

HIWIN[®]

Motion Control & Systems



Positioning Systems

Linear Axes and Axis Systems HX

Positioning Systems

Linear axes and axis systems HX

Linear axes and axis systems are used in many industrial areas, e.g. to transport or position components. HIWIN offers linear axes with toothed belt drive for applications requiring high dynamic responses and speeds. The HIWIN modular system is a flexible solution for combining belt axes into twin and multi-axis systems, depending on the application. HIWIN linear axes with ballscrew are available for applications requiring high feed forces and precision.

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Linear axes and axis systems HX

Product overview

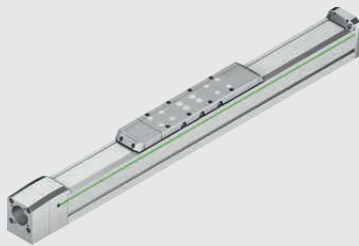
1. Product overview



Toothed belt axes HM-B

[Page 14](#)

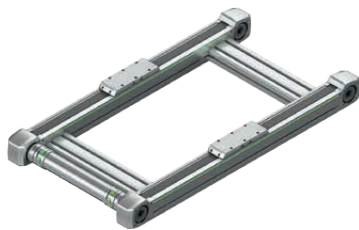
- High speed
- High acceleration
- Large stroke lengths



Spindle axes HM-S

[Page 24](#)

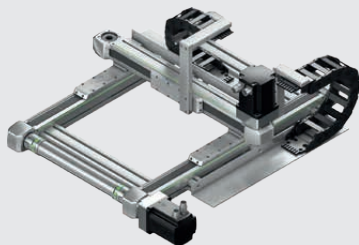
- High positioning accuracy
- High feed force
- High drive rigidity



Double axis HD

[Page 34](#)

- Two belt axes HM-B connected to synchronous shaft
- Fully assembled unit
- For custom assemblies



Two-axis system HS2

[Page 40](#)

- XY system with HM-B belt axes
- Individual stroke length
- Complete system ready for installation



Motor adapter for HM-B

[Page 48](#)

- Motor connection with and without gears
- Adapter
- Coupling assembly



Motor adapter for HM-S

[Page 61](#)

- Adapter for flexible motor connection
- Belt drive
- Coupling assembly



Accessories

[Page 70](#)

- Servo motors and servo drives
- Fasteners and adapters
- Lubricating accessories

Linear axes and axis systems HX

General information

2. General information

2.1 Properties of the linear axes HM

HIWIN linear axes HM are compact positioning systems that are available with toothed belt drive or ballscrew. They are based on a heavy duty, low wear linear guideway combined with a lightweight, robust aluminium profile. A stroke that can be adjusted in millimetre increments and a large number of options (e.g. steel cover strip, limit switches, positioning measurement system, and additional carriages in various sizes) mean that these axes can be adapted optimally to the application requirements.



Advantages of the linear axes HM

- Aluminium profile with generously sized grooves for stable linear axis connections to the machine frame
- Stable and reproducible securing of load capacities on carriages with threaded holes and additional counter bores with narrow tolerances
- Easy relubrication in all installation positions through grease nipples on both sides
- Limit switches can be fixed directly in a profile groove at any position
- Options available for the standard version, e.g. cover strip, flexible drive attachment, adapters for all conventional motor types, positioning measurement system

2.2 Properties of the double axis HD

HIWIN HD double axes are positioning modules featuring two HM-B series belt axes connected to each other via a synchronous shaft. The stroke and the distance between the two axes can be adjusted in millimetre steps. HIWIN double axes are ideal for applications requiring a wide bolting surface or an additional carriage for Y axis support. They are also ideal as a basis for multi-axis systems.



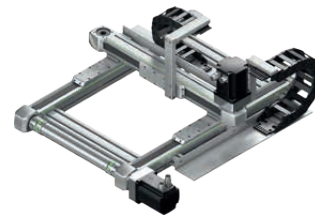
Advantages of the double axis HD

- Standardised units of flexible configuration for less design work
- Ready to install systems for less assembly work
- Options like cover strips, flexible drive attachments, adapters for all conventional motor types, and linear scales available as standard

2.3 Properties of the two-axis system HS2

HIWIN HS2 two-axis systems are flexible units for positioning along the X and Y axes. The X axis is based on a HIWIN HD double axis. The HIWIN HM-B belt axis safeguards dynamic positioning along the Y axis.

HIWIN two-axis systems are suitable for 2D handling tasks and can be easily supplemented with a Z axis for three-axis handling.



Advantages of the two-axis system HS2

- The stroke along both axes can be adjusted in millimetre steps
- Complete, ready to install systems for less assembly work
- Options include HIWIN drive and energy chains

2.4 Glossary

Typical load capacity

The typical load capacity enables the user to preselect the optimum axis size based on empirical values, also regarding combined loads.

Feed constant

The feed constant corresponds to the distance in mm that the carriage travels during one drive rotation.

Positioning accuracy

The positioning accuracy describes the maximum difference between the actual and nominal position.

Repeatability

Repeatability is the value of how precise the carriage is positioned when it approaches a position several times from the same direction. It specifies the maximum position error between the reached positions.

Static load rating C_0

The static load rating C_0 equals the static load that causes a plastic deformation of $0.0001 \times$ ball diameter at the contact point under the heaviest load. This is a fundamental quantity in calculations for static applications.

Dynamic load rating C_{dyn}

The dynamic load rating C_{dyn} equals the load under which 90 % of identical linear guideways reach the life expectancy of 50 km. This is a fundamental quantity in calculations for dynamic applications.

Stroke

Stroke is the distance the carriage must travel between the two end points of the limit switches.

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 is defined for each axis size at the factory.

The reserve stroke for each axis size can be found in Chapter 3 (Page 14 ff) for HM-B and in Chapter 4 (Page 24 ff) for HM-S.

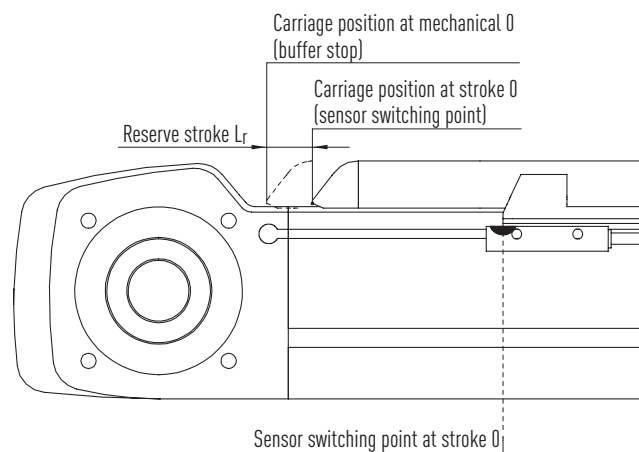


Fig. 2.1 Diagram of the reserve stroke

2.5 Requirements at the installation site

- Temperature range of 5 to 40 °C
- Dry environment
- Not explosive

Linear axes and axis systems HX

General information

2.6 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 drive torque from the toothed belt drive depends on the axis speed [see corresponding diagrams in the axis' technical data in Chapter 3].

2.6.1 Calculating the drive torque needed for the application

F 2.1 $M_A = M_{load} + M_{idle}$

F 2.2 $M_{load} = \frac{F_x \times p}{2 \times \pi \times \eta \times 1000}$

- 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/rotation]
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)

2.7 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). In the case of HS multi-axis systems, the service life must be calculated separately for each axis.

2.7.1 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.

2.7.2 Forces and torques on the linear axis

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

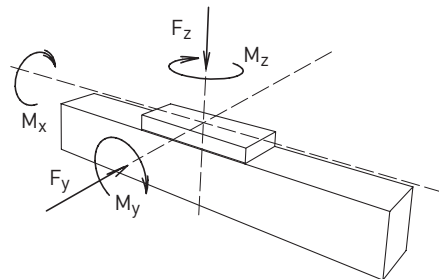


Fig. 2.2 Diagram of forces and torques on the linear axis

2.7.3 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 2.3. The comparable load factor can be used to determine the service life specific to the application from the diagrams [Fig. 2.3 to Fig. 2.6]. When $f_v = 1$, the predefined reference service life is reached.

F 2.3 $f_v = \frac{|F_y|}{F_{y\text{dynmax}}} + \frac{|F_z|}{F_{z\text{dynmax}}} + \frac{|M_x|}{M_{x\text{dynmax}}} + \frac{|M_y|}{M_{y\text{dynmax}}} + \frac{|M_z|}{M_{z\text{dynmax}}}$

- 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]

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

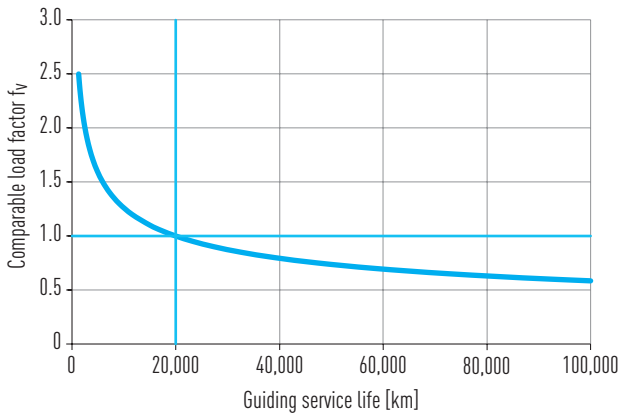


Fig. 2.3 Characteristic service life curve HM040B, HM060B, HM080B, HM120B

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

2.7.5 Characteristic service life curves for linear axes with ballscrew

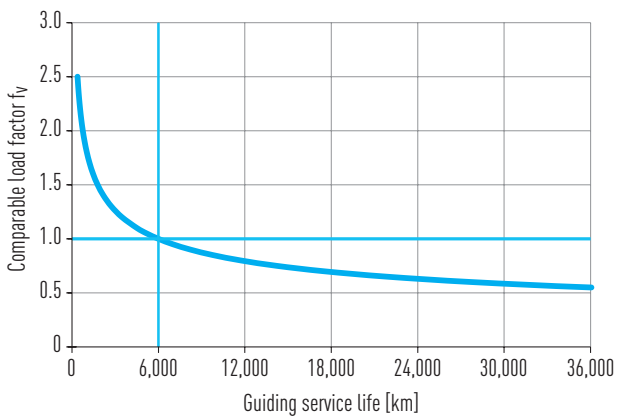


Fig. 2.4 Characteristic service life curve HM040S

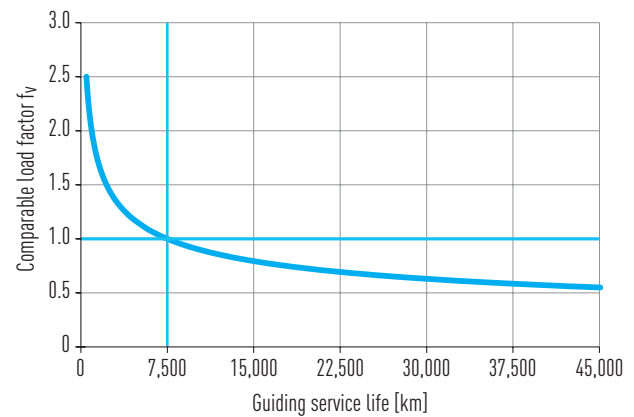


Fig. 2.5 Characteristic service life curve HM060S/HM080S

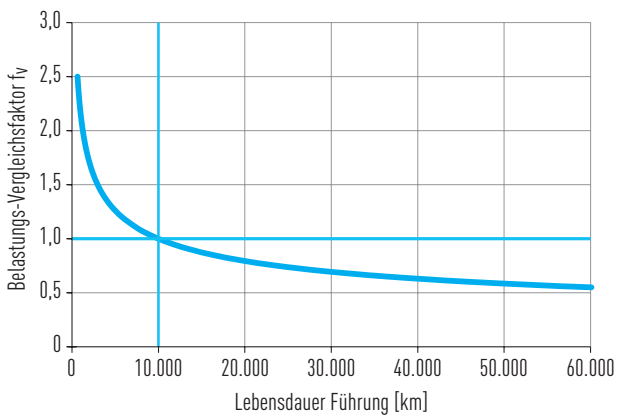


Fig. 2.6 Characteristic service life curve HM120S

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

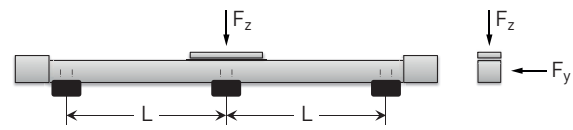
Linear axes and axis systems HX

General information

2.8 Calculating the 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.



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

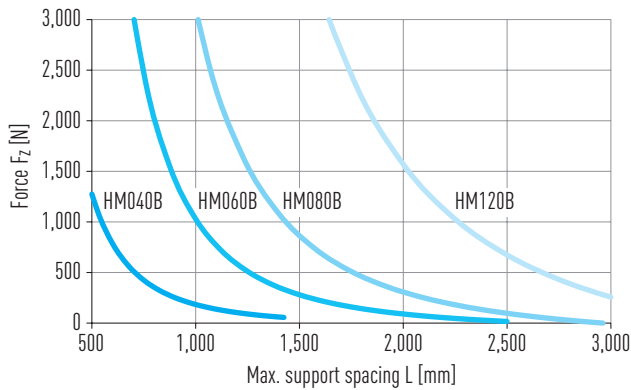


Fig. 2.7 HM-B: Maximum support spacing as a function of the force F_z

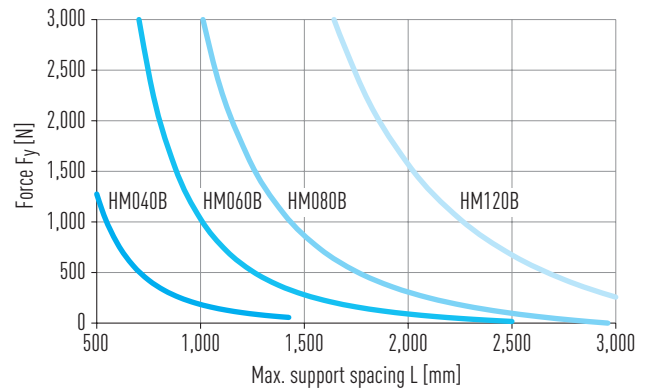


Fig. 2.8 HM-B: Maximum support spacing as a function of the force F_y

2.8.2 Maximum support spacing for the linear axis with ballscrew

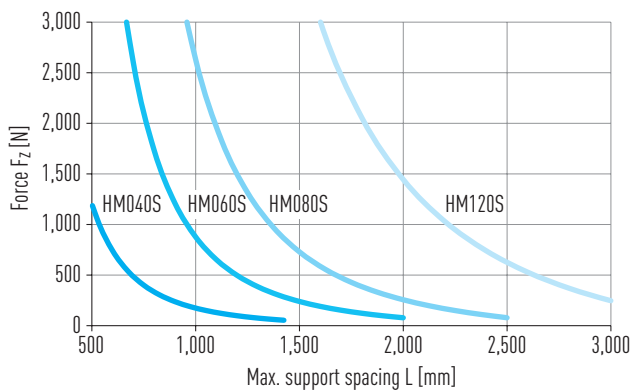


Fig. 2.9 HM-S: Maximum support spacing as a function of the force F_z

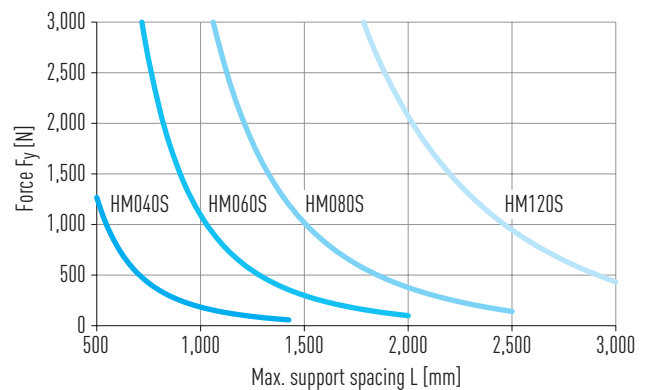


Fig. 2.10 HM-S: Maximum support spacing as a function of the force F_y

2.9 Product selection

2.9.1 Linear axes


Linear axes for positioning along the one axis.

Drive element	Typical properties	Typical load capacity [kg]	Maximum feed force [N]	Maximum travel speed [m/s]	Maximum stroke ¹⁾ [mm]	Repeatability [mm]	Axis	Page
Toothed belt 	<ul style="list-style-type: none"> High speed High acceleration Large stroke lengths 	10	300	3.0	3,000	± 0.05	HM040B	Page 16
		25	882	5.0	5,500	± 0.05	HM060B	Page 18
		60	1,235	5.0	5,500	± 0.05	HM080B	Page 20
		120	4,000	5.0	5,500	± 0.05	HM120B	Page 22
Ballscrew 	<ul style="list-style-type: none"> High positioning accuracy High feed force High drive rigidity 	10	976	0.5	1,200	± 0.02	HM040S	Page 26
		25	2,320	0.8	2,500	± 0.02	HM060S	Page 28
		60	3,020	1.0	2,500	± 0.02	HM080S	Page 30
		120	6,113	1.6	3,800	± 0.02	HM120S	Page 32
Double axis with toothed belt 	<ul style="list-style-type: none"> High torque loading capacity Wide bolting surface Synchronous axis movement 	25	450	3.0	3,000	± 0.10	HD1	Page 36
		63	1,323	5.0	5,500	± 0.10	HD2	Page 37
		150	1,852	5.0	5,500	± 0.10	HD3	Page 38
		300	6,000	5.0	5,500	± 0.10	HD4	Page 39

¹⁾ Longer strokes on request

2.9.2 Two-axis systems

Axis systems for positioning along two axes.

Drive element	Typical properties	Typical load capacity [kg]	Maximum travel speed [m/s]	Basis	Axis	Page
Toothed belt 	<ul style="list-style-type: none"> Compact system Large working space High dynamism 	5	3.0	X: HD1 Y: HM040B	HS21-D-M	Page 42
		12	5.0	X: HD2 Y: HM060B	HS22-D-M	Page 44
		30	5.0	X: HD3 Y: HM080B	HS23-D-M	Page 46

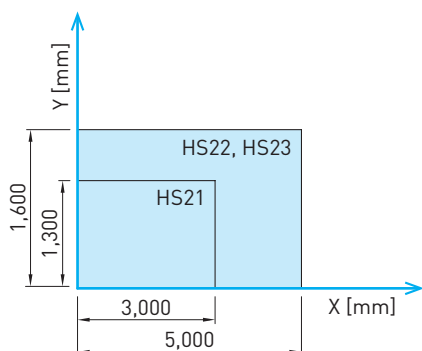


Fig. 2.11 Working space of HIWIN HS2 two-axis systems

Linear axes and axis systems HX

Linear axes HM-B

3. Linear axes HM-B

3.1 Properties of linear axes HM-B with toothed belt drive

HIWIN linear axes with toothed belt drive are compact, flexible positioning modules. They are specifically ideal for applications requiring high dynamic responses and high speeds. Also, these linear axes can be realised with large travel distances.



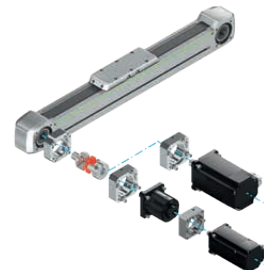
Linear guideway

High quality HIWIN linear guideways transfer forces and torques reliably from the carriage into the axis profile. Each carriage comes with two blocks that are guided over a high precision rail. The SynchMotion™ technology with ball chain also ensures a high level of synchronism and quiet running for the sizes HM060B, HM080B, and HM120B.



Drive connections

The symmetrical design of the HIWIN toothed belt axes allows the attachment of motors at all four sides of the drive blocks. Additional output and inputs drives can be positioned at any place with additional journals available as accessories (see [Page 74](#)).



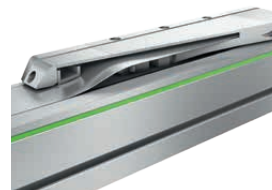
Toothed belt

The toothed belt with modern, high performance profiles (HTD form) and reinforced steel tie beams can transfer high forces under a high skipping resistance.



Cover strip

The steel cover strip protects the inside of the axis against dust and dirt. Also, when fitted with the cover strip, the axes can be used in areas with coarse, sharp edged, or hot foreign bodies. The magnetic strips integrated in the axis profile keep the strip securely in place and increase the sealing effects.



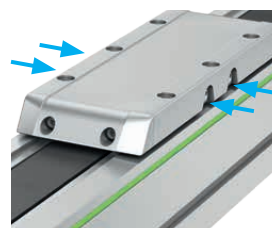
Carriages

HIWIN toothed belt modules are available with three different carriage lengths, depending on the size and dimensions of the load that has to be carried. Around each threaded hole is an additional locating hole that can be used with centring sleeves to secure the load capacity. This allows an ideal, reproducible attachment of the connecting structure. The matching centring sleeves can be found in the accessories on [Page 72](#).

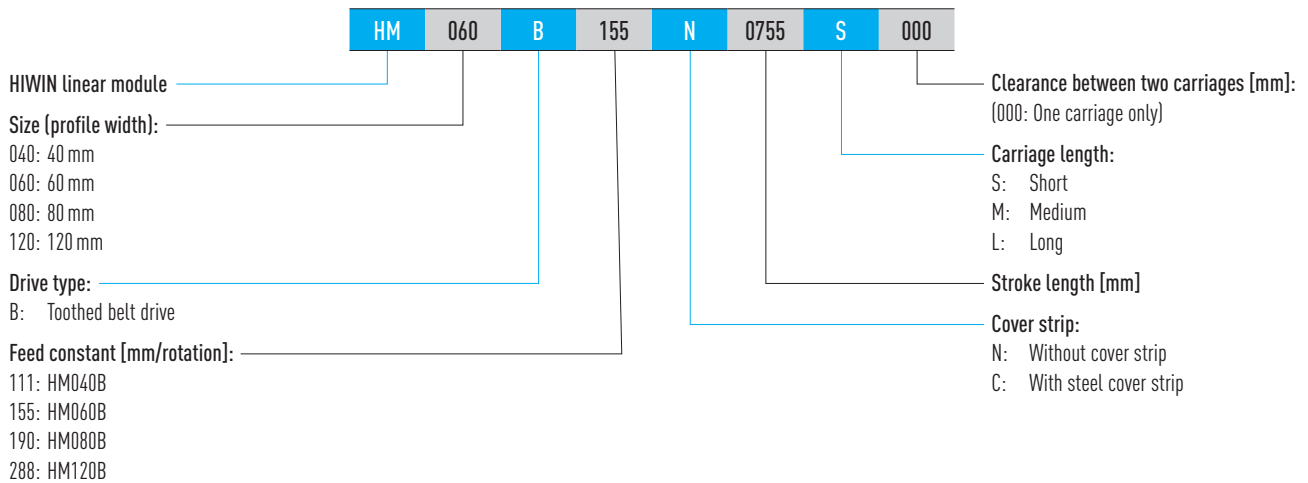


Lubrication

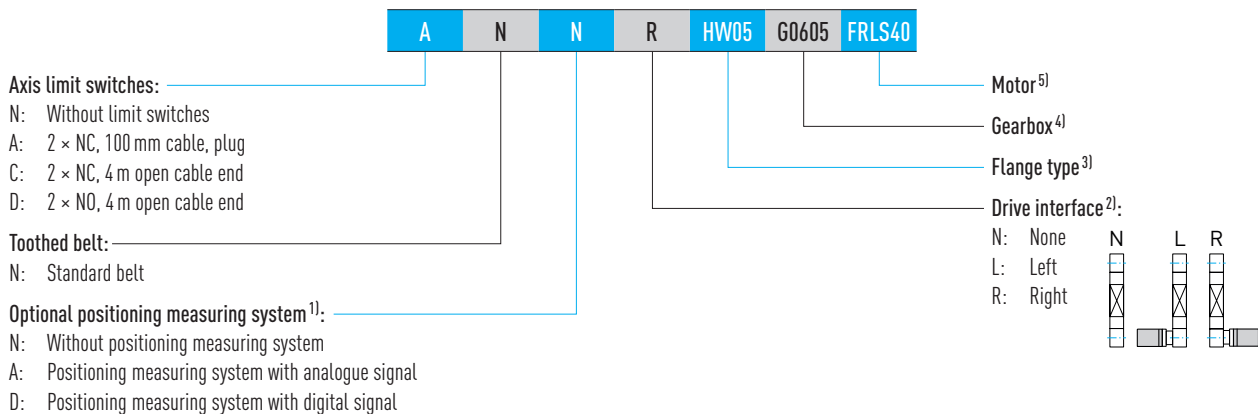
The linear axis can be lubricated easily thanks to the grease nipples at the left and right hand side of each lube point on the carriage. There is therefore optimal relubrication access even on difficult installation types.



