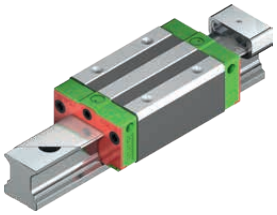
10. Bridge axes HB-B

10.1 Features of the HB-B bridge axes with toothed belt drive

The HIWIN bridge axes with toothed belt drive are flexible positioning modules with an integrated HIWIN double guide in O-arrangement. They are particularly suitable for applications where high feed force and high speeds are required.

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.



Drive adaptation
Thanks to its symmetrical design, the HIWIN the HIWIN bridge axis with toothed belt drive allows motors and gearboxes to be mounted on all four sides of the drive blocks. Suitable adapters for all common motors can be found in section 22.1 from page 159.

Toothed belt
The toothed belt with modern high performance profiles (HTD shape) and reinforced steel tension members enables high power transmission while offering high skip resistance.

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.

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.

10.2 Order code for bridge axes HB-B

HB	250	B	392	N	1234	S

HIWIN bridge axes

Size (profile width):
250: 250 mm

Drive type:
B: Toothed belt drive

Carriage length:
S: Short

Stroke length [mm]

Cover strip:
N: Without cover strip

Feed constant [mm/U]:
392: HB250B

Continuation, order code for bridge axes HB-B

A	N	N	R	BR13	G1205

Axis limit switch[5]**:**
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

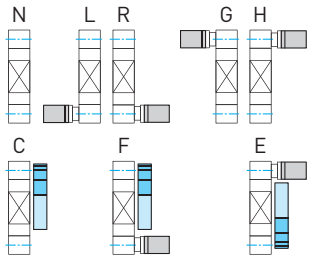
Toothed belt:
N: Standard belt

Distance measuring system option[1]**:**
N: Without distance measuring system
A: HIWIN MAGIC, analogue, 1 V_{SS} sin/cos, 5 m open cable end
D: HIWIN MAGIC, digital, TTL 5 V, 5 m open cable end

Gearbox[4]

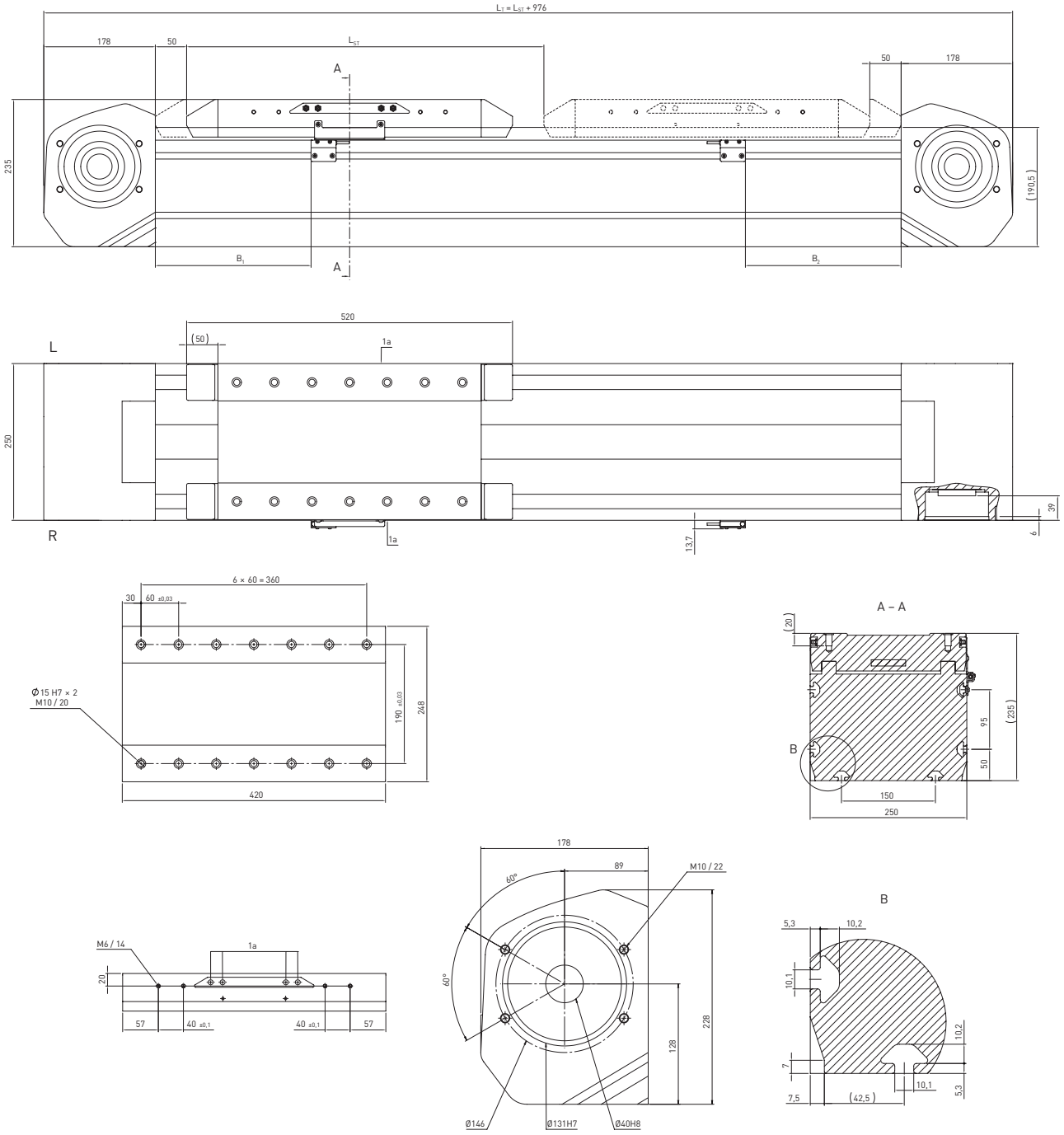
Flange type[3]

