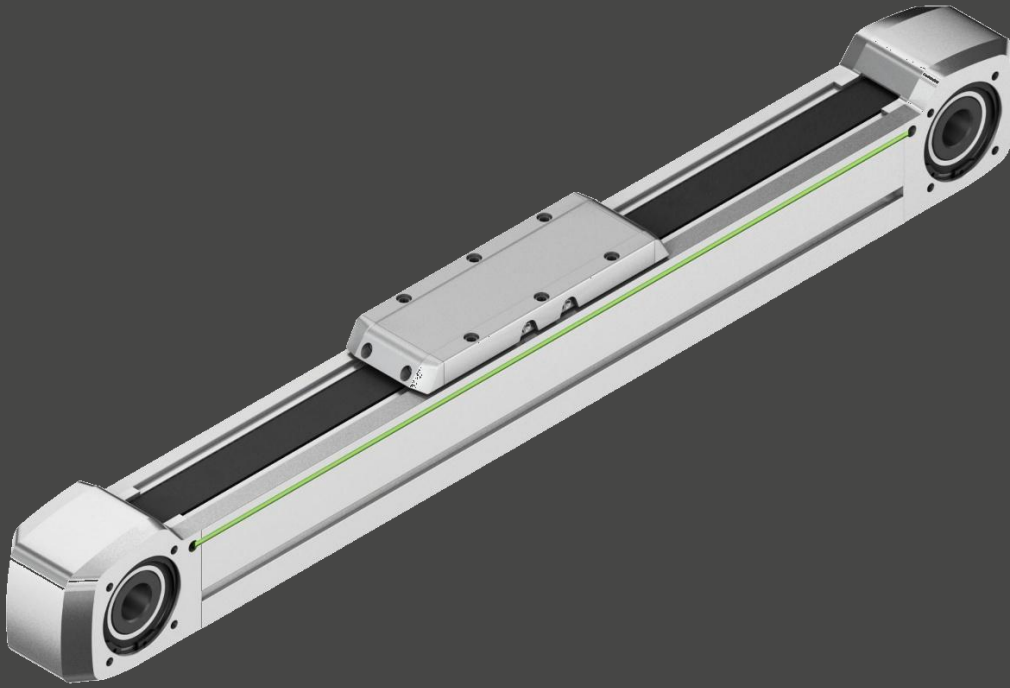


HIWIN®



ASSEMBLY INSTRUCTIONS

Toothed Belt Axes HM-B, HT-B, HB-B, HC-B, HD, HS

HMB-HTB-HBB-HCB-HD-HS-03-0-EN-2610-MA

Legal information

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1 General

1.1 About these assembly instructions

These assembly instructions are intended for planners, developers and operators of systems who plan and install the products mentioned as machine components. They are also intended for persons carrying out the following work in connection with the products mentioned:

- Transport
- Assembly
- Electrical connection, including connection to the higher-level control system
- Integration into a safety system
- Retrofitting or upgrading
- Set-up
- commissioning
- Operation
- Cleaning
- Maintenance
- Troubleshooting and fault rectification
- Decommissioning, dismantling and disposal

1.1.1 Prerequisites

We assume that

- operating personnel have been trained in the safe operation of the products mentioned and have read and understood the assembly instructions in full;
- maintenance staff maintain and repair the products in such a way that they pose no danger to people, the environment or property.

1.1.2 Availability

The assembly instructions must always be available to all persons working with or on the products mentioned. The assembly instructions are also available at [HIWIN.de](https://www.hiwin.de).

1.2 Illustrations used in these assembly instructions

1.2.1 Instructions

Instructions are labelled with triangles in the order in which they are to be carried out. The results of the completed steps are labelled with ticks.

Example:

- Step 1
- Step 2
- ✓ Result

1.2.2 Bulleted lists

Lists are labelled with bullet points.

Example:

The products must not be operated:

- outdoors
- in potentially explosive ranges
- ...

1.2.3 Presentation of safety notices

Safety notices are always labelled with a signal word and, in some cases, with a hazard-specific symbol (see section [1.2.4 Symbols used](#)).

The following signal words and hazard levels are used:

 **Danger!** Immediate danger!

Non-compliance with the safety notices may result in serious injury or death!

 **Warning!** Potentially dangerous situation!

Non-compliance with the safety notices may result in serious injury or death!

 **Caution!** Potentially dangerous situation!

Non-compliance with the safety notices may result in moderate to minor injuries!

 **Attention!** Potentially dangerous situation!

Non-compliance with the safety notices may result in damage to property or environmental pollution!

1.2.4 Symbols used

The following symbols are used in these assembly instructions and on the products mentioned:

Warning and prohibition signs

	Warning: dangerous electrical voltage!		Warning: risk of hearing damage!
	Warning: risk of cuts!		Warning: risk of crushing!
	Substance hazardous to the environment!		Warning: danger from suspended loads!

mandatory signs

	Wear protective gloves!		Wear ear protection!
	Wear safety goggles!		Disconnect the power supply before starting work!

1.2.5 Notes

Note:

Notes describe general information and recommendations.

1.3 Warranty and liability

The manufacturer's "General Terms and Conditions of Sale and Delivery" apply in all cases.

1.4 Manufacturer's details

Address	HIWIN GmbH Brücklesbünd 1 77654 Offenburg
Telephone	+49 (0) 781 / 9 32 78 - 0
Technical Customer Service	+49 (0) 781 / 9 32 78 - 77
Fax	+49 (0) 781 / 9 32 78 - 90
Technical Customer Service Fax	+49 (0) 781 / 9 32 78 - 97
Email	support@hiwin.de
Website	HIWIN.de

1.5 Product monitoring

Please inform HIWIN GmbH, the manufacturer of the mentioned products, of:

- Accidents
- Potential hazards associated with the product
- Any ambiguities in these assembly instructions

2 Basic safety notices

Warning!

This section is intended to ensure the safety of everyone who works with, assembles, installs, operates, maintains or dismantles the products mentioned. Failure to observe the following instructions may result in danger.

2.1 Intended use

The HM-B/HT-B and HB-B linear axes, HC cantilever axes, HD double axes and/or HS multi-axis systems combine guidance and drive into a compact unit. They are designed for the precise positioning, in terms of both time and location, of fixed loads within an automated system. They are particularly suitable for applications requiring high dynamic response and high precision. Furthermore, these linear axes and linear axis systems allow for long travel distances.

In the case of vertical installation, a suitable clamping or braking device must be provided to prevent the load from dropping unintentionally.

All HM-B/HT-B and HB-B linear axes, HC cantilever axes, HD double axes and/or HS multi-axis systems must be used exclusively for the specified purpose:

- Performance limits are specified for each size of the products mentioned (see the 'HX Linear Axes and Axis Systems' catalogue). These performance limits must not be exceeded during operation.
- The products must not be used in potentially explosive atmospheres.
- Products must not be operated under vacuum
- The products must be used and operated indoors only.
- The products are used as part of an overall system; therefore, personal safety must be ensured through the design of the overall system.
- Compliance with the assembly instructions and adherence to the maintenance and repair regulations are prerequisites for the intended use of the products.
- Any other use of the products is considered improper.

The products mentioned are supplied as a system (one guide, drive). You must therefore refer to the full documentation for the system. The accompanying documentation may vary depending on the type of linear axis.

Environmental requirements

Operating environmental conditions:	+5 to +40 °C
Relative humidity during operation:	in accordance with IEC 60721-3-3, Class 3K22, non-condensing
Climatic environmental conditions for transport and storage:	Ambient temperature: –20 to +50 °C, non-condensing
Climatic conditions for long-term storage:	Ambient temperature: +20 °C, non-condensing

Note:

Prevent condensation to avoid corrosion of the axis.

2.2 Reasonably foreseeable misuse

The products mentioned must not be operated:

- outdoors
- in potentially explosive ranges

2.3 Modifications or alterations

Modifications or alterations to the products mentioned are not permitted! If you have any special requirements, please contact HIWIN GmbH.

2.4 Residual hazards

The products listed do not pose any residual hazards during normal operation, as they are used as part of the overall system and the operator is responsible for ensuring personal safety through the overall system. Warnings regarding hazards that may arise during maintenance and servicing are provided in the relevant chapters.

2.5 Requirements for personnel

Only authorised and competent persons may carry out work on the products mentioned! They must be familiar with the safety devices and regulations before commencing work (see table below).

Task	Qualification
Normal operation	Trained staff
Cleaning	Trained staff
Maintenance	Trained specialist staff from the operator or manufacturer
Maintenance	Trained specialist staff from the operator or manufacturer
Transport	Trained staff
Assembly	Trained specialist staff
Dismantling	Trained specialist staff

2.6 Safety devices

Table 2.1: Personal protective equipment

Operating phase	Personal protective equipment
Normal operation	It is not permitted to remain in the vicinity of the products mentioned during normal operation. If you are in the vicinity of the products, the following personal protective equipment is required, depending on the travel speed: – Safety footwear – Hearing protection, where necessary
All other operating phases (cleaning, maintenance, servicing, changeover, troubleshooting, repair)	The following personal protective equipment is required during all other operational phases of the products mentioned: – Safety footwear – Protective gloves and safety goggles where necessary – Hearing protection, where necessary – Where applicable, a hairnet

2.7 Labelling on the product

You will find the labelling shown below on the products.

Fig.2.1: Example of a type plate

	Type: HT150B155N1500SNNNLNG13								
HIWIN GmbH Brücklesbünd 1 77654 Offenburg www.hiwin.de	<table> <tr> <td>S/N:</td><td>HSN000001508</td></tr> <tr> <td>Art. No:</td><td>25.12082</td></tr> <tr> <td>Year built:</td><td>2021</td></tr> <tr> <td>Mass of stage:</td><td>26 kg</td></tr> </table>	S/N:	HSN000001508	Art. No:	25.12082	Year built:	2021	Mass of stage:	26 kg
S/N:	HSN000001508								
Art. No:	25.12082								
Year built:	2021								
Mass of stage:	26 kg								

3 Description of linear axes and linear axis systems

3.1 HM-B linear module

3.1.1 Applications

The HM-B linear modules with toothed belt drive are compact, flexible positioning modules and are particularly suitable for applications requiring high dynamic response and high speeds.

3.1.2 Main components

Fig.3.1: Main components of the HM-B linear axis

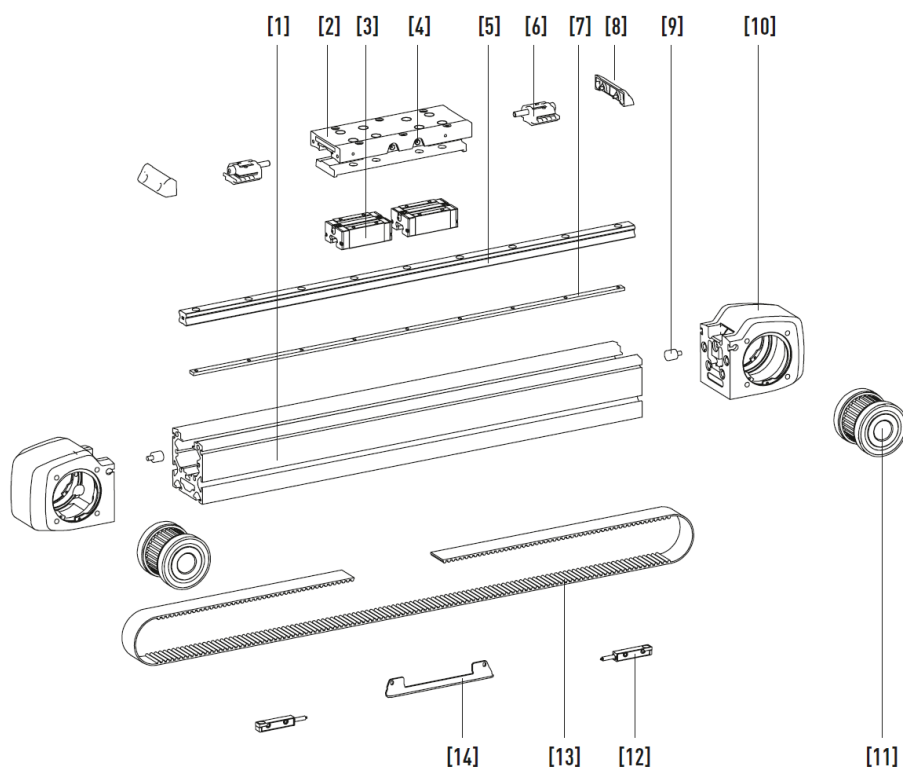


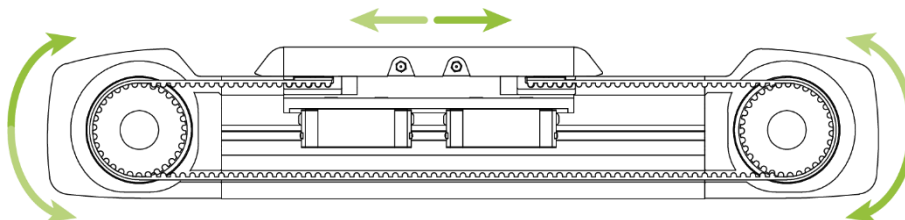
Table 3.1: Legend table

1	axis profile	8	slide end piece
2	slide	9	stop buffer
3	block	10	drive block
4	grease nipple	11	drive unit
5	profile rail	12	limit switch
6	belt tensioner	13	toothed belt
7	threaded strip	14	damping element

3.1.3 Function description

In linear axes with toothed belt drives, the drive and guide are combined in a compact unit. The forces and torques from the load to be moved are transmitted via the slides to the linear guideway. With two blocks per slide, this also ensures precise guidance of the linear movement. The movement itself is achieved via a toothed belt, which is fixed to the slide and driven by an electric motor via the toothed belt pulley.

Fig.3.2: Operating principle of the HM-B linear module



3.1.4 Order code for HM- B linear modules

Number	1	2	3	4	5	6	7	8	
order code	HM	060	B	155	N	0755	S	000	Chapter
1	HM	series: HM: Module axis							3.1
2	060	size: 040: Profile width 40 mm 060: Profile width 60 mm 080: Profile width 80 mm 120: Profile width 120 mm							
3	B	Drive type: B: toothed belt							3.1.3
4	155	Feed constant: 111: 111 mm 155: 155 mm 190: 190 mm 288: 288 mm							
5	N	cover strip: N: None C: With							4.2
6	0755	Stroke length [mm]							4.1
7	S	Carriage length: E: Extra short S: Short M: Medium L: Long H: Long – Heavy load							4.3
8	000	Carriage spacing [mm]: 000: Single slide							

Number		9	10	11	12	13	14	
Continued order code		A	N	N	R	BR07	G0605	Chapter
9	A	limit switch: N: Without A: 2x n/c contacts, connection cable with connector B: 2x n/o contacts, connection cable with connector C: 2x n/c contacts, 5m cable D: 2x n/o contacts, 5m cable						4.4
10	N	N						
11	N	distance measuring system: N: Without A: Magic analogue 1Vss sin/cos D: Magic digital TTL 5V F: APM absolute BissC						4.5
12	R	Drive interface: N: Without drive L: Drive on the front left R: Front right drive G: Left rear drive H: Drive on the rear right						4.7
13	BR07	Flange type						
14	G0605	gearbox						

3.2 HT-B linear table

3.2.1 Applications

The HT-B linear tables with toothed belt drive are ideal for transport tasks requiring high dynamic response and high speeds. Furthermore, the HT-B linear tables can be used to achieve long travel distances. The toothed belt, featuring a modern high-performance profile and reinforced steel tension members, ensures high and reliable power transmission. The numerous options, such as cover strips, limit switch variants, distance measuring systems, and an extensive range of gearboxes and adaptors for all standard servo motors on the market, make the HT-B linear axis a highly flexible positioning module.

3.2.2 Main components

Fig.3.3: Main components of the HT-B linear table

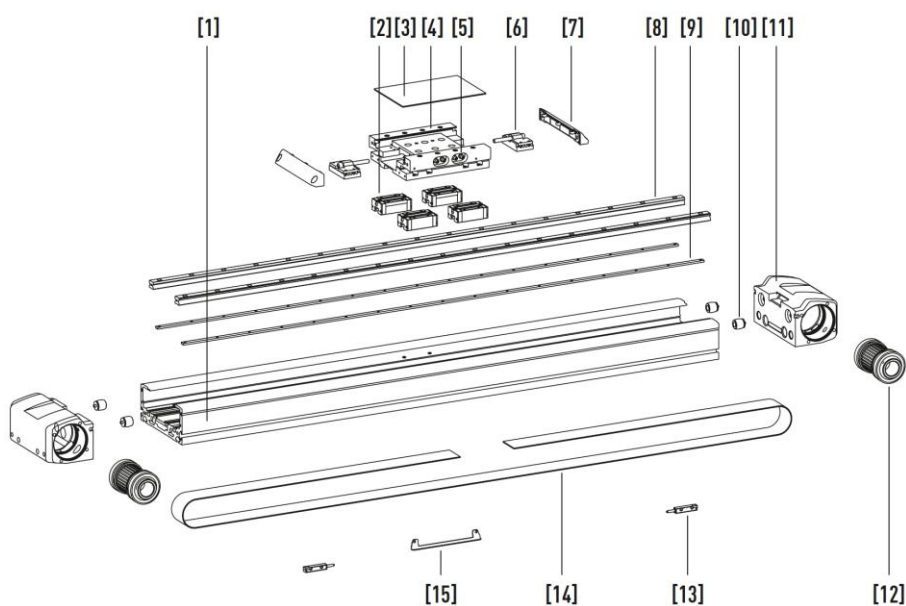


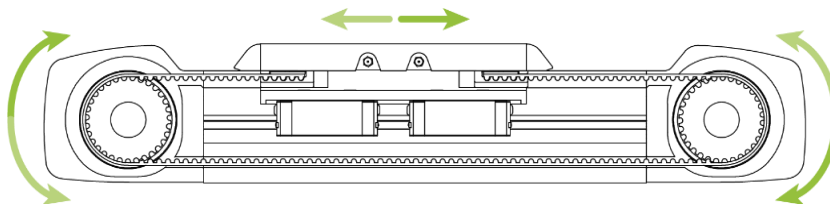
Table 3.2: Description of the main components of the HT-B linear tables

1	axis profile	9	Threaded strips
2	block	10	stop buffer
3	slide cover	11	drive block
4	slide	12	drive unit
5	grease nipple	13	limit switch
6	belt tensioner	14	toothed belt
7	slide end piece	15	damping element
8	Profile rails		

3.2.3 Function description

In linear tables with toothed belt drives, the drive and guide are combined in a single compact unit. The forces and torques from the load being moved are transferred via the slides to the linear guideways. These also ensure precise guidance of the linear movement with four blocks per slide. The movement itself is achieved via a toothed belt, which is fixed to the slide and driven by an electric motor via the toothed belt pulley.

Fig.3.4: Operating principle of the HT-B linear table



3.2.4 Order code for linear table HT- B

Number	1	2	3	4	5	6	7	
order code	HT	150	B	155	C	1234	S	Chapter
1	HT	series: HT: Table axis						3.2
2	150	size: 100: Profile width 100 mm 150: Profile width 150 mm 200: Profile width 200 mm 250: Profile width 250 mm						
3	B	Drive type: B: toothed belt						3.2.3
4	155	Feed constant: 105: 105 mm 155: 155 mm 184: 184 mm 208: 208 mm						
5	C	cover strip: N: None C: With						4.2
6	1234	Stroke length [mm]						4.1
7	S	Carriage length: S: Short						4.3

Number	8	9	10	11	12	13	
Continued order code	A	N	N	R	BR13	G0805	Chapter
8	A	limit switch: N: Without A: 2x n/c contacts, connection cable with connector B: 2x n/o contacts, connection cable with connector C: 2x n/c contacts, 5m cable D: 2x n/o contacts, 5m cable					4.4
9	N	N					
10	N	distance measuring system: N: Without A: Magic analogue 1Vss sin/cos D: Magic digital TTL 5V F: APM absolute BissC					4.5
11	S	Drive interface: N: Without drive, without energy chain L: Drive at the front left, without energy chain R: Drive on the front right, without energy chain G: Left rear drive, without energy chain H: Drive on the rear right, without energy chain C: No drive, energy chain on the right F: Drive on the front right, energy chain on the right E: Drive at the rear right, energy chain on the right					4.7 4.10.1
12	BR13	Flange type					
13	G0805	gearbox					

3.3 Bridge axis HB-B

3.3.1 Applications

The HB-B bridge axes with toothed belt drive are rigid positioning systems featuring a closed aluminium profile and external double guides. They are particularly suitable for applications requiring high load-bearing capacity and high feed forces.

3.3.2 Main components

Fig.3.5: Main components of the HB-B linear axis

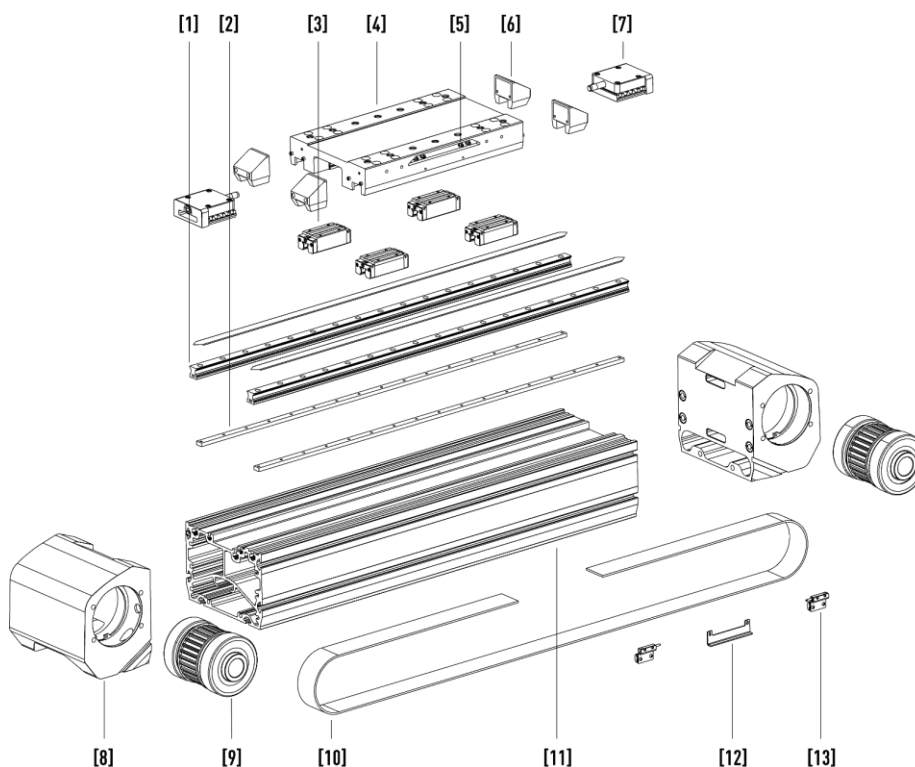


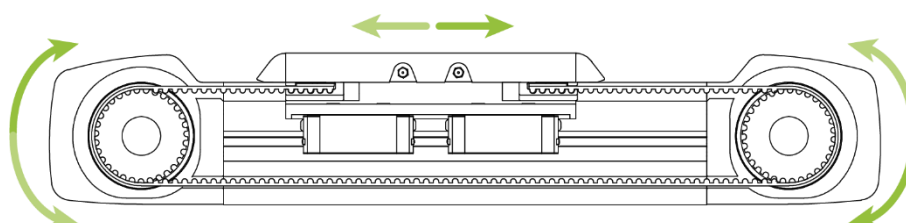
Table 3.3: Legend table

1	profile rail	8	drive block
2	threaded strip	9	drive unit
3	block	10	toothed belt
4	slide	11	axis profile
5	grease nipple	12	damping element
6	stop buffer	13	limit switch
7	belt tensioner		

3.3.3 Function description

In bridge axes with toothed belt drives, the drive and guide are combined in a compact unit. The forces and torques from the load being moved are transmitted via the slides to the linear guideways. These also ensure precise guidance of the linear movement with four blocks per slide. The movement itself is achieved via a toothed belt, which is fixed to the slide and driven by an electric motor via the toothed belt pulley.

Fig.3.6: Operating principle of the HB-B bridge axis



3.3.4 Order code for HB-B bridge axis

Number	1	2	3	4	5	6	7	
order code	HB	250	B	392	N	1234	S	Chapter
1	HB	series: HB: bridge axis						3.3
2	250	size: 250: Profile width 250 mm						
3	B	Drive type: B: toothed belt						3.3.3
4	392	Feed constant: 392: 392 mm						
5	N	cover strip: N: None						
6	1234	Stroke length [mm]						4.1
7	S	Carriage length: S: Short						4.3

Number	9	10	11	12	13	14	
Continued order code	A	N	N	R	BR13	G1205	Chapter
9	A	limit switch: N: Without A: 2x n/c contacts, connection cable with connector B: 2x n/o contacts, connection cable with connector C: 2x n/c contacts, 5m cable D: 2x n/o contacts, 5m cable					4.4
10	N	N					
11	N	distance measuring system: N: Without A: Magic analogue 1Vss sin/cos D: Magic digital TTL 5V					4.5
12	R	Drive interface: N: Without drive, without energy chain L: Drive at the front left, without energy chain R: Drive on the front right, without energy chain G: Drive on the left rear, without energy chain H: Drive on the rear right, without energy chain C: No drive, energy chain on the right F: Drive on the front right, energy chain on the right E: Drive at the rear right, energy chain on the right					4.7 4.10.1
13	BR13	Flange type					
14	G1205	gearbox					

3.4 Cantilever axis HC-B

3.4.1 Application

The HC-B cantilever axes are bendable linear units featuring an Omega toothed belt drive. The compact drive block, comprising the motor and gearbox, is stationary, whilst the lightweight boom moves. Thanks to the sophisticated structure of the aluminium profile, the boom offers high torsional rigidity despite its low weight, making it suitable for dynamic applications, particularly vertical ones.

3.4.2 Main components

Fig.3.7: Main components of the HC025 to HC100 cantilever axes

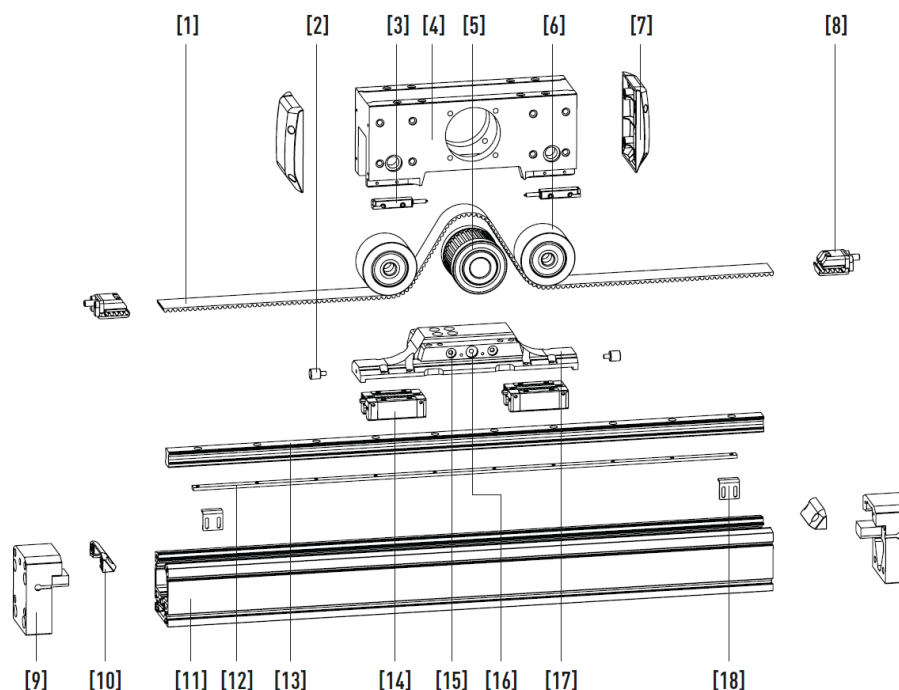


Table 3.4: Description of the main components of the cantilever axis HC025 to HC100

1	toothed belt	10	Belt tensioner cover
2	stop buffer	11	axis profile
3	limit switch	12	threaded strip
4	Drive block housing	13	profile rail
5	drive unit	14	block
6	Guide pulley	15	grease nipple
7	End piece for drive block housing	16	Connection for pneumatic clamping/brake element
8	belt tensioner	17	Lower section of drive block
9	end plate	18	damping element

Fig.3.8: Main components of the HC150B cantilever axis

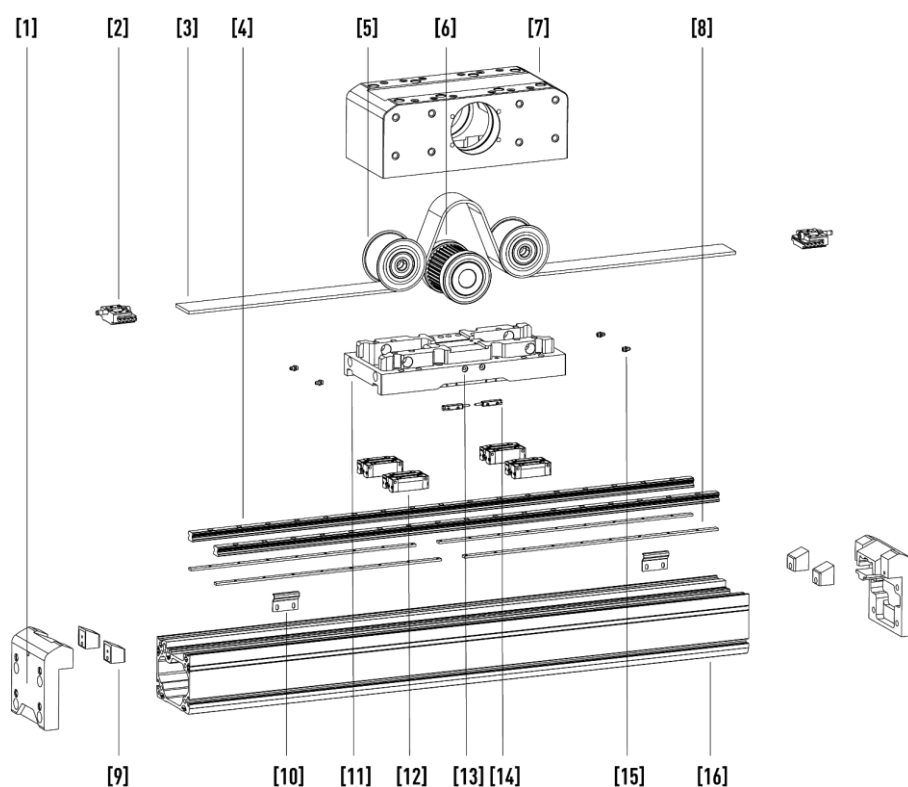


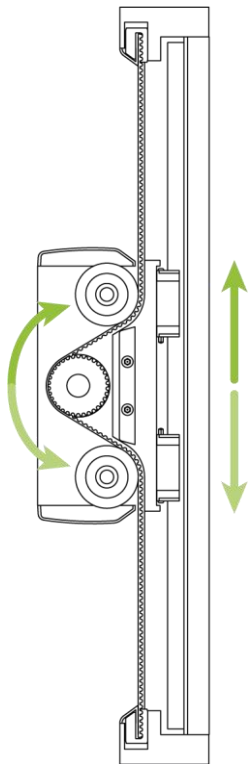
Table 3.5: Description of the main components of the HC150B cantilever axis

1	end plate	9	stop buffer
2	belt tensioner	10	damping element
3	toothed belt	11	Lower part of drive block
4	profile rail	12	block
5	Deflection pulley	13	Connection for pneumatic clamping/brake element
6	drive unit	14	limit switch
7	Drive block housing	15	grease nipple
8	threaded strip	16	axis profile

3.4.3 Function description

The HC-B cantilever axis is a linear unit in which the drive block is stationary whilst the lightweight cantilever moves. Thanks to the linear guideway with two carriages (HC025 – HC100) or four carriages (HC150), forces and torques are safely transferred from the cantilever to the drive block. The movement itself is achieved via a toothed belt, which is fixed to the end plates and driven by an electric motor via the toothed belt pulley.

Fig.3.9: Operating principle of the HC-B cantilever axis



3.4.4 Order code for HC-B cantilever axis

Number	1	2	3	4	5	6	7	
order code	HC	060	B	170	N	1234	S	Chapter
1	HC	series: HC: cantilever axis						3.4
2	060	size: 025: Profile width 25 mm 040: Profile width 40 mm 060: Profile width 60 mm 080: Profile width 80 mm 100: Profile width 100 mm 150: Profile width 150 mm						
3	B	Drive type: B: toothed belt						3.4.3
4	170	Feed constant: 081: 81 mm 123: 123 mm 170: 170 mm 200: 200 mm 280: 280 mm 288: 288 mm						
5	N	cover strip: N: None						
6	1234	Stroke length [mm]						4.1
7	S	Carriage length: S: Short						4.3

Number	8	9	10	11	12	13	
Continued order code	A	N	N	R	HW01	G0608	Chapter
8	A	limit switch: N: Without A: 2x n/c contacts, connection cable with connector B: 2x n/o contacts, connection cable with connector C: 2x n/c contacts, 5m cable D: 2x n/o contacts, 5m cable					4.4
9	N	Clamping and brake element: N: Without C: Pneumatic clamping element B: Pneumatic brake element D: 2x pneumatic clamping element E: 2x pneumatic brake elements					4.6
10	N	distance measuring system: N: Without A: Magic analogue 1Vss sin/cos D: Magic digital TTL 5V F: APM absolute BissC					4.5
11	R	Drive interface: N: Without drive L: Drive on the left R: Drive on the right					4.7
12	HW01	Flange type					
13	G0608	gearbox					

3.5 Double axis HD

3.5.1 Applications

HD double axes are suitable for applications where a single axle is insufficient due to high torque loads or the dimensions of the load to be transported. HD double axes are also ideal for use as the basis for linear axis systems.

3.5.2 Main components

Fig.3.10: Main components of the HD double axis

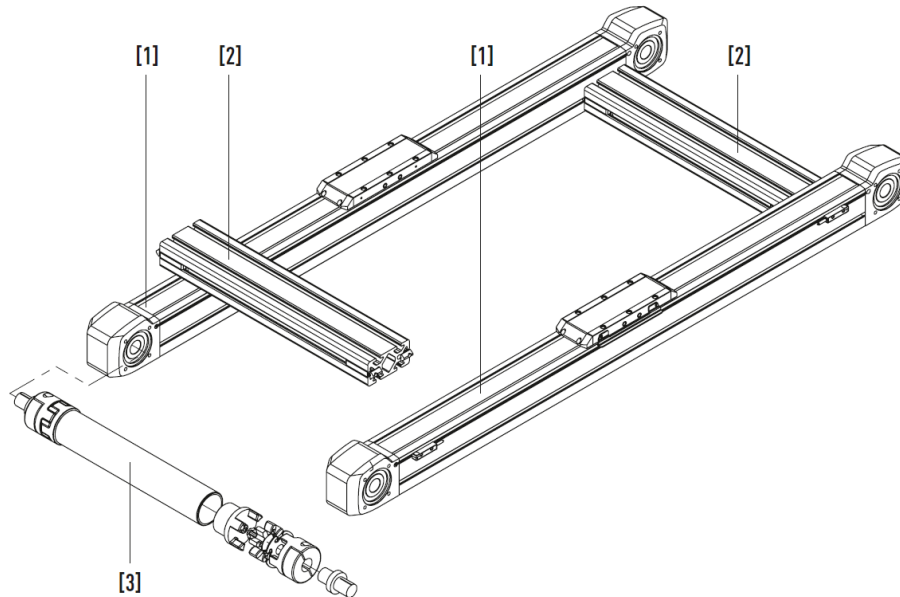


Table 3.6: Description of the main components of the HD double axis

1	linear axis
2	spacer profile
3	synchronous shaft

3.5.3 Order code for HD double axes

Number	1	2	3	4	5	6	
order code	HD	2	N	1234	S	000	Chapter
1	HD	series: HD: double axis					3.5
2	2	size: 1: Size 1 2: Size 2 3: Size 3 4: Size 4					
3	N	cover strip: N: Without C: With					4.2
4	1234	Stroke length [mm]					4.1
5	S	Carriage length: S: Short M: Medium L: Long H: Long – Heavy load					4.3
6	000	Carriage spacing [mm]: 000: Single slide					

Number	7	8	9	10	11	12	
Continued order code	A	N	1234	R	BE04	G0608	Chapter
7	A	limit switch: N: Without A: 2x n/c contacts, connection cable with connector B: 2x n/o contacts, connection cable with connector C: 2x n/c contacts, 5m cable D: 2x n/o contacts, 5m cable					4.4
8	N	distance measuring system: N: Without A: Magic analogue 1Vss sin/cos D: Magic digital TTL 5V F: APM absolute BissC					4.5
9	1234	Centre-to-centre distance [mm]					
10	R	Drive interface: N: without drive L: with drive on the left R: with right-hand drive					4.7
11	BE04	Flange type					
12	G0608	gearbox					

3.6 HS2 two-axis system

3.6.1 Application

HS2 two-axis systems are particularly suitable for two-dimensional or planar movements in a single plane and form the basis for three-axis systems.

3.6.2 Main components

Fig.3.11: Main components of the HS2 two-axis system

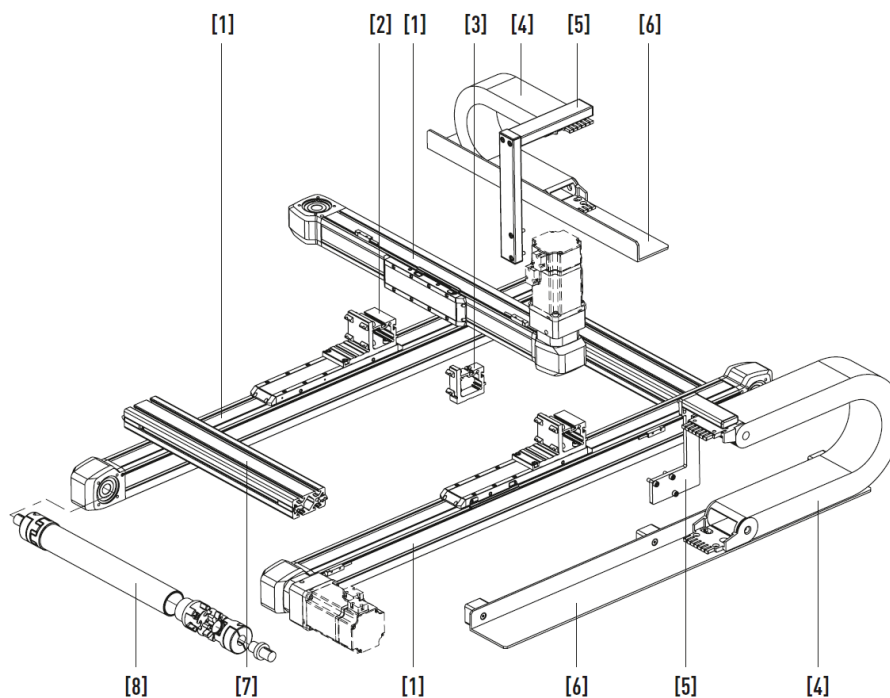


Table 3.7: Description of the main components of the HS2 two-axis system

1	linear axis	5	energy chain connection
2	adaptation angle	6	energy chain support
3	support bracket	7	spacer profile
4	energy chain	8	synchronous shaft

3.6.3 Order code for HS2 two-axis systems

Number	1	2	3	4	
order code	HS2	2	XD2	YM2 –	Chapter
1	HS2	series: HS2: two-axis system			3.6
2	2	size: 1: Size 1 2: Size 2 3: Size 3 4: Size 4			
3	XD2	Series and size, System X: XD1: Double axis HM040 XD2: Double axis HM060 XD3: Double axis HM080 XD4: Double axis HM120			
4	YM2 –	Series and size, System Y: YM1: Modular axis HM040 YM2: Module axis HM060 YM3: Module axis HM080 YT1: Table axis HT100 YT2: Table axis HT150 YT3: Table axis HT200 YT4: Table axis HT250			

Number	7	8	9	10	11	12	13	14	15	
Continued order code	1000 –	0800	A	2	R	BR04	G0803 –	BE04	G0608	Chapter
7	1000 –	Stroke length X [mm]								4.1
8	0800	Stroke length Y [mm]								4.1
9	A	limit switch: N: Without limit switch A: 2x n/c contacts, connection cable with connector								4.4
10	2	energy chain: N: Without 1: E-chain along the X-axis 2: E-chain along the X/Y-axis								4.10.2
11	R	Drive interface: N: without drive L: with drive on the left R: with right-hand drive A: without drive on the left B: without drive, right-hand side								4.7
12	BR04	Flange type X								
13	G0803	Gearbox X								
14	BE04	Flange type Y								
15	G0608	Gearbox Y								

3.7 HS3 three-axis system

3.7.1 Applications

HS3 three-axis systems are bendable units for positioning in the X, Y and Z directions. They are particularly suitable for three-dimensional movements.

3.7.2 Main components

Fig.3.12: Main components of the HS3 three-axis system

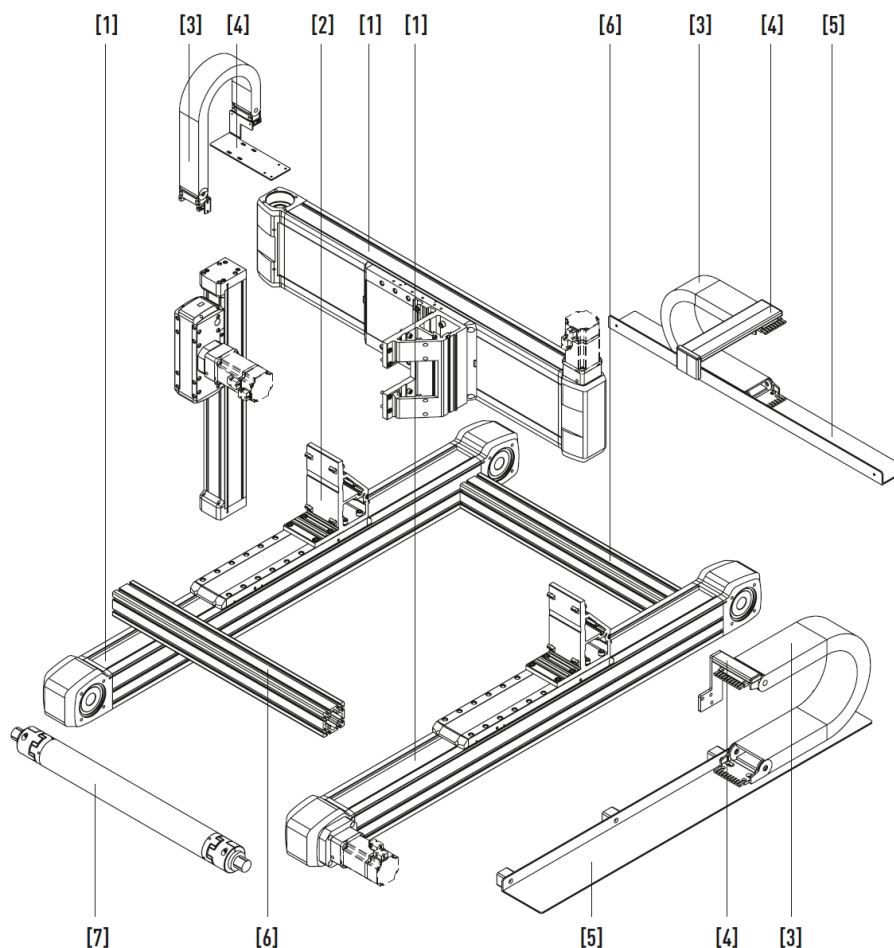


Table 3.8: Description of the main components of the HS3 three-axis system

1	linear axis	5	energy chain support
2	adaptation angle	6	spacer profile
3	energy chain	7	synchronous shaft
4	energy chain connection		

3.7.3 Order code for HS3 three-axis systems

Number	1	2	3	4	5	
order code	HS3	2	XD2	YT2	ZC1 –	Chapter
1	HS3	series: HS3: three-axis system				3.7
2	2	size: 1: Size 1 2: Size 2 3: Size 3 4: Size 4				
3	XD2	Series and size, System X: XD1: Double axis HM040 XD2: Double axis HM060 XD3: Double axis HM080 XD4: Double axis HM120				
4	YT2	Series and size, System Y: YT1: Table axis HT100 YT2: Table axis HT150 YT3: Table axis HT200 YT4: Table axis HT250				
5	ZC1 –	Series and size of System Z: ZC0: Cantilever axis HC025 ZC1: Cantilever axis HC040 ZC2: Cantilever axis HC060 ZC3: Cantilever axis HC080				

Number	6	7	8	9	10	11	
Continued order code	1000 –	0800 –	0600	A	3	R	Chapter
6	1000 –	Stroke length X [mm]					4.1
7	0800 –	Stroke length Y [mm]					4.1
8	0600	Stroke length Z [mm]					4.1
9	A	limit switch: N: Without limit switch A: 2x n/c contacts, connection cable with connector					4.4
10	3	energy chain: N: Without 1: E-chain along the X-axis 2: E-chain along the X/Y-axis 3: E-chain along the X/Y/Z axes					4.10.2
11	R	Drive interface: N: without drive L: with drive on the left R: with right-hand drive A: without drive on the left B: without drive, right-hand side					4.7

Number	12	13	14	15	16	17	
Continued order code	BR04	G0803 –	BE04	G0608 –	B002	G0405	Chapter
12	BR04	Flange type X					
13	G0803 –	Gearbox X					
14	BE04	Flange type Y					
15	G0608 –	Gearbox Y					
16	B002	Flange type Z					
17	G0405	Gearbox Z					

3.8 HSL linear gantry

3.8.1 Applications

HSL linear gantries are bendable units for positioning in the X and Z directions. They are particularly suitable for two-dimensional movements.

3.8.2 Main components

Fig.3.13: Main components of the HSL linear gantry

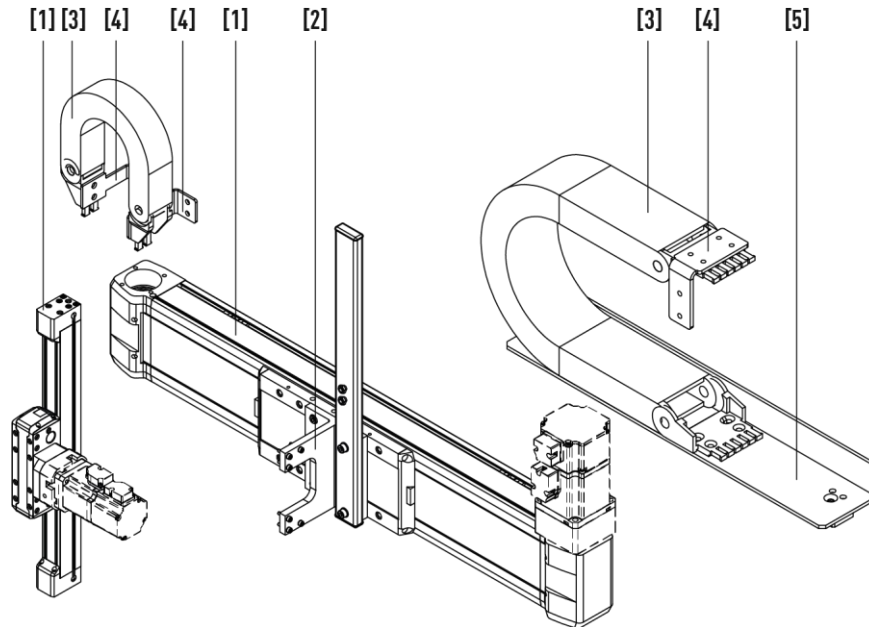


Table 3.9: Description of the main components of the HSL linear gantry

1	linear axis
2	adaptation angle
3	energy chain
4	energy chain connection
5	energy chain support

3.8.3 Order code for HSL linear gantries

Number	1	2	3	4	5	
order code	HSL	2	XT2	ZC1 –	1000 –	Chapter
1	HSL	series: HSL: linear gantry				3.8
2	2	size: 1: Size 1 2: Size 2 3: Size 3 4: Size 4				
3	XT2	Series and size, System X: XT1: Table axis HT100 XT2: Table axis HT150 XT3: Table axis HT200 XT4: Table axis HT250				
4	ZC1 –	Series and size, System Z: ZC0: Cantilever axis HC025 ZC1: Cantilever axis HC040 ZC2: Cantilever axis HC060 ZC3: Cantilever axis HC080				
5	1000 –	Stroke length X [mm]				4.1

Number	6	7	8	9	10	11	12	13	
Continued order code	0600	A	2	R	BE04	G0608 –	B002	G0405	Chapter
6	0600	Stroke length Z [mm]							4.1
7	A	limit switch: N: Without limit switch A: 2x n/c contacts, connection cable with connector							4.4
8	2	energy chain: N: Without 1: E-chain along the X-axis 2: E-chain along the X/Z-axis							4.10.2
9	R	Drive interface: N: without drive L: with drive on the left R: with right-hand drive A: without drive on the left B: without drive, right-hand side							4.7
10	BE04	Flange type X							
11	G0608 –	Gearbox X							
12	B002	Flange type Z							
13	G0405	Gearbox Z							

4 Options for linear axes and linear axis systems

4.1 Stroke length

The stroke lengths of the linear axes can be selected in millimetre steps.

The maximum stroke length, depending on the series and size, is listed in the 'Linear Axes & Linear Axis Systems' catalogue, in the 'Product Selection' chapter. Longer stroke lengths are available on request.

Please note that the selection of certain options may result in further restrictions on the maximum stroke length.

4.1.1 Reserve stroke

! Warning! Risk of damage to the linear axis!

- The mechanical end position must not be reached during operation!

The reserve stroke L_r corresponds to the distance that can be travelled on both sides of the end positions (stroke 0, max. stroke) in addition to the stroke, before the slide reaches the mechanical end position (mechanical 0) at the fitted stop buffers. The reserve stroke for each axis size can be found in the 'HX Linear Axes and Axis Systems' catalogue.

Fig.4.1: Illustration of reserve stroke using a HM-B linear module as an example

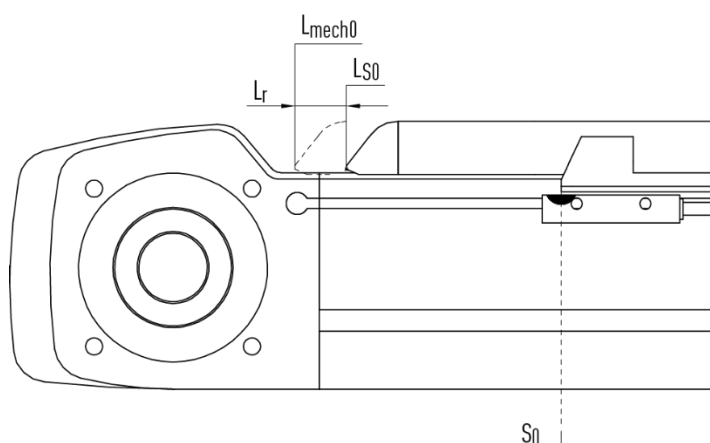
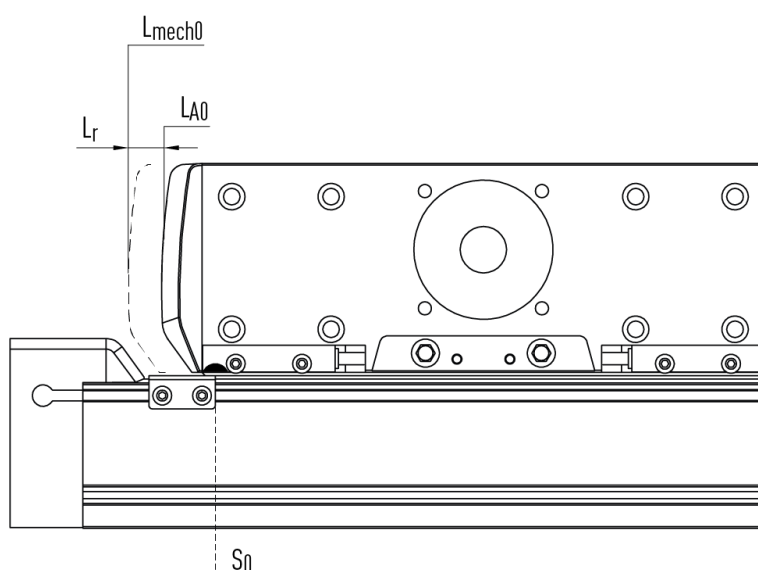


Fig.4.2: Illustration of the reserve stroke using the HC-B cantilever axis as an example



4.2 Cover strip

A steel cover strip is available as an option for all sizes of the HM-B linear modules, the HT-B linear tables and the HD double axes. The cover strip is held in place by magnetic strips to protect the interior of the axis from contamination. Please note that the carriage length is increased for axes with a cover strip due to the required belt deflection.

