

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

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General information

1. General information

1.1 About these assembly instructions

These assembly instructions are intended for planners, developers and operators of systems who plan for and install linear modules HM-B (with toothed belt drive), linear tables HT-B (with toothed belt drive), cantilever axes HC, double axes HD (with toothed belt drive) and/or multi-axis systems HS as machine elements. They are also intended for persons who perform the following tasks in connection with the above mentioned axes:

- Transportation
- Assembly
- Electrical connection including connection to the higher-level control system
- Integration into a security system
- Retrofitting or upgrading
- Setup
- Commissioning
- Operation
- Maintenance
- Cleaning
- Troubleshooting and error elimination
- Shutdown, disassembly and disposal

1.1.1 Version management

Table 1.1 **Version management**

Version	Date	Notes
01-1	November 2020	Three-axis system HS3 added
01-0	July 2020	Initial creation of this document: Original document "HMB_HTB_HD_HS-01-0-EN-1905-MA": cantilever axis HC-B added

1.1.2 Requirements

We assume that

- ➔ operating personnel are trained in the safe operation practices for linear axes HM-B/HT-B, cantilever axes HC, double axes HD and/or multi-axis systems HS and have read and understood these assembly instructions in full;
- ➔ maintenance personnel maintain and repair the linear axes HM-B/HT-B, cantilever axes HC, double axes HD and/or multi-axis systems HS in such a way that they pose no danger to people, property or the environment.

1.1.3 Availability

These assembly instructions must remain constantly available to all persons who work with or on the linear axes HM-B/HT-B, cantilever axes HC, double axes HD and/or multi-axis systems HS.

1.2 Depictions used in these assembly instructions

1.2.1 Instructions

Instructions are indicated by triangular bullet points in the order in which they are to be carried out. Results of the actions carried out are indicated by ticks.

Example:

- ▶ Produce appropriate mounting holes on the mounting surface if not already present.
- ▶ Clean mounting surface and position linear axis on it
- ▶ With the help of T nuts and clamping profiles fix the linear axis.

✓ Linear axis is mounted.

1.2.2 Lists

Lists are indicated by bullet points.

Example:

Linear axes must not be operated:

- Outdoors
- In potentially explosive atmospheres
- ...

1.2.3 Depiction of safety notices

Safety notices are always indicated using a signal word and sometimes also a symbol for the specific risk (see Section [1.2.4](#), "Symbols used").

The following signal words and risk levels are used:

 DANGER!
Imminent danger! Noncompliance with the safety notices will result in serious injury or death!
 WARNING!
Potentially dangerous situation! Noncompliance with the safety notices runs the risk of serious injury or death!
 CAUTION!
Potentially dangerous situation! Noncompliance with the safety notices runs the risk of slight to moderate injury!
ATTENTION!
Potentially dangerous situation! Noncompliance with the safety notices runs the risk of damage to property or environmental pollution!

General information

1.2.4 Symbols used

The following symbols are used in these assembly instructions and on the linear axes:

Table 1.2 **Warning signs**

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

Table 1.3 **Mandatory signs**

	Wear protective gloves!		Wear hearing protection!
	Wear safety goggles!		Isolate before work!

1.2.5 Information

NOTE

Describes general information and recommendations.

1.3 Warranty and liability

The manufacturer's "General conditions of sale and delivery" apply.

1.4 Manufacturer's details

Table 1.4 **Manufacturer's details**

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

1.5 Copyright

These assembly instructions are protected by copyright. Any reproduction, publication in whole or in part, modification or abridgement requires the written approval of HIWIN GmbH.

1.6 Product monitoring

Please inform HIWIN, the manufacturer of the linear axes HM-B/HT-B, cantilever axes HC, double axes HD and/or multi-axis systems HS of:

- Accidents
- Potential sources of danger in the linear axes
- Anything in these assembly instructions which is difficult to understand

2. Basic safety notices

WARNING!

This chapter serves to ensure the safety of everyone working with linear axes HM-B/HT-B, cantilever axes HC, double axes HD and/or multi-axis systems HS and those who assemble, install, operate, maintain or disassemble them. Non-compliance with the following information results in dangerous working conditions!

2.1 Intended use

The linear axes HM-B/HT-B, cantilever axes HC, double axes HD and/or multi-axis systems HS combine guiding and drive functions in the one compact unit. They are designed for the precise positioning in terms of time and location of fixed mounted loads within an automated system. It is specifically ideal for applications requiring high dynamic responses and precision. Also, with these linear axes and linear axis systems large travel distances can be realised. In the case of vertical assembly, a suitable clamping or braking device must be provided in order to prevent unintended 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 intended purpose as described.

- All linear axis HM-B/HT-B, cantilever axis HC, double axis HD and/or multi-axis system HS sizes are subject to performance limits (see catalogue „Linear Axes and Axis Systems HX“). These performance limits may not be exceeded during operations.
- Linear axes HM-B/HT-B, cantilever axes HC, double axes HD and/or multi-axis systems HS must not be operated in potentially explosive atmospheres.
- The linear axes HM-B/HT-B, cantilever axes HC, double axes HD and/or multi-axis systems HS may only be used and operated indoors.
- The linear axes HM-B/HT-B, cantilever axes HC, double axes HD and/or multi-axis systems HS form part of a complete system. Personal safety must therefore be safeguarded beyond the concept for this complete system.
- Proper use of the linear axes HM-B/HT-B, cantilever axes HC, double axes HD and/or multi-axis systems HS includes observing the assembly instructions and following the maintenance and repair specifications.
- Use of the linear axes HM-B/HT-B, cantilever axes HC, double axes HD and/or multi-axis systems HS for any other purpose shall be considered improper use.

The linear axes HM-B/HT-B, cantilever axes HC, double axes HD and/or multi-axis systems HS are delivered as a system (guiding/drive). Therefore observe the whole documentation for this system. The provided documentation may vary depending on the linear axis type.

2.2 Reasonably foreseeable misuse

Linear axes HM-B/HT-B, cantilever axes HC, double axes HD and/or multi-axis systems HS must not be operated:

- Outdoors
- In potentially explosive atmospheres

2.3 Conversions and modifications

Conversions or modifications to the linear axes HM-B/HT-B, cantilever axes HC, double axes HD and/or multi-axis systems HS are not permitted!

2.4 Residual risks

During normal operation, there are no residual risks associated with the linear axes HM-B/HT-B, cantilever axes HC, double axes HD and/or multi-axis systems HS because they form part of the complete system and the operator must safeguard personal safety beyond the concept for this complete system. Warnings about risks that may arise during maintenance and repair work are provided in the relevant sections.

2.5 Personnel requirements

Only authorised and competent persons may carry out work on the linear axes HM-B/HT-B, cantilever axes HC, double axes HD and/or multi-axis systems HS! They must be familiar with the safety equipment and regulations before starting work (see Table 2.1).

Table 2.1 Personnel requirements

Activity	Qualification
Normal operation	Trained personnel
Cleaning	Trained personnel
Maintenance	Trained specialist personnel of the operator or manufacturer
Repair	Trained specialist personnel of the operator or manufacturer
Transportation	Trained personnel
Assembly	Trained specialist personnel
Disassembly	Trained specialist personnel

2.6 Protective equipment

2.6.1 Personal protective equipment

Table 2.2 Personal protective equipment

Operating phase	Personal protective equipment
Normal operation	No persons may remain at the linear axes HM-B/HT-B, cantilever axes HC, double axes HD and/or multi-axis systems HS during normal operations. Persons near the linear axes HM-B/HT-B, cantilever axes HC, double axes HD and/or multi-axis systems HS must wear the following personal protective equipment depending on the travel speed: – Safety shoes – If necessary, hearing protection
All other operating phases (cleaning, maintenance, resetting, troubleshooting, repair)	The following personal protective equipment is needed for all other operating phases of the linear axes HM-B/HT-B, cantilever axes HC, double axes HD and/or multi-axis systems HS: – Safety shoes – If necessary, safety gloves and safety goggles – If necessary, hearing protection

2.7 Labels on the linear axis system

The linear axes HM-B/HT-B, cantilever axes HC, double axes HD and/or multi-axis systems HS bear the labels depicted in the following.

2.7.1 Type plate

 HIWIN GmbH Brücklesbünd 1 77654 Offenburg	Model No: HM060B155N0755S000ANNN ID-No: 24-12345 S/N: S-123456789 Weight: 5 kg Mfg. date: 2015/03
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Fig. 2.1 Type plate (example only)

3. Description of the linear axes and linear axis systems

3.1 Linear module HM-B

3.1.1 Field of application

HIWIN linear modules HM-B with toothed belt drive are compact, flexible positioning modules. They are specifically ideal for applications requiring high dynamic responses and high speeds.

3.1.2 Ambient conditions

Ambient conditions during operation:

+5 to +40 °C

Relative air humidity during operation:

complying with IEC60721-3-3, Class 3K3, non-condensing

Climatic environmental conditions for transport and storage:

ambient temperature: -20 to +50 °C, non-condensing

Vacuum:

it may not be operated in vacuum

NOTE

Prevent condensation to avoid corrosion of the axis.

3.1.3 Main components

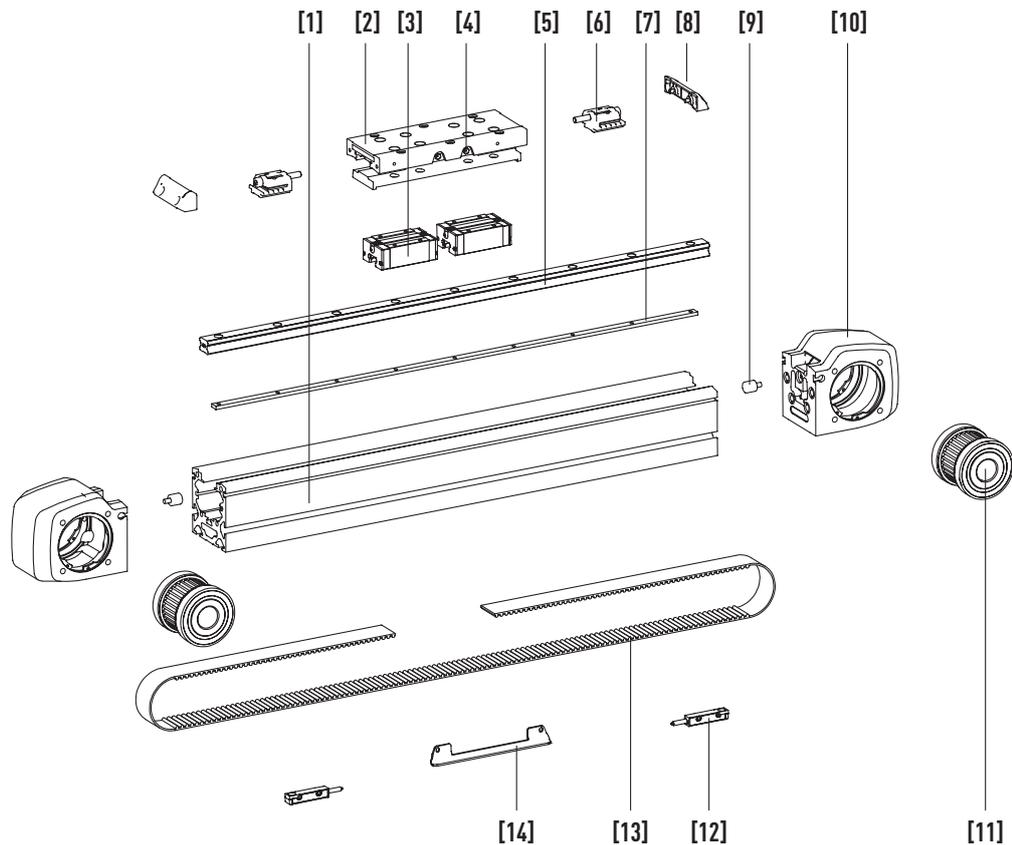


Fig. 3.1 Main components of the linear modules HM-B

Table 3.1 **Description of the main components of the linear modules HM-B**

Pos.	Description	Pos.	Description
1	Axis body of aluminium	8	Carriage end piece
2	Carriage	9	Stopping buffer
3	Block	10	Drive block
4	Grease nipple, 2 grease nipples on each side	11	Toothed belt pulley
5	Profile rail	12	Limit switch
6	Belt tightener	13	Toothed belt
7	Threaded bar	14	Damping element

3.1.4 Functional description

Toothed belt drive linear axes combine guiding and drive functions in the one compact unit. The forces and torques generated by the moving load are transferred through the carriages into the linear guideway. The linear guideway also executes precise linear movements with two blocks per carriage. The movements themselves are executed over a toothed belt that is secured to the carriage and driven by an electric motor acting via a pulley.

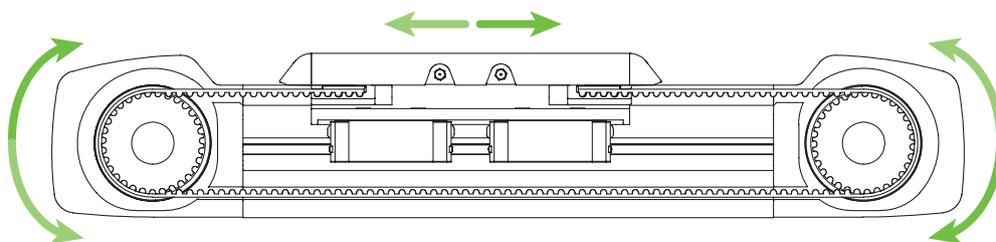
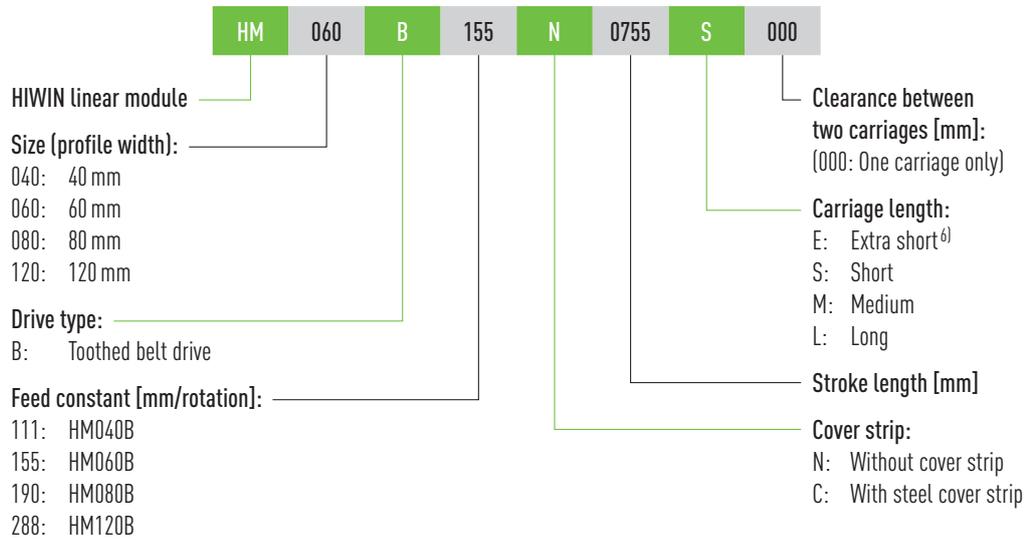


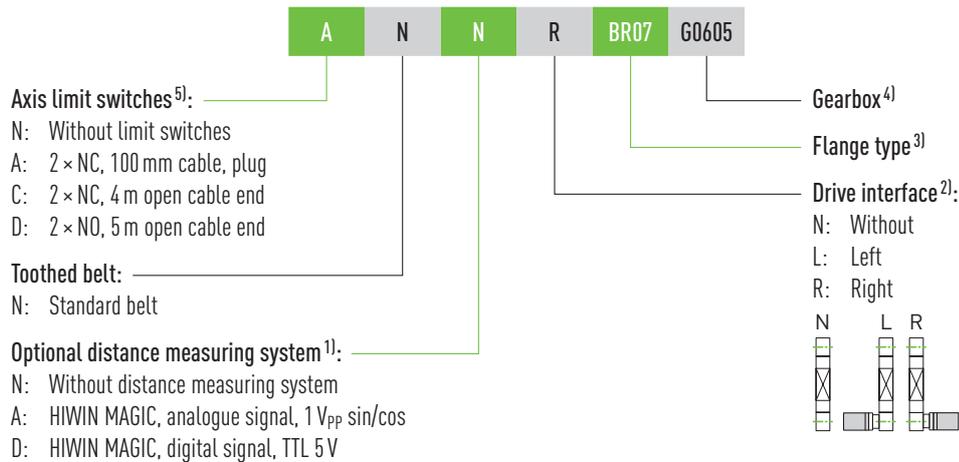
Fig. 3.2 **Functional principle of the linear modules HM-B**

Description of the linear axes and linear axis systems

3.1.5 Order code for linear modules HM-B



Order code for linear modules HM-B (continuation)



¹⁾ Details in Section 4.5 on Page 31 ff. or in the assembly instructions "HIWIN MAGIC Distance Measuring Systems"

²⁾ If no drive interface is selected, the order code ends at this position

³⁾ All flange types can be found in Table 11.1 on Page 132 ff.

If no gear box is selected, the order code ends at this position

⁴⁾ Suitable gearboxes for HIWIN axes can be found in Table 11.9 on Page 155

⁵⁾ Further reference switches on request

⁶⁾ Only available for HM040B

3.2 Linear table HT-B

3.2.1 Field of application

HIWIN linear tables HT-B with toothed belt drive are perfect for transportation tasks requiring high dynamic responses and high speeds. In addition, with the linear tables HT-B large travel distances can be realized. The toothed belt with modern, high performance profiles and reinforced steel tie beams ensures a high and reliable transfer of forces. The numerous options, such as cover strip, limit switch variants, distance measuring system as well as a wide range of gearboxes and adaptation material for all commercially available servomotors, make the linear axis HT-B a flexible positioning module.

3.2.2 Ambient conditions

Ambient conditions during operation:	+5 to +40 °C
Relative air humidity during operation:	complying with IEC60721-3-3, Class 3K3, non-condensing
Climatic environmental conditions for transport and storage:	ambient temperature: -20 to +50 °C, non-condensing
Vacuum:	it may not be operated in vacuum

Prevent forming of condensation to prevent corrosion of the axis.

NOTE

3.2.3 Main components

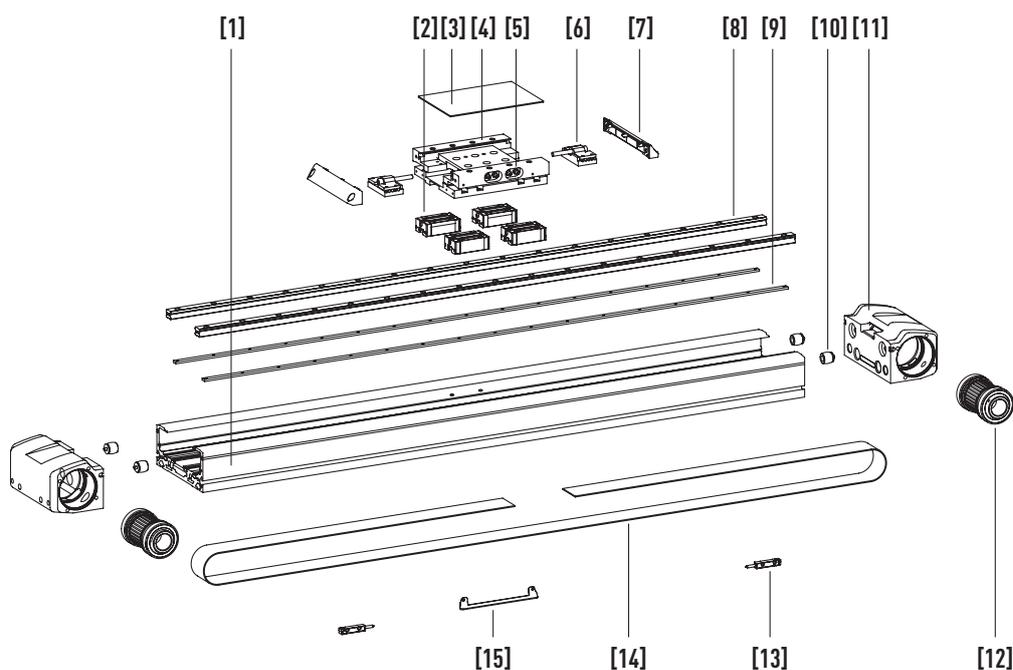


Fig. 3.3 Main components of the linear tables HT-B

Description of the linear axes and linear axis systems

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

Pos.	Description	Pos.	Description
1	Axis body of aluminium	9	Threaded bars
2	Block	10	Stopping buffer
3	Carriage cover	11	Drive block
4	Carriage	12	Toothed belt pulley
5	Grease nipple	13	Limit switch
6	Belt tightener	14	Toothed belt
7	Carriage end piece	15	Damping element
8	Profile rails		

3.2.4 Functional description

Toothed belt drive linear tables combine guiding and drive functions in the one compact unit. The forces and torques generated by the moving load are transferred through the carriages into the linear guideway. The linear guideways also execute precise linear movements with four blocks per carriage. The movements themselves are executed over a toothed belt that is secured to the carriage and driven by an electric motor acting via a pulley.

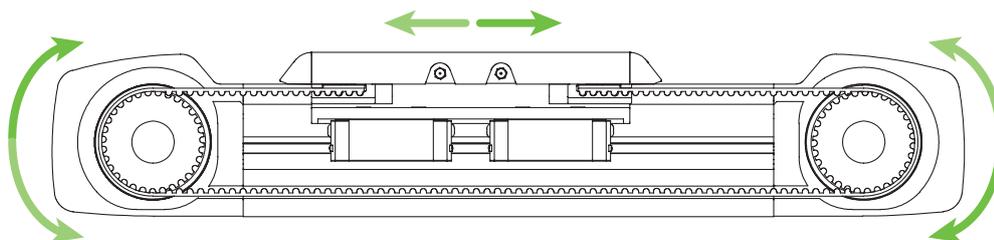
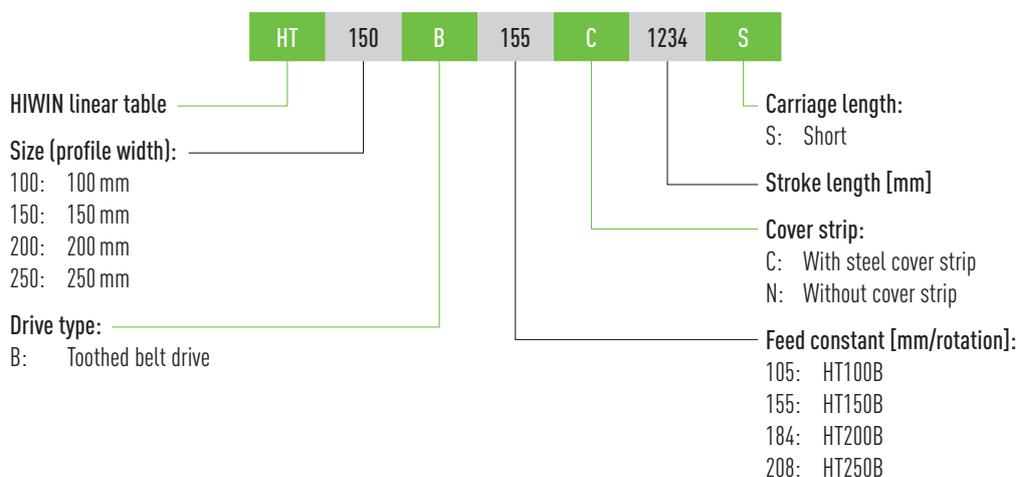
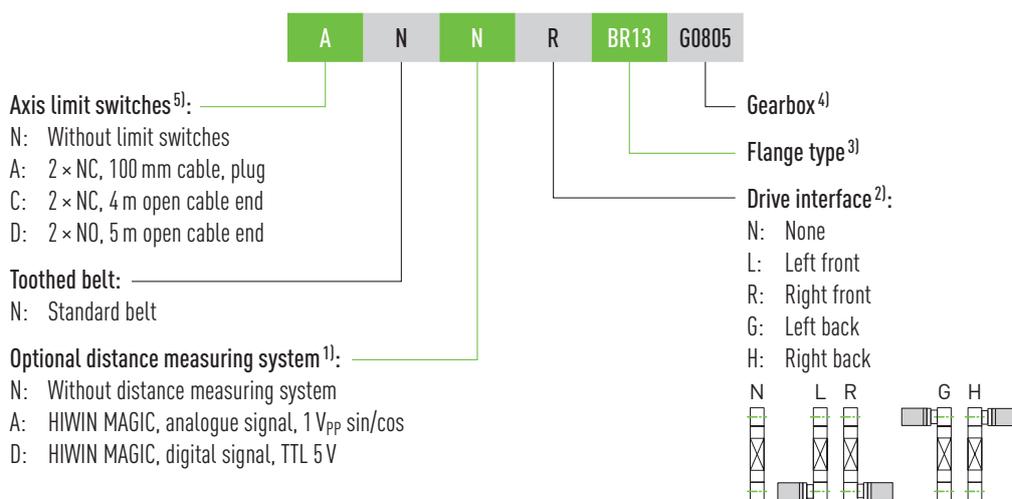


Fig. 3.4 **Functional principle of the linear tables HT-B**

3.2.5 Order code for linear tables HT-B



Order code for linear tables HT-B (continuation)



¹⁾ Details in Section 4.5 on Page 31 ff. or in the assembly instructions “HIWIN MAGIC Distance Measuring Systems”

²⁾ If no drive interface is selected, the order code ends at this position

³⁾ All flange types can be found in Table 11.2 on Page 136 ff.

If no gear box is selected, the order code ends at this position

⁴⁾ Suitable gearboxes for HIWIN axes can be found in Table 11.9 on Page 155

⁵⁾ Further reference switches on request

Description of the linear axes and linear axis systems

3.3 Cantilever axis HC-B

3.3.1 Field of application

HIWIN cantilever axes HC-B are flexible linear units with an Omega belt drive. The compact drive block with motor and gearbox is stationary while the light cantilever beam moves. Due to the sophisticated structure of the aluminium profile, the beam has a high torsional rigidity despite its low weight and is therefore suitable for dynamic applications, especially for vertical installations. The stroke is freely selectable in millimetre increments.

3.3.2 Ambient conditions

Ambient conditions during operation:	+5 to +40 °C
Relative air humidity during operation:	complying with IEC60721-3-3, Class 3K3, non-condensing
Climatic environmental conditions for transport and storage:	ambient temperature: -20 to +50 °C, non-condensing
Vacuum:	it may not be operated in vacuum

NOTE

Prevent condensation to avoid corrosion of the axis.

3.3.3 Main components

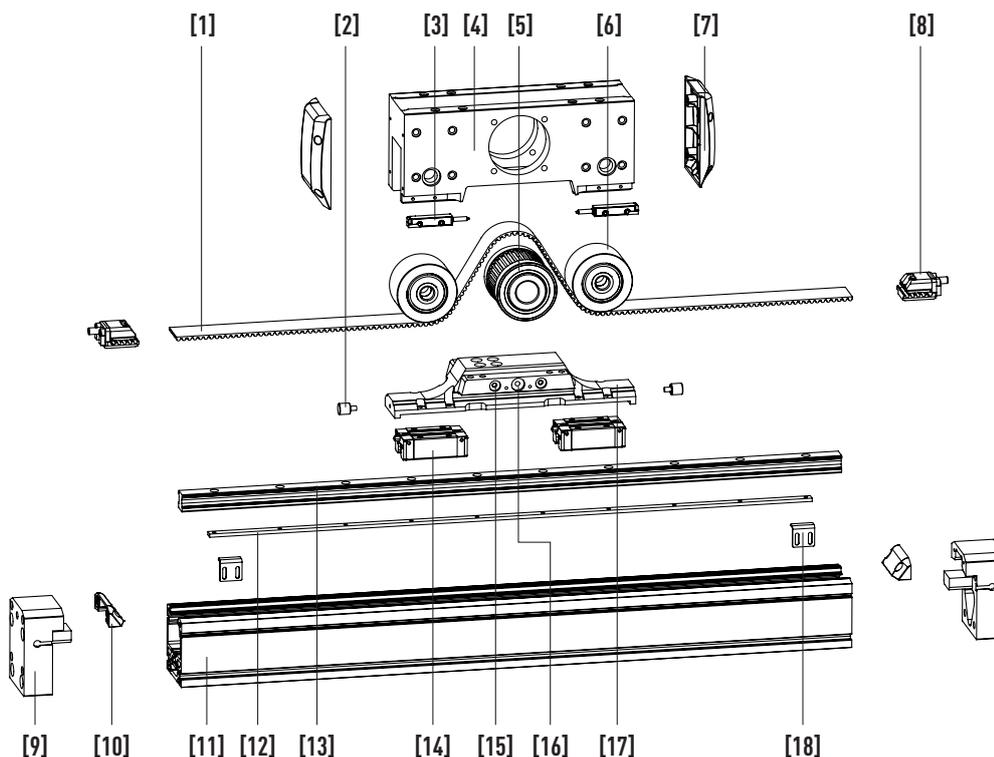


Fig. 3.5 Main components of the cantilever axis HC-B

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

Pos.	Description	Pos.	Description
1	Toothed belt pulley	10	Cover of belt tightener
2	Stopping buffer	11	Axis body of aluminium
3	Limit switch	12	Threaded bar
4	Drive block housing	13	Profile rail
5	Toothed belt pulley	14	Block
6	Deflection pulley	15	Grease nipple, 2 grease nipples on each side
7	End piece of drive block	16	Connection for pneumatic clamping element
8	Belt tightener	17	Lower part of drive block
9	End plate	18	Damping element

3.3.4 Functional description

The cantilever axis HC-B is a linear unit in which the drive block is stationary while the lightweight beam moves. Linear guideways with two blocks transfer forces and torques reliably from the beam into the drive block. The movements themselves are executed over a toothed belt that is secured to the carriage and driven by an electric motor acting via a pulley.

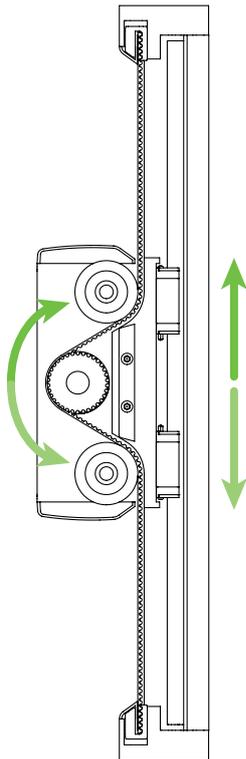
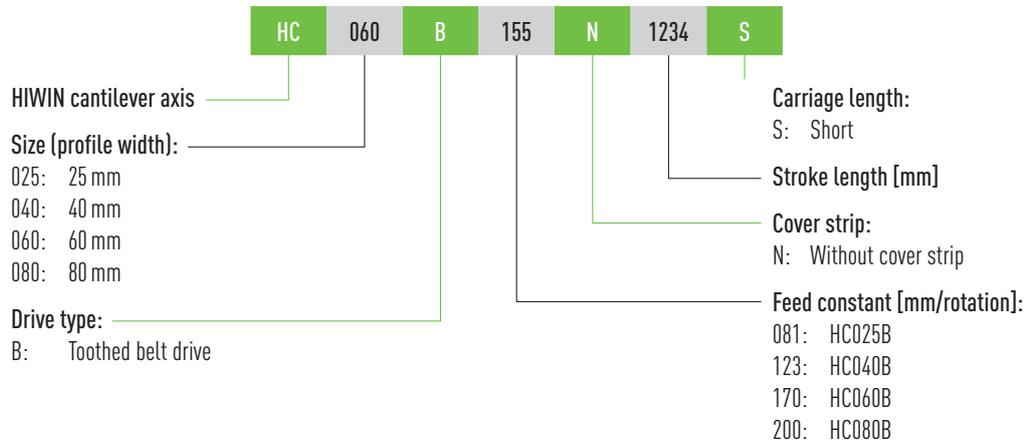


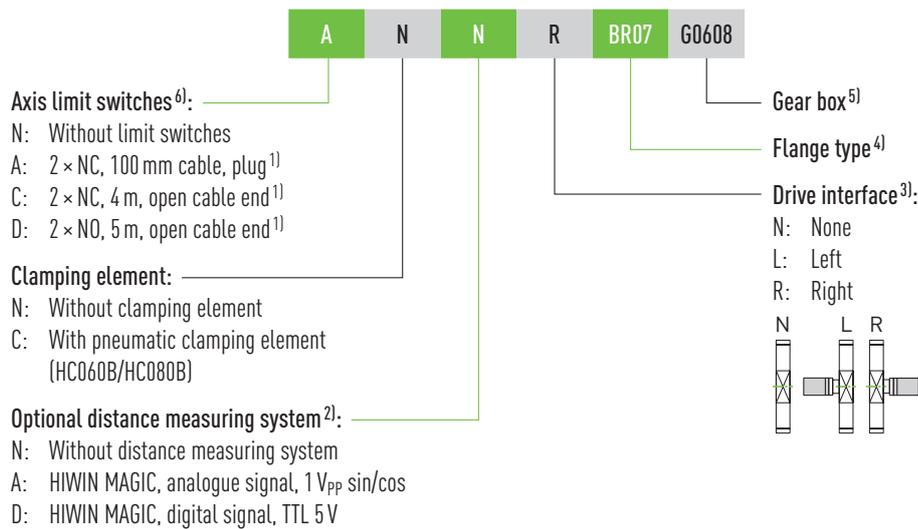
Fig. 3.6 Functional principle of the cantilever axis HC-B

Description of the linear axes and linear axis systems

3.3.5 Order code for cantilever axes HC-B



Order code for cantilever axes HC-B (continuation)



¹⁾ HC025B: A: 2 × NC, 200 mm cable, plug; C: 2 × NC, 2 m open cable end; D: not available

²⁾ Details in Section 4.5 on Page 31 ff. or in the assembly instructions "HIWIN MAGIC Distance Measuring Systems"

³⁾ If no drive interface is selected, the order code ends at this position

⁴⁾ All flange types can be found in Table 11.3 on Page 141 ff.

If no gear box is selected, the order code ends at this position

⁵⁾ Suitable gearboxes for HIWIN axes can be found in Table 11.9 on Page 155

⁶⁾ Further reference switches on request

3.4 Double axis HD

3.4.1 Field of application

Double axes HD are suitable for applications where a single axis is inadequate owing to the torques exerted by or the size of the transported loads. HIWIN double axes HD are also ideal as a basis for multi-axis systems.

3.4.2 Ambient conditions

Ambient conditions during operation:

+5 to +40 °C

Relative air humidity during operation:

complying with IEC60721-3-3, Class 3K3, non-condensing

Climatic environmental conditions for transport and storage:

ambient temperature: -20 to +50 °C, non-condensing

Vacuum:

it may not be operated in vacuum

Prevent condensation to avoid corrosion of the axis.

NOTE

3.4.3 Main components

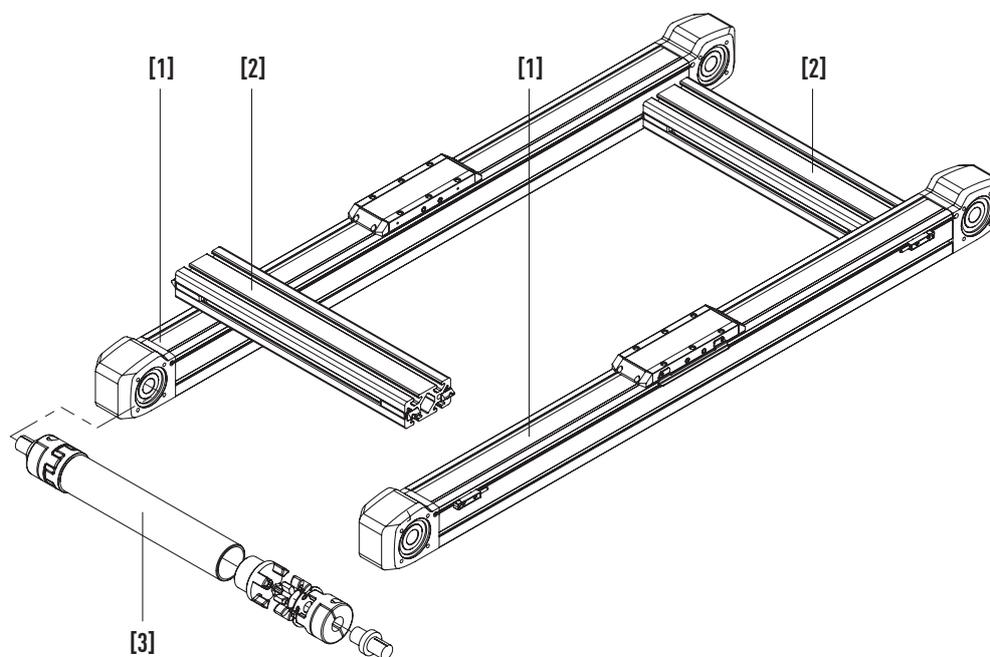


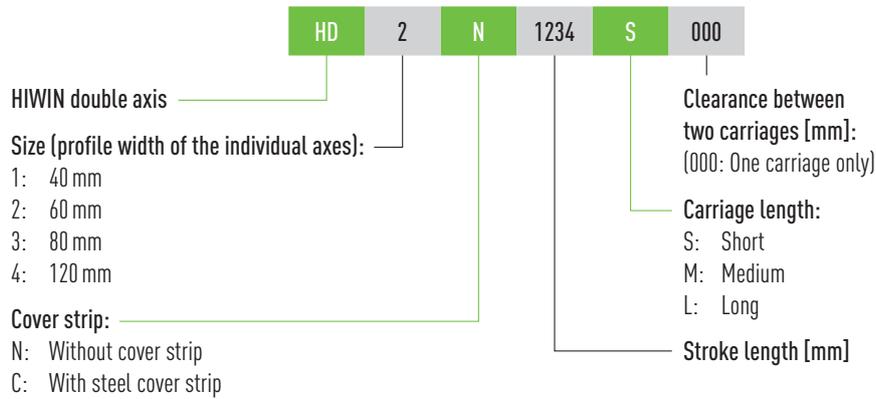
Fig. 3.7 Main components of the double axis HD

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

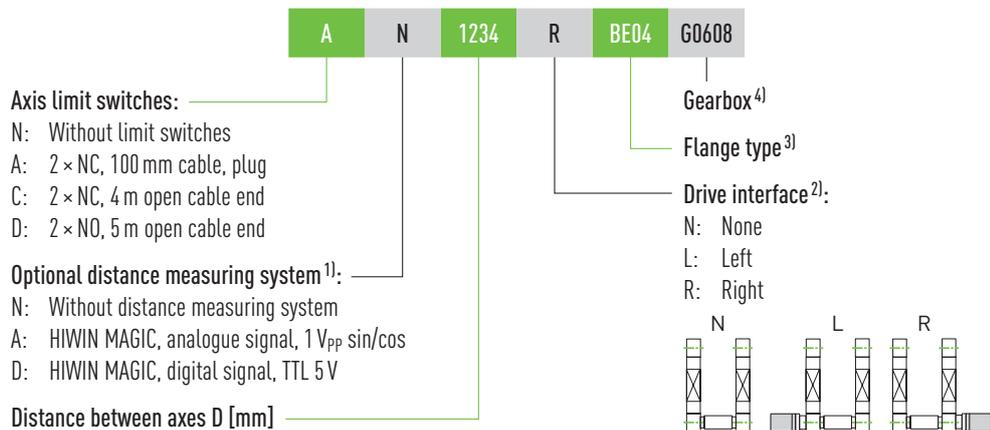
Pos.	Description	Pos.	Description
1	Linear axis	3	Synchronous shaft
2	Spacer profile		

Description of the linear axes and linear axis systems

3.4.4 Order code for double axes HD



Order code for double axes HD (continuation)



¹⁾ Details in Section 4.5 on Page 31 ff. or in the assembly instructions "HIWIN MAGIC Distance Measuring Systems"
²⁾ If no drive interface is selected, the order code ends at this position
³⁾ All flange types can be found in Table 11.1 on Page 132 ff.
 If no gear box is selected, the order code ends at this position
⁴⁾ Suitable gearboxes can be found in Section Table 11.9 on Page 155

3.5 Two-axis system HS2

3.5.1 Field of application

Two-axis systems HS2 are specifically suitable for 2D or single-plane movements and form the basis for three-axis systems.

3.5.2 Ambient conditions

Ambient conditions during operation:	+5 to +40 °C
Relative air humidity during operation:	complying with IEC60721-3-3, Class 3K3, non-condensing
Climatic environmental conditions for transport and storage:	ambient temperature: -20 to +50 °C, non-condensing
Vacuum:	it may not be operated in vacuum

Prevent condensation to avoid corrosion of the axis.

