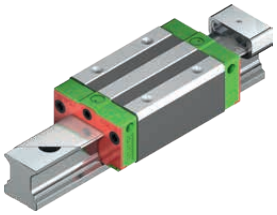
11. Bridge axes HB-R

11.1 Features of the HB-R bridge axes with rack and pinion drive

The HIWIN bridge axes with rack and pinion drive are flexible positioning modules with an integrated HIWIN double guide in O-arrangement. They are particularly suitable for applications where high positioning accuracy 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.



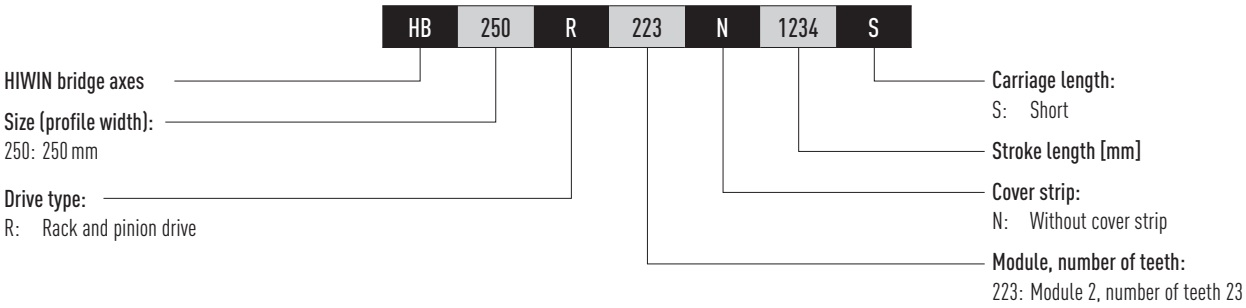
Drive adaptation
Thanks to its symmetrical design, the HIWIN the HIWIN bridge axis with toothed belt drive allows motors and gearboxes to be mounted on all four sides of the drive blocks. Suitable adapters for all common motors can be found in section 22.1 from page 159.

Rack and pinion
The rack and pinion ensures precise positioning, smooth running, high efficiency and maximum power density. The integrated lubrication pinion ensures that the rack and pinion drive is supplied with grease.

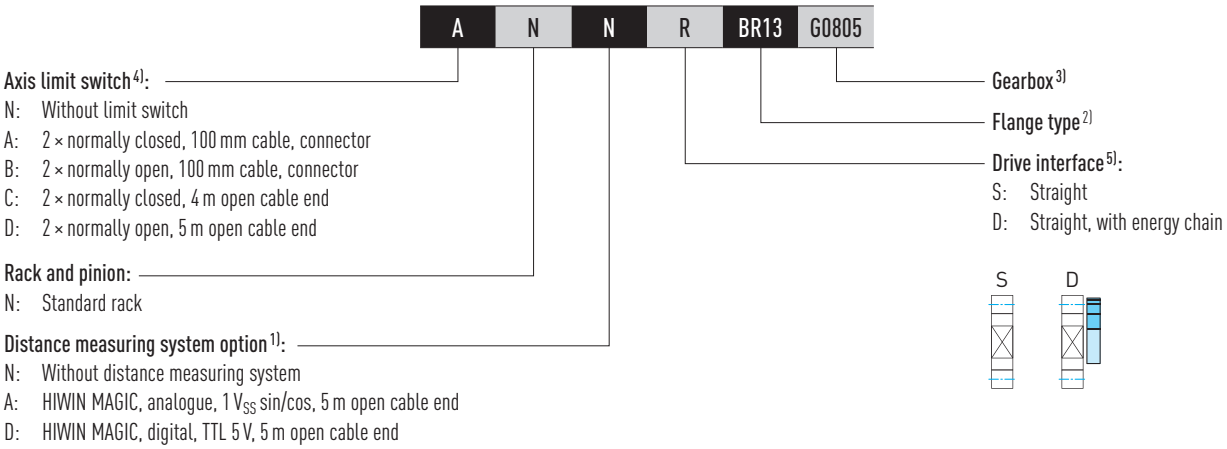
Energy chain
Generously dimensioned energy chains provide space for safely carrying the supply lines. They are extremely compact and save space when attached to the axis. For details on the orientation of the energy chain, see section 22.4 from page 225.

