+230
		+210	+125	+62	+62	+62	+18	+18	0	0	0	0	0	0

h11	js5	js6	j5	j6	k5	k6	m5	m6	n5	n6	p6	p5	over	up to
0	+2	+3	+2	+4	+4	+6	+6	+8	+8	+10	+12	+10	-	3
-60	-2	-3	-2	-2	0	0	+2	+2	+4	+4	+6	+6		
0	+ 2.5	+4	+3	+6	+6	+9	+9	+12	+13	+16	+20	+17	3	6
-75	- 2.5	-4	-2	-2	+1	+1	+4	+4	+8	+8	+12	+12		
0	+3	+ 4.5	+4	+7	+7	+10	+12	+15	+16	+19	+24	+21	6	10
-90	-3	- 4.5	-2	-2	+1	+1	+6	+6	+10	+10	+15	+15		
0	+4	+ 5.5	+5	+8	+9	+12	+15	+18	+20	+23	+29	+26	10	18
-110	-4	- 5.5	-3	-3	+1	+1	+7	+7	+12	+12	+18	+18		
0	+ 4.5	+ 6.5	+5	+9	+11	+15	+17	+21	+24	+28	+35	+31	18	30
-130	- 4.5	- 6.5	-4	-4	+2	+2	+8	+8	+15	+15	+22	+22		
0	+ 5.5	+8	+6	+11	+13	+18	+20	+25	+28	+33	+42	+37	30	50
-160	- 5.5	-8	-5	-5	+2	+2	+9	+9	+17	+17	+26	+26		
0	+ 6.5	+ 9.5	+6	+12	+15	+21	+24	+30	+33	+39	+51	+45	50	80
-190	- 6.5	- 9.5	-7	-7	+2	+2	+11	+11	+20	+20	+32	+32		
0	+ 7.5	+11	+6	+13	+18	+25	+28	+35	+38	+45	+59	+52	80	120
-220	- 7.5	-11	-9	-9	+3	+3	+13	+13	+23	+23	+37	+37		
0	+9	+ 12.5	+7	+14	+21	+28	+33	+40	+45	+52	+68	+61	120	180
-250	-9	- 12.5	-11	-11	+3	+3	+15	+15	+27	+27	+43	+43		
0	+10	+ 14.5	+7	+16	+24	+33	+37	+46	+51	+60	+79	+70	180	250
-290	-10	- 14.5	-13	-13	+4	+4	+17	+17	+31	+31	+50	+50		
0	+ 11.5	+16	+7	+16	+27	+36	+43	+52	+57	+66	+88	+79	250	315
-320	- 11.5	-16	-16	-16	+4	+4	+20	+20	+34	+34	+56	+56		
0	+ 12.5	+18	+7	+18	+29	+40	+46	+57	+62	+73	+98	+87	315	400
-360	- 12.5	-18	-18	-18	+4	+4	+21	+21	+37	+37	+62	+62		

JS7	JS6	J7	J6	K6	K7	M6	M7	N6	N7	N9	P7	P9	over	up to
+5	+3	+4	+2	0	0	-2	-2	-4	-4	-4	-6	-6	-	3
-5	-3	-6	-4	-6	-10	-8	-12	-10	-14	-29	-16	-31		
+6	+4	+6	+5	+2	+3	-1	0	-5	-4	0	-8	-12	3	6
-6	-4	-6	-3	-6	-9	-9	-12	-13	-16	-30	-20	-42		
+ 7.5	+ 4.5	+8	+5	+2	+5	-3	0	-7	-4	0	-9	-15	6	10
- 7.5	- 4.5	-7	-4	-7	-10	-12	-15	-16	-19	-36	-24	-51		
+9	+ 5.5	+10	+6	+2	+6	-4	0	-9	-5	0	-11	-18	10	18
-9	- 5.5	-8	-5	-9	-12	-15	-18	-20	-23	-43	-29	-61		
+ 10.5	+ 6.5	+12	+8	+2	+6	-4	0	-11	-7	0	-14	-22	18	30
- 10.5	- 6.5	-9	-5	-11	-15	-17	-21	-24	-28	-52	-35	-74		
+ 12.5	+8	+14	+10	+3	+7	-4	0	-12	-8	0	-17	-26	30	50
- 12.5	-8	-11	-6	-13	-18	-20	-25	-28	-33	-62	-42	-88		
+15	+ 9.5	+18	+13	+4	+9	-5	0	-14	-9	0	-21	-32	50	80
-15	- 9.5	-12	-6	-15	-21	-24	-30	-33	-39	-74	-51	-106		
+ 17.5	+11	+22	+16	+4	+10	-6	0	-16	-10	0	-24	-37	80	120
- 17.5	-11	-13	-6	-18	-25	-28	-35	-38	-45	-87	-59	-124		
+20	+ 12.5	+26	+18	+4	+12	-8	0	-20	-12	0	-28	-43	120	180
-20	- 12.5	-14	-7	-21	-28	-33	-40	-45	-52	-100	-68	-143		
+23	+ 14.5	+30	+22	+5	+13	-8	0	-22	-14	0	-33	-50	180	250
-23	- 14.5	-16	-7	-24	-33	-37	-46	-51	-60	-115	-79	-165		
+26	+16	+36	+25	+5	+16	-9	0	-25	-14	0	-36	-56	250	315
-26	-16	-16	-7	-27	-36	-41	-52	-57	-66	-130	-88	-186		
+ 28.5	+18	+39	+29	+7	+17	-10	0	-26	-16	0	-41	-62	315	400
- 28.5	-18	-18	-7	-29	-40	-46	-57	-62	-73	-140	-98	-202		