NOTE

3.5.3 Main components

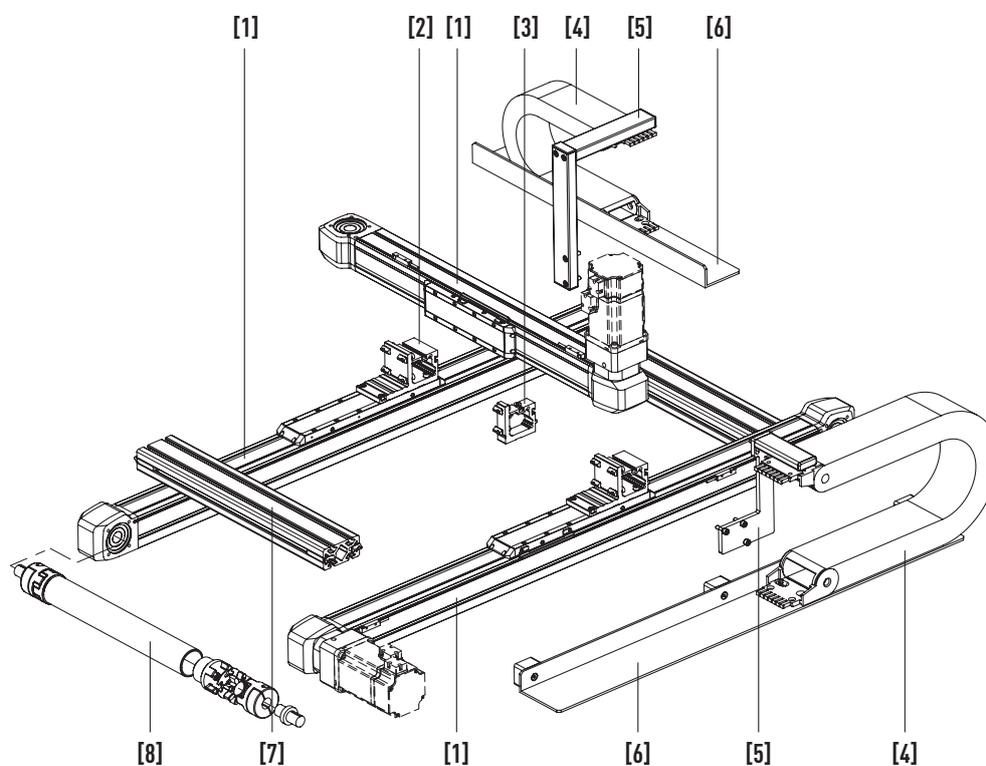


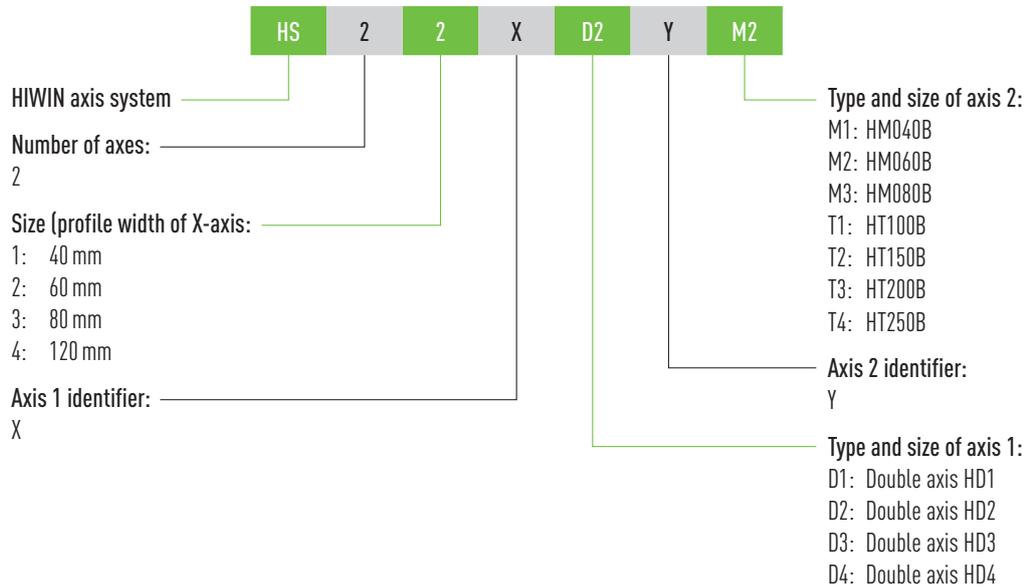
Fig. 3.8 Main components of the two-axis system HS2

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

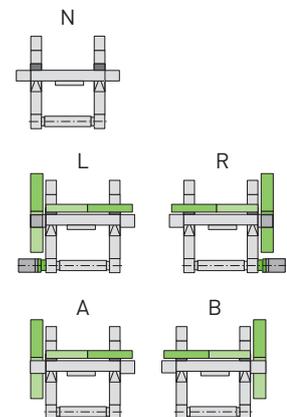
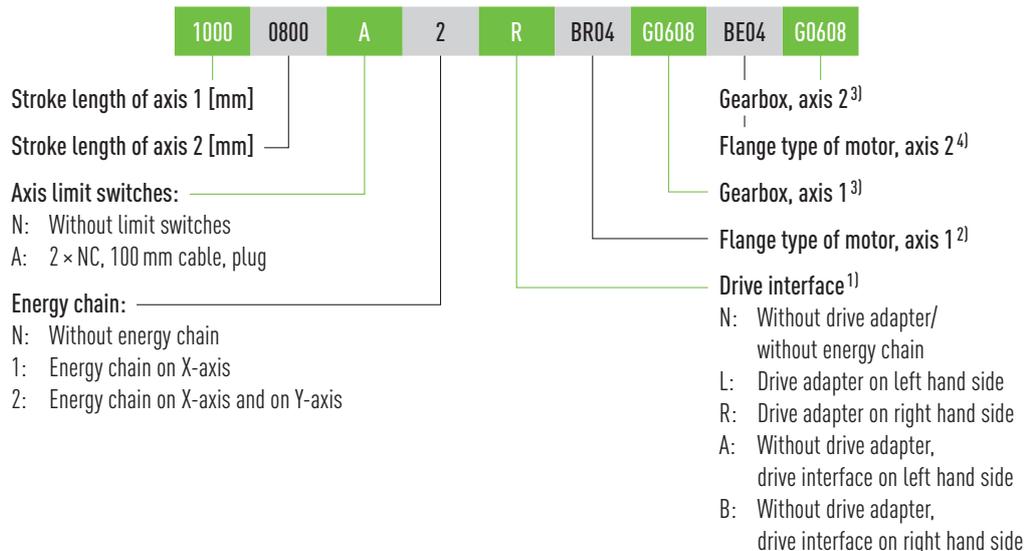
Pos.	Description	Pos.	Description
1	Linear axis	5	Energy chain connection
2	Adaption angle	6	Energy chain support
3	Support angle	7	Spacer profile
4	Energy chain	8	Synchronous shaft

Description of the linear axes and linear axis systems

3.5.4 Order code for two-axis systems HS2



Order code for two-axis systems HS2 (continuation)



¹⁾ If no drive interface is selected, the order code ends at this position
²⁾ All flange types can be found in Chapter 11 on Page 130 ff.
 "Gearbox, Axis 1" is applicable only when a flange type has been selected
³⁾ Suitable gearboxes can be found in Table 11.9 on Page 155
⁴⁾ All flange types can be found in Chapter 11 on Page 130 ff.
 If no gear box is selected, the order code ends at this position

3.6 Three-axis system HS3

3.6.1 Field of application

HIWIN three-axis systems HS3 are flexible units for positioning along the X-, Y- and Z-axes. They are especially suitable for three-dimensional movements.

3.6.2 Ambient conditions

Ambient conditions during operation:

+5 to +40 °C

Relative air humidity during operation:

complying with IEC60721-3-3, Class 3K3, non-condensing

Climatic environmental conditions for transport and storage:

ambient temperature: -20 to +50 °C, non-condensing

Vacuum:

it may not be operated in vacuum

Prevent condensation to avoid corrosion of the axis.

NOTE

3.6.3 Main components

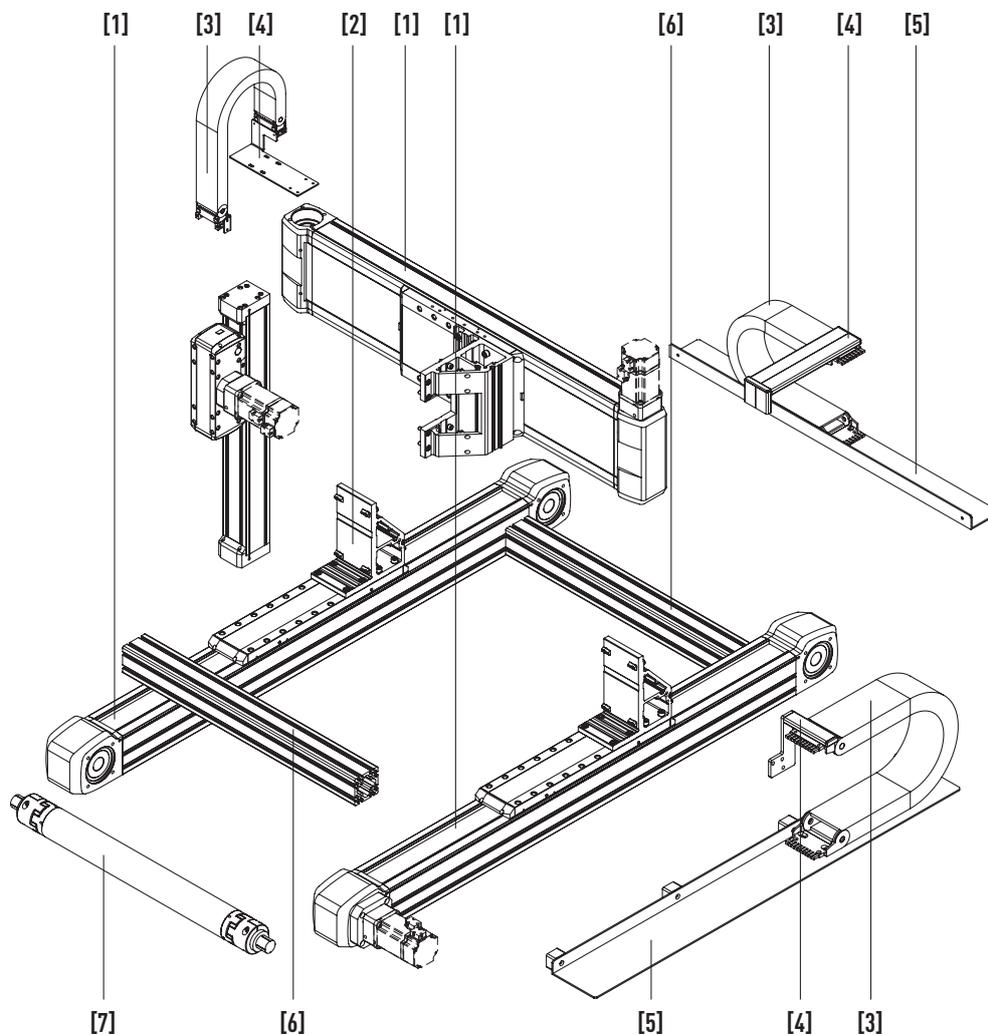


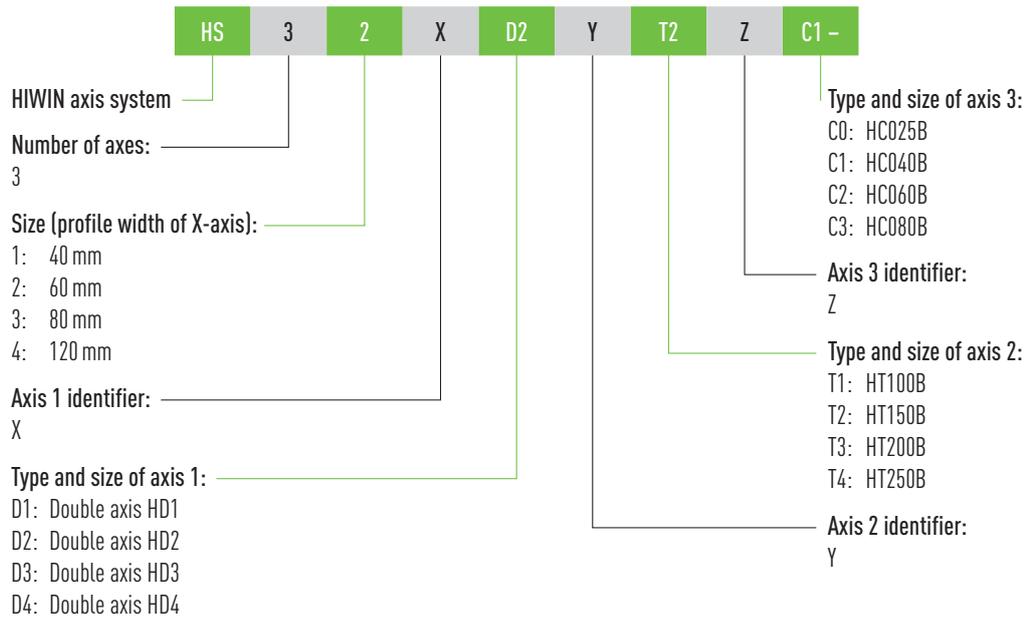
Fig. 3.9 Main components of the three-axis system HS3

Description of the linear axes and linear axis systems

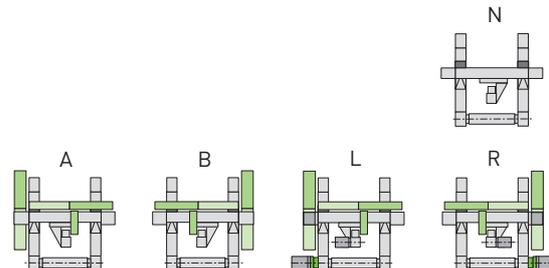
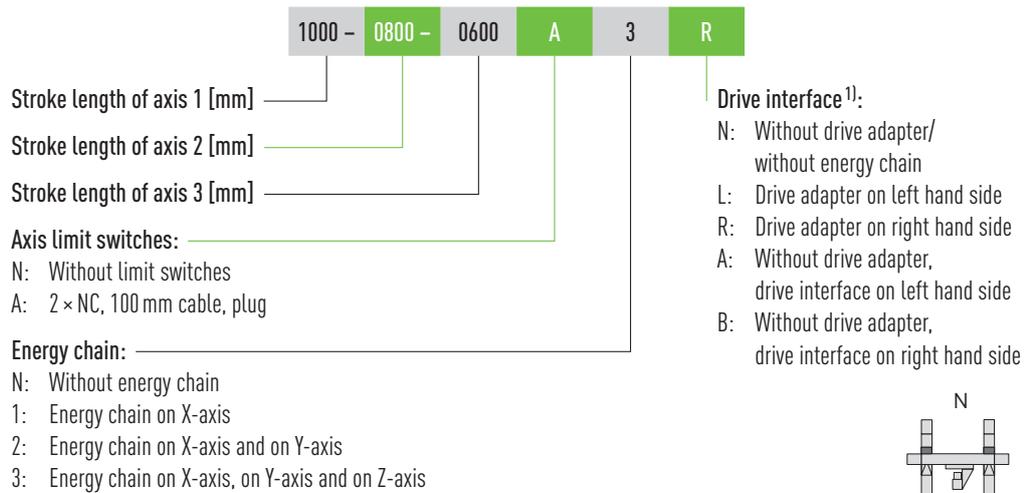
Table 3.6 Description of the main components of the three-axis system HS3

Pos.	Description	Pos.	Description
1	Linear axis	5	Energy chain support
2	Adaption angle	6	Spacer profile
3	Energy chain	7	Synchronous shaft
4	Energy chain connection		

3.6.4 Order code for three-axis systems HS3

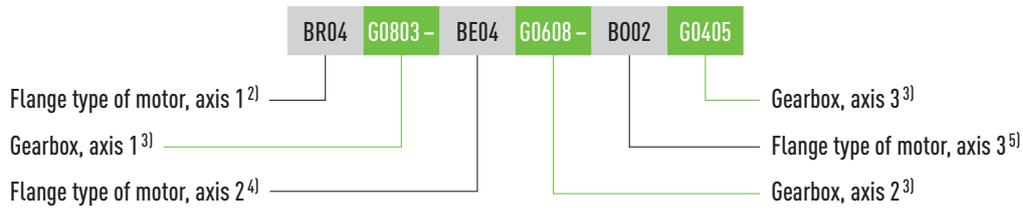


Order code for three-axis systems HS3 (continuation)



¹⁾ If no drive interface is selected, the order code ends after this position

Order code for three-axis systems HS3 (continuation)



²⁾ All flange types can be found in Chapter 11 on Page 130 ff.

“Gearbox, axis 1” is applicable only when a flange type has been selected

³⁾ Suitable gearboxes can be found in Table 11.9 on Page 155

⁴⁾ All flange types can be found in Chapter 11 on Page 130 ff.

“Gearbox, axis 2” is applicable only when a flange type has been selected

⁵⁾ All flange types can be found in Chapter 11 on Page 130 ff.

If no gear box is selected, the order code ends after this position

4. Options of the linear axes and linear axis systems

4.1 Stroke length

The stroke lengths for the linear axes and linear axis systems can be set to the millimetre.

The maximum stroke lengths depending on the series and size are listed in [Table 4.1](#).

Table 4.1 **Maximum stroke**

Model	Axis	Maximum stroke [mm]
Linear module 	HM040B	3,000
	HM060B	5,500
	HM080B	5,500
	HM120B	5,500
Linear table 	HT100B	5,500
	HT150B	5,500
	HT200B	5,500
	HT250B	5,500
Cantilever axis 	HM025B	300
	HM040B	500
	HM060B	800
	HM080B	1,200
Double axis 	HD1	3,000
	HD2	5,500
	HD3	5,500
	HD4	5,500
Two-axis system 	HS21-D-M	X: 3,000 Y: 1,300
	HS22-D-M	X: 5,000 Y: 1,600
	HS23-D-M	X: 5,000 Y: 1,600
	HS21-D-T	X: 3,000 Y: 5,500
	HS22-D-T	X: 5,500 Y: 5,500
	HS23-D-T	X: 5,500 Y: 5,500
	HS24-D-T	X: 5,500 Y: 5,500

¹⁾ Longer strokes on request

Table 4.1 **Maximum stroke (continuation)**

Model	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

Please bear in mind that the maximum possible stroke is shorter with the following options:

- Longer carriages (carriage type M and L)
- Second carriage
- Type with cover strip (owing to required cover strip deflections)

Options of the linear axes and linear axis systems

4.1.1 Reserve stroke

ATTENTION!

Damage to the linear axes!

► Hoist the linear axes/linear axis systems only at the designated points (see Section 5.5)!

The reserve stroke L_r equals 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 buffer stops. The reserve stroke for each axis size can be found in the catalogue „Linear Axes and Axis Systems HX“.

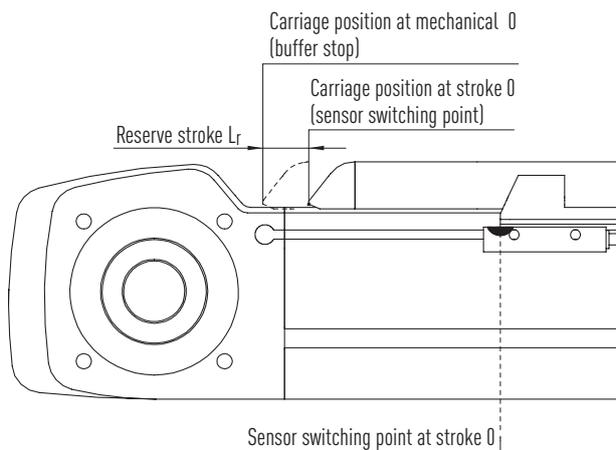


Fig. 4.1 Example reserve stroke on a linear module HM-B

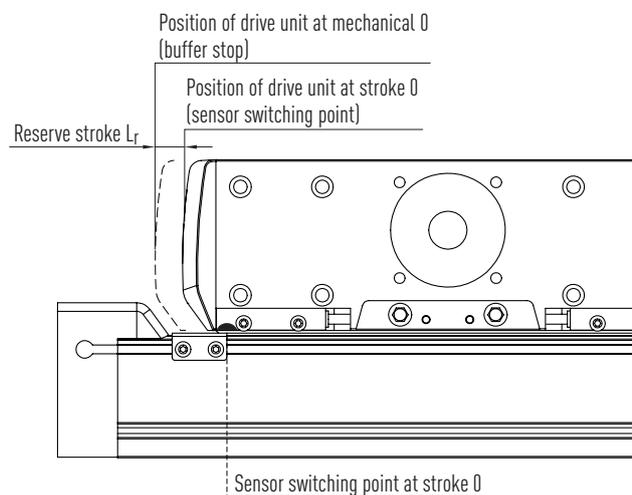


Fig. 4.2 Example reserve stroke on a cantilever axis HC-B

4.2 Cover

An optional steel cover strip is available for all sizes of the linear modules HM-B, linear tables HT-B and double axes HD. This cover strip is held in place with magnetic strips to prevent contaminants from entering the axis's interior. Bear in mind that the carriage is longer on axes with cover strip because of the required cover strip deflection.

NOTE

The optional cover strip cannot be retrofitted.

4.3 Carriage

There are three carriage types available for the linear modules HM-B and the double axes HD (carriage type S, M, and L). The linear tables HT-B and the cantilever axes HC are available with the carriage type S. The multi-axis systems HS have carriage type L in the X axis and carriage type M in the Y axis. The carriages are equipped with mounting threads for mounting the imposed load. These have additional counterbores that can take centring sleeves.

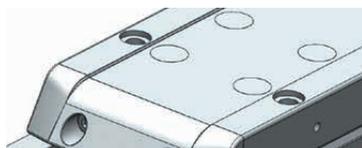


Fig. 4.3 Carriage with mounting threads

The typical applications for each of the linear axes' carriage lengths are:

Short carriage (S)

- For individual axes

Mid length carriage (M)

- For high torques (M_y , M_z)
- For use in gantry systems (primarily for Y-axis)

Long carriage (L)

- For very high torques (M_y , M_z)
- For use in gantry systems (primarily for X-axis)



Fig. 4.4 Carriage types S, M and L

Options of the linear axes and linear axis systems

4.4 Limit switches

The linear axes feature two inductive PNP or proximity switches that signal the end positions of the travel distance. The limit switch cables can be routed either directly to the interface or into the mounting groove. The limit switches are available as NC or contacts, with or without plug.

4.4.1 Limit switch dimensions

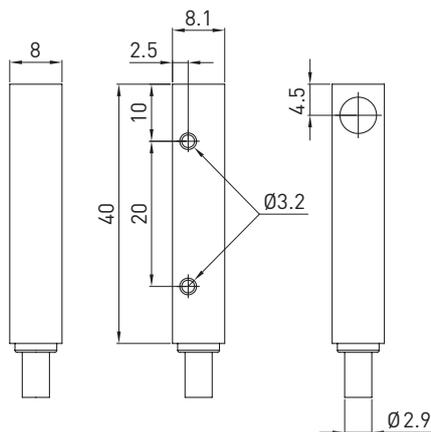


Fig. 4.5 Limit switch dimensions
(HM-B, HT-B, HC040B, HC060B, HC080B, HD)

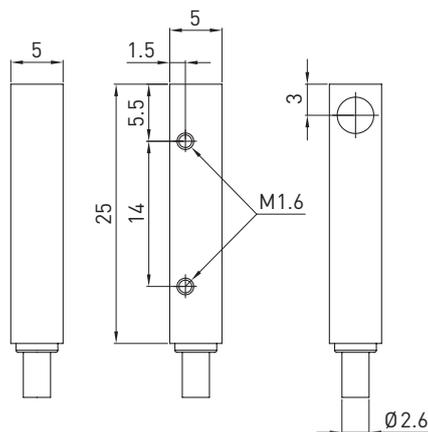


Fig. 4.6 Limit switch dimensions
(HC025B)

4.4.2 Limit switch specifications

Table 4.2 General features of the limit switches

Properties	Linear axis				
	HM-B, HT-B, HC040B, HC060B, HC080B, HD			HC025B	
Article number	25-000786	25-000787	25-000788	25-002204	25-002205
Type	NC	NC	NO	NC	NC
Connection type	Cable with plug M8, 3-pin, 100 mm	Cable, 3-wire, 4 m	Cable, 3-wire, 5 m	Cable with plug M8, 3-pin, 100 mm, knurled screw connection, 200 mm	Cable, 3-wire, 2 m
Housing	Rectangular				
Dimensions (W × H × D)	8 × 8 × 40 mm			5 × 5 × 25 mm	
Max. sensing range	2 mm			0.8 mm	
Switching frequency	2,000 Hz			5,000 Hz	
Output type	PNP				
Electrical wiring	DC 3-wire				
Protection class	IP67, IP68 ¹⁾			IP67	

¹⁾ According to EN 60529

Table 4.3 **Mechanics/electronics of the limit switches**

Properties	Linear axis				
	HM-B, HT-B, HC040B, HC060B, HC080B, HD			HC025B	
Article number	25-000786	25-000787	25-000788	25-002204	25-002205
Type	NC	NC	NO	NC	NC
Supply voltage	10 to 30 VDC				
Ripple	≤ 10 % ¹⁾			≤ 20 % ¹⁾	
Voltage drop	≤ 2 V ²⁾				
Current consumption	≤ 10 mA ³⁾			10 mA ³⁾	
Time delay before availability	≤ 100 ms			≤ 10 ms	
Hysteresis	5 to 15 %			1 to 10 %	
Repeatability	≤ 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				
Power-up pulse protection	Yes				
Shock and vibration resistance	30 g, 11 ms/10 to 55 Hz, 1 mm				
Ambient operating temperature	-25 °C to +75 °C			-25 °C to +70 °C	
Housing material	Plastic, VISTAL [®]			Metal, chromium-plated brass	
Sensing face material	Plastic, VISTAL [®]			Plastic, Polyester	
UL-File-No. (certificate)	NRKH.E348498			E191603	

¹⁾ Of U_v

²⁾ At I_a max.

³⁾ Without load

⁴⁾ At constant voltage and temperature

4.5 Distance measuring system

If the accuracy of the linear axis, delivered through the drive element, is not sufficient for the application, a distance measuring system can be used to increase positioning accuracy and repeatability. The distance measuring system is an external component located on the side of the carriage (cantilever axes HC: at the side of the drive block) and enables a repeatability of ±0.02 mm for belt axes. The encoder housing is electrically shielded. The output signals can be either analogue or digital. The HIWIN-MAGIC distance measuring system consists of the encoder (Fig. 4.7) and the magnetic scale (Fig. 4.8) as the measurement standard. It is assembled prior to delivery.



Fig. 4.7 **MAGIC encoder**



Fig. 4.8 **MAGIC magnetic scale**

NOTE

The measuring scale of the magnetic measuring systems may not be subjected to any strong magnetic fields (keep it well away from permanent magnets!). Strong shocks (e.g. hammer blows) can also damage the magnetization of the measuring scale. The system is not suitable for environments where there is magnetic dust (e.g. graphite dust). These things can falsify the encoder signal or damage the distance measuring system.

4.5.1 Technical data of the MAGIC distance measuring system

Table 4.4 Electrical and mechanical properties of the MAGIC encoder

Properties	Type	
	1 V _{PP} (analogue)	TTL (digital)
Article number	8-08-0120	8-08-0122
Electrical properties		
Output signal	sin/cos, 1 V _{PP} (0.85 V _{PP} – 1.2 V _{PP})	Quadrature signal, RS422
Resolution	Infinite, signal period 1 mm	1 µm
Repeatability bidirectional	0.003 mm	0.002 mm
Absolute accuracy	±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	High-quality aluminium alloy, encoder bottom made of stainless steel	
MAGIC encoder dimensions	L × W × B: 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 used e.g. with reference switch

²⁾ For use in energy chains, we recommend our prefabricated encoder cables with M17 round connector on one end (coupling, female), matching the optional M17 round connector (plug, male) for the encoder.

4.5.2 Formats and outputs of the MAGIC measuring system (analogue)

Electrical signals after the differential input of the downstream electronic components. The sinus/cosinus interface of HIWIN MAGIC is strictly based on the Siemens specifications. The period length of the sinus output signal is 1 mm. The period length of the reference signal is 1 mm.

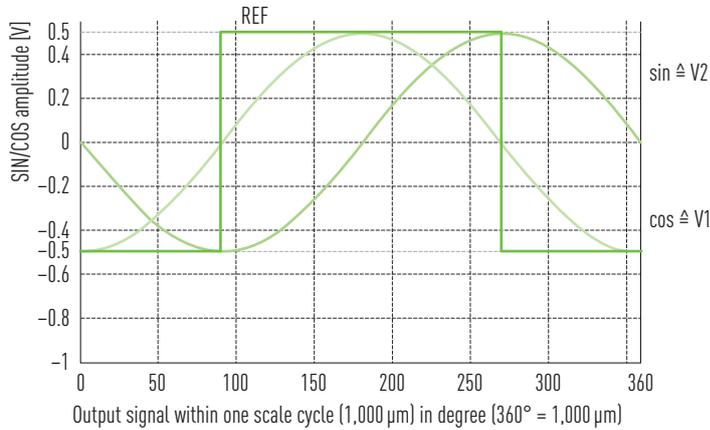


Fig. 4.9 Electrical signals after the differential input of the downstream electronic components (analogue version)

4.5.3 Formats and outputs of the MAGIC measuring system (digital)

Digital TTL output: 90° phase shifted square signal in compliance with RS422 specification (according to DIN 66259);
Differential output signal: A, \bar{A} , B, \bar{B} and Z, \bar{Z} .

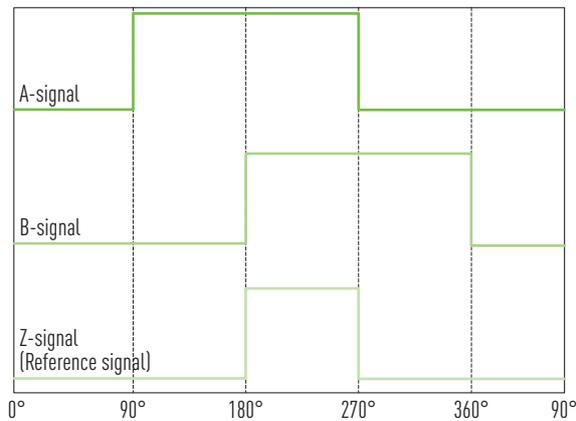


Fig. 4.10 Signals of the MAGIC encoder (TTL version)

For more information, please refer to the assembly instructions "HIWIN MAGIC Distance Measuring Systems".

Options of the linear axes and linear axis systems

4.6 Clamping element LKPS (HC060B and HC080B)

⚠ CAUTION!

Risk of injury and material damage!
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 braking element or emergency brake!

The clamping element may only be used for the 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 spring-loaded energy storage (clamps with spring force).
- If an air pressure between 5.5 and 6.5 bar is present, free movement is possible. The air pressure keeps the clamping profiles apart (relaxation with air pressure).

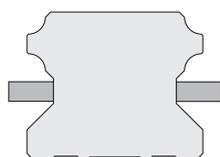


Fig. 4.11 Clamping element closed (0 bar)

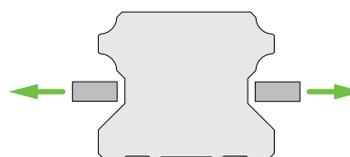


Fig. 4.12 Clamping element open (5,5 to 6,5 bar)

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

Table 4.5 Clamping element specifications

Properties	Size	
	HC060B	HC080B
Static holding force ¹⁾	400 N	650 N
Air connection	M5	
Min. pressure (opening pressure)	5.5 bar	
Max. pressure	6.5 bar	
Clamping cycles	Up to 5 million	
Braking cycles	Not allowed	
Plug-in connector for hose	6 mm	
Operation	Pneumatic	
Air quality	Oiled air according to ISO 8573-1, class 4 Filter size 25 µm, the air filter must be kept clean	

¹⁾ Axial load

4.7 Drive interfaces

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

Possible drive interfaces:



Fig. 4.13 Drive interfaces of the linear axis HM-B

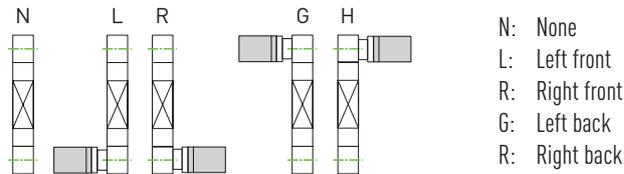


Fig. 4.14 Drive interfaces of the linear axis HT-B

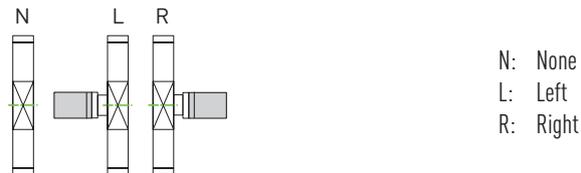


Fig. 4.15 Drive interfaces of the cantilever axis HC-B

The double axis HD allows the drive unit (coupling, also gears and/or motor) to be mounted on the right hand and on the left hand side, in each case in the extension of the synchronous shaft. Depending on the motor, delivery includes a coupling housing, a matching coupling, and an adapter plate for the motor and/or gears.

Possible drive interfaces:

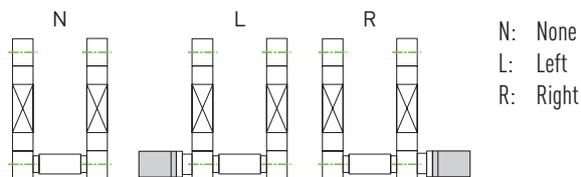
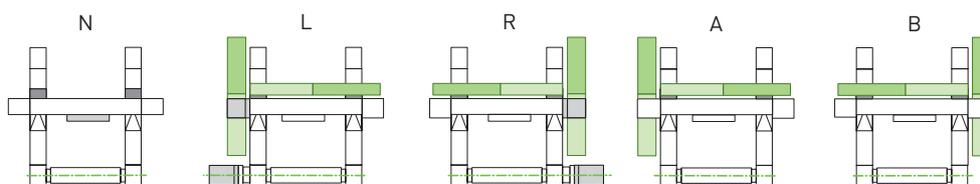


Fig. 4.16 Drive interfaces of the double axis HD

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

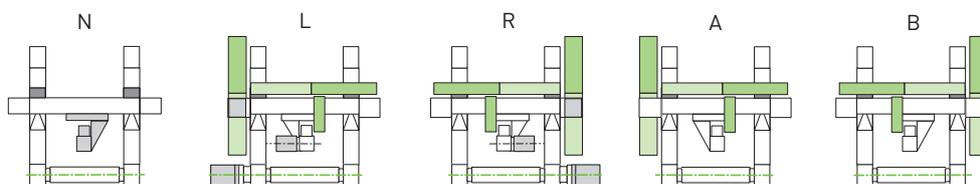
Possible drive interfaces HS2:



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

Fig. 4.17 Drive interfaces of the two-axis system HS2

Possible drive interfaces HS3:



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

Fig. 4.18 Drive interfaces of the three-axis system HS3

Options of the linear axes and linear axis systems

4.8 Gearboxes (HM-B, HT-B, HC-B, HD)

Gears are used to adjust the motor speed and inertia. The linear axes come with a range of gear sizes of differing ratios. For the standard gear versions see [Table 4.6](#).

Table 4.6 **Gearboxes for linear modules HM-B, linear tables HT-B, cantilever axes HC-B and double axes HD**

Linear axis	Ratio i	Ø H [mm]	L _G [mm]	Gearbox type ¹⁾	Order code for gear ²⁾
HC025B, HM040B, HD1, HT100B, 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	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 from Neugart, registered trademarks of Neugart GmbH

²⁾ See order code on [Page 12](#) for linear modules HM-B, [Page 15](#) for linear tables HT-B, [Page 18](#) for cantilever axes HC-B and on [Page 20](#) for double axes HD

4.9 Toothed belt

The used toothed belts with steel tie beams or glass cord tie beams (HC025B/HC040B) are designed to transfer high torques. The rounded tooth geometry is designed for uniform torque transfer. Also the uniform distribution of load minimises deformation in the teeth.

Advantages:

- Form fit, non-slip drive system
- High capacity
- Little space requirements
- Large speed range
- Low toothed belt tension
- No lubrication or maintenance
- Quiet running
- High efficiency (98 %)

4.10 Energy chain

Optional energy chains are available for the multi-axis systems HS. All directions of movement are supported and the chains can be installed on either the right or the 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.

For details of the different energy chain types and sizes, please see [Table 4.7](#), [Table 4.8](#) and [Table 4.9](#). 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 4.7 Energy chain specifications X-axis

System	Manufacturer ID ¹⁾	Inside cross-section W × H [mm]	Bending radius [mm]
HS21, HS31	2400.07.100.0	77 × 25	100
HS22, HS32	2600.07.100.0	75 × 35	100
HS23, HS33	2600.07.100.0	75 × 35	100
HS24, HS34	2600.10.125.0	100 × 35	125

¹⁾ Manufacturer: igus GmbH

Table 4.8 Energy chain specifications Y-axis

System	Manufacturer ID ¹⁾	Inside cross-section 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 4.9 Energy chain specifications Z-axis

System	Manufacturer ID ¹⁾	Inside cross-section W × H [mm]	Bending radius [mm]
HS31	1500.20.048.0	20 × 21	48
HS32	2500.03.075.0	38 × 25	75
HS33	2500.05.075.0	57 × 25	75
HS34	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.

General notes:

- 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 $8 \times D$) 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 separators.
- 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 separators where applicable.
- Observe the maximum additional load from cables and hoses that is permitted based on the stroke (see Fig. 4.19, Fig. 4.20 and Fig. 4.21).

Options of the linear axes and linear axis systems

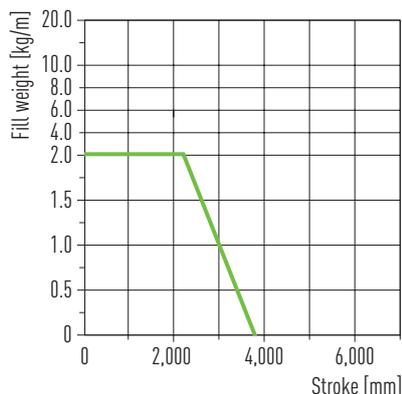


Fig. 4.19 Maximum permissible additional load as a function of the stroke, Series 1500 (source: igus)

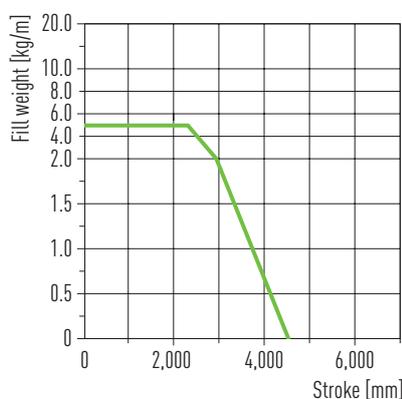


Fig. 4.20 Maximum permissible additional load as a function of the stroke, Series 2400 and 2500 (source: igus)

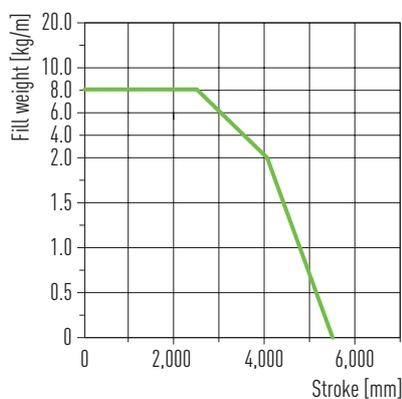


Fig. 4.21 Maximum permissible additional load as a function of the stroke, Series 2600 (source: igus)

4.10.1 Tape for noise reduction of the energy chain

Cellular rubber tape to reduce the noise of energy chains. The single-sided self-adhesive noise reduction tapes are glued to the energy chain's contact surface in such a way that the energy chain links are resting on the tapes when the carriage moves, which significantly reduces noise emissions. The noise reduction tape is available in rolls of 10 m (article number: 25-002485).

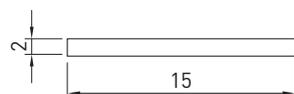


Fig. 4.22 Dimensions of the tape for noise reduction of energy chains

5. Transport and installation

5.1 Delivery

5.1.1 Delivery state

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

5.1.2 Scope of delivery

The contents of delivery vary depending on the ordered model, accessories, and options.

5.2 Transport to the installation site

WARNING!



Danger from suspended loads or falling parts!

Lifting heavy loads may damage your health!

- ▶ Only qualified personnel may assemble, install, and service the linear axes/linear axis systems!
- ▶ Note the mass when transporting the parts. Use suitable hoisting gear!
- ▶ Observe the applicable occupational health and safety regulations when handling suspended loads!
- ▶ Hoist the linear axes/linear axis systems only at the designated points!
- ▶ Secure machinery and machine parts against tilting!

CAUTION!



Danger of impacts 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 the applicable occupational health and safety regulations!
- ▶ Transport to the installation site only by qualified personnel!

ATTENTION!

Damage to the linear axes/linear axis systems!

The linear axis/linear axis system may be damaged by mechanical loading.

- ▶ Hoist the linear axes/linear axis systems only at the designated points (see Section 5.5)!
- ▶ For longer linear axes/linear axis systems, provide additional protection of the centre section!
- ▶ Ensure that the linear axes/linear axis systems do not bend as this could permanently damage accuracy!
- ▶ During transport, do not transport any additional loads on the linear axis/linear axis system!
- ▶ Provide heavy attachments with additional supports!

The linear axes and linear axis systems are precision products and must be treated with care. Impacts of any kind may damage the axis. The result may be compromised running precision and service life. Transport the packaged product as close as possible to its installation site. Remove the packaging at this site only.

5.3 Requirements at the installation site

5.3.1 Ambient conditions

Ambient conditions during operation:

+5 to +40 °C

Relative air humidity during operation:

complying with IEC60721-3-3, Class 3K3, non-condensing

Climatic environmental conditions for transport and storage:

ambient temperature: -20 to +50 °C, non-condensing

Vacuum:

it may not be operated in vacuum

Transport and installation

5.3.2 Safety equipment to be provided by the operator

Possible safety equipment/measures:

- Personal protective equipment in accordance with UVV (German accident prevention regulations)
- Zero-contact protective equipment
- Mechanical protective equipment

5.4 Storage

- ▶ Store the linear axes/linear axis systems in their transport packaging.
- ▶ Alternatively: Use packaging that secures the linear axes/linear axis systems against slipping, damage, and vibrations.
- ▶ Store the linear axes/linear axis systems in dry, frost free rooms only.
- ▶ Clean and protect used linear axes/linear axis systems before storage.

5.5 Unpacking and installing

⚠ CAUTION!



Warning! Health and environmental hazards!

Contact with lubricants may cause irritation, poisoning, allergic reactions, and damage to the environment.

- ▶ Use only suitable, non-hazardous agents. Note the manufacturer's safety data sheets!
- ▶ Ensure proper disposal!

NOTE

The linear axes HM-B/HT-B, cantilever axes HC-B, double axes HD and the multi-axis systems HS may only be installed and operated indoors.

5.5.1 Unpacking and installing the linear axes HM-B/HT-B and cantilever axes HC-B

- ▶ Remove packaging.
- ▶ To transport the linear axis, hoist it at the points designated A and B (see Fig. 5.1, Fig. 5.2 and Fig. 5.3). The points A and B should be a quarter of the axis' overall length from each of its ends.
- ▶ Do not hoist the linear axis by its attachments. During transport, provide additional support for heavy attachments such as the drive.
- ▶ Dispose of packaging in an environmentally friendly way.

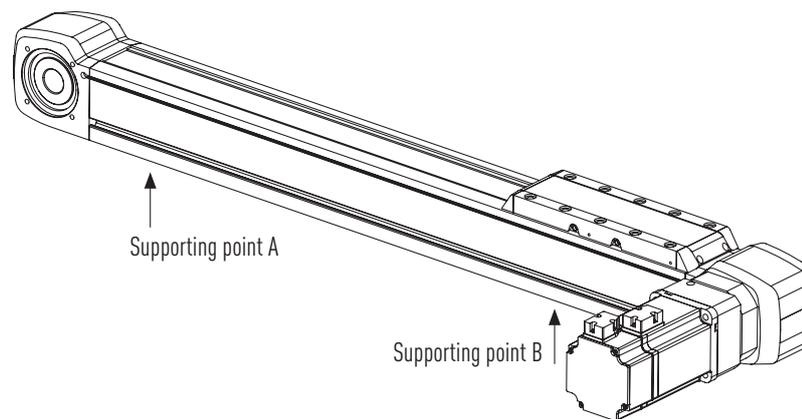


Fig. 5.1 Supporting points A and B for hoisting and transporting, here on an linear axis HM-B

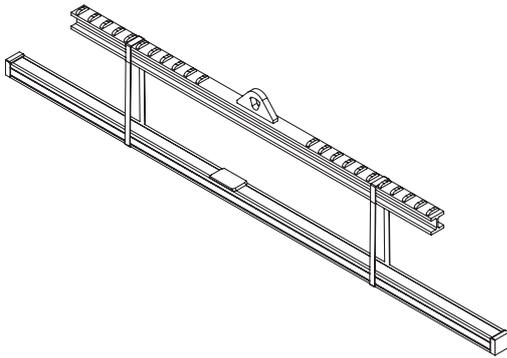


Fig. 5.2 Correct position of the supporting points

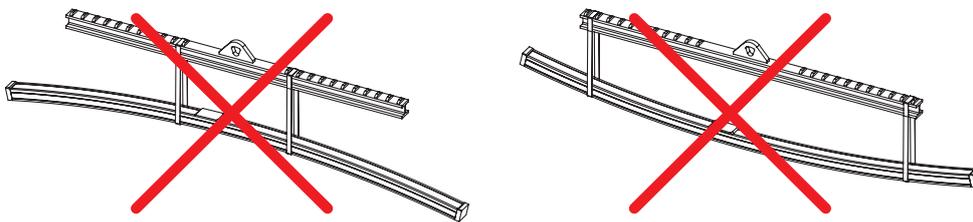


Fig. 5.3 Incorrect position of the supporting points

5.5.2 Unpacking and installing the double axes HD and axis systems HS

- ▶ Remove the protective film from the pallet and the transport securing device 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 the designated support points A, B, C and D (see Fig. 5.4). Use suitable hoisting gear for this purpose, such as an underslung or gantry crane, crane slings and – depending on the dimensions – a lifting beam. The points A and B as well as C and D should be a quarter of the axis' overall length from each of its ends.
- ▶ 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.

