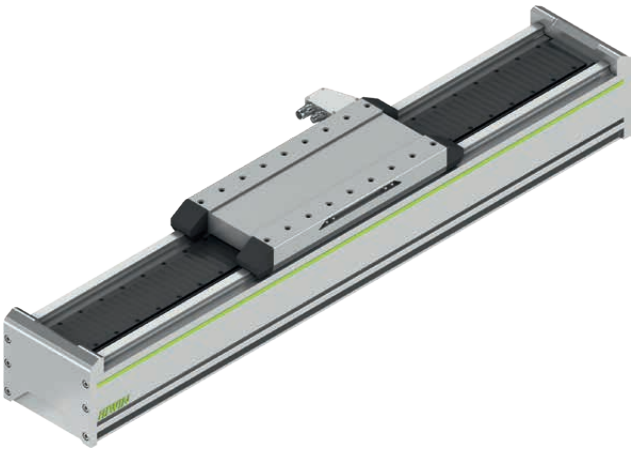
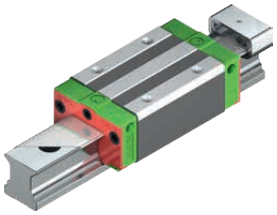
12. Bridge axes HB-L



12.1 Features of the HB-L bridge axes with linear motor

The HIWIN bridge axes with linear motor drive are flexible positioning modules with an integrated HIWIN double guide in O-arrangement. They are particularly suitable for precise positioning at high speed and high dynamics.

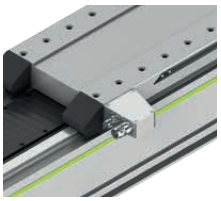
Linear guideway
A high-quality HIWIN double guide safely transfers forces and torques from the carriage to the axis profile. Four blocks are used per carriage, which are guided on a two parallel, high-precision profile rails. The O arrangement of the balls ensures high torque load capacity and high load ratings.



Positioning measuring systems
The distance measuring system is integrated into the inside of the axis to save space and determines the repeatability. Different measuring systems are available depending on the requirements for measuring method, interface and resolution. You can find more information on Page 156.
Optionally also with functional safety encoder.

Linear motor
The integrated HIWIN linear motors ensure dynamic and precise positioning. Two motor sizes are available for each size in order to optimally meet the requirements for the required feed force.

Electric interface
The quick-release connectors allow motor and encoder cables to be connected quickly and easily to the side of the carriage without tools. Depending on the installation situation and the desired cable routing, two different orientations of the connector are available as options.



Carriage
The carriages have additional bore holes on each mounting hole to ensure ideal, reproducible alignment of the adjacent construction. You will find the matching centring sleeves in the accessories on Page 231.
A grease nipple is provided on the carriage for each lubrication point for convenient maintenance of the linear axis.

Energy chain
Generously dimensioned energy chains provide space for safely carrying the supply lines. They are extremely compact and save space when attached to the axis. For details on the orientation of the energy chain, see section 22.4 from page 225.

12.2 Order code for bridge axes HB-L

HB	250	L	A34	N	1234	S

HIWIN bridge axes

Size (profile width):
250: 250 mm

Drive type:
R: Rack and pinion drive

Carriage length:
S: Short

Stroke length [mm]

Cover strip:
N: Without cover strip

Feed constant [mm/U]:
A34: HB250L

Continuation, order code for bridge axes HB-L

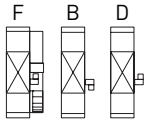
A	N	A	R

Axis limit switch [3]:
N: Without limit switch
A: 2 × normally closed, 100 mm cable, connector
B: 2 × normally open, 100 mm cable, connector
C: 2 × normally closed, 4 m open cable end
D: 2 × normally open, 5 m open cable end

Option clamping and braking element:
N: Without clamping and braking element (standard)

