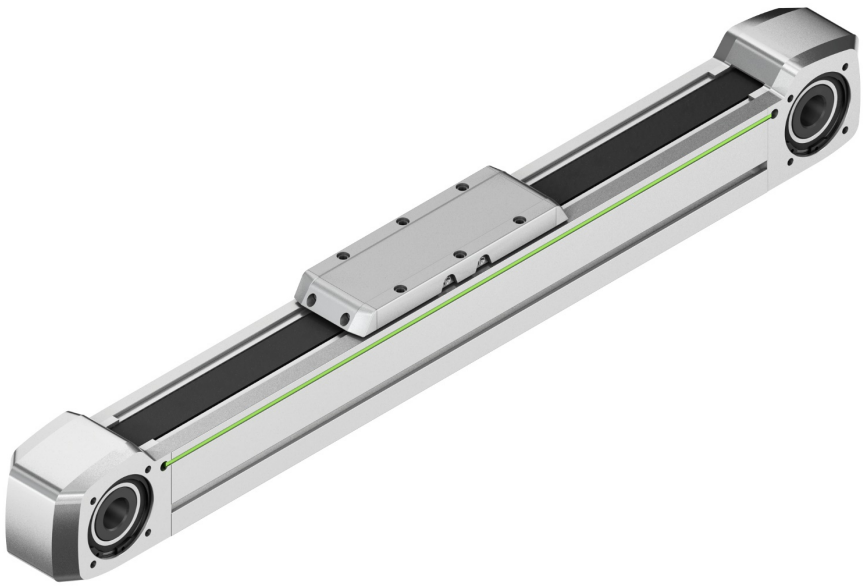

Valid from serial no. HSN 000 000 000 1

Assembly instructions

Linear axes HM-B, linear tables HT-B, cantilever axes HC-B, double axes HD, multi-axis systems HS

HMB_HTB_HCB_HD_HS-01-6-EN-2306-MA

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Legal information

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Contents

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 named products as machine elements. It is also addressed to the persons who carry out the following work in connection with the named products:

- Transport
- Assembly
- Electrical connection including connection to the higher-level control system
- Integration into a safety system
- Retrofitting or upgrading
- Setup
- Commissioning
- Operation
- Cleaning
- Maintenance
- Troubleshooting
- Decommissioning, disassembly and disposal

1.1.1 Requirements

We assume that

- The operating personnel have been instructed in the safe operation of the named products and have read and understood these assembly instructions in full
- Maintenance personnel maintain and repair the products in such a way that they present no danger to persons, the environment or property

1.1.2 Availability

The assembly instructions must always be available to all persons working with or on the named products. The assembly instructions are also available at www.hiwin.de.

1.2 Presentation and layout conventions used in these assembly instructions

1.2.1 Instructions for actions

Instructions for actions are provided in sequential order and identified with a triangle symbol. The results of the actions are accompanied by a tick symbol.

Example:

- ▶ Instruction 1
- ▶ Instruction 2
- ✓ Result

1.2.2 Lists

Lists are identified through the use of bullet points.

Example:

The products must not be operated:

- Outdoors
- In areas where there is a risk of explosion
- …

1.2.3 Presentation of safety notices

Safety notices are always indicated by a signal word and sometimes with a hazard-specific symbol (see section 1.2.4 Symbols used).

The following signal words/hazard levels are used:

⚠ **Danger!** Immediate danger!

Failure to follow this safety notice will result in severe or fatal injury!

⚠ **Warning**! Potentially dangerous situation!

Failure to follow this safety notice could result in severe or fatal injury!

⚠ **Attention!** Potentially dangerous situation!

Failure to follow this safety notice could result in moderately severe or minor injury!

Caution! Potentially dangerous situation!

Failure to follow this safety notice could result in damage to property or the environment!

1.2.4 Symbols used

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

Warning and prohibition signs			
	Warning of dangerous electrical voltage!		Warning of risk of hearing damage!
	Warning of cutting injuries!		Warning of crushing risk!
	Environmentally hazardous substance!		Warning of danger from suspended loads!

Mandatory signs			
	Wear safety gloves!		Wear hearing protection!
	Wear protective goggles!		Release prior to work!

1.2.5 Information

Note:
Notes describe general advice and recommendations.

1.3 Warranty and liability

The manufacturer's “General Terms and Conditions of Sale and Delivery” apply.

1.4 Manufacturer information

Address	HIWIN GmbH Brücklesbünd 1 77654 Offenburg, Germany
Telephone	+49 (0) 781 / 9 32 78 - 0
Technical customer service team	+49 (0) 781 / 9 32 78 - 77
Fax	+49 (0) 781 / 9 32 78 - 90
Technical customer service team fax	+49 (0) 781 / 9 32 78 - 97
E-mail	support@hiwin.de
Internet	www.hiwin.de

1.5 Product monitoring

Please inform HIWIN GmbH, as manufacturer of the named products, about:

- Accidents
- Possible sources of danger on the product
- Any unclear information in these assembly instructions

2 Basic safety notices

⚠ **Warning**!

> This chapter is for the safety of everyone who works with, assembles, installs, operates, maintains or disassembles the named products. Failure to comply with the following information could be dangerous!

2.1 Proper use

Linear axes HM-B/HT-B, cantilever axes HC, double axes HD and/or multi-axis systems HS combine guide and drive to form a compact unit. They are used for the exact positioning in time and place of fixed loads within an automated system. They are ideal in particular for applications requiring high dynamic responses and high precision. In addition, long travel distances can be travelled with these linear axes and linear axis systems.

In the event of vertical mounting, a suitable clamping or braking device must be provided to be able to prevent unintentional lowering of the load.

All linear axes HM-B/HT-B, cantilever axes HC, double axes HD and/or multi-axis systems HS may only be used for the stated purpose:

- Performance limits are given for each size of the named products (see “Linear axes and axis systems HX” catalogue). These performance limits must not be exceeded during operation.
- The products must not be used in potentially explosive atmospheres.
- The products may only be used and operated indoors.
- The products are used as part of an overall system, therefore personal safety must be ensured via the concept of the overall system.
- The assembly instructions and the maintenance and servicing instructions must be complied to ensure the intended use of the products.
- Any other use of the products is considered improper use.

The named products are delivered as a system (guide, drive). That is why the entire documentation of the system must be observed. Depending on the linear axis type, the accompanying documentation may vary.

Requirements for ambient conditions

Ambient conditions during operation:	+5 to +40 °C
Relative humidity during operation:	according to IEC 60721-3-3, class 3K22, non-condensing
Climatic ambient conditions for transport and storage:	Ambient temperature: -20 to +50 °C, non-condensing
Vacuum:	Operation in a vacuum is not permissible

Note:

Prevent condensation from forming to avoid corrosion of the axis.

2.2 Reasonably foreseeable misuse

The named products must not be operated:

- Outdoors
- In areas where there is a risk of explosion

2.3 Conversions or modifications

Conversions or modifications to the products are not permitted! For special requirements, please contact HIWIN GmbH.

2.4 Residual risks

No residual hazards emanate from the named products during normal operation, as they are used as part of the overall system and personal safety is to be ensured by the operator via the overall system. Dangers that may arise during maintenance and servicing are specified in the respective chapters.

2.5 Requirements for personnel

Only authorised and competent persons may carry out work on the named products! They must be familiar with the safety equipment and regulations before they start work (see following table).

Activity	Qualifications
Normal operation	Instructed personnel
Cleaning	Instructed personnel
Maintenance	Qualified personnel of the operator or manufacturer
Servicing	Qualified personnel of the operator or manufacturer
Transport	Instructed personnel
Assembly	Instructed qualified personnel
Disassembly	Instructed qualified personnel

2.6 Safety equipment

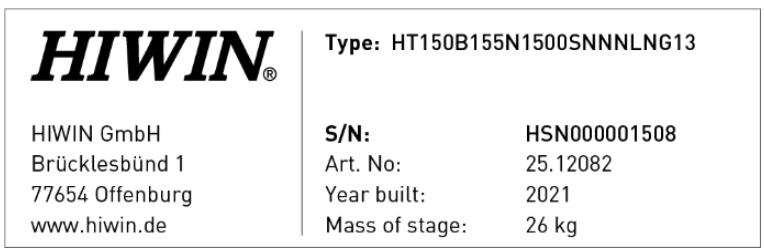
Table 2.1: Personal protective equipment

Operating phase	Personal protective equipment
Normal operation	Staying around the named products is not permitted during normal operation. When staying in the vicinity of the products, the following personal protective equipment is necessary, depending on the travel speed: ○ Safety shoes ○ Hearing protection if necessary
All other operating phases (Cleaning, maintenance, servicing, retrofitting, troubleshooting, repair)	The following personal protective equipment is required for all other phases of operation of the named products: ○ Safety shoes ○ If necessary, protective gloves and goggles ○ Hearing protection if necessary

2.7 Labels on the product

The labels shown below can be found on the products.

Fig. 2.1: Example of a type plate



3 Description of the linear axes and linear axis systems

3.1 Linear module HM-B

3.1.1 Application

Linear modules HM-B with toothed belt drive are compact, flexible positioning modules and are particularly suitable for applications where high dynamics and high speeds are required.

3.1.2 Main components

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

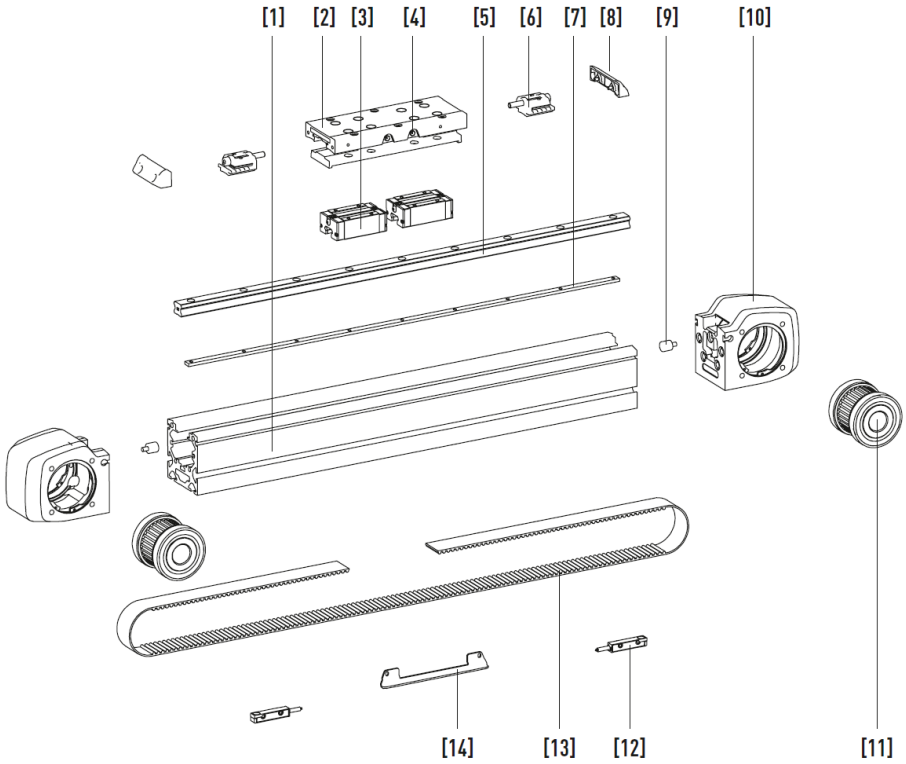


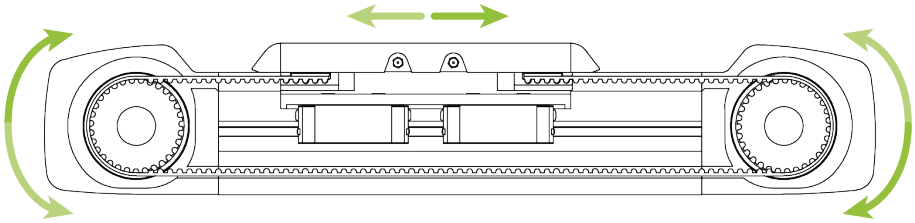
Table 3.1: Legend table

1	Aluminium axis beam	8	Carriage end piece
2	Carriage	9	Stop buffer
3	Block	10	Drive block
4	Grease nipple, 2 grease nipples per side	11	Toothed belt wheel
5	Profile rail	12	Limit switch
6	Belt tensioner	13	Toothed belt
7	Threaded strip	14	Damping element

3.1.3 Application function

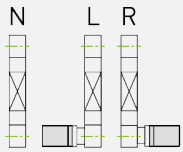
Linear axes with toothed belt drive combine drive and guide in one compact unit. The forces and torques from the load to be moved are transmitted into the linear guideway via the carriages. This also ensures precise guidance of the linear movement with two blocks per carriage. The movement itself takes place via a toothed belt that is fixed to the carriage and driven via the toothed belt wheel by means of an electric motor.

Fig. 3.2: Principle of operation of linear module HM-B



3.1.4 Order code for linear modules HM-B

Number		1	2	3	4	5	6	7	8
Order code		HM	060	B	155	N	0755	S	000
1	HM	HIWIN linear module							
2	060	Size (profile width): 040: 40 mm 060: 60 mm 080: 80 mm 120: 120 mm							
3	B	Drive type: B: Toothed belt drive							
4	155	Feed constant [mm/rev]: 111: HM040B 155: HM060B 190: HM080B 288: HM120B							
5	N	Cover strip: N: Without cover strip C: With steel cover strip							
6	0755	Stroke length [mm]							
7	S	Carriage length: E: Extra short [6)] S: Short M: Medium L: Long							
8	000	Clearance between two carriages [mm]: (000: Only one carriage)							

Number		9	10	11	12	13	14
Continued Order code		A	N	N	R	BR07	G0605
9	A	Axis limit switch [5]: N: Without limit switch A: 2 × NC contact, 100 mm cable, plug B: 2 × NO contact, 100 mm cable, plug C: 2 × NC contact, 4 m open cable end D: 2 × NO contact, 5 m open cable end					
10	N	Toothed belt: N: Standard belt					
11	N	Distance measuring system option [1]: N: Without distance measuring system A: HIWIN MAGIC, analogue, 1 V_{SS} sin/cos, 5 m open cable end D: HIWIN MAGIC, digital, TTL 5 V, 5 m open cable end					
12	R	Drive interface [2]: N: Without L: Left R: Right 					
13	BR07	Flange type [3]					
14	G0605	Gearbox [3]					

[1] Detailed information in section 4.5 from page 36 or in the “HIWIN MAGIC distance measuring systems” assembly instructions.
[2] If no drive interface is selected, the order code ends after this digit.
[3] All flange types can be found in section Table 11.1 from page 137. If no flange type is selected, the order code ends after this digit.
[4] Suitable gearboxes for the HIWIN axes can be found in Table 11.9 on page 165.
[5] Additional reference switches on request.
[6] Only available for HM040B.

3.2 Linear tables HT-B

3.2.1 Application

HIWIN linear tables HT-B with toothed belt drive are perfect for transport tasks where high dynamics and high speeds are required. Also, long travel distances can be travelled with the HT-B linear tables. The toothed belt with modern high-performance profile and reinforced steel tension members ensures safe and high power transmission. The numerous options, such as cover strip, limit switch variants, distance measuring system as well as an extensive range of gearboxes and adaptation material for all commercially available servo motors, make linear axis HT-B a positioning module with flexible application scenarios.

3.2.2 Main components

Fig. 3.3: Main components of linear tables HT-B

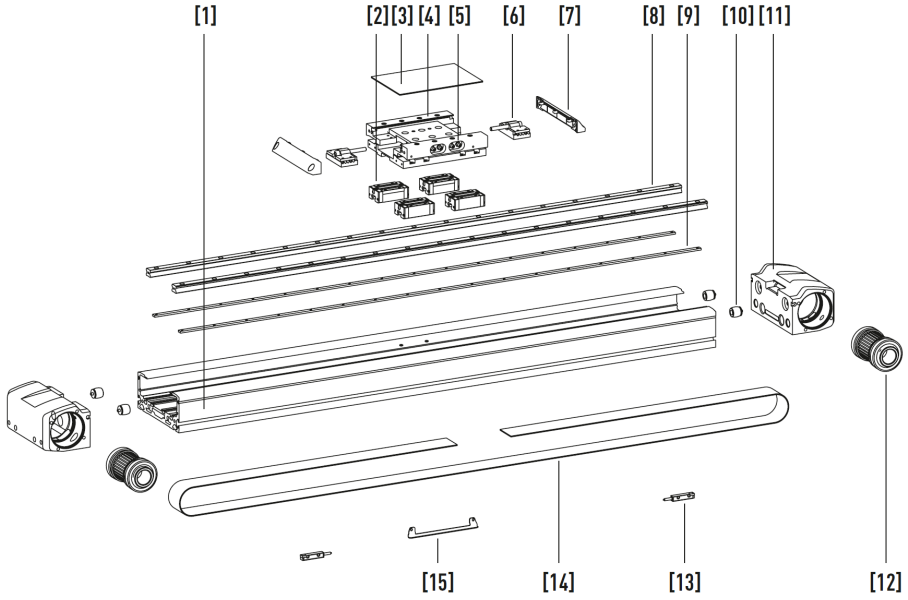


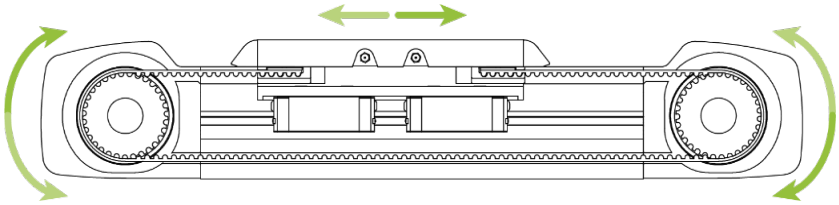
Table 3.2: Description of the main components of linear tables HT-S

1	Aluminium axis beam	9	Threaded strips
2	Block	10	Stop buffer
3	Carriage cover	11	Drive block
4	Carriage	12	Toothed belt wheel
5	Grease nipple	13	Limit switch
6	Belt tensioner	14	Toothed belt
7	Carriage end piece	15	Damping element
8	Profile rails		

3.2.3 Application function

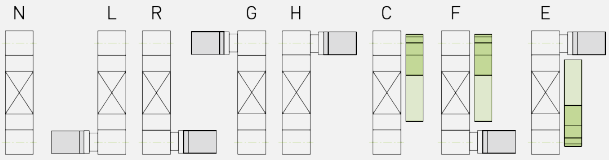
Linear tables with toothed belt drive combine drive and guide in one compact unit. The forces and torques from the load to be moved are transmitted into the linear guideways via the carriages. They also ensure precise guidance of the linear movement with four blocks per carriage. The movement itself takes place via a toothed belt that is fixed to the carriage and driven via the toothed belt wheel by means of an electric motor.

Fig. 3.4: Principle of operation of linear table HT-B



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
1	HT	HIWIN linear table						
2	150	Size (profile width): 100: 100 mm 150: 150 mm 200: 200 mm 250: 250 mm						
3	B	Drive type: B: Toothed belt drive						
4	155	Feed constant [mm/rev]: 105: HT100B 155: HT150B 184: HT200B 208: HT250B						
5	C	Cover strip: C: With steel cover strip N: Without cover strip						
6	1234	Stroke length [mm]						
7	S	Carriage length: S: Short						

Number		8	9	10	11	12	13
Continued Order code		A	N	N	R	BR13	G0805
8	A	Axis limit switch [5]: N: Without limit switch A: 2 × NC contact, 100 mm cable, plug B: 2 × NO contact, 100 mm cable, plug C: 2 × NC contact, 4 m open cable end D: 2 × NO contact, 5 m open cable end					
9	N	Toothed belt: N: Standard belt					
10	N	Distance measuring system option [1]: N: Without distance measuring system A: HIWIN MAGIC, analogue, 1 V_{SS} sin/cos, 5 m open cable end D: HIWIN MAGIC, digital, TTL 5 V, 5 m open cable end					
11	S	Drive interface [2]: N: Without L: Left front R: Right front G: Left rear H: Right rear C: Without, with energy chain on the right F: Right front, with energy chain on the right E: Right rear, with energy chain on the right 					
12	BR13	Flange type [3]					
13	G0805	Gearbox [4]					

[1] Detailed information in section 4.5 from page 36 or in the “HIWIN MAGIC distance measuring systems” assembly instructions.
[2] If no drive interface is selected, the order code ends after this digit.
[3] All flange types can be found in Table 11.2 from page 142. If no flange type is selected, the order code ends after this digit.
[4] Suitable gearboxes for the HIWIN axes can be found in Table 11.9 on page 165.
[5] Additional reference switches on request.

3.3 Cantilever axis HC-B

3.3.1 Application

Cantilever axes HC-B are flexible linear units with an Omega toothed belt drive. The compact drive block with motor and gearbox is stationary while the lightweight cantilever moves. Thanks to the sophisticated structure of the aluminium profile, the cantilever features high torsional rigidity despite its low weight and is therefore suitable for dynamic applications, especially vertical ones.

3.3.2 Main components

Fig. 3.5: Main components of cantilever axis HC-B

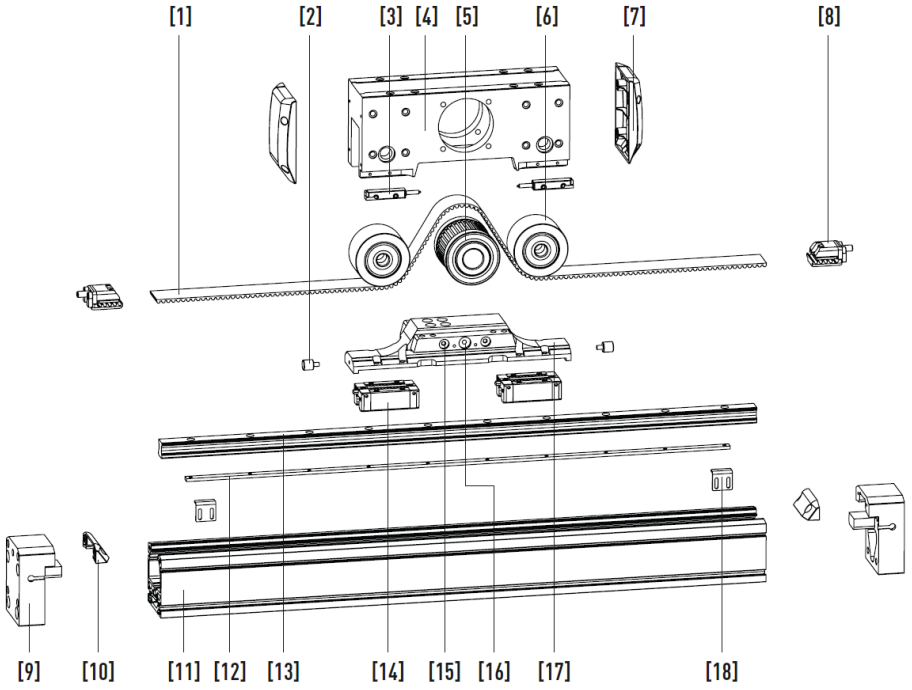


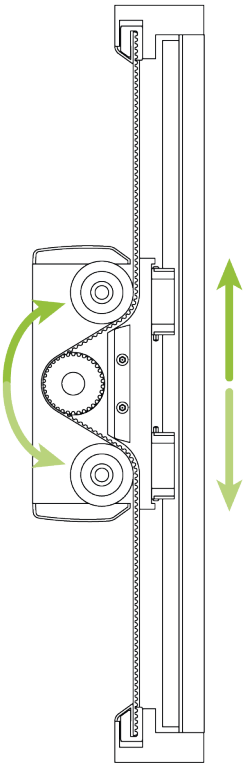
Table 3.3: Description of the main components of cantilever axis HC-B

1	Toothed belt	10	Belt tensioner cover
2	Stop buffer	11	Aluminium axis beam
3	Limit switch	12	Threaded strip
4	Drive block housing	13	Profile rail
5	Toothed belt wheel	14	Block
6	Deflection pulley	15	Grease nipple, 2 grease nipples per side
7	End piece for drive block housing	16	Pneumatic clamping/braking element connection
8	Belt tensioner	17	Lower part of drive block
9	End plate	18	Damping element

3.3.3 Application function

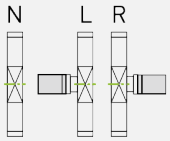
Cantilever axis HC-B is a linear unit in which the drive block remains stationary while the lightweight cantilever moves. The linear guideway with two blocks ensures that forces and torques are transferred reliably from the cantilever to the drive block. The movement itself takes place via a toothed belt that is fixed to the end plates and driven via the toothed belt wheel by means of an electric motor.

Fig. 3.6: Principle of operation of cantilever axis HC-B



3.3.4 Order code for cantilever axis HC-B

Number		1	2	3	4	5	6	7
Order code		HC	060	B	170	N	1234	S
1	HC	HIWIN cantilever axis						
2	060	Size (profile width): 025: 25 mm 040: 40 mm 060: 60 mm 080: 80 mm 100: 100 mm						
3	B	Drive type: B: Toothed belt drive						
4	170	Feed constant [mm/rev]: 081: HC025B 123: HC040B 170: HC060B 200: HC080B 280: HC100B						
5	N	Cover strip: N: Without cover strip						
6	1234	Stroke length [mm]						
7	S	Carriage length: S: Short						

Number		8	9	10	11	12	13
Continued Order code		A	N	N	R	HW01	G0608
8	A	Axis limit switch [6]: N: Without limit switch A: 2 × NC contact, 100 mm cable, plug [1] B: 2 × NO contact, 100 mm cable, plug [1] C: 2 × NC contact, 4 m open cable end [1] D: 2 × NO contact, 5 m open cable end [1]					
9	N	Clamping and braking element option: N: Without holding brake (standard) B: With pneumatic braking element (HC060B/HC080B/HC100B) C: With pneumatic clamping element (HC060B/HC080B/HC100B) [7]					
10	N	Distance measuring system option [2]: N: Without distance measuring system A: HIWIN MAGIC, analogue, 1 V_{SS} sin/cos, 5 m open cable end D: HIWIN MAGIC, digital, TTL 5 V, 5 m open cable end					
11	S	Drive interface [3]: N: Without L: Left R: Right					
12	HW01	Flange type of motor [4]					
13	G0608	Gearbox [5]					

[1] HC025B: A: 2 × NC contact, 200 mm cable, plug; C: 2 × NC contact, 2 m open cable end; B and D: not available

[2] Detailed information in section 4.5 from page 36 or in the “HIWIN MAGIC distance measuring systems” assembly instructions.

[3] If no drive interface is selected, the order code ends after this digit.

[4] All flange types can be found in Table 11.3 from page 148. If no gearbox is selected, the order code ends after this digit.

[5] Suitable gearboxes for the HIWIN axes can be found in Table 11.9 on page 165.

[6] Additional reference switches on request.

[7] The clamping element may only be used when the axis is stationary and not as a brake.

3.4 Double axes HD

3.4.1 Application

Double axes HD are suitable for applications where a single axes is not sufficient due to high torque loads or the dimensions of the load to be transported. Double axes HD are also excellent as a basis for multi-axis systems.

3.4.2 Main components

Fig. 3.7: Main components of double axis HD

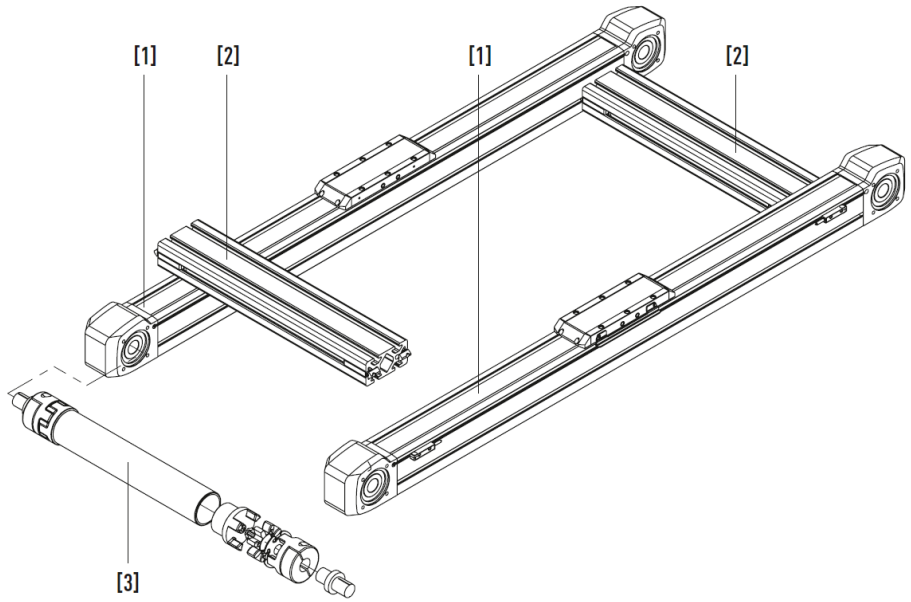
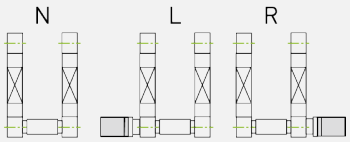


Table 3.4: Description of the main components of double axis HD

1	Linear axis
2	Spacer profile
3	Synchronous shaft

3.4.3 Order code for double axes HD

Number		1	2	3	4	5	6
Order code		HD	2	N	1234	S	000
1	HT	HIWIN double axis					
2	2	Size (profile width of the individual axes): 1: 40 mm 2: 60 mm 3: 80 mm 4: 120 mm					
3	N	Cover strip: N: Without cover strip C: With steel cover strip					
4	1234	Stroke length [mm]					
5	S	Carriage length: S: Short M: Medium L: Long					
6	000	Clearance between two carriages: (000: Only one carriage)					

Number		7	8	9	10	11	12	13
Continued Order code		A	N	1234	R	BE04	G0608	-T
7	A	Axis limit switch: N: Without limit switch A: 2 × NC contact, 100 mm cable, plug B: 2 × NO contact, 100 mm cable, plug C: 2 × NC contact, 4 m open cable end D: 2 × NO contact, 5 m open cable end						
8	N	Distance measuring system option [1]: N: Without distance measuring system A: HIWIN MAGIC, analogue, 1 V_{SS} sin/cos, 5 m open cable end D: HIWIN MAGIC, digital, TTL 5 V, 5 m open cable end						
9	1234	Centre distance D [mm]						
10	R	Drive interface [2]: N: Without L: Left R: Right						
11	BE04	Flange type [3]						
12	G0608	Gearbox [4]						
13	-T	Delivery condition: T: Partially assembled (standard) Without: Assembled						

[1] Detailed information in section 4.5 from page 36 or in the “HIWIN MAGIC distance measuring systems” assembly instructions.
[2] If no drive interface is selected, the order code ends after this digit.
[3] All flange types can be found in Table 11.1 from page 137. If no flange type is selected, the order code ends after this digit.
[4] Suitable gearboxes can be found in Table 11.9 on page 165.

3.5 Two-axis system HS2

3.5.1 Application

Two-axis systems are especially suitable for two-dimensional or planar movements in one plane and form the basis for three-axis systems.

3.5.2 Main components

Fig. 3.8: Main components of two-axis system HS2

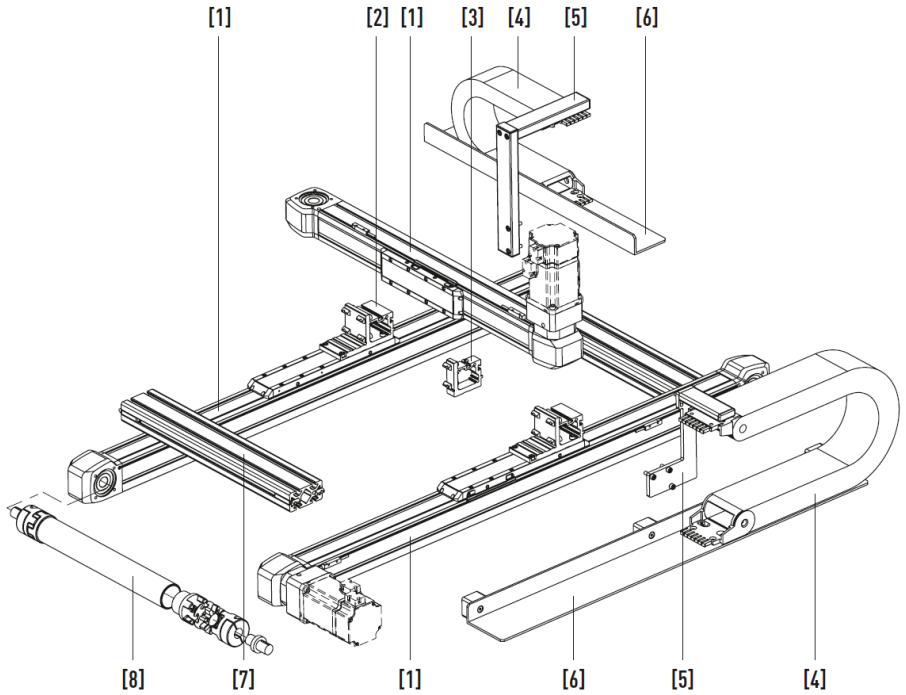


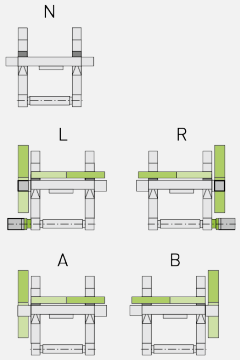
Table 3.5: Description of the main components of two-axis system HS2

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

3.5.3 Order code for two-axis systems HS2

Number		1	2	3	4	5	6	7
Order code		HS	2	2	X	D2	Y	M2 –
1	HS	HIWIN axis system						
2	2	Axis system type: 2: Two-axis system						
3	2	Size (profile width of the X-axis): 1: 40 mm 2: 60 mm 3: 80 mm 4: 120 mm						
4	X	Axis 1 identifier: X						
5	D2	Type and size of axis 1: D1: Double axis HD1 D2: Double axis HD2 D3: Double axis HD3 D4: Double axis HD4						
6	Y	Axis 2 identifier: Y						
7	M2 –	Type and size of axis 2: M1: HM040B M2: HM060B M3: HM080B T1: HT100B T2: HT150B T3: HT200B T4: HT250B						

Number		8	9	10	11	12	13	14	15	16
Continued Order code		1000 –	0800	A	2	R	BR04	G0803 –	BE04	G0608
8	1000 –	Stroke axis 1 [mm]								
9	0800	Stroke axis 2 [mm]								
10	A	Axis limit switch: N: Without limit switch A: 2 × NC contact, 100 mm cable, plug								
11	2	Energy chain: N: Without 1: Energy chain on X-axis 2: Energy chain on X- and Y-axis								
12	R	Drive interface [1]: N: Without drive adapter/Without energy chain L: Drive adapter left R: Drive adapter right A: Without drive adapter, drive interface left B: Without drive adapter, drive interface right								
13	BR04	Flange type of the motor, axis 1 [2]								
14	G0803	Gearbox, axis 1 [3]								
15	BE04	Flange type of the motor, axis 2 [4]								
16	G0608	Gearbox, axis 2 [3]								



[1] If no drive interface is selected, the order code ends after this digit.
[2] All flange types can be found in chapter 11 from page 136.
If no flange type is selected, the “Gearbox, axis 1” position is omitted.
[3] Suitable gearboxes can be found in Table 11.9 on page 165.
[4] All flange types can be found in chapter 11 from page 136.
If no gearbox is selected, the order code ends after this digit.

3.6 Three-axis system HS3

3.6.1 Application

Three-axis systems are flexible units for positioning along the X- Y- and Z-axis. They are especially suitable for three-dimensional movements.

3.6.2 Main components

Fig. 3.9: Main components of three-axis system HS3

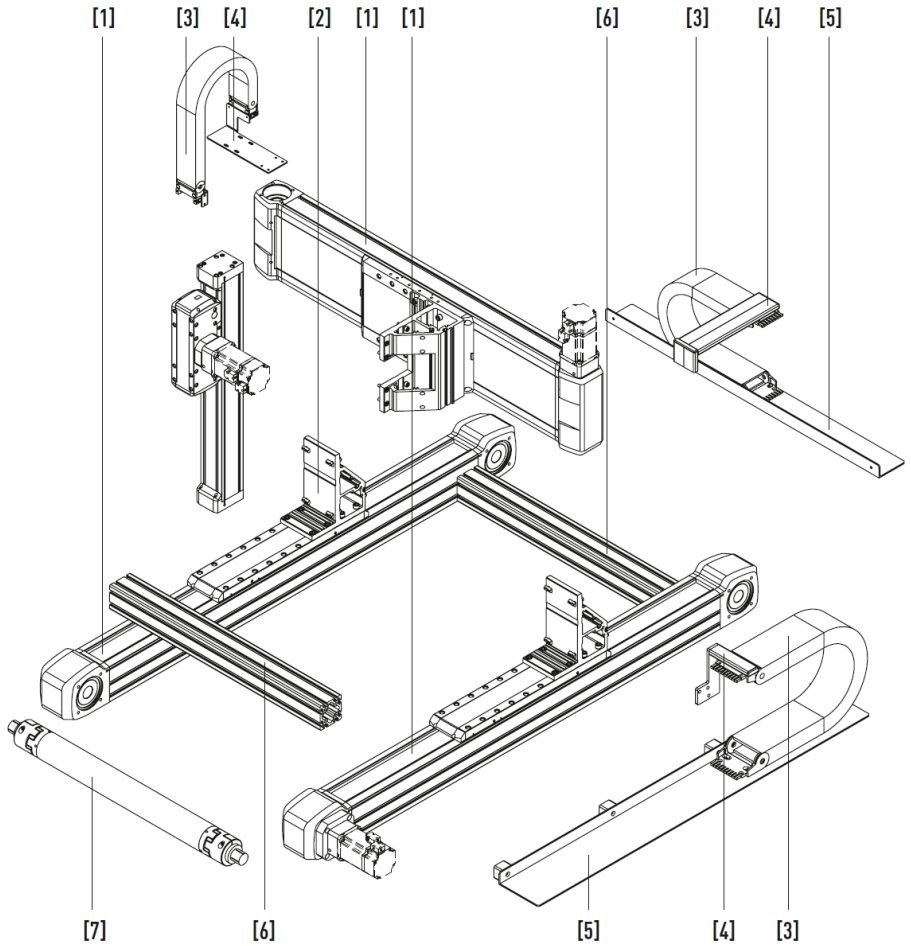


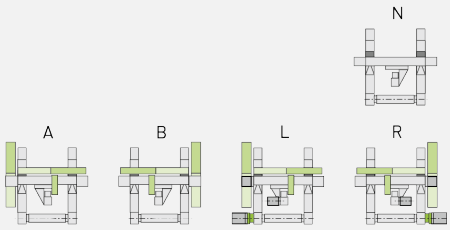
Table 3.6: Description of the main components of three-axis system HS3

1	Linear axis	5	Energy chain support
2	Adaptation angle	6	Spacer profile
3	Energy chain	7	Synchronous shaft
4	Energy chain connection		

3.6.3 Order code for three-axis systems HS3

Number		1	2	3	4	5	6	7	8	9
Order code		HS	3	2	X	D2	Y	T2	U	C1 –
1	HS	HIWIN axis system								
2	3	Axis system type: 3: Three-axis system								
3	2	Size (profile width of the X-axis): 1: 40 mm 2: 60 mm 3: 80 mm 4: 120 mm								
4	X	Axis 1 identifier: X								
5	D2	Type and size of axis 1: D1: Double axis HD1 D2: Double axis HD2 D3: Double axis HD3 D4: Double axis HD4								
6	Y	Axis 2 identifier: Y								
7	T2	Type and size of axis 2: T1: HT100B T2: HT150B T3: HT200B T4: HT250B								
8	Z	Axis 3 identifier: Z								
9	C1 –	Type and size of axis 3: C0: HC025B C1: HC040B C2: HC060B C3: HC080B								

Number	10	11	12	13	14	15
Continued Order code	1000 –	0800 –	0600	A	3	R

10	1000 –	Stroke axis 1 [mm]
11	0800 –	Stroke axis 2 [mm]
12	0600	Stroke axis 3 [mm]
13	A	Axis limit switch: N: Without limit switch A: 2 × NC contact, 100 mm cable, plug
14	3	Energy chain: N: Without 1: Energy chain on X-axis 2: Energy chain on X- and Y-axis 3: Energy chain on X-, Y- and Z-axis
15	R	Drive interface [1]: N: Without drive adapter/Without energy chain L: Drive adapter left R: Drive adapter right A: Without drive adapter, drive interface left B: Without drive adapter, drive interface right 

[1] If no drive interface is selected, the order code ends after this digit.

Number	16	17	18	19	20	21
Continued Order code	BR04	G0803 –	BE04	G0608 –	BO02	G0405

16	BR04	Flange type of the motor, axis 1 [2]
17	G0803 –	Gearbox, axis 1 [2]
18	BE04	Flange type of the motor, axis 2 [4]
19	G0608 –	Gearbox, axis 2 [4]
20	BO02	Flange type of the motor, axis 3 [5]
21	G0405	Gearbox, axis 3 [3]

[2] All flange types can be found in chapter 11 from page 136.
If no flange type is selected, the “Gearbox, axis 1” position is omitted.
[3] For suitable gearboxes, see section Table 11.9 on page 165.
[4] All flange types can be found in chapter 11 from page 136.
If no flange type is selected, the “Gearbox, axis 2” position is omitted.
[5] All flange types can be found in chapter 11 from page 136.
If no flange type is selected, the order code ends after this digit.

3.7 Linear gantries HSL

3.7.1 Application

Linear gantries are flexible units for positioning along the X- and Z-axis. They are especially suitable for two-dimensional movements.

3.7.2 Main components

Fig. 3.10: Main components of linear gantry HSL

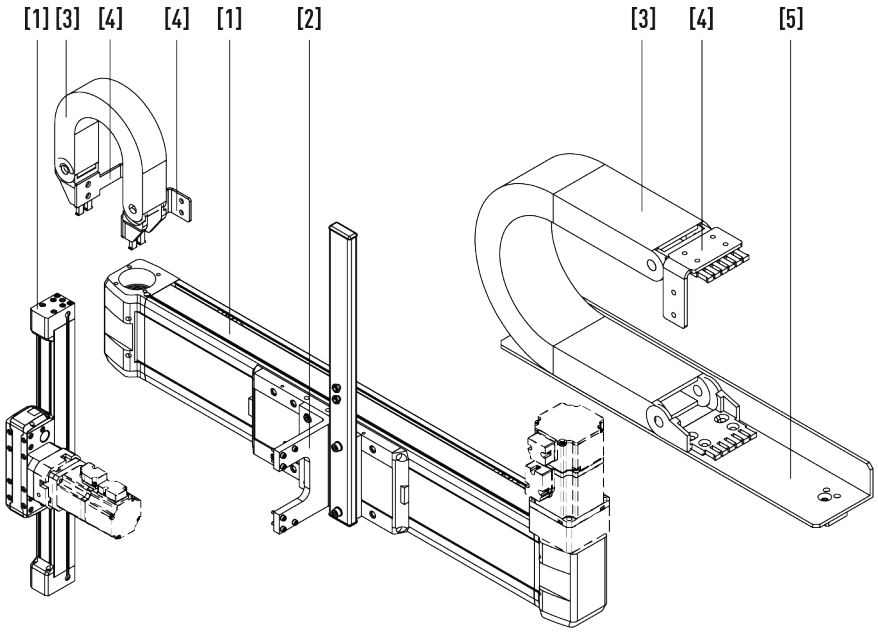
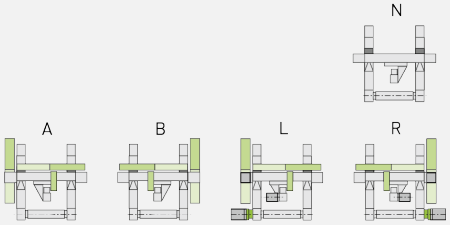


Table 3.7: Description of the main components of linear gantry HSL

1	Linear axis
2	Adaptation angle
3	Energy chain
4	Energy chain connection
5	Energy chain support

3.7.3 Order code for linear gantries HSL

Number		1	2	3	4	5	6	7	8
Order code		HS	L	2	X	T2	Z	C1 –	1000 –
1	HS	HIWIN axis system							
2	L	Axis system type: L: Linear gantry							
3	2	Size (profile width of the X-axis): 1: 100 mm 2: 150 mm 3: 200 mm 4: 250 mm							
4	X	Axis 1 identifier: X							
6	T2	Type and size of axis 1: T1: HT100B T2: HT150B T3: HT200B T4: HT250B							
7	Z	Axis 2 identifier: Z							
8	C1 –	Type and size of axis 2: C0: HC025B C1: HC040B C2: HC060B C3: HC080B							
9	1000 –	Stroke axis 1 [mm]							

Number		9	10	11	12	13	14	15	16
Continued Order code		0600	A	2	R	BE04	G0608 –	BO02	G0405
9	0600	Stroke axis 2 [mm]							
10	A	Axis limit switch: N: Without limit switch A: 2 × NC contact, 100 mm cable, plug							
11	2	Energy chain: N: Without 1: Energy chain on X-axis 2: Energy chain on X- and Z-axis							
12	R	Drive interface [1]: N: Without drive adapter/Without energy chain L: Drive adapter left R: Drive adapter right A: Without drive adapter, drive interface left B: Without drive adapter, drive interface right 							
13	BE04	Flange type of the motor, axis 1 [3]							
14	G0608 –	Gearbox, axis 1 [2]							
15	BO02	Flange type of the motor, axis 1 [4]							
16	G0405	Gearbox, axis 2 [2]							

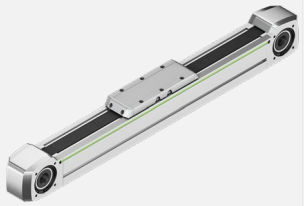
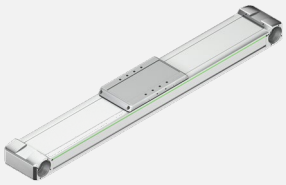
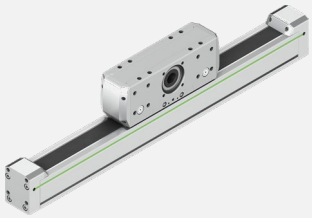
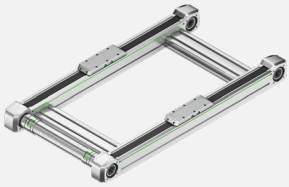
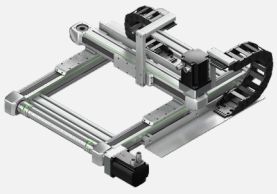
[1] If no drive interface is selected, the order code ends after this digit.
[2] For suitable gearboxes, see section Table 11.9 on page 165.
[3] All flange types can be found in chapter 11 from page 136.
If no flange type is selected, the “Gearbox, axis 1” position is omitted.
[4] All flange types can be found in chapter 11 from page 136.
If no flange type is selected, the order code ends after this digit.

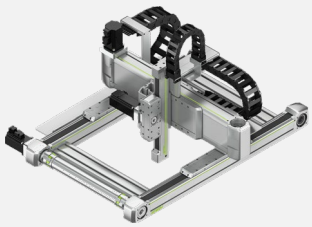
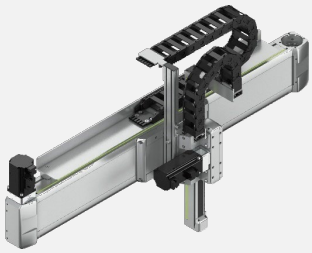
4 Options of the linear axes and linear axis systems

4.1 Stroke length

The stroke lengths of the linear axes and linear axis systems can be selected in millimetre increments.
The maximum stroke length depending on the series and size is listed in Table 4.1.

Table 4.1: Maximum stroke length

Type	Axis	Maximum stroke [mm]
Linear module 	**HM040B**	3.000
	HM060B	5.700 [1)]
	HM080B	5.600 [1)]
	HM120B	5.500 [1)]
Linear table 	**HT100B**	5.600
	HT150B	5.550 [1)]
	HT200B	5.500 [1)]
	HT250B	5.500 [1)]
Cantilever axis 	**HC025B**	300
	HC040B	500
	HC060B	800
	HC080B	1.200
	HC100B	1.800
Double axis 	**HD1**	3.000
	HD2	5.700 [1)]
	HD3	5.600 [1)]
	HD4	5.500 [1)]
Two-axis system 	**HS21-D-M**	X: 3.000 Y: 1.300
	HS22-D-M	X: 5.000 Y: 1.700
	HS23-D-M	X: 5.000 Y: 1.600
	HS21-D-T	X: 3.000 Y: 1.300
	HS22-D-T	X: 5.000 Y: 1.700
	HS23-D-T	X: 5.000 Y: 1.600
	HS24-D-T	X: 5.000 Y: 1.400

Type	Axis	Maximum stroke [mm]
Three-axis system 	**HS31-D-T-C**	X: 3.000 Y: 1.300 Z: 300
	HS32-D-T-C	X: 5.000 Y: 1.650 Z: 500
	HS33-D-T-C	X: 5.000 Y: 1.550 Z: 800
	HS34-D-T-C	X: 5.000 Y: 1.400 Z: 1.200
Linear gantry 	**HSL1-T-C**	X: 5.000 Y: 300
	HSL2-T-C	X: 5.000 Y: 500
	HSL3-T-C	X: 5.000 Y: 800
	HSL4-T-C	X: 5.000 Y: 1.200

[1)] Larger strokes on request

Please note that the maximum possible stroke is reduced with the following options:

- Long carriages (carriage type M and L)
- Second carriage
- Design with cover strip (due to the required cover strip deflections)
- Version with energy chain

4.1.1 Reserve stroke

Caution! Possible damage to the linear axis!

▶ The mechanical end position must not be approached during operation!

Reserve stroke L_r corresponds to the distance that can be travelled in addition to the stroke on both sides of the end positions (stroke 0, stroke max.) before the carriage reaches the mechanical end position (mechanical 0) at the built-in stop buffers. The reserve stroke for each axis size can be found in the “Linear axes and axis systems HX” catalogue.

Fig. 4.1: Illustration of reserve stroke using the example of linear module HM-B

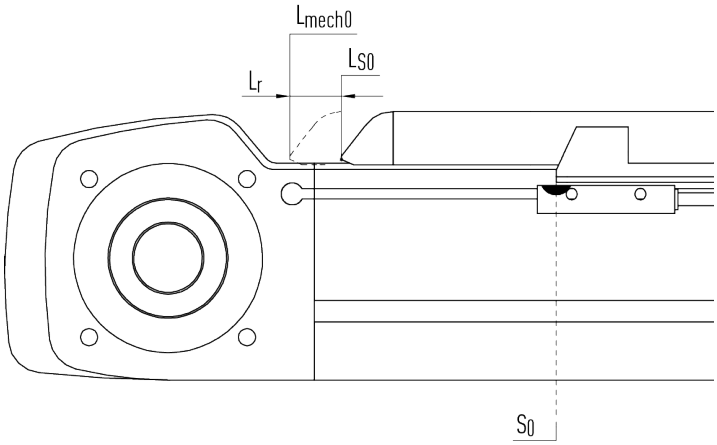
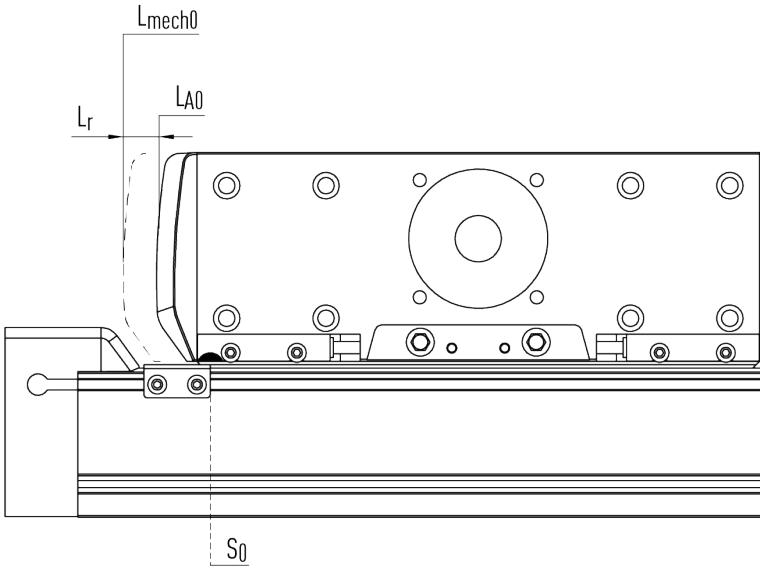


Fig. 4.2: Illustration of reserve stroke using the example of cantilever axis HC-B



4.2 Cover

A steel cover strip is available as an option for all sizes of linear modules HM-B, linear tables HT-B and double axes HD. The cover strip is held down with magnetic strips to protect the inside of the axis from dirt. Note that the carriage length increases for axes with cover strip due to the required cover strip deflection.