Do not remove the transportation safety devices from the axis system until after it has been transported and assembled properly (see Sections 6.1 and 6.2)!

NOTE

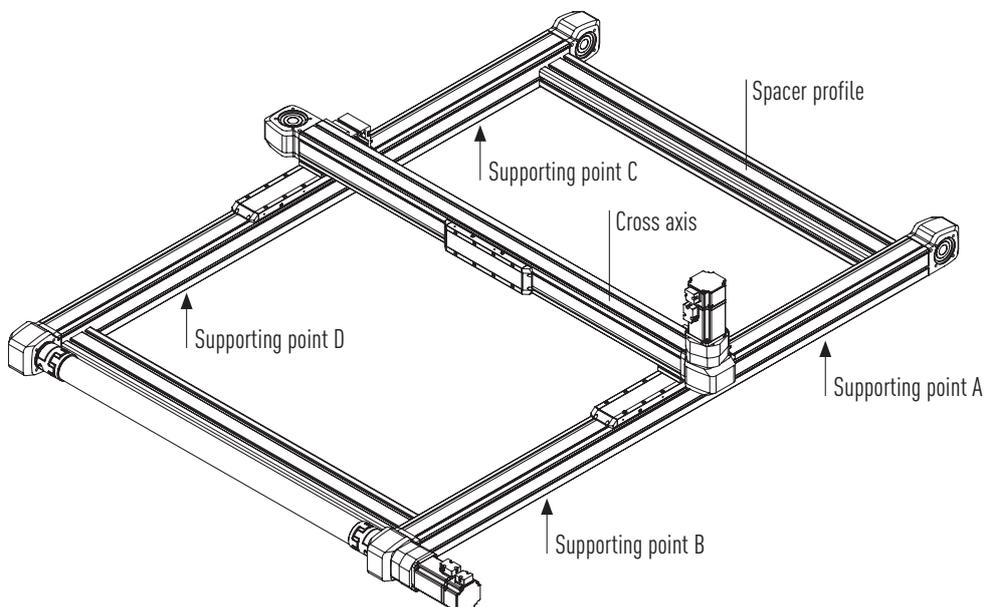


Fig. 5.4 Supporting points A, B, C and D for hoisting and transporting, here on a two-axis system HS2

6. Assembly and connection

DANGER!



Danger from electrical voltage!

Electrical currents may flow even if the motor is not moving.

- ▶ Ensure that the linear axis/linear axis system is disconnected from the power supply before the electrical connections are detached from the motors!
- ▶ After disconnecting the drive amplifier from the power supply, wait at least 5 minutes before touching live parts or breaking connections!
- ▶ For safety reasons, measure the voltage in the intermediate circuit and wait until it has fallen below 40 V!
- ▶ Only qualified personnel may work on electrical installations!

DANGER!



Warning! Electric shock or burns by contact with live parts!

Contact with live parts can result in injuries.

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

- ▶ Controller design complying with DIN EN 12100. No start after:
 - power connected, reinstated!
 - troubleshooting!
 - machine stop!
- ▶ Only qualified personnel may install cabling!
- ▶ Only qualified personnel may work on electrical installations!

WARNING!



Danger of impacts and crushing!

Uncontrolled or manual carriage movements may cause injury.

- ▶ Isolating protective equipment must be provided for linear axis/linear axis system operations!
- ▶ Only qualified personnel may be assigned to commissioning, setup, and troubleshooting!

WARNING!



Danger of impacts and crushing!

If the linear axis is used in cantilever mode, injuries may occur when the axis body is extended.

- ▶ Only qualified personnel may be assigned to commissioning, setup, and troubleshooting!
- ▶ Isolating protective equipment must be provided for linear axis/linear axis system operations!
- ▶ When mounted vertically, the linear axis must be secured against unintentional lowering by motors with spring-applied brakes and by an additional clamping element.

WARNING!



Danger of cutting injuries!

Installing or removing the cover strip may cause cutting injuries.

- ▶ Only qualified personnel wearing appropriate protective equipment (gloves, goggles) may be assigned to commissioning and setup!

WARNING!



Danger of impacts and crushing!

Uncontrolled movements by the powered elements of the linear axis/linear axis system may cause injury.

- ▶ Controller design complying with DIN EN 12100. No start after:
 - power connected, reinstated!
 - troubleshooting!
 - machine stop!

WARNING!



Danger of impacts and crushing if the clamping element is opened!

As soon as air is applied, the clamping opens.

- ▶ Before carrying out work on the linear axes/linear axis systems, disconnect the power supply and protect it from being switched back on!
- ▶ Make sure that moving parts of the linear axis are secured against unintentional movement!
- ▶ Observe applicable safety regulations for working with compressed air!

WARNING!



Danger from suspended loads or falling parts!

- ▶ Only qualified personnel may assemble, install, and service the linear axes/linear axis systems!
- ▶ Note the mass when transporting the parts. Use suitable hoisting gear!
- ▶ Observe the applicable occupational health and safety regulations when handling suspended loads!
- ▶ Hoist the linear axes/linear axis systems only at the designated points!
- ▶ Secure machinery and machine parts against tilting!
- ▶ Secure the linear axes/linear axis systems as described in the assembly instructions!
- ▶ When installing a vertical linear axis/linear axis system, provide support for the carriage during down-times!

CAUTION!



Warning! Damage to hearing!

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

- ▶ Hearing protection must be worn when high speed linear axes/linear axis systems generate noise greater than 70 dB(A)!

CAUTION!



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.

- ▶ Your assembly must ensure that parts cannot detach even under high accelerations or constant vibrations!
- ▶ Secure the imposed load as described in the assembly instructions!

CAUTION!



Danger of impacts 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).

- ▶ Isolating protective equipment must be provided for linear axis/linear axis system operations!
- ▶ When installing a vertical linear axis/linear axis system, provide support for the carriage during down-times!

CAUTION!

Danger of injury!

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

- ▶ Isolating protective equipment must be provided for linear axis/linear axis system operations!
- ▶ Only qualified personnel may be assigned to commissioning, setup, and troubleshooting!

CAUTION!



Warning! Health and environmental hazards!

Contact with lubricants may cause irritation, poisoning, allergic reactions, and damage to the environment.

- ▶ Use only suitable, non-hazardous agents. Note the manufacturer's safety data sheets!
- ▶ Ensure proper disposal!

6.1 Installation of the double axis HD with partially 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).
- ▶ Insert the T nuts [3] into the lateral grooves of the linear axes [2]. Ensure that the threads of the T nuts are facing outwards. (see Fig. 6.2).
- ▶ Arrange the T nuts in such a way that the screws of the automatic fastener [4] in the spacer profiles [1] meet the threads of the T nuts (see Fig. 6.2).
- ▶ Position the linear axes [2] against the spacer profiles [1].

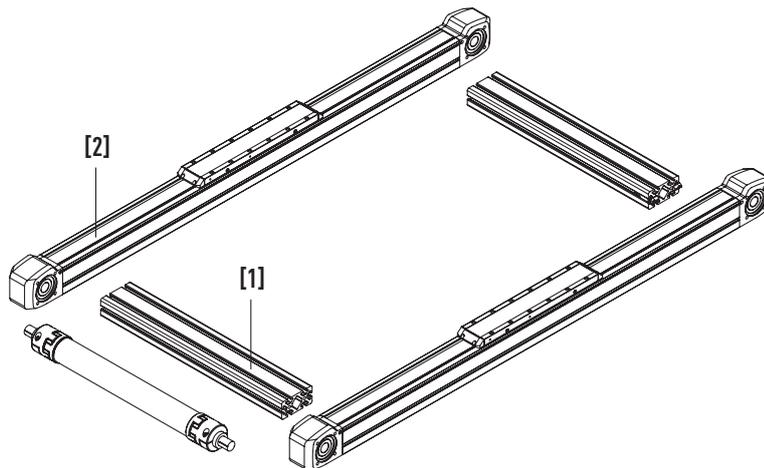


Fig. 6.1 Positioning of the spacer profiles [1] and the linear axis [2]

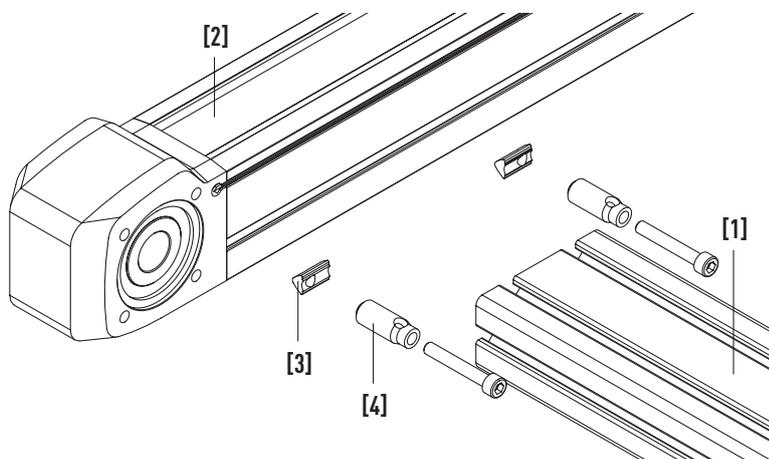


Fig. 6.2 Screwing the automatic fasteners [4] to the T nuts [3]

- ▶ Screw the automatic fasteners [4] in the spacer profiles [1] with the T nuts [3] in the linear axes (see Fig. 6.2).
 - ▶ Ensure that the spacer profile does not protrude beyond the axis base profile (see Fig. 6.3).
 - ▶ Tighten the automatic fasteners [4] with the tightening torque shown in Table 6.1.
- ✓ The spacer profiles have now been mounted.

Table 6.1 Screw tightening torques for the automatic fasteners

Size	Thread size × length	Screw tightening torque [Nm]
HD1	M4 × 30	3
HD2	M6 × 40	10
HD3	M6 × 40	10
HD4	M6 × 40	10

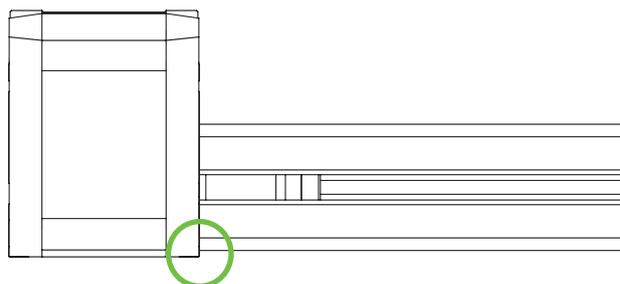


Fig. 6.3 Correct connection of the spacer profile on the linear axis: no protrusion

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 Section 6.6.5.
 - ▶ Carefully place the synchronous shaft on the journals.
 - ▶ Make sure that the synchronous shaft is positioned centrally between both journals.
 - ▶ Mount the half shell clamping pieces on both sides, securing them loosely with the provided bolts (see Fig. 6.4).
 - ▶ Fit a clamping screw to one coupling half shell and then tighten the second clamping screw slightly. Make sure that there is an even gap between the half shell and the coupling hub all the way round.
 - ▶ Tighten both clamping screws of the coupling. For details of the tightening torque, see Table 6.2 or the engraving on the coupling hub.
 - ▶ Make sure to observe the measurement L_1 according to Table 6.3 (see Fig. 6.5).
 - ▶ Move the carriages of both single axes to their end positions. 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 Tightening torques for clamping screws 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

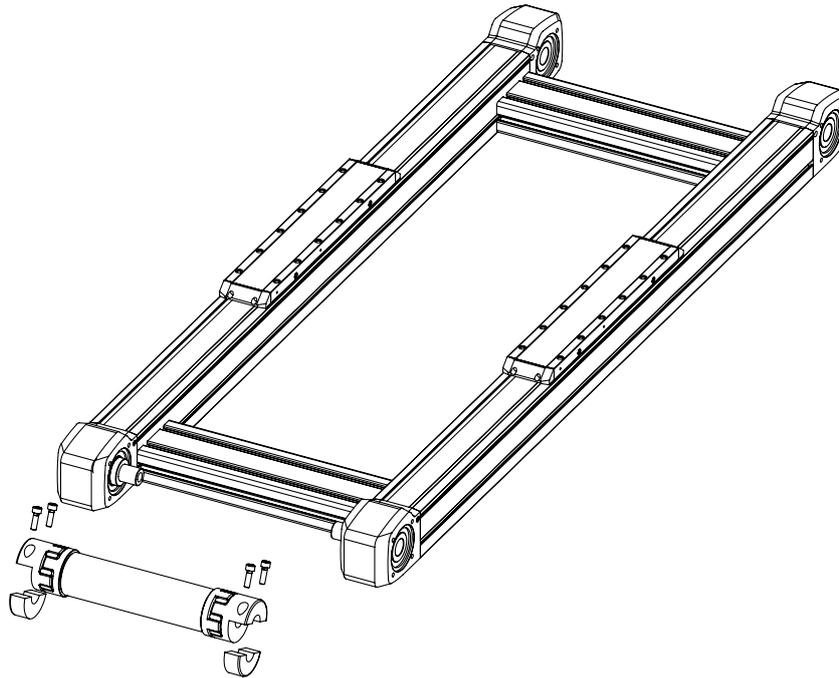


Fig. 6.4 Mounting the synchronous shaft

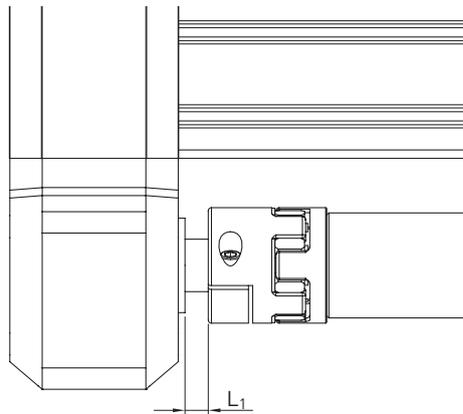


Fig. 6.5 Measurement L_1 on the synchronous shaft

Table 6.3 Measurement L_1 on the synchronous shaft

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

6.2 Assembling the linear axes, cantilever axes, double axes and axis systems

The linear axes HM-B/HT-B/HC-B can be installed in any position. Fasteners must be applied to the axis' aluminium profile. The axis systems HS cannot just be installed in any position. Technical clarification must be sought before mounting them overhead. If the double axis HD is mounted vertically at the side, spacers must be added to the synchronous shaft coupling (see Fig. 6.6).

The linear axis, double axis and axis system can be secured to the mounting surface by means of clamping profiles (side grooves) or T nuts (grooves at bottom). Bear in mind that, depending on the installation position, the linear axis weight acts as an additional load and that the actually induced forces and torques must remain within the permitted range (see catalogue "Linear Axes and Axis Systems HX").

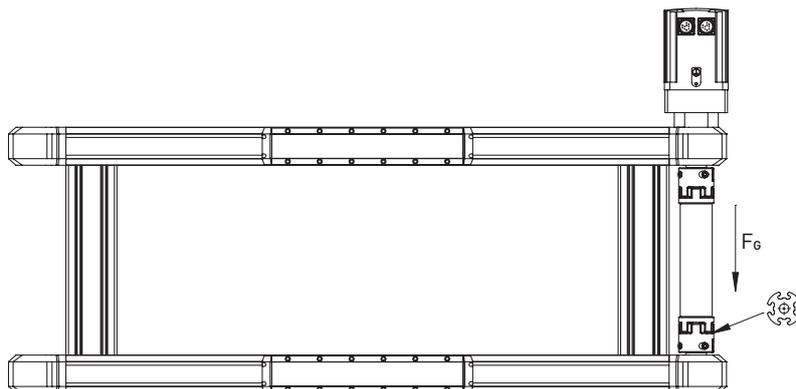


Fig. 6.6 Addition of a spacer when double axes HD are mounted vertically at the side

The axis' aluminium profile has been extruded in compliance with EN 12020-2.

NOTE

If higher running precision is required, the axis must be aligned and secured to a precision reference edge.

NOTE

Please note the support spacing for each of the axis sizes (see Section 6.2.1). Not only the end blocks may lie on the mounting surface.

NOTE

The bolts must be secured to prevent them coming loose.

NOTE

The spacer profiles of the double axis HD and multi-axis systems HS must not be removed until the axes have been secured with T nuts in accordance with Section 6.2.3 or with clamping profiles in accordance with Section 6.2.5.

NOTE

It may be necessary to remove the synchronous shaft first before removing the spacer profile. For further details, see Section 7.9 on Page 123 ff..

6.2.1 Maximum support spacing

Depending on how the linear axis is fixed, the body may undergo excessive bending, especially with large stroke lengths and high load capacities. This can be prevented when the axis body is mounted on multiple supports on a stable sub construction. The maximum support spacing L is a function of the acting force and can be determined from the following diagrams. In the case of multi-axis systems, the masses of the moving axes must also be taken into account.

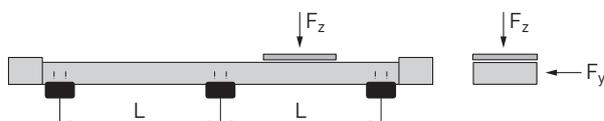


Fig. 6.7 Horizontal axis position

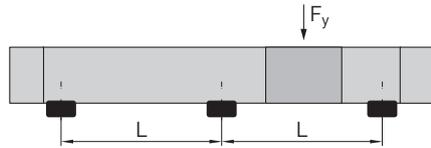


Fig. 6.8 Vertical axis position

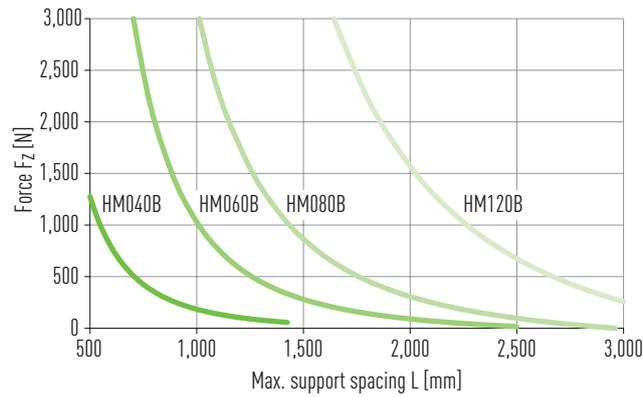


Fig. 6.9 HM-B: Maximum support spacing as a function of the force F_z

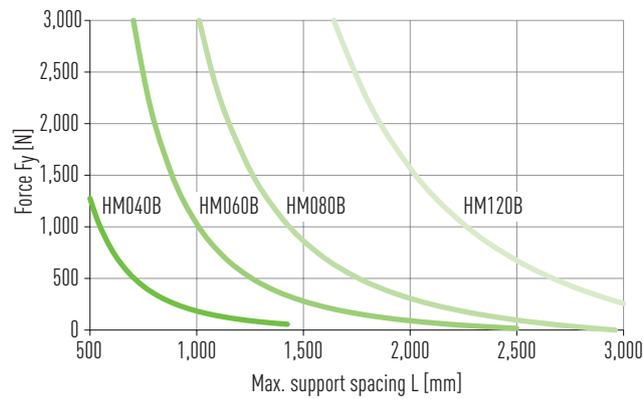


Fig. 6.10 HM-B: Maximum support spacing as a function of the force F_y

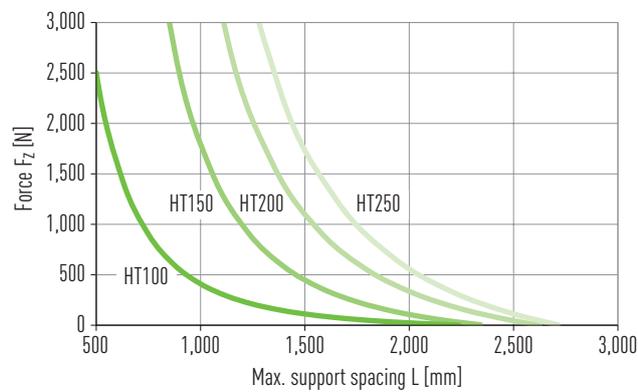


Fig. 6.11 HT-B: Maximum support spacing as a function of the force F_z

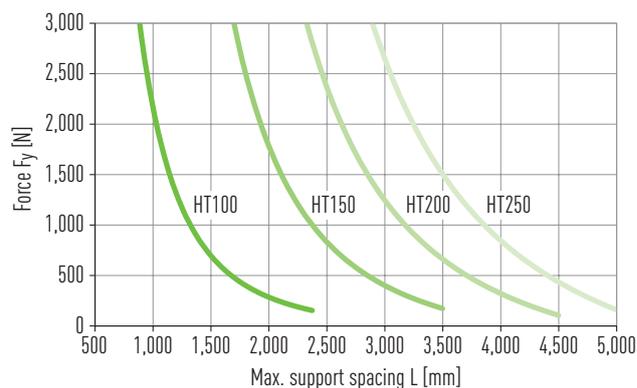


Fig. 6.12 HT-B: Maximum support spacing as a function of the force F_y

6.2.2 Reference surface accuracy requirements

Linear axis HM-B/HT-B/HC-B

When securing the 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 axis HD and multi-axis system HS

When securing the double axis HD and the 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.

 0.2 mm/m Level of accuracy required for all reference surfaces in order to secure the axis profiles

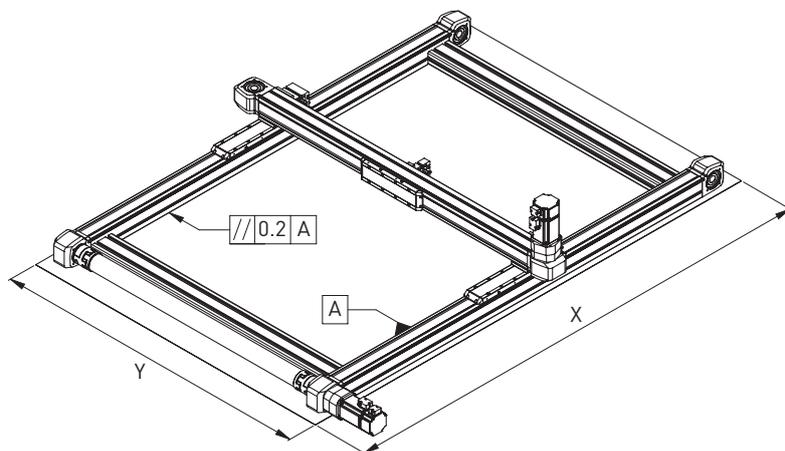


Fig. 6.13 Flatness and parallelism requirements for mounting double axes HD and multi-axis systems HS

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

The T nuts to be used for each axis size are given in Table 6.4. In the case of single axes, the T nuts must be arranged as per Fig. 6.14 and Fig. 6.17 or Fig. 6.18; in the case of double axes and multi-axis systems, they must be arranged as per Fig. 6.15 and Fig. 6.17 or Fig. 6.18. Four T nuts (six for HM120 and HD4) must be used at each mounting point. 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 tension direction per T nut) must be taken into account. Don't drop below the minimum number of T nuts specified in Table 6.4. The T nuts are to be positioned grouped in the form of mounting points as shown in Fig. 6.17 and Fig. 6.18. Make sure that each mounting point for itself transmits the external load safely. The distances between the mounting points are to be selected depending on the load situation. The recommended distances L_{NX} listed in Table 6.4 are only reference values.

- ▶ Drill mounting holes in the mounting surface (hole spacing listed in Table 6.4).
 - ▶ Clean mounting surface and position linear axis on it.
 - ▶ Swivel the T nut into the bottom groove.
 - ▶ Secure the T nut with a small tightening torque on the bolts.
 - ▶ Now tighten the bolts with the full tightening torques, proceeding in a crosswise manner.
- ✓ The linear axis has now been installed.

Note the hole spacing L_{NY} when securing the linear axes and linear axis systems.

 0.2 mm/m Precision requirements for all reference surfaces for securing the axis profile.

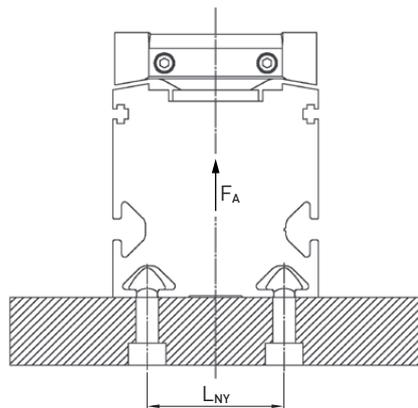


Fig. 6.14 Hole spacing for securing the linear axes with a T nut from below

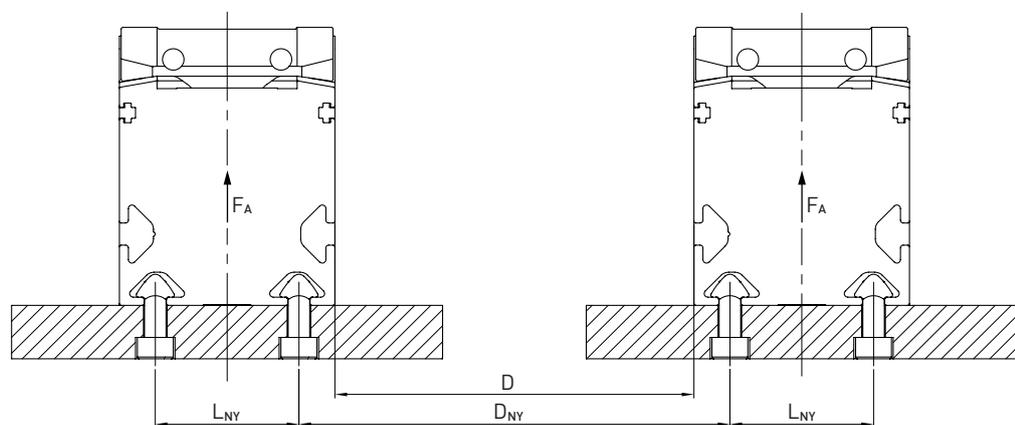


Fig. 6.15 Hole spacing for securing the double axes HD with a T nut from below

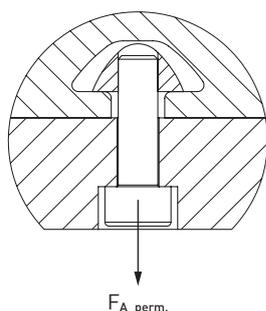


Fig. 6.16 Permissible axial operating force in tension direction per slot nut ($F_{A_perm.}$)

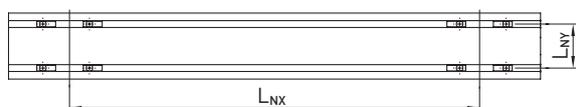


Fig. 6.17 Securing with T nuts – HM040S, HM060S, HM080S

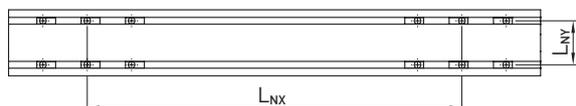


Fig. 6.18 Securing with T nuts – HM120S

Table 6.4 Minimum number of T nuts for securing the axis, and recommended spacing of mounting points on long axes – linear modules HM-B and double axes HD

Axis type/size	Minimum number of T nuts	L_{NY} [mm]	D_{NY} [mm]	Recommended distance L_{NX} [mm]	Thread size	Screw tightening torque [Nm]	Clamping force per T nut [N]	$F_{A_perm.}$ ¹⁾ [N]	Art. 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 tension direction per T nut

6.2.4 Assembly with T nuts – linear tables HT-B

The T nuts to be used for each axis size are given in Table 6.5. The T nuts must be arranged as per Fig. 6.19, Fig. 6.20, Fig. 6.22, Fig. 6.23 or Fig. 6.24. 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 operating force in tension direction per T nut) must be taken into account. Don't drop below the minimum number of T nuts specified in Table 6.5. The T nuts are to be positioned grouped in the form of mounting points as shown in Fig. 6.22, Fig. 6.23 and Fig. 6.24. Make sure that each mounting point for itself transmits the external load safely. The distances between the mounting points are to be selected depending on the load situation. The recommended distances L_{NX} listed in Table 6.5 are only reference values.

- ▶ Drill mounting holes in the mounting surface (hole spacing listed in Table 6.5).
- ▶ Clean mounting surface and position linear table on it.
- ▶ Swivel the T nut into the bottom groove.
- ▶ Secure the T nut with a small tightening torque on the bolts.
- ▶ Now tighten the bolts with the full tightening torques, proceeding in a crosswise manner.

✓ The linear table has now been installed.

Assembly and connection

Note the hole spacing L_{NY} when securing the linear tables.

 0.2 mm/m Precision requirements for all reference surfaces for securing the axis profile.

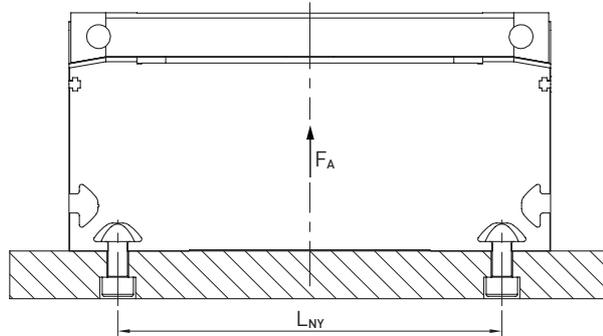


Fig. 6.19 Hole spacing for securing the linear tables HT100B, HT150B, HT200B with a T nut from below

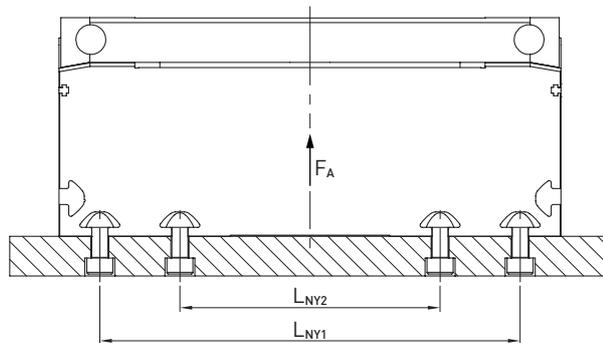


Fig. 6.20 Hole spacing for securing the linear tables HT250B with a T nut from below

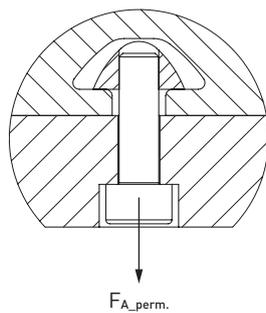


Fig. 6.21 Permissible axial operating force in tension direction per slot nut ($F_{A_perm.}$)

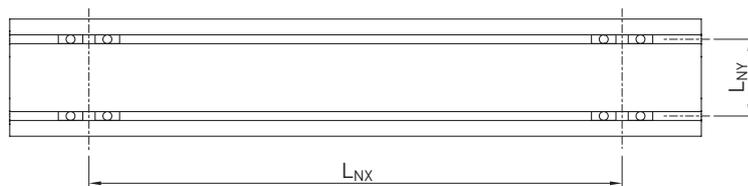


Fig. 6.22 Securing with T nuts – HT100B, HT150B

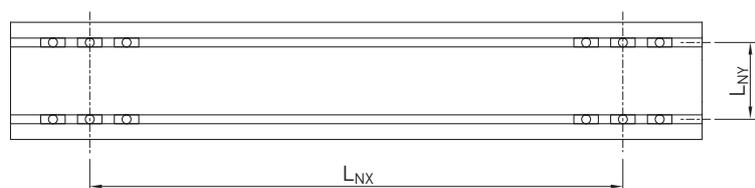


Fig. 6.23 Securing with T nuts – HT200B

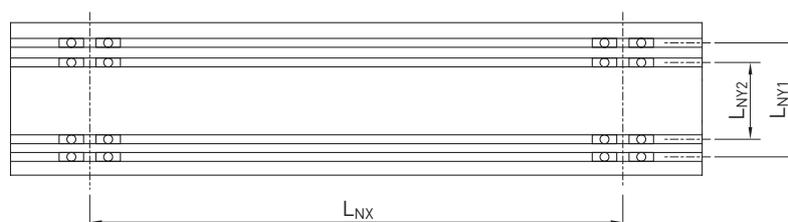


Fig. 6.24 Securing with T nuts – HT250B

Table 6.5 Minimum number of T nuts for securing the axis, and recommended spacing of mounting points on long axes – linear tables HT-B

Size	Minimum number of T nuts	L_{NY}/L_{NY1} [mm]	L_{NY2} [mm]	Recommended distance L_{NX} [mm]	Thread size	Screw tightening torque [Nm]	Clamping force per T nut [N]	$F_{A,perm.}^{1)}$ [N]	Art. 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	130	1,000	M8	24.6	18,600	5,000	20-000534

¹⁾ Permissible axial operating force in tension 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 attached in pairs to the left and right of the axis body (see Fig. 6.27 and Fig. 6.28). 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 force in tension direction per clamping profile) must be taken into account. Don't drop below the minimum number of clamping profiles specified in Table 6.6. The distances between the mounting points are to be selected depending on the load situation. The recommended distances L_{SX} listed in Table 6.6 are only reference values.

- ▶ Drill mounting holes in the mounting surface (hole spacing listed in Table 6.6).
- ▶ Clean mounting surface and position linear axis on it.
- ▶ Swivel the clamping profile into the side groove.
- ▶ Secure the clamping profile with a small tightening torque on the bolts.
- ▶ Now tighten the bolts with the full tightening torques, proceeding in a crosswise manner.

✓ The linear axis has now been installed.

Observe the L_{SY} hole spacing (Fig. 6.25) when securing linear axes, and the L_{SY} and D_{SY} hole spacings (Fig. 6.26) in the case of linear axis systems.

 0.2 mm/m Precision requirements for all reference surfaces for securing the axis profile.

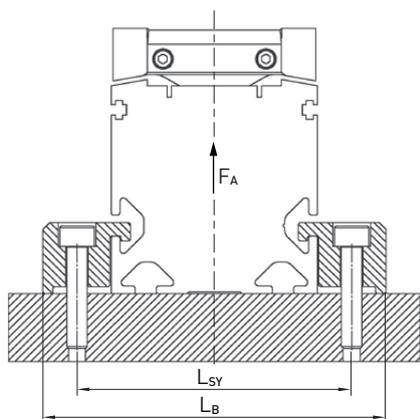


Fig. 6.25 Hole spacing for the lateral securing of linear modules HM-B with clamping profiles

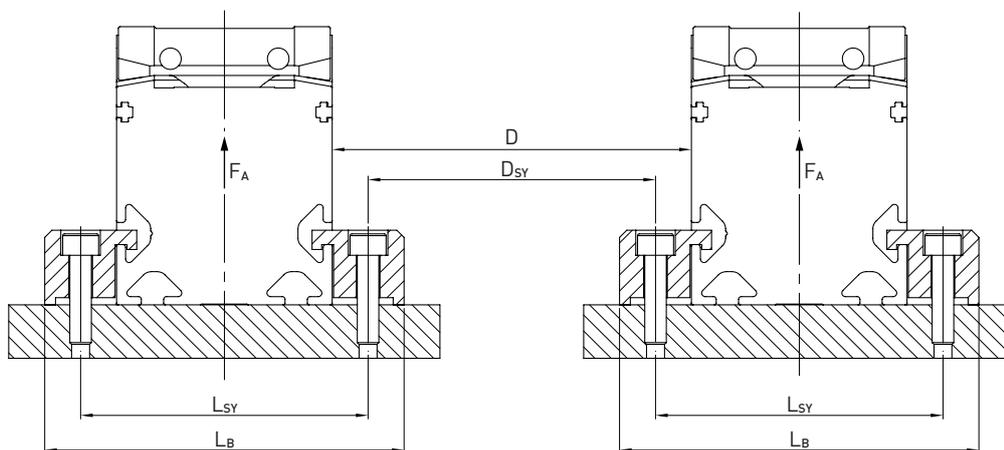


Fig. 6.26 Hole spacing for the lateral securing of double axes HD with clamping profiles

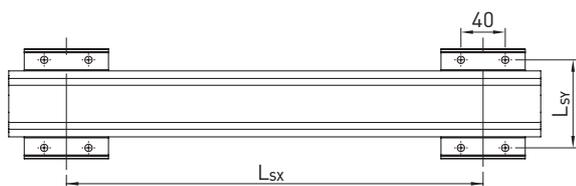


Fig. 6.27 Securing with clamping profiles – HM040B, HM060B, HM080B

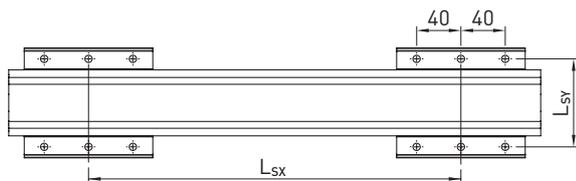


Fig. 6.28 Securing with clamping profiles – HM120B

Table 6.6 **Minimum number of clamping profiles for securing the axis, and recommended spacing of mounting points on long axes – linear modules HM-B and double axes HD**

Axis type/size	Min. number of clamping profiles	L_{SY} [mm]	D_{SY} [mm]	L_B [mm]	Recommended distance L_{SX} [mm]	Thread size	Screw tightening torque [Nm]	Clamping force per clamping profile [N]	$F_{A,perm.}^{1)}$ [N]	Art. no. clamping profiles (4 pcs)
HM040B/HD1	4	55	D – 15	70	400	M5	4.9	4,700	200	25-000517
HM060B/HD2	4	80	D – 20	100	600	M6	6.4	5,500	500	25-000518
HM080B/HD3	4	100	D – 20	120	800	M8	18.5	11,400	1,200	25-000519
HM120B/HD4	4	140	D – 20	160	1,200	M8	18.5	17,000	2,400	25-000520

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

6.2.6 Mounting with clamping profiles – linear tables HT-B

The clamping profiles must always be attached in pairs to the left and right of the axis body (see Fig. 6.30 and Fig. 6.31). 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 force in tension direction per clamping profile) must be taken into account. Don't drop below the minimum number of clamping profiles specified in Table 6.7. The distances between the mounting points are to be selected depending on the load situation. The recommended distances L_{SX} listed in Table 6.7 are only reference values.

- ▶ Drill mounting holes in the mounting surface (hole spacing listed in Table 6.7).
- ▶ Clean mounting surface and position linear table on it.
- ▶ Swivel the clamping profile into the side groove.
- ▶ Secure the clamping profile with a small tightening torque on the bolts.
- ▶ Now tighten the bolts with the full tightening torques, proceeding in a crosswise manner.

✓ The linear table has now been installed.

Observe the L_{SY} hole spacing (Fig. 6.29) when securing the linear tables.

 0.2 mm/m Precision requirements for all reference surfaces for securing the axis profile.

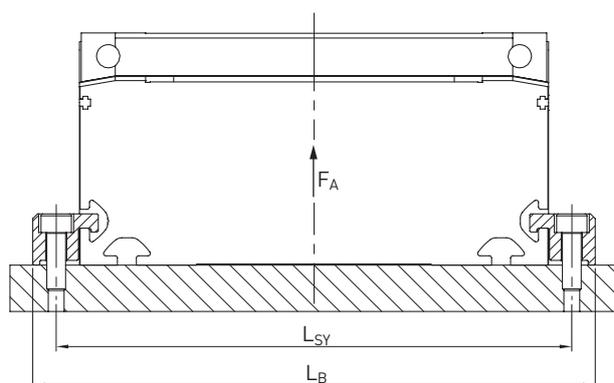


Fig. 6.29 **Hole spacing for the lateral securing of linear tables HT-B with clamping profiles**

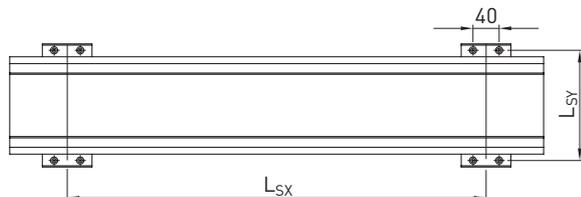


Fig. 6.30 Securing with clamping profiles – HT100B, HT150B

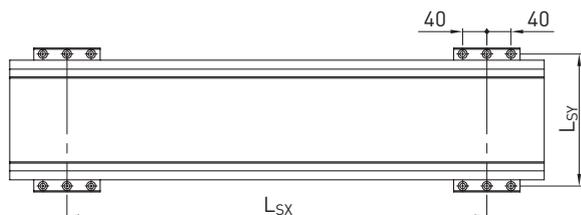


Fig. 6.31 Securing with clamping profiles – HT200B, HT250B

Table 6.7 Minimum number of clamping profiles for securing the axis, and recommended spacing of mounting points on long axes – linear tables HT-B

Size	Min. number of clamping profiles	L _{SY} [mm]	L _B [mm]	Recommended distance L _{SX} [mm]	Thread size	Screw tightening torque [Nm]	Clamping force per clamping profile [N]	F _{A,perm.} ¹⁾ [N]	Art. 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 tension direction per pair of clamping profiles

6.2.7 Assembly of the cantilever axis HC

The cantilever axis HC can be fitted to the drive block housing either laterally or from above (see Fig. 6.32 and Fig. 6.33). The number of screws and the thread sizes are specified (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 want to attach the axis. Three sides are possible for the attachment: left, right or from above.
 - ▶ Place the axis against your adjacent construction.
 - ▶ Tighten the fixing bolts with the matching torque, proceeding in a crosswise manner.
- ✓ The cantilever axis has now been mounted.

Table 6.8 Assembly of the cantilever axis HC – fastening from the side

Size	Thread size × depth	Counterbore depth for centring sleeve [mm]	Counterbore diameter for centring sleeve [mm]	Number of fixing 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

Table 6.9 Assembly of the cantilever axis HC – fastening from above

Size	Thread size × depth	Counterbore depth for centring sleeve [mm]	Counterbore diameter for centring sleeve [mm]	Number of fixing screws
HC025B	M3 × 7,5	1,5	∅6 H7	8
HC040B	M5 × 11,5	1,5	∅8 H7	8
HC060B	M6 × 12	1,5	∅8 H7	8
HC080B	M8 × 16	2,0	∅12 H7	8

A. Fastening from the side

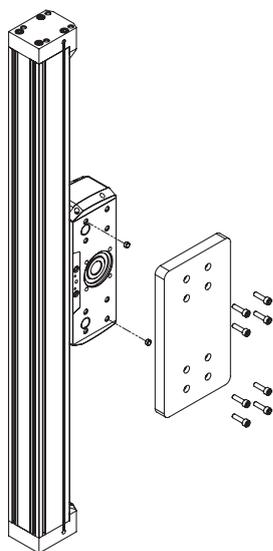


Fig. 6.32 Lateral mounting of the cantilever axis HC

B. Fastening from above

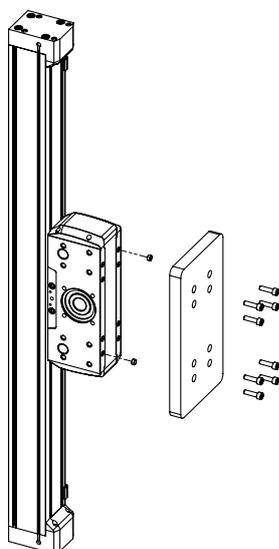


Fig. 6.33 Mounting the cantilever axis HC from above

The cantilever axes HC040B, HC060B and HC080B can alternatively be mounted at the beam profile with T-nuts or clamping profiles. See more in Section 6.2.3 and Section 6.2.5.

