

Valid from serial no. HSN 000 000 000 1

Assembly Instructions

Linear Axes and Axis Systems HX

Contents

1. General information	4	7.6 Mounting the synchronous shaft on the HM-B linear axis/ HD double axis	50
1.1 About these assembly instructions	4	7.7 Mounting the drive unit on the HM-B linear axis	51
1.2 Depictions used in these assembly instructions	5	7.8 Mounting the drive unit on the HM-S linear axis	59
1.3 Warranty and liability	7	7.9 Mounting the drive unit on the HD linear axis and HS multi-axis system	65
1.4 Manufacturer's details	7	7.10 Electrical connection	66
1.5 Copyright	7		
1.6 Product monitoring	7		
2. Basic safety notices	8	8. Maintenance and cleaning	67
2.1 Intended use	8	8.1 Lubrication	68
2.2 Reasonably foreseeable misuse	8	8.2 Cleaning the linear axis and linear axis system	71
2.3 Conversions and modifications	8	8.3 Replacing the cover strip	71
2.4 Residual risks	8	8.4 Replacing the toothed belt	74
2.5 Personnel requirements	9	8.5 Replacing the synchronous shaft	77
2.6 Protective equipment	9	8.6 Visual examination of electrical componentry	77
2.7 Labels on the linear axis system	9		
3. Bases of calculations	10	9. Faults	78
3.1 Calculating the maximum drive torque	10	9.1 Linear axis and linear axis system malfunctions	78
3.2 Calculating the service life	10	9.2 Motor malfunctions	79
3.3 Maximum support spacing	13	9.3 Faults during operation with drive amplifier	79
4. Description of the linear axes and linear axis systems	15	10. Disassembly.....	80
4.1 HM-B linear axis	15	11. Disposal	82
4.2 HM-S linear axis	18		
4.3 HD double axes	21	12. Appendix 1: Accessories and spare parts.....	83
4.4 HS2 two-axis system	23	12.1 Motor adapter of the HM-B linear axis	83
5. Options of the linear axes and linear axis systems.....	25	12.2 Motor adapter of the HM-B linear axis	99
5.1 Stroke length	25	12.3 Clamping profiles	110
5.2 Cover	26	12.4 T nut	111
5.3 Carriage	26	12.5 Centring sleeve	111
5.4 Limit switches	27	12.6 Groove cover	112
5.5 Positioning measurement system	28	12.7 Limit switch	112
5.6 Drive interfaces	32	12.8 Damping element	113
5.7 Motor	33	12.9 Positioning measurement system HIWIN MAGIC	113
5.8 Gear boxes (HM-B, HD, HS2)	33	12.10 Cover strip	114
5.9 Toothed belt (HM-B)	33	12.11 Magnetic strip	114
5.10 Spindle support (HM-S)	33	12.12 Belt deflection	115
5.11 Energy chain	34	12.13 Buffer stop	115
6. Transport and installation	36	12.14 Separators for energy chain	116
6.1 Delivery	36	12.15 Journal for HM-B linear axis	116
6.2 Transport to the installation site	36	12.16 Toothed belt for linear axis HM-B	116
6.3 Requirements at the installation site	36	12.17 Drive unit for HM-B linear axis	117
6.4 Storage	37	12.18 Synchronous shaft	117
6.5 Unpacking and installing	37	12.19 HIWIN lubricants	119
7. Assembly and connection	39	12.20 HIWIN grease nipples	119
7.1 Assembling the linear axes, double axes and axis systems	41	13. Appendix 2: Declaration of Incorporation.....	120
7.2 Mounting the imposed load	46		
7.3 Mounting the limit switches	48		
7.4 Mounting the damping element	48		
7.5 Setting the switching distance	49		

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 HM-B linear axes (with toothed belt drive), HM-S linear axes (with ballscrew), 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
01-0	July 2017	Initial creation of this document

1.1.2 Requirements

We assume that

- operating personnel are trained in the safe operation practices for HM-B/HM-S linear axes, HD double axes and/or HS multi-axis systems and have read and understood these assembly instructions in full;
- maintenance personnel maintain and repair the HM-B/HM-S linear axes, HD double axes and/or HS multi-axis systems 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 HM-B/HM-S linear axes, HD double axes and/or HS multi-axis systems.

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 2 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 HM-B/HM-S linear axes, HD double axes and/or HS multi-axis systems 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 HM-B/HM-S linear axes, HD double axes and/or HS multi-axis systems 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 HM-B/HM-S linear axis, HD double axes and/or HS multi-axis systems 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 HM-B/HM-S linear axes, HD double axes and/or HS multi-axis systems may only be used for the intended purpose as described.

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

The HM-B/HM-S linear axes, HD double axes and/or HS multi-axis systems 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

HM-B/HM-S linear axes, HD double axes and/or HS multi-axis systems must not be operated:

- outdoors
- in potentially explosive atmospheres

2.3 Conversions and modifications

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

2.4 Residual risks

During normal operation, there are no residual risks associated with the HM-B/HM-S linear axes, HD double axes and/or HS multi-axis systems 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 HM-B/HM-S linear axes, HD double axes and/or HS multi-axis systems! 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 HM-B/HM-S linear axes, HD double axes and/or HS multi-axis systems during normal operations. Persons near the HM-B/HM-S linear axes, HD double axes and/or HS multi-axis systems must wear the following personal protective equipment depending on the travel speed: <ul style="list-style-type: none"> ○ 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 HM-B/HM-S linear axes, HD double axes and/or HS multi-axis systems: <ul style="list-style-type: none"> ○ Safety shoes ○ If necessary, safety gloves and safety goggles ○ If necessary, hearing protection

2.7 Labels on the linear axis system

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

2.7.1 Type plate

HIWIN [®]	Model No: HM060B155C1000S123A1BR
HIWIN GmbH	ID-No: 24-12345
Brücklesbünd 2	S/N: S-123456789
77654 Offenburg	Weight: 5 kg
	Mfg. date: 2015/03

Fig. 2.1 Type plate (example only)

3. Bases of calculations

The technical data and diagrams specific to each size can be found in the catalogue "Linear Axes and Axis Systems HX".

3.1 Calculating the maximum drive torque

The specified maximum drive torque for the axis is calculated from the technical data for the drive elements (toothed belt or ballscrew). It may not be exceeded during operations. The motors and gears selected must not transfer higher torques. The maximum permissible drive torque from the toothed belt drive depends on the axis speed (see corresponding diagrams in the axis' technical data in the catalogue "Linear Axes and Axis Systems HX").

3.1.1 Calculating the drive torque needed for the application

$$F 3.1 \quad M_A = M_{load} + M_{idle}$$

$$F 3.2 \quad M_{load} = \frac{F_x \times p}{2 \times \pi \times \eta \times 1000}$$

F_x	Feed force [N]
M_A	Required drive torque [Nm]
M_{load}	Load torque [Nm]
M_{idle}	Idle Torque [Nm]
p	Feed constant [mm] Toothed belt drive: equals the pulley circumference Ballscrew: equals the spindle lead
η	Efficiency (about 0.9 for ballscrew) (about 0.98 for toothed belt drive)

3.2 Calculating the service life

The service life is defined as the total kilometre reading of the axis before the first signs of material fatigue on its components (excluding wearing parts). For HS multi-axis systems, the service life for each axis must be calculated separately.

3.2.1 Loading point

The specified dynamic forces and torques are based on the carriage of the linear axis. The loading point is defined as the centre point of the carriage surface.

3.2.2 Forces and torques on the linear axis

The maximum dynamic forces and torques specified for each axis type may not be exceeded during operations.

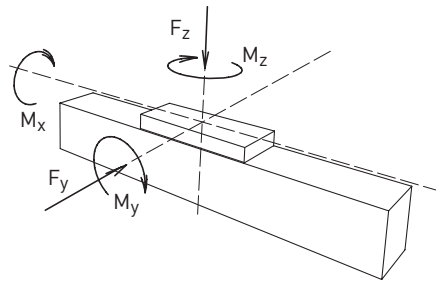


Fig. 3.1 Illustration of forces and torques on the linear axis

3.2.3 Reference service life and comparable load factor

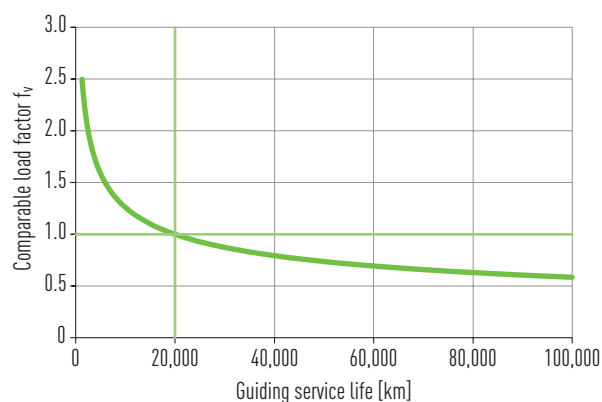
In the case of combined loads from multiple forces and torques, the comparable load factor f_v is first calculated with the formula F 3.3. The comparable load factor can be used to determine the service life specific to the application from the diagrams (see Section 3.2.4). When $f_v = 1$, the predefined reference service life is reached.

$$F 3.3 \quad f_v = \frac{|F_y|}{F_{y\text{dynmax}}} + \frac{|F_z|}{F_{z\text{dynmax}}} + \frac{|M_x|}{M_{x\text{dynmax}}} + \frac{|M_y|}{M_{y\text{dynmax}}} + \frac{|M_z|}{M_{z\text{dynmax}}}$$

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]

3.2.4 Characteristic service life curves

○ Characteristic service life curve for linear axes with toothed belt drive

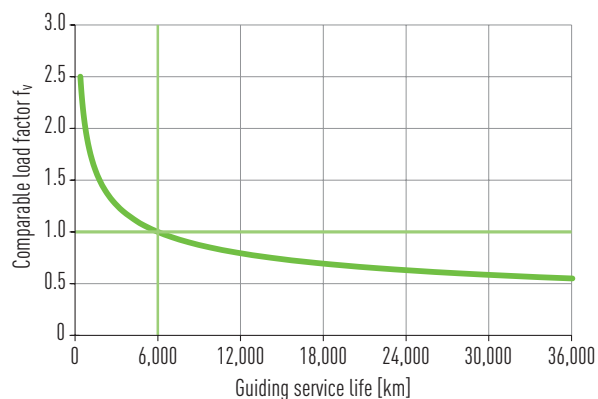


When $f_v = 1$, the predefined reference service life is reached.
For more information, please contact HIWIN.

Fig. 3.2 Characteristic service life curve HM040B, HM060B, HM080B, HM120B

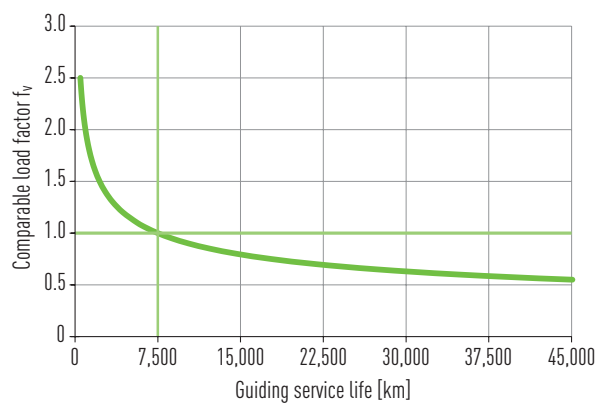
Bases of calculations

○ Characteristic service life curves for linear axes with ballscrew



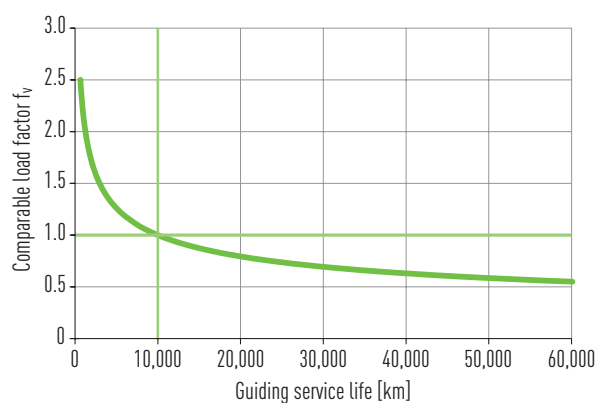
When $f_v = 1$, the predefined reference service life is reached.
For more information, please contact HIWIN.

Fig. 3.3 Characteristic service life curve HM040S



When $f_v = 1$, the predefined reference service life is reached.
For more information, please contact HIWIN.

Fig. 3.4 Characteristic service life curve HM060S/HM080S



When $f_v = 1$, the predefined reference service life is reached.
For more information, please contact HIWIN.

Fig. 3.5 Characteristic service life curve HM120S

3.3 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.

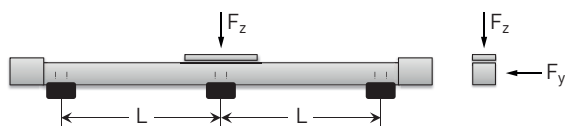


Fig. 3.6 Illustration of maximum support spacing

○ Maximum support spacing for the linear axis with toothed belt drive

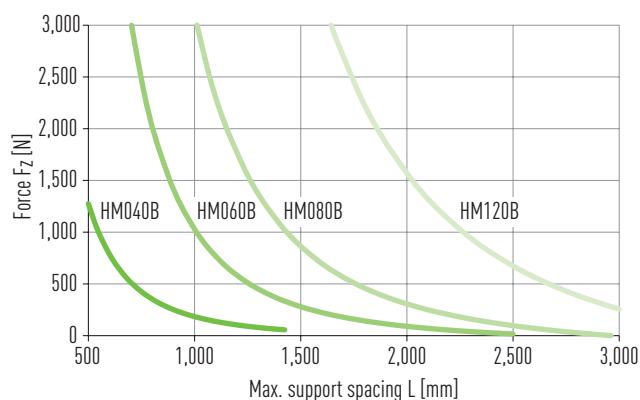


Fig. 3.7 HM-B: Maximum support spacing as a function of the force F_z

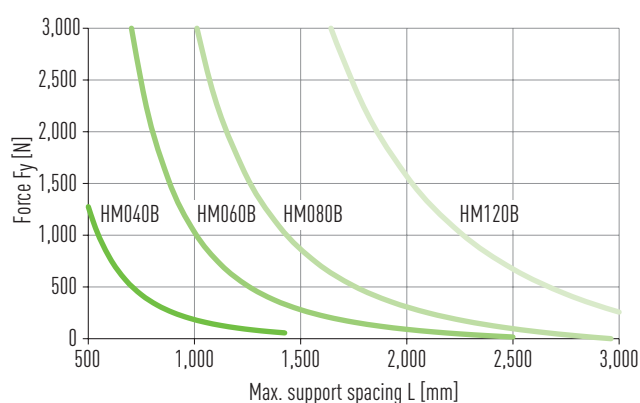


Fig. 3.8 HM-B: Maximum support spacing as a function of the force F_y

Bases of calculations

○ **Maximum support spacing for the linear axis with ballscrew**

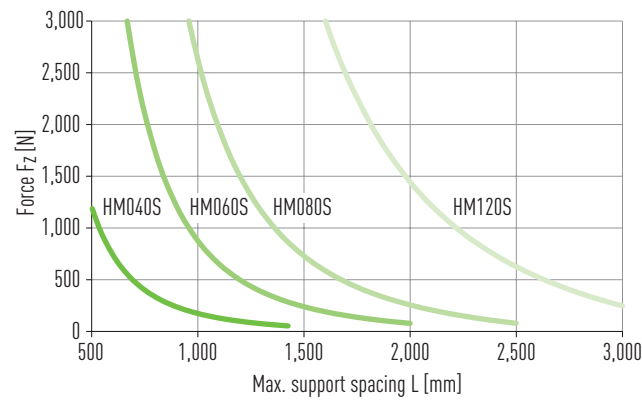


Fig. 3.9 **HM-S: Maximum support spacing as a function of the force F_z**

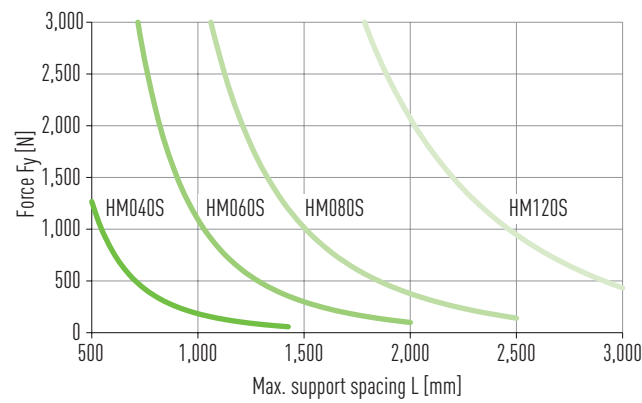


Fig. 3.10 **HM-S: Maximum support spacing as a function of the force F_y**

4. Description of the linear axes and linear axis systems

4.1 HM-B linear axis

4.1.1 Field of application

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

4.1.2 Ambient conditions

Ambient conditions during operation:

0 to +50 °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

Vacuum:

it may not be operated in vacuum

4.1.3 Main components

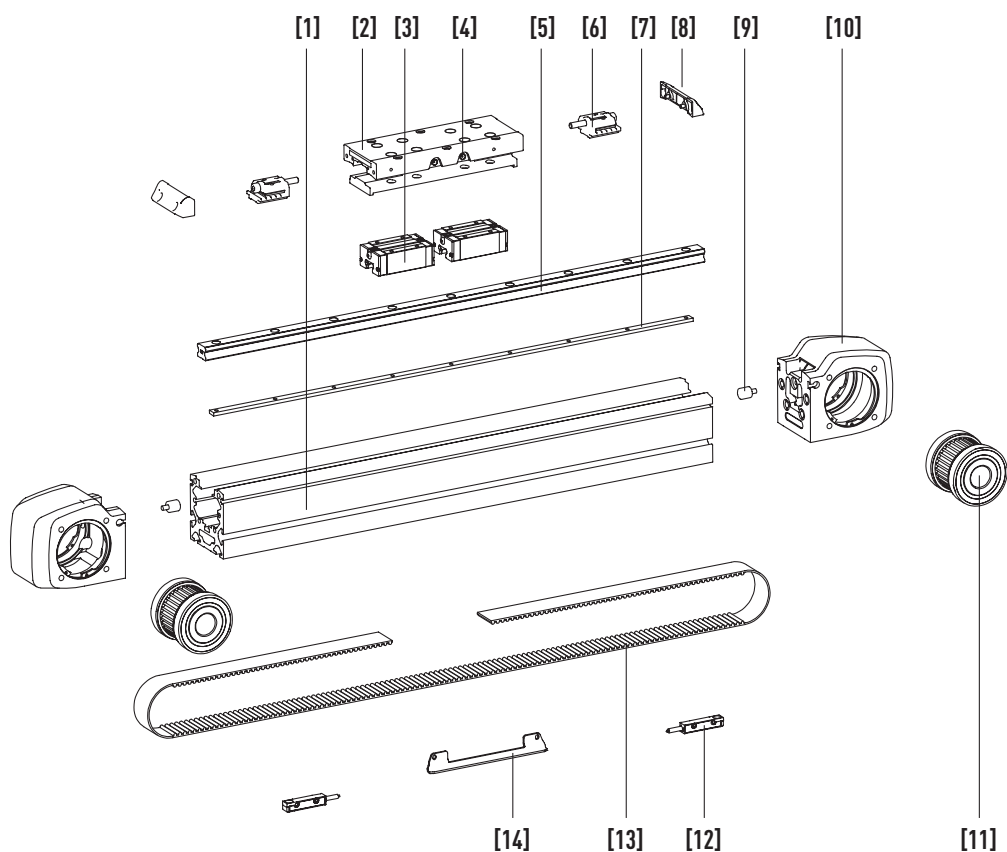


Fig. 4.1 Main components of the HM-B linear axis

Table 4.1 Description of the main components of the HM-B linear axis

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 tensioner	13	Toothed belt
7	Threaded bar	14	Damping element

Description of the linear axes and linear axis systems

4.1.4 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.

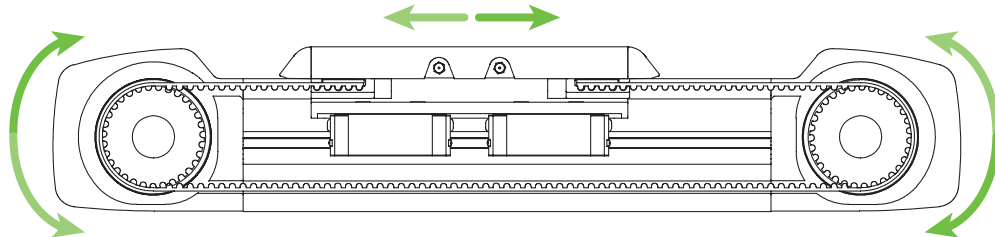
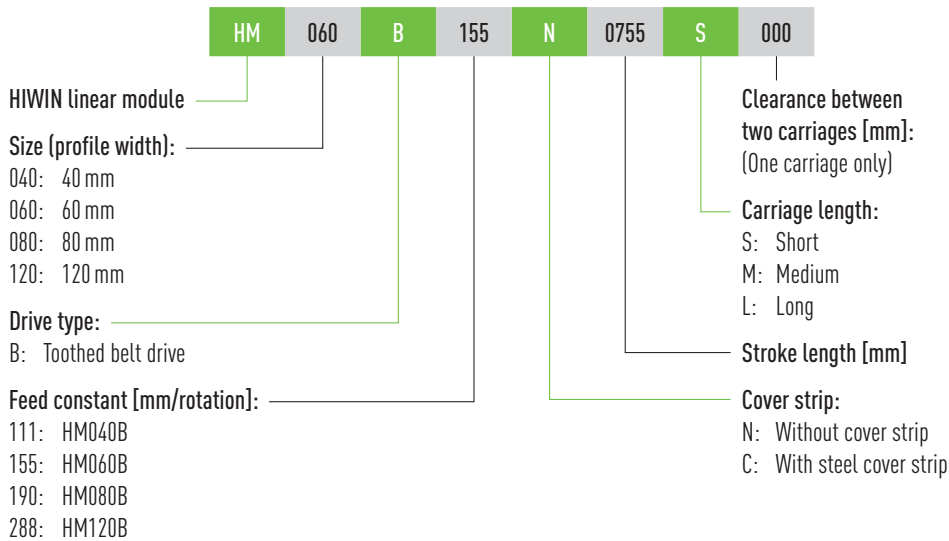
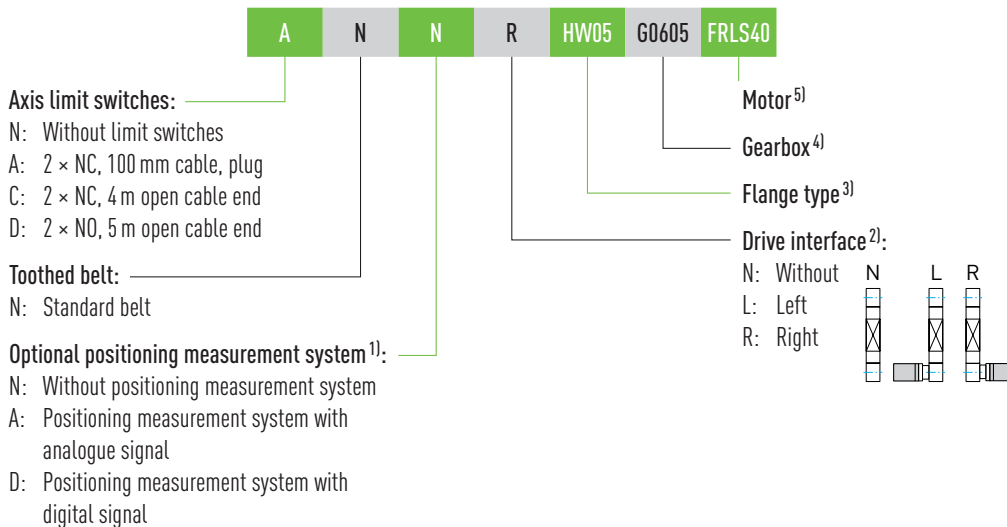


Fig. 4.2 Functional principle of the HM-B linear axes

4.1.5 Order code for linear axes HM-B



Order code for linear axes HM-B (continuation)



¹⁾ Detailed information upon request or in the assembly instructions "HIWIN MAGIC Positioning Measurement Systems"

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

³⁾ Flange type for motor or for motor and gear box; all flange types can be found in [Table 12.1 on Page 84 ff.](#)

If no flange type is selected, the order code ends at this position

⁴⁾ Suitable gearboxes for HIWIN axes can be found in [Section 5.8 on Page 33](#)

⁵⁾ Suitable HIWIN motors can be found in the catalogue "Drives and Servo Motors"

Description of the linear axes and linear axis systems

4.2 HM-S linear axis

4.2.1 Field of application

HIWIN HM-S linear axes with ballscrew are compact, flexible positioning modules. They are specifically ideal for applications requiring high precision and high feed forces.

4.2.2 Ambient conditions

Ambient conditions during operation:

0 to +50 °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

Vacuum:

it may not be operated in vacuum

4.2.3 Main components

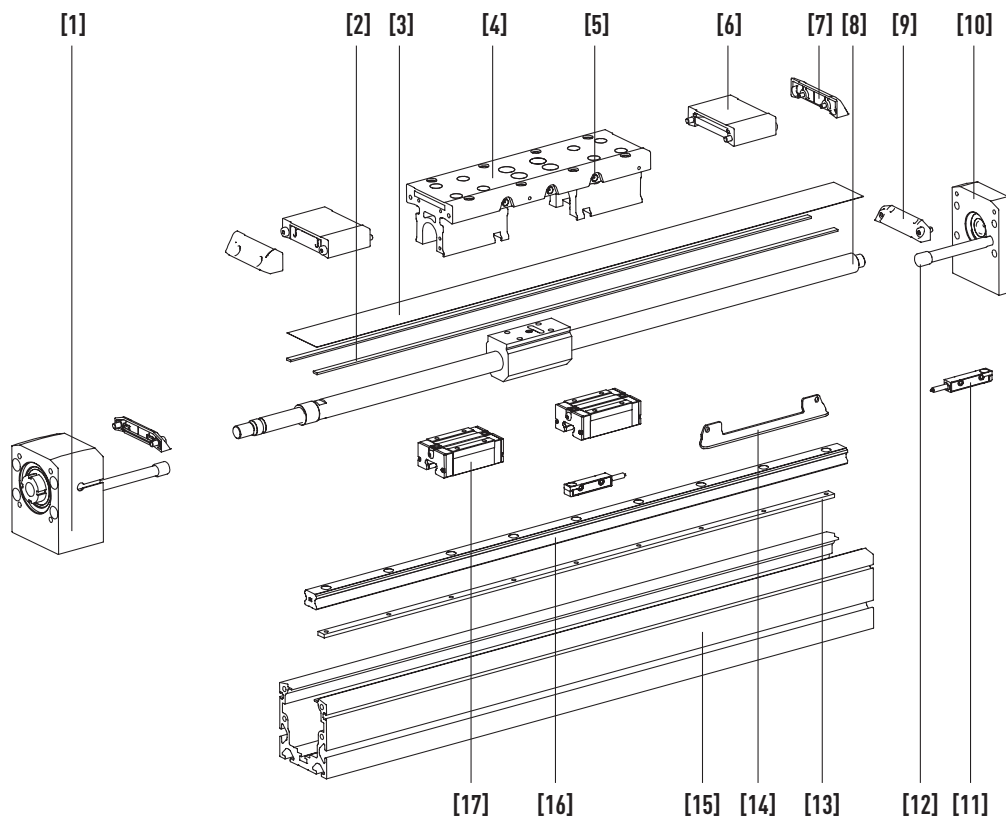


Fig. 4.3 Main components of the HM-S linear axis

Table 4.2 Description of the main components of the HM-S linear axis

Pos.	Description	Pos.	Description
1	Drive block	10	End plate
2	Magnetic strip	11	Limit switch
3	Steel cover strip	12	Stopping buffer
4	Carriage	13	Threaded bar
5	Grease nipple, 3 grease nipples on each side	14	Clamping element
6	Cover strip deflection	15	Axis body of aluminium
7	Carriage end piece	16	Profile rail
8	Ballscrew	17	Block
9	Clamp housing for cover strip		

4.2.4 Functional description

Ballscrew 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 ballscrew whose spindle is driven by an electric motor. The ballscrew converts the motor's rotations into linear motion of the nut secured firmly to the carriage.