3.2 Order code for linear axes HM-B



Order code for linear axes HM-B (continuation)



¹⁾ Details on 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 7.1 on Page 49 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 7.1.5 on Page 57

⁵⁾ Suitable HIWIN motors can be found in Section 8.1 on Page 70

Linear axes and axis systems HX

Linear axes HM-B

3.3 Dimensions of HM040B

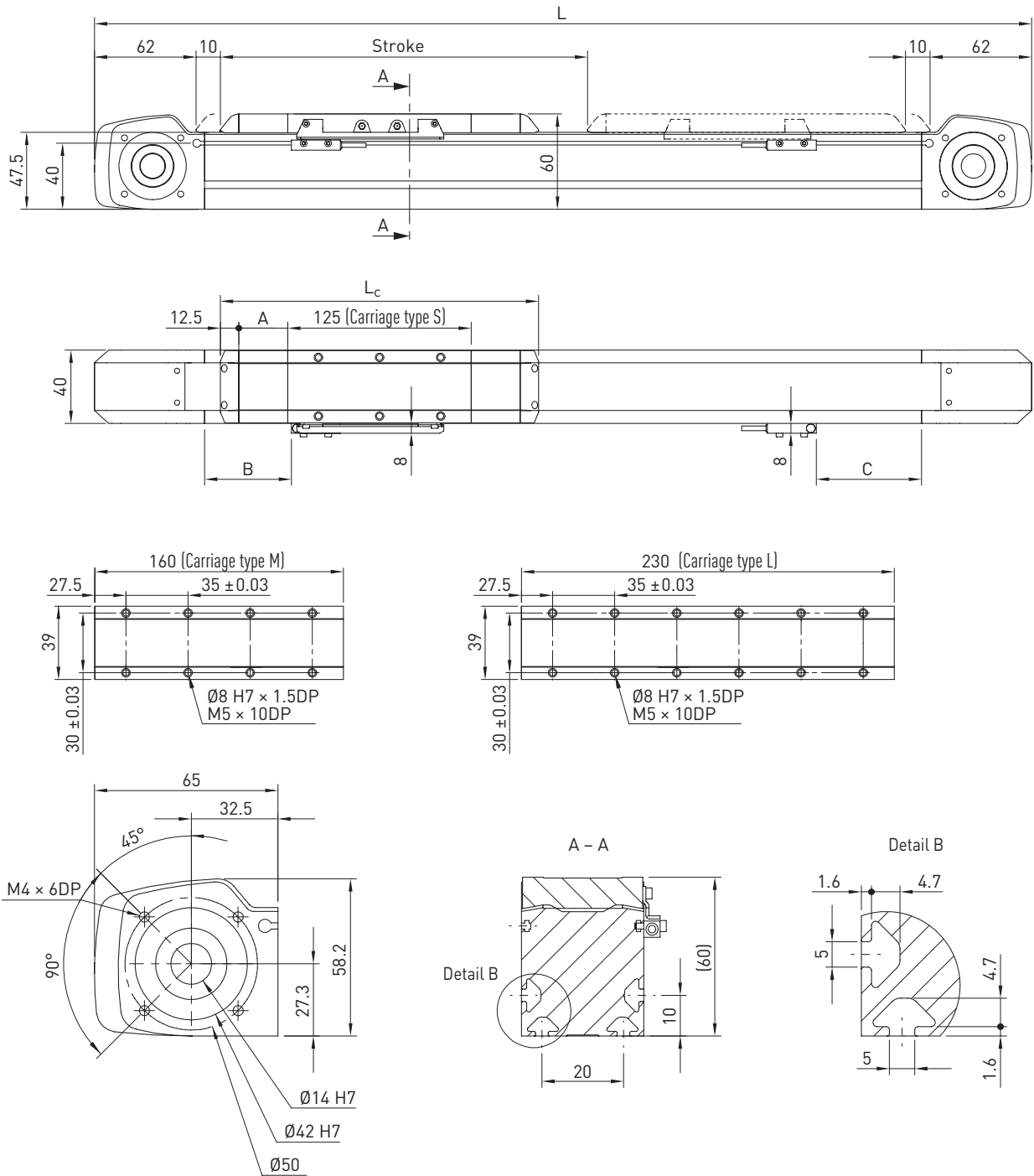


Table 3.1 Dimensions of HM040B

	Variant without cover			Variant with cover		
	Carriage type S	Carriage type M	Carriage type L	Carriage type S	Carriage type M	Carriage type L
Total carriage length L_c [mm]	150	185	255	230	265	335
Length of cover strip deflection A [mm]	—	—	—	40	40	40
Switch position B [mm]	24	24	24	64	64	64
Switch position C [mm]	9	44	114	49	84	154
Total length L [mm]	$L = \text{Stroke} + 294$	$L = \text{Stroke} + 329$	$L = \text{Stroke} + 399$	$L = \text{Stroke} + 374$	$L = \text{Stroke} + 409$	$L = \text{Stroke} + 479$

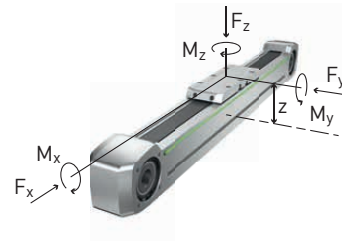
3.4 Specifications of HM040B

	Carriage type S	Carriage type M	Carriage type L
$F_{y\text{dynmax}}^{1)}$ [N]	963		
$F_{z\text{dynmax}}$ [N]	963		
$M_{x\text{dynmax}}$ [Nm]	8		
$M_{y\text{dynmax}}$ [Nm]	35	52	85
$M_{z\text{dynmax}}$ [Nm]	35	52	85
$z^{2)}$ [mm]	34.1		

¹⁾ Force may act only without torque

²⁾ Upper carriage edge to guiding centre

See Section 2.7.3 on Page 10 (reference service life)



Repeatability [mm]	± 0.05
Max feed force F_{x_max} [N]	300
Max speed [m/s]	3
Max acceleration [m/s ²]	30
Max drive torque M_{a_max} [Nm]	5
Typical load capacity [kg]	10.0
Max total length [mm]	3,480
Area moment of inertia I_x [mm ⁴]	117,795
Area moment of inertia I_y [mm ⁴]	122,922

Guiding type	MGN15C
Static load rating C_0 [N]	5,590
Dynamic load rating C_{dyn} [N]	4,610

Drive element	B15HTD3
Feed constant [mm/rotation]	111
Effective diameter of toothed belt pulley [mm]	35.33
Idle torque 0 stroke axis [Nm]	0.15

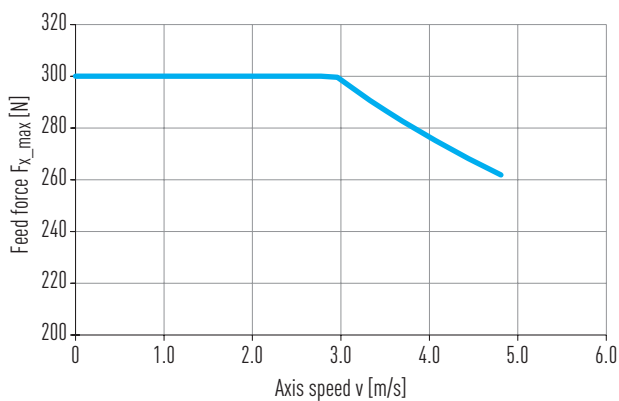


Fig. 3.1 Max feed force F_x as a function of axis speed v

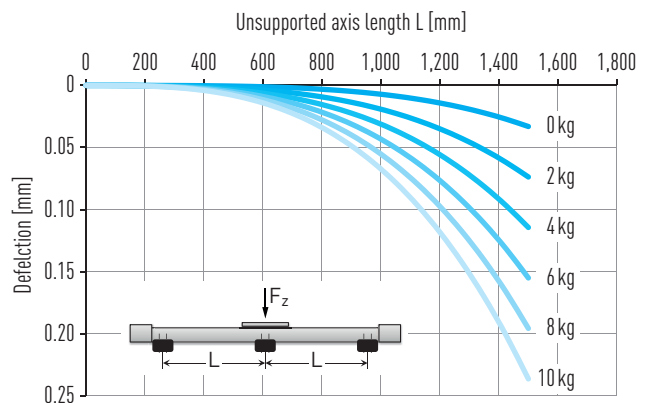


Fig. 3.2 Deflection under load capacity

	Variant without cover			Variant with cover		
	Carriage type S	Carriage type M	Carriage type L	Carriage type S	Carriage type M	Carriage type L
Carriage mass [kg]	0.33	0.38	0.50	0.37	0.43	0.54
Mass 0 stroke axis [kg]	1.41	1.58	1.91	1.69	1.85	2.18
Mass per 1 m stroke [kg/m]	3.02			3.04		
$M_{rot.}^{1)}$ [kgcm ²]	0.34			0.34		

¹⁾ Rotatory moment of inertia

Linear axes and axis systems HX

Linear axes HM-B

3.5 Dimensions of HM060B

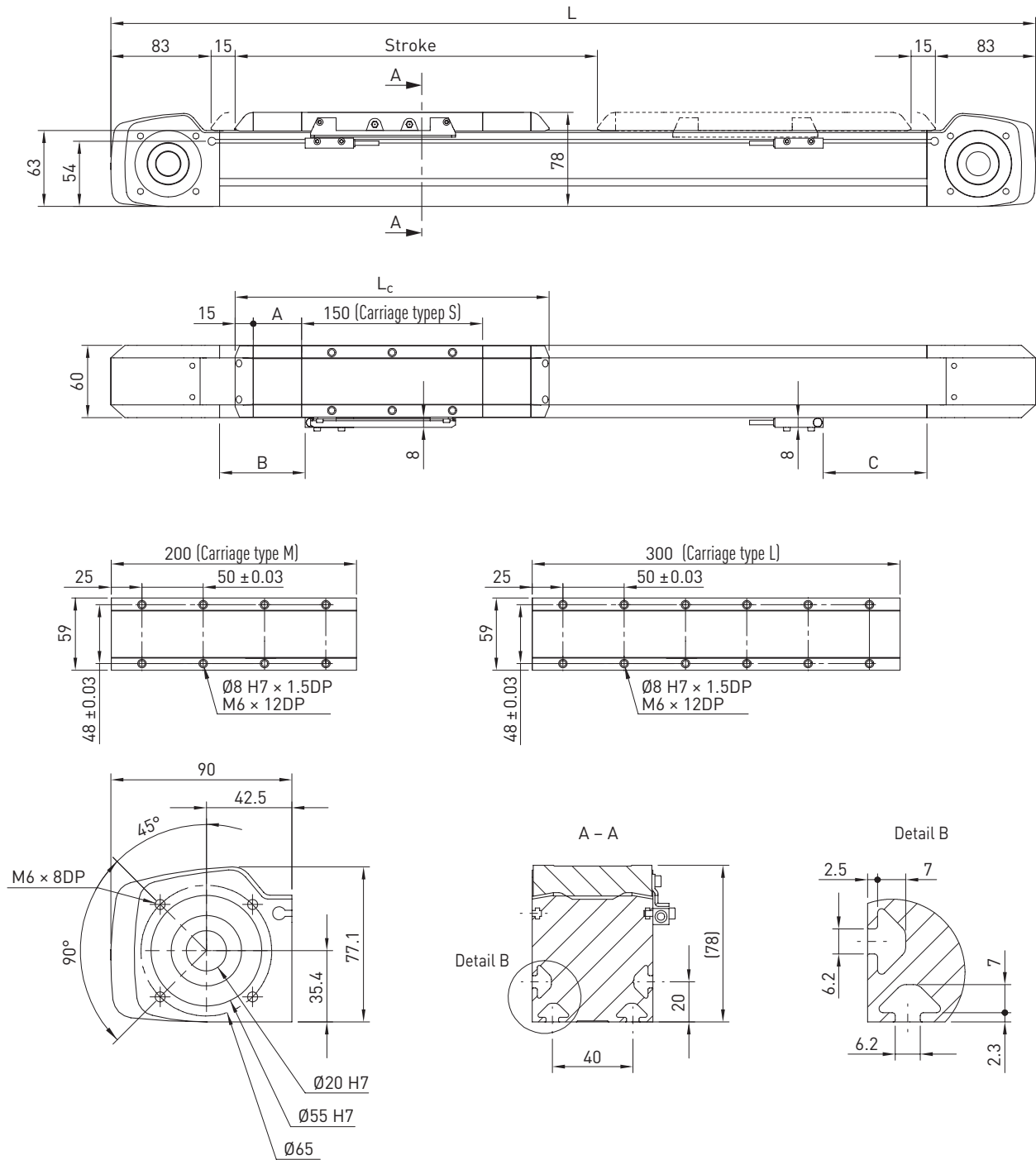


Table 3.7 Dimensions of HM060B

	Variant without cover			Variant with cover		
	Carriage type S	Carriage type M	Carriage type L	Carriage type S	Carriage type M	Carriage type L
Total carriage length L_c [mm]	180	230	330	260	310	410
Length of cover strip deflection A [mm]	—	—	—	40	40	40
Switch position B [mm]	25	25	25	65	65	65
Switch position C [mm]	40	90	190	80	130	230
Total length L [mm]	$L = \text{Stroke} + 376$	$L = \text{Stroke} + 426$	$L = \text{Stroke} + 526$	$L = \text{Stroke} + 456$	$L = \text{Stroke} + 506$	$L = \text{Stroke} + 606$

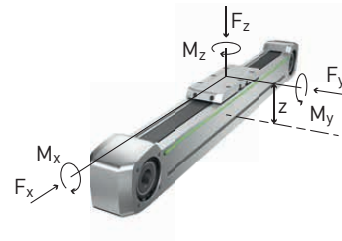
3.6 Specifications of HM060B

	Carriage type S	Carriage type M	Carriage type L
$F_{y\text{dynmax}}^{1)}$ [N]	2,152		
$F_{z\text{dynmax}}$ [N]	2,616		
$M_{x\text{dynmax}}$ [Nm]	21		
$M_{y\text{dynmax}}$ [Nm]	81	135	242
$M_{z\text{dynmax}}$ [Nm]	98	164	294
$z^{2)}$ [mm]	45.6		

¹⁾ Force may act only without torque

²⁾ Upper carriage edge to guiding centre

See Section 2.7.3 on Page 10 (reference service life)



Repeatability [mm]	± 0.05
Max feed force F_{x_max} [N]	882
Max speed [m/s]	5
Max acceleration [m/s ²]	30
Max drive torque M_{a_max} [Nm]	22
Typical load capacity [kg]	25
Max total length [mm]	6,080
Area moment of inertia I_x [mm ⁴]	507,521
Area moment of inertia I_y [mm ⁴]	625,920

Guiding type	QEH15C
Static load rating C_0 [N]	15,280
Dynamic load rating C_{dyn} [N]	12,530

Drive element	B25HTD5
Feed constant [mm/rotation]	155
Effective diameter of toothed belt pulley [mm]	49.34
Idle torque 0 stroke axis [Nm]	0.5

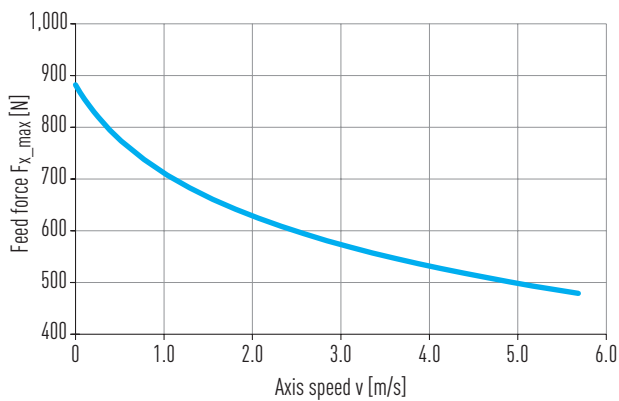


Fig. 3.3 Max feed force F_x as a function of axis speed v

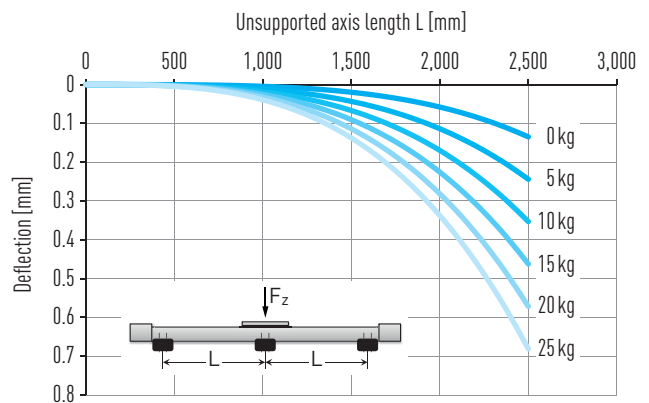


Fig. 3.4 Deflection under load capacity

	Variant without cover			Variant with cover		
	Carriage type S	Carriage type M	Carriage type L	Carriage type S	Carriage type M	Carriage type L
Carriage mass [kg]	0.81	0.96	1.25	0.89	1.03	1.32
Mass 0 stroke axis [kg]	3.44	3.85	4.69	3.97	4.39	5.23
Mass per 1 m stroke [kg/m]	5.47			5.51		
$M_{rot.}^{1)}$ [kgcm ²]	1.92			1.92		

¹⁾ Rotatory moment of inertia

Linear axes and axis systems HX

Linear axes HM-B

3.7 Dimensions of HM080B

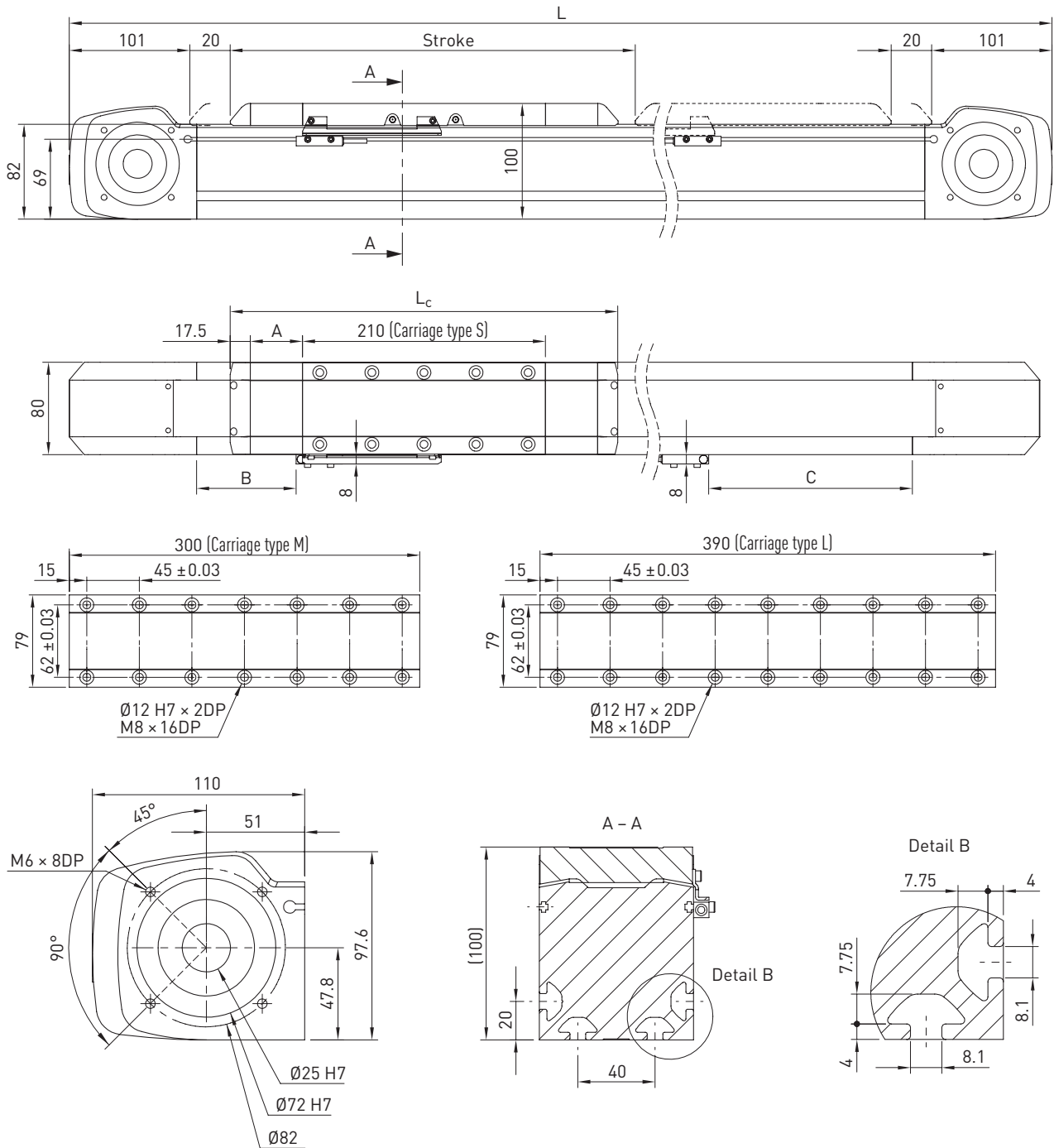


Table 3.13 Dimensions of HM080B

	Variant without cover			Variant with cover		
	Carriage type S	Carriage type M	Carriage type L	Carriage type S	Carriage type M	Carriage type L
Total carriage length L_c [mm]	245	335	425	335	425	515
Length of cover strip deflection A [mm]	—	—	—	45	45	45
Switch position B [mm]	23	23	23	68	68	68
Switch position C [mm]	113	203	293	158	248	338
Total length L [mm]	$L = \text{Stroke} + 487$	$L = \text{Stroke} + 577$	$L = \text{Stroke} + 667$	$L = \text{Stroke} + 577$	$L = \text{Stroke} + 667$	$L = \text{Stroke} + 757$

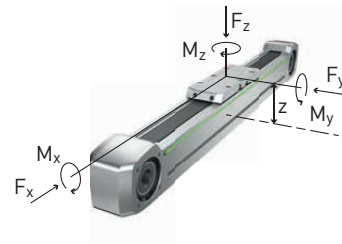
3.8 Specifications of HM080B

	Carriage type S	Carriage type M	Carriage type L
$F_{y\text{dynmax}}^{1)}$ [N]	3,855		
$F_{z\text{dynmax}}$ [N]	4,819		
$M_{x\text{dynmax}}$ [Nm]	48		
$M_{y\text{dynmax}}$ [Nm]	220	393	567
$M_{z\text{dynmax}}$ [Nm]	275	492	708
$z^{2)}$ [mm]	53.4		

¹⁾ Force may act only without torque

²⁾ Upper carriage edge to guiding centre

See Section 2.7.3 on Page 10 (reference service life)



Repeatability [mm]	± 0.05
Max feed force F_{x_max} [N]	1,235
Max speed [m/s]	5
Max acceleration [m/s ²]	30
Max drive torque M_{a_max} [Nm]	37
Typical load capacity [kg]	60
Max total length [mm]	6,120
Area moment of inertia I_x [mm ⁴]	1,522,057
Area moment of inertia I_y [mm ⁴]	2,081,321

Guiding type	QHH20C
Static load rating C_0 [N]	25,630
Dynamic load rating C_{dyn} [N]	23,080

Drive element	B35HTD5
Feed constant [mm/rotation]	190
Effective diameter of toothed belt pulley [mm]	60.48
Idle torque 0 stroke axis [Nm]	1.5

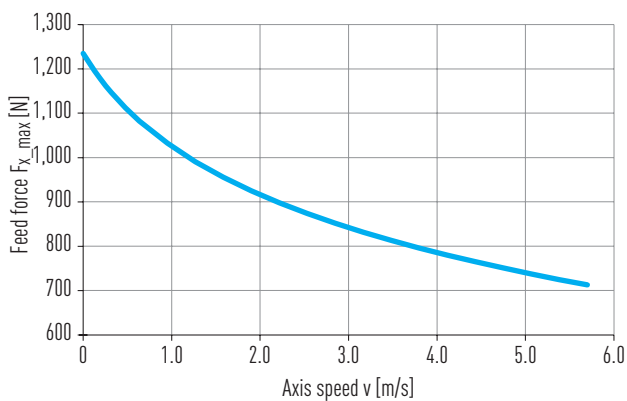


Fig. 3.5 Max feed force F_x as a function of axis speed v

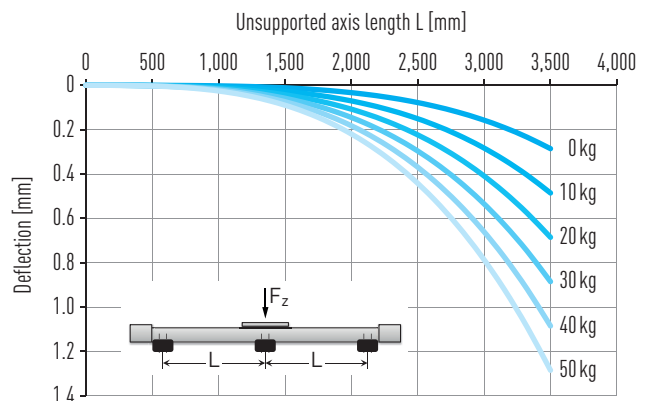


Fig. 3.6 Deflection under load capacity

	Variant without cover			Variant with cover		
	Carriage type S	Carriage type M	Carriage type L	Carriage type S	Carriage type M	Carriage type L
Carriage mass [kg]	1.75	2.17	2.58	1.90	2.32	2.74
Mass 0 stroke axis [kg]	7.47	8.78	10.08	8.54	9.85	11.16
Mass per 1 m stroke [kg/m]	9.86			9.92		
$M_{rot.}^{1)}$ [kgcm ²]	6.03			6.03		