NOTE

6.3 Mounting the imposed load

The spacings of the threaded holes for mounting the imposed load can be found in the catalogue "Linear Axes and Axis Systems HX". Additional counterbores can take centring rings. HIWIN recommends to position two centring rings diagonally opposite each other. For axes with more than one carriage or double axes, it is recommended to equip only one carriage each with centring sleeves to avoid distortion.

Table 6.10 Threaded holes for securing the imposed load

Axis type/ size	Thread size × depth	Counterbore depth for centring sleeve [mm]	Counterbore 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

- ▶ Clean mounting surface at the carriage (HM-B/HT-B/HD) or at the end plate (HC-B).
 - ▶ Clean the mounting surface of the load.
 - ▶ If necessary, use centring sleeves (see Fig. 6.34, Fig. 6.35 and Fig. 6.36).
 - ▶ 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 the free movement of the load over the entire stroke.
 - ▶ Lock the bolts.
- ✓ The imposed load has now been installed.

 0.02 Precision requirements for the imposed load's mounting surface.

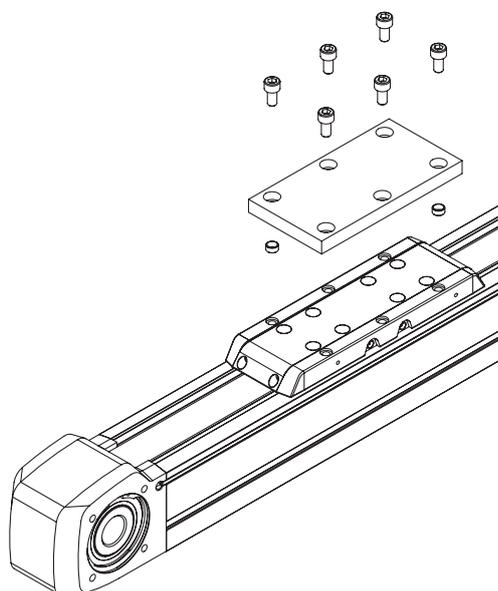


Fig. 6.34 Securing the load with centring sleeves (HM-B)

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.

NOTE

 0.02 Precision requirements for the imposed load's mounting surface.

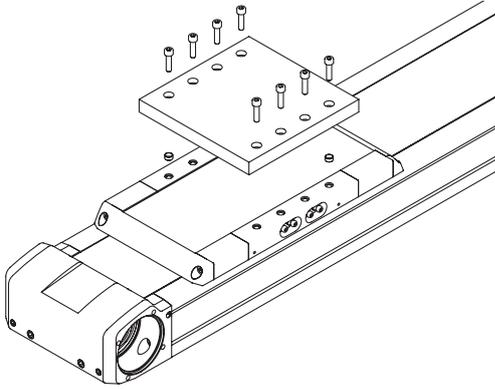


Fig. 6.35 Securing the load with centring sleeves (HT-B)

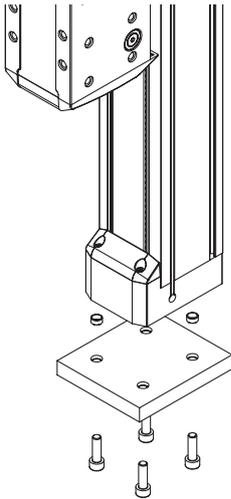


Fig. 6.36 Securing the load with centring sleeves (HC-B)

6.3.1 Carriage synchronisation with double axes

If you are using an 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 screws slightly. Keep alternating between the two clamping screws 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. 6.37.
- ▶ 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. 6.37.
- ▶ Mount the synchronous shaft as described in Section 6.1.2 on Page 45 ff.

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.

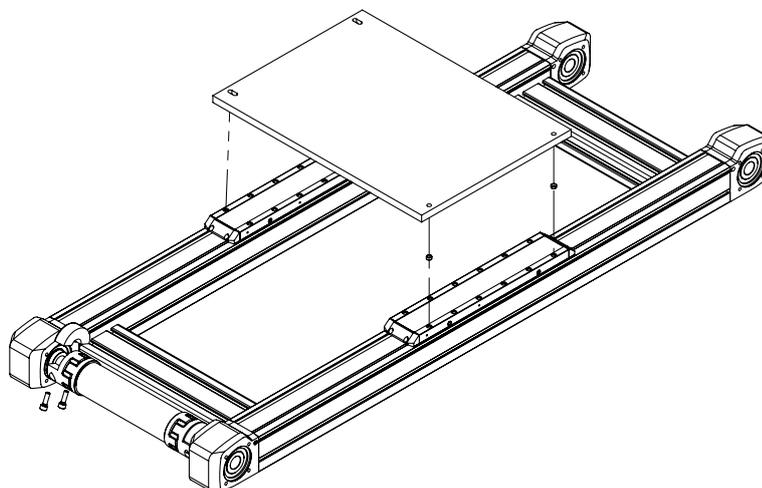


Fig. 6.37 Mounting the adapter plate above both double axis carriages

6.4 Mounting and adjusting the limit switches – linear modules HM-B, linear tables HT-B, doubles axes HD

6.4.1 Mounting the limit switches

The limit switches are available as an NC or NO contact. The limit switch can be secured directly in the limit switch groove (T groove) with the provided M3 bolts and nuts. The limit switches can be mounted on the left or right.

- ▶ If necessary, remove the green decorative strip from the upper T groove.
 - ▶ Push two nuts into the upper T groove through the notch at the drive block.
 - ▶ Attach the limit switch with two bolts (see Fig. 6.38). In the case of axis sizes HM040 and HT100, the spacer plate must also be installed between the limit switch and axis (see Fig. 6.39). First leave the two bolts untightened.
 - ▶ Push the limit switch to the required position, and press it up slightly.
 - ▶ Tighten the bolts. The tightening torque is 0.5 Nm.
- ✓ The limit switches have now been installed.

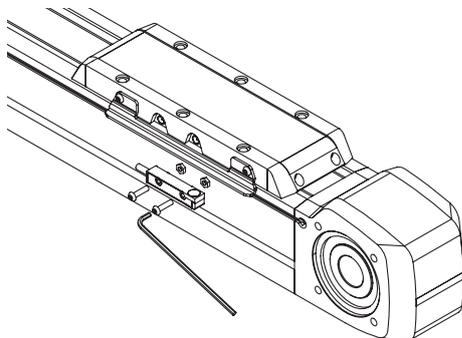


Fig. 6.38 Mounting the limit switch: HM060, HM080, HM120, HT150, HT200, HT250

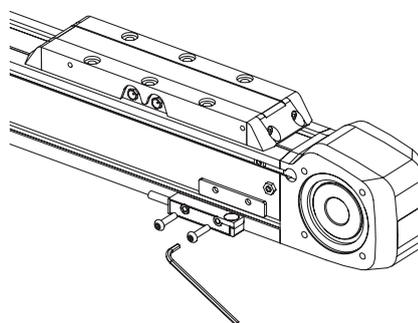


Fig. 6.39 Mounting the limit switch: HM040, HT100

6.4.2 Mounting the damping element

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

- ▶ Place the damping element at the carriage.
 - ▶ Using the enclosed M3 bolts, secure the damping element loosely on the carriage.
 - ▶ Align the damping element parallel to the carriage's lower edge.
- ✓ The damping element has now been pre-installed.

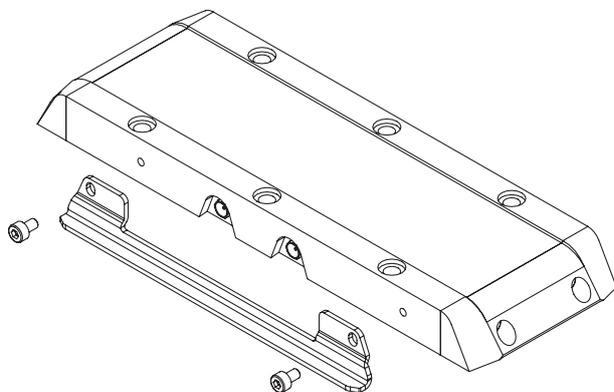


Fig. 6.40 Mounting the damping element

6.4.3 Setting the switching distance

The limit switches are inductive units and need a defined switching distance of 0.8 mm (± 0.2 mm) to the damping element.

- ▶ Move the carriage until the damping element is above a limit switch. Using a feeler gauge, align the damping element for a switching distance of 0.8 mm (± 0.2 mm). Make sure in doing so that the damping element remains parallel to the carriage's lower edge (see Fig. 6.41).
- ▶ Tighten the bolts for the damping element. The tightening torque is 1 Nm.
- ▶ If a second limit switch has been installed: Move the carriage until the damping element is above the second limit switch, and check with a feeler gauge that the switching distance is 0.8 mm (± 0.2 mm). Correct where necessary until the switching distance is reached for both limit switches.
- ▶ Route the limit switch cable into the lower groove (see Fig. 6.42). There the cable is protected under the groove cover. The groove cover is available separately, see Section 12.4 on Page 161.

✓ The switching distance has now been set.

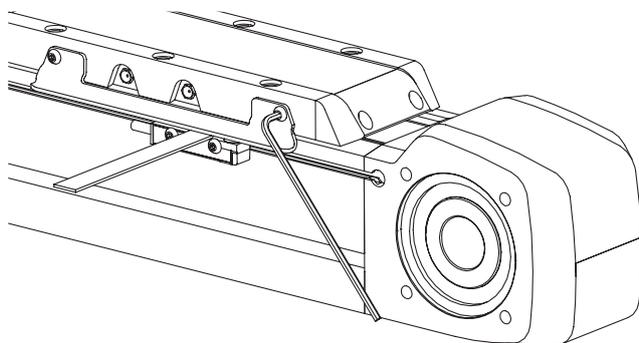


Fig. 6.41 Setting the switching distance with a feeler gauge, and tightening the bolts

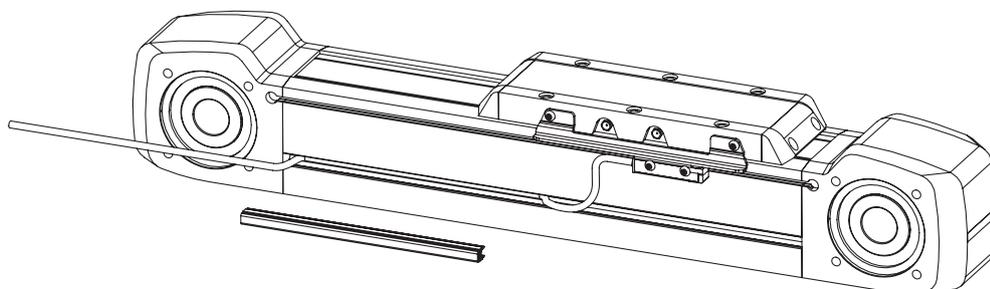


Fig. 6.42 Mounting the limit switch: Routing the cables

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

6.5.1 Mounting the limit switches

The limit switches are available as an N/C or N/O contact (HC025B only N/C contact). The limit switch can be secured directly at the drive block housing with the provided bolts (HC040B/HC060B/HC080B: M3, HC025B: M1.2. The limit switches are always mounted on the left axis side.

- ▶ Position the limit switches on the drive block housing (see Fig. 6.43).
- ▶ Lightly screw the limit switches to the drive block housing using the M3 or M1.2 screws supplied.
- ▶ Press the limit switches slightly against the stop edge of the drive block housing.
- ▶ Tighten the screws. The screw tightening torque is 0.5 Nm for the M3 screws and 0.2 Nm for the M1.2 screws.

✓ The limit switches have now been installed.

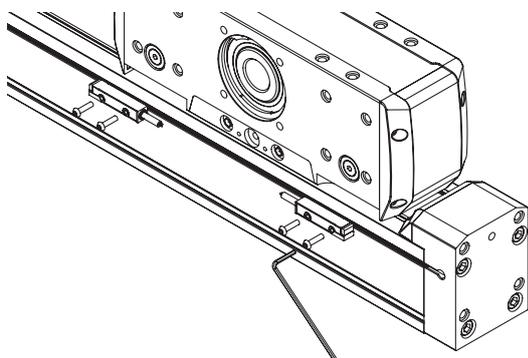


Fig. 6.43 Mounting the limit switches: HC-B (all sizes)

6.5.2 Mounting the damping elements

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

- ▶ If necessary, remove the green decorative strip from the upper T groove.
- ▶ Push two nuts into the upper T groove through the notch at the end plate.
- ▶ Attach the damping elements with the two M3 bolts (in the case of axis size HC025B, the spacer plate must also be installed between the damping elements and axis, see Fig. 6.44). First leave the two bolts untightened.
- ▶ Push the damping elements to the required position.

✓ The damping elements have now been pre-installed.

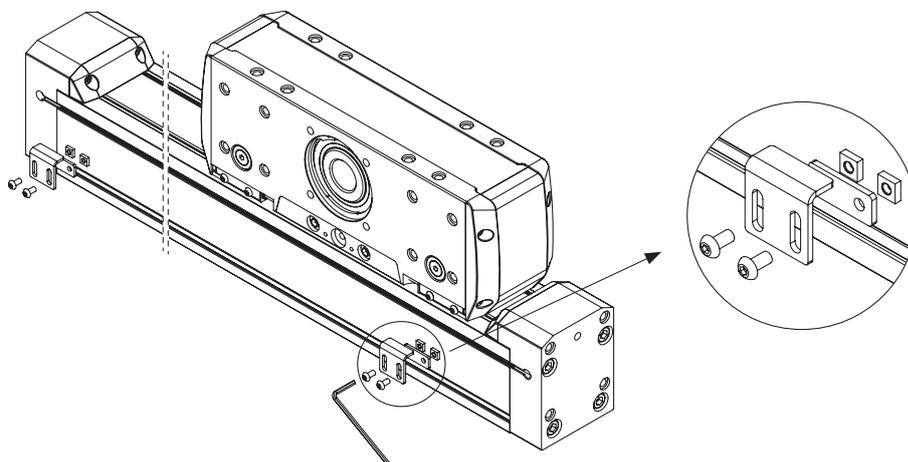


Fig. 6.44 Mounting the damping elements – HC025B and HC040B (with spacer plate)

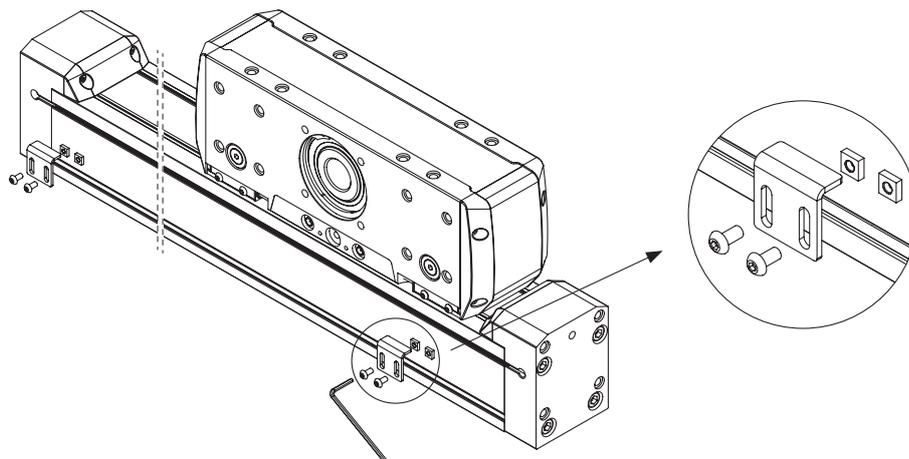


Fig. 6.45 **Mounting the damping elements – HC060B and HC080B (without spacer plates)**

6.5.3 Setting the switching distance

The limit switches are inductive units and need a defined switching distance to the damping element.

- ▶ Move the drive block housing until one limit switch is above a damping element (see Fig. 6.46). Using a feeler gauge, align the damping element so that the following values are set for the switching distance:
 - HC025B: 0,4 mm (± 0.1 mm)
 - HC040B, HC060B and HC080B: 0.8 mm (± 0.2 mm)

Make sure that the damping element remains parallel to the axis' upper edge.
 - ▶ Tighten the bolts for the damping element. The tightening torque is 1 Nm.
 - ▶ Move the drive block housing until the second limit switch is above the second damping element and repeat the procedure on this side.
- ✓ The switching distance has now been set.

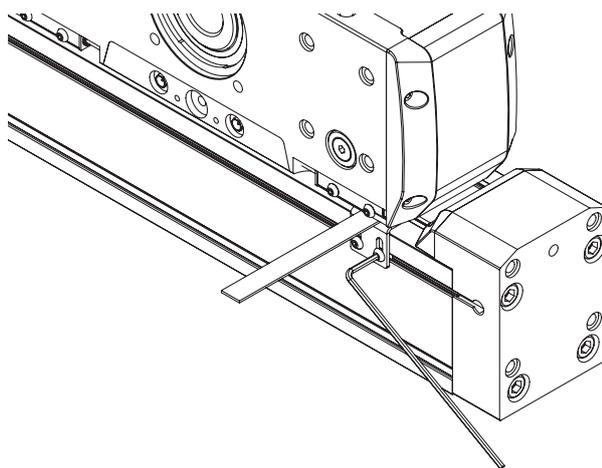


Fig. 6.46 **Setting the switching distance with a feeler gauge, and tightening the bolts**

6.6 Mounting the drive unit on the linear axis HM-B

6.6.1 Assembly of the HM-B coupling components

A suitable coupling is needed for the motor attachment. Couplings can be found in Section 11.4.6 on Page 156 ff.

The coupling components for the linear axis HM-B consist of:

- 1 clamping hub for the drive side [1]
- 1 elastomer insert [2]
- 1 expansion hub for the axis side [3]

There are two types of clamping hubs:

- Variant 1 with one clamping screw, see Fig. 6.47
- Variant 2 with two clamping screws, see Fig. 6.48

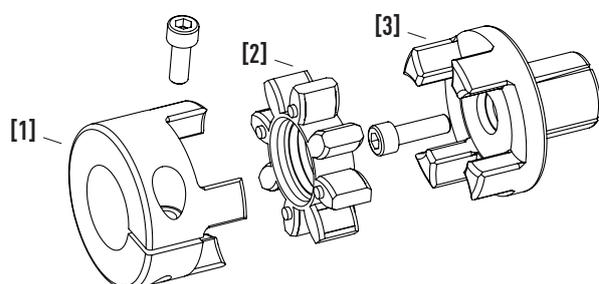


Fig. 6.47 Coupling assembly variant 1: clamping hubs with one clamping screw

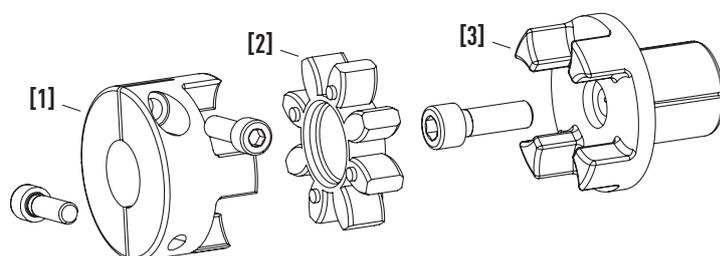


Fig. 6.48 Coupling assembly variant 2: clamping hubs with two clamping screws

Before mounting please make sure that

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

The tightening torques in Table 6.11 and Table 6.12 must be used for mounting the coupling assembly:

Table 6.11 Screw tightening torques for the expansion hub and the 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	8	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 with 24 mm clamping diameter: 10 Nm

²⁾ Special version with 16 mm clamping diameter: 2,8 Nm

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

Table 6.12 **Screw tightening torques for the coupling housing**

Size	Screw 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

- ▶ Move the carriage to its end position. The toothed belt pulley is therefore prevented from turning.
- ▶ Carefully depress the expansion hub in the toothed belt pulley's hollow shaft until it lies flat.

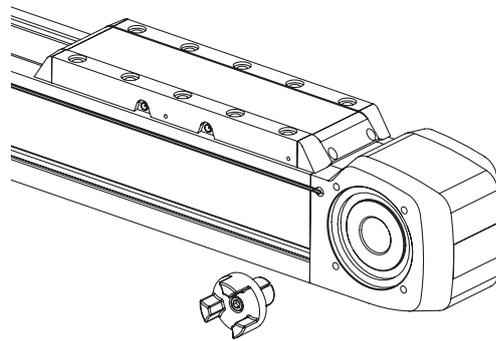


Fig. 6.49 **Inserting the expansion hub**

- ▶ At the centre of the expansion hub is an expanding mandrel that is used to secure the coupling. Secure the expansion hub with the tightening torque in [Table 6.11](#).

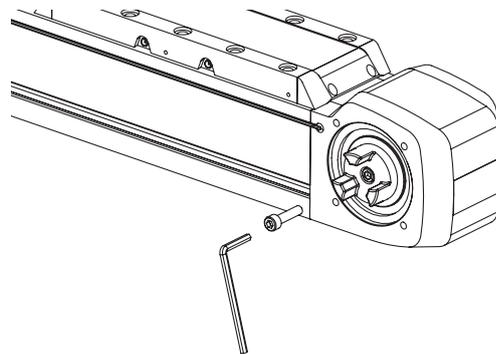


Fig. 6.50 **Mounting the expansion hub by tightening the expanding mandrel**

- ▶ Attach the elastomer insert to the expansion hub.
- ▶ Using four bolts, mount the coupling housing KB so that it lies flat.

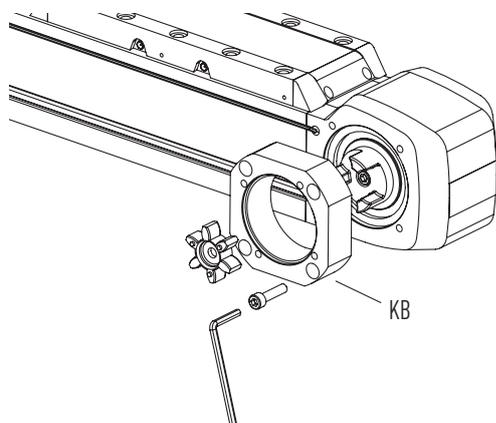


Fig. 6.51 Attaching the elastomer insert and mounting the coupling housing KB on the linear axis HM-B

The elastomer insert must be lightly preloaded and should have no backlash. If it can be mounted under too slight a pressure, it must be replaced. A small quantity of PU compatible grease can be applied to the elastomer insert for easier installation.

NOTE

- ▶ Push the clamping hub onto the elastomer insert until measurement L_1 (see Table 6.13) is achieved.

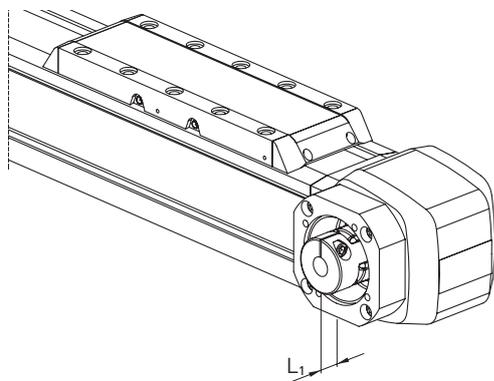


Fig. 6.52 Adjusting the clamping hub distance in the direction of the motor on linear axis HM-B

Table 6.13 Adjusting the coupling distance based on measurement 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

If the coupling is mounted without a coupling housing, the coupling distance L_2 must be set in accordance with Fig. 6.53 and Table 6.14.

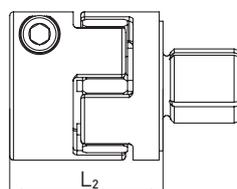


Fig. 6.53 Total length of HM-B coupling assembly

Table 6.14 Adjusting the coupling distance based on measurement L_2 when there is no coupling housing

Size	L_2 variant 1 [mm]	L_2 variant 2 [mm]
HM040B	27.5	28.0
HM060B	41.0	41.0
HM080B	46.0	46.0
HM120B	48.0	48.0

6.6.2 Mounting the motor (without gears)

- ▶ Attach the motor adapter plate AM so that it lies flat. In doing so, note the position of the hole for the clamping hub's clamping bolt.
- ▶ Tighten the four bolts. See Table 6.15 for the tightening torques.

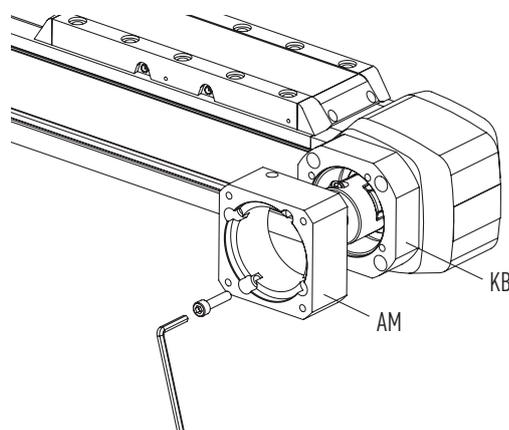


Fig. 6.54 Mounting the motor adapter plate AM (HM-B)

Table 6.15 Tightening torques for the motor adapter plate AM

Size	Screw 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 against falling.
- ▶ Place the motor flat on the motor adapter plate AM.
- ▶ Secure the motor in accordance with the manufacturer's specifications.

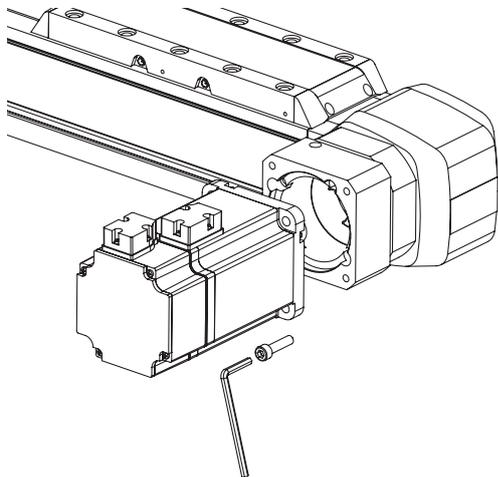


Fig. 6.55 Bolting the motor to the linear axis HM-B

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

NOTE

- ▶ Remove the seal plug from the hole on the side of the motor adapter plate AM.

Variant 1:

- ▶ Tighten the clamping hub's bolt through the bore with the tightening torque shown in [Table 6.11](#).

Variant 2:

- ▶ Tighten both screws of the clamping hub one after the other through the bore. First, position the screw on the 1st side,
- ▶ then tighten the screw on the 2nd side and then on the 1st side with the tightening torque shown in [Table 6.11](#).

- ▶ Insert the seal plug back in the hole.

- ✓ The motor has now been assembled.

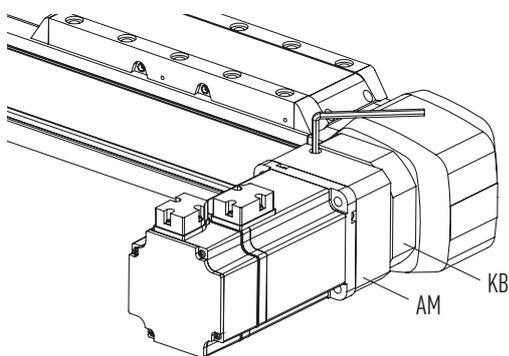


Fig. 6.56 Tightening the clamping hub on the motor shaft

The manual for the used gears must be consulted for attaching the motor to the gears.

NOTE

6.6.3 Mounting the gears

HM040B:

- ▶ Attach the first part of the gear adapter plate (AG-A) so that it lies flat (see Fig. 6.57). In doing so, note the position of the hole for the clamping hub's clamping bolt.
- ▶ Tighten the four bolts. See Table 6.16 for the tightening torques.
- ▶ Attach the second part of the gear adapter plate (AG-B) onto the first piece (AG-A) (see Fig. 6.57).
- ▶ Tighten the four bolts. See Table 6.16 for the tightening torques.

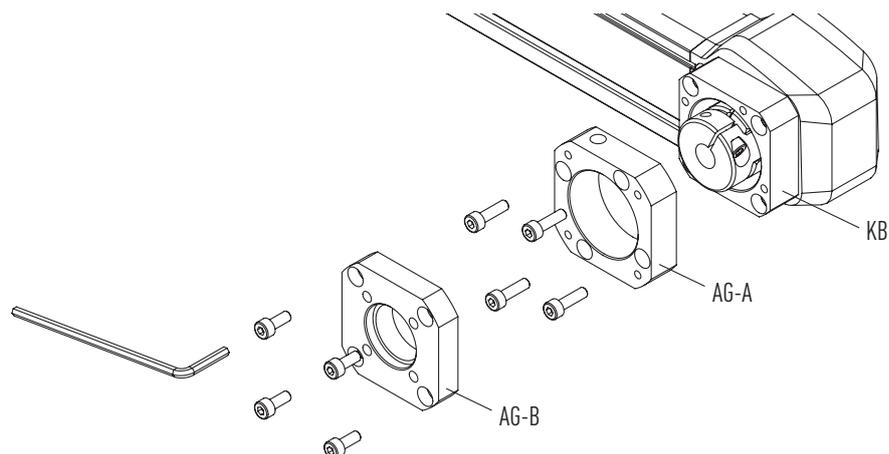


Fig. 6.57 Mounting the two-part gear adapter plate AG-A and AG-B – HM040B

HM060B, HM080B, HM120B:

- ▶ Attach the gear adapter plate AG so that it lies flat (see Fig. 6.58). In doing so, note the position of the hole for the clamping hub's clamping bolt.
- ▶ Tighten the four bolts. See Table 6.16 for the tightening torques.

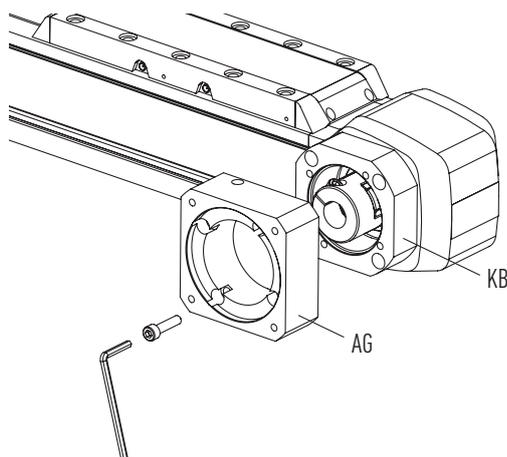


Fig. 6.58 Mounting the gear adapter plate AG – HM060B, HM080B, HM120B

Table 6.16 Tightening torques for the gear adapter plate AG

Size	Screw 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 gears against falling.
- ▶ Place the gears flat on the gear adapter plate AG (see Fig. 6.59).
- ▶ Using four bolts, secure the gears in accordance with the manufacturer's specifications.

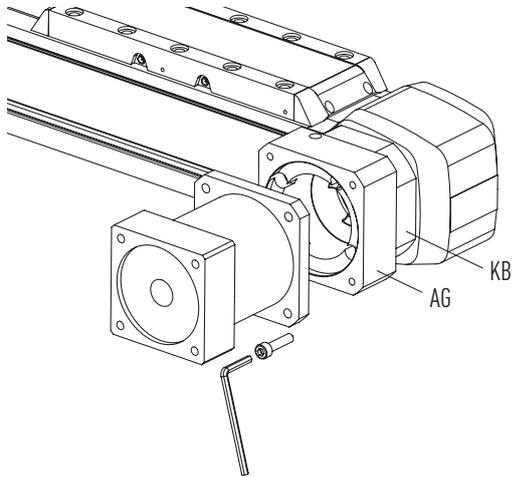


Fig. 6.59 Bolting the gears to the linear axis

- ▶ Remove the seal plug from the hole on the gear adapter plate AG.

Variant 1:

- ▶ Tighten the clamping hub's bolt through the bore with the tightening torque shown in [Table 6.11](#).

Variant 2:

- ▶ Tighten both screws of the clamping hub one after the other through the bore. First, position the screw on the 1st side, then tighten the screw on the 2nd side and then on the 1st side with the tightening torque shown in [Table 6.11](#).
- ▶ Insert the seal plug back in the hole.
- ✓ The gears have now been installed.

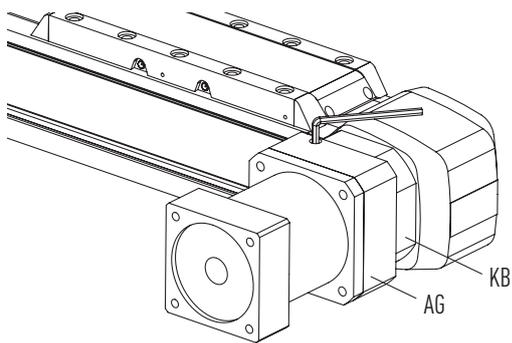


Fig. 6.60 Tightening the clamping hub on the gear shaft

The manual for the gears used must be consulted for attaching a motor to the gears.

NOTE

6.6.4 Mounting the motor on PLE/PLQE gears¹⁾

- ▶ Loosen the gears' clamping bolt so that you can later insert the motor shaft easily into the gears' hollow shaft. The provided bush must be used for smaller motor shaft diameters.
- ▶ Attach the motor gear adapter plate GM so that it lies flat on the gears. In doing so, note the position of the hole for the clamping hub's clamping bolt (see Fig. 6.61).
- ▶ Tighten the four bolts. See Table 6.17 for the tightening torques.

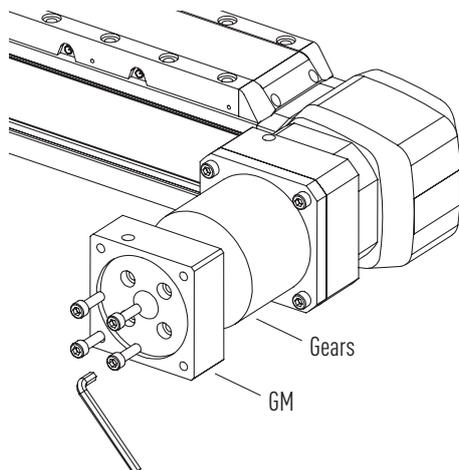


Fig. 6.61 Mounting the motor gear adapter plate GM (HM-B)

Table 6.17 Tightening torques for the motor gear adapter plate GM

Size	Gears ¹⁾	Screw strength class	Thread size × length	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

- ▶ Whenever possible, turn the axis so that the vertical motor can be mounted from above.
- ▶ Place the motor flat on the motor gear adapter plate GM (see Fig. 6.62).
- ▶ Remove the headless screw from the hole on the side of the motor gear adapter plate GM.
- ▶ Apply the tightening torque in Table 6.18 to the clamping hub's clamping bolt through the hole.
- ▶ Insert the headless screw back in the hole.

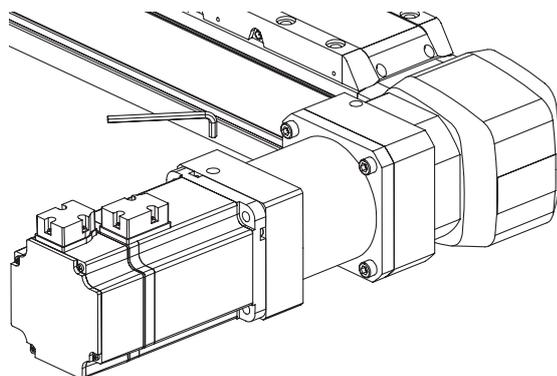


Fig. 6.62 Tightening the clamping hub on the motor shaft

Table 6.18 **Tightening torques for the clamping bolt**

Size	Gears ¹⁾	Screw 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⁾ Hex socket size; varies depending on coupling size/motor used

The manual for the used gears must be consulted for attaching the motor to the gears.

NOTE

▶ Secure the motor in accordance with the manufacturer's specifications.

✓ The motor has now been installed.

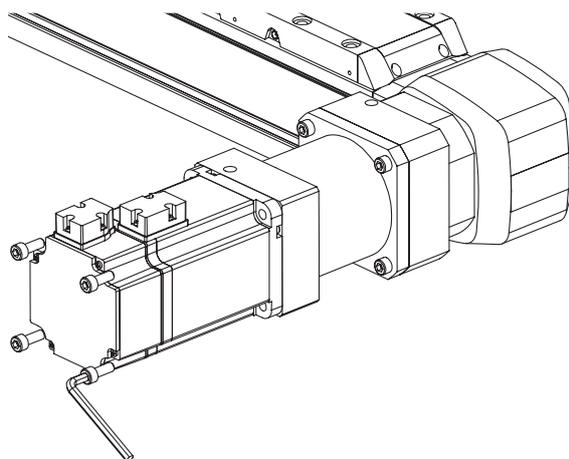


Fig. 6.63 **Bolting the motor to the linear axis HM-B with gears**

6.6.5 Mounting the journal

The journal presents an alternative interface for motors and encoders. It can be retrofitted to both sides of each drive block.

Table 6.19 **Tightening torques for the journal**

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

Before mounting please make sure that

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

Assembly and connection

- ▶ Move the carriage to its end position. The toothed belt pulley is therefore prevented from turning.
- ▶ Carefully depress the journal in the toothed belt pulley's hollow shaft until the expansion hub lies flat.
- ▶ Make sure that the journal flange lies flat. If necessary, use a light plastic hammer (see Fig. 6.64).

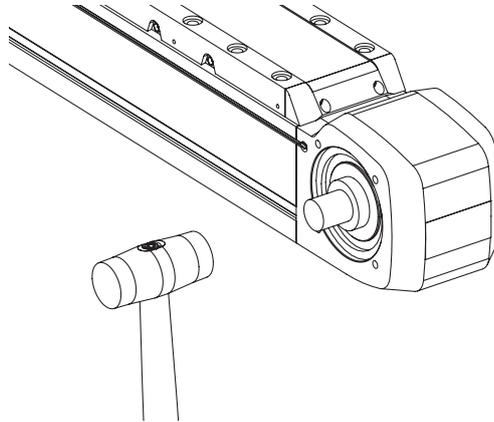


Fig. 6.64 **Inserting the journal in the linear axis HM-B drive block**

- ▶ Apply the tightening torque in [Table 6.19](#) to the bolt at the centre of the journal.

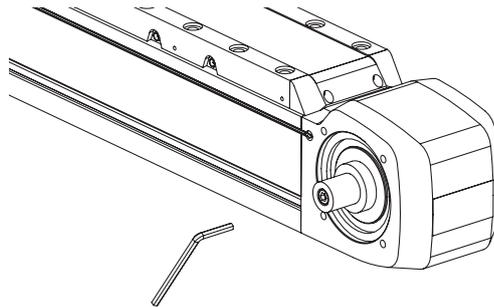


Fig. 6.65 **Tightening the bolt on the journal**

6.7 Mounting the drive unit on the linear table HT-B

6.7.1 Assembly of the coupling components (HT-B)

A suitable coupling is needed for the motor attachment. Couplings can be found in Section 11.4.6 on Page 156 ff.

The coupling components for the linear table HT-B consist of:

- 1 clamping hub for the drive side [1]
- 1 elastomer insert [2]
- 1 expansion hub for the axis side [3]

There are two types of clamping hubs:

- Variant 1 with one clamping screw, see Fig. 6.66
- Variant 2 with two clamping screws, see Fig. 6.67

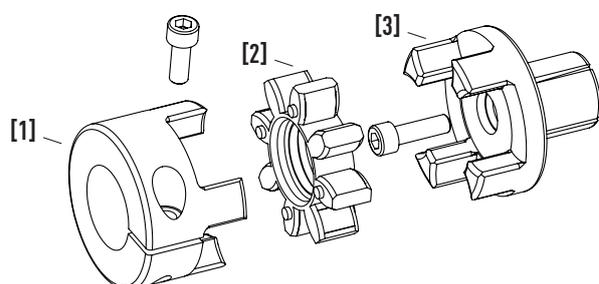


Fig. 6.66 Coupling assembly variant 1: clamping hub with one clamping screw

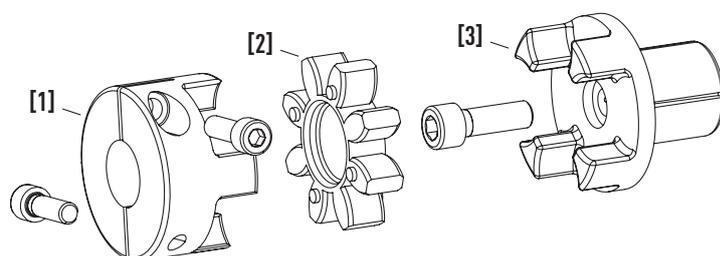


Fig. 6.67 Coupling assembly variant 2: clamping hub with two clamping screws

Before mounting please make sure that

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

The tightening torques in Table 6.20 must be used for mounting the coupling assembly:

Table 6.20 Screw tightening torques for the expansion hub and the 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	8	5.0	5.0 ²⁾
HT150B	25	14.0 ¹⁾	15.0
HT200B	49	35.0	35.0
HT250B	49	35.0	35.0

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

²⁾ Special version with 16 mm clamping diameter: 3.8 Nm

Assembly and connection

- ▶ Move the carriage to its end position. The toothed belt pulley is therefore prevented from turning.
- ▶ Carefully depress the expansion hub in the toothed belt pulley's hollow shaft until it lies flat.

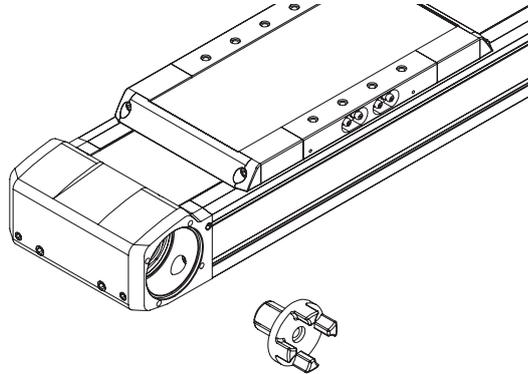


Fig. 6.68 **Inserting the expansion hub**

- ▶ At the centre of the expansion hub is an expanding mandrel that is used to secure the coupling. Secure the expansion hub with the tightening torque in [Table 6.20](#).

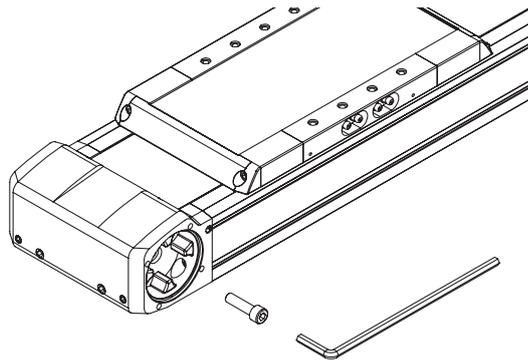


Fig. 6.69 **Mounting the expansion hub by tightening the expanding mandrel**

- ▶ Attach the elastomer insert to the expansion hub.

