

Linear axes and axis systems HX

Cantilever axes HC-B

13. Cantilever axes HC-B

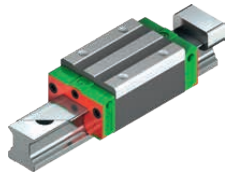
13.1 Properties of cantilever axes HC-B with toothed belt drive

The HIWIN cantilever axes with toothed belt drive are flexible linear units in which the drive block is stationary while the light cantilever moves. They are especially suitable for vertical applications where high dynamics and high speeds are required.



Linear guideway

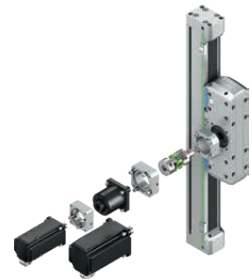
High-quality HIWIN linear guideways with two blocks safely transfer forces and torques from the cantilever to the drive block. The CG guide with O-arrangement of the ball track also ensures increased rigidity and high torque load capacity in the HC060B, HC080B and HC100B sizes.



Drive connection

Thanks to the symmetrical design, the HIWIN cantilever axis allows motors and gearboxes to be mounted on both sides of the drive block.

Additional journals, which are available as accessories (see Page 238), can be used to mount additional drives and outputs.



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.



Lubrication

For convenient maintenance of the linear axis, a separate grease nipple is installed on the left and right of the drive block for each lubrication point. This ensures optimum accessibility for relubrication, even under difficult installation conditions.



Mounting

The drive block as well as the interfaces for attaching the load capacity on both sides of the cantilever have additional bore holes on each mounting hole. This ensures ideal, reproducible alignment of the adjacent construction. You will find the matching centring sleeves in the accessories on Page 231.



Clamping and braking element

The clamping or braking element can be controlled via a pneumatic connection on the drive block. Clamping onto the profile rail is fail-safe as soon as there is no more compressed air at the connection. Particularly in vertical applications, clamping may be necessary to securely fix the axis at standstill.

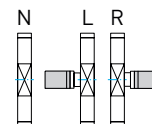


13.2 Order code for cantilever axes HC-B

HC	060	B	170	N	1234	S
HIWIN cantilever axis	Size (profile width):	Drive type:	Carriage length:	Stroke length [mm]	Cover strip:	Feed constant [mm/rev]:
	025: 25 mm	B: Toothed belt drive	S: Short		N: Without cover strip	081: HC025B
	040: 40 mm					123: HC040B
	060: 60 mm					170: HC060B
	080: 80 mm					200: HC080B
	100: 100 mm					280: HC100B
	150: 150 mm					288: HC150B

Continuation, order code for cantilever axes HC-B

A	N	N	R	HW01	G0608
Axis limit switch ⁶⁾ :	Motor flange type ⁴⁾	Drive interface ³⁾ :			
N: Without limit switch	N: Without	N: Without			
A: 2 × normally closed, 100 mm cable, connector ¹⁾	L: Left	L: Left			
B: 2 × normally open, 100 mm cable, connector ¹⁾	R: Right	R: Right			
C: 2 × normally closed, 4 m open cable end ¹⁾					
D: 2 × normally open, 5 m open cable end ¹⁾					
Clamping and braking element option:					
N: Without holding brake (standard)					
C: With 1 pneumatic clamping element (HC060B/HC080B/HC100B/HC150) ⁷⁾					
B: With 1 pneumatic braking element (HC060B/HC080B/HC100B/HC150)					
D: With 2 pneumatic clamping elements (HC150) ⁷⁾					
E: With 2 pneumatic braking elements (HC150)					
Distance measuring system option ²⁾ :					
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					



¹⁾ HC025B: A: 2 × normally closed, 200 mm cable, connector, C: 2 × normally closed, 2 m open cable end; B and D: not available.

²⁾ More detailed information in chapter 21 from page 156 or in the "HIWIN MAGIC Distance Measuring Systems" assembly instructions".

³⁾ If no drive interface is selected, the order code ends after this digit.

⁴⁾ You can find all flange types in Table 22.1 from page 160. If no gearbox is selected, the order code ends after this digit.

⁵⁾ You can find the right gearbox for the HIWIN axes in section 22.1.5.5 from page 195.

⁶⁾ Additional reference switches on request.

⁷⁾ The clamping element may only be used when the axis is stationary and not as a brake.

Cantilever axes HC-B

Technical drawing of a mechanical part, showing multiple views and dimensions. The drawing includes the following views and dimensions:

- Top View:** Shows the overall length $L_T = L_{ST} + 190$. The total width is 30,5. The central section has a width of 30 and a length of L_{ST} . The end sections have a width of 16 and a length of 7. The total height is 39,2. The end view shows a width of 16 and a height of 10.
- Front View:** Shows the overall length L and the total width 30. The end view shows a width of 16 and a height of 10.
- Side View:** Shows the overall width 30 and the total height 70. The end view shows a width of 16 and a height of 10.
- End View (Left):** Shows the overall width 30 and the total height 70. The end view shows a width of 16 and a height of 10.
- End View (Right):** Shows the overall width 30 and the total height 70. The end view shows a width of 16 and a height of 10.
- Section C-C:** Shows the internal structure of the part. The overall width is 38. The central section has a width of 30,5. The end sections have a width of 16. The total height is 26,5. The end view shows a width of 16 and a height of 10.
- Section A-A:** Shows the internal structure of the part. The overall width is 30. The central section has a width of 30. The end sections have a width of 16. The total height is 26,5. The end view shows a width of 16 and a height of 10.