¹⁾ Rotatory moment of inertia

Linear axes and axis systems HX

Linear axes HM-B

3.9 Dimensions of HM120B

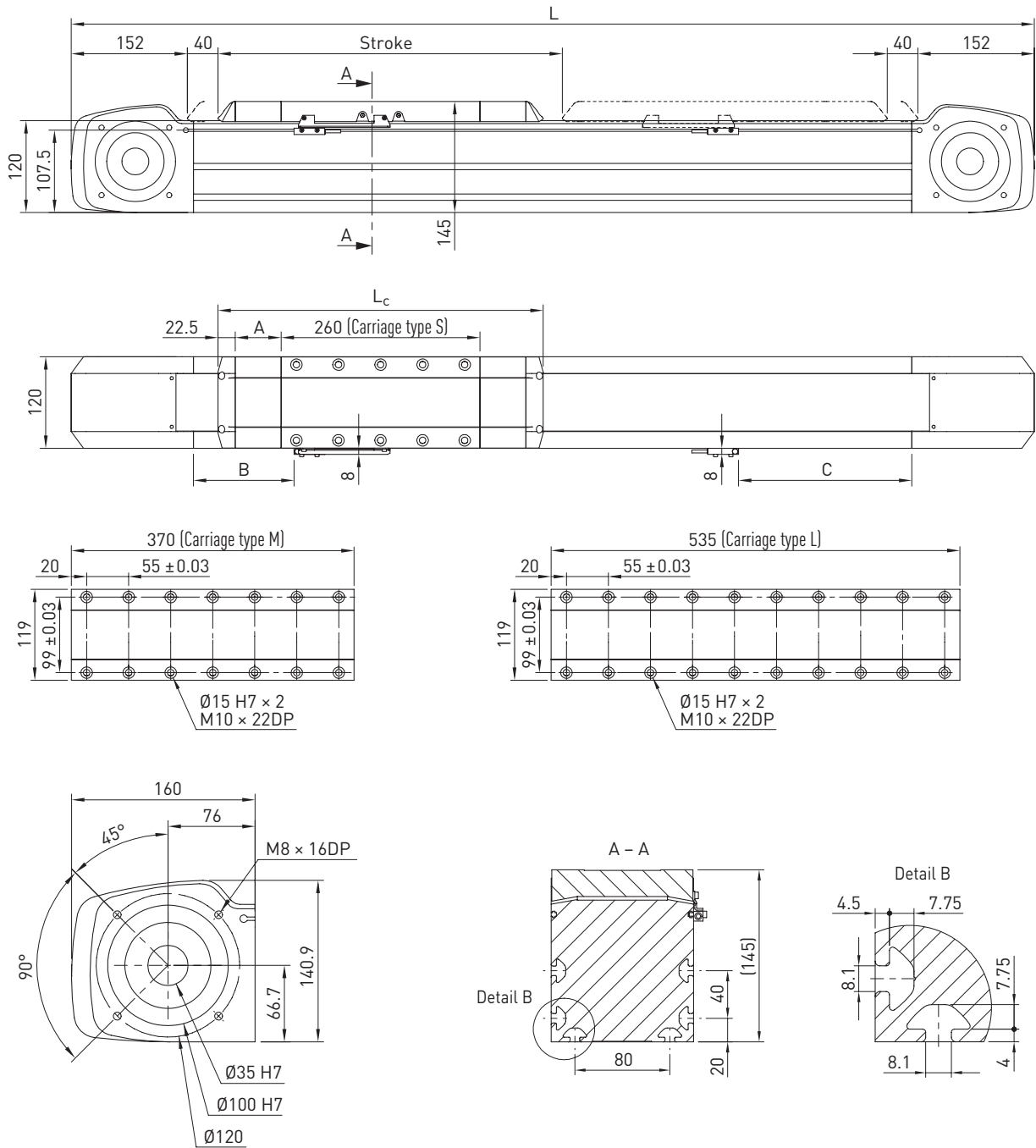


Table 3.19 Dimensions of HM120B

	Variant without cover			Variant with cover		
	Carriage type S	Carriage type M	Carriage type L	Carriage type S	Carriage type M	Carriage type L
Total carriage length L_c [mm]	305	415	580	425	535	700
Length of cover strip deflection A [mm]	—	—	—	60	60	60
Switch position B [mm]	71.5	71.5	71.5	131.5	131.5	131.5
Switch position C [mm]	166.5	276.5	441.5	226.5	336.5	501.5
Total length L [mm]	$L = \text{Stroke} + 689$	$L = \text{Stroke} + 799$	$L = \text{Stroke} + 964$	$L = \text{Stroke} + 809$	$L = \text{Stroke} + 919$	$L = \text{Stroke} + 1,084$

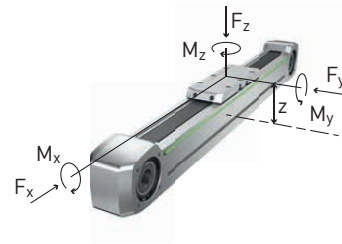
3.10 Specifications of HM120B

	Carriage type S	Carriage type M	Carriage type L
$F_{y\text{dynmax}}^{1)}$ [N]	9,707		
$F_{z\text{dynmax}}$ [N]	9,707		
$M_{x\text{dynmax}}$ [Nm]	123		
$M_{y\text{dynmax}}$ [Nm]	718	1,252	2,053
$M_{z\text{dynmax}}$ [Nm]	718	1,252	2,053
$z^{2)}$ [mm]	77.1		

¹⁾ Force may act only without torque

²⁾ Upper carriage edge to guiding centre

See Section 2.7.3 on Page 10 (reference service life)



Repeatability [mm]	± 0.05
Max feed force F_{x_max} [N]	4,000
Max speed [m/s]	5
Max acceleration [m/s ²]	30
Max drive torque M_{a_max} [Nm]	183
Typical load capacity [kg]	120
Max total length [mm]	6,220
Area moment of inertia I_x [mm ⁴]	6,791,541
Area moment of inertia I_y [mm ⁴]	9,553,626

Guiding type	QHH30C
Static load rating C_0 [N]	48,170
Dynamic load rating C_{dyn} [N]	46,490

Drive element	B60HTD8
Feed constant [mm/rotation]	288
Effective diameter of toothed belt pulley [mm]	91.67
Idle torque 0 stroke axis [Nm]	4.0

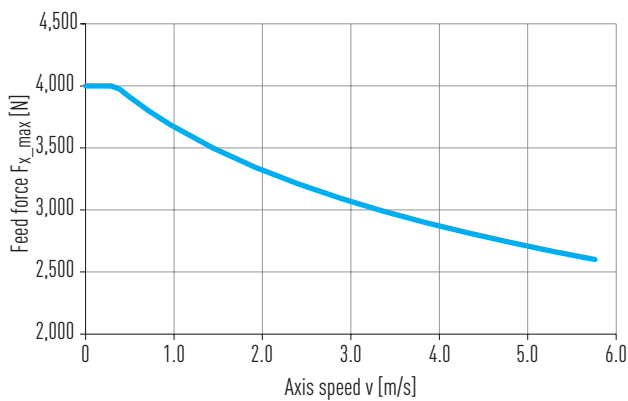


Fig. 3.7 Max feed force F_x as a function of axis speed v

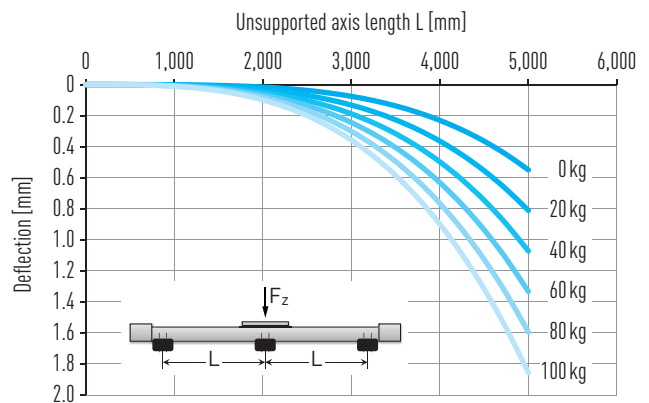


Fig. 3.8 Deflection under load capacity

	Variant without cover			Variant with cover		
	Carriage type S	Carriage type M	Carriage type L	Carriage type S	Carriage type M	Carriage type L
Carriage mass [kg]	5.29	6.08	7.79	5.81	6.59	8.30
Mass 0 stroke axis [kg]	21.54	24.60	29.74	24.60	27.68	32.84
Mass per 1 m stroke [kg/m]	20.77			20.86		
$M_{rot.}^{1)}$ [kgcm ²]	42.42			42.42		

¹⁾ Rotatory moment of inertia

Linear axes and axis systems HX

Linear axes HM-S

4. Linear axes HM-S

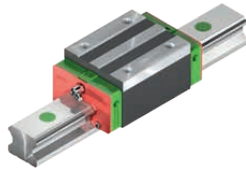
4.1 Properties of linear axes HM-S with ballscrew

HIWIN linear axes with ballscrew are compact, flexible positioning modules. They are specifically ideal for applications moving high loads to high precision.



Linear guideway

High quality HIWIN linear guideways transfer forces and torques reliably from the carriage into the axis profile. Each carriage comes with two blocks that are guided over a high precision rail. The SynchMotion™ technology with ball chain also ensures a high level of synchronism and quiet running for the sizes HM060S, HM080S, and HM120S.



Motor connections and belt drive

The motor adapters are made up of several parts that offer an extremely flexible drive interface for attaching and modifying the drive installation. Optionally, a belt transmission can be used to turn the motor attachment through 180°, reducing the total length to a considerable extent.



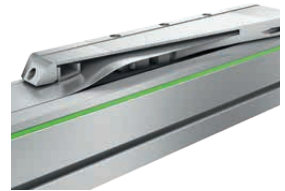
Ballscrew

The integrated HIWIN ballscrews exhibit high lead accuracy and rigidity for precise positioning. Each size comes with various spindle leads for the optimal solution to feed force and dynamic response requirements.



Cover strip

The steel cover strip protects the inside of the axis against dust and dirt. Also, when fitted with the cover strip, the axes can be used in areas with coarse, sharp edged, or hot foreign bodies. The magnetic strips integrated in the axis profile keep the strip securely in place and increase the sealing effects.



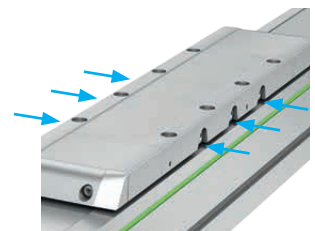
Carriages

HIWIN spindle axes are available with two different carriage lengths, depending on the size and dimensions of the load that has to be carried. Around each threaded hole is an additional locating hole that can be used with centring sleeves to secure the load capacity. This allows an ideal, reproducible attachment of the connecting structure. The matching centring sleeves can be found in the accessories on [Page 72](#).



Lubrication

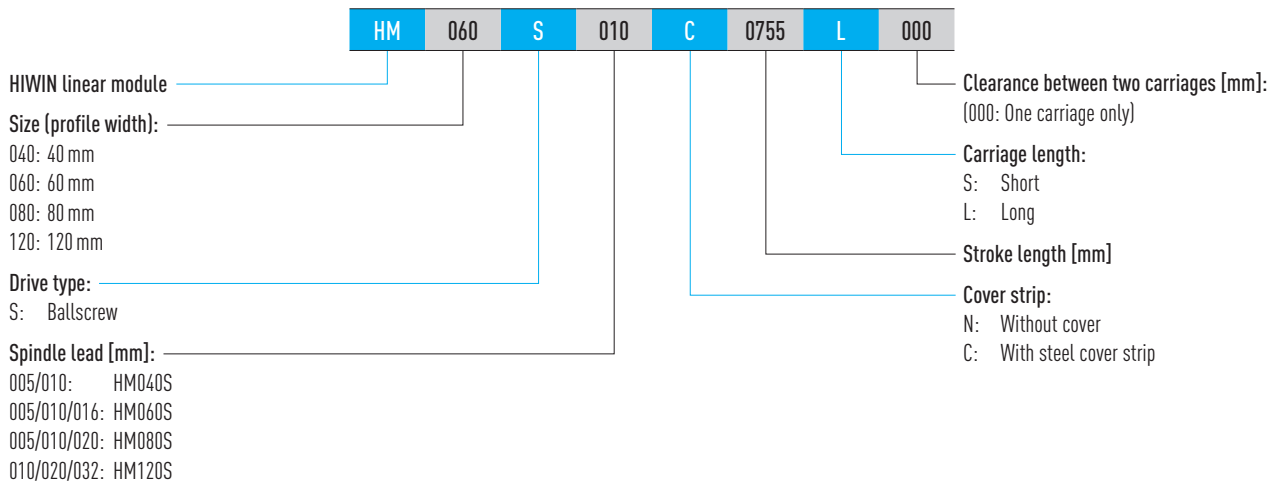
The linear axis can be lubricated easily thanks to the grease nipples at the left and right hand side of each lube point on the carriage. There is therefore optimal relubrication access even on difficult installation types.



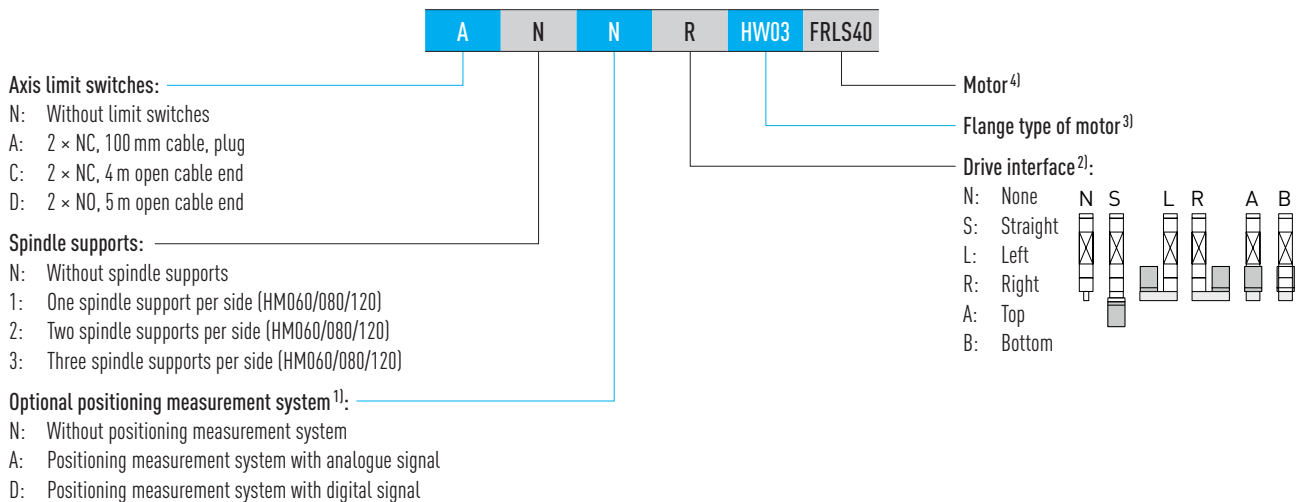
Spindle supports

In applications involving long travel distances and high speeds, the spindle quickly reaches its critical speed. It must therefore be mounted on adequate supports that prevent the spindle from deflecting. Up to three adequate supports can be mounted at each side of the carriage of HIWIN spindle axes. Travel is therefore possible at full speed even over long strokes.

4.2 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 7.10 on Page 61 ff. If no flange type is selected, the order code ends at this position

⁴⁾ Suitable HIWIN motors can be found in Section 8.1 on Page 70

Linear axes and axis systems HX

Linear axes HM-S

4.3 Dimensions of HM040S

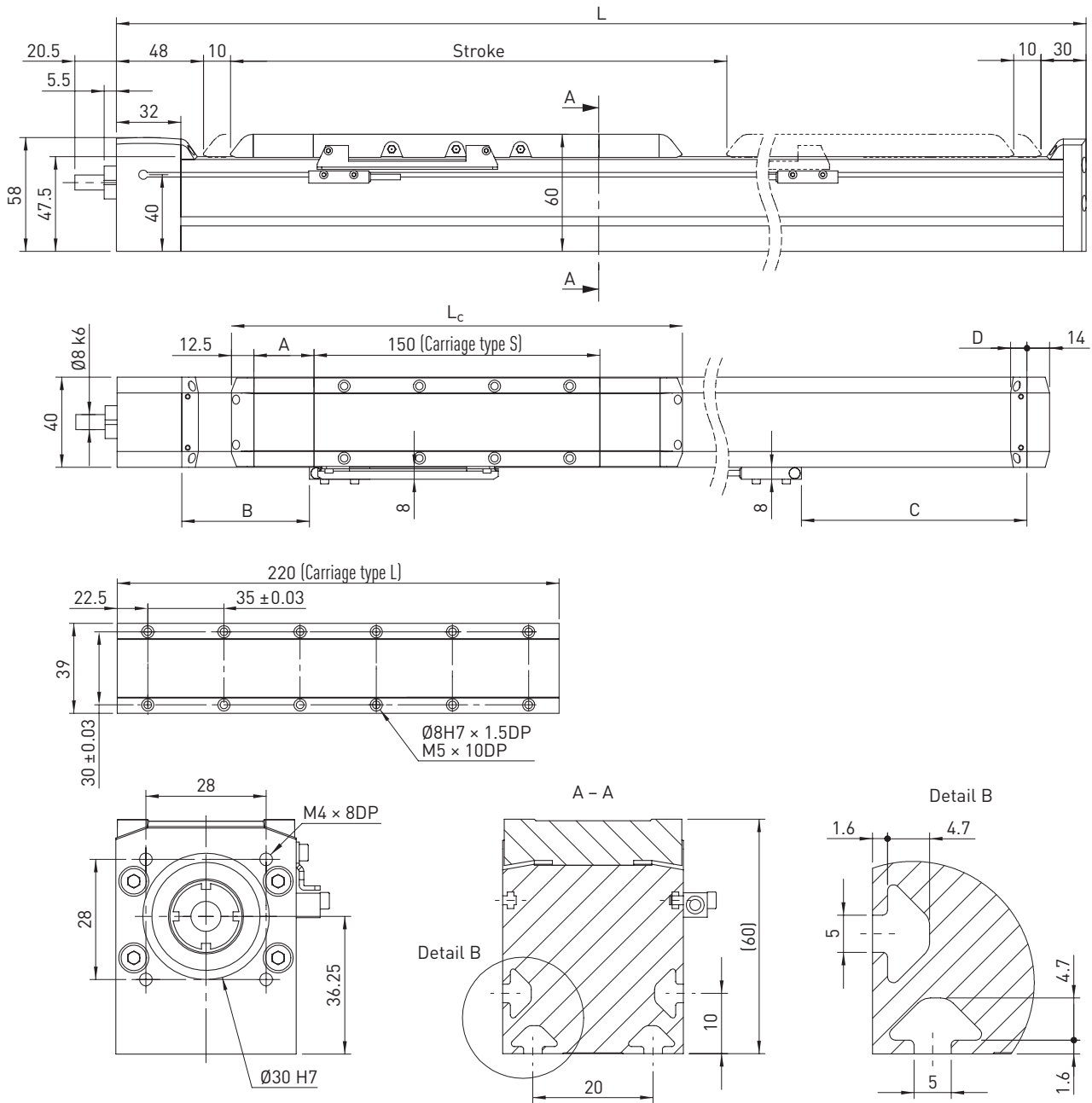


Table 4.1 Dimensions of HM040S

	Variant without cover		Variant with cover	
	Carriage type S	Carriage type L	Carriage type S	Carriage type L
Total carriage length L_c [mm]	175	245	255	325
Length of cover strip deflection A [mm]	—	—	40	40
Switch position B [mm]	33.5	33.5	83.5	83.5
Switch position C [mm]	42.5	112.5	92.5	162.5
Clamp housing length D [mm]	—	—	10	10
Total length L [mm]	$L = \text{Stroke} + 253$	$L = \text{Stroke} + 323$	$L = \text{Stroke} + 353$	$L = \text{Stroke} + 423$

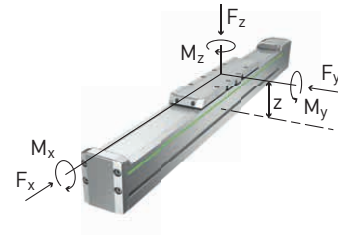
4.4 Specifications of HM040S

	Carriage type S	Carriage type L
$F_{y\text{dynmax}}^{1)}$ [N]	1,438	
$F_{z\text{dynmax}}$ [N]	1,438	
$M_{x\text{dynmax}}$ [Nm]	12	
$M_{y\text{dynmax}}$ [Nm]	80	130
$M_{z\text{dynmax}}$ [Nm]	80	130
$z^{2)}$ [mm]	39.6	

¹⁾ Force may act only without torque

²⁾ Upper carriage edge to guiding centre

See Section 2.7.3 on Page 10 (reference service life)



Repeatability [mm]	± 0.02
Max acceleration [m/s ²]	20
Typical load capacity [kg]	10
Max total length [mm]	1,484
Area moment of inertia I_x [mm ⁴]	111,032
Area moment of inertia I_y [mm ⁴]	116,769

Guiding type	MGN15C
Static load rating C_0 [N]	5,590
Dynamic load rating C_{dyn} [N]	4,610

	Spindle lead	
	5 mm	10 mm
Spindle diameter [mm]	12	
Axial play [mm]	0.02	
Max feed force $F_{x\text{max}}$ [N]	976	792
Max speed [m/s]	0.25	0.50
Max drive torque $M_{a\text{max}}$ [Nm]	0.98	1.46
Static load rating ballscrew C_0 [N]	8,800	6,500
Dynamic load rating ballscrew C_{dyn} [N]	5,300	4,300
Idle torque 0 stroke axis [Nm]	0.2	

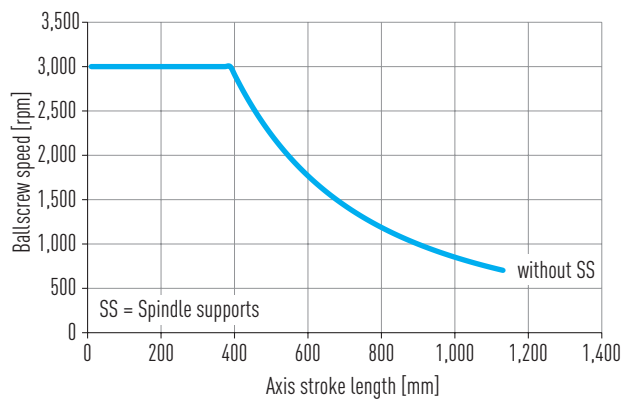


Fig. 4.1 Critical speed

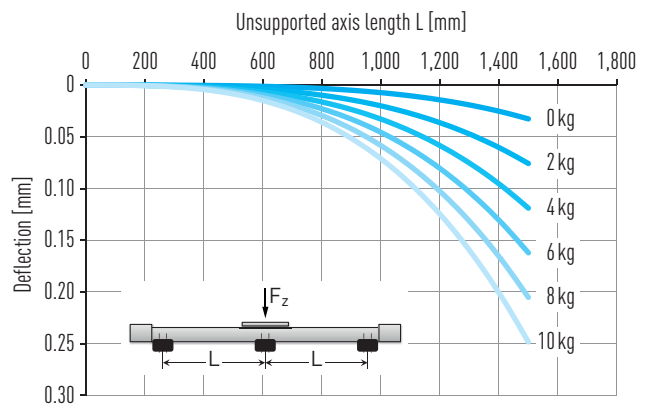


Fig. 4.2 Deflection under load capacity

	Variant without cover				Variant with cover			
	Carriage type S		Carriage type L		Carriage type S		Carriage type L	
Spindle lead [mm]	5	10	5	10	5	10	5	10
Carriage mass [kg]	0.43	0.43	0.55	0.55	0.48	0.48	0.6	0.6
Mass 0 stroke axis [kg]	1.49	1.49	1.86	1.86	1.91	1.91	2.28	2.28
Mass per 1 m stroke [kg/m]	3.61				3.63			
$M_{\text{rot.}}^{1)}$ 0 stroke axis [kgcm ²]	0.07	0.07	0.08	0.08	0.08	0.08	0.09	0.09
$M_{\text{rot.}}^{1)}$ per 1 m stroke [kgcm ²]	0.16				0.16			

¹⁾ Rotatory moment of inertia

Linear axes and axis systems HX

Linear axes HM-S

4.5 Dimensions of HM060S

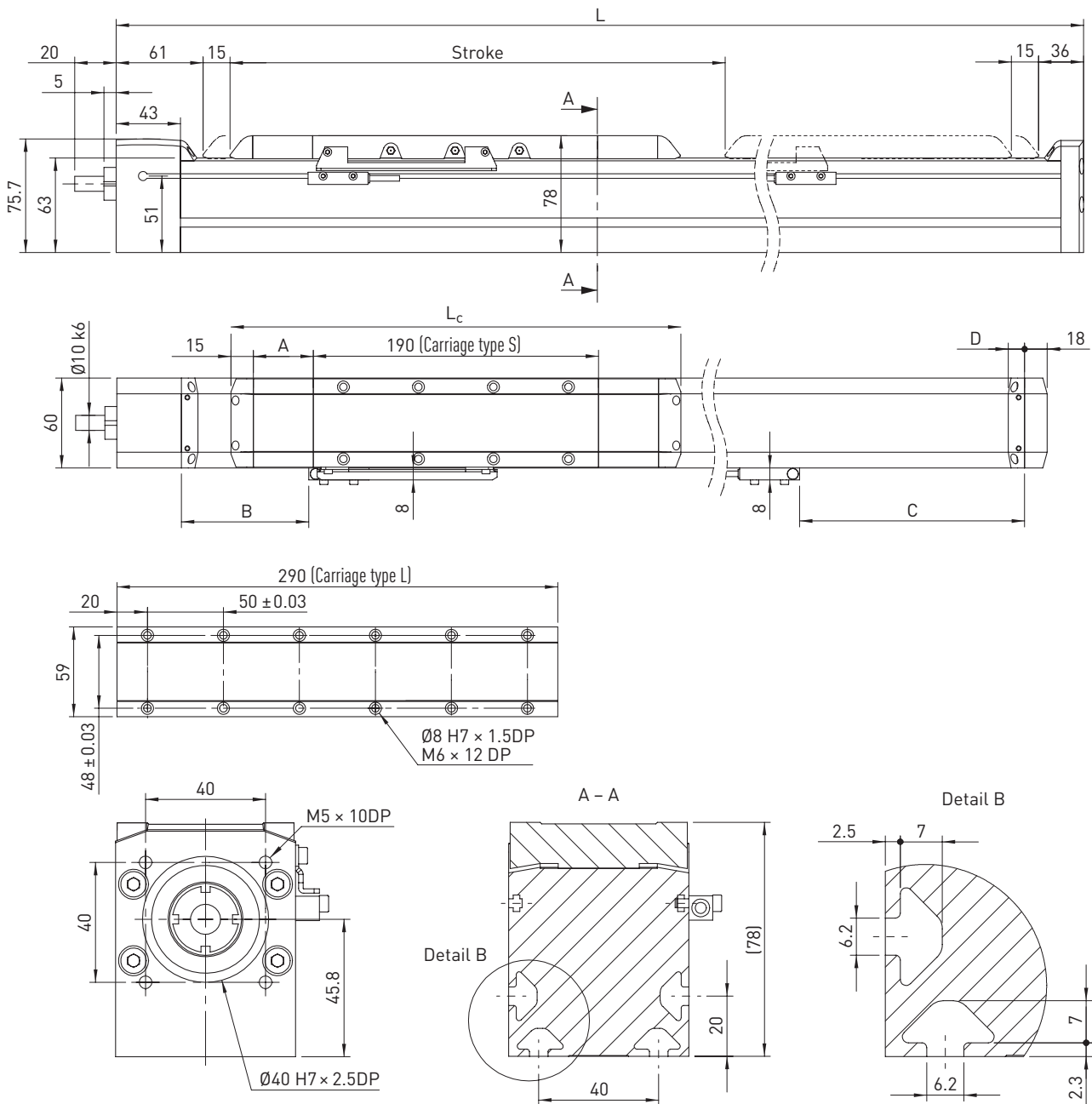


Table 4.7 Dimensions of HM060S

	Variant without cover		Variant with cover	
	Carriage type S	Carriage type L	Carriage type S	Carriage type L
Total carriage length L_c [mm]	220	320	300	400
Length of cover strip deflection A [mm]	—	—	40	40
Switch position B [mm]	35	35	86	86
Switch position C [mm]	98	198	149	249
Clamp housing length D [mm]	—	—	11	11
Total length L [mm]	$L = \text{Stroke} + 325$	$L = \text{Stroke} + 425$	$L = \text{Stroke} + 427$	$L = \text{Stroke} + 527$