12. Guide to queries

Company _____ Date _____

Contact person _____ Offer valid until _____

Position/department _____

Address _____

_____

Phone _____ Fax _____

E-mail _____

Project description _____

Unique needs _____ Number of items _____

Series product_____ Items / year _____

Requested delivery date for: _____ items _____ calendar week
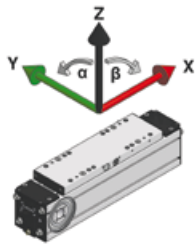
New design _____ yes / no
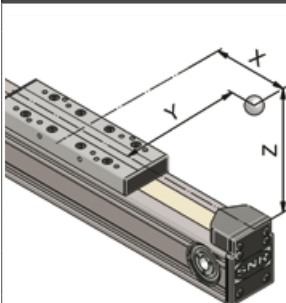
Cost reduction_____ Budget _____€

Alternative to competition _____ Competition product_____

Technical upgrade_____ Previous solution _____

Application parameters

General application parameters	Single Axis	Multi-Axis system		
		X	Y	Z
For parallel axis: axis distance [mm]				
Monting position: horizontal/vertical				
Mounting angle $\propto / \beta$ [°]				
Travel range [mm]				
Velocity: [m/s]				
Acceleration: [m/s^2]				
Alternative - travel time [s]				
Cycle time [s]				
Repeatability [mm]				
Required service life time [h]				
Operating conditions (dust, splash water...)				

Loads					
Masses [kg]	Position of the force application point				
	longitudinal [mm]		lateral [mm] y	vertical [mm] z	Comments
	x_{max}	x_{min}			

Forces [N]	Position of the the center of mass				
	longitudinal [mm]		lateral [mm] y	vertical [mm] z	Comments
	x_{max}	x_{min}			
Force direction X					
Force direction Y					
Force direction Z					

Please attach drawings / sketches / travel cycle for complex applications.

Comments / sketch:

Annex for axis: please tick / record as appropriate

Drive type	Guiding system
☐ Ball screw	☐ Linear guides
☐ Trapezoidal screw	☐ Track roller guides
☐ Sliding screw	☐ Polymer track roller guides
☐ Toothed belt	☐ No guiding system
☐ Toothed belt / Ω - Drive	
☐ Rack and pinion	
☐ Telescopic axis	
☐ Linear motor	
☐ Without drive	

Attachments left
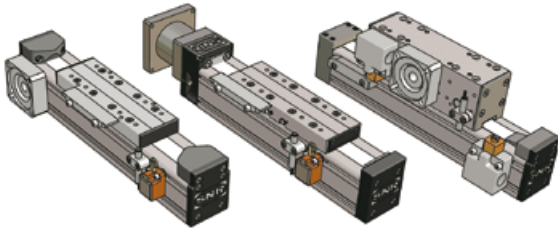
Attachments right
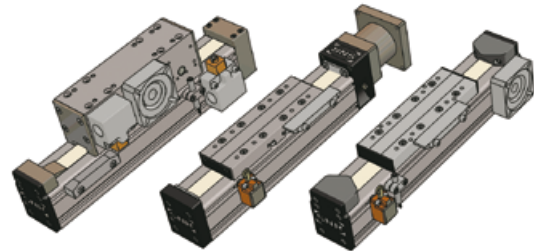
AXS_Y Attachments left