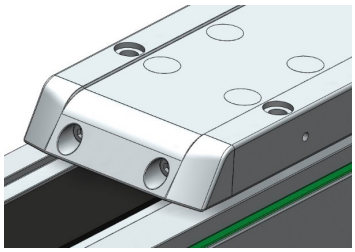
Note:

The “cover strip” option cannot be retrofitted.

4.3 Carriage

Three carriage types are available for linear modules HM-B and double axes HD (carriage type S, M and L). Linear tables HT-B and cantilever axes HC are equipped with carriage type S. Multi-axis systems HS have carriage type L in the X-axis and carriage type M in the Y-axis. The carriages have fastening threads for mounting the payload. These have additional counter bores to allow for insertion of centring sleeves.

Fig. 4.3: Carriage with fastening threads



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

Short carriage (S)

- For single axes

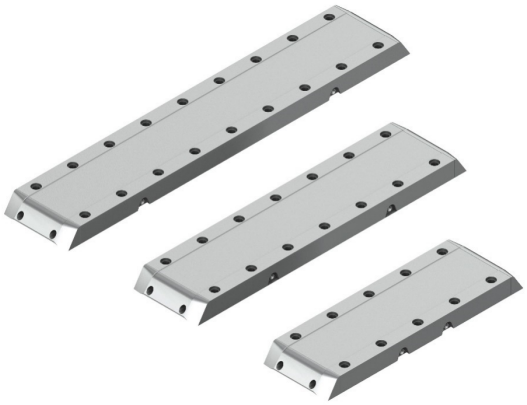
Medium carriage (M)

- For high torque load (My, Mz)
- For use in gantry systems (mainly for Y-axis)

Long carriage (L)

- For very high torque load (My, Mz)
- For use in gantry systems (mainly for X-axis)

Fig. 4.4: Carriage types S, M and L



4.4 Limit switch

On the linear axes, two inductive PNP switches, also called proximity 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 NC or NO contacts and optionally with open cable end or with plug.

4.4.1 Limit switch dimensions

Fig. 4.5: Limit switch dimensions (HM-B, HT-B, HC040B, HC060B, HC080B, HC100B, HD)

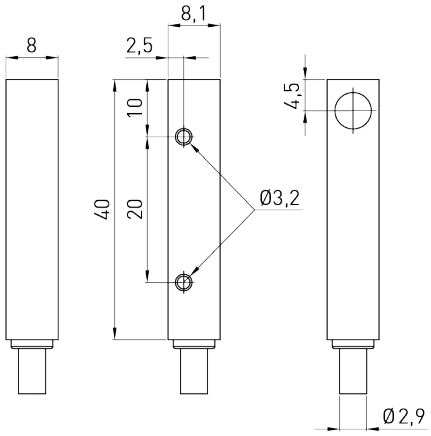
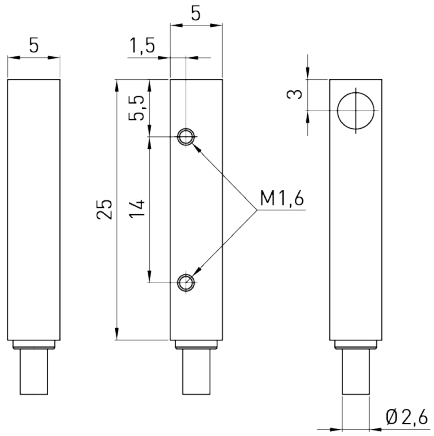


Fig. 4.6: Limit switch dimensions (HC025B)



4.4.2 Limit switch specifications

Table 4.2: General features of the limit switches

Features	Linear axis					
	HM-B, HT-B, HC040B, HC060B, HC080B, HC100B, HD				HC025B	
Article number	25-000786	25-002766	25-000787	25-000788	25-002204	25-002205
Model	NC contact	NO contact	NC contact	NO contact	NC contact	NC contact
Connection type	Cable with M8 plug, 3-pin, 100 mm	Cable with M8 plug, 3-pin, 100 mm	Cable, 3-wire, 4 m[2)]	Cable, 3-wire, 5 m[2)]	Cable with M8 plug, 3-pin, with knurled screw connection, 200 mm	Cable, 3-wire, 2 m[2)]
Type	Cuboid					
Dimensions (W × H × D)	8 × 8 × 40 mm				5 × 5 × 25 mm	
Max. switching distance	2 mm				0,8 mm	
Secured switching distance	1,62 mm				0,648 mm	
Switching distance to be set	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)] According to EN 60529
[2)] Not suitable for energy chains

Table 4.3: Mechanics/Electrics of the limit switches

Features	Linear axis					
	HM-B, HT-B, HC040B, HC060B, HC080B, HC100B, HD, HS				HC025B	
Article number	25-000786	25-002766	25-000787	25-000788	25-002204	25-002205
Model	NC contact	NO contact	NC contact	NO contact	NC contact	NC 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)]	
Delay before start-up	≤ 100 ms				≤ 10 ms	
Hysteresis	5 to 15%				1 to 10%	
Reproducibility	≤ 2% [4)]				≤ 1,5% [4)]	
Temperature drift	±10%					
EMC	According to EN 60947-5-2					
Continuous current I_a	≤ 200 mA					
Cable material	PVC				PUR	
Short-circuit protection	Yes					
Reverse polarity protection	Yes					
Switch-on pulse suppression	Yes					

Features	Linear axis	
	HM-B, HT-B, HC040B, HC060B, HC080B, HC100B, HD, HS	**HC025B**
Shock and vibration resistance	30 g, 11 ms/10 to 55 Hz, 1 mm	
Ambient temperature during operation	-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 precision of the linear axis given by the drive element is not sufficient for an application, the positioning and repeat accuracy can be increased by using a distance measuring system. The distance measuring system is located externally, on the side of the carriage (for cantilever axes HC: on the side of the drive block) and enables a repeat accuracy of ±0,02 mm for belt axes. The housing of the encoder is electrically shielded, the output is either an analogue or digital signal.
The HIWIN MAGIC distance measuring system consists of the encoder (Fig. 4.7) and the magnetic tape (Fig. 4.8) as the measuring standard. Assembly is done at the factory.

Fig. 4.7: MAGIC encoder

Fig. 4.8: MAGIC magnetic tape

Note:
The measuring tape of the magnetic distance measuring systems must not be exposed to strong magnetic fields (keep a distance to permanent magnets!). Strong vibrations (e.g. a blow with a hammer) can also damage the magnetisation of the measuring tape. The system is not suitable for environments with magnetic dust (e.g. graphite dust). These can falsify the measuring signal or damage the distance measuring system.

4.5.1 Technical data of MAGIC distance measuring system

Table 4.4: Electrical and mechanical properties of the MAGIC encoder

Features	Model	
	1 V_{SS} (analogue)	TTL (digital)
Article number	8-08-0120	8-08-0122
Electrical properties		
Output signal specification	Sin/Cos, 1 VSS (0,85 VSS – 1,2 VSS)	Quadrature signals acc. to RS422
Resolution	Infinite, signal period 1 mm	1 µm
Repeatability bidirectional	0,003 mm	0,002 mm
Absolute precision	±20 µm/m	
Reference signal [1)]	Periodic index impulse at a distance of 1 mm	
Phase angle	90° ±0,1° el	90°
DC component	2,5 V ±0,3 V	–
Distortion factor	Typ. < 0,1%	–
Operating voltage	5 V ±5%	
Power consumption	Typ. 35 mA, max. 70 mA	Typ. 70 mA, max. 120 mA
Max. measurement speed	10 m/s	5 m/s
EMC class	3, according to IEC 801	
Mechanical properties		
Housing material	Aluminium alloy, stainless steel sensor base	
Dimensions of MAGIC encoder	L × W × H: 45 mm × 12 mm × 14 mm	
Standard cable length [2)]	5.000 mm	
Min. bending radius cable	40 mm	
Protection class	IP67	
Operating temperature	0 °C to +50 °C	
Weight of MAGIC encoder	80 g	

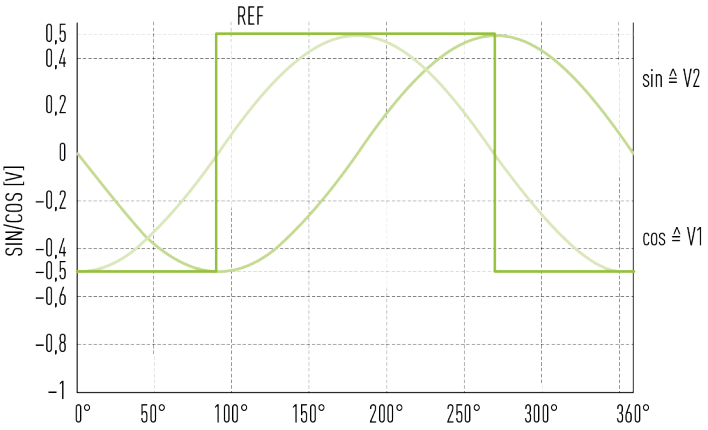
[1)] Can be with reference switch, for example.

[2)] For use in energy chains, we recommend our pre-assembled encoder cable with a pre-mounted M17 round connector (coupling, female) on one side, which matches the optional M17 round connector (plug, male) of the encoder.

4.5.2 Formats and outputs for MAGIC measuring system (analogue)

Signal format sine/cosine 1 V_{SS} output: The electrical signals after the differential input of the downstream electronic components. The HIWIN MAGIC-PG interface sine/cosine 1 V_{SS} is strictly based on the Siemens specification. The period length of the sine output signal is 1 mm. The period length of the reference signal is 1 mm.

Fig. 4.9: Electrical signals after the difference input of the subsequent electronics (analogue version)

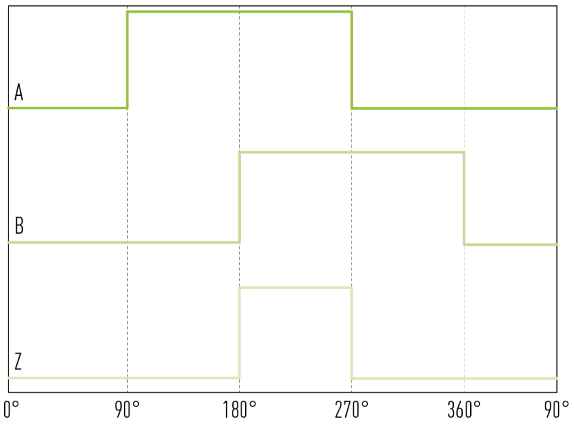


Output signals within one scale period (1.000 µm) in degrees (360°=1.000µm)

4.5.3 Formats and outputs for MAGIC measuring system (digital)

Digital TTL output: The signals to the A and B channels are phase-shifted by 90° (according to the RS-422 specifications conforming to DIN 66259). Output signals: A, $\bar{A}$, B, $\bar{B}$ and Z, $\bar{Z}$.

Fig. 4.10: Signals of the MAGIC encoder (TTL version)



A A signal

B B signal

Z Z signal (reference switch)

For more information, see the “HIWIN MAGIC distance measuring system” assembly instructions.

4.6 Clamping and braking elements

⚠ **Attention!**

Failure to do so may result in serious injury. Injuries and malfunctions can occur in particular due to

- Improperly installed pneumatic lines
- Malfunction of the pneumatic supply , e.g. due to pressure fluctuations
- Damaged or loosened pneumatic lines

4.6.1 Clamping element LKPS [1] (HC060B, HC080B and HC100B)

[1] Manufacturer: Zimmer Group

⚠ **Attention!** Danger of injury and damage to property!

Improper use of the clamping element can result in damage to property and personal injury.

- Only use the clamping element when the axis is stationary!
- Do not use as a braking element or emergency brake!

The clamping element may only be used for static holding of a position.

- If there is no air pressure (air pressure: 0 bar), the clamping element clamps with spring force. The clamping profiles are pressed against the guide rail via a spring energy accumulator (clamps with spring force).
- If the air pressure is between 5,5 and 6,5 bar, free travel is possible. The air pressure keeps the clamping profiles apart (release with air pressure).

Fig. 4.11: Clamping element closed (0 bar)

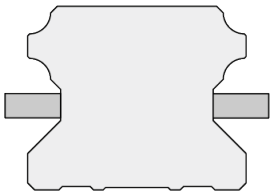
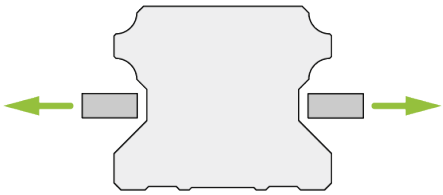


Fig. 4.12: Clamping element open (5,5 to 6,5 bar)



According to EN ISO 13849-1, the clamping element is considered a safety-relevant component of control systems and, as a proven component, can be used in category B or 1 control systems without any further control-related measures.

Table 4.5: Clamping element specifications

Features	Size		
	HC060B	**HC080B**	**HC100B**
Manufacturer	Zimmer Group		
Model	LKPS1512IS2	LKPS2012IS2	LKPS2512IS2
Static holding force [2)]	400 N	650 N	750 N
Air connection	M5		
Pressure min. (opening pressure)	5,5 bar		
Pressure max.	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 according to ISO 8573-1, class 4 Filter size 25 µm, the air filter must be kept clean		

2) Axial load.

4.6.2 Braking element LBPS [1)] (HC060B, HC080B and HC100B)

1) Manufacturer: Zimmer Group

⚠ **Attention!** Danger of injury and damage to property!

Improper use of the braking element can result in damage to property and personal injury.

- Observe the maximum number of dynamic braking cycles according to the data sheet!
- Calculation of the stopping distance according to the manufacturer's specifications!

The braking element may be used for static holding of a position as well as for dynamic braking cycles.

- If there is no air pressure (air pressure: 0 bar), the braking element clamps with spring force. The clamping profiles are pressed against the guide rail via a spring energy accumulator (clamps with spring force).
- If the air pressure is between 5,5 and 6,5 bar, free travel is possible. The air pressure keeps the clamping profiles apart (release with air pressure).

Fig. 4.13: Braking element closed (0 bar)

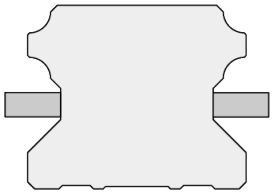
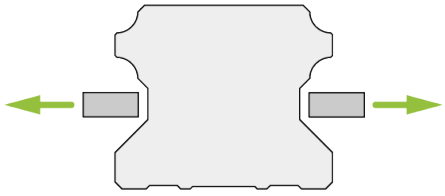


Fig. 4.14: Braking element open (5,5 to 6,5 bar)



According to EN ISO 13849-1, the clamping element is considered a safety-relevant component of control systems and, as a proven component, can be used in category B or 1 control systems without any further control-related measures.

Table 4.6: Braking element specifications

Features	Size		
	HC060B	**HC080B**	**HC100B**
Manufacturer	Zimmer Group		
Model	LBPS1512IS2	LBPS2012IS2	LBPS2512IS2
Static holding force [2)]	400 N	650 N	750 N
Air connection	M5		
Pressure min. (opening pressure)	5,5 bar		
Pressure max.	6,5 bar		
Clamping cycles	Up to 5 million		
Braking cycles	Not allowed		
Plug-in connection for hose	6 mm		
Actuation	Pneumatic		
Air quality	Oiled air according to ISO 8573-1, class 4 Filter size 25 µm, the air filter must be kept clean		

2) Axial load.

Calculation of the stopping distance for vertical installation [1)]

1) Source: Zimmer Group

Vertical application accelerates the system via the earth's gravity until the braking element is triggered and the braking process begins.

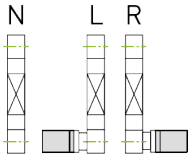
- Speed at the beginning of the braking process V_{brake}:
  $V_{Brems} = v_0 + g \times (t_R + t_A) = 2\frac{m}{s} + 9{,}81\ \frac{m}{s^2} \times (0{,}06\ s + 0{,}01\ s) = 2{,}69\frac{m}{s}$
- Braking distance S_B:
  $$S_B = \frac{m \times v_{Brems}^2}{2 \times \left(F \times A \times \frac{\mu_G}{\mu_H}\right) - m \times g)} = \frac{50\ kg \times \left(2{,}69\frac{m}{s}\right)^2}{2 \times \left(\left(3.100\ N\ \times 1 \times \frac{0{,}06}{0{,}1}\right) - 50\ kg \times 9{,}81\frac{m}{s^2}\right)} = 0{,}132\ m$$
- Reaction path and response path S_R:
  $$S_R = v_0 \times (t_r + t_A) + \frac{1}{2} \times g \times (t_R + t_A)^2 = 2\frac{m}{s} \times (0{,}06\ s + 0{,}01\ s) + \frac{1}{2} \times 9{,}81\frac{m}{s^2} \times (0{,}06\ s + 0{,}01\ s)^2 = 0{,}164$$
- Stopping distance S_H:
  $S_H = S_B + S_R = 0{,}132\ m + 0{,}164\ m = 0{,}296\ m$

4.7 Drive interfaces

Linear axes HM-B/HT-B and cantilever axes HC allow the drive unit (coupling, gearbox and/or motor if necessary) to be mounted on both sides of the drive blocks. Depending on the motor, the scope of delivery includes a coupling housing, a matching coupling and an adapter plate for the motor and/or gearbox.

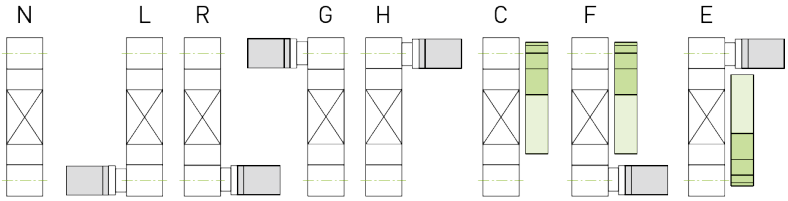
Possible drive interfaces:

Fig. 4.15: Drive interfaces of linear axis HM-B



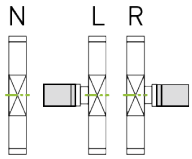
N: Without
L: Left
R: Right

Fig. 4.16: Drive interfaces of linear axis HT-B



N: Without
L: Left
R: Right
G: Left rear
H: Right rear
C: Without, with energy chain
F: Right front, with energy chain
E: Right rear, with energy chain

Fig. 4.17: Drive interfaces of linear axis HC-B

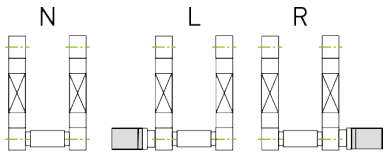


N: Without
L: Left
R: Right

Double axis HD allows the drive unit (coupling, gearbox and/or motor if necessary) to be mounted on the right and left, in each case as an extension of the synchronous shaft. Depending on the motor, the scope of delivery includes a coupling housing, a matching coupling and an adapter plate for the motor and/or gearbox.

Possible drive interfaces:

Fig. 4.18: Drive interfaces of double axis HD

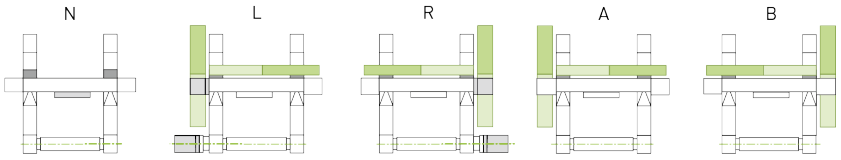


N: Without
L: Left
R: Right

Multi-axis system HS allows the drive unit and energy chain to be mounted on the right and left. Drive and energy chain can be selected individually for each axis. Depending on the motor, the scope of delivery includes a coupling housing, a matching coupling and an adapter plate for the motor and/or gearbox.

Possible drive interfaces HS2:

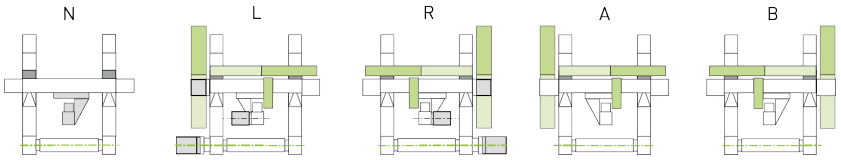
Fig. 4.19: Drive interfaces of two-axis system HS2



N: Without drive adapter/without energy chain
L: Drive adapter left
R: Drive adapter right
A: Without drive adapter, drive interface left
B: Without drive adapter, drive interface right

Possible drive interfaces HS3:

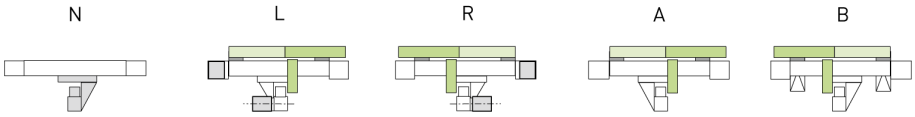
Fig. 4.20: Drive interfaces of three-axis system HS3



N: Without drive adapter/without energy chain
L: Drive adapter left
R: Drive adapter right
A: Without drive adapter, drive interface left
B: Without drive adapter, drive interface right

Possible drive interfaces HSL:

Fig. 4.21: Drive interfaces of linear gantry HSL



N: Without drive adapter/without energy chain
L: Drive adapter left
R: Drive adapter right
A: Without drive adapter, drive interface left
B: Without drive adapter, drive interface right

4.8 Gearbox

Gearboxes are used to adjust the speed and inertia of the motor. Various gearbox sizes with different ratios can be selected for the linear axes.
The gearbox versions available as standard can be found at Table 4.7.

Table 4.7: Gearboxes for linear modules HM-B, linear tables HT-B, cantilever axes HC-B and double axes HD

Axis type/size	Ratio i	Ø H [mm]	L_G [mm]	Gearbox [1]	Order code for gearbox position [2]
HM040B, HD1, HT100B, HC025B, HC040B	3	40	48,5	PLE40-3	G0403
	5	40	48,5	PLE40-5	G0405
	8	40	48,5	PLE40-8	G0408
	12	40	61,5	PLE40-12	G0412
HM040B, HM060B, HD1, HD2, HT100B, HC040B, HC060B	3	60	63,0	PLQE60-3	G0603
	5	60	63,0	PLQE60-5	G0605
	8	60	63,0	PLQE60-8	G0608
	12	60	75,5	PLQE60-12	G0612
HM060B, HM080B, HD2, HD3, HT150B, HC060B, HC080B	3	80	83,5	PLQE80-3	G0803
	5	80	83,5	PLQE80-5	G0805
	8	80	83,5	PLQE80-8	G0808
	12	80	101,0	PLQE80-12	G0812
HM080B, HM120B, HD3, HD4, HT150B, HT200B, HT250B, HC080B, HC100B	3	115	124,5	PLQE120-3	G1203
	5	115	124,5	PLQE120-5	G1205
	8	115	124,5	PLQE120-8	G1208
	12	115	152,5	PLQE120-12	G1212

[1] Economy series PLE/PLQE, registered trademarks of Neugart GmbH
[2] See order code page 12 for linear modules HM-B, page 15 for linear tables HT-B, page 18 for cantilever axes HC-B and page 20 for double axes HD

4.9 Toothed belt

The toothed belt used with steel tension members or glass cord tension members (HC025B/HC040B) is used to transmit high torques. Due to the rounded tooth profile, uniform force transmission is possible, with only minimal tooth deformation occurring in the tooth itself due to uniform stress distribution.

Advantages:

- Form-fitting drive system without slip
- High performance capacity
- Low space requirement
- Wide speed range
- Low toothed belt tension
- No lubrication and maintenance
- Quiet running
- High efficiency (98%)

4.10 Energy chain

4.10.1 Energy chain – HT

For safe carrying of additional cables, linear axes HT-B can optionally be supplied with generously dimensioned energy chains. They are extremely compact and save space when attached to the axis. The alignment of the energy chain depends on the selected drive interface (see section 4.7). The energy chain type and specification can be found in Table 4.8.
The linear tables with energy chain are optimised for horizontal installation. Axes with energy chain for vertical use on request.

Table 4.8: Specifications of energy chain HT

Axis type	Manufacturer's reference [1)]	Cross-section interior W × H [mm]	Bending radius [mm]
HT100B	2400.05.075.0	57 × 25	75
HT150B, HT200B, HT250B	2600.07.100.0	75 × 35	100

[1)] Manufacturer: igus GmbH

4.10.2 Energy chain – HS

Optional energy chains are available for multi-axis systems HS. All directions of movement are supported. Mounting is optionally on the right or left. The generously dimensioned energy chains provide enough space for the supply cables to be carried safely. They are extremely compact and achieve space savings when integrated into the system as a whole. The energy chain types and sizes can be found in Table 4.9, Table 4.10 and Table 4.11. The energy chains are perfectly matched to the attachable drive axis motors and can accommodate the space requirements of standard motor/signal cables. As well as this, they contain enough space for additional cables and hoses.

Table 4.9: Specifications of energy chain HS – X-axis

Axis type	Manufacturer's reference [1)]	Cross-section interior W × H [mm]	Bending radius [mm]
HS21, HS31, HSL1	2400.07.100.0	77 × 25	100
HS22, HS32, HSL2	2600.07.100.0	75 × 35	100
HS23, HS33, HSL3	2600.07.100.0	75 × 35	100
HS24, HS34, HSL4	2600.10.125.0	100 × 35	125

[1)] Manufacturer: igus GmbH

Table 4.10: Specifications of energy chain HS – Y-axis

Axis type	Manufacturer's reference [1)]	Cross-section interior W × H [mm]	Bending radius [mm]
HS21, HS31	2400.05.075.0	57 × 25	75
HS22, HS32	2400.05.075.0	57 × 25	75
HS23, HS33	2400.07.100.0	77 × 25	100
HS24, HS34	2400.07.100.0	77 × 25	100

[1)] Manufacturer: igus GmbH

Table 4.11: Specifications of energy chain HS – Z-axis

Axis type	Manufacturer's reference [1)]	Cross-section interior 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 GmbH

The upper run is self-supporting but there is a surface for the lower run that supports the energy chain as it unrolls. To prevent the cables and hoses from riding over each other, there is a partition in every second link. The connecting pieces are of a rigid design. Strain relief combs are fitted at both ends so that the cables and hoses can be secured with cable ties.

To ensure that the energy chains are handled correctly, and that the cables and hoses are installed and secured properly, please observe the assembly instructions from the energy chain manufacturer.

4.10.3 Energy chains – general information

- For details of suitable motor and signal cables, please refer to the operating manual from the motor manufacturer.
- Observe the minimum bending radii (industrial standard 8 × D) specified for the cables and hoses, and the associated service life that is to be anticipated.
- In the case of shielded cables, make sure the shields are resistant to bending.
- Low-friction and abrasion-resistant cable/hose sheaths should be used.
- To prevent cables and hoses with different outer sheaths from bonding, separate them with partitions.
- Ensure twist-free installation of cables and hoses.
- Leave enough spare room (10 to 20%, at least 1 mm) all the way around the cables and hoses, and allow for the lateral expansion that occurs when hoses are pressurised.
- Make sure that the weight is distributed evenly/symmetrically. Ideally, heavy cables and hoses should be positioned at the outer edges.
- Provide strain relief for cables and hoses at both ends so that they are located in the neutral zone when the energy chain is in the extended position and can move freely within its radius.
- In the case of high acceleration values or if the cables have a wide variety of diameters, use additional partitions where applicable.
- Observe the maximum additional load from cables and hoses that is permitted based on the stroke; see Fig. 4.22, Fig. 4.23 and Fig. 4.24.

Fig. 4.22: Maximum permissible additional load F_{Add} depending on stroke L_T, series 1500 (source: igus)

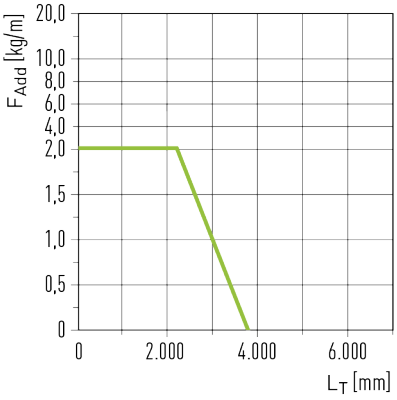


Fig. 4.23: Maximum permissible additional load F_{Add} depending on stroke L_T, series 2400 and 2500 (source: igus)

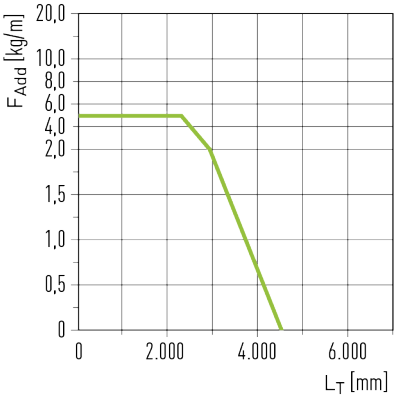
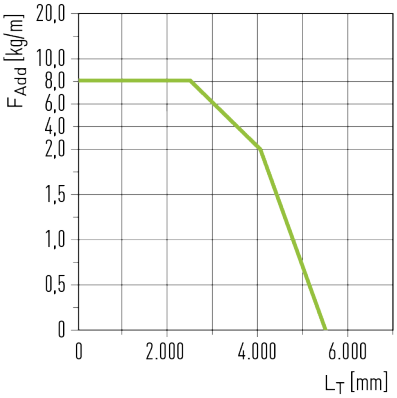


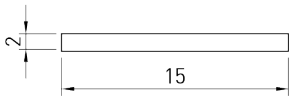
Fig. 4.24: Maximum permissible additional load F_{Add} depending on stroke L_T, series 2600 (source: igus)



4.10.4 Tape for reduction of noise emissions from the energy chain

Cellular rubber tape for the reduction of noise emissions from energy chains. The noise reduction tapes, which are self-adhesive on one side, are attached to the energy chain support in such a way that the links of the energy chain are deposited on the tapes when the carriage moves, significantly reducing noise emissions. The noise reduction tape is available in rolls of 10 m (Article number: 25-002485).

Fig. 4.25: Dimensions of tape for reduction of noise emissions from the energy chain



5 Transport and setup

5.1 Delivery

5.1.1 Delivery condition

The linear axes and linear axis systems are delivered 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 location

⚠ **Warning**! Danger from suspended loads or falling parts!

Lifting heavy loads can cause damage to health.

- Assembly and maintenance of the linear axes/linear axis systems only by qualified personnel!
- Take the mass of the parts into account during transport. Use suitable lifting gear!
- Comply with the applicable industrial safety regulations for handling suspended loads.
- Lift linear axes/linear axis systems only at specified support points!
- Secure machines and machine parts against tipping over!

⚠ **Attention!** Risk of impact and crushing!

If the axes are moved/driven manually, injuries can be caused by moving axes and attachments (energy chains, attachments installed by customer).

- Observe applicable industrial safety regulations!
- Transport to the installation site only by qualified personnel!

Caution! Possible damage to the linear axis/the linear axis system!

The linear axis or the linear axis system can be damaged by mechanical stress.

- Lift linear axes/linear axis systems only at specified support points! (See section 5.5)!
- For longer linear axes/linear axis systems, ensure the centre sections have additional protection!
- Ensure that the linear axes/linear axis systems do not bend, as this will permanently affect the precision!
- Do not transport any additional loads on the linear axis/linear axis system during transport!
- Provide additional support for heavy attachments!

The linear axes and linear axis systems are precision products and must be handled with care. Shocks and impacts can damage the axes. Reduced running accuracy and a reduced service life could be the result. Transport the product packed as close as possible to the installation site. Only remove the packaging once there.

5.3 Installation location requirements

5.3.1 Environmental conditions

Ambient conditions during operation:	+5 to +40 °C
Relative humidity during operation:	according to IEC 60721-3-3, class 3K22, non-condensing
Climatic ambient conditions for transport and storage:	Ambient temperature: -20 to +50 °C, non-condensing
Vacuum:	Operation in a vacuum is not permissible

5.3.2 Safety equipment to be provided by the operator

Possible safety equipment/measures:

- Personal protective equipment according to UVV (accident prevention regulation)
- Electrosensitive protective equipment
- Mechanical safety equipment

5.4 Storage

- Store the linear axes/linear axis systems in the transport packaging.
- Alternative: Select packaging in which the linear axes/linear axis systems are secured against slipping, damage and vibration.
- Store the linear axes/linear axis systems only in dry, frost-free rooms.
- Clean and protect used linear axes/linear axis systems before storage.

5.5 Unpacking and setup

⚠ **Attention!** Danger to health and the environment!

Contact with lubricants can cause irritation, poisoning and allergic reactions as well as damage to the environment.

- Only use suitable media that are not dangerous for humans. Observe the manufacturer's safety data sheets.
- Dispose of substances appropriately.

Note:

Linear axes HM-B/HT-B, cantilever axes HC-B, double axes HD and multi-axis systems HS may only be set up and operated indoors.

5.5.1 Unpacking and setting up linear axes HM-B/HT-B and cantilever axes HC-B

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

Fig. 5.1: Support points A and B for lifting and transporting, using the example of linear axis HM-B

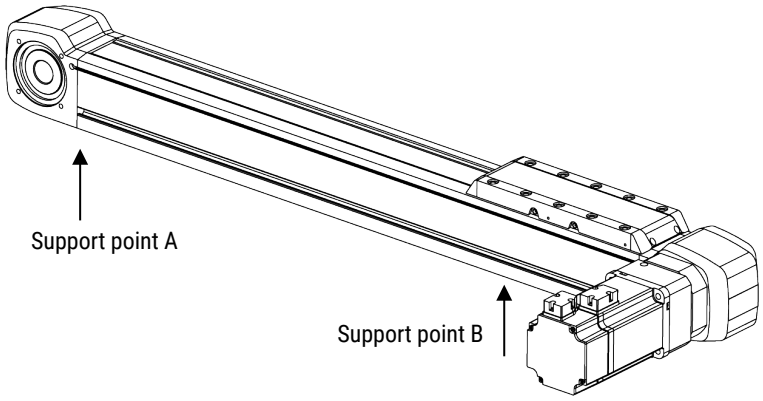


Fig. 5.2: Correct position of the support points

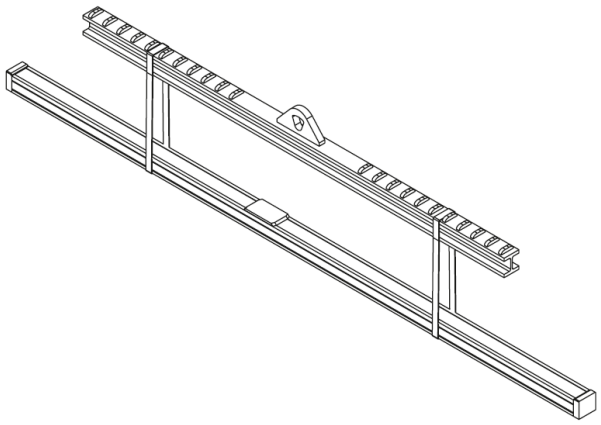
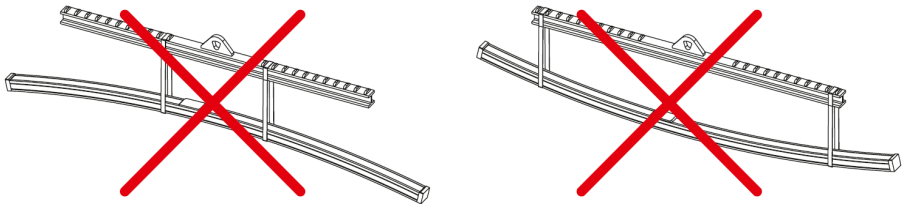


Fig. 5.3: Incorrect position of the support points



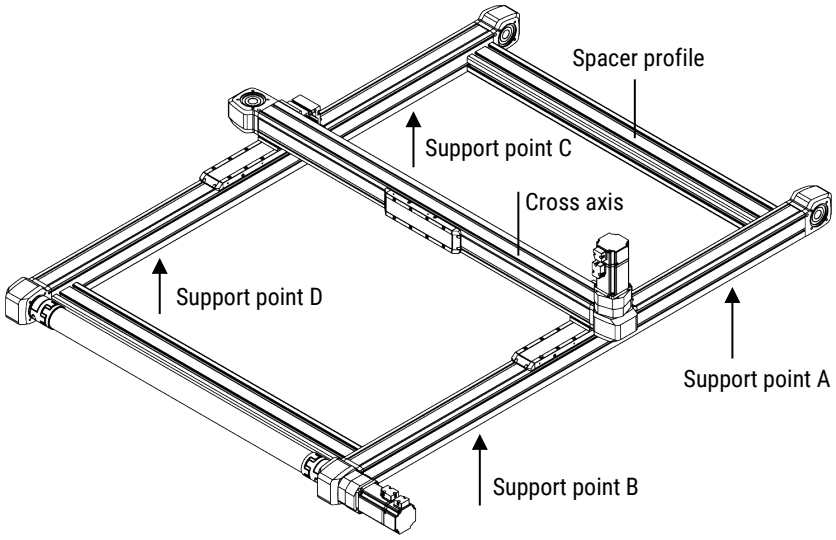
5.5.2 Unpacking and setting up double axes HD and axis systems HS

- Remove the protective film from the pallet and the transport lock from the packaging.
- Prior to transport, secure all moving parts to prevent them from slipping.
- To transport the double axis/axis system, hoist it by designated support points A, B, C and D (see Fig. 5.4). Use suitable lifting gear for this purpose, such as an underslung or gantry crane, crane slings and – depending on the dimensions – a lifting beam. The distance of points A and B as well as C and D from the end of the axis should be one quarter of the total length of the axis.
- Do not hoist the double axis/axis system by the spacer profiles, cross axis or attachments. During transport, provide additional support for heavy attachments such as the drive.

Note:

Only remove the transport locks of the axis system after transport and proper assembly (see sections 6.1 and 6.2)!

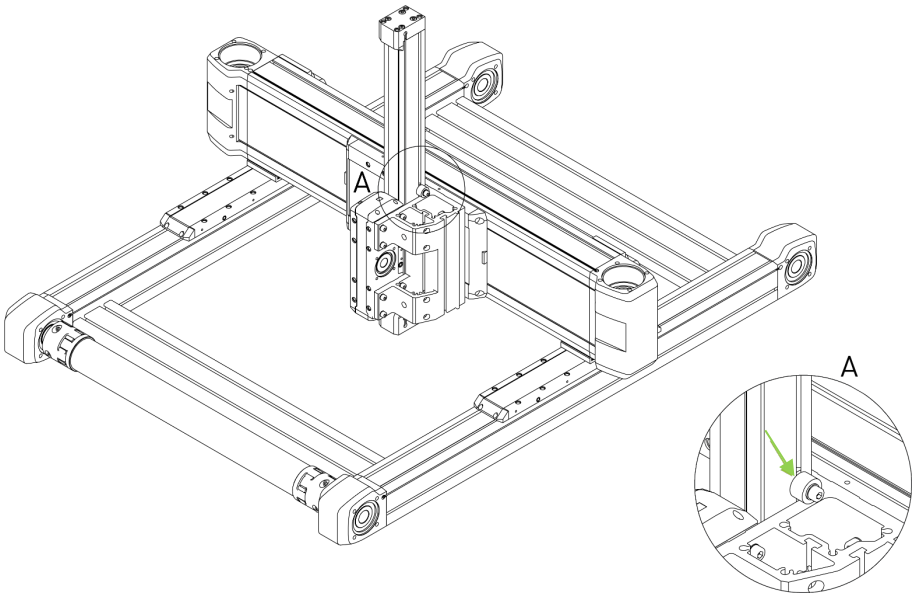
Fig. 5.4: Support points A, B, C and D for lifting and transporting, using the example of a two-axis system HS2



5.5.3 Removing transport lock

Three-axis systems HS32, HS33 and HS34 are supplied as standard with a transport lock on the Z-axis to prevent uncontrolled movements of the Z-axis during transport. The transport lock can be removed as soon as the three-axis system is placed at the installation site, but at the latest before commissioning.

Fig. 5.5: Transport lock



6 Assembly and connection

⚠ **Danger!** Danger due to electrical voltage!

Electrical currents can also flow when the motor is not moving.

- Make sure that the linear axes/linear axis systems are disconnected from the power supply before disconnecting the electrical connections of the motors!
- After disconnecting the servo drive from the power supply, wait at least 5 minutes before touching live parts or loosening connections!
- To be on the safe side, measure the voltage in the intermediate circuit of the servo drive. Wait until it has dropped below 40 V!
- Work on electrical installations only by qualified personnel!

⚠ **Danger!** Danger of electric shock or burns from contact with live parts!

Contact with live parts can cause injuries. If the customer installs cables incorrectly, the constant motion inside the energy chain can cause chafing and expose the electrical contact points.

- Construction of the control system according to DIN EN 12100. No start up after:
  - Application, return of energy!
  - Correction of a fault!
  - Machine stop!
- Only qualified personnel may install cabling!
- Work on electrical installations only by qualified personnel!

⚠ **Warning**! Risk of impact and crushing!

Injuries may occur due to automatic or manual movement of the carriage.

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

⚠ **Warning**! Risk of impact and crushing!

When using the linear axis in cantilever operation, there is a risk of injury when the axis body moves out.

- Commissioning, set-up and troubleshooting only by qualified personnel!
- A safety guard must be provided for the operation of the linear axes/linear axis systems!
- In the case of vertical installation, the linear axis must be secured against unintended lowering by means of motors with spring-loaded brake and an additional clamping element.

⚠ **Warning**! Danger of cutting!

The cover strip can cause cuts during assembly or disassembly.

- Commissioning and set-up only by qualified personnel with appropriate protective equipment (gloves, goggles)!

⚠ **Warning**! Danger of impacts and crushing caused by the clamping/braking element opening!

As soon as compressed air is applied, the clamp opens.

- Before working, 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 only by qualified personnel!
- Take the mass of the parts into account during transport. Use suitable lifting gear!
- Comply with the applicable industrial safety regulations for handling suspended loads.
- Lift linear axes/linear axis systems only at specified support points!
- Secure machines and machine parts against tipping over!
- Fasten linear axes/linear axis systems according to the assembly instructions!
- When linear axes/linear axis systems are arranged vertically, secure the carriage when stationary!

⚠ **Attention!** Danger of hearing damage!

The linear axes/linear axis systems can generate noise above 70 dB(A) at high speeds.

- For fast running linear axes/linear axis systems with a noise level above 70 dB(A), ear protection must be worn!
- Linear axes with energy chain and chain support can generate noise up to 94db(A) depending on load and speed. Noise reduction tape is available as an accessory.

⚠ **Attention!** Danger of impacts and crushing due to imposed load becoming detached!

If the fastener is fastened incorrectly or fails, injuries can be caused by falling or flying parts.

- Carry out assembly in such a way that parts do not come loose even in the event of strong acceleration or continuous vibrations!
- Attach the payload in accordance with the assembly instructions!

⚠ **Attention!** Risk of impact and crushing!

If the axes are moved by the motor, injuries can be caused by moving axes and attachments (energy chains, attachments installed by customer).

- A safety guard must be provided for the operation of the linear axes/linear axis systems!
- When linear axes/linear axis systems are arranged vertically, secure the carriage when stationary!

⚠ **Attention!** Risk of injury!

Rotation of the toothed belt pulley or the synchronous shaft during movement of the carriage/carriages can result in fingers, hair or items of clothing getting caught and entangled.

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

⚠ **Attention!** Danger to health and the environment!

Contact with lubricants can cause irritation, poisoning and allergic reactions as well as damage to the environment.

- Only use suitable media that are not dangerous for humans. Observe the manufacturer's safety data sheets.
- Dispose of substances appropriately.

6.1 Installation of double axis HD with partially pre-assembled delivery

6.1.1 Mounting the spacer profiles

- Clean the mounting surface and position the spacer profiles **[1]** between the linear axes **[2]** (see Fig. 6.1). With the HD2 or HM060B with MAGIC distance measuring system, the distance profile must be aligned according to Fig. 6.3
- Insert the T nuts **[3]** into the groove on the side of the linear axes **[2]**. Make sure that the threads of the T nuts point outward in each case (see Fig. 6.2).
- Arrange the T nuts so that the screws of the automatic fastener **[4]** meet the threads of the T nuts inside the spacer profiles **[1]** (see Fig. 6.2).
- Place the linear axes **[2]** against the spacer profiles **[1]**.

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

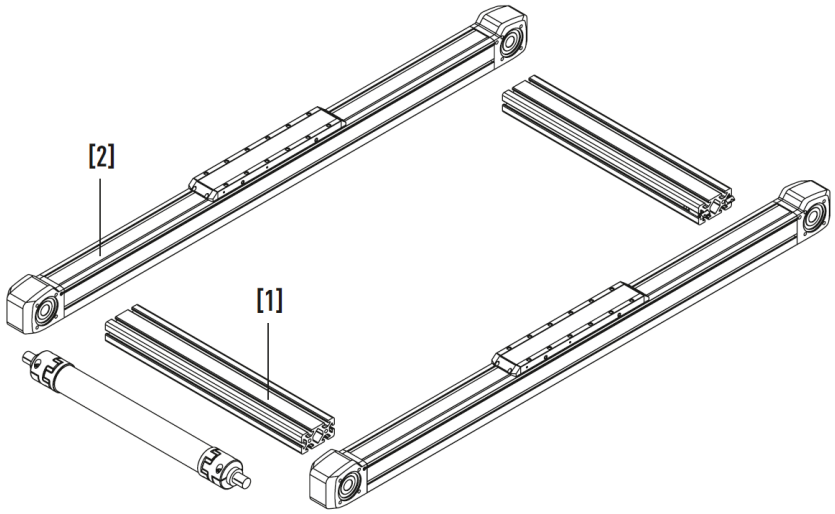


Fig. 6.2: Screw the automatic fasteners **[4]** to the T nuts **[3]**

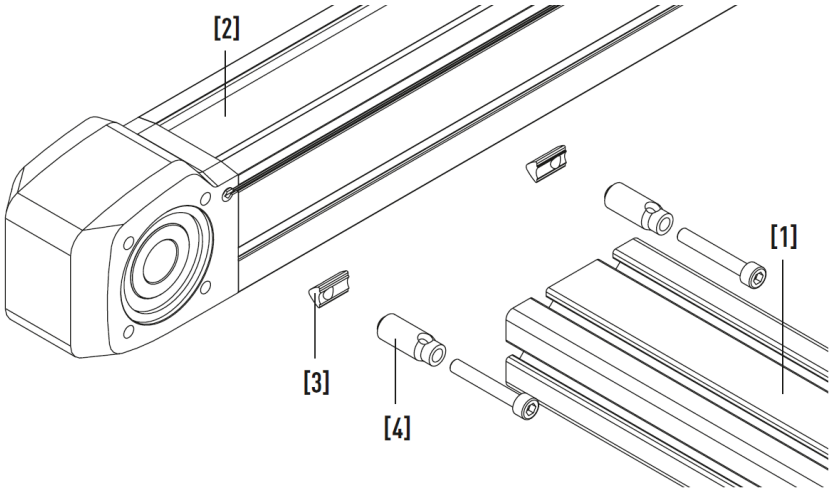
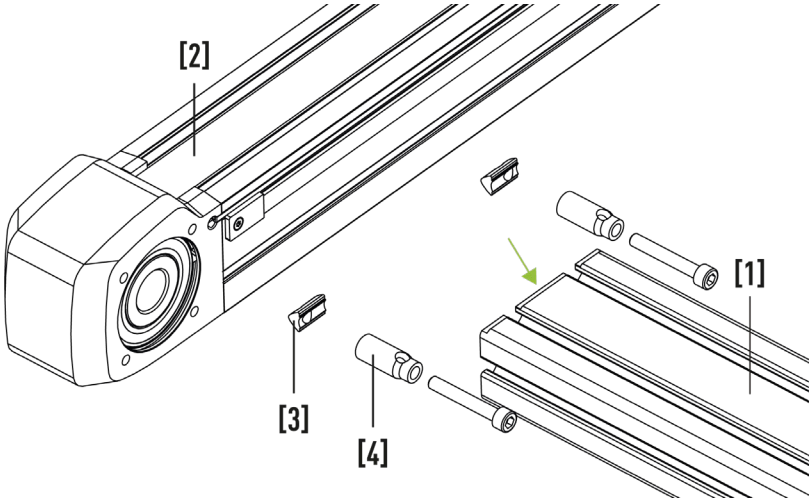


Fig. 6.3: Alignment of the distance profile with MAGIC distance measuring system

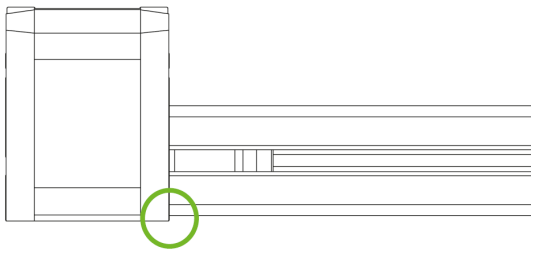


- Screw the automatic fasteners **[4]** in the spacer profiles **[1]** to the T nuts **[3]** in the linear axes (see Fig. 6.2).
- Make sure that the spacer profile does not protrude beyond the basic profile of the axis (see Fig. 6.4).
- Tighten the automatic fasteners **[4]** to the screw tightening torques shown in Table 6.1.
- ✓ The spacer profiles have been mounted.

Table 6.1: Screw tightening torques for the automatic fasteners

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 overhang



6.1.2 Mounting the synchronous shaft

- Clean the clamping surfaces so that they are free of grease and dirt.
- Mount the journals at both ends as described in 6.6.5 on page 82.
- Carefully place the synchronous shaft on the journals.
- Make sure that the synchronous shaft is positioned centrally between both journals.
- Loosely attach the half shell clamping pieces at both ends using the screws supplied (see Fig. 6.5).
- Fit a clamping bolt to one coupling half shell and then tighten the second clamping bolt slightly. Make sure that there is an even gap between the half shell and the coupling hub all the way round.
- Tighten both clamping bolts of the coupling. For details of the screw tightening torque, see Table 6.2 or the engraving on the coupling hub.
- Make sure that dimension L1 is maintained according to Table 6.3 (see Fig. 6.6).

- Move the carriages of both single axes to their end position. Then clamp the second axis in exactly the same way.
- Move the carriages to both end positions, checking for freedom of movement.

✓ The synchronous shaft has been mounted.