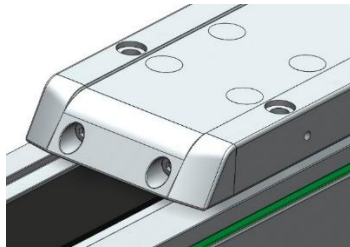
Note:

The 'cover strip' option cannot be retrofitted at a later date.

4.3 Slide

Various carriage types are available for the HM-B linear modules and the HD double axis systems (carriage types S, M and L / HM040B: additionally E / HM120B: additionally H). The HT-B linear tables, HB-B bridge axes and HC cantilever axes are fitted with carriage type S. The HS multi-axis systems feature slide type L on the X-axis and slide type M on the Y-axis. The slides have mounting threads for attaching the payload. These have additional counter bores to allow the insertion of centring sleeves.

Fig.4.3: Slide with mounting threads



Typical applications for the respective slide lengths of the linear axes are:

Extra short (E)

- Slide with only one block
- For very limited installation space

Short slide (S)

- For single axes

Medium-length slide (M)

- For high torque loads (M_y , M_z)
- For use in gantry systems (mainly for the Y-axis)

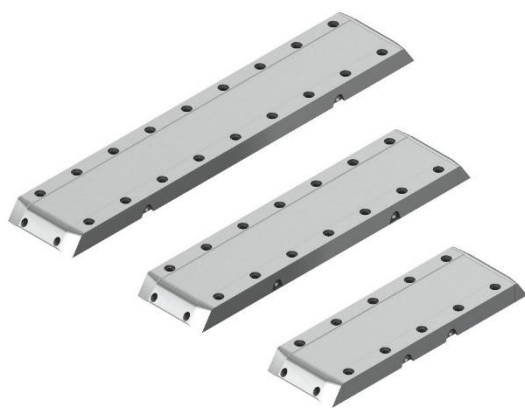
Long slide (L)

- For very high torque loads (M_y , M_z)
- For use in gantry systems (mainly for the X-axis)

Long slide – heavy load (H)

- Dimensions identical to carriage type L
- Integrated heavy load blocks for high loads

Fig.4.4: S, M and L carriage types



4.4 Limit switch

On the linear axes, two inductive limit switches indicate the end positions of the travel distance. The limit switch cables can either be routed directly to the interface or laid laterally in the mounting groove. The limit switches are available as n/c contacts or n/o contacts and, optionally, with an open cable end or a connector.

Note

Additional reference switches are available on request.

4.4.1 Dimensions of the limit switch

Fig.4.5: Dimensions of the limit switch

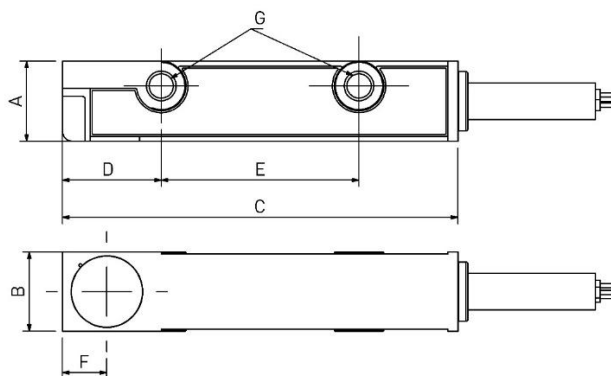


Table4.1: Dimensions of the limit switch

	HM-B, HT-B, HC040B, HC060B, HC080B, HC100B, HC150B, HD	HB250B	HC025B
A	8.1 mm	8.1 mm	5 mm
B	8 mm	8 mm	5 mm
C	40 mm	40 mm	25 mm
D	10 mm	10 mm	5.5 mm
E	20 mm	20 mm	14 mm
F	4.5 mm	4.5 mm	3 mm
G	3.2 mm	M3	M1.6

4.4.2 Limit Switch Specifications

Table 4.2: General characteristics of limit switches

order code						
	A	B	C	D	A	C
article number HM060-120B, HT150-250B, HM040B, HT100B HC040-150B HB-B HC025B	80169076 80168980 80168933 80073805	80169099 80168994 80168937 80073846	80169202 80169033 80168941 80073857	80169231 80169036 80168945 80073860	25-002204	25-002205
Output function	n/c contact	n/o contact	n/c contact	n/o contact		
Connection type HM-B, HT-B, HC-B HB-B HC025B	100 mm cable with M8 connector 300 mm cable with M8 connector		5m ^{cable2)} 5 m ^{cable2)}	5 m ^{cable2)} 5 m ^{cable2)}	200 mm cable with M8 connector,	2 m ^{cable2)}
Connection	3-pin		3-wire		3-pin	3-wire
Design	Rectangular					
Dimensions (W × H × D)	8 × 8 × 40 mm				5 × 5 × 25 mm	
Max. switching distance	2 mm				0.8 mm	
Guaranteed switching distance	1.62 mm				0.648 mm	
Adjustable switching distance	1 mm				0.5 mm	
Switching sequence	2,000 Hz				5,000 Hz	
Switching output	PNP					
Electrical type	DC 3-wire					
protection class	IP67, IP68 ¹⁾				IP67	

¹⁾ In accordance with EN 60529

²⁾ Not suitable for use with energy chains

Table 4.3: Mechanical and electrical specifications of the limit switches

Features						
	A	B	C	D	A	C
article number HM060-120B, HT150-250B, HM040B, HT100B HC040-150B HB-B HC025B	80169076 80168980 80168933 80073805	80169099 80168994 80168937 80073846	80169202 80169033 80168941 80073857	80169231 80169036 80168945 80073860	25-002204	25-002205
Type	n/c contact	n/o contact	n/c contact	n/o contact	n/c contact	n/c contact
power supply	10 to 30 VDC					
Residual ripple	≤ 10 % ¹⁾				≤ 20 % ¹⁾	
Voltage drop	≤ 2 V ²⁾					
Current consumption	≤ 10 mA ³⁾				10 mA ³⁾	
Standby delay	≤ 100 ms				≤ 10 ms	
Hysteresis	5 to 15 %				1 to 10 %	
Reproducibility	≤ 2 % ⁴⁾				≤ 1.5 % ⁴⁾	
Temperature drift	±10 %					

Features						
	A	B	C	D	A	C
EMC	In accordance with EN 60947-5-2					
Continuous current _{ia}	≤ 200 mA					
Cable material	PVC				PUR	
Short-circuit protection	Yes					
Reverse polarity protection	Yes					
Turn-on pulse suppression	Yes					
Shock and vibration resistance	30 g, 11 ms/10 to 55 Hz, 1 mm					
Operating ambient temperature	-25 °C to +75 °C				-25 °C to +70 °C	
Housing material	Plastic, ^{VISTAL®}				Metal, chrome-plated brass	
Material, active surface	Plastic, ^{VISTAL®}				Plastic, polyester	
UL file no. (certificate)	NRKH.E348498				E191603	

¹⁾ From U_V

²⁾ At I_a max.

³⁾ Without load

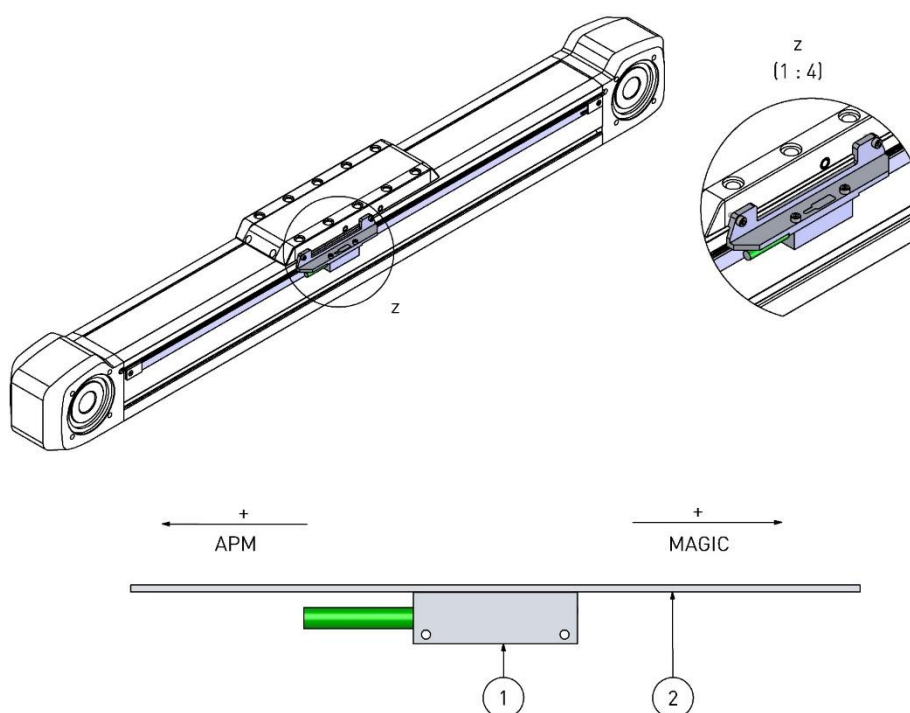
⁴⁾ At constant voltage and temperature.

4.5 Distance measuring system

If the accuracy of the linear axis provided by the drive element is insufficient for a particular application, the positioning and repeatability accuracy can be improved by using a position measurement system. The distance measuring system is located externally, on the side of the slide (for HC cantilever axes: on the side of the drive block / for HC150B and HB250B: inside the axis) and consists of an encoder (item 1) and a measurement tape (item 2).

HM-B, HT-B, HC-B: MAGIC and APM distance measuring systems

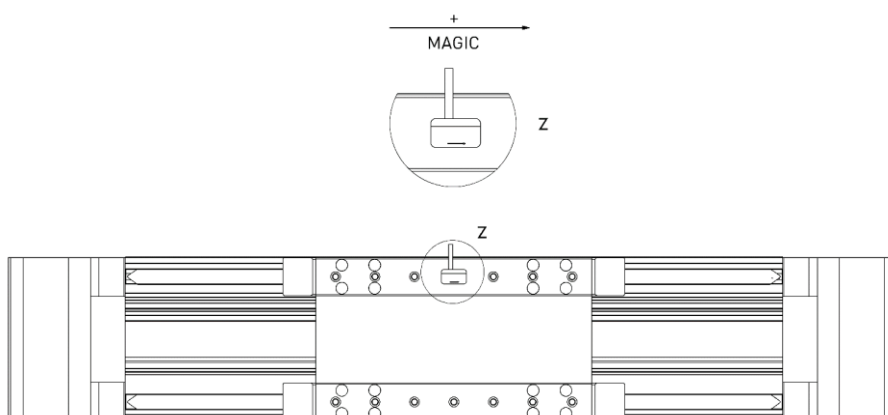
Fig.4.6 : Position and positive direction of travel of the distance measuring system on HM-B, HT-B and HC-B linear axes



The cable outlet on the encoder is used to determine the positive direction of travel. With HIWIN MAGIC, the positive direction of travel is opposite to the cable outlet. With HIWIN APM, the positive direction of travel is in the direction of the cable outlet. When connecting the position measuring system in accordance with Table 6.46 or Table 6.47, the positive direction of travel shown in Fig. 4.6 applies. The cable length is 5 m with an open cable end.

HB-B: MAGIC distance measuring system

Fig. 4.7 : Position and positive direction of travel of the distance measuring system on HB-B linear axes



The HIWIN-MAGIC distance measuring system is integrated into the side of the linear axis slide at the factory. When connecting the distance measuring system in accordance with Table 6.46, the positive direction of travel shown in Fig. 4.7, applies. The cable length is 1 m with an open cable end.

4.5.1 HIWIN MAGIC

The HIWIN-MAGIC distance measuring system is used in linear axes for incremental distance measurement. The output is available as either an analogue or digital signal. The HIWIN-MAGIC distance measuring system consists of the encoder (Fig. 4.4) and the magnetic scale (Fig. 4.5) as the measuring medium.

The HIWIN-MAGIC distance measuring system is compatible with all standard servo drives and the HIWIN ED1 servo drive. Further information on HIWIN servo drives can be found in the 'Servo Drives' catalogue or at hiwin.de.

Fig. 4.8 : MAGIC encoder



Fig. 4.9 : MAGIC magnetic scale



Note:

The measurement tape of the magnetic position measurement systems must not be exposed to strong magnetic fields (maintain a safe distance from permanent magnets!). Severe vibrations (e.g. a blow from a hammer) can also damage the magnetisation of the measurement tape. The system is not suitable for environments containing magnetic dust (e.g. graphite dust). This can distort the measurement signal or damage the distance measuring system.

Note

Further information can be found in the 'Linear Motors & Positioning Systems' catalogue, as well as in the 'HIWIN-MAGIC Positioning Systems' assembly instructions.

Note

Information on connection and pin configuration can be found in the chapter '6.14.2'.

4.5.2 HIWIN APM

The HIWIN APM distance measuring system is used in linear axes for absolute position determination without the need for a reference run. The APM is a magnetically encoded, non-contact, absolute position measuring system consisting of a sensor head and a scale. The scale features two magnetic tracks: one track with alternating magnetic north and south poles, and one track encoding the absolute position. The sensors in the sensor head measure the alternating magnetic field. As the sensor head passes over the scale bar without contact, the sensors detect the magnetic poles and transmit the position data to the controller. This enables the controller to determine the absolute position and the distance travelled. The system is integrated via a BiSS-C interface.

Note

Further information can be found in the 'Linear Motors & Position Measurement Systems' catalogue, as well as in the 'HIWIN Absolute Position Measurement System' assembly instructions.

Note

Information on connection and pin assignment can be found in the chapter '6.14.2'.

4.6 Clamping and Brake Element

⚠ Caution!

Failure to observe these instructions may result in serious injury. Injuries and malfunctions may occur in particular as a result of

- ▶ incorrectly fitted pneumatic lines
- ▶ Disruption to the pneumatic supply, e.g. due to pressure fluctuations
- ▶ Damaged or loose pneumatic lines

4.6.1 LKPS clamping element (HC060B, HC080B, HC100B and HC150B)

Caution! Risk of injury and damage to property!

Incorrect use of the clamping element can lead to damage to property and personal injury.

- ▶ Only use the clamping element when the axis is at a standstill!
- ▶ Do not use as a brake element or emergency brake!

The clamping element must only be used to hold a position statically.

- If there is no air pressure (air pressure: 0 bar), the clamping element clamps by spring force. The clamping profiles are pressed against the guide rail by a spring energy storage device (clamping by spring force).
- If air pressure is between 5.5 and 6.5 bar, free movement is possible. The air pressure keeps the clamping profiles apart (release via air pressure).

Fig.4 .10 : Clamping element closed (0 bar)

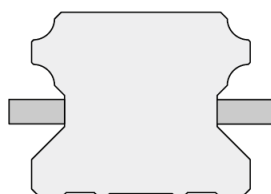
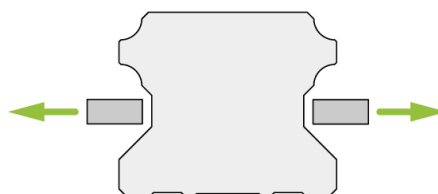


Fig.4 .11 : Clamping element open (5.5 to 6.5 bar)



According to EN ISO 13849-1, the clamping element is classified as a safety-related part of a control system and, as a tried-and-tested component, can be used in categories B or 1 without the need for further control engineering measures.

Table 4.4: Clamping element specifications

Features	size			
	HC060B	HC080B	HC100B	HC150B
Manufacturer	Zimmer Group			
Type	LKPS1512IS2	LKPS2012IS2	LKPS2512IS2	LKPS2001AS2
Static axial holding force	400 N	650 N	750 N	650 N per element
Air connection	M5			
Min. pressure (opening pressure)	5.5 bar			
Max. pressure	6.5 bar			
Clamping cycles	Up to 5 million			
Braking cycles	Up to 500			
Plug-in connection for hose	6 mm			
Actuation	Pneumatic			
Air quality	Oiled air in accordance with ISO 8573-1, Class 4 Filter size 25 µm/; the air filter must be kept clean			

Note

This option has been discontinued and is no longer available.

4.6.2 Clamping and brake element LBPS (HC060B, HC080B, HC100B and HC150B)

⚠ Caution! Risk of injury and damage to property!

Incorrect use of the brake element may result in damage to property or personal injury.

- ▶ Observe the maximum number of dynamic braking cycles as specified in the data sheet!
- ▶ Observe the manufacturer's specifications for calculating the stopping distance!

The brake element may be used for static positioning as well as for dynamic braking cycles.

- If there is no air pressure (air pressure: 0 bar), the brake element clamps using spring force. The clamping profiles are pressed against the guide rail by a spring energy storage device (clamping via spring force).
- When air pressure is between 5.5 and 6.5 bar, free movement is possible. The air pressure keeps the clamping profiles apart (release via air pressure).

Fig.4 .12 : Brake element closed (0 bar)

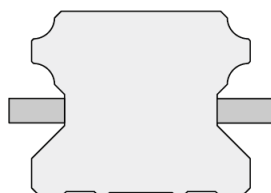
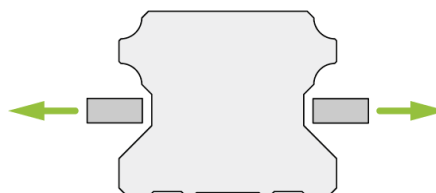


Fig.4 .13 : Brake element open (5.5 to 6.5 bar)



According to EN ISO 13849-1, the clamping element is classified as a safety-related part of a control system and, as a tried-and-tested component, can be used in category B or 1 control systems without the need for any further control-related measures.

Table 4.5: Brake element specifications

Features	size			
	HC060B	HC080B	HC100B	HC150B
Manufacturer	Zimmer Group			
Type	LBPS1512IS2	LBPS2012IS2	LBPS2512IS2	LBPS2001AS2
Static axial holding force	400 N	650 N	750 N	650 N per element
Air connection	M5			
Min. pressure (opening pressure)	5.5 bar			
Max. pressure	6.5 bar			
Clamping cycles	Up to 5 million			
Braking cycles	Not permitted			
Hose connector	6 mm			
Actuation	Pneumatic			
Air quality	Oiled air in accordance with ISO 8573-1, Class 4 Filter size 25 µm/; the air filter must be kept clean			

Calculation of the holding stroke for vertical installation ¹⁾

¹⁾ Source: Zimmer Group

Due to vertical operation, the system experiences acceleration due to gravity until the brake element is triggered and the braking process begins.

- Velocity at the start of the braking process v_{Brake} :

$$v_{\text{Brems}} = v_0 + g \times (t_R + t_A) = 2 \frac{\text{m}}{\text{s}} + 9,81 \frac{\text{m}}{\text{s}^2} \times (0,06 \text{ s} + 0,01 \text{ s}) = 2,69 \frac{\text{m}}{\text{s}}$$

- Braking distance s_B :

$$s_B = \frac{m \times v_{\text{Brems}}^2}{2 \times \left(F \times A \times \frac{\mu_G}{\mu_H} \right) - m \times g} = \frac{50 \text{ kg} \times \left(2,69 \frac{\text{m}}{\text{s}} \right)^2}{2 \times \left((3.100 \text{ N} \times 1 \times \frac{0,06}{0,1}) - 50 \text{ kg} \times 9,81 \frac{\text{m}}{\text{s}^2} \right)} = 0,132 \text{ m}$$

- Reaction distance and response distance s_R :

$$\begin{aligned} s_R &= v_0 \times (t_r + t_A) + \frac{1}{2} \times g \times (t_R + t_A)^2 \\ &= 2 \frac{\text{m}}{\text{s}} \times (0,06 \text{ s} + 0,01 \text{ s}) + \frac{1}{2} \times 9,81 \frac{\text{m}}{\text{s}^2} \times (0,06 \text{ s} + 0,01 \text{ s})^2 \\ &= 0,164 \end{aligned}$$

- Stopping distance s_H :

$$s_H = s_B + s_R = 0,132 \text{ m} + 0,164 \text{ m} = 0,296 \text{ m}$$

4.7 Drive interface

The linear axes allow the drive adaptation to be mounted on either side of the drive blocks. Depending on the selected motor variant, the scope of delivery includes a coupling housing, a suitable coupling and an adapter plate for the motor and/or gearbox.

The following drive interfaces are available as standard:

Fig.4.14: Drive interfaces for the HM-B linear axes

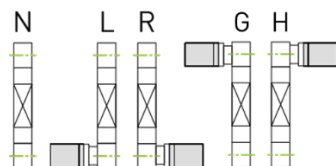


Table4.6 : Drive interfaces for HM-B linear axes

N	Without drive
L	Drive at front left
R	Front right drive
G	Left rear drive
H	Right rear drive

Fig.4.15: Drive interfaces of the HT-B and HB-B linear axes

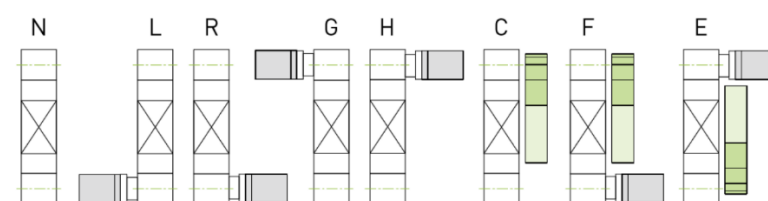


Table4.7 : Drive interfaces of the HT-B and HB-B linear axes

N	Without drive, without energy chain
L	Drive at front left, without energy chain
R	Drive on the front right, without energy chain
G	Left rear drive, without energy chain
H	Drive unit, rear right, without energy chain
C	No drive, energy chain on the right
F	Drive on the front right, energy chain on the right
E	Drive at the rear right, energy chain on the right

Fig.4.16: Drive interfaces of the HC-B linear axes

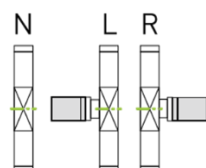


Table4.8: Drive interfaces of the HC-B linear axes

N	Without drive
L	Drive on the left
R	Drive on the right

The HD double axis system allows the drive adaptor to be fitted on the right or left, in each case as an extension of the synchronous shaft.

Fig.4.17: Drive interfaces of the HD double axes

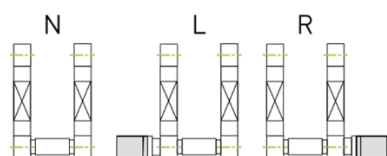


Table4.9 : Drive interfaces of the HD double axes

N	without drive
L	with drive on the left
R	with drive on the right

The HS2, HS3 and HSL linear axis systems allow the drive adaptation and energy chain to be fitted on the right or left. The drive and energy chain can be selected individually for each axis.

Fig.4.18: Drive interfaces of the HS2 two-axis systems – front synchronous shaft

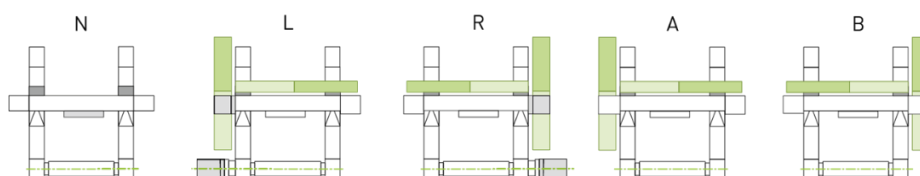


Fig.4.19: Drive interfaces of the HS2 two-axis systems – rear synchronous shaft

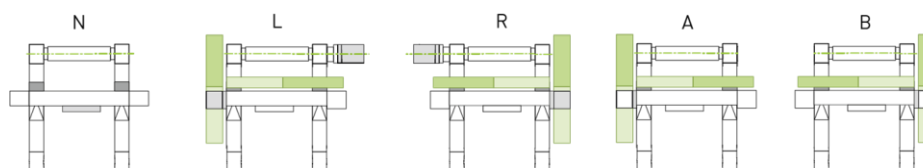


Table4.10 : Drive interfaces of the HS2 two-axis systems

N	without drive
L	with drive on the left
R	with right-hand drive
A	without drive on the left
B	without drive on the right

Fig.4.20: Drive interfaces of the HS3 three-axis systems – front synchronous shaft

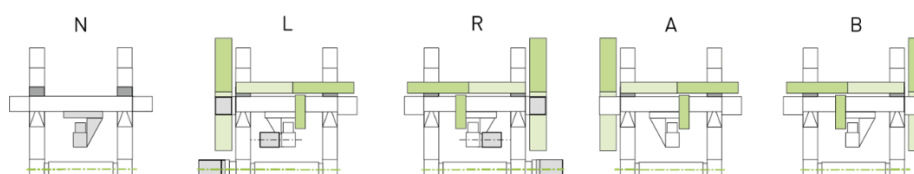


Fig.4.21: Drive interfaces of the HS3 three-axis systems – rear synchronous shaft

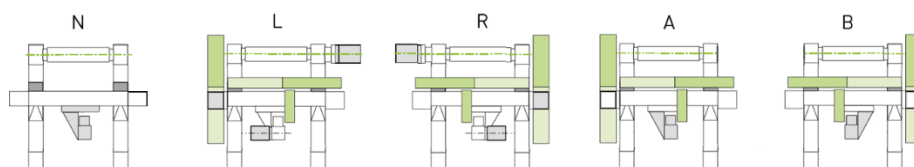


Table 4.11: Drive interfaces of the HS3 three-axis systems

N	without drive
L	with drive on the left
R	with right-hand drive
A	without drive on the left
B	without drive, right-hand side

Fig. 4.22: Drive interfaces of the HSL linear gantries

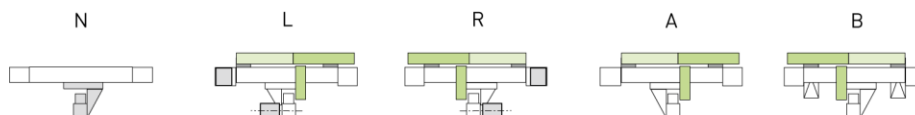


Table 4.12: Drive interfaces for HSL linear gantries

N	without drive
L	with drive on the left
R	with right-hand drive
A	without drive on the left
B	without drive, right-hand side

4.8 Gearbox

Planetary gearboxes from the manufacturer Neugart GmbH can be used to adjust the motor's speed and inertia. Using a gearbox allows the engine speed to be adapted to the application's requirements and increases the torque available at the output. This enables heavy loads to be moved and improves unfavourable inertia ratios between the motor and the load. This facilitates economical and dynamically optimised operation of the linear axis. Depending on the installation situation, the following planetary gearboxes can be used for straight or angled motor mounting:

-For straight mounting: PLE040, PLQE060, PLQE080, PLQE120, PSBN142

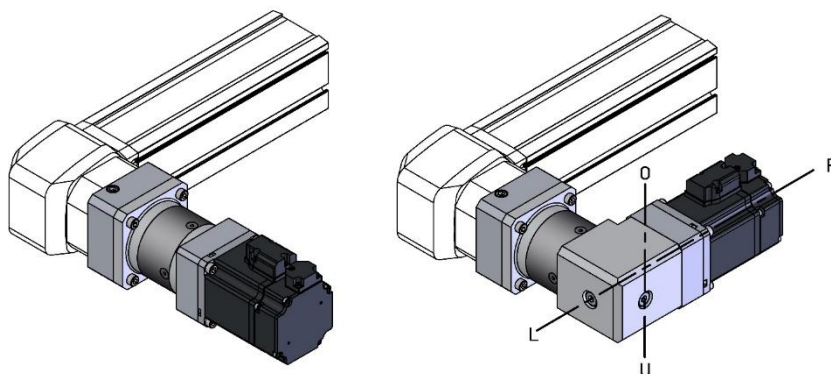
-For angled mounting: WPLE040, WPLQE060, WPLQE080, WPLQE120

-Gear ratios: 3:1 / 5:1 / 8:1 / 12:1 / 16:1 / 20:1 / 25:1

Note

PLE, WPLE, PLQE, WPLQE and PSBN are registered trademarks of Neugart GmbH

Fig. 4.23 : Planetary gearbox with straight and angled motor mounting



The orientation of the right-angle gearbox is defined by the coordinate system shown (Right, Left, Top, Bottom). This coordinate system is permanently assigned to the right-angle gearbox and is independent of its mounting position on the linear axis. Fig. 4.23 shows the right-angle gearbox in the R (right) orientation.

4.9 Toothed belt

The toothed belt used, with steel or glass cord reinforcements (HC025B/HC040B), is designed to transmit high torques. The rounded tooth profile enables uniform power transmission, whilst the even distribution of stress within the tooth itself ensures that only minimal tooth deformation occurs.

Advantages:

- Positive-lock drive system with no slippage
- High performance
- Compact design
- Wide speed range
- Low timing belt tension
- No lubrication or maintenance required
- Quiet operation
- High efficiency (98 per cent)

4.10 Energy chain

4.10.1 Energy chain – HT-B and HB-B linear axes

To ensure the safe routing of additional cables, the HT-B linear axes and HB-B bridge axes can be supplied with generously dimensioned energy chains as an option. The energy chains are mounted on the axis in a particularly compact and space-saving manner. The alignment of the energy chain depends on the selected drive interface (see section 4.7). Linear axes with energy chains can only be installed in a horizontal mounting position (see Fig. 6.7). Axes with energy chains for vertical use are available on request. The specifications of the energy chains can be found at Table 4.6.

Table 4.13 : Specification of energy chains for HT-B and HB-B linear axes

size	Manufacturer's designation ¹⁾	Internal cross-section B × H [mm]	Bending radius [mm]
HT100B	2400.05.075.0	57 × 25	75
HT150B, HT200B, HT250B, HB250B	2600.07.100.0	75 × 35	100

¹⁾ Manufacturer: igus SE & Co. KG

4.10.2 Energy chain – HS2, HS3 and HSL linear axis systems

Energy chains are available as an option for the HS multi-axis systems for all directions of movement. They can be mounted on either the right or left-hand side. The generously dimensioned energy chains provide ample space for the safe routing of supply cables. The energy chains are integrated into the complete system in a particularly compact and space-saving manner. The energy chain types and sizes can be found at Table 4.7, Table 4.9 and Table 4.10. They are adapted to the motors that can be fitted to the drive axes and cover the space requirements of standard motor and signal cables. Furthermore, they offer sufficient space for additional cables and hoses.

Table 4.14 : Specifications for energy chains for linear axis systems HS2, HS3 and HSL – X-axis

size	Manufacturer's designation ¹⁾	Internal cross-section W × H [mm]	Bending radius [mm]
HSL1, HSL2	2400.05.075.0	57 × 25	75
HS21, HS31, HSL3, HSL4	2400.07.100.0	77 × 25	100
HS22, HS23, HS32, HS33	2600.07.100.0	75 × 35	100
HS24, HS34	2600.10.125.0	100 × 35	125

¹⁾ Manufacturer: igus SE & Co. KG

Table 4.15 : Specifications for HS2, HS3 and HSL energy chains – Y-axis

size	Manufacturer's designation ¹⁾	Internal cross-section B × H [mm]	Bending radius [mm]
HS21, HS22, HS31, HS32	2400.05.075.0	57 × 25	75
HS23, HS24, HS33, HS34	2400.07.100.0	77 × 25	100

¹⁾ Manufacturer: igus SE & Co. KG

Table 4.16 : Specifications for HS2, HS3 and HSL energy chain linear axis systems – Z-axis

size	Manufacturer's designation ¹⁾	Internal cross-section W × H [mm]	Bending radius [mm]
HS31, HSL1	1500.20.048.0	20 × 21	48
HS32, HSL2	2500.03.075.0	38 × 25	75
HS33, HSL3	2500.05.075.0	57 × 25	75
HS34, HSL4	2500.05.100.0	57 × 25	100

¹⁾ Manufacturer: igus SE & Co. KG

The top strand is mounted as a self-supporting structure; an energy chain support is provided for the bottom strand to allow it to unroll. To prevent cables and hoses from sliding over one another, a separating bar is provided in every second chain link. The connectors are of a rigid type. Strain relief combs for securing the cables and hoses with cable ties are provided on both sides.

For the correct handling of the energy chains, as well as the routing and securing of cables and hoses, please refer to the energy chain manufacturer's assembly instructions.

4.10.3 Energy chains – general information

- Please refer to the motor manufacturer's operating manual for details of suitable motor and signal cables.
- Observe the minimum bending radii (industry standard $8 \times D$) for cables and hoses and the associated expected service life.
- For shielded cables, ensure that the shields are resistant to bending.
- The sheaths of cables and hoses should be low-friction and abrasion-resistant.
- To prevent them from sticking together, separate cables and hoses with different outer sheaths using spacers.
- Lay cables and hoses without twisting.
- Allow for sufficient clearance (10–20 per cent, min. 1 mm) around the cables and hoses, and take into account the transverse expansion of hoses when pressurised.
- Ensure an even/symmetrical weight distribution. Position heavy cables and hoses preferably on the outside.
- Ensure strain relief on both sides of cables and hoses so that, when fully extended, they are located in the neutral zone and can move freely within the radius of the energy chain.
- Where necessary, provide additional separator bars in the event of high accelerations or cables with significantly different diameters.
- Please note the maximum permissible additional load caused by cables and hoses, which depends on the stroke, as shown in [Fig. 4.22](#) , [Fig. 4.23](#) and [Fig. 4.24](#) .

Fig.4.24 : Maximum permissible additional load F_{Add} as a function of stroke L_T , Series 1500
(Source: igus SE & Co. KG)

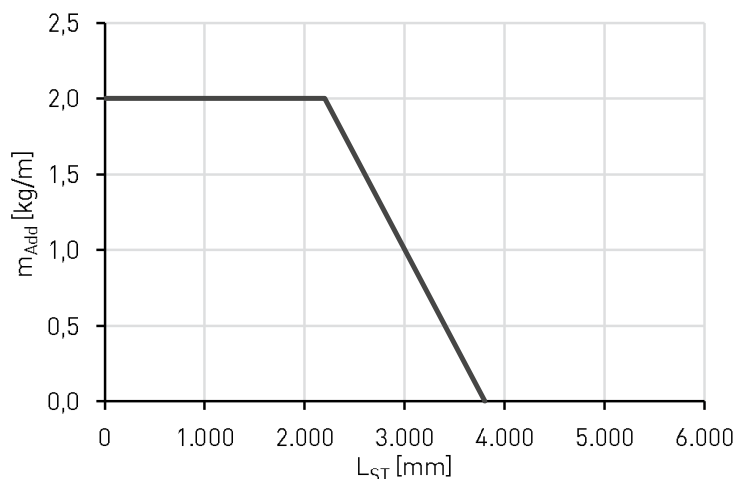


Fig.4.25 : Maximum permissible additional load F_{Add} as a function of stroke L_T , Series 2400 and 2500 (Source: igus SE & Co. KG)

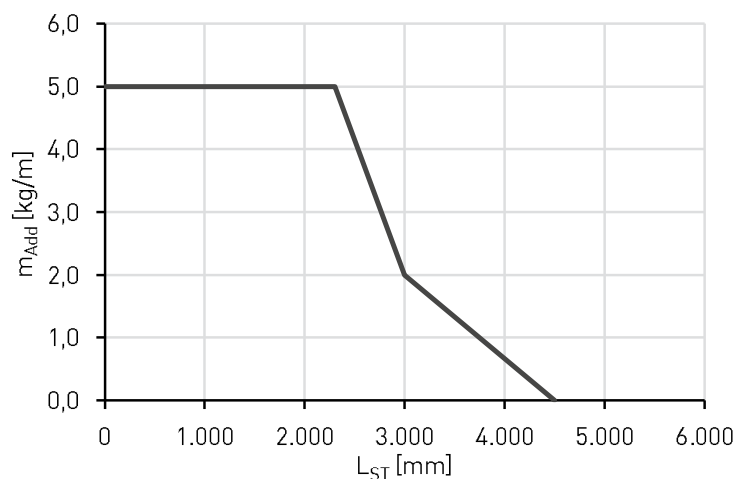
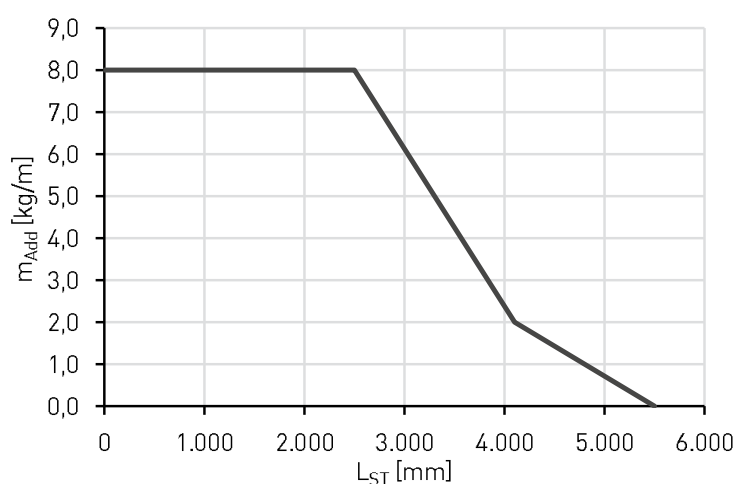


Fig.4.26 : Maximum permissible additional load F_{Add} as a function of stroke L_T , Series 2600 (Source: igus SE & Co. KG)



4.10.4 Tape for reducing noise in energy chains

Cellular rubber strip for reducing noise generated by energy chains. The single-sided self-adhesive noise-reduction strips are affixed to the energy chain support in such a way that the energy chain links rest on the strips as the energy chain slides, which significantly reduces noise emissions.

Fig.4.27: Dimensions of the noise-reduction tape for energy chains

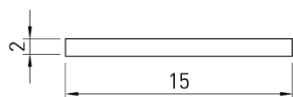


Table 4.17: Article number for noise-reduction tape

Suitable for linear axis	Article number (10 m)
HT-B, HB-B	25-002485

5 Transport and installation

5.1 Delivery

5.1.1 Condition on delivery

The linear axes and linear axis systems are supplied fully assembled and functionally tested.

5.1.2 Scope of delivery

The scope of delivery varies depending on the model, accessories and options ordered.

5.2 Transport to the installation site

⚠ Warning! Danger from suspended loads or falling parts!

Lifting heavy loads can cause injury.

- ▶ Assembly and maintenance of the linear axes/linear axis systems must only be carried out by qualified personnel!
- ▶ Take the mass of the parts into account during transport. Use suitable lifting equipment!
- ▶ Observe the applicable health and safety regulations for handling suspended loads!
- ▶ Only lift linear axes/linear axis systems at the specified lifting points!
- ▶ Secure machines and machine parts to prevent them from tipping over!

⚠ Caution! Risk of shock and crushing!

When moving or manoeuvring the axes manually, injuries may occur due to moving and displaced axes as well as attached components (energy chains, customer-supplied attachments).

- ▶ Observe applicable health and safety regulations!
- ▶ Transport to the installation site must only be carried out by qualified personnel!

⚠ Warning! Potential damage to the linear axis/linear axis system!

The linear axis or linear axis system may be damaged if subjected to mechanical stress.

- ▶ Only lift linear axes/linear axis systems at the specified support points! (see section 5.5)!
- ▶ For axes with a length, ensure that the centre sections are additionally secured!
- ▶ Ensure that the linear axes/linear axis systems do not bend, as this will permanently impair their accuracy!
- ▶ Do not carry any additional loads on the linear axis/linear axis system during transport!
- ▶ Provide additional support for heavy attachments!

Linear axes and linear axis systems are precision products and must be handled with care. Impacts and shocks can damage the axes. This may result in reduced positioning accuracy and a shorter service life. Transport the product in its packaging as close as possible to the installation site. Do not remove the packaging until you reach the site.

5.3 Requirements for the installation site

5.3.1 Environmental conditions

Operating environmental conditions:	+5 to +40 °C
Relative humidity during operation:	in accordance with IEC 60721-3-3, Class 3K22, non-condensing
Climatic conditions for transport and bearing:	Ambient temperature: –20 to +50 °C, non-condensing
Environmental conditions for long-term storage:	Ambient temperature: +20 °C, non-condensing

5.3.2 Safety devices to be provided by the operator

Possible safety devices/measures:

- Personal protective equipment in accordance with UVV (Accident Prevention Regulations)
- Non-contact safety devices
- Mechanical safety devices

5.4 Bearing

- Store the linear axes/linear axis systems in their transport packaging.
- Alternatively: Choose packaging in which the linear axes/linear axis systems are secured against slipping, damage and vibrations.
- Store the linear axes/linear axis systems only in dry, frost-free rooms.
- Clean and protect used linear axes/linear axis systems before storing them.
- After long-term storage, the linear axes/linear axis systems must be relubricated before commissioning.

5.5 Unpacking and installation

 **Caution!** Hazard to health and the environment!

Contact with lubricants may cause irritation, poisoning and allergic reactions, as well as environmental damage.

- ▶ Use only suitable media that are harmless to humans. Observe the manufacturers' safety data sheets!
- ▶ Ensure proper disposal!

Note:

The linear axes must only be installed and operated indoors.

5.5.1 Unpacking and installation of HM-B/HT-B linear axes and cantilever axes HC-B and bridge axes HB-B

- Remove the packaging.
- Lift the linear axis for transport at the specified support points A and B (see [Fig. 5.1](#), [Fig. 5.2](#) and [Fig. 5.3](#)). The distance between points A and B should be one quarter of the total length of the axis from each end of the axis.
- Do not lift the linear axis by its attachments. Provide additional support for heavy attachments, such as the drive, during transport.
- Dispose of the packaging in an environmentally responsible manner.

Fig.5.1 : Support points A and B for lifting and transport, using a linear axis HM-B as an example

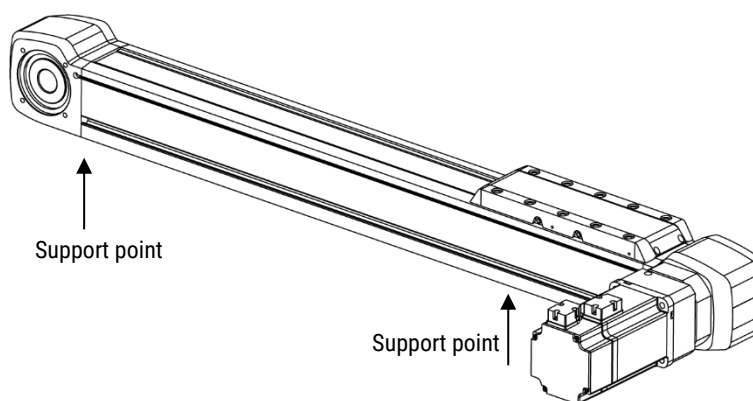


Fig.5.2 : Correct position of the support points

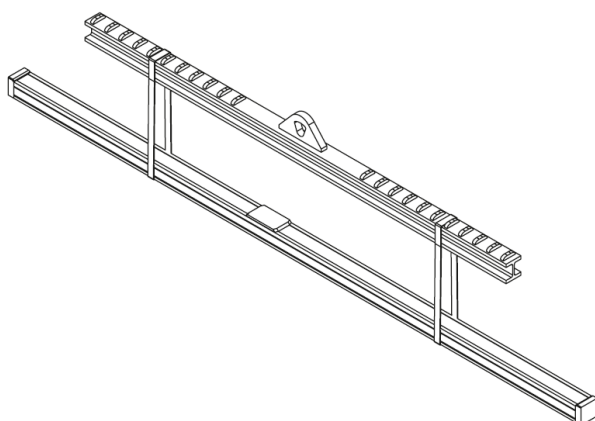
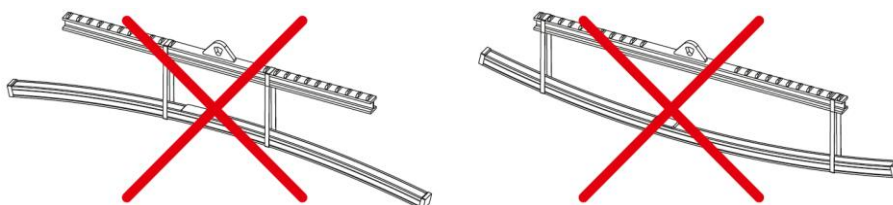


Fig.5.3 : Incorrect position of the support points



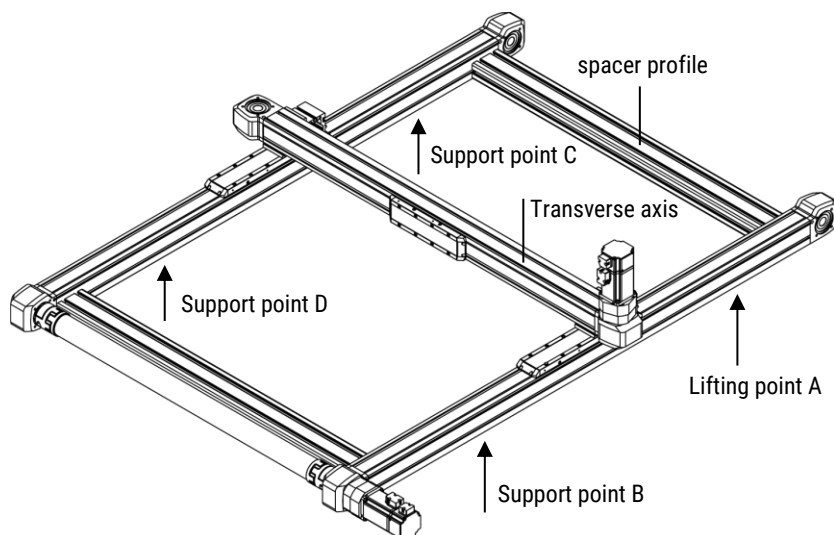
5.5.2 Unpacking and setting up the HD double axis units and HS axle systems

- Remove the protective film from the pallet and the transport locks from the packaging.
- Before transport, secure all moving parts to prevent them from shifting.
- Lift the double axis/axis system for transport at the specified support points A, B, C and D (see Fig. 5.4). Use suitable lifting equipment for this, e.g. an overhead or gantry crane, crane slings and, depending on the dimensions, a crossbeam. The distance between points A and B, and between C and D, should each be one quarter of the total length of the axis, measured from the end of the axis.
- Do not lift the double axis/axis system by the spacer profiles, the cross-axle or any attachments. Provide additional support for heavy attachments, such as the drive unit, during transport.

Note:

Do not remove the transport locks from the axle system until after transport and following correct assembly (see sections 6.1 and 6.2)!

Fig.5.4 : Support points A, B, C and D for lifting and transport, using a two-axle HS2 system as an example



5.6 Removing the transport lock

HS multi-axis systems and HC-B cantilever axes are supplied as standard with red transport locks or transport locks with red labels to prevent uncontrolled movement during transport. The transport locks can be removed as soon as the multi-axis system has been positioned at the installation site, but no later than before commissioning.

Fig.5.5: HS transport lock

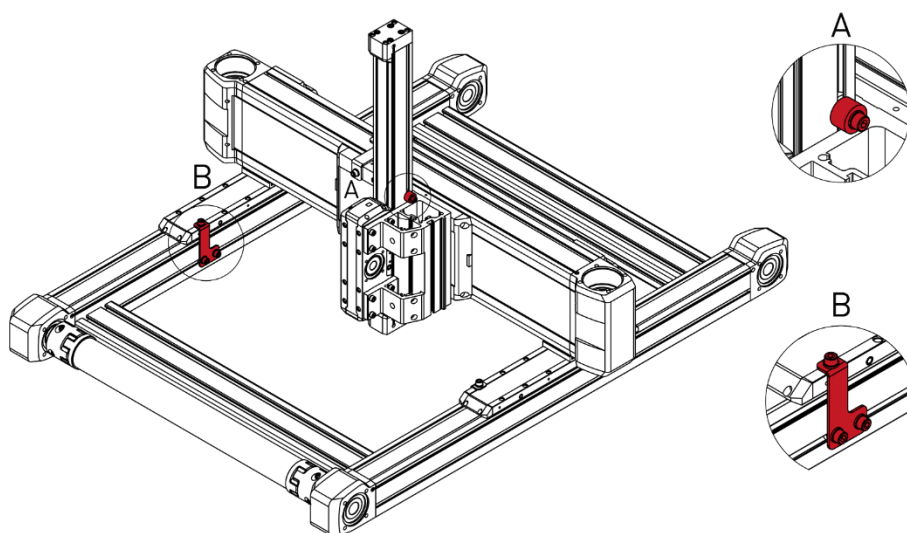
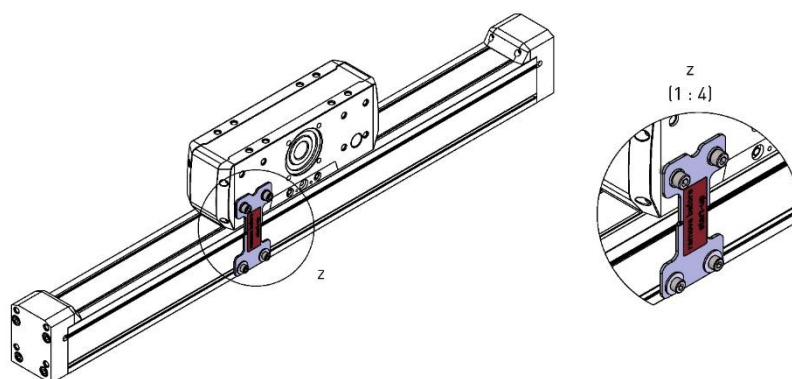


Fig.5.6: HC-B transport lock



6 Installation and connection

Danger! Danger due to electrical voltage!

Electric currents may still flow even when the motor is not moving.

- ▶ Ensure that the linear axes/linear axis systems are de-energised before disconnecting the motors' electrical connections!
- ▶ After disconnecting the servo drive from the power supply, wait at least 5 minutes before touching live parts or disconnecting any connections!
- ▶ For safety reasons, measure the voltage in the servo drive's DC link. Wait until it has dropped below 40 V!
- ▶ Work on electrical installations must only be carried out by qualified personnel!

Danger! Risk of electric shock or burns due to contact with live parts!

Contact with live parts may result in injury. Cables installed by the customer may become frayed due to constant movement within the energy chain if laid incorrectly, thereby exposing electrical contact points.

- ▶ Control system design in accordance with DIN EN 12100. Do not start up after:
 - Power-up, return of power!
 - Troubleshooting!
 - Stopping the machine!
- ▶ Cabling must only be installed by qualified personnel!
- ▶ Work on electrical installations must only be carried out by qualified personnel!

