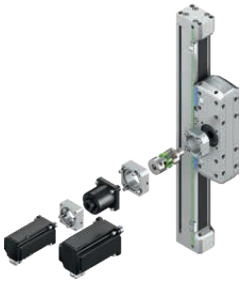
13. Cantilever axes HC-B

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.

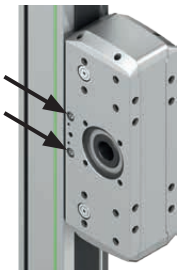
Linear guideway
High-quality HIWIN linear guideways with two blocks safely transfer forces and torques from the cantilever to the drive block.
The CG guide with O-arrangement of the ball track also ensures increased rigidity and high torque load capacity in the HC060B, HC080B and HC100B sizes.

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.



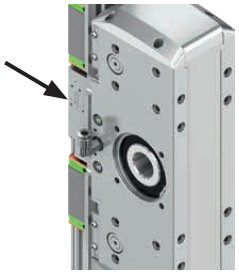
Toothed belt
The toothed belt with modern high performance profiles (HTD shape) and reinforced steel tension members enables high power transmission while offering high skip resistance.

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):
025: 25 mm
040: 40 mm
060: 60 mm
080: 80 mm
100: 100 mm
150: 150 mm

Drive type:
B: Toothed belt drive

Carriage length:
S: Short

Stroke length [mm]

Cover strip:
N: Without cover strip

Feed constant [mm/rev]:
081: HC025B
123: HC040B
170: HC060B
200: HC080B
280: HC100B
288: HC150B

Continuation, order code for cantilever axes HC-B

A	N	N	R	HW01	G0608

Axis limit switch[6]**:**
N: Without limit switch
A: 2 × normally closed, 100 mm cable, connector[1]
B: 2 × normally open, 100 mm cable, connector[1]
C: 2 × normally closed, 4 m open cable end[1]
D: 2 × normally open, 5 m open cable end[1]

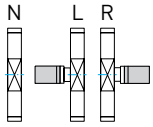
Clamping and braking element option:
N: Without holding brake (standard)
C: With 1 pneumatic clamping element (HC060B/HC080B/HC100B/HC150)[7]
B: With 1 pneumatic braking element (HC060B/HC080B/HC100B/HC150)
D: With 2 pneumatic clamping elements (HC150)[7]
E: With 2 pneumatic braking elements (HC150)

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

Gearbox[5]