Drive interface[2] [6]**:**
N: Without
L: Left front
R: Right front
G: Left rear
H: Right rear
C: Without, with energy chain on the rights
F: Right front, with energy chain on the right
E: Right rear, with energy chain on the right



[1] More detailed information in chapter 21 from page 156 or in the "HIWIN MAGIC Distance Measuring Systems" assembly instructions".
[2] If no drive interface is selected, the order code ends after this point.
[3] All flange types can be found in tableTable 22.3 from page 172. If no gearbox is selected, the order code ends after this point.
[4] You can find suitable gearboxes for the HIWIN axes in section 22.1.4.5 from page 188.
[5] Additional reference switches on request.
[6] Dimensions of the drive interface and the energy chain can be found on pagePage 208.

10.3 Dimensions and specifications of HB250B



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 10.1 **HB250B dimensions**

Total carriage length L_c [mm]	520
Switch distance B_1 [mm]	248.5
Switch distance B_2 [mm]	248.5
Max. stroke length L_{ST} [mm]	5,280
Total length L_T [mm]	$L_T = L_{ST} + 976$

Table 10.2 **Load data**	
$F_{ydynmax}$ [1)2)] [N]	11,600
$F_{zdynmax}$ [2)] [N]	16,913
$M_{xdynmax}$ [Nm]	1,607
$M_{ydynmax}$ [Nm]	2,461
$M_{zdynmax}$ [Nm]	1,688
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)

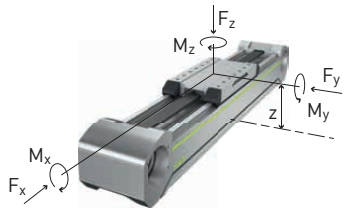


Table 10.3 **General technical data**	
Repeatability [1)] [mm]	± 0.05
Max. feed force Fx_{max} [N]	5,775
Max. speed [m/s]	5
Max. acceleration [m/s²]	30
Max. drive torque Ma_{max} [Nm]	360
Typical load capacity [kg]	350
Maximum total length [2) 3)] [mm]	6,256
Area moment of inertia of profile cross section 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 10.4 **Guide**	
Guide type	CGH25HA
Static load rating C_0 [N]	54,080
Dynamic load rating C_{dyn} [N]	40,500

Table 10.5 **Drive**	
Drive element	b55HTD14
Feed constant [mm/U]	392
Effective diameter of toothed belt pulley [mm]	124.78

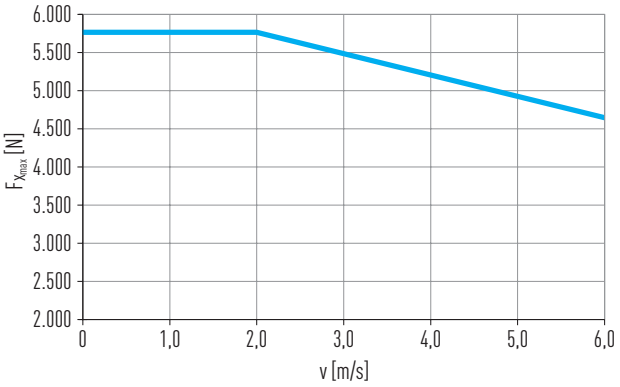


Fig. 10.1 **Max. Feed force Fx_{max} as a function of the axis speed v**

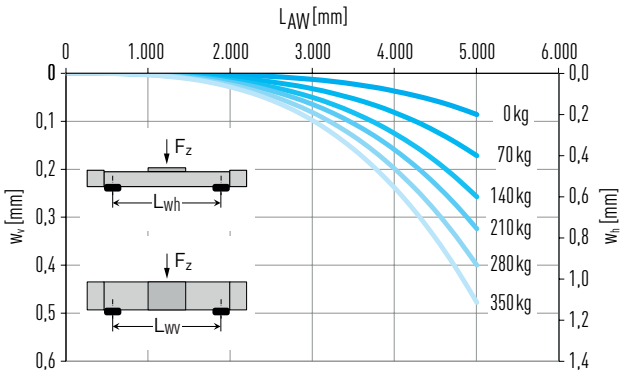


Fig. 10.2 **Deflection w over unsupported axle length L_{AW} under payload F_z**

Table 10.6 **Mechanical properties**	
Mass of the carriage [kg]	12.92
Mass at 0-stroke [kg]	74.21
Mass per 1 m stroke [kg/m]	39.60
$J_{rot.}$ [1)] [kgcm²]	155.51
Breakaway force F_L [N]	7.00

1) Rotational moment of inertia