Warning! Risk of shock and crushing!

Injuries may occur as a result of the slide moving automatically or manually.

- ▶ A safety guard must be fitted for the operation of the linear axes/linear axis systems!
- ▶ Commissioning, set-up, troubleshooting and fault rectification must only be carried out by qualified personnel!

Warning! Risk of shock and crushing!

When using the linear axis in cantilever mode, injuries may occur when the axis body extends .

- ▶ Commissioning, set-up, fault-finding and troubleshooting must only be carried out by qualified personnel!
- ▶ A protective barrier must be provided for the operation of the linear axes/linear axis systems!
- ▶ In the case of vertical installation, secure the linear axis against unintentional lowering by using motors with spring-loaded brakes and an additional clamping element.

Warning! Risk of cuts!

The cover strip may cause cuts during assembly or disassembly.

- ▶ Commissioning and set-up must only be carried out by qualified personnel wearing appropriate protective equipment (gloves, safety goggles)!

Warning! Risk of shock and crushing when opening the clamping/brake element!

As soon as air is supplied, the clamping mechanism opens.

- ▶ Before carrying out any work, disconnect the linear axes/linear axis systems from the power supply and secure them against being switched on again!
- ▶ Ensure that moving parts of the linear axis are secured against unintended movement!
- ▶ Observe the applicable safety regulations for working with compressed air!

⚠ Warning! Danger from suspended loads or falling parts!

- ▶ Assembly and maintenance of the linear axes/linear axis systems must only be carried out by qualified personnel!
- ▶ Take the mass of the parts into account during transport. Use suitable lifting equipment!
- ▶ Observe the applicable health and safety regulations for handling suspended loads!
- ▶ Lift linear axes/linear axis systems only at the specified lifting points!
- ▶ Secure machines and machine parts to prevent them from tipping over!
- ▶ Secure linear axes/linear axis systems in accordance with the assembly instructions!
- ▶ If linear axes/linear axis systems are arranged vertically, ensure that the slide is secured when at a standstill!

⚠ Caution! Risk of hearing damage!

Linear axes/linear axis systems can generate noise levels exceeding 70 dB(A) at high speeds.

- ▶ Wear ear protection when using high-speed linear axes/linear axis systems that generate noise levels exceeding 70 dB(A)!
- ▶ Linear axes with an energy chain and chain support may generate noise levels of up to 94 dB(A), depending on the load and speed. A noise-reduction tape is available as an accessory to reduce noise.

⚠ Caution! Risk of shock and crushing due to the payload becoming detached!

Incorrect fastening or failure of the fastenings may result in injury from falling or flying parts.

- ▶ Type of assembly to be carried out: ensure that parts do not come loose, even under high acceleration or continuous vibration!
- ▶ Secure the payload in accordance with the assembly instructions!

⚠ Caution! Risk of shock and crushing!

When the axes are moved by motor, injuries may occur due to moving and driven axes as well as attached components (energy chains, customer-supplied components).

- ▶ A separating safety guard must be provided for the operation of the linear axes/linear axis systems!
- ▶ Where linear axes/linear axis systems are arranged vertically, ensure the slide is secured when at a standstill!

⚠ Caution! Risk of injury!

Rotation of the toothed belt pulley or the synchronous shaft whilst the slide(s) is/are being moved may result in fingers, hair or clothing being caught and twisted.

- ▶ A separating safety guard must be provided for the operation of the linear axes/linear axis systems!
- ▶ Commissioning, set-up, troubleshooting and fault rectification must only be carried out by qualified personnel!

⚠ Caution! Risk to health and the environment!

Contact with lubricants may cause irritation, poisoning and allergic reactions, as well as environmental damage.

- ▶ Use only suitable media that are harmless to humans. Observe the manufacturers' safety data sheets!
- ▶ Ensure proper disposal!

6.1 Assembly of the HD double axis in the case of a partially assembled delivery

6.1.1 Fitting the spacer profiles

- Clean the mounting surface and position the spacer profiles **[1]** between the linear axes **[2]** (see Fig. 6.1). For the HD2 or HM060B with the MAGIC distance measuring system, align the spacer profile as shown in Fig. 6.3
- Insert the nuts **[3]** into the side groove of the linear axes **[2]**. Ensure that the threads on the nuts are facing outwards (see Fig. 6.2).
- Position the nuts so that the screws of the automatic connector **[4]** in the spacer profiles **[1]** align with the threads of the nuts (see Fig. 6.2).
- Position the linear axes **[2]** against the spacer profiles **[1]**.

Fig.6.1 : Positioning the spacer profiles **[1]** and the linear axis **[2]**

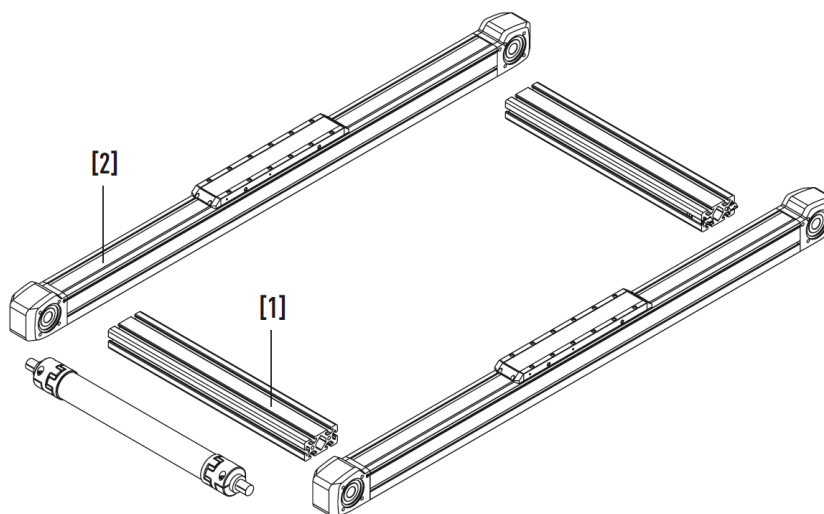


Fig.6.2 : Screwing the automatic connectors **[4]** to the nuts **[3]**

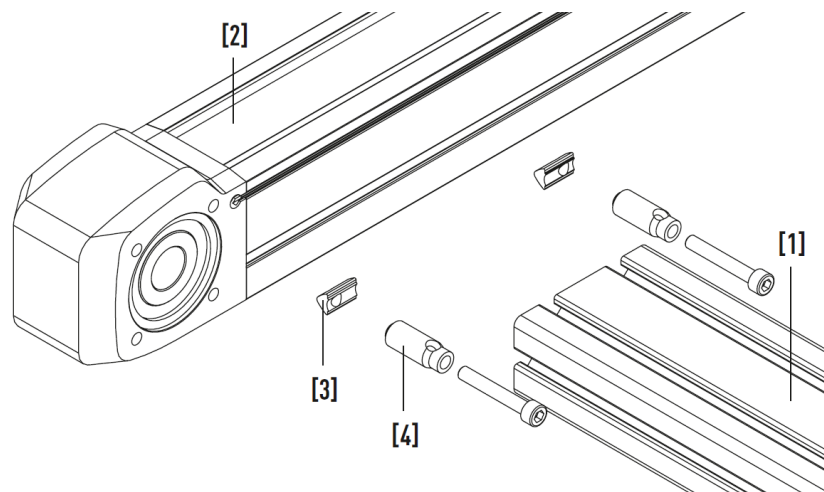
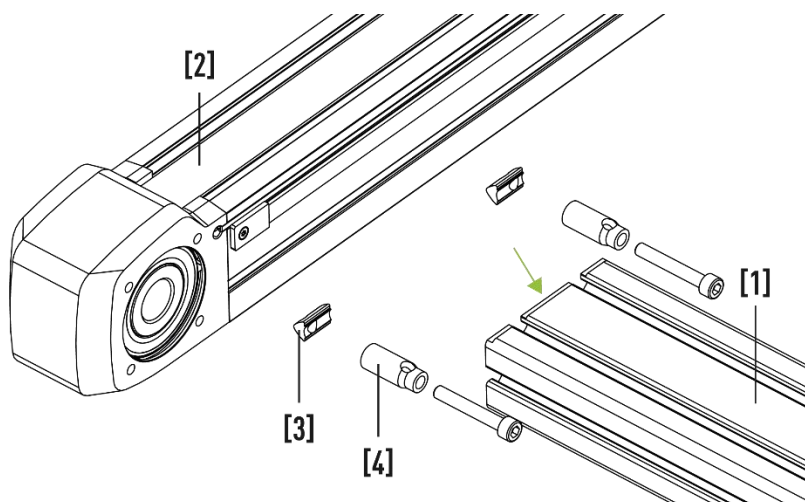


Fig.6.3 : Aligning the spacer profile using the MAGIC distance measuring system

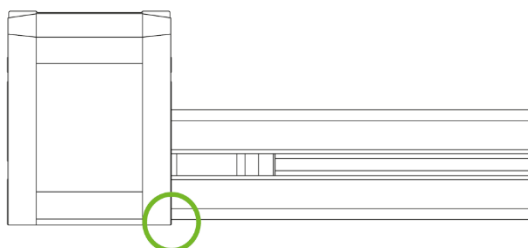


- Screw the automatic connectors [4] in the spacer profiles [1] to the nuts [3] in the linear axes (see Fig. 6.2).
- Ensure that the spacer profile does not protrude beyond the axis profile (see Fig. 6.4).
- Tighten the automatic connectors [4] to the screw tightening torque specified in Table 6.1.
- ✓ The spacer profiles are now fitted.

Table 6.1 : Screw tightening torques for the quick-connect couplers

size	Thread size × length	Screw tightening torque [Nm]
HD1	M4 × 30	2.4
HD2	M6 × 40	7.5
HD3	M6 × 40	10
HD4	M6 × 40	10

Fig.6.4 : Correct connection of the spacer profile to the linear axis: no protrusion



6.1.2 Fitting the synchronous shaft

- Clean the clamping surfaces until they are free of grease and dirt.
- Fit the journals on both sides as described in the section '6.7.5' on page 89.
- Carefully place the synchronous shaft onto the journals.
- Ensure that the synchronous shaft is centred between the two journals.
- Loosely fit the half-shell clamping pieces on both sides using the screws supplied (see Fig. 6.5).
- Position one clamping bolt on one half-shell of the coupling, then lightly tighten the second clamping bolt. Ensure there is an even gap all the way round the half-shell relative to the coupling hub.
- Tighten both clamping bolts on the coupling. For the screw tightening torque, see Table 6.2 or the engraving on the coupling hub.
- Ensure that dimension L1 is maintained in accordance with Table 6.3 (see Fig. 6.6).
- Move the slides of both individual axes to their end positions and secure the second axis in the same way.

- Move the slides to both end positions and check that they move smoothly.
- ✓ The synchronous shaft is now fitted.

Table 6.2 : Screw tightening torques for the clamping bolts of the coupling half-shells

Axis type/size	Thread size	Screw tightening torque [Nm]
HM040B/HD1	M6	11
HM060B/HD2	M6	15
HM080B/HD3	M6	15
HM120B/HD4	M8	38

Fig.6.5 : Fitting the synchronous shaft

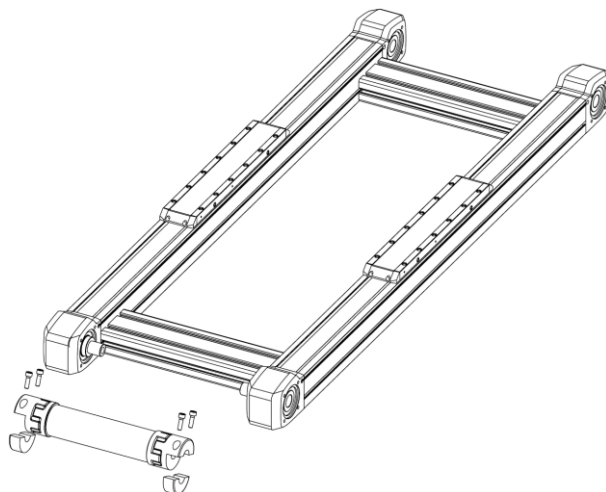


Fig.6.6 : Dimension L_1 on the synchronous shaft

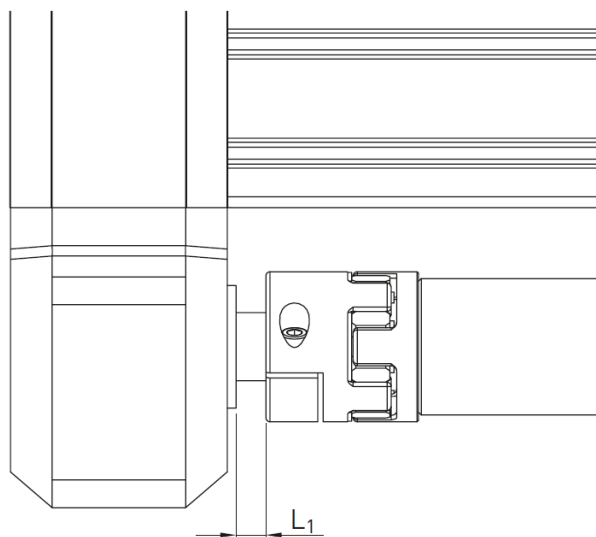


Table 6.3 : Dimension L_1 on the synchronous shaft

size	L_1 [mm]
HD1	1.0
HD2	3.0
HD3	11.6
HD4	2.0

6.2 Assembly of linear axes, cantilever axes, double axes and axis systems

The HM-B/HT-B/HC-B linear axes can be installed in any orientation; they must be secured to the aluminium profile of the axis. For axes with a cover strip, ceiling mounting is only permitted under certain conditions. Please consult HIWIN. HT-B linear axes with an energy chain can only be installed in a horizontal orientation (see Fig. 6.7). HS linear axis systems cannot be installed in any position; ceiling mounting must be technically assessed. For side-mounted installation of the HD double axis, spacer washers must be added to the synchronous shaft coupling (see Fig. 6.11).

The linear axis, double axis and linear axis system can be secured to the mounting surface using clamping profiles (side grooves) or nuts (bottom grooves). Please note that, depending on the installation orientation, the weight of the linear axis acts as an additional load and that the actual forces and torques must remain below the permissible values (see the 'HX Linear Axes and Axis Systems' catalogue).

Fig. 6.7 : Horizontal mounting position



Fig. 6.8 : Horizontal upright mounting position



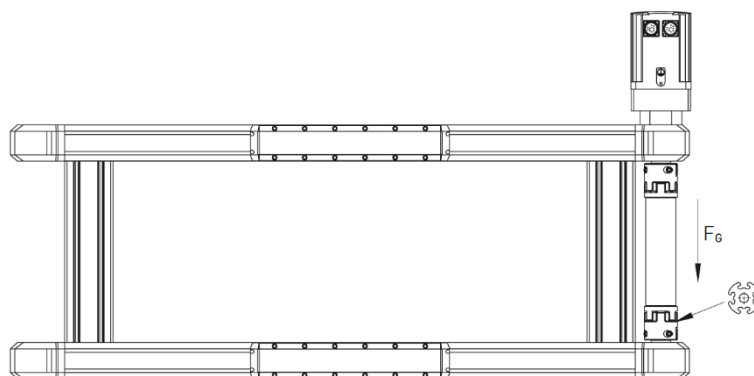
Fig. 6.9 : Ceiling mounting



Fig. 6.10 : Vertical mounting position



Fig. 6.11 : Additional spacer washer for HD double axis units with side-mounted installation



Note:

The axis profile is manufactured using the extrusion process in accordance with EN 12020-2 (HM, HT, HC series) or EN 755-9 (HB series).

Note:

If increased positioning accuracy is required, the axis must be aligned with and secured to a precise reference edge.

Note:

Please observe the support spacing for the respective shaft sizes (see section 6.2.1). The end blocks must not be the only parts resting on the mounting surface!

Note:

The screws must be secured against accidental loosening.

Note:

The spacer profiles for the HD double-axis and HS multi-axis systems must only be removed once they have been secured with nuts in accordance with the section 6.2.4 or with clamping profiles in accordance with the section 6.2.6. It may be necessary to remove the synchronous shaft first in order to remove the spacer profile. For further details, see the section 7.10 from page 150 onwards.

6.2.1 Maximum support spacing for linear axes

For linear axes with long stroke lengths and high payloads, depending on the mounting method, the axis body may experience an impermissibly high degree of deflection. To prevent this, the axis body should be supported at multiple points and mounted securely on a level surface. At least one support point per side, at each end of the profile, must be provided. The maximum permissible support spacing L_{SUP} , which depends on the loads F_y and F_z as shown in the diagrams below, must not be exceeded. To ensure this, additional support points may need to be provided where necessary. For multi-axis systems, the masses of the moving axes must also be taken into account.

Fig.6.12: Axle position when lying horizontally

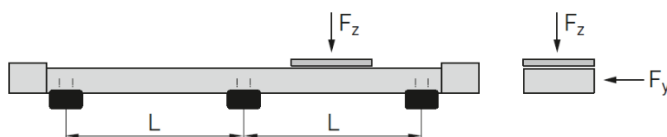


Fig.6.13: Axle position, horizontal, upright

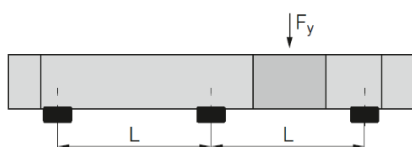


Fig. 6.14: HM-B: Maximum support spacing as a function of the force F_z

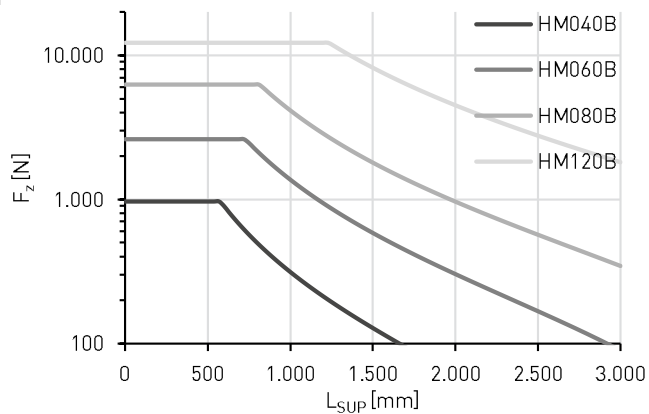


Fig.6.15: HM-B: Maximum support spacing L_{SUP} as a function of force F_y

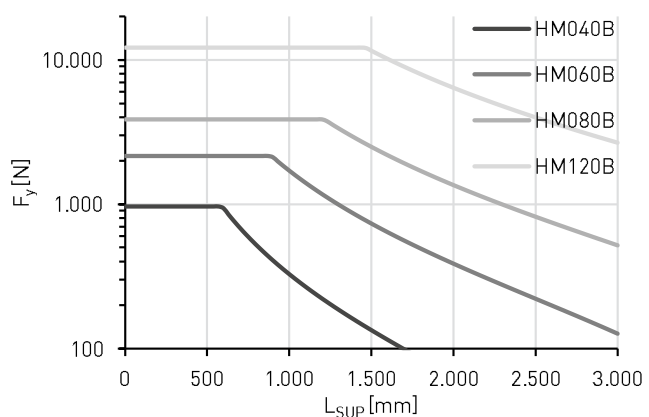
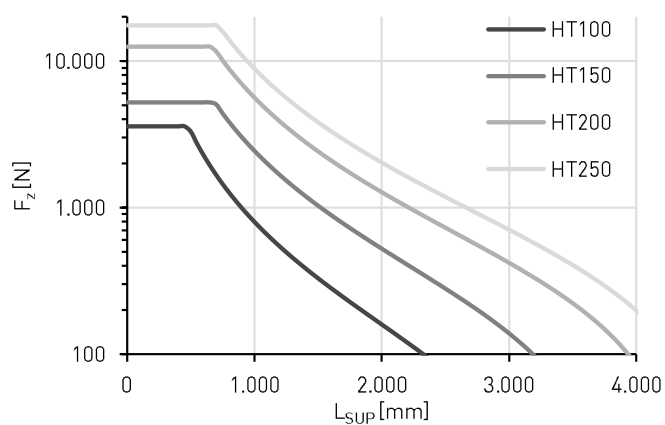


Fig.6.16: HT-B: Maximum support spacing L_{SUP} as a function of force F_z



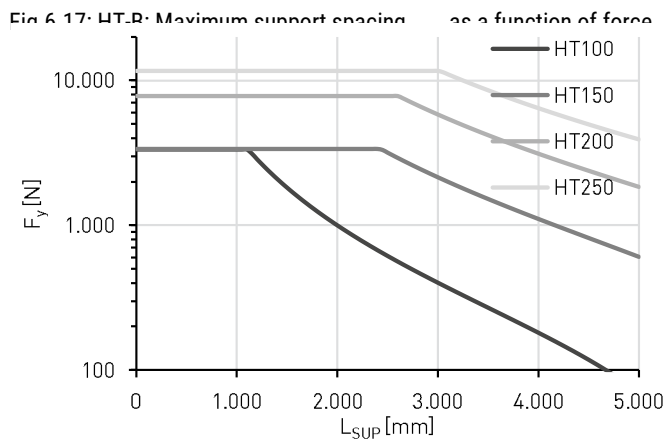


Fig.6.18: HB-B: Maximum support spacing L_{SUP} as a function of force F_z

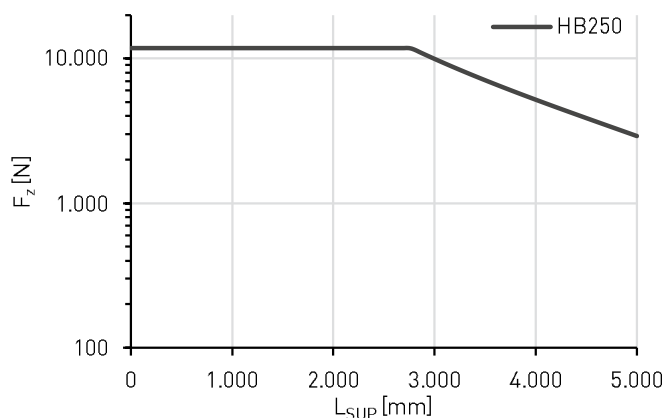
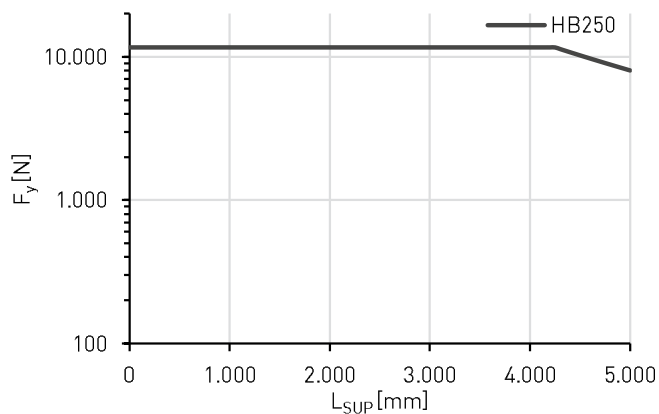
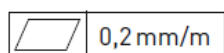


Fig.6.19: HB-B: Maximum support spacing L_{SUP} as a function of force F_y



6.2.2 Accuracy requirements for the mounting surface

When fixing the linear axis, ensure that the axis profile is mounted on a level surface and that the fixing points are aligned with one another in such a way that the required flatness is achieved.



Accuracy requirements for the mounting surface

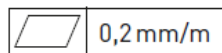
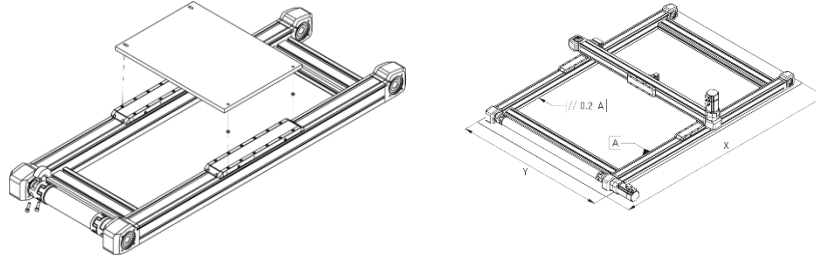
6.2.3 Alignment of HD double axes and HS multi-axis systems

If the two slides of a double axis system are connected to one another via an adapter plate, it is necessary to align the two axes with one another. Secure one of the two axes completely.

- Secure the load adapter plate to both slides (refer to Section 6.3.1 if necessary).

- Move the connected slides to an end position.
- Move the connected slides over their entire travel distance, gradually tightening the screws at the fixing points of the second axis as you do so.
- ✓ The two axes are now aligned with one another.

Fig.6.20: Flatness and parallelism requirements for the assembly of HD double axis and HS multi-axis systems



Accuracy requirements for the mounting surface

6.2.4 Assembly with nuts – HM-B linear modules and HD systems with double axes

The number of slotted nuts to be used for each axle size can be found in [Fig. 6.21](#) and [Fig. 6.22](#). For single axes, the slotted nuts must be arranged as shown in [Fig. 6.21](#) and [Fig. 6.22](#); for twin axes and multi-axis systems, they must be arranged as shown in [Fig. 6.22](#) and [Fig. 6.23](#). The required number of nuts depends on the external load. To calculate the required number, the load values listed in [Table 6.4](#) must be taken into account. The minimum number of nuts specified in [Table 6.4](#) must not be undercut. The nuts must be positioned in groups at fixing points, as shown in [Fig. 6.24](#) and [Fig. 6.25](#). It must be ensured that there is at least one fixing point at each end of the shaft and that each fixing point is capable of safely transmitting the external load on its own. The number and spacing of additional fixing points must be selected according to the load conditions. The LNX spacings listed in [Table 6.4](#) are for guidance only.

- Drill the mounting holes in the mounting surface (hole spacings in accordance with [Table 6.4](#)).
- Clean the mounting surface and position the linear axis on the mounting surface.
- Swivel the nut into the lower groove.
- Pre-assemble the nut using the screws with a low screw tightening torque.
- Tighten the screws at each fixing point in a criss-cross pattern, observing the specified screw tightening torques. Observe the sequence of the fixing points: tighten either from the outside in or from one side to the other to avoid stress concentrations.
- ✓ The linear axis is now installed

When fixing the linear axes and linear axis systems, observe the hole spacing L_{NY} .

Fig.6.21 : Bore spacing for mounting linear axes from below using nuts

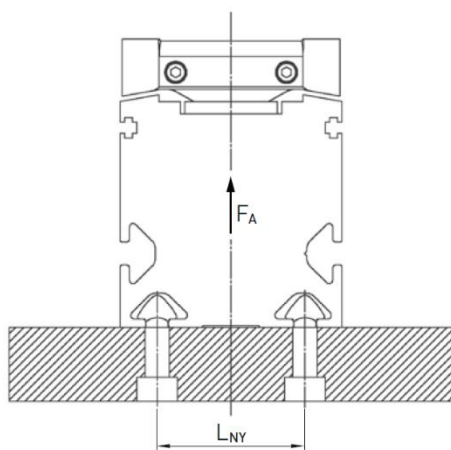


Fig.6.22 : Bore spacing for mounting HD double axes from below using nuts

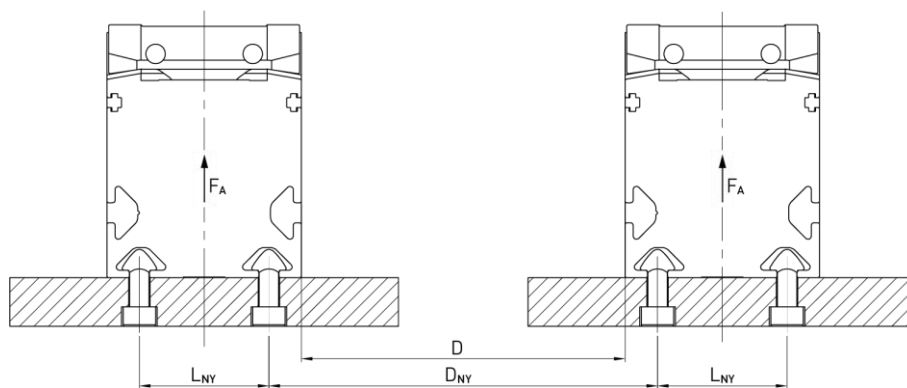


Fig.6.23: Permissible axial operating force in the direction of tension per nut ($F_{A_perm.}$)

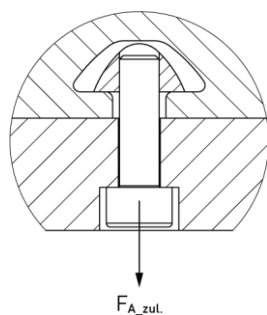


Fig.6.24 : Mounting with nuts – HM040B, HM060B, HM080B

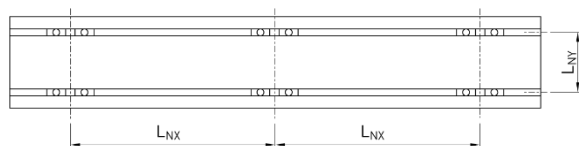


Fig.6.25 : Mounting with t nuts – HM120B

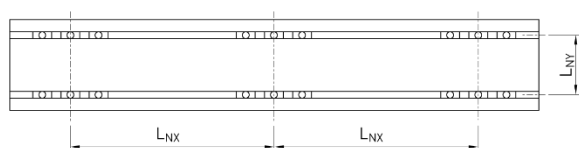


Table 6.4 : Minimum number of nuts required to secure the axis and recommended spacing of fixing points for longer axes – HM-B linear modules and double axes

axis type/ size	Minimum number of nuts	L _{NY} [mm]	D _{NY} [mm]	Recommend ed spacing L _{NX} [mm]	Thread size	Screw tightening torque [Nm]	F _{A,permissible} ¹⁾ [N]	Item no. Slotted nuts (10 pcs.)
HM040B/HD1	8	20	D + 20	400	M5	4.5	500	20-000529
HM060B/HD2	8	40	D + 20	600	M6	10.0	1,250	20-000531
HM080B/HD3	8	40	D + 40	800	M8	20.0	3,200	20-000534
HM120B/HD4	12	80	D + 40	1,200	M8	20.0	3,200	20-000534

¹⁾ Permissible axial operating force in the direction of tension per nut.

6.2.5 Installation with nut blocks – HT-B linear tables and HB250B bridge axes

The slotted nuts to be used for each shaft size can be found in [Table 6.5](#) . The slotted nuts must be arranged in accordance with [Fig. 6.26](#) , [Fig. 6.27](#) , [Fig. 6.29](#) , [Fig. 6.30](#) and [Fig. 6.31](#) . The required number of slotted nuts depends on the external load. To calculate the required number, the load values listed in [Table 6.5](#) must be taken into account. The minimum number of nuts listed in [Table 6.5](#) must not be undercut. The nuts must be positioned in groups around fixing points, as shown in [Fig. 6.29](#) , [Fig. 6.30](#) and [Fig. 6.31](#) . It should be noted that there must be at least one fixing point at each end of the shaft and that each fixing point must be capable of safely transferring the external load on its own. The number and spacing of additional fixing points must be selected according to the load conditions. The L_{NX} spacings listed in [Table 6.5](#) are merely guide values.

- Drill the mounting holes into the mounting surface (hole spacing in accordance with [Table 6.5](#)).
- Clean the mounting surface and position the linear table on the mounting surface.
- Swivel the nut into the lower groove.
- Pre-assemble the nut using the screws with a low screw tightening torque.
- Tighten the screws at each fixing point in a criss-cross pattern, observing the specified screw tightening torques. Observe the sequence of the fixing points: tighten either from the outside in or from one side to the other to avoid stress concentrations.

✓ The linear table is now assembled

When fixing the linear tables, observe the hole spacing L_{NY}.

Fig.6.26 : Hole spacing for mounting the HT100B, HT150B, HT200B and HB250B linear tables from below using nuts

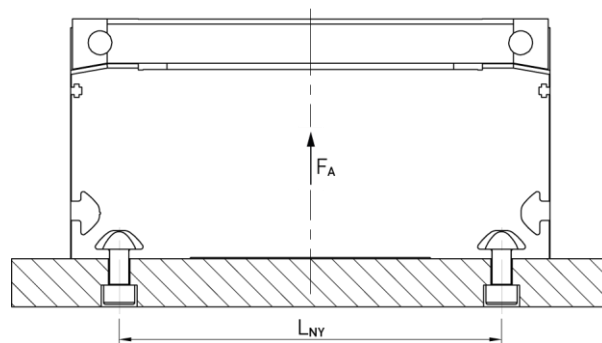


Fig.6.27 : Hole spacing for mounting the HT250B linear tables from below using nuts

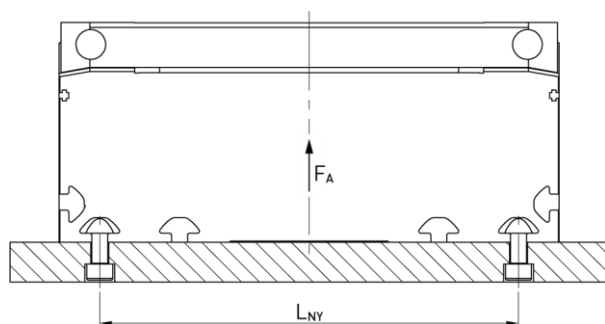


Fig.6.28: Permissible axial operating force in the direction of tension per nut ($F_{A,perm.}$)

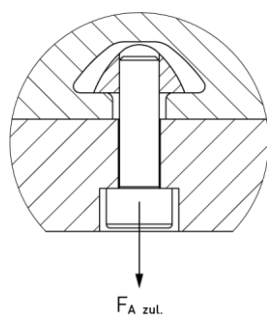


Fig.6.29 : Mounting with nuts – HT100B, HT150B

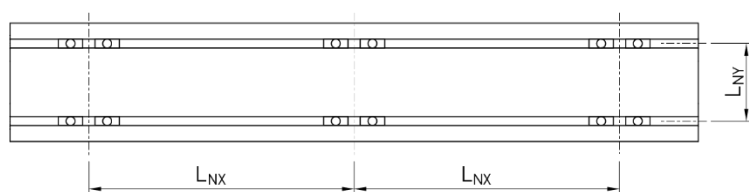


Fig.6.30 : Mounting with t nuts – HT200B

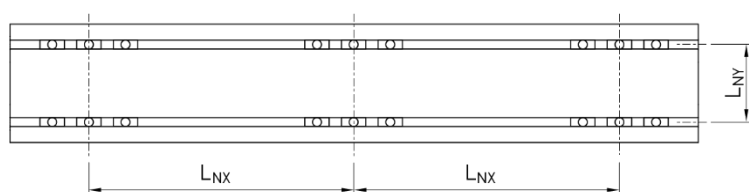


Fig.6.31 : Fastening with nuts – HT250B

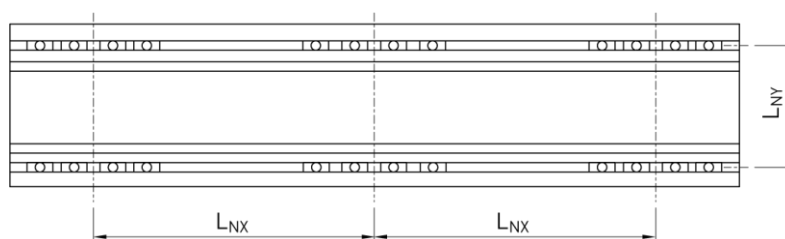


Table 6.5 : Minimum number of nuts required to secure the axis and recommended spacing of fixing points for longer axes – HT-B linear tables

size	Minimum number of nuts	L_{NY} [mm]	Recommended spacing L_{NX} [mm]	Thread size	Screw tightening torque [Nm]	$F_{A_permissible}^{1)}$ [N]	Item no. Slotted nuts (10 pcs.)
HT100B	8	80	500	M5	4.5	500	20-000529
HT150B	8	120	600	M6	10.0	1,250	20-000531
HT200B	12	160	800	M8	20.0	3,200	20-000534
HT250B	16	210	1,000	M8	20.0	3,200	20-000534
HB250B	16	150	1,000	M10	46.0	7,000	80114691

¹⁾ Permissible axial operating force in the direction of pull per nut.

6.2.6 Installation with clamping profiles – HM-B linear modules and HD double axis modules

The clamping profiles must always be fitted in pairs (to the left and right of the axis body) (see Fig. 6.34 and Fig. 6.35). The required number of clamping profiles depends on the external load. To calculate the required number, the load values listed in Table 6.6 must be taken into account. The minimum number of clamping profiles specified in Table 6.6 must not be undercut. It should be noted that there must be at least one fixing point at each end of the shaft and that each fixing point must safely transfer the external load on its own. The number and spacing of additional fixing points must be selected according to the load conditions. The L_{SX} spacings listed in Table 6.6 are for guidance only.

- Drill the mounting holes in the mounting surface (hole spacing in accordance with Table 6.6).
- Clean the mounting surface and position the linear axis on the mounting surface.
- Swing the clamping profile into the side groove.
- Pre-assemble the clamping profile using the screws with a low screw tightening torque.
- Tighten the screws at each fixing point in a criss-cross pattern, observing the specified screw tightening torques. When doing so, follow the sequence of fixing points: tighten either from the outside in or from one side to the other to avoid stress concentrations.

✓ The linear axis is now installed.

When fixing the linear axes, observe the hole spacing L_{SY} (Fig. 6.32) and, for linear axis systems, the hole spacing L_{SY} and D_{SY} (Fig. 6.33).

Fig.6.32 : Bore spacing for lateral mounting of HM-B linear modules with clamping profiles

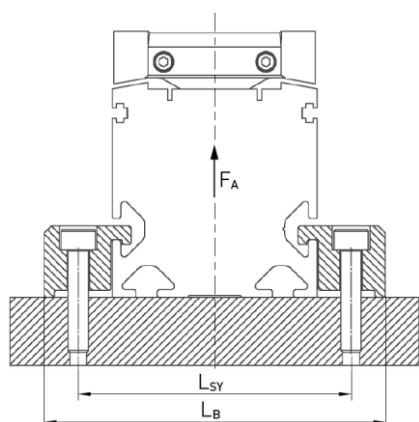


Fig.6.33 : Hole spacing for lateral mounting of HD double axis modules using clamping profiles

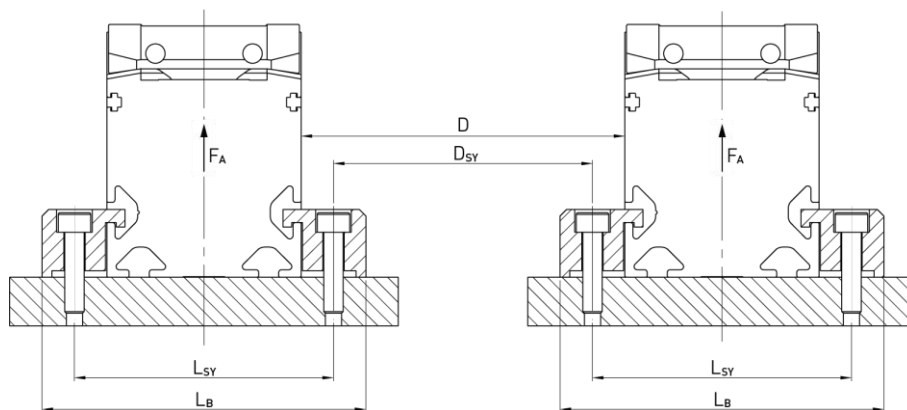


Fig.6.34 : Mounting with clamping profiles – HM040B, HM060B, HM080B

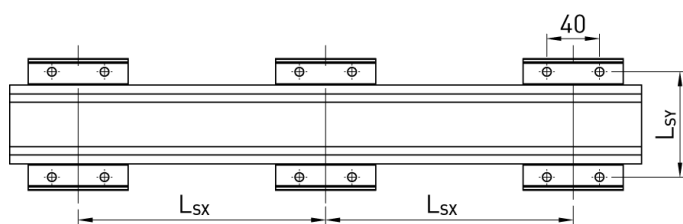


Fig.6.35 : Mounting with clamping profiles – HM120B

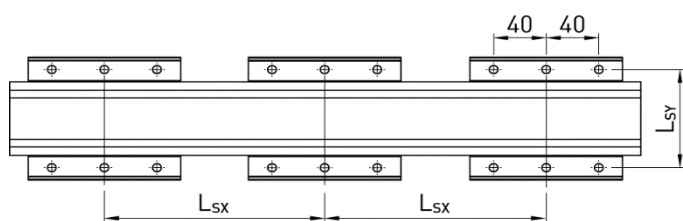


Table 6.6 : Minimum number of clamping profiles required to secure the axis and recommended spacing of fixing points for longer axes – HM-B linear modules and double axes HD

axis type/ size	Minimum number of clamping profiles	L_{SY} [mm]	D_{SY} [mm]	L_B [mm]	Recommend ed spacing L_{SX} [mm]	Thread size	Screw tightening torque [Nm]	$F_{A,permissible}$ ¹⁾ [N]	Item no. Clamping profiles (4 pcs.)
HM040/HD1	4	55	D – 15	70	400	M5	4.9	200	25-000517
HM060/HD2	4	80	D – 20	100	600	M6	6.4	500	25-000518
HM080/HD3	4	100	D – 20	120	800	M8	18.5	1,200	25-000519
HM120/HD4	4	140	D – 20	160	1,200	M8	18.5	2,400	25-000520

¹⁾ Permissible axial operating force in the direction of tension per pair of clamping profiles.

6.2.7 Installation with clamping profiles – HT-B linear tables

The clamping profiles must always be fitted in pairs (to the left and right of the axis body) (see [Fig. 6.37](#) and [Fig. 6.38](#)). The required number of clamping profiles depends on the external load. To calculate the required number, the load values listed in [Table 6.7](#) must be taken into account. The minimum number of clamping profiles specified in [Table 6.7](#) must not be undercut. It should be noted that there must be at least one fixing point at each end of the shaft and that each fixing point must safely transfer the external load on its own. The number and spacing of additional fixing points must be selected according to the load conditions. The L_{SX} spacings listed in [Table 6.7](#) are for guidance only.

- Drill the mounting holes into the mounting surface (hole spacing in accordance with [Table 6.7](#)).
- Clean the mounting surface and position the linear table on the mounting surface.
- Swivel the clamping profile into the side groove.
- Pre-assemble the clamping profile using the screws with a low screw tightening torque.
- Tighten the screws at each fixing point in a criss-cross pattern, observing the specified screw tightening torques. Observe the sequence of the fixing points: tighten either from the outside in or from one side to the other to avoid stress concentrations.

✓ The linear table is now installed

When fixing the linear tables, observe the hole spacing L_{SY} ([Fig. 6.36](#)).

Fig.6.36 : Hole spacing for lateral mounting of HT-B linear tables using clamping profiles

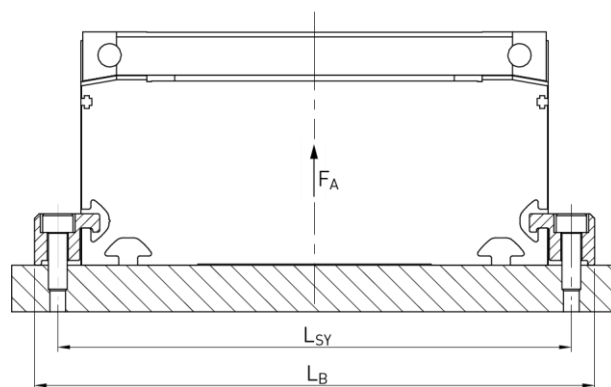


Fig.6.37 : Mounting with clamping profiles – HT100B, HT150B

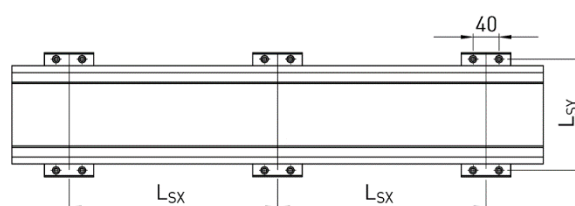


Fig.6.38 : Mounting with clamping profiles – HT200B, HT250B

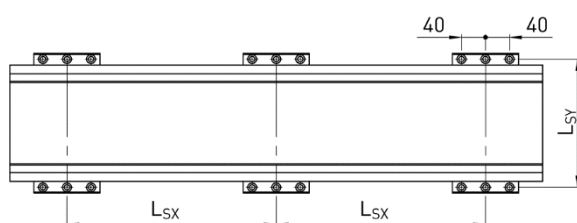


Table 6.7 : Minimum number of clamping profiles required to secure the axis and recommended spacing of fixing points for axes of longer length – HT-B linear tables

size	Minimum number of clamping profiles	L _{SY} [mm]	L _B [mm]	Recommend ed spacing for L _{SX} [mm]	Thread size	Screw tightening torque [Nm]	F _{A,permissible} ¹⁾ [N]	Item no. Clamping profiles (4 pcs.)
HT100B	4	115	130	500	M5	4.9	800	25-000517
HT150B	4	170	190	600	M6	10.1	1,600	25-001023
HT200B	4	220	240	800	M8	18.5	3,000	25-000520
HT250B	6	270	290	1,000	M8	18.5	5,000	25-000520
HB250	8	283	321	1,000	M10	33.0	7,000	80089273

¹⁾ Permissible axial operating force in the direction of tension per pair of clamping profiles.

6.2.8 Installation of the HC cantilever axis

The HC cantilever axis can be mounted either from the side or from above on the drive unit housing (see Fig. 6.39 and Fig. 6.40). The number of screws and the thread sizes are specified (see Table 6.8 and Table 6.9).

- Position the two centring sleeves diagonally opposite each other on the side of the drive unit housing where you wish to secure the axis. There are three sides available for mounting: left, right or from above.
- Position the axis against your adjacent construction.
- Tighten the mounting bolts in a cross-pattern to the correct torque.

✓ The cantilever axis is now fitted.

Table 6.8 : Installation of the HC-B cantilever axis – side mounting

size	Thread size × depth	Counter bore depth for centring sleeve [mm]	Diameter of counter bore for centring sleeve [mm]	Number of mounting bolts
HC025B	M3 × 6	1.5	Ø6 H7	6
HC040B	M5 × 10	1.5	Ø8 H7	8
HC060B	M6 × 12	1.5	Ø8 H7	8
HC080B	M8 × 14	2.0	Ø12 H7	8
HC100B	M10 × 20	2.0	Ø15 H7	8
HC150B	M10 × 20	2.0	Ø15 H7	8

Table 6.9 : Assembly of the HC-B cantilever axis – top mounting

size	Thread size × depth	Counter bore depth for centring sleeve [mm]	Diameter of counter bore for centring sleeve [mm]	Number of mounting bolts
HC025B	M3 × 7.5	1.5	Ø6 H7	8
HC040B	M5 × 11.5	1.5	Ø8 H7	8
HC060B	M6 × 12	1.5	Ø8 H7	8
HC080B	M8 × 16	2.0	Ø12 H7	8
HC100B	M10 × 20	2.0	Ø15 H7	8
HC150B	M10 × 20	2.0	Ø15 H7	12

A. Side mounting

Fig.6 .39 : Side mounting of the HC cantilever axis

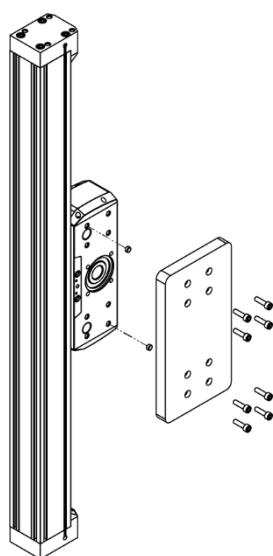
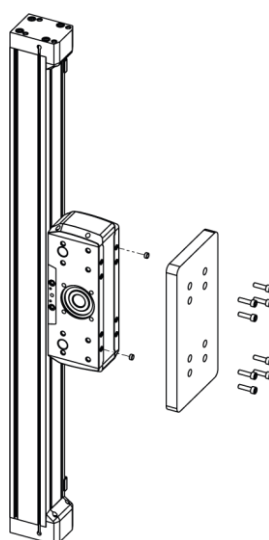

B. Top mounting

Fig.6 .40 : Installation of the HC cantilever axis from above


Note:

The HC040B, HC060B, HC080B, HC100B and HC150B cantilever axes can alternatively also be mounted on the boom profile using nuts or clamping profiles. See sections [6.2.4](#) and [6.2.6](#) for further details.

6.3 Mounting the payload

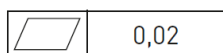
The spacing of the threaded holes for mounting the payload can be found in the 'HX Linear Axes and Axis Systems' catalogue. Additional counter bores allow for the insertion of centring sleeves. HIWIN recommends arranging two centring sleeves diagonally opposite each other. For axes with more than one slide or double axes, it is recommended that only one slide be fitted with centring sleeves in each case to avoid stress concentrations.

Table 6.10: Threaded holes for securing the payload

Axis type/size	Thread size × depth	Counter bore depth for centring sleeve [mm]	Counter bore diameter for centring sleeve [mm]
HM040	M5 × 10	1.5	Ø8 H7
HM060	M6 × 12	1.5	Ø8 H7
HM080	M8 × 16	2.0	Ø12 H7
HM120	M10 × 22	2.0	Ø15 H7
HT100	M5 × 10	1.5	Ø8 H7
HT150	M6 × 14	1.5	Ø8 H7
HT200	M8 × 14	2.0	Ø12 H7
HT250	M10 × 20	2.0	Ø15 H7
HC025	M3 × 7.5	1.5	Ø6 H7
HC040	M5 × 11.5	1.5	Ø8 H7
HC060	M6 × 12	1.5	Ø8 H7
HC080	M8 × 18	2.0	Ø12 H7
HC100	M10 × 22	2.0	Ø15 H7
HC150	M10 × 20	2.0	Ø15 H7
HB250	M10 × 20	2.0	Ø15 H7

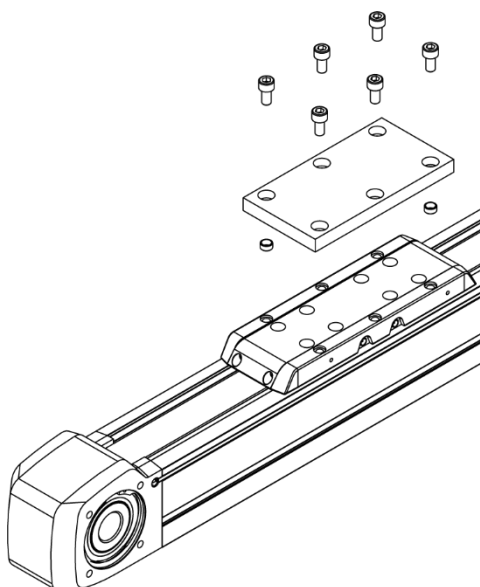
Clean the mounting surface on the slide (HM-B/HT-B/HD) or on the end plate (HC-B).

- Clean the mounting surface on the slide.
 - Clean the mounting surface of the load.
 - If necessary, use centring sleeves (see Fig. 6.41, Fig. 6.42 and Fig. 6.43).
 - Position the load on the slide of the linear axis (HM-B/HT-B/HD/HB-B) or on the end plate of the cantilever axis (HC-B).
 - Tighten the mounting bolts in a crosswise pattern.
 - Check that the load moves freely over the entire stroke.
 - Tighten the screws.
- ✓ The payload is now installed.



Accuracy requirements for the payload mounting surface.

Fig.6.41 : Mounting the load with centring sleeves (HM-B)



Note:

For HM-B linear axes and HD double axes with more than one slide, always insert centring sleeves into only one slide at a time.