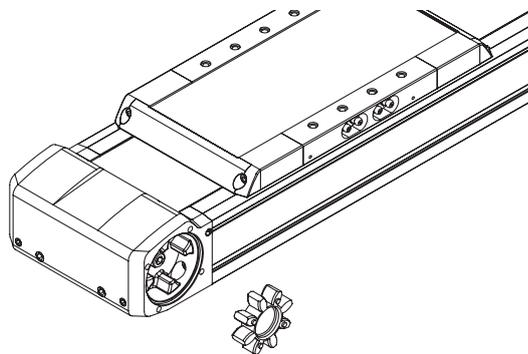


Fig. 6.70 **Attaching the elastomer insert**

The elastomer insert must be lightly preloaded and should have no backlash. If it can be mounted under too slight a pressure, it must be replaced. A small quantity of PU compatible grease can be applied to the elastomer insert for easier installation.

NOTE

- ▶ Push the clamping hub onto the elastomer insert until measurement L_1 (see [Table 6.21](#)) is achieved.

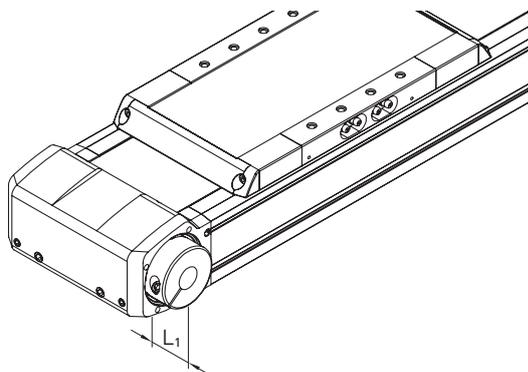


Fig. 6.71 Adjusting the clamping hub distance in the direction of the motor

Table 6.21 Adjusting the coupling distance based on measurement L_1

Size	Coupling size	L_1 variant 1 [mm]	L_1 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

Should it not be possible to adjust the coupling distance according to [Fig. 6.71](#) and [Table 6.21](#), alternatively it is possible to set the coupling distance L_2 according to [Fig. 6.72](#) and [Table 6.22](#).

NOTE

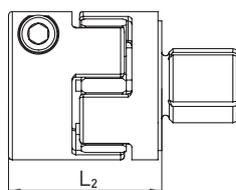


Fig. 6.72 Total length of coupling assembly (HT-B)

Table 6.22 Adjusting the coupling distance based on measurement L_2 when there is no coupling housing

Size	L_2 variant 1 [mm]	L_2 variant 2 [mm]
HT100B	28	28
HT150B	46	44
HT200B	48	48
HT250B	48	48

6.7.2 Mounting the motor (without gears)

- ▶ Attach the motor adapter plate AM so that it lies flat. In doing so, note the position of the hole for the clamping hub's clamping bolt (see Fig. 6.73).
- ▶ Tighten the four bolts. See Table 6.23 for the tightening torques.

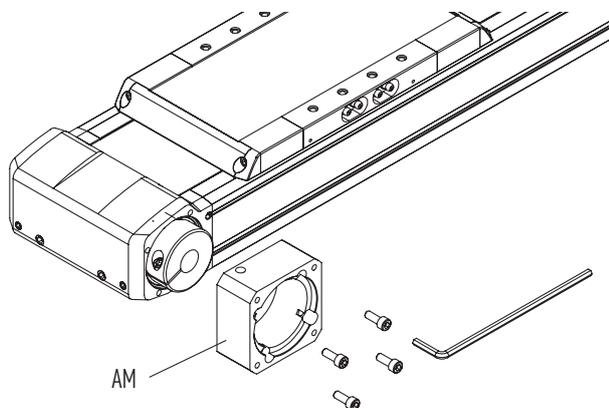


Fig. 6.73 Mounting the motor adapter plate AM (HT-B)

Table 6.23 Tightening torques for the motor adapter plate AM

Size	Screw 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 against falling.
- ▶ Place the motor flat on the motor adapter plate AM.
- ▶ Secure the motor in accordance with the manufacturer's specifications.

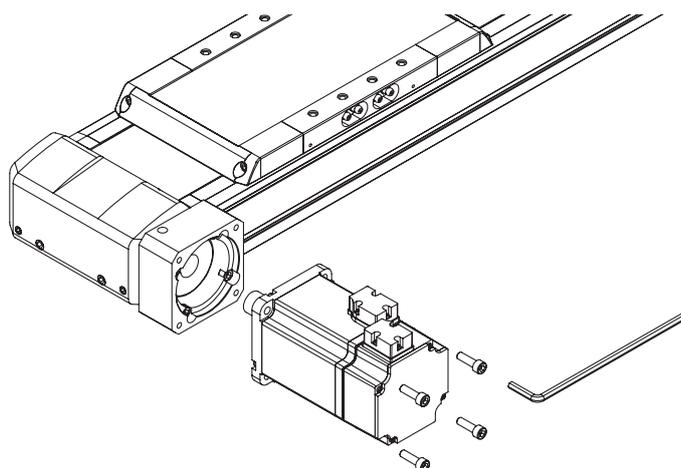


Fig. 6.74 Bolting the motor to the linear table HT-B

NOTE

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

- ▶ Remove the seal plug from the hole on the side of the motor adapter plate AM.

Variant 1:

- ▶ Tighten the clamping hub's bolt through the bore with the tightening torque shown in [Table 6.20](#).

Variant 2:

- ▶ Tighten both screws of the clamping hub one after the other through the bore. First, position the screw on the 1st side, then tighten the screw on the 2nd side and then on the 1st side with the tightening torque shown in [Table 6.20](#).

- ▶ Insert the seal plug back in the hole.

- ✓ The motor has now been assembled.

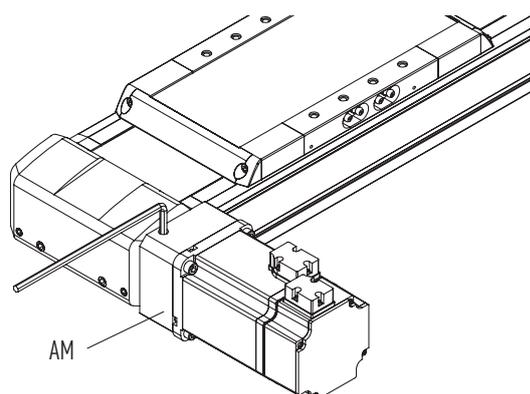


Fig. 6.75 Tightening the clamping hub on the motor shaft

6.7.3 Mounting the gears

HT100B:

- ▶ Attach the first part of the gear adapter plate (AG-A) so that it lies flat (see [Fig. 6.76](#)). In doing so, note the position of the hole for the clamping hub's clamping bolt.
- ▶ Tighten the four bolts. See [Table 6.24](#) for the tightening torques.
- ▶ Attach the second part of the gear adapter plate (AG-B) onto the first piece (AG-A, see [Fig. 6.76](#)).
- ▶ Tighten the four bolts. See [Table 6.24](#) for the tightening torques.

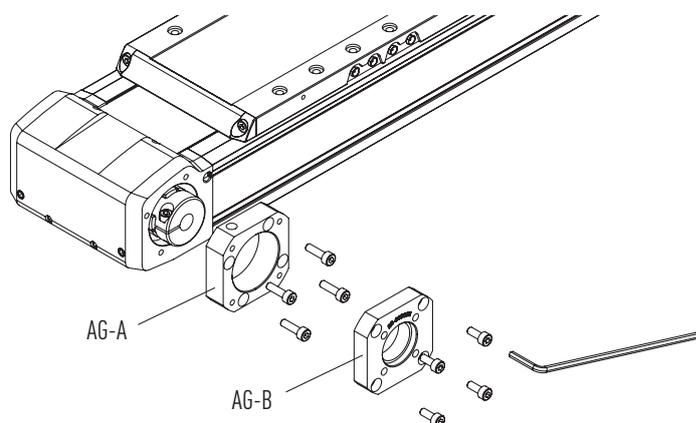


Fig. 6.76 Mounting the two-part gear adapter plate AG-A and AG-B – HT100B

Assembly and connection

HT150B, HT200B, HT250B:

- ▶ Attach the gear adapter plate AG so that it lies flat. (see Fig. 6.77). In doing so, note the position of the hole for the clamping hub's clamping bolt.
- ▶ Tighten the four bolts. See Table 6.24 for the tightening torques.

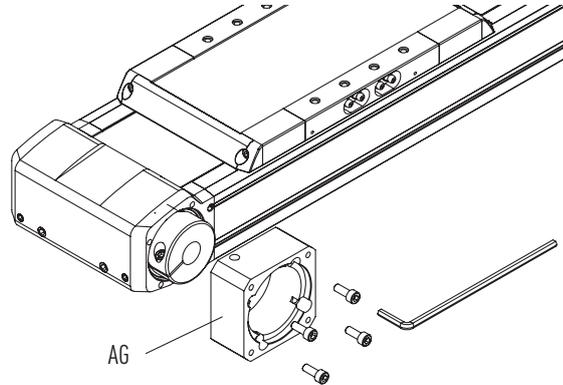


Fig. 6.77 Mounting the gear adapter plate AG

Table 6.24 Tightening torques for the gear adapter plate AG

Size	Screw 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 gears against falling.
- ▶ Place the gears flat on the gear adapter plate AG.
- ▶ Using four bolts, secure the gears in accordance with the manufacturer's specifications.

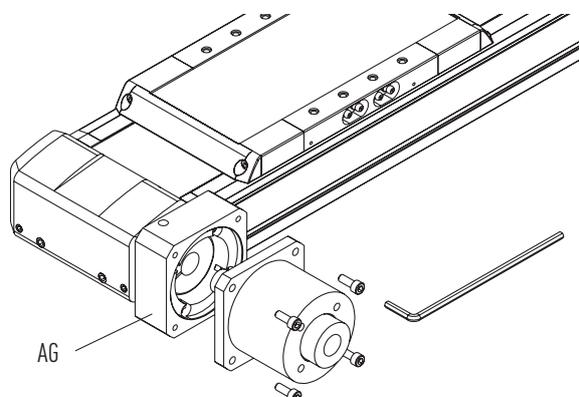


Fig. 6.78 **Bolting the gears to the linear table**

- ▶ Remove the seal plug from the hole on the gear adapter plate AG.

Variant 1:

- ▶ Tighten the clamping hub's bolt through the bore with the tightening torque shown in [Table 6.20](#).

Variant 2:

- ▶ Tighten both screws of the clamping hub one after the other through the bore. First, position the screw on the 1st side, then tighten the screw on the 2nd side and then on the 1st side with the tightening torque shown in [Table 6.20](#).

- ▶ Insert the seal plug back in the hole.

- ✓ The gears have now been installed.

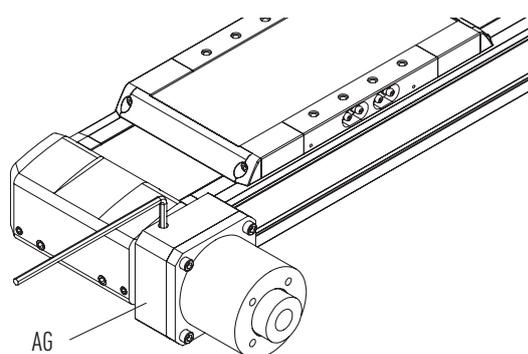


Fig. 6.79 **Tightening the clamping hub on the gear shaft**

The manual for the used gears must be consulted for attaching a motor to the gears

NOTE

6.7.4 Mounting the motor on PLE/PLQE gears¹⁾

- ▶ Loosen the gears' clamping bolt so that you can later insert the motor shaft easily into the gears' hollow shaft. The provided bush must be used for smaller motor shaft diameters.
- ▶ Attach the motor gear adapter plate GM so that it lies flat on the gears. In doing so, note the position of the hole for the clamping hub's clamping bolt (see Fig. 6.80).
- ▶ Tighten the four bolts. See Table 6.25 for the tightening torques.

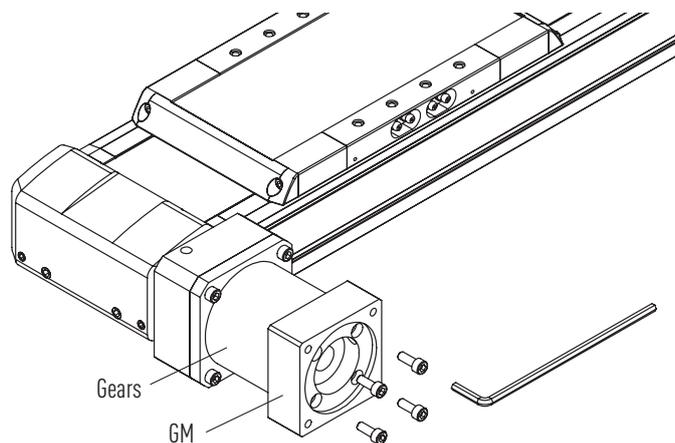


Fig. 6.80 Mounting the motor gear adapter plate GM (HT-B)

Table 6.25 Tightening torques for motor gear adapter plates GM

Size	Gears ¹⁾	Screw 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

- ▶ Whenever possible, turn the axis so that the vertical motor can be mounted from above.
- ▶ Place the motor flat on the motor gear adapter plate GM.
- ▶ Remove the headless screw from the hole on the side of the motor gear adapter plate GM.
- ▶ Apply the tightening torque in Table 6.26 to the clamping hub's clamping bolt through the hole.
- ▶ Insert the headless screw back in the hole.

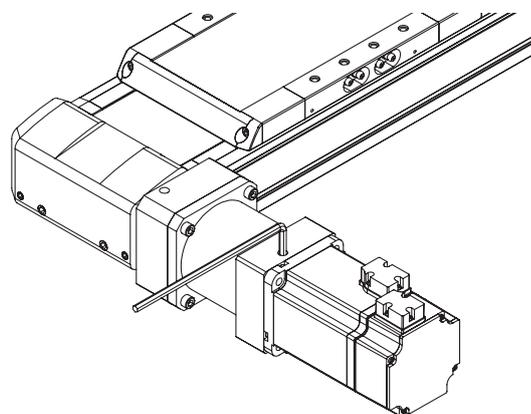


Fig. 6.81 Tightening the clamping hub on the motor shaft

Table 6.26 Tightening torques for the clamping bolt

Size	Gears ¹⁾	Screw 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⁾ Hex socket size; varies depending on coupling size/motor used

The manual for the used gears must be consulted for attaching the motor to the gears.

NOTE

- ▶ Secure the motor in accordance with the manufacturer's specifications.
- ✓ The motor has now been installed.

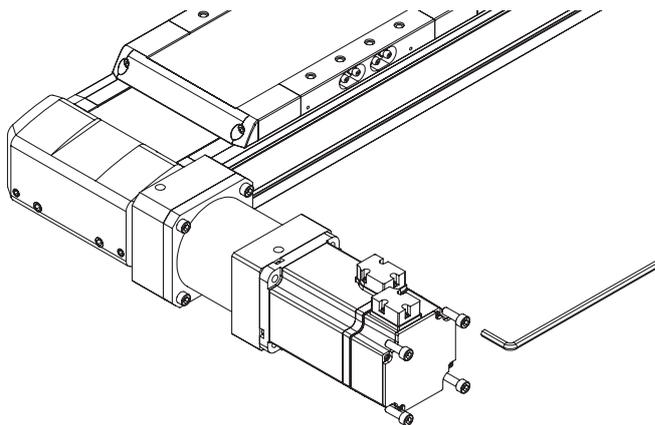


Fig. 6.82 Bolting the motor to the linear table HT-B with gears

6.8 Mounting the drive unit on the cantilever axis HC-B

6.8.1 Assembly of the HC-B coupling components

A suitable coupling is needed for the motor attachment. Couplings can be found in Section [11.4.6](#) on Page 156 ff.

The coupling components for the cantilever axis HC-B consist of:

- 1 clamping hub for the drive side [1]
- 1 elastomer insert [2]
- 1 expansion hub for the axis side [3]

There are two types of clamping hubs:

- Variant 1 with one clamping screw, see Fig. 6.83
- Variant 2 with two clamping screws, see Fig. 6.84

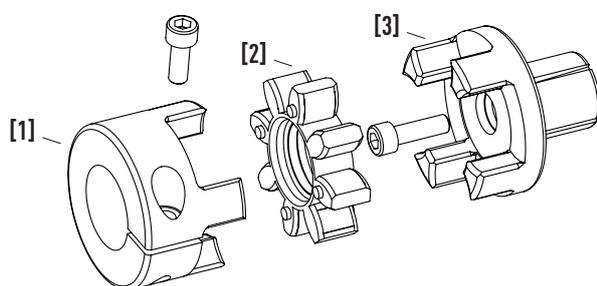


Fig. 6.83 Coupling assembly variant 1: clamping hub with one clamping screw

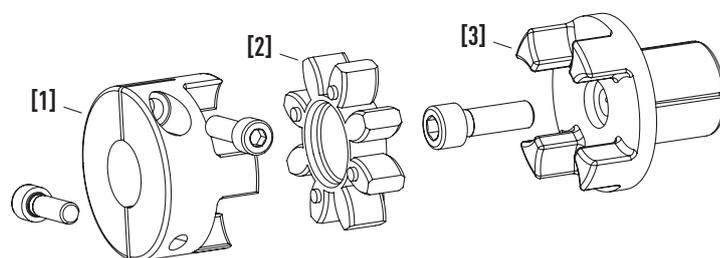


Fig. 6.84 Coupling assembly variant 2: clamping hubs with two clamping screws

Before mounting please make sure that

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

The tightening torques in [Table 6.27](#) and [Table 6.28](#) must be used for mounting the coupling assembly:

Table 6.27 Screw tightening torques for the expansion hub and the 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	8	5.0	5.0 ¹⁾
HC060B	10	14.0	14.0 ²⁾
HC080B	25	14.0	15.0

¹⁾ Special version with 24 mm clamping diameter: 3,8 Nm

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

Table 6.28 Screw tightening torques for the coupling housing

Size	Screw strength class	Thread size	Screw tightening torque [Nm]
HC025B	8.8	M4	3.0
HC040B	8.8	M4	3.0
HC060B	8.8	M6	10.1
HC080B	8.8	M6	10.1

- ▶ Move the drive block to the left end position. The toothed belt pulley is therefore prevented from turning.
- ▶ Carefully depress the expansion hub in the toothed belt pulley's hollow shaft until it lies flat.

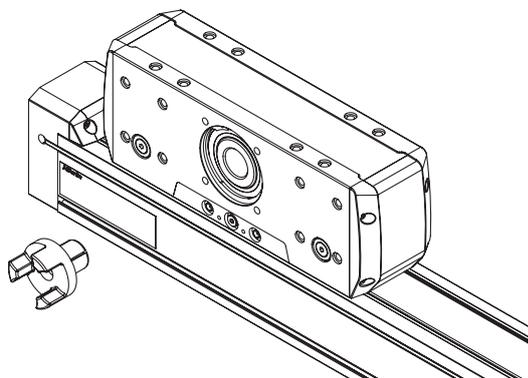


Fig. 6.85 Inserting the expansion hub

- ▶ At the centre of the expansion hub is an expanding mandrel that is used to secure the coupling. Secure the expansion hub with the tightening torque in [Table 6.27](#).

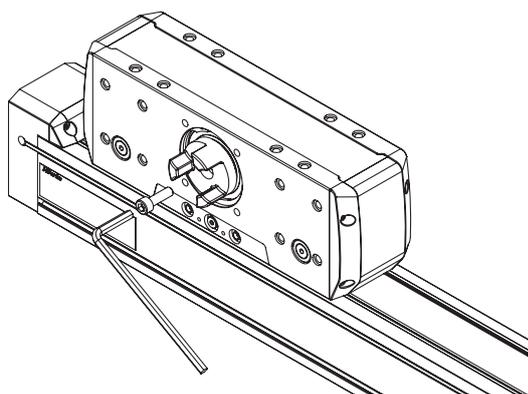


Fig. 6.86 Mounting the expansion hub by tightening the expanding mandrel

Assembly and connection

- ▶ Attach the elastomer insert to the expansion hub.
- ▶ Using four bolts, mount the coupling housing KB so that it lies flat.

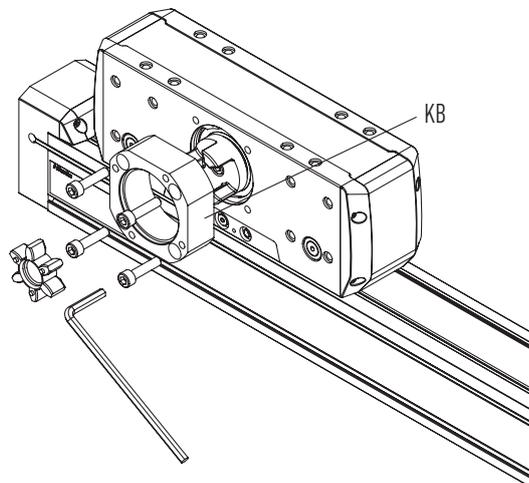


Fig. 6.87 Attaching the elastomer insert and mounting the coupling housing KB

NOTE

The elastomer insert must be lightly preloaded and should have no backlash. If it can be mounted under too slight a pressure, it must be replaced. A small quantity of PU compatible grease can be applied to the elastomer insert for easier installation.

- ▶ Push the clamping hub onto the elastomer insert until measurement L_1 (see Table 6.29) is achieved.

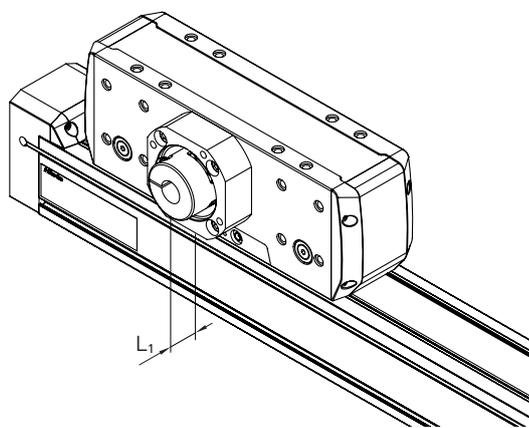


Fig. 6.88 Adjusting the clamping hub distance in the direction of the motor

Table 6.29 Adjusting the coupling distance based on measurement 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

If the coupling is mounted without a coupling housing, the coupling distance L_2 must be set in accordance with Fig. 6.89 and Table 6.30.

NOTE

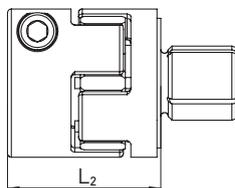


Fig. 6.89 Total length of HC-B coupling components

Table 6.30 Adjusting the coupling distance based on measurement 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	28.0
HC060B	41.0	41.0
HC080B	46.5	46.0

6.8.2 Mounting the motor (without gears)

- ▶ Attach the motor adapter plate AM so that it lies flat. In doing so, note the position of the hole for the clamping hub's clamping bolt.
- ▶ Tighten the four bolts. See Table 6.31 for the tightening torques.

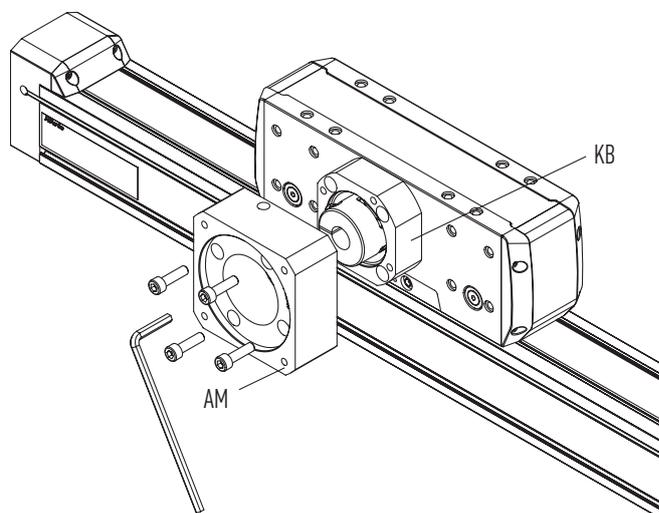


Fig. 6.90 Mounting the motor adapter plate AM (HC-B)

Table 6.31 Tightening torques for the motor adapter plate AM

Size	Screw strength class	Thread size	Screw tightening torque [Nm]
HC025B	8.8	M4	3.0
HC040B	8.8	M4	3.0
HC060B	8.8	M6	10.1
HC080B	8.8	M6	10.1

Assembly and connection

- ▶ Secure the motor against falling.
- ▶ Place the motor flat on the motor adapter plate AM.
- ▶ Secure the motor in accordance with the manufacturer's specifications.

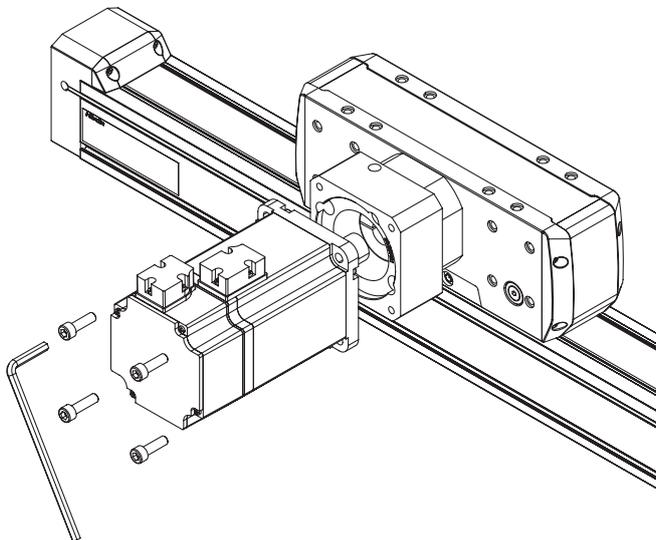


Fig. 6.91 Bolting the motor to the cantilever axis HC-B

NOTE

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

- ▶ Remove the seal plug from the hole on the side of the motor adapter plate AM.

Variant 1:

- ▶ Tighten the clamping hub's bolt through the bore with the tightening torque shown in [Table 6.27](#).

Variant 2:

- ▶ Tighten both screws of the clamping hub one after the other through the bore. First, position the screw on the 1st side, then tighten the screw on the 2nd side and then on the 1st side with the tightening torque shown in [Table 6.27](#).

- ▶ Insert the seal plug back in the hole.

- ✓ The motor has now been assembled.

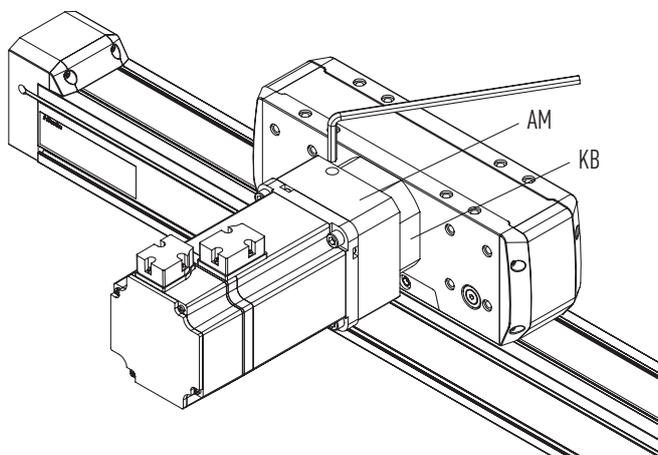


Fig. 6.92 Tightening the clamping hub on the motor shaft

NOTE

The manual for the used gears must be consulted for attaching the motor to the gears.

6.8.3 Mounting the gears

HC025B, HC040B:

- ▶ Attach the first part of the gear adapter plate (AG-A) so that it lies flat (see Fig. 6.93). In doing so, note the position of the hole for the clamping hub's clamping bolt.
- ▶ Tighten the four bolts. See Table 6.32 for the tightening torques.
- ▶ Attach the second part of the gear adapter plate (AG-B) onto the first piece (AG-A, see Fig. 6.93).
- ▶ Tighten the four bolts. See Table 6.32 for the tightening torques..

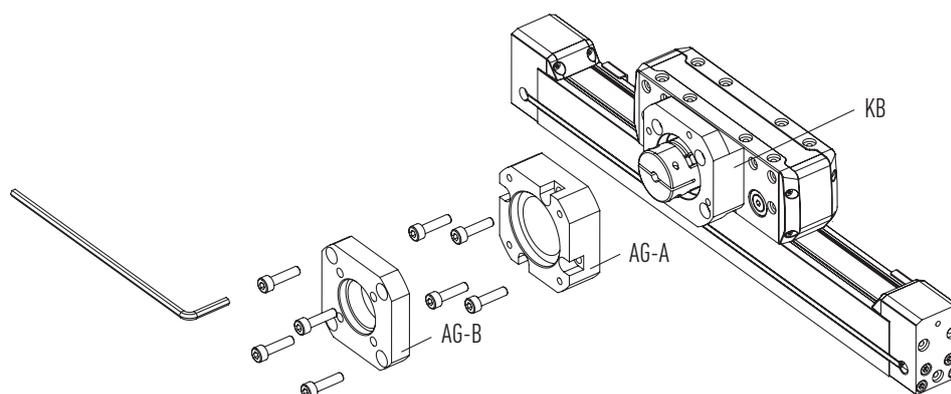


Fig. 6.93 Mounting the two-part gear adapter plate AG-A and AG-B – HC025B, HC040B

6.8.4 Mounting the gears

- ▶ Attach the gear adapter plate AG so that it lies flat (see Fig. 6.94). In doing so, note the position of the hole for the clamping hub's clamping bolt.
- ▶ Tighten the four bolts. See Table 6.32 for the tightening torques.

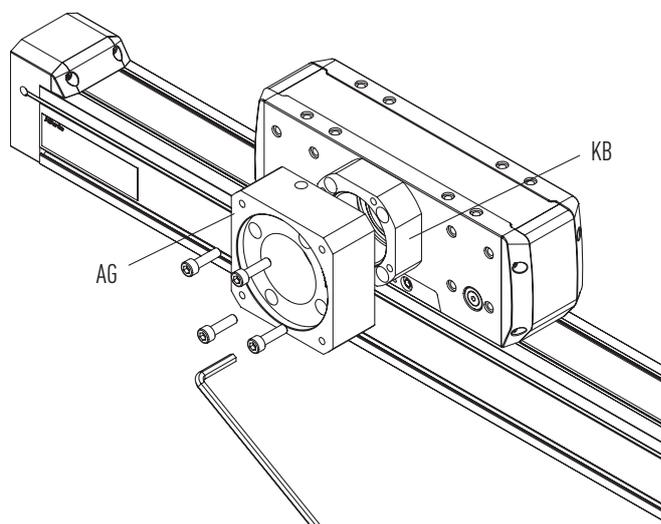


Fig. 6.94 Mounting the gear adapter plate AG

Table 6.32 **Tightening torques for the gear adapter plate AG**

Size	Screw 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	10.1
HC080B	8.8	M6	10.1

- ▶ Secure the gears against falling.
- ▶ Place the gears flat on the gear adapter plate AG (see Fig. 6.95).
- ▶ Using four bolts, secure the gears in accordance with the manufacturer's specifications.

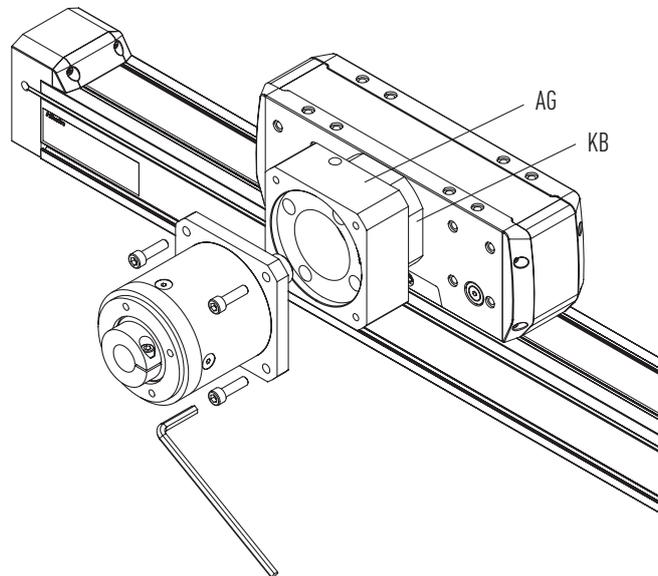


Fig. 6.95 **Bolting the gears to the cantilever axis**

- ▶ Remove the seal plug from the hole on the gear adapter plate AG.

Variant 1:

- ▶ Tighten the clamping hub's bolt through the bore with the tightening torque shown in [Table 6.27](#).

Variant 2:

- ▶ Tighten both screws of the clamping hub one after the other through the bore. First, position the screw on the 1st side, then tighten the screw on the 2nd side and then on the 1st side with the tightening torque shown in [Table 6.27](#).

- ▶ Insert the seal plug back in the hole.

- ✓ The gears have now been installed.

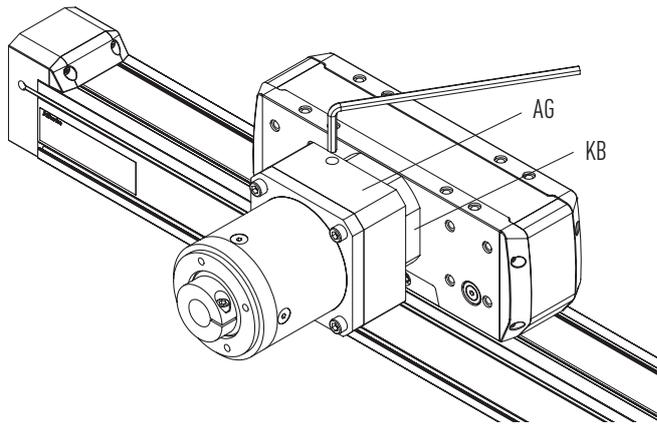


Fig. 6.96 Tightening the clamping hub on the gear shaft

The manual for the used gears must be consulted for attaching a motor to the gears.

NOTE

6.8.5 Mounting the motor on PLE/PLQE gears¹⁾

- ▶ Loosen the gears' clamping bolt so that you can later insert the motor shaft easily into the gears' hollow shaft. The provided bush must be used for smaller motor shaft diameters.
- ▶ Attach the motor gear adapter plate GM so that it lies flat on the gears. In doing so, note the position of the hole for the clamping hub's clamping bolt (see Fig. 6.97).
- ▶ Tighten the four bolts. See Table 6.33 for the tightening torques.

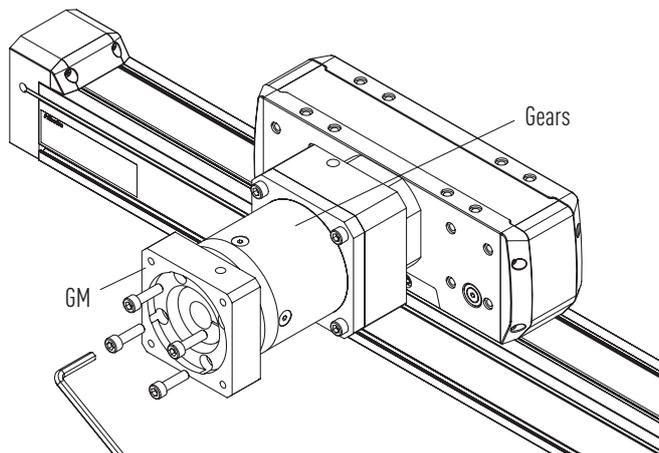


Fig. 6.97 Mounting the motor gear adapter plate GM (HC-B)

Table 6.33 Tightening torques for motor the gear adapter plate GM

Size	Gears ¹⁾	Screw 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	10.1

¹⁾ PLE and PLQE are registered trademarks of Neugart GmbH

- ▶ Whenever possible, turn the axis so that the vertical motor can be mounted from above.
- ▶ Place the motor flat on the motor gear adapter plate GM.
- ▶ Remove the headless screw from the hole on the side of the motor gear adapter plate GM.
- ▶ Apply the tightening torque in Table 6.34 to the clamping hub's clamping bolt through the hole.
- ▶ Insert the headless screw back in the hole.

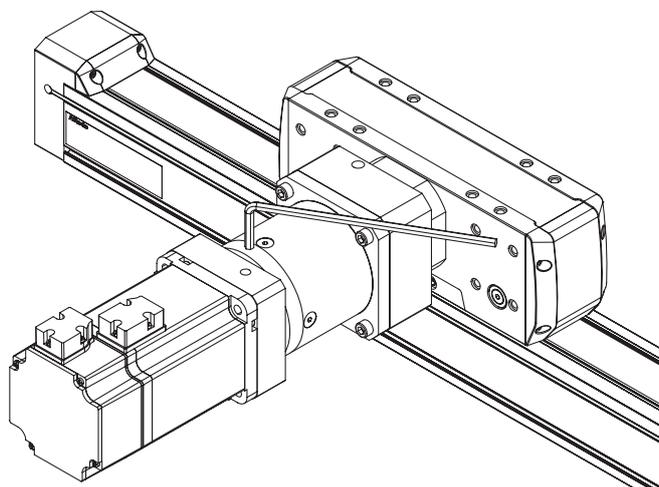


Fig. 6.98 Tightening the clamping hub on the motor shaft

Table 6.34 Tightening torques for the clamping bolt

Size	Gears ¹⁾	Screw 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

¹⁾ PLE and PLQE are registered trademarks of Neugart GmbH

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

The manual for the used gears must be consulted for attaching the motor to the gears.

NOTE

- ▶ Secure the motor in accordance with the manufacturer's specifications.
- ✓ The motor has now been installed.

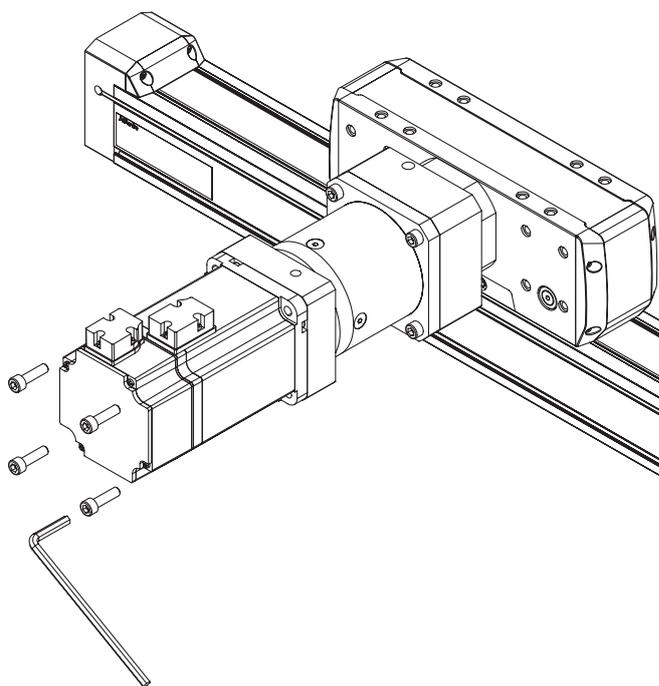


Fig. 6.99 Bolting the motor to the cantilever axis HC-B with gears

6.8.6 Mounting the journal

The journal presents an alternative interface for motor and encoder. It can be retrofitted to the drive block.

Table 6.35 Tightening torques for the journal

Size	Screw	Screw strength class	Screw tightening torque [Nm]
HC040B	ISO 4762 M4 × 30	8.8	4.5
HC060B	ISO 4762 M6 × 65	8.8	10.0
HC080B	ISO 4762 M8 × 55	8.8	25.0

Before mounting please make sure that

- ➔ no parts are damaged;
 - ➔ all parts are free of dirt and grease.
- ▶ Move the drive block to the left end position. The toothed belt pulley is therefore prevented from turning.
 - ▶ Carefully depress the journal in the toothed belt pulley's hollow shaft until the expansion hub lies flat.
 - ▶ Make sure that the journal flange lies flat. If necessary, use a light plastic hammer.

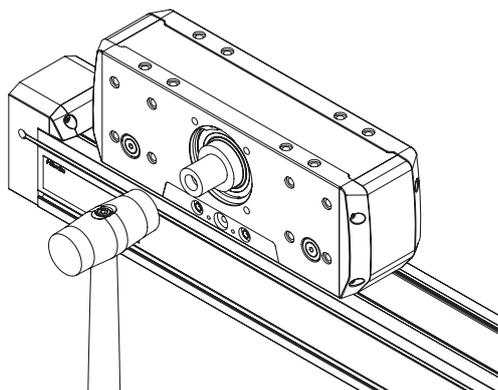


Fig. 6.100 Inserting the journal in the cantilever axis HC-B drive block

- ▶ Apply the tightening torque in [Table 6.35](#) to the bolt at the centre of the journal.

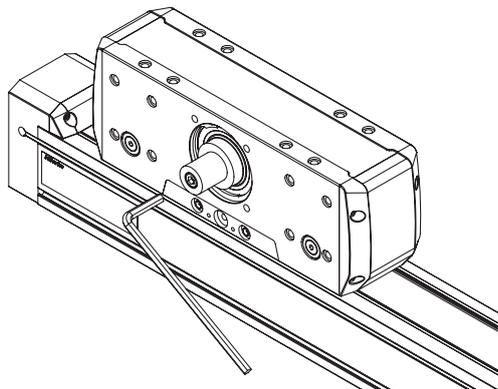


Fig. 6.101 Tightening the bolt on the journal

6.9 Mounting the drive unit on the double axis HD and the multi-axis system HS

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

6.10 Mounting the drive block cover

The cover plate is used to seal unneeded input and output drives on linear axes HM-B, HT-B and HC-B with toothed belt drives.

- ▶ Place the cover plate on the drive block.
 - ▶ Screw the cover plate tightly to the drive block using the screws supplied.
 - ▶ Tighten the screws of the cover plate. See Table 6.36 for tightening torques.
- ✓ The drive block cover has now been mounted.

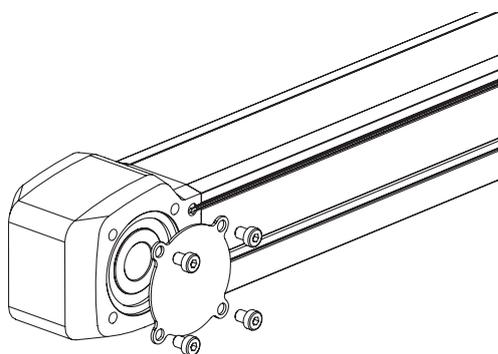


Fig. 6.102 Placing the cover plate on the drive block

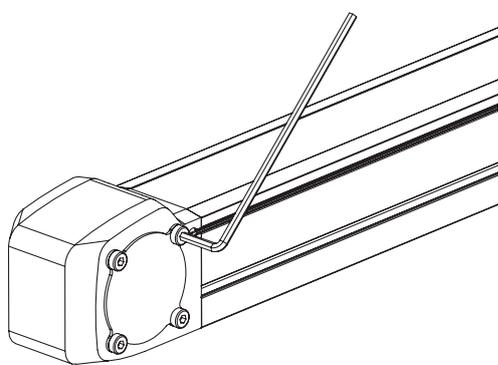


Fig. 6.103 Tightening the screws of the cover plate

Table 6.36 Screw tightening torques for the drive block cover

Axis type/size	Screw 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	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 the noise reduction of energy chains

The tape serves to reduce the noise emission of the energy chain.