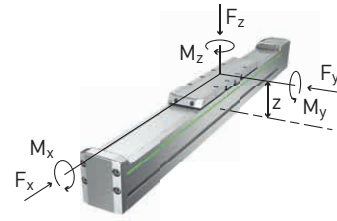
4.6 Specifications of HM060S

	Carriage type S	Carriage type L
$F_{y\text{dynmax}}^{1)}$ [N]	2,896	
$F_{z\text{dynmax}}$ [N]	3,628	
$M_{x\text{dynmax}}$ [Nm]	28	
$M_{y\text{dynmax}}$ [Nm]	191	336
$M_{z\text{dynmax}}$ [Nm]	240	421
$z^{2)}$ [mm]	57.4	

¹⁾ Force may act only without torque

²⁾ Upper carriage edge to guiding centre

See Section 2.7.3 on Page 10 (reference service life)



Repeatability [mm]	± 0.02
Max acceleration [m/s ²]	20
Typical load capacity [kg]	25
Max total length [mm]	2,986
Area moment of inertia I_x [mm ⁴]	431,907
Area moment of inertia I_y [mm ⁴]	539,706

Guiding type	QEH15C
Static load rating C_0 [N]	15,280
Dynamic load rating C_{dyn} [N]	12,530

	Spindle lead		
	5 mm	10 mm	16 mm
Spindle diameter [mm]	16		
Axial play [mm]	0.02		
Max feed force $F_{x\text{max}}$ [N]	2,320	1,823	1,823
Max speed [m/s]	0.25	0.50	0.80
Max drive torque $M_{a\text{max}}$ [Nm]	2.05	3.10	4.94
Static load rating ballscrew C_0 [N]	21,000	16,400	17,000
Dynamic load rating ballscrew C_{dyn} [N]	12,600	9,900	9,900
Idle torque 0 stroke axis [Nm]	0.2		

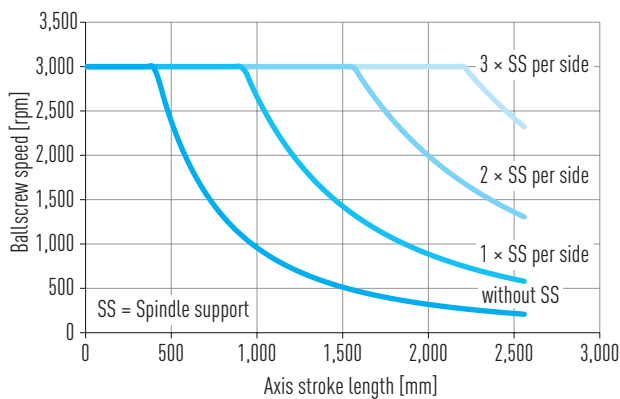


Fig. 4.3 Critical speeds

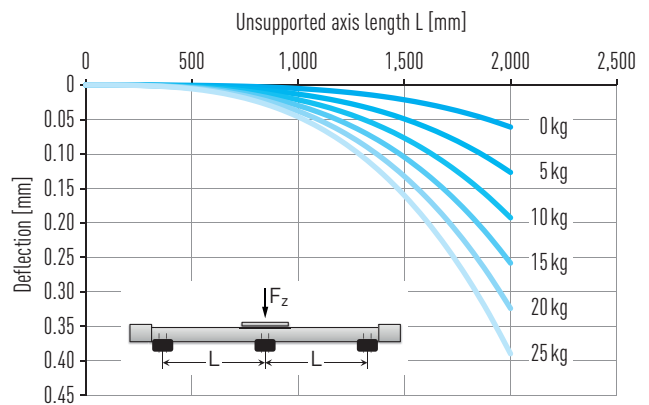


Fig. 4.4 Deflection under load capacity

	Variant without cover						Variant with cover					
	Carriage type S			Carriage type L			Carriage type S			Carriage type L		
Spindle lead [mm]	5	10	16	5	10	16	5	10	16	5	10	16
Carriage mass [kg]	1.05	1.15	1.15	1.37	1.47	1.47	1.13	1.23	1.23	1.45	1.55	1.55
Mass 0 stroke axis [kg]	3.31	3.41	3.41	4.22	4.32	4.32	4.03	4.13	4.13	4.95	5.05	5.05
Mass per 1 m stroke [kg/m]	5.88						5.93					
$M_{\text{rot.}}^{1)}$ 0 stroke axis [kgcm ²]	0.17	0.19	0.18	0.20	0.22	0.22	0.21	0.22	0.22	0.24	0.26	0.25
$M_{\text{rot.}}^{1)}$ per 1 m stroke [kgcm ²]	0.33	0.37	0.36	0.33	0.37	0.36	0.33	0.37	0.36	0.33	0.37	0.36

¹⁾ Rotatory moment of inertia

Linear axes and axis systems HX

Linear axes HM-S

4.7 Dimensions of HM080S

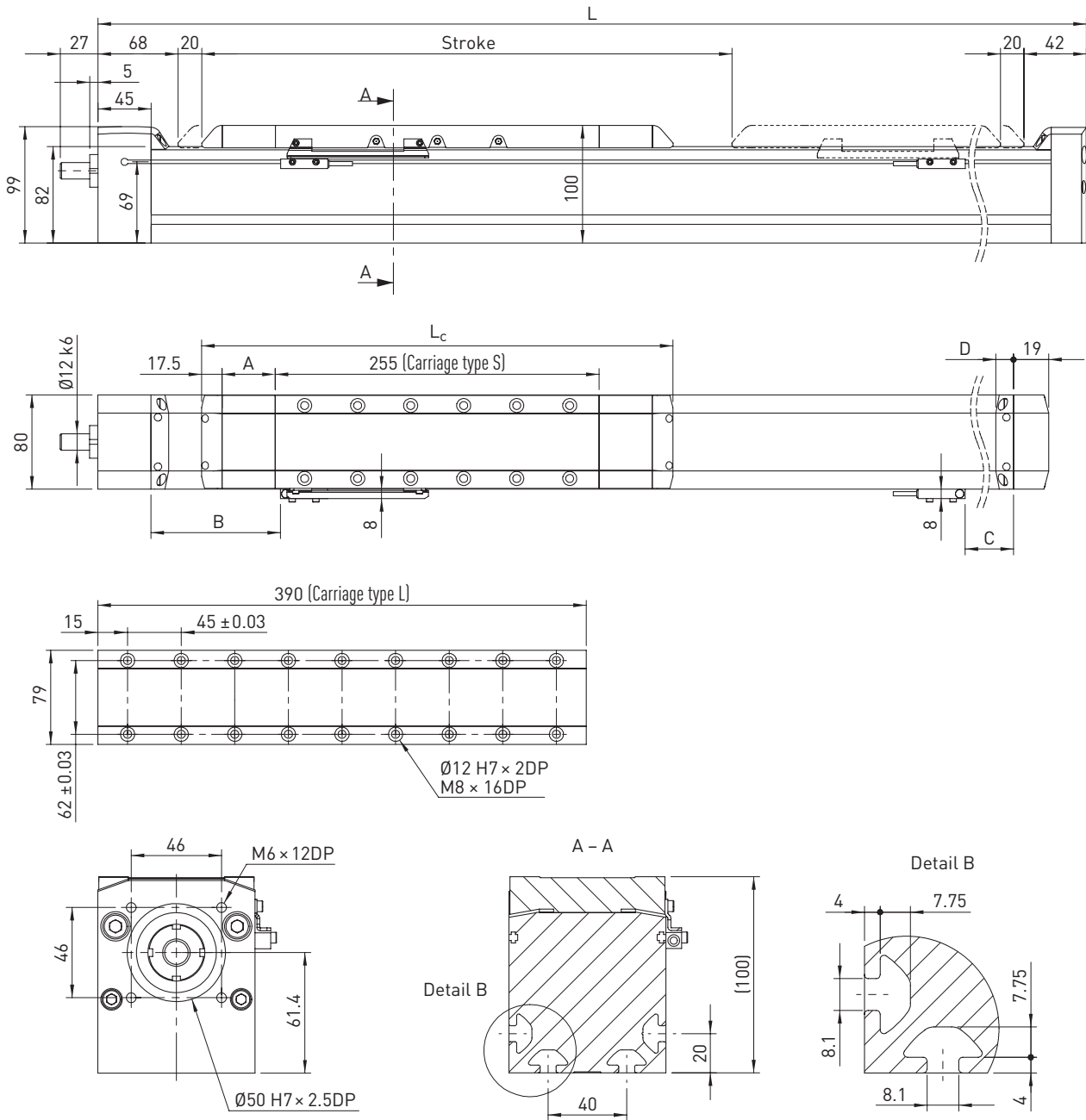


Table 4.13 Dimensions of HM080S

	Variant without cover		Variant with cover	
	Carriage type S	Carriage type L	Carriage type S	Carriage type L
Total carriage length L_c [mm]	290	425	380	515
Length of cover strip deflection A [mm]	—	—	45	45
Switch position B [mm]	40	40	100	100
Switch position C [mm]	175	310	235	370
Clamp housing length D [mm]	—	—	15	15
Total length L [mm]	$L = \text{Stroke} + 410$	$L = \text{Stroke} + 545$	$L = \text{Stroke} + 530$	$L = \text{Stroke} + 665$

4.8 Specifications of HM080S

Table 4.14 Load data

	Carriage type S	Carriage type L
$F_{y\text{dynmax}}^{1)}$ [N]	4,000	
$F_{z\text{dynmax}}$ [N]	6,683	
$M_{x\text{dynmax}}$ [Nm]	67	
$M_{y\text{dynmax}}$ [Nm]	353	623
$M_{z\text{dynmax}}$ [Nm]	589	1,040
$z^{2)}$ [mm]	68.5	

¹⁾ Force may act only without torque

²⁾ Upper carriage edge to guiding centre

See Section 2.7.3 on Page 10 (reference service life)

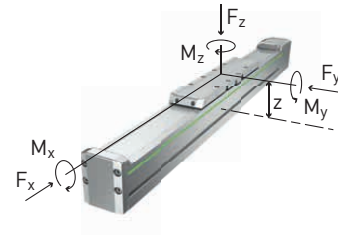


Table 4.15 General technical data

Repeatability [mm]	± 0.02
Max acceleration [m/s ²]	20
Typical load capacity [kg]	60
Max total length [mm]	2,979
Area moment of inertia I_x [mm ⁴]	1,293,796
Area moment of inertia I_y [mm ⁴]	1,759,898

Table 4.16 Guiding

Guiding type	QHH20C
Static load rating C_0 [N]	25,630
Dynamic load rating C_{dyn} [N]	23,080

Table 4.17 Drive

	Spindle lead		
	5 mm	10 mm	20 mm
Spindle diameter [mm]	20		
Axial play [mm]	0.02		
Max feed force $F_{x\text{max}}$ [N]	3,020	2,302	2,817
Max speed [m/s]	0.25	0.50	1.00
Max drive torque $M_{a\text{max}}$ [Nm]	2.75	4.01	9.32
Static load rating ballscrew C_0 [N]	32,000	30,100	30,500
Dynamic load rating ballscrew C_{dyn} [N]	16,400	12,500	15,300
Idle torque 0 stroke axis [Nm]	0.35		

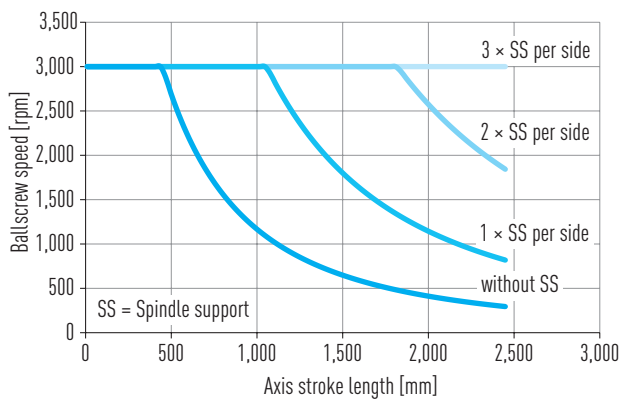


Fig. 4.5 Critical speeds

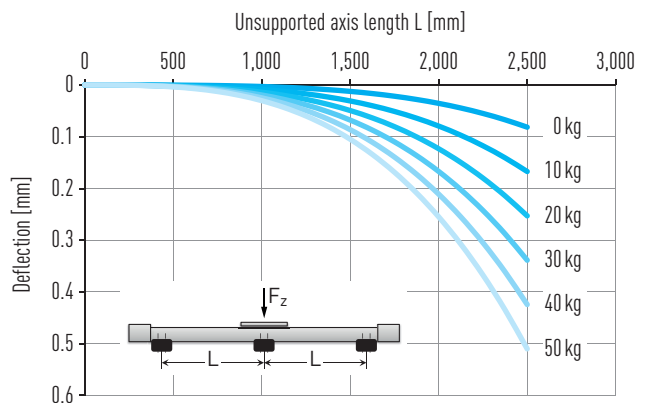


Fig. 4.6 Deflection under load capacity

Table 4.18 Mechanical properties

	Variant without cover						Variant with cover					
	Carriage type S			Carriage type L			Carriage type S			Carriage type L		
Spindle lead [mm]	5	10	20	5	10	20	5	10	20	5	10	20
Carriage mass [kg]	1.91	2.11	2.21	2.73	2.93	3.03	2.07	2.27	2.37	2.88	3.08	3.18
Mass 0 stroke axis [kg]	6.94	7.14	7.24	9.19	9.39	9.49	8.46	8.66	8.76	10.72	10.92	11.02
Mass per 1 m stroke [kg/m]	10.67						10.72					
$M_{\text{rot.}}^{1)}$ 0 stroke axis [kgcm ²]	0.80	0.78	0.80	0.95	0.94	0.95	0.94	0.92	0.94	1.09	1.08	1.09
$M_{\text{rot.}}^{1)}$ per 1 m stroke [kgcm ²]	1.17	1.15	1.17	1.17	1.15	1.17	1.17	1.15	1.17	1.17	1.15	1.17

¹⁾ Rotatory moment of inertia

Linear axes and axis systems HX

Linear axes HM-S

4.9 Dimensions of HM120S

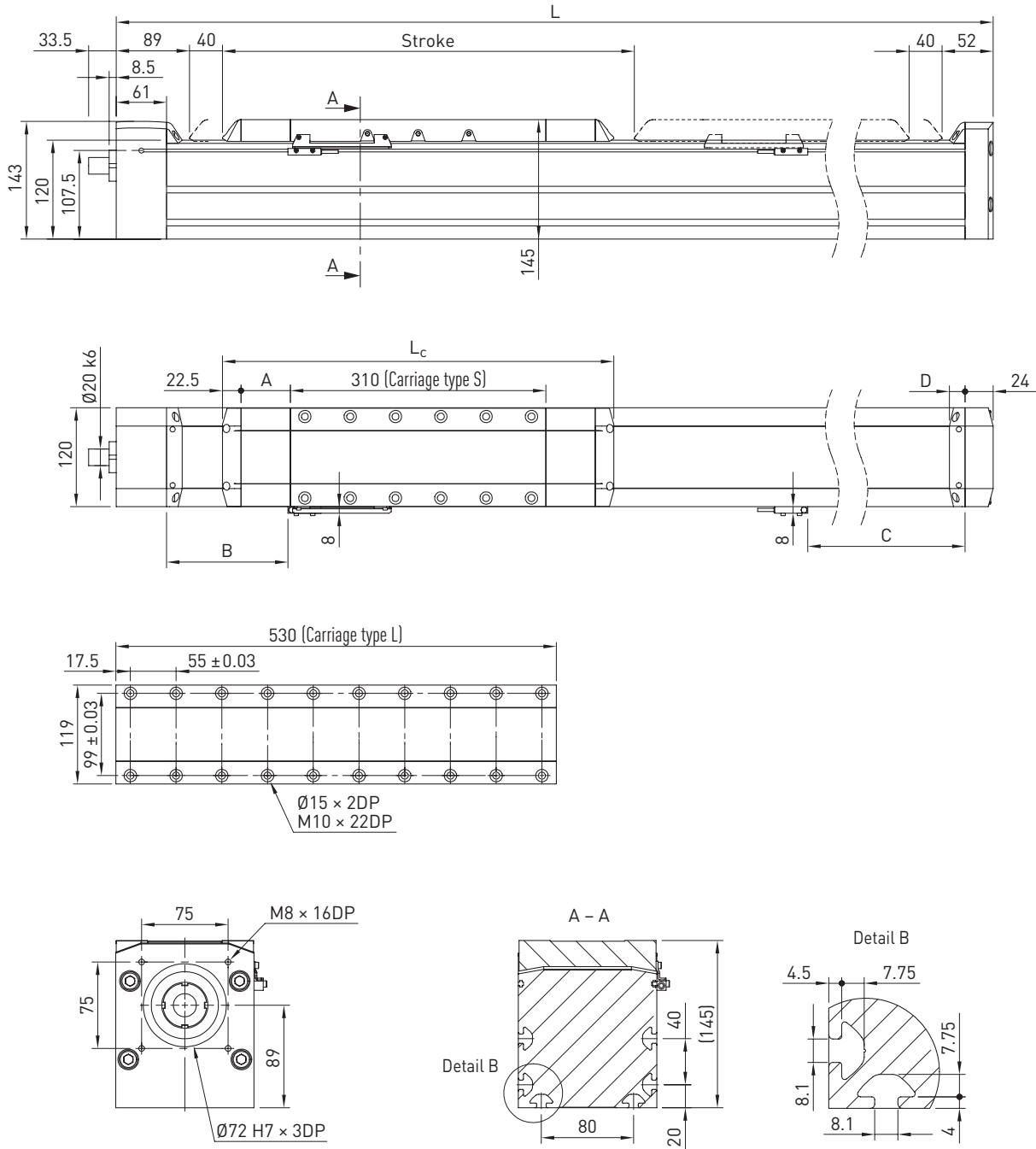


Table 4.19 Dimensions of HM120S

	Variant without cover		Variant with cover	
	Carriage type S	Carriage type L	Carriage type S	Carriage type L
Total carriage length L_c [mm]	355	575	475	695
Length of cover strip deflection A [mm]	—	—	60	60
Switch position B [mm]	68.5	68.5	87.5	87.5
Switch position C [mm]	253.5	473.5	332.5	552.5
Clamp housing length D [mm]	—	—	19	19
Total length L [mm]	$L = \text{Stroke} + 538$	$L = \text{Stroke} + 758$	$L = \text{Stroke} + 696$	$L = \text{Stroke} + 916$

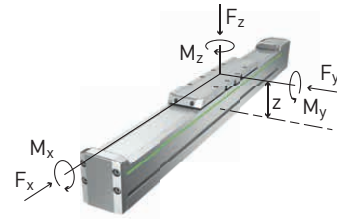
4.10 Specifications of HM120S

	Carriage type S	Carriage type L
$F_{y\text{dynmax}}^1$ [N]	12,230	
$F_{z\text{dynmax}}$ [N]	12,230	
$M_{x\text{dynmax}}$ [Nm]	155	
$M_{y\text{dynmax}}$ [Nm]	1,296	2,642
$M_{z\text{dynmax}}$ [Nm]	1,296	2,642
z^2 [mm]	99.1	

¹⁾ Force may act only without torque

²⁾ Upper carriage edge to guiding centre

See Section 2.7.3 on Page 10 (reference service life)



Repeatability [mm]	± 0.02
Max acceleration [m/s ²]	15
Typical load capacity [kg]	120
Max total length [mm]	4,473.5
Area moment of inertia I_x [mm ⁴]	6,235,456
Area moment of inertia I_y [mm ⁴]	8,646,933

Guiding type	QHH30C
Static load rating C_0 [N]	48,170
Dynamic load rating C_{dyn} [N]	46,490

	Spindle lead		
	10 mm	20 mm	32 mm
Spindle diameter [mm]	32		
Axial play [mm]	0.02		
Max feed force $F_{x\text{max}}$ [N]	6,113	3,849	4,732
Max speed [m/s]	0.5	1.0	1.6
Max drive torque $M_{a\text{max}}$ [Nm]	10.53	13.05	24.90
Static load rating ballscrew C_0 [N]	80,000	47,900	62,200
Dynamic load rating ballscrew C_{dyn} [N]	33,200	20,900	25,700
Idle torque 0 stroke axis [Nm]	0.8		

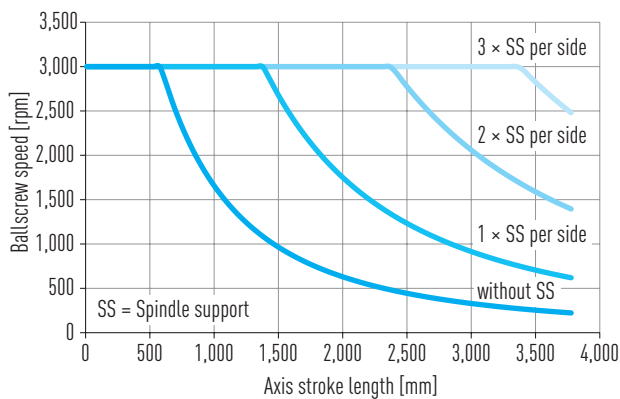


Fig. 4.7 Critical speeds

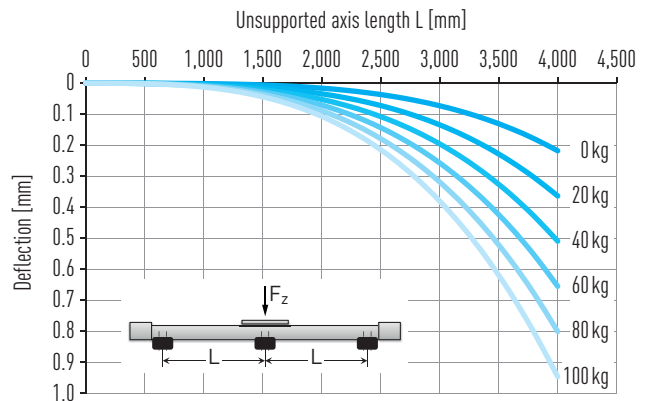


Fig. 4.8 Deflection under load capacity

	Variant without cover						Variant with cover					
	Carriage type S			Carriage type L			Carriage type S			Carriage type L		
Spindle lead [mm]	10	20	32	10	20	32	10	20	32	10	20	32
Carriage mass [kg]	6.18	6.08	6.08	8.61	8.51	8.51	6.7	6.6	6.6	9.13	9.03	9.03
Mass 0 stroke axis [kg]	20.85	20.75	20.75	28.57	28.47	28.47	25.3	25.2	25.2	33.0	32.9	32.9
Mass per 1 m stroke [kg/m]	24.01						24.10					
$M_{\text{rot.}}^1$ 0 stroke axis [kgcm ²]	5.71	5.71	5.74	7.47	7.47	7.51	6.98	6.98	7.01	8.73	8.73	8.78
$M_{\text{rot.}}^1$ per 1 m stroke [kgcm ²]	7.98	7.98	8.03	7.98	7.98	8.03	7.98	7.98	8.03	7.98	7.98	8.03

¹⁾ Rotatory moment of inertia

Linear axes and axis systems HX

Double axes HD

5. Double axes HD

5.1 Properties of the double axes HD with toothed belt drive

The HIWIN HD double axes are flexible linear modules consisting of two HM-B belt axes connected to each other via a synchronous shaft. They are used primarily in 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.



Synchronous shaft

The synchronous shaft safeguards a reliable, undeflecting transfer of forces to the parallel movements of both axes. With a generously dimensioned diameter, the synchronous shaft is particularly stable under torque, so it does not need additional bearings even at greater speeds and with larger distances between axes.



Critical speed of the synchronous shaft

The critical speed is a function of the synchronous shaft's length and diameter, and may not be exceeded during operation. A function of the size and speed of the HIWIN double axes, the resulting maximum distance between axes can be taken from [Fig. 5.1](#).