Key dimensions and features:

- Overall length: $L_T = L_{ST} + 190$
- Overall width: 30,5
- Central section width: 30
- End section width: 16
- End section length: 7
- Central section length: L_{ST}
- Overall height: 39,2
- End view height: 10
- Section C-C width: 38
- Section C-C central width: 30,5
- Section C-C end width: 16
- Section C-C total height: 26,5
- Section C-C end height: 10
- Section A-A width: 30
- Section A-A central width: 30
- Section A-A end width: 16
- Section A-A total height: 26,5
- Section A-A end height: 10

L_{ST}	Stroke
L_T	Total length
L	Left
R	Right

Table 13.1 Load data

$F_{y\text{dynmax}}^{1)}$ [N]	616
$F_{z\text{dynmax}}^{1)}$ [N]	616
$M_{x\text{dynmax}}$ [Nm]	2.65
$M_{y\text{dynmax}}$ [Nm]	20.65
$M_{z\text{dynmax}}$ [Nm]	20.65

¹⁾ Force must only act free of torque

See section 3.3.2 on page 17 (lifetime reference value)

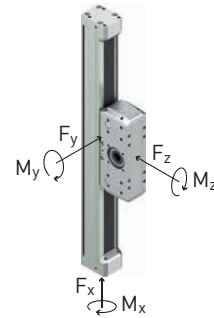


Table 13.2 General technical data

Repeatability [mm]	± 0.05
Max. feed force F_{x_max} [N]	241
Max. speed [m/s]	5
Max. acceleration [m/s ²]	30
Max. drive torque M_{A_max} [Nm]	3.1
Typical load capacity [kg]	2
Maximum vertical stroke length [mm]	300
Maximum horizontal stroke length [mm]	200
Area moment of inertia of profile cross section I_x [mm ⁴]	18,706
Area moment of inertia of profile cross section I_y [mm ⁴]	19,299

Table 13.3 Guide

Guide type	MGN09C
Static load rating C_0 [N]	2,550
Dynamic load rating C_{dyn} [N]	1,860

Table 13.4 Drive

Drive element	B12HTD3
Feed constant [mm/U]	81
Toothed belt effective diameter [mm]	25.78

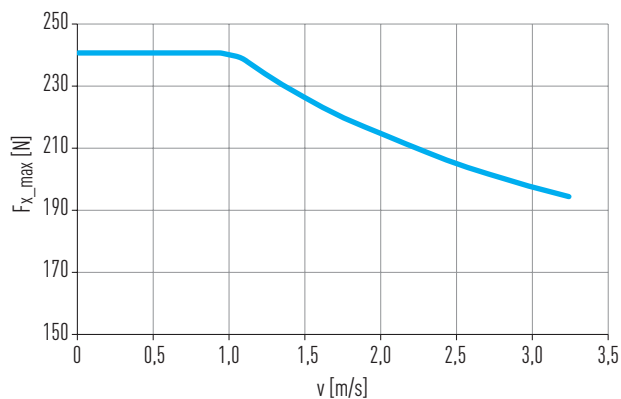
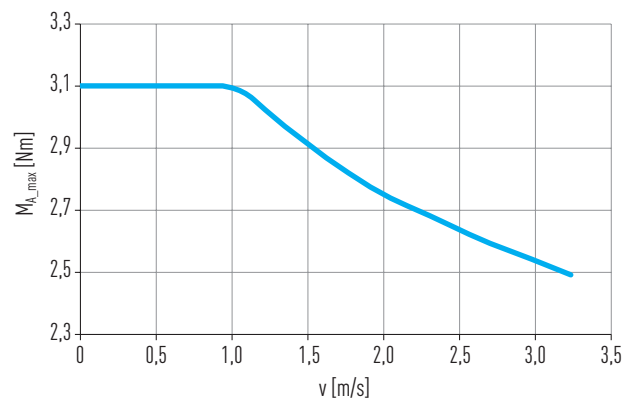

 Fig. 13.1 Max. feed force F_{x_max} depending on axis speed v

 Fig. 13.2 Max. drive force M_{A_max} depending on axis speed v

Table 13.5 Mechanical properties

Mass at 0-stroke [kg]	0.63
Mass per 100 mm stroke [kg/100 mm]	0.13
Mass of cantilever at 0-stroke [kg]	0.30
Mass of cantilever per 100 mm stroke [kg/100 mm]	0.13
$J_{rot.}^{1)}$ [kgcm ²]	0.16
Idle torque at 0-stroke [Nm]	0.15

¹⁾ Rotational moment of inertia

Cantilever axes HC-B

Technical drawing of a mechanical assembly, showing multiple views and dimensions.

Top View: Dimensions include $L_T = L_{ST} + 286$, L_{ST} , 36, 10, 19, 45, 57,2, 10, 36, 40, and [57]. Section line A-A is indicated.

Right View: Dimensions include 46 and 110.

Front View: Dimensions include 2,2, L, 40, and [39,6].

Bottom View: Dimensions include 30 ± 0,03, 92 ± 0,03, 30 ± 0,03, 10, 40 ± 0,03, 45°, Ø42H7, Ø14H7, Ø50, M4/8, Ø8H7×1,5 M5/10, 194, 170, 15, 30 ± 0,03, Ø8H7×1,5 M5/11,5, 35 ± 0,03, 70 ± 0,03, 35 ± 0,03.

Detail View (Bottom Left): Dimensions include 39,6, 28 ± 0,03, Ø8H7×1,5 M5/11,5, 46 ± 0,03, 5.

Section A-A: Shows a cross-section of the assembly with dimensions 10 and 20.

Section B-B: Shows a cross-section of the assembly with dimensions 1,6, 4,7, 5, 4,7, 1,6, and 5.