Table 6.2: Screw tightening torque for clamping bolts of 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: Mounting the synchronous shaft

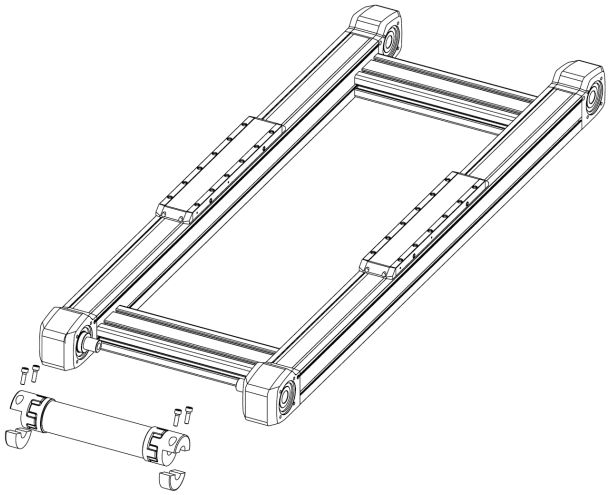


Fig. 6.6: Dimension L_1 on the synchronous shaft

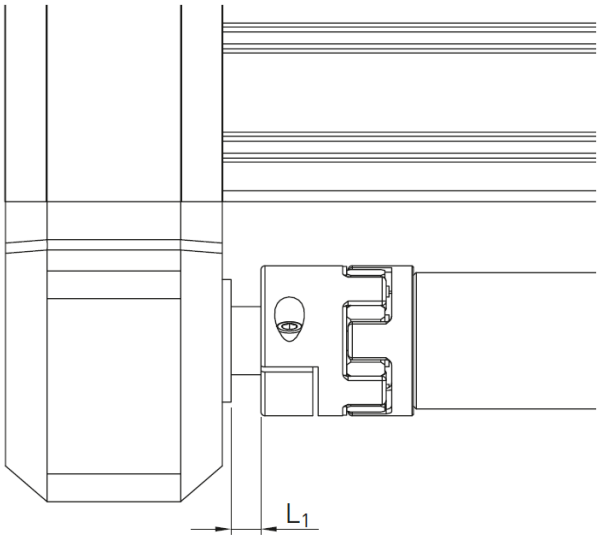


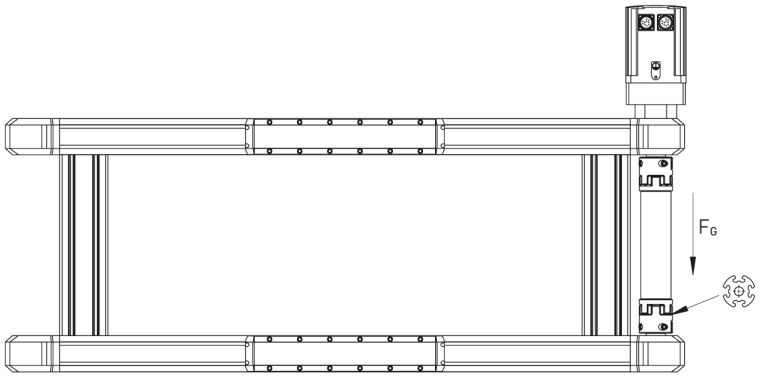
Table 6.3: Dimension L_1 on the synchronous shaft

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

Linear axes HM-B/HT-B/HC-B can be installed in any position, the attachment is to be made to the aluminium profile of the axis. Axis systems HS cannot just be installed in any position. Technical clarification must be sought before mounting them overhead. If double axis HD is mounted vertically at the side, spacers must be added to the synchronous shaft coupling (see Fig. 6.7).
The linear axis, double axis and axis system can be fastened to the mounting surface with clamping profiles (lateral grooves) or with T nuts (bottom grooves). Please note that depending on the installation position, the weight of the linear axis acts as an additional load and that the actually acting forces and torques must be below the permissible values (see “Linear axes and axis systems HX” catalogue).

Fig. 6.7: Addition of a spacer when HD double axes are mounted vertically at the side



Note:

The aluminium profile of the axis is manufactured using the extrusion process in accordance with EN 12020-2.

Note:

If increased running accuracy is required, the axis must be aligned and fastened to an accurate reference edge.

Note:

Please observe the support spacing of the respective axis sizes (see section 6.2.1). Not only the end blocks must rest on the mounting surface!

Note:

The screws must be secured against unintentional loosening.

Note:

The spacer profiles of double axis HD and multi-axis systems HS must not be removed until the axes have been secured with T nuts in accordance with6.2.3 or with clamping profiles in accordance with 6.2.5. It may be necessary to remove the synchronous shaft first before removing the spacer profile. For more information, see section 7.9 from page 130.

6.2.1 Maximum support distance of linear axes HM-B and HT-B

In the case of linear axes with long stroke lengths and high payloads, an impermissibly high deflection of the axis beam can occur depending on the mounting. To avoid this, the axis beam should be supported several times and mounted stably on a flat surface. At least one support point must be provided on each side, in each case at the end of the profile. The max. permissible support distance L_{SUP} as a function of load F_y and F_z according to the following diagrams must not be exceeded. Additional support points may have to be provided to ensure this. For multi-axis systems, the masses of the moving axes must also be taken into account.

Fig. 6.8: Horizontal lying axis position

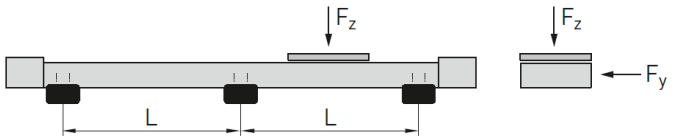


Fig. 6.9: Horizontal standing axis position

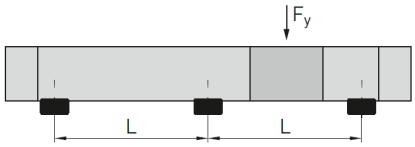


Fig. 6.10: HM-B: Maximum support distance as a function of force F_z

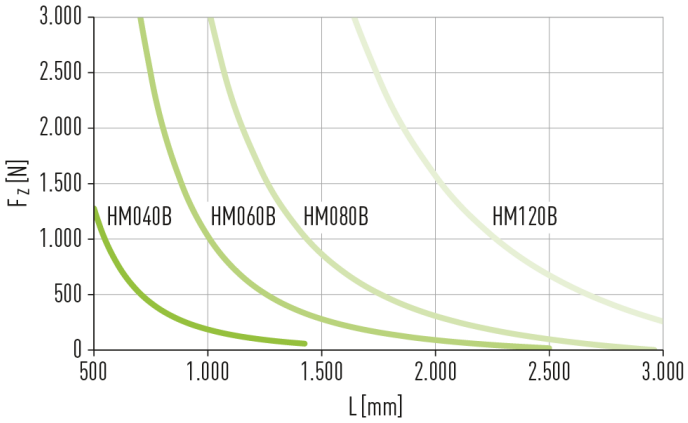


Fig. 6.11: HM-B: Maximum support distance as a function of force F_y

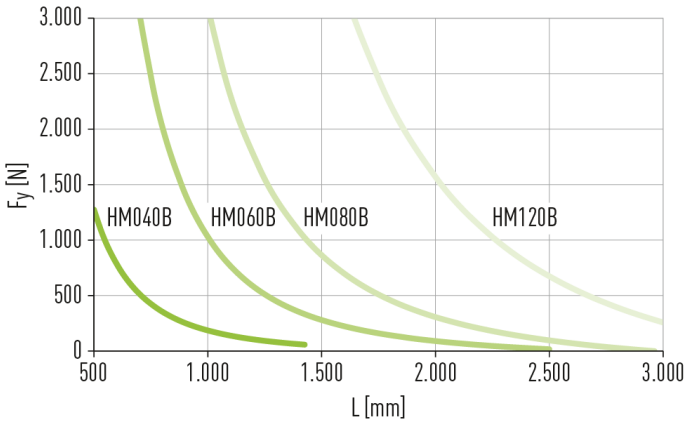


Fig. 6.12: HT-B: Maximum support distance as a function of force F_z

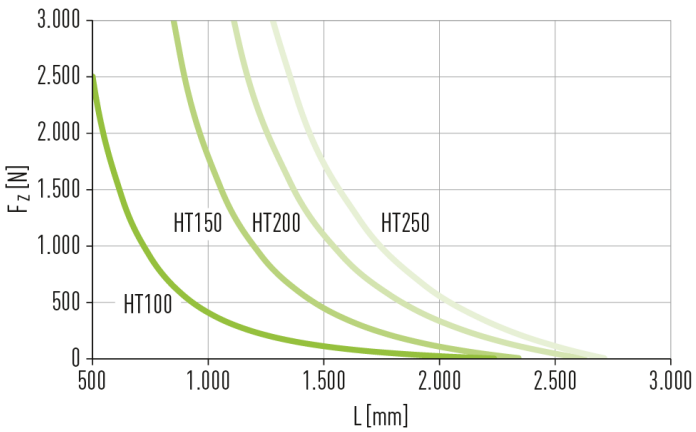
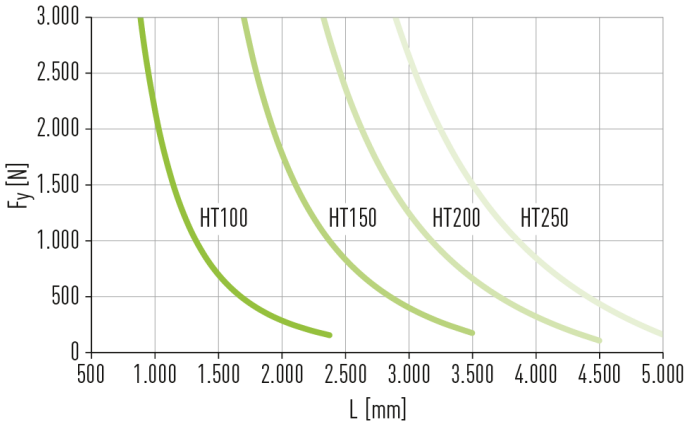


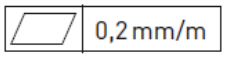
Fig. 6.13: HT-B: Maximum support distance as a function of force F_y



6.2.2 Reference surface accuracy requirements

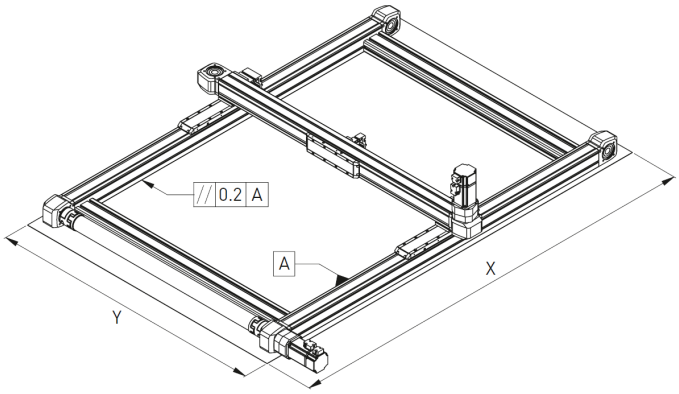
Linear axis HM-B/HT-B/HC-B
When securing linear axis HM-B/HT-B/HC-B, mount the axis on a flat surface and make sure that the mounting points are aligned with each other so that the necessary flatness of 0,2 mm/m is achieved.

Double axes HD and multi-axis system HS
When securing double axis HD and multi-axis system HS, mount the relevant axis system on a flat surface. Make sure that the mounting points are aligned with each other so that the necessary flatness of 0,2 mm/m and the necessary parallelism of 0,2 mm are achieved.



Level of accuracy required for all reference surfaces in order to secure the axis profiles

Fig. 6.14: Flatness and parallelism requirements for mounting double axes HD and multi-axis systems HS

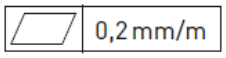


6.2.3 Mounting with T nuts – linear modules HM-B and double axes HD

The T nut to be used for each axis size can be found in Table 6.4. For single axes, the T nuts must be arranged according to Fig. 6.15 and Fig. 6.18 or Fig. 6.19, for double axes and multi-axis systems according to Fig. 6.16 and Fig. 6.18 or Fig. 6.19. The required number of T nuts depends on the external load. To calculate the required number, the load values listed in Table 6.4 (clamping force per T nut; permissible axial operating force in tensile direction per T nut) must be taken into account. The minimum number of T nuts specified in Table 6.4 must not be undercut. The T nuts are to be positioned grouped into mounting points as shown in Fig. 6.18 and Fig. 6.19. It is important to ensure that there is at least one mounting point at each end of the axis and each mounting point is capable of safely transmitting the external load. The number and spacing of the additional mounting points should be chosen according to the load situation. Distances LNX listed in Table 6.4 are only reference values.

- Drill the mounting holes in the mounting surface (hole spacing according to Table 6.4).
- Clean the mounting surface and position the linear axis on the mounting surface.
- Swing the T nut into the lower groove.
- Pre-assemble the T nut with the screws with low screw tightening torque.
- Tighten the screws crosswise, taking into account the screw tightening torques.
- ✓ The linear axis is mounted.

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



Level of accuracy required for all reference surfaces in order to secure the axis profiles

Fig. 6.15: Hole spacing for fastening the linear axes from below with T nuts

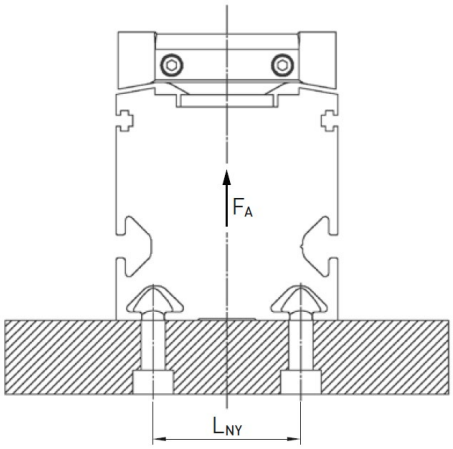


Fig. 6.16: Hole spacing for fastening double axes HD from below with T nuts

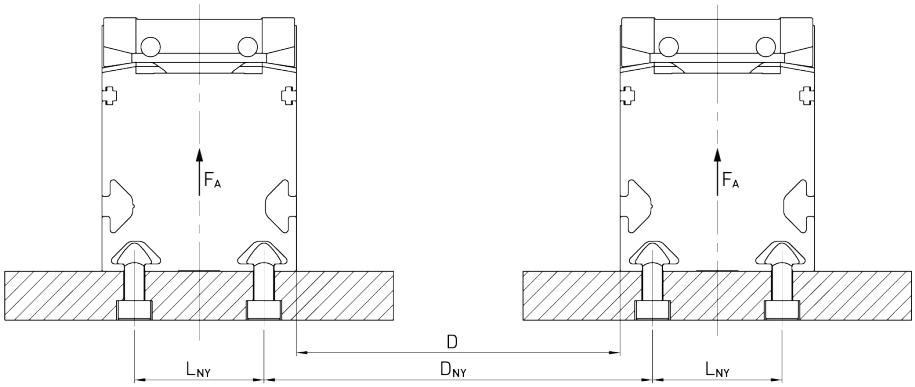


Fig. 6.17: Permissible axial operating force in tensile direction per T nut ($F_{A\_per.}$)

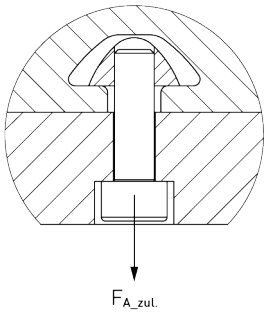


Fig. 6.18: Mounting with T nuts – HM040B, HM060B, HM080B

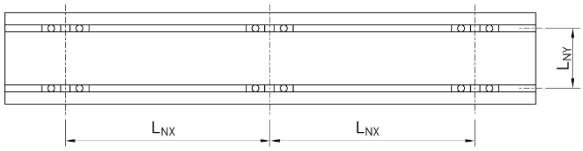


Fig. 6.19: Mounting with T nuts – HM120B

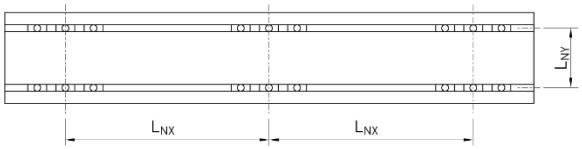


Table 6.4: Minimum number of T nuts for fastening the axis and recommended spacing of the mounting points for longer axes – linear modules HM-B and double axes HD

Axis type/ size	Minimum number of T nuts	L_{NY} [mm]	D_{NY} [mm]	Rec. distance L_{NX} [mm]	Thread size	Screw tightening torque [Nm]	Clamping force per T nut [N]	$F_{A\_per.}$ [1] [N]	Article no. T nuts (10 pcs.)
HM040B/HD1	8	20	D + 20	400	M5	4,5	5.400	500	20-000529
HM060B/HD2	8	40	D + 20	600	M6	10,1	10.200	1.750	20-000531
HM080B/HD3	8	40	D + 40	800	M8	24,6	18.600	5.000	20-000534
HM120B/HD4	12	80	D + 40	1.200	M8	24,6	18.600	5.000	20-000534

[1] Permissible axial operating force in tensile direction per T nut.

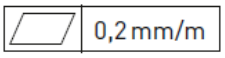
6.2.4 Mounting with T nuts – linear tables HT-B

The T nut to be used for each axis size can be found in Table 6.5. The T nuts are to be arranged according to Fig. 6.20, Fig. 6.21, Fig. 6.23, Fig. 6.24 or Fig. 6.25. The required number of T nuts depends on the external load. To calculate the required number, the load values listed in Table 6.5 (clamping force per T nut; permissible axial force in tensile direction per T nut) must be taken into account. The minimum number of T nuts specified in Table 6.5 must not be undercut. The T nuts are to be positioned grouped into mounting points as shown in Fig. 6.23, Fig. 6.24 and Fig. 6.25. It is important to ensure that there is at least one mounting point at each end of the axis and each mounting point is capable of safely transmitting the external load. The number and spacing of the additional mounting points should be chosen according to the load situation. Distances LNX listed in Table 6.5 are only reference values.

- Drill the mounting holes in the mounting surface (hole spacing according to Table 6.5).
- Clean the mounting surface and position the linear table on the mounting surface.
- Swing the T nut into the lower groove.
- Pre-assemble the T nut with the screws with low screw tightening torque.
- Tighten the screws crosswise, taking into account the screw tightening torques.

✓ The linear table is mounted.

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



Level of accuracy required for all reference surfaces in order to secure the axis profiles

Fig. 6.20: Hole spacing for fastening linear tables HT100B, HT150B, HT200B from below with T nuts

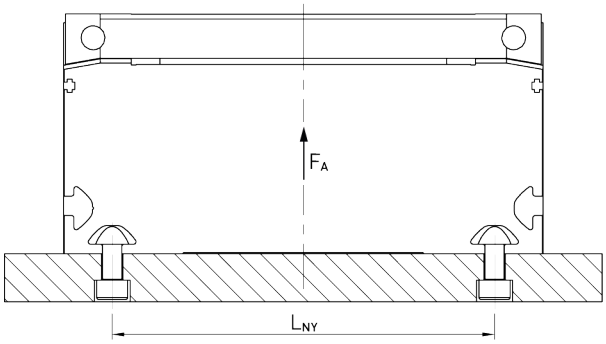


Fig. 6.21: Hole spacing for fastening linear tables HT250B from below with T nuts

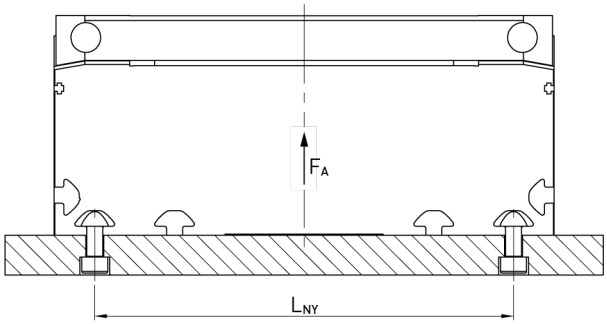


Fig. 6.22: Permissible axial operating force in tensile direction per T nut ($F_{A\_per.}$)

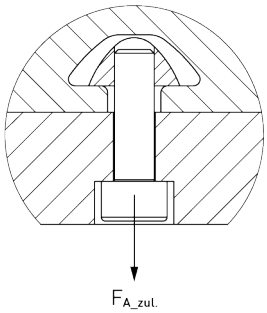


Fig. 6.23: Mounting with T nuts – HT100B, HT150B

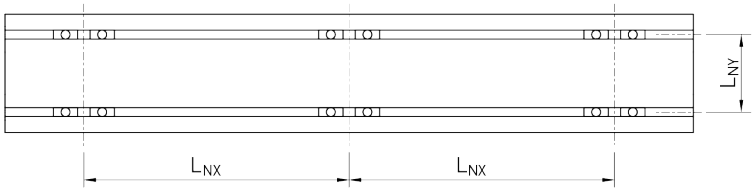


Fig. 6.24: Mounting with T nuts – HT200B

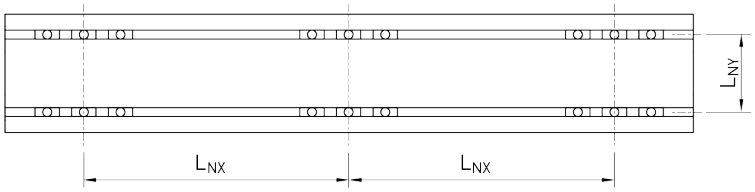


Fig. 6.25: Mounting with T nuts – HT250B

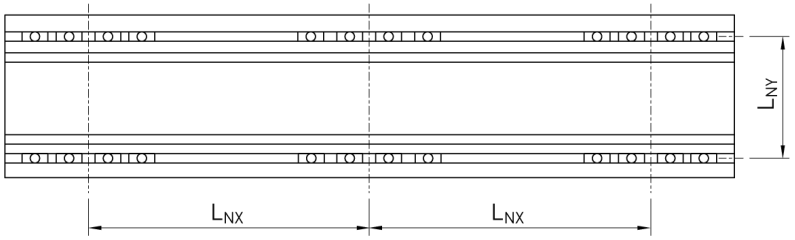


Table 6.5: Minimum number of T nuts for fastening the axis and recommended spacing of the mounting points for longer axes – linear tables HM-B

Size	Minimum number of T blocks	L_{NY}[mm]	Rec. distance L_{NX} [mm]	Thread size	Screw tightening torque [Nm]	Clamping force per T nut [N]	$F_{A\_per.}$ [1] [N]	Article no. T nuts (10 pcs.)
HT100B	8	80	500	M5	4,5	5.400	500	20-000529
HT150B	8	120	600	M6	10,1	10.200	1.750	20-000531
HT200B	12	160	800	M8	24,6	18.600	5.000	20-000534
HT250B	16	210	1.000	M8	24,6	18.600	5.000	20-000534

[1] Permissible axial operating force in tensile direction per T nut.

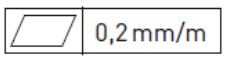
6.2.5 Mounting with clamping profiles – linear modules HM-B and double axes HD

The clamping profiles must always be mounted in pairs (left and right of the axis beam) (see Fig. 6.28 and Fig. 6.29). The required number of clamping profiles depends on the external load. To calculate the required number, the load values listed in Table 6.6 (clamping force per clamping profile; permissible axial operating load in tensile direction per pair of clamping profiles) must be taken into account. The minimum number of clamping profiles specified in Table 6.6 must not be undercut. It is important to ensure that there is at least one mounting point at each end of the axis and each mounting point is capable of safely transmitting the external load. The number and spacing of the additional mounting points should be chosen according to the load situation. Distances L_{SX} listed in Table 6.6 are only reference values.

- Drill the mounting holes in the mounting surface (hole spacing according to Table 6.6).
- Clean the mounting surface and position the linear axis on the mounting surface.
- Swivel the clamping profile into the lateral groove.
- Pre-assemble the clamping profile with the screws with low screw tightening torque.
- Tighten the screws crosswise, taking into account the screw tightening torques.

✓ The linear axis is mounted.

When mounting the linear axes, observe hole spacing L_{SY} (Fig. 6.26) and for linear axis systems hole spacing L_{SY} and D_{SY} (Fig. 6.27).



Level of accuracy required for all reference surfaces in order to secure the axis profile.

Fig. 6.26: Hole spacing for lateral mounting of linear modules HM-B with clamping profiles

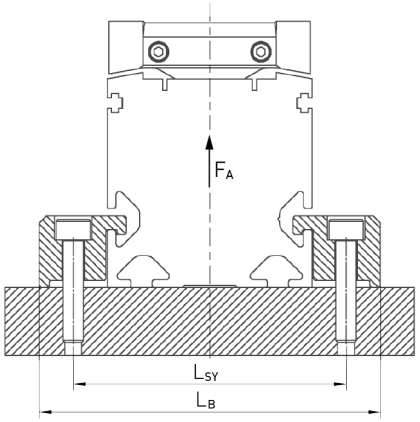


Fig. 6.27: Hole spacing for lateral mounting of double axes HD with clamping profiles

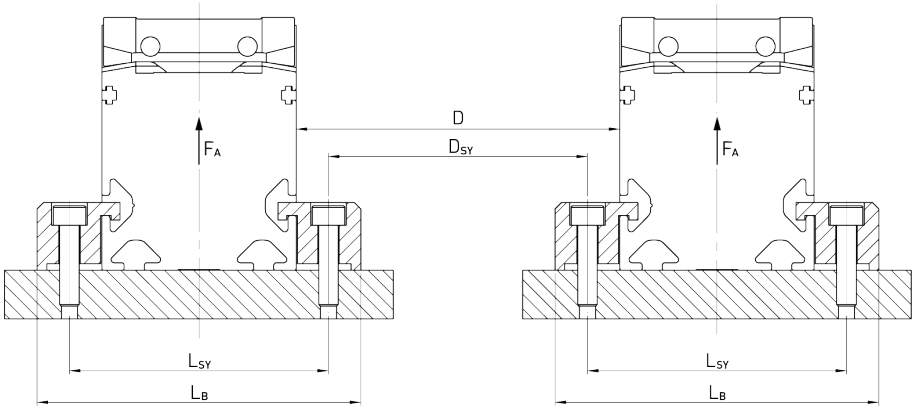


Fig. 6.28: Mounting with clamping profiles – HM040B, HM060B, HM080B

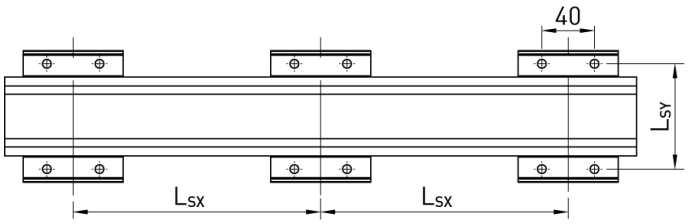


Fig. 6.29: Mounting with clamping profiles – HM120B

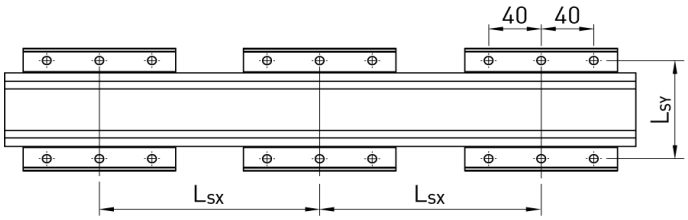


Table 6.6: Minimum number of clamping profiles for fastening the axis and recommended spacing of the mounting points for longer axes – linear modules HM-B and double axes HD

Axis type/ size	Minimum number of clamping profiles	L_{SY} [mm]	D_{SY} [mm]	L_B [mm]	Rec. Distance L_{SX} [mm]	Thread size	Screw tightening torque [Nm]	Clamping force per clamping profile [N]	$F_{A\_per.}$ [1] [N]	Article no. clamping profiles (4 pcs.)
HM040/HD1	4	55	D – 15	70	400	M5	4,9	4.700	200	25-000517
HM060/HD2	4	80	D – 20	100	600	M6	6,4	5.500	500	25-000518
HM080/HD3	4	100	D – 20	120	800	M8	18,5	11.400	1.200	25-000519
HM120/HD4	4	140	D – 20	160	1.200	M8	18,5	17.000	2.400	25-000520

[1] Permissible axial operating force in tensile direction per pair of clamping profiles.

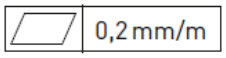
6.2.6 Mounting with clamping profiles – linear tables HT-B

The clamping profiles must always be mounted in pairs (left and right of the axis beam) (see Fig. 6.31 and Fig. 6.32). The required number of clamping profiles depends on the external load. To calculate the required number, the load values listed in Table 6.7 (clamping force per clamping profile; permissible axial operating load in tensile direction per pair of clamping profiles) must be taken into account. The minimum number of clamping profiles specified in Table 6.7 must not be undercut. It is important to ensure that there is at least one mounting point at each end of the axis and each mounting point is capable of safely transmitting the external load. The number and spacing of the additional mounting points should be chosen according to the load situation. Distances L_{SX} listed in Table 6.7 are only reference values.

- Drill the mounting holes in the mounting surface (hole spacing according to Table 6.7).
- Clean the mounting surface and position the linear table on the mounting surface.
- Swivel the clamping profile into the lateral groove.
- Pre-assemble the clamping profile with the screws with low screw tightening torque.
- Tighten the screws crosswise, taking into account the screw tightening torques.

✓ The linear table is mounted.

When mounting the linear tables, observe hole spacing L_{SY} (Fig. 6.30).



Level of accuracy required for all reference surfaces in order to secure the axis profile.

Fig. 6.30: Hole spacing for lateral mounting of linear tables HT-B with clamping profiles

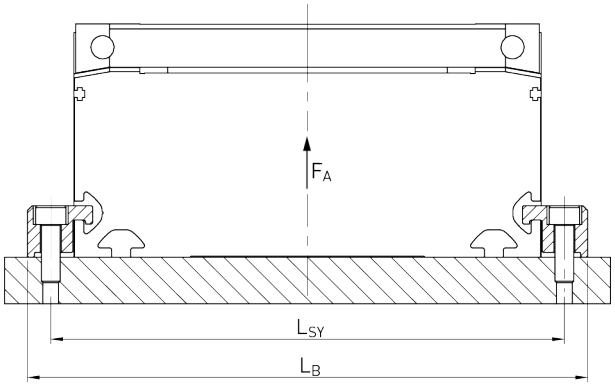


Fig. 6.31: Mounting with clamping profiles – HT100B, HT150B

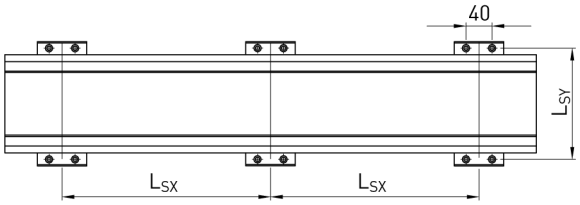


Fig. 6.32: Mounting with clamping profiles – HT200B, HT250B

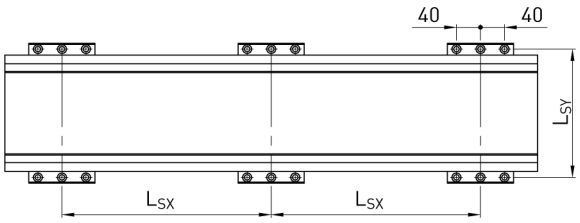


Table 6.7: Minimum number of clamping profiles for fastening the axis and recommended spacing of the mounting points for longer axes – linear tables HM-B

Size	Minimum number of clamping profiles	L_{SY} [mm]	L_B [mm]	Rec. Distance L_{SX} [mm]	Thread size	Screw tightening torque [Nm]	Clamping force per clamping profile [N]	$F_{A\_per.}$ [1] [N]	Article no. clamping profiles (4 pcs.)
HT100B	4	115	130	500	M5	4,9	4.700	800	25-000517
HT150B	4	170	190	600	M6	10,1	8.600	1.600	25-001023
HT200B	4	220	240	800	M8	18,5	17.000	3.000	25-000520
HT250B	6	270	290	1.000	M8	18,5	17.000	5.000	25-000520

[1] Permissible axial operating force in tensile direction per pair of clamping profiles.

6.2.7 Installation of cantilever axis HC

Cantilever axis HC can be mounted either laterally or from above on the drive block housing (see Fig. 6.33 and Fig. 6.34). The number of screws and the thread sizes are predefined (see Table 6.8 and Table 6.9).

- Place the two centring sleeves diagonally opposite each other on the side of the drive block housing on which you wish to attach the axis. Three sides are available for mounting: left, right or from above.
- Position the axis on your adjacent construction.
- Tighten the mounting bolts in a criss-cross fashion to the specified tightening torque.

✓ The cantilever axis is mounted.

Table 6.8: Mounting cantilever axis HC-B – fastening on side

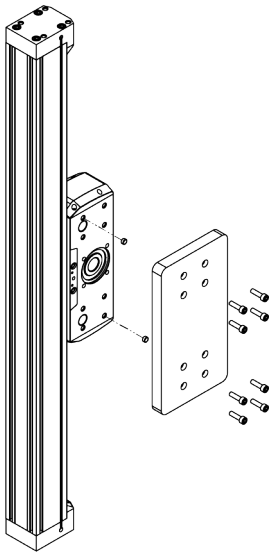
Size	Thread size × depth	Counter bore depth for centring sleeve [mm]	Counter bore diameter for centring sleeve [mm]	Number of mounting bolts
HC025B	M3 × 6	1,5	Ø6 H7	6
HC040B	M5 × 10	1,5	Ø8 H7	8
HC060B	M6 × 12	1,5	Ø8 H7	8
HC080B	M8 × 14	2,0	Ø12 H7	8
HC100B	M10 × 20	2,0	Ø15 H7	8

Table 6.9: Mounting cantilever axis HC-B – fastening from above

Size	Thread size × depth	Counter bore depth for centring sleeve [mm]	Counter bore diameter 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

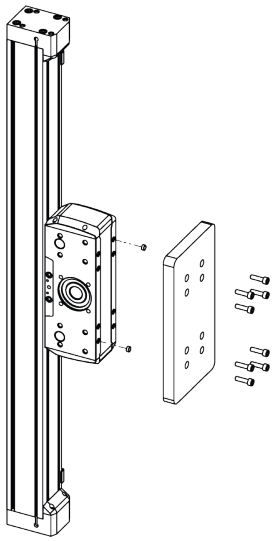
A. Fastening from the side

Fig. 6.33: Lateral mounting of cantilever axis HC



B. Fastening from above

Fig. 6.34: Mounting cantilever axis HC from above



Note:

Alternatively, cantilever axes HC040B, HC060B, HC080B and HC100B can be mounted on the cantilever profile with T nuts or clamping profiles. See section 6.2.3 and section 6.2.5.

6.3 Mounting the payload

The distances of the threaded holes for mounting the payload can be found in the “Linear axes and axis systems HX” catalogue. Additional counter bores allow for insertion of centring rings. HIWIN recommends arranging two centring rings diagonally opposite each other. For axes with more than one carriage or double axes, only equipping one carriage at a time with centring sleeves is recommended to avoid stress.

Table 6.10: Threaded holes for fastening the payload

Axis type/size	Thread size × depth	Counter bore depth for centring sleeve [mm]	Counter bore diameter for centring sleeve [mm]
HM040B	M5 × 10	1,5	Ø8 H7
HM060B	M6 × 12	1,5	Ø8 H7
HM080B	M8 × 16	2,0	Ø12 H7
HM120B	M10 × 22	2,0	Ø15 H7
HT100B	M5 × 10	1,5	Ø8 H7
HT150B	M6 × 14	1,5	Ø8 H7
HT200B	M8 × 14	2,0	Ø12 H7
HT250B	M10 × 20	2,0	Ø15 H7
HC025B	M3 × 7,5	1,5	Ø6 H7
HC040B	M5 × 11,5	1,5	Ø8 H7
HC060B	M6 × 12	1,5	Ø8 H7
HC080B	M8 × 18	2,0	Ø12 H7
HC100B	M10 × 22	2,0	Ø15 H7

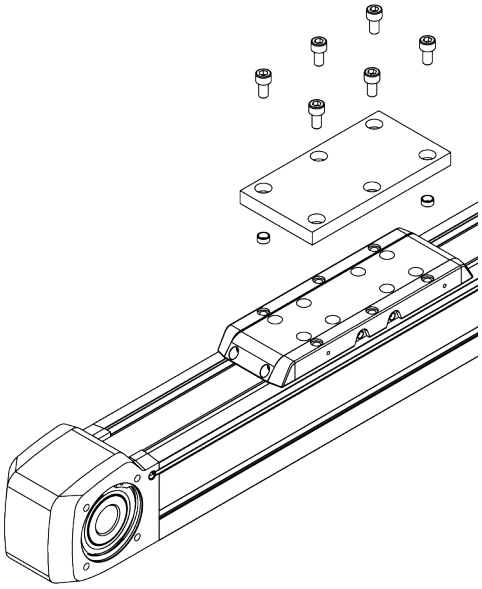
Clean the mounting surface on the carriage (HM-B/HT-B/HD) or on the end plate (HC-B).

- Clean the mounting surface of the load.
- If necessary, use centring sleeves (see Fig. 6.35, Fig. 6.36 and Fig. 6.37).
- Position the load on the carriage of the linear axis (HM-B/HT-B/HD) or on the end plate of the cantilever axis (HC-B).
- Tighten the mounting bolts crosswise.
- Check if the load moves freely throughout the entire stroke.
- Secure the screws.

✓ The payload is mounted.

Accuracy requirement for the mounting surface of the payload.

Fig. 6.35: Mounting the load with centring sleeves (HM-B)



Note:

If you are using linear axes HM-B and double axes HD with more than one carriage, only insert centring sleeves in one of the carriages.

Accuracy requirement for the mounting surface of the payload.

Fig. 6.36: Mounting the load with centring sleeves (HT-B)

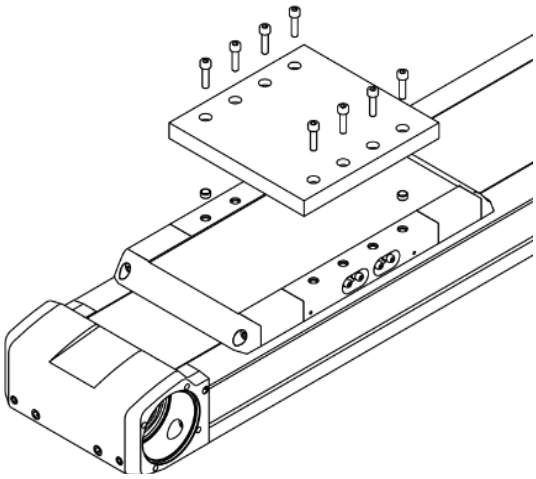
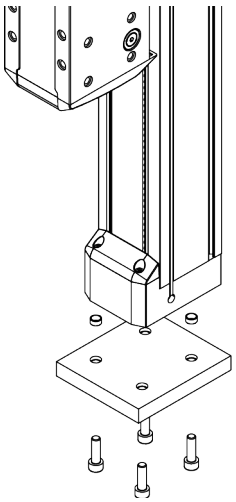


Fig. 6.37: Mounting the load with centring sleeves (HC-B)



6.3.1 Carriage synchronisation with double axes

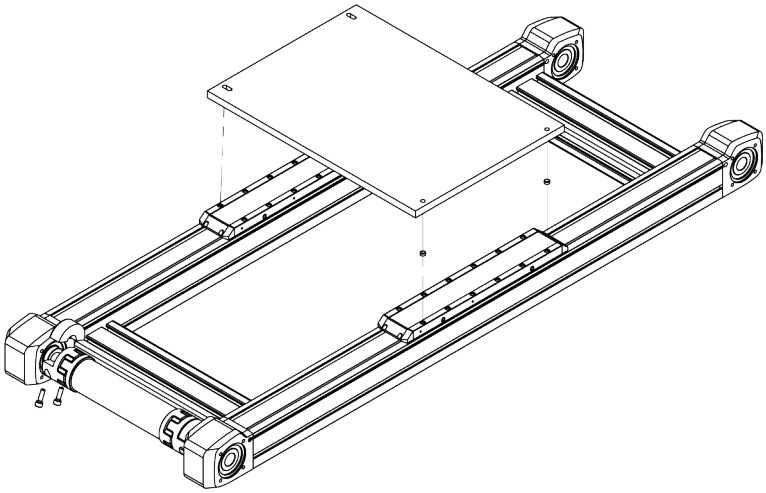
If you are using a double axis HD and need to mount an adapter plate for the load above both carriages, the carriages must first be precisely aligned with each other in the axial direction.

- Loosen the half shell coupling at one end of the synchronous shaft by undoing the clamping bolts slightly. Keep alternating between the two clamping bolts as you undo them to avoid overload. Once the carriage is able to move freely on this side of the double axis, the adapter plate can be mounted.
- Mount the adapter plate on one of the carriages as described in Fig. 6.38.
- Adjust the second carriage in the axial direction so that the prepared mounting holes are perfectly aligned in the axial direction.
- Mount the adapter plate on the second carriage as described in Fig. 6.38.
- Mount the synchronous shaft as described in Section 6.1.2 from page 55.

Note:

The distance between axes may be subject to certain tolerances at right angles to the axial direction. Therefore, the mounting holes of the adapter plate for the second carriage should ideally take the form of elongated holes.

Fig. 6.38: Mounting the adapter plate above both double axis carriages



6.4 Mounting and adjustment of the limit switches – linear modules HM-B, linear tables HT-B and double axes HD

6.4.1 Mounting the limit switches

The limit switches are optionally available as NC or NO contacts. The limit switch can be fixed directly in the limit switch groove (T groove) with the enclosed M3 screws and square nuts. The limit switches can be mounted either on the right or on the left.

- Where applicable, remove the green trim from the upper T groove.
- Slide two square nuts into the upper T groove through each recess on the drive block.
- Position the limit switch with both screws (see Fig. 6.39). For sizes HM040 and HT100, the spacer plate must also be fitted between the limit switch and the axis (see Fig. 6.40). Leave the two screws unfastened for the time being.
- Slide the limit switch to the desired position and push it slightly upwards.
- Tighten the screws. The screw tightening torque is 0,5 Nm.

✓ The limit switches have been mounted.

Fig. 6.39: Mounting of limit switch: HM060, HM080, HM120, HT150, HT200, HT250

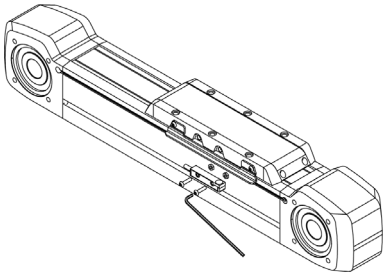
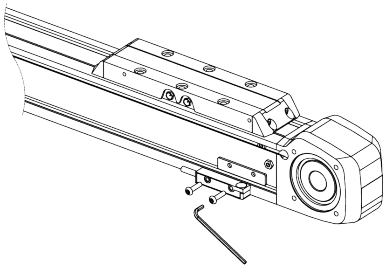


Fig. 6.40: Mounting of limit switch: HM040, HT100



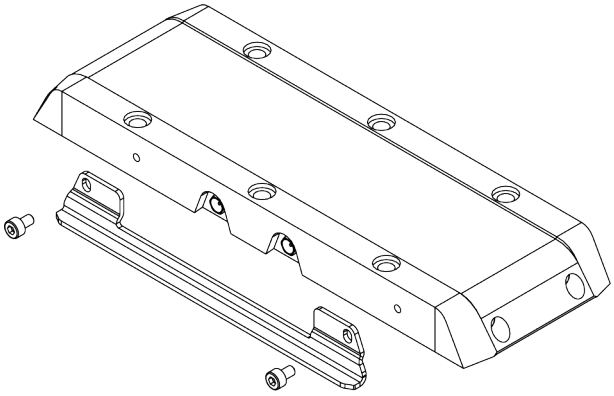
6.4.2 Mounting the damping element

The damping element actuates the limit switches at the two end positions of the carriage (at stroke 0 and max. stroke) and must be mounted on the same side as the limit switches.

- Place the damping element on the carriage.
- Screw the damping element lightly to the carriage with the enclosed M3 screws.
- Align the damping element parallel to the lower edge of the carriage.

✓ The damping element is pre-assembled.

Fig. 6.41: Mounting damping element



6.4.3 Setting the switching distance

The limit switches are inductive units and require a defined switching distance between limit switch and damping element of 1 mm.

- Move the carriage until the damping element is above a limit switch. Align the damping element using a feeler gauge so that the switching distance of 1 mm is maintained. Make sure that the damping element remains aligned parallel to the lower edge of the carriage (see Fig. 6.42).
- Tighten the bolts of the damping element. The screw tightening torque is 1 Nm.
- If a second limit switch is installed: Move the carriage until the damping element is above the second limit switch and check with a feeler gauge whether the switching distance of 1 mm is maintained. Correct if necessary until the switching distance is maintained for both limit switches.
- Lay the limit switch cable in the lower groove (see Fig. 6.43). The cable can be protected by the groove cover there. The groove cover is available separately, see section 12.4 on page 171.
- ✓ The switching distance has been set.

Fig. 6.42: Setting the switching distance with a feeler gauge and tightening the bolts

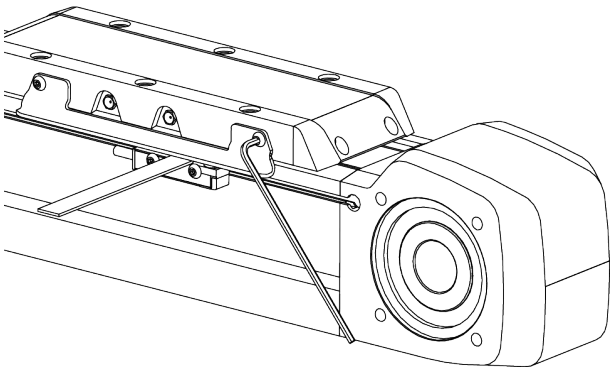
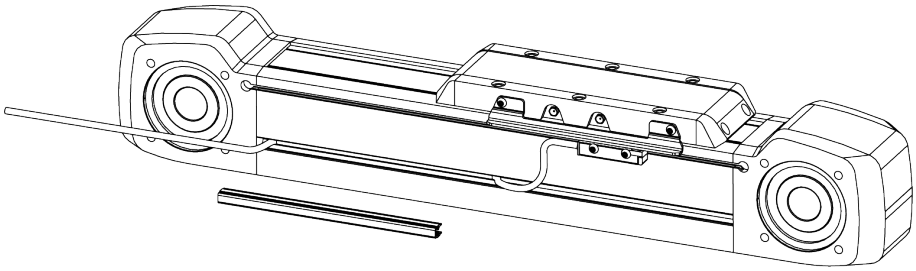


Fig. 6.43: Mounting of limit switch: Laying the cables



Check that the limit switch is functioning correctly before commissioning with a limit switch test box or by controlled travel to the end positions.

6.5 Mounting and adjusting the limit switches – cantilever axis HC-B

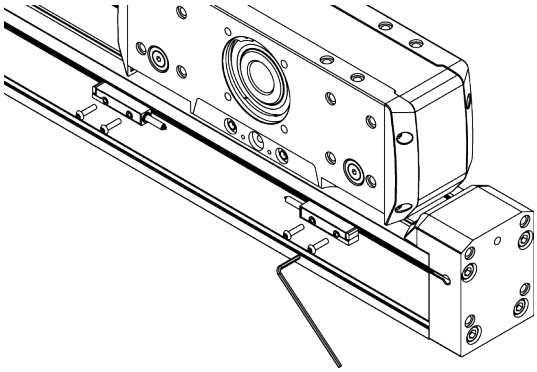
6.5.1 Mounting the limit switches

The limit switches are available in a normally closed or normally open version (HC025B only with normally closed version). The bolts provided can be used to attach the limit switch (HC040B/HC060B/HC080B/HC100B) M3, HC025B: M1,2) directly to the drive block housing. The limit switches are always attached on the left side of the axis.

- Place the limit switches on the drive block housing (see Fig. 6.44).
- Loosely screw the limit switches to the drive block housing using the M3 or M1,2 bolts provided.
- Lightly press the limit switches against the reference edge of the drive block housing.
- Tighten the screws. The screw tightening torque is 0,5 Nm for the M3 bolts, 0,2 Nm for the M1,2 bolts.

✓ The limit switches have been mounted.

Fig. 6.44: Mounting of limit switch: HC-B (all sizes)



6.5.2 Mounting the damping elements

The damping elements actuate the limit switches at the two end positions of the axis (at stroke 0 and max. stroke) and must be mounted on the same side as the limit switches.

- Where applicable, remove the green trim from the upper T groove.
- Slide two square nuts into the upper T groove through each recess in the end plate.
- Position the damping elements with both M3 screws (for sizes HC025B and HC040B, the spacer plate must also be inserted between the damping elements and the axis, see Fig. 6.45). Leave the two screws unfastened for the time being.
- Slide the damping elements to the desired position.

✓ The damping elements are pre-assembled.

Fig. 6.45: Mounting the damping elements – HC025B and HC040B (with spacer plate)

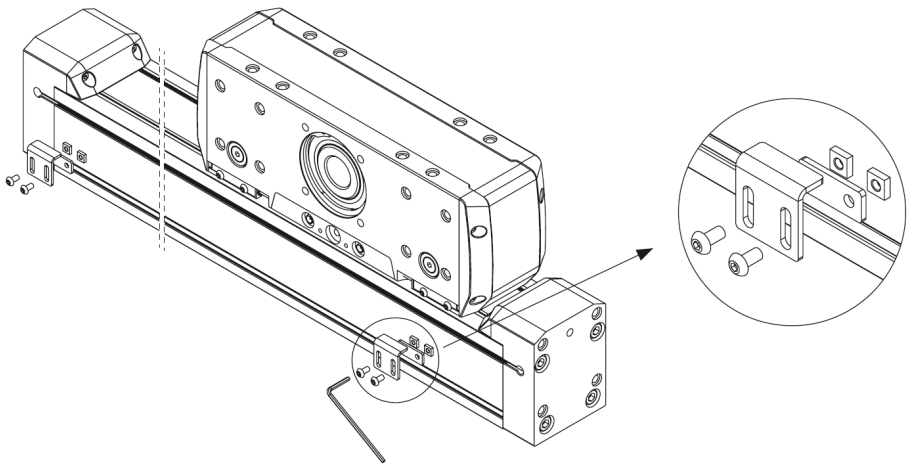
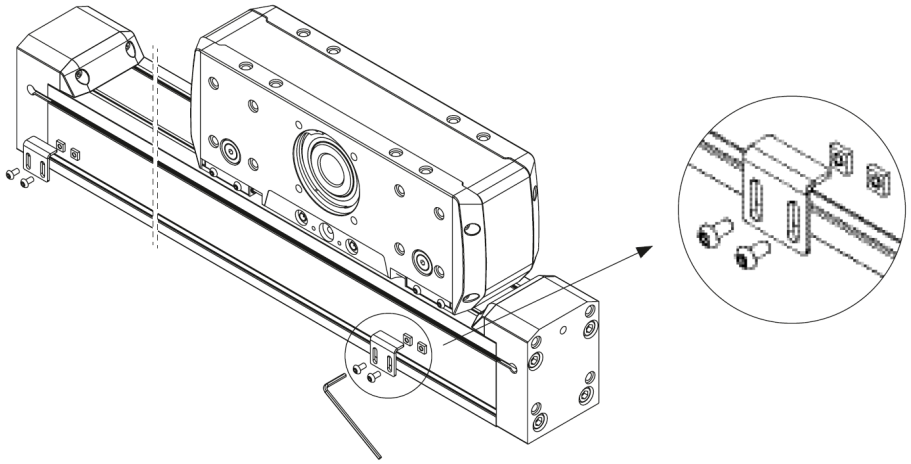


Fig. 6.46: Mounting damping elements – HC060B, HC080B and HC100B (without spacer plate)



6.5.3 Setting the switching distance

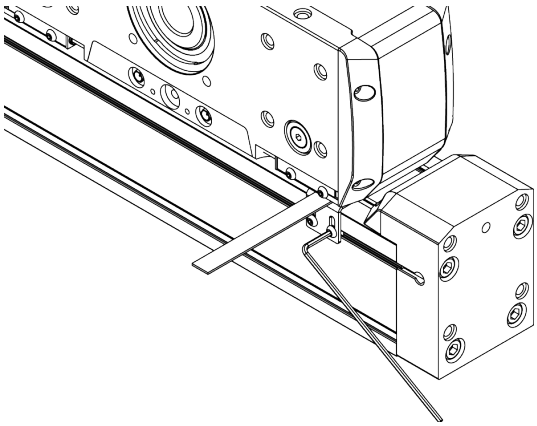
The limit switches are inductive units and require a defined switching distance between limit switch and damping element.

- Move the drive block housing until a limit switch is located above a damping element (see Fig. 6.47). Using a feeler gauge, align the damping element to produce the following switching distance:
  - HC025B: 0,5 mm
  - HC040B, HC060B, HC080B and HC100B: 1 mm

  Make sure that the damping element remains aligned parallel to the upper edge of the axis.
- Tighten the bolts of the damping element. The screw tightening torque is 1 Nm.
- Move the drive block housing until the second limit switch is located above the second damping element, and repeat the process on this side.

✓ The switching distance has been set.

Fig. 6.47: Setting the switching distance with a feeler gauge and tightening the bolts



Check that the limit switch is functioning correctly before commissioning with a limit switch test box or by controlled travel to the end positions.

6.6 Mounting the drive unit of linear axis HM-B

6.6.1 Assembly of coupling assembly HM-B

A suitable coupling is required for attaching the motor. These can be found in section 11.4.6 from page 165.