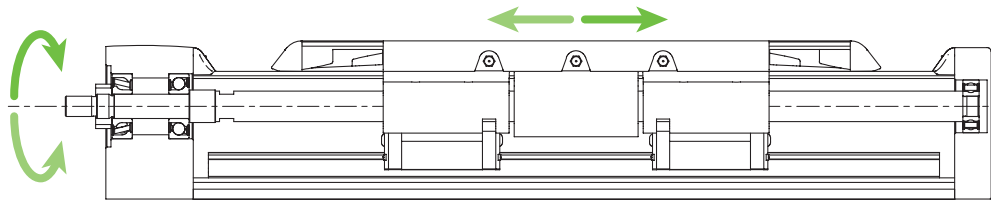
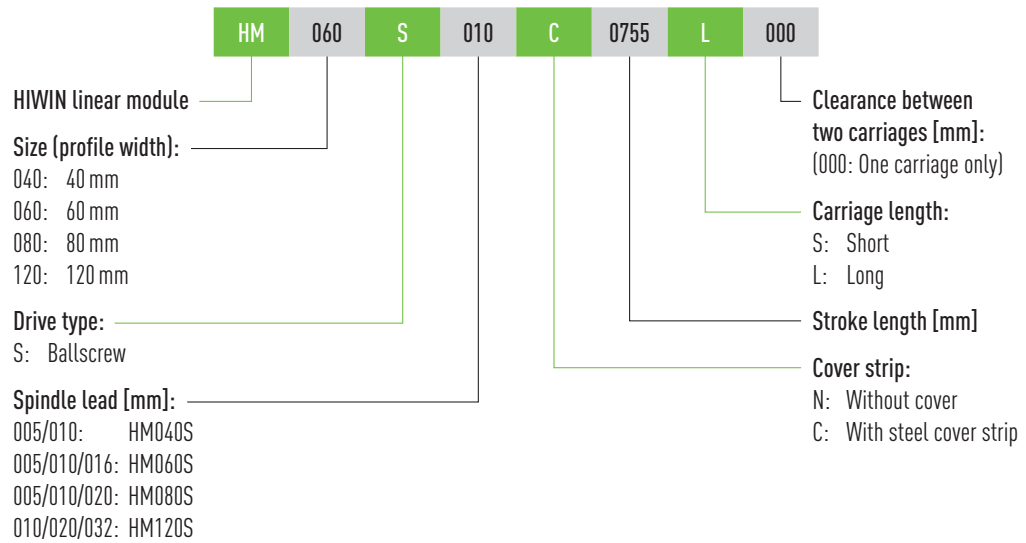


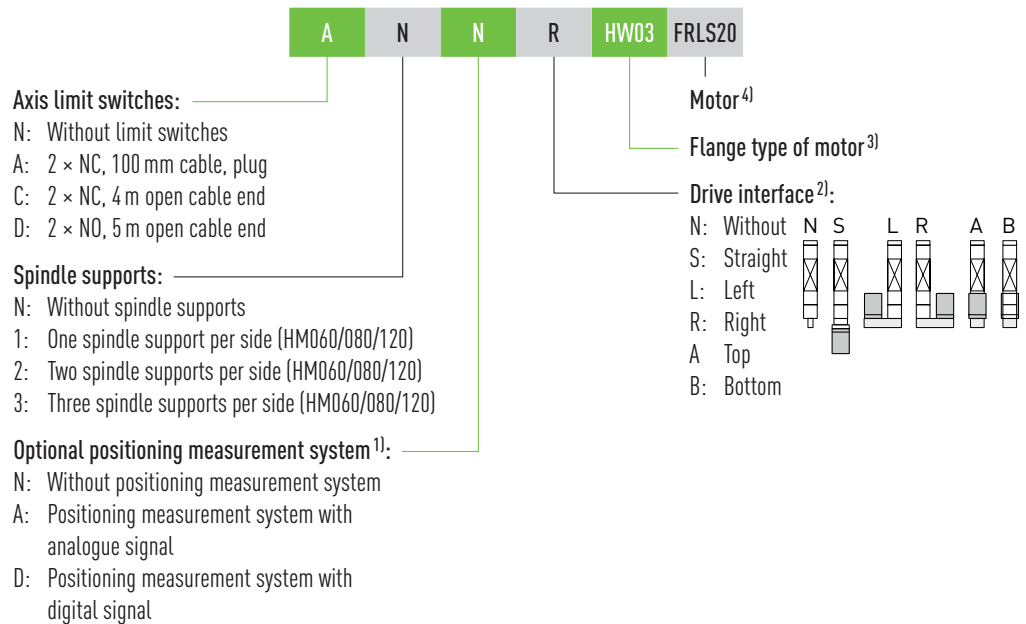
Fig. 4.4 Functional principle of the HM-S linear axes

Description of the linear axes and linear axis systems

4.2.5 Order code for linear axes HM-S



Order code for linear axes HM-S (continuation)



¹⁾ Detailed information upon request or in the assembly instructions "HIWIN MAGIC Positioning Measurement Systems"

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

³⁾ All flange types can be found in Table 12.10 on Page 100 ff.

If no flange type is selected, the order code ends at this position

⁴⁾ Suitable HIWIN motors can be found in the catalogue "Drives and Servo Motors"

4.3 HD double axes

4.3.1 Field of application

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

4.3.2 Ambient conditions

Ambient conditions during operation:

0 to +50 °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

Vacuum:

it may not be operated in vacuum

4.3.3 Main components

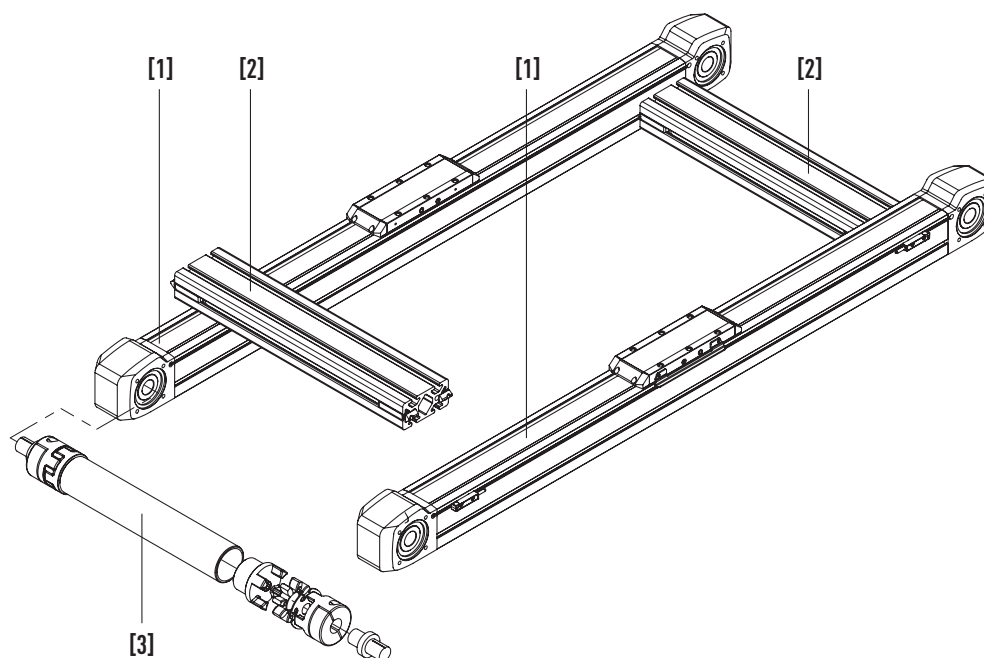


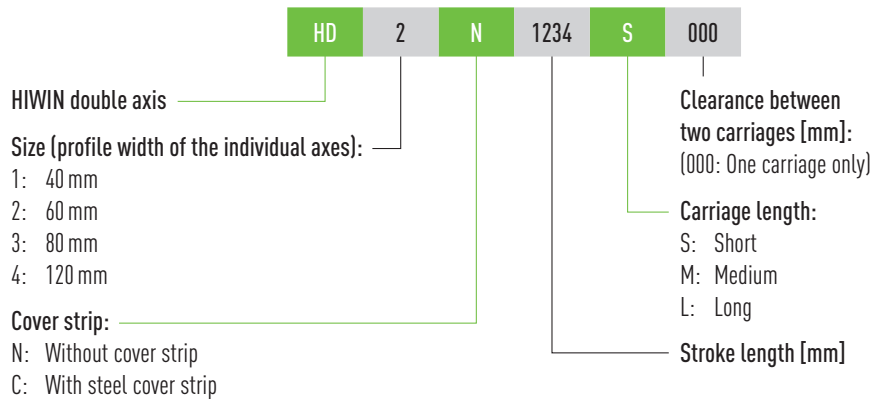
Fig. 4.5 Main components of the HD double axis

Table 4.3 Description of the main components of the HD double axis

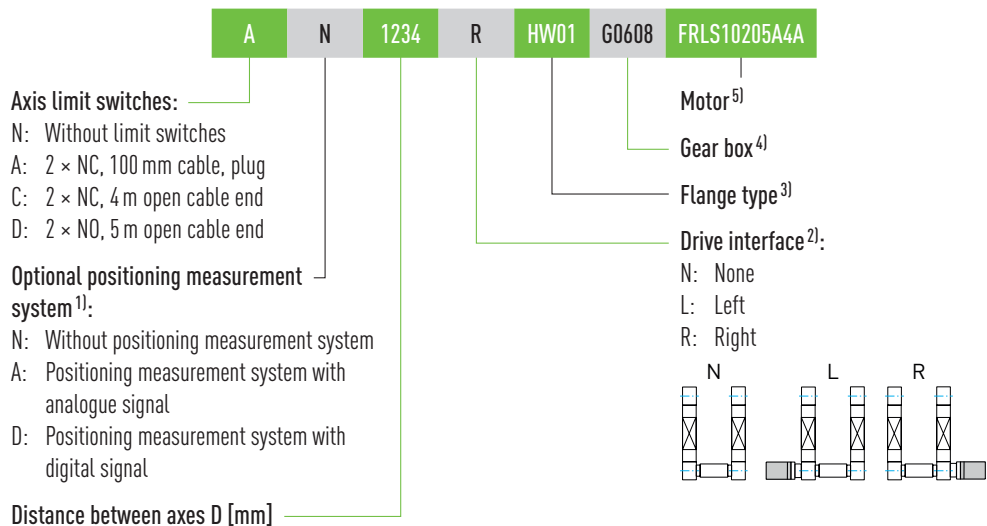
Pos.	Description	Pos.	Description
1	Linear axis	3	Synchronous shaft
2	Spacer profile		

Description of the linear axes and linear axis systems

4.3.4 Order code for double axes HD



Order code for double axes HD (continuation)



¹⁾ Detailed information upon request or in the assembly instructions "HIWIN MAGIC Positioning Measurement Systems"

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

³⁾ All flange types can be found in Table 12.1 on Page 84 ff.

If no flange type is selected, the order code ends at this position

⁴⁾ Suitable gearboxes can be found in Section 5.8 on Page 33

⁵⁾ Suitable HIWIN motors can be found in the catalogue "Drives and Servo Motors"

4.4 HS2 two-axis system

4.4.1 Field of application

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

4.4.2 Ambient conditions

Ambient conditions during operation:

0 to +50 °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

Vacuum:

it may not be operated in vacuum

4.4.3 Main components

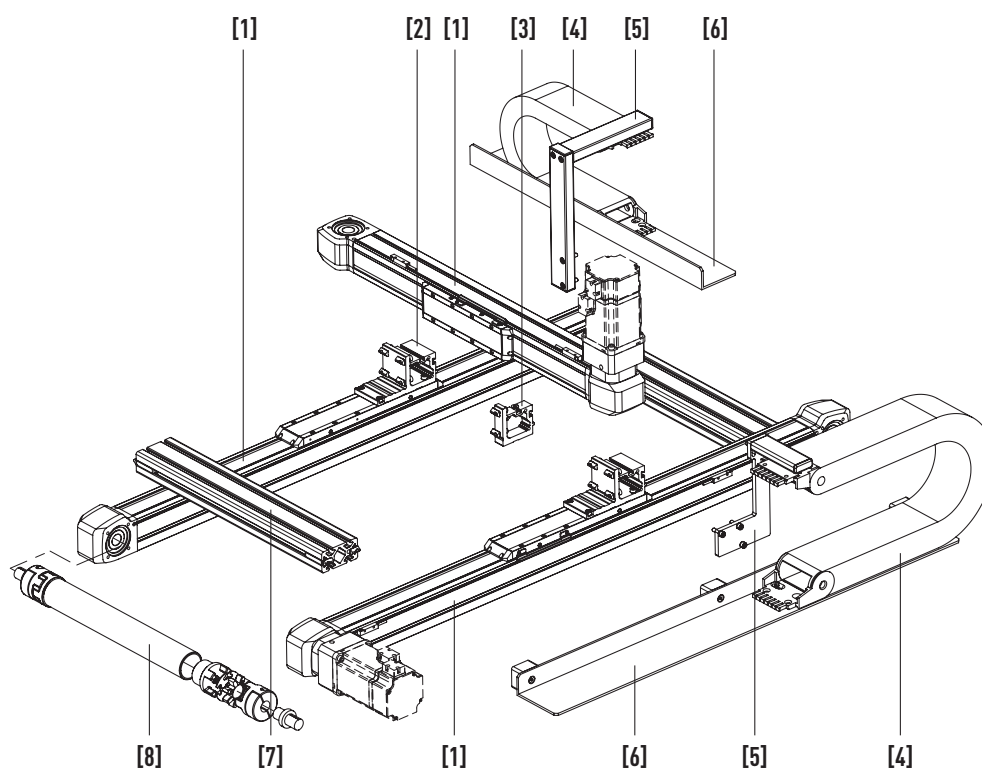


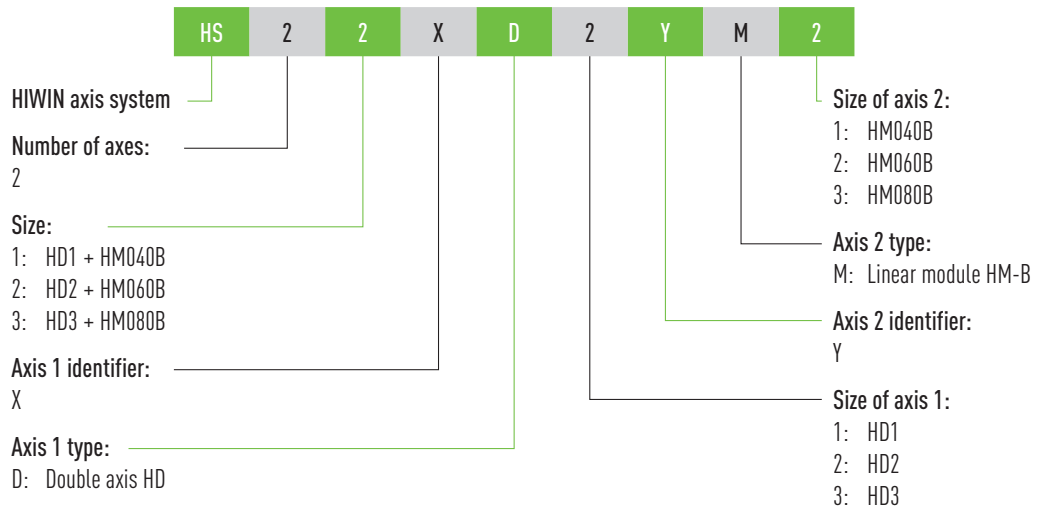
Fig. 4.6 Main components of the HS2 two-axis system

Table 4.4 Description of the main components of the HS2 two-axis system

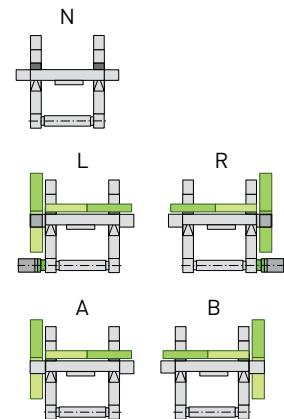
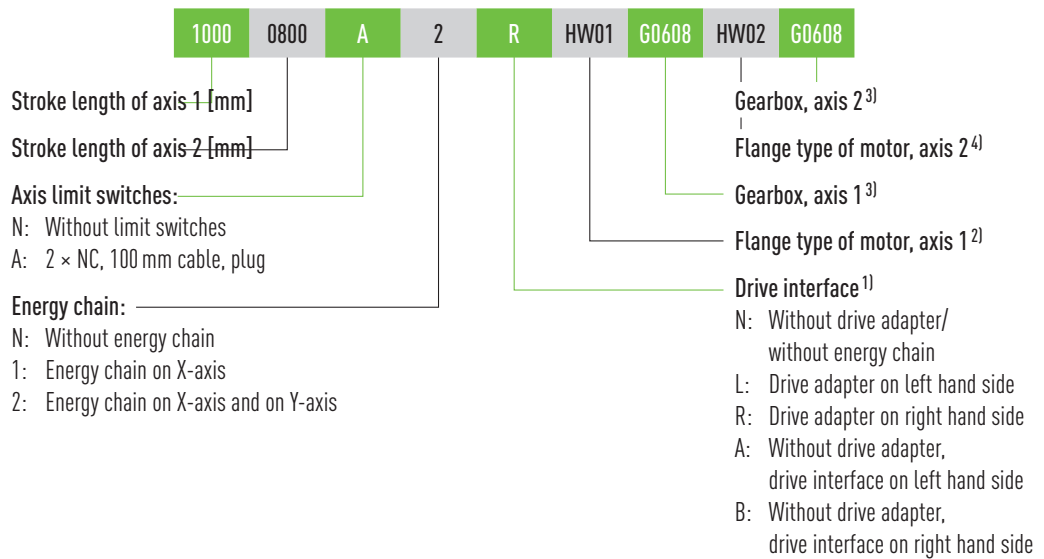
Pos.	Description	Pos.	Description
1	Linear axis	5	Energy chain connection
2	Adaption angle	6	Energy chain support
3	Support angle	7	Spacer profile
4	Energy chain	8	Synchronous shaft

Description of the linear axes and linear axis systems

4.4.4 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 Table 12.1 on Page 84 ff.
 "Gearbox, Axis 1" is applicable only when a flange type has been selected
³⁾ Suitable gearboxes can be found in Section 5.8 on Page 33
⁴⁾ All flange types can be found in Table 12.1 on Page 84 ff.
 If no drive interface is selected, the order code ends at this position



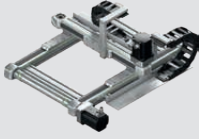
5. Options of the linear axes and linear axis systems

5.1 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 5.1](#).

Table 5.1 **Maximum stroke**

Drive element	Axis	Maximum stroke [mm]
Toothed belt 	HM040B	3,000
	HM060B	5,500
	HM080B	5,500
	HM120B	5,500
Ballscrew 	HM040S	1,200
	HM060S	2,500
	HM080S	2,500
	HM120S	3,800
Double axis with toothed belt 	HD1	3,000
	HD2	5,500
	HD3	5,500
	HD4	5,500
Toothed belt 	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

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 belt deflections)
- If necessary, spindle supports

Options of the linear axes and linear axis systems

5.1.1 Reserve stroke

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 installed dampers. The reserve stroke for each axis size can be found in the catalogue „Linear Axes and Axis Systems HX“.

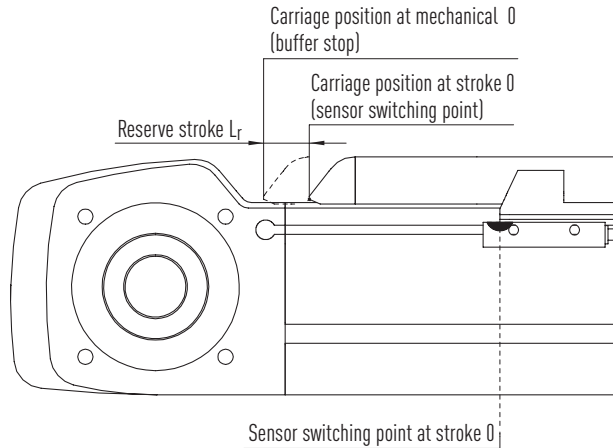


Fig. 5.1 Example reserve stroke on an HM-B linear axis

5.2 Cover

An optional steel cover strip is available for all linear axis and double axis sizes. 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 belt deflection.

NOTE

The optional cover strip cannot be retrofitted.

5.3 Carriage

There are three optional carriage types available for the HM-B linear axis and the HD double axis (carriage type S, M, and L). There are two carriage types available for the HM-S linear axis (carriage type S and L). For the HS2 two-axis systems, the carriage type L in the X-axis and the carriage type M in the Y-axis are provided as standard. The threads for mounting the imposed load feature additional counterbores that can take centring sleeves.

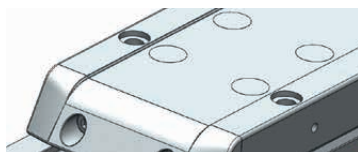


Fig. 5.2 Carriage with mounting threads

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. 5.3 Carriage types S, M and L

5.4 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 N/C or N/O contacts, with or without plug.

5.4.1 Limit switch dimensions

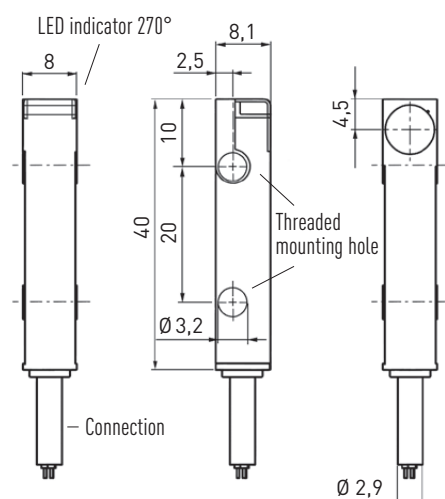


Fig. 5.4 Limit switch dimensions

5.4.2 Limit switch specifications

Table 5.2 General features of the limit switches

Properties	N/C contact (25-000786)	N/C contact (25-000787)	N/O contact (25-000788)
Housing	Rectangular		
Dimensions (W × H × D)	8 × 8 × 40 mm		
Max. sensing range	2 mm		
Switching frequency	2,000 Hz		
Connection type	Cable with M8, 3-pin plug, 100 mm	Cable, 3-wire, 4 m	Cable, 3-wire, 5 m
Output type	PNP		
Electrical wiring	DC 3-wire		
Protection class	IP67, IP68 ¹⁾		

¹⁾ According to EN 60529

Table 5.3 **Mechanics/electronics of the limit switches**

Mechanics/electronics	N/C contact (25-000786)	N/C contact (25-000787)	N/O contact (25-000788)
Supply voltage	10 to 30 VDC		
Ripple	≤ 10 % ¹⁾		
Voltage drop	≤ 2 V ²⁾		
Current consumption	≤ 10 mA ³⁾		
Time delay before availability	≤ 100 ms		
Hysteresis	5 to 15 %		
Repeatability	≤ 2 % ⁴⁾		
Temperature drift	±10 %		
EMC	According to EN 60947-5-2		
Continuous current I _a	≤ 200 mA		
Cable material	PVC		
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		
Housing material	Plastic, VISTAL [®]		
Sensing face material	Plastic, VISTAL [®]		
UL-File-No. (certificate)	NRKH.E348498		

¹⁾ Of U_v

²⁾ At I_a max.

³⁾ Without load

⁴⁾ At constant voltage and temperature

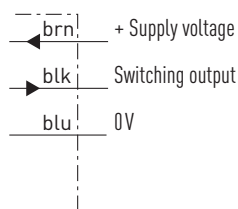
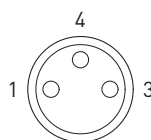


Fig. 5.5 **Connection diagram**



Pin assignment:

1: Brown (+ supply voltage)

3: Blue (0V)

4: Black (switching output)

Fig. 5.6 **Pin assignment of limit switch plug**

5.5 Positioning measurement system

The HIWIN-MAGIC positioning measurement system is used when direct, higher-precision distance measurements are needed in addition to the servo drive's encoder signal. The encoder housing is electrically shielded. The output signals can be either analogue or digital.

The HIWIN-MAGIC positioning measurement system consists of the encoder (Fig. 5.7) and the magnetic scale (Fig. 5.8) as the measurement standard. It is assembled prior to delivery.



Fig. 5.7 MAGIC encoder



Fig. 5.8 MAGIC magnetic scale

The measuring scale of the magnetic measurement 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 positioning measurement system.

NOTE

5.5.1 Technical data of the MAGIC positioning measurement system

Table 5.4 Electrical and mechanical properties of the MAGIC encoder

Type	1 V _{pp} (analogue)	TTL (digital)
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.

Options of the linear axes and linear axis systems

5.5.2 Formats and outputs of the MAGIC measurement 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.

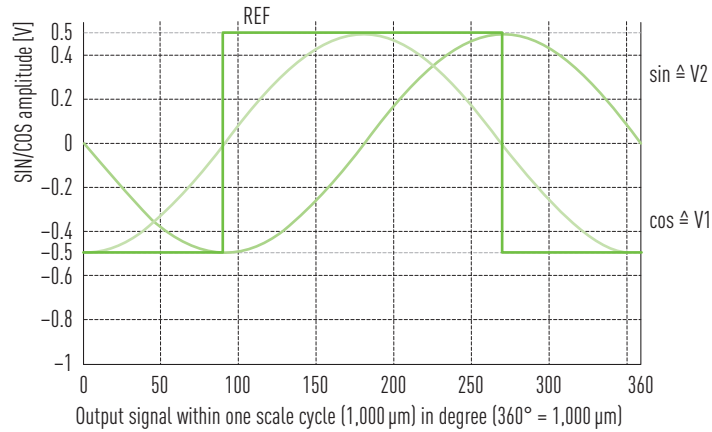


Fig. 5.9 Electrical signals after the differential input of the downstream electronic components (analogue version)

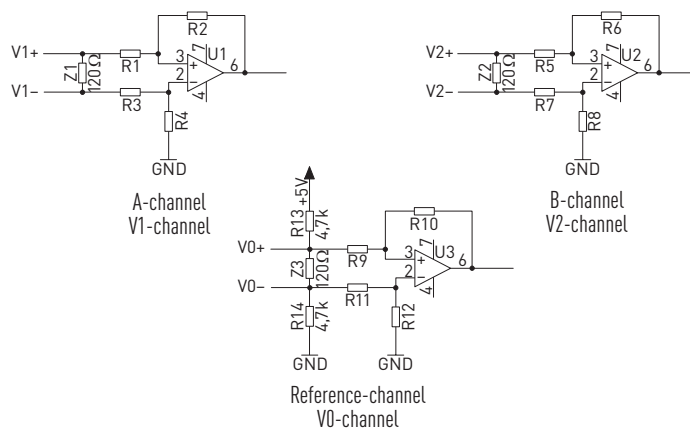


Fig. 5.10 Recommended switching of the subsequent electronic components for sin/cos 1V_{pp} output

5.5.3 Formats and outputs of the MAGIC measurement system (digital)

Digital TTL output: 90° phase shifted square signal in compliance with RS422 specification (according to DIN 66259);

Recommended termination $Z = 120 \Omega$; Differential output signal: A, \bar{A} , B, \bar{B} and Z, \bar{Z} . As an option: single reference pulse and definition of a minimum pulse duration.