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.

11.2 Order code for bridge axes HB-R

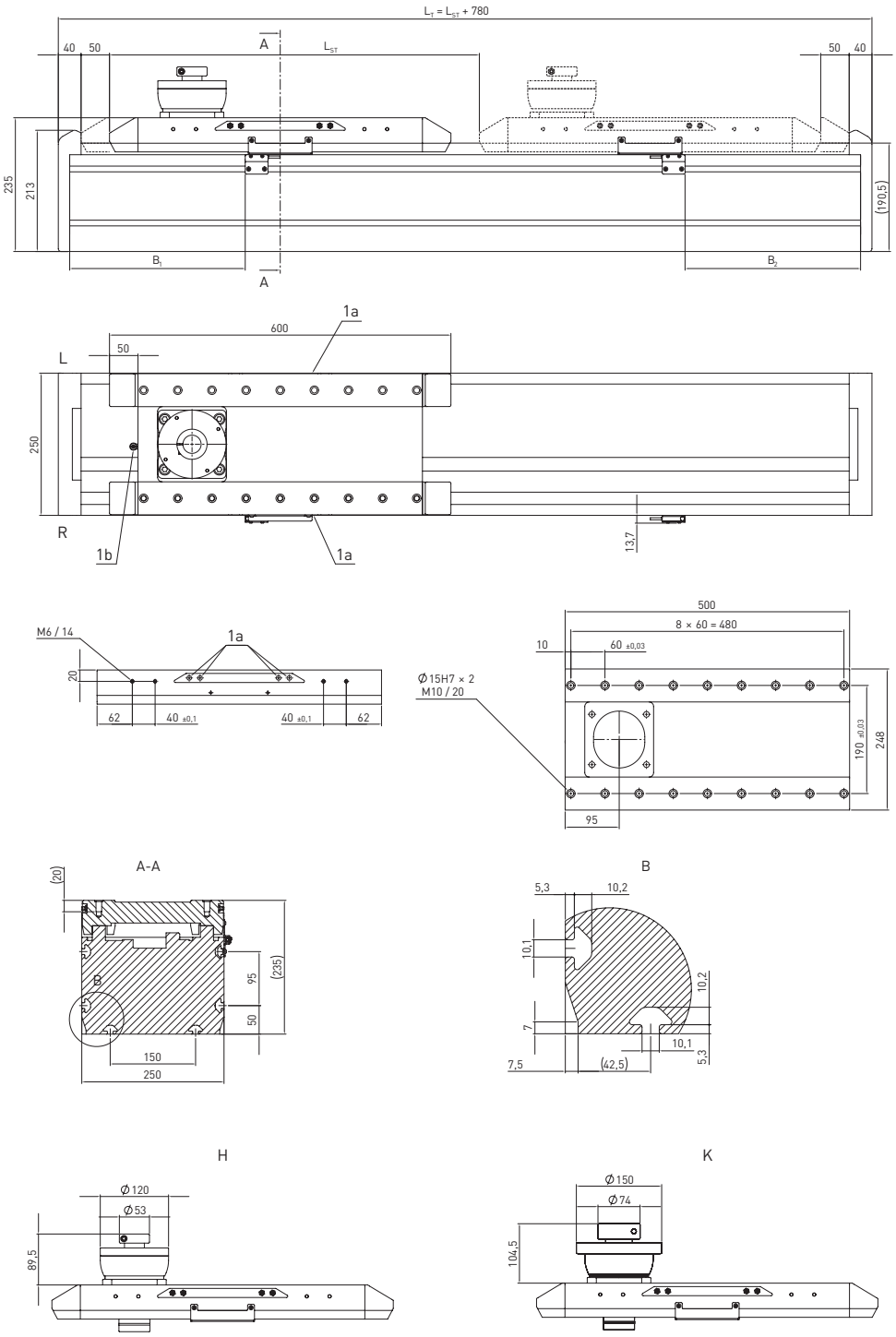


Continuation, order code for bridge axes HB-R



[1] More detailed information in chapter 21 from page 156 or in the "HIWIN MAGIC Distance Measuring Systems" assembly instructions".
[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.