- ▶ Manually slide the carriage into the mechanical end position so that the energy chain's maximally rests on the energy chain contact surface.
 - ▶ Cut the noise reduction tape to correspond to the maximum contact length of the energy chain. Two bands of the same length are required per energy chain.
 - ▶ Manually move the carriage to the other end position so that the lower part of the energy chain is lifted as far as possible from the energy chain's contact surface.
 - ▶ Clean the energy chain's support plate so that it is free of dirt, dust and grease.
 - ▶ Glue the 1st tape **[1]** flush with the edge of the energy chain's contact surface (see Fig. 6.104).
 - ▶ Glue the 2nd tape **[2]** flush with the outer edge of the contact angle (X axis HS24-D-T: 23 mm distance parallel to the outer edge).
 - ▶ Move the carriage and make sure that the energy chain rolls on the tapes over the complete travel distance.
- ✓ The noise reduction tape has now been installed.

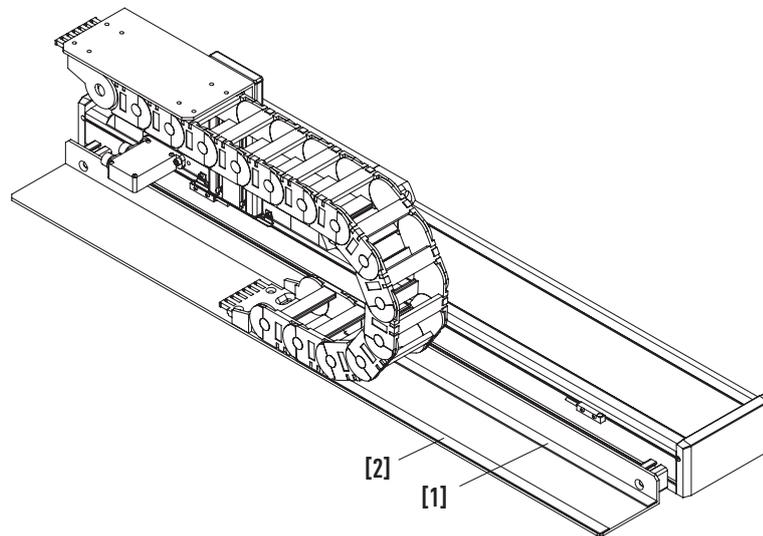


Fig. 6.104 Linear axis with mounted noise reduction tape

6.12 Electrical connection

⚠ DANGER!

⚡ Danger from electrical voltage!
If motors are incorrectly earthed, there is a danger of electric shock.

- ▶ Before connecting the electrical power supply, ensure that the linear axis/linear axis system is correctly earthed via the PE rail in the switch cabinet!

⚠ DANGER!

⚡ Danger from electrical voltage!
Electrical currents may flow even if the motor is not moving.

- ▶ Ensure that the linear axis/linear axis system is disconnected from the power supply before the electrical connections are detached from the motors!
- ▶ After disconnecting the drive amplifier from the power supply, wait at least 5 minutes before touching live parts or breaking connections!
- ▶ For safety reasons, measure the voltage in the intermediate circuit and wait until it has fallen below 40 V!
- ▶ Only qualified personnel may work on electrical installations!

6.12.1 Connecting the limit switches

The pin assignment of the limit switch connector for variant A (order codes: linear modules HM-B on Page 12, linear tables HT-B on Page 15, cantilever axes HC-B on Page 18, double axes HD on Page 20, two-axis systems HS2 on Page 22, three-axis systems HS3 on Page 24) is shown in Fig. 6.106. For variants C and D with open cable ends, the wires must be connected according to Fig. 6.105.

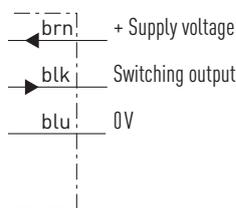


Fig. 6.105 Connection diagram

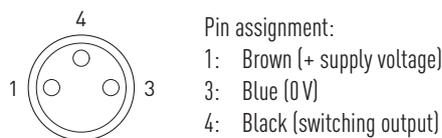


Fig. 6.106 Pin assignment of limit switch plug

The sensor is operated at a low voltage, so there is not normally any risk of injuries or fatalities from this alone.

NOTE

Do not operate the sensor with a voltage other than the one specified. This can destroy it.

NOTE

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

The distance measuring system HIWIN MAGIC is located on the side of the carriage. 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 moving) is given according to the definitions in Fig. 6.107 (HM-B, HT-B), Fig. 6.108 (HC-B) and Fig. 6.109.

If a positive counting direction in the opposite direction is desired, "A" must be exchanged with "B" and "Ä" with "B̄" when connecting to the electronic evaluation system.

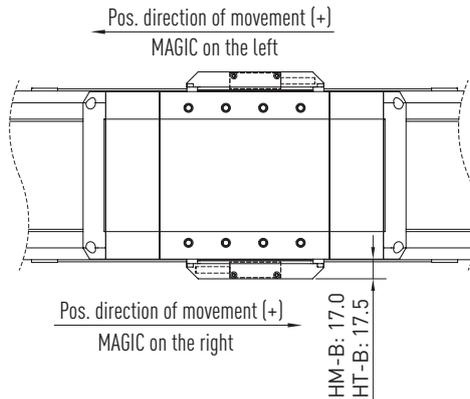


Fig. 6.107 Distance measuring system MAGIC – linear axes HM-B and HT-B

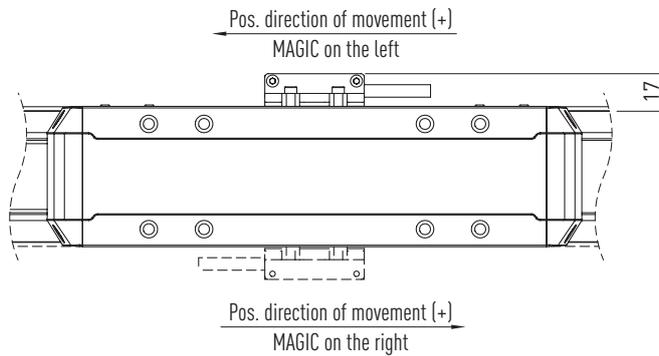


Fig. 6.108 Distance measuring system MAGIC – linear axes HC-B

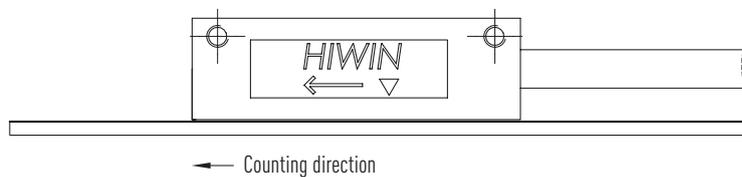


Fig. 6.109 Detailed view of positive direction of movement of the MAGIC encoder

Table 6.37 Cable and connector assignments

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

Further information can be found in the assembly instructions "HIWIN MAGIC Distance Measuring Systems"

6.12.3 Connecting the motor

Details on the motor's connections can be found in its operating instructions!

NOTE

6.12.4 Connecting the drive amplifier

Details on the drive amplifier's connections can be found in its operating instructions!

NOTE

6.13 Pneumatic connection

The cantilever axis HC-B (HC060B and HC080B) can optionally be equipped with a pneumatic clamping element (see order code on Page 18). The pneumatic connection for the clamping element is mounted ex works laterally on the base of the axis' drive block (see Fig. 6.110).

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

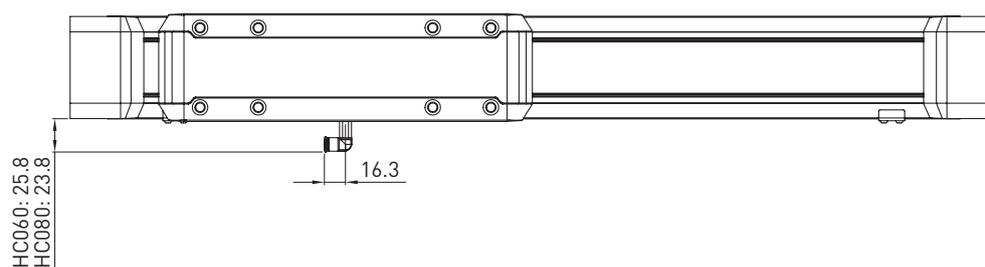


Fig. 6.110 Position of pneumatic connection for the clamping element (HC060B, HC080B)

Table 6.38 General characteristics of the pneumatic connection

Constructive structure	Push-pull principle
Nominal tightening torque	1,33 Nm
Pneumatic connector for hose	Outer diameter: 6 mm
Nominal width	2 mm

7. Maintenance and cleaning

DANGER!



Warning! Electric shock or burns by contact with live parts!

Contact with live parts can result in injuries.

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

- ▶ Controller design complying with DIN EN 12100. No start after:
 - power connected, reinstated!
 - troubleshooting!
 - machine stop!
- ▶ Only qualified personnel may install cabling!
- ▶ Only qualified personnel may work on electrical installations!

WARNING!



Danger of impacts and crushing!

If the carriage is moved or started unintentionally, injuries may result!

- ▶ When installing a vertical linear axis/linear axis system, provide support for the carriage during down-times!
- ▶ Controller design complying with DIN EN 12100. No start after:
 - power connected, reinstated!
 - troubleshooting!
 - machine stop!

WARNING!

Risk of injury and material damage!

Unauthorised work on the system creates the risk of injuries and may invalidate the warranty.

- ▶ Only qualified personnel may assemble, install, and service the linear axes/linear axis systems!

WARNING!



Falling axis or detached imposed load can cause impact and crushing injuries!

Danger from high loads!

- ▶ Use suitable hoisting gear!
- ▶ Secure the linear axis/linear axis system as described in the assembly instructions (see Section 6.2)!
- ▶ Secure the imposed load as described in the assembly instructions (see Section 6.3)!

WARNING!



Danger of impacts and crushing if the clamping element is opened!

As soon as air is applied, the clamping opens.

- ▶ Before carrying out work on the linear axes/linear axis systems, disconnect the power supply and protect it from being switched back on!
- ▶ Make sure that moving parts of the linear axis are secured against unintentional movement!
- ▶ Observe applicable safety regulations for working with compressed air!

CAUTION!



Tilting linear axes can cause crushing injuries!

- ▶ Secure machinery and machine parts against tilting!

CAUTION!



Danger of impacts 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 the applicable occupational health and safety regulations!
- ▶ Transport to the installation site only by qualified personnel!

⚠ CAUTION!



Warning! Health and environmental hazards!

Contact with lubricants may cause irritation, poisoning, allergic reactions, and damage to the environment.

- ▶ Use only suitable, non-hazardous agents. Note the manufacturer's safety data sheets!
- ▶ Ensure proper disposal!

ATTENTION!

Damage from wrong lubricant!

Using a wrong lubricant can cause damage to property and pollute the environment.

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

During maintenance:

- ▶ Secure the linear axis against being switched on without authorisation.
- ▶ Disconnect the power supply of the linear axis.
- ▶ Secure the linear axis against being switched back on without authorisation.



The cleaning and lubrication intervals must be observed without fail. Include these maintenance intervals in your maintenance schedule.

NOTE

7.1 Lubrication

Linear axis/linear axis system operations consume lubricant on a continuous basis. The product must be relubricated at regular intervals. Bear in mind that small quantities of lubricant can exit the lubrication system.

The following factors affect the lubrication intervals:

- Dust and dirt
- Operating temperatures
- Loads
- Vibration stress
- Permanently short positioning distances
- Rotary speeds

Inadequate lubrication or the wrong lubricant increases wear and reduces the service life.

NOTE

Maintenance and cleaning

7.1.1 Linear axis HM-B/HT-B/HC-B lubrication

The linear axis HM-B/HC-B includes a linear guideway with two blocks, the linear table HT-B have two rails with two blocks each. The linear guideways are initially lubricated prior to delivery. Relubrication is introduced through two (HM-B/HC-B) or four (HT-B) grease nipples (one for each block) that are located on the side of the carriage.

The lubrication interval depends on the loading, speed, cycle time, and ambient conditions. Recommended lubrication intervals are listed in [Table 7.1](#).

Table 7.1 **Lubricant quantities for the linear guideway of the linear axes HM-B/HT-B/HC-B**

Axis type/size	Block	Lubricant	Relubrication quantity [cm ³]
HC025B	MGN09	Klüber ISOFLEX TOPAS AK 50	0.50
HM040B, HC040B	MGN15	Klüber ISOFLEX TOPAS AK 50	0.50
HM060B, HT100B, HT150B	QE15	G04	0.55
HC060B	CG15	G04	0.55
HM080B, HT200B	QH20	G04	0.70
HC080B	CG20	G04	0.70
HT250B	QH25	G04	0.75
HM120B	QH30	G04	0.75

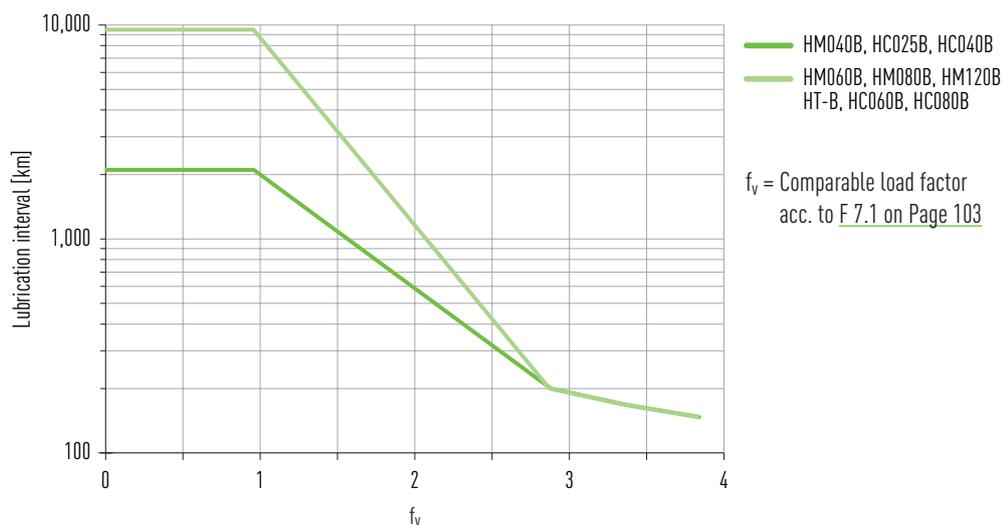


Fig. 7.1 **Load-dependent relubrication intervals for linear guideways of the linear axes HM-B/HT-B/HC-B**

7.1.2 Calculating the comparable load factor f_v

In the case of combined loads from multiple forces and torques, the comparable load factor f_v is calculated with the Formula F 7.1.

$$F7.1 \quad f_v = \frac{|F_y|}{F_{y\text{dynmax}}} + \frac{|F_z|}{F_{z\text{dynmax}}} + \frac{|M_x|}{M_{x\text{dynmax}}} + \frac{|M_y|}{M_{y\text{dynmax}}} + \frac{|M_z|}{M_{z\text{dynmax}}}$$

f_v	Comparable load factor
F_y	Force acting along the Y axis [N]
F_z	Force acting along the Z axis [N]
M_x	Torque acting around the X axis [Nm]
M_y	Torque acting around the Y axis [Nm]
M_z	Torque acting around the Z axis [Nm]
$F_{y\text{dynmax}}$	Maximum dynamic force along the Y axis [N]
$F_{z\text{dynmax}}$	Maximum dynamic force along the Z axis [N]
$M_{x\text{dynmax}}$	Maximum dynamic torque acting around the X axis [Nm]
$M_{y\text{dynmax}}$	Maximum dynamic torque acting around the Y axis [Nm]
$M_{z\text{dynmax}}$	Maximum dynamic torque acting around the Z axis [Nm]

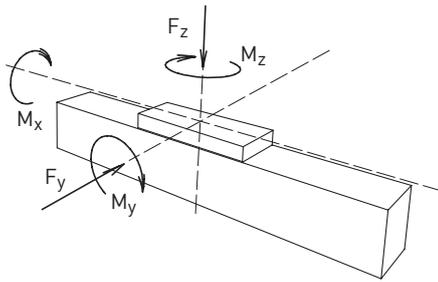


Fig. 7.2 Illustration of forces and moments on the linear axis

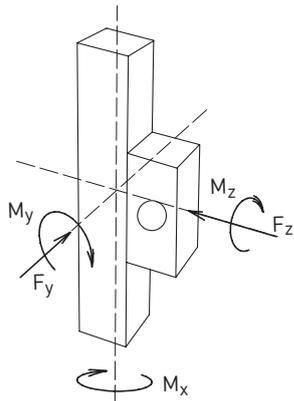


Fig. 7.3 Illustration of forces and moments on the cantilever axis

Maintenance and cleaning

7.1.3 Double axis HD lubrication

In the case of the double axis HD, each single axis installed must be lubricated separately as described in Section [7.1.1](#).

7.1.4 Linear axis system HS lubrication

Linear axis systems HS must be lubricated in accordance with the lubrication specifications for the single axes installed as described in Section [7.1.1](#).

7.1.5 Lubrication procedure

NOTE

Use only lubricants that are in accordance with DIN 51825, KP2K of the consistency class NGLI2!

NOTE

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

NOTE

For vertical installation, the relubricant quantity is increased by approx. 50 %.

NOTE

Under special operating conditions (soiling, short stroke, installation type), the lubrication intervals must be adjusted from case to case.

NOTE

With HM-B, each lube point features two grease nipples, one each on the left and right of the carriage. Relubrication can then be introduced on the left or right side of the carriage.

NOTE

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

Example lubrication of the linear guideway:

- ▶ Move the carriage to an arbitrary position.
- ▶ Apply the nozzle at right angles to a lube point on the side.
- ▶ Press the nozzle manually against the grease nipple.
- ▶ Discharge the required quantity of lubricant from the grease gun (see [Table 7.1](#)).
- ▶ Repeat the process for all lube points on this carriage side.

✓ The linear guideway has been lubricated.

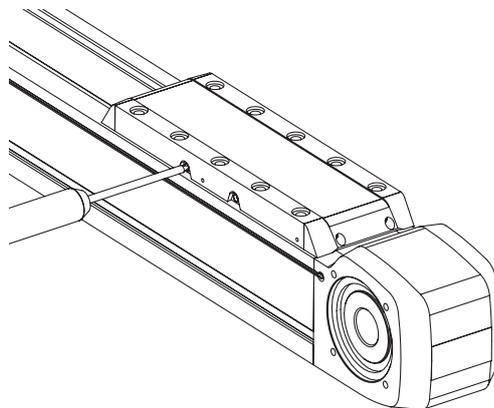


Fig. 7.4 Example lubrication of HM-B

7.2 Cleaning the linear axis and linear axis system

WARNING!



Danger of cutting injuries!

Installing or removing the cover strip may cause cutting injuries.

- ▶ Only qualified personnel wearing appropriate protective equipment (gloves, goggles) may be assigned to commissioning and setup!

CAUTION!



Warning! Health and environmental hazards!

Contact with lubricants may cause irritation, poisoning, allergic reactions, and damage to the environment.

- ▶ Use only suitable, non-hazardous agents. Note the manufacturer's safety data sheets!
- ▶ Ensure proper disposal!

Thanks to their layout and optional cover strips, linear axes HM-B/HT-B are insensitive to penetration by contaminants and foreign particles. Nevertheless, the linear axis must be examined and its outside cleaned at regular intervals.

Note the following points when cleaning:

- Do not use compressed air.
- The surface is anodised and therefore only partially resistant to alkaline cleaning agents. Only neutral cleaning agents may be used for cleaning.
- Regularly remove coarse particles from the surface. Ideal is a moistened, soft, and lint free cleaning cloth.
- The cover strip is exposed to friction and therefore abrasion. Remove the abrasion particles regularly.

7.3 Replacing 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 sealing is no longer guaranteed.

- ▶ Undo the clamping screw 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 pieces from both ends of all carriages (see [Fig. 7.9](#)).
- ▶ Undo the cover strip deflection 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 screws.
- ▶ 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 screws of the cover strip clamp (see [Fig. 7.11](#)).
- ▶ Move the carriages to both end positions and check that the cover strip is seated correctly. If necessary, loosen the cover strip clamp screws again, realign the cover strip and then retighten the screws.

- ✓ The new cover strip has been mounted.

Maintenance and cleaning

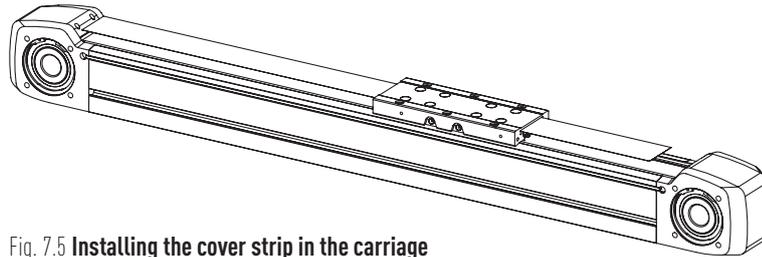


Fig. 7.5 Installing the cover strip in the carriage

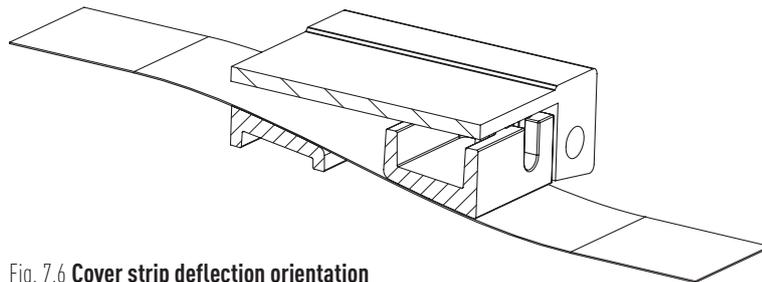


Fig. 7.6 Cover strip deflection orientation

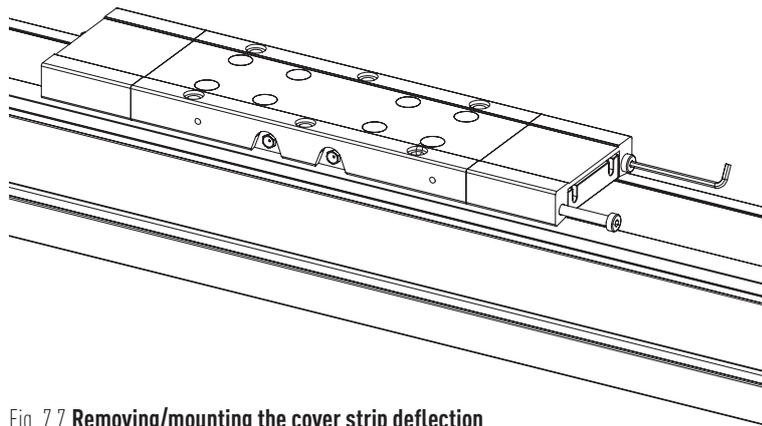


Fig. 7.7 Removing/mounting the cover strip deflection

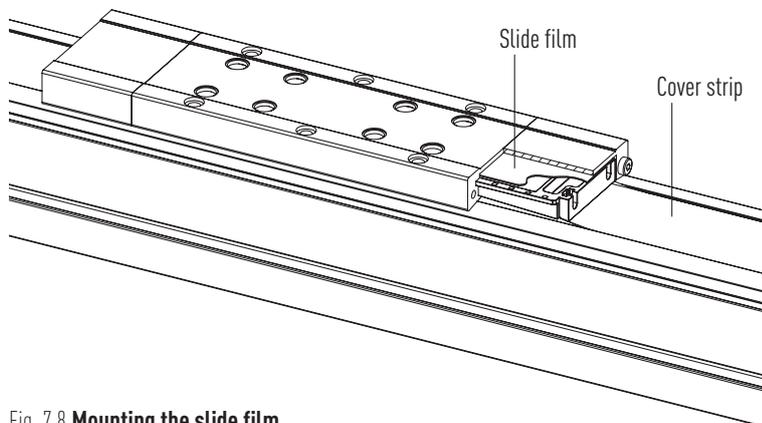


Fig. 7.8 Mounting the slide film

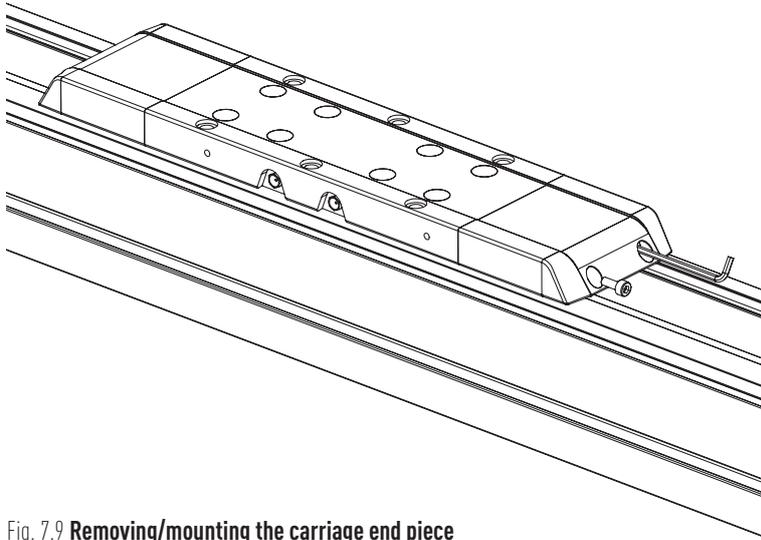


Fig. 7.9 Removing/mounting the carriage end piece

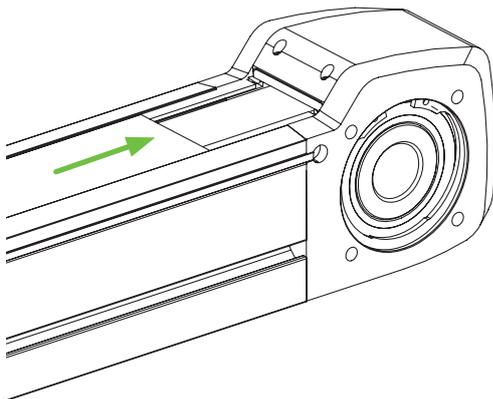


Fig. 7.10 Installing the cover strip in the cover strip clamp on the HM-B

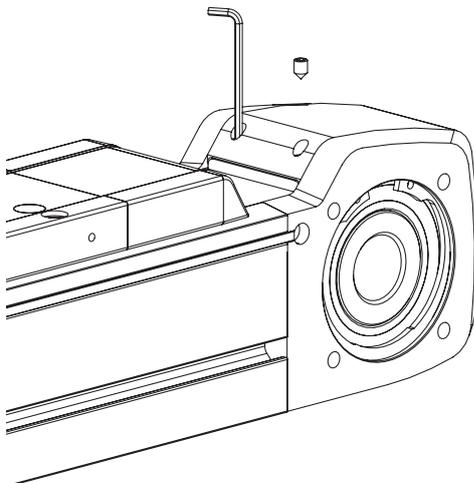


Fig. 7.11 Installing/removing the cover strip clamp on/from the HM-B

Table 7.2 **Screws for the cover strip deflection**

Size	Screw strength class	Thread size
HMD40	8.8	M4
HMD60	8.8	M4
HMO80	8.8	M5
HM120	8.8	M5

Table 7.3 **Screws for the carriage end piece**

Size	Screw strength class	Thread size
HMD40	8.8	M3
HMD60	8.8	M3
HMO80	8.8	M3
HM120	8.8	M4

7.4 Replacing the 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 sealing is no longer guaranteed.

- ▶ Undo the clamping screw 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 pieces from both ends of all carriages (see [Fig. 7.16](#)).
 - ▶ Remove the carriage cover by pushing it out of the carriage profile (see [Fig. 7.12](#)).
 - ▶ Undo the cover strip deflection mounting screws. 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 to remove any dirt from the cover strip clamp, carriage end piece, cover strip deflection, cover strip guide and carriage cover (e.g. with ethanol).
 - ▶ If necessary, replace the cover strip guides on the top of the carriage profile and the bottom 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.
 - ▶ Lay the cover strip on the magnetic strip of the axis base profile and guide it over the carriage profile (see [Fig. 7.15](#)).
 - ▶ Center the cover strip.
 - ▶ Mount the cover strip deflection on both sides of the carriage as shown in [Fig. 7.13](#).
 - ▶ Center the cover strip deflection.
 - ▶ Hand-tighten the cover strip deflection screws.
 - ▶ Mount the carriage cover by inserting 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 as shown in [Fig. 7.16](#) and hand-tighten the mounting screws.
 - ▶ Push the ends of the cover strip under the cover strip clamp on both sides. 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 screws of the cover strip clamp (see [Fig. 7.17](#) and [Fig. 7.18](#)).
 - ▶ Move the carriages to both end positions and check that the cover strip is seated correctly. If necessary, loosen the cover strip clamp screws again, realign the cover strip and then retighten the screws.
- ✓ The new cover strip has been mounted.

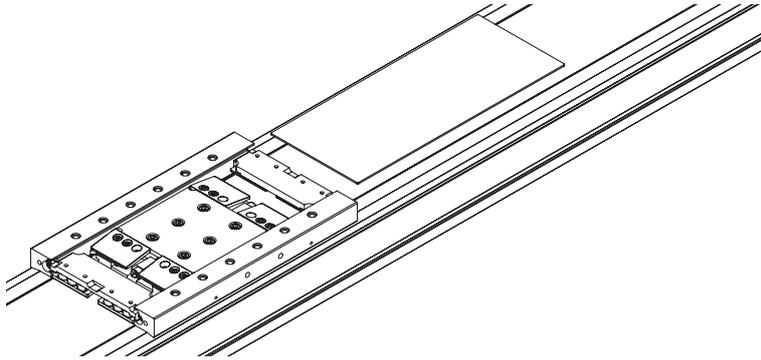


Fig. 7.12 Removing/mounting the carriage cover

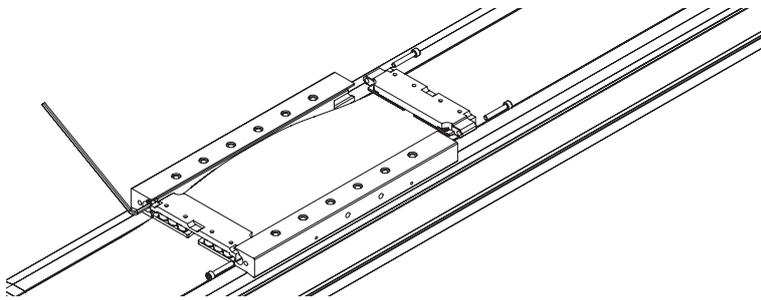


Fig. 7.13 Removing/mounting the cover strip deflection

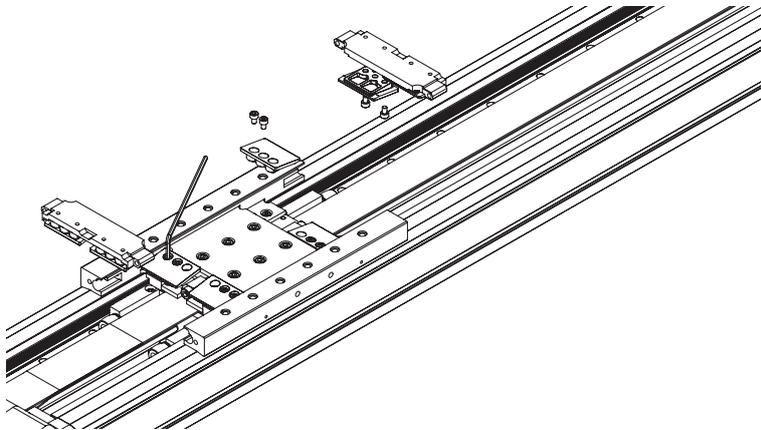


Fig. 7.14 Removing/mounting the cover strip guide

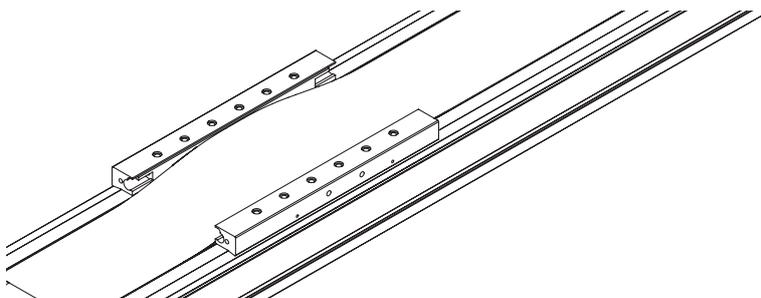


Fig. 7.15 Guiding the cover strip

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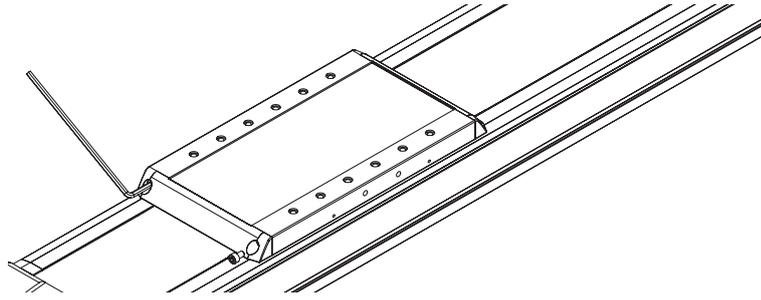


Fig. 7.16 **Removing/mounting the carriage end piece**

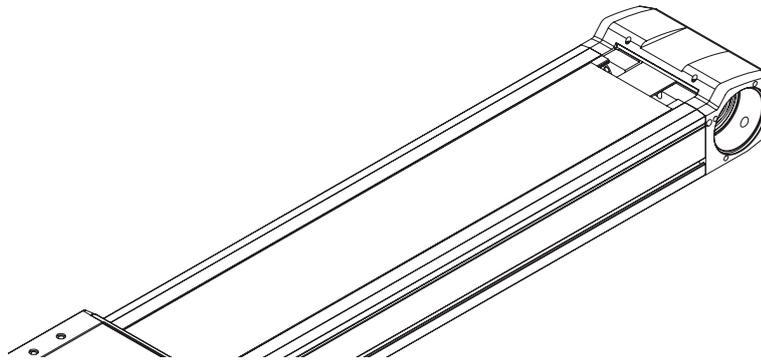


Fig. 7.17 **Mounting the cover strip under the cover strip clamp for HT-B**

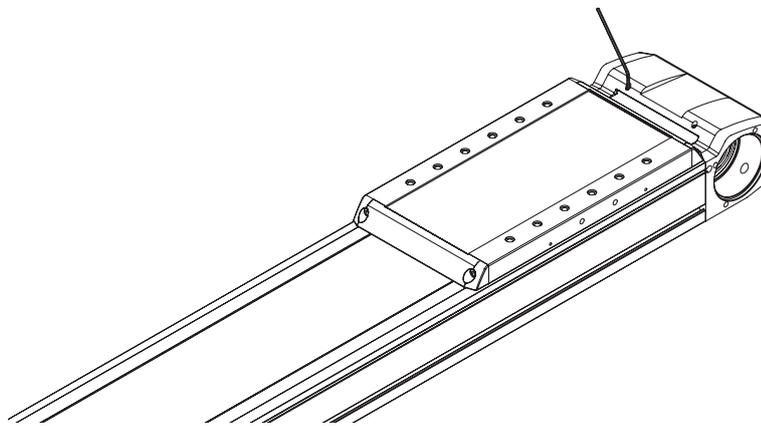


Fig. 7.18 **Removing/mounting the cover strip clamp for HT-B**

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 fixing screws 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 seats of the cover strip guides in the carriage.
 - ▶ Insert the new cover strip guides into the carriage on both sides.
 - ▶ Tighten the fixing screws with 3.0 Nm.
 - ▶ 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 guides have been mounted.

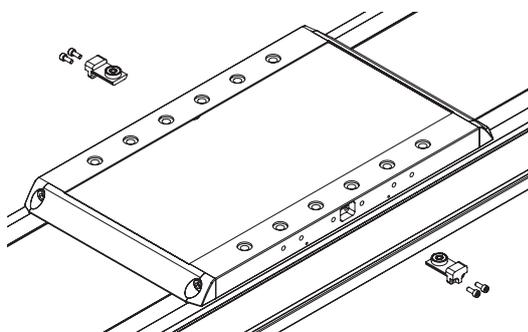


Fig. 7.19 Cover strip guides

7.6 Replacing 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 Section 7.3 on Page 105 ff..
- ▶ To remove the drive elements, follow the steps described in Section 6.6 on Page 65 ff..

7.6.2 Removing the belt tighteners and toothed belt

- ▶ Undo the belt tightener clamping screws [1] (at both ends) and pull both belt tighteners out of the carriage.
- ▶ Undo the headless screws [2], and remove the clamping plate [3].
- ▶ Push the toothed belt sideways out of the belt tightener.

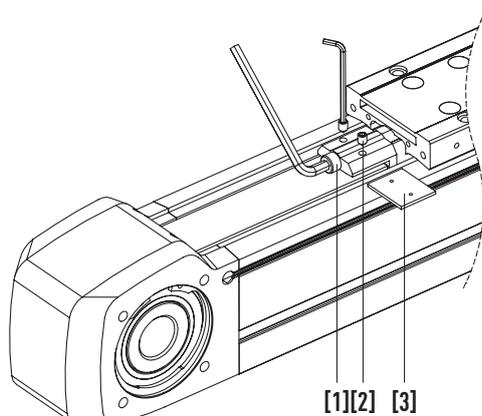


Fig. 7.20 Removing the belt tightener

- ▶ 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 Removing the drive units

- ▶ Using circlip pliers, remove the circlip [4] from each drive block housing on one side and push the drive units [8] out of their bearing seats.

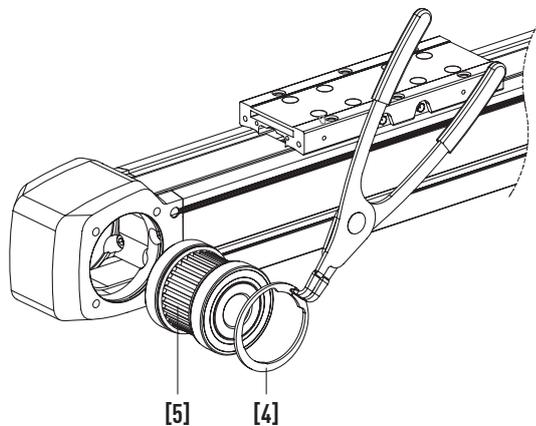


Fig. 7.21 Removing the drive unit

7.6.4 Mounting the new toothed belt

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

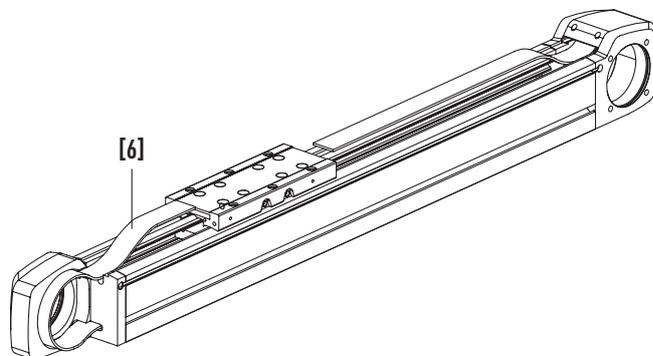


Fig. 7.22 Inserting the toothed belt

- ▶ Position the toothed belt so that the bearing seats are exposed and the drive units can be reinstalled.
- ▶ Push the drive units back into the bearing seats and reinstall the circlips.

7.6.5 Mounting the belt tightener

ATTENTION!

Risk of material damage due to accidental detachment!

- ▶ Use only the bolts provided by HIWIN! The strength classes, thread lengths, and lock coatings are matched precisely to the axis requirements!
- ▶ The belt tightener clamping screws must not be readjusted more than five times!

- ▶ Insert the toothed belt **[6]** sideways into the belt tightener and centre it inside the belt tightener. Make sure that all the teeth of the belt tightener are engaged.
- ▶ Push the clamping plates **[3]** on the back of the toothed belt into the belt tightener. Tighten the headless screws **[2]** hand-tight until the clamping plates can no longer be shifted laterally. Make sure that the tips of the headless screws are engaged in the centring holes of the clamping plates.

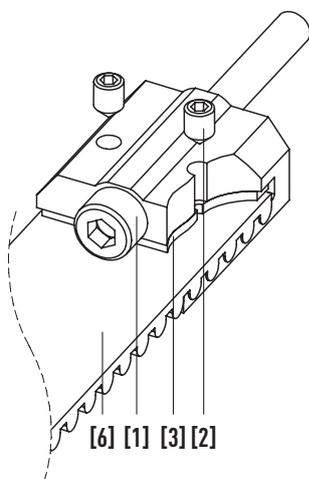


Fig. 7.23 Installing the toothed belt in the belt tightener

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- ▶ Insert the clamping screw **[1]** into the hole in the belt tightener and guide both belt tighteners into the designated slots on the carriage.
- ▶ Screw in both belt tighteners until the heads of the clamping screws 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 as shown in Fig. 7.24.
- ▶ Use the clamping screws **[1]** in the belt tightener 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.

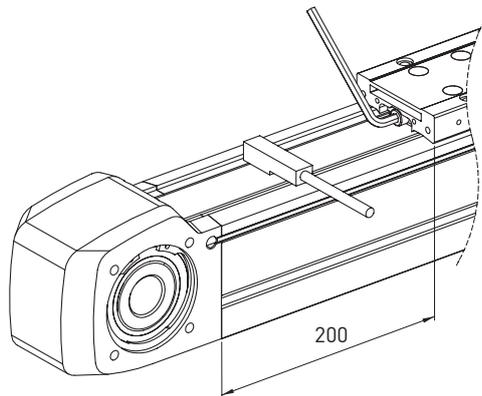


Fig. 7.24 Preloading the toothed belt

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 screws again.
- ✓ 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 Section 7.3 on Page 105 ff..
- ▶ To mount the drive elements, follow the steps described in Section 6.6 on Page 65 ff..

7.7 Replacing 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 Section 7.4 on Page 108 ff..
- ▶ To remove the drive elements, follow the steps described in Section 6.7 on Page 75 ff..

7.7.2 Removing the belt tighteners and the toothed belt

- ▶ Undo the belt tightener clamping screws [1] (at both ends) and pull both belt tighteners out of the carriage.

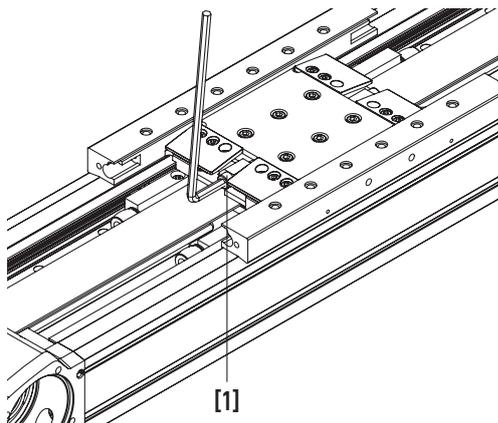


Fig. 7.25 Removing the belt tightener

7.7.2.1 Removing the toothed belt from the belt tightener for linear tables HT100B

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

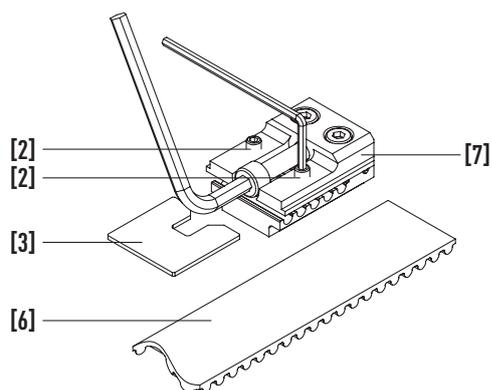


Fig. 7.26 Removing the toothed belt from the belt tightener (HT100B)

7.7.2.2 Removing the toothed belt from the belt tightener for linear tables HT150B, HT200B and HT250B

- ▶ Undo the 4 cylinder screws [8], and disassemble the belt tightener [7].
- ▶ The toothed belt ends are now free and can be pulled out of the axis.