Fig.6.42 : Securing the load with centring sleeves (HT-B and HB-B)

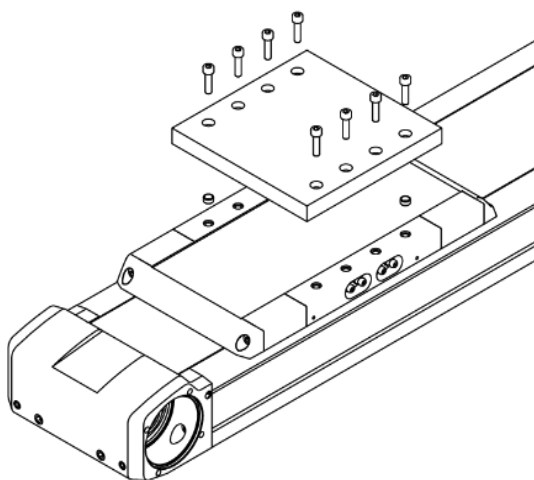
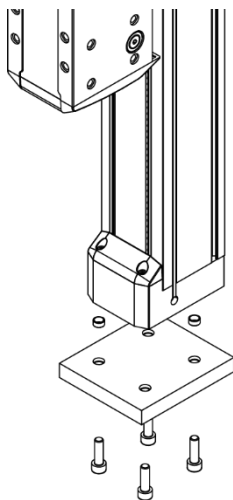


Fig.6.43 : Securing the load with centring sleeves (HC-B)



6.3.1 Synchronisation of slides on double axes

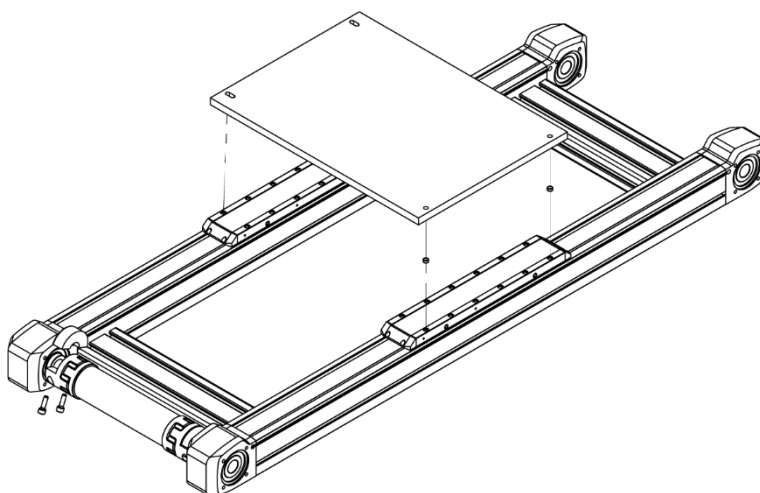
If an adaptation plate for the load is to be secured across both slides on a double axis HD system, it is first necessary to achieve high accuracy in aligning the slides with each other in the axial direction.

- Loosen the half-shell coupling on one side of the synchronous shaft by slightly loosening the clamping bolts. Loosen the two clamping bolts alternately to avoid overloading. Once the slide on this side of the double axis can move freely, the adapter plate can be fitted.
- Fit the adapter plate to one of the slides in accordance with [Fig. 6.44](#).
- Adjust the second slide in the axial direction so that the prepared mounting holes are precisely aligned in the axial direction.
- Fit the adapter plate to the second slide as shown in [Fig. 6.44](#).
- Fit the synchronous shaft in accordance with the section '6.1.2' from [page 57](#).

Note:

The centre distance may have tolerances perpendicular to the axis direction. It is therefore advantageous if the mounting holes in the adapter plate for the second slide are of the slotted hole type.

Fig.6.44 : Fitting the adapter plate across both slides of the double axis system



6.4 HM-B linear modules, HT-B linear tables and HD double axes

6.4.1 Fitting the limit switches

The limit switches are available either as n/c contacts or n/o contacts. The limit switch can be fixed directly into the limit switch groove (T-slot) using the supplied M3 screws and square nuts. The limit switches can be fitted on either the right or left-hand side.

- If necessary, remove the green trim strip from the upper T-slot.
- Slide two square nuts through the cut-out on the drive block into the upper T-slot.
- Fit the limit switch using both screws (see Fig. 6.45). For sizes HM040 and HT100, the limit switch is mounted either with a spacer plate and M3x12 screws (see Fig. 6.46) or without a spacer plate using M3x10.8 screws, depending on the type. First, leave both screws loosely tightened.
- Slide the limit switch into the desired position and press it upwards slightly.
- Tighten the screws. The screw tightening torque is 0.5 Nm.

✓ The limit switches are now fitted.

Fig.6 .45 : Fitting limit switches: HM060, HM080, HM120, HT150, HT200, HT250

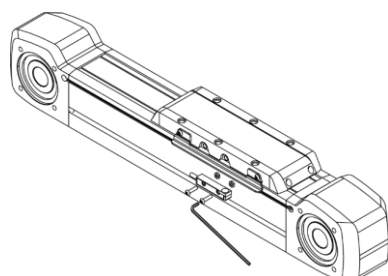
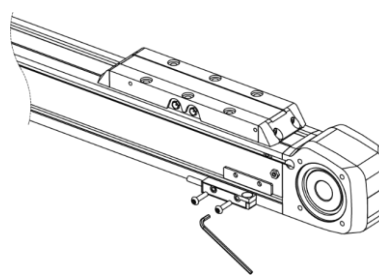


Fig.6 .46 : Fitting limit switches: HM040, HT100



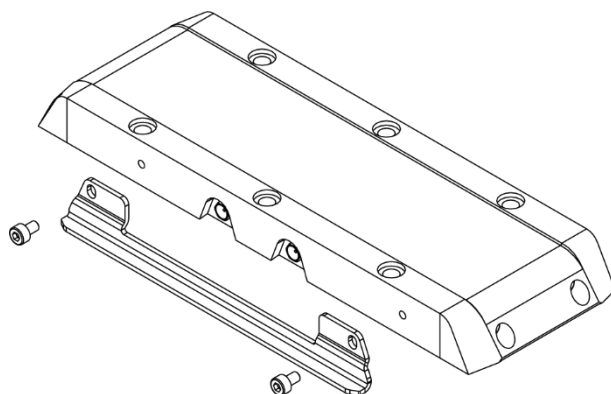
6.4.2 Fitting the damping element

The damping element is used to activate the limit switches in the two end positions of the slide (at stroke 0 and maximum stroke) and must be fitted on the same side as the limit switches.

- Position the damping element against the slide.
- Lightly screw the damping element to the slide using the M3 screws provided.
- Align the damping element parallel to the lower edge of the carriage.

✓ The damping element is pre-assembled.

Fig.6.47: Fitting the damping element



6.4.3 Adjusting the switching distance

The limit switches operate inductively and require a defined switching distance between the limit switch and the damping element.

Switching distance	1 mm
screw tightening torque	1 Nm

- Move the slide until the damping element is positioned above a limit switch. Use a feeler gauge to align the damping element so that the switching distance is maintained. Ensure that the damping element remains parallel to the lower edge of the slide (see Fig. 6.48).
 - Tighten the screws on the damping element to the specified screw tightening torque.
 - If a second limit switch is fitted: Move the slide until the damping element is positioned above the second limit switch and use a feeler gauge to check that the switching distance is maintained. Adjust as necessary until the switching distance is maintained for both limit switches.
 - Route the limit switch cable through the lower groove (see Fig. 6.49). There, the cable can be protected by the groove cover. The groove cover is available separately; see section 12 .
- ✓ The switching distance is now set.

Note

Check that the limit switch is functioning correctly before commissioning, either using a limit switch test box or by moving the unit to the end positions in a controlled manner.

Fig.6.48 : Adjusting the switching distance using a feeler gauge and tightening the screws

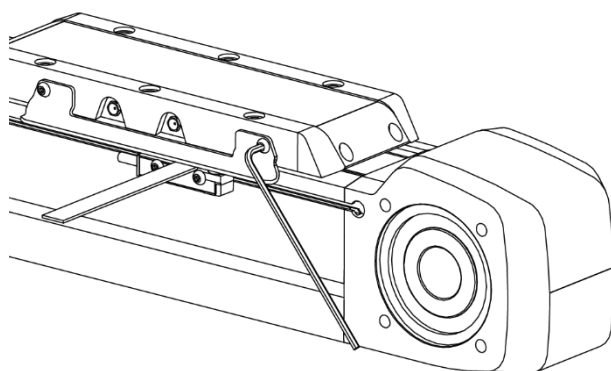
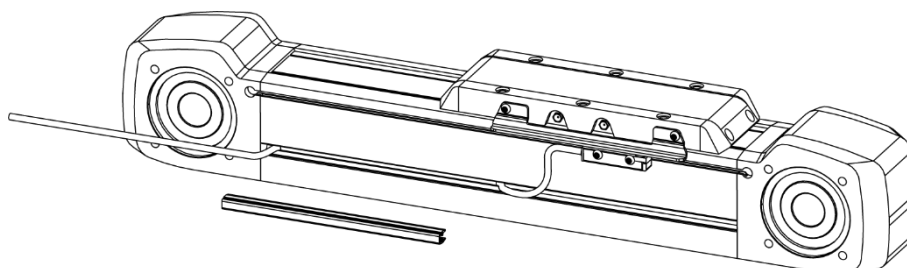


Fig.6.49 : Fitting limit switches: Routing the cables

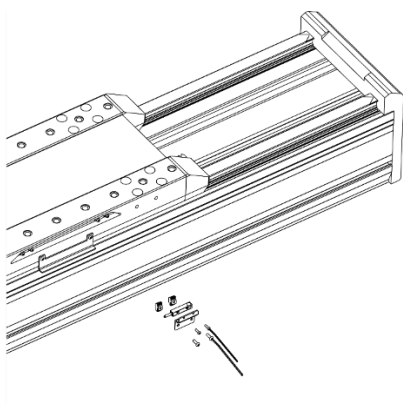


6.5 Fitting and adjustment of limit switches – HB-B bridge axes

6.5.1 Fitting the limit switches

- The limit switches are available as either n/c contacts or n/o contacts. The limit switch can be fixed directly into the limit switch groove (T-slot) using the screws and hammer-head nuts supplied.
- If necessary, remove the green trim strip from the upper groove
- The first step is to attach the limit switch to the mounting plate.
- Align the limit switch horizontally with the upper edge of the mounting plate.
- Secure the limit switch using the M3 screws; screw tightening torque $\leq 1.5 \text{ Nm}$
- Insert the M4 screw through the holes in the mounting plate and screw in the hammer-head nuts a few threads
- Turn the hammer-head nuts to feed them through the opening in the upper groove
- Tighten the M4 screws slowly and one at a time; the hammer-head nuts will turn into position
- Tighten the M4 screw to a tightening torque of $\leq 3 \text{ Nm}$

Fig.6 .50 : Installation of limit switch: HB250B

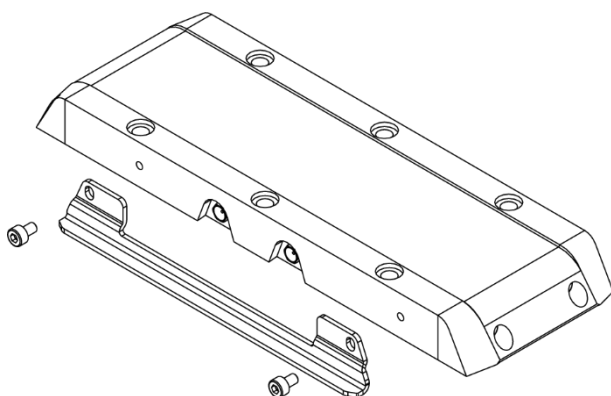


6.5.2 Fitting the damping element

The damping element is used to activate the limit switches in the two end positions of the slide (at stroke 0 and maximum stroke) and must be fitted on the same side as the limit switches.

- Position the damping element against the slide.
- Lightly screw the damping element to the slide using the screws provided.
- Align the damping element parallel to the lower edge of the carriage.
- ✓ The damping element is pre-assembled.

Fig.6.51: Fitting the damping element



6.5.3 Adjusting the switching distance

The limit switches operate on an inductive principle and require a specified switching distance between the limit switch and the damping element.

Switching distance	1 mm
screw tightening torque	1 Nm

- Move the slide until the damping element is positioned above a limit switch. Use a feeler gauge to align the damping element so that the switching distance is maintained. Ensure that the damping element remains parallel to the lower edge of the slide (see Fig. 6.48).
 - Tighten the screws on the damping element to the specified screw tightening torque.
 - If a second limit switch is fitted: Move the slide until the damping element is positioned above the second limit switch and use a feeler gauge to check that the switching distance is maintained. Adjust as necessary until the switching distance is maintained for both limit switches.
 - Route the limit switch cable through the lower groove (see Fig. 6.49). There, the cable can be protected by the groove cover. The groove cover is available separately; see section 12 .
- ✓ The switching distance is now set.

Note

Check that the limit switch is functioning correctly before commissioning, either using a limit switch test box or by moving the system to the end positions in a controlled manner.

Fig.6.52: Adjusting the switching distance using a feeler gauge and tightening the screws

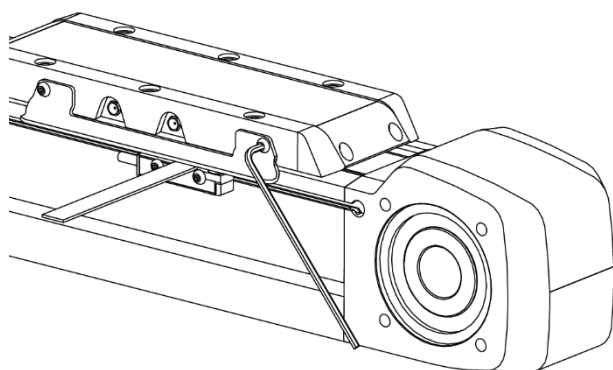
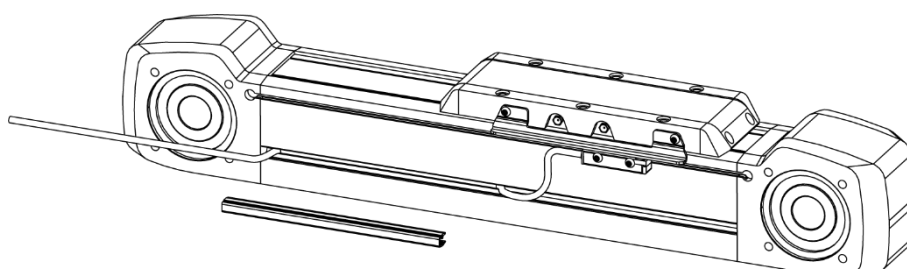


Fig.6.53: Fitting the limit switches: routing the cables



6.6 Fitting and adjusting the limit switches – HC-B cantilever axis

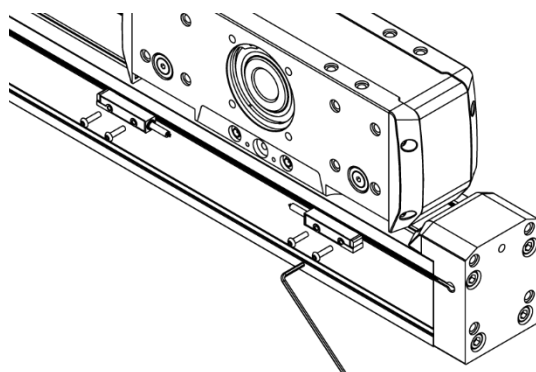
6.6.1 Fitting the limit switches

The limit switches are available either as n/c contacts or n/o contacts (HC025B only with n/c contacts). The limit switch can be fixed directly to the drive unit housing using the screws supplied (HC040B/HC060B/HC080B/HC100B/HC150B: M3, HC025B: M1.2). The limit switches are always fitted on the left-hand side of the shaft.

- Position the limit switches against the drive unit housing (see Fig. 6.54).
- Lightly screw the limit switches to the drive unit housing using the supplied M3 or M1.2 screws.
- Press the limit switches lightly against the reference edge of the drive unit housing.
- Tighten the screws. The screw tightening torque is 0.5 Nm for the M3 screws and 0.2 Nm for the M1.2 screws.

✓ The limit switches are now fitted.

Fig.6.54 : Fitting limit switches: HC-B (all sizes)



6.6.2 Fitting the damping elements

The damping elements are used to trigger the limit switches in the two end positions of the axis (at stroke 0 and maximum stroke) and must be fitted on the same side as the limit switches.

- If necessary, remove the green trim strip from the upper T-slot.
- Slide two square nuts (or, for the HC150B, two nuts) through the cut-out in the end plate into the upper T-slot.
- Fit the damping elements using both screws (for sizes HC025B and HC040B, the spacer plate must also be fitted between the damping elements and the axis; see Fig. 6.55). Leave both screws loose for the time being.
- Slide the damping elements into the desired position.

✓ The damping elements are pre-assembled.

Fig.6.55 : Fitting the damping elements – HC025B and HC040B (with spacer plate)

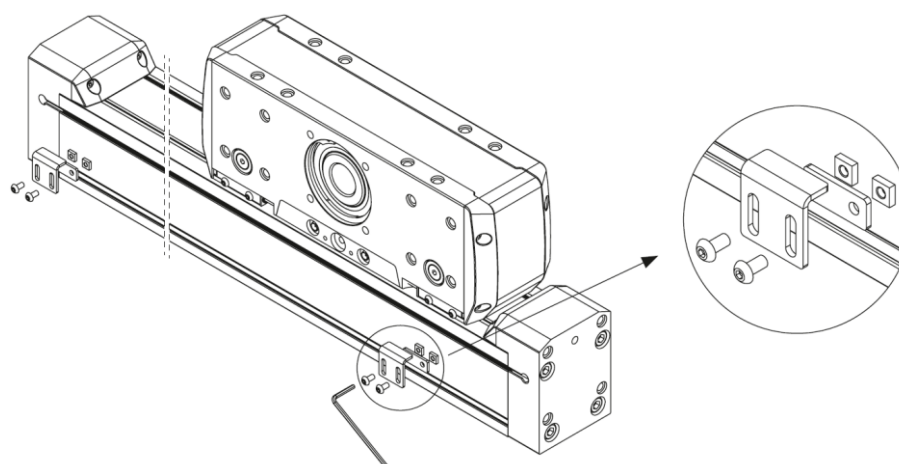
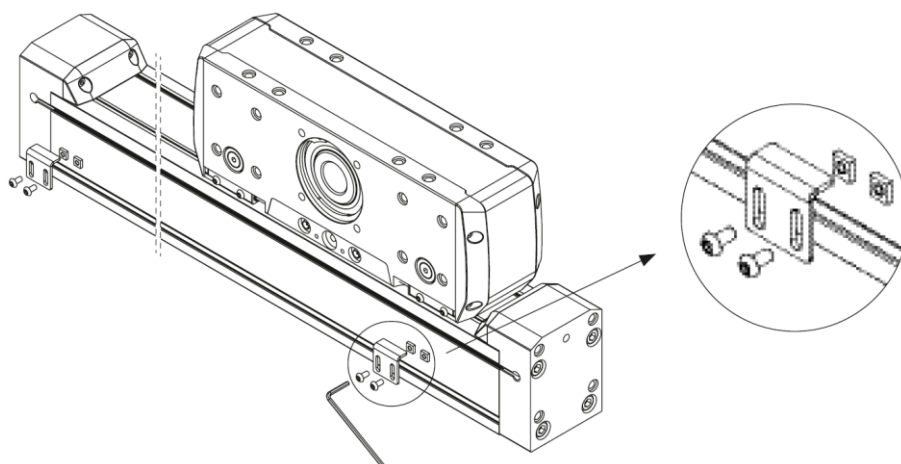


Fig.6 .56 : Fitting the damping elements – HC060B, HC080B, HC100B and HC150 (without spacer plate)



6.6.3 Adjusting the switching distance

The limit switches operate inductively and require a defined switching distance between the limit switch and the damping element.

- Move the drive unit housing until a limit switch is positioned above a damping element (see Fig. 6.57). Use a feeler gauge to align the damping element so that the following dimensions are set for the switching distance:

Table 6.11: Standard with head

Switching distance	HC025B: 0.5 mm HC040B, HC060B, HC080B, HC100B and HC150B: 1 mm
screw tightening torque	1 Nm

Ensure that the damping element remains aligned parallel to the top edge of the shaft.

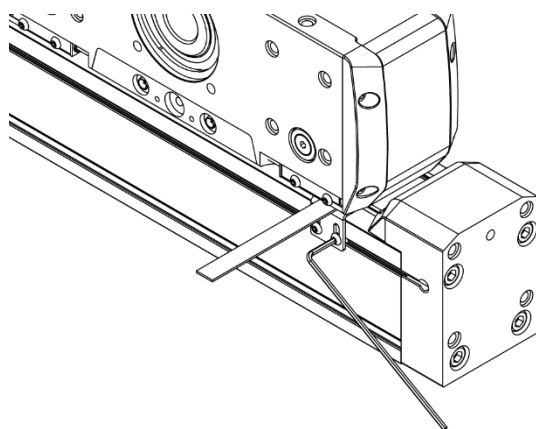
- Tighten the screws on the damping element to the specified screw tightening torque.
- Move the drive unit housing until the second limit switch is positioned above the second damping element and repeat the procedure on this side as well.

Note

Check that the limit switch is functioning correctly before commissioning, either using a limit switch test box or by moving the system to the end positions in a controlled manner.

- ✓ The switching distance is now set.

Fig.6.57 : Adjusting the switching distance using a feeler gauge and tightening the screws



6.7 Fitting the drive adapter for the HM-B linear axis

6.7.1 Fitting the coupling assembly

A suitable coupling assembly is required for mounting the motor. You will find this in section 11.5.6 from page 168.

The coupling assembly for the HM-B linear axis consists of:

- Clamping hub for the drive side [1]
- Elastomer insert [2]
- Expansion hub for the axis side [3]

There are two designs of clamping hub:

- Variant 1 with a clamping bolt, see Fig. 6.58
- Variant 2 with two clamping bolts, see Fig. 6.59

Fig.6.58 : Coupling assembly, variant 1: clamping hub with one clamping bolt

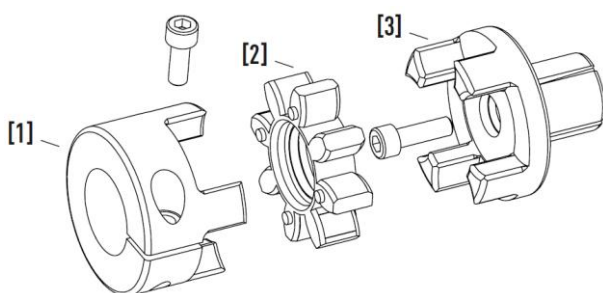
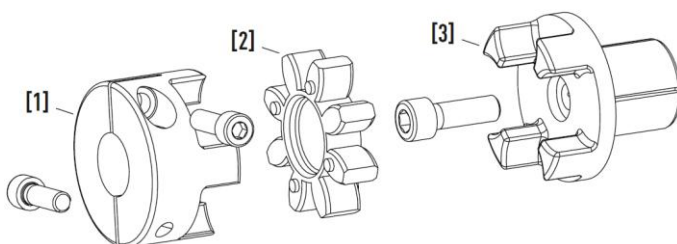


Fig.6.59 : Coupling assembly, variant 2: clamping hub with two clamping bolts



Before assembly, please ensure that

- no parts are damaged;
- all parts are free from dirt and grease.

The screw tightening torques listed in Table 6.12 and Table 6.13 apply to the assembly of the coupling assembly:

Table 6.12 : Screw tightening torques for the expansion and clamping hub

size	Screw tightening torque for expansion hub [Nm]	Screw tightening torque for clamping hub, variant 1 [Nm]	Screw tightening torque for clamping hub, variant 2 [Nm]
HM040B	10	5.0	5.0 ²⁾
HM060B	10	14.0 ¹⁾	14.0 ³⁾
HM080B	25	14.0	15.0
HM120B-S/M/L	49	35.0	35.0
HM120B-H	86	–	49.0

¹⁾ Special version with a clamping diameter of 24 mm: 10 Nm

²⁾ Special version with a clamping diameter of 16 mm: 4.0 Nm

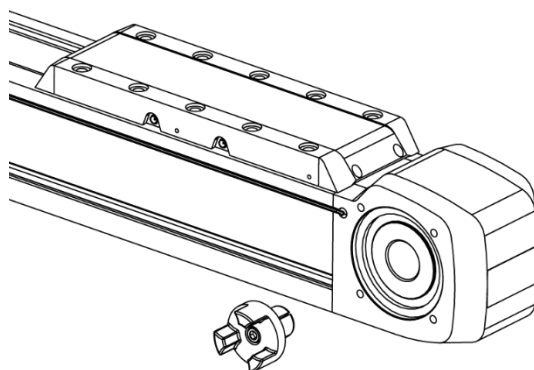
³⁾ Special version with clamping diameters of 22 and 24 mm: 10 Nm

Table 6.13 : Screw tightening torques for the coupling housing

size	Strength class of screw	Thread size	Screw tightening torque [Nm]
HM040B	8.8	M4	3.0
HM060B	8.8	M6	10.0
HM080B	8.8	M6	10.0
HM120B	8.8	M8	25.0

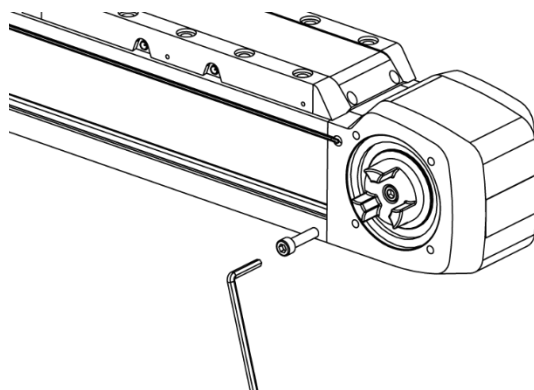
- Move the slide to its end position so that the toothed belt pulley cannot rotate.
- Carefully press the expansion hub into the hollow shaft of the toothed belt pulley until the expansion hub sits flush.

Fig.6.60: Fitting the expansion hub



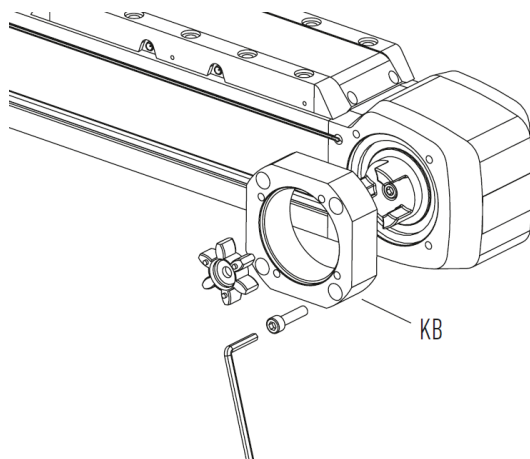
- The expansion mandrel, which is used to secure the coupling, is located in the centre of the expansion hub. Tighten the expansion hub to the screw tightening torque specified in [Table 6.12](#).

Fig.6.61: Fitting the expansion hub by tightening the expansion pin



- Slide the elastomer insert onto the expansion hub.
- Fit the KB coupling housing using 4 screws so that it lies flush.

Fig.6.62: Fitting the elastomer insert and mounting the KB coupling housing on the HM-B linear axis



Note:

The elastomer insert must be slightly preloaded and should have no backlash. If it fits too loosely, it must be replaced. Lightly greasing the elastomer insert with PU-compatible lubricants can make installation easier.

- Slide the clamping hub onto the elastomer insert until the dimension L_1 (see [Table 6.14](#)) is achieved.

Fig.6.63: Adjusting the clamping hub clearance towards the motor on the HM-B linear axis

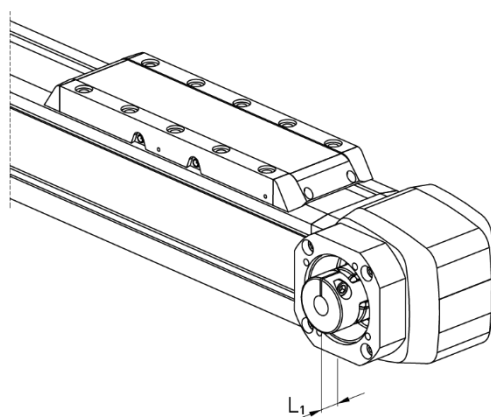


Table 6.14 : Adjustment of the coupling distance via dimension L_1

size	Coupling size	L_1 variant 1 [mm]	L_1 variant 2 [mm]
HM040B	14	10.0	10.0
HM060B	19	14.0	14.0
HM080B	24	16.5	14.5
HM120B-S/M/L	28	16.7	16.7
HM120B-H	38	–	0 (flush)

Note:

When installing without a coupling housing, the coupling distance L_2 must be set in accordance with [Fig. 6.64](#) and [Table 6.15](#).

Fig.6.64 : Overall length of the HM-B coupling assembly

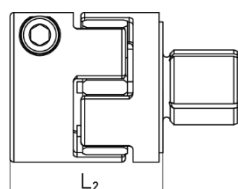


Table 6.15 : Adjustment of the coupling distance via dimension L_2 for installation without a coupling housing

size	L_2 variant 1 [mm]	L_2 variant 2 [mm]
HM040B	27.5	27.5
HM060B	41.0	41.0
HM080B	46.0	44.0
HM120B-S/M/L	48.0	48.0
HM120B-H	–	64.0

6.7.2 Fitting the motor (without gearbox)

- Fit the motor adapter plate AM flush, taking care to ensure the correct position of the hole for the clamping bolt on the clamping hub.
- Tighten the 4 screws. For screw tightening torques, see [Table 6.16](#).

Fig.6.65: Fitting the AM motor adapter plate

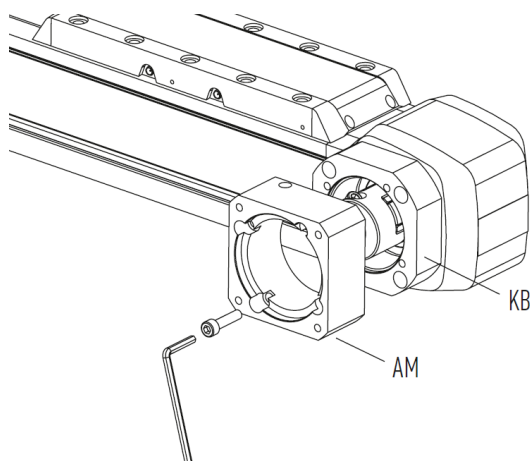
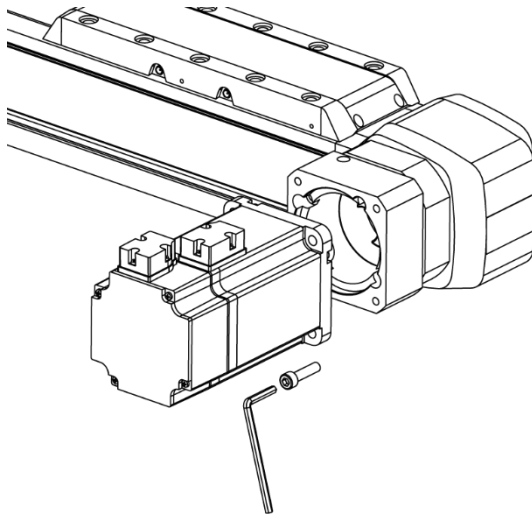


Table 6.16 : Screw tightening torques for the AM motor adapter plate

size	Strength class of screw	Thread size	Screw tightening torque [Nm]
HM040B	8.8	M4	3.0
HM060B	8.8	M6	10.0
HM080B	8.8	M6	10.0
HM120B-S/M/L	8.8	M8	25.0
HM120B-H	8.8	M10	48.0

- Secure the motor to prevent it from falling.
- Place the motor flat on the motor adapter plate AM.
- Secure the motor in accordance with the manufacturer's instructions.

Fig.6.66: Securing the motor with screws



Note:

Ensure that the motor is slid on straight so that the previously set dimension L remains unchanged.

- Remove the side locking elements from the motor adapter plate AM.

Option 1:

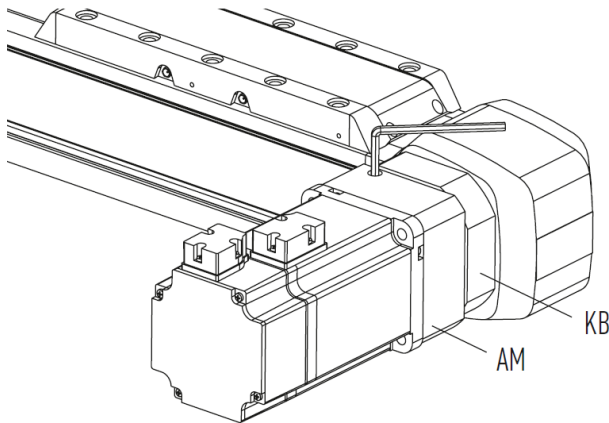
- Tighten the screw on the clamping hub through the bore to the specified screw tightening torque as per [Table 6.12](#).

Option 2:

- Tighten both screws of the clamping hub one after the other through the bore. First position the screw on the first side, then tighten the screw on the second side and finally on the first side to the screw tightening torque specified in [Table 6.12](#).
- Fit the locking elements into the motor adapter plate AM until they reach the stop.

- ✓ The motor is now fitted.

Fig.6.67: Tightening the clamping hub on the motor shaft

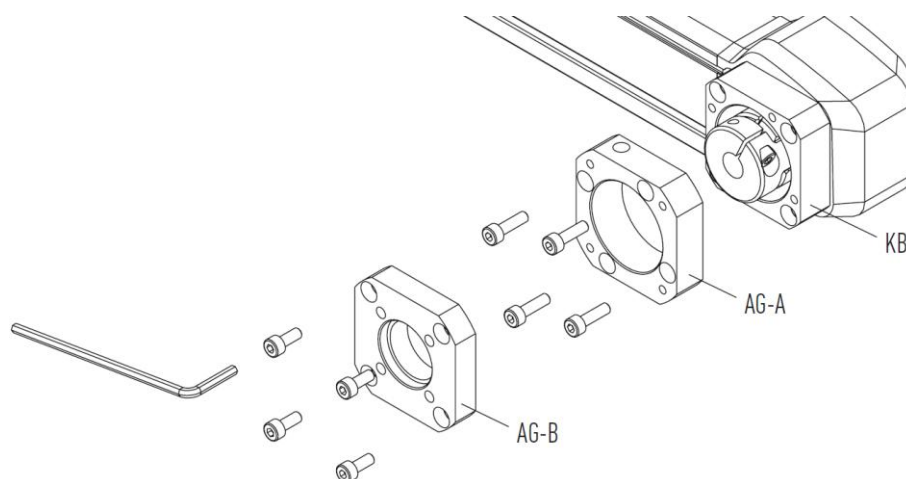


6.7.3 Fitting the gearbox

HM040B:

- Fit the first part of the gear adapter plate (AG-A) flush (see [Fig. 6.68](#)). Ensure that the position of the bore for the clamping bolt of the clamping hub is correct.
- Tighten the 4 screws. For screw tightening torques, see [Table 6.17](#).
- Slide the second part of the gear adapter plate (AG-B) onto the first part (AG-A) (see [Fig. 6.68](#)).
- Tighten the 4 screws. For screw tightening torques, see [Table 6.17](#).

Fig.6.68 : Fitting the two-part gear adapter plates AG-A and AG-B – HM040B



HM060B, HM080B, HM120B:

- Fit the AG gear adapter plate flat (see Fig. 6.69). Ensure that the position of the hole for the clamping bolt of the clamping hub is correct.
- Tighten the 4 screws. For screw tightening torques, see Table 6.17 .

Fig.6.69 : Fitting the AG gear adapter plate – HM060B, HM080B, HM120B

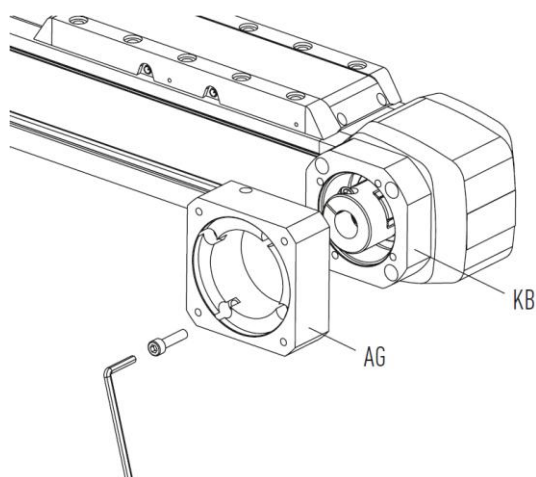
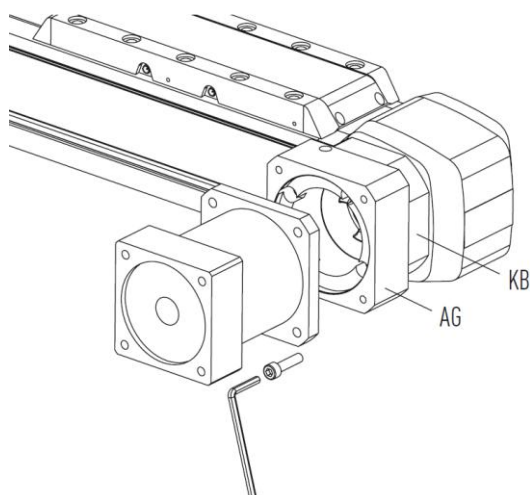


Table 6.17 : Screw tightening torques for the AG gear adapter plate

size	Strength class of screw	Thread size	Screw tightening torque [Nm]
HM040B (AG-A)	8.8	M4	3.0
HM040B (AG-B)	8.8	M4	3.0
HM060B	8.8	M6	10.0
HM080B	8.8	M6	10.0
HM120B	8.8	M8	25.0
HM120B-H	8.8	M10	48.0

- Secure the gearbox to prevent it from falling.
- Place the gearbox flat on the AG gear adapter plate (see Fig. 6.70).
- Secure the gearbox with 4 screws in accordance with the manufacturer's instructions.

Fig.6.70 : Securing the gearbox to the AG gear adapter plate



- Remove the side locking elements from the AG gear adapter plate.

Option 1:

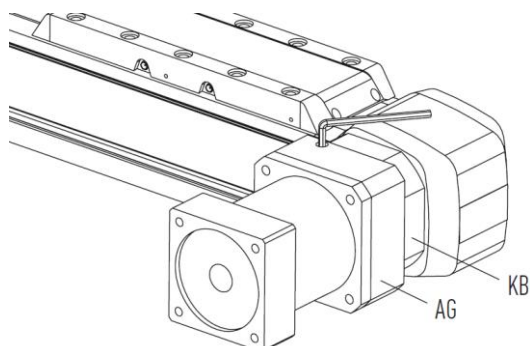
- Tighten the screw on the clamping hub through the bore to the screw tightening torque specified in [in](#) .

Option 2:

- Tighten both screws on the clamping hub one after the other through the bore. First position the screw on the first side, then tighten the screw on the second side, and finally the one on the first side to the screw tightening torque specified in [Table 6.12](#) at .
- Fit the locking elements into the AG gear adapter plate until they reach the stop.

✓ The gearbox is now fitted.

Fig.6.71: Tightening the clamping hub on the gearbox shaft



6.7.4 Fitting the motor to Neugart gearboxes

Note:

When mounting the motor onto a gearbox, you will need the manual for the gearbox being used.

- Loosen the clamping bolt on the gearbox so that you can later insert the motor shaft into the gearbox's clamping system without difficulty. For smaller motor shaft diameters, use the supplied reduction sleeve.
- Fit the GM motor gear adapter plate flat onto the gearbox, taking care to align the hole for the clamping bolt of the clamping system (see [Fig. 6.72](#)).
- Tighten the 4 screws. For screw tightening torques, see [Table 6.18](#) .

Fig.6.72 : Fitting the GM (HM-B) motor gear adapter plate

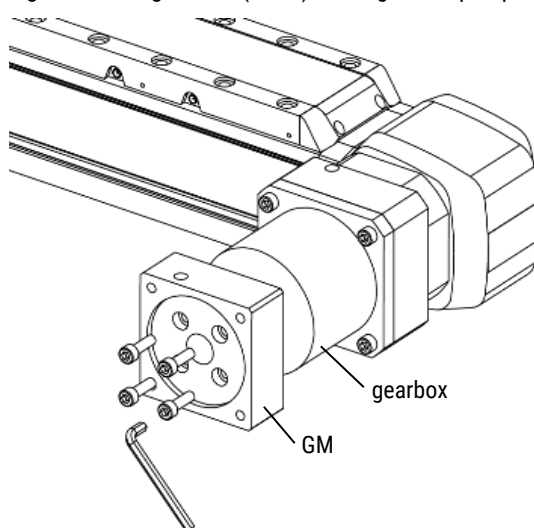


Table 6.18 : Screw tightening torques for the GM motor gear adapter plate

Gearbox ¹⁾	Strength class of screw	Thread size	Screw tightening torque [Nm]
PLE040 WPLE040	8.8	M3 × 16	1.3
PLQE060 WPLQE060	8.8	M5 × 10	6.0
PLQE080 WPLQE080	8.8	M6 × 16	10.0
PLQE120 WPLQE120	8.8	M8 × 20	25.0
PSBN142 3:1/5:1/8:1	8.8	M6 × 45	10.0
PSBN142 12:1	8.8	M6 × 30	10.0

¹⁾ PLE, WPLE, PLQE, WPLQE and PSBN are registered trademarks of Neugart GmbH

- If possible, rotate the axis so that the motor can be mounted from above in a vertical position.
- Place the motor flat on the GM motor gear adapter plate (see Fig. 6.73).
- Remove the side locking element from the GM motor gear adapter plate.
- Tighten the clamping bolt of the clamping system through the bore to the screw tightening torque specified in, .
- Fit the locking element into the GM motor gear adapter plate until it reaches the stop.

Fig.6.73 : Securing the motor shaft to the gearbox clamping system

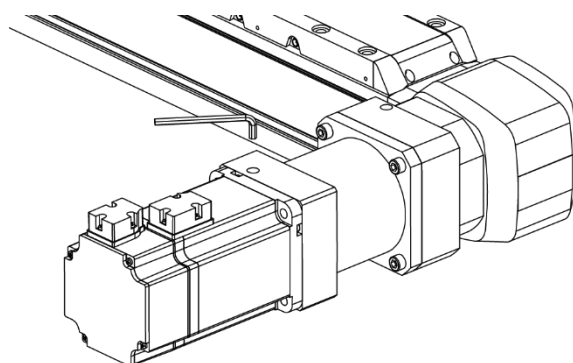


Table 6.19 : Screw tightening torques for the clamping bolt of the gearbox clamping system

Gearbox1)	Strength class of screw	SWISK2)	Screw tightening torque [Nm]
PLE040 WPLE040	12.9	2.5	2.0
		3.0	4.5
PLQE060 WPLQE060	12.9	3.0	4.5
		4.0	9.5
PLQE080 WPLQE080	12.9	4.0	9.5
		5.0	16.5
PLQE120 WPLQE120	12.9	5.0	16.5
		6.0	40.0
PSBN142	12.9	6.0	40.0

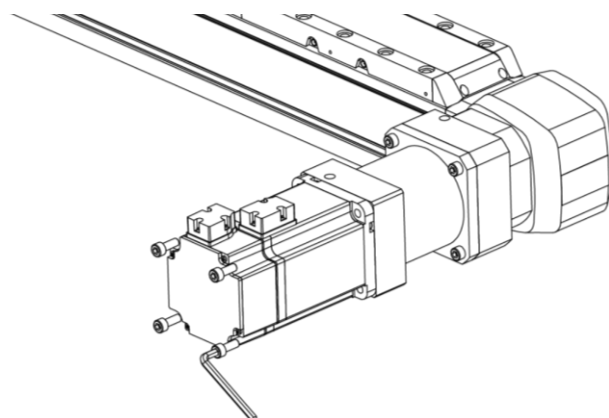
¹⁾ PLE, WPLE, PLQE, WPLQE and PSBN are registered trademarks of Neugart GmbH

²⁾ Hexagon socket size; varies depending on the coupling size/motor used

– Mount the motor in accordance with the manufacturer's instructions.

✓ The motor is now fitted.

Fig.6.74: Screwing the motor to the HM-B linear axis with gearbox



6.7.5 Fitting the journal

The journal is an alternative interface for motors and encoders. It can be retrofitted to either side of any drive block.

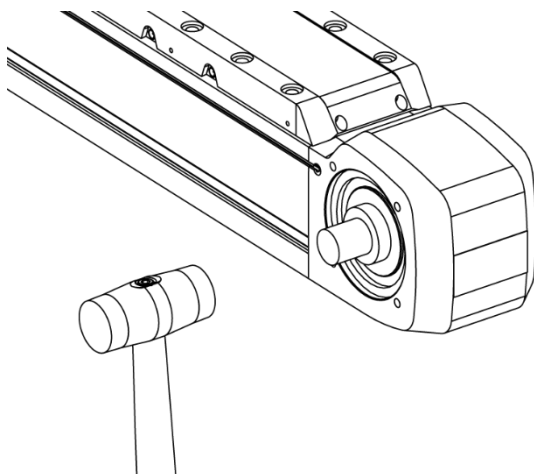
Table 6.20 : Screw tightening torques for the journal

size	screw	Screw strength class	Screw tightening torque [Nm]
HM040B	ISO 4762 M4 × 30	8.8	4.5
HM060B	ISO 4762 M6 × 45	8.8	10.0
HM080B	ISO 4762 M8 × 55	8.8	25.0
HM120B	ISO 4762 M10 × 60	8.8	55.0

Please ensure before assembly that

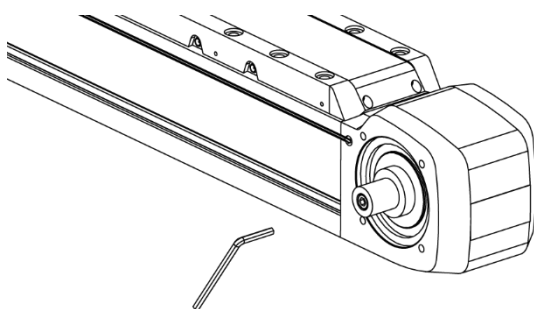
- no parts are damaged;
- all parts are free from dirt and grease.
- Position the slide in its end position so that the toothed belt pulley cannot rotate.
- Carefully press the journal into the hollow shaft of the toothed belt pulley until the expansion hub sits flush.
- Ensure that the shaft journal flange sits flush. If necessary, use a light plastic hammer (see [Fig. 6.75](#)).

Fig.6.75 : Inserting the journal into the drive block of the HM-B linear axis



- Tighten the screw in the centre of the journal to the screw tightening torque specified in [in](#) .

Fig.6.76: Tightening the screw on the journal



6.8 Fitting the drive adapter for the HB-B bridge axis

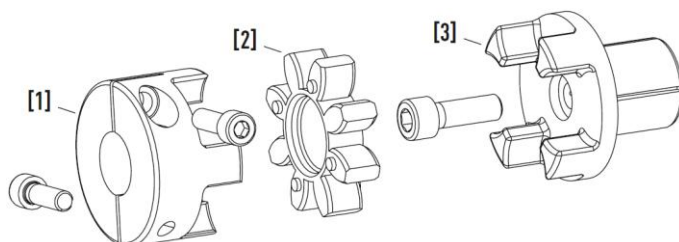
6.8.1 Fitting the coupling assembly

A suitable coupling is required for mounting the motor. You will find this in section 11.5.6 from page 168 onwards.

The coupling assembly for the HB-B bridge axis consists of:

- Clamping hub for the drive side [1]
- Elastomer insert [2]
- Expansion hub for the axle side [3]

Fig.6.77: Coupling assembly: clamping hub with two clamping bolts



Before assembly, please ensure that

- no parts are damaged;
- all parts are free from dirt and grease.

The screw tightening torques listed in Table 6.21 and Table 6.22 apply to the assembly of the coupling assembly:

Table 6.21 : Screw tightening torques for the expansion and clamping hub

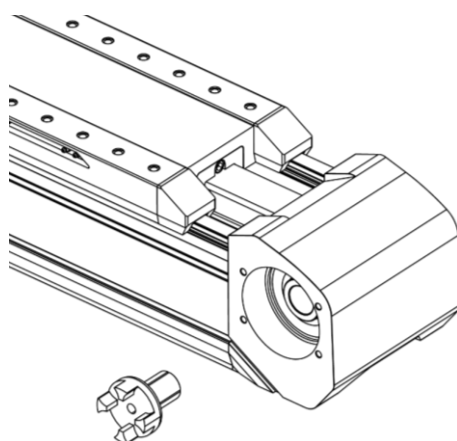
size	Screw tightening torque for expansion hub [Nm]	Screw tightening torque for clamping hub [Nm]
HB250B	95	49

Table 6.22 : Screw tightening torques for the coupling housing

size	Strength class of screw	Thread size	Screw tightening torque [Nm]
HB250B	8.8	M10	48.0

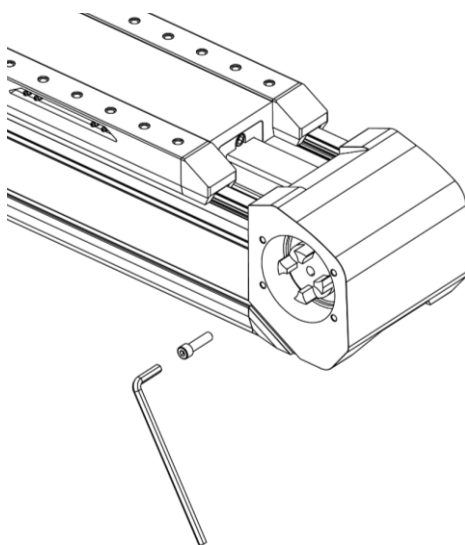
- Move the slide to its end position so that the toothed belt pulley cannot rotate.
- Carefully press the expansion hub into the hollow shaft of the toothed belt pulley until the expansion hub sits flush.

Fig.6.78: Fitting the expansion hub



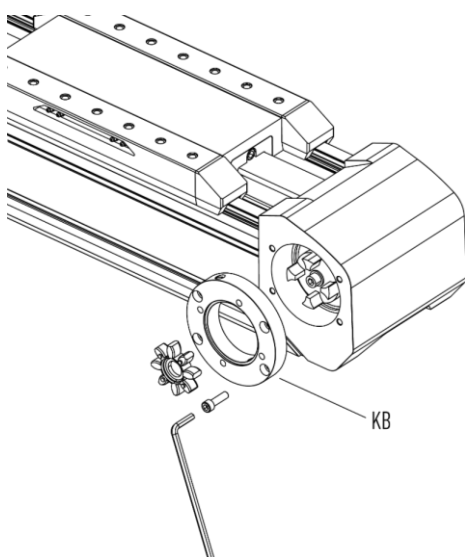
- The expansion pin, which secures the coupling, is located in the centre of the expansion hub. Tighten the expansion hub to the screw tightening torque specified in [Table 6.20](#).

Fig.6.79: Fitting the expansion hub by tightening the expansion pin



- Slide the elastomer insert onto the expansion hub.
- Fit the coupling housing KB so that it sits flush, taking care to ensure the correct position of the bore for the clamping bolt of the clamping hub.
- Fit the KB coupling housing using 4 screws so that it lies flush.

Fig.6.80: Fitting the elastomer insert and mounting the KB coupling housing



Note:

The elastomer insert must be slightly preloaded and should have no backlash. If it fits too loosely, it must be replaced. Lightly greasing the elastomer insert with PU-compatible lubricants can make installation easier.