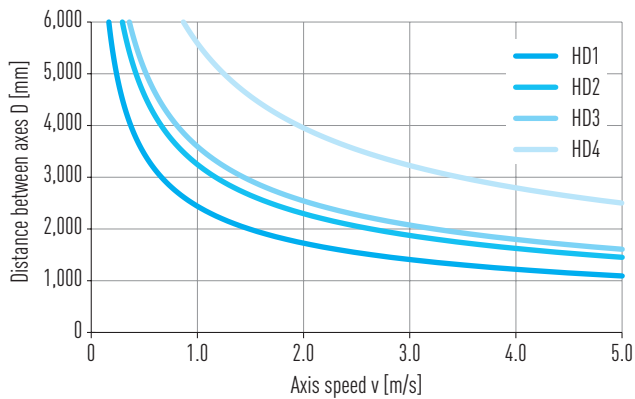
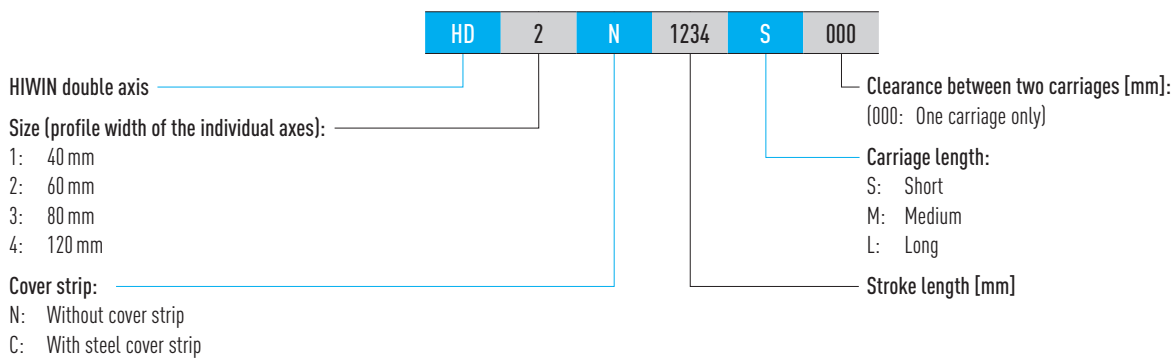
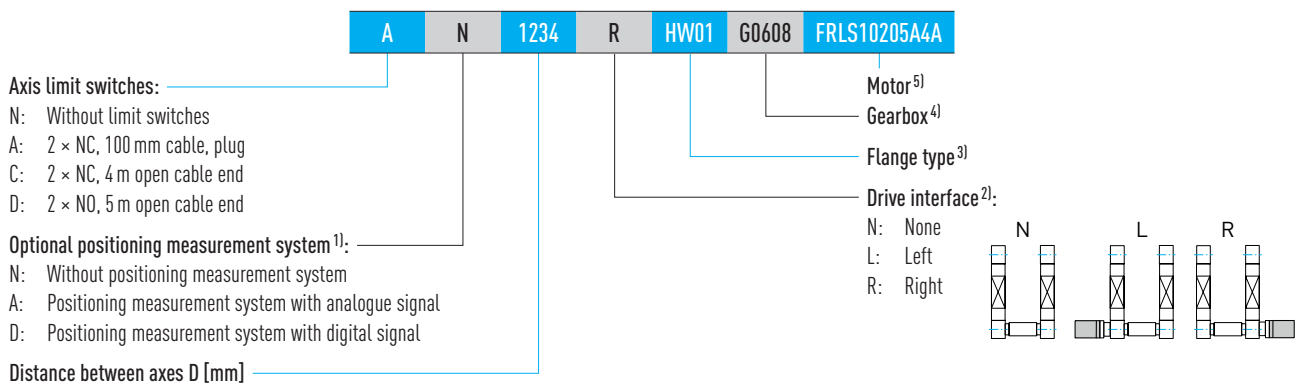


Fig. 5.1 Maximum distance between axes D versus axis speed v

5.2 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 7.10](#) on [Page 61](#) ff. If no flange type is selected, the order code ends at this position

⁴⁾ Suitable gearboxes can be found in [Section 7.1.5](#) on [Page 57](#)

⁵⁾ Suitable HIWIN motors can be found in [Section 8.1](#) on [Page 70](#)

Linear axes and axis systems HX

Double axes HD

5.3 Dimensions and specifications of double axis HD1

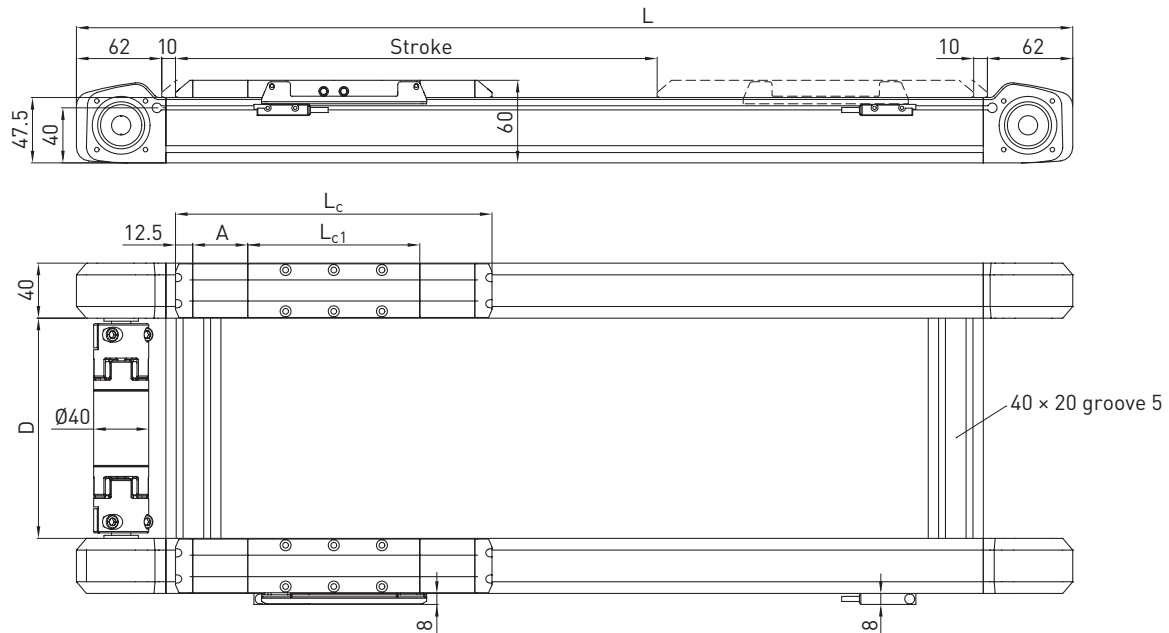


Table 5.1 HD1 dimensions

	Variant without cover			Variant with cover		
	Carriage type S	Carriage type M	Carriage type L	Carriage type S	Carriage type M	Carriage type L
Carriage section length L_{c1} [mm]	125	160	230	125	160	230
Total carriage length L_c [mm]	150	185	255	230	265	335
Length of cover strip deflection A [mm]	—	—	—	40	40	40
Total length L [mm]	$L = \text{Stroke} + 294$	$L = \text{Stroke} + 329$	$L = \text{Stroke} + 399$	$L = \text{Stroke} + 374$	$L = \text{Stroke} + 409$	$L = \text{Stroke} + 479$
Min distance between axes [mm]	160	160	160	160	160	160
Max distance between axes [mm]	1,500	1,500	1,500	1,500	1,500	1,500

Table 5.2 General technical data

Max feed force F_{x_max} [N]	450
Max speed [m/s]	3
Max drive torque M_{a_max} [Nm]	8
Typical load capacity ¹⁾ [kg]	25
Idle torque 0 stroke axis [Nm]	0.6
Individual axis	HM040B

¹⁾ When load distributed evenly over both axes

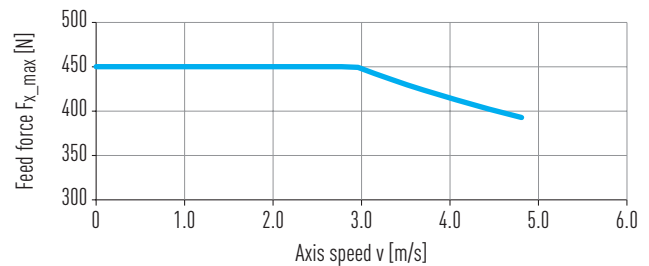


Fig. 5.2 Max feed force F_x as a function of axis speed v

Table 5.3 Mechanical properties

	Variant without cover			Variant with cover		
	Carriage type S	Carriage type M	Carriage type L	Carriage type S	Carriage type M	Carriage type L
Carriage mass [kg]	0.66	0.76	1.00	0.74	0.86	1.08
Mass at 0 stroke + distance between axes $D = 0$ [kg]	3.28	3.61	4.26	3.87	4.20	4.86
Mass per 1 m stroke [kg/m]	6.04			6.09		
Mass per 1 m of distance between axes D [kg/m]	2.74			2.74		
$M_{rot.}$ ¹⁾ at 0 stroke + distance between axes $D = 0$ [kgcm ²]	1.40			1.40		
$M_{rot.}$ ¹⁾ per 1 m of distance between axes D [kgcm ²]	3.24			3.24		

¹⁾ Rotatory moment of inertia

Note: Further sizes and details of the HM040B belt axis can be found on [Page 16](#).

5.4 Dimensions and specifications of double axis HD2

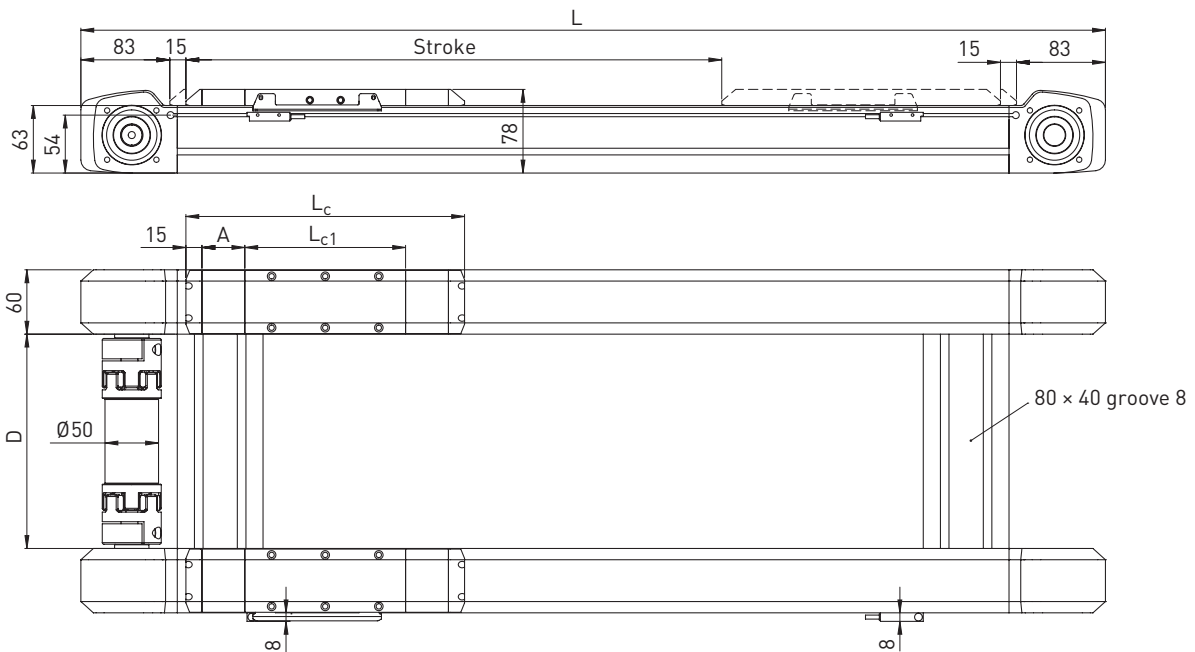


Table 5.4 HD2 dimensions

	Variant without cover			Variant with cover		
	Carriage type S	Carriage type M	Carriage type L	Carriage type S	Carriage type M	Carriage type L
Carriage section length L_{c1} [mm]	150	200	300	150	200	300
Total carriage length L_c [mm]	180	230	330	260	310	410
Length of cover strip deflection A [mm]	—	—	—	40	40	40
Total length L [mm]	$L = \text{Stroke} + 376$	$L = \text{Stroke} + 426$	$L = \text{Stroke} + 526$	$L = \text{Stroke} + 456$	$L = \text{Stroke} + 506$	$L = \text{Stroke} + 606$
Min distance between axes [mm]	186	186	186	186	186	186
Max distance between axes [mm]	2,000	2,000	2,000	2,000	2,000	2,000

Table 5.5 General technical data

Max feed force F_{x_max} [N]	1,323
Max speed [m/s]	5
Max drive torque M_{a_max} [Nm]	33
Typical load capacity ¹⁾ [kg]	63
Idle torque 0 stroke axis [Nm]	2
Individual axis	HM060B

¹⁾ When load distributed evenly over both axes

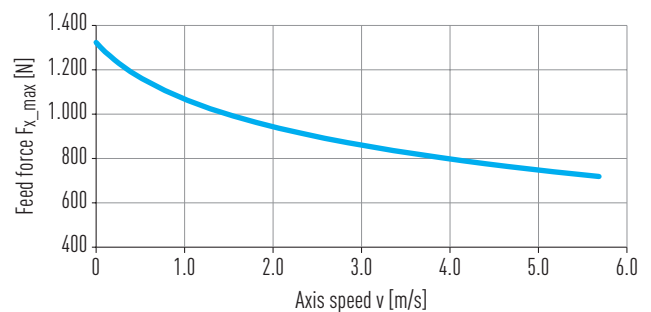


Fig. 5.3 Max feed force F_x as a function of axis speed v

Table 5.6 Mechanical properties

	Variant without cover			Variant with cover		
	Carriage type S	Carriage type M	Carriage type L	Carriage type S	Carriage type M	Carriage type L
Carriage mass [kg]	1.62	1.92	2.50	1.78	2.06	2.64
Mass at 0 stroke + distance between axes $D = 0$ [kg]	8.07	8.90	10.57	9.13	9.97	11.65
Mass per 1 m stroke [kg/m]	10.93			11.02		
Mass per 1 m of distance between axes D [kg/m]	10.26			10.26		
$M_{rot.}$ ¹⁾ at 0 stroke + distance between axes $D = 0$ [kgcm ²]	6.53			6.53		
$M_{rot.}$ ¹⁾ per 1 m of distance between axes D [kgcm ²]	6.63			6.63		

¹⁾ Rotatory moment of inertia

Note: Further sizes and details of the HM060B belt axis can be found on [Page 18](#).

Linear axes and axis systems HX

Double axes HD

5.5 Dimensions and specifications of double axis HD3

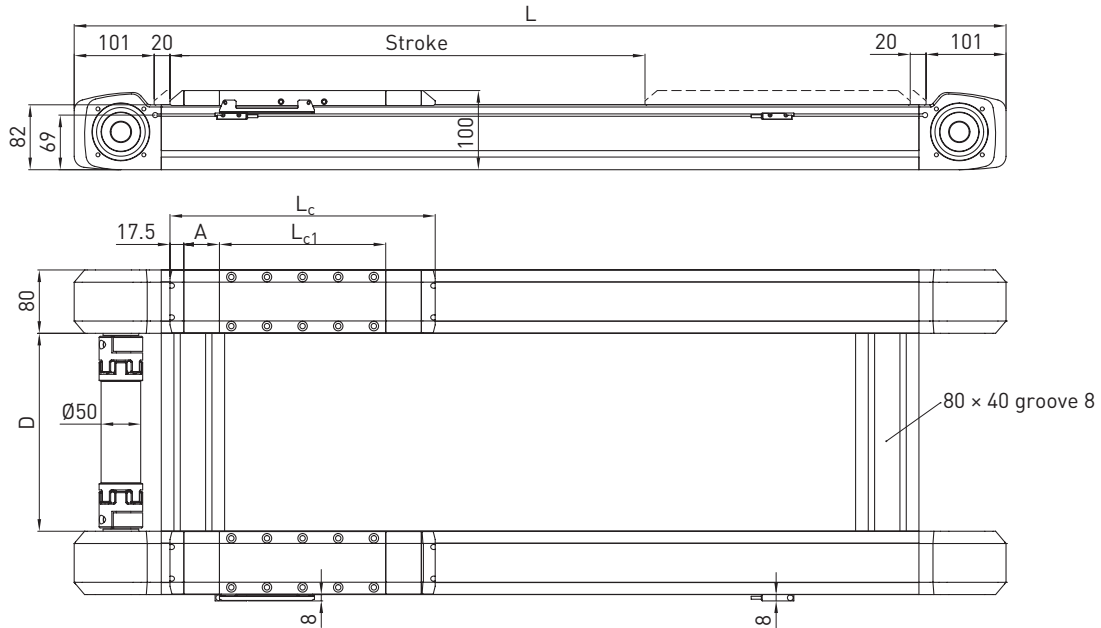


Table 5.7 HD3 dimensions

	Variant without cover			Variant with cover		
	Carriage type S	Carriage type M	Carriage type L	Carriage type S	Carriage type M	Carriage type L
Carriage section length L_{c1} [mm]	210	300	390	210	300	390
Total carriage length L_c [mm]	245	335	425	335	425	515
Length of cover strip deflection A [mm]	—	—	—	45	45	45
Total length L [mm]	$L = \text{Stroke} + 487$	$L = \text{Stroke} + 577$	$L = \text{Stroke} + 667$	$L = \text{Stroke} + 577$	$L = \text{Stroke} + 667$	$L = \text{Stroke} + 757$
Min distance between axes [mm]	200	200	200	200	200	200
Max distance between axes [mm]	2,400	2,400	2,400	2,400	2,400	2,400

Table 5.8 General technical data

Max feed force F_{x_max} [N]	1,852
Max speed [m/s]	5
Max drive torque M_{a_max} [Nm]	56
Typical load capacity ¹⁾ [kg]	150
Idle torque 0 stroke axis [Nm]	4
Individual axis	HM080B

¹⁾ When load distributed evenly over both axes

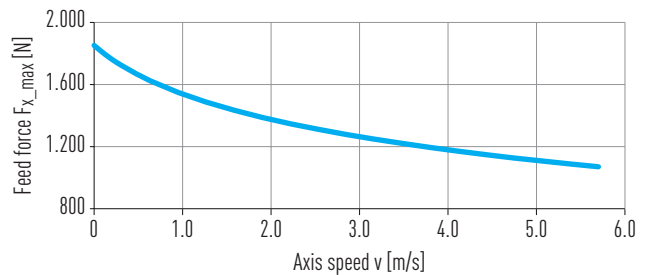


Fig. 5.4 Max feed force F_x as a function of axis speed v

Table 5.9 Mechanical properties

	Variant without cover			Variant with cover		
	Carriage type S	Carriage type M	Carriage type L	Carriage type S	Carriage type M	Carriage type L
Carriage mass [kg]	3.50	4.34	5.16	3.80	4.64	5.48
Mass at 0 stroke and distance between + D = 0 [kg]	15.87	18.48	21.09	18.01	20.63	23.25
Mass per 1 m stroke [kg/m]	19.73			19.84		
Mass per 1 m of distance between axes D [kg/m]	10.26			10.26		
$M_{rot.}$ ¹⁾ at 0 stroke + distance between axes D = 0 [kgcm ²]	15.00			15.00		
$M_{rot.}$ ¹⁾ per 1 m of distance between axes D [kgcm ²]	6.63			6.63		

¹⁾ Rotatory moment of inertia

Note: Further sizes and details of the HM080B belt axis can be found on [Page 20](#).

5.6 Dimensions and specifications of double axis HD4

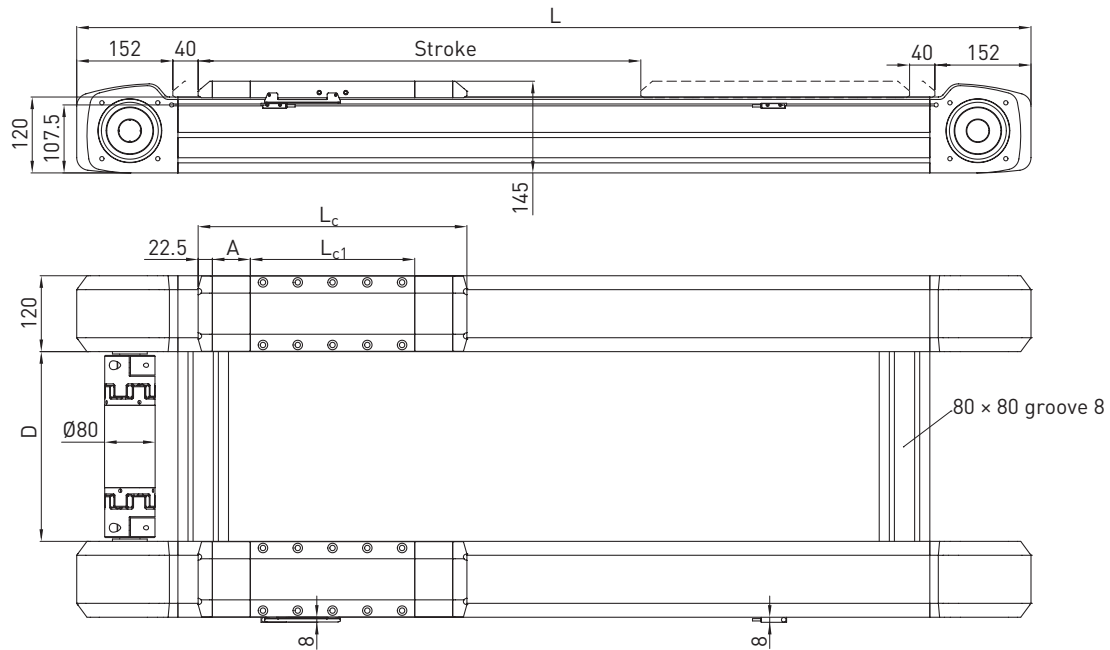


Table 5.10 HD4 dimensions

	Variant without cover			Variant with cover		
	Carriage type S	Carriage type M	Carriage type L	Carriage type S	Carriage type M	Carriage type L
Carriage section length L_{c1} [mm]	260	370	535	260	370	535
Total carriage length L_c [mm]	305	415	580	425	535	700
Length of cover strip deflection A [mm]	—	—	—	60	60	60
Total length L [mm]	$L = \text{Stroke} + 689$	$L = \text{Stroke} + 799$	$L = \text{Stroke} + 964$	$L = \text{Stroke} + 809$	$L = \text{Stroke} + 919$	$L = \text{Stroke} + 1,084$
Min distance between axes [mm]	256	256	256	256	256	256
Max distance between axes [mm]	3,000	3,000	3,000	3,000	3,000	3,000

Table 5.11 General technical data

Max feed force F_{x_max} [N]	4,385
Max speed [m/s]	5
Max drive torque M_{a_max} [Nm]	201
Typical load capacity ¹⁾ [kg]	300
Idle torque 0 stroke axis [Nm]	9
Individual axis	HM120B

¹⁾ When load distributed evenly over both axes

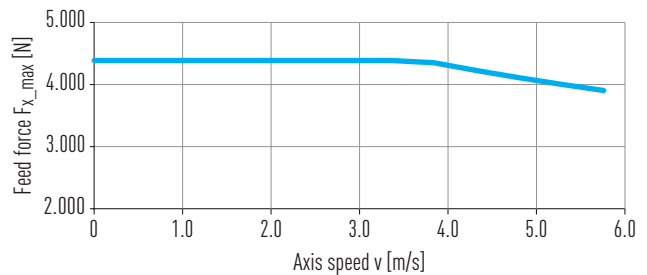


Fig. 5.5 Max feed force F_x as a function of axis speed v

Table 5.12 Mechanical properties

	Variant without cover			Variant with cover		
	Carriage type S	Carriage type M	Carriage type L	Carriage type S	Carriage type M	Carriage type L
Carriage mass [kg]	10.58	12.16	15.58	11.62	13.59	16.60
Mass at 0 stroke + distance between axes $D = 0$ [kg]	49.44	55.57	65.85	55.53	61.73	72.04
Mass per 1 m stroke [kg/m]	41.54			41.72		
Mass per 1 m of distance between axes D [kg/m]	18.42			18.42		
$M_{rot.}$ ¹⁾ at 0 stroke + distance between axes $D = 0$ [kgcm ²]	104.30			104.30		
$M_{rot.}$ ¹⁾ per 1 m of distance between axes D [kgcm ²]	44.90			44.90		

¹⁾ Rotatory moment of inertia

Note: Further sizes and details of the HM120B belt axis can be found on [Page 22](#).

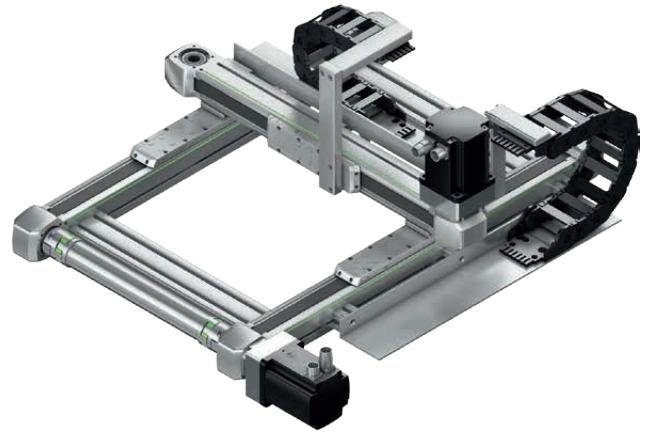
Linear axes and axis systems HX

Two-axis systems HS2

6. Two-axis systems HS2

6.1 Properties of the two-axis systems HS2

HIWIN HS2 two-axis systems are flexible units for positioning along the X and Y axes. They consist of a HIWIN HD double axis along the X axis and a HIWIN HM-B belt axis along the Y axis. HIWIN HS2 two-axis systems have been designed specifically for 2D or single-plane movements and form the basis for three-axis systems.



Energy chain

Generously dimensioned energy chains provide space for the reliable carrying of supply lines. Nevertheless, these energy chains are particularly compact and space saving solutions when integrated in the complete system.



Maximum X axis speed

The maximum X axis speed is a function of the size and the distance between axes presented by the Y axis stroke of the HS2 two-axis system. The maximum axis speed versus Y axis stroke length can be taken from Fig. 6.1.