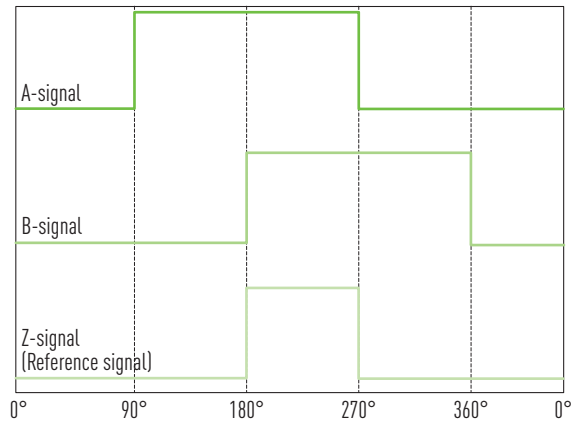


Fig. 5.11 Signals of the MAGIC encoder (TTL version)

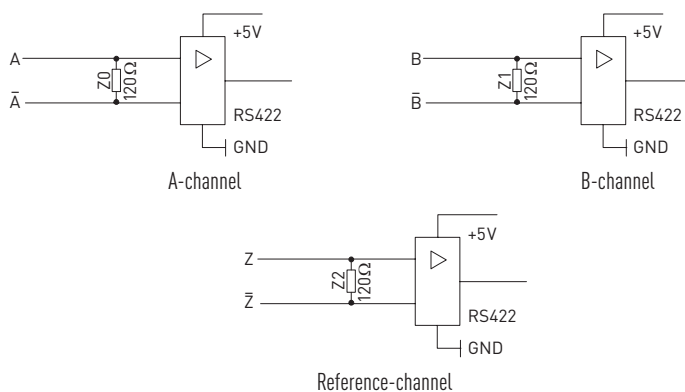


Fig. 5.12 Recommended switching of the subsequent electronic components for digital TTL output

For more information, please refer to the assembly instructions "HIWIN MAGIC Positioning Measurement Systems".

Options of the linear axes and linear axis systems

5.6 Drive interfaces

The HM-B linear axis allows the drive unit (coupling, also gears and/or motor) to be mounted on both sides of the 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:

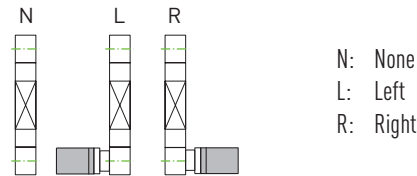


Fig. 5.13 Drive interfaces of the HM-B linear axis

On the HM-S linear axis, the drive is mounted in the spindle extension. Depending on the motor, delivery includes a coupling housing, a matching coupling, and an adapter plate for the motor. If fitted with a belt drive, the motor may also be swivelled through 180°, reducing effectively the overall length of the HM-S linear axis.

Possible drive interfaces:

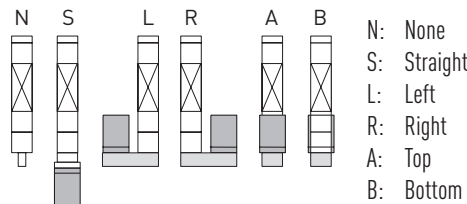


Fig. 5.14 Drive interfaces of the HM-S linear axis

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:

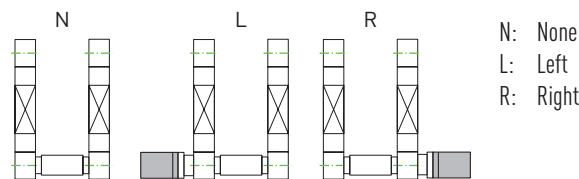
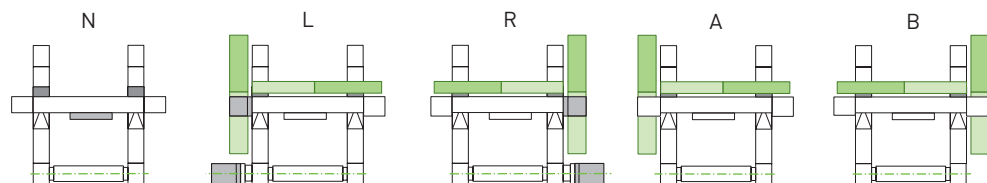


Fig. 5.15 Drive interfaces of the HD double axis

The two-axis system HS2 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:



- 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. 5.16 Drive interfaces of the HS2 two-axis system

5.7 Motor

When using HIWIN servo motors and/or drives, consult the information at www.hiwin.de:

- Assembly and commissioning instructions "D2 Servo Drive"
- Catalogue „Drives and Servo Motors“

5.8 Gear boxes (HM-B, HD, HS2)

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 5.5](#)

Table 5.5 **Gear boxes for toothed belt axes HM-B, double axes HD and two-axis systems HS2**

Linear axis	Ratio i	Gear box type ¹⁾
HM040B HD1 HS21	3	PLE40-3
	5	PLE40-5
	8	PLE40-8
	12	PLE40-12
HM040B HM060B HD1, HS21 HD2, HS22	3	PLQE60-3
	5	PLQE60-5
	8	PLQE60-8
	12	PLQE60-12
HM060B HM080B HD2, HS22 HD3, HS23	3	PLQE80-3
	5	PLQE80-5
	8	PLQE80-8
	12	PLQE80-12
HM080B HM120B HD3, HS23 HD4	3	PLQE120-3
	5	PLQE120-5
	8	PLQE120-8
	12	PLQE120-12

¹⁾ PLE and PLQE are registered trademarks of Neugart GmbH

5.9 Toothed belt (HM-B)

The used toothed belts with steel tie beams 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, nonslip drive system
- High capacity
- Little space requirements
- Large speed range
- Low toothed belt tension
- No lubrication or maintenance
- Quiet running
- High efficiency (98 %)

5.10 Spindle support (HM-S)

With long strokes at high speeds, the HM-S linear axis can reach the critical spindle speed. These must then be supported accordingly. HIWIN spindle axes (with the exception of the HM040S) allow up to three optional spindle supports to be fitted on each side of the carriage. The critical speeds for spindle support can be taken from the catalogue "Linear Axes and Axis Systems HX".

Options of the linear axes and linear axis systems

5.11 Energy chain

Optional energy chains are available for the HS multi-axis systems. 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 5.6. 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 5.6 **Energy chain specifications**

System	Energy chain X-axis			Energy chain Y-axis		
	Manufacturer ID ¹⁾	Inside cross-section W × H [mm]	Bending radius [mm]	Manufacturer ID ¹⁾	Inside cross-section W × H [mm]	Bending radius [mm]
HS21	2400.07.100.0	77 × 25	100	2400.05.075.0	57 × 25	75
HS22	2600.07.100.0	75 × 35	100	2400.05.075.0	57 × 25	75
HS23	2600.07.100.0	75 × 35	100	2400.07.100.0	77 × 25	100
HS24	2600.10.125.0	100 × 35	125	2400.07.100.0	77 × 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 partitions.
- Ensure twist-free installation of cables and hoses.
- Leave enough spare room (10 to 20 %, at least 1 mm) all the way around the cables and hoses, and allow for the lateral expansion that occurs when hoses are pressurised.
- Make sure that the weight is distributed evenly/symmetrically. Ideally, heavy cables and hoses should be positioned at the outer edges.
- Provide strain relief for cables and hoses at both ends so that they are located in the neutral zone when the energy chain is in the extended position and can move freely within its radius.
- In the case of high acceleration values or if the cables have a wide variety of diameters, use additional partitions where applicable.
- Observe the maximum additional load from cables and hoses that is permitted based on the stroke (see Fig. 5.17 and Fig. 5.18).

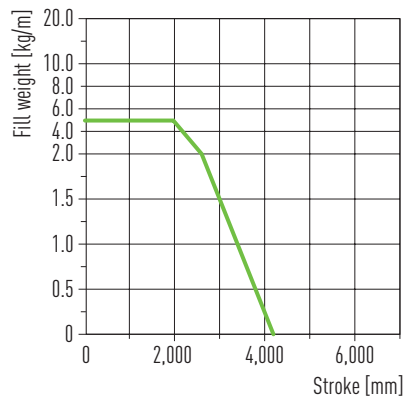


Fig. 5.17 **Maximum permissible additional load as a function of the stroke, Series 2400 (source: igus)**

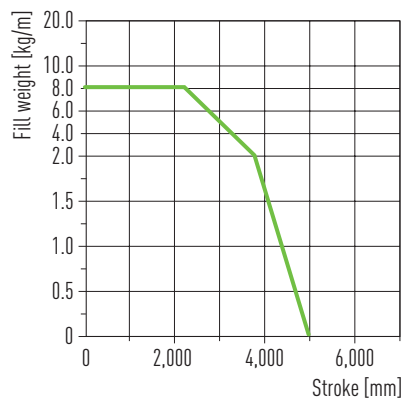


Fig. 5.18 **Maximum permissible additional load as a function of the stroke, Series 2600 (source: igus)**

6. Transport and installation

6.1 Delivery

6.1.1 Delivery state

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

6.1.2 Scope of delivery

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

6.2 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 6.5)!
- ▶ 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.

6.3 Requirements at the installation site

6.3.1 Ambient conditions

Ambient temperature	+5 °C to +40 °C, n condensing
Installation site	flat, dry, vibration-free
Atmosphere	not corrosive, not explosive, no vacuum

6.3.2 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

6.4 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.

6.5 Unpacking and installing

ATTENTION!



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!

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

NOTE

6.5.1 Unpacking and installing the linear axes HM-B/HM-S

- ▶ Remove packaging.
- ▶ To transport the linear axis, hoist this at the points designated A and B (see Fig. 6.1 and Fig. 6.2). The points A and B should be a quarter of the axis's 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.

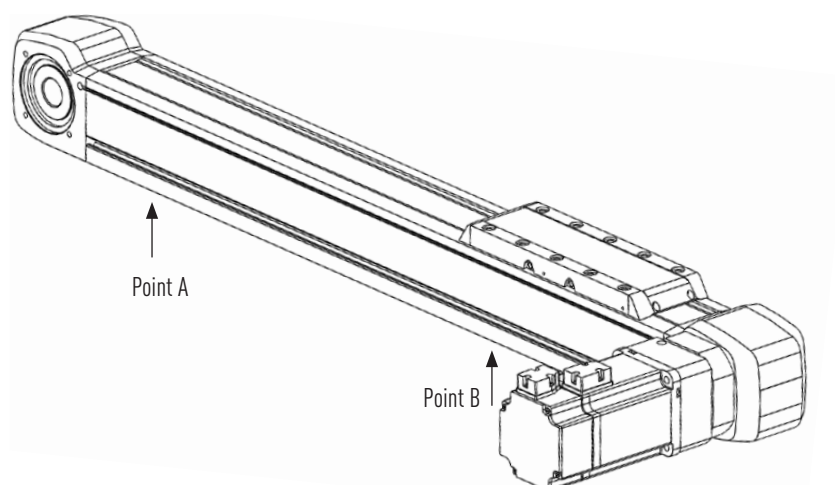


Fig. 6.1 Points A and B for hoisting and transporting, here on an HM-B linear axis

Transport and installation

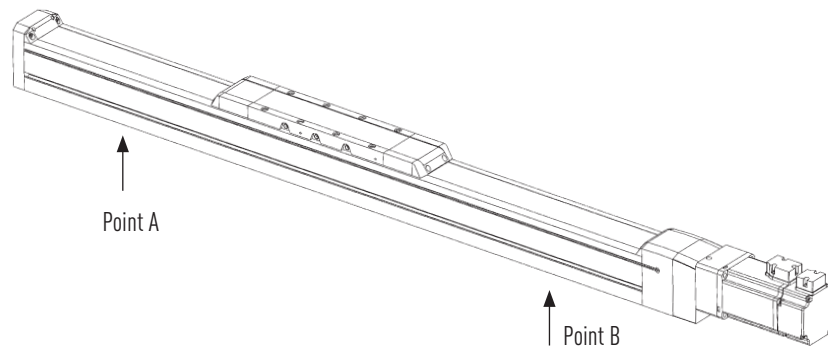


Fig. 6.2 Points A and B for hoisting and transporting, here on an HM-S linear axis

6.5.2 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. 6.3). 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.

NOTE

Do not remove the transportation safety devices from the axis system until after it has been transported and assembled properly (see Section 7.1)!

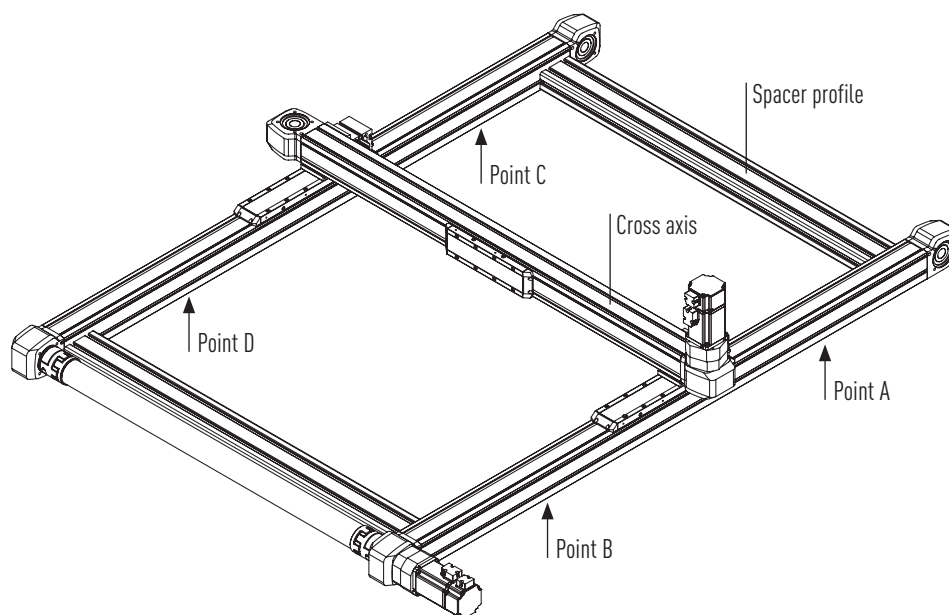


Fig. 6.3 Points A, B, C and D for hoisting and transporting, here on an two-axis system HS2

7. Assembly and connection

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 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!

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 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 instructions!
- ▶ When installing a vertical linear axis/linear axis system, provide support for the carriage during down-times!

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!



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!

ATTENTION!



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!

7.1 Assembling the linear axes, double axes and axis systems

The HM-B/HM-S linear axis can be installed in any position. Fasteners must be applied to the axis' aluminium profile. The HS axis systems cannot just be installed in any position. Technical clarification must be sought before mounting them overhead. If the HD double axis is mounted vertically at the side, spacers must be added to the synchronous shaft coupling (see Fig. 7.1).

The 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 type, the linear axis's 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").

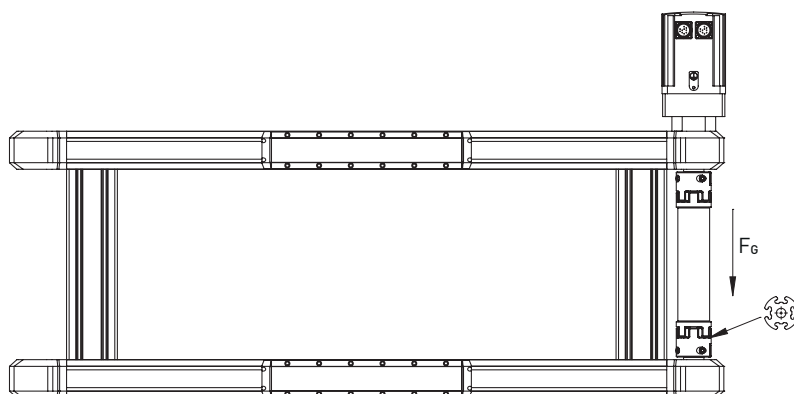


Fig. 7.1 Addition of a spacer when HD double axes are mounted vertically at the side

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 3.3, "Maximum support spacing"). 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 HD double axis and HS multi-axis systems must not be removed until the axes have been secured with T nuts in accordance with Section 7.1.2 or with clamping profiles in accordance with Section 7.1.3.

NOTE

It may be necessary to remove the synchronous shaft first before removing the spacer profile. For further details, see Section 8.5.

7.1.1 Reference surface accuracy requirements

HM-B/HM-S linear axis

When securing the HM-B/HM-S linear axis, 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.

HD double axis and HS multi-axis system

When securing the HD double axis and the HS multi-axis system, 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

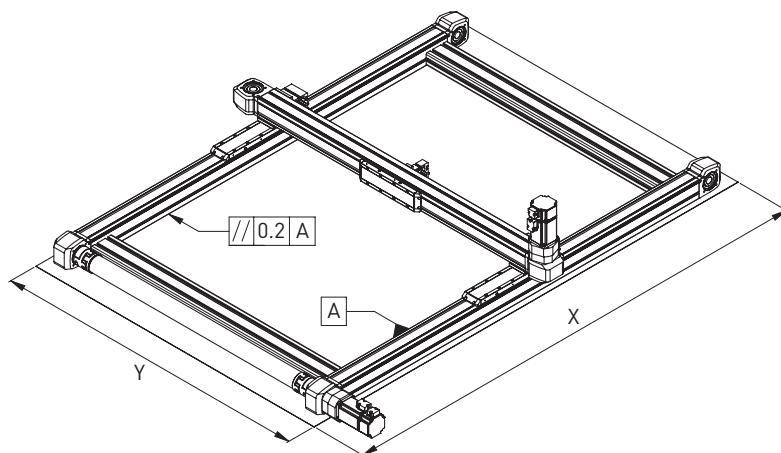


Fig. 7.2 Flatness and parallelism requirements for mounting HD double axes and HS multi-axis systems

7.1.2 Assembly with T nuts

The number of T nuts needed for each axis can be taken from Table 7.1. In the case of single axes, the T nuts must be arranged as per Fig. 7.3 and Fig. 7.5 or Fig. 7.6; in the case of double axes and multi-axis systems, they must be arranged as per Fig. 7.4 and Fig. 7.5 or Fig. 7.6. Four T nuts (six for HM120 and HD4) must be used at each mounting point.

- ▶ Drill mounting holes in the mounting surface (hole spacing listed in Table 7.1).
- ▶ Clean mounting surface and position linear axis on it.
- ▶ Swivel 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.

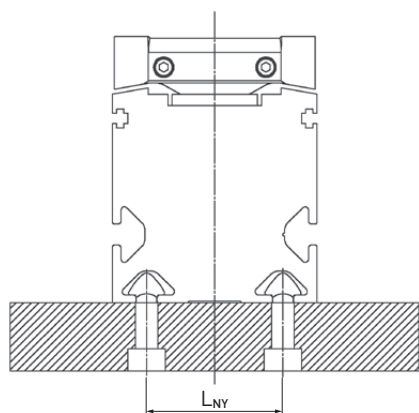


Fig. 7.3 Hole spacing for securing the linear axes with a T nut from below

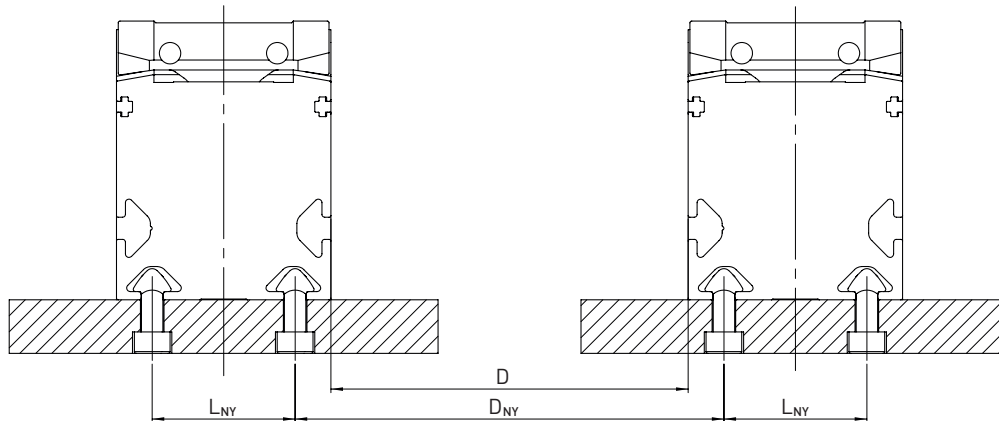


Fig. 7.4 Hole spacing for securing the double axes HD with a T nut from below

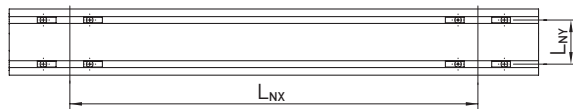


Fig. 7.5 Securing with T nuts – HM040, HM060, HM080

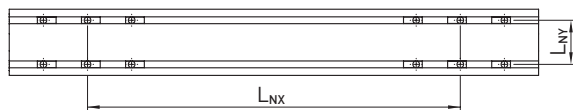


Fig. 7.6 Securing with T nuts – HM120

Table 7.1 Minimum number of T nuts for securing the axis, and recommended spacing of mounting points on long axes

Size	Minimum number of T nuts		L_{NY} [mm]	D_{NY} [mm]	Recommended distance L_{NX} [mm]	Thread size	Screw tightening torque [Nm]	Art. No. T nuts (10 pcs.)
	Small and medium loading	High loading						
HM040/HD1	8	8	20	$D + 20$	400	M5	5.9	20-000529
HM060/HD2	8	8	40	$D + 20$	600	M6	10.1	20-000531
HM080/HD3	8	12	40	$D + 40$	800	M8	24.6	20-000534
HM120/HD4	12	18	80	$D + 40$	1,200	M8	24.6	20-000534

7.1.3 Mounting with clamping profiles

The clamping profiles must always be attached in pairs to the left and right of the axis body (see Fig. 7.9 and Fig. 7.10). The required minimum number must be taken from Table 7.2.

- ▶ Drill mounting holes in the mounting surface (hole spacing listed in Table 7.2).
- ▶ 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. 7.7) when securing linear axes, and the L_{SY} and D_{SY} hole spacing (Fig. 7.8) in the case of linear axis systems.

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

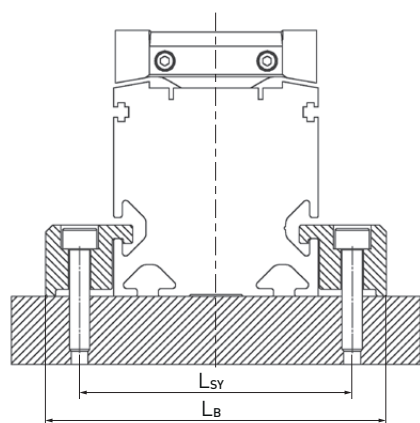


Fig. 7.7 Hole spacing for the lateral securing of linear axes with clamping profiles

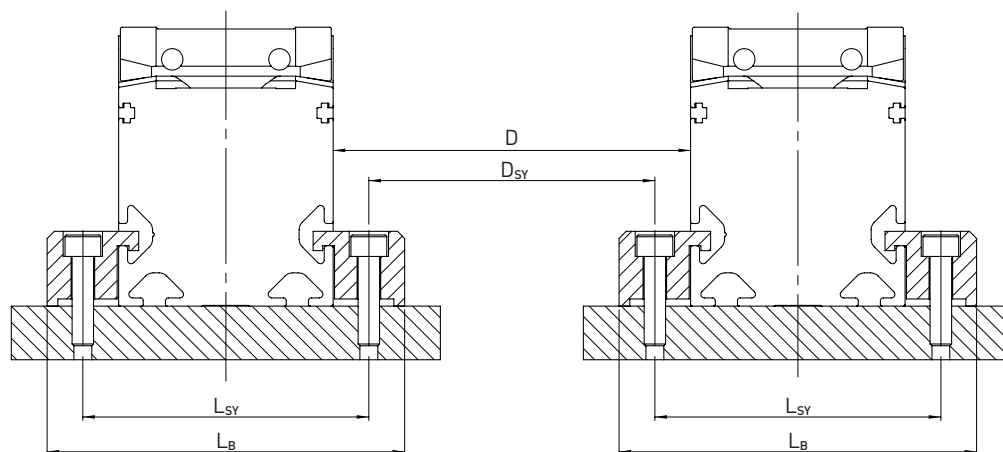


Fig. 7.8 Hole spacing for the lateral securing of double axes with clamping profiles

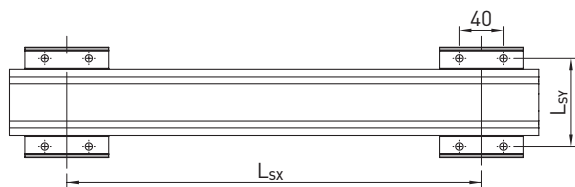


Fig. 7.9 Securing with clamping profiles – HM040, HM060, HM080

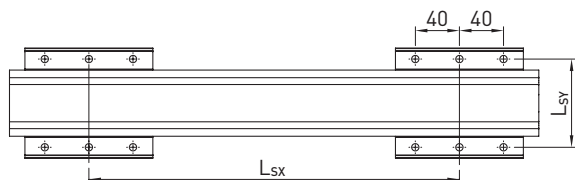


Fig. 7.10 Securing with clamping profiles – HM120

Table 7.2 Minimum number of clamping profiles for securing the axis, and recommended spacing of mounting points on long axes

Size	Minimum number of clamping profiles		L _{SY} [mm]	D _{SY} [mm]	L _B [mm]	Recommended distance L _{SX} [mm]	Thread size	Screw tightening torque [Nm]	Art. No. Clamping profiles (4 pcs.)
	Small and medium loading	High loading							
HM040/HD1	4	4	55	D – 15	70	400	M5	5.9	25-000517
HM060/HD2	4	4	80	D – 20	100	600	M6	10.1	25-000518
HM080/HD3	4	6	100	D – 20	120	800	M8	24.6	25-000519
HM120/HD4	4	6	140	D – 20	160	1,200	M8	24.6	25-000520

7.2 Mounting the imposed load

The spacings of the threaded holes for mounting the imposed load are identical for all drive options available to a size. Additional counterbores can take centring rings.

Table 7.3 Threaded holes for securing the imposed load

Size	Thread size × depth	Counterbore depth for centring sleeve [mm]	Counterbore diameter for centring sleeve [mm]
HM040B/HM040S	M5 × 10	1.5	Ø8 H7
HM060B/HM060S	M6 × 12	1.5	Ø8 H7
HM080B/HM080S	M8 × 16	2.0	Ø12 H7
HM120B/HM120S	M10 × 22	2.0	Ø15 H7

- ▶ Clean mounting surfaces at the carriage.
- ▶ Clean the mounting surface of the load.
- ▶ Position the load on the carriage of the linear axis.
- ▶ Tighten the mounting bolts crosswise.
- ▶ If necessary, use centring sleeves.
- ▶ 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.