- Slide the clamping hub onto the elastomer insert until the dimension L_1 (see [Table 6.23](#)) is achieved.

Fig.6.81: Adjusting the clamping hub clearance towards the motor

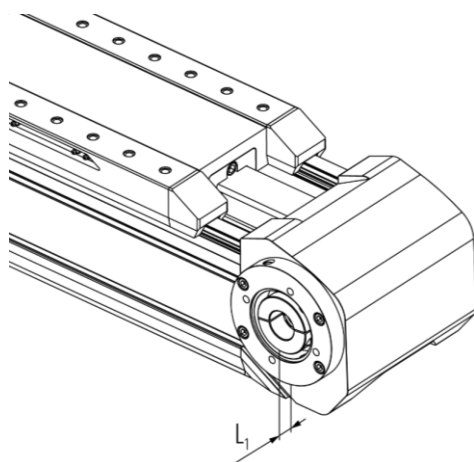


Table 6.23 : Adjustment of the coupling distance via dimension L_1

size	Coupling size	L_1 [mm]
HB250B	38	0 (flush)

Note:

When fitting without a coupling housing, the coupling distance L_2 must be set in accordance with Fig. 6.82 and Table 6.24 .

Fig.6.82 : Total length of the coupling assembly

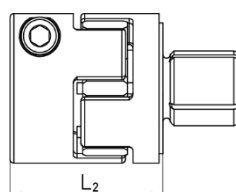


Table 6.24 : Adjustment of the coupling clearance via dimension L_2 for installation without a coupling housing

size	L_2 [mm]
HB250B	64.0

6.8.2 Installation of the motor (without gearbox)

- Fit the motor adapter plate AM flush.
- Tighten the 4 screws. For screw tightening torques, see Table 6.25 .

Fig.6.83: Fitting the AM motor adapter plate

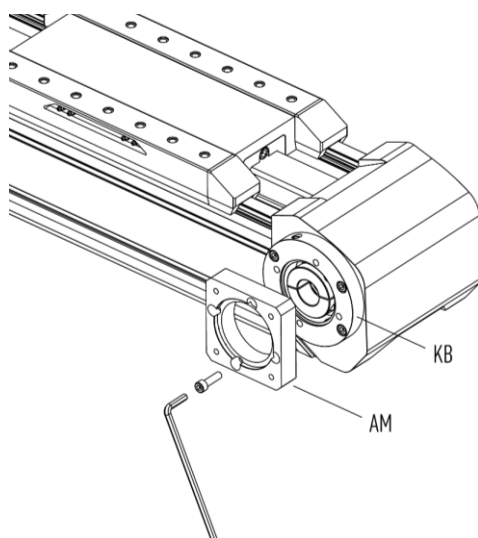
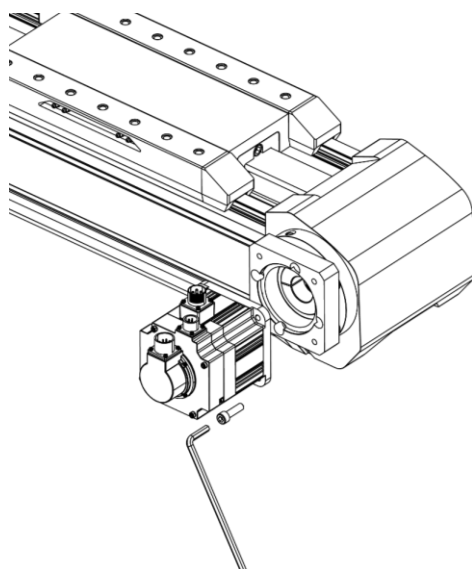


Table 6.25 : Screw tightening torques for the AM motor adapter plate

size	Strength class of screw	Thread size	Screw tightening torque [Nm]
HB250B	8.8	M10	48.0

- Secure the motor to prevent it from falling.
- Place the motor flat on the motor adapter plate AM.
- Secure the motor in accordance with the manufacturer's instructions.

Fig.6.84: Securing the motor with screws

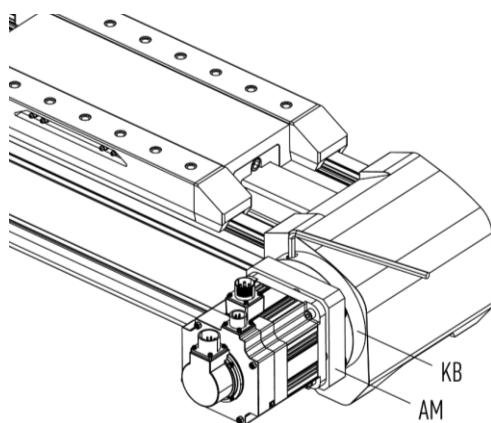


Note:

Ensure that the motor is slid on straight so that the previously set dimension L remains unchanged.

- Remove the side cover plates from the coupling housing KB.
- Tighten both screws on the clamping hub one after the other through the bore. First position the screw on the first side, then tighten the screw on the second side, and finally on the first side again to the screw tightening torque specified in [Table 6.20](#).
- Fit the locking elements into the KB coupling housing until they reach the stop.
- ✓ The motor is now installed.

Fig.6.85: Tightening the clamping hub on the motor shaft



6.8.3 Fitting the gearbox

- Fit the gear adapter plate AG flush (see [Fig. 6.86](#)).
- Tighten the 4 screws. For screw tightening torques, see [Table 6.26](#) .

Fig.6.86 : Fitting the AG – HB250B gear adapter plate

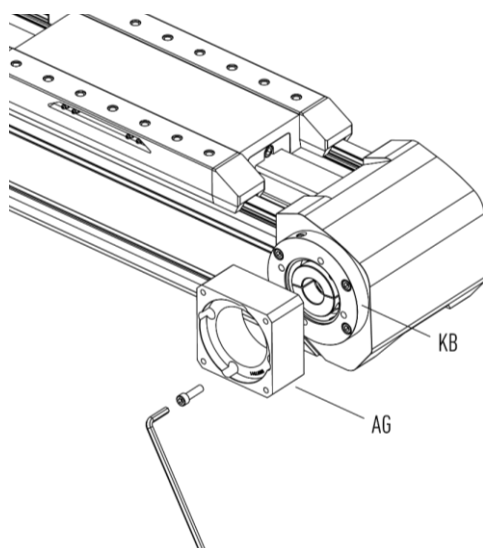
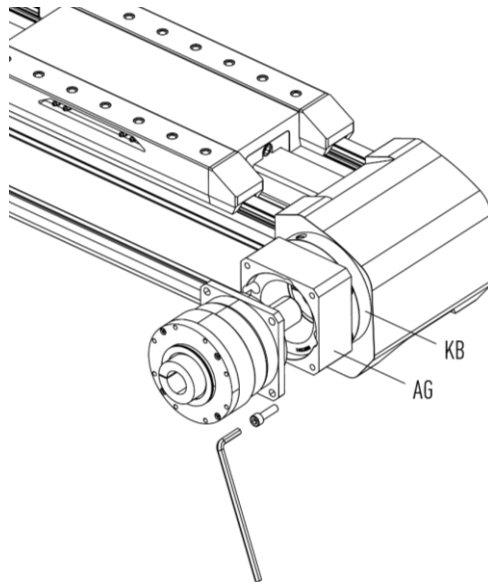


Table 6.26 : Screw tightening torques for the AG gear adapter plate

size	Strength class of screw	Thread size	Screw tightening torque [Nm]
HB250B	8.8	M10	48.0

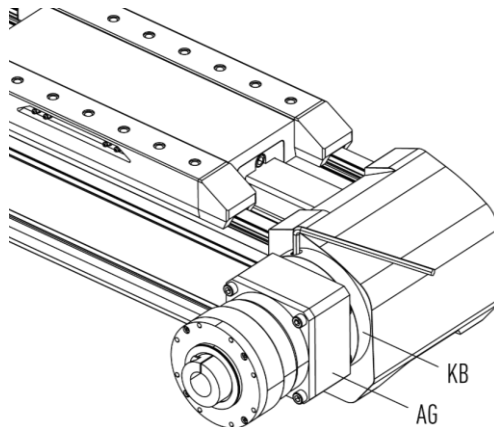
- Secure the gearbox to prevent it from falling.
- Place the gearbox flat on the gear adapter plate AG (see [Fig. 6.70](#)).
- Secure the gearbox with 4 screws in accordance with the manufacturer's instructions.

Fig.6.87: Securing the gearbox to the gear adapter plate AG



- Remove the side cover plates from the coupling housing KB.
- Tighten both screws of the clamping hub one after the other through the bore. First position the screw on the first side, then tighten the screw on the second side and finally on the first side to the screw tightening torque specified in Table 6.21.
- Fit the locking elements into the coupling housing KB until they reach the stop.
- ✓ The gearbox is now fitted.

Fig.6.88: Tightening the clamping hub on the gearbox shaft



6.8.4 Fitting the motor to Neugart gearboxes

Note:

When mounting the motor onto a gearbox, you will need the manual for the gearbox being used.

- Loosen the clamping bolt on the gearbox so that you can later insert the motor shaft into the gearbox's clamping system without difficulty. For smaller motor shaft diameters, use the supplied reduction sleeve.
- For the PSBN142 3:1/5:1/8:1 only: First place the ball bearing shims (2x) and then the fitting washer (1x) onto the outer bearing ring of the gearbox (see Fig. 6.89). This is not necessary for the PSBN142 12:1, as the ball bearing shims and the fitting washer are already integrated into the gearbox.
- Fit the GM motor gear adapter plate flat onto the gearbox, taking care to ensure the correct position of the bore for the clamping bolt of the clamping system (see Fig. 6.89).
- Tighten the screws. For screw tightening torques, see Table 6.27.

Fig.6.89 : Fitting the GM (HB-B) motor gear adapter plate

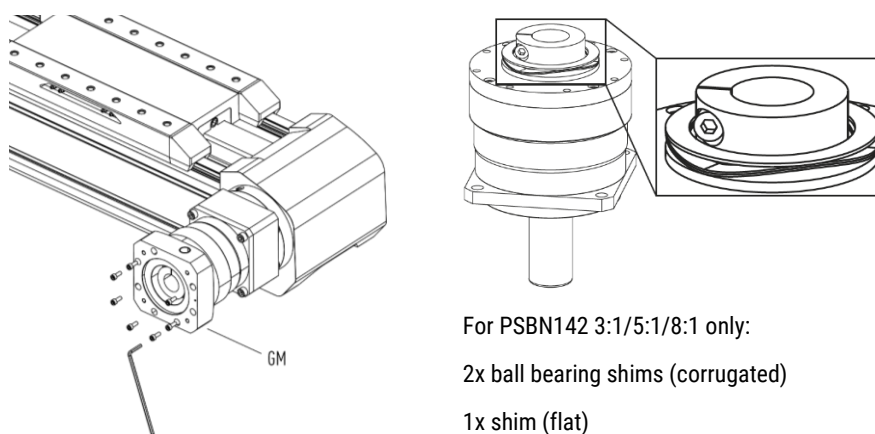


Table 6.27 : Screw tightening torques for the GM motor gear adapter plate

Gearbox ¹⁾	Strength class of screw	Thread size	Screw tightening torque [Nm]
PLQE120 WPLQE120	8.8	M8 × 20	25.0
PSBN142 3:1/5:1/8:1	8.8	M6 × 45	10.0
PSBN142 12:1	8.8	M6 × 30	10.0

¹⁾ PLE, WPLE, PLQE, WPLQE and PSBN are registered trademarks of Neugart GmbH

- If possible, rotate the axis so that the motor can be fitted from above in a vertical position.
- Place the motor flat on the GM motor gear adapter plate (see Fig. 6.90).
- Remove the side locking element from the GM motor gear adapter plate.
- Tighten the clamping bolt of the clamping system through the bore to the screw tightening torque specified in...
- Fit the locking element into the GM motor gear adapter plate until it reaches the stop.

Fig.6.90 : Securing the engine shaft to the gearbox clamping system

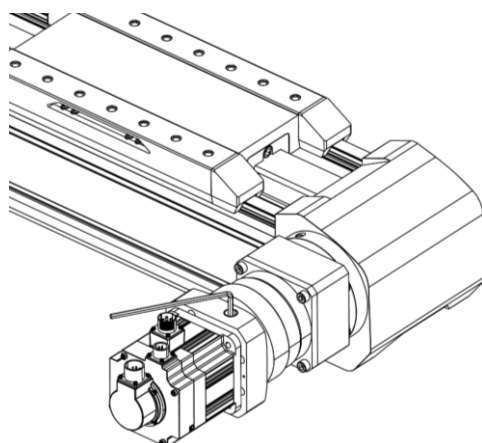


Table 6.28 : Screw tightening torques for the clamping bolt of the gearbox clamping system

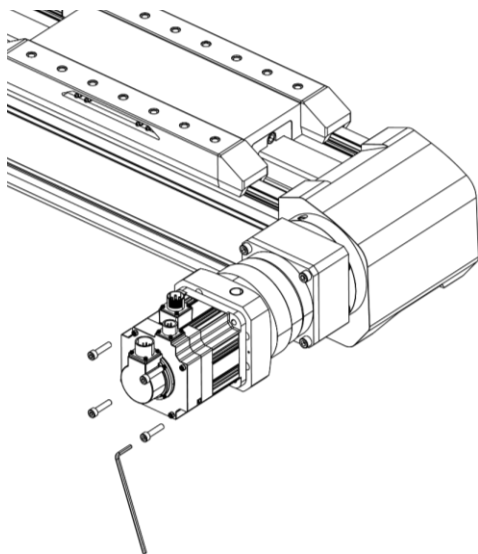
Gearbox ¹⁾	Strength class of screw	SWISK ²⁾	Screw tightening torque [Nm]
PLQE120 WPLQE120	12.9	5.0	16.5
		6.0	40.0
PSBN142	12.9	6.0	40.0

¹⁾ PLE, WPLE, PLQE, WPLQE and PSBN are registered trademarks of Neugart GmbH

²⁾ Hexagon socket size; varies depending on the coupling size/motor used

- Mount the motor in accordance with the manufacturer's instructions.
- ✓ The motor is now fitted.

Fig.6.91: Screwing the motor to the HB-B linear axis with gearbox



6.9 Fitting the drive adapter for the HT-B linear table

6.9.1 Fitting the coupling assembly

A suitable coupling assembly is required for mounting the motor. You will find this in section 11.5.6 from page 168.

The coupling assembly for the HT-B linear tables consists of:

- Clamping hub for the drive side [1]
- Elastomer insert [2]
- Expansion hub for the axis side [3]

There are two designs of clamping hubs:

- Variant 1 with one clamping bolt, see Fig. 6.92
- Variant 2 with two clamping bolts, see Fig. 6.93

Fig.6.92 : Coupling assembly, variant 1: clamping hub with one clamping bolt

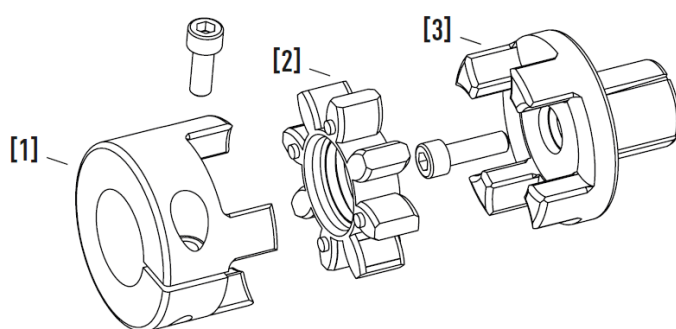
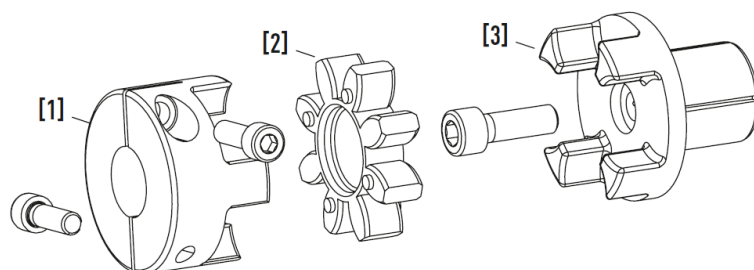


Fig.6.93 : Coupling assembly, variant 2: clamping hub with two clamping bolts



Before assembly, please ensure that

- no parts are damaged;
- all parts are free from dirt and grease.

The screw tightening torques listed in Table 6.29 apply to the assembly of the coupling assembly:

Table 6.29 : Screw tightening torques for the expansion and clamping hub

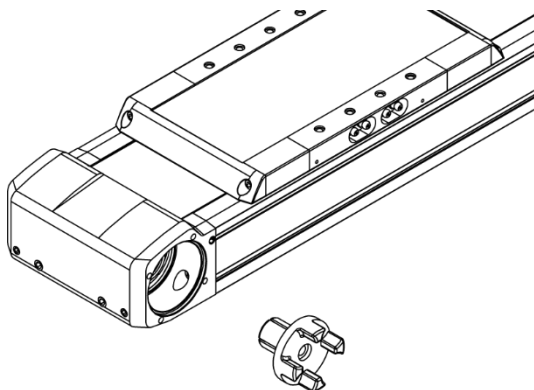
size	Screw tightening torque for expansion hub [Nm]	Screw tightening torque for clamping hub, variant 1 [Nm]	Screw tightening torque for clamping hub, variant 2 [Nm]
HT100B	10	5.0	5.0 ²⁾
HT150B	25	14.0 ¹⁾	15.0
HT200B	49	35.0	35.0
HT250B	49	35.0	35.0

¹⁾ Special version with a clamping diameter of 24 mm: 10 Nm

²⁾ Special version with a clamping diameter of 16 mm: 4.0 Nm

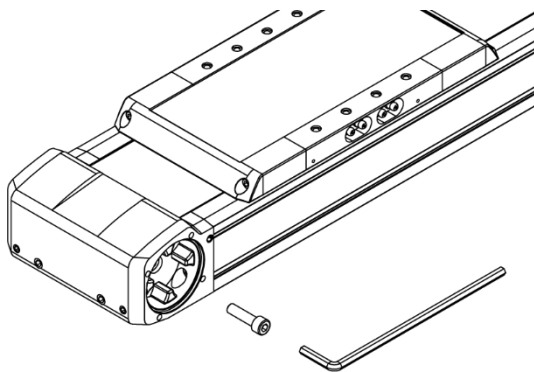
- Move the slide to its end position so that the toothed belt pulley cannot rotate.
- Carefully press the expansion hub into the hollow shaft of the toothed belt pulley until the expansion hub sits flush.

Fig.6.94: Fitting the expansion hub



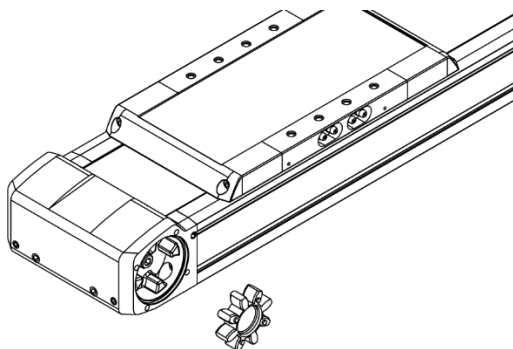
- The expansion pin, which is used to secure the coupling, is located in the centre of the expansion hub. Tighten the expansion hub to the screw tightening torque specified in [Table 6.29](#).

Fig.6.95: Fitting the expansion hub by tightening the expansion pin



- Slip the elastomer insert onto the expansion hub.

Fig.6.96: Fitting the elastomer insert



Note:

The elastomer insert must be slightly preloaded and should have no backlash. If it fits too loosely, it must be replaced. Lightly greasing the elastomer insert with PU-compatible lubricants can make installation easier.

- Slide the clamping hub onto the elastomer insert until dimension L_1 (see [Table 6.30](#)) is achieved.

Fig.6.97 : Adjusting the clamping hub clearance towards the motor

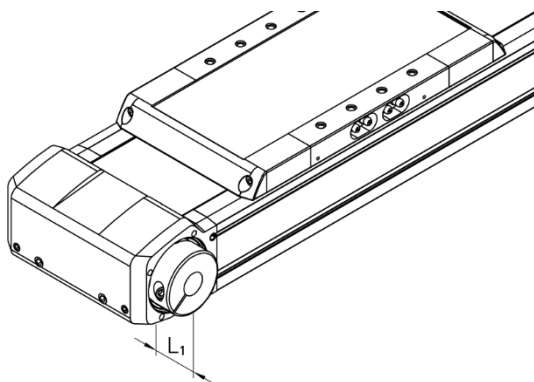


Table 6.30 : Adjustment of the coupling distance via dimension L_1

size	Coupling size	L1 variant 1 [mm]	L1 variant 2 [mm]
HT100B	14	10.0	10.0
HT150B	24	16.5	14.5
HT200B	28	16.7	16.7
HT250B	28	16.7	16.7

Note:

If it is not possible to adjust the coupling distance in accordance with Fig. 6.97 and Table 6.30, there is the alternative option of adjusting the coupling distance L_2 in accordance with Fig. 6.98 and Table 6.31.

Fig.6.98 : Overall length of the coupling assembly (HT-B)

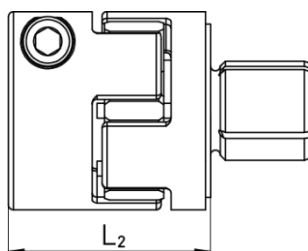


Table 6.31 : Adjustment of the coupling clearance via dimension L_2 for installation without a coupling housing

size	L_2 variant 1 [mm]	L_2 variant 2 [mm]
HT100B	28	27.5
HT150B	46	44.0
HT200B	48	48.0
HT250B	48	48.0

6.9.2 Fitting the motor (without gearbox)

- Fit the motor adapter plate AM flush, taking care to ensure the correct position of the hole for the clamping bolt of the clamping hub (see Fig. 6.99).
- Tighten the 4 screws. For screw tightening torques, see Table 6.32.

Fig.6.99 : Fitting the motor adapter plate AM

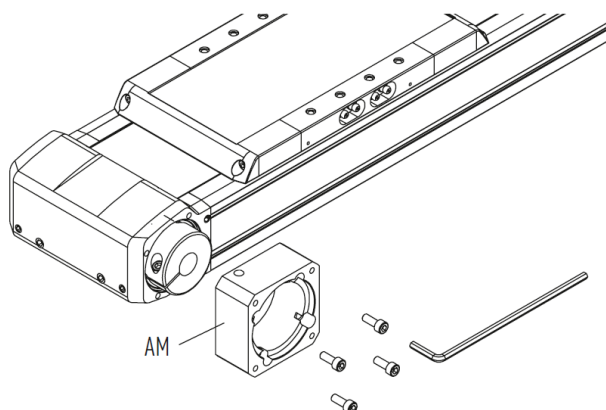
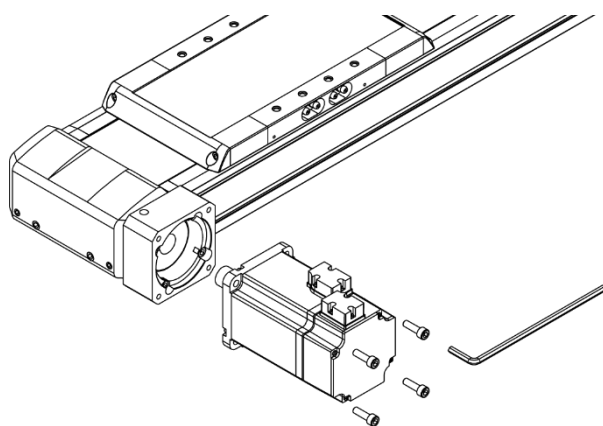


Table 6.32 : Screw tightening torques for the AM motor adapter plate

size	Screw strength class	Thread size	Screw tightening torque [Nm]
HT100B	8.8	M4	3.0
HT150B	8.8	M6	10.0
HT200B	8.8	M8	25.0
HT250B	8.8	M8	25.0

- Secure the motor to prevent it from falling.
- Place the motor flat on the motor adapter plate AM.
- Secure the motor in accordance with the manufacturer's instructions.

Fig.6.100: Screwing the motor to the HT-B linear table



Note:

Ensure that the motor is slid on straight so that the previously set dimension L remains unchanged.

Remove the side locking elements from the motor adapter plate AM.

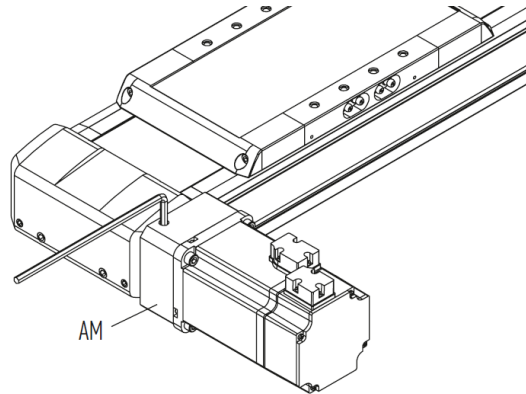
Option 1:

- Tighten the screw on the clamping hub through the bore to the specified screw tightening torque as per Table 6.29.

Option 2:

- Tighten both screws of the clamping hub one after the other through the bore. First position the screw on the first side, then tighten the screw on the second side and finally on the first side to the screw tightening torque specified in [Table 6.29](#).
- Fit the locking elements into the motor adapter plate AM until they reach the stop.
- ✓ The motor is now fitted.

Fig.6.101: Tightening the clamping hub on the motor shaft

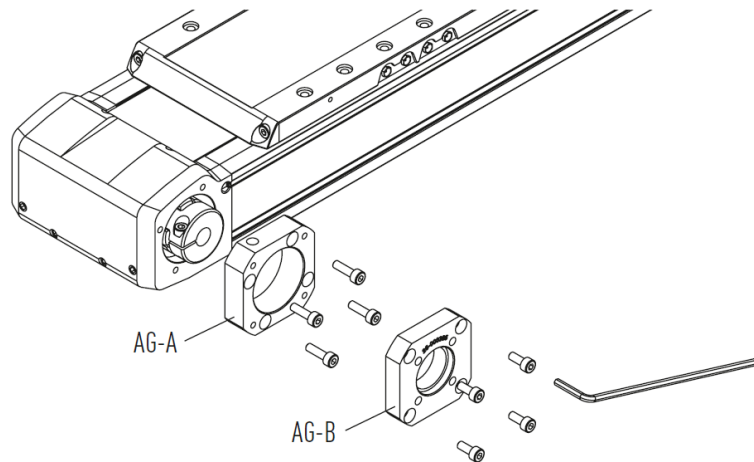


6.9.3 Fitting the gearbox

HT100B:

- Align the first part of the gear adapter plate (AG-A) flush (see [Fig. 6.102](#)). Ensure that the position of the bore for the clamping bolt of the clamping hub is correct.
- Tighten the 4 screws. For screw tightening torques, see [Table 6.33](#).
- Slide the second part of the gear adapter plate (AG-B) onto the first part (AG-A) (see [Fig. 6.102](#)).
- Tighten the 4 screws. For screw tightening torques, see [Table 6.33](#).

Fig.6.102 : Fitting the two-part gear adapter plate AG-A and AG-B – HT100B



HT150B, HT200B, HT250B:

- Fit the AG gear adapter plate flat (see [Fig. 6.103](#)). Ensure that the position of the hole for the clamping bolt of the clamping hub is correct.
- Tighten the 4 screws. For screw tightening torques, see [Table 6.33](#).

Fig.6.103 : Fitting the AG gear adapter plate – HT150B, HT200B, HT250B

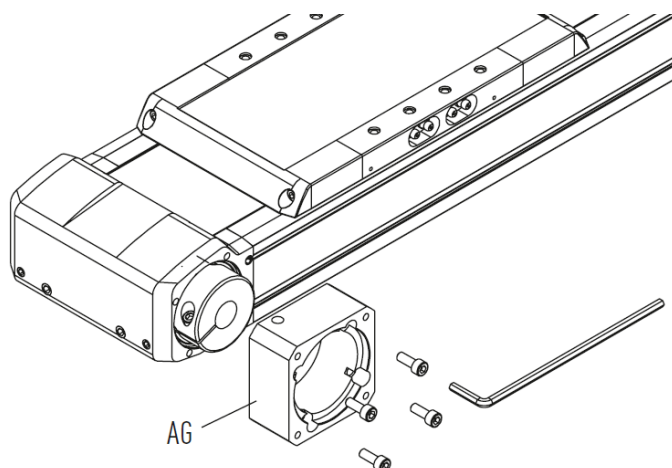
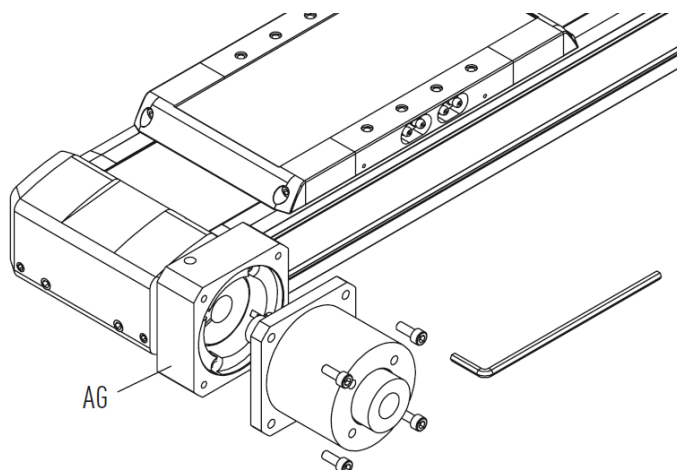


Table 6.33 : Screw tightening torques for the AG gear adapter plate

size	Strength class of screw	Thread size	Screw tightening torque [Nm]
HT100B (AG-A)	8.8	M4	3.0
HT100B (AG-B)	8.8	M4	3.0
HT150B	8.8	M6	10.0
HT200B	8.8	M8	25.0
HT250B	8.8	M8	25.0

- Secure the gearbox to prevent it from falling.
- Place the gearbox flat on the AG gear adapter plate.
- Secure the gearbox with 4 screws in accordance with the manufacturer's instructions.

Fig.6.104: Securing the gearbox to the AG gear adapter plate



Remove the side locking elements from the AG gear adapter plate.

Option 1:

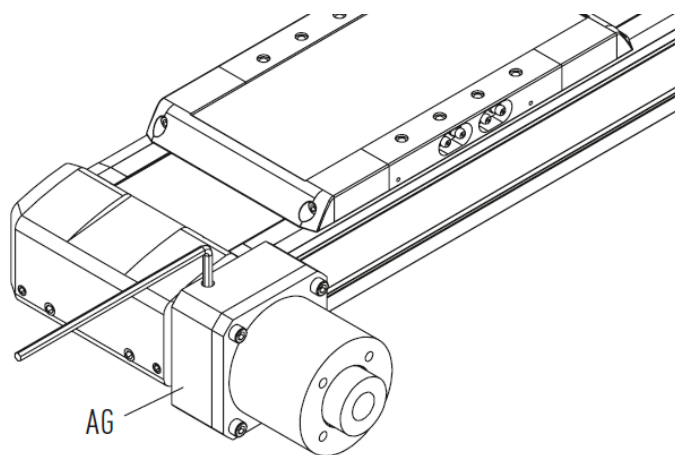
- Tighten the screw on the clamping hub through the bore to the specified screw tightening torque as per [Table 6.29](#).

Option 2:

- Tighten both screws of the clamping hub one after the other through the bore. First apply the screw on the first side, then tighten the screw on the second side and finally on the first side to the screw tightening torque specified in [Table 6.29](#).
- Fit the locking elements into the AG gear adapter plate until they reach the stop.

✓ The gearbox is now fitted.

Fig.6.105: Tightening the clamping hub on the gearbox shaft



6.9.4 Fitting the motor to Neugart gearboxes

Note:

When mounting the motor onto a gearbox, you will need the manual for the gearbox being used.

- Loosen the clamping bolt on the gearbox so that you can later insert the motor shaft into the gearbox's clamping system without difficulty. For smaller motor shaft diameters, use the supplied reduction sleeve.
- Fit the GM motor gear adapter plate flat onto the gearbox, taking care to align the hole for the clamping bolt of the clamping system (see Fig. 6.106).
- Tighten the 4 screws. For screw tightening torques, see Table 6.34 .

Fig.6.106 : Fitting the GM (HT-B) motor gear adapter plate

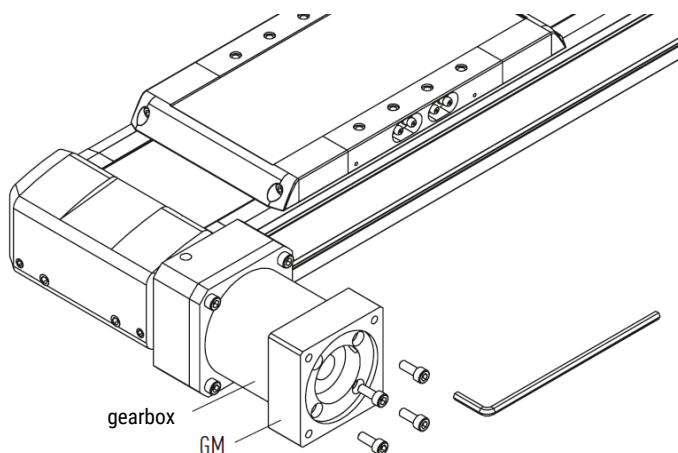


Table 6.34 : Screw tightening torques for the GM motor gear adapter plate

Gearbox ¹⁾	Strength class of screw	Thread size × length	Screw tightening torque [Nm]
PLE040 WPLE040	8.8	M3 × 16	1.3
PLQE060 WPLQE060	8.8	M5 × 10	6.0
PLQE080 WPLQE080	8.8	M6 × 16	10.0
PLQE120 WPLQE120	8.8	M8 × 20	25.0

¹⁾ PLE, WPLE, PLQE, WPLQE and PSBN are registered trademarks of Neugart GmbH

- If possible, rotate the axis so that the motor can be mounted from above in a vertical position.
- Place the motor flat on the GM motor gear adapter plate.
- Remove the side locking element from the GM motor gear adapter plate.
- Tighten the clamping bolt of the clamping system through the bore to the screw tightening torque specified in [in](#) .
- Fit the locking element into the GM motor gear adapter plate until it reaches the stop.

Fig.6.107: Securing the motor shaft to the gearbox clamping system

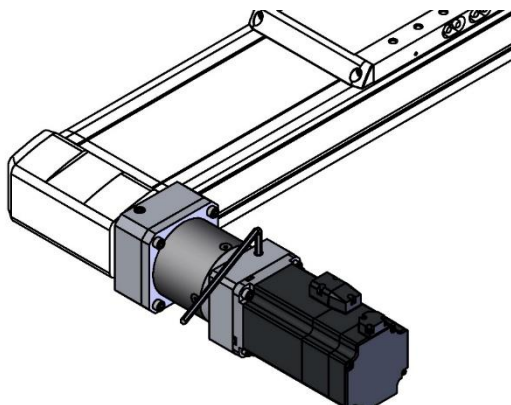


Table 6.35 : Screw tightening torques for the clamping bolt of the gearbox clamping system

Gearbox1)	Strength class of screw	SWISK2)	Screw tightening torque [Nm]
PLE040 WPLE040	12.9	2.5	2.0
		3.0	4.5
PLQE060 WPLQE060	12.9	3.0	4.5
		4.0	9.5
PLQE080 WPLQE080	12.9	4.0	9.5
		5.0	16.5
PLQE120 WPLQE120	12.9	5.0	16.5
		6.0	40.0

1) PLE, WPLE, PLQE, WPLQE and PSBN are registered trademarks of Neugart GmbH

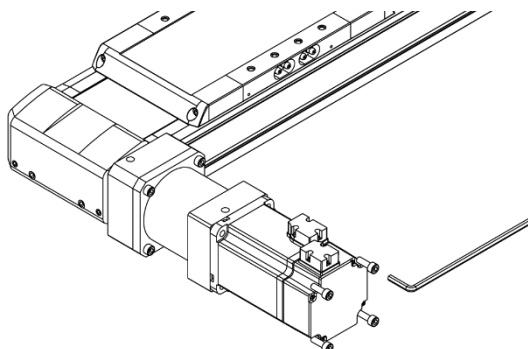
2) Hexagon socket size; varies depending on coupling size/motor used

Note:

When mounting the motor to a gearbox, the manual for the gearbox in question is required.

- Secure the motor in accordance with the manufacturer's instructions.
- ✓ The motor is now fitted.

Fig.6.108: Screwing the motor to the HT-B linear axis with gearbox



6.10 Fitting the drive adapter for the HC-B cantilever axis

6.10.1 Fitting the HC-B coupling assembly

A suitable coupling assembly is required for mounting the motor. You will find this in [section 11.5.6](#) from [page 168](#).

The coupling assembly for the HC-B cantilever axis consists of:

- Clamping hub for the drive side **[1]**
- Elastomer insert **[2]**
- Expansion hub for the axle side **[3]**

There are two designs of clamping hub:

- Variant 1 with one clamping bolt, see [Fig. 6.109](#)
- Variant 2 with two clamping bolts, see [Fig. 6.110](#)

Fig.6.109 : Coupling assembly, variant 1: clamping hub with one clamping bolt

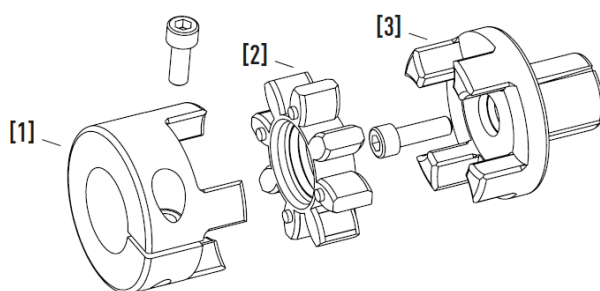
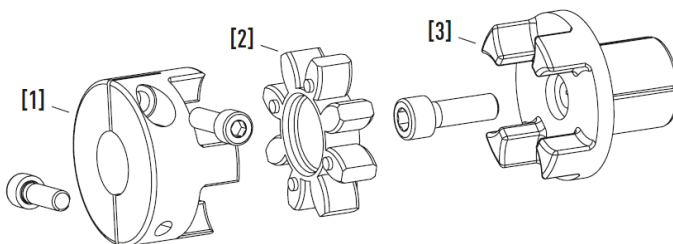


Fig.6.110 : Coupling assembly, variant 2: clamping hub with two clamping bolts



Before assembly, please ensure that

- no parts are damaged;
- all parts are free from dirt and grease.

The screw tightening torques listed in [Table 6.36](#) and [Table 6.37](#) apply to the assembly of the coupling assembly:

Table 6.36 : Screw tightening torques for the expansion and clamping hub

size	Screw tightening torque for expansion hub [Nm]	Screw tightening torque for clamping hub, variant 1 [Nm]	Screw tightening torque for clamping hub, variant 2 [Nm]
HC025B	4	1.9	2.1
HC040B	10	5.0	5.0 ¹⁾
HC060B	10	14.0	14.0 ²⁾
HC080B	25	14.0	15.0
HC100B	49	–	35.0
HC150B	49	–	35.0

¹⁾ Special version with a clamping diameter of 16 mm: 4.0 Nm

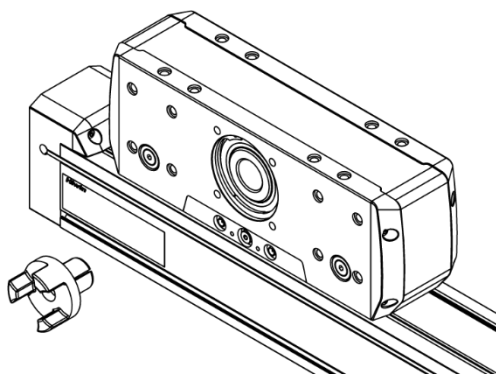
²⁾ Special version with clamping diameters of 22 and 24 mm: 10 Nm

Table 6.37 : Screw tightening torques for the coupling housing

size	Strength class of screw	Thread size	Screw tightening torque [Nm]
HC025B	8.8	M4	3.0
HC040B	8.8	M4	3.0
HC060B	8.8	M6	10.0
HC080B	8.8	M6	10.0
HC100B	8.8	M8	25.0

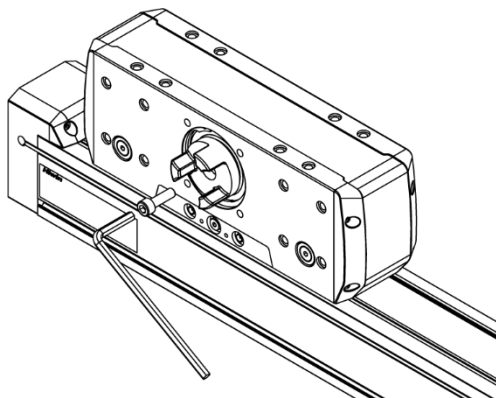
- Position the drive block in the left-hand end position so that the toothed belt pulley cannot rotate.
- Press the expansion hub into the hollow shaft of the toothed belt pulley until the expansion hub sits flush.

Fig.6.111: Fitting the expansion hub



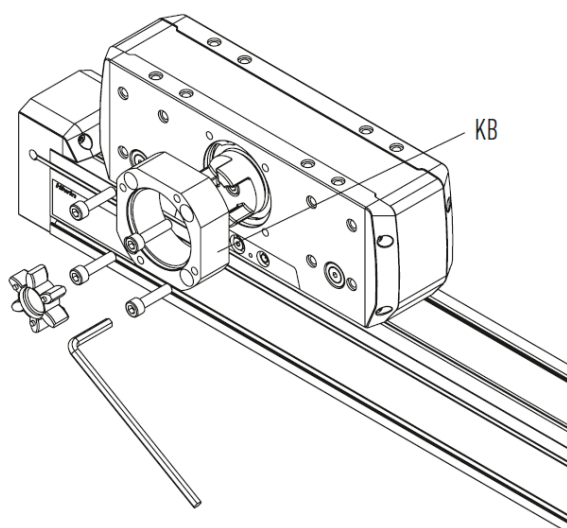
- The expansion mandrel, which is used to secure the coupling, is located in the centre of the expansion hub. Tighten the expansion hub to the screw tightening torque specified in [Table 6.36](#).

Fig.6.112: Fitting the expansion hub by tightening the expansion pin



- Slide the elastomer insert onto the expansion hub.
- Fit the KB coupling housing using 4 screws so that it lies flush
- The coupling housing is not required for the HC150B.

Fig.6.113: Fitting the elastomer insert and mounting the KB coupling housing



Note:

The elastomer insert must be slightly preloaded and should have no backlash. If it fits too loosely, it must be replaced. Lightly greasing the elastomer insert with PU-compatible lubricants can make installation easier.

- Slide the clamping hub onto the elastomer insert until the dimension L_1 (Table 6.38) is achieved.

Fig.6.114: Adjusting the distance of the clamping hub towards the motor with the coupling housing

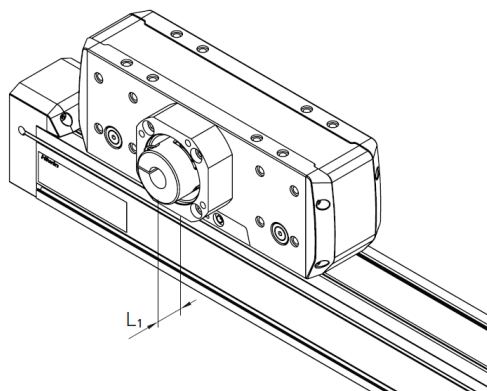


Fig.6.115: Adjustment of the distance between the clamping hub and the motor, without the coupling housing

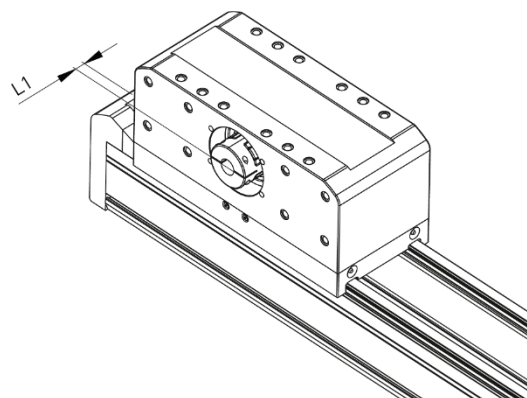


Table 6.38 : Setting the coupling distance using dimension L_1

size	Coupling size	L_1 variant 1 [mm]	L_1 variant 2 [mm]
HC025B	12	13.0	13.3
HC040B	14	10.0	10.0
HC060B	19	14.0	14.0
HC080B	24	16.5	14.5
HC100B	28	–	16.7
HC150B	28	–	16.5

Note:

When installing without a coupling housing, the coupling distance L_2 must be set in accordance with Fig. 6.116 and Table 6.39 .

Fig.6.116 : Overall length of the coupling assembly (HC-B)

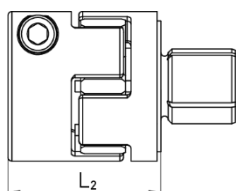


Table 6.39 : Adjustment of the coupling clearance via dimension L_2 for installation without a coupling housing

size	L_2 variant 1 [mm]	L_2 variant 2 [mm]
HC025B	31.0	31.0
HC040B	24.0	27.5
HC060B	41.0	41.0
HC080B	46.5	44.0
HC100B/ HC150B	–	48.0

6.10.2 Fitting the motor (without gearbox)

- Fit the motor adapter plate AM flush, taking care to ensure the correct position of the hole for the clamping bolt on the clamping hub.
- Tighten the 4 screws. For screw tightening torques, see [Table 6.40](#) .

Fig.6.117: Fitting the AM (HC-B) motor adapter plate

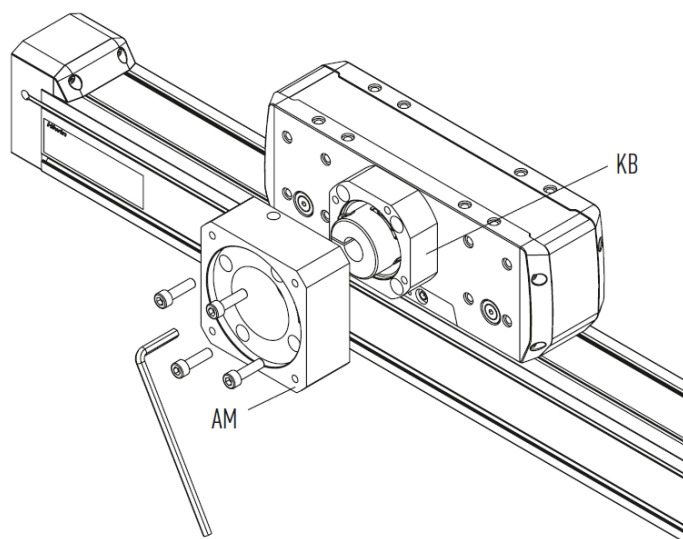
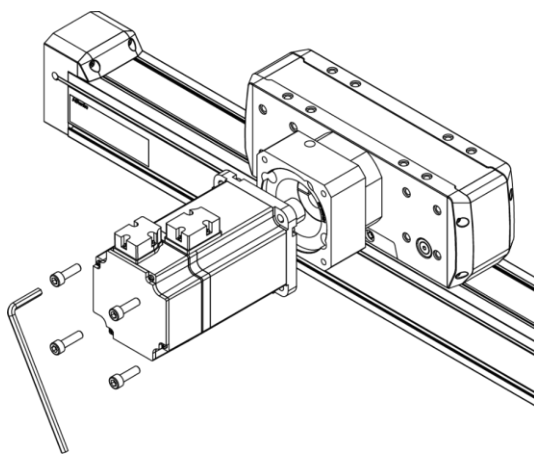


Table 6.40 : Screw tightening torques for the AM motor adapter plate

size	Strength class of screw	Thread size	Screw tightening torque [Nm]
HC025B	8.8	M4	3.0
HC040B	8.8	M4	3.0
HC060B	8.8	M6	10.0
HC080B	8.8	M6	10.0
HC100B	8.8	M8	25.0
HC150B	8.8	M8	25.0

- Secure the motor to prevent it from falling.
- Place the motor flat on the motor adapter plate AM.
- Secure the motor in accordance with the manufacturer's instructions.

Fig.6.118: Bolting the motor to the cantilever axis HC-B



Note:

Ensure that the motor is slid on straight so that the previously set dimension L remains unchanged.

- Remove the side locking elements from the motor adapter plate AM.

Option 1:

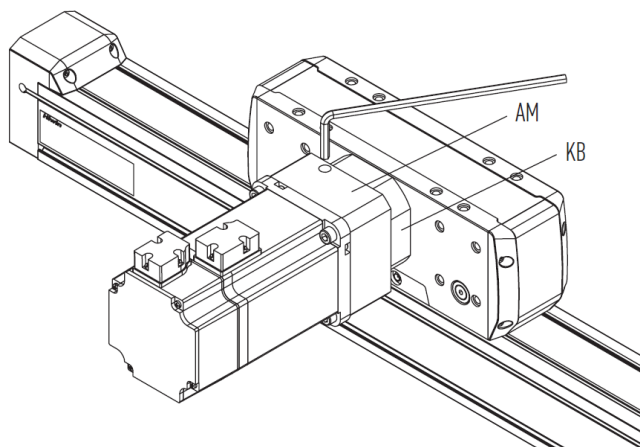
- Tighten the screw on the clamping hub through the bore to the specified screw tightening torque as per [Table 6.36](#).

Option 2:

- Tighten both screws of the clamping hub one after the other through the bore. First position the screw on the first side, then tighten the screw on the second side and finally on the first side to the screw tightening torque specified in [Table 6.36](#).
- Fit the locking elements into the motor adapter plate AM until they reach the stop.

- ✓ The motor is now fitted.

Fig.6.119: Tightening the clamping hub on the motor shaft



Note:

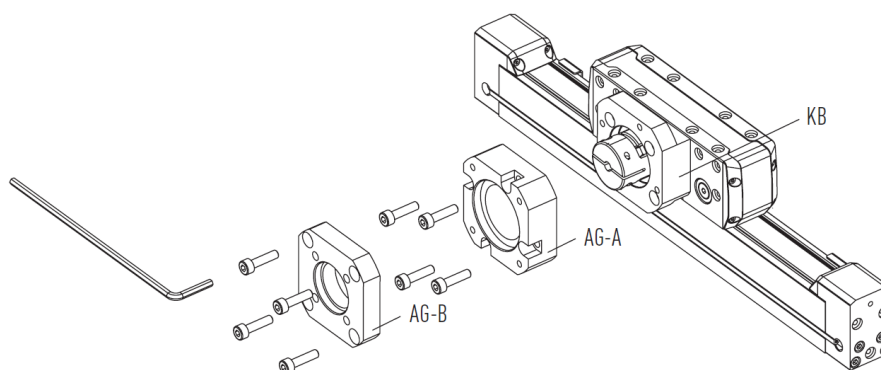
When mounting the motor on a gearbox, the manual for the gearbox in use is required.

6.10.3 Fitting the gearbox

HC025B and HC040B

- Align the first part of the gear adapter plate (AG-A) flush (see Fig. 6.120). Ensure that the position of the hole for the clamping bolt of the clamping hub is correct.
- Tighten the 4 screws. For screw tightening torques, see Table 6.41 .
- Slide the second part of the gear adapter plate (AG-B) onto the first part (AG-A) (see Fig. 6.120).
- Tighten the 4 screws. For screw tightening torques, see Table 6.41 .

Fig.6.120 : Fitting the two-part gear adapter plate AG-A and AG-B – HC025B, HC040B



HC060B, HC080B, HC100B and HC150B

- Fit the AG gear adapter plate flat (see Fig. 6.121), taking care to ensure the correct position of the hole for the clamping bolt of the clamping hub.
- Tighten the 4 screws. For screw tightening torques, see Table 6.41 .