Right

Table 13.6 Load data

$F_{y\text{dynmax}}^{1)}$ [N]	1,213
$F_{z\text{dynmax}}^{1)}$ [N]	1,213
$M_{x\text{dynmax}}$ [Nm]	10
$M_{y\text{dynmax}}$ [Nm]	78
$M_{z\text{dynmax}}$ [Nm]	78

¹⁾ Force must only act free of torque

See section 3.3.2 on page 17 (lifetime reference value)

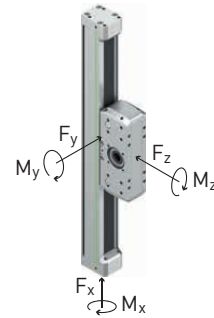


Table 13.7 General technical data

Repeatability [mm]	± 0.05
Max. feed force $F_{x\text{max}}$ [N]	404
Max. speed [m/s]	5
Max. acceleration [m/s ²]	30
Max. drive torque $M_{A\text{max}}$ [Nm]	7.9
Typical load capacity [kg]	8
Maximum vertical stroke length [mm]	500
Maximum horizontal stroke length [mm]	400
Area moment of inertia of profile cross section I_x [mm ⁴]	94,400
Area moment of inertia of profile cross section I_y [mm ⁴]	102,030

Table 13.8 Guide

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

Table 13.9 Drive

Drive element	B20HTD3
Feed constant [mm/U]	123
Toothed belt effective diameter [mm]	39.15

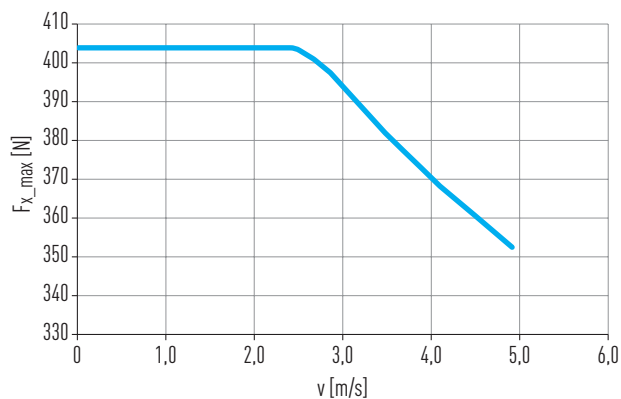
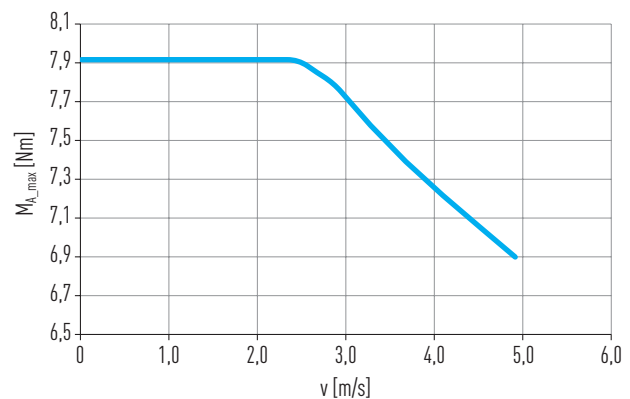

 Fig. 13.3 Max. feed force $F_{x\text{max}}$ depending on axis speed v

 Fig. 13.4 Max. drive force $M_{A\text{max}}$ depending on axis speed v

Table 13.10 Mechanical properties

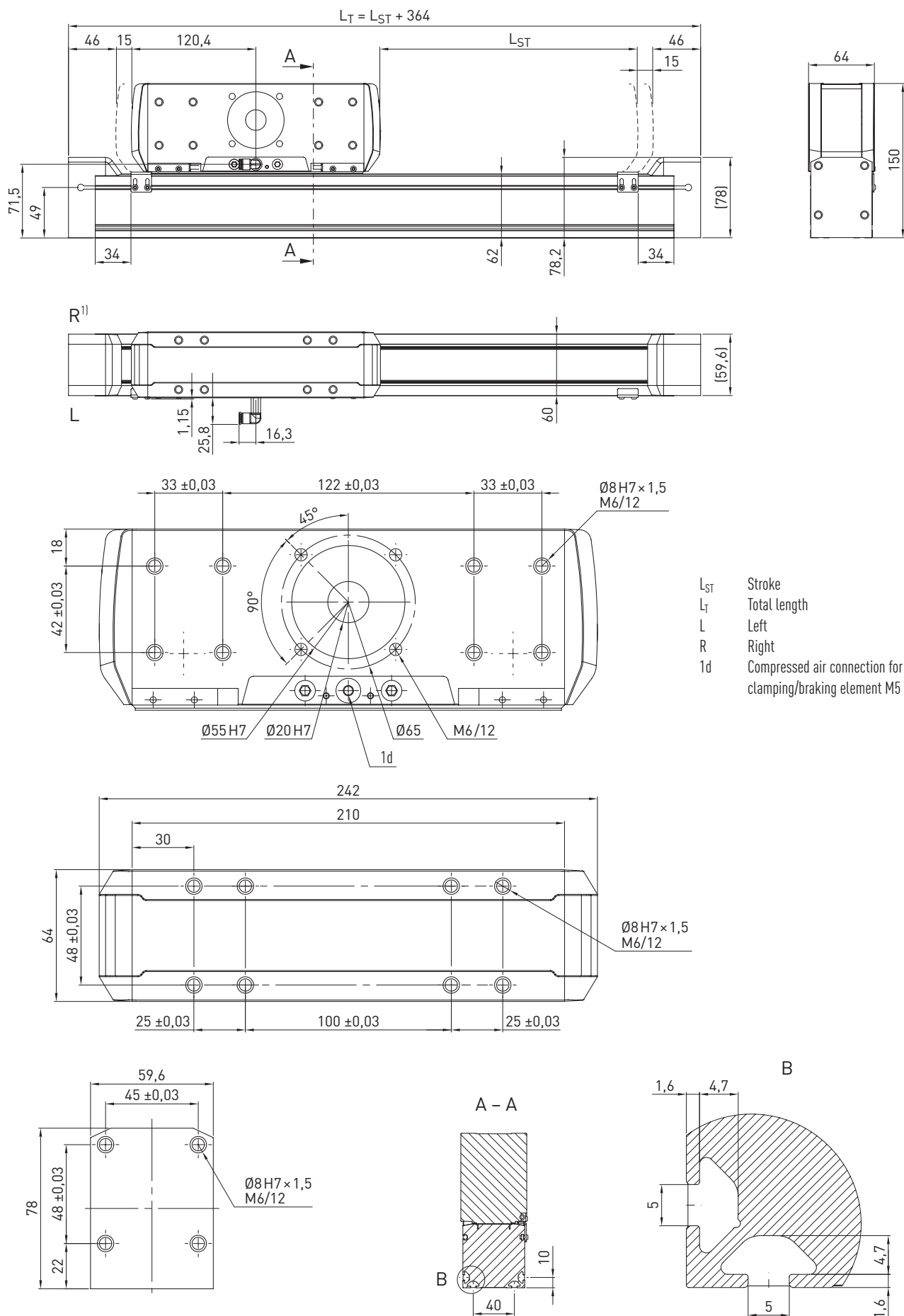
Mass at 0-stroke [kg]	2.18
Mass per 100 mm stroke [kg/100 mm]	0.28
Mass of cantilever at 0-stroke [kg]	0.92
Mass of cantilever per 100 mm stroke [kg/100 mm]	0.28
$J_{\text{rot.}}^{1)}$ [kgcm ²]	0.44
Idle torque at 0-stroke [Nm]	0.20