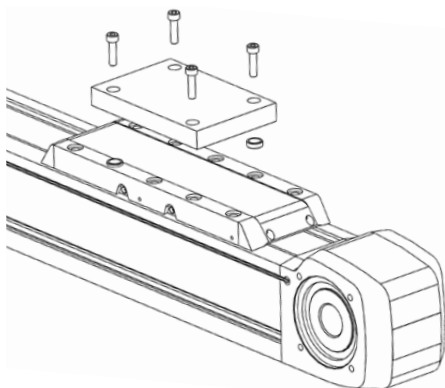


Fig. 7.11 Securing the load with centring sleeves (HM-B)

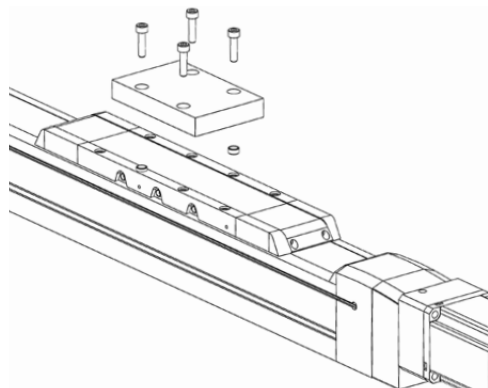


Fig. 7.12 Securing the load with centring sleeves (HM-S)

NOTE

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

7.2.1 Carriage synchronisation with double axes

If you are using an HD double axis 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 Section 7.2.
- ▶ 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 Section 7.2.
- ▶ Mount the synchronous shaft as described in Section 7.6.

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.

NOTE

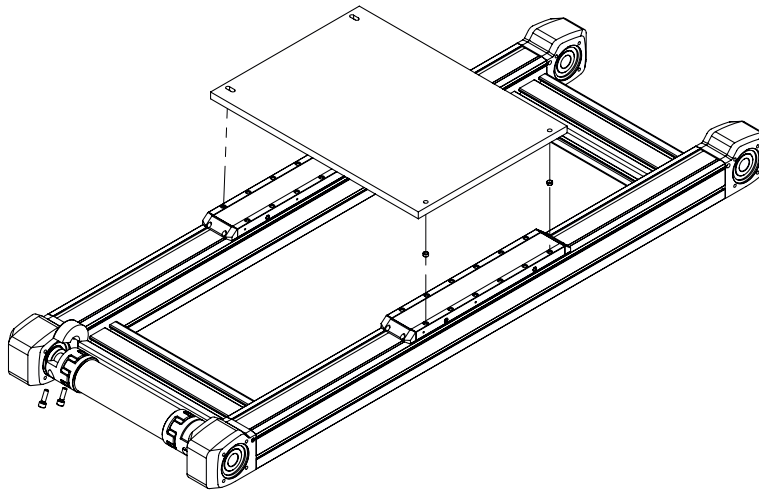


Fig. 7.13 Mounting the adapter plate above both double axis carriages

Assembly and connection

7.3 Mounting the limit switches

The limit switches are available as an N/C or N/O 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 (in the case of axis size HM040, the spacer plate must also be installed between the limit switch and axis, see Fig. 7.15). 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.

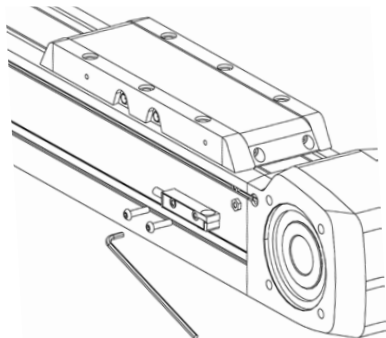


Fig. 7.14 **Mounting the limit switch: HM060, HM080, HM120**

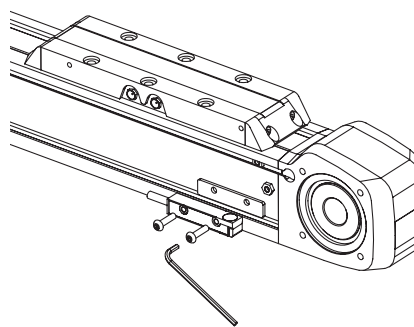


Fig. 7.15 **Mounting the limit switch: HM040**

7.4 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.

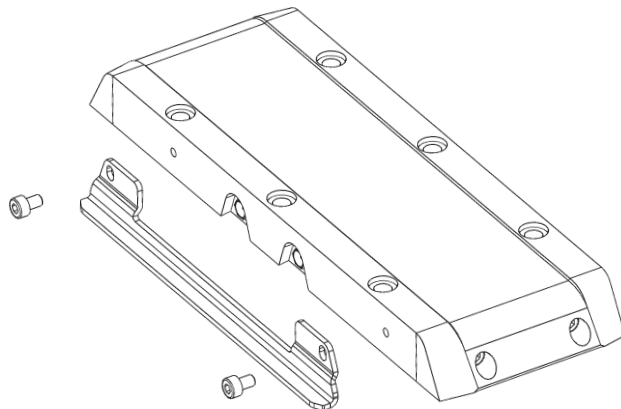


Fig. 7.16 **Mounting the damping element**

7.5 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.
- ▶ 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 line into the lower groove. There the line is protected under the groove cover. The groove cover is available separately, see Section [12.6](#).

✓ The switching distance has now been set.

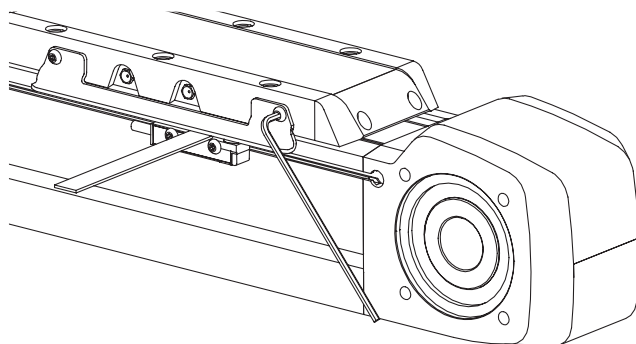


Fig. 7.17 Setting the switching distance with a feeler gauge, and tightening the bolts

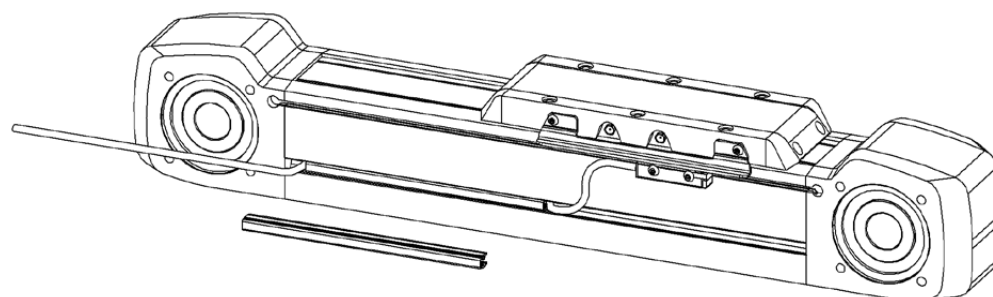


Fig. 7.18 Mounting the limit switch: Routing the lines

7.6 Mounting the synchronous shaft on the HM-B linear axis/HD double axis

- ▶ Clean the clamping surfaces so that they are free of grease and dirt.
 - ▶ Mount the journals at both ends as described in Section 7.7.5, see Fig. 7.19.
 - ▶ 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.
 - ▶ 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 7.4 or the engraving on the coupling hub.
 - ▶ 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 7.4 Tightening torques for clamping screws of coupling half shells

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

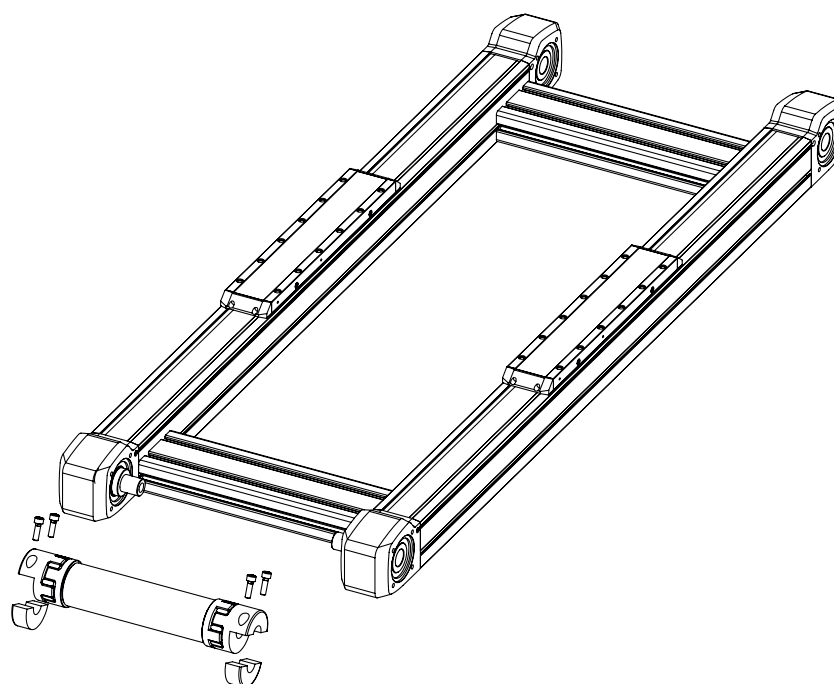


Fig. 7.19 Mounting the synchronous shaft

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

7.7.1 Assembly of the HM-B coupling components

A suitable coupling is needed for the motor attachment. These can be found in Chapter 12, "Appendix 1: Accessories and spare parts".

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

- 1 expansion hub for the axis side
- 1 clamping hub for the drive side
- 1 elastomer insert

Please make sure before mounting that

- no parts are damaged
- all parts are free of dirt and grease

The tightening torques in [Table 7.5](#) and [Table 7.6](#) must be used for mounting the coupling assembly:

Table 7.5 **Screw tightening torques for expansion hub and clamping hub**

Size	Screw tightening torque expansion hub [Nm]	Screw tightening torque clamping hub [Nm]
HM040B	8	5.0
HM060B	10	14.0 ¹⁾
HM080B	25	14.0
HM120B	49	35.0

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

Table 7.6 **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.

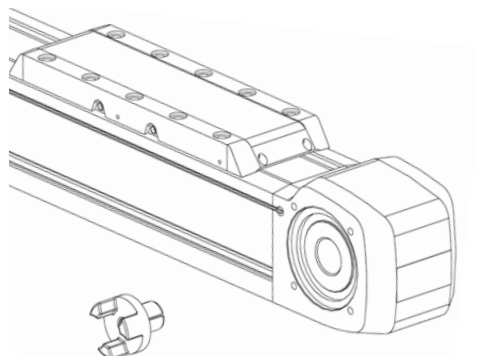


Fig. 7.20 **Inserting the expansion hub**

Assembly and connection

- ▶ 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 7.5](#).

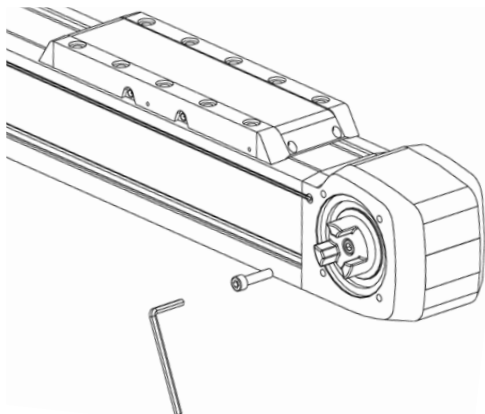


Fig. 7.21 Mounting the expansion hub by tightening the expanding mandrel

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

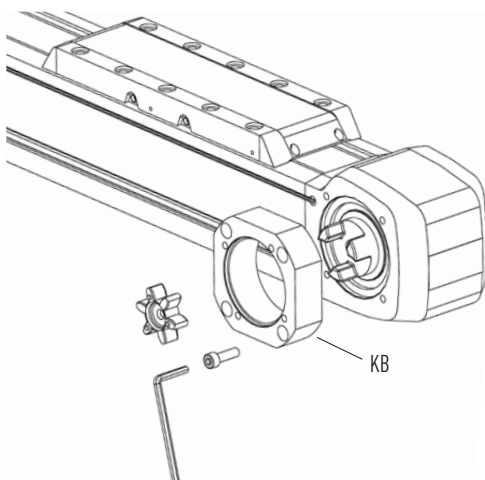


Fig. 7.22 Attaching the elastomer insert and mounting the coupling housing KB on the HM-B linear axis

NOTE

The elastomer insert must be lightly preloaded and should have no backlash. If this 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 7.7](#)) is achieved.

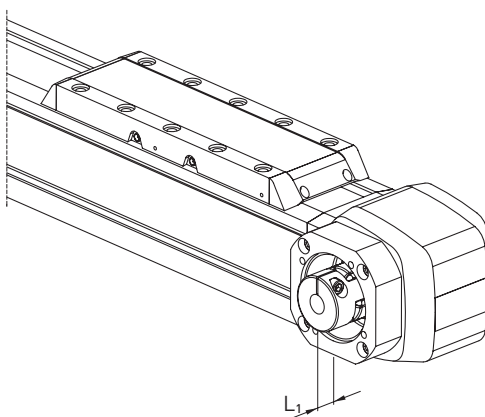


Fig. 7.23 Adjusting the clamping hub distance in the direction of the motor on linear axis HM-B

Table 7.7 Adjusting the coupling distance based on measurement L_1

Axis type	Coupling size	L_1 [mm]
HM040B	14	10.0
HM060B	19	14.0
HM080B	24	16.5
HM120B	28	16.7

If the coupling is mounted without a coupling housing, the coupling distance L_2 must be set in accordance with Fig. 7.24 and Table 7.8.

NOTE

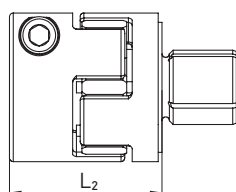


Fig. 7.24 Total length of HM-B coupling assembly

Table 7.8 Adjusting the coupling distance based on measurement L_2 when there is no coupling housing

Axis type	L_2 [mm]
HM040B	28
HM060B	41
HM080B	46
HM120B	48

7.7.2 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.
- ▶ Tighten the four bolts. See Table 7.9 for the tightening torques.

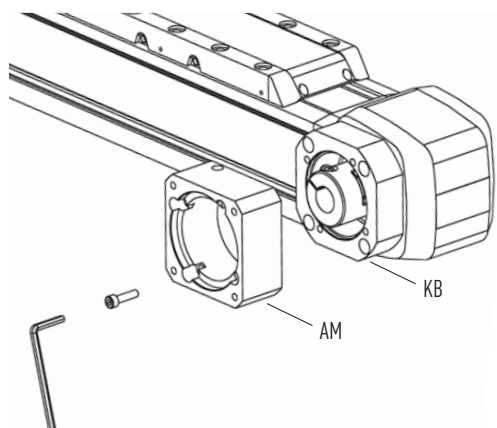


Fig. 7.25 Mounting the motor adapter plate AM (HM-B)

Table 7.9 Tightening torques for the motor adapter plate AM

Size	Screw strength class	Thread size	Screw tightening torque [Nm]
HMD40B	8.8	M4	3.0
HMD60B	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.

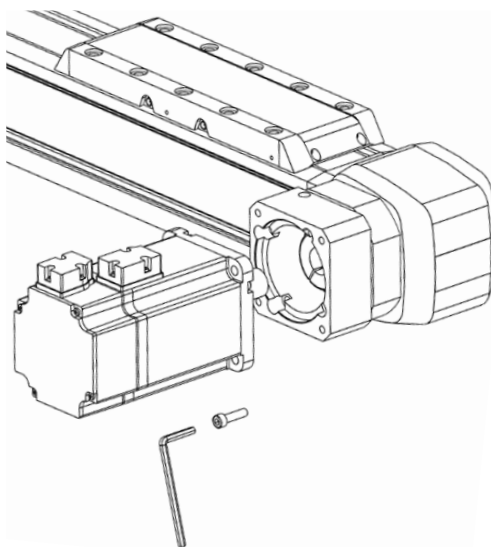


Fig. 7.26 Bolting the motor to the HM-B linear axis

NOTE

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

- ▶ Remove the seal plugs from the hole on the side of the motor adapter plate AM.
 - ▶ Apply the tightening torque in Table 7.5 to the clamping hub's bolt through the hole.
 - ▶ Insert the seal plug back in the hole.
- ✓ The motor has now been assembled.

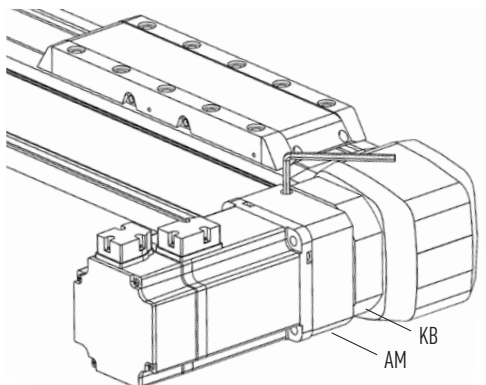


Fig. 7.27 Tightening the clamping hub on the motor shaft

NOTE

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

7.7.3 Mounting the gears

- ▶ Attach the gear adapter plate AG 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 7.10](#) for the tightening torques.

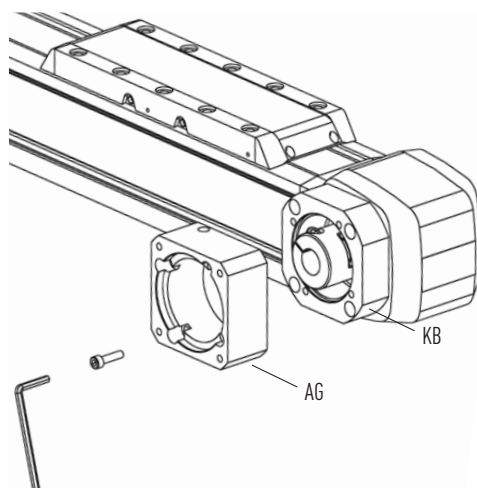


Fig. 7.28 Mounting the gear adapter plate AG

Table 7.10 Tightening torques for the gear adapter plate AG

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 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.

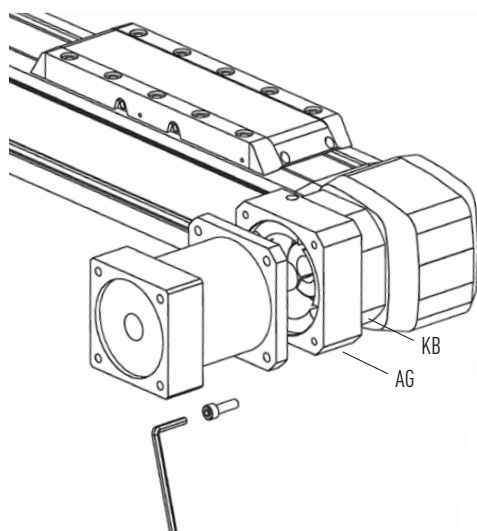


Fig. 7.29 Bolting the gears to the linear axis

Assembly and connection

- ▶ Remove the seal plugs from the hole on the gear adapter plate AG.
- ▶ Apply the tightening torque in [Table 7.5](#) to the clamping hub's bolt through the hole.
- ▶ Insert the seal plug back in the hole.

✓ The gears have now been installed.

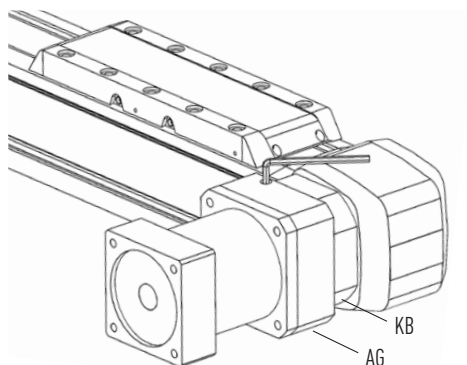


Fig. 7.30 Tightening the clamping hub on the gear shaft

NOTE

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

7.7.4 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.
- ▶ Tighten the four bolts. See [Table 7.11](#) for the tightening torques.

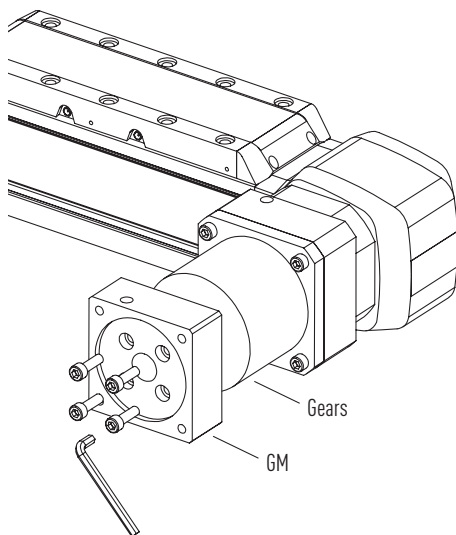


Fig. 7.31 Mounting the motor gear adapter plate GM (HM-B)

Table 7.11 Tightening torques for motor gear adapter plates 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.
- ▶ Remove the headless screw from the hole on the side of the motor gear adapter plate GM.
- ▶ Apply the tightening torque in Table 7.12 to the clamping hub's clamping bolt through the hole.
- ▶ Insert the headless screw back in the hole.

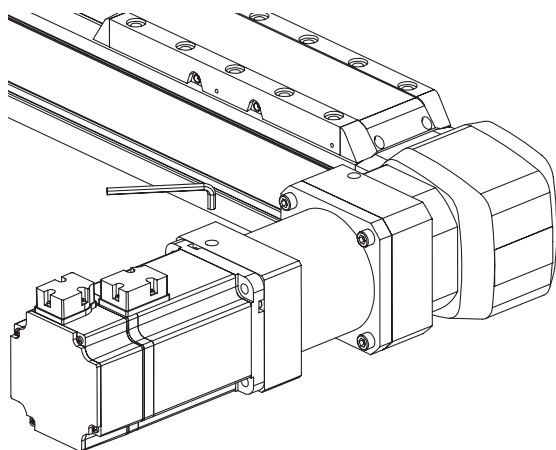


Fig. 7.32 Tightening the clamping hub on the motor shaft

Table 7.12 Tightening torques for the clamping bolt

Size	Gears	Screw strength class	SWISK ¹⁾	Screw tightening torque [Nm]
HM040B	PLE040	8.8	2.5	2.0
HM060B	PLQE060	8.8	4.0	9.5
HM080B	PLQE080	8.8	5.0	16.5
HM120B	PLQE120	8.8	6.0	40.0

¹⁾ Hex socket size

PLE and PLQE are registered trademarks of Neugart GmbH

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.

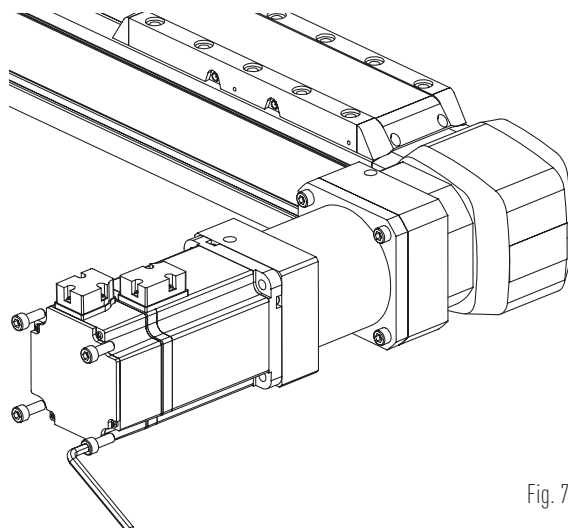


Fig. 7.33 Bolting the motor to the HM-B linear axis with gears

7.7.5 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 7.13 **Tightening torques for the journal**

Size	Screw	Screw strength class	Screw tightening torque [Nm]
HMD40B	ISO 4762 M4 × 30	8.8	4.5
HMD60B	ISO 4762 M6 × 45	8.8	10.0
HMD80B	ISO 4762 M8 × 55	8.8	25.0
HM120B	ISO 4762 M10 × 60	8.8	55.0

Please make sure before mounting that

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

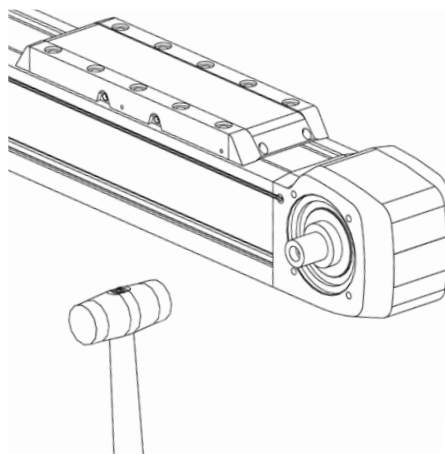


Fig. 7.34 **Inserting the journal in the HM-B linear axis drive block**

- ▶ Apply the tightening torque in [Table 7.13](#) to the bolt at the centre of the journal.

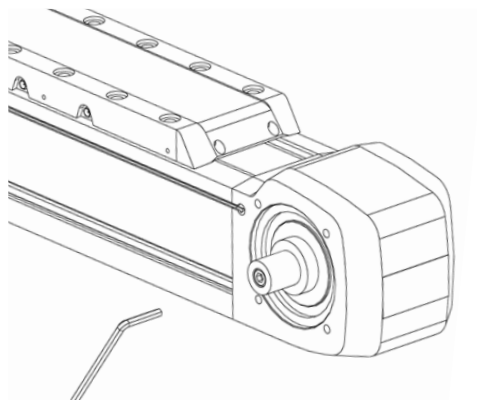


Fig. 7.35 **Tightening the bolt on the journal**

7.8 Mounting the drive unit on the HM-S linear axis

7.8.1 Assembly of the HM-S coupling components

A suitable coupling assembly is needed for the motor attachment. These can be found in Chapter 12, "Appendix 1: Accessories and spare parts".

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

- 1 clamping hub for the axis side
- 1 elastomer insert
- 1 clamping hub for the drive side

Please make sure before mounting that

- no parts are damaged
- all parts are free of dirt and grease

The tightening torques in [Table 7.14](#) and [Table 7.15](#) must be used for mounting the coupling assembly:

Table 7.14 **Screw tightening torque for the clamping hub**

Size	Screw tightening torque for clamping hub [Nm]
HM040S	1.9
HM060S	5.0
HM080S	14.0 ¹⁾
HM120S	14.0

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

Table 7.15 **Screw tightening torque for the coupling housing**

Size	Screw strength class	Thread size	Screw tightening torque [Nm]
HM040S	8.8	M4	3.0
HM060S	8.8	M5	5.9
HM080S	8.8	M6	10.1
HM120S	8.8	M8	24.6

Attaching the coupling assembly:

- ▶ Carefully depress the clamping hub on the spindle's journal. The clamping hub must have the following distances (measurement d) from the locknut:
 - HM040S: d = 5.5 mm (until serial no. HSN 0000000669: d = 3 mm)
 - HM060S: d = 5 mm
 - HM080S/HM120S: d = 0 mm (lying flat)

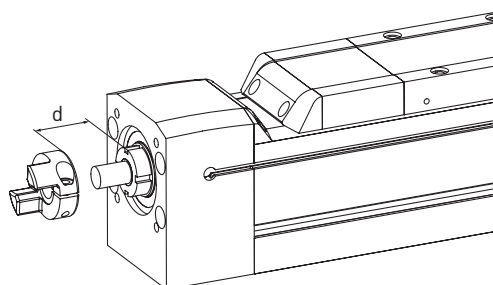


Fig. 7.36 **Attaching the clamping hub to the HM-S linear axis drive journal**

Assembly and connection

- ▶ Tighten the bolt on the clamping hub. See [Table 7.14](#) for the tightening torque.
- ▶ Depress the elastomer insert into the clamping hub.

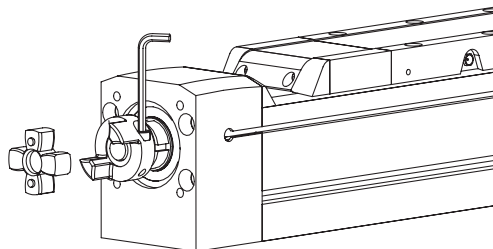


Fig. 7.37 Tightening the clamping hub and depressing the elastomer insert

NOTE

The elastomer insert must be lightly preloaded and should have no backlash. A small quantity of PU compatible grease can be applied to the elastomer insert for easier installation.