Fig.6.121 : Fitting the gear adapter plate AG – HC060B, HC080B, HC100B, HC150B

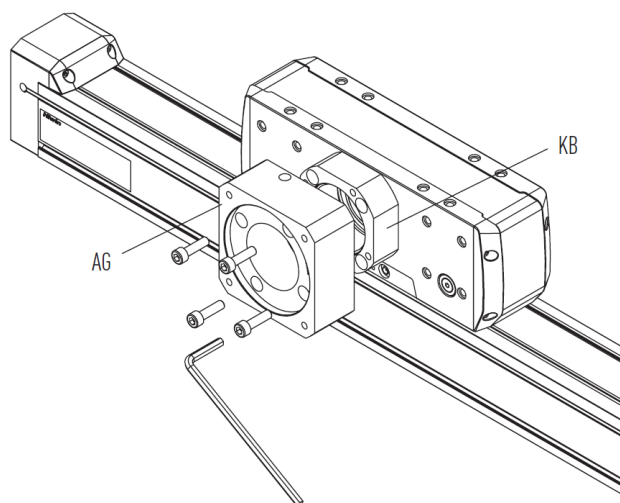
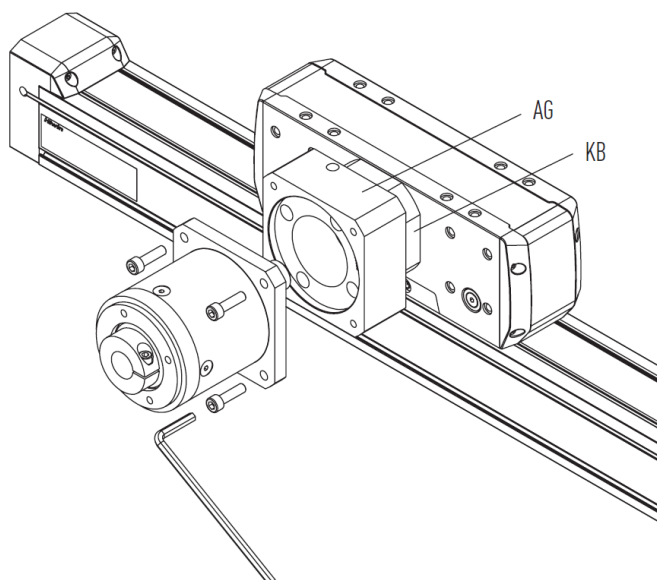


Table 6.41 : Screw tightening torques for the AG gear adapter plate

size	Strength class of screw	Thread size	Screw tightening torque [Nm]
HC025B (AG-A)	8.8	M4	3.0
HC025B (AG-B)	8.8	M4	3.0
HC040B (AG-A)	8.8	M4	3.0
HC040B (AG-B)	8.8	M4	3.0
HC060B	8.8	M6	10.0
HC080B	8.8	M6	10.0
HC100B/HC150B	8.8	M8	25.0

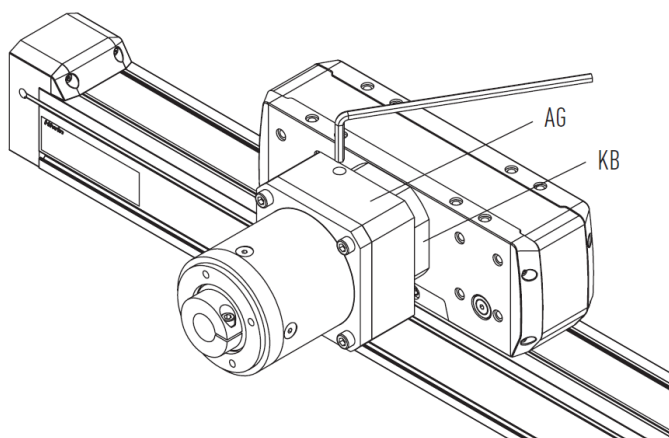
- Secure the gearbox to prevent it from falling.
- Place the gearbox flat on the AG gear adapter plate (see Fig. 6.122).
- Secure the gearbox with 4 screws in accordance with the manufacturer's instructions.

Fig.6.122 : Securing the gearbox to the AG gear adapter plate



- Remove the side locking elements from the AG gear adapter plate.
- **Option 1:** Tighten the screw on the clamping hub through the bore to the screw tightening torque specified in Table 6.36.
- **Option 2:** Tighten both screws of the clamping hub one after the other through the bore. First apply the screw on the first side, then tighten the screw on the second side, and finally on the first side again, using the screw tightening torque specified in Table 6.36.
- Fit the locking elements into the AG gear adapter plate until they reach the stop.
- ✓ The gearbox is now fitted.

Fig.6.123: Tightening the clamping hub on the gearbox shaft



6.10.4 Fitting the motor to Neugart gearboxes

Note:

When mounting the motor onto a gearbox, you will need the manual for the gearbox being used.

- Loosen the clamping bolt on the gearbox so that you can later insert the motor shaft into the gearbox's clamping system without difficulty. For smaller motor shaft diameters, use the supplied reduction sleeve.
- Fit the GM motor gear adapter plate flat onto the gearbox, taking care to align the hole for the clamping bolt of the clamping system (see Fig. 6.124).
- Tighten the 4 screws. For screw tightening torques, see Table 6.42.

Fig.6.124 : Fitting the GM (HC-B) motor gear adapter plate

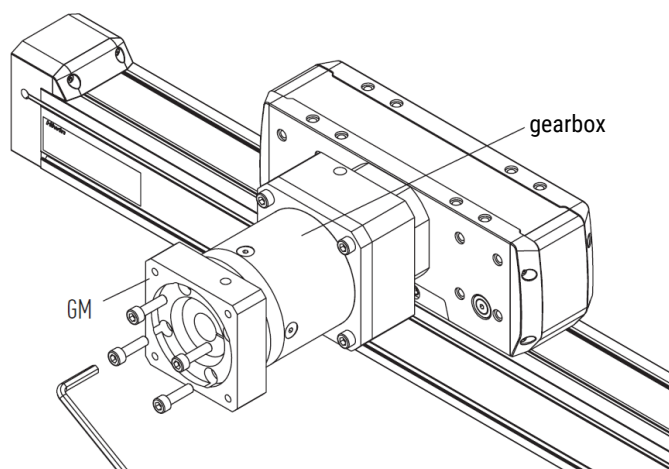


Table 6.42 : Screw tightening torques for the GM motor gear adapter plate

Gearbox ¹⁾	Strength class of screw	Thread size × length	Screw tightening torque [Nm]
PLE040 WPLE040	8.8	M3 × 16	1.3
PLQE060 WPLQE060	8.8	M5 × 10	6.0
PLQE080 WPLQE080	8.8	M6 × 16	10.0
PLQE120 WPLQE120	8.8	M8 × 20	25.0

¹⁾ PLE, WPLE, PLQE, WPLQE and PSBN are registered trademarks of Neugart GmbH

- If possible, rotate the axis so that the motor can be mounted from above in a vertical position.
- Place the motor flat on the GM motor gear adapter plate.
- Remove the side locking element from the GM motor gear adapter plate.
- Tighten the clamping bolt of the clamping system through the bore to the screw tightening torque specified in [in](#) .
- Fit the locking element into the GM motor gear adapter plate until it reaches the stop.

Fig.6.125: Securing the motor shaft to the gearbox clamping system

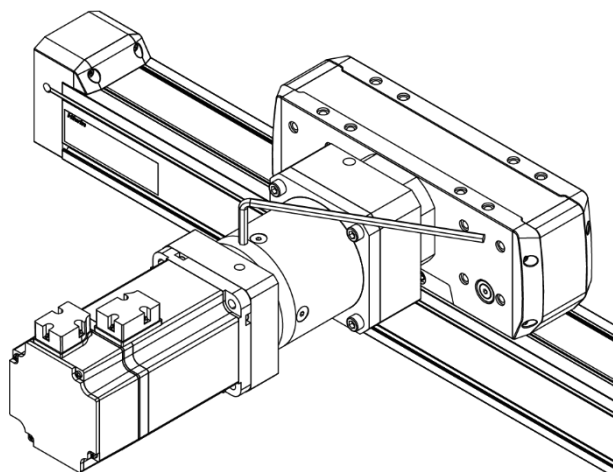


Table 6.43 : Screw tightening torques for the clamping bolt of the gearbox clamping system

Gearbox ¹⁾	Strength class of screw	SWISK ²⁾	Screw tightening torque [Nm]
PLE040 WPLE040	12.9	2.5	2.0
		3.0	4.5
PLQE060 WPLQE060	12.9	3.0	4.5
		4.0	9.5
PLQE080 WPLQE080	12.9	4.0	9.5
		5.0	16.5
PLQE120 WPLQE120	12.9	5.0	16.5
		6.0	40.0

¹⁾ PLE, WPLE, PLQE, WPLQE and PSBN are registered trademarks of Neugart GmbH

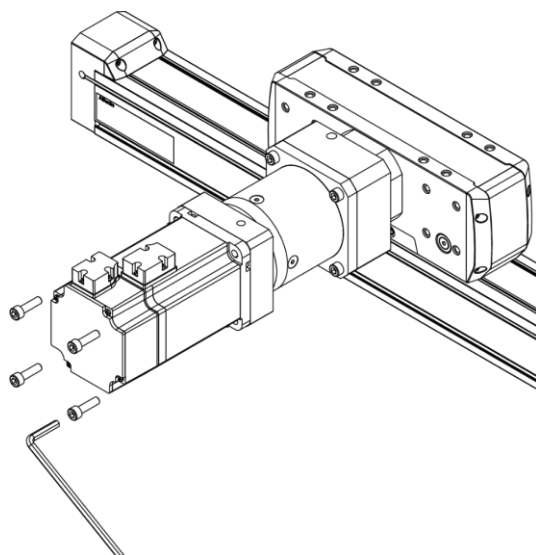
²⁾ Hexagon socket size; varies depending on coupling size/motor used

Note:

When mounting the motor to a gearbox, the manual for the gearbox in question is required.

- Secure the motor in accordance with the manufacturer's instructions.
- ✓ The motor is now fitted.

Fig.6.126: Screwing the motor to the HC-B linear axis with gearbox



6.10.5 Fitting the journal

The journal is an alternative interface for the motor and encoder. It can be retrofitted to the drive unit housing.

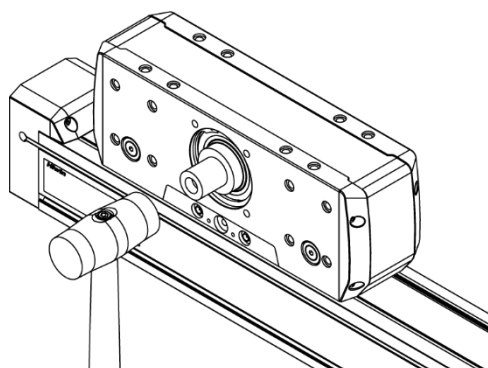
Table 6.44 : Screw tightening torques for journals

size	screw	Screw strength class	Screw tightening torque [Nm]
HC025B	ISO 4762 M4 × 25	12.9	2.9
HC040B	ISO 4762 M4 × 30	12.9	4.5
HC060B	ISO 4762 M6 × 45	12.9	10.0
HC080B	ISO 4762 M8 × 55	12.9	25.0
HC100B, HC150B	ISO 4762 M10 × 60	12.9	55.0

Please ensure before assembly that

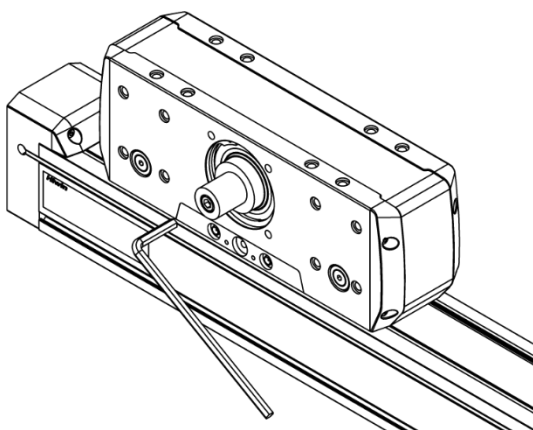
- no parts are damaged;
- all parts are free from dirt and grease.
- Position the drive block in the left-hand end position so that the toothed belt pulley cannot rotate.
- Carefully press the journal into the hollow shaft of the toothed belt pulley until the expansion hub sits flush.
- Ensure that the shaft journal flange sits flush. If necessary, use a light plastic hammer to assist.

Fig.6.127: Inserting the journal into the drive block of the HC-B cantilever axis



- Tighten the screw in the centre of the journal to the screw tightening torque specified in [Table 6.44](#).

Fig.6.128: Tightening the screw on the journal



6.11 Fitting the drive adaptor for the HD double axis systems and the HS multi-axe systems

To fit the drive adaptor, follow the installation instructions for the individual axes installed ([sections 6.7](#), [6.8](#), [6.9](#), [6.10](#)).

6.12 Fitting the cover for the drive block

The cover plate is used to cover any unused input and output shafts on the HM-B, HT-B, HC-B and HB-B linear axes with toothed belt drives.

- Place the sheet metal cover onto the drive block.
- Lightly screw the sheet metal cover to the drive block using the screws provided.
- Tighten the screws on the sheet metal cover. For screw tightening torques, see [Table 6.45](#).
- ✓ The sheet metal cover is now fitted.

Fig.6.129: Placing the sheet metal cover onto the HT-B or HM-B drive block

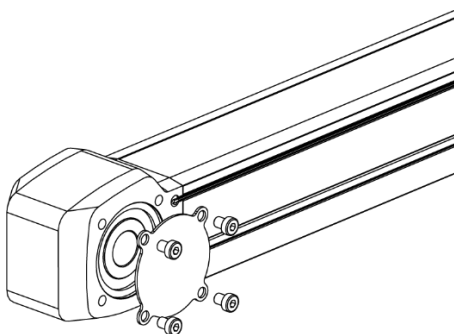


Fig.6.130: Placing the sheet metal cover onto the HC-B drive

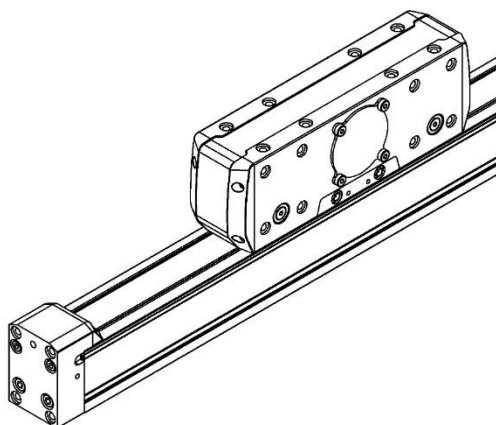


Fig.6.131: Tightening the screws on the sheet metal cover

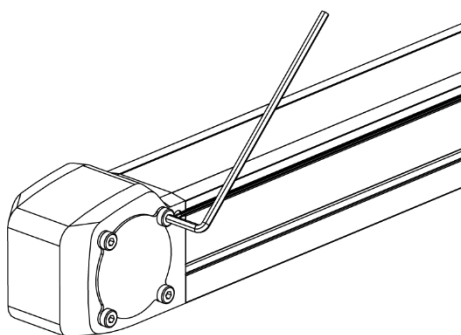


Table 6.45 : Screw tightening torques for the sheet metal cover

Axis type/size	Screw strength class	Thread size × length	Screw tightening torque [Nm]	Item number
HC025B	8.8	M4 × 6	2.4	25-002379
HM040B, HC040B	8.8	M4 × 6	2.4	25-002375
HM060B, HC060B	8.8	M6 × 8	8.0	25-002376
HM080B, HC080B	8.8	M6 × 8	8.0	25-002377
HM120B, HC100B	8.8	M8 × 12	20.0	25-002378
HC150B	8.8	M8 × 12	20.0	80111835
HT100B	8.8	M4 × 6	2.4	25-002372
HT150B	8.8	M6 × 8	8.0	25-002373
HT200B, HT250B	8.8	M8 × 12	20.0	25-002374
HB250B	8.8	M10 × 16	38.0	80111787

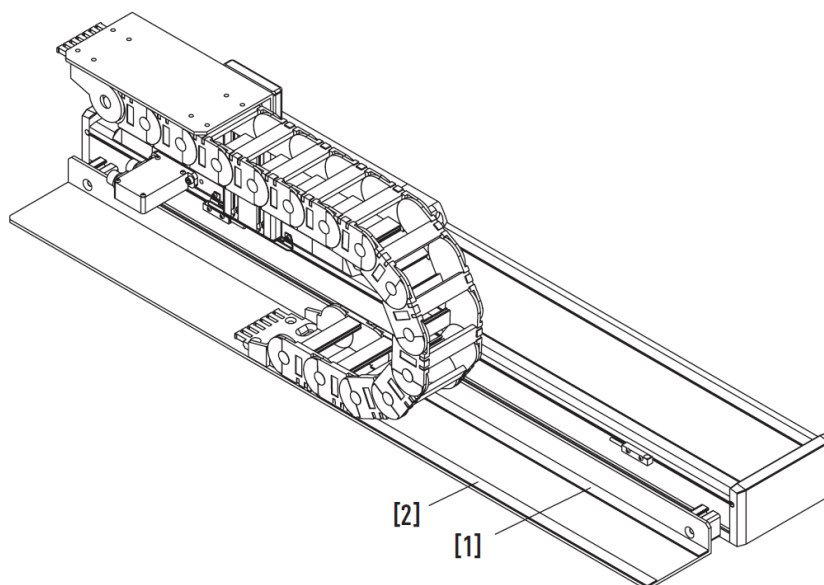
6.13 Fitting the noise-reduction strip to energy chains

The strip is designed to reduce noise emissions from the energy chain.

- Manually push the slide to its mechanical end position so that the energy chain rests as fully as possible on the energy chain support.
- Cut the noise-reduction tape to a length corresponding to the maximum contact length of the energy chain. Two strips of the same length are required for each energy chain.
- Push the slide by hand to the other end position so that the lower part of the energy chain is lifted as far as possible off the energy chain support.
- Clean the energy chain support so that it is free of dirt, dust and grease.

- Stick the first strip **[1]** flush with the corner of the energy chain support (see Fig. 6.131).
 - Stick the second strip **[2]** flush with the outer edge of the support bracket (X-axis HS24-D-T: 23 mm distance parallel to the outer edge).
 - Move the slide and ensure that the energy chain rolls along the straps over its entire travel distance.
- ✓ The noise-reduction tape is fitted.

Fig.6.132 : Linear axis with noise-reduction tape fitted



6.14 Electrical connection

⚠ **Danger!** Risk of electric shock!

If the motor is not properly earthed, there is a risk of electric shock.

- Ensure that the linear axes/linear axis systems are properly earthed via the PE rail in the switch cabinet before connecting the electrical power supply!

⚠ **Danger!** Risk of electric shock!

Electric currents can still flow even when the motor is not moving.

- Ensure that the linear axes/linear axis systems are de-energised before disconnecting the motors' electrical connections!
- After disconnecting the servo drive from the power supply, wait at least 5 minutes before touching live parts or disconnecting any connections!
- For safety reasons, measure the voltage in the servo drive's DC link. Wait until it has dropped below 40 V!
- Work on electrical installations must only be carried out by qualified personnel!

6.14.1 Limit switch connection

The pin assignment for the limit switch plug for variants A and B can be found at [Fig. 6.133](#). For variants C and D with exposed wire ends, the wires must be connected as shown at [Fig. 6.132](#).

Fig.6 .133 : Wiring diagram

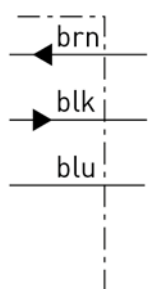
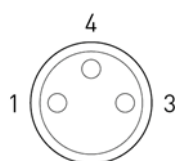


Fig.6 .134 : Pin assignment: limit switch plug



Pin assignment:
1: Brown brn (+ Vsp)
3: Blue blu (0 V)
4: Black (switching output)

SA Switching output

Note:

As the sensor operates at a low voltage, it does not normally pose a risk of injury or danger to life on its own.

Note:

Do not operate the sensor at a voltage other than that specified, as this may damage it!

6.14.2 Connection of external distance measuring system

 **Danger!** Risk of injury

Incorrect connection of the position measurement system can lead to uncontrolled movement of the slide and, under certain circumstances, to damage to the axis.

The position measurement system must only be connected by qualified personnel!

HM-B, HT-B, HC-B: MAGIC and APM distance measuring systems

When connecting the position measurement system in accordance with Table 6.46 or Table 6.47, the positive direction of travel shown in Fig. 4.6 applies.

HB-B: MAGIC distance measuring system

When connecting the position measuring system in accordance with Table 6.46, the positive direction of travel shown in Fig. 4.7 applies.

Table 6.46 : HIWIN MAGIC cable and connector pin assignments

Colour of encoder cable	Signal
Brown	5 V power supply
White	GND / 0 V
Green	V1+ / A
Yellow	V1- / $\bar{A}$
Blue	V2+ / B
Red	V2- / $\bar{B}$
Violet	Ref+ / Z
Grey	Ref- / $\bar{Z}$
	Shield

If a positive counting direction in the opposite direction is required, 'A' must be swapped with 'B' and ' $\bar{A}$ ' with ' $\bar{B}$ ' when connecting to the evaluation electronics.

Table 6.47: Cable and connector pin assignments HIWIN APM

Colour of encoder cable	Signal
Brown	Power supply 4.5 – 28 V
Green	Power supply 4.5 – 28 V
Grey	Power supply 4.5 – 28 V
White	GND / 0 V
Yellow	GND / 0 V
Pink	GND / 0 V
Dotted cable Yellow and brown	SIN+
Dotted cable, yellow and white	SIN-
Dotted cable: green and brown	COS+
Dotted cable, green and white	COS-
Blue	MA+ / Clock+
Red	MA- / Clock-
Violet	SLO+ / Data+
Black	SLO- / Data-
Inner shield	Inner shield
Outer shield	Outer shield

6.14.3 Motor connection

Note:

For information on the motor's connection options, please refer to the instruction manual for the motor in use!

6.14.4 Servo drive connection

Note:

For information on the servo drive's connection options, please refer to the instruction manual for the servo drive you are using!

6.15 Pneumatic connection

The HC-B cantilever axis (HC060B, HC080B, HC100B and HC150B) can be optionally fitted with a pneumatic clamping or brake element (see order code on [page 22](#)). The pneumatic connection for the clamping or brake element is factory-fitted on the side of the lower part of the drive block of the axis (see [Fig. 6.139](#)).

The connection for the hose has an external diameter of 6 mm. Further technical details can be found in [Table 6.47](#).

Fig.6.135 : Position of the pneumatic connection for the clamping or brake element (HC060B, HC080B, HC100B, HC150B)

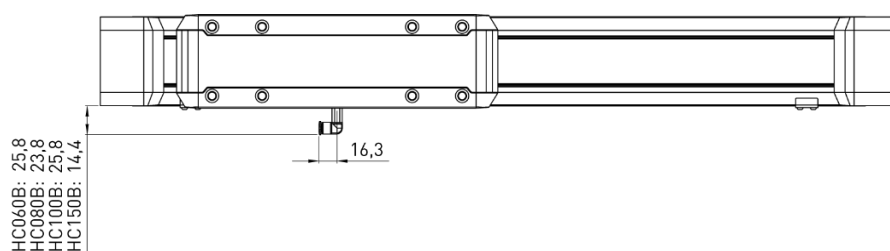


Table 6.47 : General features of the pneumatic connection

Design	Push-pull principle
Nominal tightening torque	1.33 Nm
Pneumatic connection for hose	Outer diameter: 6 mm
Nominal diameter	2 mm

7 Maintenance and cleaning

⚠ Danger! Risk of electric shock or burns due to contact with live parts!

Contact with live parts may result in injury.

Cables installed by the customer may become frayed due to constant movement within the energy chain if laid incorrectly, thereby exposing electrical contact points.

- ▶ Control system design in accordance with DIN EN 12100. No start-up after:
 - Power-up, return of power!
 - Troubleshooting!
 - Stop the machine!
- ▶ Cabling must only be installed by qualified personnel!
- ▶ Work on electrical installations must only be carried out by qualified personnel!

⚠ Warning! Risk of shock and crushing!

Injuries may result from the slide moving or starting unintentionally.

- ▶ Where linear axes or linear axis systems are arranged vertically, secure the slide when it is at a standstill!
- ▶ Control system design in accordance with DIN EN 12100: No start-up following:
 - application or return of energy!
 - Troubleshooting!
 - Stopping the machine!

⚠ Warning! Risk of injury and damage to property!

Unauthorised work on the system poses a risk of injury and may invalidate the warranty.

- ▶ Assembly and maintenance of linear axes/linear axis systems must only be carried out by qualified personnel!

⚠ Warning! Risk of shock and crushing due to the axis falling or the payload becoming detached! Risk from heavy loads!

- ▶ Use suitable lifting equipment!
- ▶ Secure the linear axes/linear axis systems in accordance with the assembly instructions (see section 6.2)!
- ▶ Secure the payload in accordance with the assembly instructions (see section 6.3)!

⚠ Warning! Risk of shock and crushing due to the clamping or brake element opening!

As soon as air is supplied, the clamping mechanism opens.

- ▶ Before carrying out any work, disconnect the linear axes/linear axis systems from the power supply and secure them against being switched on again!
- ▶ Ensure that moving parts of the linear axis are secured against unintended movement!
- ▶ Observe the applicable safety regulations for working with compressed air!

⚠ Caution! Risk of crushing due to the axes tipping over!

- ▶ Secure the machine and its components to prevent them from tipping over!

⚠ Caution! Risk of shock and crushing!

When moving the axes manually, injuries may occur due to moving and displaced axes as well as attached components (energy chains, customer-supplied attachments).

- ▶ Observe the applicable health and safety regulations!
- ▶ Transport to the installation site must only be carried out by qualified personnel!

⚠ Caution! Risk to health and the environment!

Contact with lubricants may cause irritation, poisoning and allergic reactions, as well as environmental damage.

- ▶ Use only suitable media that are harmless to humans. Observe the manufacturers' safety data sheets!
- ▶ Ensure proper disposal!

! Warning! Damage caused by the wrong lubricant!

Using the wrong lubricant can lead to property damage or environmental pollution.

- ▶ Use the correct type of lubricant (grease, oil) as specified in these assembly instructions!

During maintenance work:

- Secure the linear axis/linear axis systems to prevent unauthorised activation.
- De-energise the linear axis/linear axis systems.
- Secure the linear axis/linear axis systems to prevent unauthorised reactivation.



Note:

It is essential to adhere to the maintenance intervals for cleaning and lubrication.

- ▶ Include the maintenance intervals in your maintenance schedule.

⚠ Warning! Risk of cuts!

The cover strip may cause cuts during assembly and disassembly.

- ▶ Commissioning and set-up must only be carried out by qualified personnel wearing appropriate protective equipment (gloves, safety goggles)!

⚠ Caution! Risk to health and the environment!

Contact with lubricants may cause irritation, poisoning and allergic reactions, as well as environmental damage.

- ▶ Use only suitable media that are harmless to humans. Observe the manufacturers' safety data sheets!
- ▶ Ensure proper disposal!

7.1 Lubrication

The operation of the linear axis/linear axis systems results in the continuous consumption of lubricant. The product must be relubricated regularly. Please note that small quantities of lubricant may leak from the lubrication system.

The following factors influence the lubrication intervals:

- Dust and dirt
- Operating temperatures
- Loads
- Vibration loads
- Constantly short positioning strokes
- Rotational speeds

Note:

Inadequate lubrication or the use of the wrong lubricant increases wear and reduces service life!

7.1.1 Lubrication of the HM-B/HT-B/HC-B /HB-B linear axes

The HM-B/HC-B linear axis comprises a linear guideway with two blocks, whilst the HT-B linear tables are fitted with two rails, each with two blocks. The linear guideways are factory-lubricated with an initial lubricant. This initial lubrication is sufficient for the first lubrication interval. For relubrication, there are two (HM-B/HC-B) or four (HT-B) grease nipples (one for each block) on the side of the slide. The relubrication quantity can be found Table 7.1 .

The lubrication interval depends on the load, speed, cycle time and ambient conditions. The guide values given in Fig. 7.1 , Fig. 7.2 and Fig. 7.3 apply to the lubrication interval.

Table 7.1 : Relubrication quantity per block

size	Optional profile rail	block	lubricant	Relubrication quantity [cm ³]
HM040B	–	MGN15C	G04	0.04
HM060B	–	QEH15CA	G04	0.30
HM060B	O: Mx+ (CG)	CGL15CA	G04	0.30
HM080B	–	QHH20CA	G04	0.50
HM080B	O: Mx+ (CG)	CGH20CA	G04	0.50
HM120B	–	QHW30CC	G04	1.30
HM120B	O: Mx+ (CG)	CGW30CC	G04	1.30
HM120B-H	–	QHW30HC	G04	1.70
HT100B	–	QEH15CA	G04	0.30
HT150B	–	QEH15CA	G04	0.30
HT200B	–	QHH20CA	G04	0.50
HT250B	–	QHH25CA	G04	0.80
HC025B	–	MGN09C	G04	0.04
HC040B	–	MGN15C	G04	0.04
HC060B	–	CGL15CA	G04	0.30
HC080B	–	CGH20CA	G04	0.50
HC100B	–	CGL25CA	G04	0.80
HC150B	–	QHH20CA	G04	0.50
HB250B	–	CGH25HA	G04	1.00

Fig.7.1 : Load-dependent relubrication interval for HM-B/HT-B/HB-B linear axes

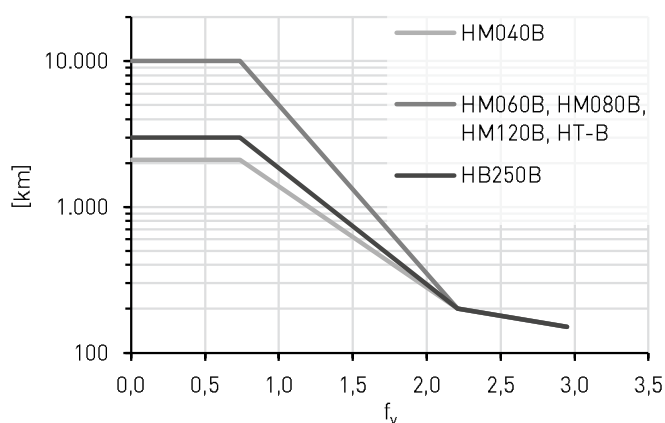


Fig.7.2 : Load-dependent relubrication interval for HM-B linear axes with optional Mx+ profile rail (CG)

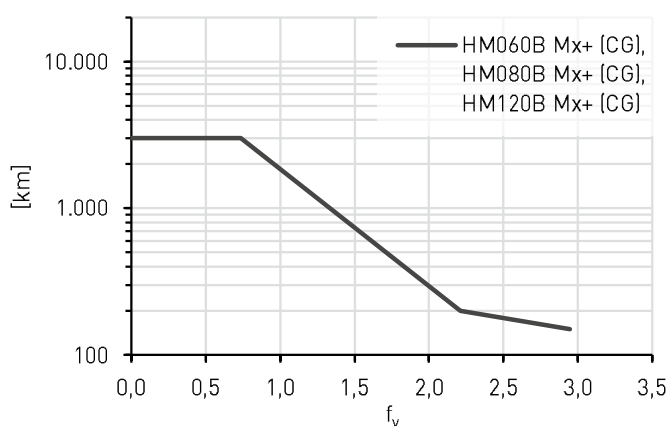
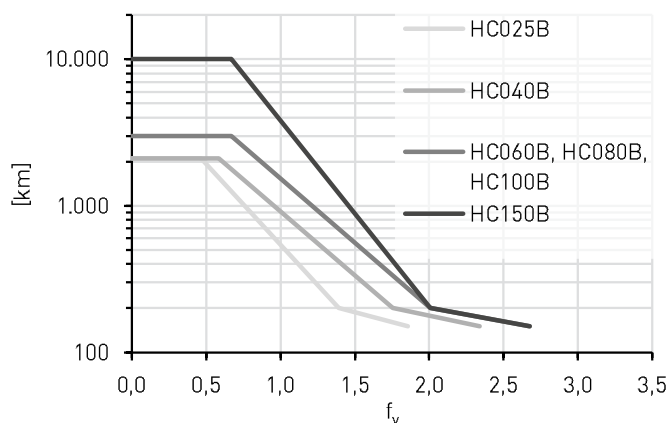


Fig.7.3 : Load-dependent relubrication interval for HC-B linear axes



f_v = load comparison factor as per the 'Linear Axes & Linear Axis Systems' catalogue, chapter 'Calculation Principles'

Table7.2: Lubricant for linear guideways

Designation / Type	Application range	Unit of measurement	article number
G04	HX Standard / high speed	400g cartridge	20-000345
G02	HX Cleanroom / HX Special	400g cartridge	20-000339

7.1.2 Lubrication of HD double axis and HS2/HS3 linear axis systems

For HD double axis and HS2/HS3 linear axis systems, each individual axis must be lubricated separately in accordance with the specifications in section [7.1.1](#).

7.1.3 Lubrication procedure

Note:

Use only lubricants in accordance with DIN 51825, KP2K, NLGI consistency class 2!

Note:

Ensure that only lubricants without solid lubricant content (e.g. graphite or MoS₂) are used!

Note:

If the linear axes are installed vertically, horizontally or ceiling-mounted, the relubrication quantities must be increased by approx. 50 per cent.

Note:

Under special operating conditions (contamination, short stroke, mounting type), the lubrication intervals must be adapted to the specific application.

Note:

On the HM-B model, each lubrication point has two grease nipples, positioned on the left and right of the slide. This allows relubrication to be carried out from both the left and right sides of the slide.

Note:

On the HT-B model, there are four grease nipples on the right-hand side of the carriage, which are used to lubricate all four blocks.

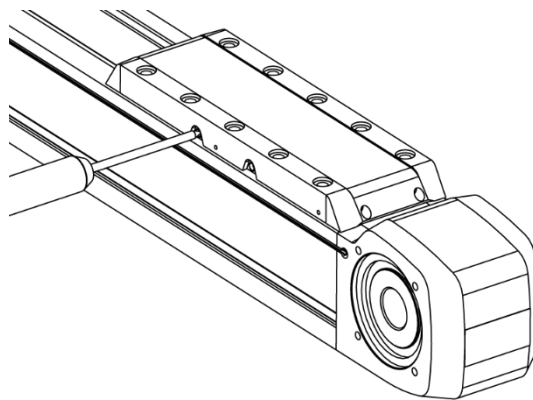
Note:

For cleanroom applications, use lubricant G02.

Lubrication using the linear guideway as an example:

- Move the slide to any position.
 - Position the nozzle at a right angle to a lubrication point on the side.
 - Press the nozzle against the grease nipple using manual force.
 - Operate the lubricant gun until the required amount of lubricant (see [Table 7.1](#)) has been applied.
 - Repeat the procedure for all lubrication points on the selected carriage side.
- ✓ The linear guideway is now lubricated.

Fig.7.4: Lubrication using the HM-B as an example



7.2 Cleaning the linear axis

The linear axes must be checked regularly and cleaned from the outside.

Please note the following points when cleaning:

- Do not use compressed air.
- The surface is anodized and only has limited resistance to alkaline cleaning agents. Only neutral cleaning agents must be used for cleaning.
- Remove coarse particles from the surface regularly. A damp, soft, lint-free cleaning cloth is ideal.
- The cover strip is subject to abrasion due to operational friction. Remove the abrasion regularly.

7.3 Replacing the cover strip – HM-B

The cover strip must be replaced when it begins to ripple and when it is no longer held in position by the magnetic strips. In this case, an adequate sealing effect can no longer be guaranteed.

- Loosen the clamping bolt on the cover strip clamp on both sides of the axis as shown. Fig.7.14: Dismantling/assembly of the slide end piece [Fig. 7.9](#)
 - Loosen the screws on the slide end piece and remove it from both sides on all slides (see [Fig. 7.7](#)).
 - Loosen the screws on the belt deflection unit and remove it from both sides of all slides (see [Fig. 7.5](#)).
 - Now remove the cover strip and the tribo-tape by pulling both out of the carriage profile.
 - Remove any dirt from the cover strip clamp, slide end piece, belt deflection unit and tribo-tape using a damp, soft, lint-free cloth.
 - Cut the new cover strip to the same length as the removed cover strip.
 - Feed the cover strip through the upper opening of the carriage profile as shown in [Fig. 7.3](#).
 - Thread the belt deflection guide onto the cover strip on both sides of the slide. Ensure the belt deflection guide is correctly oriented as shown in [Fig. 7.4](#).
 - Tighten the belt deflection screws by hand.
 - Slide the tribo-tape through the upper opening of the belt deflection as shown in [Fig. 7.6](#) and align it lengthways.
 - Fit the slide end pieces onto the belt deflection as shown in [Fig. 7.7](#) and tighten the mounting bolts by hand.
 - Slide the ends of the cover strip on both sides under the cover strip clamp (see [Fig. 7.8](#)). Ensure that the cover strip is aligned with the axis profile and rests on the magnetic strips along its entire length.
 - Tighten the clamping bolts on the cover strip clamp (see [Fig. 7.9](#)) by hand until snug.
 - Move the slide to both end positions and check the alignment of the cover strip. If necessary, loosen the screws on the cover strip clamp again, align the cover strip and retighten the screws.
- ✓ The new cover strip is now fitted

Fig.7.5 : Fitting the cover strip in the slide

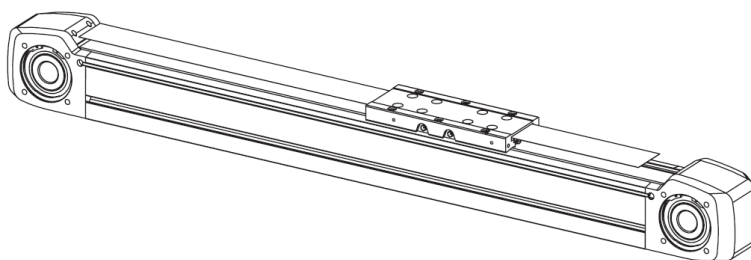


Fig.7.6 : Orientation of the belt deflection

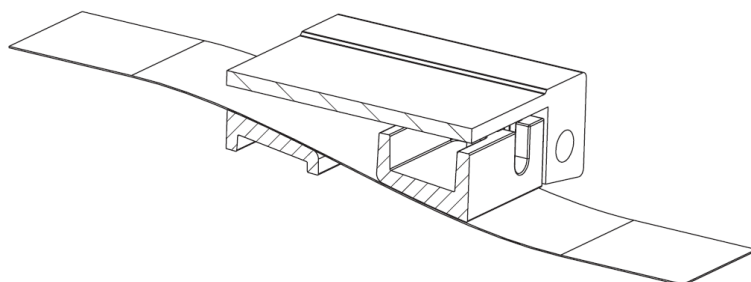


Fig.7.7 : Removal/fitting of the belt deflection mechanism

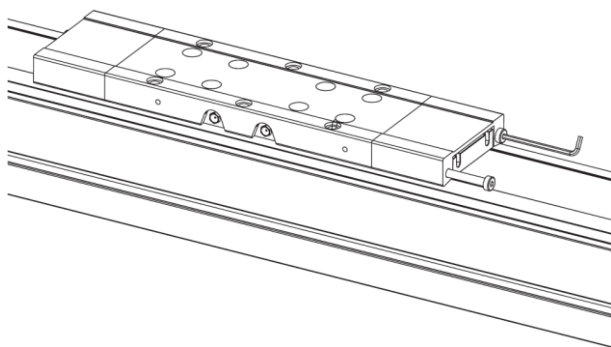


Fig.7.8 : Fitting the tribo-tape

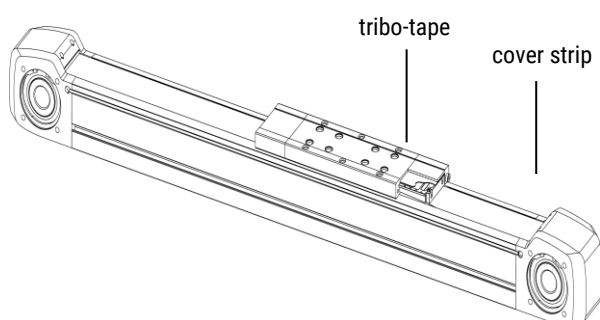


Fig.7.9 : Removal/fitting of the slide end piece

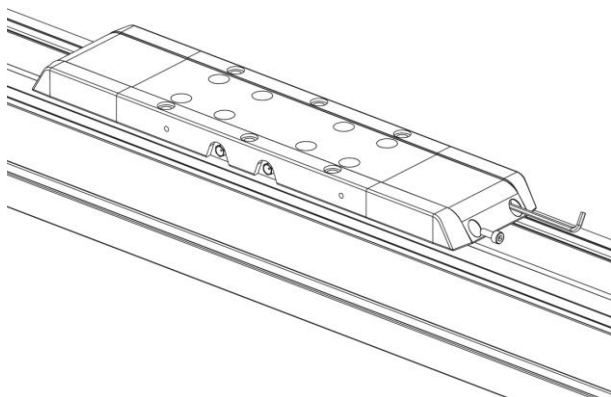


Fig.7.10 : Fitting the cover strip into the cover strip clamp on the HM-B

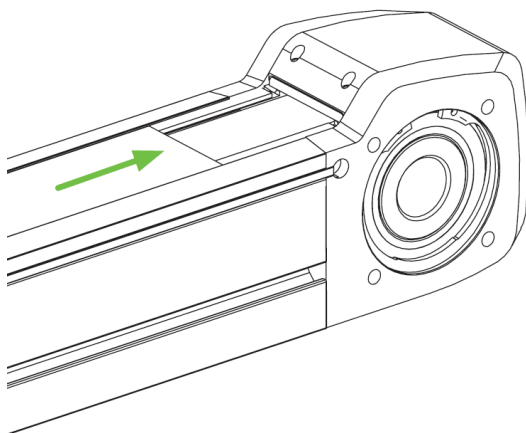
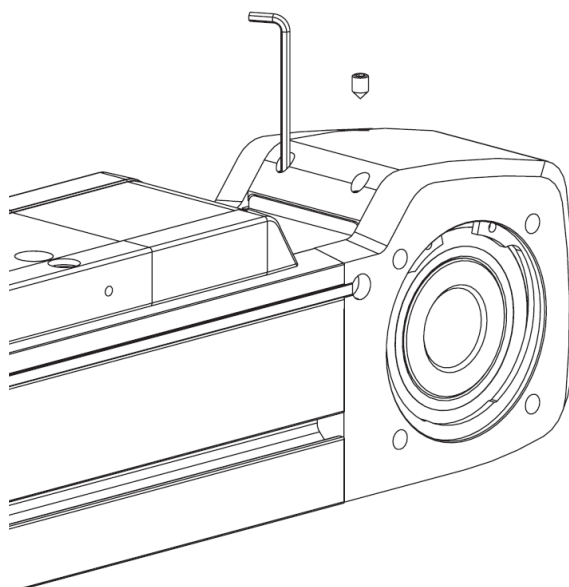


Fig.7.11 : Removal/installation of the cover clamp on the HM-B



7.4 Replacing the cover strip – HT-B

The cover strip must be replaced when it begins to ripple and when it is no longer held in position by the magnetic strips. In this case, an adequate sealing effect can no longer be guaranteed.

- Loosen the clamping bolt on the cover strip clamp on both sides of the axis as shown in [Fig. 7.16](#) .
- Loosen the screws on the slide end piece and remove it from both sides on all slides (see [Fig. 7.14](#)).
- If present, remove the cover tape guide as described in Chapter [7.5](#)
- Remove the slide cover by sliding it out of the carriage profile (see [Fig. 7.10](#)).
- Loosen the mounting bolts for the belt deflection and remove them on both sides of all slides (see [Fig. 7.11](#)).
- Now remove the cover strip by lifting it off the carriage profile.
- Remove any dirt from the cover strip clamp, slide end piece, belt deflection unit, strip guide and slide cover using a damp, soft, lint-free cloth (with ethanol if necessary).
- If necessary, replace the strip guides on the top of the carriage profile and the bottom side of the belt deflection (see [Fig. 7.12](#)).
- Cut the new cover strip to the same length as the cover strip that has been removed.
- Place the cover strip on the magnetic strip of the base profile and run it across the carriage profile (see [Fig. 7.13](#)).
- Align the cover strip.
- Fit the belt deflection on both sides of the slide as shown in [Fig. 7.11](#) .
- Align the belt deflection unit.
- Tighten the belt deflection unit screws by hand.
- Fit the slide cover by sliding it into the groove in the carriage profile and the belt deflection (see [Fig. 7.10](#)).
- Fit the slide end pieces onto the slide as shown in [Fig. 7.14](#) and tighten the mounting bolts by hand.
- Slide the ends of the cover strip on both sides under the cover strip clamp (see [Fig. 7.15](#)). Ensure that the cover strip is aligned with the axis profile and rests on the magnetic strips along its entire length.

- Tighten the clamping bolts on the cover strip clamp by hand (see Fig. 7.16).
 - Move the slide to both end positions and check the alignment of the cover strip. If necessary, loosen the screws on the cover strip clamp again, align the cover strip and retighten the screws.
- ✓ The new cover strip is now fitted

Fig.7.12 : Removal/installation of the slide cover

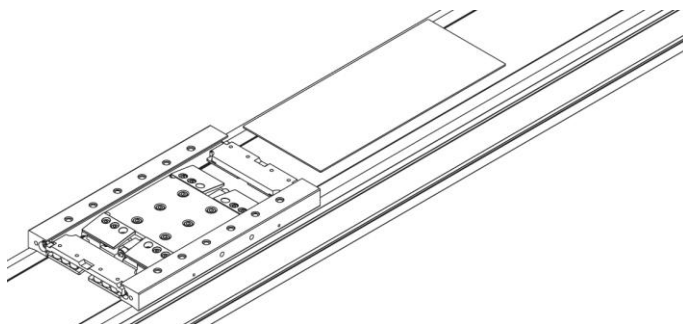


Fig.7.13 : Removal/installation of belt deflection

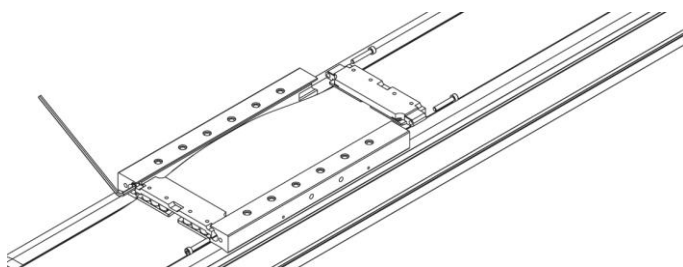


Fig.7.14 : Removal/installation of the strip guide

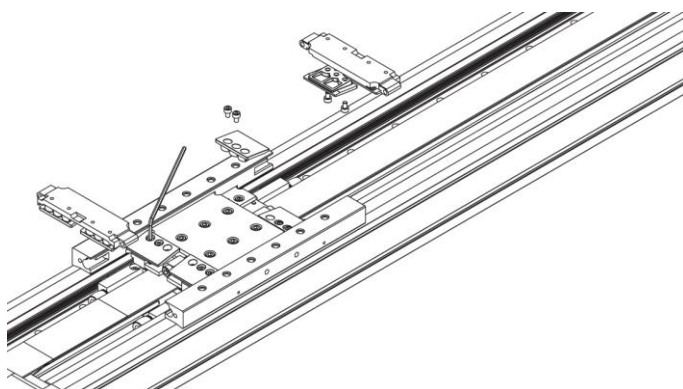


Fig.7.15 : Cover strip guide

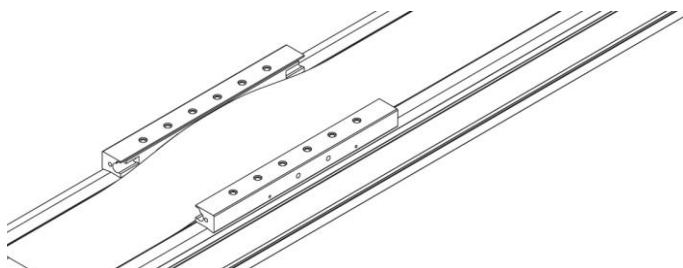


Fig.7.16 : Removal/installation of the slide end piece

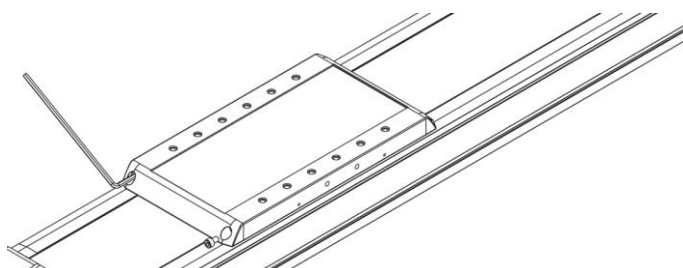


Fig.7.17 : Fitting the cover strip into the cover strip clamp on the HT-B

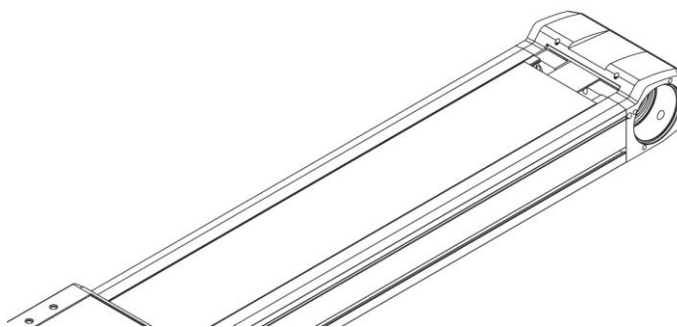
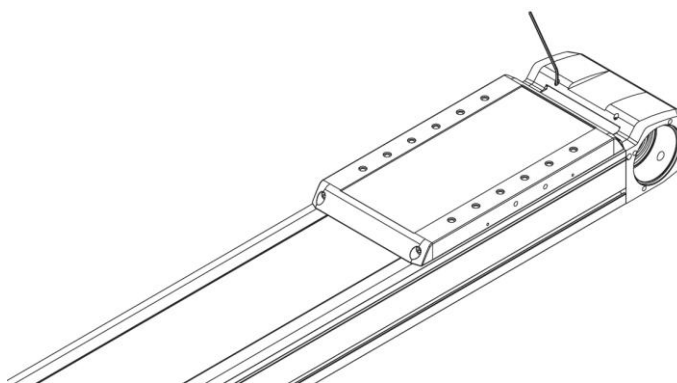


Fig.7.18 : Removal/installation of the cover strip clamp on the HT-B



7.5 Replacing the cover strip guide – HT-B , HM-B

On longer HT-B and HM-B linear axes, the cover strip is guided through an additional cover strip guide to ensure that it remains centred within the axis. The cover strip guide is integrated into the slide and consists of a roll holder and a ball bearing over which the cover strip rolls laterally. The ball bearings in the cover tape guides must be checked at regular intervals to ensure they are running smoothly (service life approx. 20,000 km). If necessary, the entire cover tape guide must be replaced on both sides.

- Loosen the mounting bolts for the cover belt guide on both sides.
 - Pull the cover belt guides out of the slide from the side (see Fig. 7.17).
 - Remove any dirt from the seats of the cover strip guides in the slide.
 - Insert the new cover strip guides into the slide on both sides.
 - Tighten the mounting bolts to the screw tightening torques specified in the table '7.3 ' at REF_Ref237433136 \h .
 - Check that the cover strip lies centrally within the axis profile as the slide moves, and, if necessary, align the cover strip by loosening the strip clamp (Fig. 7.16).
- ✓ The new cover strip guide is now fitted.