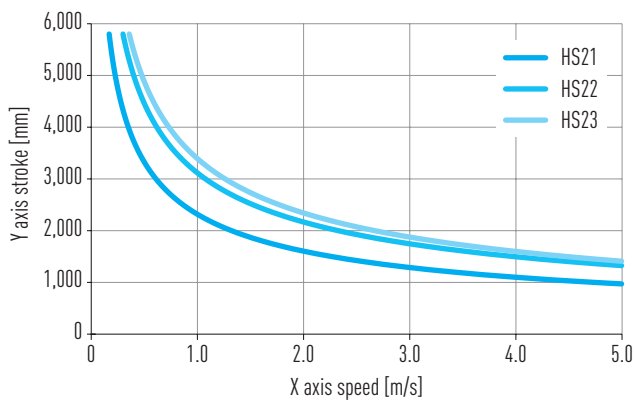
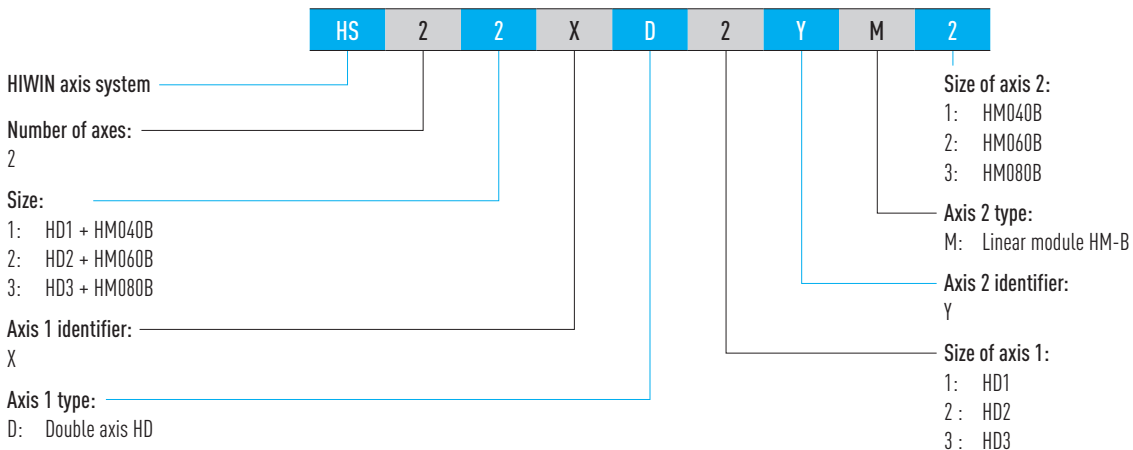
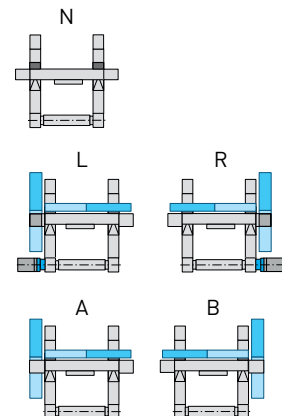
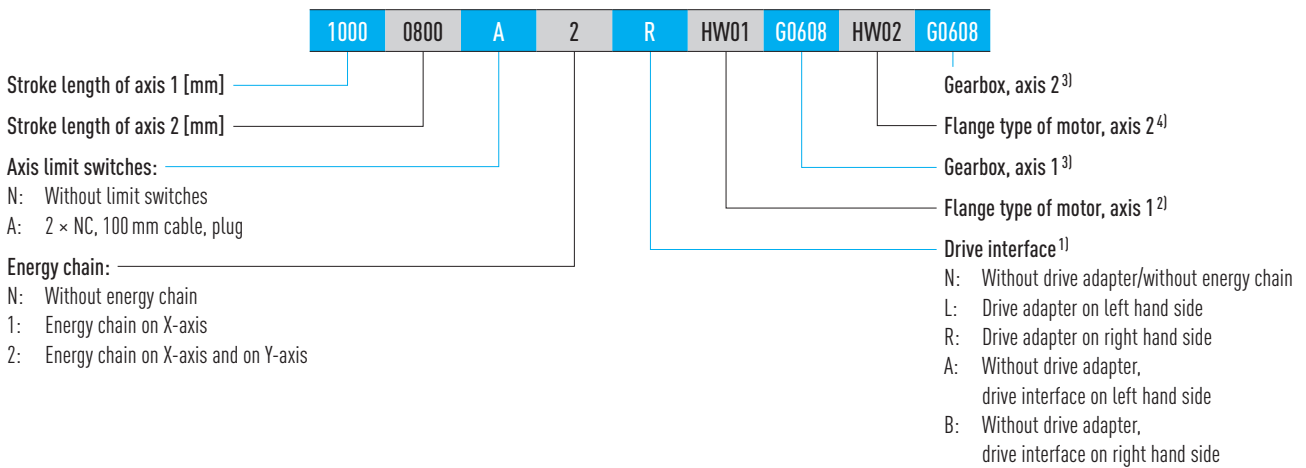


Fig. 6.1 Max X axis speed as a function of Y axis stroke

6.2 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 7.1](#) on [Page 49](#) ff. "Gearbox, Axis 1" is applicable only when a flange type has been selected

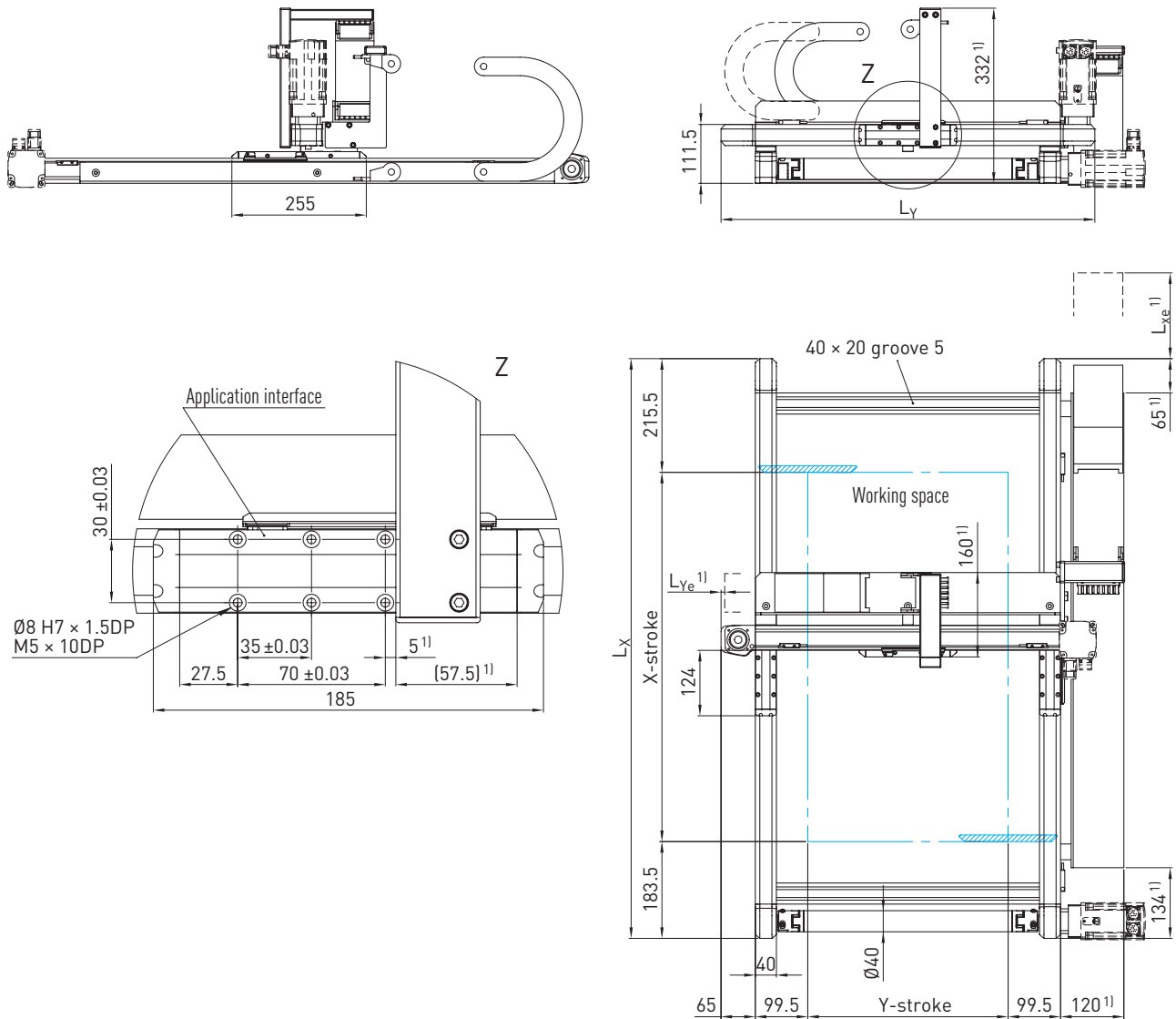
³⁾ Suitable gearboxes can be found in [Section 7.1.5](#)

⁴⁾ All flange types can be found in [Table 7.1](#) on [Page 49](#) ff. If no flange type is selected, the order code ends at this position

Linear axes and axis systems HX

Two-axis systems HS2

6.3 Dimensions of two-axis system HS21



¹⁾ Not applicable when variant without energy chain

Total length of X-axis L_x [mm]	$L_x = \text{Stroke} + 399$
Total length of Y-axis L_y [mm]	$L_y = \text{Stroke} + 329$

	X-axis	Y-axis
Internal cross section $W \times H$ [mm]	77 × 25	57 × 25
Bending radius [mm]	100	75
End position $L_{xe}^{2)}$	167	—
End position $L_{ye}^{2)}$	—	2

²⁾ at electrical zero

6.4 Specifications of HS21

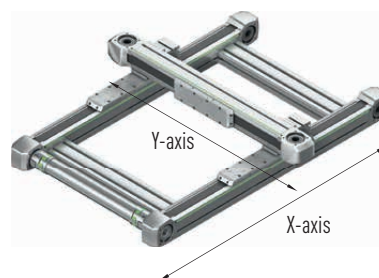


Table 6.3 General technical data

	X-axis	Y-axis
Axis type	HD1	HM040B
Carriage type	L	M
Max feed force F_{x_max} [N]	450	300
Max speed [m/s] ¹⁾	3	3
Max acceleration [m/s ²] ¹⁾	30	30
Max drive torque M_{a_max} [Nm]	8	5
Max stroke length [mm]	3,000	1,300
Typical load capacity [kg]	5	

¹⁾ Restrictions in version with energy chain possible, depending on stroke

Note: Measurements and specifications of HM040B single axes can be found in Sections [3.3](#) and [3.4](#)

Table 6.4 Drive

	X-axis	Y-axis
Toothed belt drive element	B15HTD3	B15HTD3
Feed constant [mm/rotation]	111	111
Effective diameter of toothed belt pulley [mm]	35.33	35.33

Table 6.5 Mechanical properties

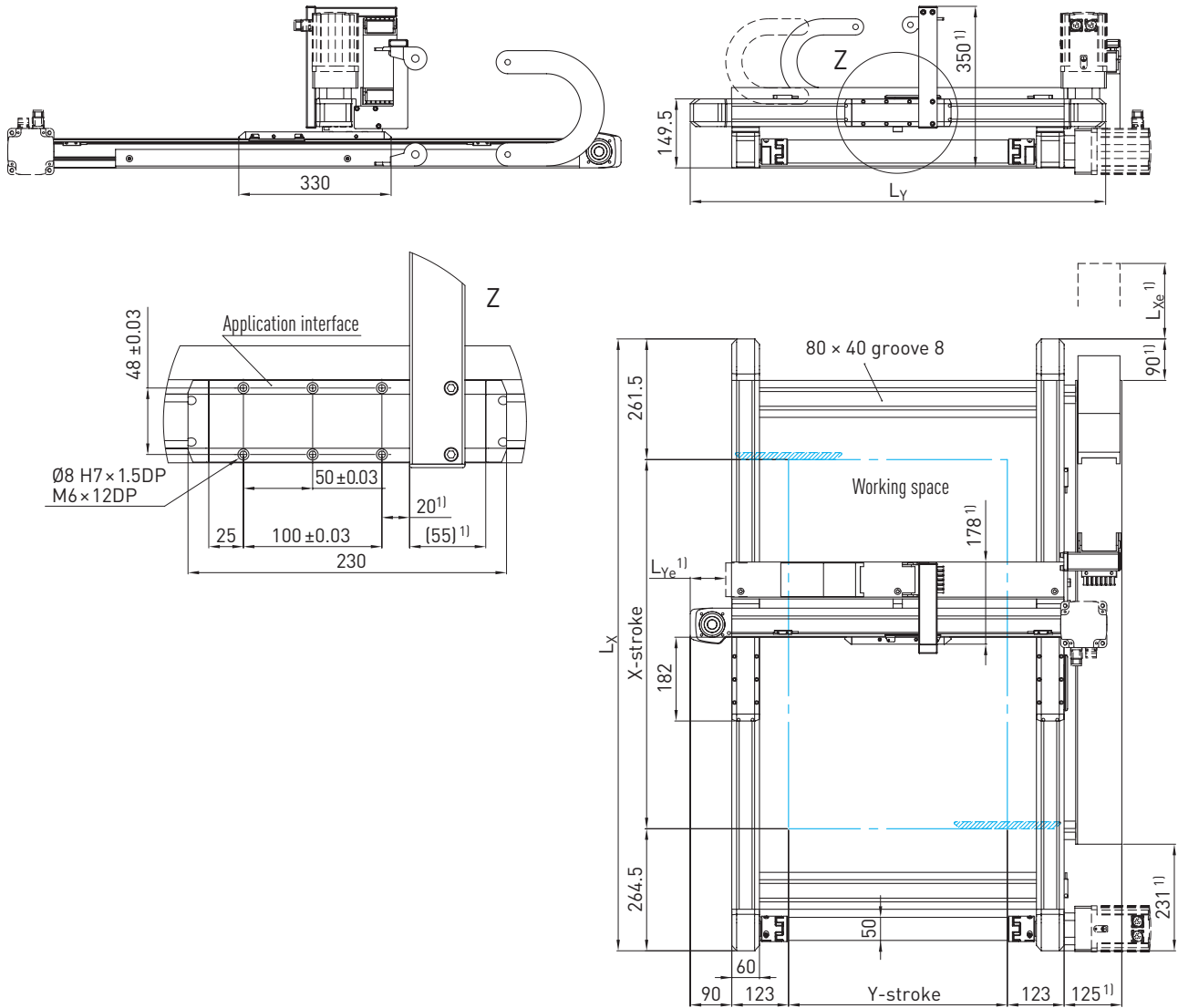
Moving mass on Y axis [kg]	0.42
Moving mass on X axis at 0 stroke Y axis [kg]	2.91
Moving mass on X axis per 1 m of stroke Y axis [kg]	3.02
Mass of all systems at 0 stroke X and Y axes [kg]	7.26
Mass of all systems per 1 m of stroke X axis [kg]	6.04
Mass of all systems per 1 m of stroke Y axis [kg]	5.34

Note: All values without energy chain and without drive

Linear axes and axis systems HX

Two-axis systems HS2

6.5 Dimensions of two-axis system HS22



¹⁾ Not applicable when variant without energy chain

Total length of X-axis L_x [mm]	$L_x = \text{Stroke} + 526$
Total length of Y-axis L_y [mm]	$L_y = \text{Stroke} + 426$

	X-axis	Y-axis
Internal cross section $W \times H$ [mm]	75 × 35	57 × 25
Bending radius [mm]	100	75
End position L_{Xe}²⁾	171	—
End position L_{Ye}²⁾	—	71

²⁾ at electrical zero

6.6 Specifications of HS22

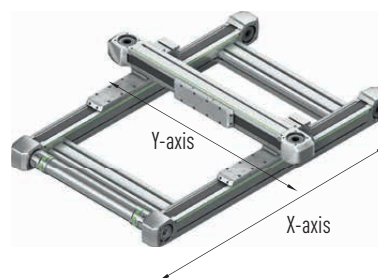


Table 6.8 General technical data

	X-axis	Y-axis
Axis type	HD2	HMO60B
Carriage type	L	M
Max feed force F_{x_max} [N]	1,323	882
Max speed [m/s] ¹⁾	5	5
Max acceleration [m/s ²] ¹⁾	30	30
Max drive torque M_{a_max} [Nm]	33	22
Max stroke length [mm]	5,000	1,600
Typical load capacity [kg]	12	

¹⁾ Restrictions in version with energy chain possible, depending on stroke

Note: Measurements and specifications of HMO60B single axes can be found in Sections [3.5](#) and [3.6](#)

Table 6.9 Drive

	X-axis	Y-axis
Toothed belt drive element	B25HTD5	B25HTD5
Feed constant [mm/rotation]	155	155
Effective diameter of toothed belt pulley [mm]	49.34	49.34

Table 6.10 Mechanical properties

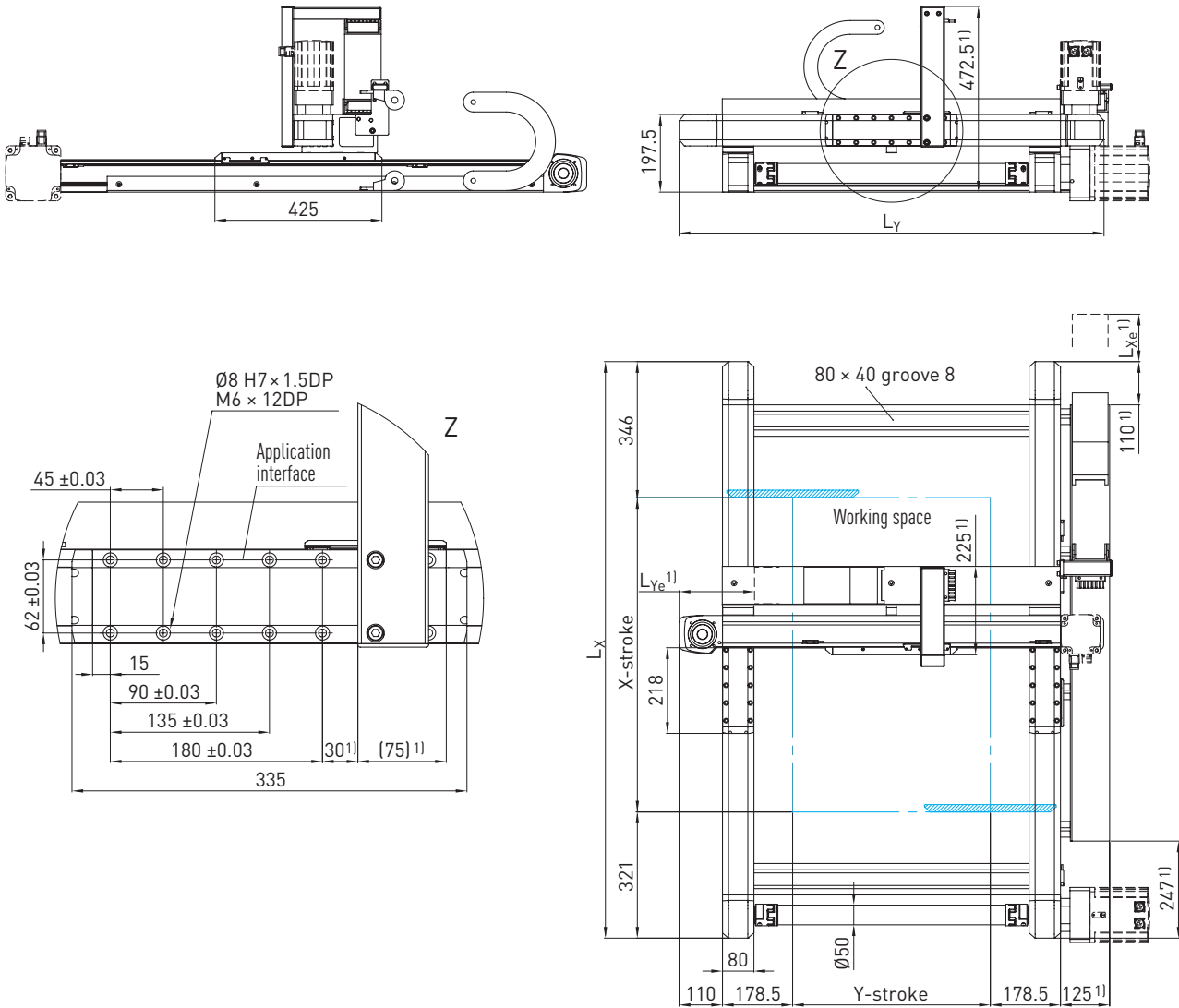
Moving mass on Y axis [kg]	1.04
Moving mass on X axis at 0 stroke Y axis [kg]	7.02
Moving mass on X axis per 1 m of stroke Y axis [kg]	5.47
Mass of all systems at 0 stroke X and Y axes [kg]	17.85
Mass of all systems per 1 m of stroke X axis [kg]	10.93
Mass of all systems per 1 m of stroke Y axis [kg]	15.66

Note: All values without energy chain and without drive

Linear axes and axis systems HX

Two-axis systems HS2

6.7 Dimensions of two-axis system HS23



¹⁾ Not applicable when variant without energy chain

Table 6.11 HS23 dimensions

Total length of X-axis L_x [mm]	$L_x = \text{Stroke} + 667$
Total length of Y-axis L_y [mm]	$L_y = \text{Stroke} + 577$

Table 6.12 Energy chain

	X-axis	Y-axis
Internal cross section $W \times H$ [mm]	75 × 35	77 × 25
Bending radius [mm]	100	100
End position L_{Xe}²⁾	130	—
End position L_{Ye}²⁾	—	182

²⁾ at electrical zero

6.8 Specifications of HS23

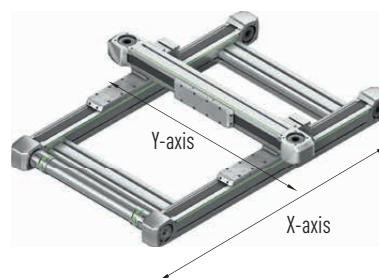


Table 6.13 General technical data

	X-axis	Y-axis
Axis type	HD3	HM080B
Carriage type	L	M
Max feed force F_{x_max} [N]	1,852	1,235
Max speed [m/s]¹⁾	5	5
Max acceleration [m/s²]¹⁾	30	30
Max drive torque M_{a_max} [Nm]	56	37
Max stroke length [mm]	5,000	1,600
Typical load capacity [kg]	30	

¹⁾ Restrictions in version with energy chain possible, depending on stroke

Note: Measurements and specifications of HM080B single axes can be found in Sections [3.7](#) and [3.8](#)

Table 6.14 Drive

	X-axis	Y-axis
Toothed belt drive element	B35HTD5	B35HTD5
Feed constant [mm/rotation]	190	190
Effective diameter of toothed belt pulley [mm]	60.48	60.48

Table 6.15 Mechanical properties

Moving mass on Y axis [kg]	2.13
Moving mass on X axis at 0 stroke Y axis [kg]	15.10
Moving mass on X axis per 1 m of stroke Y axis [kg]	9.86
Mass of all systems at 0 stroke X and Y axes [kg]	33.69
Mass of all systems per 1 m of stroke X axis [kg]	19.73
Mass of all systems per 1 m of stroke Y axis [kg]	19.68

Note: All values without energy chain and without drive

Linear axes and axis systems HX

Motor adapter

7. Motor adapter

7.1 Motor adapter of the HM-B linear axis and the HD double axis

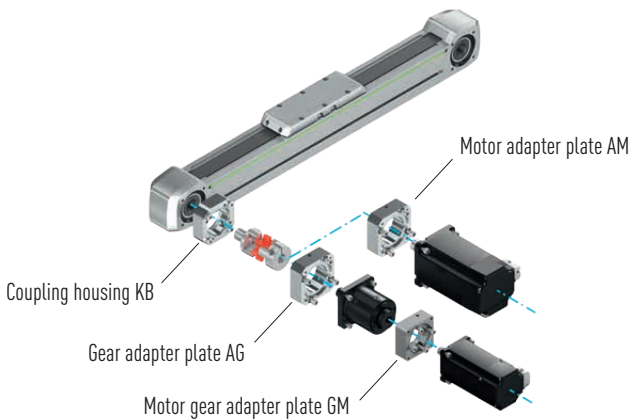
The adapter on the axis is a multi-part structure that simplifies the flange connections of all possible motors or gears.