- ▶ Using four bolts, mount the coupling housing KB so that it lies flat. See [Table 7.15](#) for the tightening torques.
- ▶ Push the clamping hub onto the elastomer insert until measurement L_1 (see [Table 7.16](#)) has been achieved.

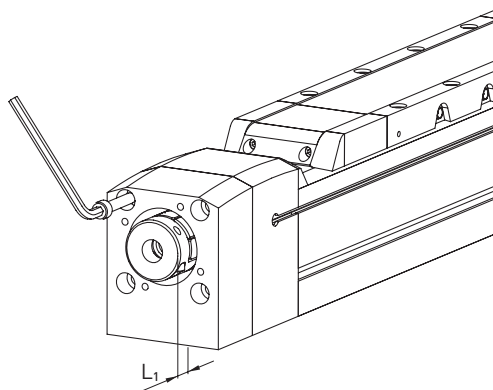


Fig. 7.38 Mounting the clamping hub and the coupling housing KB on the HM-S linear axis

Table 7.16 Adjusting the coupling distance based on measurement L_1

Axis type	Coupling size	L_1 [mm]
HM040S	12	8.5
HM060S	14	10.0
HM080S	19	14.0
HM120S	24	16.5

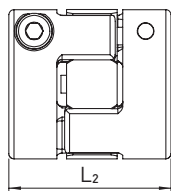


Fig. 7.39 Total length of HM-S coupling assembly

NOTE

If the coupling is mounted without a coupling housing, the coupling distance L_2 must be set in accordance with [Fig. 7.39](#) and [Table 7.18](#).

Table 7.17 Adjusting the coupling distance based on measurement L_2 when there is no coupling housing

Axis type	L_2 [mm]
HM040B	34
HM060B	32
HM080B	50
HM120B	58

7.8.2 Mounting the motor

- ▶ 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 7.18 for the tightening torques.

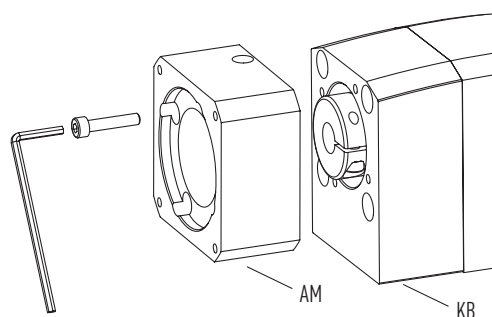


Fig. 7.40 Mounting the motor adapter plate AM

Table 7.18 Tightening torques for the motor adapter plate AM

Size	Screw strength class	Thread size	Screw tightening torque [Nm]
HM040S	8.8	M4	3.0
HM060S	8.8	M5	5.9
HM080S	8.8	M6	10.1
HM120S	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.

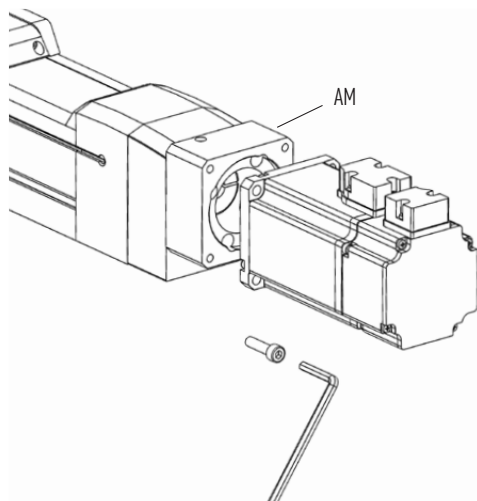


Fig. 7.41 Bolting the motor to the HM-S linear axis

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

NOTE

Assembly and connection

- ▶ Remove the seal plugs from the hole on the side of the motor adapter plate AM.
- ▶ Apply the tightening torque in [Table 7.14](#) to the clamping hub's bolt through the hole.
- ▶ Insert the seal plug back in the hole.

✓ The motor has now been installed.

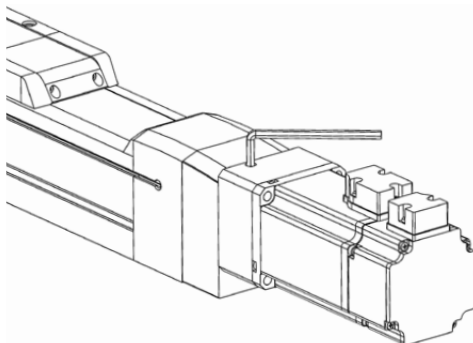


Fig. 7.42 Tightening the clamping hub on the motor shaft

7.8.3 Mounting the belt drive

- ▶ Align the belt drive housing in the direction you want, and place it flat on the axis drive block.
- ▶ Tighten the four bolts. See [Table 7.19](#). for the tightening torques. Secure the bolts.

Table 7.19 Belt drive housing mounting bolts

Size	Screw strength class	Thread size × length	Screw tightening torque [Nm]
HM040S	8.8	M4 × 12	3
HM060S	8.8	M5 × 12	6
HM080S	8.8	M6 × 16	10
HM120S	8.8	M8 × 20	25

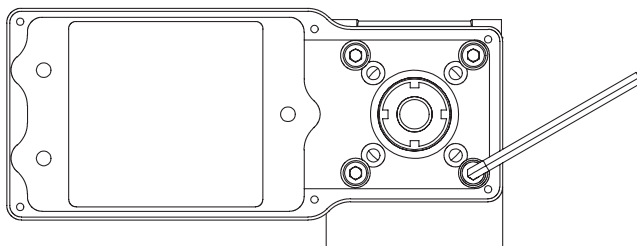


Fig. 7.43 Mounting the belt drive housing

- ▶ Insert the motor flange **[1]** in the window provided in the housing.
- ▶ Tighten loosely the mounting bolts **[2]** for the motor flange.
- ▶ Push the motor flange towards the linear axis to the stop.
- ▶ Through the hole on the housing's face side, turn the clamping screw **[3]** into the motor flange until the bolt's head lies flat.
- ▶ Mount the motor **[4]** through the back of the housing as depicted in [Fig. 7.44](#). The length of the mounting bolts **[5]** for the specific motor must not project by more than 0.5 mm into the housing.

Table 7.20 Motor flange mounting bolts and clamping bolt

Size	Motor flange mounting bolts				Clamping bolt	
	Strength class	Thread size × length	Number [Pcs.]	Screw tightening torque [Nm]	Strength class	Thread size × length
HM040S/HM060S	8.8	M6 × 10	3	4	8.8	M4 × 20
HM080S	8.8	M8 × 12	3	8	8.8	M4 × 30
HM120S	8.8	M8 × 16	4	10	8.8	M6 × 25

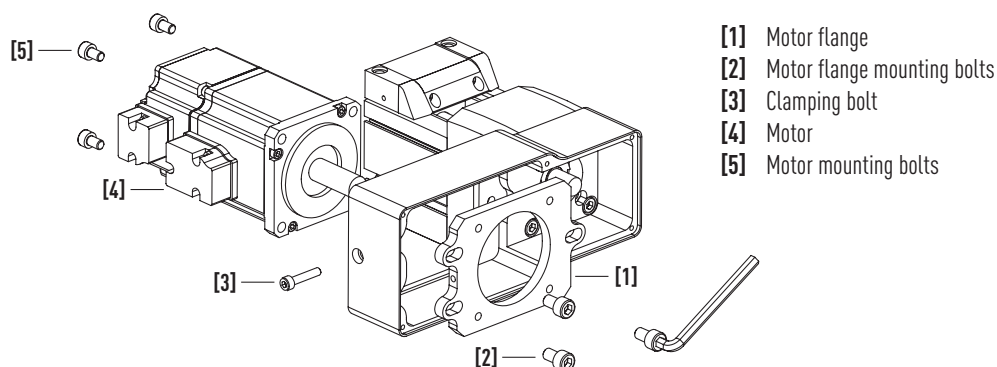


Fig. 7.44 Mounting the motor flange, clamping bolt, and motor

- ▶ Push the clamping set [7] for the pulley [6] to the stop on the axis side. Push the preassembled unit (clamping set and pulley) on the spindle axis' [8] shaft end. Use a feeler gauge to confirm an adequate safety distance (according to Fig. 7.46) between the pulley and the housing.
- ▶ Push the clamping set [9] for the pulley [10] to the stop on the motor side. Attach the preassembled unit (clamping set and pulley) to the motor shaft [11].
- ▶ Use the feeler gauge as depicted in Fig. 7.46 to confirm an adequate safety distance between the pulley's flanged wheel and the motor flange.
- ▶ Working in a criss-cross fashion and in 3 steps, tighten the clamping screws of the clamping sets to the tightening torque specified in Table 7.21.
- ▶ Then repeat the process of tightening the clamping set clamping screws one after the other as per the tightening torques specified in Table 7.21.
- ▶ First place the toothed belt over the motor-side pulley, then over the axis-side pulley.

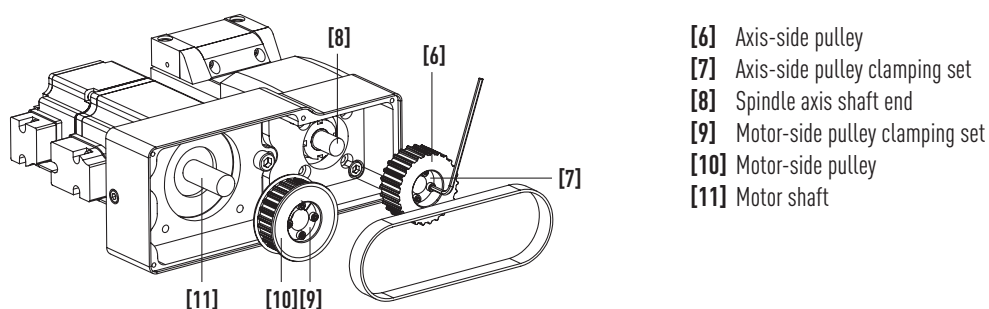


Fig. 7.45 Mounting the pulleys and toothed belt

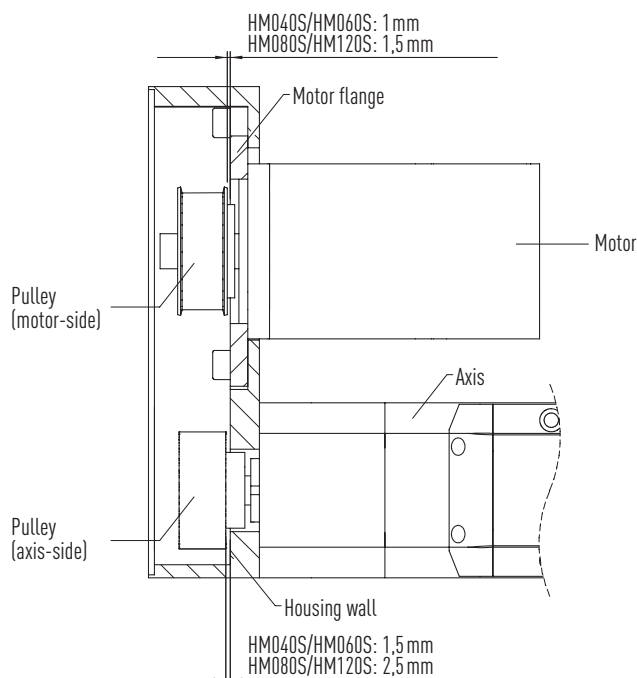


Fig. 7.46 Safety distances between the (motor-side) pulley's flanged wheel and motor flange and between (motor-side) pulley and housing

Table 7.21 Clamping bolt tightening torques

Motor shaft diameter (linear axis) [mm]	Clamping bolt tightening torque [Nm]
6 – 12 (HM040S, HM060S, HM080S)	1.2
14 – 15	2.1
16 – 19	4.9
20 (HM120S)	9.7
22 – 32	17.0

- ▶ Make sure that the axes are not under load and the motor is disconnected from the power supply.
- ▶ Carefully tighten the clamping bolt **[3]** on the housing's face side until the belt frequency $\pm 10\%$ calculated with formula F 7.1. This can be measured with a so called Trummeter, or belt tension meter, applied to the inside of the belt as shown in Fig. 7.47. Once the frequency is within the specified range, the mounting bolts **[2]** can be tightened on the motor flange (see Table 7.20). Tighten the bolts.
- ▶ Again check the preload. Tightening the bolts may change this slightly.

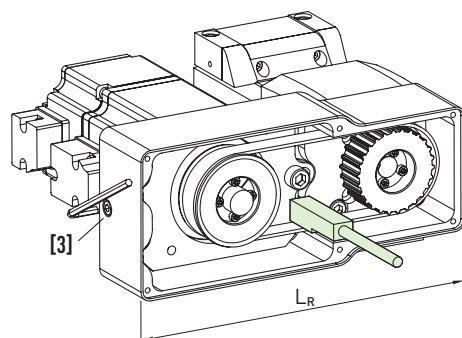


Fig. 7.47 Setting the belt frequency

Calculating the belt frequency

F 7.1

$$f = \sqrt{\frac{10^3 \times M}{X}}$$

f Belt frequency [Hz]
M Application-based motor drive torque [Nm]
X Factor for calculating the belt frequency [Nm/Hz²]
(see [Table 7.22](#))

Table 7.22 Factor for calculating the belt frequency

Size	Belt drive type	X [Nm/Hz ²]	L _R [mm]
HM040S	V ₁	0.064	168.5
HM060S	V ₁	0.064	168.5
	V ₂	0.059	198.5
HM080S	V ₁	0.193	236.0
	V ₂	0.244	265.0
HM120S	V ₁	1.405	303.5
	V ₂	1.193	343.0

- ▶ Place the cover plate over the belt drive.
- ▶ Apply a tightening torque of 1.0 Nm to the provided M3 × 6 rounded head screws.
- ✓ The belt drive has now been installed.

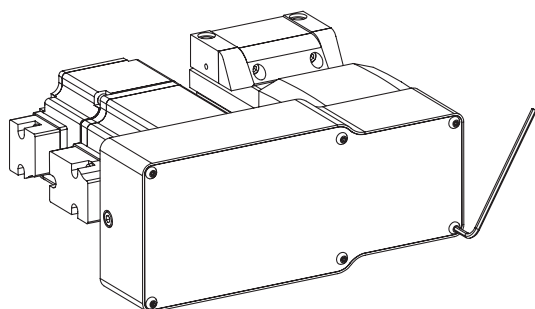


Fig. 7.48 Mounting the belt drive cover plate

7.9 Mounting the drive unit on the HD linear axis and HS multi-axis system

To mount the drive unit, follow the assembly instructions for the single axes installed (HM-B: Section 7.7 from Page 51; HM-S, Section 7.8 from Page 59).

7.10 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!

7.10.1 Connecting the motor

NOTE

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

7.10.2 Connecting the drive amplifier

NOTE

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

8. Maintenance and cleaning

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

CAUTION!

Unauthorised repairs on the system!

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!

CAUTION!



Tilting axes can cause crushing injuries!

- ▶ Secure machinery and machine parts against tilting!

CAUTION!



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 7.1)!
- ▶ Secure the imposed load as described in the assembly instructions! (see Section 7.2)!

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! 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!

ATTENTION!



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!

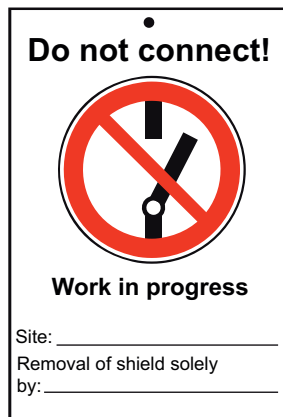
Damage from wrong lubricant!

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.



NOTE

The cleaning and lubrication intervals must be observed without fail.

- ▶ Include these maintenance intervals in your maintenance schedule.

8.1 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

NOTE

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

8.1.1 HM-B linear axis lubrication

The HM-B linear axis includes a linear guideway with two blocks that are initially lubricated prior to delivery. Relubrication is introduced through two grease nipples (one for each block) on both sides of the carriage.

The lubrication interval depends on the loading, speed, cycle time, and ambient conditions. Recommended lubrication intervals are listed in [Table 8.1](#).

Table 8.1 Lubrication interval for the linear guideway

Size	Block	Lubricant	Relubrication quantity [cm ³]	Running performance under low load [km]	Running performance under high load [km]
HM040B	MGN15	G04	0.50	1,000	400
HM060B	QE15	G04	0.55	2,000	600
HM080B	QH20	G04	0.70	2,000	600
HM120B	QH30	G04	0.75	2,000	600

8.1.2 HM-S linear axis lubrication

The HM-S linear axis includes a linear guideway with two blocks and a ballscrew that are initially lubricated prior to delivery. Relubrication is introduced through three grease nipples each on both sides of the carriage. The outer grease nipples are used to lubricate the blocks, the middle one the ballscrew.

Table 8.2 Lubrication interval for the linear guideway

Size	Block	Lubricant	Relubrication quantity [cm ³]	Running performance under low load [km]	Running performance under high load [km]
HM040S	MGN15	G04	0.50	1,000	400
HM060S	QE15	G04	0.55	2,000	600
HM080S	QH20	G04	0.70	2,000	600
HM120S	QH30	G04	0.75	2,000	600

Table 8.3 Lubrication interval for the ballscrew

Size	Spindle diameter [mm]	Spindle lead [mm]	Lubricant	Relubrication quantity [cm ³]	Running performance [km]
HM040S	12	5	G04	0.19	100
		10		0.31	
HM060S	16	5	G04	1.15	100
		10		0.91	
		16		1.66	
HM080S	20	5	G04	1.02	100
		10		1.10	
		20		2.49	
HM120S	32	10	G04	3.29	100
		20		4.52	
		32		4.64	

8.1.3 HD double axis lubrication

In the case of the HD double axis, each single axis installed must be lubricated separately as described in Section 8.1.1.

8.1.4 HS linear axis system lubrication

HS linear axis systems must be lubricated in accordance with the lubrication specifications for the single axes installed.

8.1.5 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

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.

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 8.1](#), [Table 8.2](#) and [Table 8.3](#)).
- ▶ Repeat the process for all lube points on this carriage side.

✓ The linear guideway is lubricated.

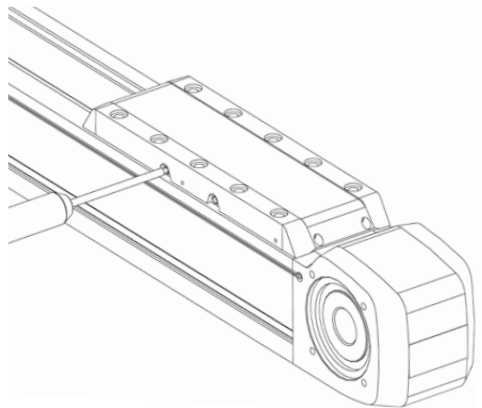


Fig. 8.1 Example lubrication of the linear guideway

8.1.5.1 HIWIN lubricants

The grease type G04 is recommended for the linear axis. HIWIN can also offer you a suitable grease gun with matching adapter (see [Section 12.19](#)).

8.2 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!

ATTENTION!



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, HM-B/HM-S linear axes 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.

8.3 Replacing the cover strip

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. 8.8](#).
- ▶ Undo the carriage end piece screws. Remove the end piece from both ends of all carriages (see [Fig. 8.6](#)).
- ▶ Undo the belt deflection screws. Remove the belt deflection from both ends of all carriages (see [Fig. 8.4](#)).
- ▶ 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, belt 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. 8.2](#).
- ▶ Thread the belt deflection onto the cover strip at both ends of the carriage. Make sure that the belt deflection is correctly oriented as shown in [Fig. 8.3](#).
- ▶ Hand-tighten the belt deflection screws.
- ▶ Push the slide film through the upper opening in the belt deflection as shown in [Fig. 8.5](#) and align it centrally in the longitudinal direction.
- ▶ Place the carriage end pieces on the belt deflection as shown in [Fig. 8.6](#) 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. Tighten the clamping screws of the cover strip clamp (see [Fig. 8.7](#) and [Fig. 8.8](#)). For details of the tightening torques, see [Table 8.6](#).
- ▶ 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

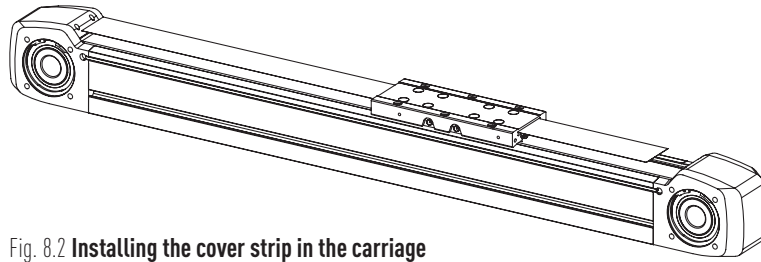


Fig. 8.2 **Installing the cover strip in the carriage**

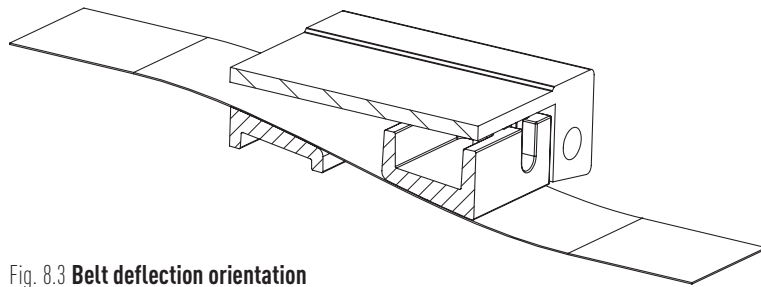


Fig. 8.3 **Belt deflection orientation**

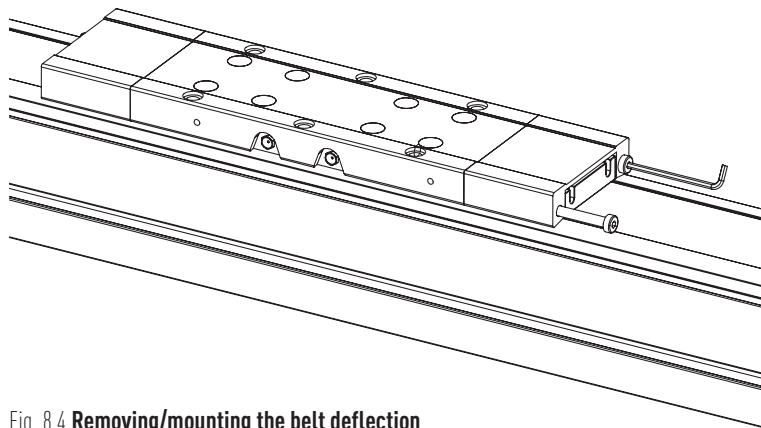


Fig. 8.4 **Removing/mounting the belt deflection**

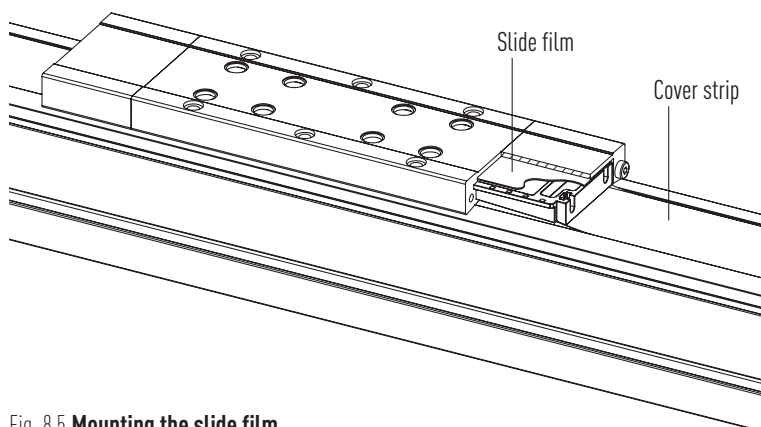


Fig. 8.5 **Mounting the slide film**

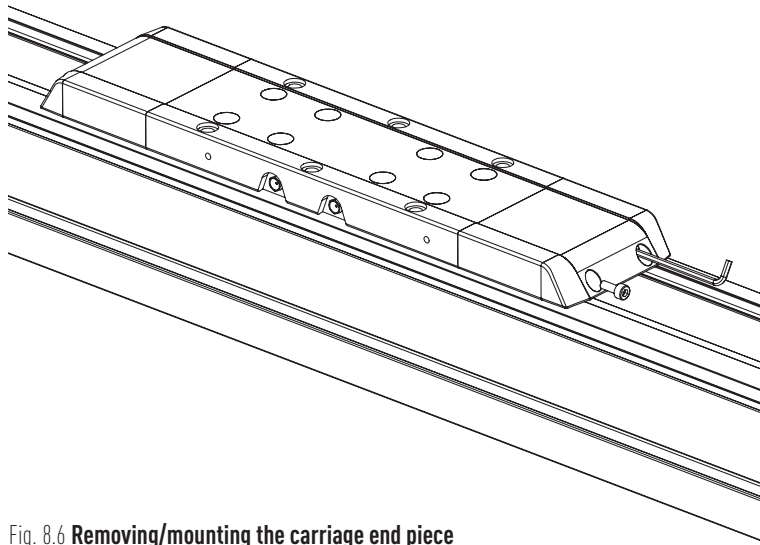


Fig. 8.6 Removing/mounting the carriage end piece

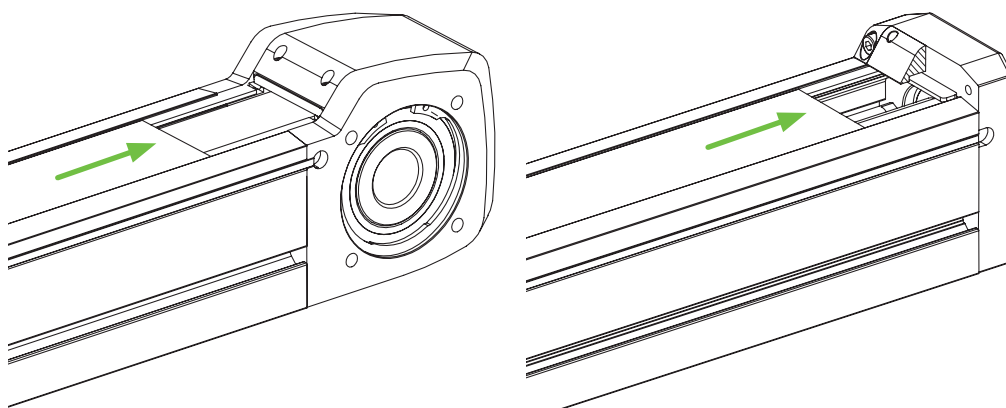


Fig. 8.7 Installing the cover strip in the cover strip clamp on the HM-B (left) and HM-S (right)

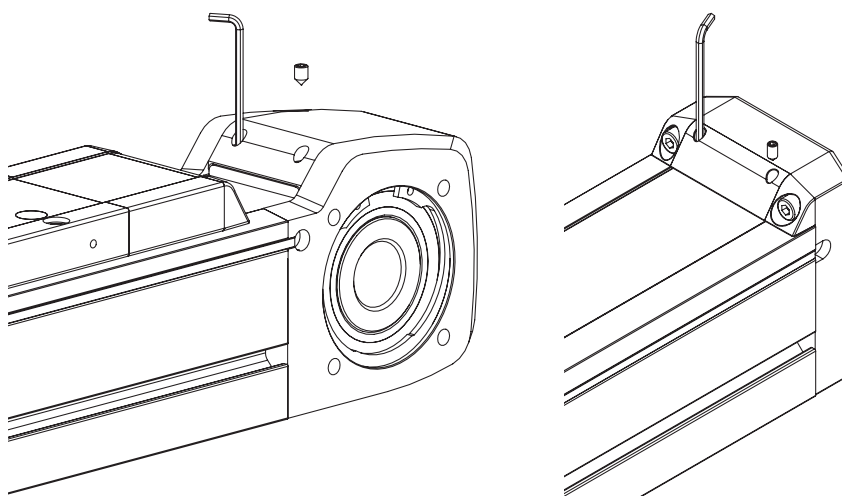


Fig. 8.8 Installing/removing the cover strip clamp on/from the HM-B (left) and HM-S (right)

Table 8.4 **Screws for the belt deflection**

Size	Screw strength class	Thread size
HMD40S	8.8	M4
HMD60S	8.8	M4
HM080S	8.8	M5
HM120S	8.8	M5

Table 8.5 **Screws for the carriage end piece**

Size	Screw strength class	Thread size
HMD40S	8.8	M3
HMD60S	8.8	M3
HM080S	8.8	M3
HM120S	8.8	M4

Table 8.6 **Tightening torques for the cover strip clamp**

Size	Thread size
HMD40S	M3
HMD60S	M4
HM080S	M4
HM120S	M5

8.4 Replacing the toothed belt

8.4.1 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 8.3, “Replacing the cover strip”.
- ▶ To remove the drive elements, follow the steps described in Section 7.7, “Mounting the drive unit on the HM-B linear axis”.