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

- 1 clamping hub for the drive side **[1]**
- 1 sprocket **[2]**
- 1 expansion hub for the axis side **[3]**

The clamping hubs come in two versions:

- Variant 1 with a clamping bolt, see Fig. 6.48
- Variant 2 with two clamping bolts, see Fig. 6.49

Fig. 6.48: Coupling assembly variant 1: Clamping hub with one clamping bolt

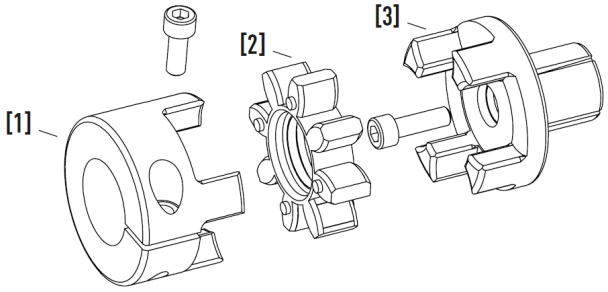
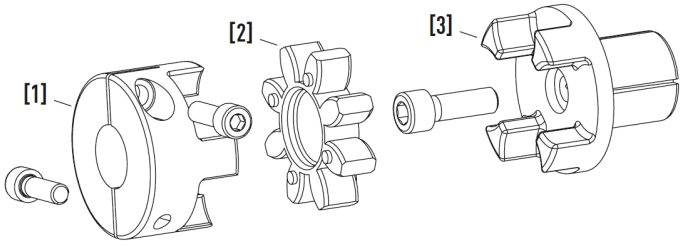


Fig. 6.49: Coupling assembly variant 2: Clamping hub with two clamping bolts



Before mounting, please ensure that

- No parts are damaged
- All parts are free of dirt and grease

For assembly of the coupling assembly, the screw tightening torques listed in Table 6.11 and Table 6.12 apply:

Table 6.11: 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	49	35,0	35,0

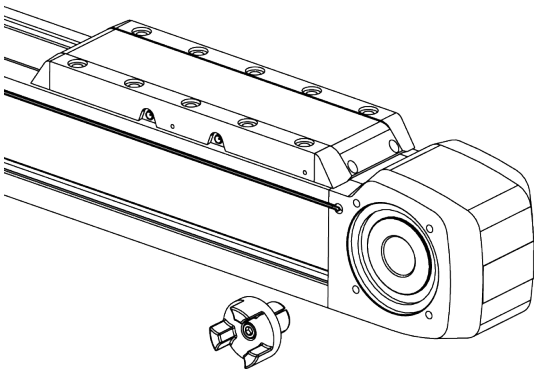
[1)] Special version clamping diameter with 24 mm: 10 Nm
[2)] Special version clamping diameter with 16 mm: 2,8 Nm
[3)] Special version clamping diameter with 22 and 24 mm: 10 Nm

Table 6.12: Screw tightening torques for the clutch housing

Size	Bolt strength class	Thread size	Screw tightening torque [Nm]
HM040B	8,8	M4	3,0
HM060B	8,8	M6	10,1
HM080B	8,8	M6	10,1
HM120B	8,8	M8	24,6

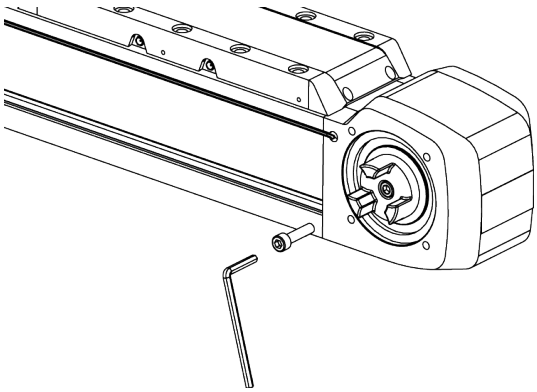
- Position the carriage in the end position so that the toothed belt cannot rotate with it.
- Carefully press the expansion hub into the hollow shaft of the toothed belt until the expansion hub sits flat.

Fig. 6.50: Inserting the expansion hub



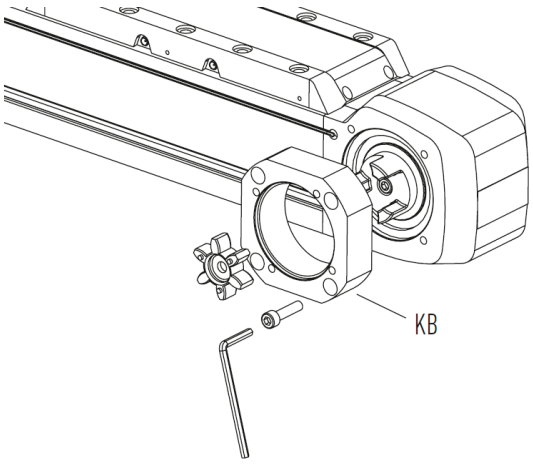
- In the centre of the expansion hub is the expanding mandrel with which the coupling is fastened. Screw the expansion hub with the screw tightening torque from Table 6.11.

Fig. 6.51: Mounting the expansion hub by tightening the expansion mandrel



- Fit the sprocket onto the expansion hub.
- Mount coupling housing KB with 4 screws so that it lies flat.

Fig. 6.52: Attaching sprocket and mounting coupling housing KB on linear axis HM-B



Note:

The sprocket must be slightly pre-tensioned and should not exhibit any backlash. If it is too easy to attach, it must be replaced. Lightly greasing the sprocket with PU-compatible lubricants can make installation easier.

- Push the clamping hub onto the sprocket until dimension L_1 is achieved (see Table 6.13).

Fig. 6.53: Adjusting the clamping hub distance in the direction of the motor on linear axis HM-B

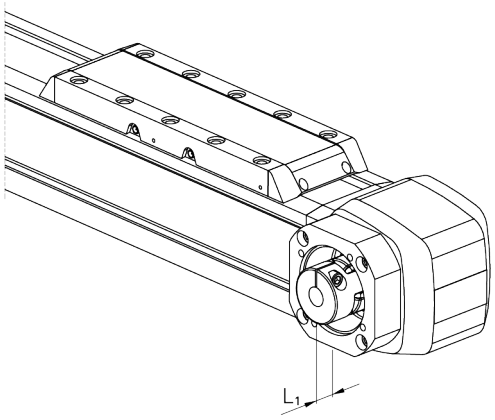


Table 6.13: Adjusting the coupling distance via dimension L_1

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	28	16,7	16,7

Note:

When mounting without coupling housing, coupling distance L_2 must be set according to Fig. 6.54 and Table 6.14.

Fig. 6.54: Total length of coupling assembly HM-B

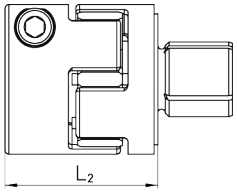


Table 6.14: Adjusting the coupling distance via dimension L_2 when there is no coupling housing

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	48,0	48,0

6.6.2 Assembly of the motor (without gearbox)

- Push motor adapter plate AM on flat, taking note of the position of the hole for the clamping bolt of the clamping hub.
- Tighten the 4 screws. For screw tightening torques, see Table 6.15.

Fig. 6.55: Mounting motor adapter plate AM (HM-B)

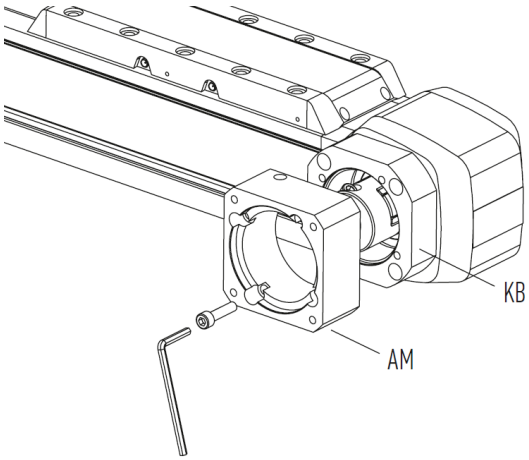
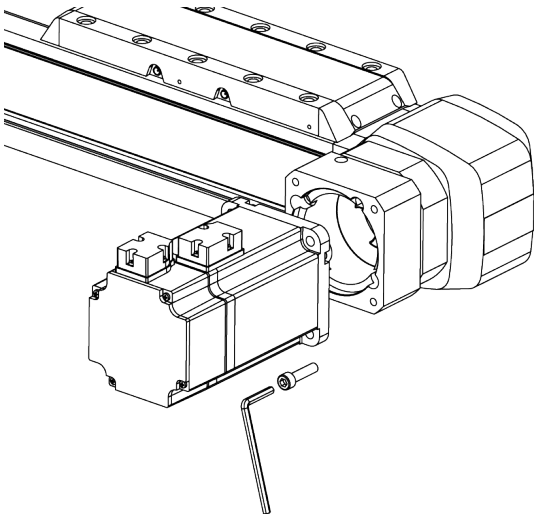


Table 6.15: Screw tightening torques for motor adapter plate AM

Size	Bolt strength class	Thread size	Screw tightening torque [Nm]
HM040B	8,8	M4	3,0
HM060B	8,8	M6	10,1
HM080B	8,8	M6	10,1
HM120B	8,8	M8	24,6

- Secure the motor to make sure it cannot fall.
- Place the motor flat on motor adapter plate AM.
- Mount the motor according to the manufacturer's instructions.

Fig. 6.56: Screwing the motor to linear axis HM-B



Note:

Take care to slide the motor on straight so that the preset L measurement does not change.

- Remove the sealing plug from the side hole of motor adapter plate AM.

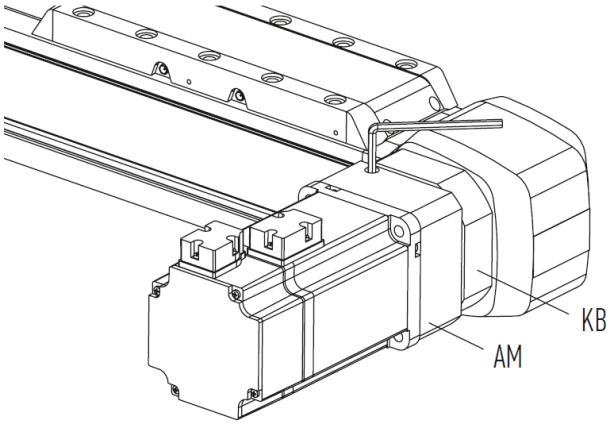
Variant 1:

- Tighten the screw of the clamping hub through the bore hole to the screw tightening torque as shown in Table 6.11.

Variant 2:

- Tighten the two screws of the clamping hub one after the other, through the bore hole. First, position the screw on the 1st side, then tighten the screw on the 2nd side, followed by the screw on the 1st side, to the screw tightening torque shown in Table 6.11.
- Close the hole with the sealing plug.
- ✓ The motor is mounted.

Fig. 6.57: Tightening the clamping hub on the motor shaft



Note:

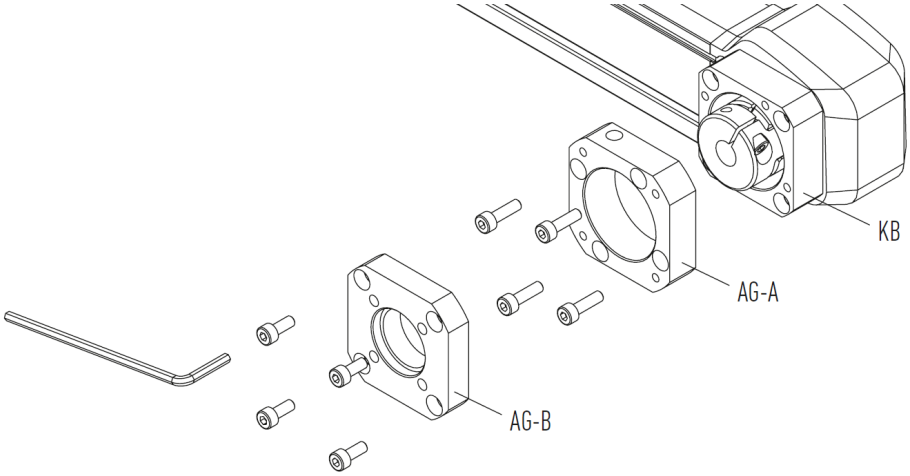
When mounting the motor to a gearbox, the gearbox manual is required.

6.6.3 Assembly of the gearbox

HM040B:

- Attach the first section of the gear adapter plate (AG-A) so that it lies flat (see Fig. 6.58). Note the position of the hole for the clamping bolt of the clamping hub.
- Tighten the 4 screws. For screw tightening torques, see Table 6.16.
- Place the second section of the gear adapter plate (AG-B) on the first section (AG-A) (see Fig. 6.58).
- Tighten the 4 screws. For screw tightening torques, see Table 6.16.

Fig. 6.58: Mounting the two-section gear adapter plate AG-A and AG-B – HM040B



HM060B, HM080B, HM120B:

- Put gearbox adapter plate AG on flat (see Fig. 6.59). Note the position of the hole for the clamping bolt of the clamping hub.
- Tighten the 4 screws. For screw tightening torques, see Table 6.16.

Fig. 6.59: Mounting gear adapter plate AG – HM060B, HM080B, HM120B

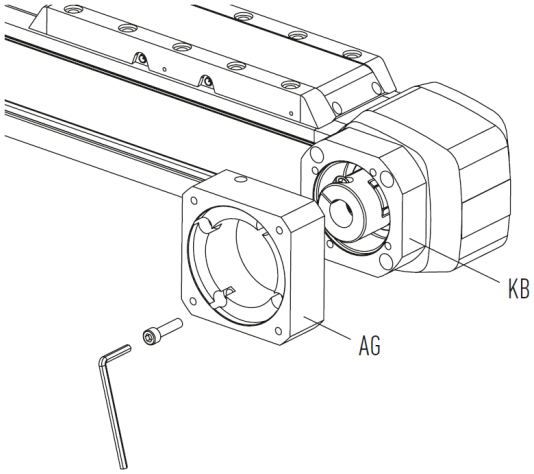
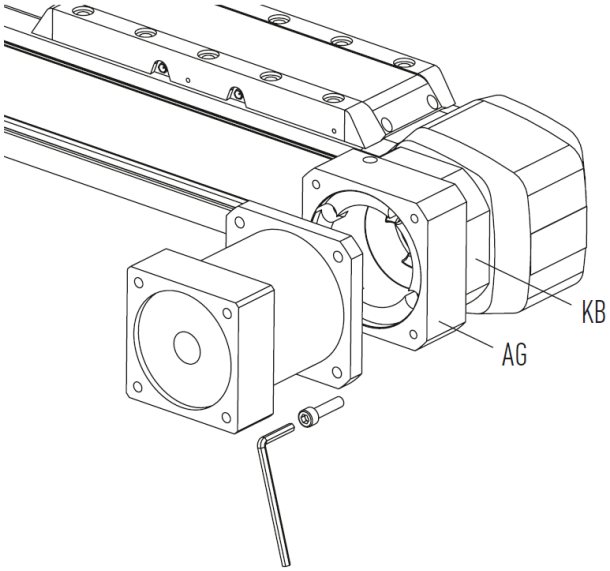


Table 6.16: Screw tightening torques for gear adapter plate AG

Size	Bolt strength class	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	10,1
HM080B	8,8	M6	10,1
HM120B	8,8	M8	24,6

- Secure the gearbox to make sure it cannot fall.
- Place the gearbox flat on gear adapter plate AG (see Fig. 6.60).
- Secure the gearbox with 4 screws according to the manufacturer's instructions.

Fig. 6.60: Screwing the gearbox to the linear axis



Remove the sealing plug on the hole of gear adapter plate AG.

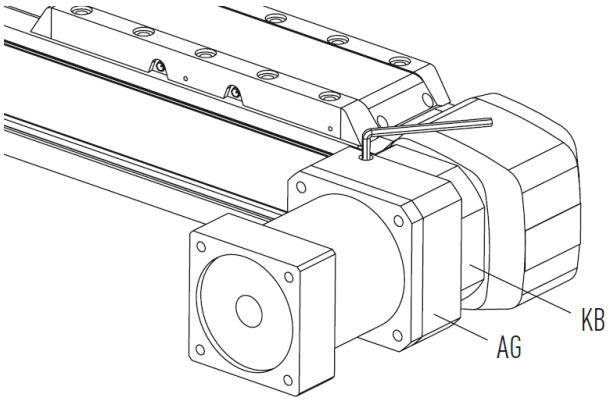
Variant 1:

- Tighten the screw of the clamping hub through the bore hole to the screw tightening torque as shown in Table 6.11.

Variant 2:

- Tighten the two screws of the clamping hub one after the other, through the bore hole. First, position the screw on the 1st side, then tighten the screw on the 2nd side, followed by the screw on the 1st side, to the screw tightening torque shown in Table 6.11.
- Close the hole with the sealing plug.
- ✓ The gearbox is mounted.

Fig. 6.61: Tightening the clamping hub on the gear shaft



Note:

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

6.6.4 Mounting the motor on PLE/PLQE gearbox [1)]

- Open the clamping bolt of the gearbox so that you can later easily fit the shaft of the motor into the hollow shaft of the gearbox. For smaller motor shaft diameters, use the enclosed bushing.
- Push gear adapter plate GM flat on the gearbox, taking note of the position of the hole for the clamping bolt of the clamping hub (see Fig. 6.62).
- Tighten the 4 screws. For screw tightening torques, see Table 6.17.

Fig. 6.62: Mounting motor gear adapter plate GM (HM-B)

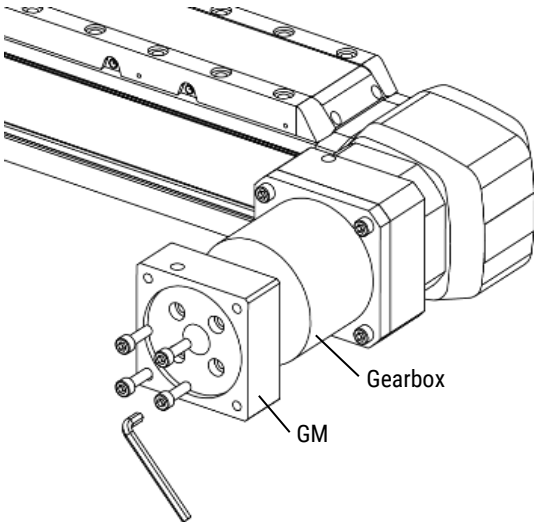


Table 6.17: Screw tightening torques for motor gear adapter plate GM

Size	Gearbox [1)]	Bolt strength class	Thread size	Screw tightening torque [Nm]
HM040B	PLE040	8,8	M3 × 16	1,1
HM060B	PLQE060	8,8	M5 × 10	5,9
HM080B	PLQE080	8,8	M6 × 16	10,1
HM120B	PLQE120	8,8	M8 × 25	24,6

[1)] PLE and PLQE are registered trademarks of Neugart GmbH.

- If possible, turn the axis so that the motor can be mounted in a vertical position from above.
- Place the motor flat on motor gear adapter plate GM (see Fig. 6.63).
- Remove the headless screw from the side hole of motor gear adapter plate GM.
- Tighten the clamping bolt of the clamping hub through the hole to the screw tightening torque as shown in Table 6.18.
- Close the hole with the headless screw.

Fig. 6.63: Tightening the clamping hub on the motor shaft

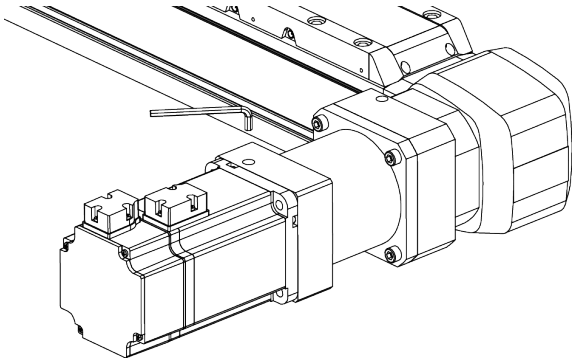


Table 6.18: Screw tightening torques for the clamping bolt

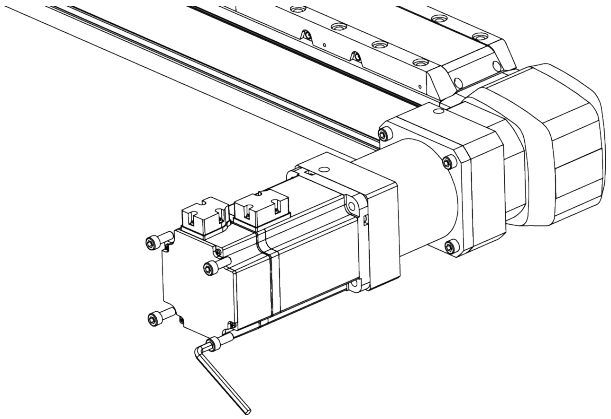
Size	Gearbox [1]	Bolt strength class	SWISK [2]	Screw tightening torque [Nm]
HM040B	PLE040	12,9	2,5	2,0
			3,0	4,5
HM060B	PLQE060	12,9	3,0	4,5
			4,0	9,5
HM080B	PLQE080	12,9	4,0	9,5
			5,0	16,5
HM120B	PLQE120	12,9	5,0	16,5
			6,0	40,0

[1] PLE and PLQE are registered trademarks of Neugart GmbH
[2] Width across flats of hexagon socket; varies depending on coupling size/motor used

Note:
When mounting the motor to a gearbox, the gearbox manual is required.

- ▶ Mount the motor according to the manufacturer's instructions.
- ✓ The motor is mounted.

Fig. 6.64: Screwing the motor to linear axis HM-B with gearbox



6.6.5 Mounting the journal

The journal is an alternative interface for motors and encoders. It can be retrofitted on both sides of any drive block.

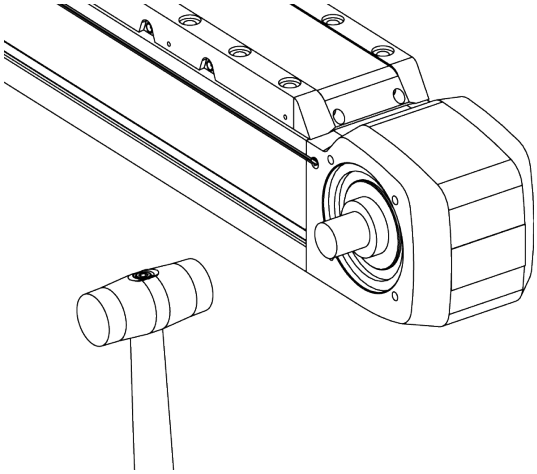
Table 6.19: Screw tightening torques for the journal

Size	Screw	Bolt 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

Before mounting, please ensure that

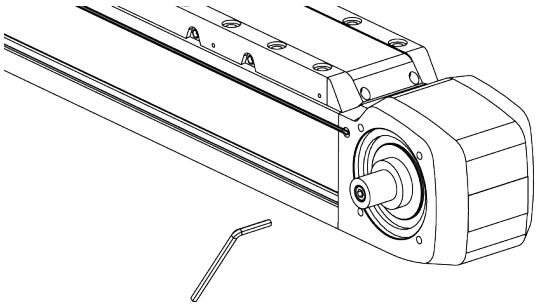
- No parts are damaged
- All parts are free of dirt and grease
- Position the carriage in the end position so that the toothed belt cannot rotate with it.
- Carefully press the journal into the hollow shaft of the toothed belt until the expansion hub sits flat.
- Ensure that the journal flange is seated flat. If necessary, use a light plastic hammer (see Fig. 6.65).

Fig. 6.65: Inserting the journal into the drive block of linear axis HM-B



- Tighten the screw in the centre of the journal with the screw tightening torque according to Table 6.19 .

Fig. 6.66: Tightening the screw on the journal



6.7 Mounting the drive unit of linear table HT-B

6.7.1 Assembly of the coupling assembly

A suitable coupling is required for attaching the motor. These can be found in section 11.4.6 from page 165.

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

- 1 clamping hub for the drive side **[1]**
- 1 sprocket **[2]**
- 1 expansion hub for the axis side **[3]**

The clamping hubs come in two versions:

- Variant 1 with a clamping bolt, see Fig. 6.67
- Variant 2 with two clamping bolts, see Fig. 6.68

Fig. 6.67: Coupling assembly variant 1: Clamping hub with one clamping bolt

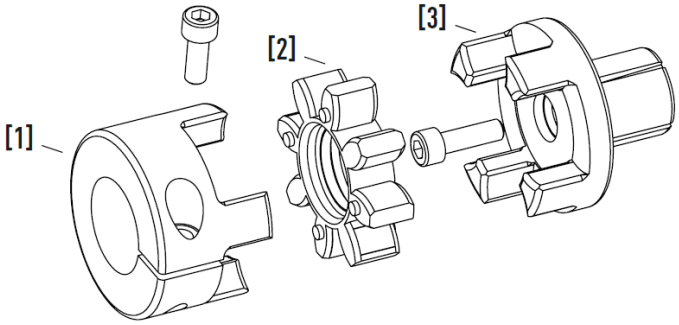
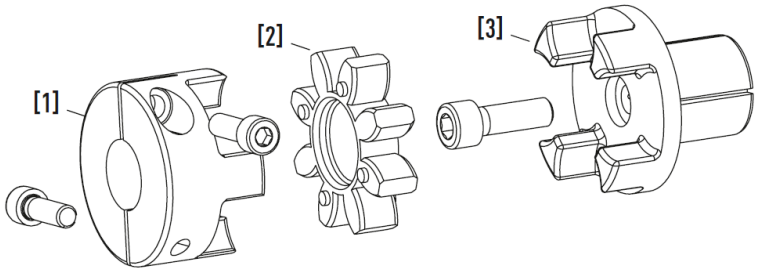


Fig. 6.68: Coupling assembly variant 2: Clamping hub with two clamping bolts



Before mounting, please ensure that

- No parts are damaged
- All parts are free of dirt and grease

For assembly of the coupling assembly, the screw tightening torques listed in Table 6.20 apply:

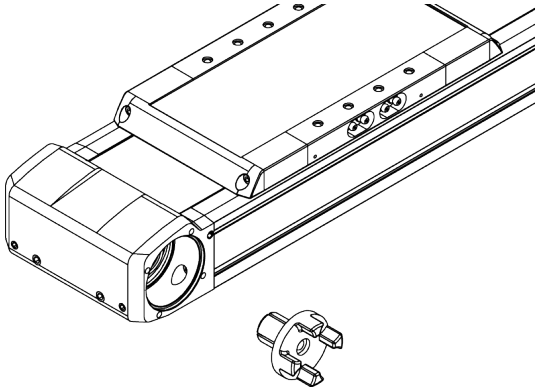
Table 6.20: Screw tightening torques for the expansion and clamping hub

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 clamping diameter with 24 mm: 10 Nm
[2)] Special version clamping diameter with 16 mm: 3,8 Nm

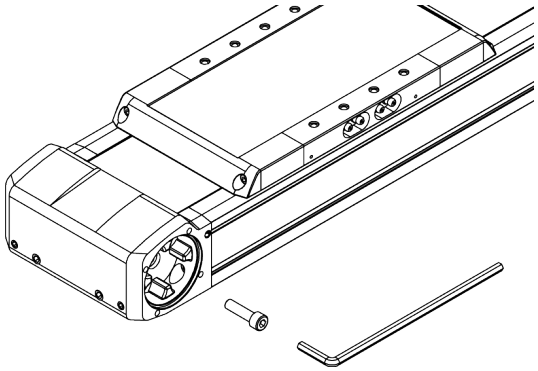
- ▶ Position the carriage in the end position so that the toothed belt cannot rotate with it.
- ▶ Carefully press the expansion hub into the hollow shaft of the toothed belt until the expansion hub sits flat.

Fig. 6.69: Inserting the expansion hub



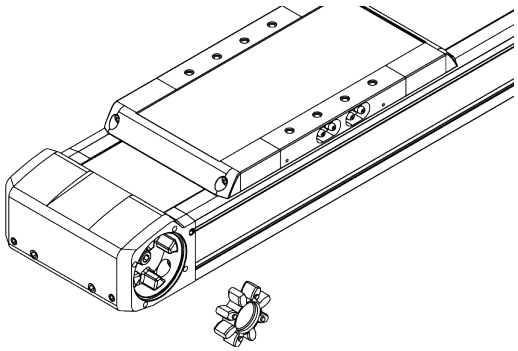
- In the centre of the expansion hub is the expanding mandrel with which the coupling is fastened. Screw the expansion hub with the screw tightening torque from Table 6.20.

Fig. 6.70: Mounting the expansion hub by tightening the expansion mandrel



- Fit the sprocket onto the expansion hub.

Fig. 6.71: Attaching the sprocket



Note:

The sprocket must be slightly pre-tensioned and should not exhibit any backlash. If it is too easy to attach, it must be replaced. Lightly greasing the sprocket with PU-compatible lubricants can make installation easier.

- Push the clamping hub onto the sprocket until dimension L_1 is achieved (see Table 6.21).

Fig. 6.72: Adjusting the clamping hub distance in the direction of the motor

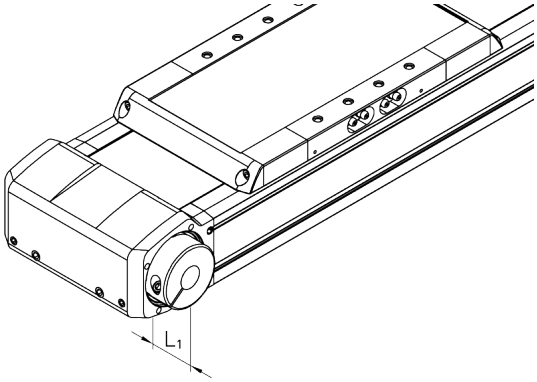


Table 6.21: Adjusting the coupling distance via dimension L_1

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 according to Fig. 6.72 and Table 6.21, there is an alternative for adjusting coupling distance L_2 according to Fig. 6.73 and Table 6.22.

Fig. 6.73: Total length of the coupling assembly (HT-B)

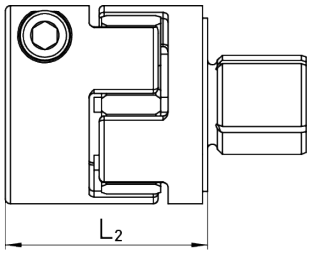


Table 6.22: Adjusting the coupling distance via dimension L_2 when there is no coupling housing

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

6.7.2 Assembly of the motor (without gearbox)

- Push motor adapter plate AM on flat, taking note of the position of the hole for the clamping bolt of the clamping hub (see Fig. 6.74).
- Tighten the 4 screws. For screw tightening torques, see Table 6.23.

Fig. 6.74: Mounting motor adapter plate AM (HT-B)

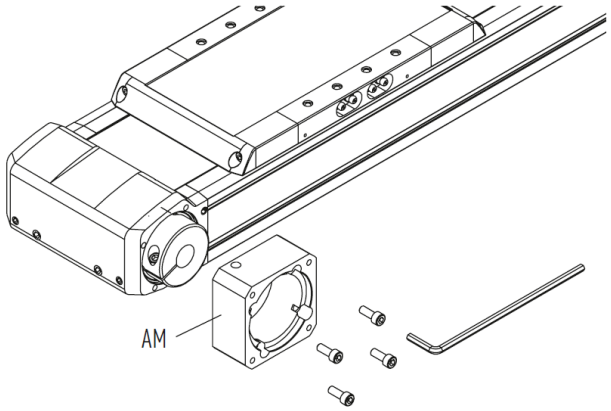
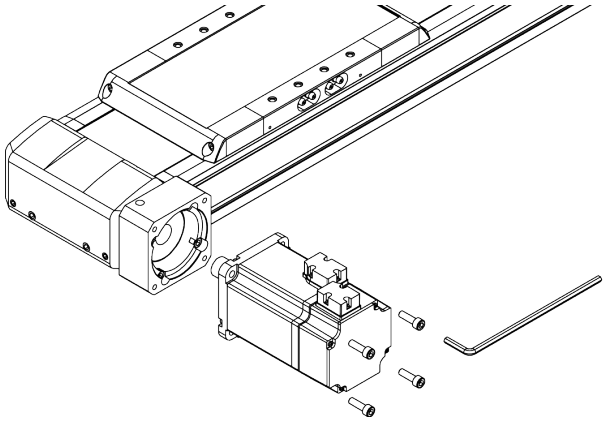


Table 6.23: Screw tightening torques for motor adapter plate AM

Size	Bolt strength class	Thread size	Screw tightening torque [Nm]
HT100B	8,8	M4	3,0
HT150B	8,8	M6	10,1
HT200B	8,8	M8	24,6
HT250B	8,8	M8	24,6

- Secure the motor to make sure it cannot fall.
- Place the motor flat on motor adapter plate AM.
- Mount the motor according to the manufacturer's instructions.

Fig. 6.75: Screwing the motor to linear table HT-B



Note:
Take care to slide the motor on straight so that the preset L measurement does not change.

- Remove the sealing plug from the side hole of motor adapter plate AM.

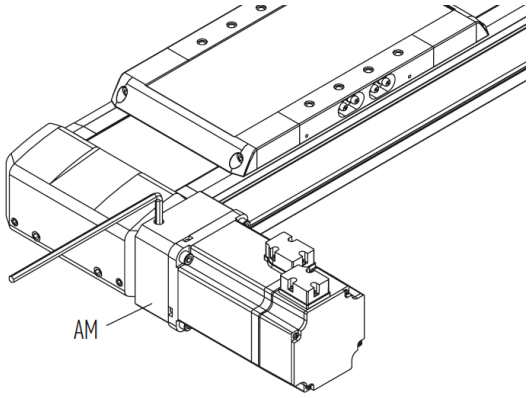
Variant 1:

- Tighten the screw of the clamping hub through the bore hole to the screw tightening torque as shown in Table 6.20.

Variant 2:

- Tighten the two screws of the clamping hub one after the other, through the bore hole. First, position the screw on the 1st side, then tighten the screw on the 2nd side, followed by the screw on the 1st side, to the screw tightening torque shown in Table 6.20.
- Close the hole with the sealing plug.
- ✓ The motor is mounted.

Fig. 6.76: Tightening the clamping hub on the motor shaft

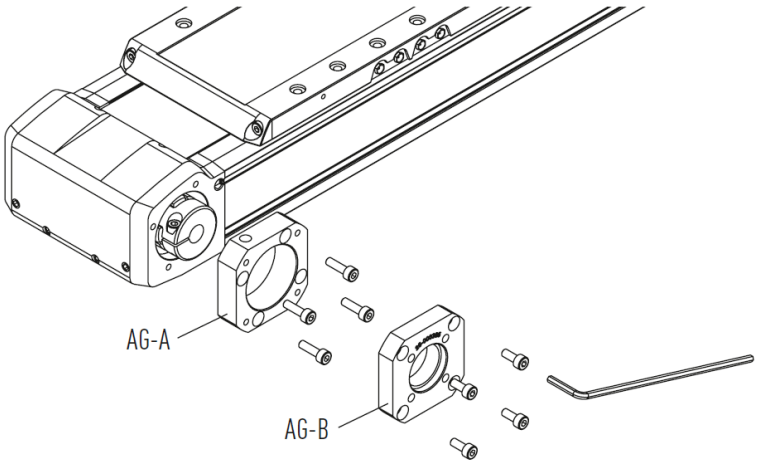


6.7.3 Assembly of the gearbox

HT100B:

- Attach the first section of the gear adapter plate (AG-A) so that it lies flat (see Fig. 6.77). Note the position of the hole for the clamping bolt of the clamping hub.
- Tighten the 4 screws. For screw tightening torques, see Table 6.24.
- Place the second section of the gear adapter plate (AG-B) on the first section (AG-A) (see Fig. 6.77).
- Tighten the 4 screws. For screw tightening torques, see Table 6.24.

Fig. 6.77: Mounting the two-section gear adapter plate AG-A and AG-B – HT100B



HT150B, HT200B, HT250B:

- Put gearbox adapter plate AG on flat (see Fig. 6.78). Note the position of the hole for the clamping bolt of the clamping hub.
- Tighten the 4 screws. For screw tightening torques, see Table 6.24.

Fig. 6.78: Mounting gear adapter plate AG – HT150B, HT200B, HT250B

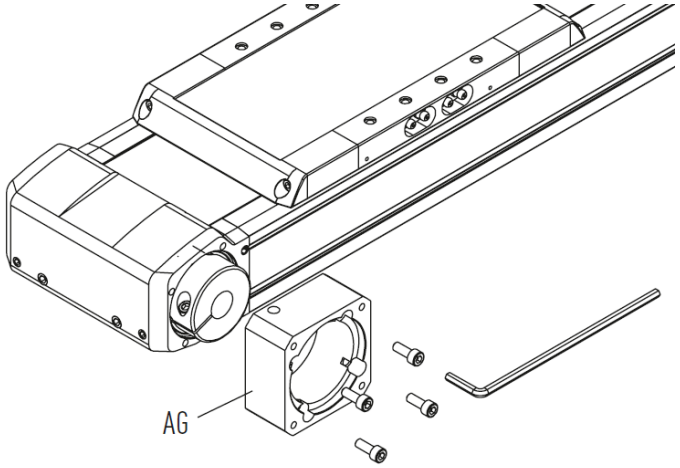
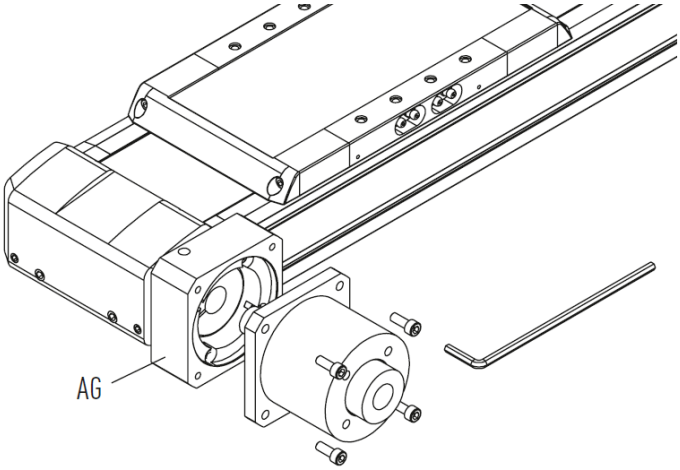


Table 6.24: Screw tightening torques for gear adapter plate AG

Size	Bolt strength class	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	10,1
HT200B	8,8	M8	24,6
HT250B	8,8	M8	24,6

- Secure the gearbox to make sure it cannot fall.
- Place the gearbox flat on the gear adapter plate AG.
- Secure the gearbox with 4 screws according to the manufacturer's instructions.

Fig. 6.79: Screwing the gearbox to the linear table



- Remove the sealing plug on the hole of gear adapter plate AG.

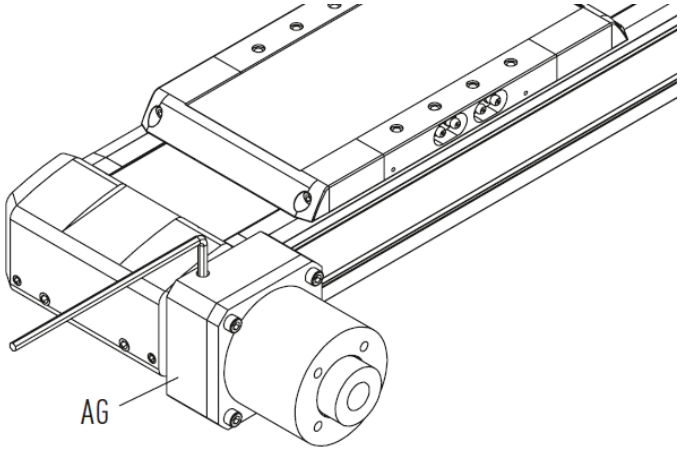
Variant 1:

- Tighten the screw of the clamping hub through the bore hole to the screw tightening torque as shown in Table 6.20.

Variant 2:

- Tighten the two screws of the clamping hub one after the other, through the bore hole. First, position the screw on the 1st side, then tighten the screw on the 2nd side, followed by the screw on the 1st side, to the screw tightening torque shown in Table 6.20.
- Close the hole with the sealing plug.
- ✓ The gearbox is mounted.

Fig. 6.80: Tightening the clamping hub on the gear shaft



Note:

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

6.7.4 Mounting the motor on PLE/PLQE gearbox 1)

- Open the clamping bolt of the gearbox so that you can later easily fit the shaft of the motor into the hollow shaft of the gearbox. For smaller motor shaft diameters, use the enclosed bushing.
- Push gear adapter plate GM flat on the gearbox, taking note of the position of the hole for the clamping bolt of the clamping hub (see Fig. 6.81).
- Tighten the 4 screws. For screw tightening torques, see Table 6.25.

Fig. 6.81: Mounting motor gear adapter plate GM (HT-B)

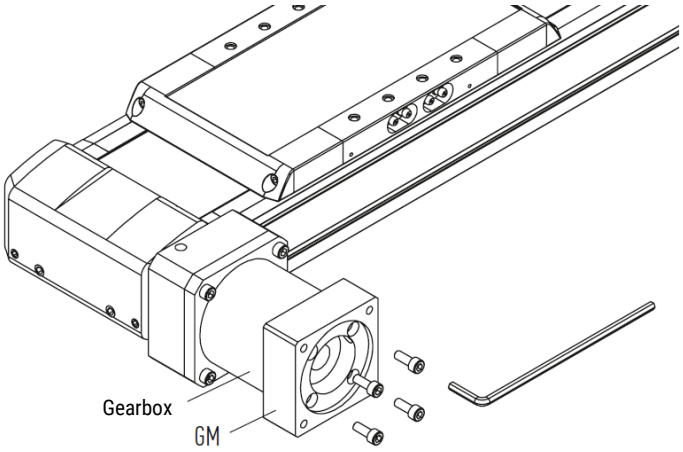


Table 6.25: Screw tightening torques for motor gear adapter plates GM

Size	Gearbox [1)]	Bolt strength class	Thread size × length	Screw tightening torque [Nm]
HT100B	PLE040	8,8	M3 × 16	1,1
HT100B	PLQE060	8,8	M5 × 10	5,9
HT150B	PLQE080	8,8	M6 × 16	10,1
HT150B, HT200B, HT250B	PLQE120	8,8	M8 × 25	24,6

[1)] PLE and PLQE are registered trademarks of Neugart GmbH

- If possible, turn the axis so that the motor can be mounted in a vertical position from above.
- Place the motor flat on motor gear adapter plate GM.
- Remove the headless screw from the side hole of motor gear adapter plate GM.
- Tighten the clamping bolt of the clamping hub through the hole to the screw tightening torque as shown in Table 6.26.

▶ Close the hole with the headless screw.

Fig. 6.82: Tightening the clamping hub on the motor shaft

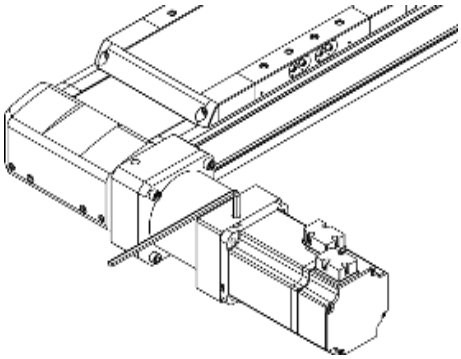


Table 6.26: Screw tightening torques for the clamping bolt

Size	Gearbox [1]	Bolt strength class	SWISK [2]	Screw tightening torque [Nm]
HT100B	PLE040	12,9	2,5	2,0
			3,0	4,5
HT100B	PLQE060	12,9	3,0	4,5
			4,0	9,5
HT150B	PLQE080	12,9	4,0	9,5
			5,0	16,5
HT150B, HT200B, HT250B	PLQE120	12,9	5,0	16,5
			6,0	40,0

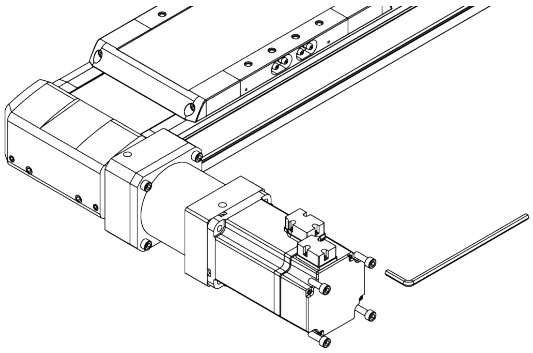
[1] PLE and PLQE are registered trademarks of Neugart GmbH
[2] Width across flats of hexagon socket; varies depending on coupling size/motor used

Note:
When mounting the motor to a gearbox, the gearbox manual is required.

▶ Mount the motor according to the manufacturer's instructions.

✓ The motor is mounted.

Fig. 6.83: Screwing the motor to linear table HT-B with gearbox



6.8 Mounting the drive unit of cantilever axis HC-B

6.8.1 Mounting of coupling assembly HC-B

A suitable coupling is required for attaching the motor. These can be found in section 11.4.6 from page 165.

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

- 1 clamping hub for the drive side **[1]**
- 1 sprocket **[2]**
- 1 expansion hub for the axis side **[3]**

The clamping hubs come in two versions:

- Variant 1 with a clamping bolt, see Fig. 6.84
- Variant 2 with two clamping bolts, see Fig. 6.85

Fig. 6.84: Coupling assembly variant 1: Clamping hub with one clamping bolt

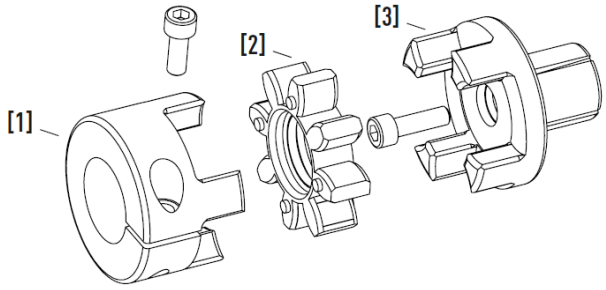
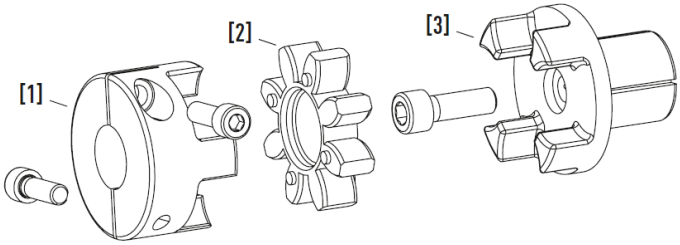


Fig. 6.85: Coupling assembly variant 2: Clamping hub with two clamping bolts



Before mounting, please ensure that

- No parts are damaged
- All parts are free of dirt and grease

For assembly of the coupling assembly, the screw tightening torques listed in Table 6.27 and Table 6.28 apply:

Table 6.27: 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	1,9
HC040B	10	5,0	5,0 [1)]
HC060B	10	14,0	14,0 [2)]
HC080B	25	14,0	15,0
HC100B	49	–	35,0

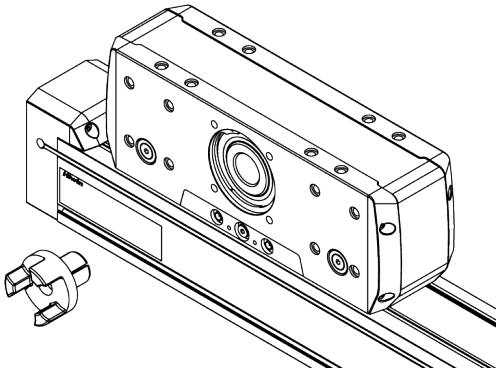
[1)] Special version clamping diameter with 16 mm: 3,8 Nm
[2)] Special version clamping diameter with 22 and 24 mm: 10 Nm

Table 6.28: Screw tightening torques for the clutch housing

Size	Bolt strength class	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

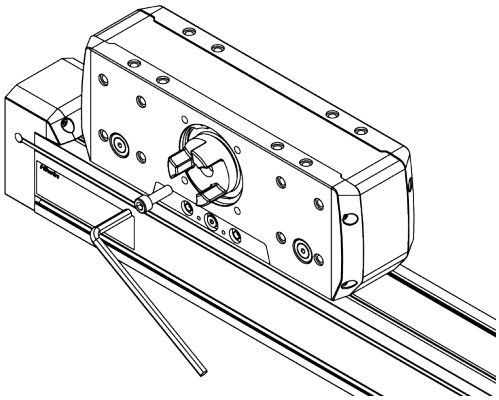
- Position the drive block in the left end position so that the toothed belt cannot rotate with it.
- Press the expansion hub into the hollow shaft of the toothed belt until the expansion hub sits flat.

Fig. 6.86: Inserting the expansion hub



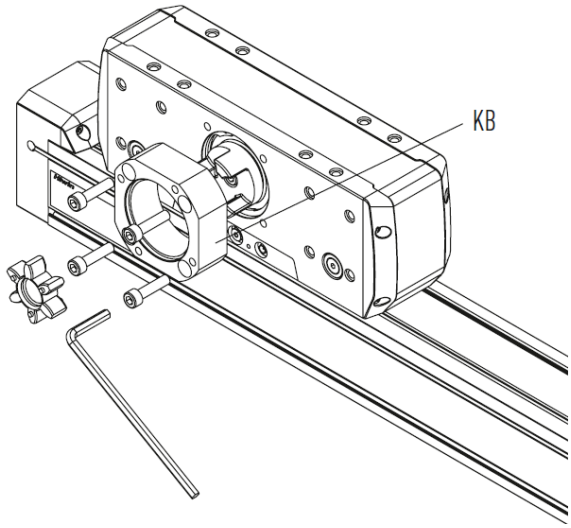
- In the centre of the expansion hub is the expanding mandrel with which the coupling is fastened. Screw the expansion hub with the screw tightening torque from Table 6.27.

Fig. 6.87: Mounting the expansion hub by tightening the expansion mandrel



- Fit the sprocket onto the expansion hub.
- Mount coupling housing KB with 4 screws so that it lies flat.

Fig. 6.88: Attaching sprocket and mounting coupling housing KB



Note:

The sprocket must be slightly pre-tensioned and should not exhibit any backlash. If it is too easy to attach, it must be replaced. Lightly greasing the sprocket with PU-compatible lubricants can make installation easier.

- Push the clamping hub onto the sprocket until dimension L_1 (Table 6.29) is set.

Fig. 6.89: Adjusting the clamping hub distance in the direction of the motor

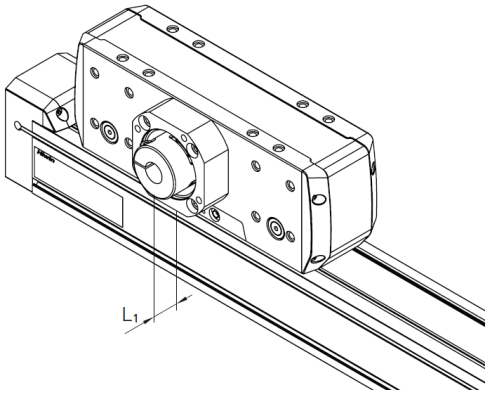


Table 6.29: Adjusting the coupling distance via dimension L_1

Size	Coupling size	L_1 variant 1 [mm]	L_1 variant 2 [mm]
HC025B	12	13,0	13,0
HC040B	14	10,0	10,0
HC060B	19	14,0	14,0
HC080B	24	16,5	14,5
HC100B	28	–	16,7

Note:

When mounting without coupling housing, coupling distance L_2 must be set according to Fig. 6.90 and Table 6.30.

Fig. 6.90: Total length of the coupling assembly (HC-B)

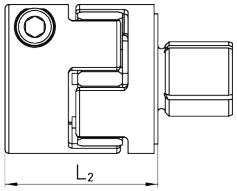


Table 6.30: Adjusting the coupling distance via dimension L_2 when there is no coupling housing

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	–	48,0

6.8.2 Assembly of the motor (without gearbox)

- Push motor adapter plate AM on flat, taking note of the position of the hole for the clamping bolt of the clamping hub.
- Tighten the 4 screws. For screw tightening torques, see Table 6.31.