Fig.7.19 : HT-B cover strip guides

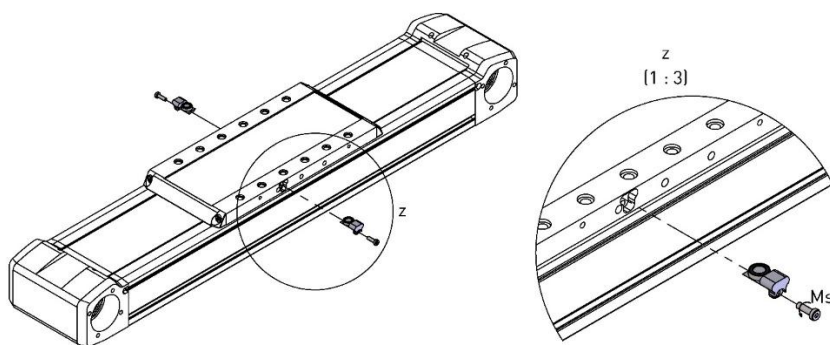


Fig.7.20: HM-B cover

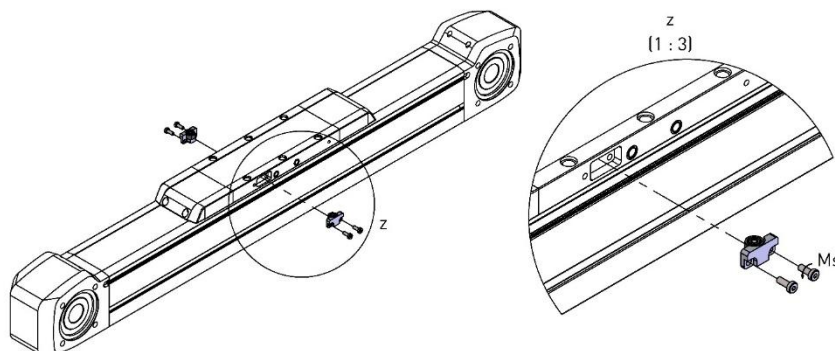


Table7.3 : Screw tightening torques

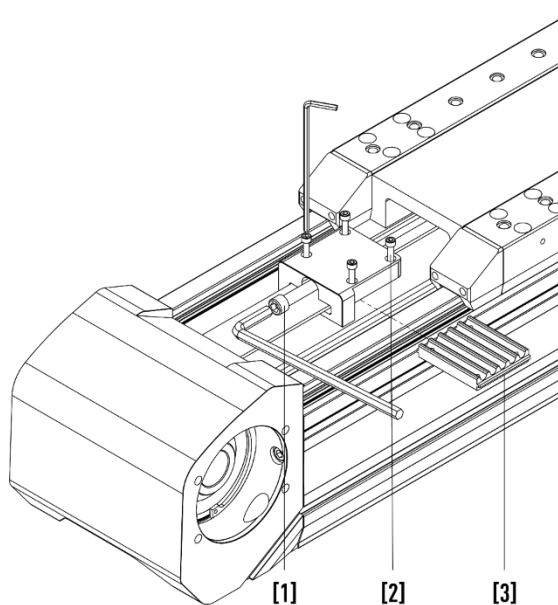
Shaft size	Screw size	Screw tightening torque Ms [Nm]
HM060B, HM080B	M3	1
HM120B	M4	3
HT100B	M3	1
HT150B, HT200B, HT250B	M4	3

7.6 Replacing the toothed belt – HB-B

7.6.1 Removing the belt tensioners and the toothed belt

- Loosen the tensioning screws [1] on the belt tensioner (on both sides) and pull the two parts of the belt tensioner out of the slide.
- Loosen the cylinder screw [2] and remove the belt tensioner [3].
- Pull the toothed belt forwards out of the belt tensioner.

Fig.7.21: Removing the belt tensioner

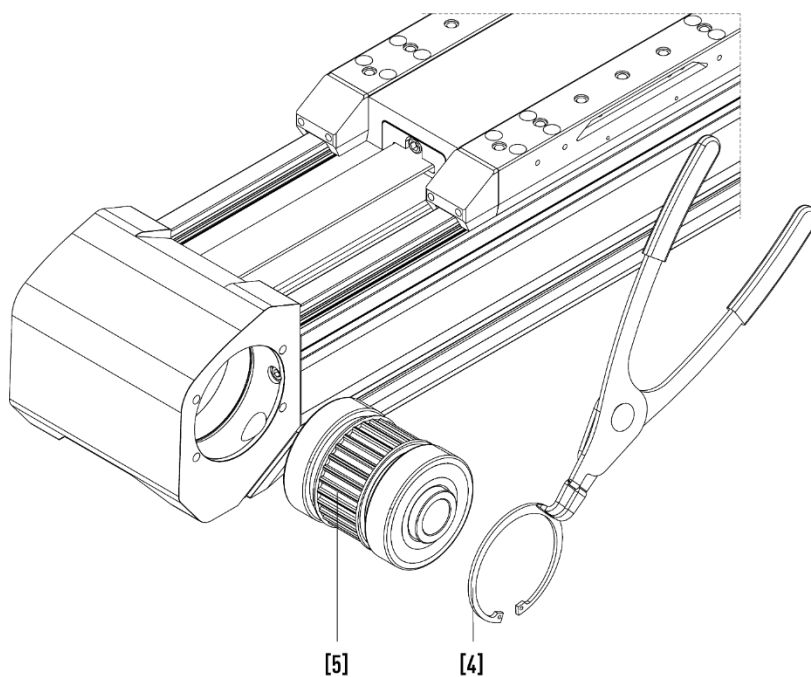


- Pull the toothed belt out of the axis.
- Cut the new toothed belt to the length of the old one using a suitable tool (e.g. tin snips).

7.6.2 Removing the drive units

- On each drive unit housing, remove the circlip [4] on one side using circlip pliers and slide the drive units [5] out of the bearing seats.

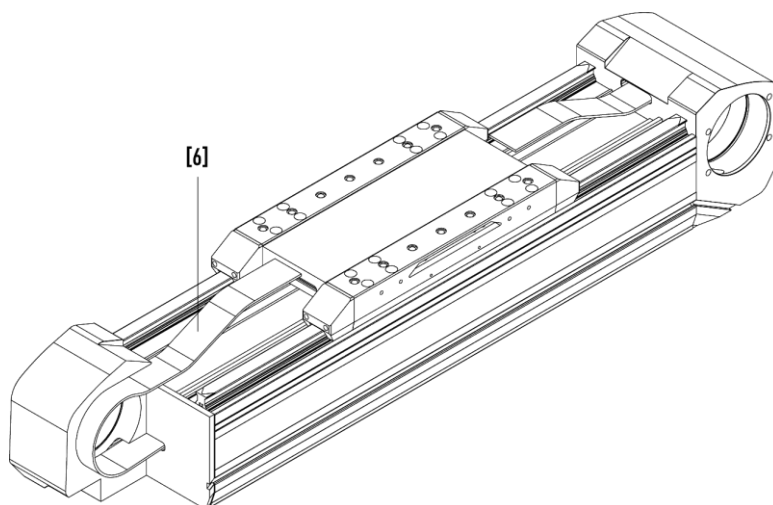
Fig.7.22: Dismantling the drive unit



7.6.3 Fitting the new toothed belt

- Slide the new toothed belt [6] in from one side through the belt window of the drive unit until it emerges from the belt window on the other side.

Fig.7.23: Inserting the toothed belt



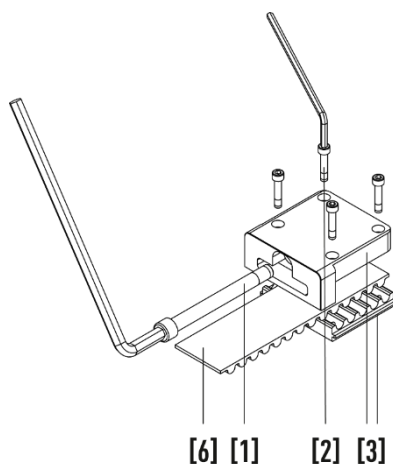
- Position the toothed belt so that the bearing seats are exposed, allowing the drive units to be refitted.
- Slide the drive units back into the bearing seats and fit the circlips.

7.6.4 Fitting the belt tensioner

! Warning! Risk of damage due to accidental loosening!

- ▶ Use only the screws supplied by HIWIN! The strength grades, thread lengths and anti-loosening coatings are precisely tailored to the requirements of the axis!
- ▶ The tensioning screws on the belt tensioners may be readjusted a maximum of five times!
- Slide the toothed belt [6] into the belt tensioner from the side and centre it. Ensure that all the teeth of the belt tensioner are engaged.
- Insert the toothed belt [6] into the belt tensioner from the front and centre it. Ensure that all the teeth of the belt tensioner are engaged.

Fig.7.24: Fitting the toothed belt into the belt tensioner



- Insert the tensioning screw [1] into the hole in the belt tensioner and guide both belt tensioners into the designated slots on the slide.
- Tighten both belt tensioners until the heads of the tensioning screws are fully recessed into the slot in the slide on both sides.

7.6.5 Adjusting the preload of the toothed belt

Note

The 'Theoretical setting frequency from application [Hz]' can be determined using the HIWIN sizing tool at hiwin.de.

If the calculated "Theoretical setting frequency from application [Hz]" exceeds the "Factory setting frequency on delivery [Hz]", the toothed belt must be retensioned. In this case, adjust the toothed belt pre-tension to the calculated frequency in accordance with the instructions below.

- Adjust the distance A (see Fig. 7.25) from the edge of the carriage to the edge of the drive unit housing in accordance with Table 7.4.
- Increase the preload of the toothed belt by evenly tightening the tensioning screws [1] on the belt tensioner until the adjustment frequency specified in Table 7.4 is reached. Check the frequency using a belt tension gauge on the back of the toothed belt. When doing so, follow the operating instructions for the belt tension gauge being used.

Fig. 7.25 : Preload of the toothed belt on the HB-B linear axis

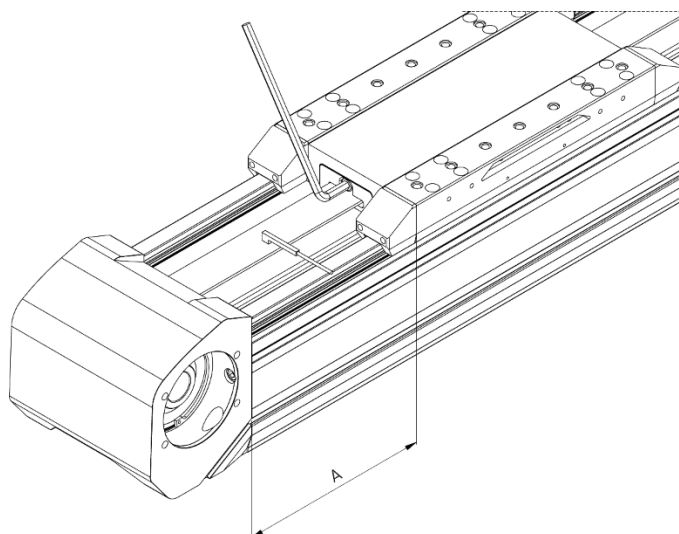


Table 7.4 : Factory-set frequency on delivery [Hz] for the HB-B linear axis

size	Stroke ≥ 200 mm				Stroke < 200 mm			
	A [mm]	Lower limit of set frequency [Hz]	Setpoint adjustment frequency [Hz]	Upper limit for set frequency [Hz]	A [mm]	Lower limit of set frequency [Hz]	Setpoint adjustment frequency [Hz]	Upper limit for set frequency [Hz]
HB250B	200	118	131	144	100	180	201	220

- Move the slide manually from one end position to the other several times and check the adjustment frequency again as described above. If the frequency is not within the specified range as per Table 7.2, adjust the preload again using the tensioning screws.

✓ The new belt is now fitted.

7.7 Replacing the toothed belt – HM-B

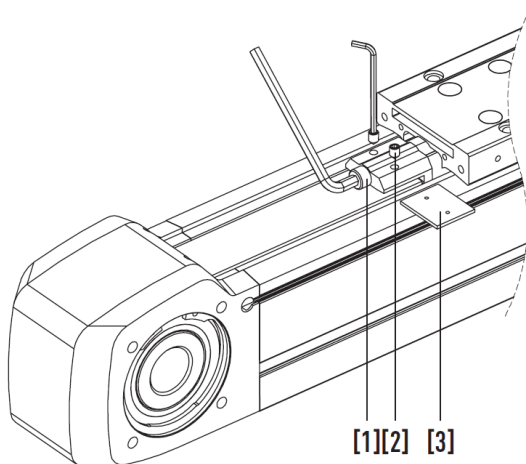
7.7.1 Removing the attachments

- Remove the slide end pieces and, if applicable, the cover strip deflectors including the cover strip, as described in the section 7.3 from page 130.
- Remove the drive elements in the reverse order to that described in section 6.7 from page 81.

7.7.2 Removing the belt tensioners and the toothed belt

- Loosen the tensioning screws **[1]** on the belt tensioners (on both sides) and pull the two belt tensioners out of the slide.
- Loosen the set screws **[2]** and remove the clamping sheet **[3]**.
- Slide the toothed belt out of the belt tensioner sideways.

Fig.7.26: Removing the belt tensioner

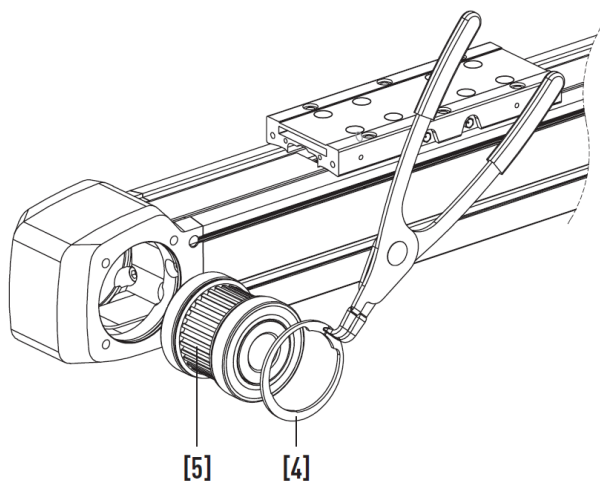


- Pull the toothed belt out of the axis.
- Cut the new toothed belt to the length of the old one using a suitable tool (e.g. tin snips).

7.7.3 Removing the drive units

- On each drive unit housing, remove the circlip **[4]** on one side using circlip pliers and slide the drive units **[5]** out of the bearing seats.

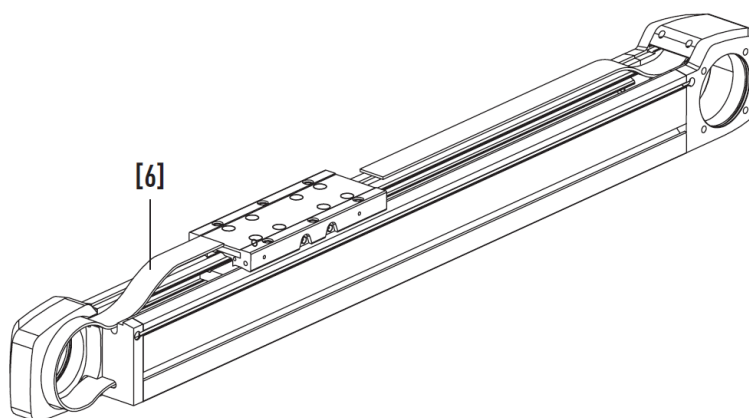
Fig.7.27: Dismantling the drive unit



7.7.4 Fitting the new toothed belt

- Slide the new toothed belt **[6]** in from one side through the belt window of the drive unit until it emerges from the belt window on the other side.

Fig.7.28: Inserting the toothed belt



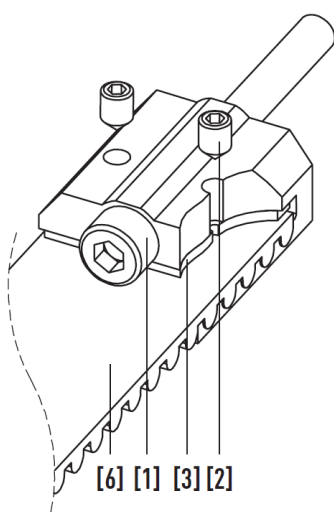
- Position the toothed belt so that the bearing seats are exposed, allowing the drive units to be refitted.
- Slide the drive units back into the bearing seats and fit the circlips.

7.7.5 Fitting the belt tensioner

! Warning! Risk of damage due to accidental loosening!

- ▶ Use only the screws supplied by HIWIN! The strength grades, thread lengths and anti-loosening coatings are accurately tailored to the requirements of the axis!
- ▶ The tensioning screws on the belt tensioners may be readjusted a maximum of five times!
- Slide the toothed belt [6] sideways into the belt tensioner and centre it within the tensioner. Ensure that all the teeth of the belt tensioner are engaged.
- Insert the clamping sheets [3] at the back of the toothed belt into the belt tensioner. Tighten the set screws [2] by hand until the clamping sheets can no longer be moved sideways. Ensure that the tips of the set screws engage with the centring holes in the clamping sheets.

Fig.7.29: Fitting the toothed belt in the belt tensioner



- Insert the tensioning screw [1] into the hole in the belt tensioner and guide both belt tensioners into the designated slots on the slide.
- Tighten both belt tensioners until the heads of the tensioning screws are fully recessed into the window of the slide on both sides.

7.7.6 Adjusting the preload of the toothed belt

Note

The 'Theoretical setting frequency from application [Hz]' can be determined using the HIWIN sizing tool at hiwin.de.

If the calculated "Theoretical setting frequency from application [Hz]" exceeds the "Factory setting frequency on delivery [Hz]", the toothed belt must be retensioned. In this case, adjust the toothed belt pre-tension to the calculated frequency in accordance with the instructions below.

- Set the distance A (see Fig. 7.30) from the edge of the carriage to the edge of the drive unit housing in accordance with [Table 7.3](#).
- Increase the preload of the toothed belt by evenly tightening the tensioning screws [1] on the belt tensioner until the setting frequency specified in [Table 7.3](#) is reached. Check the frequency using a belt tension meter on the back of the toothed belt. When doing so, follow the operating instructions for the belt tension meter being used.

Fig. 7.30 : Preload of the toothed belt on the HM-B linear axis

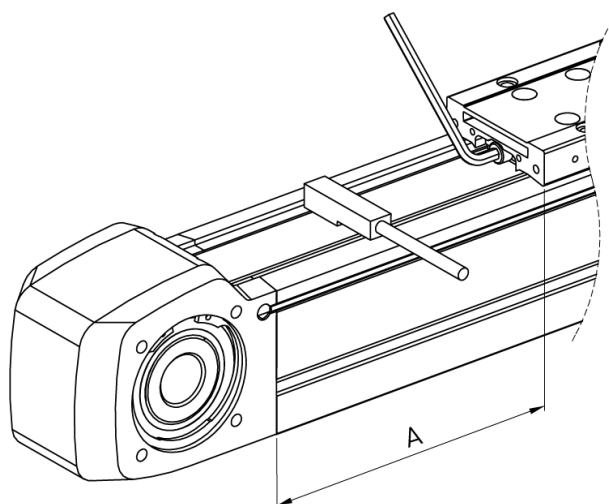


Table 7.5 : Factory-set frequency on delivery [Hz] for the HM-B linear axis

size	Stroke ≥ 200 mm				Stroke < 200 mm			
	A [mm]	Lower limit of set frequency [Hz]	Setpoint adjustment frequency [Hz]	Upper limit for set frequency [Hz]	A [mm]	Lower limit of set frequency [Hz]	Setpoint adjustment frequency [Hz]	Upper limit for set frequency [Hz]
HM040B	200	108	121	133	100	190	213	233
HM060B	200	144	161	176	100	245	274	300
HM080B	200	139	155	170	100	231	258	283
HM120B	200	133	149	163	100	209	233	256

- Move the slide manually from one end position to the other several times and check the adjustment frequency again as described above. If the frequency is not within the specified range as per [Table 7.3](#), adjust the preload again using the tensioning screws.

✓ The new belt is now fitted.

7.7.7 Fitting the attachments

- Fit the slide end pieces and, if applicable, the cover strip deflectors including the cover strip as described in the section [7.3](#) from page [130](#).
- Fit the drive elements as described in section [6.7](#) from page [81](#).

7.8 Replacing the toothed belt – HT-B

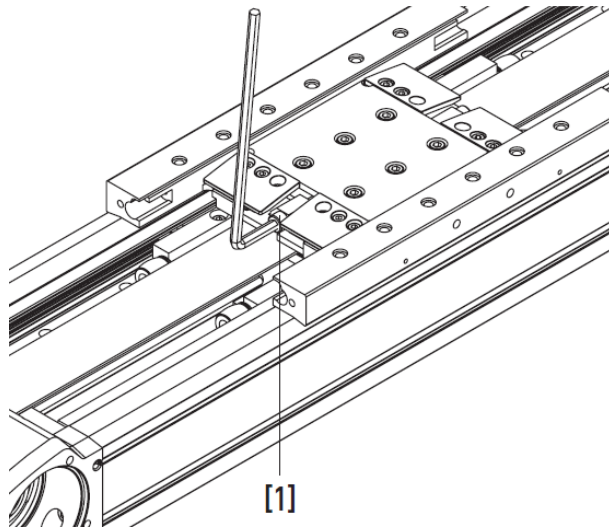
7.8.1 Removing the attachments

- Remove the slide end pieces and – if fitted – the cover strip deflectors including the cover strip as described in section 7.4 from page 132.
- Remove the drive elements in the reverse order to that described in section 6.8 from page 91.

7.8.2 Removing the belt tensioners and the toothed belt

- Loosen the tensioning screws [1] on the belt tensioners (on both sides) and pull the two belt tensioners out of the slide.

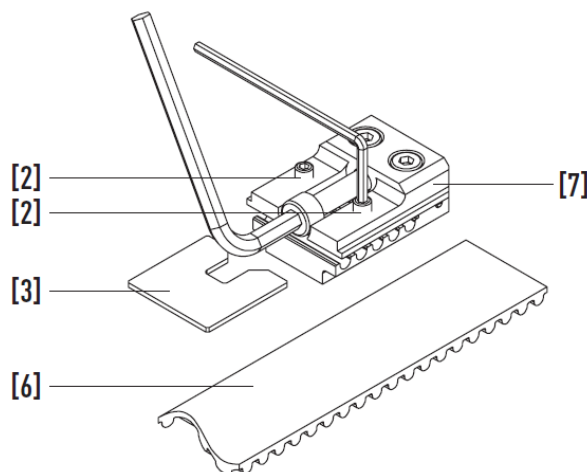
Fig.7.31: Removing the belt tensioner



7.8.2.1 Removing the toothed belt from the belt tensioner on HT100B linear tables

- Loosen the set screws [2] and remove the clamping sheet [3].
- Slide the toothed belt [6] out sideways from the belt tensioner [7].

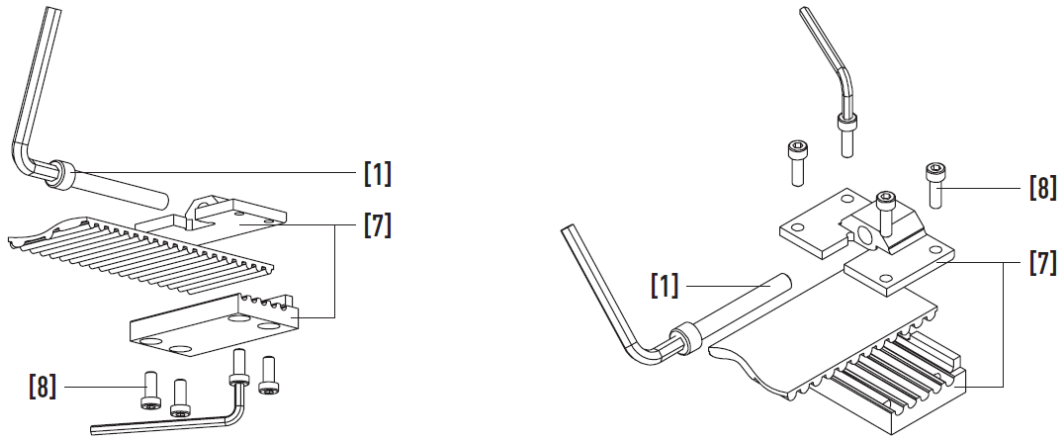
Fig.7.32: Removing the toothed belt from the belt tensioner (HT100B)



7.8.2.2 Removing the toothed belt from the belt tensioner on HT150B, HT200B and HT250B linear tables

- Loosen the 4 cylinder head screws [8] and dismantle the belt tensioner [7].
- The ends of the timing belt are now free and can be pulled out of the axis.

Fig.7.33: Removing the toothed belt from the belt tensioner (left: HT150B, right: HT200B, HT250B)

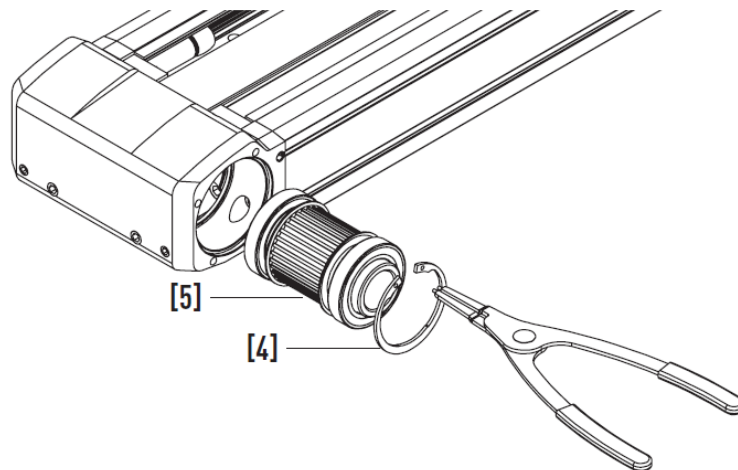


- Pull the toothed belt out of the axis.
- Cut the new toothed belt to the same length as the old one using a suitable tool (e.g. tin snips).

7.8.3 Removing the drive units

- On each drive unit housing, remove the circlip [4] on one side using circlip pliers and slide the drive units [5] out of the bearing seats.

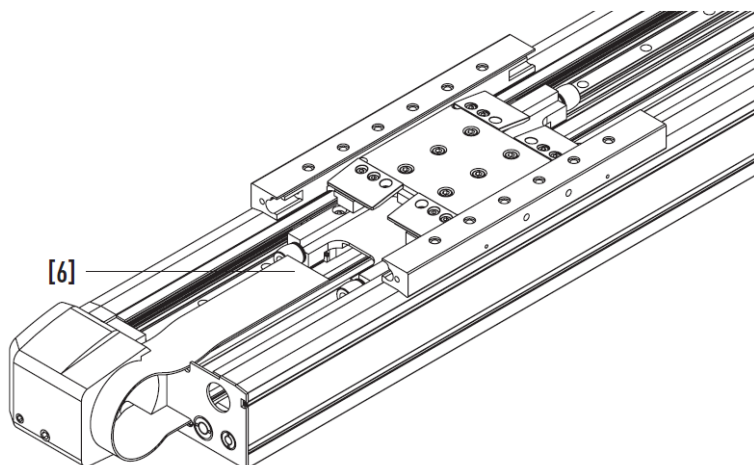
Fig.7.34: Dismantling the drive unit



7.8.4 Fitting the new toothed belt

- Slide the new toothed belt [6] in from one side through the belt window of the drive unit until it emerges from the belt window on the other side.

Fig.7.35: Inserting the toothed belt



- Position the toothed belt so that the bearing seats are exposed, allowing the drive units to be refitted.
- Slide the drive units back into the bearing seats and fit the circlips.

7.8.5 Fitting the belt tensioner

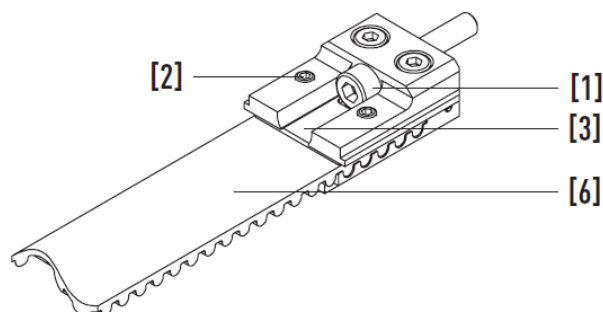
! Warning! Risk of damage due to accidental loosening!

- ▶ Use only the screws supplied by HIWIN! The strength grades, thread lengths and anti-loosening coatings are accurately matched to the requirements of the axis!
- ▶ The tensioning screws on the belt tensioners may be readjusted a maximum of five times!

7.8.5.1 Fitting the toothed belt on HT100B linear tables

- Slide the toothed belt [6] into the belt tensioner from the side and centre it within the tensioner. Ensure that all the teeth of the belt tensioner are engaged.
- Insert the clamping sheets [3] at the back of the toothed belt into the belt tensioner. Tighten the set screws [2] by hand until the clamping sheets can no longer be moved sideways. Ensure that the tips of the set screws engage with the centring holes in the clamping sheets.

Fig.7.36: Fitting the toothed belt in the belt tensioner (HT100B)



7.8.5.2 Fitting the toothed belt on HT150B, HT200B and HT250B linear tables

- Insert the toothed belt [6] into the teeth of the belt tensioner lower section [7-1] and centre it.
- Place the upper part of the belt tensioner [7-2] on top of the toothed belt and insert the cylindrical screws [8] as follows: Insert them in a criss-cross pattern until the screws are flush. Then tighten the screws in a criss-cross pattern to the tightening torque specified in .

Fig.7.37: Fitting the toothed belt in the belt tensioner (left: HT150B, right: HT200B, HT250B)

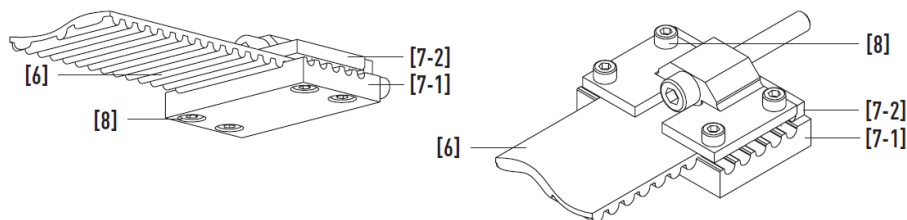


Table 7.6 : Tightening torques for the cylinder bolts of the belt tensioner

size	Thread size	Tightening torque [Nm]
HT150B	M4	1.0
HT200B	M5	1.5
HT250B	M5	1.5

- Insert the tensioning screw [1] into the hole in the belt tensioner and insert both belt tensioners into the designated slots on the slide.
- Tighten both belt tensioners until the heads of the tensioning screws are completely recessed into the slot in the slide on both sides.

7.8.6 Adjusting the preload of the toothed belt

Note

The HIWIN sizing tool available at hiwin.de can be used to determine the 'Theoretical setting frequency based on application [Hz]'.

If the calculated 'Theoretical setting frequency from application [Hz]' exceeds the 'Factory setting frequency on delivery [Hz]', the toothed belt must be retensioned. In this case, adjust the toothed belt tension to the calculated frequency in accordance with the instructions below.

- Set the distance A or B (see Fig.7.38 and Fig.7.39) from the edge of the carriage to the edge of the drive unit housing in accordance with Table 7.5 .
- Increase the preload of the toothed belt by evenly tightening the tensioning screws [1] on the belt tensioner until the adjustment frequency specified in Table 7.5 is reached. Check the frequency using a belt tension meter on the back of the toothed belt. When doing so, follow the operating instructions for the belt tension meter being used.

Fig.7.38 : Preload of the toothed belt on the HT-B linear axis without a cover strip

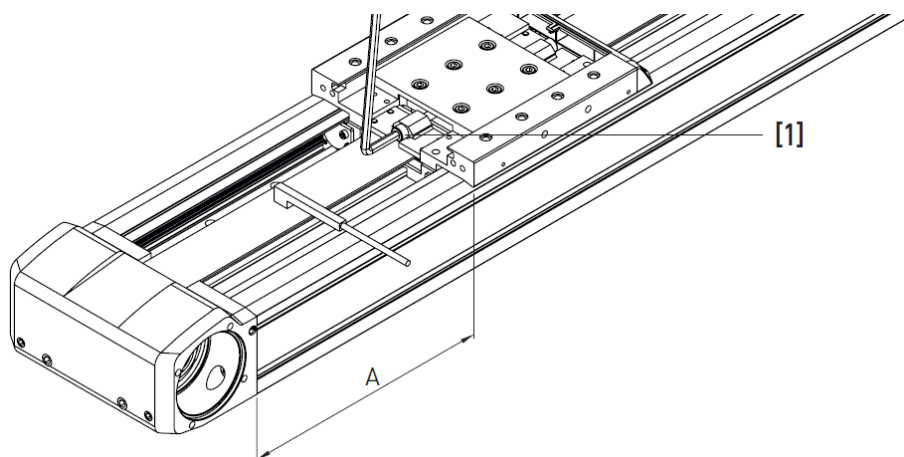


Fig.7.39 : Preload of the toothed belt on the HT-B linear axis with cover strip

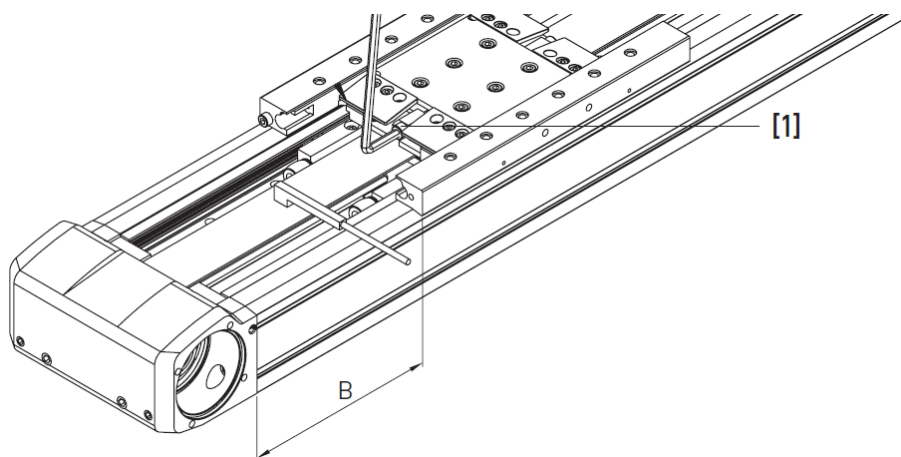


Table 7.7 : Factory-set frequency on delivery [Hz] for the HT-B linear axis

size	Stroke $\geq$ 200 mm					Stroke < 200 mm				
	A [mm]	B [mm]	Lower limit of set frequency [Hz]	Setpoint adjustment frequency [Hz]	Upper limit for setpoint frequency [Hz]	A [mm]	B [mm]	Lower limit of set frequency [Hz]	Setpoint adjustment frequency [Hz]	Upper limit for setpoint frequency [Hz]
HT100B	200	170	151	168	185	100	70	267	298	326
HT150B	200	152.5	143	160	175	100	52.5	244	273	299
HT200B	200	152.5	146	164	179	100	52.5	243	272	298
HT250B	200	130	145	162	177	100	30	238	267	292

- Move the slide manually from one end position to the other several times and check the adjustment frequency again as described above. If the frequency is not within the specified range as per [Table 7.5](#) , adjust the preload again using the tensioning screws.

✓ The new belt is now fitted.

7.8.7 Fitting the attachments

- Fit the slide end pieces and, if applicable, the cover strip deflectors including the cover strip as described in the [section 7.4](#) from [page 132](#) .
- Fit the drive elements as described in [section 6.8](#) from [page 91](#) .

7.9 Replacing the toothed belt – HC-B

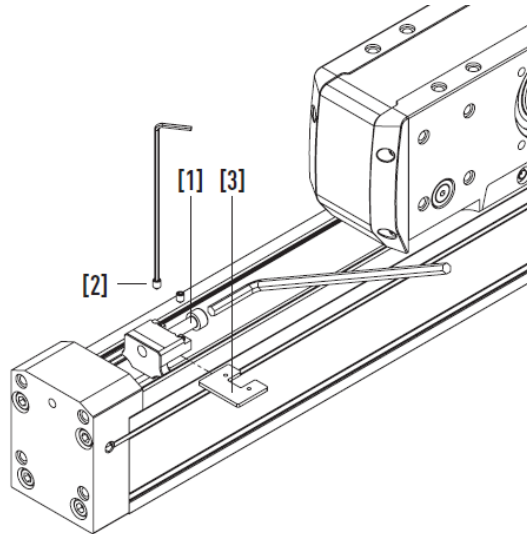
7.9.1 Removing the attachments

- Remove the covers from the belt tensioners.

7.9.2 Removing the belt tensioners and the toothed belt

- Loosen the tensioning screw [1] on the belt tensioners (on both sides) and pull the two belt tensioners out of the end plates.
- Loosen the set screws [2] and remove the clamping sheet [3].
- Slide the toothed belt out of the belt tensioner sideways.

Fig.7.40: Removing the belt tensioner

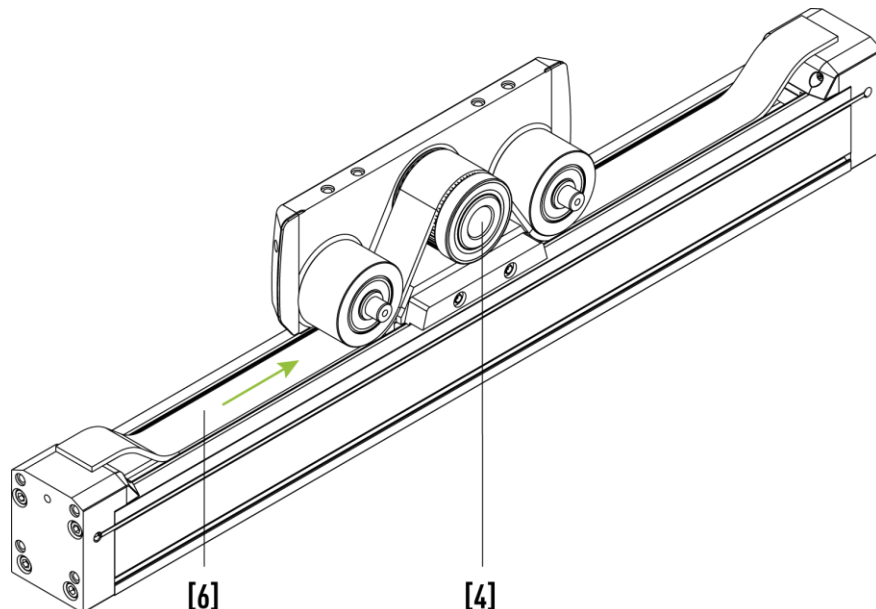


- Pull the belt out of the drive unit housing.
- Cut the new toothed belt to the length of the old one using a suitable tool (e.g. tin snips).

7.9.3 Fitting the new toothed belt

- Slide the new toothed belt [6] into the drive unit housing from one side until it emerges on the other side of the drive unit housing.
- Turning the drive unit [4] helps to guide the belt in and around the pulleys for recirculation.
- Position the toothed belt so that it has the same length on both sides of the end plates.

Fig.7.41: Inserting the toothed belt

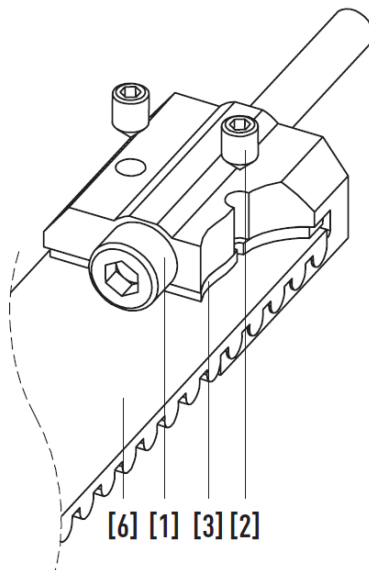


7.9.4 Fitting the belt tensioner

! Warning! Risk of damage due to accidental loosening!

- ▶ Use only the screws supplied by HIWIN! The strength grades, thread lengths and anti-loosening coatings are precisely matched to the requirements of the axis!
 - ▶ The tensioning screws on the belt tensioners may be readjusted a maximum of five times!
- Slide the toothed belt **[6]** into the belt tensioner from the side and centre it within the tensioner. Ensure that all the teeth of the belt tensioner are engaged.
 - Insert the clamping sheets **[3]** at the back of the toothed belt into the belt tensioner. Tighten the set screws **[2]** by hand until the clamping sheets can no longer be moved sideways. Ensure that the tips of the set screws engage with the centring holes in the clamping sheets.

Fig.7.42: Fitting the toothed belt in the belt tensioner



- Insert the tensioning screw **[1]** into the hole in the belt tensioner and insert both belt tensioners into the designated slots in the end plates.
- Tighten both belt tensioners until the heads of the tensioning screws are fully recessed into the window of the end plate on both sides.

7.9.5 Adjusting the preload of the toothed belt

Note

The 'Theoretical setting frequency from application [Hz]' can be determined using the HIWIN sizing tool at hiwin.de.

If the calculated "Theoretical setting frequency from application [Hz]" exceeds the "Factory setting frequency on delivery [Hz]", the toothed belt must be retensioned. In this case, adjust the toothed belt pre-tension to the calculated frequency in accordance with the instructions below.

- Set the distance A (see Fig. 7.43) from the edge of the carriage to the edge of the drive unit housing in accordance with Δ .
- Increase the preload of the toothed belt by evenly tightening the tensioning screws **[1]** on the belt tensioner until the setting frequency specified in Table 7.6 is reached. Check the frequency using a belt tension meter on the back of the toothed belt. When doing so, follow the operating instructions for the belt tension meter being used.

Fig.7.43 : Preload of the toothed belt on the HC-B linear axis

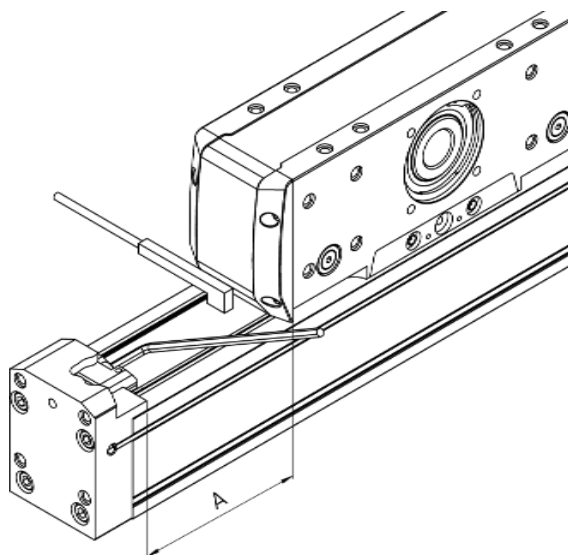


Table 7.8 : Factory-set frequency on delivery [Hz] for the HC-B linear axis

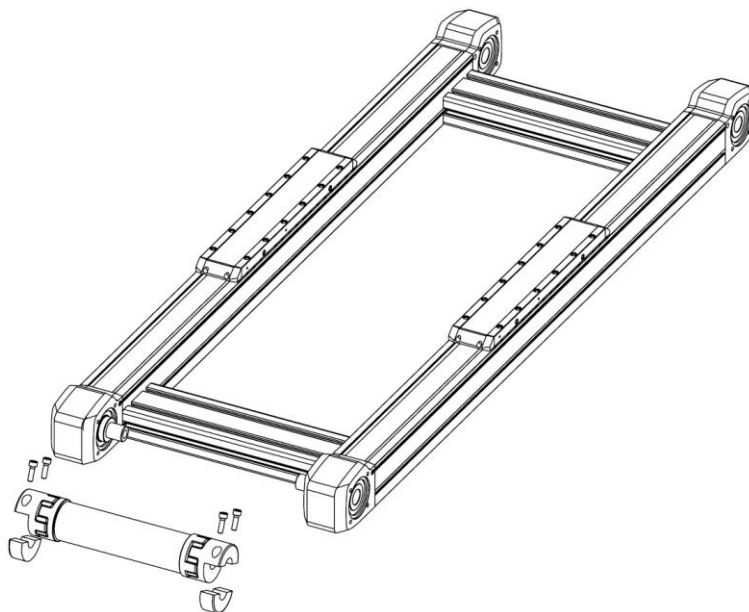
size	Stroke ≥ 200 mm				Stroke < 200 mm			
	A [mm]	Lower limit of set frequency [Hz]	Setpoint adjustment frequency [Hz]	Upper limit for set frequency [Hz]	A [mm]	Lower limit of set frequency [Hz]	Setpoint adjustment frequency [Hz]	Upper limit for set frequency [Hz]
HC025B	200	138	155	169	100	258	289	316
HC040B	200	134	150	165	100	244	273	299
HC060B	200	161	180	197	100	290	324	355
HC080B	200	159	177	194	100	283	316	346
HC100B	200	149	167	183	100	258	288	316
HC150B	200	140	157	171	100	225	252	276

- Manually move the drive block several times from one end position to the other and check the adjustment frequency again as described above. If the frequency is not within the specified range as per [Table 7.6](#) , adjust the preload again using the tensioning screws.
- Fit the covers on the belt tensioners.
- ✓ The new belt is now fitted.

7.10 Replacing the synchronous shaft

- Secure the synchronous shaft to prevent it from falling.
 - To remove it, carefully loosen the clamping bolts on both sides of the half-shell clamp. Loosen the clamping bolts alternately to avoid overloading.
 - Remove the screws and half-shells completely to remove the synchronous shaft. For fitting, see section [6.1.2 Fitting the synchronous shaft](#) from [page 57](#).
- ✓ The synchronous shaft has been replaced.

Fig.7.44: Fitting the synchronous shaft



8 Faults

Possible faults with the linear axis and their remedies can be found at [Table 8.1](#).

In the event of faults affecting the motor or servo drive, refer to the motor or servo drive instruction manual for the nature of the fault and instructions on how to rectify it

⚠ Danger! Risk of electric shock or burns due to contact with live parts!

Contact with live parts may result in injury.

Cables installed by the customer may become frayed due to constant movement within the energy chain if laid incorrectly, thereby exposing electrical contact points.

- ▶ Control system design in accordance with DIN EN 12100. No start-up after:
 - Application or restoration of power!
 - Troubleshooting!
 - Stopping the machine!
- ▶ Cabling must only be installed by qualified personnel!
- ▶ Work on electrical installations must only be carried out by qualified personnel!

⚠ Caution! Risk of injury!

Turning the toothed belt pulley or the synchronous shaft whilst moving the slide may result in fingers, hair or clothing being caught and twisted.

- ▶ A protective barrier must be provided for the operation of the linear axes/linear axis systems!
- ▶ Commissioning, set-up, troubleshooting and fault rectification must only be carried out by qualified personnel!

⚠ Caution! Risk of shock and crushing!

During motorised movement of the axes, injuries may occur due to moving and driven axes as well as attached components (energy chains, customer-supplied components).

- ▶ A protective barrier must be provided for the operation of the linear axes/linear axis systems!
- ▶ Where linear axes or linear axis systems are arranged vertically, ensure the slide is secured when at a standstill!

Table 8.1 : Fault table for linear axes and linear axis systems

Fault	Possible cause	Remedy
The slide or axis body does not move	Load too high	Reduce the payload or the drive's acceleration
	Coupling is slipping	Check that the clutch assembly has been fitted correctly. Check the tightening torques of the clamping bolts and adjust them correctly. Check the maximum drive torque applied and reduce it if necessary
	Toothed belt not fitted correctly or toothed belt tension set incorrectly	Fit the toothed belt correctly and apply preload to it
	Synchronous shaft clamping loose	Check that the synchronous shaft clutch assembly is correctly assembled. Check the tightening torques of the clamping bolts and adjust them correctly
Limit switch not functioning	Shifting distance too great	Readjust the shift distance and set it correctly
	Limit switch faulty or cable break	Replace the limit switch
	Signal not reaching the control unit	Check the cable to the control unit

Fault	Possible cause	Remedy
Noise and vibrations at high speed	Tension in the system	Install the linear axis without any tension; check the flatness of the support surface and the mounted payload
	Incorrect settings on the drive controller	Re-tune and adjust the controller settings to suit the application conditions
	Speed too high	Reduce the speed
Noise from the linear guideways	Lack of lubricant	Re-lubricate and, if necessary, reduce relubrication intervals
	Damage to the linear guideways, for example due to extreme impact loads on the slide or extreme contamination	Send the linear axis to HIWIN GmbH for repair
Motor load increases; the control system switches off due to overload	Tension in the system	Install the linear axis without any tension; check the flatness of the support surface and the mounted payload.
	Lack of lubricant	Re-lubricate and, if necessary, reduce relubrication intervals
	Heavy contamination of the linear axis and the internal linear guideways	Clean the linear axis; ensure that the guides and drive elements move freely
The slide or axis body has backlash and positions inaccurately	Backlash in the linear guideway or the drive element following a collision or due to extreme external influences (shocks, load peaks, etc.)	Send the linear axis to HIWIN GmbH for repair
	Toothed belt tension incorrectly adjusted	Preload the toothed belt correctly
Programmed absolute position changes	Coupling is slipping	Check that the clutch assembly has been fitted correctly. Check the tightening torques of the clamping bolts and adjust them correctly. Check the maximum drive torque applied and reduce it if necessary
	Toothed belt skips	Toothed belt tension too low → Tighten the toothed belt
	Toothed belt skips	Drive torque on the linear axis too high → Reduce the drive torque and adjust the control parameters in the drive controller to suit the application conditions
	Synchronous shaft clamping loose	Check that the synchronous shaft clutch assembly is correctly assembled. Check the tightening torques of the clamping bolts and adjust them correctly

9 Dismantling

Danger! Danger due to electrical voltage!

Dangerous currents may flow before and during assembly, disassembly and repair work.

- ▶ Work must only be carried out by a qualified electrician when the system is de-energised!
- ▶ Before carrying out any work, disconnect the linear axes/linear axis systems from the power supply and secure them against being switched on again!

Danger! Risk of electric shock or burns from contact with live parts!

Contact with live parts may result in injury.

Cables installed by the customer may become frayed due to constant movement within the energy chain if laid incorrectly, thereby exposing electrical contact points.

- ▶ Control system design in accordance with DIN EN 12100. No start-up after:
 - Power being applied or restored!
 - Troubleshooting!
 - Stopping the machine!
- ▶ Cabling must only be installed by qualified personnel!
- ▶ Work on electrical installations must only be carried out by qualified personnel!

Warning! Risk of shock and crushing!

Injuries may result from the slide moving or starting unintentionally.

- ▶ When linear axes or linear axis systems are arranged vertically, ensure the slide is secured when at a standstill!
- ▶ Control system design in accordance with DIN EN 12100: No start-up following:
 - application or return of energy!
 - Troubleshooting!
 - Stopping the machine!

Warning! Risk of crushing by the travel carriage!

Risk of injury due to crushing and damage to the linear axes/linear axis systems caused by the movement of the slide carriage due to gravity, as the axes are not fitted with brakes as standard.

- ▶ Ensure that the slide is secured against unintentional movement when at a standstill!

Warning! Risk of cuts!

The cover strip may cause cuts during assembly or disassembly.

- ▶ Commissioning and set-up must only be carried out by qualified personnel wearing appropriate protective equipment (gloves, safety goggles)!