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

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

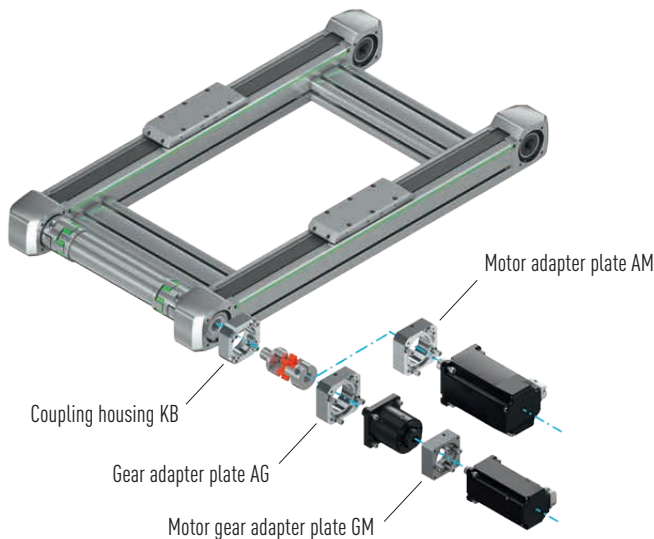


Gear adapter plate AG:
Motor gear adapter plate GM:
Motor adapter plate AM:

Axis-gear adapter
Gear-motor adapter
Axis-motor adapter

Fig. 7.1 Motor adapter of the HM-B linear axis

Motor adapter of the double axis (HD)



Gear adapter plate AG:
Motor gear adapter plate GM:
Motor adapter plate AM:

Axis-gear adapter
Gear-motor adapter
Axis-motor adapter

Fig. 7.2 Motor adapter of the HD double axis

¹⁾ Not applicable to NG01-NG07

Table 7.1 Order code for flange type¹⁾ – HM-B linear axis and HD double axis

Drive Manufacturer/type	HM040B/HD1			HM060B/HD2			HM080B/HD3			HM120B/HD4	
	Motor only	With PLE40	With PLQE60	Motor only	With PLQE60	With PLQE80	Motor only	With PLQE80	With PLQE120	Motor only	With PLQE120
Gearbox only		NG01	NG02		NG03	NG04		NG05	NG06		NG07
HIWIN	FRLS10		HW04		HW07						
	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
	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

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¹⁾ See order code on Page 15

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

Linear axes and axis systems HX

Motor adapter

Table 7.1 Order code for flange type¹⁾ – HM-B linear axis and HD double axis (continuation)

Drive Manufacturer/type	HM040B/HD1			HM060B/HD2			HM080B/HD3			HM120B/HD4	
	Motor only	With PLE40	With PLQE60	Motor only	With PLQE60	With PLQE80	Motor only	With PLQE80	With PLQE120	Motor only	With PLQE120
Beckhoff	AM8052			BE07			BE11		BE11		BE19
	AM8053						BE11		BE11		BE19
	AM8551			BE07			BE11		BE11		BE19
	AM8552			BE07			BE11		BE11	BE15	BE15
	AM8553						BE11		BE11	BE15	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
	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	

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¹⁾ See order code on Page 15

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

Table 7.1 Order code for flange type¹⁾ – HM-B linear axis and HD double axis (continuation)

Drive Manufacturer/type		HM040B/HD1			HM060B/HD2			HM080B/HD3			HM120B/HD4	
		Motor only	With PLE40	With PLQE60	Motor only	With PLQE60	With PLQE80	Motor only	With PLQE80	With PLQE120	Motor only	With PLQE120
Lenze	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	
	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	

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¹⁾ See order code on [Page 15](#)

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

Linear axes and axis systems HX

Accessories

Table 7.1 Order code for flange type¹⁾ – HM-B linear axis and HD double axis (continuation)

Drive Manufacturer/type	HM040B/HD1			HM060B/HD2			HM080B/HD3			HM120B/HD4	
	Motor only	With PLE40	With PLQE60	Motor only	With PLQE60	With PLQE80	Motor only	With PLQE80	With PLQE120	Motor only	With PLQE120
SEW	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	
	1FK7042				SM05		SM05	SM08	SM08	SM08	
	1FK7060				SM06 ²⁾			SM09		SM09	
	1FK7062				SM06 ²⁾			SM09		SM09	SM12
	1FK7063				SM06 ²⁾			SM09		SM09	SM12
	1FK7080							SM10 ²⁾			SM13
	1FK7081							SM10 ²⁾			SM13
	1FK7083							SM10 ²⁾			SM13
	1FK7084							SM10 ²⁾			SM13
	1FK7100										SM14
	1FK7101										SM14
	1FK7103										SM14
	1FK7105										SM14

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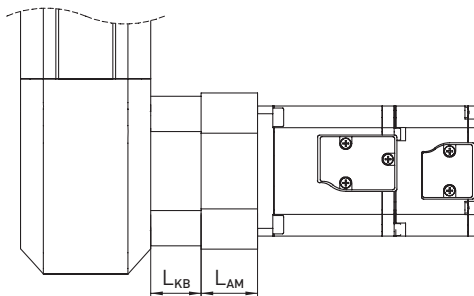
¹⁾ See order code on [Page 15](#)

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)
- Gearbox
- Motor

HM-B linear axis without gearbox

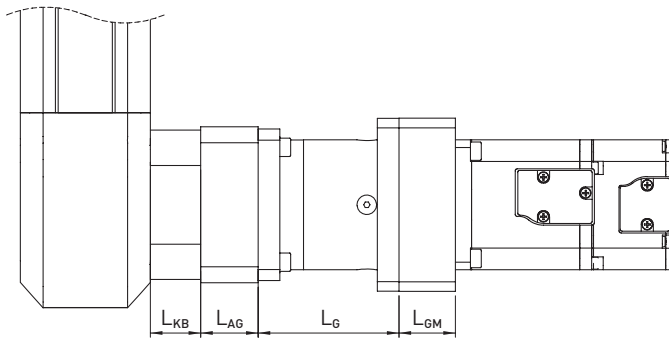


L_{KB} Length of coupling housing, see [Table 7.2](#)

L_{AM} Motor adapter plate length, see [Table 7.3](#)

Fig. 7.3 HM-B linear axis motor connection without gears

HM-B linear axis with gearbox



- L_{KB} Length of coupling housing, see [Table 7.2](#)
- L_{AG} Gear adapter plate length, see [Table 7.4](#)
- L_G Length of gear box, see [Table 7.6](#)
- L_{GM} Motor gear adapter plate length, see [Table 7.5](#)

Fig. 7.4 HM-B linear axis motor connection with gears

7.1.1 Coupling housing KB for HM-B linear axis

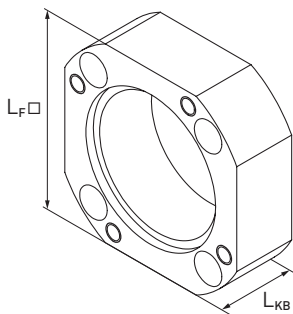


Fig. 7.5 Coupling housing KB for HM-B linear axis

Table 7.2 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	25-000350
HM060B	69	23.2	25-000351
HM080B	84	24.1	25-000352
HM120B	118	25.0	25-000353

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

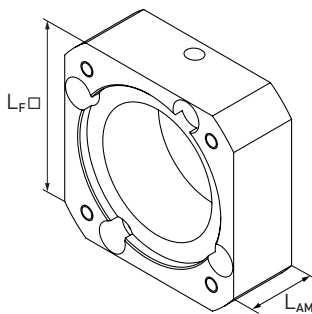


Fig. 7.6 Motor adapter plate AM for HM-B linear axis without gears

Linear axes and axis systems HX

Motor adapter

Table 7.3 Motor adapter plate AM for HM-B linear axis without gears

Linear axis	Manufacturer	Motors	L _F [mm]	L _{AM} [mm]	Article number	
HM040B	Bosch	MSK030B, MSK030S	54	22	25-000401	
	SEW	CMP40M				
	Siemens	1FK7022	55	22	25-000402	
	Beckhoff	AM8022D, AM8022E, AM8023E, AM8023F				
	B&R	8LSA25	58	25	25-000403	
	HIWIN	FRLS202, FRLS402	60	31	25-000404	
	Bosch	MSK040B, MSK040C	62	25	25-000405	
	Schneider	BSH0701, BSH0702, BMH0701, BMH0702				
	Lenze	MCS06F41, MCS06F60, MCS06I41, MCS06I60	70	31	25-000407	
	SEW	CMP50S, CMP50M				
	Schneider	BMH0703				
	Beckhoff	AM8031D, AM8031F, AM8531D, AM8531F	72	31	25-000408	
	Siemens	1FK7032				
	B&R	8LSA33, 8LSA34, 8LSA35	86	31	25-000411	
	Lenze	MCS09D41, MCS09D60				
HM060B	Bosch	MSK040B, MSK040C, MSK043B	82	27	25-000415	
	Schneider	BMH0701, BMH0702	72	21	25-000417	
	SEW	CMP50M, CMP50L	70	27	25-000418	
	Schneider	BMH0703				
	Beckhoff	AM8032D, AM8032E, AM8032H, AM8033E, AM8033F, AM8033J, AM8531F, AM8532D, AM8532E, AM8532H, AM8533E, AM8533F, AM8533J	72	27	25-000419	
	Siemens	1FK7034				
	HIWIN	FRMS752	80	37	25-000421	
	B&R	8LSA35, 8LSA34	86	27	25-000423	
	Lenze	MCS09D41, MCS09D60, MCS09F38, MCS09F60, MCS09H41, MCS09H60, MCS09L41, MCS09L51				
	SEW	CMP63S, CMP63M, CMP63SL	87	37	25-000424	
	Beckhoff	AM8041D, AM8041E, AM8041H, AM8042E, AM8042F, AM8042J, AM8043E, AM8043H, AM8043K, AM8541D, AM8541E, AM8541H, AM8542E, AM8542F, AM8542J, AM8543E, AM8543H, AM8543K				
	Schneider	BSH1001, BSH1002, BSH1003, BMH1001, BMH1002, BMH1003	98	37	25-000425	
	B&R	8LSA43, 8LSA44, 8LSA45	100	37	25-000426	
	Beckhoff	AM8051E, AM8051G, AM8051K, AM8052F, AM8052J, AM8052L, AM8551E, AM8551G, AM8551K, AM8552F, AM8552J, AM8552L	104	47	25-000427	
	Bosch	MSK061B-0300, MSK061C-0200, MSK061C-0300, MSK061C-0600	116	37	25-000428	
	Bosch	MSK060B-0300, MSK060B-0600, MSK060C-0300, MSK060C-0600	116	47	25-000429	
	Lenze	MCS12D20, MCS12D41, MCS12H15, MCS12H35	116	37	25-000430	
	B&R	8LSN43, 8LSN44, 8LSN45				
	Siemens	1FK7060, 1FK7062, 1FK7063	116	47	25-000431	
	SEW	CMP71S, CMP71M, CMPZ71S, CMPZ71M				
	HM080B	Beckhoff	AM8532D, AM8532E, AM8532H, AM8533E, AM8533F, AM8533J	73	27	25-000436
		Lenze	MCS09H41, MCS09H60, MCS09L41, MCS09L51	86	27	25-000440
		SEW	CMP63M, CMP63L			
Siemens		1FK7042	87	37	25-000441	
Beckhoff		AM8042E, AM8042F, AM8042J, AM8043E, AM8043H, AM8043K, AM8541D, AM8541E, AM8541H, AM8542E, AM8542F, AM8542J, AM8543E, AM8543H, AM8543K				
Schneider		BSH1002, BSH1003, BMH1001, BMH1002, BMH1003	98	37	25-000442	
Bosch		MSK050B, MSK050C				
B&R		8LSA43, 8LSA44, 8LSA45	100	37	25-000443	
Schneider		BSH1004	100	51	25-000444	
Beckhoff		AM8051E, AM8051G, AM8051K, AM8052F, AM8052J, AM8052L, AM8053G, AM8053K, AM8053N, AM8551E, AM8551G, AM8551K, AM8552F, AM8552J, AM8552L, AM8553G, AM8553K, AM8553N				

Table 7.3 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	MSK061B, MSK061C	116	37	25-000445
	Bosch	MSK060B, MSK060C	116	51	25-000446
	Lenze	MCS12D20, MCS12D41, MCS12H15, MCS12H35, MCS12L20, MCS12L41	116	37	25-000447
	Siemens	1FK7060, 1FK7062, 1FK7063	116	51	25-000448
	SEW	CMP71S, CMP71M, CMP71L, CMPZ71S, CMPZ71M, CMPZ71L			
	Bosch	MSK076C, MSK100A	140	51	25-000451
	Schneider	BSH1401, BSH1402, BMH1401, BMH1402	140	51	25-000452
	Lenze	MCS14D15, MCS14D36, MCS14H15, MCS14H32			
	SEW	CMP80S, CMP80M, CMPZ80S, CMPZ80M	138	56	25-000453
	B&R	8LSA46, 8LSA53, 8LSA54, 8LSA55, 8LSA56, 8LSA57, 8LSN54, 8LSN55, 8LSN56	142	51	25-000454
HM120B	Beckhoff	AM8552F, AM8552J, AM8552L, AM8553G, AM8553K, AM8553N	104	46	25-000456
	Siemens	1FK7062, 1FK7063	116	46	25-000457
	SEW	CMPZ71M, CMPZ71L			
	Bosch	MSK076C, MSK100A	140	46	25-000458
	Schneider	BSH1402, BSH1403, BSH1404, BMH1401, BMH1402, BMH1403	140	46	25-000459
	Lenze	MCS14H15, MCS14H32, MCS14L15, MCS14L32, MCS14P14			
	SEW	CMP80M, CMP80L, CMPZ80S, CMPZ80M, CMPZ80L	138	56	25-000460
	B&R	8LSA56, 8LSA57, 8LSN54, 8LSN55, 8LSN56, 8LSN57	142	46	25-000461
	SEW	CMP100S, CMP100M, CMP100L, CMPZ100S, CMPZ100M, CMPZ100L	163	56	25-000463
	B&R	8LSA64, 8LSA65, 8LSA66	190	46	25-000464
	Siemens	1FK7100, 1FK7101, 1FK7103, 1FK7105	192	76	25-000466
	Beckhoff	AM8071K, AM8071R, AM8072T			

7.1.3 Gear adapter plate AG for HM-B linear axis

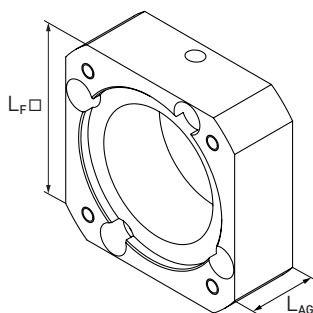


Fig. 7.7 Gear adapter plate AG for HM-B linear axis

Table 7.4 Gear adapter plate AG for HM-B linear axis

Linear axis	Gearbox type	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

Linear axes and axis systems HX

Motor adapter

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

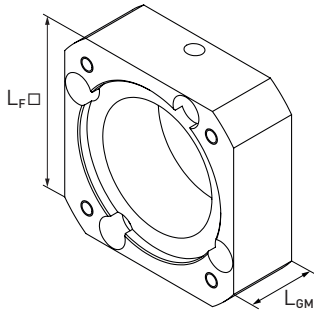


Fig. 7.8 Motor gear adapter plate GM for HM-B linear axis

Gearbox type	Manufacturer	Motors	L _F [mm]	L _{GM} [mm]	Article number
PLE40	HIWIN	FRLS102	40	19.0	25-000479
	B&R	8LSA24, 8LSA25	60	18.0	25-000481
	Bosch	MSK030B, MSK030C	60	15.0	25-000480
	SEW	CMP40S, CMP40M			
	Schneider	BSH0551, BSH0552, BSH0553	60	15.0	25-000478
	Siemens	1FK7022			
	Beckhoff	AM8022D, AM8022E, AM8023E, AM8023F			
PLQE60	B&R	8LSA24, 8LSA25	60	17.1	25-000490
	Schneider	BSH0701, BSH0702, BMH0701, BMH0702	70	16.1	25-000483
	Lenze	MCS06F41, MCS06F60, MCS06I41, MCS06I60			
	SEW	CMP50S, CMP50M, CMP50L			
PLQE60	Schneider	BSH0703, BMH0703	70	23.1	25-000484
	Beckhoff	AM8031D, AM8031F, AM8032D, AM8032E, AM8032H, AM8033E, AM8033F, AM8033J, AM8531D, AM8531F, AM8532D, AM8532E, AM8532H, AM8533E, AM8533F, AM8533J			
	HIWIN	FRLS202, FRLS402	60	23.1	25-000486
	Bosch	MSK040B, MSK040C, MSK043C	80	23.1	25-000489
	Schneider	BSH0551, BSH0552, BSH0553	60	16.0	25-000482
	Siemens	1FK7022			
	Beckhoff	AM8022D, AM8022E, AM8023E, AM8023F			
	B&R	8LSA33, 8LSA34, 8LSA35	90	23.1	25-000487
	Lenze	MCS09D41, MCS09D60, MCS09F38, MCS09F60, MCS09H41, MCS09H60, MCS09L41, MCS09L51			
	SEW	CMP63S, CMP63M			
	Bosch	MSK030B, MSK030C	60	16.0	25-000488
	SEW	CMP40S, CMP40M			
	Siemens	1FK7022, 1FK7032, 1FK7034	70	23.1	25-000485
	PLQE80	B&R	8LSA33, 8LSA34, 8LSA35	90	21.2
Bosch		MSK050B, MSK050C			
Lenze		MCS09D41, MCS09D60, MCS09F38, MCS09F60, MCS09H41, MCS09H60, MCS09L41, MCS09L51			
SEW		CMP63S, CMP63M, CMP63L			
Schneider		BSH1001, BSH1002, BSH1003, BMH1001, BMH1002, BMH1003	100	31.2	25-000492
Bosch		MSK050B, MSK050C			
HIWIN		FRMS752	80	31.2	25-000495
Siemens		1FK7040, 1FK7042	90	21.2	25-000493
Beckhoff		AM8041D, AM8041E, AM8041H, AM8042E, AM8042F, AM8042J, AM8043E, AM8043H, AM8043K, AM8541D, AM8541E, AM8541H, AM8542E, AM8542F, AM8542J, AM8543E, AM8543H, AM8543K			
HIWIN		FRLS202, FRLS402	80	21.2	25-000494

Table 7.5 Motor gear adapter plate GM for HM-B linear axis (continuation)

Gearbox type	Manufacturer	Motors	L _F [mm]	L _{GM} [mm]	Article number
PLQE80	Bosch	MSK040B, MSK040C, MSK043C	80	21.2	25-000497
	Schneider	BSH0701, BSH0702, BSH0703, BMH0701, BMH0702, BMH0703	80	21.2	25-000498
	Lenze	MCS06F41, MCS06F60, MCS06I41, MCS06I60			
	SEW	CMP50S, CMP50M, CMP50L			
	Beckhoff	AM8031D, AM8031F, AM8032D, AM8032E, AM8032H, AM8033E, AM8033F, AM8033J, AM8531D, AM8531F, AM8532D, AM8532E, AM8532H, AM8533E, AM8533F, AM8533J	80	21.2	25-000491
	Siemens	1FK7032, 1FK7034	80	21.2	25-000491
	Bosch	MSK061B, MSK061C	115	31.2	25-000500
	Lenze	MCS12D20, MCS12D41, MCS12H15, MCS12H35, MCS12L20, MCS12L41	115	31.2	25-000499
PLQE120	Schneider	BSH1001, BSH1002, BSH1003, BMH1001, BMH1002, BMH1003	115	21.8	25-000501
	Bosch	MSK050B, MSK050C	140	31.8	25-000503
	Schneider	BSH1004, BSH1402, BSH1403, BMH1401, BMH1402, BMH1403			
	Lenze	MCS14D15, MCS14D36, MCS14H15, MCS14H32, MCS14L15, MCS14L32, MCS14P14			
	Lenze	MCS12D20, MCS12D41, MCS12H15, MCS12H35, MCS12L20, MCS12L41	115	21.8	25-000507
	Siemens	1FK7040, 1FK7042	115	21.8	25-000504
	Beckhoff	AM8041D, AM8041E, AM8041H, AM8042E, AM8042F, AM8042J, AM8043E, AM8043H, AM8043K, AM8541D, AM8541E, AM8541H, AM8542E, AM8542F, AM8542J, AM8543E, AM8543H, AM8543K	115	21.8	25-000508
	Bosch	MSK061B, MSK061C			
	Bosch	MSK076C, MSK100A			
	Siemens	1FK7060, 1FK7062, 1FK7063	115	31.8	25-000505
	SEW	CMP71S, CMP71M, CMP71L, CMPZ71S, CMPZ71M, CMPZ71L	115	31.8	25-000502
	Schneider	BSH1004			
	Beckhoff	AM8051E, AM8051G, AM8051K, AM8052F, AM8052J, AM8052L, AM8053G, AM8053K, AM8053N, AM8551E, AM8551G, AM8551K, AM8552F, AM8552J, AM8552L, AM8553G, AM8553K, AM8553N			
	Bosch	MSK060B, MSK060C	115	31.8	25-000509

PLE and PLQE are registered trademarks of Neugart GmbH

7.1.5 Gearboxes

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

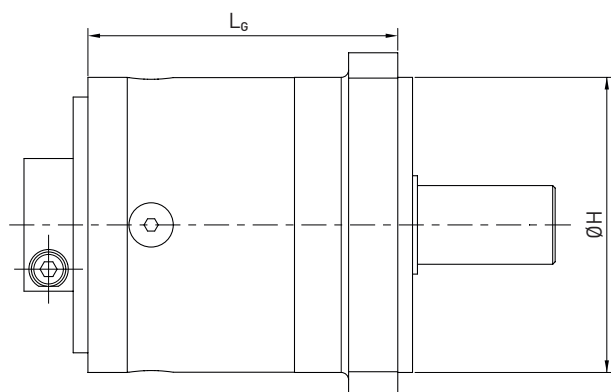


Fig. 7.9 Dimensional drawing of gearbox

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

Linear axes and axis systems HX

Motor adapter

Linear axis	Ratio i	Ø H [mm]	L _G [mm]	Gearbox type	Order code for gear ¹⁾
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⁾ See order code on Page 15

7.1.6 Coupling components for linear axis HM-B

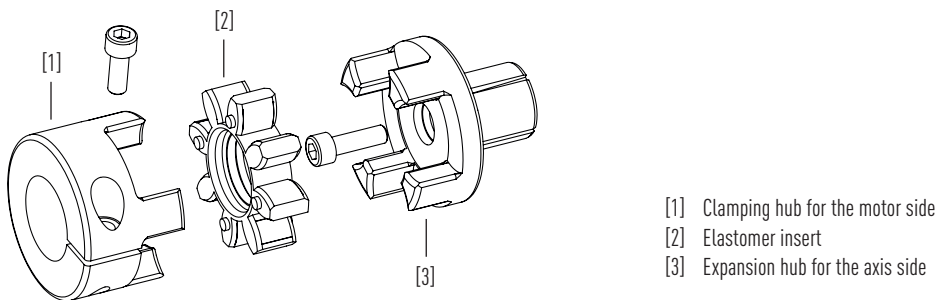


Fig. 7.10 Coupling components for linear axis HM-B

7.1.6.1 Expansion hub

Coupling element to axis side.

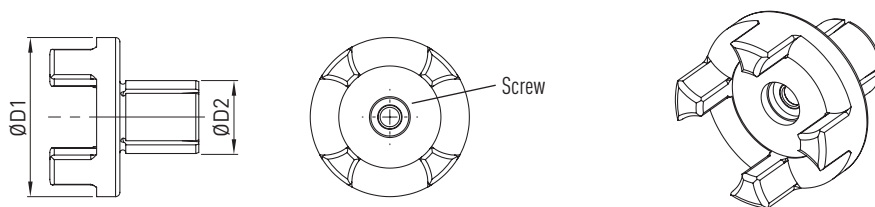


Fig. 7.11 Expansion hub for linear axis HM-B

Linear axis	Ø D1 [mm]	Ø D2 [mm]	Screw	Screw tightening torque [Nm]	Inertia torque [kgmm ²]	Friction grip torque [Nm]	Article number
HM040B	29.5	14	M5 × 18	8	1.8	25	25-000198
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

7.1.6.2 Elastomer insert

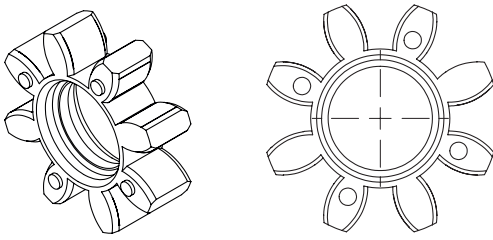


Fig. 7.12 Elastomer insert for linear axis HM-B

Table 7.8 Article number for elastomer insert	
Linear axis	Article number
HM040B	25-000203
HM060B	25-000204
HM080B	25-000205
HM120B	25-000206

Linear axes and axis systems HX

Motor adapter

7.1.6.3 Clamping hub

Coupling element to motor side.

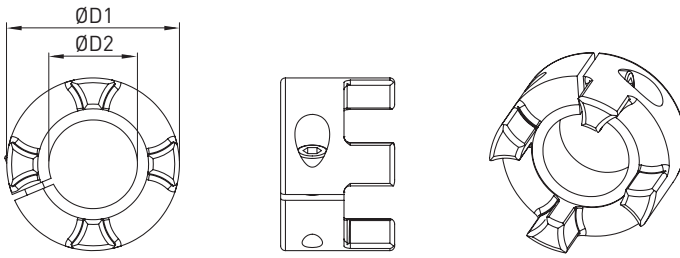


Fig. 7.13 Clamping hub for linear axis HM-B

Table 7.9 Article numbers and specifications for clamping hub

Linear axis	Ø D1 [mm]	Ø D2 H7 [mm]	Screw	Screw tightening torque [Nm]	Friction grip torque [Nm]	Inertia torque [kgmm ²]	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	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
		HM120B	65	19	M8 × 25	35	151.9
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

7.2 Motor adapter of the HM-S linear axis

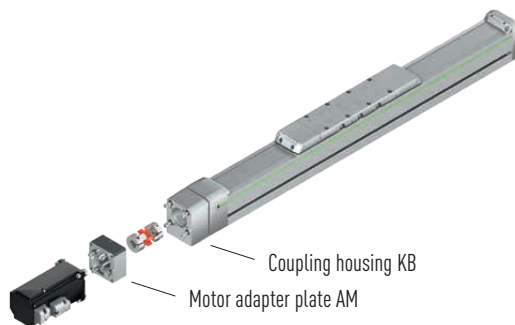
The adapter on the axis is a two-part structure that simplifies the flange connections of all possible motors.

The flange type set consists of the following parts:

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

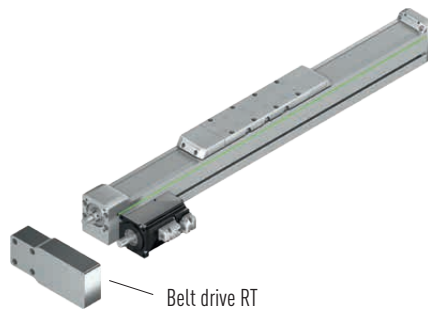
The following sections list the dimensions for the coupling housing, motor adapter plate, and belt drive.