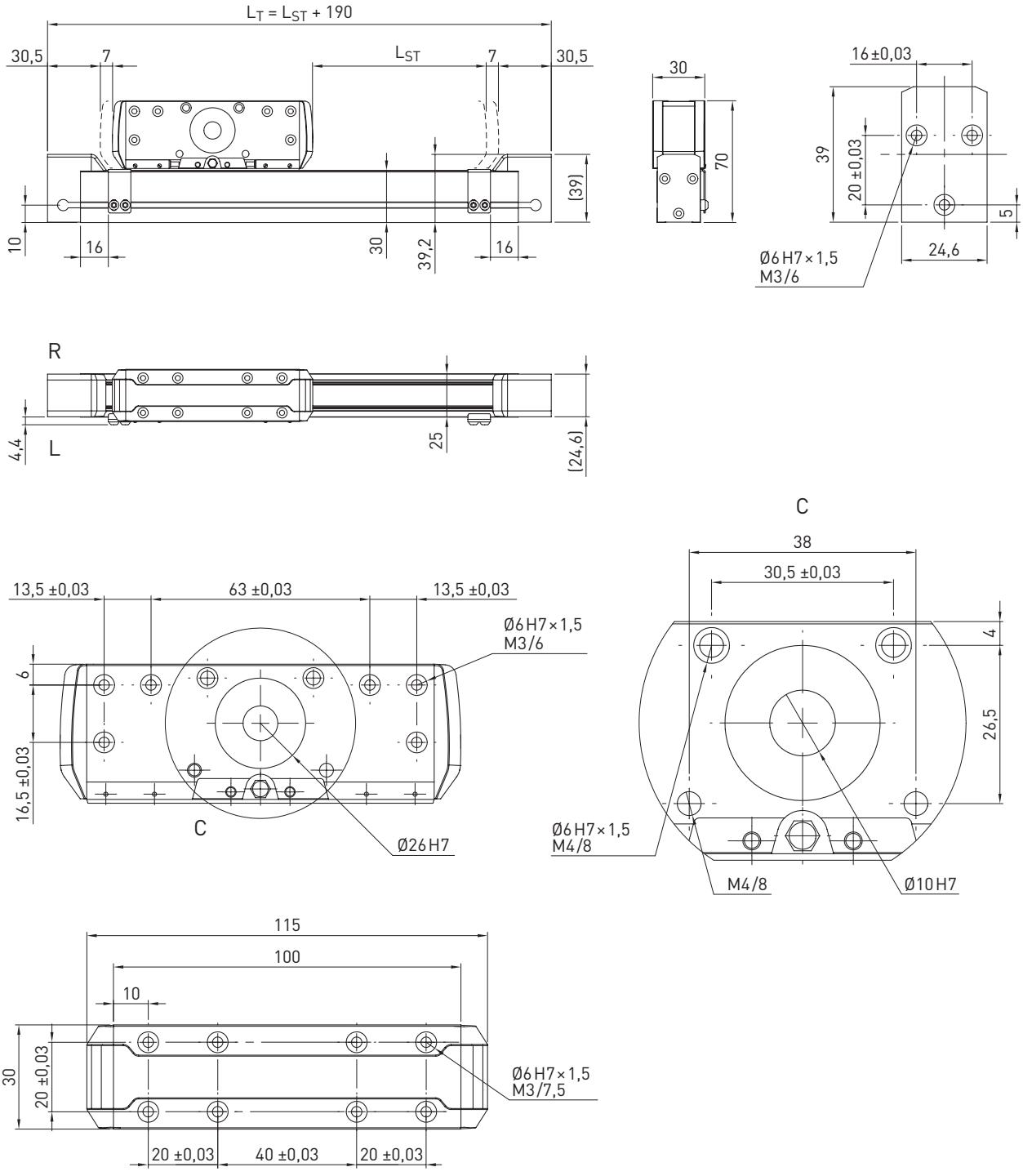
Motor flange type[4]

Drive interface[3]**:**
N: Without
L: Left
R: Right



[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.

13.3 Dimensions and specifications of HC025B



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

Table 13.1 **Load data**	
$F_{ydynmax}$ [1] [N]	616
$F_{zdynmax}$ [1] [N]	616
$M_{xdynmax}$ [Nm]	2.65
$M_{ydynmax}$ [Nm]	20.65
$M_{zdynmax}$ [Nm]	20.65

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

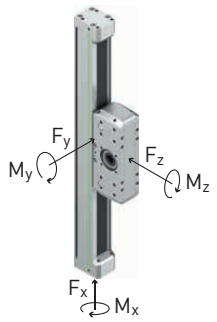


Table 13.2 **General technical data**	
Repeatability [mm]	± 0.05
Max. feed force F_{x_max} [N]	241
Max. speed [m/s]	5
Max. acceleration [m/s²]	30
Max. drive torque M_{A_max} [Nm]	3.1
Typical load capacity [kg]	2
Maximum vertical stroke length [mm]	300
Maximum horizontal stroke length [mm]	200
Area moment of inertia of profile cross section I_x [mm⁴]	18,706
Area moment of inertia of profile cross section I_y [mm⁴]	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