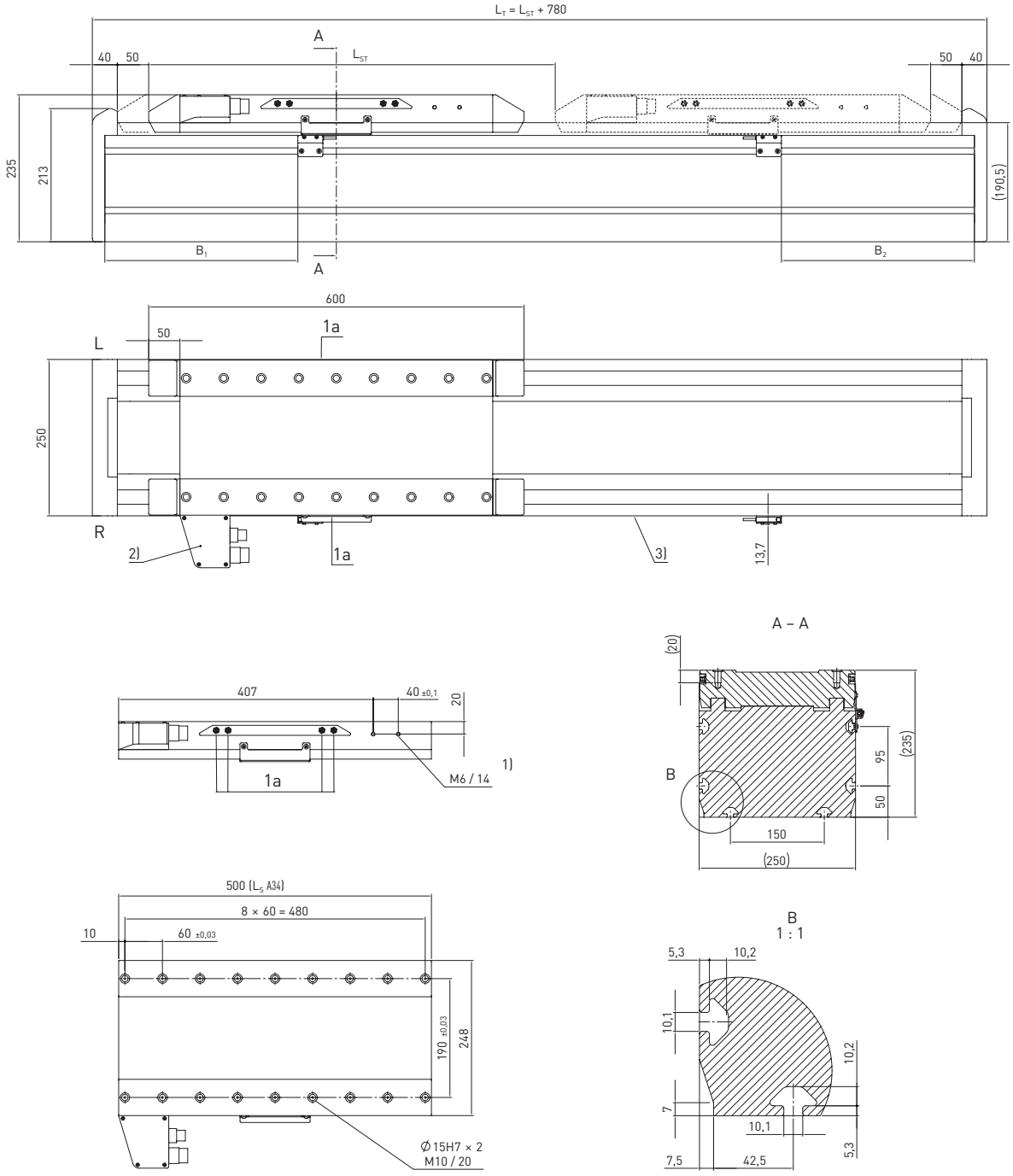
Distance measuring system option[1]:
A: HIWIN MAGIC, analogue, 1 V_{SS} sin/cos
D: HIWIN MAGIC, digital, TTL 5 V
R: BML-S1G0, absolute, BiSS-C, 1 V_{SS} sin/cos [4]
S: BML-S1G0, absolute, SSI [5]

Drive interface [2]:
F: With energy chain, plug right/rear [5]
B: Without energy chain, plug right/front
D: Without energy chain, plug right/front



[1] More detailed information in chapter 21 from page 156 or in the "HIWIN MAGIC Distance Measuring Systems" assembly instructions".
[2] Details on plug alignment and position of the energy chain in section 22.4 from page 210.
[3] Additional reference switches on request.
[4] The position measuring system has a safety-related, analogue, incremental real-time signal.
[5] Max. possible stroke: 5,000 mm.