8.4.2 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.

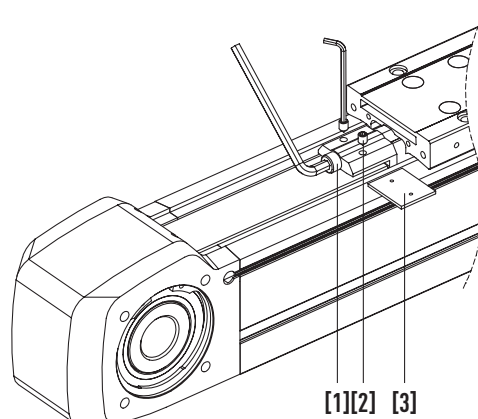


Fig. 8.9 **Removing the belt tightener**

- ▶ 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.

8.4.3 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] out of their bearing seats.

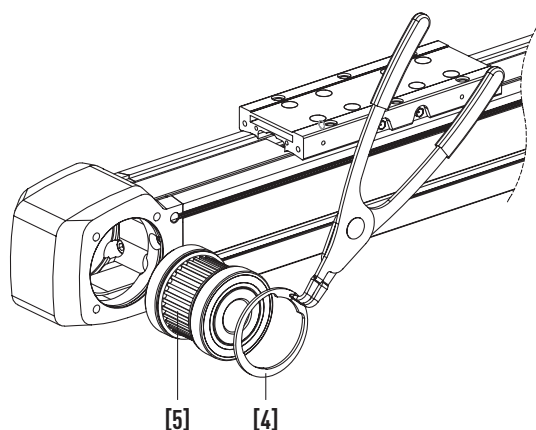


Fig. 8.10 Removing the drive unit

8.4.4 Mounting the new toothed belt

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

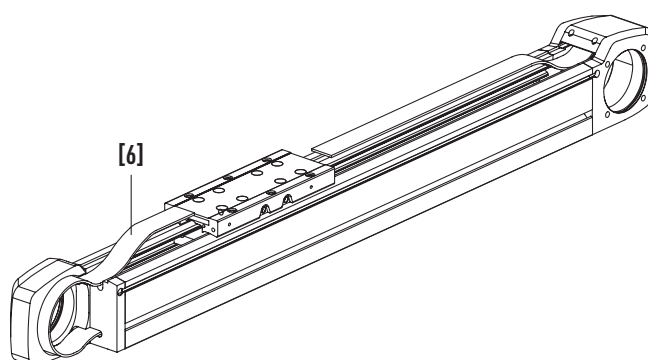


Fig. 8.11 Inserting the toothed belt

- ▶ Position the toothed belt so that the bearing seats are exposed and the drive units can be reinstalled.
- ▶ Position the toothed belt so that the bearing seats are exposed and the drive units can be reinstalled.

8.4.5 Mounting the belt tightener

ATTENTION!

Risk of material damage due to accidental detachment!

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

Maintenance and cleaning

- ▶ 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 and tighten the headless screws [2] to the torque specified in [Table 8.7](#). Make sure that the tips of the headless screws are engaged in the centring holes of the clamping plates.

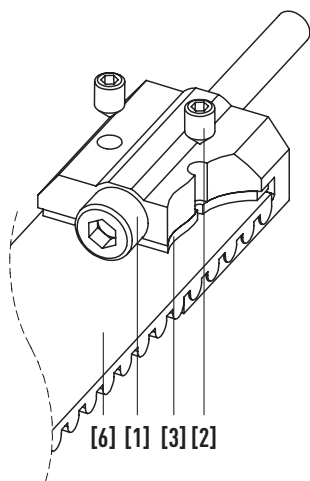


Fig. 8.12 Installing the toothed belt in the belt tightener

Table 8.7 Tightening torques for headless screws of clamping plate

Size	Thread size	Screw tightening torque [Nm]
HM040B	M3	0.3
HM060B	M4	0.4
HM080B	M4	0.4
HM120B	M5	0.6

- ▶ 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.

8.4.6 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. 8.13](#).
- ▶ 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 8.8](#). 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.

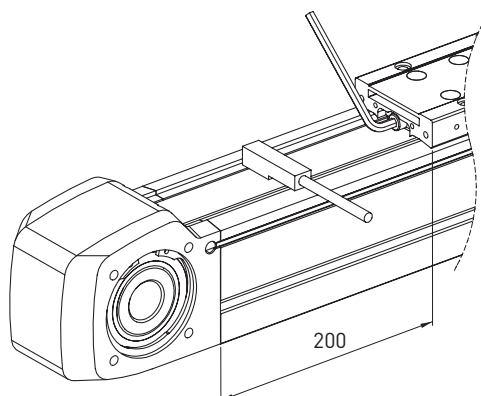


Fig. 8.13 Preloading the toothed belt

Table 8.8 **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	144	162	177
HM080B	140	156	171
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 8.8](#), correct the preload via the clamping screws again.
- ✓ The new belt has been mounted.

8.4.7 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 8.3, “[Replacing the cover strip](#)”.
- ▶ To mount the drive elements, follow the steps described in Section 7.7, “[Mounting the drive unit on the HM-B linear axis](#)”.

8.5 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 7.6.
- ✓ The synchronous shaft has been replaced.

8.6 Visual examination of electrical componentry

CAUTION!



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!

9. Faults

9.1 Linear axis and linear axis system malfunctions

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!

CAUTION!



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!

Table 9.1 **Table of linear axis and linear axis system malfunctions**

Fault	Possible cause	Remedy
Carriage 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
	Ballscrew catching or seizing	Send axis to HIWIN for repair
	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 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 9.1 **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 line break	Replace limit switch
	Signal not arriving at controller	Check input line to controller
Noise and vibrations at high speeds	Speed too high, or overcritical spindle axis speed	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

9.2 Motor malfunctions

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

9.3 Faults during operation with drive amplifier

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

10. 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!

⚠ 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 it does not feature brakes in its 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!

⚠ 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 when handling suspended loads!
- ▶ Transport to the installation site only by qualified personnel!!

⚠ CAUTION!



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!



Tilting linear axes can cause crushing injuries!

- ▶ Secure machinery and machine parts against tilting!!

ATTENTION!



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..

11. Disposal


ATTENTION!	
	<p>Warning! Health and environmental hazards!</p> <p>Contact with lubricants may cause irritation, poisoning, allergic reactions, and damage to the environment.</p> <ul style="list-style-type: none"> ▶ Use only suitable, non-hazardous agents. Note the manufacturer's safety data sheets! ▶ Ensure proper disposal!

Table 11.1 **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

12. Appendix 1: Accessories and spare parts

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 Motor adapter of the HM-B linear axis

The adapter on the axis is a multi-part structure that simplifies the flange connections of all possible motors or gears.

The flange type set consists of the following parts:

- Coupling housing KB
- Coupling components
- Motor adapter plate AM or gear adapter plate AG and motor gear adapter plate¹⁾ GM

The following sections list the dimensions for the coupling housing, motor adapter plate, and gear adapter plate.

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

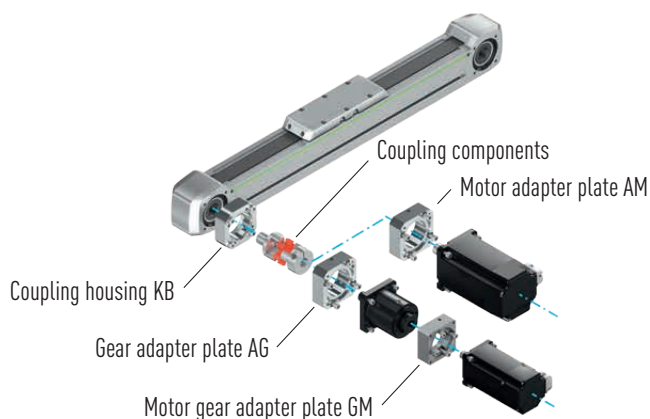


Fig. 12.1 Motor adapter of the HM-B linear axis

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

¹⁾ Not applicable to NG01-NG07

Appendix 1: Accessories and spare parts

Motor adapter of the double axis (HD)

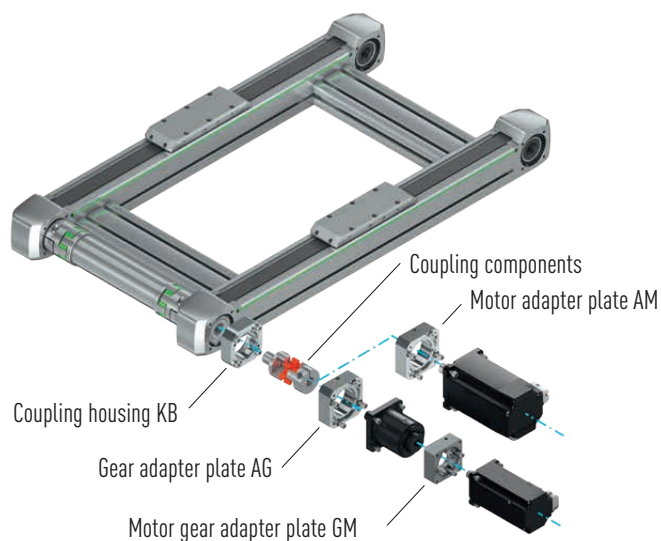


Fig. 12.2 **Motor adapter of the HD double axis**

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

Table 12.1 **Order code for flange type¹⁾ – HM-B linear axis and HD double axis**

Drive manufacturer/type	HM040B			HM060B			HM080B			HM120B	
	Motor only	With PLE40	With PLQE60	Motor only	With PLQE60	With PLQE80	Motor only	With PLQE80	With PLQE120	Motor only	With PLQE120
Gear box only		NG01	NG02		NG03	NG04		NG05	NG06		NG07
HIWIN	FRLS10		HW04								
	FRLS20	HW03		HW03		HW05	HW05		HW10		
	FRLS40	HW03		HW03		HW05	HW05		HW10		
	FRMS75				HW06	HW06		HW08			
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							BR10			
	8LSA53							BR12 ²⁾			
	8LSA54							BR12 ²⁾			
	8LSA55							BR12 ²⁾			
	8LSA56							BR12 ²⁾			BR14
	8LSA57							BR12 ²⁾			BR14
8LSA64										BR15	

PLE and PLQE are registered trademarks of Neugart GmbH

¹⁾ See order code on Page 17

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

Table 12.1 Order code for flange type¹⁾ – HM-B linear axis and HD double axis (continuation)

Drive manufacturer/type	HM040B			HM060B			HM080B			HM120B	
	Motor only	With PLE40	With PLQE60	Motor only	With PLQE60	With PLQE80	Motor only	With PLQE80	With PLQE120	Motor only	With PLQE120
B&R	8LSA65									BR15	
	8LSA66									BR15	
	8LSN43				BR06 ²⁾		BR11				
	8LSN44				BR06 ²⁾		BR11				
	8LSN45				BR06 ²⁾		BR11				
	8LSN46						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		BE13		
	AM8032			BE03	BE05	BE05	BE05		BE09		
	AM8033			BE03	BE05	BE05	BE05		BE09		
	AM8531	BE02		BE02	BE05	BE05	BE05		BE09		
	AM8532			BE03	BE05	BE05	BE05	BE09	BE09		
	AM8533			BE03	BE05	BE05	BE05	BE09	BE09		
	AM8041				BE06		BE06		BE10	BE10	BE18
	AM8042				BE06		BE06	BE10	BE10	BE10	BE18
	AM8043				BE06		BE06	BE10	BE10	BE10	BE18
	AM8541				BE06		BE06	BE10	BE10	BE10	BE18
	AM8542				BE06		BE06	BE10	BE10	BE10	BE18
	AM8543				BE06		BE06	BE10	BE10	BE10	BE18
	AM8051				BE07			BE11		BE11	BE19
	AM8052				BE07			BE11		BE11	BE19
	AM8053							BE11		BE11	BE19
	AM8551				BE07			BE11		BE11	BE19
	AM8552				BE07			BE11		BE11	BE15
	AM8553							BE11		BE11	BE15
	AM8061							BE12 ²⁾			BE16
	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			B004 ²⁾	B005	B005	B005		B010		
	MSK050B				B006		B006	B011	B011	B011	B019

PLE and PLQE are registered trademarks of Neugart GmbH

¹⁾ See order code on [Page 17](#)

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

Appendix 1: Accessories and spare parts

Table 12.1 Order code for flange type¹⁾ – HM-B linear axis and HD double axis (continuation)

Drive manufacturer/type	HM040B			HM060B			HM080B			HM120B	
	Motor only	With PLE40	With PLQE60	Motor only	With PLQE60	With PLQE80	Motor only	With PLQE80	With PLQE120	Motor only	With PLQE120
Bosch	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										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		LE03 ²⁾	LE05	LE05	LE05		LE08			
	MCS09H		LE03 ²⁾	LE05	LE05	LE05	LE08	LE08			
	MCS09L		LE03 ²⁾	LE05	LE05	LE05	LE08	LE08			
	MCS12D			LE06 ²⁾		LE06 ²⁾	LE09	LE09	LE09		LE15
	MCS12H			LE06 ²⁾		LE06 ²⁾	LE09	LE09	LE09		LE15
	MCS12L					LE07 ²⁾	LE09	LE09	LE09		LE15
	MCS14D						LE10 ²⁾		LE10 ²⁾		LE16
	MCS14H						LE10 ²⁾		LE10 ²⁾	LE13	LE13
	MCS14L								LE12 ²⁾	LE13	LE13
	MCS14P								LE12 ²⁾	LE13	LE13
	MCS19F										LE14
Schneider	BSH0551		SE02	SE02		SE10					
	BSH0552		SE02	SE02		SE10					
	BSH0553		SE05	SE05		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		SE14		SE21
	BSH1401						SE15 ²⁾		SE15 ²⁾		SE22
	BSH1402						SE15 ²⁾		SE15 ²⁾	SE19	SE19
	BSH1403								SE18 ²⁾	SE19	SE19
BSH1404									SE19		

PLE and PLQE are registered trademarks of Neugart GmbH

¹⁾ See order code on Page 17

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

Table 12.1 Order code for flange type¹⁾ – HM-B linear axis and HD double axis (continuation)

Drive manufacturer/type	HM040B			HM060B			HM080B			HM120B		
	Motor only	With PLE40	With PLQE60	Motor only	With PLQE60	With PLQE80	Motor only	With PLQE80	With PLQE120	Motor only	With PLQE120	
Schneider	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									SE18 ²⁾	SE19 SE19	
SEW	CMP40S		SW02	SW02		SW06						
	CMP40M	SW02	SW02	SW02		SW06						
	CMP50S	SW03		SW03		SW07	SW07		SW15			
	CMP50M	SW03		SW03	SW07	SW07	SW07		SW11			
	CMP50L			SW04	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		SW20
	CMPZ71M				SW09 ²⁾			SW13		SW13	SW17	SW17
	CMPZ71L							SW13		SW13	SW17	SW17
CMPZ80S							SW14 ²⁾				SW18	
CMPZ80M							SW14 ²⁾				SW18	
CMPZ80L											SW18	
CMPZ100S											SW19	
CMPZ100M											SW19	
CMPZ100L											SW19	
Siemens	1FK7022	SM02	SM02	SM02		SM07						
	1FK7032	SM03		SM03		SM04	SM04		SM11			
	1FK7034	SM03		SM03	SM04	SM04	SM04		SM11			
	1FK7040				SM05		SM05		SM08	SM08	SM15	
	1FK7042				SM05		SM05	SM08	SM08	SM08	SM15	
	1FK7060				SM06 ²⁾			SM09		SM09	SM16	
	1FK7062				SM06 ²⁾			SM09		SM09	SM12	
	1FK7063				SM06 ²⁾			SM09		SM09	SM12	
	1FK7080							SM10 ²⁾			SM13	

PLE and PLQE are registered trademarks of Neugart GmbH

¹⁾ See order code on [Page 17](#)

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

Appendix 1: Accessories and spare parts

Table 12.1 Order code for flange type¹⁾ – HM-B linear axis and HD double axis (continuation)

Drive manufacturer/type		HM040B			HM060B			HM080B			HM120B	
		Motor only	With PLE40	With PLQE60	Motor only	With PLQE60	With PLQE80	Motor only	With PLQE80	With PLQE120	Motor only	With PLQE120
Siemens	1FK7081							SM10 ²⁾			SM13	
	1FK7083							SM10 ²⁾			SM13	
	1FK7084							SM10 ²⁾			SM13	
	1FK7100										SM14	
	1FK7101										SM14	
	1FK7103										SM14	
	1FK7105										SM14	

PLE and PLQE are registered trademarks of Neugart GmbH

¹⁾ See order code on Page 17

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

The overall width of the 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)
- Gear box
- Motor

HM-B linear axis without gear box

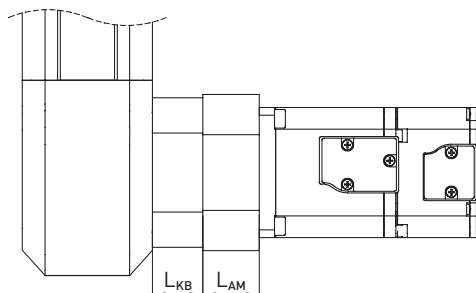


Fig. 12.3 HM-B linear axis motor connection without gears

L_{KB} Length of coupling housing, see [Table 12.2](#)

L_{AM} Motor adapter plate length, see [Table 12.3](#)

HM-B linear axis with gear box

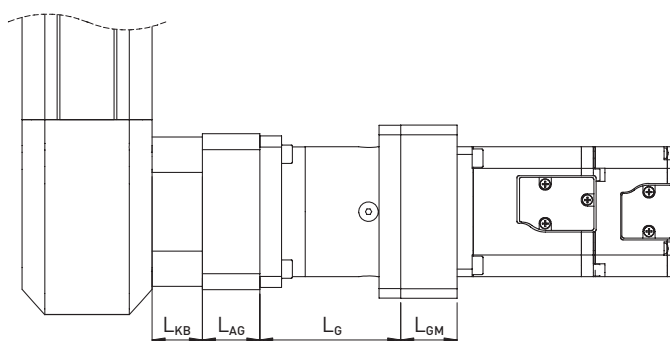


Fig. 12.4 HM-B linear axis motor connection with gears

L_{KB} Length of coupling housing, see [Table 12.2](#)

L_{AG} Gear adapter plate length, see [Table 12.4](#)

L_G Length of gear box, see [Table 12.6](#)

L_{GM} Motor gear adapter plate length, see [Table 12.5](#)

Appendix 1: Accessories and spare parts

12.1.1 Coupling housing KB for HM-B linear axis

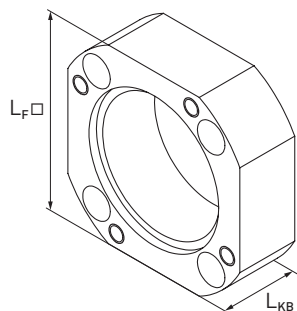


Fig. 12.5 Coupling housing KB for HM-B linear axis

Table 12.2 Dimensions of coupling housing KB for HM-B linear axis

Coupling housing for	L_F [mm]	L_{KB} [mm]	Article number
HM040B	47	14.7	25-000798
HM060B	69	23.2	25-000799
HM080B	84	24.1	25-000800
HM120B	118	25.0	25-000801

12.1.2 Motor adapter plate AM for HM-B linear axis without gears

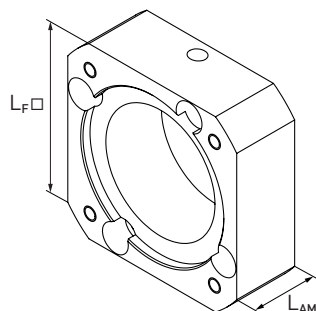


Fig. 12.6 Motor adapter plate AM for HM-B linear axis without gears

Table 12.3 Motor adapter plate AM for HM-B linear axis without gears

Linear axis	Manufacturer	Motors	L_F [mm]	L_{AM} [mm]	Article number
HM040B	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	70	31	25-000407
	Bosch	MSK030B, MSK030C	54	22	25-000401
		MSK040B, MSK040C	82	31	25-000405
	HIWIN	FRLS200W, FRLS 400W	60	31	25-000404
	Lenze	MCS06F41, MCS06F60, MCS06I41, MCS06I60	62	25	25-000406
		MCS09D41, MCS09D60	82	31	25-000411
	Schneider	BSH0701, BSH0702, BMH0701, BMH0702	62	25	25-000406
		BMH0703	70	31	25-000407
	SEW	CMP40M	54	22	25-000401
		CMP50S, CMP50M	62	25	25-000406

Table 12.3 Motor adapter plate AM for HM-B linear axis without gears (continuation)

Linear axis	Manufacturer	Motors	L _F [mm]	L _{AM} [mm]	Article number	
HM040B	Siemens	1FK7022	55	22	25-000402	
		1FK7032, 1FK7034	72	31	25-000408	
HM060B	Bosch	MSK040B, MSK040C, MSK043B	82	27	25-000415	
		MSK061B, MSK061C	116	37	25-000428	
		MSK060B, MSK060C	116	47	25-000429	
	B&R	8LSA35, 8LSA34	86	27	25-000423	
		8LSA43, 8LSA44, 8LSA45	100	37	25-000426	
		8LSN43, 8LSN44, 8LSN45	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	104	47	25-000427	
	HIWIN	FRMS750W	80	37	25-000421	
	Lenze	MCS09D41, MCS09D60, MCS09F38, MCS09F60, MCS09H41, MCS09H60, MCS09L41, MCS09L51	86	27	25-000423	
		MCS12D20, MCS12D41, MCS12H15, MCS12H35	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	116	47	25-000431	
	Siemens	1FK7034	72	27	25-000419	
		1FK7040, 1FK7042	87	37	25-000424	
1FK7060, 1FK7062, 1FK7063		116	47	25-000431		
HM080B	Beckhoff	AM8532D, AM8532E, AM8532H, AM8533E, AM8533F, AM8533J	73	27	25-000436	
		AM8042E, AM8042F, AM8042J, AM8043E, AM8043H, AM8043K, AM8541D, AM8541E, AM8541H, AM8542E, AM8542F, AM8542J, AM8543E, AM8543H, AM8543K	87	37	25-000441	
		AM8051E, AM8051G, AM8051K, AM8052F, AM8052J, AM8052L, AM8053G, AM8053K, AM8053N, AM8551E, AM8551G, AM8551K, AM8552F, AM8552J, AM8552L, AM8553G, AM8553K, AM8553N	100	51	25-000444	
			AM8061G, AM8061J, AM8061M, AM8062J, AM8062L, AM8062P, AM8561G, AM8561J, AM8561M	138	56	25-000453
	B&R	8LSA43, 8LSA44, 8LSA45, 8LSA46	100	37	25-000443	
		8LSA53, 8LSA54, 8LSA55, 8LSA56, 8LSA57, 8LSN54, 8LSN55, 8LSN56	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	

Appendix 1: Accessories and spare parts

Table 12.3 **Motor adapter plate AM for HM-B linear axis without gears (continuation)**

Linear axis	Manufacturer	Motors	L _F [mm]	L _{AM} [mm]	Article number	
HM080B	Bosch	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	139	51	25-000452	
	Schneider	BSH1002, BSH1003, BMH1001, BMH1002, BMH1003	98	37	25-000442	
		BSH1004	100	51	25-000444	
		BSH1401, BSH1402, BMH1401, BMH1402	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, 1FK7984	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, AM8071K, AM8071R, AM8072T	138	56	25-000460
				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, 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, 1FK7984	138	56	25-000460	

12.1.3 Gear adapter plate AG for HM-B linear axis

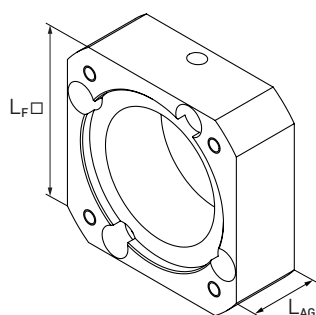


Fig. 12.7 Gear adapter plate AG for HM-B linear axis

Table 12.4 Gear adapter plate AG for HM-B linear axis

Linear axis	Gear box type ²⁾	L _F [mm]	L _{AG} [mm]	Article number
HM040B	PLE040 ¹⁾	50	22.0	25-000735
HM040B	PLQE60	70	32.0	25-000387
HM060B	PLQE60	72	26.5	25-000388
HM060B	PLQE80	90	36.5	25-000389
HM080B	PLQE80	90	34.0	25-000390
HM080B	PLQE120	115	46.5	25-000391
HM120B	PLQE120	115	43.0	25-000392

¹⁾ Adapter consists of two parts

²⁾ PLE and PLQE are registered trademarks of Neugart GmbH

12.1.4 Motor gear adapter plate GM for HM-B linear axis

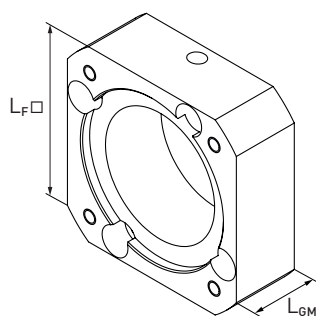


Fig. 12.8 Motor gear adapter plate GM for HM-B linear axis

Table 12.5 Motor gear adapter plate GM for HM-B linear axis

Gear box type ¹⁾	Manufacturer	Motors	L _F [mm]	L _{GM} [mm]	Article number
PLE 40	B&R	8LSA24, 8LSA25	60	18	25-000481
	Beckhoff	AM8022D, AM8022E, AM8023E, AM8023F	60	15	25-000478
	Bosch	MSK030B, MSK030C	60	15	25-000480
	HIWIN	FRLS100W	40	19	25-000479
	Schneider	BSH0551, BSH0552, BSH0553	60	15	25-000478
	SEW	CMP40S, CMP40M	60	15	25-000480
	Siemens	1FK7022	60	15	25-000478

¹⁾ PLE and PLQE are registered trademarks of Neugart GmbH

Appendix 1: Accessories and spare parts

Table 12.5 Motor gear adapter plate GM for HM-B linear axis (continuation)

Gear box 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	25-000482
	Bosch	MSK040B, MSK040C, MSK043C	80	23.1	25-000489
		MSK030B, MSK030C	60	16.0	25-000488
	HIWIN	FRLS200W, FRLS400W	60	23.1	25-000486
	Lenze	MCS06F41, MCS06F60, MCS06I41, MCS06I60	70	16.1	25-000483
		MCS09D41, MCS09D60, MCS09F38, MCS09F60, MCS09H41, MCS09H60, MCS09L41, MCS09L51	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	25-000482
	SEW	CMP50S, CMP50M, CMP50L	70	16.1	25-000483
		CMP63S, CMP63M	90	23.1	25-000487
		CMP40S, CMP40M	60	16	25-000488
	Siemens	1FK7022	60	16	25-000482
1FK7022, 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
	HIWIN	FRLS200W, FRLS400W	80	21.2	25-000494
		FRMS750W	80	31.2	25-000495
	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

Table 12.5 Motor gear adapter plate GM for HM-B linear axis (continuation)

Gear box 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, MCS14P14	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

Appendix 1: Accessories and spare parts

12.1.5 Gear boxes

Gear box¹⁾ for the optimal transfer of motor torque to the toothed belt drive.