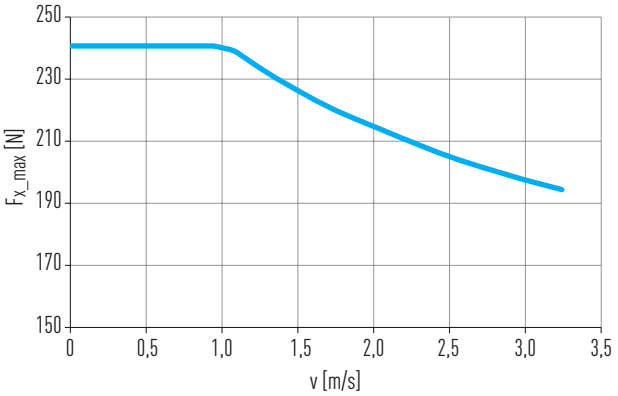


Fig. 13.1 **Max. feed force F_{x_max} depending on axis speed v**

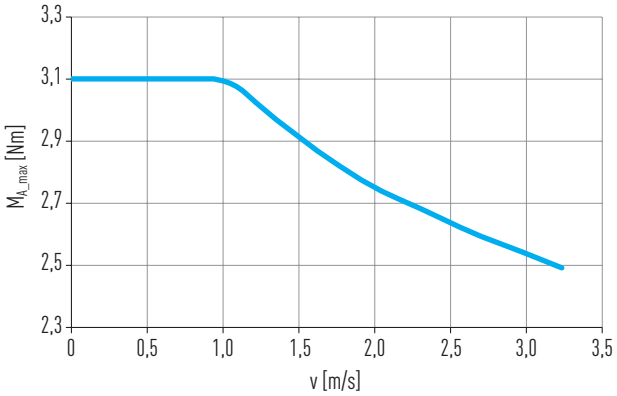
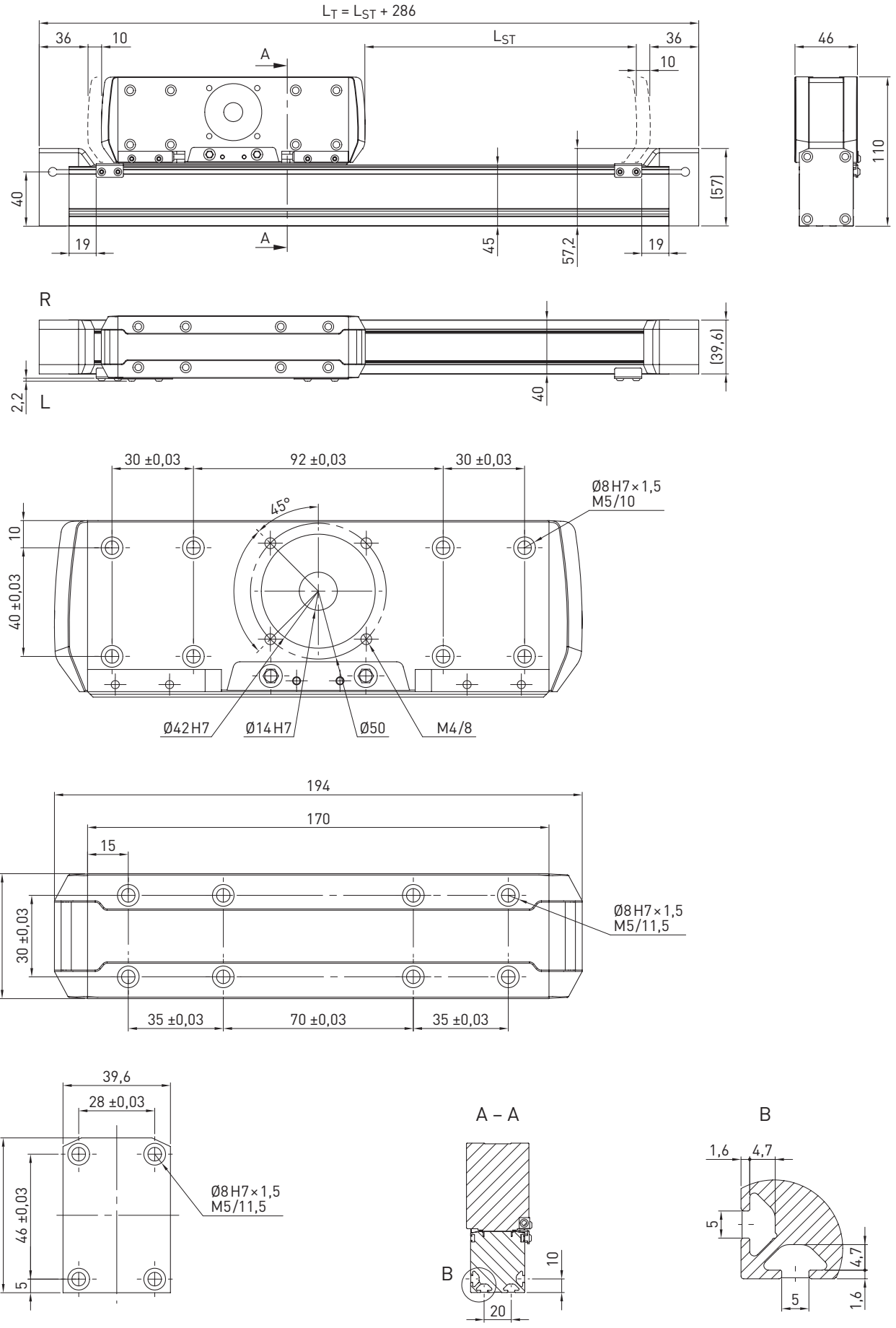