12.3 Dimensions and specifications of HB250L



L_S	Carriage plate	R	Right
L	Left	1a + 1b	Block lubrication connectors

[1] Omitted for variant with energy chain [2] Drive interface shown: Option "D"; for other series, see section 22.4 from page 225

[3] Internal measuring system always on the right side of the axis. The positive direction of travel depends on the selected measuring system, see section 21.2 from page 158

Table 12.1 **HB250L dimensions**

Total carriage length L_c [mm]	600
Switch distance B_1 [mm]	308.5
Switch distance B_2 [mm]	308.5
Max. stroke length L_{ST} [mm]	5,160.0
Total length L_T [mm]	$L_T = L_{ST} + 780$

Table 12.2 **Load data**	
$F_{ydynmax}$ [1)2)] [N]	11,136
$F_{zdynmax}$ [2)] [N]	11,136
$M_{xdynmax}$ [Nm]	1,058
$M_{ydynmax}$ [Nm]	1,670
$M_{zdynmax}$ [Nm]	1,670
z [2)] [mm]	54.3

[1)] Force must only act free of torque
[2)] Carriage upper edge – centre guide
See section 3.3.2 on page 17 (lifetime reference value)

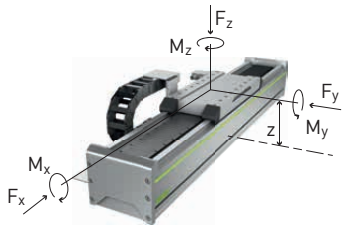


Table 12.3 **General technical data**	
Repeatability [2)] [mm]	± 0.005
Max. speed [m/s]	4.5
Max. acceleration [m/s²]	80
Typical load capacity [kg]	350
Maximum total length [2) 3)] [mm]	5,940
Flatness (mm/300mm) [1)]	±0.03/300
Straightness (mm/300mm) [1)]	±0.03/300
Area moment of inertia of profile cross section I_x [mm⁴]	34.509.373
Area moment of inertia of profile cross section I_y [mm⁴]	80.997.444

[1)] Values apply with correspondingly specified mounting surface or mounting plate
[2)] Dependent on stroke measuring system (chapter 17) and energy chain (section 18.4)
[3)] Longer axes on request

Table 12.4 **Guide**	
Guide type	CGH25HA
Static load rating C_0 [N]	54,080
Dynamic load rating C_{dyn} [N]	40,500

Table 12.5 **Drive**	
Drive element	LMSA34
Continuous force [N]	1,166
Peak force [N]	3,292

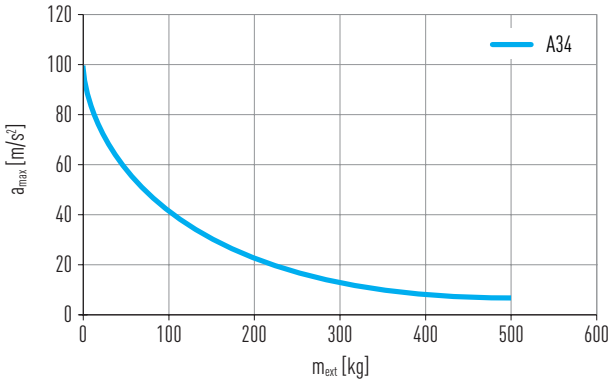


Fig. 12.1 **Max. Acceleration a_{max} as a function of the external payload m_{ext}**

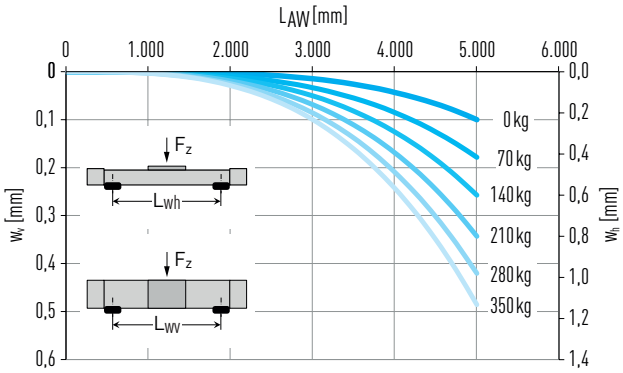


Fig. 12.2 **Deflection w over unsupported axle length L_{AW} under payload F_z**

Table 12.6 **Mechanical properties**	
Mass of the carriage [kg]	20.2
Mass at 0-stroke [kg]	59.94
Mass per 1 m stroke [kg/m]	47.66
Breakaway force 0-stroke axis [N]	60