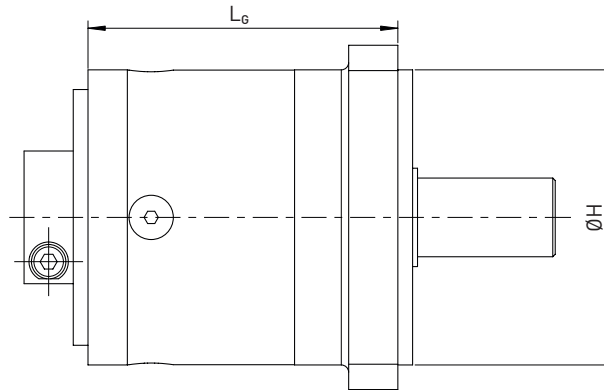


Fig. 12.9 Dimensional drawing of gear box

Table 12.6 Gear boxes for toothed belt axes HM-B

Linear axis	Ratio i	Ø H [mm]	L _G [mm]	Gear box type	Order code for gear ²⁾
HM040B	3	40	39	PLE40-3	G0403
	5	40	39	PLE40-5	G0405
	8	40	39	PLE40-8	G0408
	12	40	52	PLE40-12	G0412
HM040B HM060B	3	60	55	PLQE60-3	G0603
	5	60	55	PLQE60-5	G0605
	8	60	55	PLQE60-8	G0608
	12	60	67.5	PLQE60-12	G0612
HM060B HM080B	3	80	71.5	PLQE80-3	G0803
	5	80	71.5	PLQE80-5	G0805
	8	80	71.5	PLQE80-8	G0808
	12	80	89	PLQE80-12	G0812
HM080B HM120B	3	115	99	PLQE120-3	G1203
	5	115	99	PLQE120-5	G1205
	8	115	99	PLQE120-8	G1208
	12	115	127	PLQE120-12	G1212

¹⁾ Economy series PLE/PLQE from Neugart, registered trademarks of Neugart GmbH

²⁾ See order code on [Page 17](#)

12.1.6 Coupling components for linear axis HM-B

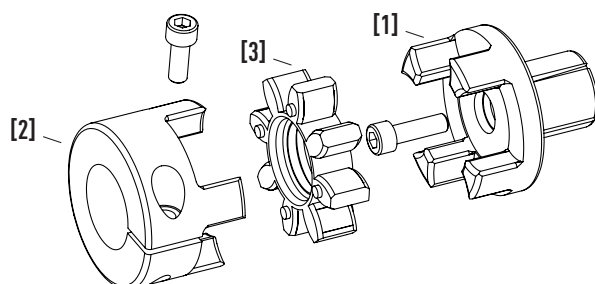


Fig. 12.10 Coupling components for linear axis HM-B

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

12.1.6.1 Expansion hub

Coupling element to axis side.

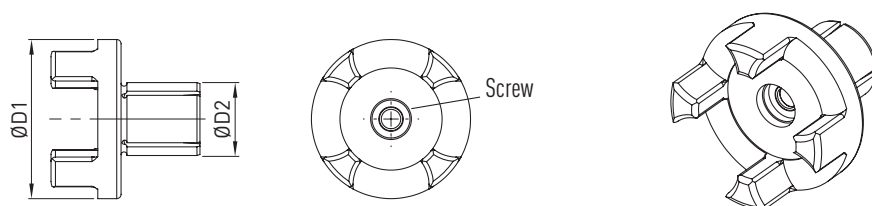


Fig. 12.11 Expansion hub for linear axis HM-B

Table 12.7 Article numbers and dimensions for expansion hub

Linear axis	Ø D1 [mm]	Ø D2 [mm]	Thread size × length	Screw tightening torque [Nm]	Inertia torque [kg mm ²]	Friction grip torque [Nm]	Article number
HM040B	29.5	14	M5 × 18	8	1.8	25	25-000819
HM060B	39.5	20	M6 × 20	10	9.0	38	25-000199
HM080B	54.5	25	M8 × 30	25	35.6	91	25-000200
HM120B	64.5	35	M10 × 35	49	77.0	201	25-000201

12.1.6.2 Elastomer insert

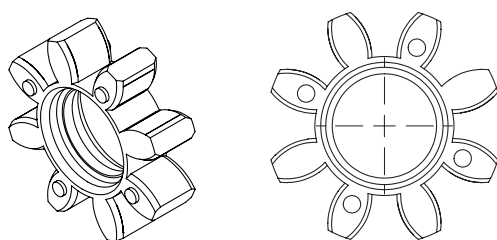


Fig. 12.12 Elastomer insert for linear axis HM-B

Appendix 1: Accessories and spare parts

Table 12.8 Article number for elastomer insert

Linear axis	Article number
HM040B	25-000203
HM060B	25-000204
HM080B	25-000205
HM120B	25-000206

12.1.6.3 Clamping hub

Coupling element to motor side.

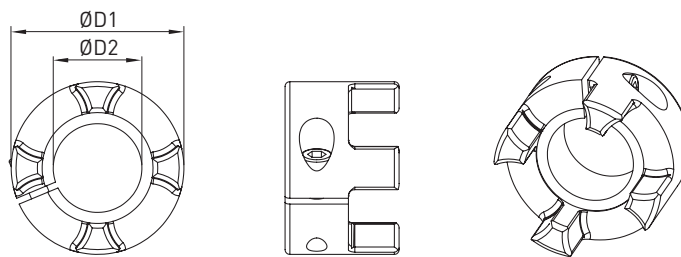


Fig. 12.13 Clamping hub for linear axis HM-B

Table 12.9 Article numbers and specifications for clamping hub

Linear axis	Ø D1 [mm]	Ø D2 H7 [mm]	Thread size × length	Screw tightening torque [Nm]	Friction grip torque [Nm]	Inertia torque [Nm]	Article number
HM040B	29.5	6.35	M4 × 12	5	11.1	2.58	25-000214
		8	M4 × 12	5	13.7	2.58	25-000215
		9	M4 × 12	5	15.2	2.57	25-000182
		10	M4 × 12	5	16.6	2.56	25-000183
		11	M4 × 12	5	18.1	2.56	25-000184
		12	M4 × 12	5	19.5	2.54	25-000216
		14	M4 × 12	5	22.2	2.50	25-000185
		16	M4 × 12	5	24.8	2.43	25-000229
HM060B	40	9	M6 × 16	14	36.4	15.33	25-000217
		10	M6 × 16	14	40.5	15.29	25-000218
		11	M6 × 16	14	44.1	15.27	25-000186
		12	M6 × 16	14	47.7	15.24	25-000187
		14	M6 × 16	14	54.5	15.16	25-000188
		16	M6 × 16	14	62.3	15.07	25-000219
		19	M6 × 16	14	70.8	14.76	25-000189
		20	M6 × 16	14	73.9	14.63	25-000220
HM080B	55	24	M6 × 16	14	62	13.76	25-000221
		14	M6 × 20	14	57.6	59.82	25-000190
		19	M6 × 20	14	75.4	59.33	25-000191
		20	M6 × 20	14	78.8	59.17	25-000192
		24	M6 × 20	14	92.1	58.26	25-000193
		25	M6 × 20	14	95.3	57.94	25-000222
		28	M6 × 20	14	106.7	56.71	25-000223
	32	M6 × 20	14	117.1	54.40	25-000224	

Table 12.9 Article numbers and specifications for clamping hub (continuation)

Linear axis	Ø D1 [mm]	Ø D2 H7 [mm]	Thread size × length	Screw tightening torque [Nm]	Friction grip torque [Nm]	Inertia torque [Nm]	Article number
HM120B	65	19	M8 × 25	35	151.9	127.40	25-000194
		20	M8 × 25	35	158.9	127.24	25-000225
		24	M8 × 25	35	186.1	125.94	25-000195
		25	M8 × 25	35	192.7	125.94	25-000196
		28	M8 × 25	35	215.8	124.70	25-000226
		32	M8 × 25	35	237.2	122.23	25-000197
		35	M8 × 25	35	259.4	119.67	25-000227
		38	M8 × 25	35	237.4	116.34	25-000228

12.2 Motor adapter of the HM-B linear axis

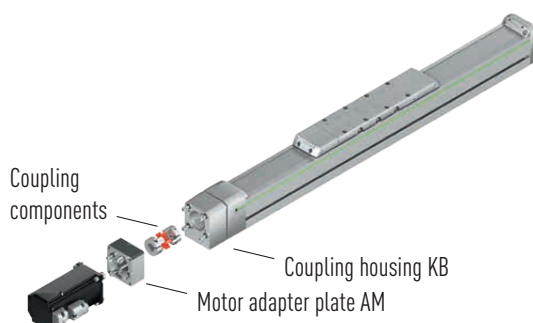
The adapter on the axis is a two-part structure that simplifies the flange connections of all possible motors.

The flange type set consists of the following parts:

- Coupling housing KB
- Coupling components
- Motor adapter plate AM or belt drive RT

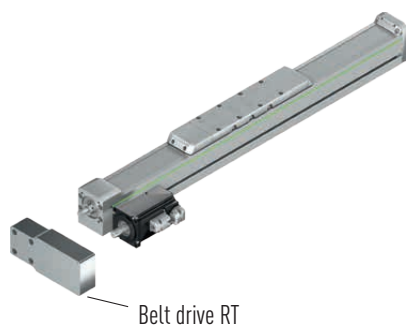
The following sections list the dimensions for the coupling housing, motor adapter plate, and belt drive.

Motor adapter of the linear axis with ballscrew (HM-S)



Motor adapter plate AM: Axis-motor adapter

Fig. 12.14 Motor adapter of linear axis HM-S



Belt drive RT: For deflecting the drive through 180°

Fig. 12.15 Motor adapter of linear axis HM-S with belt drive

Table 12.10 Order code for flange type³⁾ – HM-S linear axis

Drive manufacturer/type		HM040S	HM060S	HM080S	HM120S
		Motor only	Motor only	Motor only	Motor only
HIWIN	FRLS10	HW01 ¹⁾			
	FRLS20	HW02 ¹⁾	HW03 ¹⁾	HW05 ¹⁾	
	FRLS40		HW03 ¹⁾	HW05 ¹⁾	
	FRMS75			HW06 ¹⁾	HW08 ¹⁾
B&R	8LSA24	BR01 ¹⁾	BR02 ¹⁾		
	8LSA25	BR01 ¹⁾	BR02 ¹⁾		
	8LSA33		BR03 ²⁾	BR04 ²⁾	
	8LSA34		BR03 ²⁾	BR04 ²⁾	
	8LSA35		BR03 ²⁾	BR04 ²⁾	
	8LSA43			BR05 ²⁾	BR10 ¹⁾
	8LSA44				BR10 ¹⁾
	8LSA45				BR10 ¹⁾
	8LSA46				BR10 ²⁾
	8LSA53				BR12 ²⁾
	8LSA54				BR12 ²⁾
	8LSA55				BR12 ²⁾
	8LSA56				BR11 ²⁾
	8LSN43				BR11 ²⁾
	8LSN44				BR11 ²⁾
	8LSN45				BR11 ²⁾
	8LSN54				BR12 ²⁾
8LSN55				BR12 ²⁾	
Beckhoff	AM8022		BE01 ¹⁾	BE04 ¹⁾	
	AM8023		BE01 ¹⁾	BE04 ¹⁾	
	AM8031		BE02 ²⁾	BE05 ¹⁾	
	AM8032			BE05 ¹⁾	BE09 ¹⁾
	AM8033			BE05 ¹⁾	BE09 ¹⁾
	AM8531		BE02 ²⁾	BE05 ¹⁾	BE09 ¹⁾
	AM8532			BE05 ¹⁾	BE09 ¹⁾
	AM8533			BE05 ¹⁾	BE09 ¹⁾
	AM8041			BE06 ²⁾	BE10 ¹⁾
	AM8042			BE06 ²⁾	BE10 ¹⁾
	AM8043				BE10 ¹⁾
	AM8541			BE06 ²⁾	BE10 ¹⁾
	AM8542			BE06 ²⁾	BE10 ¹⁾
	AM8543				BE10 ¹⁾
	AM8051			BE07 ²⁾	BE11 ¹⁾
	AM8052				BE11 ¹⁾
	AM8551			BE07 ²⁾	BE11 ¹⁾
AM8552				BE11 ¹⁾	
AM8061				BE12 ²⁾	
AM8561				BE12 ²⁾	
Bosch	MSK030B	B001 ¹⁾	B002 ¹⁾		
	MSK030C		B002 ¹⁾		
	MSK040B		B003 ²⁾	B005 ¹⁾	B010 ¹⁾

¹⁾ Possible belt drive V₁

²⁾ Possible belt drive V₂

³⁾ See order code on Page 20

Table 12.10 Order code for flange type³⁾ – HM-S linear axis (continuation)

Drive manufacturer/type		HM040S	HM060S	HM080S	HM120S
		Motor only	Motor only	Motor only	Motor only
Bosch	MSK040C		B003 ²⁾	B005 ¹⁾	B010 ¹⁾
	MSK043C			B005 ¹⁾	B010 ¹⁾
	MSK050B			B006 ²⁾	B011 ¹⁾
	MSK050C			B006 ²⁾	B011 ¹⁾
	MSK060B			B008 ²⁾	B013 ²⁾
	MSK060C				B013 ²⁾
	MSK061B			B007 ²⁾	B012 ²⁾
	MSK061C				B012 ²⁾
	MSK070C				B015 ²⁾
	MSK071C				B015 ²⁾
	MSK075C				B015 ²⁾
	MSK075C				B014 ²⁾
	Lenze	MCS06F		LE01 ²⁾	LE04 ¹⁾
MCS06I			LE01 ²⁾	LE04 ¹⁾	
MCS09D			LE02 ²⁾	LE05 ²⁾	LE08 ¹⁾
MCS09F				LE05 ²⁾	LE08 ¹⁾
MCS09H					LE08 ¹⁾
MCS09L					LE08 ¹⁾
MCS12D				LE06 ²⁾	LE09 ²⁾
MCS12H					LE09 ²⁾
MCS14D					LE10 ²⁾
Schneider	BSH0551	SE01 ¹⁾	SE02 ¹⁾		
	BSH0552	SE01 ¹⁾	SE02 ¹⁾		
	BSH0701		SE03 ²⁾	SE07 ¹⁾	
	BSH0702		SE03 ²⁾	SE07 ¹⁾	
	BSH0703			SE08 ¹⁾	
	BSH1001			SE09 ²⁾	SE13 ¹⁾
	BSH1002				SE13 ¹⁾
	BSH1003				SE13 ¹⁾
	BSH1004				SE14 ¹⁾
	BSH1401				SE15 ²⁾
	BMH0701		SE03 ²⁾	SE07 ¹⁾	
	BMH0702		SE03 ²⁾	SE07 ¹⁾	
	BMH0703			SE08 ¹⁾	SE12 ¹⁾
	BMH1001			SE09 ²⁾	SE13 ¹⁾
	BMH1002			SE09 ²⁾	SE13 ¹⁾
	BMH1003				SE13 ¹⁾
BMH1401				SE15 ²⁾	
SEW	CMP40S	SW01 ¹⁾	SW02 ¹⁾	SW06 ¹⁾	
	CMP40M		SW02 ¹⁾	SW06 ¹⁾	
	CMP50S		SW03 ²⁾	SW07 ¹⁾	
	CMP50M			SW07 ¹⁾	SW11 ¹⁾
	CMP50L			SW07 ¹⁾	SW11 ¹⁾
	CMP63S			SW08 ²⁾	SW12 ¹⁾
	CMP63M				SW12 ¹⁾

¹⁾ Possible belt drive V₁

²⁾ Possible belt drive V₂

³⁾ See order code on [Page 20](#)

Appendix 1: Accessories and spare parts

Table 12.10 Order code for flange type³⁾ – HM-S linear axis (continuation)

Drive manufacturer/type		HM040S	HM060S	HM080S	HM120S
		Motor only	Motor only	Motor only	Motor only
SEW	CMP63L				SW12 ¹⁾
	CMP71S				SW13 ²⁾
	CMP71M				SW13 ²⁾
	CMP71L				SW13 ²⁾
	CMP80S				SW14 ²⁾
	CMPZ71S				SW13 ²⁾
	CMPZ71M				SW13 ²⁾
	CMPZ71L				SW13 ²⁾
	CMPZ80S				SW14 ²⁾
Siemens	1FK7022	SM01 ¹⁾	SM02 ¹⁾		
	1FK7032		SM03 ²⁾	SM04 ¹⁾	
	1FK7034		SM03 ²⁾	SM04 ¹⁾	
	1FK7040			SM05 ²⁾	SM08 ¹⁾
	1FK7042			SM05 ²⁾	SM08 ¹⁾
	1FK7060				SM09 ²⁾
	1FK7062				SM09 ²⁾
	1FK7063				SM09 ²⁾
	1FK7080				SM10 ²⁾
	1FK7081				SM10 ²⁾
	1FK7083				SM10 ²⁾

¹⁾ Possible belt drive V₁

²⁾ Possible belt drive V₂

³⁾ See order code on [Page 20](#)

The overall length of the spindle axis depends on the following factors:

- Adapter materials (coupling housing KS, motor adapter plate AM)
- Belt drive RT
- Motor

HM-S linear axis without belt drive

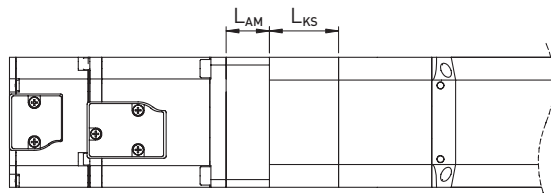


Fig. 12.16 **HM-S linear axis motor connection without belt drive**

L_{KS} Length of coupling housing, see [Table 12.11](#)

L_{AM} Motor adapter plate length, see [Table 12.12](#)

HM-S linear axis with belt drive

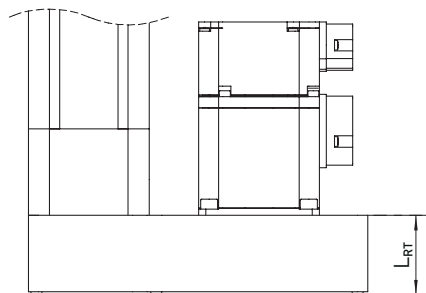


Fig. 12.17 **HM-S linear axis motor connection with belt drive**

L_{RT} Belt drive length, see [Table 12.13](#)

12.2.1 Coupling housing KS for HM-S linear axis

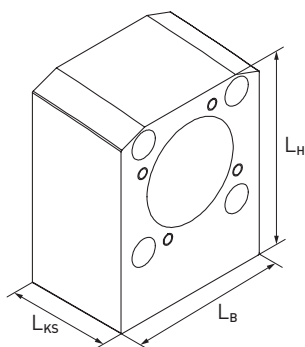


Fig. 12.18 Coupling housing KS for HM-S linear axis

Table 12.11 Dimensions of coupling housing KS for HM-S linear axis

Coupling housing for	L _B [mm]	L _H [mm]	L _{KS} [mm]	Article number
HMD40S	39.6	57.6	34	25-000305
HMD60S	59.6	75.0	32	25-000306
HMD80S	79.6	95.5	41	25-000307
HM120S	119.6	141.9	50	25-000308

12.2.2 Motor adapter plate AM for HM-S linear axis

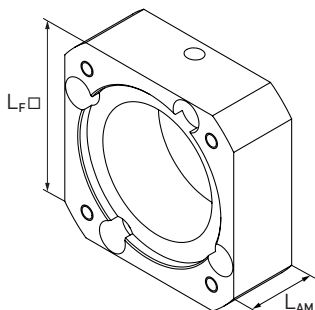


Fig. 12.19 Motor adapter plate AM for HM-S linear axis

Table 12.12 Motor adapter plate AM for HM-S linear axis

Linear axis	Manufacturer	Motors	L _F [mm]	L _{AM} [mm]	Article number
HMD40S	B&R	8LSA24, 8LSA25	58	24.5	25-000397
	Bosch	MSK030B	54	20.5	25-000395
	HIWIN	FRLS100W	42	24.5	25-000393
		FRLS200W	60	30.0	25-000398
	Schneider	BSH0551, BSH0552	55	20.5	25-000396
	SEW	CMP40S	54	20.5	25-000395
	Siemens	1FK7022	55	20.5	25-000396
HMD60S	B&R	8LSA24, 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	70	31	25-000407

Table 12.12 Motor adapter plate AM for HM-S linear axis (continuation)

Linear axis	Manufacturer	Motors	L _F [mm]	L _{AM} [mm]	Article number
HM060S	Bosch	MSK030B, MSK030C	54	22	25-000401
		MSK040B, MSK040C	82	31	25-000405
	HIWIN	FRLS200W, FRLS 400W	60	31	25-000404
	Lenze	MCS06F41, MCS06F60, MCS06I41, MCS06I60	62	25	25-000406
		MCS09D41, MCS09D60	82	31	25-000411
	Schneider	BSH0551, BSH0552	55	22	25-000402
		BSH0701, BSH0702, BMH0701, BMH0702	62	25	25-000406
	SEW	CMP40S, CMP40M	54	22	25-000401
		CMP50S	62	25	25-000406
	Siemens	1FK7022	55	22	25-000402
		1FK7032, 1FK7034	72	31	25-000408
	HM080S	B&R	8LSA33, 8LSA34, 8LSA35	86	27
8LSA43			100	37	25-000426
Beckhoff		AM8022D, AM8022E, AM8023E, AM8023F	72	21	25-000413
		AM8031D, AM8031F, AM8032D, AM8032E, AM8032H, AM8033E, AM8033F, AM8033J, AM8531D, AM8531F, AM8532D, AM8532E, AM8532H, AM8533E, AM8533F, AM8533J	70	27	25-000418
		AM8041D, AM8041E, AM8041H, AM8042E, AM8042F, AM8042J, AM8541D, AM8541E, AM8541H, AM8542E, AM8542F, AM8542J,	87	37	25-000424
		AM8051E, AM8051G, AM8051K, AM8551E, AM8551G, Am8551K	104	47	25-000427
Bosch		MSK040B, MSK040C, MSK043C	82	27	25-000415
		MSK050B, MSK050C	98	37	25-000425
		MSK061B	116	37	25-000428
		MSK060B	116	47	25-000429
HIWIN		FRLS200W, FRLS400W	72	27	25-000414
		FRMS750W	80	37	25-000421
Lenze		MCS06F41, MCS06F60, MCS06I41, MCS06I60	72	21	25-000417
		MCS09D41, MCS09D60, MCS09F38, MCS09F60	86	27	25-000423
		MCS12D20, MCS12D41	116	37	25-000430
Schneider		BSH0701, BSH0702, BMH0701, BMH0702	72	21	25-000417
		BSH0703, BMH0703	70	27	25-000418
		BSH1001, BMH1001, BMH1002, BMH1003	98	37	25-000425
SEW		CMP40M	72	21	25-000412
		CMP63S	86	27	25-000423
		CMP50S, CMP50M, CMP50L	72	21	25-000417
Siemens		1FK7032, 1FK7034	72	27	25-000419
		1KF7040, 1KF7042	87	37	25-000424
		1FK7060	116	47	25-000431
HM120S	B&R	8LSA43, 8LSA44, 8LSA45, 8LSA46	100	37	25-000443
		8LSN43, 8LSN44, 8LSN45, 8LSN46	116	37	25-000447
		8LSA53, 8LSA54, 8LSA55, 8LSN54, 8LSN55	142	51	25-000454
	Beckhoff	AM8032D, AM8032E, AM8032H, AM8033E, AM8033F, AM8033J, AM8531D, AM8531F, AM8532D, AM8532E, AM8532H, AM8533E, AM8533F, AM8533J	73	27	25-000436

Appendix 1: Accessories and spare parts

Table 12.12 Motor adapter plate AM for HM-S linear axis (continuation)

Linear axis	Manufacturer	Motors	L _F [mm]	L _{AM} [mm]	Article number
HM120S	Beckhoff	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, AM8551E, AM8551G, Am8551K, AM8552F, AM8552J, AM8552L	100	51	25-000444
		AM8061G, AM8061J, AM8061M, AM8561G, AM8561J, AM8561M	138	56	25-000453
	Bosch	MSK040B, MSK040C, MSK043C	82	27	25-000433
		MSK050B, MSK050C	98	37	25-000442
		MSK061B, MSK061C	116	37	25-000445
		MSK060B, MSK060C	116	51	25-000446
		MSK70C, MSK71C, MSK75C	138	56	25-000453
		MSK076C	139	51	25-000451
	HIWIN	FRMS750W	80	37	25-000438
	Lenze	MCS09D41, MCS09D60, MCS09F38, MCS09F60, MCS09H41, MCS09H60, MCS09L41, MCS09L51	86	27	25-000440
		MCS12D20, MCS12D41, MCS12H15, MCS12H35	116	37	25-000447
		MCS14D15, MCS14D36	139	51	25-000452
	Schneider	BMH0703	73	27	25-000436
		BSH1001, BSH1002, BSH1003, BMH1001, BMH1002, BMH1003	98	37	25-000442
		BSH1004	100	51	25-000444
		BSH1401, BMH1401	139	51	25-000452
	SEW	CMP50L	73	20	25-000435
		CMP63S, CMP63M, CMP63L	86	27	25-000440
		CMP71S, CMP71M, CMP71L, CMPZ71S, CMPZ71M, CMPZ71L	116	51	25-000448
		CMP80S, CMPZ80S	138	56	25-000453
	Siemens	1FK7040, 1FK7042	87	37	25-000441
		1FK7060, 1FK7062, 1FK7063	116	51	25-000448
		1FK7080, 1FK7081, 1FK7083	138	56	25-000453

12.2.3 Belt drive RT for HM-S linear axis

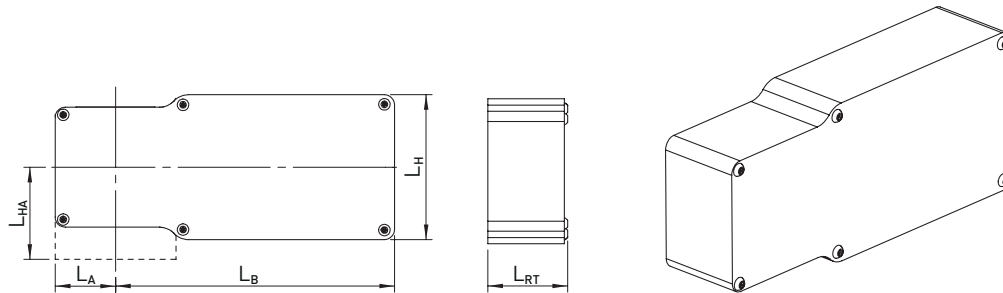


Fig. 12.20 Belt drive for HM-S linear axis

Table 12.13 Belt drive specifications

Linear axis	Type ¹⁾	L _H	L _B	L _{RT}	L _A	L _{HA}	Ratio
HM040S	V ₁	72	138.5	40	30	36.25	1
HM060S	V ₁	72	138.5	40	30	45.80	1
	V ₂	102	168.5	40	30	45.80	1
HM080S	V ₁	102	197.0	51	39	61.40	1
	V ₂	131	226.0	61	39	61.40	1
HM120S	V ₁	175	248.5	63	55	89.00	1
	V ₂	175	288.0	73	55	89.00	1

¹⁾ The required type can be found in [Table 12.10](#)

Please bear in mind that the belt drive projects over the lower axis edge when:

$$\frac{L_H}{2} > L_{HA}$$

NOTE

Please bear in mind that the belt drive may project over the side of the axis when:

$$L_A > \frac{\text{Profile width (axis)}}{2}$$

NOTE

Appendix 1: Accessories and spare parts

12.2.4 Coupling components for linear axis HM-S

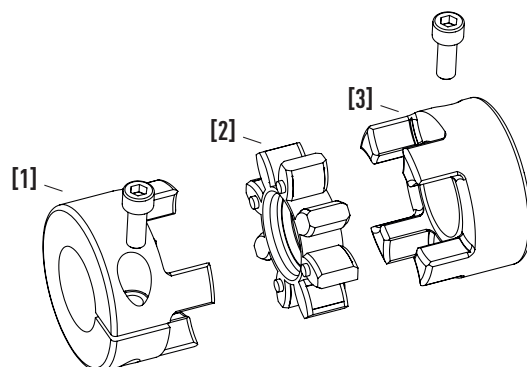


Fig. 12.21 Coupling components for linear axis HM-S

- Clamping hub for axis side [1]
- Elastomer insert [2]
- Clamping hub for motor side [3]

12.2.4.1 Clamping hub

Motor- and axis-side coupling element.