Fig. 6.91: Mounting motor adapter plate AM (HC-B)

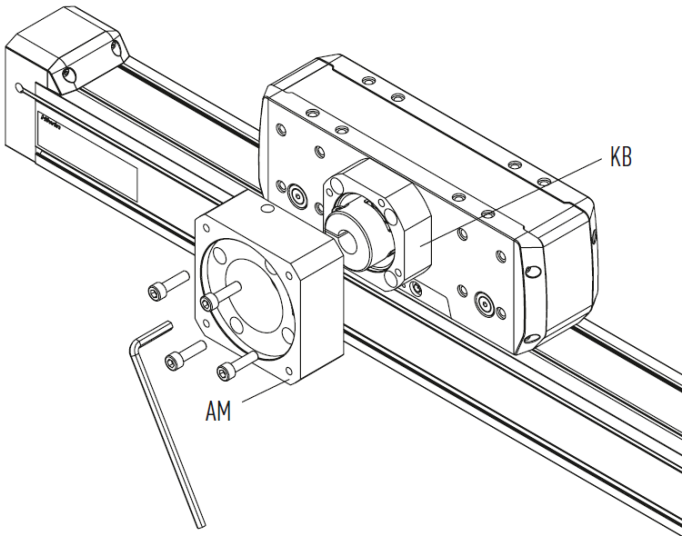
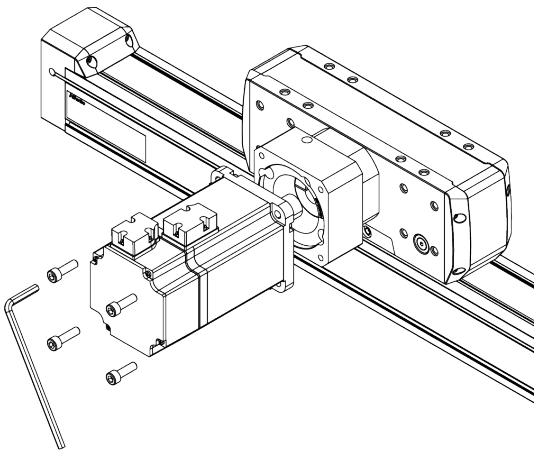


Table 6.31: Screw tightening torques for motor adapter plate AM

Size	Bolt strength class	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

- Secure the motor to make sure it cannot fall.
- Place the motor flat on motor adapter plate AM.
- Mount the motor according to the manufacturer's instructions.

Fig. 6.92: Screwing the motor to cantilever axis HC-B



Note:

Take care to slide the motor on straight so that the preset L measurement does not change.

- Remove the sealing plug from the side hole of motor adapter plate AM.

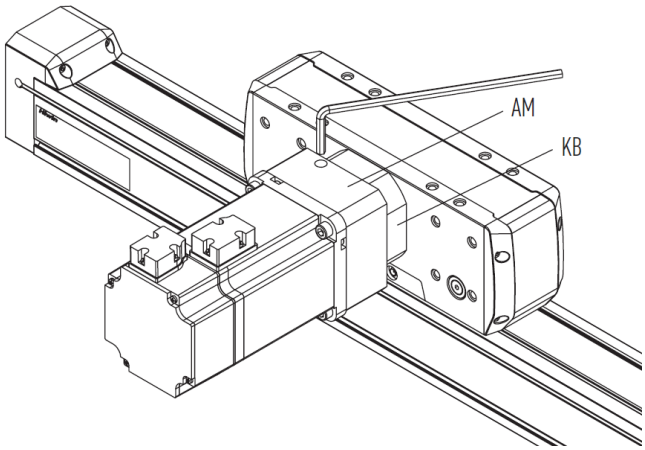
Variant 1:

- Tighten the screw of the clamping hub through the bore hole to the screw tightening torque as shown in Table 6.27.

Variant 2:

- Tighten the two screws of the clamping hub one after the other, through the bore hole. First, position the screw on the 1st side, then tighten the screw on the 2nd side, followed by the screw on the 1st side, to the screw tightening torque shown in Table 6.27.
- Close the hole with the sealing plug.
- ✓ The motor is mounted.

Fig. 6.93: Tightening the clamping hub on the motor shaft



Note:

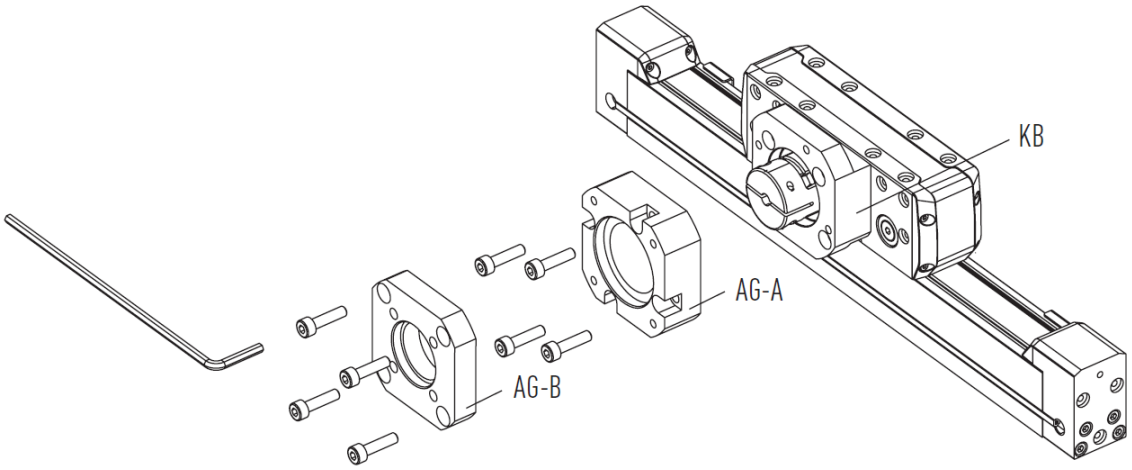
When mounting the motor to a gearbox, the gearbox manual is required.

6.8.3 Assembly of the gearbox

HC025B, HC040B:

- Attach the first section of the gear adapter plate (AG-A) so that it lies flat (see Fig. 6.94). Note the position of the hole for the clamping bolt of the clamping hub.
- Tighten the 4 screws. For screw tightening torques, see Table 6.32.
- Place the second section of the gear adapter plate (AG-B) on the first section (AG-A) (see Fig. 6.94).
- Tighten the 4 screws. For screw tightening torques, see Table 6.32.

Fig. 6.94: Mounting two-section gear adapter plate AG-A and AG-B – HC025B, HC040B



6.8.4 Assembly of the gearbox

HC060B, HC080B, HC100B:

- Push gear adapter plate AG on flat (see Fig. 6.95), taking note of the position of the hole for the clamping bolt of the clamping hub.
- Tighten the 4 screws. For screw tightening torques, see Table 6.32.

Fig. 6.95: Mounting gear adapter plate AG – HC060B, HC080B, HC100B

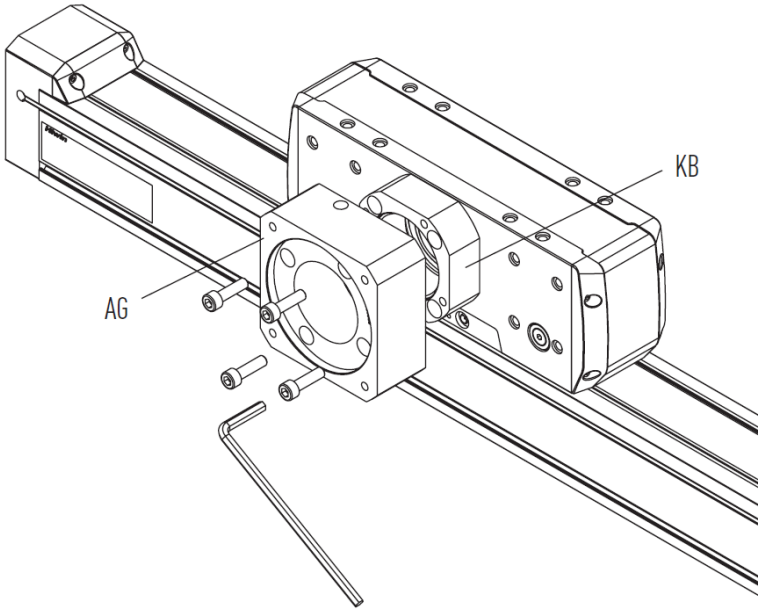
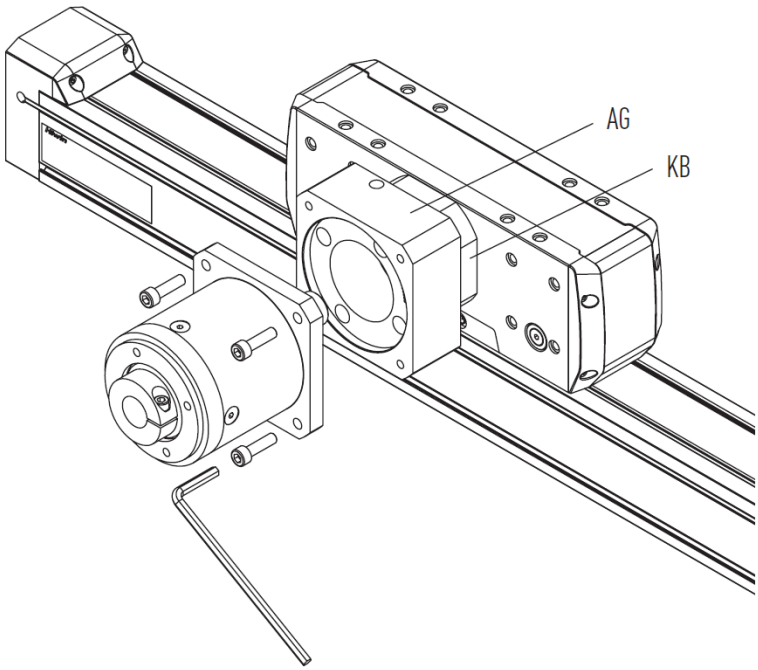


Table 6.32: Screw tightening torques for gear adapter plate AG

Size	Bolt strength class	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	8,8	M8	25,0

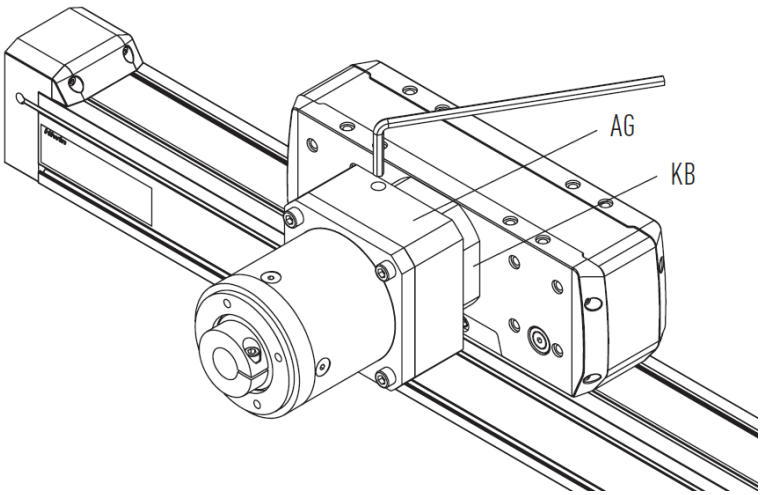
- Secure the gearbox to make sure it cannot fall.
- Place the gearbox flat on gear adapter plate AG (see Fig. 6.96).
- Secure the gearbox with 4 screws according to the manufacturer's instructions.

Fig. 6.96: Screwing the gearbox to the cantilever axis



- Remove the sealing plug on the hole of gear adapter plate AG.
- **Variant 1:** Tighten the screw of the clamping hub through the bore hole to the screw tightening torque as shown in Table 6.27.
- **Variant 2:** Tighten the two screws of the clamping hub one after the other, through the bore hole. First, position the screw on the 1st side, then tighten the screw on the 2nd side, followed by the screw on the 1st side, to the screw tightening torque shown in Table 6.27.
- Close the hole with the sealing plug.
- ✓ The gearbox is mounted.

Fig. 6.97: Tightening the clamping hub on the gear shaft



Note:
When mounting the motor to a gearbox, the gearbox manual is required.

6.8.5 Mounting the motor on PLE/PLQE gearbox 1)

- Open the clamping bolt of the gearbox so that you can later easily fit the shaft of the motor into the hollow shaft of the gearbox. For smaller motor shaft diameters, use the enclosed bushing.
- Push gear adapter plate GM flat on the gearbox, taking note of the position of the hole for the clamping bolt of the clamping hub (see Fig. 6.98).
- Tighten the 4 screws. For screw tightening torques, see Table 6.33.

Fig. 6.98: Mounting motor gear adapter plate GM (HC-B)

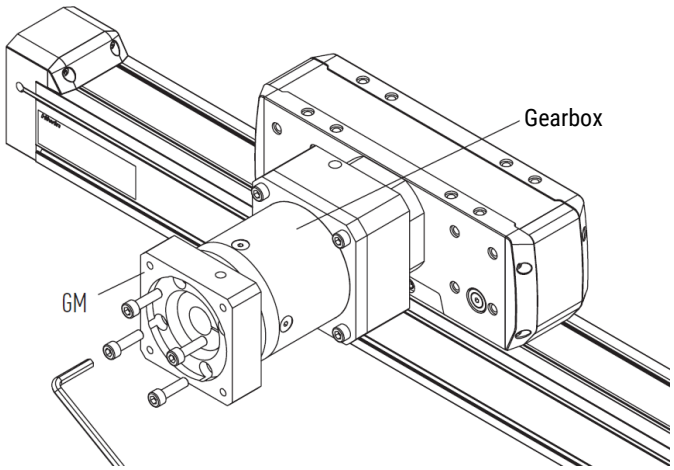


Table 6.33: Screw tightening torques for motor gear adapter plate GM

Size	Gearbox 1)	Bolt strength class	Thread size × length	Screw tightening torque [Nm]
HC025B	PLE040	8,8	M3 × 16	1,1
HC040B	PLE040	8,8	M3 × 16	1,1
HC060B	PLQE060	8,8	M5 × 16	5,9
HC080B	PLQE080	8,8	M6 × 16	10,0
HC100B	PLQE120	8,8	M8 × 10	25,0

1) PLE and PLQE are registered trademarks of Neugart GmbH

- If possible, turn the axis so that the motor can be mounted in a vertical position from above.
- Place the motor flat on motor gear adapter plate GM.
- Remove the headless screw from the side hole of motor gear adapter plate GM.
- Tighten the clamping bolt of the clamping hub through the hole to the screw tightening torque as shown in Table 6.34.
- Close the hole with the headless screw.

Fig. 6.99: Tightening the clamping hub on the motor shaft

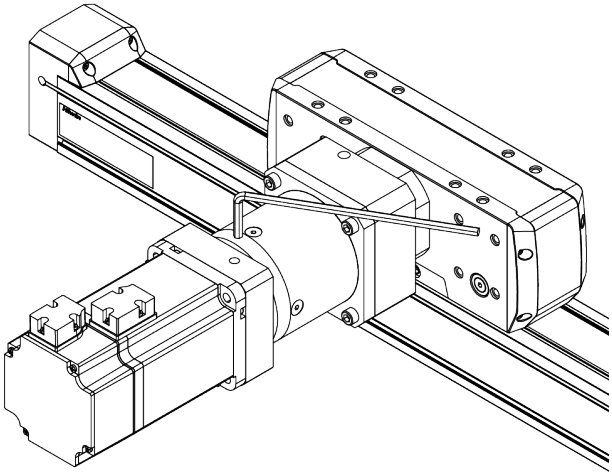


Table 6.34: Screw tightening torques for the clamping bolt

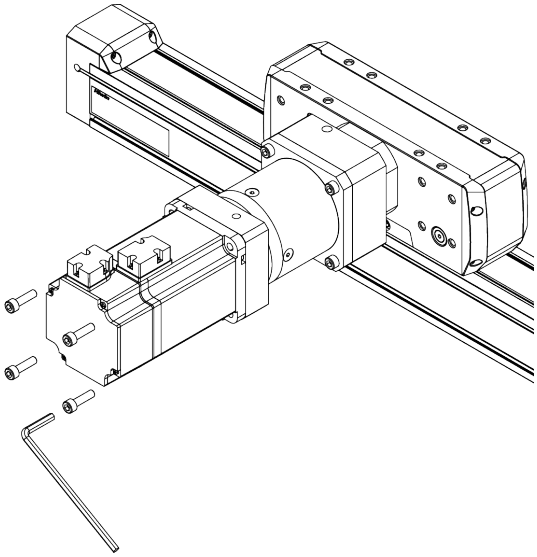
Size	Gearbox [1]	Bolt strength class	SWISK [2]	Screw tightening torque [Nm]
HC025B	PLE040	12,9	2,5	2,0
			3,0	4,5
HC040B	PLE040	12,9	2,5	2,0
			3,0	4,5
HC060B	PLQE060	12,9	3,0	4,5
			4,0	9,5
HC080B	PLQE080	12,9	4,0	9,5
			5,0	16,5
HC100B	PLQE120	12,9	5,0	16,5
			6,0	40,0

[1] PLE and PLQE are registered trademarks of Neugart GmbH
[2] Width across flats of hexagon socket; varies depending on coupling size/motor used

Note:
When mounting the motor to a gearbox, the gearbox manual is required.

- ▶ Mount the motor according to the manufacturer's instructions.
- ✓ The motor is mounted.

Fig. 6.100: Screwing the motor to cantilever axis HC-B with gearbox



6.8.6 Mounting the journal

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

Table 6.35: Screw tightening torques for journals

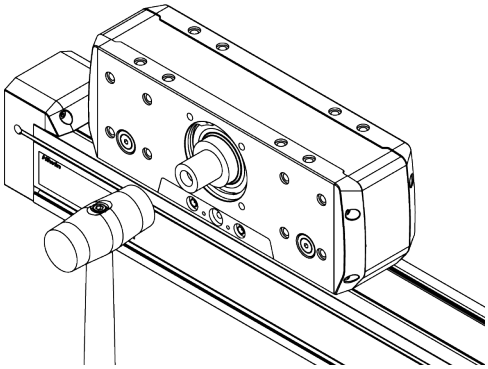
Size	Screw	Bolt strength class	Screw tightening torque [Nm]
HC025B	ISO 4762 M4 × 25	12,9	2,9
HC040B	ISO 4762 M4 × 30	12,9	4,5
HC060B	ISO 4762 M6 × 45	12,9	10,0
HC080B	ISO 4762 M8 × 55	12,9	25,0
HC100B	ISO 4762 M10 × 60	12,9	55,0

Before mounting, please ensure that

- No parts are damaged
- All parts are free of dirt and grease

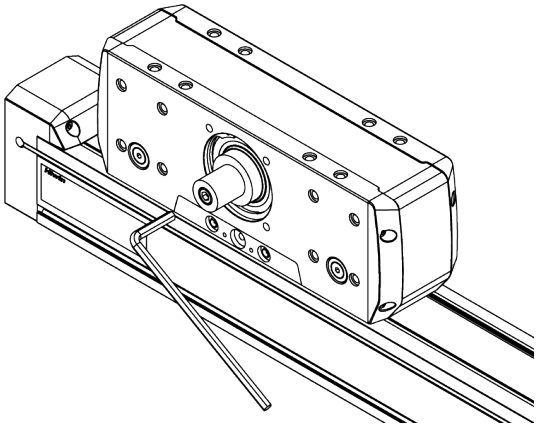
- Position the drive block in the left end position so that the toothed belt cannot rotate with it.
- Carefully press the journal into the hollow shaft of the toothed belt until the expansion hub sits flat.
- Ensure that the journal flange is seated flat. If necessary, use a light plastic hammer.

Fig. 6.101: Inserting the journal into the drive block of cantilever axis HC-B



- Tighten the screw in the centre of the journal with the screw tightening torque according to Table 6.35 .

Fig. 6.102: Tightening the screw on the journal



6.9 Mounting drive unit of double axes HD and multi-axis systems HS

To mount the drive unit, follow the assembly instructions for the single axes installed (sections 6.6, 6.7 and 6.8).

6.10 Mounting the cover plate for the drive block

The cover strip closes off inputs and outputs which are not required on linear axes with toothed belt drive HM-B, HT-B and HC-B.

- Place the sheet metal cover on the drive block.
- Loosely screw the sheet metal cover to the drive block using the screws provided.
- Tighten the bolts of the sheet metal cover. For screw tightening torques, see Table 6.36.

✓ The sheet metal cover has been mounted.

Fig. 6.103: Placing the sheet metal cover on the drive block

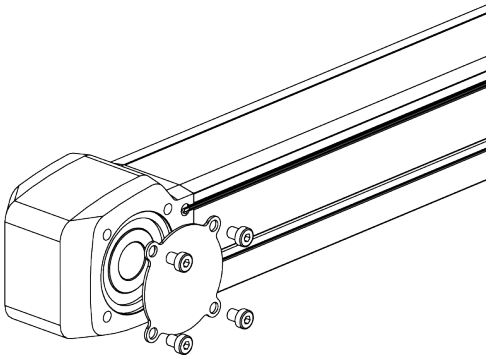


Fig. 6.104: Tightening the bolts of the sheet metal cover

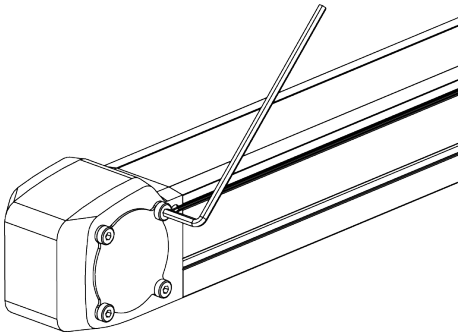


Table 6.36: Screw tightening torques for the sheet metal cover

Axis type/size	Bolt strength class	Thread size × length	Screw tightening torque [Nm]	Article 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
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

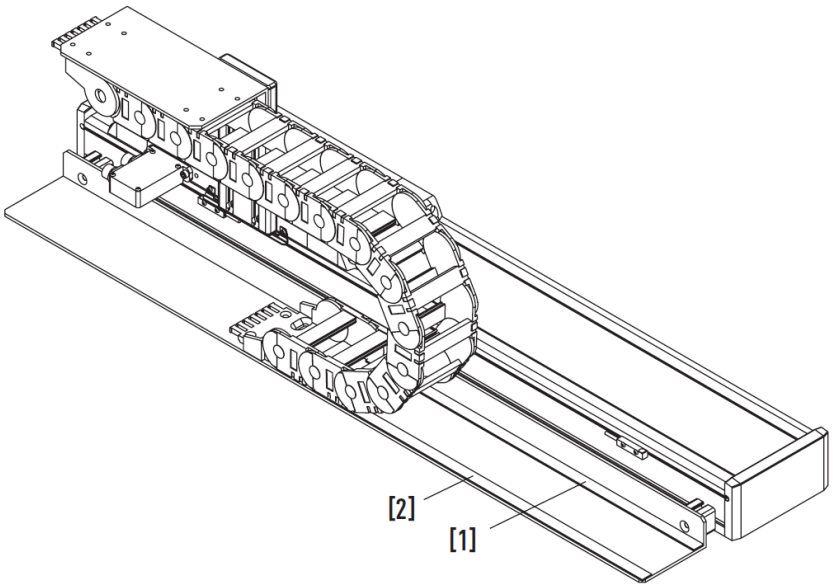
6.11 Mounting the tape for reduction of noise emissions from the energy chain

The tape reduces the noise emission of the energy chain.

- Slide the carriage by hand to the mechanical end position so that the energy chain rests on the energy chain support to the maximum extent.
- Shorten the noise reduction tape until it corresponds to the maximum support length of the energy chain. Two tapes of the same length are required for each energy chain.
- Slide the carriage by hand to the other end position so that the lower section of the energy chain is lifted as far as possible from the energy chain support.
- Clean the energy chain support so that it is free of dirt, dust and grease.
- Attach the 1st Tape **[1]** flush with the corner of the energy chain support (see Fig. 6.105).
- Attach the 2nd tape **[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 carriage and make sure that the energy chain runs on the tapes over its entire travel distance.

✓ The noise reduction tape has been mounted.

Fig. 6.105: Linear axis with mounted noise reduction tape



6.12 Electrical connection

⚠ **Danger!** Danger due to electrical voltage!

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

- Make sure 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!** Danger due to electrical voltage!

Electrical currents can also flow when the motor is not moving.

- Make sure that the linear axes/linear axis systems are disconnected from the power supply before disconnecting the electrical connections of the motors!
- After disconnecting the servo drive from the power supply, wait at least 5 minutes before touching live parts or loosening connections!
- To be on the safe side, measure the voltage in the intermediate circuit of the servo drive. Wait until it has dropped below 40 V!
- Work on electrical installations only by qualified personnel!

6.12.1 Limit switch connection

The pin assignment of the limit switch plug for variant A and B (see order codes: Linear modules HM-B page 12, linear tables HT-B page 15, cantilever axes HC-B page 18, double axes HD page 20, two-axis systems HS2 page 23, three-axis systems HS3 page 26, linear gantries HSL page 28) can be found in Fig. 6.107. For variant C and D with open cable end, connect the wires according to Fig. 6.106.

Fig. 6.106: Wiring diagram

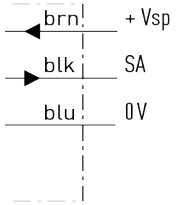
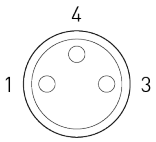


Fig. 6.107: Pin assignment: Limit switch plug



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

SA Switching output

Note:

Since the sensor is operated with a low voltage, it alone does not normally pose a risk of injury or death.

Note:

Do not operate the sensor with a voltage other than the specified voltage, otherwise it may be destroyed!

6.12.2 Connection of external distance measuring system for HM-B, HT-B and HC-B

The HIWIN MAGIC distance measuring system is factory-mounted on the side of the carriage of the axis. The cable length is 5 m with open cable end.

If the encoder is connected according to Table 6.37, the counting direction (with the encoder in motion) results according to the definitions in Fig. 6.108 (HM-B, HT-B), Fig. 6.109 (HC-B) and Fig. 6.110.

If you wish to have a positive counting direction in the opposite direction, when connecting to the electronic evaluation system, you must switch “A” with “B and “$\bar{A}$” with “$\bar{B}$”.

Fig. 6.108: MAGIC distance measuring system – linear axes HM-B and HT-B

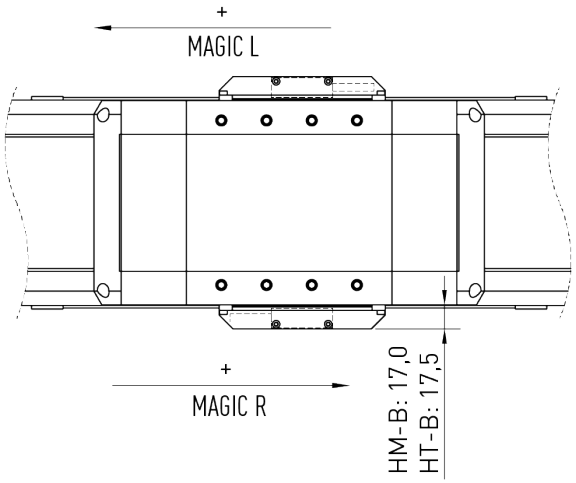


Fig. 6.109: MAGIC distance measuring system – linear axes HC-B

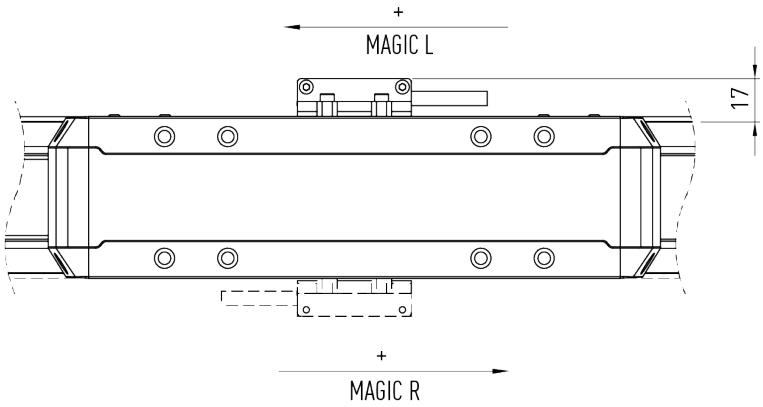


Fig. 6.110: Detail view, positive direction of travel of MAGIC encoder

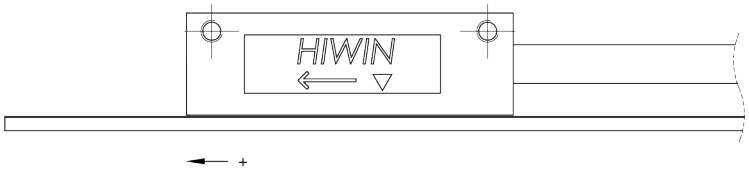


Table 6.37: Line and plug assignments

Colour of encoder cable	Signal
Brown	Power supply 5 V
White	GND / 0 V
Green	V1+ / A
Yellow	V1- / Ā
Blue	V2+ / B
Red	V2- / $\overline{B}$
Purple	Ref+ / Z
Grey	Ref- / $\overline{Z}$
	Shielding

For more information, see the “HIWIN MAGIC distance measuring system” assembly instructions.

6.12.3 Motor connection

Note:

Information on the connection options of the motor can be found in the operating manual of the motor used!

6.12.4 Servo drive connection

Note:

Information on the connection options of the servo drive can be found in the operating manual of the servo drive used!

6.13 Pneumatic connection

Cantilever axis HC-B (HC060B, HC080B and HC100B) can optionally be equipped with a pneumatic clamping or braking element (see order code on page 18). At the factory, the pneumatic connection for the clamping or braking element is mounted laterally on the lower section of the drive block of the axis (see Fig. 6.111).

The connection for the hose has an outer diameter of 6 mm. For further technical details, see Table 6.38.

Fig. 6.111: Position of pneumatic connection for the clamping or braking element (HC060B, HC080B, HC100B)

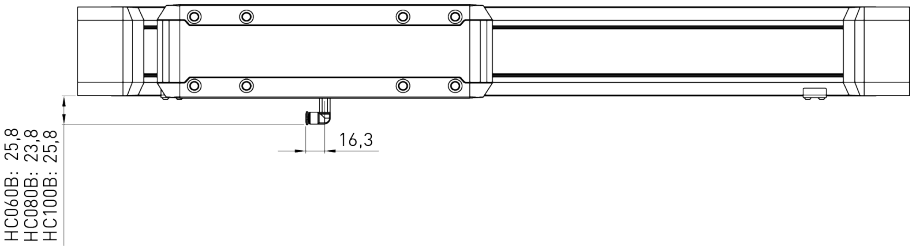


Table 6.38: General features of the pneumatic connection

Structural design	Push-pull principle
Nominal tightening torque	1,33 Nm
Pneumatic connection for hose	Outer diameter: 6 mm
Nominal size	2 mm

7 Maintenance and cleaning

⚠ **Danger!** Danger of electric shock or burns from contact with live parts!

Contact with live parts can cause injuries.
If the customer installs cables incorrectly, the constant motion inside the energy chain can cause chafing and expose the electrical contact points.

- Construction of the control system according to DIN EN 12100. No start up after:
  - Application, return of energy!
  - Correction of a fault!
  - Machine stop!
- Only qualified personnel may install cabling!
- Work on electrical installations only by qualified personnel!

⚠ **Warning**! Risk of impact and crushing!

Injuries can occur if the carriage is moved or accidentally started up.

- When linear axes/linear axis systems are arranged vertically, secure the carriage when stationary!
- Construction of the control system according to DIN EN 12100: No start up after:
  - Application, return of energy!
  - Correction of a fault!
  - Machine stop!

⚠ **Warning**! Danger of injury and damage to property!

Unauthorised work on the unit may cause injury and invalidate the warranty.

- Assembly and maintenance of the linear axes/linear axis systems only by qualified personnel!

⚠ **Warning**! Danger of impacts and crushing due to the axis falling down or the payload coming loose! Danger due to high loads!

- Use suitable lifting gear!
- Fasten linear axes/linear axis systems according to the assembly instructions (see 6.2)!
- Attach the payload according to the assembly instructions (see section 6.3)!

⚠ **Warning**! Danger of impacts and crushing caused by the clamping or braking element opening!

As soon as compressed air is applied, the clamp opens.

- Before working, 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!

⚠ **Attention!** Danger of crushing due to tilting of the axes!

- Secure machine and machine parts against tipping over!

⚠ **Attention!** Risk of impact and crushing!

If the axes are moved/driven manually, injuries can be caused by moving axes and attachments (energy chains, attachments installed by customer).

- Observe applicable industrial safety regulations!
- Transport to the installation site only by qualified personnel!

Attention! Danger to health and the environment!

Contact with lubricants can cause irritation, poisoning and allergic reactions as well as damage to the environment.

- Only use suitable media that are not dangerous for humans. Observe the manufacturer's safety data sheets.
- Dispose of substances appropriately.

Caution! Damage due to incorrect lubricant!

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

- Use the correct type of lubricant (grease, oil) according to the specifications in these assembly instructions!

For maintenance work:

- Secure the linear axis/linear axis systems against unauthorised switching on.
- Disconnect the linear axis/linear axis systems from the power supply.
- Secure the linear axis/linear axis systems against unauthorised restart.

Note:

Compliance with the maintenance intervals for cleaning and lubrication is essential.

- Include the maintenance intervals in your maintenance schedule.

7.1 Lubrication

Operation of the linear axis/linear axis systems continuously consumes lubricant. The product must be relubricated regularly. Note that the lubricant may leak out of the lubrication system in small quantities.

The following factors influence the lubrication intervals:

- Dust and dirt
- Operating temperatures
- Loads
- Vibration stress
- Permanently short positioning paths
- Speeds

Note:

Insufficient lubrication or the wrong lubricant increase wear and reduce the service life!

7.1.1 Lubrication of linear axis HM-B/HT-B/HC-B

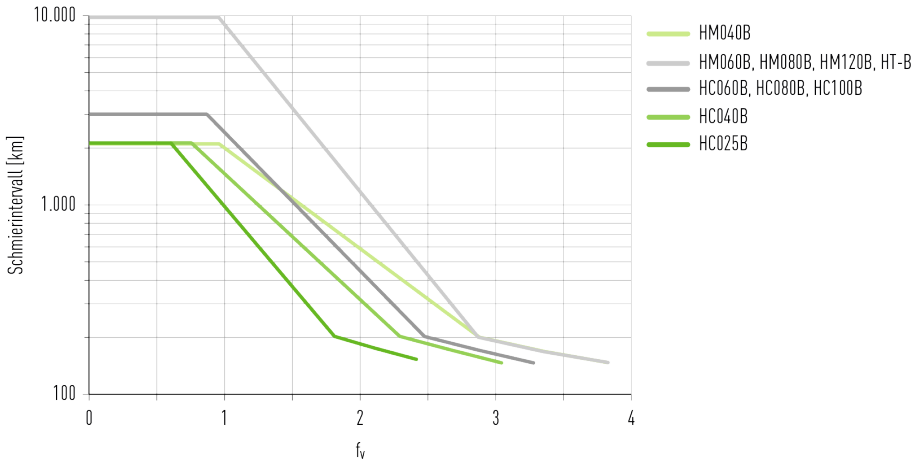
Part of linear axis HM-B/HC-B is a linear guideway with two blocks, with linear tables HT-B two rails with two blocks each are installed. The linear guideways are provided with initial lubrication at the factory. For relubrication, there are two (HM-B/HC-B) or four (HT-B) grease nipples (one for each block) on the side of the carriage.

The lubrication interval depends on the load, speed, cycle time and ambient conditions. For the lubrication interval, the reference values from Table 7.1 apply.

Table 7.1: Load-depending lubrication intervals amounts of the linear guideway of linear axes HM-B/HT-B/HC-B

Size	Guide carriage	Lubricant	Relubrication quantity [cm³]
HM040B	MGN15	G04	0,04
HM060B	QE15	G04	0,30
HM080B	QH20	G04	0,50
HM120B	QH30	G04	1,30
HT100B	QE15	G04	0,20
HT150B	QE15	G04	0,30
HT200B	QH20	G04	0,50
HT250B	QH25	G04	0,80
HC025B	MGN09	G04	0,04
HC040B	MGN15	G04	0,04
HC060B	CG15	G04	0,30
HC080B	CG20	G04	0,50
HC100B	CG25	G04	0,80

Fig. 7.1: Load-dependent relubrication intervals [km] of the linear guideway of linear axes HM-B/HT-B/HC-B



f_v Load comparison factor according to "F 7.1"

7.1.2 Determination of load comparison factor f_v

In case of combined load from several forces and torques, load comparison factor fv is calculated according to formula F 7.1.

F 7.1 $$f_v = \frac{|F_y|}{F_{ydynmax}} + \frac{|F_z|}{F_{zdynmax}} + \frac{|M_x|}{M_{xdynmax}} + \frac{|M_y|}{M_{ydynmax}} + \frac{|M_z|}{M_{zdynmax}}$$

f_v	Load comparison factor	$F_{ydynmax}$	Maximum dynamic force in Y-direction [N]
F_y	Effective force in Y-direction [N]	$F_{zdynmax}$	Maximum dynamic force in Z-direction [N]
F_z	Effective force in Z-direction [N]	$M_{xdynmax}$	Maximum dynamic moment around the X-axis [Nm]
M_x	Effective torque around the X-axis [Nm]	$M_{ydynmax}$	Maximum dynamic moment around the Y-axis [Nm]
M_y	Effective torque around the Y-axis [Nm]	$M_{zdynmax}$	Maximum dynamic moment around the Z-axis [Nm]
M_z	Effective torque around the Z-axis [Nm]		

Fig. 7.2: Illustration of the forces and torques on the linear axis

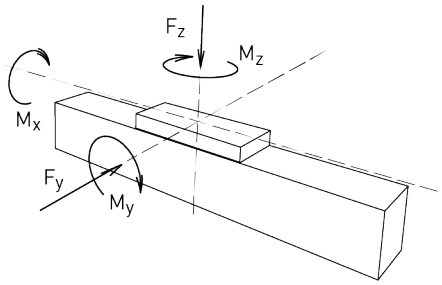
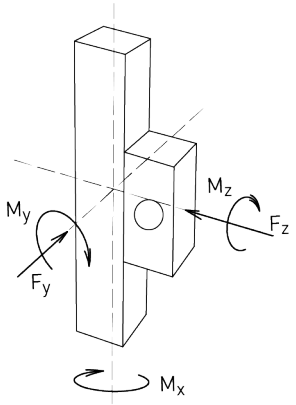


Fig. 7.3: Illustration of the forces and torques on the cantilever axis



7.1.3 Lubrication of double axis HD

With double axis HD, each single axis installed must be lubricated separately as described in section 7.1.1.

7.1.4 Lubrication of linear axis system HS

Linear axis systems HS must be lubricated in accordance with the lubrication specifications for the single axes installed according to section 7.1.1.

7.1.5 Lubrication process

Note:
Only use lubricants according to DIN 51825, KP2K, consistency class NGLI2!

Note:
Make sure that only lubricants without solid lubricant content (e.g. graphite or MoS2) are used!

Note:
With vertical installation, the relubrication quantity increases by approx. 50%.

Note:
In case of special operating conditions (contamination, short stroke, type of installation), the lubrication intervals must be adapted to the application.

Note:
With HM-B, each lubrication point has two grease nipples arranged on the left and right of the carriage. This means that relubrication can be carried out from both the left and the right side of the carriage.

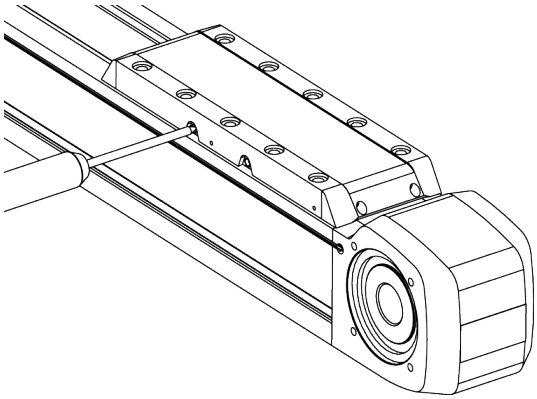
Note:
With the HT-B, four grease nipples are provided on the right-hand side of the carriage, via which all four blocks are lubricated.

Lubrication using the example of the linear guideway:

- Move the carriage to any position.
- Place the nozzle at a right angle to a lateral lubrication point.
- Press the nozzle against the grease nipple with manual force.
- Operate the lubricant gun until the required relubrication quantity (see Table 7.1) is reached.
- Repeat the procedure for all lubrication points on the selected carriage side.

✓ The linear guideway is lubricated.

Fig. 7.4: Lubrication using the example of HM-B



7.2 Cleaning the linear axis

⚠ **Warning!** Danger of cutting!

The cover strip can cause cuts during assembly and disassembly.

- Commissioning and set-up only by qualified personnel with appropriate protective equipment (gloves, goggles)!

⚠ **Attention!** Danger to health and the environment!

Contact with lubricants can cause irritation, poisoning and allergic reactions as well as damage to the environment.

- Only use suitable media that are not dangerous for humans. Observe the manufacturer's safety data sheets.
- Dispose of substances appropriately.

Linear axes HM-B/HT-B are insensitive to the penetration of dirt and foreign bodies due to their constructive design and the optionally selectable cover strips. Nevertheless, the linear axis must be checked regularly and cleaned from the outside.

Observe the following points when cleaning:

- Do not use compressed air.
- The surface is anodised and only resistant to alkaline cleaning agents under certain conditions. Only neutral cleaning agents may be used for cleaning.
- Remove coarse particles from the surface regularly. A moistened, soft and lint-free cleaning cloth is ideal for this purpose.
- The cover strip is subject to abrasion due to friction caused by its function. Remove the abrasion regularly.

7.3 Changing the cover strip – HM-B

The cover strip must be changed as soon as there are any signs of rippling and it can no longer be held in position by the magnetic strips. In this case, a sufficient seal is no longer guaranteed.

- Undo the clamping bolt of the cover strip clamp at both ends of the axis as shown in Fig. 7.11.
- Undo the carriage end piece screws. Remove the end piece from both ends of all carriages (see Fig. 7.9).
- Undo the screws. Remove the cover strip deflection from both ends of all carriages (see Fig. 7.7).
- Now remove the cover strip and the slide film by pulling them both out of the carriage profile.
- Use a soft, damp, lint-free cloth to remove any dirt from the cover strip clamp, carriage end piece, cover strip deflection and slide film.
- Cut the new cover strip to the same length as the one that you have removed.
- Insert the cover strip through the upper opening in the carriage profile as shown in Fig. 7.5.
- Thread the cover strip deflection onto the cover strip at both ends of the carriage. Make sure that the cover strip deflection is correctly oriented as shown in Fig. 7.6.
- Hand-tighten the cover strip deflection screws.
- Push the slide film through the upper opening in the cover strip deflection as shown in Fig. 7.8 and align it centrally in the longitudinal direction.
- Place the carriage end pieces on the cover strip deflection as shown in Fig. 7.9 and hand-tighten the mounting bolts.
- Push the ends of the cover strip under the cover strip clamp on both sides (see Fig. 7.10). Make sure that the cover strip is aligned centrally with the axis profile and that it is in contact with the magnetic strips across the entire length.

- Hand-tighten the clamping bolts of the cover strip (see Fig. 7.11).
- Move the carriages to both end positions and check that the cover strip is aligned correctly. If necessary, loosen the cover strip clamp screws again, realign the cover strip and then retighten the screws.

✓ The new cover strip is mounted

Fig. 7.5: Installing the cover strip in the carriage

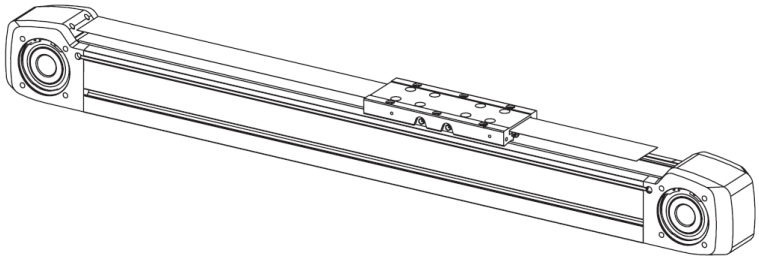


Fig. 7.6: Cover strip deflection orientation

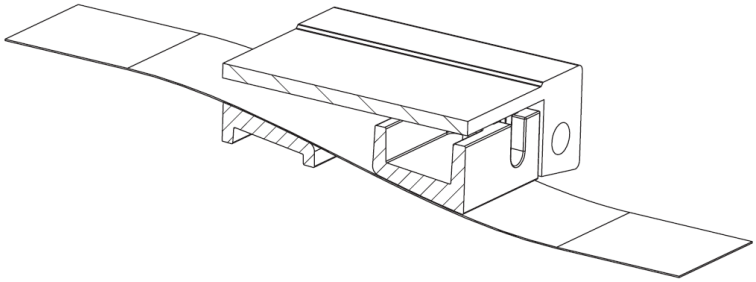


Fig. 7.7: Removing/mounting the cover strip deflection

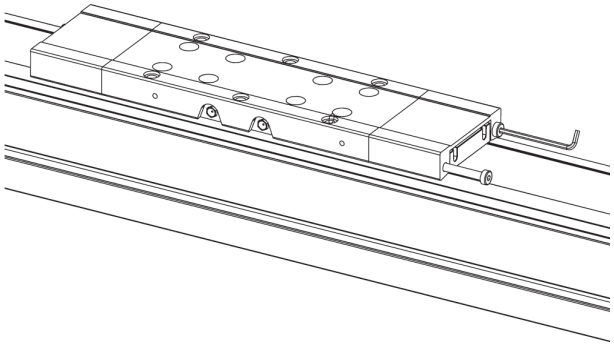


Fig. 7.8: Mounting the slide film

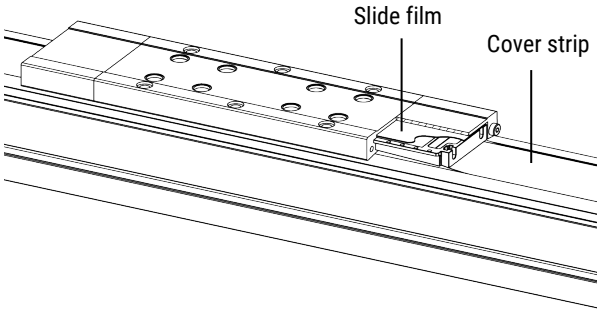


Fig. 7.9: Removing/mounting the carriage end piece

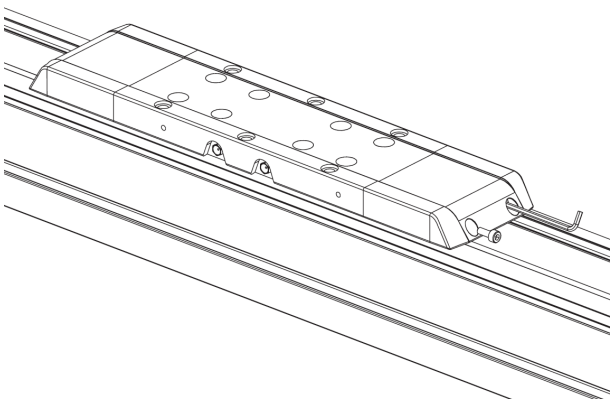


Fig. 7.10: Installing the cover strip in the cover strip clamp on the HM-B

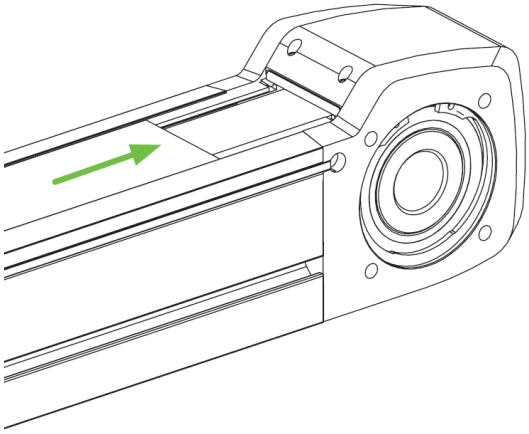


Fig. 7.11: Installing/Removing the cover strip clamp on/from the HM-B

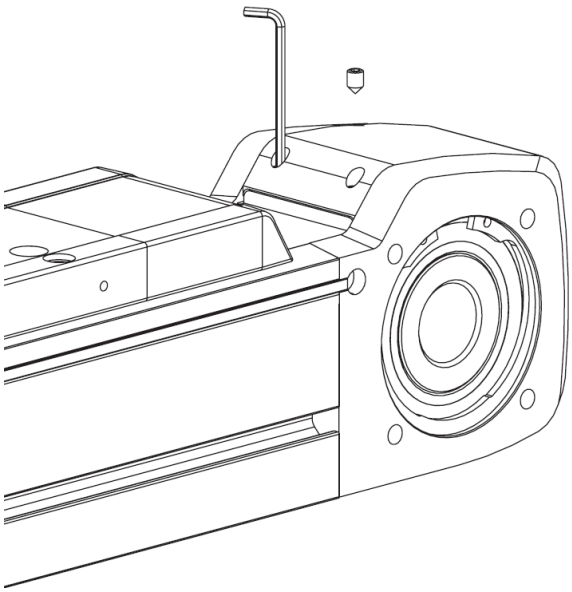


Table 7.2: Screws for cover strip deflection

Size	Bolt strength class	Thread size
HM040	8,8	M4
HM060	8,8	M4
HM080	8,8	M5
HM120	8,8	M5

Table 7.3: Screws for carriage end piece

Size	Bolt strength class	Thread size
HM040	8,8	M3
HM060	8,8	M3
HM080	8,8	M3
HM120	8,8	M4

7.4 Changing cover strip – HT-B

The cover strip must be changed as soon as there are any signs of rippling and it can no longer be held in position by the magnetic strips. In this case, a sufficient seal is no longer guaranteed.

- Undo the clamping bolt of the cover strip clamp at both ends of the axis as shown in Fig. 7.18.
- Undo the carriage end piece screws. Remove the end piece from both ends of all carriages (see Fig. 7.16).
- If present, please remove the cover strip guide according to chapter 7.5
- Remove the carriage cover by sliding it out of the carriage profile (see Fig. 7.12).
- Undo the mounting bolts. Remove the cover strip deflection from both ends of all carriages (see Fig. 7.13).
- Now remove the cover strip by lifting it off the carriage profile.
- Use a soft, damp, lint-free cloth (with ethanol if necessary) to remove any dirt from the cover strip clamp, carriage end piece, cover strip deflection, strip guide and carriage cover.
- If necessary, replace the strip guides on the top of the carriage profile and the underside of the cover strip deflection (see Fig. 7.14).
- Cut the new cover strip to the same length as the one that you have removed.
- Place the cover strip on the magnetic strip of the axis base profile and guide it over the carriage profile (see Fig. 7.15).
- Centre the cover strip.
- Mount the cover strip deflection on both sides of the carriage according to Fig. 7.13.
- Align the cover strip deflection centrally.
- Hand-tighten the cover strip deflection screws.
- Fit the carriage cover by sliding it into the groove of the carriage profile and the cover strip deflection (see Fig. 7.12).
- Place the carriage end pieces on the carriage according to Fig. 7.16 and hand-tighten the mounting bolts.
- Push the ends of the cover strip under the cover strip clamp on both sides (see Fig. 7.17). Make sure that the cover strip is aligned centrally with the axis profile and that it is in contact with the magnetic strips across the entire length.
- Hand-tighten the cover strip clamping bolts (see Fig. 7.18).
- Move the carriages to both end positions and check that the cover strip is aligned correctly. If necessary, loosen the cover strip clamp screws again, realign the cover strip and then retighten the screws.