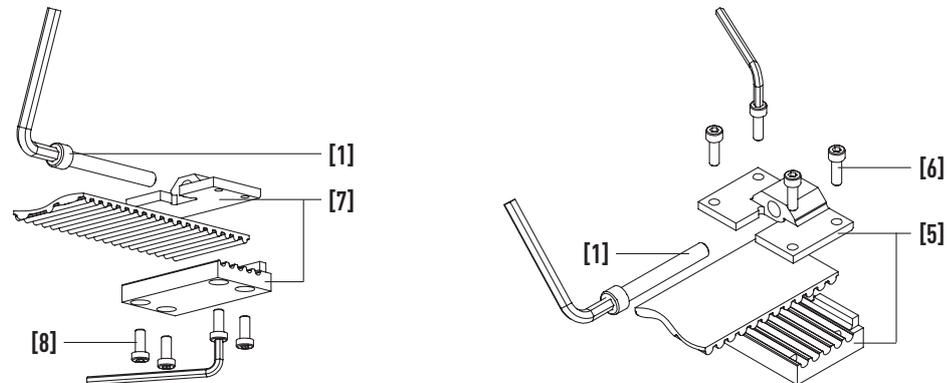


Fig. 7.27 Removing the toothed belt from the belt tightener (left: HT150B, right: HT200B, HT250B)

- ▶ 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 Removing the drive units

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

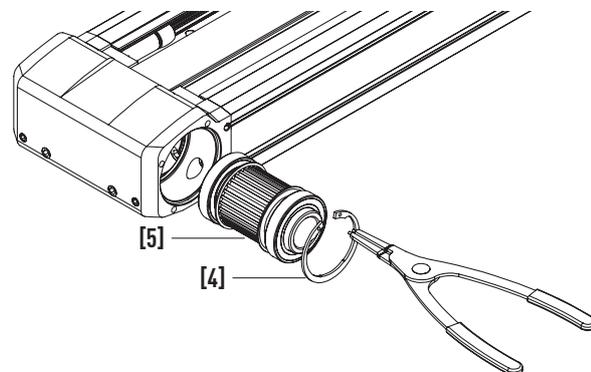


Fig. 7.28 Removing the drive unit

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.

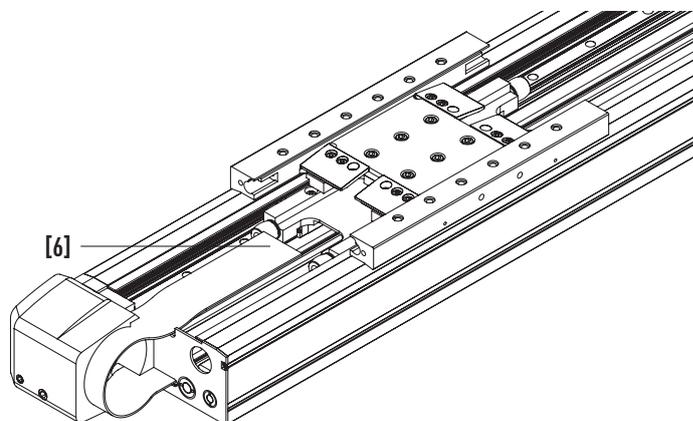


Fig. 7.29 Inserting the toothed belt

- ▶ Position the toothed belt so that the bearing seats are exposed and the drive units can be reinstalled.
- ▶ Push the drive units back into the bearing seats and reinstall the circlips.

7.7.5 Mounting the belt tightener

ATTENTION!

Risk of material damage due to accidental detachment!

- ▶ Use only the bolts provided by HIWIN! The strength classes, thread lengths, and lock coatings are matched precisely to the axis requirements!
- ▶ The belt tightener clamping screws must not be readjusted more than five times.

7.7.5.1 Inserting the toothed belt for linear tables HT100B

- ▶ Insert the toothed belt [6] sideways into the belt tightener and centre it inside the belt tightener. Make sure that all the teeth of the belt tightener are engaged.
- ▶ Push the clamping plates [3] on the back of the toothed belt into the belt tightener. Tighten the headless screws [2] hand-tight until the clamping plates can no longer be shifted laterally. Make sure that the tips of the headless screws are engaged in the centring holes of the clamping plates.

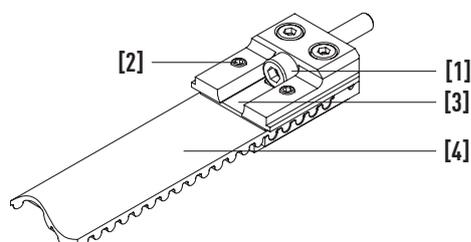


Fig. 7.30 Installing the toothed belt in the belt tightener (HT100B)

Maintenance and cleaning

7.7.5.2 Inserting the toothed belt for linear tables HT150B, HT200B and HT250B

- ▶ Insert the toothed belt [6] into the teeth of the belt tightener's bottom part [7-1] and center it.
- ▶ Place the belt tightener's upper part [7-2] on the back of the toothed belt and screw in the cylinder screws [8] as follows: Screw in crosswise until the screws touch. Then tighten the screws crosswise to the tightening torque according to Table 7.5.

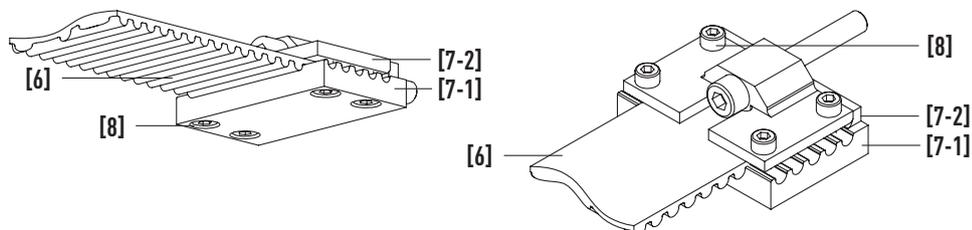


Fig. 7.31 Installing the toothed belt in the belt tightener (left: HT150B, right: HT200B, HT250B)

Table 7.5 Tightening torques for headless screws and cylinder screws of belt tightener

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

- ▶ Insert the clamping screw [1] into the hole in the belt tightener and guide both belt tighteners into the designated slots on the carriage.
- ▶ Screw in both belt tighteners until the heads of the clamping screws are fully inserted in the window of the carriage at both ends.

7.7.6 Adjusting the toothed belt preload

- ▶ Set the distance A/B (see Fig. 7.32 and Fig. 7.33) between the carriage edge and the edge of the drive block housing to the measurement shown in Table 7.6.
- ▶ Use the clamping screws [1] in the belt tightener 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.

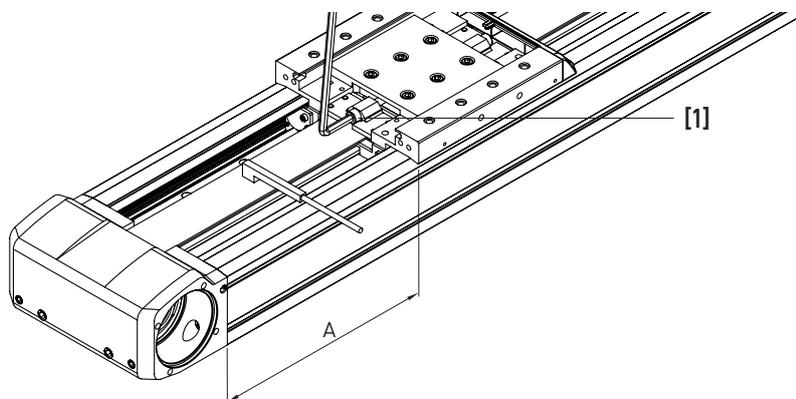


Fig. 7.32 Preloading the toothed belt: linear tables HT-B without cover strip

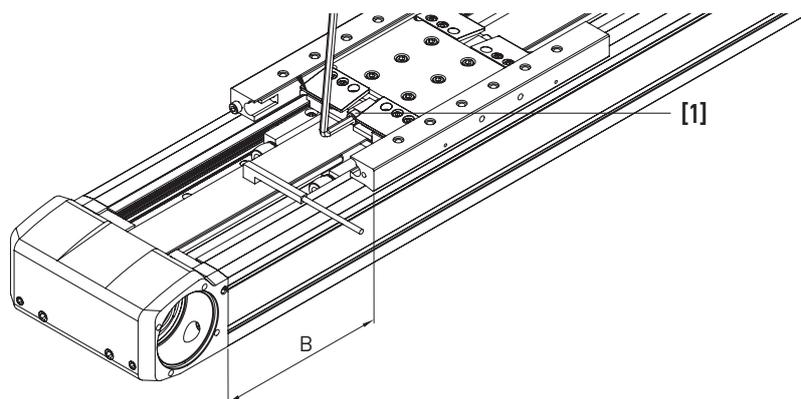


Fig. 7.33 Preloading the toothed belt: linear tables HT-B with cover strip

Table 7.6 Adjusting the span frequency

Size	A	B	Lower span frequency value [Hz]	Set span 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 screws again.

- ✓ 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 [Section 7.4 on Page 108 ff.](#)
- ▶ To mount the drive elements, follow the steps described in [Section 6.7 on Page 75 ff.](#)

7.8 Replacing the toothed belt – HC-B

7.8.1 Removing the attachments

- ▶ Remove the covers of the belt tightener.

7.8.2 Removing the belt tighteners and toothed belt

- ▶ Undo the belt tightener clamping screws [1] (at both ends) and pull both belt tighteners 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 tightener.

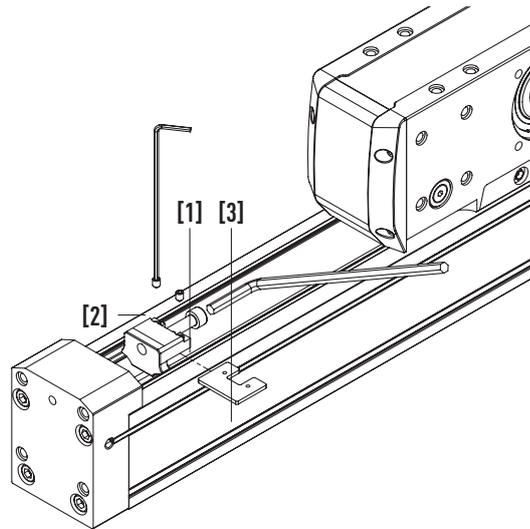


Fig. 7.34 Removing the belt tightener

- ▶ Pull the toothed 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

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

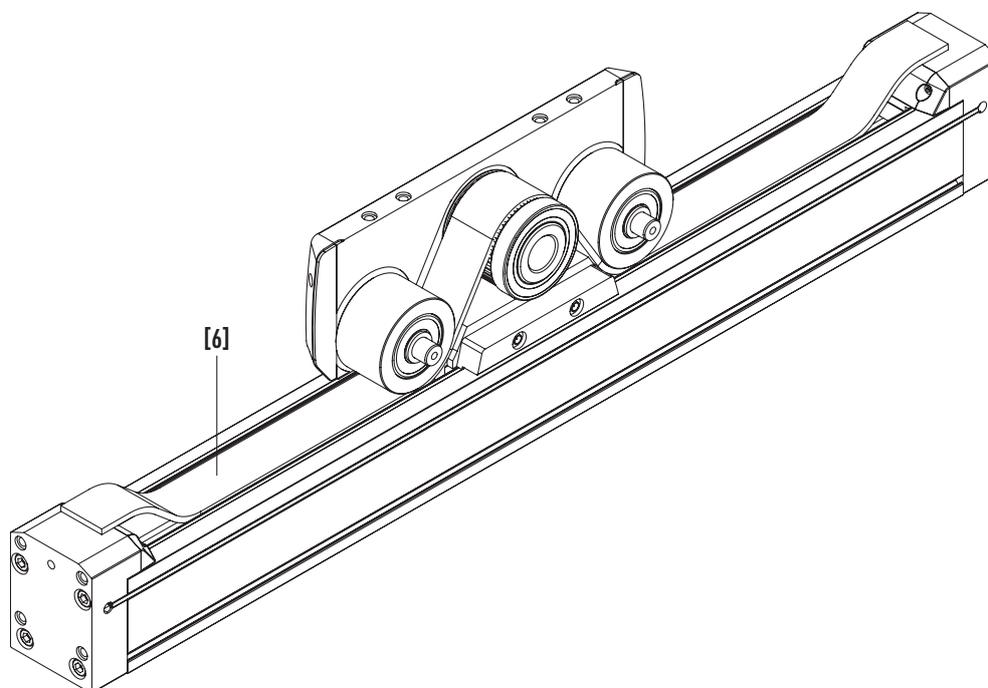


Fig. 7.35 Inserting the toothed belt

7.8.4 Mounting the belt tightener

ATTENTION!

Risk of material damage due to accidental detachment!

- ▶ Use only the bolts provided by HIWIN! The strength classes, thread lengths, and lock coatings are matched precisely to the axis' requirements!
 - ▶ The belt tightener clamping screws must not be readjusted more than five times!
-
- ▶ Insert the toothed belt [6] sideways into the belt tightener and centre it inside the belt tightener. Make sure that all the teeth of the belt tightener are engaged.
 - ▶ Push the clamping plates [3] on the back of the toothed belt into the belt tightener. Tighten the headless screws [2] hand-tight until the clamping plates can no longer be shifted laterally. Make sure that the tips of the headless screws are engaged in the centring holes of the clamping plates.

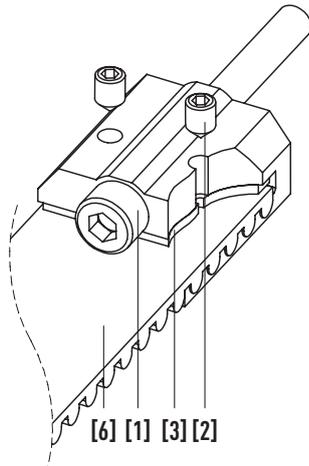


Fig. 7.36 **Installing the toothed belt in the belt tightener**

- ▶ Insert the clamping screw [1] into the hole in the belt tightener and guide both belt tighteners into the designated slots of the end plate.
- ▶ Screw in both belt tighteners until the heads of the clamping screws 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 screws in the belt tightener [1] 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.

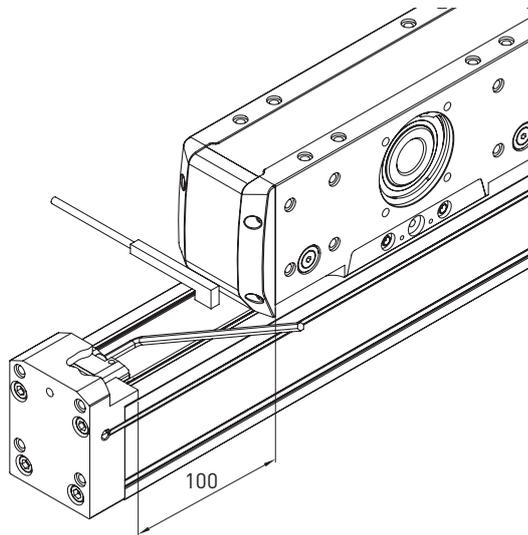


Fig. 7.37 **Preloading the toothed belt**

Table 7.7 **Adjusting the span frequency**

Size	Lower span frequency value [Hz]	Set span frequency value [Hz]	Upper span frequency value [Hz]
HC025B	210	235	257
HC040B	198	221	242
HC060B	287	321	352
HC080B	281	314	344

- ▶ 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 screws again.
- ▶ Mount the belt tightener covers
- ✓ The new belt has been mounted.

7.9 Replacing the synchronous shaft

- ▶ Secure the synchronous shaft against falling.
- ▶ To remove this component, carefully undo the clamping screws of the half shell clamp at both ends. Keep alternating between the clamping screws as you undo them to avoid overload.
- ▶ Fully remove the screws and coupling half shells to take off the synchronous shaft. For details of how to install the new one, see [Section 6.1.2 on Page 45 ff.](#)
- ✓ The synchronous shaft has been replaced.

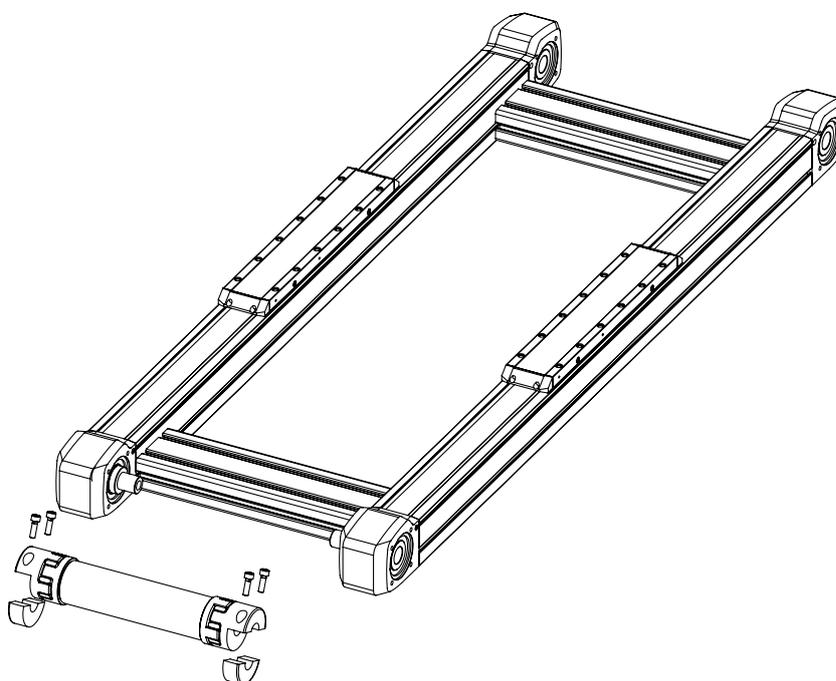


Fig. 7.38 **Mounting the synchronous shaft**

7.10 Visual examination of electrical componentry

 **DANGER!**



Warning! Electric shock or burns by contact with live parts!

Contact with live parts can result in injuries.

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

- ▶ Controller design complying with DIN EN 12100. No start after:
 - power connected, reinstated!
 - troubleshooting!
 - machine stop!
- ▶ Only qualified personnel may install cabling!
- ▶ Only qualified personnel may work on electrical installations!

8. Faults

8.1 Linear axis and linear axis system malfunctions

⚠ DANGER!

⚡ Warning! Electric shock or burns by contact with live parts!
Contact with live parts can result in injuries.
If the customer installs cables incorrectly, the constant motion inside the energy chain can cause chafing and expose the electrical contact points.

- ▶ Controller design complying with DIN EN 12100. No start after:
 - power connected, reinstated!
 - troubleshooting!
 - machine stop!
- ▶ Only qualified personnel may install cabling!
- ▶ Only qualified personnel may work on electrical installations!

⚠ CAUTION!

Danger of injury!
Rotation of the toothed belt pulley or the synchronous shaft during movement of the carriage(s) can result in fingers, hair or items of clothing getting caught and entangled.

- ▶ Isolating protective equipment must be provided for linear axis/linear axis system operations!
- ▶ Only qualified personnel may be assigned to commissioning, setup, and troubleshooting!

⚠ CAUTION!

⚠ Danger of impacts 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).

- ▶ Isolating protective equipment must be provided for linear axis/linear axis system operations!
- ▶ When installing a vertical linear axis/linear axis system, provide support for the carriage during down-times!

Table 8.1 **Table of linear axis and linear axis system malfunctions**

Fault	Possible cause	Remedy
Carriage/axis body not moving	Coupling slipping	Check that coupling assembled correctly; check and if necessary correct tightening torques on clamping bolts
	Toothed belt not mounted or preloaded correctly	Mount and preload toothed belt correctly
	Load too high	Reduce load or drive acceleration
	Synchronous shaft clamp loose	Check that the synchronous shaft coupling has been assembled correctly. Check clamping screw tightening torques and make corrections as necessary
Carriage/axis body backlash and inaccurate positioning	Guiding or drive element backlash after a collision or from extreme effects (impacts, peak loads, etc.) from outside	Send axis to HIWIN for repair
	Wrong toothed belt tension	Apply correct preload to toothed belt

Table 8.1 **Table of linear axis and linear axis system malfunctions (continuation)**

Fault	Possible cause	Remedy
Programmed absolute position changing	Toothed belt hopping	Toothed belt preload too low → retighten; axis drive torque too high → reduce drive torque, and adjust drive control parameters to the application conditions
	Coupling slipping	Check and if necessary correct clamping bolt torques on coupling elements; check and if necessary reduce maximum transferred drive torque
	Synchronous shaft clamp loose	Check that the synchronous shaft coupling has been assembled correctly. Check clamping screw tightening torques and make corrections as necessary
Limit switch not working	Switching distance too large	Adjust switching distance to correct value
	Limit switch defect or cable break	Replace limit switch
	Signal not arriving at controller	Check input cable to controller
Noise and vibrations at high speeds	Speed too high	Reduce speed
	Tensions in the system	Install axis free of tension; check flatness of bearing surface and attached load
	Wrong drive controller settings	Retune, and adjust controller settings to the application conditions
Noise generated by guiding mechanisms	Lack of lubricant	Relubricate
	Damage to guiding mechanisms, e.g. as a result of extreme impact on the carriage or extreme contamination	Send axis to HIWIN for repair
Motor load rising, controller shutting down owing to overload	Tensions in the system or lack of lubrication	Install axis free of tension; check flatness of bearing surface and attached load. Relubricate axis
	Heavy contamination on the axis and internal guiding mechanisms	Clean axis, reinstate free movement of guiding and drive elements

8.2 Motor malfunctions

For interpretation of faults and information on how to remedy them, see the motor's operating instructions.

8.3 Faults during operation with drive amplifier

For interpretation of faults and information on how to remedy them, see the drive's operating instructions.

9. Disassembly

DANGER!



Danger from electrical voltage!

Before and during assembly, disassembly and repair work, dangerous currents may flow.

- ▶ Work may only be carried out by a qualified electrician and with the power supply disconnected!
- ▶ Before carrying out work on the linear axes/linear axis systems, disconnect the power supply and protect it from being switched back on!

DANGER!



Warning! Electric shock or burns by contact with live parts!

Contact with live parts can result in injuries.

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

- ▶ Controller design complying with DIN EN 12100. No start after:
 - power connected, reinstated!
 - troubleshooting!
 - machine stop!
- ▶ Only qualified personnel may install cabling!
- ▶ Only qualified personnel may work on electrical installations!

WARNING!



Danger of impacts and crushing!

If the carriage is moved or started unintentionally, injuries may result!

- ▶ When installing a vertical linear axis/linear axis system, provide support for the carriage during downtimes!
- ▶ Controller design complying with DIN EN 12100. No start after:
 - power connected, reinstated!
 - troubleshooting!
 - machine stop!

WARNING!



Risk of crushing from carriages!

Danger of injury from crushing and damage to the linear axes/linear axis systems caused by movement of the carriage due to gravity, as the axes do not feature brakes in their standard version.

- ▶ Make sure that the carriage is secured against uncontrolled movement during downtimes!

WARNING!



Danger of cutting injuries!

Installing or removing the cover strip may cause cutting injuries.

- ▶ Only qualified personnel wearing appropriate protective equipment (gloves, goggles) may be assigned to commissioning and setup!

WARNING!



Danger from suspended loads or falling parts!

Lifting heavy loads may damage your health!

- ▶ Only qualified personnel may assemble, install, and service the linear axes/linear axis systems!
- ▶ Note the mass when transporting the parts. Use suitable hoisting gear!
- ▶ Observe the applicable occupational health and safety regulations when handling suspended loads!
- ▶ Hoist the linear axes/linear axis systems only at the designated points!
- ▶ Secure machinery and machine parts against tilting!

Disassembly

⚠ WARNING!



Danger of impacts and crushing!

- If the linear axis is used in cantilever mode, injuries may occur when the axis body is extended.
- ▶ Only qualified personnel may be assigned to commissioning, setup, and troubleshooting!
 - ▶ Isolating protective equipment must be provided for linear axis/linear axis system operations!
 - ▶ When mounted vertically, the linear axis must be secured against unintentional lowering by motors with spring-applied brakes and by an additional clamping element.

⚠ WARNING!



Danger of impacts and crushing if the clamping element is opened!

- As soon as air is applied, the clamping opens.
- ▶ Before carrying out work on the linear axes/linear axis systems, disconnect the power supply and protect it from being switched back on!
 - ▶ Make sure that moving parts of the linear axis are secured against unintentional movement!
 - ▶ Observe applicable safety regulations for working with compressed air!

⚠ CAUTION!



Danger of impacts 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 the applicable occupational health and safety regulations!
 - ▶ Transport to the installation site only by qualified personnel!

⚠ CAUTION!



Tilting linear axes can cause crushing injuries!

- ▶ Secure machinery and machine parts against tilting!

⚠ CAUTION!



Warning! Health and environmental hazards!

- Contact with lubricants may cause irritation, poisoning, allergic reactions, and damage to the environment.
- ▶ Use only suitable, non-hazardous agents. Note the manufacturer's safety data sheets!
 - ▶ Ensure proper disposal!

Disassembly steps:

- ▶ Disconnect the linear axis/double axis/multi-axis system from its power supply.
 - ▶ Unscrew and remove the moved loads.
 - ▶ Secure moving parts (e.g. carriage) against uncontrolled movements.
 - ▶ Unscrew and remove the linear axis/double axis/multi-axis system.
- ✓ The linear axis/double axis/multi-axis system has now been disassembled.

10. Disposal

CAUTION!



Warning! Health and environmental hazards!

Contact with lubricants may cause irritation, poisoning, allergic reactions, and damage to the environment.

- ▶ Use only suitable, non-hazardous agents. Note the manufacturer's safety data sheets!
- ▶ Ensure proper disposal!

Table 10.1 Disposal

Fluids	
Lubricants	Dispose of as hazardous waste in an environmentally friendly way
Soiled cleaning cloths	Dispose of as hazardous waste in an environmentally friendly way
Linear axis, double axis, multi-axis system	
Cabling, electrical components	Dispose of as electrical waste
PP components (e.g. energy chain)	Dispose of separately
Steel components (e.g. profile rail)	Dispose of separately
Aluminium components (e.g. profile, synchronous shaft)	Dispose of separately

11. Appendix 1: Drive adapter

Our products are constantly subjected to technical changes and improvements. Please always quote the serial numbers of your linear axes when ordering replacement parts, accessories, and parts without article numbers. This will ensure that you receive the correct parts. The serial number can be found on the axis' type plate.

11.1 Motor adapter for linear modules HM-B, cantilever axes HC-B and double axes HD

The adaption to the linear axis is a multi-part structure that simplifies the process of flange-mounting any standard motor or gear.

The flange type set consists of 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 to NG01–NG07)

The dimensions of the coupling housing, motor adapter plate and gear adapter plate can be found in Section 11.4 on Page 144 ff.

Motor adapter of the linear axis with toothed belt drive (HM-B)

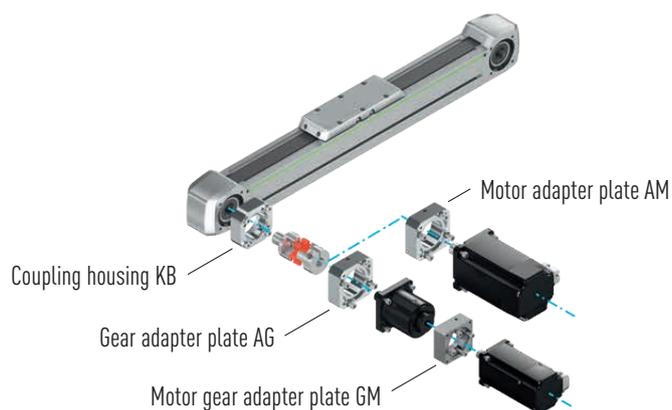


Fig. 11.1 **Motor adapter for linear modules HM-B**

Gear adapter plate AG:	axis-gear adapter
Motor gear adapter plate GM:	gear-motor adapter
Motor adapter plate AM:	axis-motor adapter

Motor adapter of the double axis HD

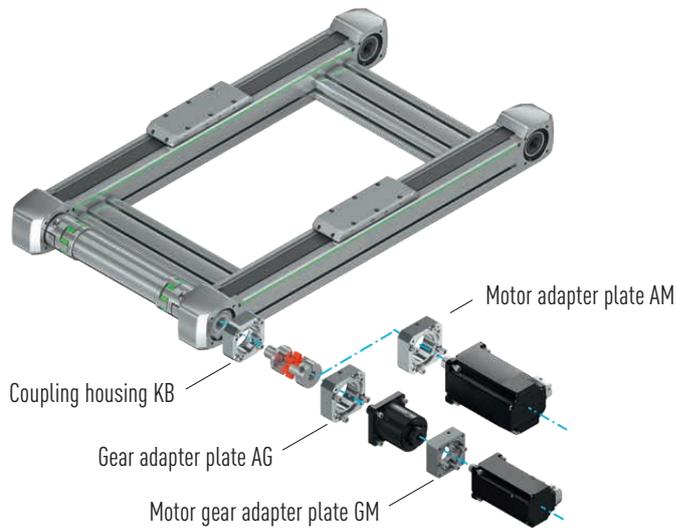


Fig. 11.2 **Motor adapter for double axes HD**

Gear adapter plate AG:	axis-gear adapter
Motor gear adapter plate GM:	gear-motor adapter
Motor adapter plate AM:	axis-motor adapter

Motor adapter of multi-axis systems (HS)

The appropriate motor adapters for HIWIN multi-axis systems HS must be selected separately for each axis.

Appendix 1: Drive adapter

Table 11.1 Order code for flange type¹⁾ – linear modules HM-B and double axes 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	
Gear adapter		NG01	NG02		NG03	NG04		NG05	NG06		NG07	
B&R	8LSA24		BR02	BR02		BR07						
	8LSA25	BR02	BR02	BR02		BR07						
	8LSA33	BR03 ²⁾		BR03 ²⁾		BR04	BR04		BR13			
	8LSA34	BR03 ²⁾		BR03 ²⁾	BR04	BR04	BR04		BR13			
	8LSA35	BR03 ²⁾		BR03 ²⁾	BR04	BR04	BR04		BR13			
	8LSA43				BR05			BR10				
	8LSA44				BR05			BR10				
	8LSA45				BR05			BR10				
	8LSA46				BR05			BR10				
	8LSA53							BR12 ²⁾				
	8LSA54							BR12 ²⁾				
	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	

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¹⁾ See order code on Page 12 for linear modules HM-B and an Page 20 for double axes HD

²⁾ Drive not suitable for Y axis of HIWIN multi-axis systems HS

Table 11.1 Order code for flange type¹⁾ – linear modules HM-B and double axes HD (continuation)

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	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		
	AM8563									BE16		
	AM8071									BE17		
	AM8072									BE17		
Bosch	MSK030B	B002	B002	B002		B009						
	MSK030C	B002	B002	B002		B009						
	MSK040B	B003 ²⁾		B003 ²⁾	B005	B005	B005		B010			
	MSK040C	B003 ²⁾		B003 ²⁾	B005	B005	B005		B010			
	MSK043C			B003 ²⁾	B005	B005	B005		B010			
	MSK050B				B006		B006	B011	B011	B011	B019	
	MSK050C				B006		B006	B011	B011	B011	B019	
	MSK060B				B008 ²⁾			B013		B013	B021	
	MSK060C				B008 ²⁾			B013		B013	B021	
	MSK061B				B007 ²⁾		B007 ²⁾	B012	B012	B012	B020	
	MSK061C				B007 ²⁾		B007 ²⁾	B012	B012	B012	B020	
	MSK070C							B015 ²⁾			B018	
	MSK070D							B015 ²⁾			B018	
	MSK070E							B015 ²⁾			B018	
	MSK071C							B015 ²⁾			B018	
	MSK071D							B015 ²⁾			B018	
	MSK071E										B018	
	MSK075C							B015 ²⁾			B018	
	MSK075D							B015 ²⁾			B018	
	MSK075E										B018	
MSK076C							B014 ²⁾		B014 ²⁾	B017	B017	
MSK100A							B014 ²⁾		B014 ²⁾	B017	B017	
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

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¹⁾ See order code on Page 12 for linear modules HM-B and an Page 20 for double axes HD

²⁾ Drive not suitable for Y axis of HIWIN multi-axis systems HS

Appendix 1: Drive adapter

Table 11.1 Order code for flange type¹⁾ – linear modules HM-B and double axes HD (continuation)

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
Lenze	MCS14P										LE13	
	MCS19F										LE14	
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			SW18	
	CMP80L										SW18	
	CMP100S										SW19	
	CMP100M										SW19	
	CMP100L										SW19	
	CMPZ71S				SW09 ²⁾			SW13		SW13		SW17
	CMPZ71M				SW09 ²⁾			SW13		SW13		SW17

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¹⁾ See order code on Page 12 for linear modules HM-B and an Page 20 for double axes HD

²⁾ Drive not suitable for Y axis of HIWIN multi-axis systems HS

Table 11.1 Order code for flange type¹⁾ – linear modules HM-B and double axes HD (continuation)

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	CMPZ71L							SW13		SW13	SW17	SW17
	CMPZ80S							SW14 ²⁾			SW18	
	CMPZ80M							SW14 ²⁾				
	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 an Page 20 for double axes HD

²⁾ Drive not suitable for Y axis of HIWIN multi-axis systems HS

Appendix 1: Drive adapter

11.2 Drive adapter for linear tables HT-B

The drive adapter on the linear table HT-B is a multi-part structure that simplifies the process of flange-mounting any standard motor or gear.

The flange type set consists of 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 to NG11–NG15)

The dimensions of the coupling housing, motor adapter plate and gear adapter plate can be found in Section 11.4 on Page 144 ff.

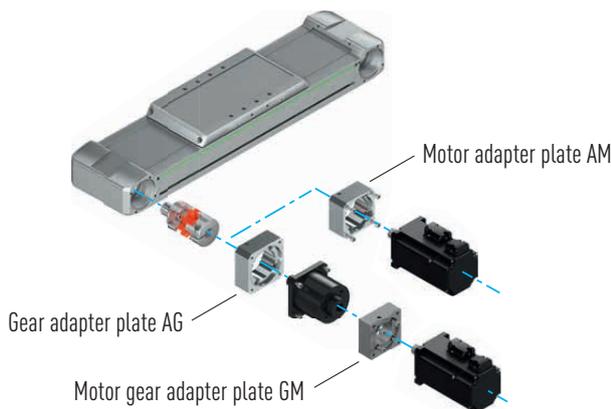


Fig. 11.3 **Motor adapter for linear tables HT-B**

- Gear adapter plate AG: axis-gear adapter
- Motor gear adapter plate GM: gear-motor adapter
- Motor adapter plate AM: axis-motor adapter

Table 11.2 **Order code for flange type¹⁾ – 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
Gear adapter		NG11	NG12		NG13	NG14		NG15		NG15
B&R	8LSA24		BR02							
	8LSA25		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	

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¹⁾ See order code on Page 15

Table 11.2 Order code for flange type¹⁾ – linear tables HT-B (continuation)

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	8LSA57						BR14		BR14		
	8LSA63						BR15		BR15		
	8LSA64						BR15		BR15		
	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		

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¹⁾ See order code on [Page 15](#)

Appendix 1: Drive adapter

Table 11.2 Order code for flange type¹⁾ – linear tables HT-B (continuation)

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	MSK030B		B002	B002							
	MSK030C		B002	B002							
	MSK040B	B003		B003	B010	B010					
	MSK040C	B003		B003	B010	B010					
	MSK043C			B003	B010	B010					
	MSK050B				B011	B011	B011		B019	B019	
	MSK050C				B011	B011	B011		B019	B019	
	MSK060B				B013		B013		B021	B021	
	MSK060C				B013		B013		B021	B021	
	MSK061B				B012	B012	B012		B020	B020	
	MSK061C				B012	B012	B012		B020	B020	
	MSK070C							B018		B018	
	MSK070D							B018		B018	
	MSK070E							B018		B018	
	MSK071C							B018		B018	
	MSK071D							B018		B018	
	MSK071E							B018		B018	
	MSK075C							B018		B018	
	MSK075D							B018		B018	
	MSK075E							B018		B018	
	MSK076C						B014	B017	B017	B017	B017
MSK100A						B014	B017	B017	B017	B017	
Lenze	MCS06F			LE01		LE11					
	MCS06I	LE01		LE01		LE11					
	MCS09D			LE02	LE08	LE08					
	MCS09F			LE03	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					
	BSH0703			SE06		SE17					
	BSH1001				SE13	SE13	SE13		SE20	SE20	
	BSH1002				SE13	SE13	SE13		SE20	SE20	
	BSH1003				SE13	SE13	SE13		SE20	SE20	

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¹⁾ See order code on [Page 15](#)

Table 11.2 Order code for flange type¹⁾ – linear tables HT-B (continuation)

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	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	
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				SM09	SM08	SM08		SM15		SM15

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¹⁾ See order code on [Page 15](#)

Appendix 1: Drive adapter

Table 11.2 Order code for flange type¹⁾ – linear tables HT-B (continuation)

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
Siemens	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](#)

11.3 Drive adapter for cantilever axes HC

The adaption to the linear axis is a multi-part structure that simplifies the process of flange-mounting any standard motor or gear.