¹⁾ Rotational moment of inertia

Linear axes and axis systems HX

Cantilever axes HC-B

13.5 Dimensions and specifications of HC060B



¹⁾ In the horizontal installation position, the axis must be aligned so that the right-hand side of the axis is at the top.

Table 13.11 Load data	
$F_{y\text{dynmax}}^{1)}$ [N]	2,152
$F_{z\text{dynmax}}^{1)}$ [N]	3,378
$M_{x\text{dynmax}}$ [Nm]	33
$M_{y\text{dynmax}}$ [Nm]	243
$M_{z\text{dynmax}}$ [Nm]	155

¹⁾ Force must only act free of torque
See section 3.3.2 on page 17 (lifetime reference value)

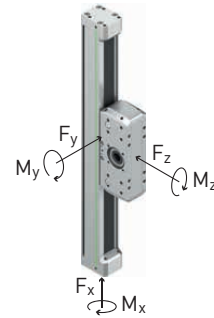


Table 13.12 General technical data	
Repeatability [mm]	± 0.05
Max. feed force F_{x_max} [N]	997
Max. speed [m/s]	5
Max. acceleration [m/s ²]	30
Max. drive torque M_{A_max} [Nm]	27
Typical load capacity [kg]	16
Maximum vertical stroke length [mm]	800
Maximum horizontal stroke length [mm]	600
Area moment of inertia of profile cross section I_x [mm ⁴]	431,271
Area moment of inertia of profile cross section I_y [mm ⁴]	536,119

Table 13.13 Guide	
Guide type	CGL15CA
Static load rating C_0 [N]	19,520
Dynamic load rating C_{dyn} [N]	14,700

Table 13.14 Drive	
Drive element	B30HTD5
Feed constant [mm/U]	170
Toothed belt effective diameter [mm]	54.11

Table 13.15 Clamping/Braking element ¹⁾	
Holding force [N]	400
Operating pressure [bar]	5.5–6.5

¹⁾ The clamping element may only be used when the axis is stationary and not as a brake.

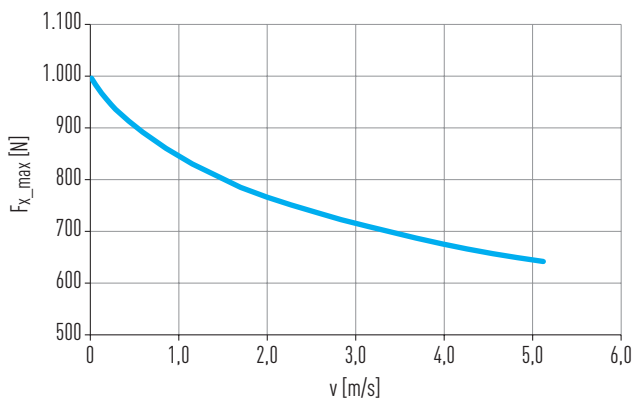


Fig. 13.5 Max. feed force F_{x_max} depending on axis speed v

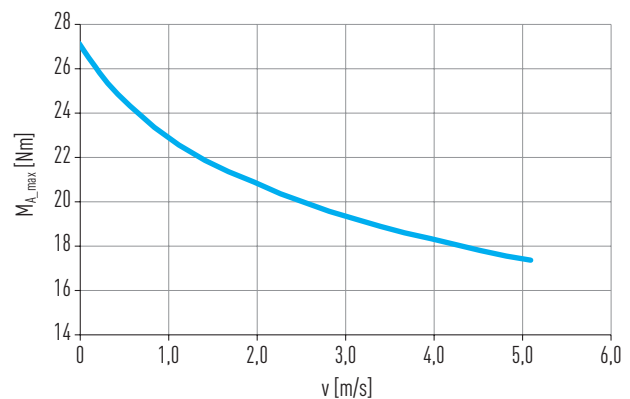


Fig. 13.6 Max. drive force M_{A_max} depending on axis speed v

Table 13.16 Mechanical properties	
Mass at 0-stroke [kg]	5.13
Mass per 100 mm stroke [kg/100 mm]	0.52
Mass of cantilever at 0-stroke [kg]	2.24
Mass of cantilever per 100 mm stroke [kg/100 mm]	0.52
$J_{rot.}^{1)}$ [kgcm ²]	2.41
Idle torque at 0-stroke [Nm]	0.60