✓ The new cover strip is mounted

Fig. 7.12: Disassembly/Assembly of carriage cover

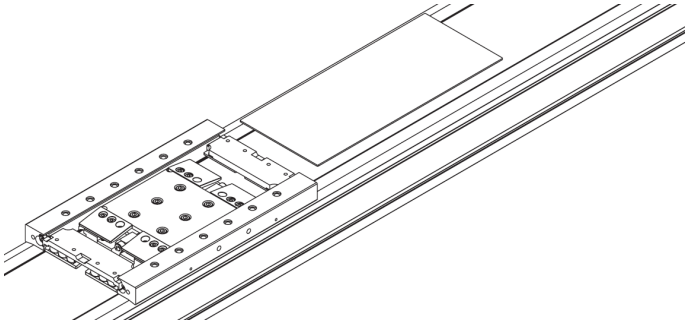


Fig. 7.13: Disassembly/Assembly of cover strip deflection

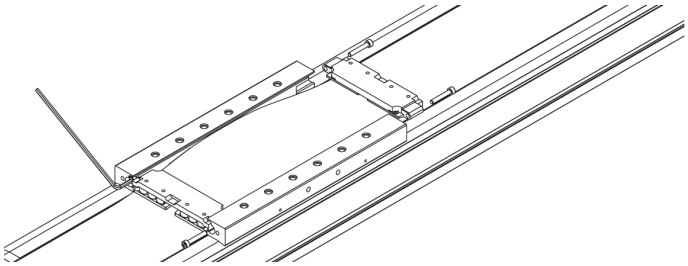


Fig. 7.14: Disassembly/Assembly of strip guide

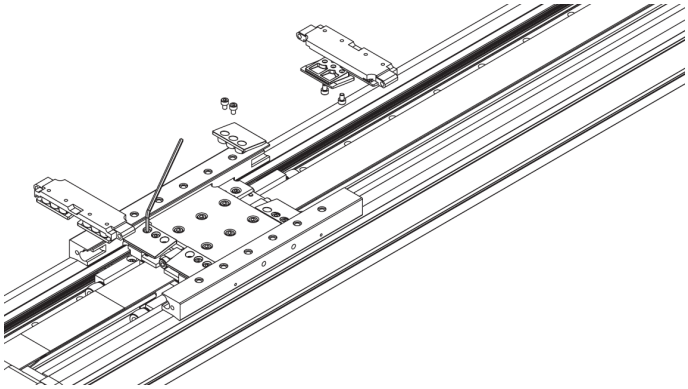


Fig. 7.15: Cover strip guide

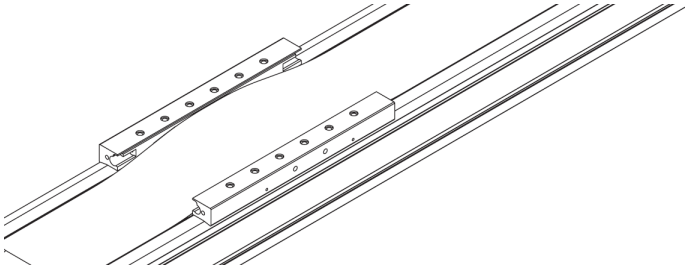


Fig. 7.16: Removing/mounting the carriage end piece

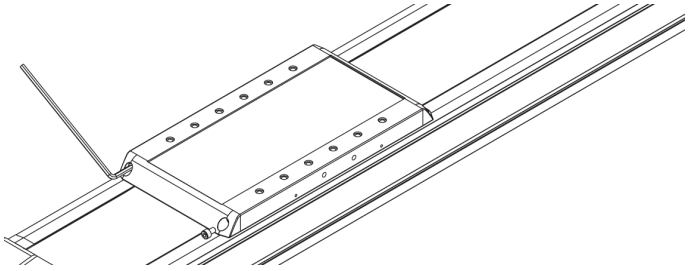


Fig. 7.17: Installing the cover strip in the cover strip clamp on the HT-B

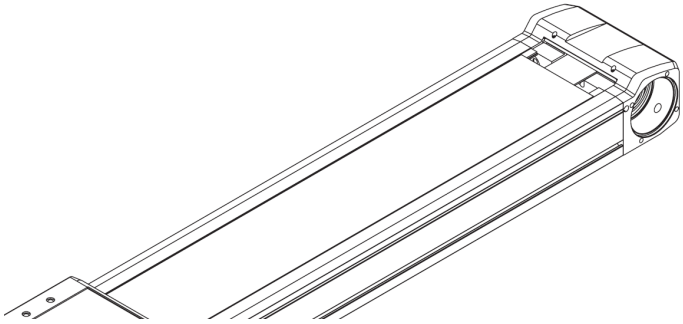
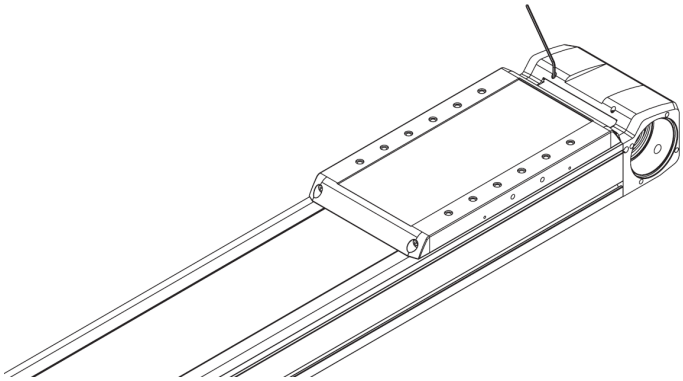


Fig. 7.18: Disassembly/Assembly of the cover strip clamp for the HT-B



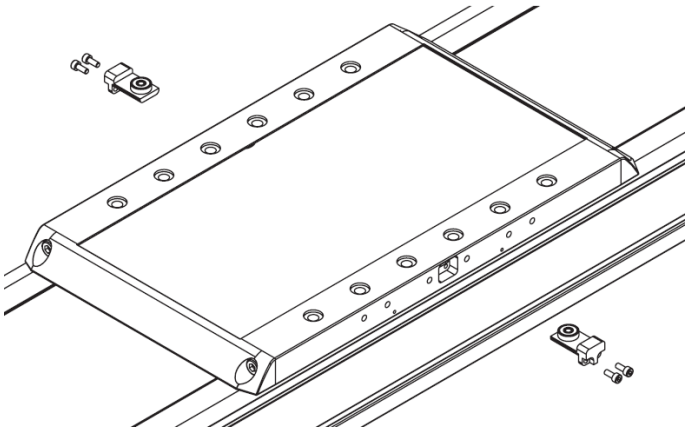
7.5 Changing the cover strip guide – HT-B

For longer linear tables HT-B, the cover strip is guided by an additional cover strip guide to ensure that the cover strip is centred in the axis. The cover strip guide is integrated in the carriage and consists of a roller holder and a ball bearing on which the cover strip rolls off laterally.
The ball bearings of the cover strip guides must be checked for their running properties at regular intervals (running performance approx. 20.000 km). If necessary, the complete cover strip guide must be replaced on both sides.

- Loosen the mounting bolts of the cover strip guide on both sides.
- Pull the cover strip guides sideways out of the carriage (see Fig. 7.19).
- Remove any dirt from the seat of the cover strip guides in the carriage.
- Insert the new cover strip guides into the carriage on both sides.
- Tighten the mounting bolts to 1,0 Nm (HT100B) or 3,0 Nm (HT150B, HT200B, HT250B).
- Check whether the cover strip is centred in the axis profile when the carriage moves and, if necessary, align the cover strip centrally by loosening the cover strip clamp (Fig. 7.18).

✓ The new cover strip guide is mounted.

Fig. 7.19: Cover strip guides



7.6 Changing the toothed belt – HM-B

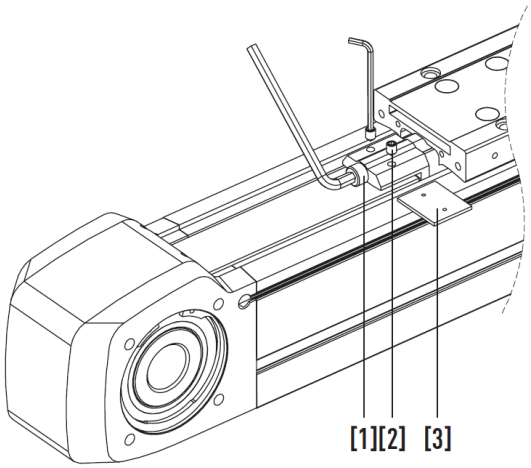
7.6.1 Removing the attachments

- To remove the carriage end pieces and – where applicable – the cover strip deflections including the cover strip, proceed as described in 7.3 from page 112.
- Dismantle the drive elements in reverse order as described in section 6.6 from page 74.

7.6.2 Removing the belt tensioners and toothed belt

- Loosen the clamping bolts **[1]** of the belt tensioners (on both sides) and pull the two belt tensioners out of the carriage.
- Undo the headless screws **[2]** and remove the clamping plate **[3]**.
- Push the toothed belt sideways out of the belt tensioner.

Fig. 7.20: Removing the belt tensioner

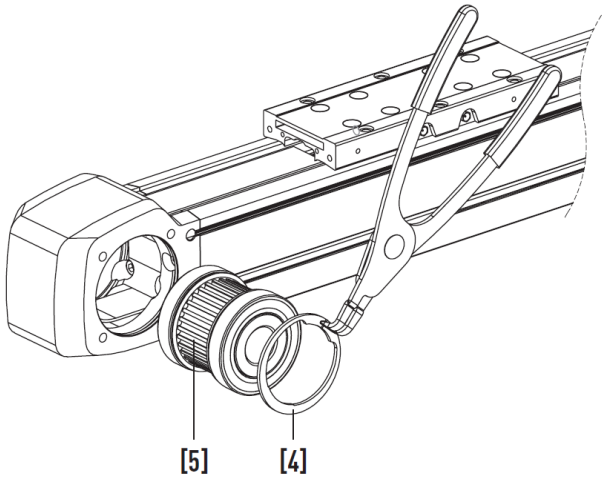


- Pull the toothed belt out of the axis.
- Using a suitable tool (e.g. tin snips), cut the new toothed belt to the same length as the old one.

7.6.3 Dismantling the drive units

- Using circlip pliers, remove the circlip **[4]** from each drive block housing on one side and push the drive units **[5]** out of the bearing seats.

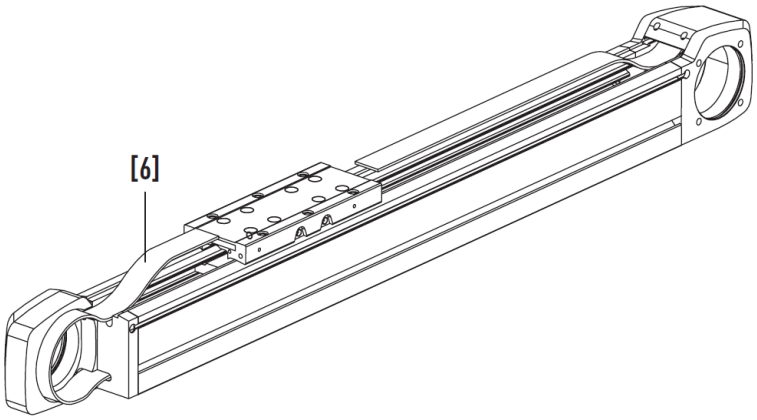
Fig. 7.21: Removing the drive unit



7.6.4 Mounting the new toothed belt

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

Fig. 7.22: Inserting the toothed belt



- Position the toothed belt so that the bearing seats are exposed and the drive units can be reinstalled.
- Reinsert the drive units in the bearing seats and mount the circlips.

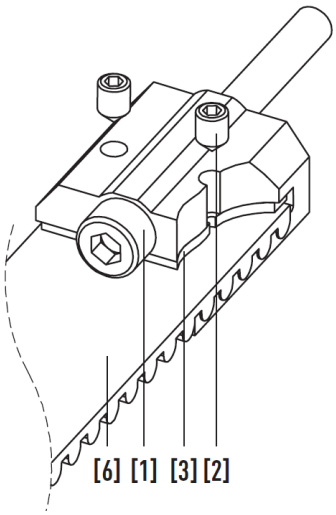
7.6.5 Mounting the belt tensioner

Caution! Risk of damage due to unintentional detachment!

- Only use the screws provided by HIWIN! The strength classes, thread lengths and thread locking coatings have been precisely matched to the axis requirements.
- The belt tensioner clamping bolts must not be readjusted more than five times.

- Insert the toothed belt **[6]** sideways into the belt tensioner and centre it inside the belt tensioner. Make sure that all the teeth of the belt tensioner are engaged.
- Push the clamping plates **[3]** on the back of the toothed belt into the belt tensioner. Hand-tighten the headless screws **[2]** until the clamping plates can no longer be moved sideways. Make sure that the tips of the headless screws are engaged in the centring holes of the clamping plates.

Fig. 7.23: Installing the toothed belt in the belt tensioner



- Insert the clamping bolt **[1]** into the hole in the belt tensioner and guide both belt tensioners into the designated slots on the carriage.
- Screw in both belt tensioners until the heads of the clamping bolts are fully inserted in the window of the carriage at both ends.

7.6.6 Adjusting the toothed belt preload

- Set the distance between the carriage edge and the edge of the drive block housing to 200 mm in accordance with Fig. 7.24.
- Use the clamping bolts **[1]** in the belt tensioner to increase the toothed belt preload until the correct span frequency has been achieved in accordance with Table 7.4. Use a belt tension meter to measure the frequency across the back of the toothed belt. Follow the operating instructions for the belt tension meter used.

Fig. 7.24: Preloading the toothed belt

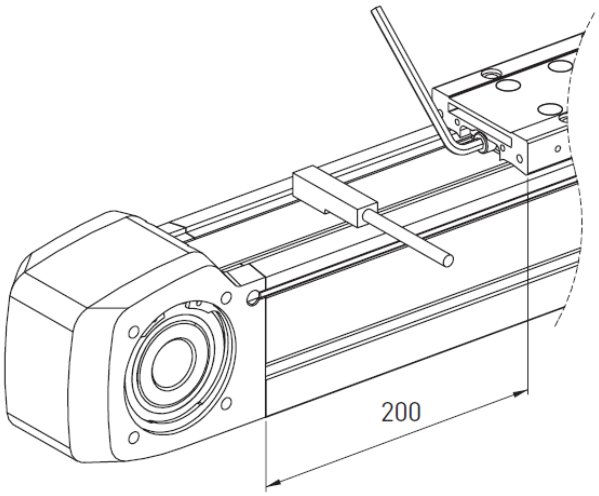


Table 7.4: Adjusting the span frequency

Size	Lower span frequency value [Hz]	Set span frequency value [Hz]	Upper span frequency value [Hz]
HM040B	108	121	133
HM060B	143	160	175
HM080B	138	154	169
HM120B	133	149	163

- Manually move the carriage from one end position to the other several times and check the span frequency again as described above. If the frequency is no longer within the specified range according to Table 7.4, correct the preload via the clamping bolts.
- ✓ The new belt has been mounted.

7.6.7 Mounting the attachments

- To mount the carriage end pieces and – where applicable – the cover strip deflections including the cover strip, proceed as described in 7.3 from page 112.
- Mount the drive elements as listed in section 6.6 from page 74.

7.7 Changing the toothed belt – HT-B

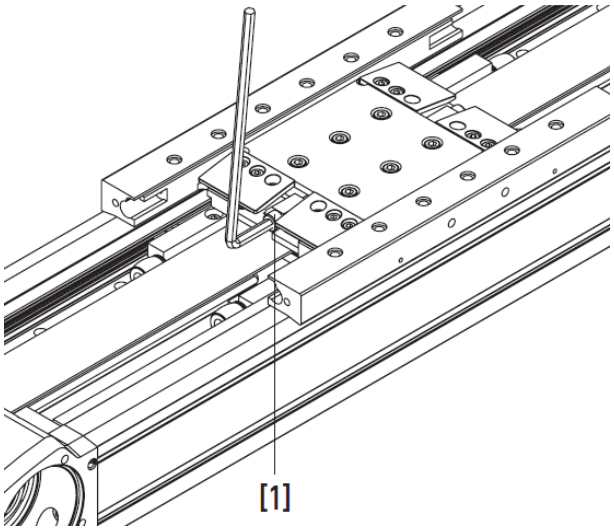
7.7.1 Removing the attachments

- To remove the carriage end pieces and – where applicable – the cover strip deflections including the cover strip, proceed as described in 7.4 from page 115.
- Dismantle the drive elements in reverse order as described in section 6.7 from page 84 .

7.7.2 Removing the belt tensioners and toothed belt

- Loosen the clamping bolts **[1]** of the belt tensioners (on both sides) and pull the two belt tensioners out of the carriage.

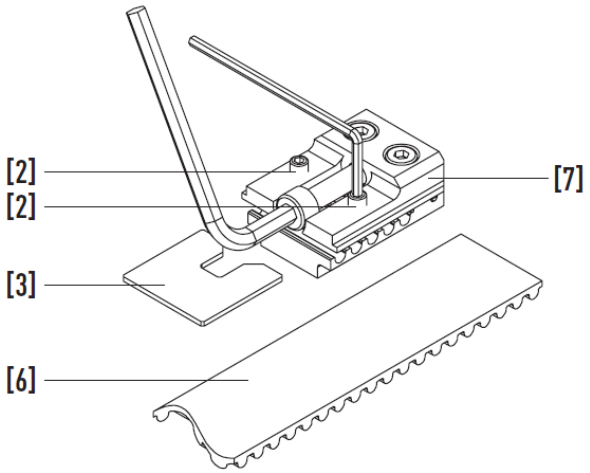
Fig. 7.25: Removing the belt tensioner



7.7.2.1 Releasing the toothed belt from the belt tensioner on linear tables HT100B

- Undo the headless screws **[2]** and remove the clamping plate **[3]**.
- Push the toothed belt **[6]** sideways out of the belt tensioner **[7]**.

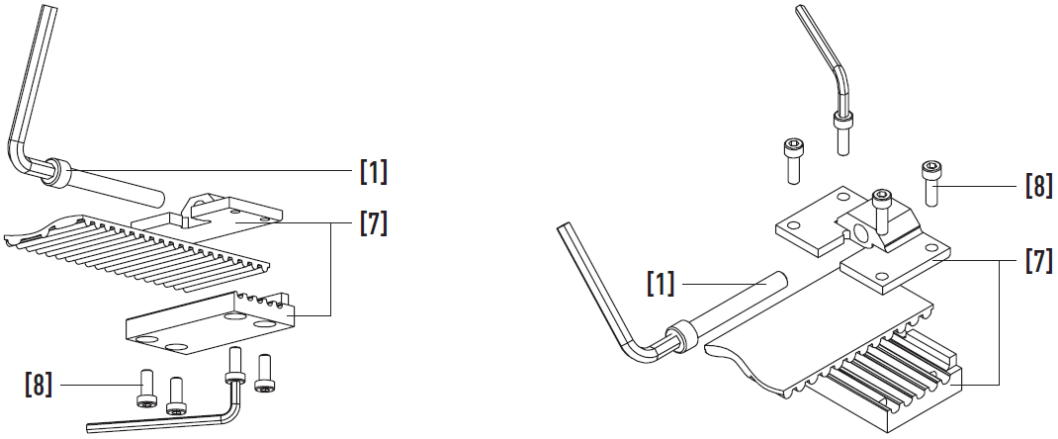
Fig. 7.26: Releasing the toothed belt from the belt tensioner (HT100B)



7.7.2.2 Releasing the toothed belt from the belt tensioner on linear tables HT150B, HT200B and HT250B

- Loosen the 4 cap screws **[8]** and disassemble the belt tensioner **[7]**.
- The toothed belt ends are now free and can be pulled out of the axis.

Fig. 7.27: Releasing the toothed belt from the belt tensioner (left: HT150B, right: HT200B, HT250B)

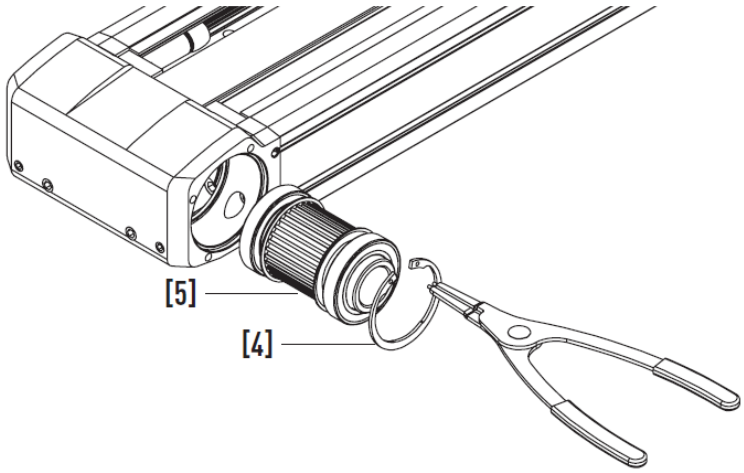


- Pull the toothed belt out of the axis.
- Using a suitable tool (e.g. tin snips), cut the new toothed belt to the same length as the old one.

7.7.3 Dismantling the drive units

- Using circlip pliers, remove the circlip **[4]** from each drive block housing on one side and push the drive units **[5]** out of the bearing seats.

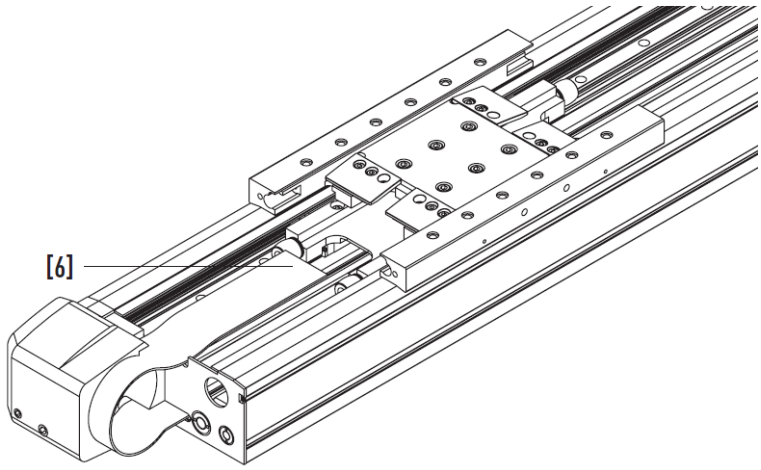
Fig. 7.28: Removing the drive unit



7.7.4 Mounting the new toothed belt

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

Fig. 7.29: Inserting the toothed belt



- Position the toothed belt so that the bearing seats are exposed and the drive units can be reinstalled.
- Reinsert the drive units in the bearing seats and mount the circlips.

7.7.5 Mounting the belt tensioner

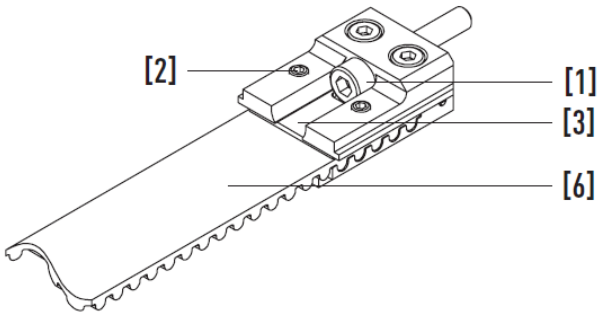
Caution! Risk of damage due to unintentional detachment!

- Only use the screws supplied by HIWIN! The strength classes, thread lengths and thread locking coatings have been precisely matched to the axis requirements.
- The belt tensioner clamping bolts must not be readjusted more than five times.

7.7.5.1 Toothed belt insertion for linear tables HT100B

- Insert the toothed belt **[6]** sideways into the belt tensioner and centre it inside the belt tensioner. Make sure that all the teeth of the belt tensioner are engaged.
- Push the clamping plates **[3]** on the back of the toothed belt into the belt tensioner. Hand-tighten the headless screws **[2]** until the clamping plates can no longer be moved sideways. Make sure that the tips of the headless screws are engaged in the centring holes of the clamping plates.

Fig. 7.30: Mounting the toothed belt in the belt tensioner (HT100B)



7.7.5.2 Toothed belt insertion for linear tables HT150B, HT200B and HT250B

- Insert the toothed belt **[6]** into the teeth of the belt tensioner lower part **[7-1]** and centre it.
- Place the belt tensioner upper part **[7-2]** on the back of the toothed belt and screw in the cap screws **[8]** as follows: Screw in crosswise until the screws are tight. Then tighten the screws crosswise to the tightening torque according to Table 7.5.

Fig. 7.31: Mounting the toothed belt in the belt tensioner (left: HT150B, right: HT200B, HT250B)

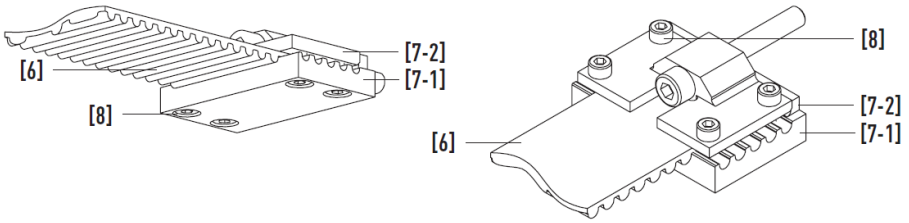


Table 7.5: Tightening torques for the cap screws of the belt tensioner

Size	Thread size	Tightening torque [Nm]
HT150B	M4	1,0
HT200B	M5	1,5
HT250B	M5	1,5

- Insert the clamping bolt **[1]** into the hole in the belt tensioner and guide both belt tensioners into the designated slots on the carriage.
- Screw in both belt tensioners until the heads of the clamping bolts are fully inserted in the window of the carriage at both ends.

7.7.6 Adjusting the toothed belt preload

- Set distance A/B (see Fig. 7.32 and Fig. 7.33) between the carriage edge and the edge of the drive block housing as shown in Table 7.6.
- Use the clamping bolts **[1]** in the belt tensioner **[1]** to increase the toothed belt preload until the correct span frequency has been achieved in accordance with Table 7.6. Use a belt tension meter to measure the frequency across the back of the toothed belt. Follow the operating instructions for the belt tension meter used.

Fig. 7.32: Preloading the toothed belt: Linear tables HT-B without cover strip

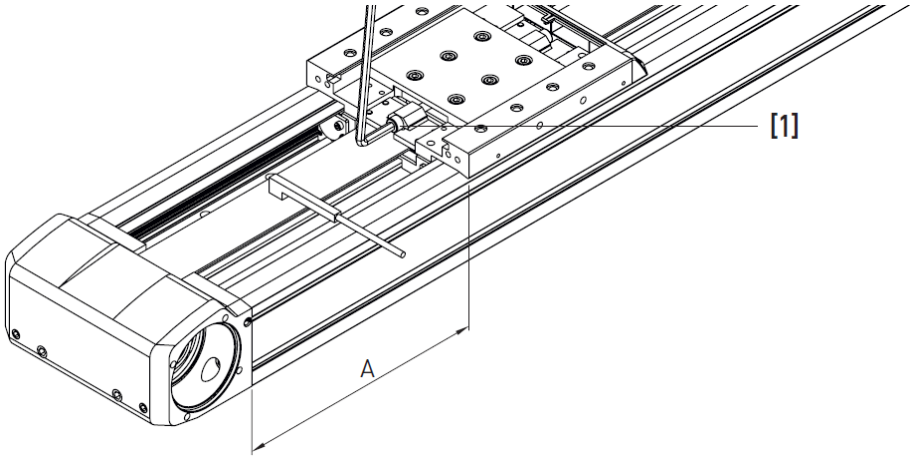


Fig. 7.33: Preloading the toothed belt: Linear tables HT-B with cover strip

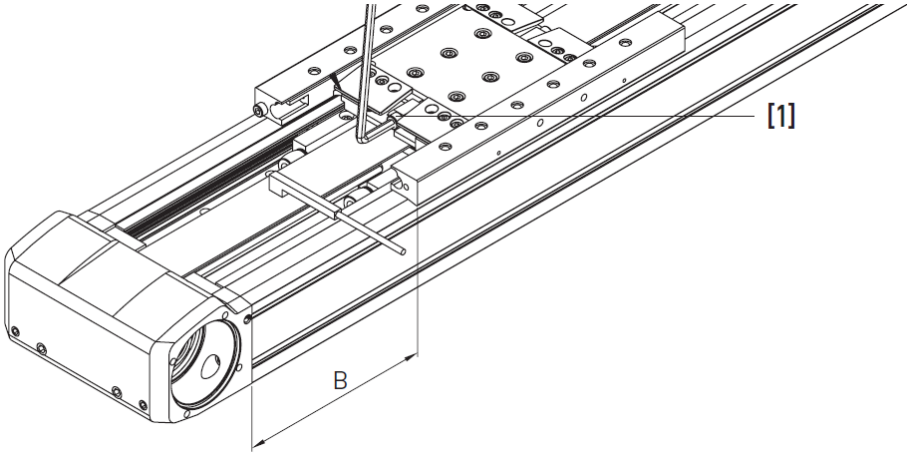


Table 7.6: Adjusting the span frequency

Size	A	B	Lower span frequency value [Hz]	Set spat frequency value [Hz]	Upper span frequency value [Hz]
HT100B	200	170,0	151	168	185
HT150B	200	152,5	143	160	175
HT200B	200	152,5	146	164	179
HT250B	200	130,0	145	162	177

- Manually move the carriage from one end position to the other several times and check the span frequency again as described above. If the frequency is no longer within the specified range according to Table 7.6, correct the preload via the clamping bolts.

✓ The new belt has been mounted.

7.7.7 Mounting the attachments

- To mount the carriage end pieces and – where applicable – the cover strip deflections including the cover strip, proceed as described in 7.4 from page 115.
- Mount the drive elements as listed in section 6.7 from page 84.

7.8 Changing the toothed belt – HC-B

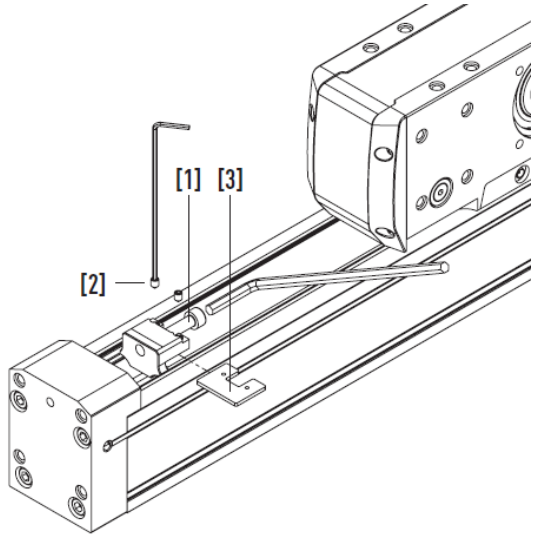
7.8.1 Removing the attachments

- Dismantle the covers of the belt tensioners.

7.8.2 Removing the belt tensioners and toothed belt

- Loosen the clamping bolt **[1]** of the belt tensioners (on both sides) and pull the two belt tensioners out of the end plates.
- Undo the headless screws **[2]** and remove the clamping plate **[3]**.
- Push the toothed belt sideways out of the belt tensioner.

Fig. 7.34: Removing the belt tensioner

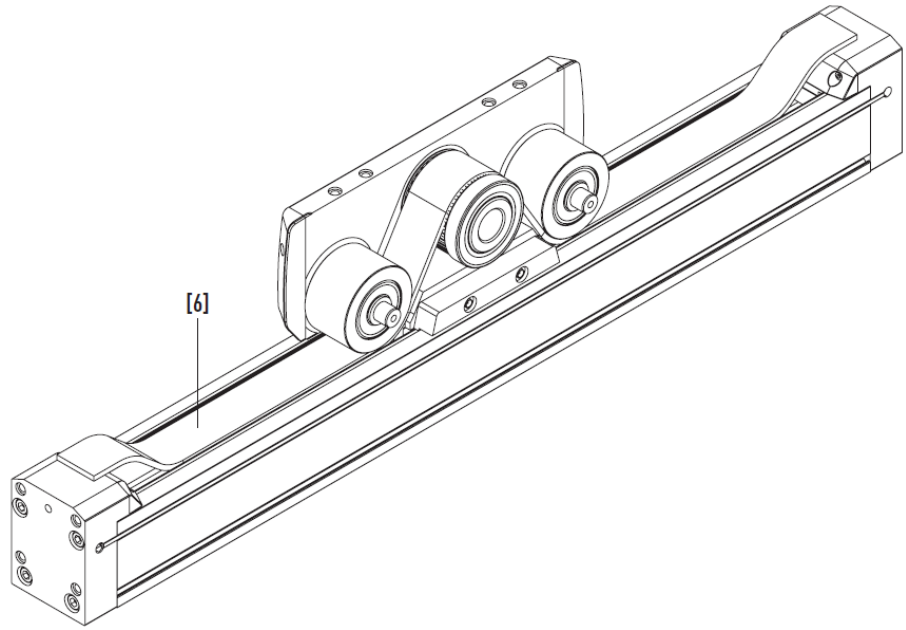


- Pull the belt out of the drive block housing.
- Using a suitable tool (e.g. tin snips), cut the new toothed belt to the same length as the old one.

7.8.3 Mounting the new toothed belt

- Push the new toothed belt **[6]** in through the drive block housing from one side until it comes out on the other side of the drive block housing.
- Position the toothed belt so that it is the same length on both sides of the end plates.

Fig. 7.35: Inserting the toothed belt



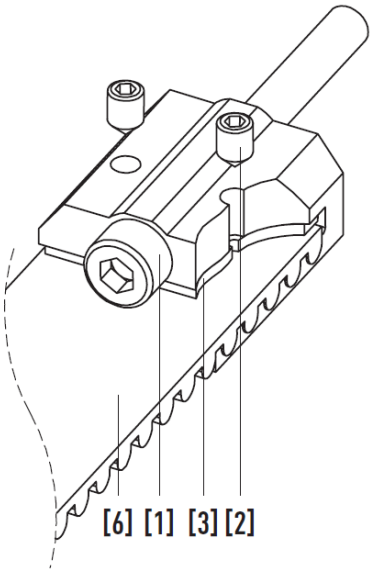
7.8.4 Mounting the belt tensioner

Caution! Risk of damage due to unintentional detachment!

- Only use the screws supplied by HIWIN! The strength classes, thread lengths and thread locking coatings have been precisely matched to the axis requirements.
- The belt tensioner clamping bolts must not be readjusted more than five times.

- Insert the toothed belt **[6]** sideways into the belt tensioner and centre it inside the belt tensioner. Make sure that all the teeth of the belt tensioner are engaged.
- Push the clamping plates **[3]** on the back of the toothed belt into the belt tensioner. Hand-tighten the headless screws **[2]** until the clamping plates can no longer be moved sideways. Make sure that the tips of the headless screws are engaged in the centring holes of the clamping plates.

Fig. 7.36: Installing the toothed belt in the belt tensioner



- Insert the clamping bolt **[1]** into the hole in the belt tensioner and guide both belt tensioners into the designated slots on the end plates.
- Screw in both belt tensioners until the heads of the clamping bolts are fully inserted in the window of the end plate at both ends.

7.8.5 Adjusting the toothed belt preload

- Set the distance between the end plate edge and the edge of the drive block housing to 100 mm as shown in Fig. 7.37.
- Use the clamping bolt **[1]** in the belt tensioner to increase the toothed belt preload until the correct span frequency has been achieved in accordance with Table 7.7. Use a belt tension meter to measure the frequency across the back of the toothed belt. Follow the operating instructions for the belt tension meter used.

Fig. 7.37: Preloading the toothed belt

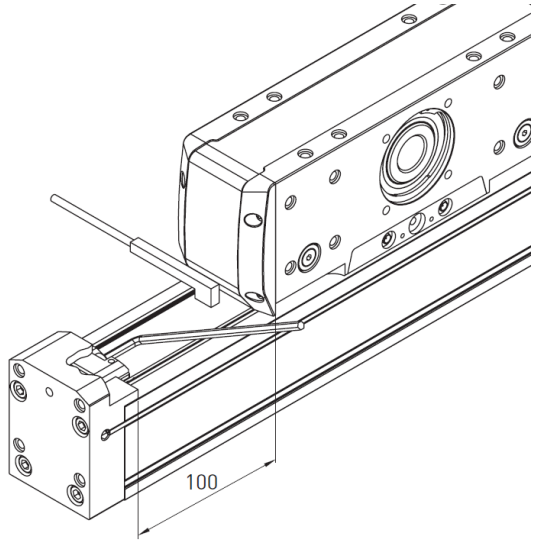


Table 7.7: Adjusting the span frequency

Size	Lower span frequency value [Hz]	Set span frequency value [Hz]	Upper span frequency value [Hz]
HC025B	258	289	316
HC040B	244	273	299
HC060B	290	324	355
HC080B	283	316	346
HC100B	258	288	316

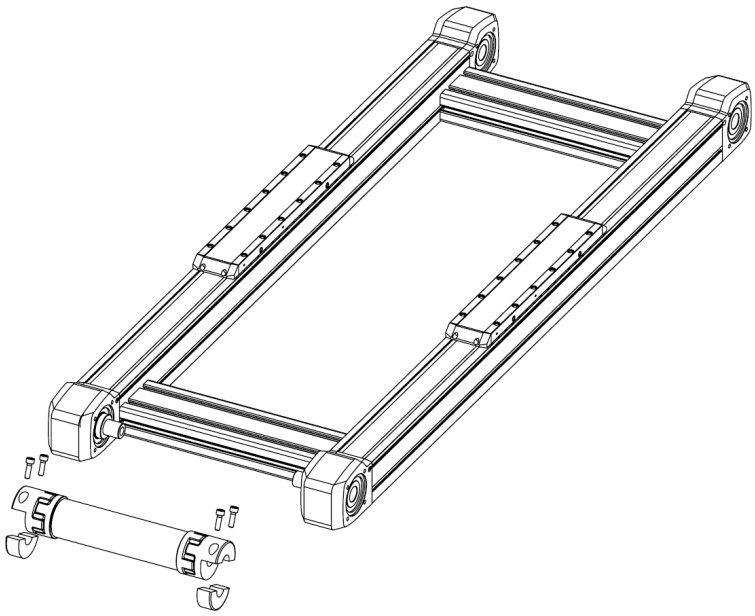
- ▶ Manually move the drive block from one end position to the other several times and check the span frequency again as described above. If the frequency is no longer within the specified range according to Table 7.7, correct the preload via the clamping bolts again.
- ▶ Mount the covers of the belt tensioners.
- ✓ The new belt has been mounted.

7.9 Replacing the synchronous shaft

- Secure the synchronous shaft to make sure it cannot fall.
- To remove this component, carefully undo the clamping bolts of the half shell clamp at both ends. Keep alternating between the clamping bolts as you undo them to avoid overload.
- Fully remove the screws and coupling half shells to take off the synchronous shaft. For assembly, see section 6.1.2 Mounting the synchronous shaft from page 55.

✓ The synchronous shaft has been replaced.

Fig. 7.38: Mounting the synchronous shaft



8 Faults

8.1 Malfunctions on the linear axis and linear axis systems

⚠ **Danger!** Danger of electric shock or burns from contact with live parts!

Contact with live parts can cause injuries.
If the customer installs cables incorrectly, the constant motion inside the energy chain can cause chafing and expose the electrical contact points.

- Construction of the control system according to DIN EN 12100. No start up after:
  - Application, return of energy!
  - Correction of a fault!
  - Machine stop!
- Only qualified personnel may install cabling!
- Work on electrical installations only by qualified personnel!

⚠ **Attention!** Risk of injury!

Rotation of the toothed belt pulley or the synchronous shaft during movement of the carriage/carriages can result in fingers, hair or items of clothing getting caught and entangled.

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

⚠ **Attention!** Risk of impact and crushing!

If the axes are moved by the motor, injuries can be caused by moving axes and attachments (energy chains, attachments installed by customer).

- A safety guard must be provided for the operation of the linear axes/linear axis systems!
- When linear axes/linear axis systems are arranged vertically, secure the carriage when stationary!

Table 8.1: Fault table, linear axes and linear axis systems

Fault	Possible cause	Remedy
Carriage/axis beam does not move	Coupling spins	Check the coupling assembly for correct assembly, check the tightening torques of the clamping bolts and set them correctly
	Toothed belt not correctly fitted or toothed belt tension incorrectly adjusted	Mount and set toothed belt preload correctly
	Load too high	Reduce load or acceleration of the drive if necessary
	Synchronous shaft clamp loose	Check that the synchronous shaft coupling has been assembled correctly. Check clamping bolt tightening torques and make corrections as necessary
Carriage/Axis beam exhibits backlash and positions inaccurately	Backlash in the guides or drive elements after a collision or due to extreme external influences (impacts, load peaks etc.)	Send axis to HIWIN GmbH for repair
	Toothed belt tension incorrectly adjusted	Set toothed belt preload correctly
Programmed absolute position changes	Toothed belt jumps	Toothed belt preload too low -> retighten or drive torque on the axis too high -> reduce drive torque and adjust control parameters in the drive controller to the application conditions

Fault	Possible cause	Remedy
	Coupling slips	Check the torques of the clamping bolts on the coupling elements and adjust if necessary, check the maximum drive torque applied and reduce if necessary
	Synchronous shaft clamp loose	Check that the synchronous shaft coupling has been assembled correctly. Check clamping bolt tightening torques and make corrections as necessary
No limit switch function	Switching distance too large	Readjust the switching distance and set correctly
	Limit switch defective or cable break	Replace limit switch
	Signal does not arrive at the control system	Check the supply line to the control system
Noise and vibrations at high speed	Speed too high	Reduce speed
	Tension in the system	Install the axis so it is free of tension, check the evenness of the supporting surface and the attached load
	Incorrect settings on the drive controller	Re-tune and adapt controller settings to the application conditions
Noise generation of the guides	Lack of lubricant	Relubrication
	Damage to the guides, for example due to extreme impact loads on the carriage or extreme contamination	Send axis to HIWIN GmbH for repair
Motor load increases, control system switches off due to overload	Tension in the system or lack of lubricant	Install the axis so it is free of tension, check the evenness of the supporting surface and the attached load. Relubricate axis
	Heavy contamination of the axis and the internal guides	Clean axis, ensure free movement of guide and drive elements

8.2 Motor faults

You will find explanations of the faults that occur and information on how to resolve them in the operating manual for the motor.

8.3 Operating faults with a servo drive

You will find explanations of the faults that occur and information on how to resolve them in the operating manual for the servo drive.

9 Disassembly

⚠ **Danger!** Danger due to electrical voltage!

Dangerous currents may flow before and during assembly, disassembly and repair work.

- Work may only be carried out by qualified electricians when the device is de-energised!
- Before working, disconnect the linear axes/linear axis systems from the power supply and secure them against being switched on again!

⚠ **Danger!** Danger of electric shock or burns from contact with live parts!

Contact with live parts can cause injuries.
If the customer installs cables incorrectly, the constant motion inside the energy chain can cause chafing and expose the electrical contact points.

- Construction of the control system according to DIN EN 12100. No start up after:
  - Application, return of energy!
  - Correction of a fault!
  - Machine stop!
- Only qualified personnel may install cabling!
- Work on electrical installations only by qualified personnel!

⚠ **Warning**! Risk of impact and crushing!

Injuries can occur if the carriage is moved or accidentally started up.

- When linear axes/linear axis systems are arranged vertically, secure the carriage when stationary!
- Construction of the control system according to DIN EN 12100: No start up after:
  - Application, return of energy!
  - Correction of a fault!
  - Machine stop!

⚠ **Warning**! Danger of crushing due to traversing carriage!

Risk of injury due to crushing and damage to the linear axes/linear axis systems due to movement of the traversing carriage due to gravity, as the axes do not have a brake by default.

- Ensure that the carriage is secured against unintentional movement when stationary!

⚠ **Warning**! Danger of cutting!

The cover strip can cause cuts during assembly or disassembly.

- Commissioning and set-up only by qualified personnel with appropriate protective equipment (gloves, goggles)!

⚠ **Warning**! Danger from suspended loads or falling parts!

Lifting heavy loads can cause damage to health.

- Assembly and maintenance of the linear axes/linear axis systems only by qualified personnel!
- Take the mass of the parts into account during transport. Use suitable lifting gear!
- Comply with the applicable industrial safety regulations for handling suspended loads.
- Lift linear axes/linear axis systems only at specified support points!
- Secure machines and machine parts against tipping over!

⚠ **Warning**! Risk of impact and crushing!

When using the linear axis in cantilever operation, there is a risk of injury when the axis body moves out.

- Disassembly by qualified personnel only!
- In the case of vertical installation, the linear axis must be secured against unintended lowering by means of motors with spring-loaded brake and an additional clamping element.

⚠ **Warning**! Danger of impacts and crushing caused by the clamping or braking element opening!

As soon as compressed air is applied, the clamp opens.

- Before working, 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!

⚠ **Attention!** Risk of impact and crushing!

If the axes are moved/driven manually, injuries can be caused by moving axes and attachments (energy chains, attachments installed by customer).

- Observe applicable industrial safety regulations!
- Transport to the installation site only by qualified personnel!

⚠ **Attention!** Danger of crushing due to tilting of the axes!

- Secure machine and machine parts against tipping over!

⚠ **Attention!** Danger to health and the environment!

Contact with lubricants can cause irritation, poisoning and allergic reactions as well as damage to the environment.

- Only use suitable media that are not dangerous for humans. Observe the manufacturer's safety data sheets.
- Dispose of substances appropriately.

Disassembly steps:

- Disconnect the linear axis/double axis/multi-axis system from the electric system.
- Unscrew the moving load.
- Protect the moving parts (e.g. carriage) from unintentional movement.
- Unscrew the linear axis/double axis/multi-axis system.

✓ The linear axis/double axis/multi-axis system is disassembled.

10 Disposal

⚠ **Attention!** Danger to health and the environment!

Contact with lubricants can cause irritation, poisoning and allergic reactions as well as damage to the environment.

- Only use suitable media that are not dangerous for humans. Observe the manufacturer's safety data sheets.
- Dispose of substances appropriately.

Table 10.1: Disposal

Liquids	
Lubricants	Dispose of as hazardous waste in an environmentally-safe manner
Soiled cleaning cloths	Dispose of as hazardous waste in an environmentally-safe manner
Linear axis, double axis, multi-axis system	
Cabling, electrical components	Dispose of as electrical waste
Plastic components (e.g. energy chain)	Sort by type before disposal
Components made of steel (e.g. profile rail)	Sort by type before disposal
Aluminium components (e.g. profile, synchronous shaft)	Sort by type before disposal

11 Appendix 1: Drive adaptation

Our products are always subject to technical changes and improvements. To avoid incorrect deliveries of spare parts and accessories or to order parts without part numbers, please always quote the serial number of the linear axes when ordering. You will find this on the type plate of the axis.

11.1 Drive adaptation of linear modules HM-B and double axis HD

Adaptation to the linear axis is of multi-sectional design to allow simple flange-mounting of all standard motors and gearboxes.

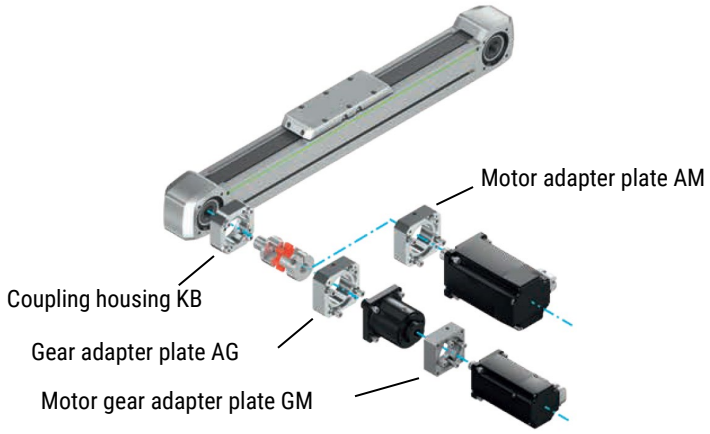
The flange type set comprises the following components:

- Coupling housing KB
- Coupling components
- Motor adapter plate AM or gear adapter plate AG and motor gear adapter plate GM (not applicable for NG01 – NG07)

You can find the dimensions of the coupling housing, motor adapter plate and gear adapter plate in section 11.4 from page 152.

Motor adaptation of linear modules with toothed belt drive (HM-B)

Fig. 11.1: Motor adaptation of linear modules HM-B



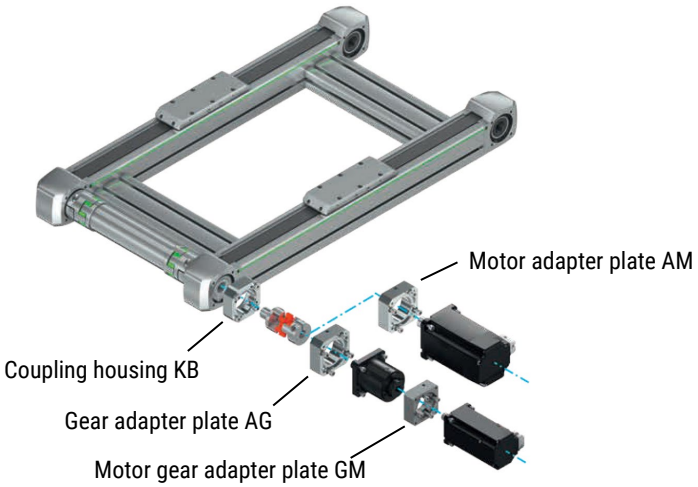
Gear adapter plate AG: Adapter from axis to gearbox

Motor gear adapter plate GM: Adapter from gearbox to motor

Motor adapter plate AM: Adapter from axis to motor

Motor adaptation of double axis (HD)

Fig. 11.2: Motor adaptation of double axes HD



Gear adapter plate AG: Adapter from axis to gearbox

Motor gear adapter plate GM: Adapter from gearbox to motor

Motor adapter plate AM: Adapter from axis to motor

Motor adaptation of multi-axis systems (HS)

The suitable motor adapter for HIWIN multi-axis systems HS must be selected separately for each axis.