Fig. 13.2 **Max. drive force M_{A_max} depending on axis speed v**

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] [kgcm²]	0.16
Idle torque at 0-stroke [Nm]	0.15

[1] Rotational moment of inertia

13.4 Dimensions and specifications of HC040B



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

Table 13.6 **Load data**	
$F_{ydynmax}$ [1] [N]	1,213
$F_{zdynmax}$ [1] [N]	1,213
$M_{xdynmax}$ [Nm]	10
$M_{ydynmax}$ [Nm]	78
$M_{zdynmax}$ [Nm]	78

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

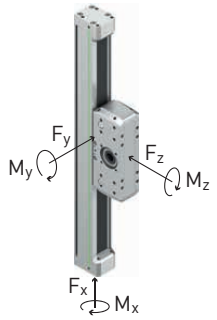


Table 13.7 **General technical data**	
Repeatability [mm]	± 0.05
Max. feed force F_{x_max} [N]	404
Max. speed [m/s]	5
Max. acceleration [m/s²]	30
Max. drive torque M_{A_max} [Nm]	7.9
Typical load capacity [kg]	8
Maximum vertical stroke length [mm]	500
Maximum horizontal stroke length [mm]	400
Area moment of inertia of profile cross section I_x [mm⁴]	94,400
Area moment of inertia of profile cross section I_y [mm⁴]	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