The flange type set consists of 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 to NG21 – NG27)

The dimensions of the coupling housing, motor adapter plate and gear adapter plate can be found in [Section 11.4 on Page 144 ff.](#)

Motor adapter of the cantilever axis HC-B

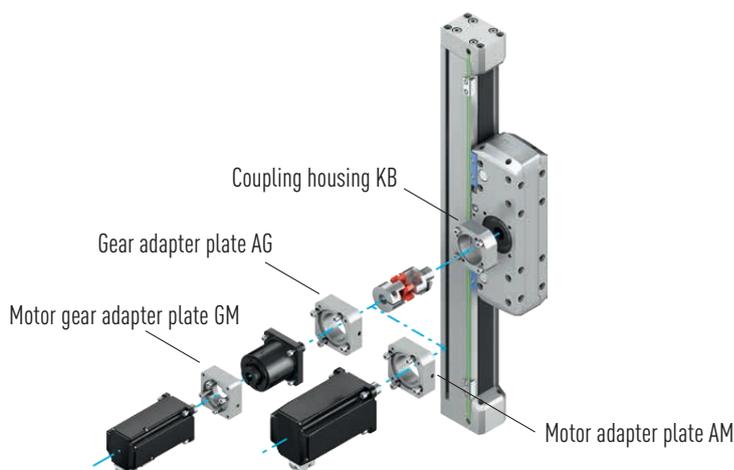


Fig. 11.4 Motor adapter for cantilever axes HC-B

- Gear adapter plate AG: axis-gear adapter
- Motor gear adapter plate GM: gear-motor adapter
- Motor adapter plate AM: axis-motor adapter

Table 11.3 Order code for flange type¹⁾ – cantilever axis HC-B

Drive manufacturer/type	HC025B		HC040B			HC060B		HC080B		
	With PLE40	Motor only	With PLE40	With PLQE60	Motor only	With PLQE60	With PLQE80	Motor only	With PLQE80	With PLQE120
Gear adapter	NG21		NG22	NG23		NG24	NG25		NG26	NG27
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	BE02	BE05	BE05		BE09	
	AM8032		BE02	BE02	BE02	BE05	BE05		BE09	
	AM8033			BE02	BE02	BE05	BE05		BE09	
	AM8531		BE02	BE02	BE02	BE05	BE05	BE05	BE09	
	AM8532		BE02	BE02	BE02	BE05	BE05	BE05	BE09	
	AM8533			BE02	BE02	BE05	BE05	BE05	BE09	
	AM8041						BE06		BE10	BE10
	AM8042					BE06	BE06		BE10	BE10
	AM8043					BE06	BE06		BE10	BE10
	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		

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¹⁾ See order code on [Page 18](#)

Appendix 1: Drive adapter

Table 11.3 Order code for flange type¹⁾ – cantilever axis HC-B (continuation)

Drive manufacturer/type		HC025B		HC040B		HC060B			HC080B		
		With PLE40	Motor only	With PLE40	With PLQE60	Motor only	With PLQE60	With PLQE80	Motor only	With PLQE80	With PLQE120
Beckhoff	AM8062								BE12		
	AM8561								BE12		
	AM8562								BE12		
Bosch	MSK030B	B001		B002	B002		B009				
	MSK030C	B001		B002	B002		B009				
	MSK040B		B003		B003		B005	B005		B010	
	MSK040C		B003		B003		B005	B005		B010	
	MSK043C		B003		B003		B005	B005		B010	
	MSK050B					B006		B006		B011	B011
	MSK050C					B006		B006		B011	B011
	MSK060B					B008			B013		B013
	MSK060C					B008			B013		B013
	MSK061B					B007		B007	B012	B012	B012
	MSK061C					B007		B007	B012	B012	B012
	MSK070C								B015		
	MSK070D								B015		
	MSK070E								B015		
	MSK071C								B015		
	MSK071D								B015		
	MSK071E								B015		
	MSK075C								B015		
	MSK075D								B015		
	MSK075E								B015		
MSK076C								B014		B014	
MSK100A								B014		B014	
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	
	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

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¹⁾ See order code on [Page 18](#)

Table 11.3 Order code for flange type¹⁾ – cantilever axis HC-B (continuation)

Drive manufacturer/type	HC025B		HC040B		HC060B			HC080B			
	With PLE40	Motor only	With PLE40	With PLQE60	Motor only	With PLQE60	With PLQE80	Motor only	With PLQE80	With PLQE120	
Schneider	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	
	CMP80S								SW14		
	CMP80M								SW14		
	CMPZ71S					SW09			SW13	SW13	
	CMPZ71M					SW09			SW13	SW13	
	CMPZ71L					SW09			SW13	SW13	
	CMPZ80S								SW14		
CMPZ80M								SW14			
Siemens	1FK7022	SM01		SM02	SM02		SM07				
	1FK7032		SM03		SM03		SM04	SM04		SM11	
	1FK7034		SM03		SM03		SM04	SM04		SM11	
	1FK7040							SM05		SM08	
	1FK7042					SM05		SM05		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⁾ See order code on Page 18

Appendix 1: Drive adapter

11.4 Dimensions of motor adapter for linear modules HM-B, linear tables HT-B cantilever axes HC-B and double axes HD

The overall width of the toothed belt axis depends on the following factors:

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

Linear axis without gearbox

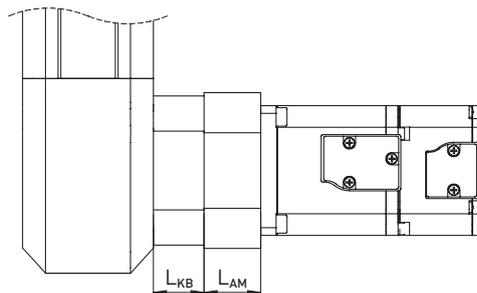


Fig. 11.5 Linear module HM-B motor connection without gears

- L_{KB} Coupling housing length, see Table 11.4
- L_{AM} Motor adapter plate length, see Table 11.5

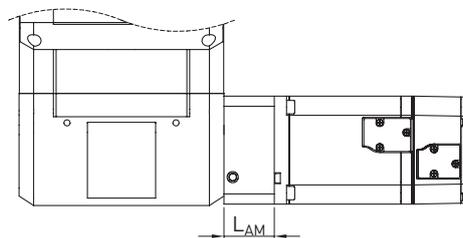


Fig. 11.6 Linear table HT-B motor connection without gears

- L_{AM} Motor adapter plate length, see Table 11.6

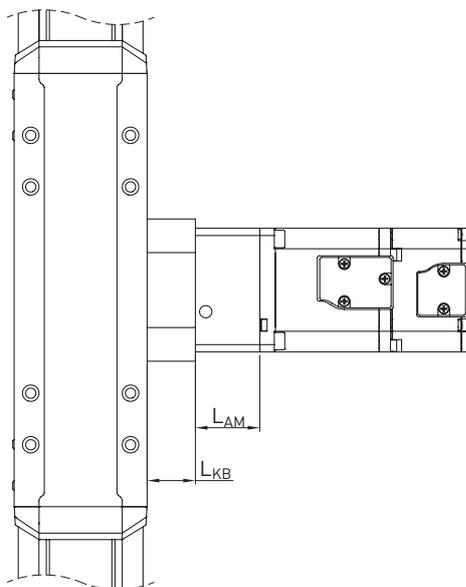


Fig. 11.7 Cantilever axis HC-B motor connection without gears

- L_{KB} Coupling housing length, see [Table 11.4](#)
- L_{AM} Motor adapter plate length, see [Table 11.5](#)

Linear axis with gearbox

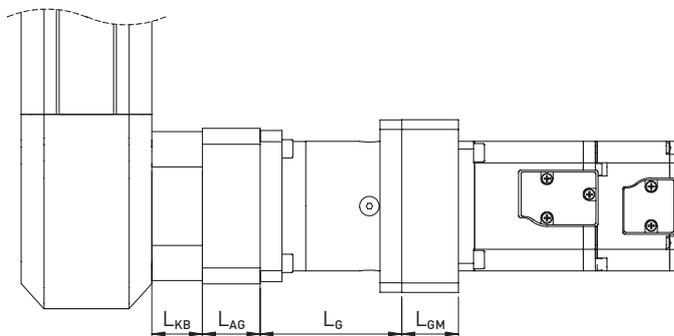


Fig. 11.8 Linear module HM-B motor connection with gears

- L_{KB} Coupling housing length, see [Table 11.4](#)
- L_{AG} Gear adapter plate length, see [Table 11.7](#)
- L_G Gearbox length, see [Table 11.9](#)
- L_{GM} Motor gear adapter plate length, see [Table 11.8](#)

Appendix 1: Drive adapter

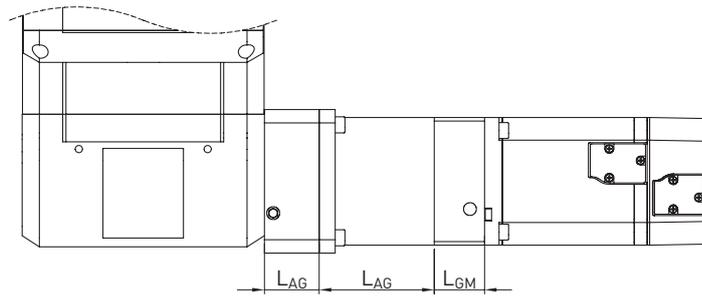


Fig. 11.9 Linear table HT-B motor connection with gears

- L_{AG} Gear adapter plate length, see [Table 11.7](#)
- L_G Gearbox length, see [Table 11.9](#)
- L_{GM} Motor gear adapter plate length, see [Table 11.8](#)

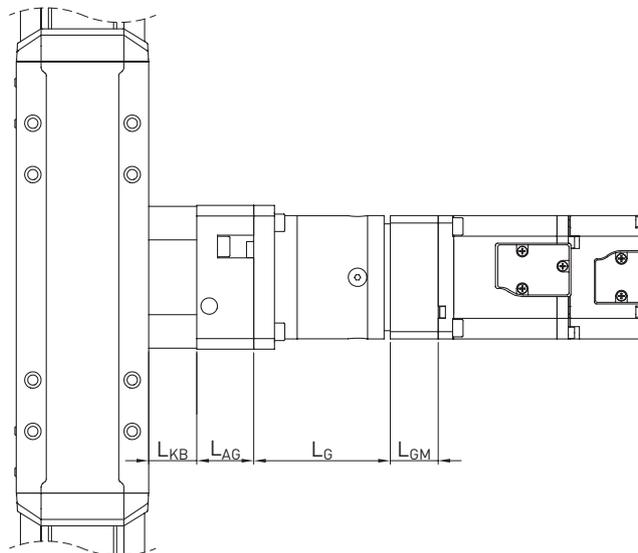


Fig. 11.10 Cantilever axis HC-B motor connection with gears

- L_{KB} Coupling housing length, see [Table 11.4](#)
- L_{AG} Gear adapter plate length, see [Table 11.7](#)
- L_G Gearbox length, see [Table 11.9](#)
- L_{GM} Motor gear adapter plate length, see [Table 11.8](#)

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

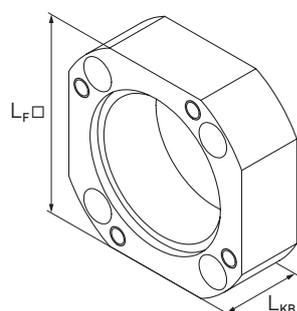


Fig. 11.11 Coupling housing KB for linear modules HM-B and cantilever axes HC-B

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
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 gears

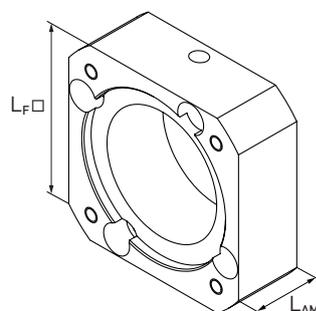


Fig. 11.12 Motor adapter plate AM for linear modules HM-B, linear tables HT-B and cantilever axes HC-B without gears

Table 11.5 Motor adapter plate AM for linear modules HM-B and cantilever axes HC-B without gears

Linear axis	Manufacturer	Motors	L _F [mm]	L _{AM} [mm]	Article number
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

Appendix 1: Drive adapter

Table 11.5 Motor adapter plate AM for linear modules HM-B and cantilever axes HC-B without gears (continuation)

Linear axis	Manufacturer	Motors	L _F [mm]	L _{AM} [mm]	Article number
HMO40B, HCO40B	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
HMO60B, HCO60B	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
	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
		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
HMO80B, HCO80B	Beckhoff	AM8532D, AM8532E, AM8532H, AM8533E, AM8533F, AM8533J	73	27	25-000436
		AM8042E, AM8042F, AM8042J, AM8043E, AM8043H, AM8043K, AM8541D, 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

Table 11.5 Motor adapter plate AM for linear modules HM-B and cantilever axes HC-B without gears (continuation)

Linear axis	Manufacturer	Motors	L _F [mm]	L _{AM} [mm]	Article number	
HM080B, HC080B	Beckhoff	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	
	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	
		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	
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	

Appendix 1: Drive adapter

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

Linear axis	Manufacturer	Motors	L _F [mm]	L _{AM} [mm]	Article number	
HT100B	Beckhoff	AM8023E, AM8023F	55	22	25-000402	
		AM8031D, AM8031F, AM8531D, AM8531F	70	31	25-000407	
	Bosch	MSK040B, MSK040C	82	31	25-000405	
	Lenze	MCS06141, MCS06160	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	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	
		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
	BSH1003		100	51	25-000444	
	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	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	

Table 11.6 Motor adapter plate AM for linear tables HT-B without gears (continuation)

Linear axis	Manufacturer	Motors	L _F [mm]	L _{AM} [mm]	Article number
HT200B	Bosch	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, 1FK7984		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
	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

Appendix 1: Drive adapter

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

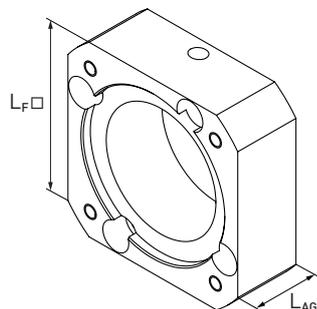


Fig. 11.13 Gear adapter plate AG for linear modules HM-B, linear tables HT-B and cantilever axes HC-B

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 type ²⁾	L _F [mm]	L _{AG} [mm]	Article number
HC025B	PLE040 ¹⁾	50	27.0	25-002609
HM040B, HT100B, HC040B	PLE040 ¹⁾	50	22.0	25-000735
HM040B, HT100B, HC040B	PLQE60	70	32.0	25-000387
HM060B, HC060B	PLQE60	70	26.5	25-000388
HM060B, HC060B	PLQE80	90	36.5	25-000389
HM080B, HT150B, HC080B	PLQE80	90	34.0	25-000390
HM080B, HT150B, HC080B	PLQE120	115	46.5	25-000391
HM120B, HT200B, HT250B	PLQE120	115	43.0	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 and linear tables HT-B

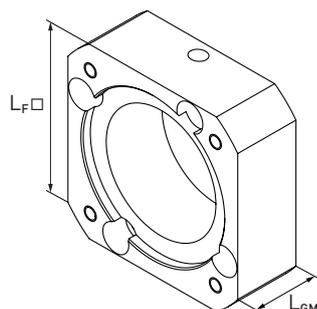


Fig. 11.14 Motor gear adapter plate GM for linear modules HM-B and linear tables HT-B

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

Gearbox type ¹⁾	Manufacturer	Motors	L _F [mm]	L _{GM} [mm]	Article number
PLE40	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

¹⁾ PLE and PLQE are registered trademarks of Neugart GmbH

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

Gearbox type ¹⁾	Manufacturer	Motors	L _F [mm]	L _{GM} [mm]	Article number
PLQE60	B&R	8LSA24, 8LSA25	60	17.1	25-000490
		8LSA33, 8LSA34, 8LSA35	90	23.1	25-000487
	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
PLQE80	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

¹⁾ PLE and PLQE are registered trademarks of Neugart GmbH

Appendix 1: Drive adapter

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

Gearbox type ¹⁾	Manufacturer	Motors	L _F [mm]	L _{GM} [mm]	Article number
PLQE120	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

Gearbox¹⁾ for the optimal transfer of motor torque to the toothed belt drive.

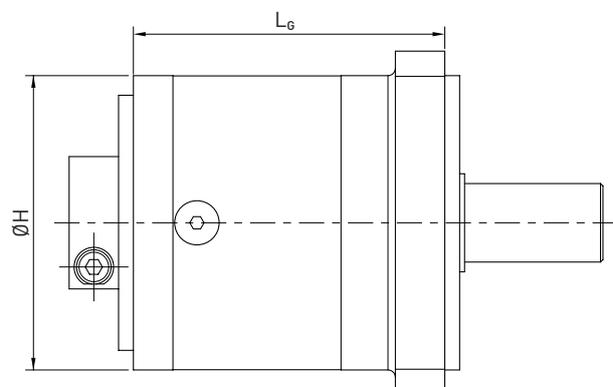


Fig. 11.15 Dimensional drawing of gearbox for linear modules HM-B, linear tables HT-B, cantilever axes HC-B and double axes HD

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]	Gearbox type ¹⁾	Order code for gear ²⁾
HC025B, HM040B, HD1, HT100B, 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	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 from Neugart, registered trademarks of Neugart GmbH

²⁾ See order code on [Page 12](#) for linear modules HM-B, [Page 15](#) for linear tables HT-B, [Page 18](#) for cantilever axes HC-B and on [Page 20](#) for double axes HD

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

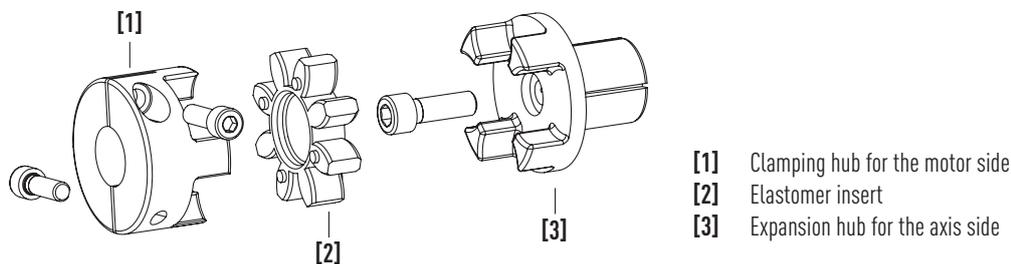


Fig. 11.16 Coupling components for linear modules HM-B, linear tables HT-B and cantilever axes HC-B

11.4.6.1 Expansion hub

Coupling element to axis side.

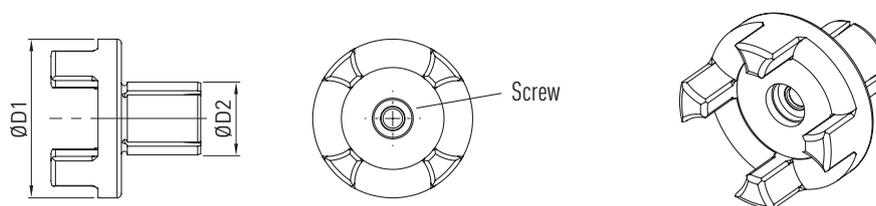


Fig. 11.17 Expansion hub for linear modules HM-B, linear tables HT-B and cantilever axes HC-B

Table 11.10 Article numbers and dimensions for expansion hub

Axis type/ size	Type	Ø D1 [mm]	Ø D2 [mm]	Thread size × length	Screw tightening torque [Nm]	Inertia torque [kgmm ²]	Friction grip 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	25-000819
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	Size 28	64.5	35	M10 × 35	49	77.0	201	25-000201

11.4.6.2 Elastomer insert

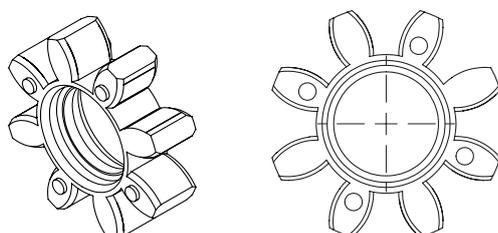


Fig. 11.18 Elastomer insert for linear modules HM-B, linear tables HT-B and cantilever axes HC-B

Table 11.11 Article numbers for elastomer insert

Axis type/size	Type	Article number
HM025B	Size 12	25-000202
HM040B, HT100B, HC040B	Size 14	25-000203
HM060B, HC060B	Size 19	25-000204
HM080B, HT150B, HC080B	Size 24	25-000205
HM120B, HT200B, HT250B	Size 28	25-000206

11.4.7 Clamping hub

Coupling element to motor side.

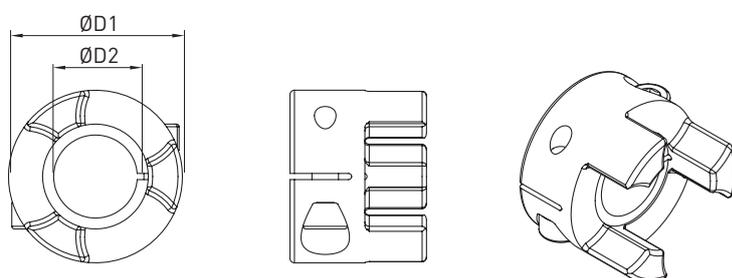


Fig. 11.19 Clamping hub for linear modules HM-B, linear tables HT-B and cantilever axes HC-B

Table 11.12 Article numbers and specifications for clamping hub

Axis type/size	Type	Ø D1 [mm]	Ø D2 H7 [mm]	Thread size × length	Screw tightening torque [Nm]	Friction grip torque [Nm]	Inertia torque [Nm]	Article number
HC025B	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
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	3.8	2.55	25.6	25-002402

Appendix 1: Drive adapter

Table 11.12 Article numbers and specifications for clamping hub (continuation)

Axis type/ size	Type	Ø D1 [mm]	Ø D2 H7 [mm]	Thread size × length	Screw tightening torque [Nm]	Friction grip torque [Nm]	Inertia torque [Nm]	Article number
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
			19	M6 × 16	14.0	14.71	77.1	25-002412
			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	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 constantly subjected to technical changes and improvements. Please always quote the serial numbers of your linear axes when ordering replacement parts, accessories, and parts without article numbers. This will ensure that you receive the correct parts. The serial number can be found on the axis' type plate.

12.1 Clamping profile

Clamping profiles are devices for installing the linear axis to the machine frame from above. The clamping profiles can be swivelled into the sides of the axis' profile groove. The required number of clamping profiles per axis depends on the axis length and the load. It can be found in Sections 6.2.5 (HM-B/HD) and 6.2.6 (HT-B). Sets are available with four clamping profiles.

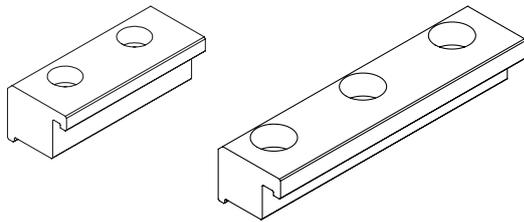


Fig. 12.1 Short and long clamping profiles

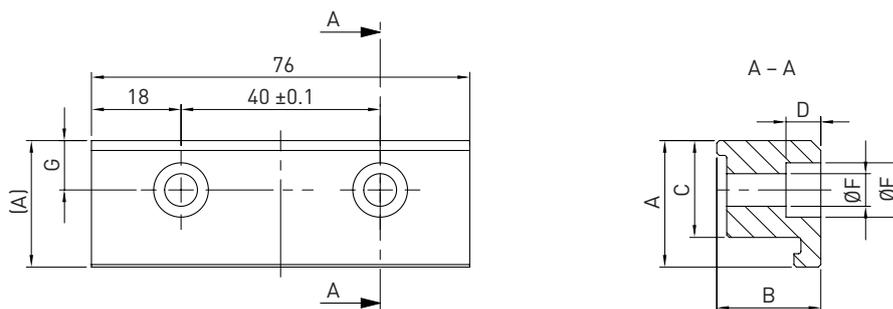


Fig. 12.2 Dimensional drawing of short clamping profile

Table 12.1 Article numbers and dimensions for short clamping profile

Suitable for linear axis	Type	A	B	C	D	Ø E	Ø F	G	Suitable screw	Article number, 4 pcs.
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
HT150B	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

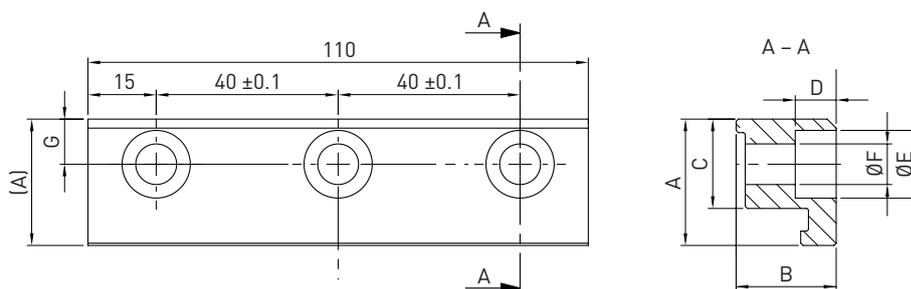


Fig. 12.3 Dimensional drawing of long clamping profile

Appendix 2: Accessories

Table 12.2 Article numbers and dimensions for long clamping profile

Suitable for linear axis	Type	A	B	C	D	Ø E	Ø F	G	Suitable screw	Article number, 4 pcs.
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 the frictional connection of the linear axis. Flexible fastening options through the grooves on the side and on the bottom of the axis profile. The required number of T nuts per axis depends on the axis length and the load. It can be found in Sections 6.2.3 (HM-B/HD) and 6.2.4 (HT-B). Sets are available with ten T nuts.

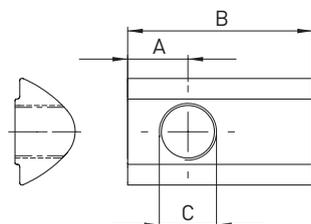


Fig. 12.4 Dimensional drawing of T nut

Table 12.3 Article numbers and dimensions for T nut

Suitable for linear axis	Type	A	B	C	Article number, 10 pcs.
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	Size 8 M5	7.5	23.0	M5	20-000532
HM080B, HM120B, HT200B, HT250B	Size 8 M6	6.5	23.0	M6	20-000533
HM080B, HM120B, HT200B, HT250B ¹⁾	Size 8 M8	7.5	23.0	M8	20-000534

¹⁾ Preferred type for axis mounting

Unit: mm

12.3 Centring sleeve

Centring sleeves that are inserted in the carriage's mounting holes for precise, repeatable load bearing. Sets are available with ten centring sleeves.

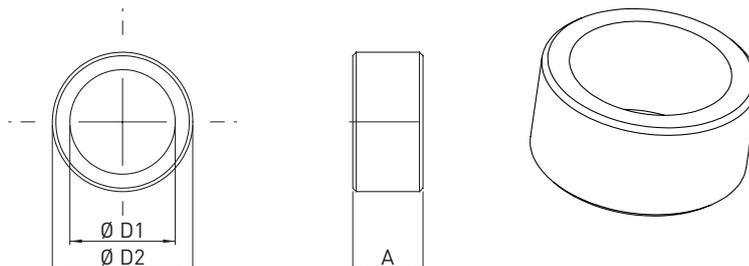


Fig. 12.5 Dimensional drawing of centring sleeve

Table 12.4 Article numbers and dimensions for centring sleeve

Suitable for linear axis	A	∅ D1	∅ D2	Article number, 10 pcs.
HC025B	4	4.5	6	25-002195
HM040B, HT100B, HC040B, HM060B, HT150B, HC060B	4	6.5	8 h6	25-000511
HM080B, HT200B, HC080B	4	9.0	12 h6	25-000512
HM120B, HT250B	4	11.0	15 h6	25-000513

Unit: mm

12.4 Groove cover

Cover for the fastening groove. Length: 2 m. Sets are available with five groove covers.

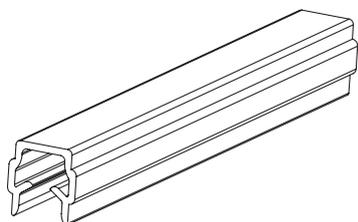


Fig. 12.6 Groove cover for linear modules HM-B, linear tables HT-B and cantilever axes HC-B

Table 12.5 Article numbers for groove cover

Suitable for linear axis	Type	Article number, 5 pcs.
HM040B, HT100B, HC040B, HC060B	Size 5	25-000514
HM060B, HT150B, HC080B	Size 6	25-000515
HM080B, HM120B, HT200B, HT250B	Size 8	25-000516

12.5 Limit switch

Inductive limit switch as NC or NO contact. A screw (M3 × 12) and nut (DIN 562 M3) is necessary to fix the sensor to the axis profile. The limit switch is supplied as standard with plug or open cable end. Set including mounting material.

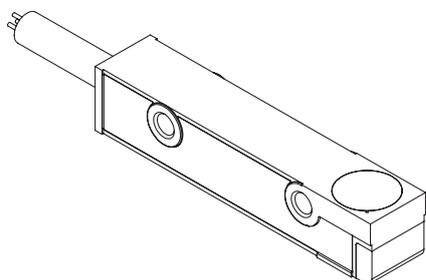


Fig. 12.7 Limit switch for linear modules HM-B, linear tables HT-B and cantilever axes HC-B

Appendix 2: Accessories

Table 12.6 Limit switch options

Suitable for linear axis	Option	Article number
HM, HT, HC040B, HC060B, HC080B	Limit switch with 100 mm cable, plug (NC)	25-000786
HM, HT, HC040B, HC060B, HC080B	Limit switch with 4 m cable (NC)	25-000787
HM, HT, HC040B, HC060B, HC080B	Limit switch with 5 m cable (NO)	25-000788
HC025B	Limit switch with 200 mm cable, plug (NC)	25-002204
HC025B	Limit switch with 2 m cable (NC)	25-002205

For more information see Section 4.4 on Page 30

12.6 Extension cable for limit switch

Cable with 3-pin M8 round connector on the limit switch side and exposed wires on the other cable end.

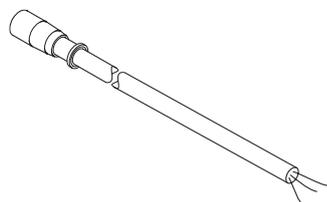


Fig. 12.8 Extension cable for limit switch

Table 12.7 Extension cable for limit switch

Length [m]	Max. cable diameter d [mm]	Min. bending radius static [mm]	Min. bending radius dynamic [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 needed to switch the limit switches at both of the carriage's end positions (at stroke 0 and stroke max). It can be attached on the left and right of the carriage. Set including mounting material.

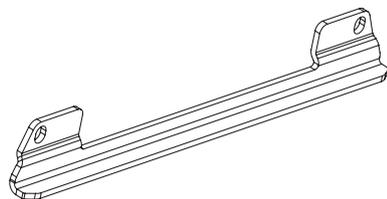


Fig. 12.9 Damping element for linear modules HM-B and linear tables HT-B

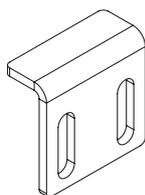


Fig. 12.10 Damping element for cantilever axes HC-B

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

12.8 Distance measuring system HIWIN MAGIC

Magnetic distance measuring system consisting of encoder (with 5 m cable length and open cable end).

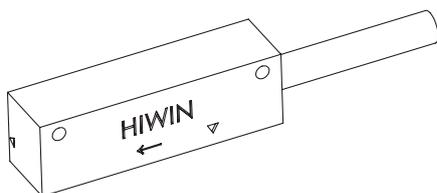


Fig. 12.11 HIWIN MAGIC encoder

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 more information see Section [4.5](#) on Page 31

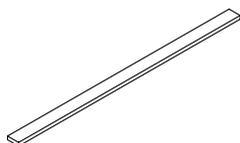


Fig. 12.12 HIWIN MAGIC magnetic scale

Table 12.10 MAGIC magnetic scale

Magnetic scale	Order code
MAGIC magnetic scale	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.

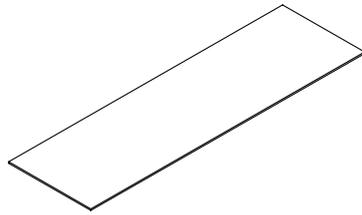


Fig. 12.13 **Cover strip**

Table 12.11 **Article numbers for cover strip**

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 holds down the cover strip and is available in a length of 7.5 m.

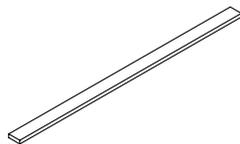


Fig. 12.14 **Magnetic strip**

Table 12.12 **Article numbers for magnetic strip**

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 consists of the following parts:

- 2 × cover strip deflection, each with
- 2 × deflector housing
- 2 × cover strip guide
- 4 × cylinder-head screw
- 4 × square nut (not applicable to HM040)

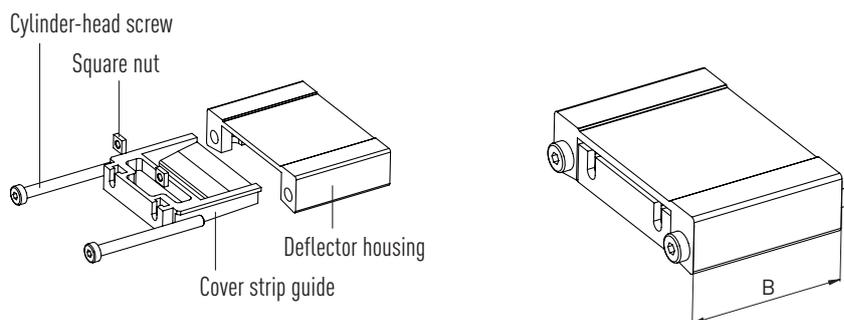


Fig. 12.15 Cover strip deflection for linear modules HM-B

Table 12.13 Article numbers for cover strip deflection set – 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 consists of the following parts:

- 8 × cover strip guide
- 16 × cylinder-head screw

Each carriage requires one cover strip deflection set.

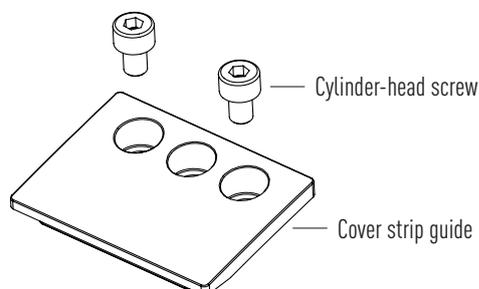


Fig. 12.16 Cover strip deflection for linear tables HT-B

Table 12.14 Article numbers for cover strip deflection set – 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

Cover strip for additional guidance of the cover strip for longer axes. The set consists of two strip guides (enough for one carriage) including fastening material.

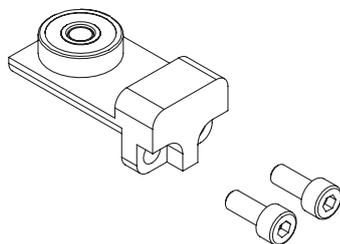


Fig. 12.17 Cover strip guide

Table 12.15 Article numbers for cover strip guide

Suitable for linear axis	Article number
HT150B	25-002586
HT200B	25-002636
HT250B	25-002632

12.14 Buffer stop

The buffer stop serves as a mechanical limit.

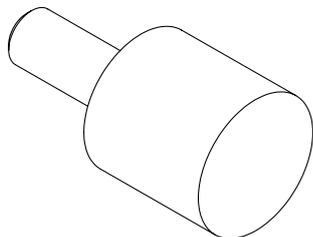


Fig. 12.18 Buffer stop

Table 12.16 Article numbers for buffer stop

Suitable for linear axis	Cover strip	Article number
HM040B	C/N	25-000055
HM060B	C/N	25-000056
HM080B	C/N	25-000057
HM120B	C/N	25-000059
HT100B	C	25-000056
HT100B	N	25-000653
HT150B, HT200B	C/N	8-13-0007
HT250B	C/N	8-13-0008

Table 12.16 Article numbers for buffer stop (continuation)

Suitable for linear axis	Cover strip	Article number
HC025B	N	22-002044
HC040B	N	25-000055
HC060B	N	25-000056
HC080B	N	25-000057

12.15 Pneumatic connector

Pneumatic connection (push-in fitting) for operating the clamping element. The blind plug is used to close the opposite hole on the drive block.

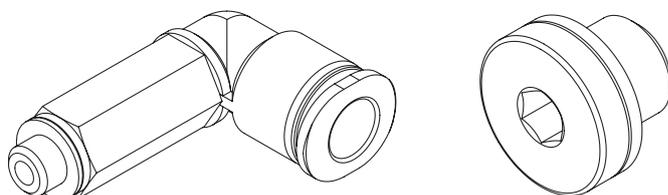


Fig. 12.19 Push-in fitting and blind plug

Table 12.17 Article numbers for pneumatic connector for clamping element

Suitable for linear axis	Article number
HC060B/HC080B	8-16-0150

12.16 Separators for energy chain

Separator for separating the cables within the energy chain. By default, the energy chain is equipped with a separator in each second chain link. Additional separators are available in sets of 20 pieces.

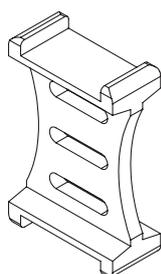


Fig. 12.20 Separator for energy chain

Table 12.18 Article numbers for separator

Separator suitable for linear axis system			Article number, 20 pcs.
HS (X-axis)	HS (Y-axis)	HS (Z-axis)	
—	—	31	8-05-0393
21, 31	21, 22, 23, 24, 31, 32, 33, 34,	32, 33, 34	8-05-0336
22, 23, 24, 32, 33, 34	—	—	8-05-0337

Appendix 2: Accessories

12.17 Tape for noise reduction of the energy chain

Single-sided self-adhesive cellular rubber tape to be glued to the contact surface of the energy chain to reduce the noise emissions of energy chains.

Roll of 10 m

Article number: 25-002485

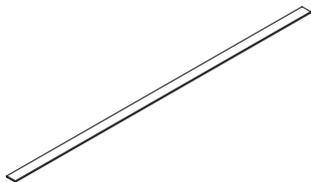


Fig. 12.21 **Tape for noise reduction of the energy chain**

12.18 Cover for drive block

Cover plate for sealing unneeded input and output drives on linear axes with toothed belt drive HM-B and HT-B as well as cantilever axes HC-B.

Set including mounting material.

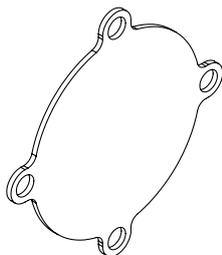


Fig. 12.22 **Cover for drive block**

Table 12.19 **Article numbers for drive block cover**

Suitable for linear axis	Article number
HC025B	25-002379
HM040B, HC040B	25-002375
HM060B, HC060B	25-002376
HM080B, HC080B	25-002377
HM120B	25-002378
HT100B	25-002372
HT150B	25-002373
HT200B, HT250B	25-002374

12.19 Journal for linear axes 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 drive, synchronous drive, encoder attachment, etc.

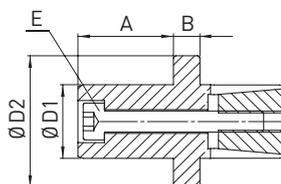
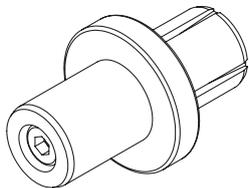


Fig. 12.23 **Journal dimensions**

Table 12.20 Article numbers and dimensions for journal

Linear axis	A [mm]	B [mm]	E (screw)	Ø D1 [mm]	Ø D2 [mm]	Screw tightening torque [Nm]	Mass inertia moment [kg mm ²]	Transferable torque (calculated) [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	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

The toothed belt is available in lengths of 2 m, 6 m and 12 m.

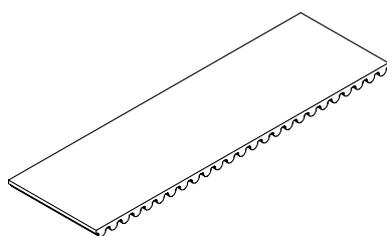


Fig. 12.24 Toothed belt

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

12.21 Drive unit for linear axes HM-B, linear tables HT-B and cantilever axes HC-B

Drive unit for belt drive consisting of toothed belt pulley and ball bearing.

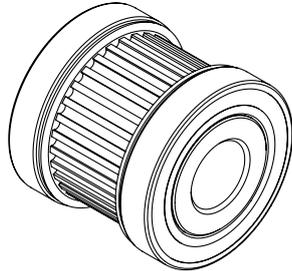


Fig. 12.25 Drive unit

Table 12.22 Article numbers for drive unit

Drive unit suitable for linear axis	Article number
HMD40B	25-000115
HMD60B	25-000116
HM080B	25-000117
HM120B	25-000118
HT100B	25-000692
HT150B	25-000693
HT200B	25-000694
HT250B	25-000695
HC025C	25-001938
HC040C	25-001939
HC060C	25-001940
HC080C	25-001941

12.22 Synchronous shaft

In the case of double axes, the synchronous shaft transfers the drive torque from the powered to the passenger axis. In addition to the actual synchronous set, the set also contains the coupling elements and the adapters.

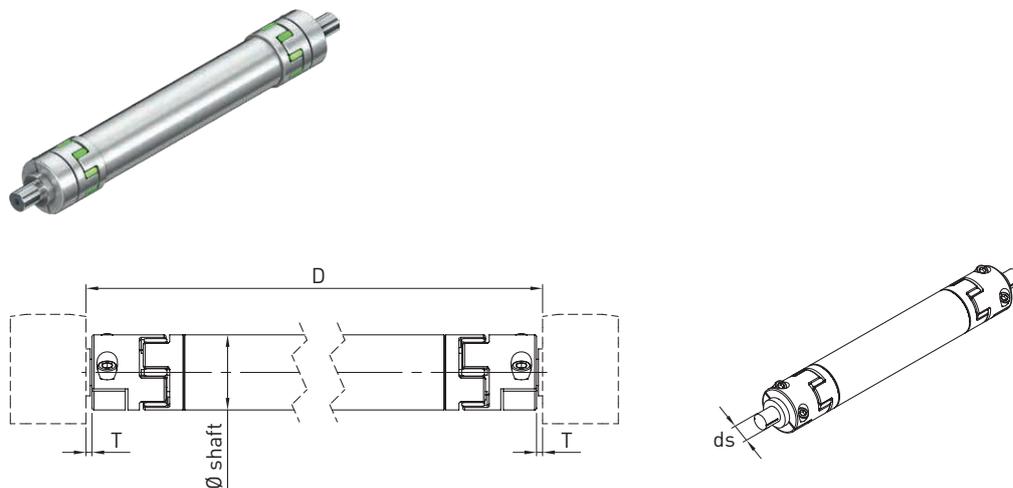


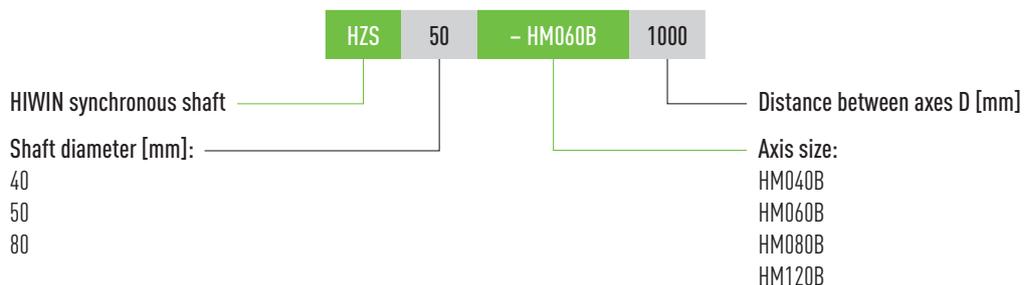
Fig. 12.26 Synchronous shaft dimensions

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



12.22.2 Elastomer insert

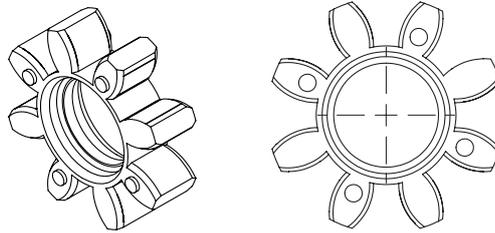


Fig. 12.27 Elastomer insert for synchronous shaft

Table 12.24 Article numbers for elastomer insert 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

If not installed vertically, the synchronous shaft must be fitted with the spacer disc. This prevents metal-on-metal contact in the lower coupling.

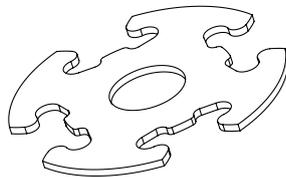


Fig. 12.28 Spacer

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	Application	Quantity unit	
		Cartridge 400 g	Can 1 kg
G04	High speed		
		Article number: 20-000345	Article number: 20-000346

Table 12.27 Recommended HIWIN grease gun

Article no.	Description	Scope of delivery	Comment
20-000333	Grease gun GN-400C incl. set of lubrication adapter and nozzles (see Fig. 12.29)	Grease gun GN-400-C consisting of: <ul style="list-style-type: none"> – Grease gun – Hydraulic coupling A1 suitable for conical grease nipples acc. to DIN 71412, outer diameter 15 mm – Hollow mouthpiece A2 suitable for conical or ball grease nipples acc. to DIN 71412/DIN 3402, outer diameter 10 mm – Set of lubrication adapter and nozzles 	Suitable for 400 g cartridge or direct filling



Fig. 12.29 Grease gun GN-400C

Appendix 2: Accessories

12.24 HIWIN grease nipples

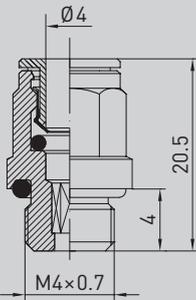
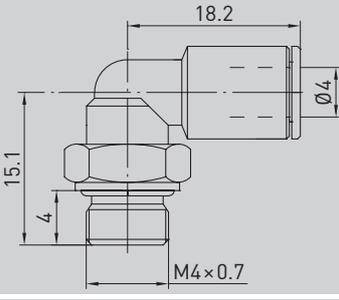
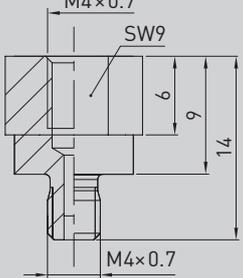
Grease nipples suitable for HM, HT and HC (all sizes, all drive types).

Table 12.28 Grease nipples M4 × 0.7

Article number	Linear axes HM	Linear axes HT	Cantilever axes HC	Picture
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 fittings and push-in fittings

Table 12.29 Lubrication fittings and push-in fittings

Article number	Type	Picture
8-12-0186	Straight push-in fitting Ø 4	
20-002116	90° angled push-in fitting Ø 4	
20-002108	Lubrication adapter M4/M4 for extending the push-in fittings to avoid collisions (e.g. damping element)	

13. Appendix 3: Declaration of Incorporation

in the sense of the EC Machinery Directive 2006/42/EC, Annex II 1. B for partly completed machinery

The manufacturer: HIWIN GmbH, Brücklesbünd 1, D-77654 Offenburg

Documentation department: HIWIN GmbH, Brücklesbünd 1, D-77654 Offenburg

Description and identification of the partly completed machine:

Product: Linear axes and linear axis systems HX

Type: HM040B, HM060B, HM080B, HM120B

HT100B, HT150B, HT200B, HT250B

HC025B, HC040B, HC060B, HC080B

HD1..., HD2..., HD3..., HD4...

HS21..., HS22..., HS23..., HS24...

HS31..., HS32..., HS33..., HS34...

Year of manufacture: from 2020

It is hereby declared that the following essential requirements of the Machinery Directive 2006/42/EC have been fulfilled.

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

Moreover, it is declared that the relevant technical documentation specified under Annex VII Part B has been compiled.

It is hereby explicitly declared that the partly completed machine complies with all of the pertinent conditions in the following EC Directives.

2006/42/EC	EC Machinery Directive
2014/30/EU	Directive on electromagnetic compatibility (EMC)
2011/65/EU	RoHS Directive on the restriction of hazardous substances

A reference to the harmonised standards used, as referred to in Article 7(2)

EN ISO 13732-1:2008	Ergonomics of the thermal environment – Methods for the assessment of 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 the authorised person undertakes to transmit, in response to a reasoned request by the national authorities, the relevant documentation on the partly completed machinery.

This is without prejudice to the intellectual property rights of the manufacturer!

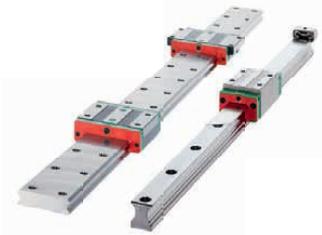
Important note! The partly completed machinery may not be commissioned until it has been ascertained that the machinery into which this partly completed machinery is to be incorporated is compliant with the provisions of this Directive.

Offenburg, 01.03.2020



Werner Mäurer,
Managing Director

We live motion.



Linear Guideways



Ballscrews



Linear Axes



Linear Axis Systems



Torque Motors



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Drives & Servo Motors

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