Warning! Danger from suspended loads or falling parts!

Lifting heavy loads can cause injury.

- ▶ Assembly and maintenance of the linear axes/linear axis systems must only be carried out by qualified personnel!
- ▶ Take the mass of the parts into account during transport. Use suitable lifting equipment!
- ▶ Observe the applicable health and safety regulations for handling suspended loads!
- ▶ Only lift linear axes/linear axis systems at the specified lifting points!
- ▶ Secure machines and machine parts to prevent them from tipping over!

⚠ Warning! Risk of shock and crushing!

When using the linear axis in cantilever mode, injuries may occur when the axis body is extended.

- ▶ Dismantling must only be carried out by qualified personnel!
- ▶ When mounted vertically, secure the linear axis against unintentional lowering using motors with spring-loaded brakes and an additional clamping element.

⚠ Warning! Risk of shock and crushing when opening the clamping or brake element!

As soon as air is supplied, the clamping mechanism opens.

- ▶ Before carrying out any work, disconnect the linear axes/linear axis systems from the power supply and secure them against being switched on again!
- ▶ Ensure that moving parts of the linear axis are secured against unintended movement!
- ▶ Observe the applicable safety regulations for working with compressed air!

⚠ Caution! Risk of shock and crushing!

When moving the axes manually, injuries may occur due to moving and displaced axes as well as attached components (energy chains, customer-supplied components).

- ▶ Observe the applicable health and safety regulations!
- ▶ Transport to the installation site must only be carried out by qualified personnel!

⚠ Caution! Risk of crushing due to the axes tipping over!

- ▶ Secure the machine and its components to prevent them from tipping over!

⚠ Caution! Risk to health and the environment!

Contact with lubricants may cause irritation, poisoning and allergic reactions, as well as environmental damage.

- ▶ Use only suitable media that are harmless to humans. Observe the manufacturers' safety data sheets!
- ▶ Ensure proper disposal!

Dismantling steps:

- Disconnect the linear axis/double axis/multi-axis system from the electrical system.
- Screw the moving load off.
- Secure the moving parts (e.g. slides) to prevent unintended movement.
- Unscrew the linear axis/double axis/multi-axis system.
- ✓ The linear axis/double axis/multi-axis system has been dismantled.

10 Disposal

 **Caution!** Hazard to health and the environment!

Contact with lubricants can cause irritation, poisoning and allergic reactions, as well as environmental damage.

- ▶ Use only suitable media that are harmless to humans. Observe the manufacturers' safety data sheets!
- ▶ Ensure proper disposal!

Table 10.1: Disposal

Liquids	
Lubricants	Dispose of as hazardous waste in an environmentally sound manner
Soiled cleaning cloths	Dispose of as hazardous waste in an environmentally sound manner
Linear axis, double axis, multi-axis system	
Cabling, electrical components	Dispose of as electronic waste
Plastic components (e.g. energy chain)	Dispose of by material type
Steel components (e.g. profile rails)	Dispose of by material type
Aluminium components (e.g. profiles, synchronous shafts)	Dispose of by material type

11 Appendix 1: Drive adaptation

Our products are subject to ongoing technical changes and improvements. To avoid incorrect deliveries of spare parts and accessories, or when ordering parts without part numbers, please always state the serial number of the linear axes when placing orders. You will find this on the axis's type plate.

The drive adaptation for the linear axis is designed in several types to ensure easy flange mounting of all standard motors or gearboxes.

11.1 Drive adaptor for the HM-B linear modules and the HD double axis

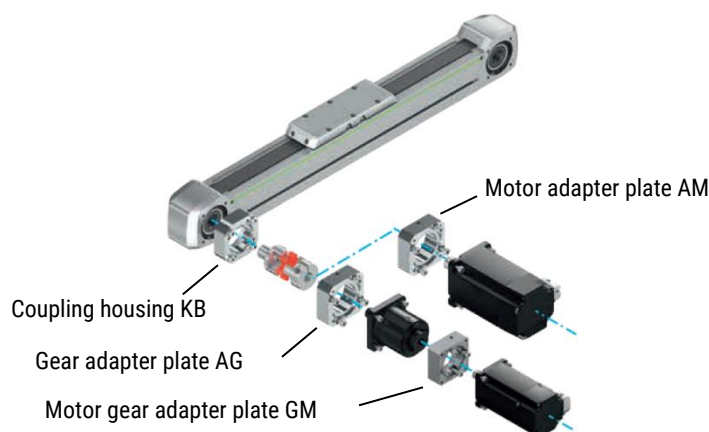
The drive adaptation comprises the following components:

- KB coupling housing
- Coupling assembly
- Motor adapter plate AM: Adapter from axis to motor
- Gear adapter plate AG: Adapter from axis to gearbox
- Motor gear adapter plate GM: Adapter from gearbox to motor

The dimensions of the coupling housing, motor adapter plate and gear adapter plate for HIWIN motors can be found in Section 11.4. Adaptations for motors from other manufacturers can be found in the configurator at hiwin.de.

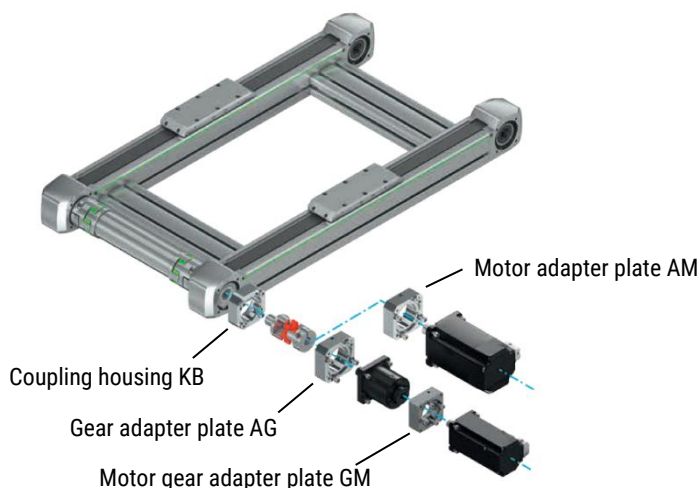
Motor adaptation for linear modules with toothed belt drive (HM-B)

Fig.11 .1 : Motor adaptation for HM-B linear modules



Engine adaptation for the double axis (HD)

Fig.11.2: Motor adaptation for HD double axes



Motor adaptation for multi-axis systems (HS)

The correct motor adaptation for HIWIN HS multi-axis systems must be selected separately for each axis.

Table 11.1 : Order code for position and flange type – HM-B linear modules and double axis modules

Drive manufacturer/type		HM040B/HD1			HM060B/HD2			HM080B/HD3			HM120B/HD4		HM120B-H/HD4-H		
		Motor only	With PLE40	With PLQE60	Motor only	With PLQE60	With PLQE80	Motor only	With PLQE80	With PLQE120	Motor only	With PLQE120	Motor only	With PLQE120	With PSBN142
Gearbox adapter			NG01	NG02		NG03	NG04		NG05	NG06		NG07		NG09	NG10
HIWIN	EM1-C-M-05-2		HW16	HW16		HW15									
	EM1-C-M-10-2		HW16	HW16		HW15									
	EM1-C-M-20-2	HW03		HW03		HW05	HW05		HW10						
	EM1-C-M-40-2	HW03		HW03		HW05	HW05		HW10						
	EM1-C-M-75-2				HW06		HW06		HW08						
	EM1-A-M-1K-2				HW25			HW13		HW13		HW14		HW27	HW27
	EM1-D-M-1A-2				HW25			HW13		HW13		HW14		HW27	HW27
	EM1-D-M-2K-2				HW25			HW13		HW13	HW14	HW14		HW27	HW27

PLE and PLQE are registered trademarks of Neugart GmbH

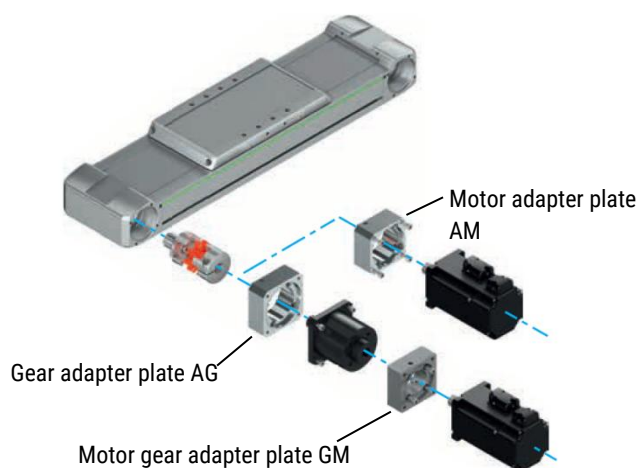
11.2 Drive adaptation for HT-B linear tables

The drive adaptation comprises the following components:

- Coupling assembly
- Motor adapter plate AM: Adapter from axis to motor
- Gear adapter plate AG: Adapter from axis to gearbox
- Motor gear adapter plate GM: Adapter from gearbox to motor

The dimensions of the coupling housing, motor adapter plate and gear adapter plate for HIWIN motors can be found in Section 11.4. Adaptations for motors from other manufacturers can be found in the configurator at hiwin.de.

Fig.11 .3 : Motor adaptation for HT-B linear tables


 Table 11.2 : Order code for item Flange type ¹⁾ – HT-B linear tables

Drive manufacturer/type		HT100B			HT150B			HT200B		HT250B	
		Motor only	With PLE40	With PLQE60	Motor only	With PLQE80	With PLQE120	Motor only	With PLQE120	Motor only	With PLQE120
Gearbox adapter			NG11	NG12		NG13	NG14		NG15		NG15
HIWIN	EM1-C-M-05-2		HW16	HW16							
	EM1-C-M-10-2		HW16	HW16							
	EM1-C-M-20-2			HW03		HW10					
	EM1-C-M-40-2	HW03		HW03		HW10					
	EM1-C-M-75-2					HW08					
	EM1-A-M-1K-2				HW13		HW13	HW14	HW14		HW14
	EM1-D-M-1A-2				HW13		HW13	HW14	HW14		HW14
	EM1-D-M-2K-2				HW13			HW14	HW14	HW14	HW14

PLE and PLQE are registered trademarks of Neugart GmbH.

¹⁾ See the order code page at [15](#) for HT-B linear tables.

11.3 Drive adaptation for the HC-B cantilever axis

The drive adaptation comprises the following components:

- Coupling housing KB
- HC150B: Coupling housing not required
- Coupling assembly
- Motor adapter plate AM: Adapter from axis to motor
- Gear adapter plate AG: Adapter from axis to gearbox
- Motor gear adapter plate GM: Adapter from gearbox to motor

The dimensions of the coupling housing, motor adapter plate and gear adapter plate for HIWIN motors can be found in Section 11.4. Adaptations for motors from other manufacturers can be found in the configurator at hiwin.de.

Motor adaptation for HC-B cantilever axes

Fig.11.4: Motor adaptor for HC cantilever axes

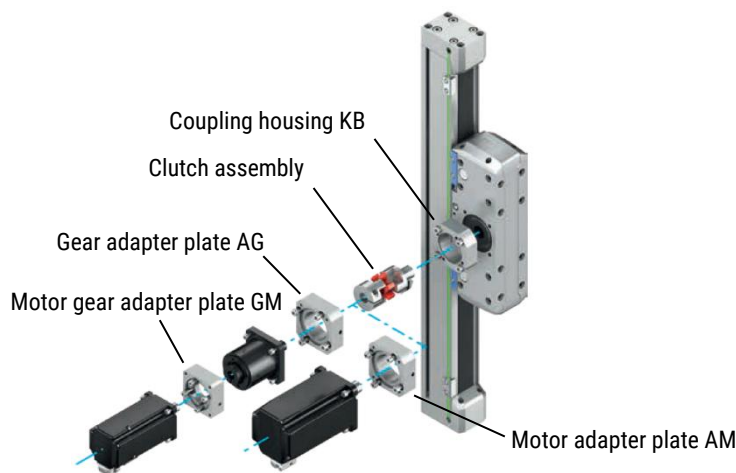


Table 11.3 : Order code for item Flange type ¹⁾ – Cantilever axis HC-B

Drive Manufacturer/ Type		HC025B			HC040B			HC060B			HC080B			HC100B			HC150B	
		Motor only	With PLE40		Motor only	With PLE40	With PLQE60	Motor only	With PLQE60	With PLQE80	Motor only	With PLQE80	With PLQE120	Motor only	With PLQE80	With PLQE120	Motor only	With PLQE120
Gearbox adapter			NG21			NG22	NG23		NG24	NG25		NG26	NG27		NG28	NG29		NG30
HIWIN	EM1-C-M-05-2		HW17			HW16	HW16		HW15									
	EM1-C-M-10-2	HW17	HW17			HW16	HW16		HW15									
	EM1-C-M-20-2	HW24					HW03		HW05	HW05		HW10			HW23			
	EM1-C-M-40-2	HW24			HW03		HW03		HW05	HW05		HW10			HW23			
	EM1-C-M-75-2									HW06		HW08			HW24			
	EM1-A-M-1K-2							HW25			HW13		HW13			HW14		HW26
	EM1-D-M-1A-2							HW25			HW13		HW13			HW14		HW26
	EM1-D-M-2K-2							HW25			HW13		HW13			HW14		HW26

PLE and PLQE are registered trademarks of Neugart GmbH.

¹⁾ See order code [3.4.4 Order code for cantilever axis HC-B](#)

11.4 Drive adaptation for the bridge axis HB-B

The drive adaptation comprises the following components:

- Coupling housing KB
- Coupling assembly
- Motor adapter plate AM: Adapter from axis to motor
- Gear adapter plate AG: Adapter from axis to gearbox
- Motor gear adapter plate GM: Adapter from gearbox to motor

The dimensions of the coupling housing, motor adapter plate and gear adapter plate for HIWIN motors can be found in Section 11.4. Adaptations for motors from other manufacturers can be found in the configurator at hiwin.de.

Fig.11.5: Motor adaptation for bridge axes with toothed belt drive (HB-B)

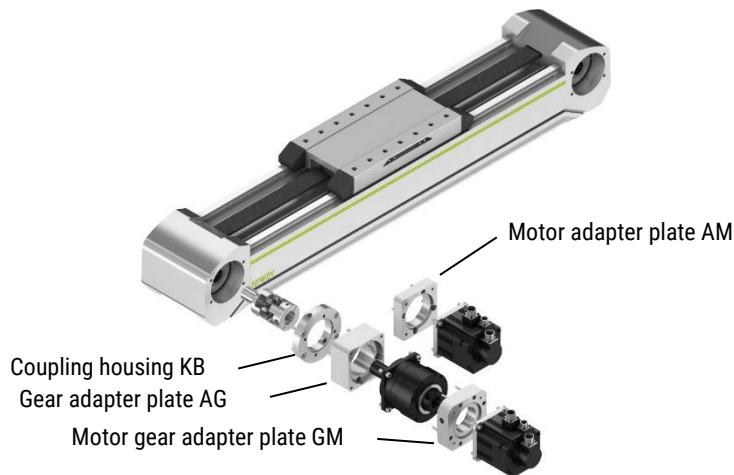


Table 11.4: Order code for item ¹⁾Flange type 1) – HB-B bridge axes

Drive manufacturer/type		HB250B		
		Motor only	With PLQE120	With PSBN142
Gearbox adapter			NG41	NG42
HIWIN	EM1-A-M-1K-2		HW27	HW27
	EM1-D-M-1A-2		HW27	HW27
	EM1-D-M-2K-2		HW27	HW27

PSBN and PLQE are registered trademarks of Neugart GmbH.

¹⁾ See order code [3.3.4 Order code for bridge axis HB-B](#)

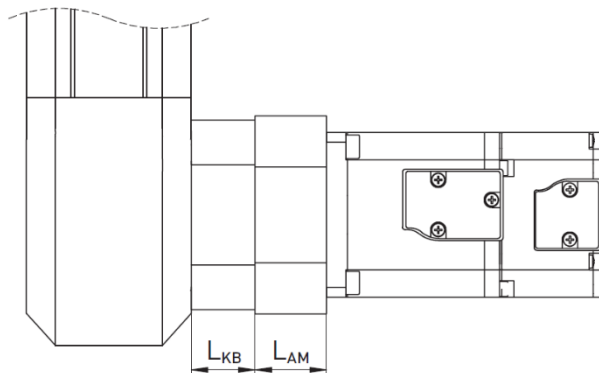
11.5 Dimensions of the drive adaptation

The overall width of the linear axes depends on the following factors:

- Adaptor material (coupling housing KB, motor adapter plate AM, gear adapter plate AG, motor gear adapter plate GM)
- gearbox
- motor

Linear axis without gearbox

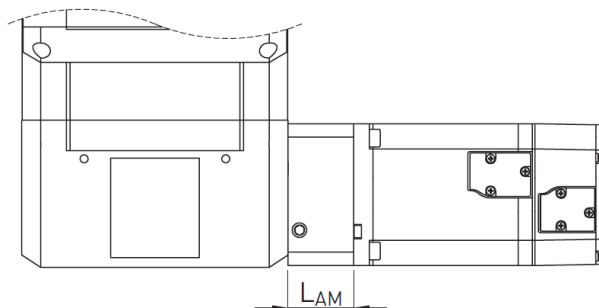
Fig.11.6: Motor connection for HM-B linear module without gearbox



L_{KB} Length of coupling housing, see [Table 11.5](#)

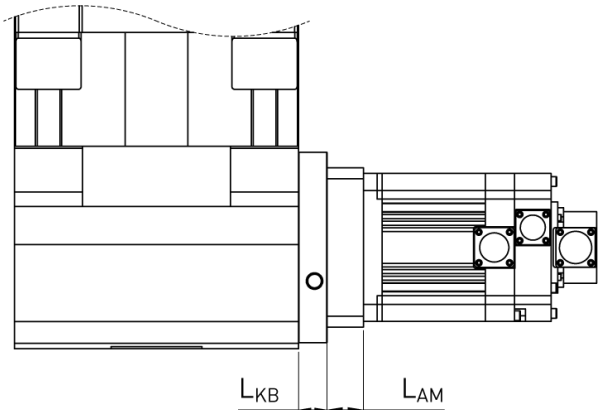
L_{AM} Length of motor adapter plate, see [Table 11.6](#)

Fig.11.7: Motor connection for HT-B linear table without gearbox



L_{AM} Length of motor adapter plate, see [Table 11.7](#)

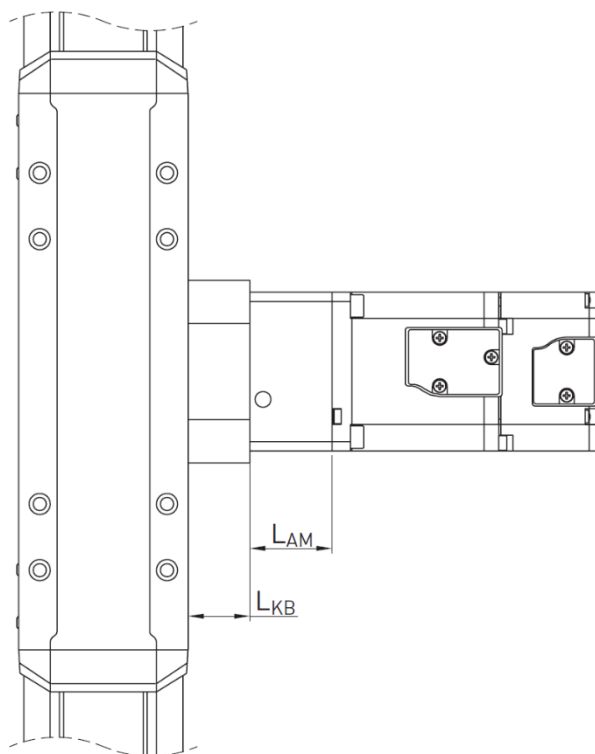
Fig.11.8: Motor connection for HB-B bridge axis without gearbox



L_{KB} Length of coupling housing, see [Table 11.7](#)

L_{AM} Length of motor adapter plate, see [Table 11.7](#)

Fig.11.9: Motor connection for cantilever axis HC-B without gearbox

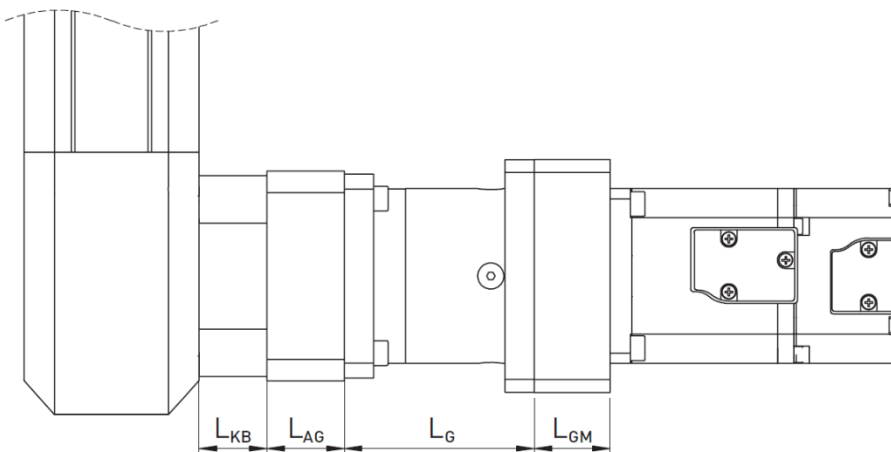


LKB Length of coupling housing, see [Table 11.5](#)

LAM Length of motor adapter plate, see [Table 11.6](#)

Linear axis with gearbox

Fig.11.10: Motor connection for HM-B linear module with gearbox



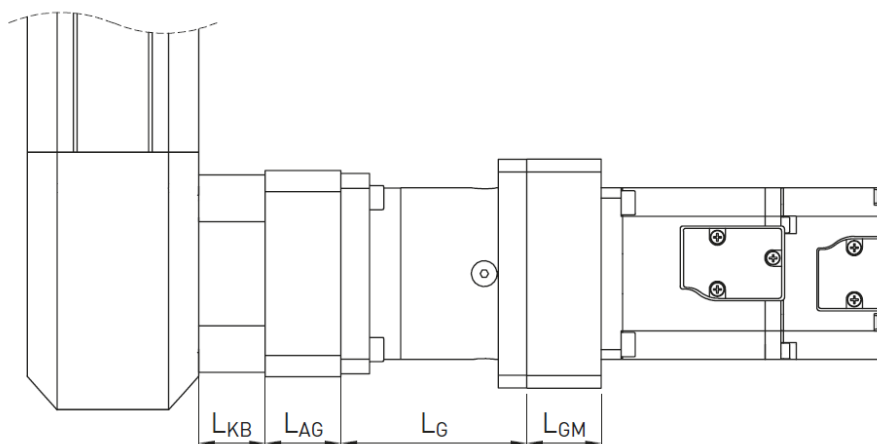
LKB Length of coupling housing, see [Table 11.5](#)

LAG Length of gear adapter plate, see [Table 11.8](#)

LG Gearbox length, see [Table 11.10](#)

LGM Length of motor gear adapter plate, see [Table 11.9](#)

Fig.11.11: Motor connection for HT-B linear table with gearbox

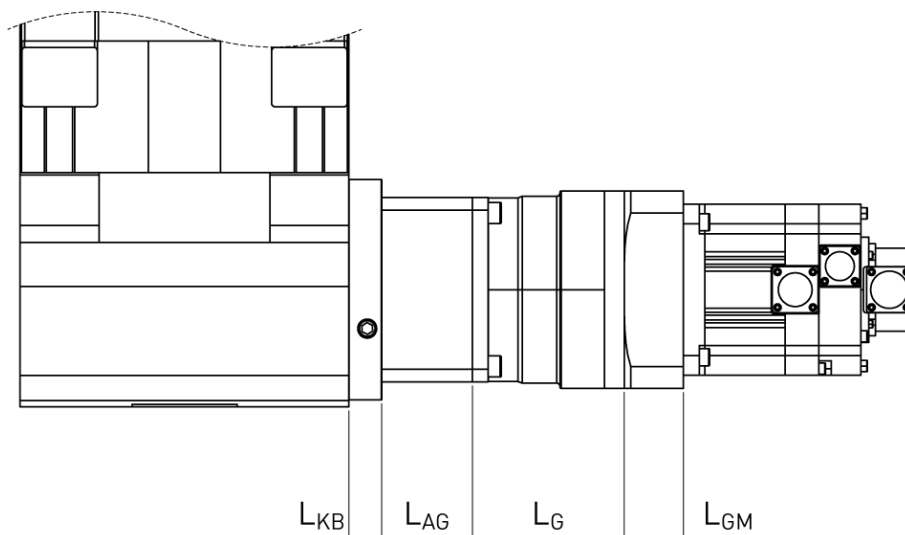


L_{AG} Length of gear adapter plate, see [Table 11.8](#)

L_G Length of gearbox, see [Table 11.10](#)

L_{GM} Length of motor gear adapter plate, see [Table 11.9](#)

Fig.11.12: Motor connection for bridge axis HB-B with gearbox



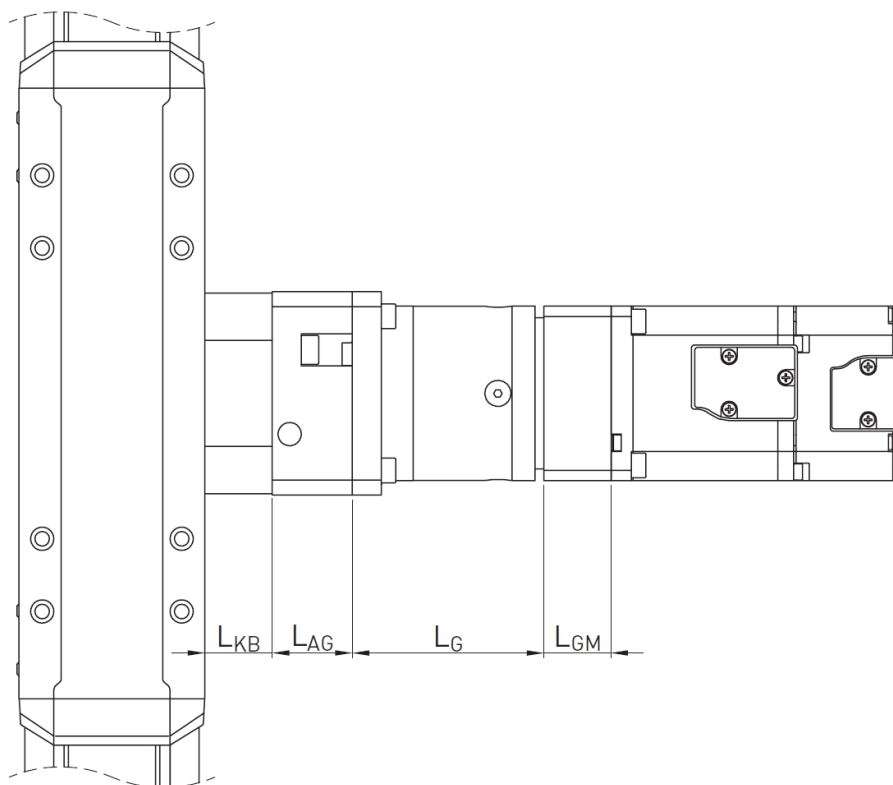
L_{KB} Length of coupling housing, see [Table 11.5](#)

L_{AG} Length of gear adapter plate, see [Table 11.8](#)

L_G Gearbox length, see [Table 11.10](#)

L_{GM} Length of motor gear adapter plate, see [Table 11.9](#)

Fig.11.13: Motor connection to HC-B cantilever axis with gearbox



LKB Length of coupling housing, see [Table 11.5](#)

LAG Length of gear adapter plate, see [Table 11.8](#)

LG Gearbox length, see [Table 11.10](#)

LGM Length of motor gear adapter plate, see [Table 11.9](#)

11.5.1 KB coupling housing

Fig.11.14: KB coupling housing for HM-B linear modules and HC-B cantilever axes

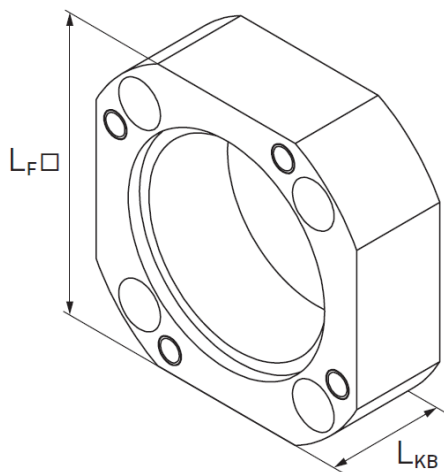


Fig.11.15: KB coupling housing for HB-B bridge axes

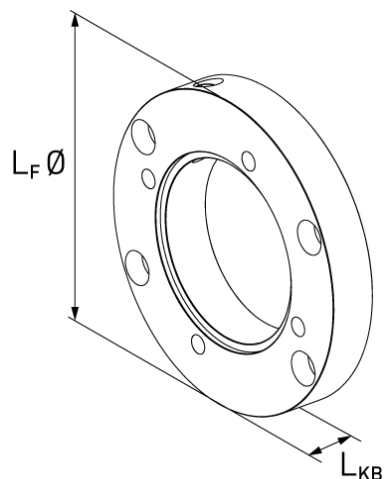


Table 11.5 : Dimensions of KB coupling housing

Axis type/size	L _F [mm]	L _{KB} [mm]	article number
HC025B	50	17.0	25-002045
HM040B, HC040B	47	14.7	25-000798
HM060B, HC060B	69	23.2	25-000799
HM080B, HC080B	84	24.1	25-000800
HC100B	107	25.0	80043137
HM120B	118	25	25-000801
HM120B-H	140	57.7	80095835
HB250B	167.5	25	80073546

11.5.2 Motor adapter plate AM

Fig.11.16: Motor adapter plate AM for HM-B linear modules, HT-B linear tables and HC-B cantilever axes without gearboxes

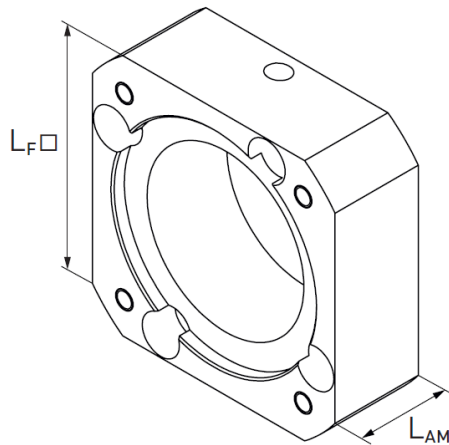


Table 11.6 : Dimensions of motor adapter plate

Linear-axis	Manufacturer	Motors	L _F [mm]	L _{AM} [mm]	Item number
HC025B	HIWIN	EM1-C-M-10-2	50	27.3	25-002722
HC025	HIWIN	EM1-C-M-20-2, EM1-C-M-40-2	60	32.3	80094829
HM040B	HIWIN	EM1-C-M-20-2	60	30.5	25-000404
HM040B, HC040B	HIWIN	EM1-C-M-40-2	60	30.5	25-000404
HM060B	HIWIN	EM1-C-M-75-2	80	37	25-000421
HM060B, HC060B	HIWIN	EM1-A-M-1K-2, EM1-D-M-1A-2, EM1-D-M-2K-2	130	52	25-001791
HM080B, HC080B	HIWIN	EM1-A-M-1K-2, EM1-D-M-1A-2, EM1-D-M-2K-2	130	51.5	25-000450
HM120B	HIWIN	EM1-D-M-2K-2	130	50.7	25-000647
HM060B, HC060B	HIWIN	EM1-A-M-1K-2, EM1-D-M-1A-2, EM1-D-M-2K-2	130	52	25-001791
HM080B, HC080B	HIWIN	EM1-A-M-1K-2, EM1-D-M-1A-2, EM1-D-M-2K-2	130	51.5	25-000450
HM120B	HIWIN	EM1-D-M-2K-2	130	50.7	25-000647

Table 11.7 : Motor adapter plate AM for HT-B linear tables without gearbox

Linear axis	Manufacturer	Motors	L _F [mm]	L _{AM} [mm]	Item number
HT100B	HIWIN	EM1-C-M-40-2	60	30.5	25-000404
HT150B	HIWIN	EM1-A-M-1K-2, EM1-D-M-1A-2, EM1-D-M-2K-2	130	51.5	25-000450
HT200B	HIWIN	EM1-A-M-1K-2, EM1-D-M-1A-2	130	50.7	25-000647

11.5.3 AG gear adapter plate for HM-B linear modules, HT-B linear tables and HC-B cantilever axes

Fig.11.17: AG gear adapter plate for HM-B linear modules, HT-B linear tables and HC-B cantilever axes

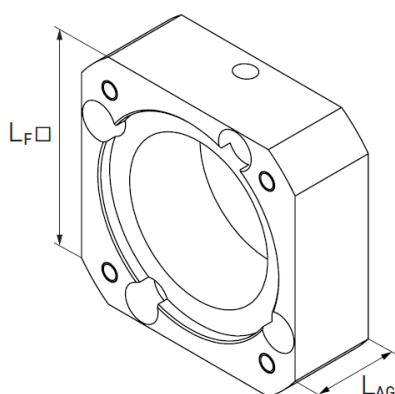


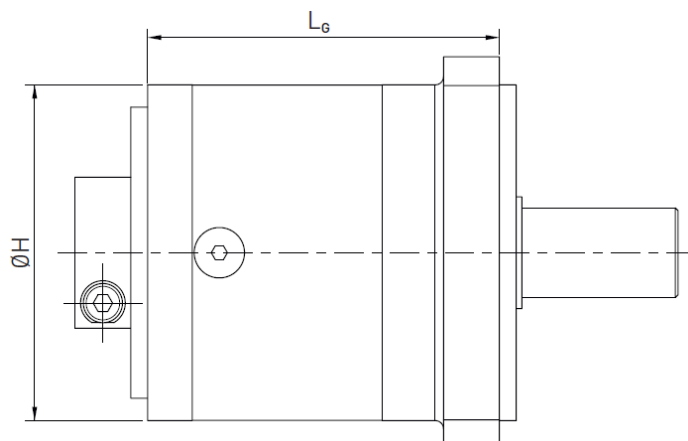
Table 11.8 : AG gear adapter plate

Axis type/size	Gearbox ²⁾	L _F [mm]	L _{KB} [mm]	article number
HC025B	PLE040 ¹⁾	50	27.0	25-002609
HM040B, HT100B, HC040B	PLE040 ¹⁾	50	23.0	25-000735
	PLQE60	70	32.8	25-000387
HM060B, HC060B	PLQE60	70	27.5	25-000388
	PLQE80	90	37.0	25-000389
HM080B, HT150B, HC080B	PLQE80	90	35.0	25-000390
	PLQE120	115	47.5	25-000391
HM120B, HT200B, HT250B, HC100B	PLQE120	115	43.6	25-000392

¹⁾ The adapter consists of two parts

²⁾ PLE and PLQE are registered trademarks of Neugart GmbH

Fig.11.18: Dimensional drawing of gearbox for linear axes with toothed belt drive



11.5.4 GM motor gear adapter plate for HM-B linear modules, HT-B linear tables and HC-B cantilever axes

Fig.11.19: GM motor gear adapter plate for HM-B linear modules, HT-B linear tables and HC-B cantilever axes

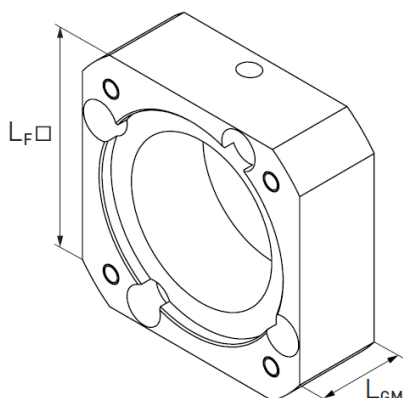


Table 11.9 : GM motor gear adapter plate for HM-B linear modules, HT-B linear tables and HC-B cantilever axes

Gearbox ¹⁾	Manufacturer	Motors	L _F [mm]	L _{GM} [mm]	Item number
PLE40	HIWIN	EM1-C-M-05-2, EM1-C-M-10-2	40	19	25-002320
PLQE60	HIWIN	EM1-C-M-05-2, EM1-C-M-10-2	60	18.1	25-002298
		EM1-C-M-20-2, EM1-C-M-40-2	60	23.1	25-000486
PLQE80	HIWIN	EM1-C-M-20-2, EM1-C-M-40-2	80	21.2	25-000494
		EM1-C-M-75-2	80	31.2	25-000495
PLQE120	HIWIN	EM1-A-M-1K-2	130	36.8	25-000690

¹⁾ PLE and PLQE are registered trademarks of Neugart GmbH.

11.5.5 Gearboxes for HM-B linear modules, HT-B linear tables, HC-B cantilever axes and HD double axes

Gearboxes for optimum power transmission from the motor to the toothed belt drive.

Fig.11.20: Dimensional drawing of gearboxes for HM-B linear modules, HT-B linear tables, HC-B cantilever axes and HD double axes

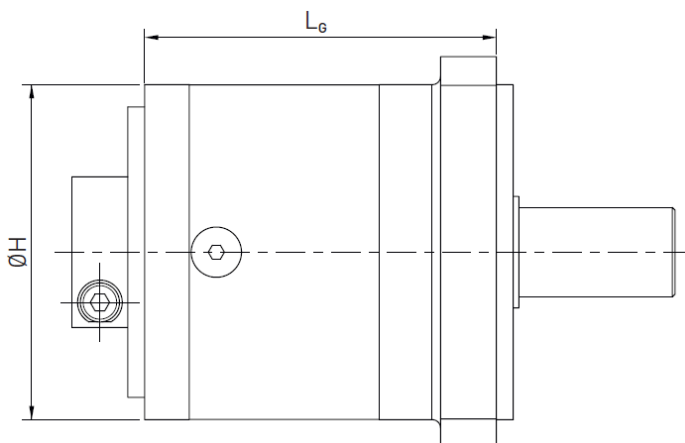


Table 11.10 : Gearboxes for HM-B linear modules, HT-B linear tables, HC-B cantilever axes and HD double axes

Axis type/size	Gear ratio i	Ø H [mm]	L _G [mm]	Max. motor shaft diameter [mm]	Gearbox ¹⁾	Order code for gearbox position ²⁾
HM040B, HD1, HT100B, HC025B, HC040B	3	40	48.5	(9) 11 ³⁾	PLE40-3	G0403
	5	40	48.5	(9) 11 ³⁾	PLE40-5	G0405
	8	40	48.5	(9) 11 ³⁾	PLE40-8	G0408
	12	40	61.5	(9) 11 ³⁾	PLE40-12	G0412
HM040B, HM060B, HD1, HD2, HT100B, HC040B, HC060B	3	60	63.0	(14) 19 ³⁾	PLQE60-3	G0603
	5	60	63.0	(14) 19 ³⁾	PLQE60-5	G0605
	8	60	63.0	(14) 19 ³⁾	PLQE60-8	G0608
	12	60	75.5	(14) 19 ³⁾	PLQE60-12	G0612
HM060B, HM080B, HD2, HD3, HT150B, HC060B, HC080B	3	80	83.5	(19) 24 ³⁾	PLQE80-3	G0803
	5	80	83.5	(19) 24 ³⁾	PLQE80-5	G0805
	8	80	83.5	(19) 24 ³⁾	PLQE80-8	G0808
	12	80	101.0	(19) 24 ³⁾	PLQE80-12	G0812
HM080B, HM120B, HD3, HD4, HT150B, HT200B, HT250B, HC080B, HC100B	3	115	124.5	(24) 35 ³⁾	PLQE120-3	G1203
	5	115	124.5	(24) 35 ³⁾	PLQE120-5	G1205
	8	115	124.5	(24) 35 ³⁾	PLQE120-8	G1208
	12	115	152.5	(24) 35 ³⁾	PLQE120-12	G1212

¹⁾ Economy series PLE/PLQE, registered trademarks of Neugart GmbH.

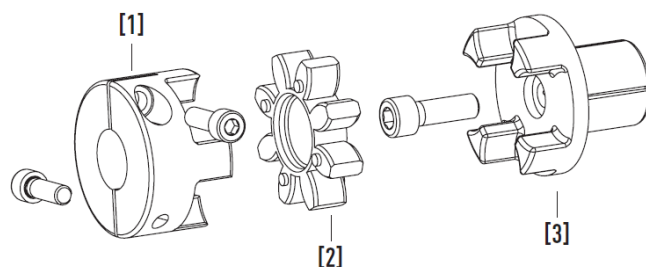
²⁾ See order code on page 12 for HM-B linear modules, page 15 for HT-B linear tables, page 18 for

HC-B cantilever axes and page 20 for HD double axes.

³⁾ Values in brackets available on request.

11.5.6 Coupling assembly for HM-B linear modules, HT-B linear tables, HB-B bridge axes and HC-B cantilever axes

Fig.11.21: Coupling assembly for HM-B linear modules, HT-B linear tables, HB-B bridge axes and HC-B cantilever axes



1	Clamping hub for the motor side
2	elastomer insert
3	Expansion hub for the axle side

11.5.6.1 expansion hub

Coupling element for the axis side.

Fig.11.22: Expansion hub for HM-B linear modules, HT-B linear tables and HC-B cantilever axes

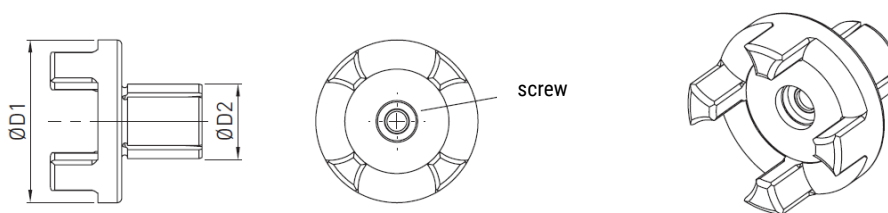


Table 11.11 : Article numbers and dimensions of expansion hub

axis type/size	Type	Ø D1 [mm]	Ø D2 [mm]	Thread size × length	Screw tightening torque [Nm]	Moment of inertia [kgmm ²]	Frictional torque [Nm]	article number
HM025B	Size 12	24.5	10	M4 × 14	4	2.9	11	25-002015
HM040B, HT100B, HC040B	Size 14	29.5	14	M5 × 18	8	1.8	25	25-002714
HM060B, HC060B	Size 19	39.5	20	M6 × 20	10	9.0	38	25-000199
HM080B, HT150B, HC080B	Size 24	54.5	25	M8 × 30	25	35.6	91	25-000200
HM120B, HT200B, HT250B, HC100B	Size 28	64.5	35	M10 × 35	49	77.0	201	25-000201

11.5.6.2 elastomer insert

Fig.11.23: Elastomer insert for HM-B linear modules, HT-B linear tables and HC-B cantilever axes

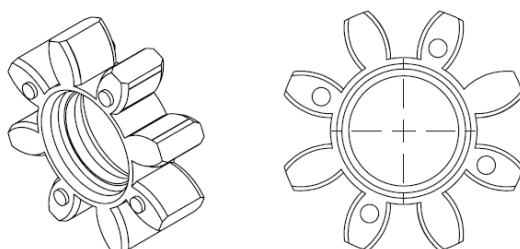


Table 11.12: Article number for elastomer insert

linear axis	Type	article number
HM025B	Size 12	25-002709
HM040B, HT100B, HC040B	Size 14	25-002710
HM060B, HC060B	Size 19	25-002711
HM080B, HT150B, HC080B	Size 24	25-002712
HM120B, HT200B, HT250B, HC100B	Size 28	25-002713

11.5.6.3 clamping hub

Coupling element for the motor side.

Fig.11.24: Clamping hub for HM-B linear modules, HT-B linear tables, HB-B bridge axes and HC-B cantilever axes

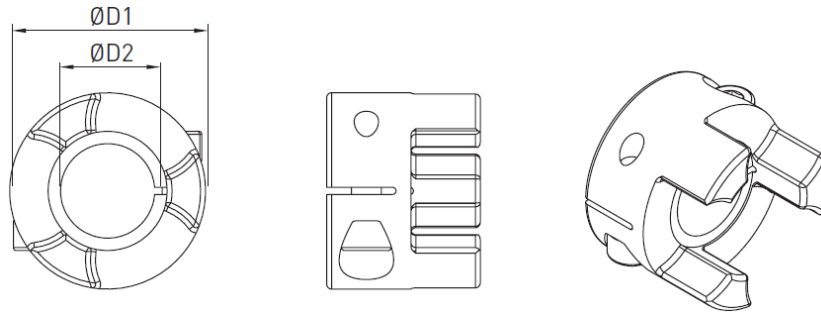


Table 11.13: Article numbers and specifications for clamping hubs

axis type/size	Type	Ø D1 [mm]	Ø D2 H7 [mm]	Thread size × length	Screw tightening torque [Nm]	Moment of inertia [Nm]	Frictional torque [Nm]	article number
HM025B	Size 12	24.5	5	M3 × 12	2.1	1.46	5.2	25-002382
			6	M3 × 12	2.1	1.46	6.1	25-002384
			6.35	M3 × 12	2.1	1.46	6.4	25-002385
			8	M3 × 12	2.1	1.45	8.1	25-002386
			9	M3 × 12	2.1	1.45	9.1	25-002387
			10	M3 × 12	2.1	1.44	10.1	25-002388
			11	M3 × 12	2.1	1.43	11.1	25-002389
			12	M3 × 12	2.1	1.41	12.1	25-002390
			14	M3 × 12	2.1	1.41	14.1	25-002391
HM040B, HT100B, HC040B	Size 14	29.5	5	M4 × 12	5.0	2.70	10.1	25-002392
			6	M4 × 12	5.0	2.69	12.2	25-002393
			6.35	M4 × 12	5.0	2.69	13.2	25-002394
			8	M4 × 12	5.0	2.68	16.5	25-002395
			9	M4 × 12	5.0	2.68	18.6	25-002396
			10	M4 × 12	5.0	2.67	20.8	25-002397
			11	M4 × 12	5.0	2.66	23.0	25-002398
			12	M4 × 12	5.0	2.65	25.1	25-002399
			13	M4 × 12	5.0	2.63	27.2	25-002400
			14	M4 × 12	5.0	2.61	29.4	25-002401
HM060B, HC060B	Size 19	39.5	6.35	M6 × 16	14.0	15.26	25.8	25-002403
			8	M6 × 16	14.0	15.25	32.5	25-002404
			9	M6 × 16	14.0	15.24	36.5	25-002405
			10	M6 × 16	14.0	15.23	40.6	25-002406
			11	M6 × 16	14.0	15.21	44.6	25-002407
			12	M6 × 16	14.0	15.18	48.7	25-002408
			14	M6 × 16	14.0	15.11	56.8	25-002409
			16	M6 × 16	14.0	14.99	64.9	25-002410
			18	M6 × 16	14.0	14.82	73.1	25-002411

axis type/size	Type	Ø D1 [mm]	Ø D2 H7 [mm]	Thread size x length	Screw tightening torque [Nm]	Moment of inertia [Nm]	Frictional torque [Nm]	article number
			19	M6 x 16	14.0	14.71	77.1	25-002412
HM060B, HC060B	Size 19	39.5	20	M6 x 16	14.0	14.58	81.2	25-002413
			22	M5 x 16	10.0	13.95	71.5	25-002414
			24	M5 x 16	10.0	13.52	75.6	25-002415
HM080B, HT150B, HC080B	Size 24	54.5	11	M6 x 20	15.0	53.30	46.0	25-002456
			14	M6 x 20	15.0	53.20	58.0	25-002416
			16	M6 x 20	15.0	53.10	66.0	25-002417
			19	M6 x 20	15.0	52.80	78.0	25-002418
			20	M6 x 20	15.0	52.70	82.0	25-002419
			22	M6 x 20	15.0	52.30	90.0	25-002420
			24	M6 x 20	15.0	51.90	98.0	25-002422
			25	M6 x 20	15.0	51.60	102.0	25-002423
			28	M6 x 20	15.0	50.50	114.0	25-002424
			32	M6 x 20	15.0	48.50	130.0	25-002425
HM120B, HT200B, HT250B, HC100B	Size 28	64.5	16	M8 x 25	35.0	125.45	130.0	25-002426
			19	M8 x 25	35.0	125.11	152.5	25-002427
			20	M8 x 25	35.0	124.95	160.0	25-002428
			22	M8 x 25	35.0	124.55	175.0	25-002429
			24	M8 x 25	35.0	124.02	190.0	25-002430
			25	M8 x 25	35.0	123.70	197.5	25-002431
			28	M8 x 25	35.0	122.47	220.0	25-002432
			32	M8 x 25	35.0	120.08	240.0	25-002433
			35	M8 x 25	35.0	117.59	262.5	25-002434
			38	M8 x 25	35.0	118.33	285.0	25-002435

12 Accessory

Information on accessories and replacement parts can be found on our website at hiwin.de

13 Declaration of Incorporation for Partly Completed Machinery

in accordance with the Machinery Directive 2006/42/EC, Annex II, Part 1 B,
and the Machinery Regulation (EU) 2023/1230, Annex V, Part B

The manufacturer: HIWIN GmbH, Brücklesbünd 1, 77654 Offenburg

Documentation Department: HIWIN GmbH, Brücklesbünd 1, 77654 Offenburg

Description and identification of the partly completed machinery:

Product/article: Linear axes and linear axis systems HX
Type: HM040B, HM060B, HM080B, HM120B
HT100B, HT150B, HT200B, HT250B
HB250B
HC025B, HC040B, HC060B, HC080B, HC100B, HC150B
HD1..., HD2..., HD3..., HD4...
HS21..., HS22..., HS23..., HS24...
HS31..., HS32..., HS33..., HS34...
HSL1..., HSL2..., HSL3..., HSL4...
Year of manufacture: from 2020

It is hereby declared that the essential health and safety requirements relevant to this product, as set out in the Machinery Directive 2006/42/EC (Annex I) and the Machinery Regulation (EU) 2023/1230 (Annex III), are met.

1.1.2, 1.1.3, 1.1.5, 1.3.2, 1.3.3, 1.3.4, 1.3.7, 1.3.9, 1.5.1, 1.5.4, 1.5.5, 1.5.8, 1.5.9, 1.6.2

It is further declared that the technical documentation for this partly completed machinery has been drawn up in accordance with the requirements of the Machinery Directive 2006/42/EC and the Machinery Regulation (EU) 2023/1230.

It is hereby declared that the partly completed machinery complies with the relevant requirements of the following European legislation.

2006/42/EC	Machinery Directive
(EU) 2023/1230	Machinery Regulation
2014/30/EU	Electromagnetic Compatibility (EMC) Directive
2011/65/EU	RoHS Directive on the Restriction of Hazardous Substances

The following harmonised standards, in particular, have been applied to meet the essential health and safety requirements.

EN ISO 13732-1:2008	Ergonomics of the thermal environment – Evaluation methods for human responses to contact with surfaces – Part 1: Hot surfaces
EN ISO 12100:2010	Safety of machinery – General principles for design – Risk assessment and risk reduction
EN 60204-1:2018	Safety of machinery – Electrical equipment of machinery – Part 1: General requirements

The manufacturer or authorised representative undertakes to provide the competent authorities with the relevant technical documentation for the partly completed machinery upon reasoned request.

Industrial property rights remain unaffected by this!

Important note! The partly completed machinery must not be put into service until it has been established that the complete machine into which the partly completed machinery is to be

incorporated complies with the requirements of the Machinery Directive 2006/42/EC or, from 20 January 2027, the Machinery Regulation (EU) 2023/1230.

Offenburg, October 2026

Werner Mäurer, Management

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