¹⁾ Rotational moment of inertia

Linear axes and axis systems HX

Cantilever axes HC-B

13.6 Dimensions and specifications of HC080B

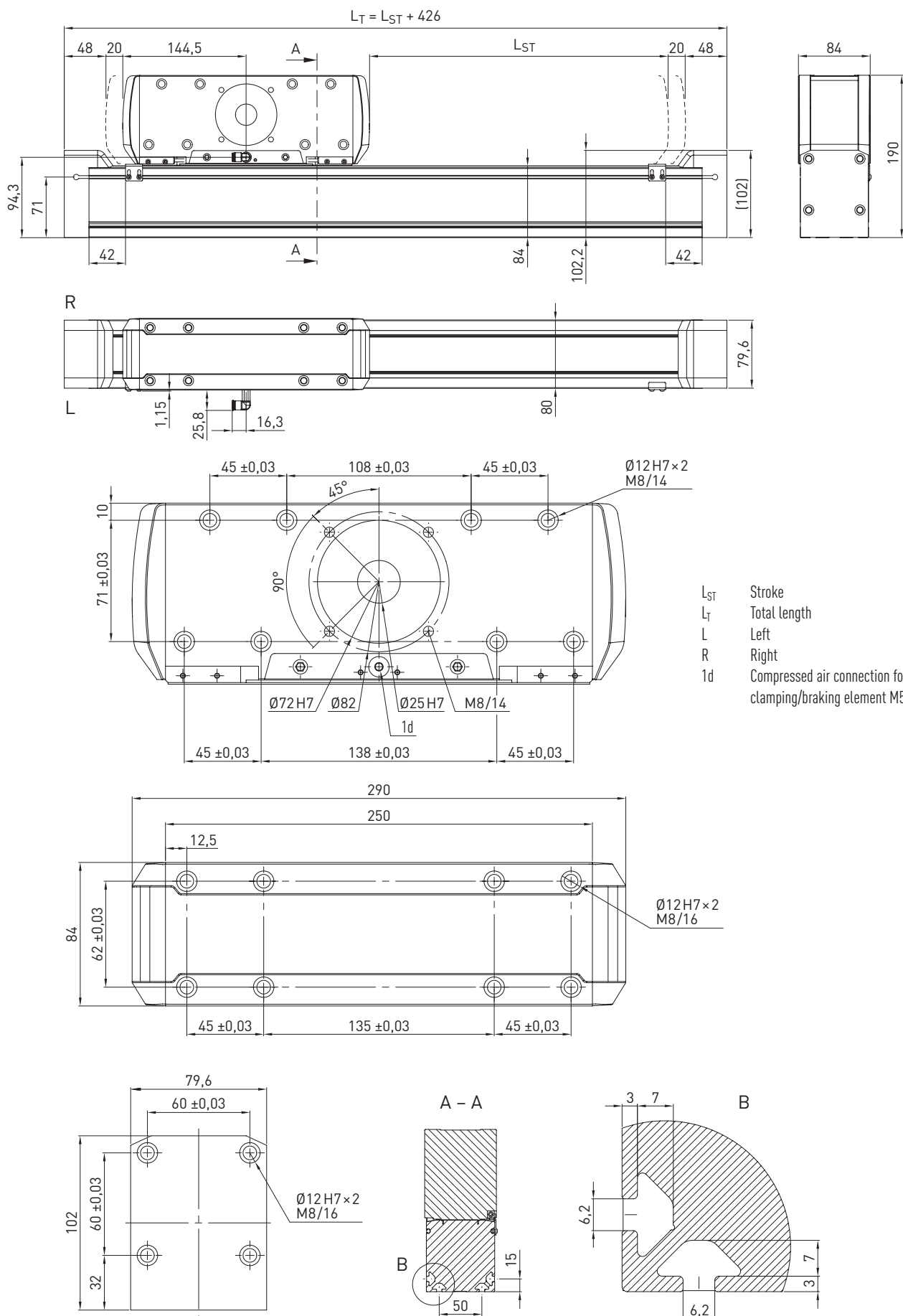


Table 13.17 Load data	
$F_{y\text{dynmax}}^{1)}$ [N]	3,855
$F_{z\text{dynmax}}^{1)}$ [N]	5,447
$M_{x\text{dynmax}}$ [Nm]	66
$M_{y\text{dynmax}}$ [Nm]	444
$M_{z\text{dynmax}}$ [Nm]	314

¹⁾ Force must only act free of torque
See section 3.3.2 on page 17 (lifetime reference value)

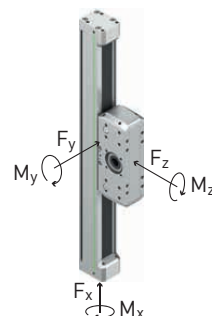


Table 13.18 General technical data	
Repeatability [mm]	± 0.05
Max. feed force F_{x_max} [N]	1,330
Max. speed [m/s]	5
Max. acceleration [m/s ²]	30
Max. drive torque M_{A_max} [Nm]	42.3
Typical load capacity [kg]	30
Maximum vertical stroke length [mm]	1,200
Maximum horizontal stroke length [mm]	800
Area moment of inertia of profile cross section I_x [mm ⁴]	1,394,922
Area moment of inertia of profile cross section I_y [mm ⁴]	1,758,779