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



Motor adapter plate AM: Axis-motor adapter

Fig. 7.14 Motor adapter Linear axis HM-S



Belt drive RT: For deflecting the drive through 180°

Fig. 7.15 Motor adapter of linear axis HM-S with belt drive

Table 7.10 Order code for flange type³⁾ – HM-S linear axis

Drive		HM040S	HM060S	HM080S	HM120S
Manufacturer/type		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 ¹⁾	BR04 ²⁾	
	8LSA34		BR03 ²⁾	BR04 ²⁾	
	8LSA35		BR03 ²⁾	BR04 ²⁾	
	8LSA43			BR05 ²⁾	BR10 ¹⁾
	8LSA44				BR10 ¹⁾
	8LSA45				BR10 ¹⁾

¹⁾ Possible belt drive V₁

²⁾ Possible belt drive V₂

³⁾ See order code on [Page 25](#)

Linear axes and axis systems HX

Motor adapter

Drive		HM040S	HM060S	HM080S	HM120S
Manufacturer/type		Motor only	Motor only	Motor only	Motor only
B&R	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⁾
	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⁾

¹⁾ Possible belt drive V₁

²⁾ Possible belt drive V₂

³⁾ See order code on [Page 25](#)

Table 7.10 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
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⁾
	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⁾	

¹⁾ Possible belt drive V₁

²⁾ Possible belt drive V₂

³⁾ See order code on [Page 25](#)

Linear axes and axis systems HX

Motor adapter

Drive		HM040S	HM060S	HM080S	HM120S
Manufacturer/type		Motor only	Motor only	Motor only	Motor only
Siemens	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 25](#)

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

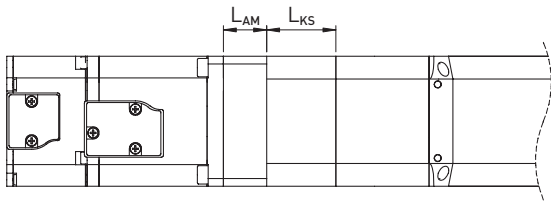


Fig. 7.16 HM-S linear axis motor connection without belt drive

L_{KS} Length of coupling housing, see [Table 7.11](#)

L_{AM} Motor adapter plate length, see [Table 7.12](#)

HM-S linear axis with belt drive

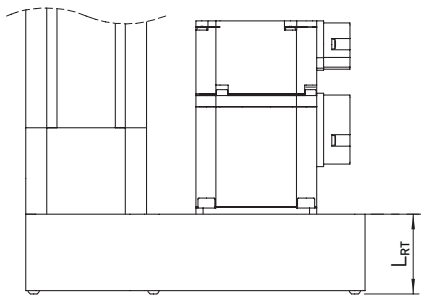


Fig. 7.17 HM-S linear axis motor connection with belt drive

L_{RT} Belt drive length, see [Table 7.13](#)

7.2.1 Coupling housing KS for HM-S linear axis

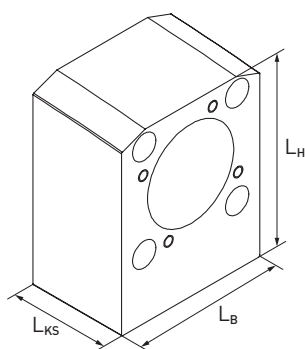


Fig. 7.18 Coupling housing for HM-S linear axis

Table 7.11 Dimensions of coupling housing KS for HM-S linear axis

Coupling housing for	L_B [mm]	L_H [mm]	L_{KS} [mm]	Article number
HM040S	39.6	57.6	34	25-000305
HM060S	59.6	75.0	32	25-000306
HM080S	79.6	95.5	41	25-000307
HM120S	119.6	141.9	50	25-000308

7.2.2 Motor adapter plate AM for HM-S linear axis

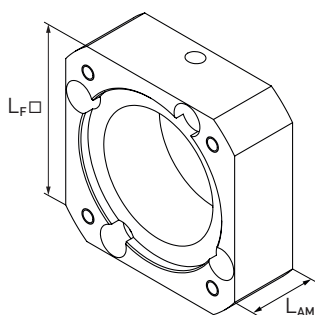


Fig. 7.19 Motor adapter plate AM for HM-S linear axis

Table 7.12 Motor adapter plate AM for HM-S linear axis

Linear axis	Manufacturer	Motors	L_F [mm]	L_{AM} [mm]	Article number
HM040S	HIWIN	FRLS102	42	24.5	25-000393
	Bosch	MSK030B	54	20.5	25-000395
	SEW	CMP40S			
	Schneider	BSH0551, BSH0552	55	20.5	25-000396
	Siemens	1FK7022			
	B&R	8LSA24, 8LSA25	58	24.5	25-000397
	HIWIN	FRLS202	60	30	25-000398
HM060S	Bosch	MSK030B, MSK030S	54	22	25-000401
	SEW	CMP40S, CMP40M			
	Siemens	1FK7022	55	22	25-000402
	Schneider	BSH0551, BSH0552			
	Beckhoff	AM8022D, AM8022E, AM8023E, AM8023F			
	B&R	8LSA33, 8LSA34, 8LSA35	58	25	25-000403
	HIWIN	FRLS202, FRLS402	60	31	25-000404
	Bosch	MSK040B, MSK040C	82	31	25-000405

Linear axes and axis systems HX

Motor adapter

Table 7.12 Motor adapter plate AM for HM-S linear axis (continuation)

Linear axis	Manufacturer	Motors	L _F [mm]	L _{AM} [mm]	Article number	
HM060S	Schneider	BSH0701, BSH0702, BMH0701, BMH0702	62	25	25-000406	
	Lenze	MCS06F41, MCS06F60, MCS06I41, MCS06I60				
	SEW	CMP50S				
	Beckhoff	AM8031D, AM8031F, AM8531D, AM8531F	70	31	25-000407	
	Siemens	1FK7032, 1FK7034	72	31	25-000408	
	B&R	8LSA33, 8LSA34, 8LSA35	86	31	25-000411	
	Lenze	MCS09D41, MCS09D60				
HM080S	SEW	CMP40S, CMP40M	72	21	25-000412	
	Beckhoff	AM8022D, AM8022E, AM8023E, AM8023F	72	21	25-000413	
	HIWIN	FRLS202, FRLS402	72	27	25-000414	
	Bosch	MSK040B, MSK040C, MSK043B	82	27	25-000415	
	Schneider	BSH0701, BSH0702, BMH0701, BMH0702	72	21	25-000417	
	Lenze	MCS06F41, MCS06F60, MCS06I41, MCS06I60				
	SEW	CMP50S, CMP50M, CMP50L				
	Schneider	BSH0703, BMH0703	70	27	25-000418	
	Beckhoff	AM8031D, AM8031F, AM8032D, AM8032E, AM8032H, AM8033E, AM8033F, AM8033J, AM8531D, AM8531F, AM8532D, AM8532E, AM8532H, AM8533E, AM8533F, AM8533J				
	Siemens	1FK7032, 1FK7034	72	27	25-000419	
	HIWIN	FRMS752	80	37	25-000421	
	B&R	8LSA33, 8LSA34, 8LSA35	86	27	25-000423	
	Lenze	MCS09D41, MCS09D60, MCS09F38, MCS09F60				
	SEW	CMP63S				
	Beckhoff	AM8041D, AM8041E, AM8041H, AM8042E, AM8042F, AM8042J, AM8043E, AM8043H, AM8043K, AM8541D, AM8541E, AM8541H, AM8542E, AM8542F, AM8542J, AM8543E, AM8543H, AM8543K	87	37	25-000424	
	Schneider	1FK7040, 1FK7042				
	Schneider	BSH1001, BSH1002, BSH1003, BMH1001, BMH1002, BMH1003	98	37	25-000425	
	Bosch	MSK050B, MSK050C				
	B&R	8LSA43, 8LSA44, 8LSA45	100	37	25-000426	
	Beckhoff	AM8051E, AM8051G, AM8051K, AM8551E, AM8551G, AM8551K	104	47	25-000427	
	Bosch	MSK061B	116	37	25-000428	
	Bosch	MSK060B	116	47	25-000429	
	Lenze	MCS12D20, MCS12D41	116	37	25-000430	
	HM120S	Bosch	MSK040B, MSK040C, MSK043C	73	27	25-000433
		SEW	CMP50M, CMP50L	73	20	25-000435
Schneider		BMH0703	73	27	25-000436	
Beckhoff		AM8032D, AM8032E, AM8032H, AM8033E, AM8033F, AM8033J, AM8531D, AM8531F, AM8532D, AM8532E, AM8532H, AM8533E, AM8533F, AM8533J				
HIWIN		FRMS752	80	37	25-000438	
Lenze		MCS09D41, MCS09D60, MCS09F38, MCS09F60, MCS09H41, MCS09H60, MCS09L41, MCS09L51	86	27	25-000440	
SEW		CMP63S, CMP63M, CMP63L				
Siemens		1FK7040, 1FK7042	87	37	25-000441	
Beckhoff		AM8041D, AM8041E, AM8041H, AM8042E, AM8042F, AM8042J, AM8043E, AM8043H, AM8043K, AM8541D, AM8541E, AM8541H, AM8542E, AM8542F, AM8542J, AM8543E, AM8543H, AM8543K				
Schneider		BSH1001, BSH1002, BSH1003, BMH1001, BMH1002, BMH1003	98	37	25-000442	
Bosch		MSK050B, MSK050C				
B&R		8LSA43, 8LSA44, 8LSA45	100	37	25-000443	
Schneider		BSH1004	100	51	25-000444	
Beckhoff		AM8051E, AM8051G, AM8051K, AM8052F, AM8052J, AM8052L, AM8551E, AM8551G, AM8551K, AM8552F, AM8552J, AM8552L				
Bosch		MSK061B, MSK061C	116	37	25-000445	

Table 7.12 Motor adapter plate AM for HM-S linear axis (continuation)

Linear axis	Manufacturer	Motors	L _F [mm]	L _{AM} [mm]	Article number
HM120S	Bosch	MSK060B, MSK060C	116	51	25-000446
	Lenze	MCS12D20, MCS12D41, MCS12H15, MCS12H35	116	37	25-000447
	Siemens	1FK7060, 1FK7062, 1FK7063	116	51	25-000448
	SEW	CMP71S, CMP71M, CMP71L, CMPZ71S, CMPZ71M, CMPZ71L			
	Bosch	MSK076C	140	51	25-000451
	Schneider	BSH1401, BMH1401	140	51	25-000452
	Lenze	MCS14D15, MCS14D36			
	SEW	CMP80S, CMPZ80S	140	51	25-000451
	B&R	8LSA46, 8LSA53, 8LSA54, 8LSA55, 8LSN54, 8LSN55	140	51	25-000452

7.2.3 Belt drive RT for HM-S linear axis

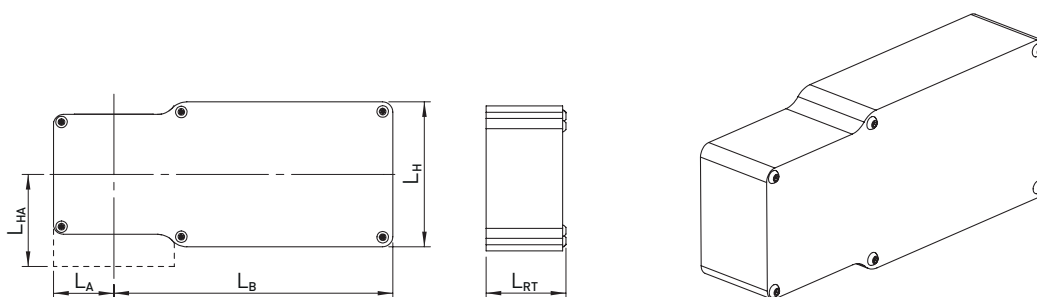


Fig. 7.20 Belt drive for HM-S linear axis-S

Table 7.13 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 7.10

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

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

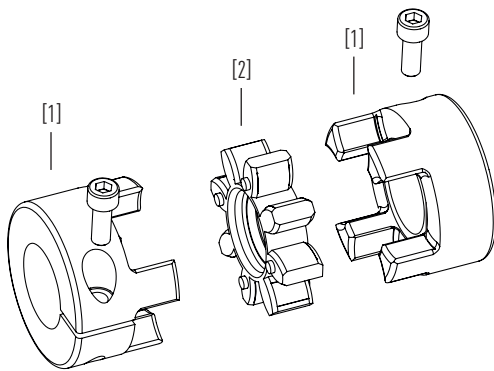
Note: Please bear in mind that the belt drive may project over the side of the axis when:

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

Linear axes and axis systems HX

Motor adapter

7.2.4 Coupling components for linear axis HM-S



- [1] Clamping hubs (1 for axis side, 1 for motor side)
- [2] Elastomer insert

Fig. 7.21 Coupling components for linear axis HM-S

7.2.4.1 Clamping hub

Motor- and axis-side coupling element.

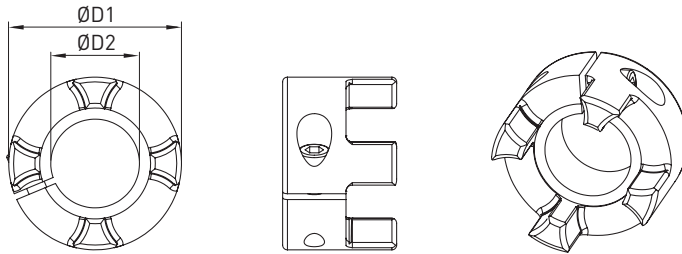


Fig. 7.22 Clamping hub for linear axis HM-S

Table 7.14 Article numbers and specifications for clamping hub

Linear axis	Ø D1 [mm]	Ø D2 H7 [mm]	Screw	Screw tightening torque [Nm]	Friction grip torque [Nm]	Inertia torque [kgmm ²]	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		
HM080S	40.0	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		

Table 7.14 Article numbers and specifications for clamping hub (continuation)

Linear axis	Ø D1 [mm]	Ø D2 H7 [mm]	Screw	Screw tightening torque [Nm]	Friction grip torque [Nm]	Inertia torque [kgmm ²]	Article number
HM080S	40.0	20	M6 × 16	14	73.9	14.63	25-000220
		24	M6 × 16	14	62	13.76	25-000221
HM120S	55.0	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

7.2.4.2 Elastomer insert

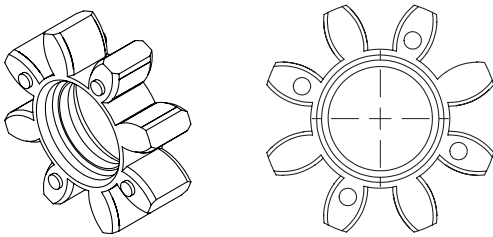


Fig. 7.23 Elastomer insert for linear axis HM-S

Table 7.15 Article number for elastomer insert

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

Linear axes and axis systems HX

HIWIN servo motors and drives/Accessories

8. HIWIN servo motors and drives

8.1 HIWIN servo motors

HIWIN synchronous AC servo motors are available with power ratings of 50 W, 100 W, 200 W, 400 W, 750 W and 1,000 W. The standard motors are equipped with a 13-bit encoder with 10,000 increments per revolution, and are available with or without a motor brake.



Table 8.1 Assignments of HIWIN servo motors and HM linear axes

Motor type	Order code	Description	Belt axis				Spindle axis			
			HM040B	HM060B	HM080B	HM120B	HM040S	HM060S	HM080S	HM120S
FRLS10	FRLS10205A4A	AC-Servomotor 100 W	●	●			●			
FRLS10	FRLS102B5A4A	AC-Servomotor 100 W with brake								
FRLS20	FRLS2020506A	AC-Servomotor 200 W	●	●	●		●	●	●	
FRLS20	FRLS202B506A	AC-Servomotor 200 W with brake								
FRLS40	FRLS4020506A	AC-Servomotor 400 W	●	●	●					
FRLS40	FRLS402B506A	AC-Servomotor 400 W with brake								
FRMS75	FRMS7520508A	AC-Servomotor 750 W		●	●					
FRMS75	FRMS752B508A	AC-Servomotor 750 W with brake							●	●

Suitable flange types for linear axes HM-B can be found in [Table 7.1](#) on [Page 49](#) ff and for linear axes HM-S in [Table 7.10](#) on [Page 61](#) ff.

8.2 HIWIN D2 servo drive

The compact HIWIN D2 servo drive is specially optimised for HIWIN servo motors and is available in the performance classes 100 W, 400 W and 1,000 W. The D2 drive offers the following properties:

- Fully digital, vector-controlled drive
- Autotuning function
- Vibration suppression
- Error compensation
- Integrated PLC function
- Plug-in connections for quick exchange
- 2-line alphanumeric display with 4 control keys on the drive
- Digital pulse-direction interface and analogue +/-10 V interface
- Position control, speed control and torque control
- Inputs/outputs which can be parameterised
- Optional EtherCAT interface with CoE (CAN over EtherCAT) protocol and DS402 drive profile
- Optional mega-ulink interface
- Efficient and freely available "Lightening" commissioning software



More information about the HIWIN servo motors can be found in the catalogue „Drives and Servo Motors“ or on www.hiwin.de

9. Accessories

9.1 Clamping profile

Clamping profiles are convenient 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.

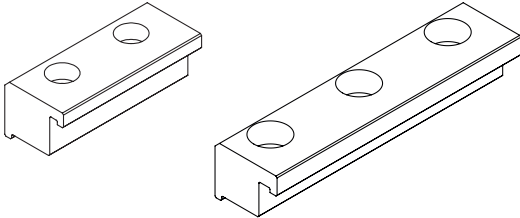


Fig. 9.1 Short and long clamping profiles

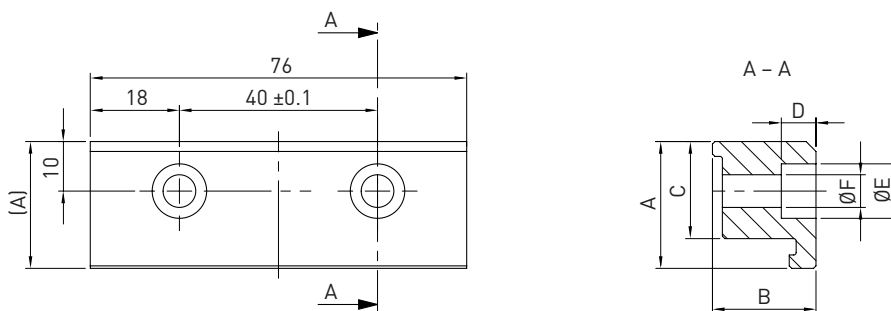


Fig. 9.2 Dimensional drawing of short clamping profile

Table 9.1 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	5.2	10	5.5	DIN 912 M5	25-000517
060	25.6	20.9	19.6	7.0	11	6.6	DIN 912 M6	25-000518
080¹⁾/120	28.0	22.0	19.8	9.0	15	9.0	DIN 912 M8	25-000519

¹⁾ Standard
Unit: mm

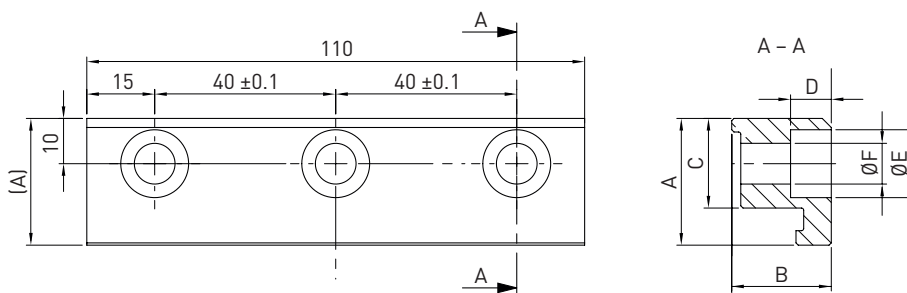


Fig. 9.3 Dimensional drawing of long clamping profile

Table 9.2 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	9.0	15.0	9.0	DIN 912 M8	25-000520

¹⁾ Standard
Unit: mm

Linear axes and axis systems HX

Accessories

9.2 T nut

T nut for the frictional connection of the linear axis. Flexible fastening options through the grooves on the side and on the bottom of the axis profile. Sets are available with ten T nuts.

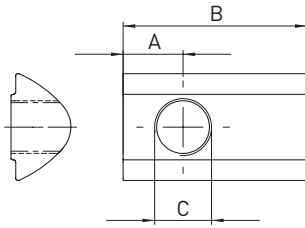


Fig. 9.4 Dimensional drawing of T nut

Table 9.3 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 ¹⁾	4.0	11.5	M5	20-000529
060	4.5	17.0	M5	20-000530
060 ¹⁾	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 ¹⁾	7.5	23.0	M8	20-000534

¹⁾ Preferred type for axis mounting

Unit: mm

9.3 Centring sleeve

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

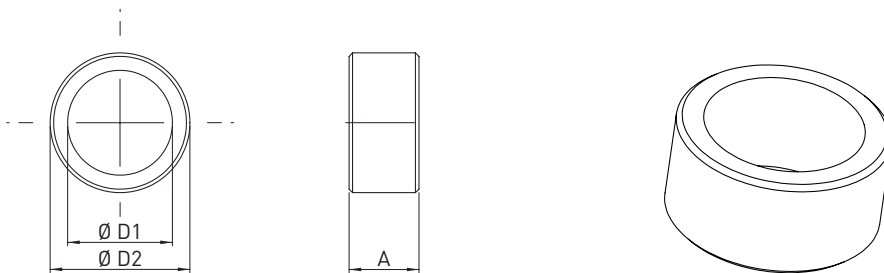


Fig. 9.5 Dimensional drawing of centring sleeve

Table 9.4 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

9.4 Groove cover

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

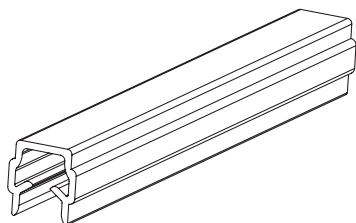


Fig. 9.6 Groove cover for linear axes HM-B/HM-S

Table 9.5 Article numbers for groove covers

Linear axis HM-B/HM-S	Article number, 5 pcs.
040	25-000514
060	25-000515
080/120	25-000516

9.5 Limit switch

Inductive limit switch as NC or NO contact. A screw (M3 × 12) and nut (DIN EN ISO 4035) is necessary to fix the sensor to the axis profile. The limit switch is supplied as standard with plug or open cable end. Set including mounting material.

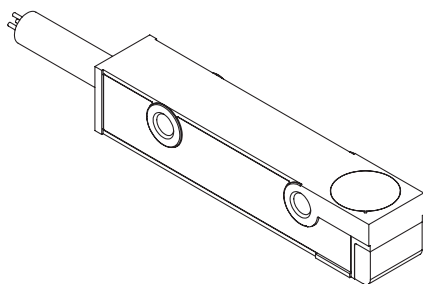


Fig. 9.7 Limit switch for linear axes HM-B/HM-S

Table 9.6 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

Linear axes and axis systems HX

Accessories

9.6 Extension cable for limit switch

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

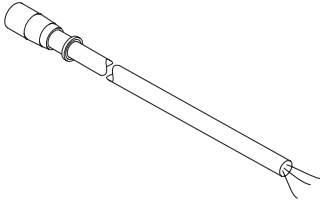


Fig. 9.8 Extension cable for limit switch

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

9.7 Damping element

The damping element is needed to switch the limit switches at both of the carriage's end positions (at stroke 0 and stroke max). It can be attached on the left and right of the carriage. Set including mounting material.

Article number: 25-000785

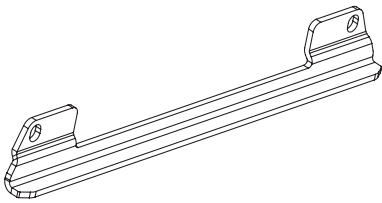


Fig. 9.9 Damping element for linear axes HM-B/HM-S

9.8 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.

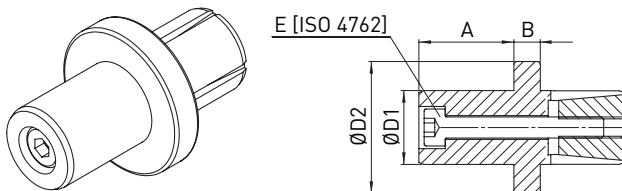


Fig. 9.10 Journal dimensions

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

9.9 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.

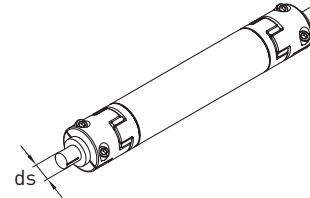
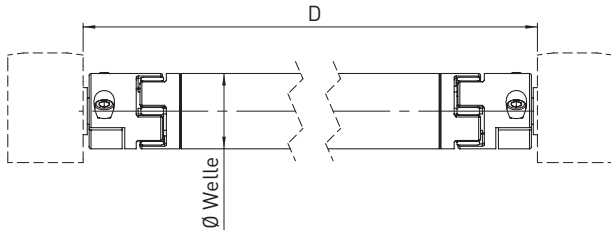
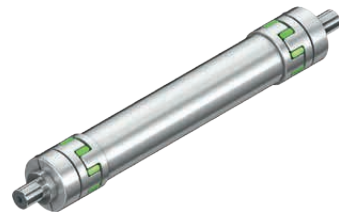
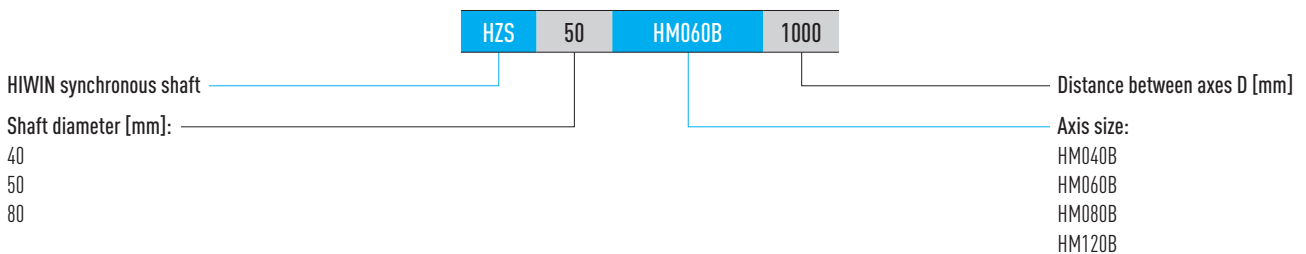


Table 9.9 Dimensions of synchronous shaft

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

9.9.1 Order code for synchronous shaft



9.9.2 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.

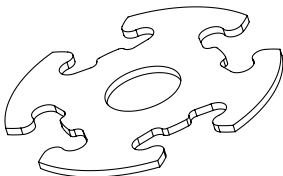


Table 9.10 Article numbers for spacer



Suitable for double axis	Suitable for synchronous shaft	Article number
HD1/HM040B	HZS40HM040Bxxxx ¹⁾	25-000730
HD2/HM060B	HZS50HM060Bxxxx ¹⁾	25-000731
HD3/HM080B	HZS50HM080Bxxxx ¹⁾	25-000731
HD4/HM120B	HZS80HM120Bxxxx ¹⁾	25-000733

¹⁾ Distance between axes D

Linear axes and axis systems HX

Accessories

9.10 HIWIN lubricants

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

Article number	Description	Scope of delivery	Comment
20-000333	Grease gun GN-400C incl. set of lubrication adapter and nozzles (see Fig. 9.11)	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. 9.11 Grease gun GN-400C

9.11 HIWIN grease nipples

Grease nipples suitable for HM-B and HM-S (all sizes).



Fig. 9.12 Art.-No. 20-000325 (standard)



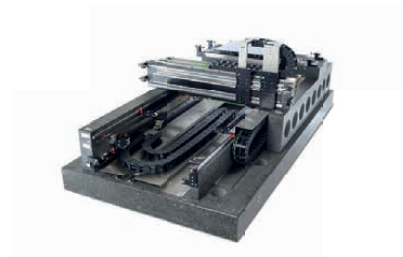
Fig. 9.13 Art.-No. 20-000538 (option)



Linear Guideways



Ballscrews



Linear Motor Systems



Linear Axes



Linear Actuators



Robots



Linear Motor Components



Rotary Tables



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