Table 11.1: Order code for position flange type [1] – linear modules HM-B and double axis HD

Drive manufacturer/type		HM040B/HD1			HM060B/HD2			HM080B/HD3			HM120B/HD4	
		Motor only	With PLE40	With PLQE60	Motor only	With PLQE60	With PLQE80	Motor only	With PLQE80	With PLQE120	Motor only	With PLQE120
Gearbox adapter			NG01	NG02		NG03	NG04		NG05	NG06		NG07
HIWIN	**EM1-C-M-05-2**		HW17	HW16		HW15						
	EM1-C-M-10-2		HW17	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							HW13		HW13		HW14
B&R	**8LSA24**	BR02	BR02		BR07							
	8LSA25	BR02	BR02		BR07							
	8LSA33		BR03 [2]		BR04	BR04		BR13				
	8LSA34		BR03 [2]	BR04	BR04	BR04		BR13				
	8LSA35		BR03 [2]	BR04	BR04	BR04		BR13				
	8LSA43			BR05			BR10					
	8LSA44			BR05			BR10					
	8LSA45			BR05			BR10					
	8LSA46			BR05			BR10					
	8LSA53						BR12 [2]					
	8LSA54						BR12 [2]					

Drive manufacturer/type		HM040B/HD1			HM060B/HD2			HM080B/HD3			HM120B/HD4	
		Motor only	With PLE40	With PLQE60	Motor only	With PLQE60	With PLQE80	Motor only	With PLQE80	With PLQE120	Motor only	With PLQE120
B&R	**8LSA55**						BR12 [2]					
	8LSA56						BR12 [2]					
	8LSA57						BR12 [2]			BR14		
	8LSA64									BR15		
	8LSA65									BR15		
	8LSA66									BR15		
	8LSN43			BR06 [2]			BR11					
	8LSN44			BR06 [2]			BR11					
	8LSN45			BR06 [2]			BR11					
	8LSN46			BR06 [2]			BR11					
	8LSN54						BR12 [2]			BR14		
	8LSN55						BR12 [2]			BR14		
	8LSN56						BR12 [2]			BR14		
	8LSN57									BR14		
Beckhoff	**AM8022**	BE01	BE01	BE01		BE04						
	AM8023	BE01	BE01	BE01		BE04						
	AM8031	BE02		BE02		BE05	BE05		BE09			
	AM8032			BE03	BE05	BE05	BE05		BE09			
	AM8033			BE03	BE05	BE05	BE05		BE09			
	AM8531	BE02		BE02	BE05	BE05	BE05	BE09	BE09			
	AM8532			BE03	BE05	BE05	BE05	BE09	BE09			
	AM8533			BE03	BE05	BE05	BE05	BE09	BE09			
	AM8041				BE06		BE06		BE10	BE10		BE18
	AM8042				BE06		BE06	BE10	BE10	BE10		BE18
	AM8043				BE06		BE06	BE10	BE10	BE10		BE18
	AM8541				BE06		BE06	BE10	BE10	BE10		BE18
	AM8542				BE06		BE06	BE10	BE10	BE10		BE18
	AM8543				BE06		BE06	BE10	BE10	BE10		BE18
	AM8051				BE07			BE11		BE11		BE19
	AM8052				BE07			BE11		BE11		BE19
	AM8053							BE11		BE11		BE19
	AM8551				BE07			BE11		BE11		BE19
	AM8552				BE07			BE11		BE11		BE15
	AM8553							BE11		BE11	BE15	BE15
	AM8061							BE12 [2]				
	AM8062							BE12 [2]			BE16	
	AM8063										BE16	
	AM8561							BE12 [2]			BE16	
	AM8562										BE16	

Drive manufacturer/type		HM040B/HD1			HM060B/HD2			HM080B/HD3			HM120B/HD4	
		Motor only	With PLE40	With PLQE60	Motor only	With PLQE60	With PLQE80	Motor only	With PLQE80	With PLQE120	Motor only	With PLQE120
Beckhoff	**AM8563**										BE16	
	AM8071										BE17	
	AM8072										BE17	
Bosch	**MSK030B**	BO02	BO02	BO02		BO09						
	MSK030C	BO02	BO02	BO02		BO09						
	MSK040B	BO03 [2)]		BO03 [2)]	BO05	BO05	BO05		BO10			
	MSK040C	BO03 [2)]		BO03 [2)]	BO05	BO05	BO05		BO10			
	MSK043C			BO03 [2)]	BO05	BO05	BO05		BO10			
	MSK050B				BO06		BO06	BO11	BO11	BO11		BO19
	MSK050C				BO06		BO06	BO11	BO11	BO11		BO19
	MSK060B				BO08 [2)]			BO13		BO13		BO21
	MSK060C				BO08 [2)]			BO13		BO13		BO21
	MSK061B				BO07 [2)]		BO07 [2)]	BO12	BO12	BO12		BO20
	MSK061C				BO07 [2)]		BO07 [2)]	BO12	BO12	BO12		BO20
	MSK070C							BO15 [2)]			BO18	
	MSK070D							BO15 [2)]			BO18	
	MSK070E							BO15 [2)]			BO18	
	MSK071C							BO15 [2)]			BO18	
	MSK071D							BO15 [2)]			BO18	
	MSK071E										BO18	
	MSK075C							BO15 [2)]			BO18	
	MSK075D							BO15 [2)]			BO18	
	MSK075E										BO18	
	MSK076C							BO14 [2)]		BO14 [2)]	BO17	BO17
	MSK100A							BO14 [2)]		BO14 [2)]	BO17	BO17
Lenze	**MCS06F**	LE01		LE01		LE04	LE04		LE11			
	MCS06I	LE01		LE01		LE04	LE04		LE11			
	MCS09D	LE02 [2)]		LE02 [2)]	LE05	LE05	LE05		LE08			
	MCS09F			LE02 [2)]	LE05	LE05	LE05		LE08			
	MCS09H				LE05		LE05	LE08	LE08			
	MCS09L				LE05		LE05	LE08	LE08			
	MCS12D				LE06 [2)]		LE06 [2)]	LE09	LE09	LE09		LE15
	MCS12H				LE06 [2)]		LE06 [2)]	LE09	LE09	LE09		LE15
	MCS12L						LE06 [2)]	LE09	LE09	LE09		LE15
	MCS14D							LE10 [2)]		LE10 [2)]		LE13
	MCS14H							LE10 [2)]		LE10 [2)]	LE13	LE13
	MCS14L									LE10 [2)]	LE13	LE13
	MCS14P										LE13	
	MCS19F										LE14	

Drive manufacturer/type		HM040B/HD1			HM060B/HD2			HM080B/HD3			HM120B/HD4	
		Motor only	With PLE40	With PLQE60	Motor only	With PLQE60	With PLQE80	Motor only	With PLQE80	With PLQE120	Motor only	With PLQE120
Schneider	**BSH0551**		SE02	SE02		SE10						
	BSH0552		SE02	SE02		SE10						
	BSH0553		SE02	SE02		SE10						
	BSH0701	SE03		SE03		SE07	SE07		SE16			
	BSH0702	SE03		SE03		SE07	SE07		SE16			
	BSH0703			SE06		SE08	SE08		SE17			
	BSH1001				SE09		SE09		SE13	SE13		SE20
	BSH1002				SE09		SE09	SE13	SE13	SE13		SE20
	BSH1003				SE09		SE09	SE13	SE13	SE13		SE20
	BSH1004									SE14		SE21
	BSH1401							SE15 [2)]		SE15 [2)]		SE19
	BSH1402							SE15 [2)]		SE15 [2)]	SE19	SE19
	BSH1403									SE15 [2)]	SE19	SE19
	BSH1404										SE19	
	BMH0701	SE03		SE03	SE07	SE07	SE07		SE16			
	BMH0702	SE03		SE03	SE07	SE07	SE07		SE16			
	BMH0703	SE04		SE04	SE08	SE08	SE08		SE12			
	BMH1001				SE09		SE09	SE13	SE13	SE13		SE20
	BMH1002				SE09		SE09	SE13	SE13	SE13		SE20
	BMH1003				SE09		SE09	SE13	SE13	SE13		SE20
	BMH1401							SE15 [2)]		SE15 [2)]	SE19	SE19
	BMH1402							SE15 [2)]		SE15 [2)]	SE19	SE19
	BMH1403									SE15 [2)]	SE19	SE19
SEW	**CMP40S**		SW02	SW02		SW06						
	CMP40M	SW02	SW02	SW02		SW06						
	CMP50S	SW03		SW03		SW07	SW07		SW11			
	CMP50M	SW03		SW03	SW07	SW07	SW07		SW11			
	CMP50L			SW03	SW07	SW07	SW07		SW11			
	CMP63S			SW05	SW08	SW08	SW08		SW12			
	CMP63M			SW05	SW08	SW08	SW08	SW12	SW12			
	CMP63L				SW08		SW08	SW12	SW12			
	CMP71S				SW09			SW13		SW13		SW20
	CMP71M				SW09			SW13		SW13		SW20
	CMP71L							SW13		SW13		SW20
	CMP80S							SW14				
	CMP80M							SW14				
	CMP80L										SW18	
	CMP100S										SW19	
	CMP100M										SW19	
	CMP100L										SW19	

Drive manufacturer/type		HM040B/HD1			HM060B/HD2			HM080B/HD3			HM120B/HD4	
		Motor only	With PLE40	With PLQE60	Motor only	With PLQE60	With PLQE80	Motor only	With PLQE80	With PLQE120	Motor only	With PLQE120
SEW	**CMPZ71S**				SW09 [2]			SW13		SW13		SW17
	CMPZ71M				SW09 [2]			SW13		SW13		SW17
	CMPZ71L							SW13		SW13	SW17	SW17
	CMPZ80S							SW14 [2]			SW18	
	CMPZ80M							SW14 [2]			SW18	
	CMPZ80L										SW18	
	CMPZ100S										SW19	
	CMPZ100M										SW19	
	CMPZ100L										SW19	
Siemens	**1FK7022**	SM02	SM02	SM02		SM07						
	1FK7032	SM03		SM03		SM04	SM04		SM11			
	1FK7034	SM03		SM03	SM04	SM04	SM04		SM11			
	1FK7040				SM05		SM05		SM08	SM08		SM15
	1FK7042				SM05		SM05	SM08	SM08	SM08		SM15
	1FK7060				SM06 [2]			SM09		SM09		SM12
	1FK7062				SM06 [2]			SM09		SM09		SM12
	1FK7063				SM06 [2]			SM09		SM09	SM12	SM12
	1FK7080							SM10 [2]			SM13	
	1FK7081							SM10 [2]			SM13	
	1FK7083							SM10 [2]			SM13	
	1FK7084							SM10 [2]			SM13	
	1FK7100										SM14	
	1FK7101										SM14	
	1FK7103										SM14	
	1FK7105										SM14	

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[1] See order code on page 12 for linear modules HM-B and on page 20 for double axes HD.

[2] Drive not suitable for Y-axis of HIWIN multi-axis systems HS.

11.2 Drive adaptation of linear tables HT-B

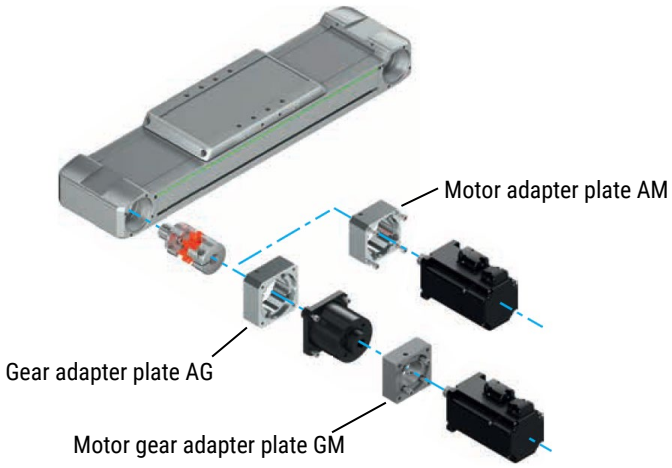
The drive adaptation of linear table HT-B is of multi-sectional design to allow for simple flange-mounting of all standard motors and gearboxes.

The flange type set comprises the following components:

- Coupling housing KB
- Coupling components
- Motor adapter plate AM or gear adapter plate AG and motor gear adapter plate GM (not applicable for NG11 – NG15)

You can find the dimensions of the coupling housing, motor adapter plate and gear adapter plate in section 11.4 from page 152.

Fig. 11.3: Motor adaptation of linear tables HT-B



Gear adapter plate AG: Adapter from axis to gearbox

Motor gear adapter plate GM: Adapter from gearbox to motor

Motor adapter plate AM: Adapter from axis to motor

Table 11.2: Order code for position flange type [1] – linear tables HT-B

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**		HW17	HW16							
	EM1-C-M-10-2		HW17	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 [2]		HW13	HW20	HW14		HW14
B&R	**8LSA24**		BR02	BR02							
	8LSA25		BR02	BR02							
	8LSA33			BR03		BR13					
	8LSA34			BR03		BR13					
	8LSA35			BR03		BR13					
	8LSA43				BR10						
	8LSA44				BR10						
	8LSA45				BR10						
	8LSA46				BR10						
	8LSA53							BR14		BR14	
	8LSA54							BR14		BR14	
	8LSA55							BR14		BR14	
	8LSA56							BR14		BR14	
	8LSA57							BR14		BR14	
	8LSA63							BR15		BR15	
	8LSA64							BR15		BR15	

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
B&R	**8LSA65**							BR15		BR15	
	8LSA66							BR15		BR15	
	8LSN43				BR11						
	8LSN44				BR11						
	8LSN45				BR11						
	8LSN46				BR11						
	8LSN54							BR14		BR14	
	8LSN55							BR14		BR14	
	8LSN56							BR14		BR14	
	8LSN57							BR14		BR14	
Beckhoff	**AM8022**		BE01	BE01							
	AM8023	BE01	BE01	BE01							
	AM8031	BE02		BE02		BE09					
	AM8032			BE02	BE09	BE09					
	AM8033			BE02	BE09	BE09					
	AM8531	BE02		BE02	BE09	BE09					
	AM8532			BE02	BE09	BE09					
	AM8533			BE02	BE09	BE09					
	AM8041				BE10	BE10	BE10		BE18		BE18
	AM8042				BE10	BE10	BE10		BE18		BE18
	AM8043				BE10	BE10	BE10		BE18		BE18
	AM8541				BE10	BE10	BE10		BE18		BE18
	AM8542				BE10	BE10	BE10		BE18		BE18
	AM8543				BE10	BE10	BE10		BE18		BE18
	AM8051				BE11		BE11	BE15	BE15		BE15
	AM8052				BE11		BE11	BE15	BE15	BE15	BE15
	AM8053				BE11		BE11	BE15	BE15	BE15	BE15
	AM8551				BE11		BE11	BE15	BE15		BE15
	AM8552				BE11		BE11	BE15	BE15	BE15	BE15
	AM8553				BE11		BE11	BE15	BE15	BE15	BE15
	AM8061							BE16		BE16	
	AM8062							BE16		BE16	
	AM8063							BE16		BE16	
	AM8561							BE16		BE16	
	AM8562							BE16		BE16	
	AM8563							BE16		BE16	
	AM8071									BE17	
	AM8072									BE17	
	AM8073									BE17	
Bosch	**MSK030B**		BO02	BO02							

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
Bosch	**MSK030C**		BO02	BO02							
	MSK040B	BO03		BO03	BO10	BO10					
	MSK040C	BO03		BO03	BO10	BO10					
	MSK043C			BO03	BO10	BO10					
	MSK050B				BO11	BO11	BO11		BO19		BO19
	MSK050C				BO11	BO11	BO11		BO19		BO19
	MSK060B				BO13		BO13		BO21		BO21
	MSK060C				BO13		BO13		BO21		BO21
	MSK061B				BO12	BO12	BO12		BO20		BO20
	MSK061C				BO12	BO12	BO12		BO20		BO20
	MSK070C							BO18		BO18	
	MSK070D							BO18		BO18	
	MSK070E							BO18		BO18	
	MSK071C							BO18		BO18	
	MSK071D							BO18		BO18	
	MSK071E							BO18		BO18	
	MSK075C							BO18		BO18	
	MSK075D							BO18		BO18	
	MSK075E							BO18		BO18	
	MSK076C						BO14	BO17	BO17	BO17	BO17
	MSK100A						BO14	BO17	BO17	BO17	BO17
Lenze	**MCS06F**			LE01		LE11					
	MCS06I	LE01		LE01		LE11					
	MCS09D			LE02	LE08	LE08					
	MCS09F			LE02	LE08	LE08					
	MCS09H				LE08	LE08					
	MCS09L				LE08	LE08					
	MCS12D				LE09	LE09	LE09		LE15		LE15
	MCS12H				LE09	LE09	LE09		LE15		LE15
	MCS12L				LE09	LE09	LE09		LE15		LE15
	MCS14D						LE10	LE13	LE13	LE13	LE13
	MCS14H						LE10	LE13	LE13	LE13	LE13
	MCS14L						LE10	LE13	LE13	LE13	LE13
	MCS14P							LE13		LE13	
	MCS19F									LE14	
Schneider	**BSH0551**		SE02	SE02							
	BSH0552		SE02	SE02							
	BSH0553		SE02	SE02							
	BSH0701			SE03		SE16					
	BSH0702	SE03		SE03		SE16					

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
Schneider	**BSH0703**			SE06		SE17					
	BSH1001				SE13	SE13	SE13		SE20		SE20
	BSH1002				SE13	SE13	SE13		SE20		SE20
	BSH1003				SE13	SE13	SE13		SE20		SE20
	BSH1004						SE14		SE21		SE21
	BSH1401						SE15	SE19	SE19	SE19	SE19
	BSH1402						SE15	SE19	SE19	SE19	SE19
	BSH1403						SE15	SE19	SE19	SE19	SE19
	BSH1404							SE19		SE19	
	BMH0701			SE03		SE16					
	BMH0702	SE03		SE03		SE16					
	BMH0703	SE04		SE04		SE12					
	BMH1001				SE13	SE13	SE13		SE20		SE20
	BMH1002				SE13	SE13	SE13		SE20		SE20
	BMH1003				SE13	SE13	SE13		SE20		SE20
	BMH1401						SE15	SE19	SE19	SE19	SE19
	BMH1402						SE15	SE19	SE19	SE19	SE19
	BMH1403						SE15	SE19	SE19	SE19	SE19
SEW	**CMP40S**		SW02	SW02							
	CMP40M		SW02	SW02							
	CMP50S	SW03		SW03		SW11					
	CMP50M	SW03		SW03		SW11					
	CMP50L			SW04	SW11	SW11					
	CMP63S			SW05	SW12	SW12					
	CMP63M			SW05	SW12	SW12					
	CMP63L				SW12	SW12		SW17			
	CMP71S				SW13		SW13	SW17	SW17		SW17
	CMP71M				SW13		SW13	SW17	SW17	SW17	SW17
	CMP71L				SW13		SW13	SW17	SW17	SW17	SW17
	CMP80S							SW18		SW18	
	CMP80M							SW18		SW18	
	CMP80L							SW18		SW18	
	CMP100S							SW19		SW19	
	CMP100M							SW19		SW19	
	CMP100L									SW19	
	CMPZ71S				SW13		SW13	SW17	SW17		SW17
	CMPZ71M				SW13		SW13	SW17	SW17	SW17	SW17
	CMPZ71L				SW13		SW13	SW17	SW17	SW17	SW17
	CMPZ80S							SW18		SW18	
	CMPZ80M							SW18		SW18	

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
SEW	**CMPZ80L**							SW18		SW18	
	CMPZ100S							SW19		SW19	
	CMPZ100M							SW19		SW19	
	CMPZ100L									SW19	
Siemens	**1FK7022**		SM02	SM02							
	1FK7032			SM03		SM11					
	1FK7034	SM03		SM03		SM11					
	1FK7040				SM08	SM08	SM08		SM15		SM15
	1FK7042				SM08	SM08	SM08		SM15		SM15
	1FK7060				SM09		SM09	SM12	SM12		SM12
	1FK7062				SM09		SM09	SM12	SM12	SM12	SM12
	1FK7063				SM09		SM09	SM12	SM12	SM12	SM12
	1FK7080							SM13			
	1FK7081							SM13		SM13	
	1FK7083							SM13		SM13	
	1FK7084							SM13		SM13	
	1FK7100									SM14	
	1FK7101									SM14	
	1FK7103									SM14	
	1FK7105									SM14	

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[1] See order code on page 15 for linear tables HT-B.

[2] Drive not suitable for X-axis or Y-axis of HIWIN multi-axis systems HS.

11.3 Drive adaptation of cantilever axis HC-B

Adaptation to the linear axis is of multi-sectional design to allow simple flange-mounting of all standard motors and gearboxes.

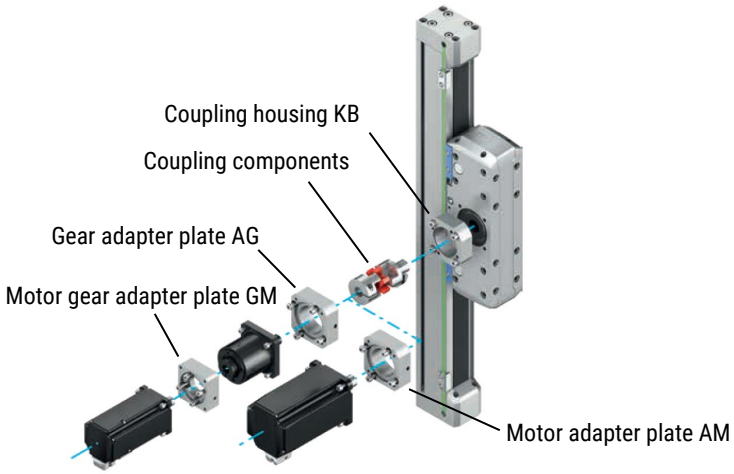
The flange type set comprises the following components:

- Coupling housing KB
- Coupling components
- Motor adapter plate AM or gear adapter plate AG and motor gear adapter plate GM (not applicable for NG21 – NG27)

You can find the dimensions of the coupling housing, motor adapter plate and gear adapter plate in section 11.4 from page 152.

Motor adaptation of cantilever axes HC-B

Fig. 11.4: Motor adaptation of cantilever axes HC



Gear adapter plate AG: Adapter from axis to gearbox

Motor gear adapter plate GM: Adapter from gearbox to motor

Motor adapter plate AM: Adapter from axis to motor

Table 11.3: Order code for position flange type [1] – cantilever axis HC-B

Drive manufacturer/type		HC025B		HC040B			HC060B			HC080B		
		Motor only	With PLE40	Motor only	With PLE40	With PLQE60	Motor only	With PLQE60	With PLQE80	Motor only	With PLQE80	With PLQE120
Gearbox adapter			NG21		NG22	NG23		NG24	NG25		NG26	NG27
HIWIN	**EM1-C-M-05-2**		HW17		HW17	HW16		HW15				
	EM1-C-M-10-2	HW18	HW17		HW17	HW16		HW15				
	EM1-C-M-20-2					HW03		HW05	HW05		HW10	
	EM1-C-M-40-2			HW03		HW03		HW05	HW05		HW10	
	EM1-C-M-75-2								HW06		HW08	
	EM1-A-M-1K-2									HW13 [1]		HW13
B&R	**8LSA24**		BR01		BR02	BR02		BR07				
	8LSA25		BR01		BR02	BR02		BR07				
	8LSA33					BR03		BR04	BR04		BR13	
	8LSA34			BR03		BR03		BR04	BR04		BR13	
	8LSA35			BR03		BR03		BR04	BR04		BR13	
	8LSA43						BR05					
	8LSA44						BR05					
	8LSA45						BR05					
	8LSA46						BR05			BR10		
	8LSA54									BR12		
	8LSA55									BR12		
	8LSA56									BR12		
	8LSA57									BR12		
	8LSN43						BR06			BR11		
	8LSN44						BR06			BR11		
	8LSN45						BR06			BR11		
	8LSN46						BR06			BR11		
	8LSN54									BR12		
	8LSN55									BR12		
	8LSN56									BR12		
	8LSN57									BR12		
Beckhoff	**AM8022**		BE19		BE01	BE01		BE04				
	AM8023		BE19	BE01	BE01	BE01		BE04				
	AM8031			BE02		BE02		BE05	BE05		BE09	
	AM8032			BE02		BE02		BE05	BE05		BE09	
	AM8033					BE02		BE05	BE05		BE09	
	AM8531			BE02		BE02	BE05	BE05	BE05		BE09	
	AM8532			BE02		BE02	BE05	BE05	BE05		BE09	
	AM8533					BE02	BE05	BE05	BE05		BE09	
	AM8041								BE06		BE10	BE10
	AM8042						BE06		BE06		BE10	BE10
	AM8043						BE06		BE06		BE10	BE10

Drive manufacturer/type		HC025B		HC040B			HC060B			HC080B		
		Motor only	With PLE40	Motor only	With PLE40	With PLQE60	Motor only	With PLQE60	With PLQE80	Motor only	With PLQE80	With PLQE120
Beckhoff	AM8541						BE06		BE06	BE10	BE10	BE10
	AM8542						BE06		BE06	BE10	BE10	BE10
	AM8543						BE06		BE06	BE10	BE10	BE10
	AM8051						BE07					BE11
	AM8052						BE07			BE11		BE11
	AM8053						BE07			BE11		BE11
	AM8551						BE07			BE11		BE11
	AM8552						BE07			BE11		BE11
	AM8553						BE07			BE11		BE11
	AM8061									BE12		
	AM8062									BE12		
	AM8561									BE12		
	AM8562									BE12		
Bosch	MSK030B		BO01		BO02	BO02		BO09				
	MSK030C		BO01		BO02	BO02		BO09				
	MSK040B			BO03		BO03		BO05	BO05		BO10	
	MSK040C			BO03		BO03		BO05	BO05		BO10	
	MSK043C			BO03		BO03		BO05	BO05		BO10	
	MSK050B						BO06		BO06		BO11	BO11
	MSK050C						BO06		BO06		BO11	BO11
	MSK060B						BO08			BO13		BO13
	MSK060C						BO08			BO13		BO13
	MSK061B						BO07		BO07	BO12	BO12	BO12
	MSK061C						BO07		BO07	BO12	BO12	BO12
	MSK070C									BO15		
	MSK070D									BO15		
	MSK070E									BO15		
	MSK071C									BO15		
	MSK071D									BO15		
	MSK071E									BO15		
	MSK075C									BO15		
	MSK075D									BO15		
	MSK075E									BO15		
	MSK076C									BO14		BO14
	MSK100A									BO14		BO14
Lenze	MCS06F					LE01		LE04	LE04		LE11	
	MCS06I					LE01		LE04	LE04		LE11	
	MCS09D			LE02		LE02		LE05	LE05		LE08	
	MCS09F					LE02		LE05	LE05		LE08	
	MCS09H						LE05		LE05		LE08	

Drive manufacturer/type		HC025B		HC040B			HC060B			HC080B		
		Motor only	With PLE40	Motor only	With PLE40	With PLQE60	Motor only	With PLQE60	With PLQE80	Motor only	With PLQE80	With PLQE120
Lenze	MCS09L						LE05		LE05		LE08	
	MCS12D						LE06		LE06		LE09	LE09
	MCS12H						LE06		LE06	LE09	LE09	LE09
	MCS12L						LE06		LE06	LE09	LE09	LE09
	MCS14D									LE10		LE10
	MCS14H									LE10		LE10
	MCS14L									LE10		LE10
Schneider	BSH0551		SE01		SE02	SE02		SE10				
	BSH0552		SE01		SE02	SE02		SE10				
	BSH0553		SE01		SE02	SE02		SE10				
	BSH0701					SE03		SE07	SE07		SE16	
	BSH0702					SE03		SE07	SE07		SE16	
	BSH0703			SE04		SE06		SE08	SE08		SE17	
	BSH1001								SE09		SE13	SE13
	BSH1002								SE09		SE13	SE13
	BSH1003								SE09		SE13	SE13
	BSH1004											SE14
	BSH1401									SE15		SE15
	BSH1402									SE15		SE15
	BSH1403											SE15
	BMH0701			SE03		SE03		SE07	SE07		SE16	
	BMH0702			SE03		SE03		SE07	SE07		SE16	
	BMH0703			SE04		SE04	SE08	SE08	SE08		SE12	
	BMH1001						SE09		SE09		SE13	SE13
	BMH1002						SE09		SE09	SE13	SE13	SE13
	BMH1003						SE09		SE09	SE13	SE13	SE13
	BMH1401									SE15		SE15
	BMH1402									SE15		SE15
	BMH1403									SE15		SE15
SEW	CMP40S		SW01		SW02	SW02		SW06				
	CMP40M		SW01		SW02	SW02		SW06				
	CMP50S			SW03		SW03		SW07	SW07		SW11	
	CMP50M			SW03		SW03		SW07	SW07		SW11	
	CMP50L			SW03		SW03		SW07	SW07		SW11	
	CMP63S					SW05		SW08	SW08		SW12	
	CMP63M					SW05	SW08	SW08	SW08		SW12	
	CMP63L						SW08		SW08		SW12	
	CMP71S						SW09					SW13
	CMP71M						SW09			SW13		SW13
	CMP71L						SW09			SW13		SW13

Drive manufacturer/type		HC025B		HC040B			HC060B			HC080B		
		Motor only	With PLE40	Motor only	With PLE40	With PLQE60	Motor only	With PLQE60	With PLQE80	Motor only	With PLQE80	With PLQE120
SEW	**CMP80S**									SW14		
	CMP80M									SW14		
Siemens	**1FK7022**		SM01		SM02	SM02		SM07				
	1FK7032			SM03		SM03		SM04	SM04		SM11	
	1FK7034			SM03		SM03		SM04	SM04		SM11	
	1FK7040								SM05		SM08	SM08
	1FK7042						SM05		SM05		SM08	SM08
	1FK7060						SM06			SM09		SM09
	1FK7062						SM06			SM09		SM09
	1FK7063						SM06			SM09		SM09
	1FK7080									SM10		
	1FK7081									SM10		
	1FK7083									SM10		
	1FK7084									SM10		

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[1)] Drive not suitable for Z-axis of HIWIN multi-axis systems HS.

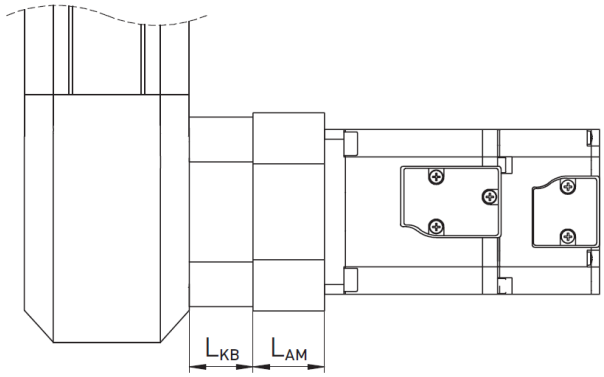
11.4 Dimensions of the motor adaptation of linear modules HM-B, linear tables HT-B, cantilever axis HC-B and double axis HD

The total width of linear axes with toothed belt drive depends on the following factors:

- Adaptation material (coupling housing KB, motor adapter plate AM, gear adapter plate AG, motor gear adapter plate GM)
- Gearbox
- Motor

Linear axis without gearbox

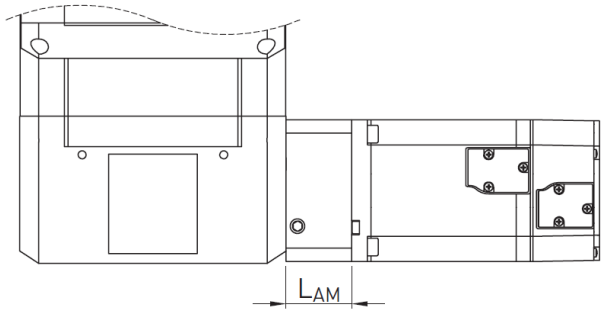
Fig. 11.5: Motor connection of linear module HM-B without gearbox



L_{KB} Length of coupling housing, see Table 11.4

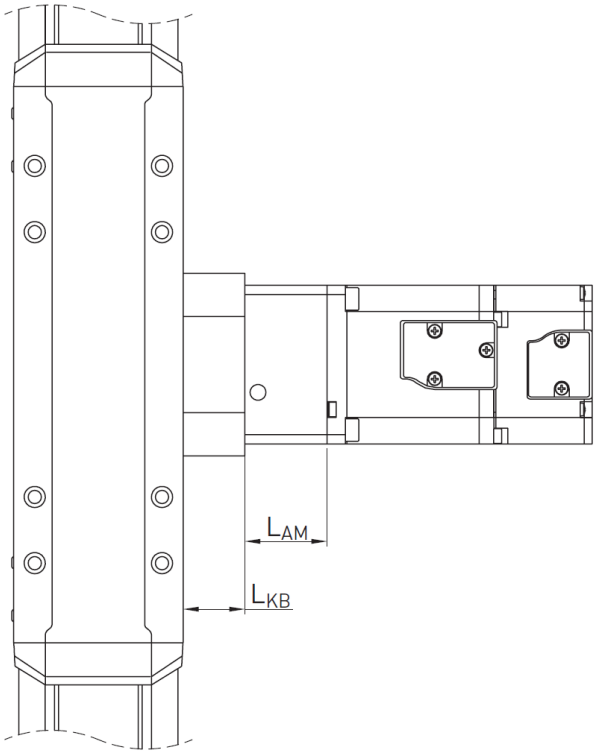
L_{AM} Length of motor adapter plate, see Table 11.5

Fig. 11.6: Motor connection of linear table HT-B without gearbox



L_{AM} Length of motor adapter plate, see Table 11.6

Fig. 11.7: Motor connection of cantilever axis HC-B without gearbox

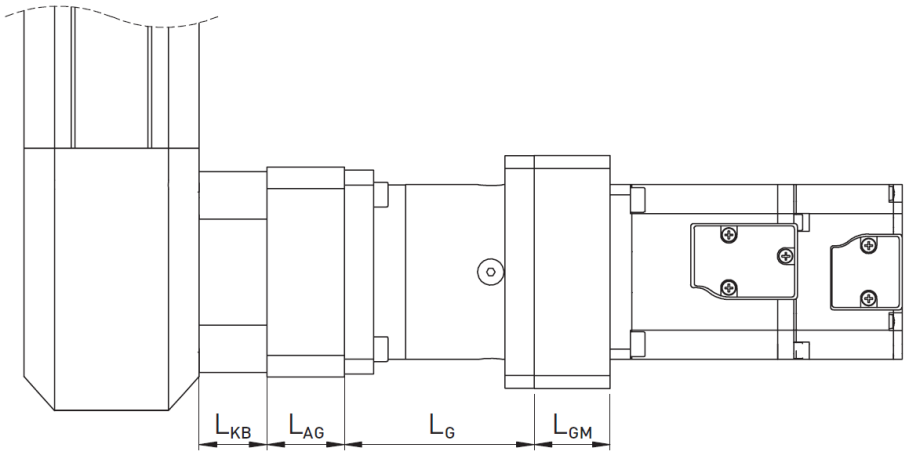


L_{KB} Length of coupling housing, see Table 11.4

L_{AM} Length of motor adapter plate, see Table 11.5

Linear axis with gearbox

Fig. 11.8: Motor connection of linear module HM-B with gearbox



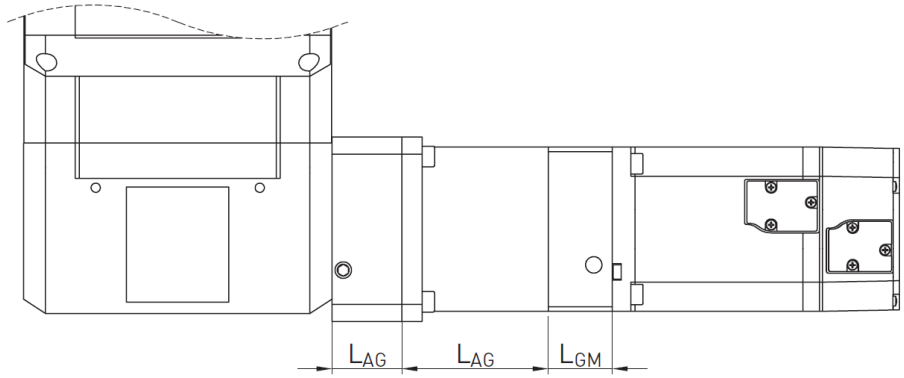
L_{KB} Length of coupling housing, see Table 11.4

L_{AG} Length of gear adapter plate, see Table 11.7

L_{G} Length of gearbox, see Table 11.9

L_{GM} Length of motor gear adapter plate, see Table 11.8

Fig. 11.9: Motor connection of linear table HT-B with gearbox

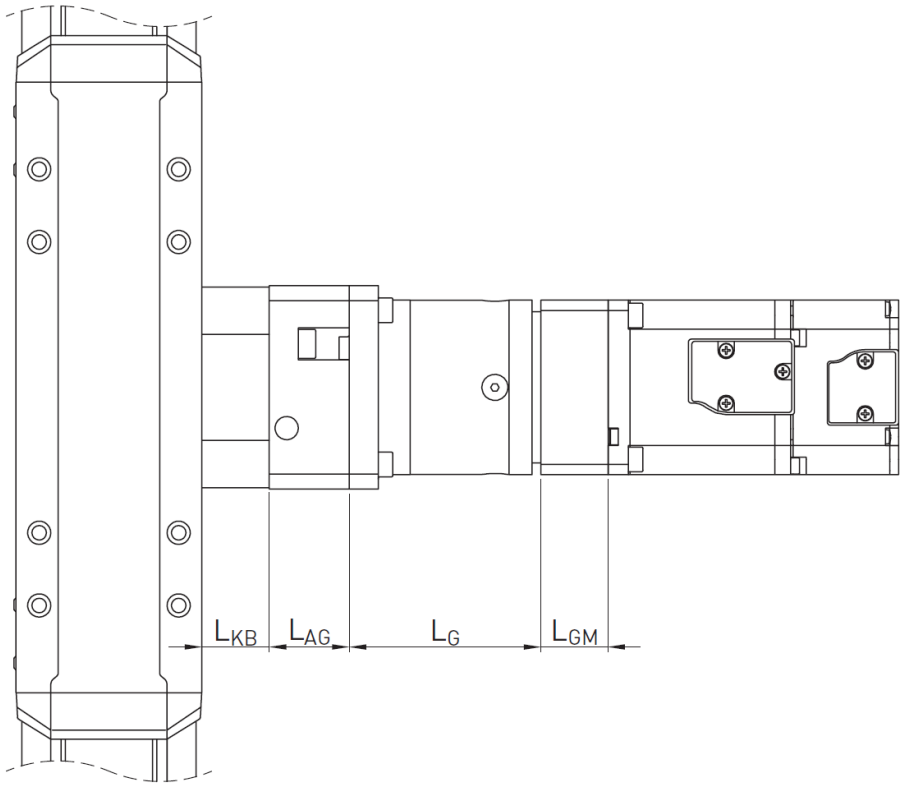


L_{AG} Length of gear adapter plate, see Table 11.7

L_G Length of gearbox, see Table 11.9

L_{GM} Length of motor gear adapter plate, see Table 11.8

Fig. 11.10: Motor connection of cantilever axis HC-B with gearbox



L_{KB} Length of coupling housing, see Table 11.4

L_{AG} Length of gear adapter plate, see Table 11.7

L_G Length of gearbox, see Table 11.9

L_{GM} Length of motor gear adapter plate, see Table 11.8

11.4.1 Coupling housing KB for linear modules HM-B and cantilever axes HC-B

Fig. 11.11: Coupling housing KB for linear modules HM-B and cantilever axes HC-B

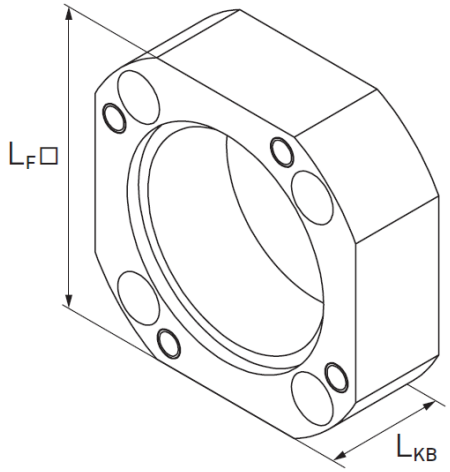


Table 11.4: Dimensions of coupling housing KB for linear modules HM-B and cantilever axes HC-B

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	25,0	25-000801

11.4.2 Motor adapter plate AM for linear modules HM-B, linear tables HT-B and cantilever axes HC-B without gearboxes

Fig. 11.12: Motor adapter plate AM for linear modules HM-B, linear tables HT-B and cantilever axes HC-B without gearboxes

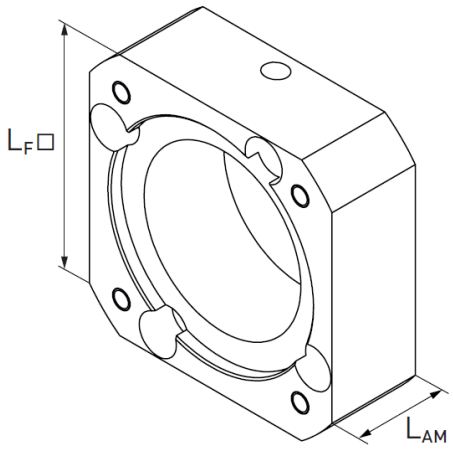


Table 11.5: Motor adapter plate AM for linear axis HM-B and cantilever axis HC-B without gearboxes

Linear axis	Manufacturer	Motors	L_F [mm]	L_{AM} [mm]	Article number
HC025B	HIWIN	EM1-C-M-10-2	27	50	25-002722
HM040B		EM1-C-M-20-2, EM1-C-M-40-2	60	31	25-000404
HC040B		EM1-C-M-40-2	60	31	25-000404
HM040B, HC040B	B&R	8LSA25	58	25	25-000403
		8LSA33, 8LSA34, 8LSA35	82	31	25-000411
	Beckhoff	AM8022D, AM8022E, AM8023E, AM8023F	55	22	25-000402
		AM8031D, AM8031F, AM8531D, AM8531F, AM8032D, AM8032E, AM8032H, AM8532D, AM8532E, AM8532H	70	31	25-000407
	Bosch	MSK030B, MSK030C	54	22	25-000401
		MSK040B, MSK040C	82	31	25-000405
	Lenze	MCS06F41, MCS06F60, MCS06I41, MCS06I60	62	25	25-000406
		MCS09D41, MCS09D60	82	31	25-000411
	Schneider	BSH0701, BSH0702, BMH0701, BMH0702	62	25	25-000406
		BMH0703, BSH0703	70	31	25-000407
	SEW	CMP40M	54	22	25-000401
		CMP50S, CMP50M, CMP50L	62	25	25-000406
	Siemens	1FK7022	55	22	25-000402
		1FK7032, 1FK7034	72	31	25-000408
HM060B	HIWIN	EM1-C-M-75-2	80	37	25-000421
HM060B, HC060B	Bosch	MSK040B, MSK040C, MSK043B	82	27	25-000415
		MSK050B, MSK050C	98	37	25-000425
		MSK061B, MSK061C	116	37	25-000428
		MSK060B, MSK060C	116	47	25-000429
	B&R	8LSA35, 8LSA34	86	27	25-000423
		8LSA43, 8LSA44, 8LSA45, 8LSA46	100	37	25-000426
		8LSN43, 8LSN44, 8LSN45, 8LSN46	116	37	25-000430

Linear axis	Manufacturer	Motors	L_F [mm]	L_{AM} [mm]	Article number
	Beckhoff	AM8032D, AM8032E, AM8032H, AM8033E, AM8033F, AM8033J, AM8531F, AM8532D, AM8532E, AM8532H, AM8533E, AM8533F, AM8533J	70	27	25-000418
		AM8041D, AM8041E, AM8041H, AM8042E, AM8042F, AM8042J, AM8043E, AM8043H, AM8043K, AM8541D, AM8541E, AM8541H, AM8542E, AM8542F, AM8542J, AM8543E, AM8543H, AM8543K	87	37	25-000424
		AM8051E, AM8051G, AM8051K, AM8052F, AM8052J, AM8052L, AM8551E, AM8551G, AM8551K, AM8552F, AM8552J, AM8552L, AM8053G, AM8053K, AM8053N, AM8553G, AM8553K, AM8553N	104	47	25-000427
	Lenze	MCS09D41, MCS09D60, MCS09F38, MCS09F60, MCS09H41, MCS09H60, MCS09L41, MCS09L51	86	27	25-000423
		MCS12D20, MCS12D41, MCS12H15, MCS12H35, MCS12L20, MCS12L41	116	37	25-000430
	Schneider	BMH0701, BMH0702	72	21	25-000417
HM060B, HC060B	Schneider	BMH0703	70	27	25-000418
		BSH1001, BSH1002, BSH1003, BMH1001, BMH1002, BMH1003	98	37	25-000425
	SEW	CMP50M, CMP50L	72	21	25-000417
		CMP63S, CMP63M, CMP63SL	86	27	25-000423
		CMP71S, CMP71M, CMPZ71S, CMPZ71M, CMP71L, CMPZ71L	116	47	25-000431
	Siemens	1FK7034	72	27	25-000419
		1FK7040, 1FK7042	87	37	25-000424
		1FK7060, 1FK7062, 1FK7063	116	47	25-000431
HM080B, HC080B	HIWIN	EM1-A-M-1K-2	130	51	25-000450
	Beckhoff	AM8532D, AM8532E, AM8532H, AM8533E, AM8533F, AM8533J, AM8531D, AM8531F	73	27	25-000436
		AM8042E, AM8042F, AM8042J, AM8043E, AM8043H, AM8043K, AM8541D, AM8541E, AM8541H, AM8542E, AM8542F, AM8542J, AM8543E, AM8543H, AM8543K	87	37	25-000441
		AM8051E, AM8051G, AM8051K, AM8052F, AM8052J, AM8052L, AM8053G, AM8053K, AM8053N, AM8551E, AM8551G, AM8551K, AM8552F, AM8552J, AM8552L, AM8553G, AM8553K, AM8553N	100	51	25-000444
		AM8061G, AM8061J, AM8061M, AM8062J, AM8062L, AM8062P, AM8561G, AM8561J, AM8561M, AM8562J, AM8562L, AM8562P	138	56	25-000453
	B&R	8LSA43, 8LSA44, 8LSA45, 8LSA46	100	37	25-000443
		8LSA53, 8LSA54, 8LSA55, 8LSA56, 8LSA57, 8LSN54, 8LSN55, 8LSN56, 8LSN57	142	51	25-000454
		8LSN43, 8LSN44, 8LSN45, 8LSN46	116	37	25-000447

Linear axis	Manufacturer	Motors	L_F [mm]	L_{AM} [mm]	Article number
	Bosch	MSK050B, MSK050C	98	37	25-000442
		MSK061B, MSK061C	116	37	25-000445
		MSK060B, MSK060C	116	51	25-000446
		MSK076C, MSK100A	139	51	25-000451
		MSK70C, MSK70D, MSK70E, MSK71C, MSK71D, MSK75C, MSK75D	138	56	25-000453
	Lenze	MCS09H41, MCS09H60, MCS09L41, MCS09L51	86	26	25-000440
		MCS12D20, MCS12D41, MCS12H15, MCS12H35, MCS12L20, MCS12L41	116	37	25-000447
		MCS14D15, MCS14D36, MCS14H15, MCS14H32, MCS14L15, MCS14L32	139	51	25-000452
	Schneider	BSH1002, BSH1003, BMH1001, BMH1002, BMH1003	98	37	25-000442
		BSH1401, BSH1402, BMH1401, BMH1402, BMH1403	139	51	25-000452
	SEW	CMP63M, CMP63L	86	27	25-000440
		CMP71S, CMP71M, CMP71L, CMPZ71S, CMPZ71M, CMPZ71L	116	51	25-000448
		CMP80S, CMP80M, CMPZ80S, CMPZ80M	138	56	25-000453
	Siemens	1FK7042	87	37	25-000441
		1FK7060, 1FK7062, 1FK7063	116	51	25-000448
HM080B, HC080B	Siemens	1FK7080, 1FK7081, 1FK7083, 1FK7084	138	56	25-000460
HM120B	Beckhoff	AM8553G, AM8553K, AM8553N	104	46	25-000456
		AM8062J, AM8062L, AM8062P, AM8063K, AM8063N, AM8063R, AM8561G, AM8561J, AM8561M, AM8562J, AM8562L, AM8562P, AM8563K, AM8563N, AM8563R	138	56	25-000460
		AM8071K, AM8071R, AM8072T	192	76	25-000466
	B&R	8LSA57, 8LSN54, 8LSN55, 8LSN56, 8LSN57	142	46	25-000461
		8LSA64, 8LSA65, 8LSA66	190	46	25-000464
	Bosch	MSK076C, MSK100A	140	46	25-000458
		MSK70C, MSK70D, MSK70E, MSK71C, MSK71E, MSK71D, MSK75C, MSK75D, MSK75E	138	56	25-000460
	Lenze	MCS14H15, MCS14H32, MCS14L15, MCS14L32, MCS14P14	140	46	25-000459
		MCS19F14	190	56	25-000465
	Schneider	BSH1402, BSH1403, BSH1404, BMH1401, BMH1402, BMH1403	140	46	25-000459

Linear axis	Manufacturer	Motors	L_F [mm]	L_{AM} [mm]	Article number
	SEW	CMPZ71L	116	46	25-000457
		CMP80L, CMPZ80S, CMPZ80M, CMPZ80L	138	56	25-000460
		CMP100S, CMP100M, CMP100L, CMPZ100S, CMPZ100M, CMPZ100L	163	56	25-000463
	Siemens	1FK7063	116	46	25-000457
		1FK7100, 1FK7101, 1FK7103, 1FK7105	192	76	25-000466
		1FK7080, 1FK7081, 1FK7083, 1FK7084	138	56	25-000460

Table 11.6: Motor adapter plate AM for linear tables HT-B without gearbox

Linear axis	Manufacturer	Motors	L_F [mm]	L_{AM} [mm]	Article number
HT100B	HIWIN	EM1-C-M-40-2	60	31	25-000404
	Beckhoff	AM8023E, AM8023F	55	22	25-000402
		AM8031D, AM8031F, AM8531D, AM8531F	70	31	25-000407
	Bosch	MSK040B, MSK040C	82	31	25-000405
	Lenze	MCS06I41, MCS06I60	62	25	25-000406
	Schneider	BSH0701, BMH0701, BMH0702	62	25	25-000406
	SEW	CMP50S, CMP50M	62	25	25-000406
	Siemens	1FK7034	72	31	25-000408
HT150B	HIWIN	EM1-A-M-1K-2	130	51	25-000450
	Beckhoff	AM8032D, AM8032E, AM8032H, AM8033E, AM8033F, AM8033J, AM8532D, AM8532E, AM8532H, AM8533E, AM8533F, AM8533J, AM8531D, AM8531F	73	27	25-000436
		AM8041D, AM8041E, AM8041H, AM8042E, AM8042F, AM8042J, AM8043E, AM8043H, AM8043K, AM8541D, AM8541E, AM8541H, AM8542E, AM8542F, AM8542J, AM8543E, AM8543H, AM8543K	87	37	25-000441
HT150B	Beckhoff	AM8051E, AM8051G, AM8051K, AM8052F, AM8052J, AM8052L, AM8053G, AM8053K, AM8053N, AM8551E, AM8551G, AM8551K, AM8552F, AM8552J, AM8552L, AM8553G, AM8553K, AM8553N	100	51	25-000444
	B&R	8LSA43, 8LSA44, 8LSA45, 8LSA46	100	37	25-000443
		8LSN43, 8LSN44, 8LSN45, 8LSN46	116	37	25-000447
	Bosch	MSK050B, MSK050C	98	37	25-000442
		MSK040B, MSK040C, MSK43C	82	27	25-000433
		MSK061B, MSK061C	116	37	25-000445
		MSK060B, MSK060C	116	51	25-000446
	Lenze	MCS09D41, MCS09D60, MCS09F38, MCS09F60, MCS09H41, MCS09H60, MCS09L41, MCS09L51	86	26	25-000440
		MCS12D20, MCS12D41, MCS12H15, MCS12H35, MCS12L20, MCS12L41	116	37	25-000447
	Schneider	BSH1001, BSH1002, BMH1001, BMH1002, BSH1003, BMH1003	98	37	25-000442

Linear axis	Manufacturer	Motors	L_F [mm]	L_{AM} [mm]	Article number
	SEW	CMP63S, CMP63M, CMP63L	86	27	25-000440
		CMP50L	73	20	25-000435
		CMP71S, CMP71M, CMP71L, CMPZ71S, CMPZ71M, CMPZ71L	116	51	25-000448
	Siemens	1FK7040, 1FK7042	87	37	25-000441
		1FK7060, 1FK7062, 1FK7063	116	51	25-000448
HT200B	HIWIN	EM1-A-M-1K-2	130	56	25-000647
	Beckhoff	AM8051E, AM8051G, AM8051K, AM8052F, AM8052J, AM8052L, AM8053G, AM8053K, AM8551E, AM8551G, AM8551K, AM8552F, AM8552J, AM8552L, AM8053N, AM8553G, AM8553K, AM8553N	104	46	25-000456
		AM8061G, AM8061J, AM8061M, AM8062J, AM8062L, AM8062P, AM8063K, AM8063N, AM8063R, AM8561G, AM8561J, AM8561M, AM8562J, AM8562L, AM8562P, AM8563K, AM8563N, AM8563R	138	56	25-000460
	B&R	8LSN54, 8LSN55, 8LSN56, 8LSN57, 8LSA54, 8LSA55, 8LSA56, 8LSA57	142	46	25-000461
		8LSA63, 8LSA64, 8LSA65, 8LSA66	190	46	25-000464
	Bosch	MSK076C, MSK100A	140	46	25-000458
		MSK70C, MSK70D, MSK70E, MSK71C, MSK71E, MSK71D, MSK75C, MSK75D, MSK75E	138	56	25-000460
	Lenze	MCS14D15, MCS14D36, MCS14H15, MCS14H32, MCS14L15, MCS14L32	140	46	25-000459
	Schneider	BSH1401, BSH1402, BSH1403, BSH1404, BMH1401, BMH1402, BMH1403	140	46	25-000459
	SEW	CMP71S, CMP71M, CMP71L, CMPZ71S, CMPZ71M, CMPZ71L	116	46	25-000457
		CMP80S, CMP80M, CMP80L, CMPZ80S, CMPZ80M, CMPZ80L	138	56	25-000460
		CMP100S, CMP100M, CMPZ100S, CMPZ100M	163	56	25-000463
	Siemens	1FK7060, 1FK7062, 1FK7063	116	46	25-000457
		1FK7080, 1FK7081, 1FK7083, 1FK7084	138	56	25-000460
HT250B	Beckhoff	AM8052F, AM8052J, AM8052L, AM8053G, AM8053K, AM8552F, AM8552J, AM8552L, AM8053N, AM8553G, AM8553K, AM8553N	104	46	25-000456
		AM8061G, AM8061J, AM8061M, AM8062J, AM8062L, AM8062P, AM8063K, AM8063N, AM8063R, AM8561G, AM8561J, AM8561M, AM8562J, AM8562L, AM8562P, AM8563K, AM8563N, AM8563R	138	56	25-000460
		AM8071K, AM8071R, AM8072T, AM8073T	192	76	25-000466
	B&R	8LSN54, 8LSN55, 8LSN56, 8LSN57, 8LSA54, 8LSA55, 8LSA56, 8LSA57, 8LSA53	142	46	25-000461
		8LSA63, 8LSA64, 8LSA65, 8LSA66	190	46	25-000464
	Bosch	MSK076C, MSK100A	140	46	25-000458
		MSK70C, MSK70D, MSK70E, MSK71C, MSK71E, MSK71D, MSK75C, MSK75D, MSK75E	138	56	25-000460
	Lenze	MCS14D15, MCS14D36, MCS14H15, MCS14H32, MCS14L15, MCS14L32, MCS14P14	140	46	25-000459
		MCS19F14	190	56	25-000465