Table 13.19 Guide	
Guide type	CGH20CA
Static load rating C_0 [N]	30,510
Dynamic load rating C_{dyn} [N]	23,700

Table 13.20 Drive	
Drive element	B40HTD5
Feed constant [mm/U]	200
Toothed belt effective diameter [mm]	63.66

Table 13.21 Clamping/Braking element ¹⁾	
Holding force [N]	650
Operating pressure [bar]	5.5–6.5

¹⁾ The clamping element may only be used when the axis is stationary and not as a brake.

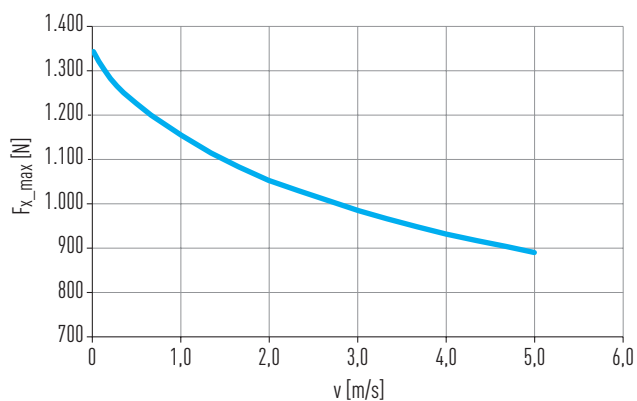


Fig. 13.7 Max. feed force F_{x_max} as a function of axis speed v

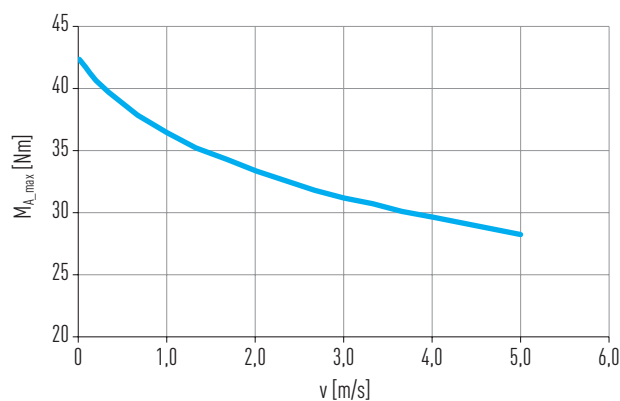


Fig. 13.8 Max. drive force M_{A_max} as a function of axis speed v

Table 13.22 Mechanical properties	
Mass at 0-stroke [kg]	9.72
Mass per 100 mm stroke [kg/100 mm]	0.90
Mass of cantilever at 0-stroke [kg]	4.51
Mass of cantilever per 100 mm stroke [kg/100 mm]	0.90
$J_{rot.}^{1)}$ [kgcm ²]	5.49
Idle torque at 0-stroke [Nm]	1.40