GBL / PBL

GFL / PFL
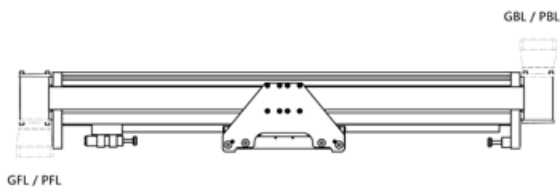
AXS_Y Attachments right

GBR / PBR

GFR / PFR
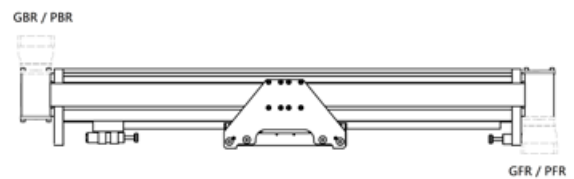
Drive version for toothed belt drive			Drive version for screw drive	
☐ Hollow shaft			☐ Coupling + Coupling cone	
☐ Free drive shaft	☐ right	☐ left	☐ Deflection belt drive	
☐ Integrated coupling	☐ right	☐ left	☐ Free drive schaft	
+ ☐ integrated coupling for connecting shaft				
+ ☐ integrated planetary gearbox	☐ right	☐ left	**Drive version for Linear motor drive**	
+ ☐ integrated coupling for connecting shaft			☐ Air cooling	
☐ AXS_Y with integrated planetary gearbox			☐ Water cooling	
	☐ Front side	☐ right	☐ left	
	☐ Rear side	☐ right	☐ left	
☐ Coupling + Coupling cone	☐ right	☐ left		
+ ☐ integrated coupling for connecting shaft				
☐ Adapter flange	☐ right	☐ left		

Switches			
☐ Mechanical switches	☐ right	☐ left	Quantity:
☐ Inductive switches	☐ right	☐ left	Quantity:
	☐ PNP - NC	☐ PNP - NO	☐ NPN - NC
☐ Magnetic field switch (for AXF)			Quantity:
☐ Magnetic encoded position measuring system (for AXLM)			
☐ without reference signal		☐ with one reference signal	
☐ with distance coded reference signal		☐ with fix periodically reference signal	

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Mounting position angular gearbox
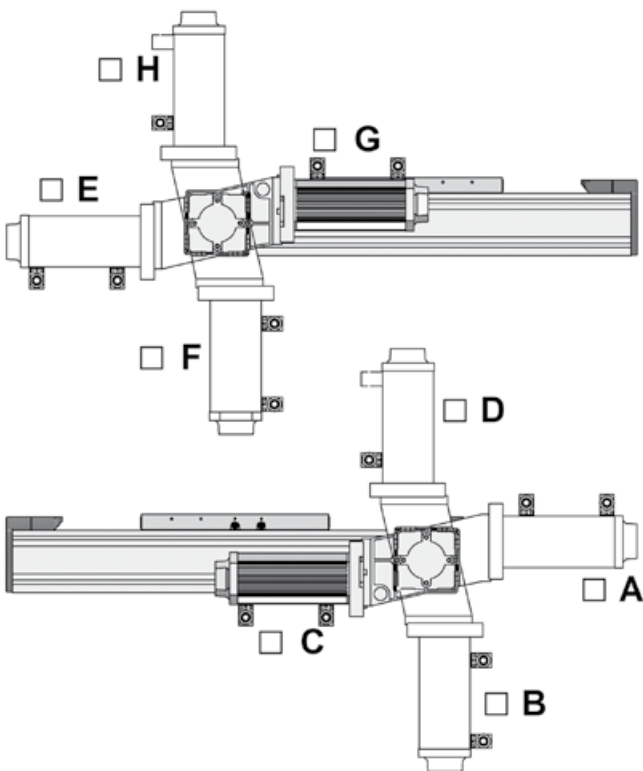
Monting position Linear Axis
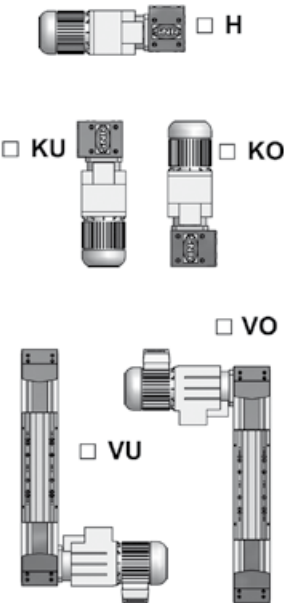
Position drive connections
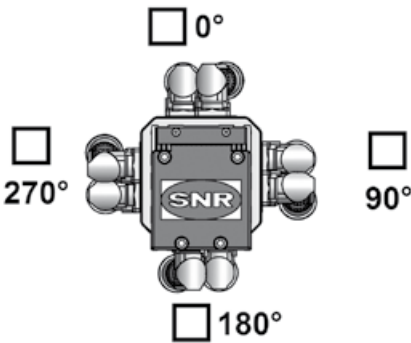
Axis position: Table up
Viewing direction: on the drive shaft

13. Index

SNR
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SNR
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NOTES

NOTES

NOTES

Manufacturer / Hersteller

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Telefax: +49 (0) 521 / 9 24 00 – 97

Email: linear@ntn-snr.de

www.ntn-europe.com/documents/linear

Make the world **NAMERAKA**

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www.ntn-europe.com

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