11.3 Dimensions and specifications of HB250R



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 11.1 **HB250R 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
Total length L_T [mm]	$L_T = L_{ST} + 780$

Table 11.2 **Load data**	
$F_{ydynmax}$ [1)2)] [N]	11,600
$F_{zdynmax}$ [2)] [N]	13,720
$M_{xdynmax}$ [Nm]	1,303
$M_{ydynmax}$ [Nm]	2,490
$M_{zdynmax}$ [Nm]	2,105
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)

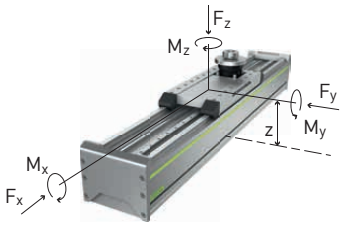


Table 11.3 **General technical data**	
Repeatability [2)] [mm]	± 0,05
Max. feed force Fx_{max} [N]	4,300
Max. speed [m/s]	5
Max. acceleration [m/s²]	50
Max. drive torque Ma_{max} [Nm]	104.9
Typical load capacity [kg]	350
Maximum total length [2) 3)] [mm]	5,160
Area moment of inertia of profile cross 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 11.4 **Guide**	
Guide type	CGH25HA
Static load rating C_0 [N]	54,080
Dynamic load rating C_{dyn} [N]	40,500

Table 11.5 **Rack and pinion**	
Toothing	Module 2, diagonally toothed
Feed constant [mm/U]	153.34
Effective diameter of pinion [mm]	48.81
Number of teeth pinion	23

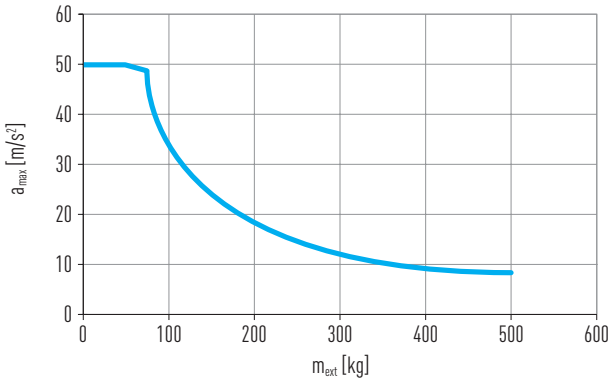


Fig. 11.1 **Max. Acceleration a_{max} as a function of the external payload m_{ext}**

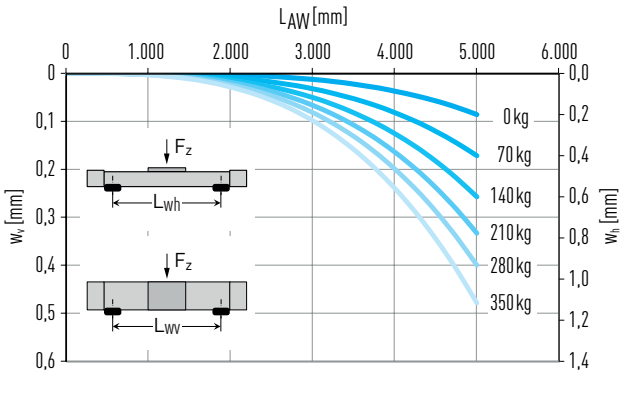


Fig. 11.2 **Deflection w over unsupported axle length L_{AW} under payload F_z**

Table 11.6 **Mechanical properties**	
Mass of the carriage [kg]	12.43
Mass at 0-stroke [kg]	48.23
Mass per 1 m stroke [kg/m]	43.42
Breakaway force F_t [N]	20.00

1) Rotational moment of inertia