¹⁾ Rotational moment of inertia

Linear axes and axis systems HX

Cantilever axes HC-B

13.7 Dimensions and specifications of HC100B

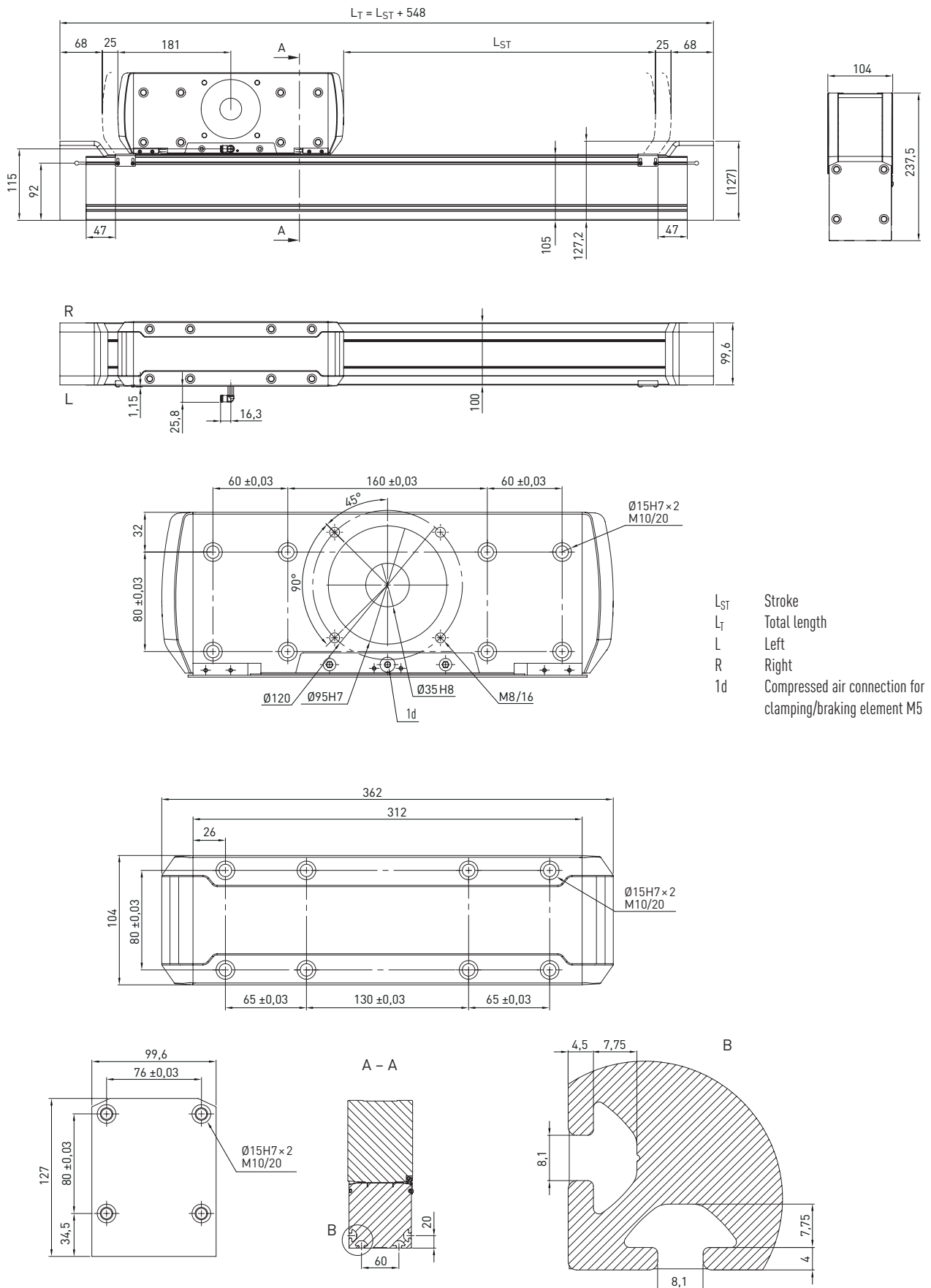


Table 13.23 Load data	
$F_{y\text{dynmax}}^{1)}$ [N]	6,979
$F_{z\text{dynmax}}^{1)}$ [N]	8,034
$M_{x\text{dynmax}}$ [Nm]	110
$M_{y\text{dynmax}}$ [Nm]	844
$M_{z\text{dynmax}}$ [Nm]	733

¹⁾ Force must only act free of torque
See section 3.3.2 on page 17 (lifetime reference value)

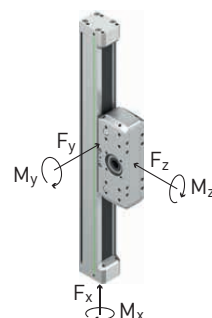


Table 13.24 General technical data	
Repeatability [mm]	± 0.05
Max. feed force F_{x_max} [N]	2,667
Max. speed [m/s]	5
Max. acceleration [m/s ²]	30
Max. drive torque M_{A_max} [Nm]	118.8
Typical load capacity [kg]	60
Maximum vertical stroke length [mm]	1,800
Maximum horizontal stroke length [mm]	1,200
Area moment of inertia of profile cross section I_x [mm ⁴]	3,290,845
Area moment of inertia of profile cross section I_y [mm ⁴]	4,100,279

Table 13.25 Guide	
Guide type	CGL25CA
Static load rating C_0 [N]	43,940
Dynamic load rating C_{dyn} [N]	34,960

Table 13.26 Drive	
Drive element	B40HTD8
Feed constant [mm/U]	280
Toothed belt effective diameter [mm]	89.13

Table 13.27 Clamping/Braking element ¹⁾	
Holding force [N]	750
Operating pressure [bar]	5.5–6.5

¹⁾ The clamping element may only be used when the axis is stationary and not as a brake.

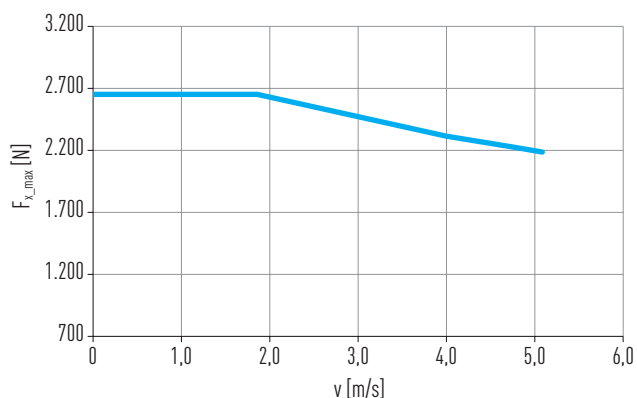


Fig. 13.9 Max. feed force F_{x_max} depending on axis speed v

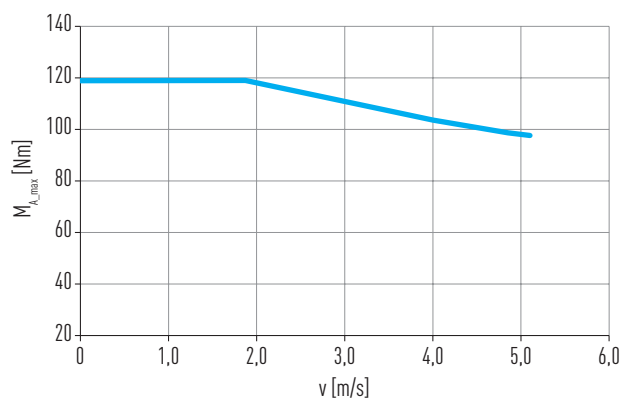


Fig. 13.10 Max. drive force M_{A_max} depending on axis speed v

Table 13.28 Mechanical properties	
Mass at 0-stroke [kg]	20.12
Mass per 100 mm stroke [kg/100 mm]	1.32
Mass of cantilever at 0-stroke [kg]	8.40
Mass of cantilever per 100 mm stroke [kg/100 mm]	1.32
$J_{rot.}^{1)}$ [kgcm ²]	28.99
Idle torque at 0-stroke [Nm]	3.00

¹⁾ Rotational moment of inertia

Cantilever axes HC-B

Technical drawing of a mechanical assembly, likely a pump or motor housing, showing multiple views and dimensions.