Linear axis	Manufacturer	Motors	L_F [mm]	L_{AM} [mm]	Article number
	Schneider	BSH1401, BSH1402, BSH1403, BSH1404, BMH1401, BMH1402, BMH1403	140	46	25-000459
	SEW	CMP71M, CMP71L, CMPZ71M, CMPZ71L	116	46	25-000457
		CMP80S, CMP80M, CMP80L, CMPZ80S, CMPZ80M, CMPZ80L	138	56	25-000460
		CMP100S, CMP100M, CMPZ100S, CMPZ100M, CMP100L, CMPZ100L	163	56	25-000463
	Siemens	1FK7062, 1FK7063	116	46	25-000457
		1FK7081, 1FK7083, 1FK7984	138	56	25-000460
		1FK7100, 1FK7101, 1FK7103, 1FK7105	192	76	25-000466

11.4.3 Gear adapter plate AG for linear modules HM-B, linear tables HT-B and cantilever axes HC-B

Fig. 11.13: Gear adapter plate AG for linear modules HM-B, linear tables HT-B and cantilever axes HC-B

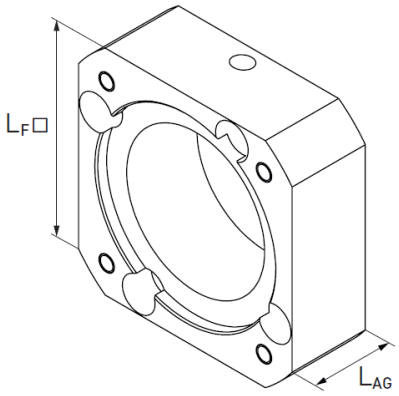


Table 11.7: Gear adapter plate AG for linear modules HM-B, linear tables HT-B and cantilever axes HC-B

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] Adapter consists of two parts
[2] PLE and PLQE are registered trademarks of Neugart GmbH

11.4.4 Motor gear adapter plate GM for linear modules HM-B, linear tables HT-B and cantilever axes HC-B

Fig. 11.14: Motor gear adapter plate GM for linear modules HM-B, linear tables HT-B and cantilever axes HC-B

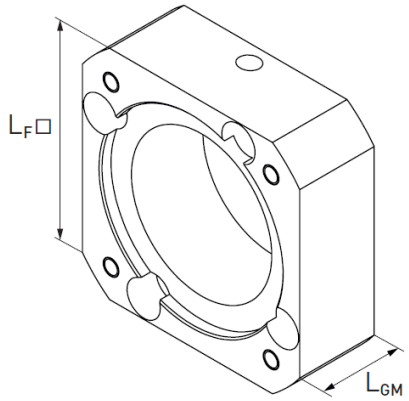


Table 11.8: Motor gear adapter plate GM for linear modules HM-B, linear tables HT-B and cantilever axes HC-B

Gearbox [1]	Manufacturer	Motors	L_F [mm]	L_{GM} [mm]	Article number
PLE40	HIWIN	EM1-C-M-05-2, EM1-C-M-10-2	40	19	25-002320
	B&R	8LSA24, 8LSA25	60	18,0	25-000481
	Beckhoff	AM8022D, AM8022E, AM8023E, AM8023F	60	15,0	25-000478
	Bosch	MSK030B, MSK030C	60	15,0	25-000480
	Schneider	BSH0551, BSH0552, BSH0553	60	15,0	25-000478
	SEW	CMP40S, CMP40M	60	15,0	25-000480
	Siemens	1FK7022	60	15,0	25-000478
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
	B&R	8LSA24, 8LSA25	60	17,1	25-000490
		8LSA33, 8LSA34, 8LSA35	90	23,1	25-000487
PLQE60	Beckhoff	AM8031D, AM8031F, AM8032D, AM8032E, AM8032H, AM8033E, AM8033F, AM8033J, AM8531D, AM8531F, AM8532D, AM8532E, AM8532H, AM8533E, AM8533F, AM8533J	70	23,1	25-000484
		AM8022D, AM8022E, AM8023E, AM8023F	60	16,0	25-000482
	Bosch	MSK040B, MSK040C, MSK043C	80	23,1	25-000489
		MSK030B, MSK030C	60	16,0	25-000488
	Lenze	MCS06F41, MCS06F60, MCS06I41, MCS06I60	70	16,1	25-000483
		MCS09D41, MCS09D60, MCS09F38, MCS09F60	90	23,1	25-000487
	Schneider	BSH0701, BSH0702, BMH0701, BMH0702	70	16,1	25-000483
		BSH0703, BMH0703	70	23,1	25-000484
		BSH0551, BSH0552, BSH0553	60	16,0	25-000482
	SEW	CMP50S, CMP50M, CMP50L	70	16,1	25-000483
		CMP63S, CMP63M	90	23,1	25-000487
		CMP40S, CMP40M	60	16,0	25-000488
	Siemens	1FK7022	60	16,0	25-000482
		1FK7032, 1FK7034	70	23,1	25-000485

Gearbox [1]	Manufacturer	Motors	L_F [mm]	L_{GM} [mm]	Article number
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
	B&R	8LSA33, 8LSA34, 8LSA35	90	21,2	25-000496
	Beckhoff	AM8041D, AM8041E, AM8041H, AM8042E, AM8042F, AM8042J, AM8043E, AM8043H, AM8043K, AM8541D, AM8541E, AM8541H, AM8542E, AM8542F, AM8542J, AM8543E, AM8543H, AM8543K	90	21,2	25-000493
		AM8031D, AM8031F, AM8032D, AM8032E, AM8032H, AM8033E, AM8033F, AM8033J, AM8531D, AM8531F, AM8532D, AM8532E, AM8532H, AM8533E, AM8533F, AM8533J	80	21,2	25-000498
	Bosch	MSK050B, MSK050C	100	31,2	25-000492
		MSK040B, MSK040C, MSK043C	80	21,2	25-000497
		MSK061B, MSK061C	115	31,2	25-000500
	Lenze	MCS09D41, MCS09D60, MCS09F38, MCS09F60, MCS09H41, MCS09H60, MCS09L41, MCS09L51	115	21,2	25-000499
		MCS06F41, MCS06F60, MCS06I41, MCS06I60	80	21,2	25-000498
		MCS12D20, MCS12D41, MCS12H15, MCS12H35, MCS12L20, MCS12L41	115	31,2	25-000499
	Schneider	BSH1001, BSH1002, BSH1003, BMH1001, BMH1002, BMH1003	100	31,2	25-000492
		BSH0701, BSH0702, BSH0703, BMH0701, BMH0702, BMH0703	80	21,2	25-000498
	SEW	CMP63S, CMP63M, CMP63L	90	21,2	25-000496
		CMP50S, CMP50M, CMP50L	80	21,2	25-000498
	Siemens	1FK7032, 1FK7034	80	21,2	25-000491
		1FK7040, 1FK7042	90	21,2	25-000493

Gearbox [1]	Manufacturer	Motors	L_F [mm]	L_{GM} [mm]	Article number
PLQE120	HIWIN	EM1-A-M-1K-2	130	36,8	25-000690
	Beckhoff	AM8041D, AM8041E, AM8041H, AM8042E, AM8042F, AM8042J, AM8043E, AM8043H, AM8043K, AM8541D, AM8541E, AM8541H, AM8542E, AM8542F, AM8542J, AM8543E, AM8543H, AM8543K	115	21,8	25-000504
		AM8051E, AM8051G, AM8051K, AM8052F, AM8052J, AM8052L, AM8053G, AM8053K, AM8053N, AM8551E, AM8551G, AM8551K, AM8552F, AM8552J, AM8552L, AM8553G, AM8553K, AM8553N	115	31,8	25-000502
	Bosch	MSK060B, MSK060C	115	31,8	25-000509
		MSK061B, MSK061C	115	21,8	25-000508
		MSK076C, MSK100A	140	31,8	25-000506
		MSK050B, MSK050C	115	21,8	25-000501
	Lenze	MCS12D20, MCS12D41, MCS12H15, MCS12H35, MCS12L20, MCS12L41	115	21,8	25-000507
		MCS14D15, MCS14D36, MCS14H15, MCS14H32, MCS14L15, MCS14L32	140	31,8	25-000503
	Schneider	BSH1001, BSH1002, BSH1003, BMH1001, BMH1002, BMH1003	115	21,8	25-000501
		BSH1401, BSH1402, BSH1403, BMH1401, BMH1402, BMH1403	140	31,8	25-000503
		BSH1004	115	31,8	25-000502
	SEW	CMP71S, CMP71M, CMP71L, CMPZ71S, CMPZ71M, CMPZ71L	115	31,8	25-000505
	Siemens	1FK7060, 1FK7062, 1FK7063	115	31,8	25-000505
		1FK7040, 1FK7042	115	21,8	25-000504

[1] PLE and PLQE are registered trademarks of Neugart GmbH.

11.4.5 Gearboxes for linear modules HM-B, linear tables HT-B, cantilever axes HC-B and double axes HD

Gearbox [1] for optimum power transmission of the motor to the toothed belt drive.

Fig. 11.15: Dimensioned drawing of gearboxes for linear modules HM-B, linear tables HT-B, cantilever axes HC-B and double axes HD

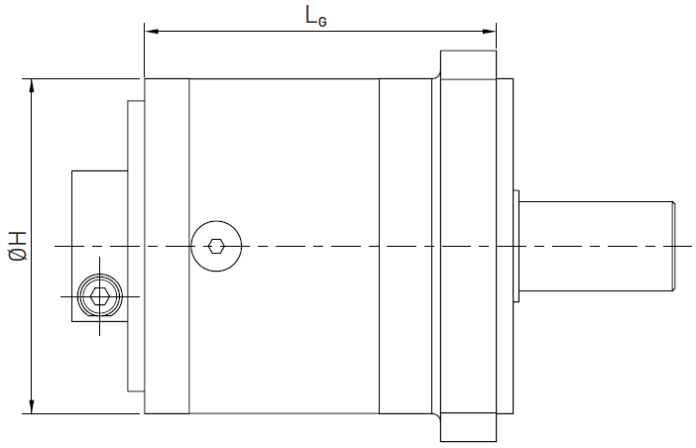


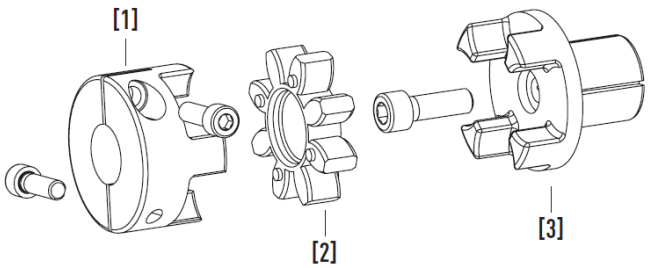
Table 11.9: Gearboxes for linear modules HM-B, linear tables HT-B, cantilever axes HC-B and double axes HD

Axis type/size	Ratio i	Ø H [mm]	L_G [mm]	Max. Ø motor shaft [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 page 12 for linear modules HM-B, page 15 for linear tables HT-B, page 18 for cantilever axes HC-B and page 20 for double axes HD.
[3] Values in brackets possible on request.

11.4.6 Coupling assembly for linear modules HM-B, linear tables HT-B and cantilever axes HC-B

Fig. 11.16: Coupling assembly for linear modules HM-B, linear tables HT-B and cantilever axes HC-B



1	Clamping hub for the motor side
2	Sprocket
3	Expansion hub for the axis side

11.4.6.1 Expansion hub

Coupling element for the axis side.

Fig. 11.17: Expansion hub for linear modules HM-B, linear tables HT-B and cantilever axes HC-B

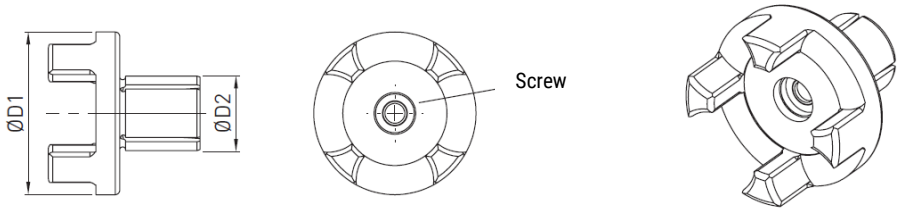


Table 11.10: Article numbers and dimensions of expansion hub

Axis type/ size	Model	Ø D1 [mm]	Ø D2 [mm]	Thread size × length	Screw tightening torque [Nm]	Moment of inertia [kgmm²]	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

11.4.6.2 Sprocket

Fig. 11.18: Sprocket for linear modules HM-B, linear tables HT-B and cantilever axes HC-B

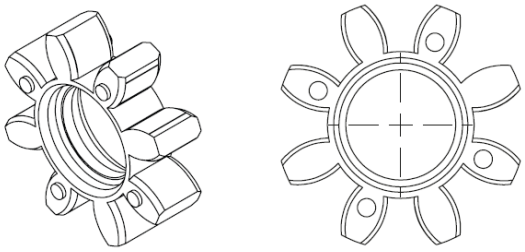


Table 11.11: Article number for sprocket

Linear axis	Model	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

11.4.6.3 Clamping hub

Coupling element for the motor side.

Fig. 11.19: Clamping hub for linear modules HM-B, linear tables HT-B and cantilever axes HC-B

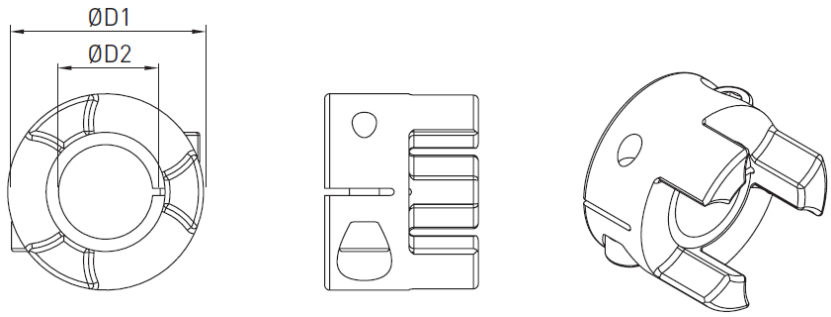


Table 11.12: Article numbers and specifications of clamping hub

Axis type/ size	Model	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
			16	M4 × 12	4,0	6,11	28,0	25-002610
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	Model	Ø D1 [mm]	Ø D2 H7 [mm]	Thread size × length	Screw tightening torque [Nm]	Moment of inertia [Nm]	Frictional torque [Nm]	Article number
			19	M6 × 16	14,0	14,71	77,1	25-002412
HM060B, HC060B	Size 19	39,5	20	M6 × 16	14,0	14,58	81,2	25-002413
			22	M5 × 16	10,0	13,95	71,5	25-002414
			24	M5 × 16	10,0	13,52	75,6	25-002415
HM080B, HT150B, HC080B	Size 24	54,5	11	M6 × 20	15,0	53,30	46,0	25-002456
			14	M6 × 20	15,0	53,20	58,0	25-002416
			16	M6 × 20	15,0	53,10	66,0	25-002417
			19	M6 × 20	15,0	52,80	78,0	25-002418
			20	M6 × 20	15,0	52,70	82,0	25-002419
			22	M6 × 20	15,0	52,30	90,0	25-002420
			24	M6 × 20	15,0	51,90	98,0	25-002422
			25	M6 × 20	15,0	51,60	102,0	25-002423
			28	M6 × 20	15,0	50,50	114,0	25-002424
			32	M6 × 20	15,0	48,50	130,0	25-002425
HM120B, HT200B, HT250B, HC100B	Size 28	64,5	16	M8 × 25	35,0	125,45	130,0	25-002426
			19	M8 × 25	35,0	125,11	152,5	25-002427
			20	M8 × 25	35,0	124,95	160,0	25-002428
			22	M8 × 25	35,0	124,55	175,0	25-002429
			24	M8 × 25	35,0	124,02	190,0	25-002430
			25	M8 × 25	35,0	123,70	197,5	25-002431
			28	M8 × 25	35,0	122,47	220,0	25-002432
			32	M8 × 25	35,0	120,08	240,0	25-002433
			35	M8 × 25	35,0	117,59	262,5	25-002434
			38	M8 × 25	35,0	118,33	285,0	25-002435

12 Appendix 2: Accessories

Our products are always subject to technical changes and improvements. To avoid incorrect deliveries of spare parts and accessories or to order parts without part numbers, please always quote the serial number of the linear axes when ordering. You will find this on the type plate of the axis.

12.1 Clamping profiles

With the help of clamping profiles, the linear axis is attached to the machine frame from above. The clamping profiles can be swivelled laterally into the profile groove of the axis. The required number of clamping profiles per axis depends on the axis length and the load and can be found in sections 6.2.5 (HM-B/HD) and 6.2.6 (HT-B). Sets containing 4 clamping profiles are available.

Fig. 12.1: Clamping profiles short and long

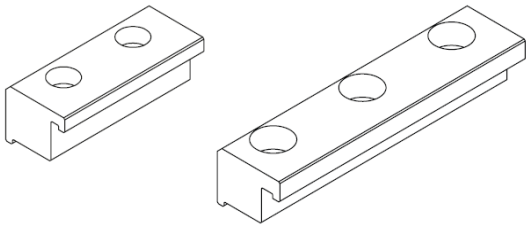


Fig. 12.2: Dimensioned drawing of clamping profile short

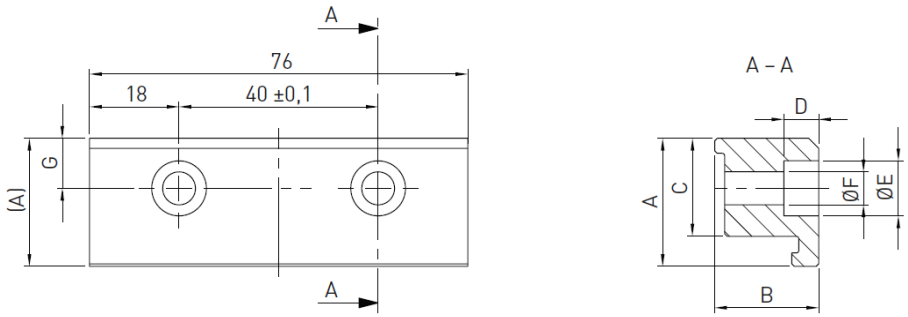


Table 12.1: Article numbers and dimensions of clamping profiles short

Suitable for linear axis	Model	A	B	C	D	Ø E	Ø F	G	Matching screw	Article number, 4 pieces
HM040B, HT100B	Size 5	18,0	10,5	14,1	6,0	10	5,5	6,85	DIN 912 M5	25-000517
HM060B	Size 6	25,6	20,9	19,6	9,5	11	6,6	10,00	DIN 912 M6	25-000518
HT150	Size 6	26,1	15,9	19,6	8,5	11	6,6	10,00	DIN 912 M6	25-001023
HM080B [1], HM120B, HT200B, HT250B	Size 8	28,0	22,0	19,5	8,0	15	9,0	10,00	DIN 912 M8	25-000519

[1] Standard
Unit: mm

Fig. 12.3: Dimensioned drawing of clamping profile long

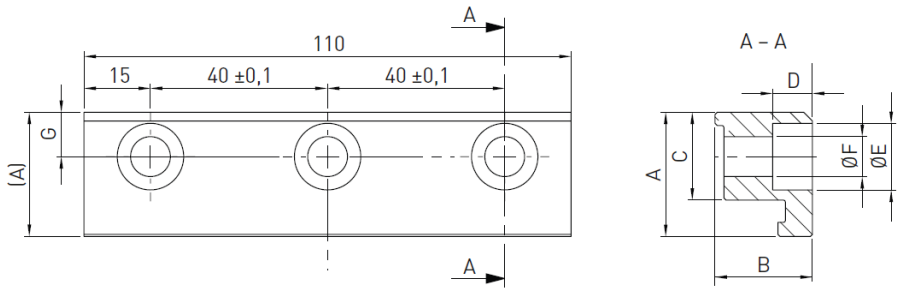


Table 12.2: Article numbers and dimensions of clamping profiles long

Suitable for linear axis	Model	A	B	C	D	Ø E	Ø F	G	Matching screw	Article number, 4 pieces
HM080B, HM120B [1], HT200B [1], HT250B [1]	Size 8	28,0	22,0	19,5	8,0	15,0	9,0	10,0	DIN 912 M8	25-000520

[1] Standard
Unit: mm

12.2 T nut

T nut for force-fit mounting of the linear axis. Flexible fastening option via the grooves on the side and underside of the axis profile. The required number of T nuts per axis depends on the axis length and the load and can be found in sections 6.2.3 (HM-B/HD) and 6.2.4 (HT-B). Sets containing 10 T nuts are available.

Fig. 12.4: Dimensioned drawing of T nut

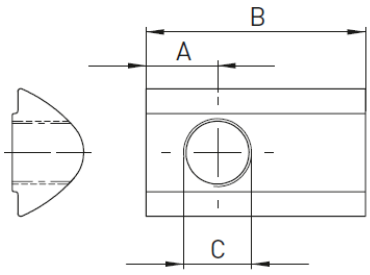


Table 12.3: Article numbers and dimensions of T nut

Suitable for linear axis	Model	A	B	C	Article number, 10 pieces
HM040B, HT100B	Size 5 M4	3,5	12,0	M4	20-000528
HM040B, HT100B [1]	Size 5 M5	3,5	12,0	M5	20-000529
HM060B, HT150B	Size 6 M5	4,5	17,0	M5	20-000530
HM060B, HT150B [1]	Size 6 M6	5,5	17,0	M6	20-000531
HM080B, HM120B, HT200B, HT250B, HC100B	Size 8 M5	7,5	23,0	M5	20-000532
HM080B, HM120B, HT200B, HT250B, HC100B	Size 8 M6	6,5	23,0	M6	20-000533
HM080B, HM120B, HT200B, HT250B [1], HC100B	Size 8 M8	7,5	23,0	M8	20-000534

[1] Preferred type for axis mounting
Unit: mm

12.3 Centring sleeve

Centring sleeves for insertion into the mounting holes of the carriage for exact and reproducible load pick-up. Sets containing 10 centring sleeves are available.

Fig. 12.5: Dimensioned drawing of centring sleeve

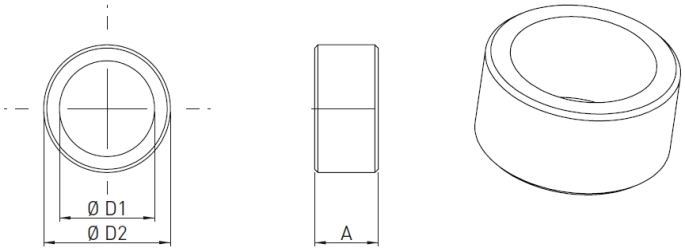


Table 12.4: Article numbers and dimensions of centring sleeve

Suitable for linear axis	A	Ø D1	Ø D2	Article number, 10 pieces
HC025B	4	4,5	6 h6	25-002195
HM040B, HM060B, HT100B, HT150B, HC040B, HC060B	4	6,5	8 h6	25-000511
HM080B, HT200B, HC080B	4	9,0	12 h6	25-000512
HM120B, HT250B, HC100B	4	11,0	15 h6	25-000513

Unit: mm

12.4 Groove cover

Groove cover for covering mounting groove. Length: 2 m. Sets of 5 groove covers are available.

Fig. 12.6: Groove cover for linear modules HM-B, linear tables HT-B and cantilever axes HC-B

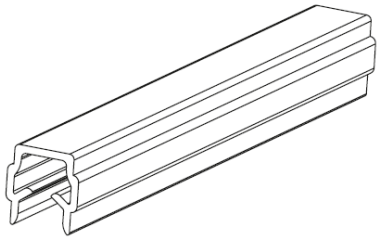


Table 12.5: Article number for groove covers

Suitable for linear axis	Model	Article number, 5 pieces
HM040B, HT100B, HC040B, HC060B	Size 5	25-000514
HM060B, HT150B, HC080B	Size 6	25-000515
HM080B, HM120B, HT200B, HT250B, HC100B	Size 8	25-000516

12.5 Limit switch

Inductive proximity switch, available in either a normally closed or a normally open version. The switch can be fixed directly in the switch profile groove with a screw (M3 × 12) and square nut (DIN 562 M3). By default, the limit switch is available with plug or open cable end. Set including mounting material.

Fig. 12.7: Limit switch for linear modules HM-B, linear tables HT-B and cantilever axes HC-B

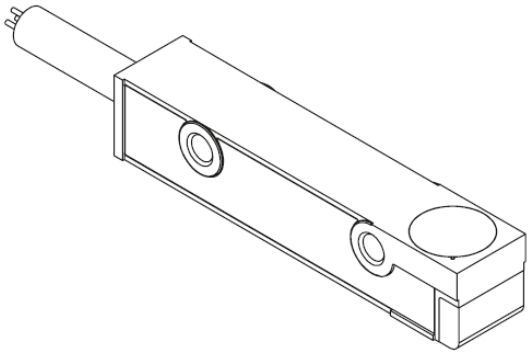


Table 12.6: Options for limit switch

Suitable for linear axis	Option	Article number
HM, HT, HC040B, HC060B, HC080B, HC100B, HD, HS	Limit switch with 100 mm cable, plug (NC contact)	25-000786
HM, HT, HC040B, HC060B, HC080B, HC100B, HD	Limit switch with 100 mm cable, plug (NO contact)	25-002766
HM, HT, HC040B, HC060B, HC080B, HC100B, HD	Limit switch with 4 m cable (NC contact)	25-000787
HM, HT, HC040B, HC060B, HC080B, HC100B, HD	Limit switch with 5 m cable (NO contact)	25-000788
HC025B	Limit switch with 200 mm cable, plug (NC contact)	25-002204
HC025B	Limit switch with 2 m cable (NC contact)	25-002205

For more information, see section 4.4 on page 34.

12.6 Extension cable for limit switch

Cable with 3-pin M8 round connector on the limit switch side and open wires at the other end of the cable.

Fig. 12.8: Extension cable for limit switch

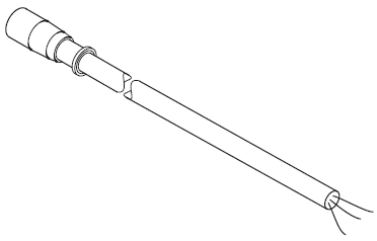


Table 12.7: Extension cable for limit switch

Length [m]	Max. cable diameter d [mm]	Min. static bending radius [mm]	Min. dynamic bending radius [mm]	Article number
3	4,5	13,5	18,0	8-10-0275
5	4,5	13,5	18,0	8-10-0276
7	4,5	13,5	18,0	8-10-0277
10	4,5	13,5	18,0	8-10-0278
15	4,5	13,5	18,0	8-10-0279

12.7 Damping element

The damping element is used to switch the limit switch in the two carriage end positions (at stroke 0 and stroke max.). It can be mounted on the left or right of the carriage. Set including mounting material.

Fig. 12.9: Damping element for linear modules HM-B and linear tables HT-B

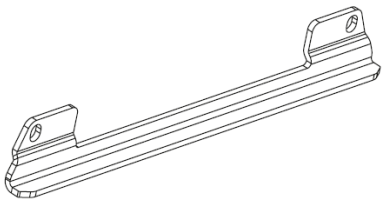


Fig. 12.10: Damping element for cantilever axes HC-B

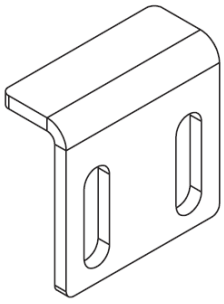


Table 12.8: Article numbers for damping element

Suitable for linear axis	Article number
HM, carriage type E	25-001999
HM, carriage type S, M, L	25-000785
HT	25-001031
HC025B	25-002196
HC040B	25-002197
HC060B, HC080B	25-002198
HC100B	80056513

12.8 HIWIN MAGIC distance measuring system

Magnetic distance measuring system consisting of encoder (with 5.000 mm cable length and open cable end).

Fig. 12.11: HIWIN MAGIC encoder

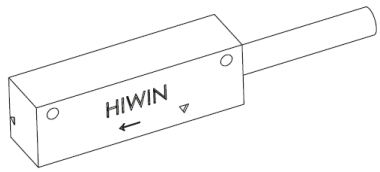


Table 12.9: MAGIC encoder

Encoder	Order code	Article number
MAGIC encoder analogue	MAGIC-T-AM5000L	8-08-0120
MAGIC encoder digital	MAGIC-T-DM5000L	8-08-0122

For further information, see section 4.5 on page 36.

Fig. 12.12: HIWIN MAGIC magnetic tape

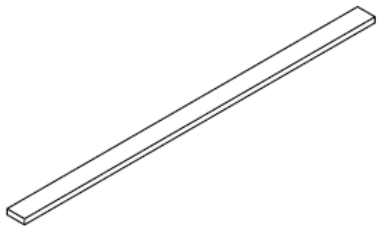


Table 12.10: MAGIC magnetic tape

Magnetic scale	Order code
MAGIC magnetic tape	MAGIC-PS-B-XXXX [1)]

[1)] XXXX = Length [mm]

12.9 Cover strip

The steel cover strip is available in lengths of 3 m and 6 m. Individual lengths on request.

Fig. 12.13: Cover strip

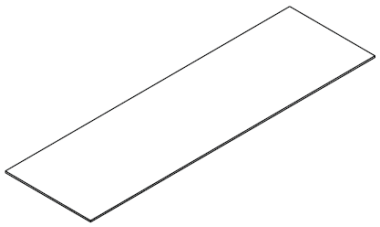


Table 12.11: Cover strip article numbers

Suitable for linear axis	Article number (3 m)	Article number (6 m)
HM040B	25-000535	25-000536
HM060B	25-000537	25-000538
HM080B	25-000539	25-000540
HM120B	25-000541	25-000542
HT100B	25-001187	25-001191
HT150B	25-001188	25-001192
HT200B	25-001189	25-001193
HT250B	25-001190	25-001194

12.10 Magnetic strip

The magnetic strip is used to hold down the cover strip and is available in a length of 7,5 m.

Fig. 12.14: Magnetic strip

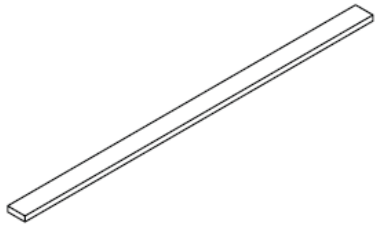


Table 12.12: Magnetic strip article numbers

Suitable for linear axis	Article number (7,5 m)
HM040B	25-001841
HM060B, HM080B, HM120B, HT100B	25-000543
HT150B, HT200B	25-001195
HT250B	25-001196

12.11 Cover strip deflection for linear modules HM-B

The cover strip deflection set includes the following parts:

2 cover strip deflections with

- 2 × deflector housing
- 2 × strip guide
- 4 × cylinder head screw
- 4 × square nut (not applicable for HM040B)

Fig. 12.15: Cover strip deflection for linear modules HM-B

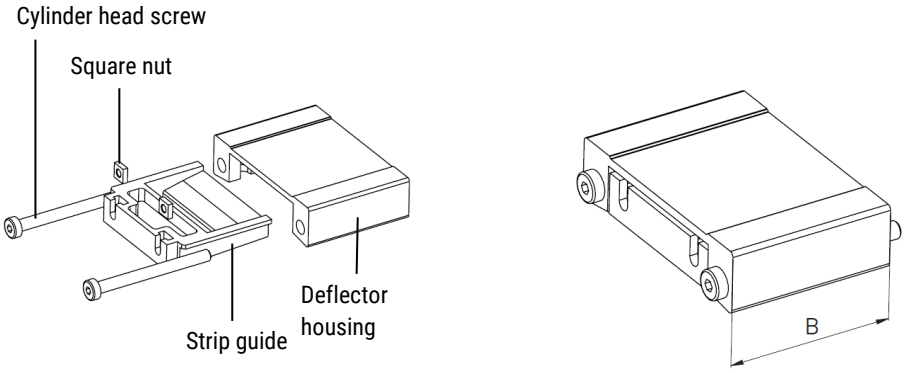


Table 12.13: Article numbers for cover strip deflection set for linear modules HM-B

Suitable for linear module	B [mm]	Cylinder head screw	Square nut	Article number
HM040B	40	DIN 7984 M4 × 30	–	25-000618
HM060B	40	DIN 7984 M4 × 45	DIN 562 M3	25-000619
HM080B	45	DIN 7984 M5 × 45	DIN 562 M3	25-000620
HM120B	60	DIN 912 M5 × 45	DIN 562 M4	25-000621

12.12 Cover strip deflection for linear tables HT-B

The cover strip deflection set includes the following parts:

- 8 × strip guide
- 16 × cylinder head screw

One cover strip deflection set is required per carriage.

Fig. 12.16: Cover strip deflection for linear tables HT-B

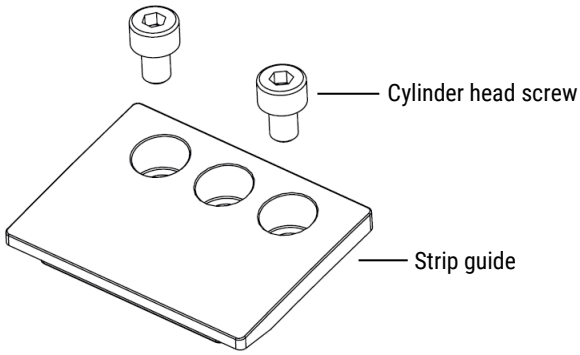


Table 12.14: Article numbers for cover strip deflection set for linear tables HT-B

Suitable for linear table	Cylinder head screw	Article number
HT100B	DIN 7984 M3 × 5	25-001203
HT150B	DIN 912 M4 × 6	25-001204
HT200B	DIN 912 M4 × 6	25-001205
HT250B	DIN 6912 M5 × 8	25-001206

12.13 Cover strip guide

Strip guide for additional guidance of the cover strip for longer axes. The set consists of two strip guides (enough for one carriage) including fastening material.

Fig. 12.17: Cover strip guide

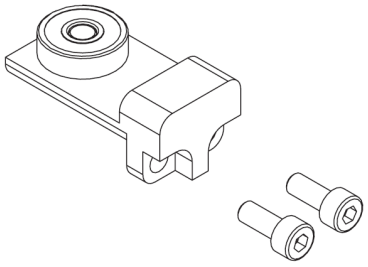


Table 12.15: Article numbers for cover strip guide

Suitable for linear axis	Article number
HT100B	25-002870
HT150B	25-002586
HT200B	25-002636
HT250B	25-002632

12.14 Stop buffer

The stop buffer serves as a mechanical limit.

Fig. 12.18: Stop buffer

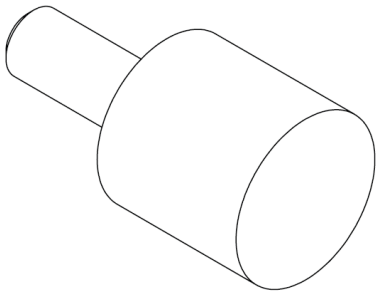


Table 12.16: Article numbers for stop buffers

Suitable for linear axis	Article number
HM040B	25-000055
HM060B	25-000056
HM080B	25-000057
HM120B	25-000059
HT100B	25-000653
HT150B, HT200B	8-13-0007
HT250B	8-13-0008
HC025B	22-002044
HC040B	25-000055
HC060B	25-000056
HC080B	25-000057
HC100B	8-13-0007

12.15 Pneumatic connection

Pneumatic connection (push-in fitting) for actuating the clamping or braking element. The blind plug is used to close off the hole on the opposite side of the drive block.

Fig. 12.19: Push-in fitting and blind plug

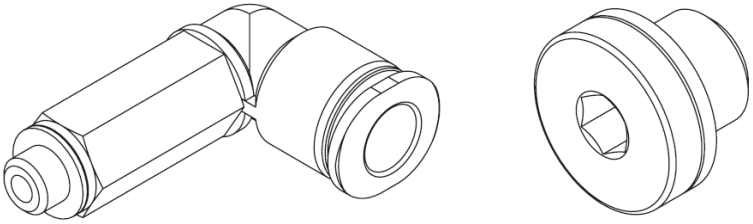


Table 12.17: Article number of pneumatic connection for the clamping/braking element

Suitable for linear axis	Article number
HC060B/HC080B/HC100B	8-16-0150

12.16 Partitions for energy chain

Partitions for separating cables in the energy chain By default, the energy chain is equipped with a partition in every second chain link. Additional partitions are available in a set of 20.

Fig. 12.20: Partition for energy chains

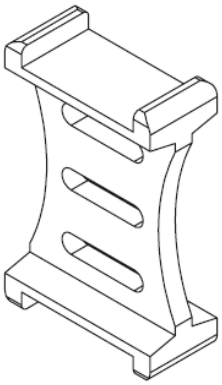


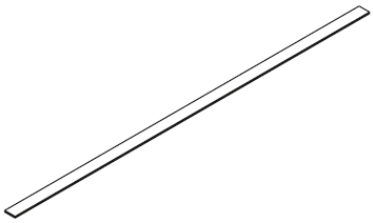
Table 12.18: Article numbers for partition

Suitable for linear table				Article number, 20 pcs.
HS (X-axis)	HS (Y-axis)	HS (Z-axis)	HT-B	
–	–	31, L1	–	8-05-0393
21, 31, L1, L2, L3, L4	21, 22, 23, 24, 31, 32, 33, 34	32, 33, 34, L2, L3, L4	100	8-05-0336
22, 23, 24, 32, 33, 34	–	–	150, 200, 250	8-05-0337

12.17 Tape for reduction of noise emissions from the energy chain

Cellular rubber tape, self-adhesive on one side, for attachment to the contact surface of the energy chain in order to reduce noise emissions. Suitable for all linear axes HT-B and HS with energy chain.
10 m roll
Article number: 25-002485

Fig. 12.21: Tape for reduction of noise emissions from the energy chain



12.18 Cover for drive block

Cover strip for closing off inputs and outputs which are not required on the linear axes with toothed belt drive HM-B and HT-B and cantilever axes HC-B. Set including fasteners.

Fig. 12.22: Cover for drive block

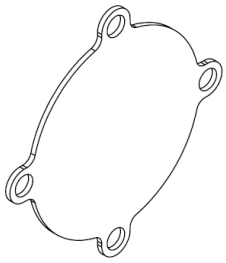


Table 12.19: Article numbers, drive block cover plate

Suitable for linear axis	Article number
HC025B	25-002379
HM040B, HC040B	25-002375
HM060B, HC060B	25-002376
HM080B, HC080B	25-002377
HM120B, HC100B	25-002378
HT100B	25-002372
HT150B	25-002373
HT200B, HT250B	25-002374

12.19 Journal for linear axis HM-B and cantilever axes HC-B

The journal can be clamped to each side of the drive wheel. It can be used to adapt the input/output, the synchronous drive, the encoder attachment, etc.

Fig. 12.23: Journal dimensions

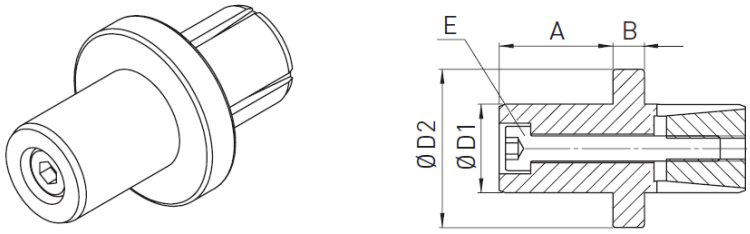


Table 12.20: Article numbers and dimensions of journals

Linear axis	A [mm]	B [mm]	E (screw)	Ø D1 [mm]	Ø D2 [mm]	Screw tightening torque [Nm]	Mass moment of inertia [kg mm²]	Transmittable torque (arithmetic) [Nm]	Article number
HC025B	12	5,5	ISO 4762 M4 × 25	12 h7	17 h9	2,9	0,24	7,7	25-002514
HM040B, HC040B	18	5,0	ISO 4762 M4 × 30	14 h7	25 h9	4,5	1,21	17,0	25-000174
HM060B, HC060B	22	8,0	ISO 4762 M6 × 45	20 h7	32 h9	10,0	5,37	36,0	25-000175
HM080B, HC080B	30	8,0	ISO 4762 M8 × 55	25 h7	45 h9	25,0	17,70	81,0	25-000176
HM120B, HC100B	30	10,0	ISO 4762 M10 × 60	32 h7	55 h9	55,0	55,70	213,0	25-000177

12.20 Toothed belt for linear axes HM-B, linear tables HT-B and cantilever axes HC-B

Fig. 12.24: Toothed belt

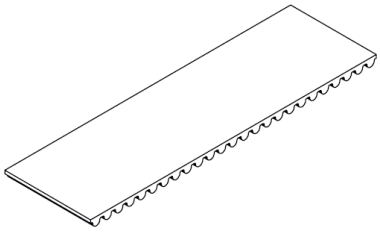


Table 12.21: Article numbers for toothed belt

Suitable for linear axis	Article number (1,5 m)	Article number (6 m)	Article number (12 m)
HM040B	–	25-000527	25-000528
HM060B	–	25-000529	25-000530
HM080B	–	25-000531	25-000532
HM120B	–	25-000533	25-000534
HT100B	–	25-000529	25-000530
HT150B	–	25-001197	25-001200
HT200B	–	25-001198	25-001201
HT250B	–	25-001199	25-001202
HC025B	25-002314	–	–
HC040B	25-002315	–	–
HC060B	–	25-002316	25-002511
HC080B	–	25-001197	25-001200
HC100B	–	80064290	–

12.21 Drive unit for linear axes HM-B, linear tables HT-B and cantilever axes HC-B

Drive unit for belt drive axes consisting of toothed belt wheel and ball bearing

Fig. 12.25: Drive unit

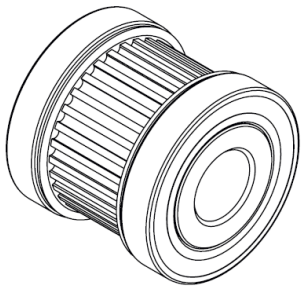


Table 12.22: Article numbers for drive unit

Suitable for linear axis	Article number
HM040B	25-000115
HM060B	25-000116
HM080B	25-000117
HM120B	25-000118
HT100B	25-000692
HT150B	25-000693
HT200B	25-000694
HT250B	25-000695
HC025B	25-001938
HC040B	25-001939
HC060B	25-001940
HC080B	25-001941
HC100B	80040231

12.22 Synchronous shaft

The synchronous shaft is used on double axes to transmit the drive torque from the driven axis to the rotating axis. In addition to the actual synchronous shaft, the set also includes the coupling elements and the adaptation material.

Fig. 12.26: Dimensions of synchronous shaft

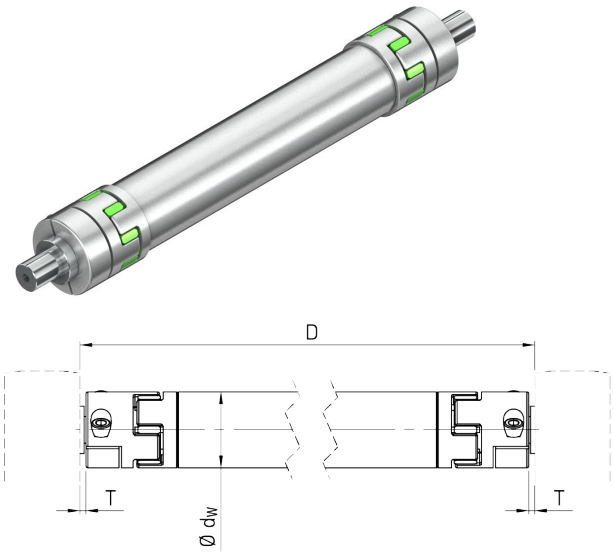


Table 12.23: Dimensions of synchronous shaft

Suitable for double axis	D min.	D max.	T	Ø shaft	Ø ds
HD1/HM040B	160	1.500	3,2	40	14
HD2/HM060B	186	2.000	7,2	50	20
HD3/HM080B	200	2.400	14,2	50	25
HD4/HM120B	256	3.000	5,7	80	35

Unit: mm

12.22.1 Order code for synchronous shaft

Number		1	2	3	4
Order code		HZS	50	-HM060B	1000
1	HZS	HIWIN synchronous shaft			
2	50	Shaft diameter [mm]: 40 50 80			
3	-HM060B	Axis size: HM040B HM060B HM080B HM120B			
4	1000	Centre distance D [mm]			

12.22.2 Sprocket for synchronous shaft

Fig. 12.27: Sprocket for synchronous shaft

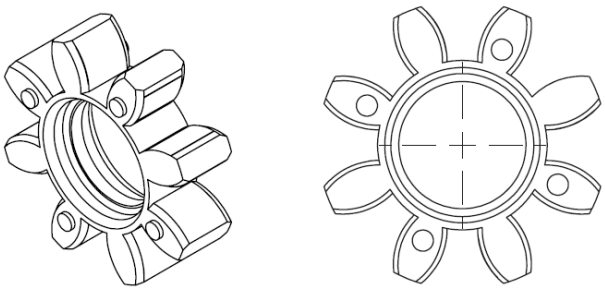


Table 12.24: Article numbers for sprocket for synchronous shaft

Linear axis	Suitable for synchronous shaft	Article number
HD1/HM040B	HZS40HM040B	25-000713
HD2/HM060B	HZS50HM060B	25-000714
HD3/HM080B	HZS50HM080B	25-000714
HD4/HM120B	HZS80HM120B	25-000712

12.22.3 Spacer

The spacer is required when the synchronous shaft is not installed horizontally to prevent metal-on-metal contact in the lower coupling.

Fig. 12.28: Spacer

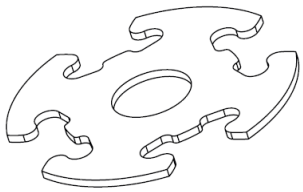


Table 12.25: Article numbers for spacer

Suitable for double axis	Suitable for synchronous shaft	Article number
HD1/HM040B	HZS40HM040B	25-000730
HD2/HM060B	HZS50HM060B	25-000731
HD3/HM080B	HZS50HM080B	25-000731
HD4/HM120B	HZS80HM120B	25-000733

12.23 HIWIN lubricants

Table 12.26: Recommended HIWIN grease

Grease type	Area of application	Unit of measure	Article number
G04	High velocity	Cartridge 400 g	20-000345

Table 12.27: Recommended HIWIN grease gun

Article number	Description	Scope of delivery	Comment
20-000333	Grease gun type GN-400C including set of lubrication adapters and nozzles (see Fig. 12.29)	Grease gun type GN-400-C consisting of: ○ Grease gun ○ Hydraulic gripping coupling A1 suitable for conical grease nipples according to DIN 71412, outer diameter 15 mm ○ Hollow mouthpiece A2 for conical and ball grease nipples to DIN 71412/DIN 3402, outer diameter 10 mm ○ Set of lubrication adapters and nozzles	Suitable for 400 g cartridge or direct filling

Fig. 12.29: Grease gun GN-400C

12.24 HIWIN grease nipple

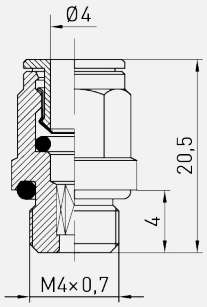
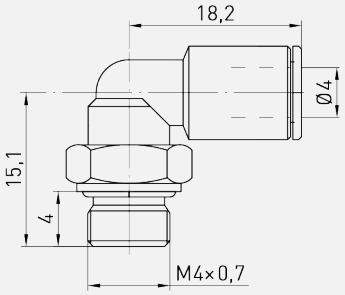
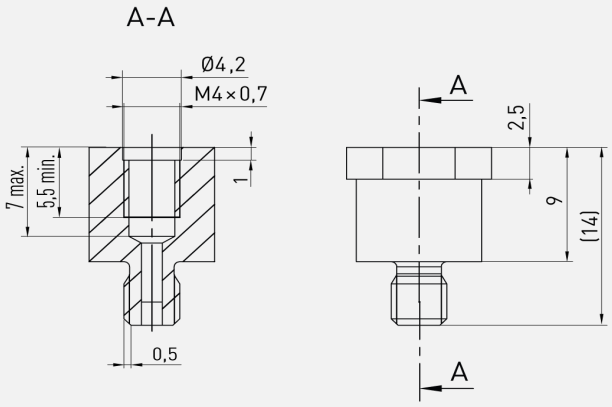
Grease nipple suitable for HM, HT and HC, all sizes, all drive types.

Table 12.28: Grease nipple M4 × 0,7

Article number	Linear axes HM	Linear axes HT	Cantilever axes HC	Figure
20-000325	Standard	Standard: HT100B Option: HT150B, HT200B, HT250B	Standard	
20-000538	Option	Standard: HT150B, HT200B, HT250B Option: HT100B	Option	
20-000272	Option	Option	Option	

12.25 Lubrication connectors and push-in fittings

Table 12.29: Lubrication connectors and push-in fittings

Article number	Model	Figure
8-12-0186	Push-in fitting, straight Ø 4	
20-002116	Push-in fitting, angled Ø 4	
20-002108	Lubrication adapter M4/M4 for extension of the push-in fittings to prevent collisions (e.g. damping element)	

13 Installation certificate

In terms of EC Machinery Directive 2006/42/EC, Appendix II 1. B for incomplete machines

The manufacturer: HIWIN GmbH, Brücklesbünd 1, 77654 Offenburg, Germany

Documentation department: HIWIN GmbH, Brücklesbünd 1, 77654 Offenburg, Germany

Description and identification of the incomplete machine:

Product:	Linear axes and linear axis systems HX
Type:	HM040B, HM060B, HM080B, HM120B HT100B, HT150B, HT200B, HT250B HC025B, HC040B, HC060B, HC080B, HC100B HD1..., HD2..., HD3..., HD4... HS21..., HS22..., HS23..., HS24... HS31..., HS32..., HS33..., HS34... HSL1..., HSL2..., HSL3..., HSL4...
Year of manufacture:	from 2020

We hereby declare that the machine satisfies the following fundamental provisions of the Machinery Directive 2006/42/EC:

1.1.3, 1.1.5, 1.3.3, 1.3.4, 1.3.7, 1.3.9, 1.5.1, 1.5.8, 1.5.9, 1.6.2, 1.5.5, 1.1.2, 1.3.2, 1.5.4

We also declare that the specialist technical documents have been produced in accordance with appendix VII, part B.
We expressly declare that the incomplete machine satisfies all of the applicable provisions of the following EC directives.

2006/42/EC	Machinery Directive
2014/30/EU	Electromagnetic Compatibility (EMC)
2011/65/EU	RoHS Directive on the restriction of hazardous substances

Reference of the harmonised standards applied in accordance with Article 7(2)

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 60204-1:2006/AC:2010	Safety of machinery – Electrical equipment of machines – Part 1: General requirements

The manufacturer or its agents undertake to provide the specialist documents on the incomplete machine to authorised organisations in the individual member states upon request.

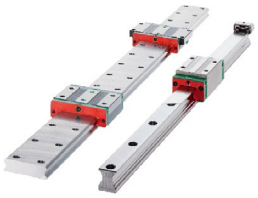
Commercial copyrights remain unaffected.

Important note: The incomplete machinery may not be put into operation until it has been ascertained that the machinery into which this incomplete machinery is to be incorporated is in conformity with this Directive.

Offenburg, 01/03/2019

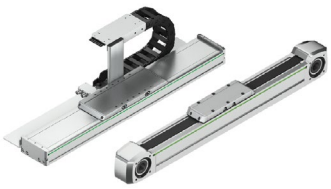
Werner Mäurer, Management

We live motion.

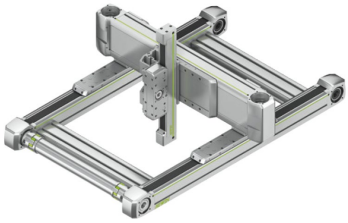


Linear guideways

Ballscrews



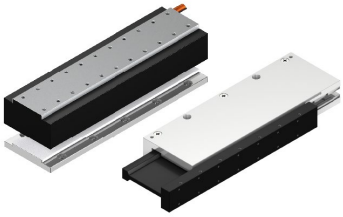
Linear axes



Linear axis systems

Torque motors

Robot



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