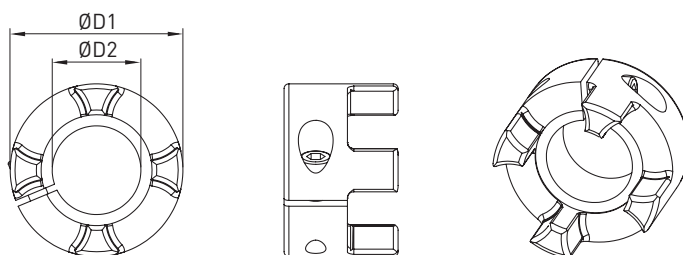


Fig. 12.22 Clamping hub for linear axis HM-S

Table 12.14 Article numbers and specifications for clamping hub

Linear axis	Ø D1 [mm]	Ø D2 H7 [mm]	Thread size × length	Screw tightening torque [Nm]	Friction grip torque [Nm]	Inertia torque [Nm]	Article number
HM040S	25.0	6.35	M3 × 12	1.9	6.6	1.55	25-000211
		8	M3 × 12	1.9	8.2	1.55	25-000178
		9	M3 × 12	1.9	9.0	1.54	25-000179
		10	M3 × 12	1.9	9.9	1.53	25-000213
		11	M3 × 12	1.9	11.0	1.52	25-000180
		12	M3 × 12	1.9	11.6	1.50	25-000212
		14	M3 × 12	1.9	14.1	1.46	25-000181
HM060S	29.5	6.35	M4 × 12	5	11.1	2.58	25-000214
		8	M4 × 12	5	13.7	2.58	25-000215
		9	M4 × 12	5	15.2	2.57	25-000182
		10	M4 × 12	5	16.6	2.56	25-000183
		11	M4 × 12	5	18.1	2.56	25-000184
		12	M4 × 12	5	19.5	2.54	25-000216
		14	M4 × 12	5	22.2	2.50	25-000185
		16	M4 × 12	5	24.8	2.43	25-000229

Table 12.14 Article numbers and specifications for clamping hub (clamping hub)

Linear axis	Ø D1 [mm]	Ø D2 H7 [mm]	Thread size × length	Screw tightening torque [Nm]	Friction grip torque [Nm]	Inertia torque [Nm]	Article number
HM080S	40	9	M6 × 16	14	36.4	15.33	25-000217
		10	M6 × 16	14	40.5	15.29	25-000218
		11	M6 × 16	14	44.1	15.27	25-000186
		12	M6 × 16	14	47.7	15.24	25-000187
		14	M6 × 16	14	54.5	15.16	25-000188
		16	M6 × 16	14	62.3	15.07	25-000219
		19	M6 × 16	14	70.8	14.76	25-000189
		20	M6 × 16	14	73.9	14.63	25-000220
		24	M6 × 16	14	62	13.76	25-000221
HM120S	55	14	M6 × 20	14	57.6	59.82	25-000190
		19	M6 × 20	14	75.4	59.33	25-000191
		20	M6 × 20	14	78.8	59.17	25-000192
		24	M6 × 20	14	92.1	58.26	25-000193
		25	M6 × 20	14	95.3	57.94	25-000222
		28	M6 × 20	14	106.7	56.71	25-000223
		32	M6 × 20	14	117.1	54.40	25-000224

12.2.4.2 Elastomer insert

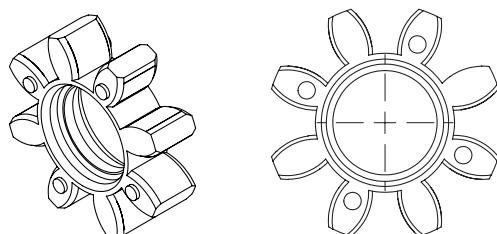


Fig. 12.23 Elastomer insert for linear axis HM-S

Table 12.15 Article number for elastomer insert

Linear axis	Article number
HM040S	25-000202
HM060S	25-000203
HM080S	25-000204
HM120S	25-000205

Appendix 1: Accessories and spare parts

12.3 Clamping profiles

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. Sets are available with four clamping profiles.

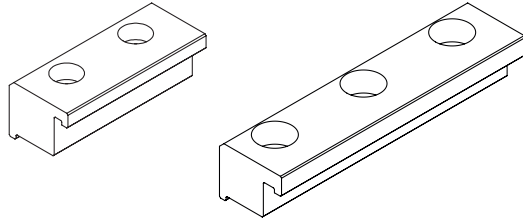


Fig. 12.24 Short and long clamping profiles

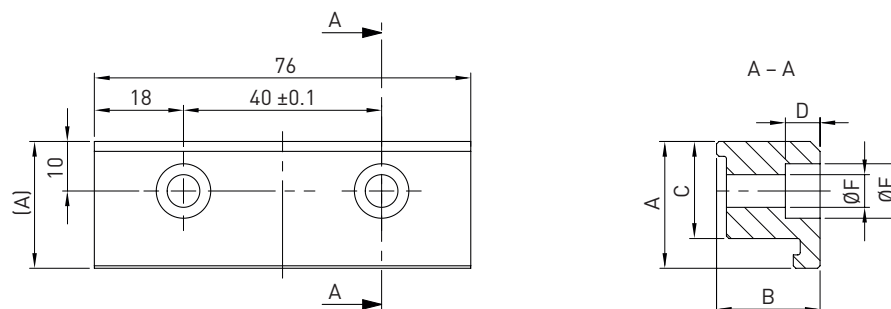


Fig. 12.25 Dimensional drawing of short clamping profile

Table 12.16 Article numbers and dimensions for short clamping profiles

Suitable for linear axis HM-B/HM-S	A	B	C	D	ØE	ØF	Suitable screw	Article number, 4 pcs.
040	18.0	10.5	14.1	6.0	10	5.5	DIN 912 M5	25-000517
060	25.6	20.9	19.6	9.5	11	6.6	DIN 912 M6	25-000518
080¹⁾/120	28.0	22.0	19.8	8.0	15	9.0	DIN 912 M8	25-000519

¹⁾ Standard

Unit: mm

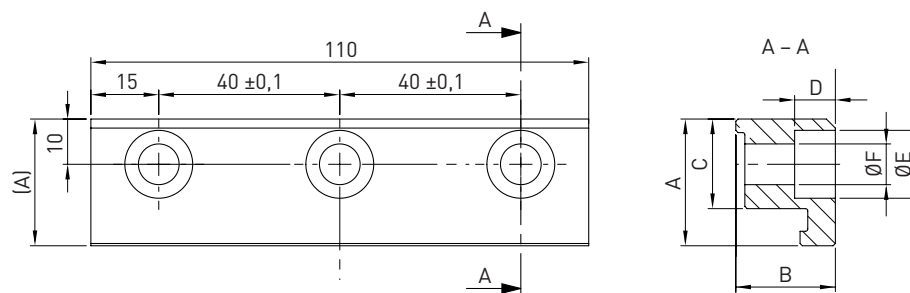


Fig. 12.26 Dimensional drawing of long clamping profile

Table 12.17 Article numbers and dimensions for long clamping profiles

Suitable for linear axis HM-B/HM-S	A	B	C	D	ØE	ØF	Suitable screw	Article number, 4 pcs.
080/120¹⁾	28.0	22.0	19.8	8.0	15.0	9.0	DIN 912 M8	25-000520

¹⁾ Standard

Unit: mm

12.4 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. Sets are available with ten T nuts.

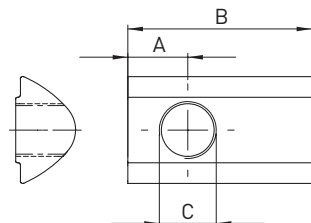


Fig. 12.27 Dimensional drawing of T nut

Table 12.18 Article numbers and dimensions for T nuts

Suitable for linear axis HM-B/HM-S	A	B	C	Article number, 10 pcs.
040	3.0	11.5	M4	20-000528
040	4.0	11.5	M5	20-000529
060	4.5	17.0	M5	20-000530
060	5.5	17.0	M6	20-000531
080/120	7.5	23.0	M5	20-000532
080/120	7.5	23.0	M6	20-000533
080/120	7.5	23.0	M8	20-000534

Unit: mm

12.5 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.

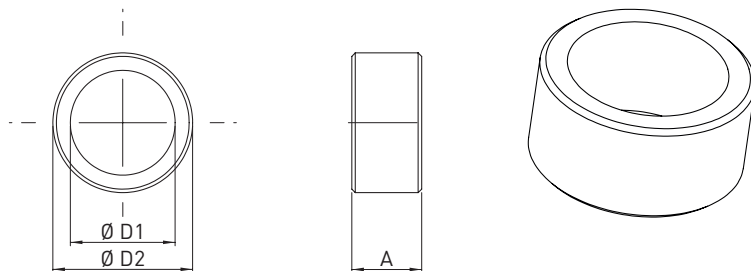


Fig. 12.28 Dimensional drawing of centring sleeve

Table 12.19 Article numbers and dimensions for centring sleeves

Suitable for linear axis HM-B/HM-S	A	Ø D1	Ø D2	Article number, 10 pcs.
040	4	5.5	8 h6	25-000510
060	4	6.5	8 h6	25-000511
080	4	9.0	12 h6	25-000512
120	4	11.0	15 h6	25-000513

Unit: mm

Appendix 1: Accessories and spare parts

12.6 Groove cover

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

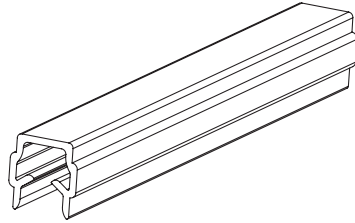


Fig. 12.29 Groove cover for linear axes HM-B/HM-S

Table 12.20 Article numbers for groove covers

Linear axis HMB/HMS	Article number, 5 pcs.
040	25-000514
060	25-000515
080/120	25-000516

12.7 Limit switch

The inductive proximity switch is available in either a normally closed or a normally open version. The switch can be secured directly inside the switch profile groove using the fasteners supplied. The limit switch is supplied as standard with plug or open cable end.

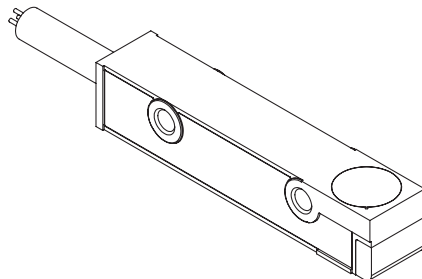


Fig. 12.30 Limit switch for linear axes HM-B/HM-S

Table 12.21 Limit switch options

Option	Article number
Limit switch with 100 mm cable, plug (NC)	25-000786
Limit switch with 4 m cable (NC)	25-000787
Limit switch with 5 m cable (NO)	25-000788

NOTE

For more information see Section 5.4.

12.7.1 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.

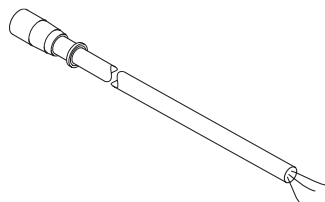


Fig. 12.31 Extension cable for limit switch

Table 12.22 Extension cable for limit switch

Length [m]	Article number
3	8-10-0275
5	8-10-0276
7	8-10-0277
10	8-10-0278
15	8-10-0279

12.8 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 incl. fasteners.

Article number: 25-000785

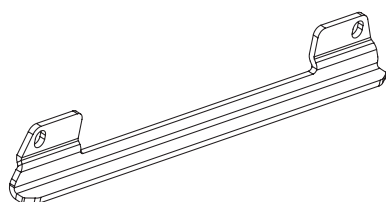


Fig. 12.32 Damping element for linear axes HM-B/HM-S

12.9 Positioning measurement system HIWIN MAGIC

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

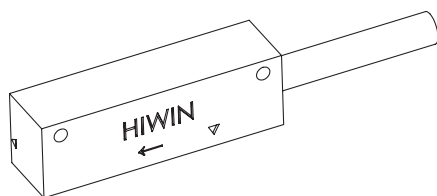


Fig. 12.33 HIWIN MAGIC encoder

Table 12.23 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 [5.5](#)

Appendix 1: Accessories and spare parts

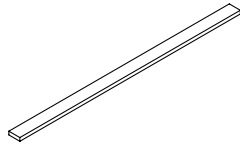


Fig. 12.34 HIWIN MAGIC magnetic scale

Table 12.24 MAGIC magnetic scale

Magnetic scale	Order code
MAGIC magnetic scale	MAGIC-PS-B-XXXX ¹⁾

¹⁾ XXXX = Length [mm]

12.10 Cover strip

The steel cover strip is available in lengths of 3 m and 6 m.

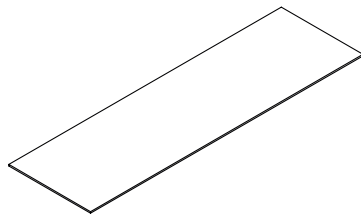


Fig. 12.35 Cover strip

Table 12.25 Article numbers for cover strip

Cover strip suitable for linear axis	Article number (3 m)	Article number (6 m)
HM040B/HM040S	25-000535	25-000536
HM060B/HM060S	25-000537	25-000538
HM080B/HM080S	25-000539	25-000540
HM120B/HM120S	25-000541	25-000542

12.11 Magnetic strip

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

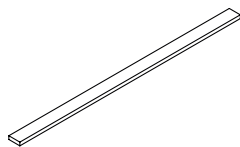


Fig. 12.36 Magnetic strip

Table 12.26 Article numbers for magnetic strip

Magnetic strip suitable for linear axis	Article number (7.5 m)
HM040B/HM040S	25-000168
HM060B/HM060S	25-000543
HM080B/HM080S	25-000543
HM120B/HM120S	25-000543

12.12 Belt deflection

The belt deflection set consists of the following parts:

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

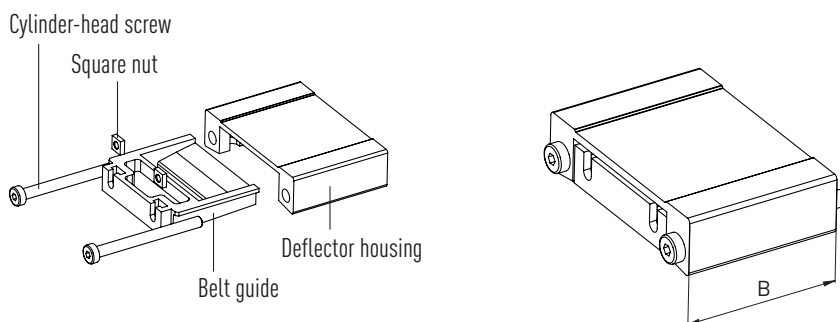


Fig. 12.37 **Belt deflection dimensions**

Table 12.27 **Belt deflection set article numbers**

Belt deflection set for linear axis	B [mm]	Cylinder-head screw	Square nut	Article number
HM040B/HM040S	40	DIN 7984 M4 × 30	—	25-000618
HM060B/HM060S	40	DIN 7984 M4 × 45	DIN 562 M3	25-000619
HM080B/HM080S	45	DIN 7984 M5 × 45	DIN 562 M3	25-000620
HM120B/HM120S	60	DIN 912 M5 × 45	DIN 562 M4	25-000621

12.13 Buffer stop

The buffer stop serves as a mechanical limit.

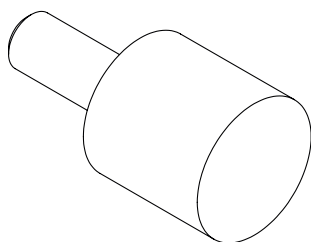


Fig. 12.38 **Buffer stop**

Table 12.28 **Article numbers for buffer stop**

Buffer stop for linear axis	Article number
HM040B/HM040S	25-000055
HM060B/HM060S	25-000056
HM080B/HM080S	25-000057
HM120S	25-000058
HM120B	25-000059

Appendix 1: Accessories and spare parts

12.14 Separators for energy chain

Separators 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.

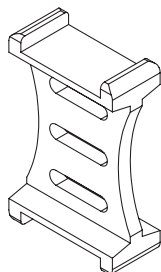


Table 12.29 Article numbers for separators

Separators suitable for linear axis		Article number, 20 pcs.
X-axis	Y-axis	
HS21	HS21, HS22, HS23	8-05-0336
HS22, HS23	—	8-05-0337

12.15 Journal for HM-B linear axis

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.

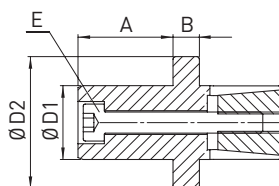
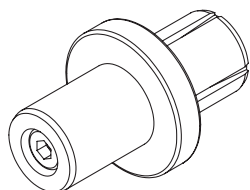


Fig. 12.39 Journal dimensions

Table 12.30 Article numbers and dimensions for journal

Linear axis	A [mm]	B [mm]	E	Ø D1 [mm]	Ø D2 [mm]	Screw tightening torque [Nm]	Mass inertia moment [kg mm ²]	Transferable torque (calculated) [Nm]	Article number
HM040B	18	5	ISO 4762 M4 × 30	14 h7	25 h9	4.5	1.21	17	25-000174
HM060B	22	8	ISO 4762 M6 × 45	20 h7	32 h9	10.0	5.37	36	25-000175
HM080B	30	8	ISO 4762 M8 × 55	25 h7	45 h9	25.0	17.70	81	25-000176
HM120B	30	10	ISO 4762 M10 × 60	32 h7	55 h9	55.0	55.70	213	25-000177

12.16 Toothed belt for linear axis HM-B

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

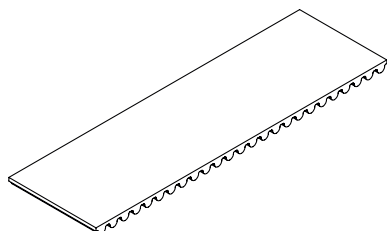


Fig. 12.40 Toothed belt

Table 12.31 Article numbers for toothed belt

Toothed belt suitable for linear axis	Article number standard (6 m)	Article number standard (12 m)
HM040B	25-000527	25-000528
HM060B	25-000529	25-000530
HM080B	25-000531	25-000532
HM120B	25-000533	25-000534

12.17 Drive unit for HM-B linear axis

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

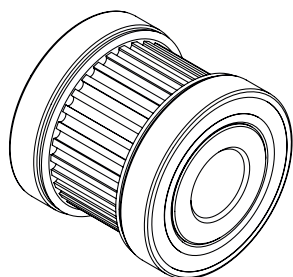


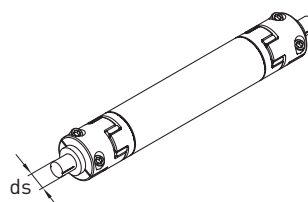
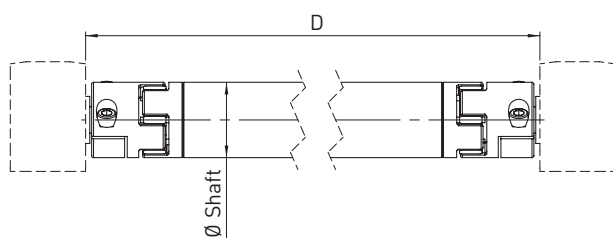
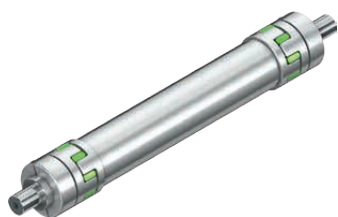
Fig. 12.41 Drive unit

Table 12.32 Article number for drive unit

Drive unit suitable for linear axis	Article number
HM040B	25-000115
HM060B	25-000116
HM080B	25-000117
HM120B	25-000118

12.18 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.



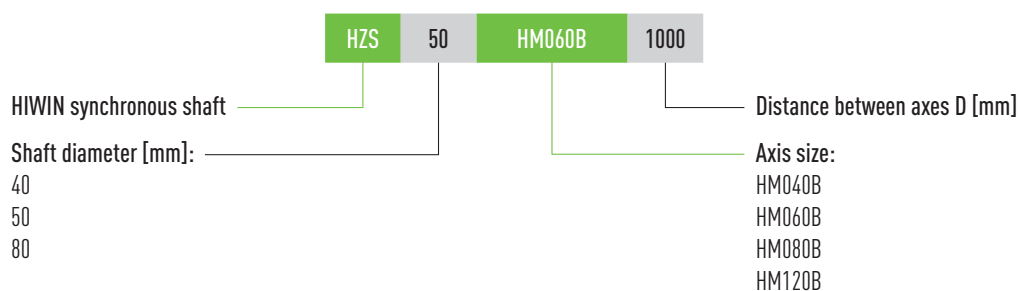
Appendix 1: Accessories and spare parts

Table 12.33 **Dimensions of synchronous shaft**

Suitable for double axis	D min.	D max.	Ø shaft	Ø ds
HD1/HM040B	160	1,500	40	14
HD2/HM060B	180	2,000	50	20
HD3/HM080B	180	2,400	50	25
HD4/HM120B	240	3,000	80	35

Unit: mm

12.18.1 Order code for synchronous shaft



12.18.2 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.

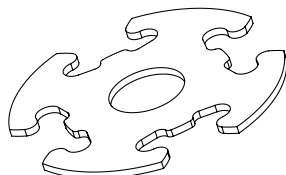


Table 12.34 **Article numbers for spacer**

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

12.19 HIWIN lubricants

Table 12.35 Recommended HIWIN grease

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

Table 12.36 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. 12.42)	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. 12.42 Grease gun GN-400C

12.20 HIWIN grease nipples

Grease nipples suitable for linear axes and linear axis systems (all sizes).



Fig. 12.43 Art.-no. 20-000325 (standard)



Fig. 12.44 Art.-no. 20-000538 (option)

13. Appendix 2: 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 2, D-77654 Offenburg

Documentation department: HIWIN GmbH, Brücklesbünd 2, D-77654 Offenburg

Description and identification of the partly completed machine:

Product: Linear axes and linear axis systems HX

Type: HM040..., HM060..., HM080..., HM120...

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

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

Year of manufacture: from 2016

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 (ISO 13732-1:2008)

EN ISO 12100:2010-11 Safety of machinery – General principles for design – Risk assessment and risk reduction (ISO 12100:2010)

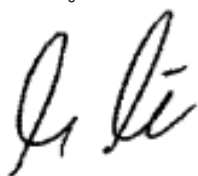
EN 60204-1:2006/AC:2010 Safety of machinery – Electrical equipment of machines – Part 1: General requirements

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, 01.06.2017



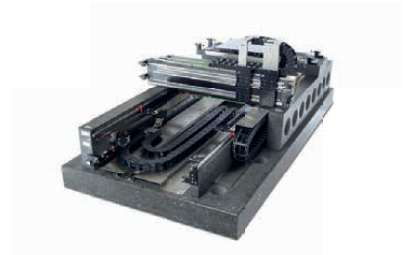
Werner Mäurer,
Managing Director



Linear Guideways



Ballscrews



Linear Motor Systems



Linear Axes



Linear Actuators



Robots



Linear Motor Components



Rotary Tables



Drives & Servo Motors

Germany

HIWIN GmbH
Brücklesbünd 2
D-77654 Offenburg
Phone +49 (0) 7 81 9 32 78 -0
Fax +49 (0) 7 81 9 32 78 -90
info@hiwin.de
www.hiwin.de

Taiwan

Headquarters
HIWIN Technologies Corp.
No. 7, Jingke Road
Taichung Precision Machinery Park
Taichung 40852, Taiwan
Phone +886-4-2359-4510
Fax +886-4-2359-4420
business@hiwin.tw
www.hiwin.tw

Taiwan

Headquarters
HIWIN Mikrosystem Corp.
No. 6, Jingke Central Road
Taichung Precision Machinery Park
Taichung 40852, Taiwan
Phone +886-4-2355-0110
Fax +886-4-2355-0123
business@hiwinmikro.tw
www.hiwinmikro.tw

France

HIWIN France s.a.r.l.
20 Rue du Vieux Bourg
F-61370 Echauffour
Phone +33 (2) 33 34 11 15
Fax +33 (2) 33 34 73 79
info@hiwin.fr
www.hiwin.fr

Italy

HIWIN Srl
Via Pitagora 4
I-20861 Brugherio (MB)
Phone +39 039 287 61 68
Fax +39 039 287 43 73
info@hiwin.it
www.hiwin.it

Poland

HIWIN GmbH
ul. Puławska 405a
PL-02-801 Warszawa
Phone +48 22 544 07 07
Fax +48 22 544 07 08
info@hiwin.pl
www.hiwin.pl

Switzerland

HIWIN Schweiz GmbH
Eichwiesstrasse 20
CH-8645 Jona
Phone +41 (0) 55 225 00 25
Fax +41 (0) 55 225 00 20
info@hiwin.ch
www.hiwin.ch

Slovakia

HIWIN s.r.o., o.z.z.o.
Mládežnícka 2101
SK-01701 Považská Bystrica
Phone +421 424 43 47 77
Fax +421 424 26 23 06
info@hiwin.sk
www.hiwin.sk

Czech Republic

HIWIN s.r.o.
Medkova 888/11
CZ-62700 BRNO
Phone +42 05 48 528 238
Fax +42 05 48 220 223
info@hiwin.cz
www.hiwin.cz

Netherlands

HIWIN GmbH
info@hiwin.nl
www.hiwin.nl

Austria

HIWIN GmbH
info@hiwin.at
www.hiwin.at

Slovenia

HIWIN GmbH
info@hiwin.si
www.hiwin.si

Hungary

HIWIN GmbH
info@hiwin.hu
www.hiwin.hu

China

HIWIN Corp.
www.hiwin.cn

Japan

HIWIN Corp.
mail@hiwin.co.jp
www.hiwin.co.jp

USA

HIWIN Corp.
info@hiwin.com
www.hiwin.com

Korea

HIWIN Corp.
www.hiwin.kr

Singapore

HIWIN Corp.
www.hiwin.sg