Top View: Shows the overall dimensions and the central circular feature. Key dimensions include 89, 30, 192, 171, 163.1, 90, 131, and 171. The total length is defined as $L_T = L_{ST} + 622$. Callouts include 1a, A, and 1a.

Side View: Shows the profile of the assembly with dimensions 150, 14.4, 150, and 8. Callouts include R, L, and 1a.

Front View: Shows the circular end face with dimensions 75 ± 0.03 , 182 ± 0.03 , 75 ± 0.03 , 25, 75 ± 0.03 , 60°, 60°, $\varnothing 100.5H7$, $\varnothing 111$, $\varnothing 35H8$, and M8 / 16. Callouts include 1a and 1d.

Top View (Detail): Shows the rectangular base with dimensions 72, 40 ± 0.03 , 40 ± 0.03 , 80 ± 0.03 , 40 ± 0.03 , 40 ± 0.03 , 170, 140 ± 0.03 , and $\varnothing 15H7 \times 2$ M10 / 20. Callouts include 1a and 1d.

Side View (Detail): Shows the profile with dimensions 149.6, 107 ± 0.03 , 70 ± 0.03 , 42, and $\varnothing 15H7 \times 2$ M10 / 20. Callouts include 1a and 1d.

Front View (Detail): Shows the circular end face with dimensions 170, 300, and 100 (150). Callouts include 1a and 1d.

Section A-A: Shows a cross-section of the assembly with dimensions (20), 65, 25, and 100 (150). Callouts include 1a and 1d.

Section B: Shows a cross-section of the assembly with dimensions 4.5, 7.75, 8.1, 7.75, 8.1, and 4.5. Callouts include 1a and 1d.

98

Table 13.29 Load data

$F_{y\text{dynmax}}^{1)}$ [N]	9,485
$F_{z\text{dynmax}}^{1)}$ [N]	13,789
$M_{x\text{dynmax}}$ [Nm]	446.0
$M_{y\text{dynmax}}$ [Nm]	1,755
$M_{z\text{dynmax}}$ [Nm]	1,207

¹⁾ Force must only act free of torque

See section 3.3.2 on page 17 (lifetime reference value)

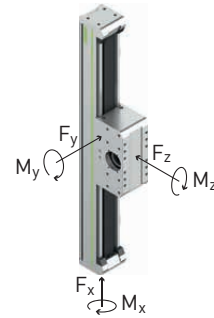


Table 13.30 General technical data

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]	183.3
Typical load capacity [kg]	80
Maximum vertical stroke length [mm]	2,000
Maximum horizontal stroke length [mm]	1,400
Area moment of inertia of profile cross section I_x [mm ⁴]	7,556,719
Area moment of inertia of profile cross section I_y [mm ⁴]	13,470,080

Table 13.31 Guide

Guide type	QHH20CA
Static load rating C_0 [N]	33,860
Dynamic load rating C_{dyn} [N]	30,000

Table 13.32 Drive

Drive element	b60HTD8
Feed constant [mm/U]	288
Toothed belt effective diameter [mm]	91.67

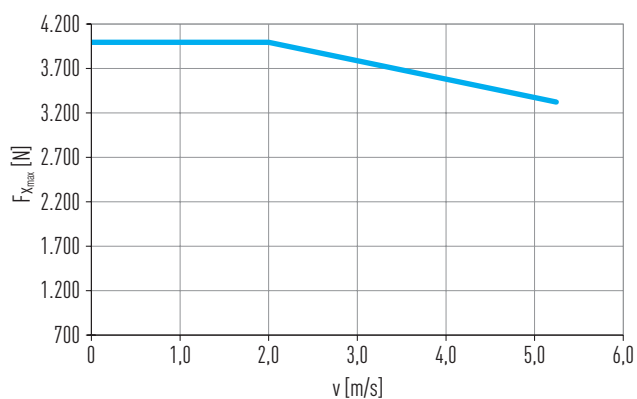
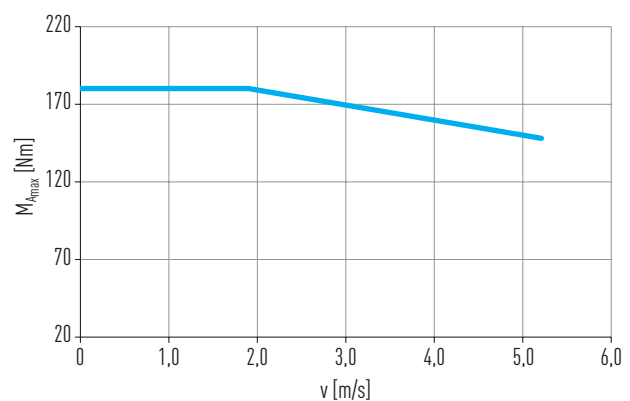

 Fig. 13.11 Max. feed force F_{x_max} depending on axis speed v

 Fig. 13.12 Max. drive force M_{A_max} depending on axis speed v

Table 13.33 Mechanical properties

Mass at 0-stroke [kg]	36.69
Mass per 100 mm stroke [kg/100 mm]	1.83
Mass of cantilever at 0-stroke [kg]	13.88
Mass of cantilever per 100 mm stroke [kg/100 mm]	1.83
$J_{rot.}^{1)}$ [kgcm ²]	48.37
Idle torque at 0-stroke [Nm]	5.50

¹⁾ Rotational moment of inertia