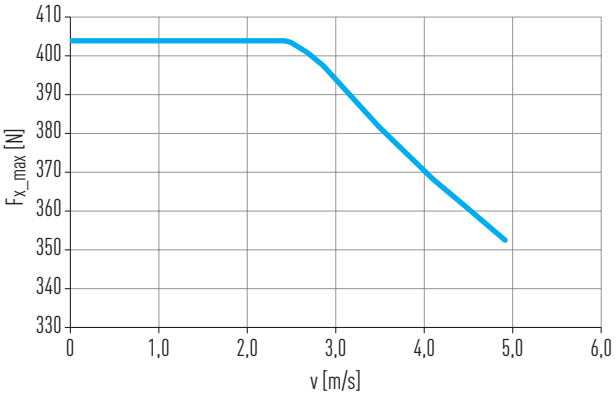


Fig. 13.3 **Max. feed force F_{x_max} depending on axis speed v**

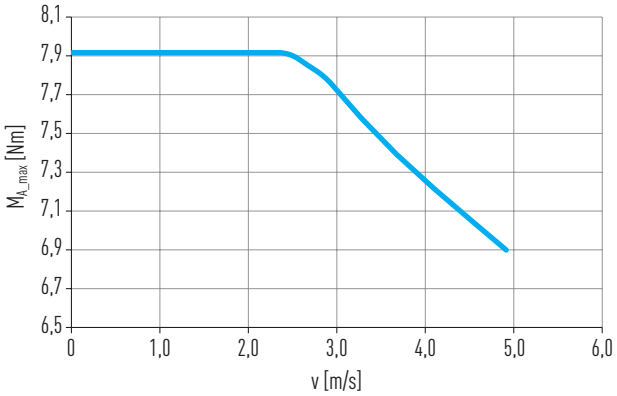
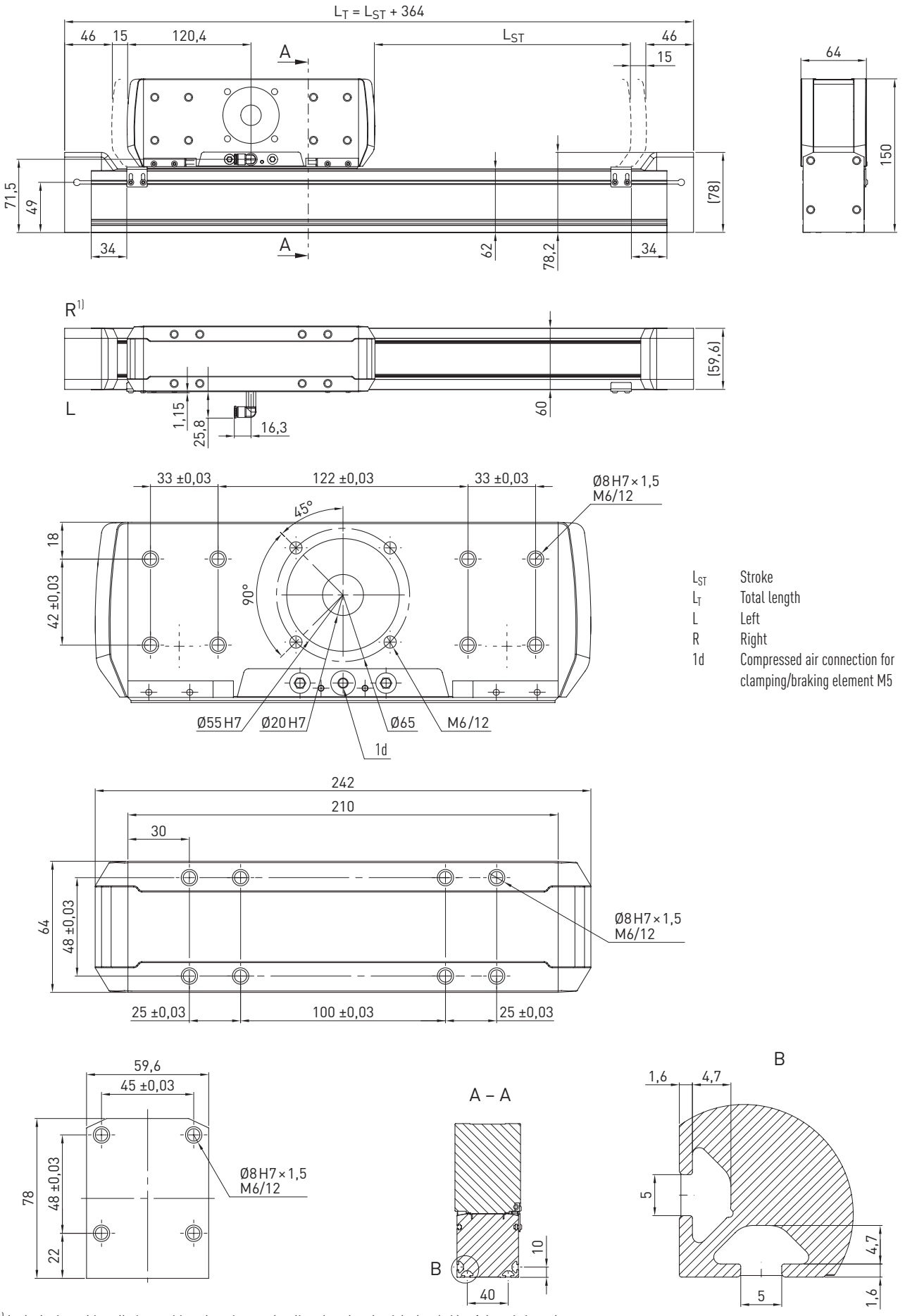


Fig. 13.4 **Max. drive force M_{A_max} depending on axis speed v**

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
$J_{rot.}$ [1] [kgcm²]	0.44
Idle torque at 0-stroke [Nm]	0.20

[1] Rotational moment of inertia

13.5 Dimensions and specifications of HC060B



L_{ST}	Stroke
L_T	Total length
L	Left
R	Right
1d	Compressed air connection for clamping/braking element M5

[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**	
$F_{ydynmax}$ [1] [N]	2,152
$F_{zdynmax}$ [1] [N]	3,378
$M_{xdynmax}$ [Nm]	33
$M_{ydynmax}$ [Nm]	243
$M_{zdynmax}$ [Nm]	155

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

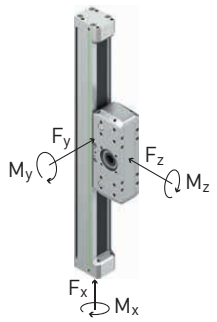


Table 13.12 **General technical data**	
Repeatability [mm]	± 0.05
Max. feed force F_{x_max} [N]	997
Max. speed [m/s]	5
Max. acceleration [m/s²]	30
Max. drive torque M_{A_max} [Nm]	27
Typical load capacity [kg]	16
Maximum vertical stroke length [mm]	800
Maximum horizontal stroke length [mm]	600
Area moment of inertia of profile cross section I_x [mm⁴]	431,271
Area moment of inertia of profile cross section I_y [mm⁴]	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.

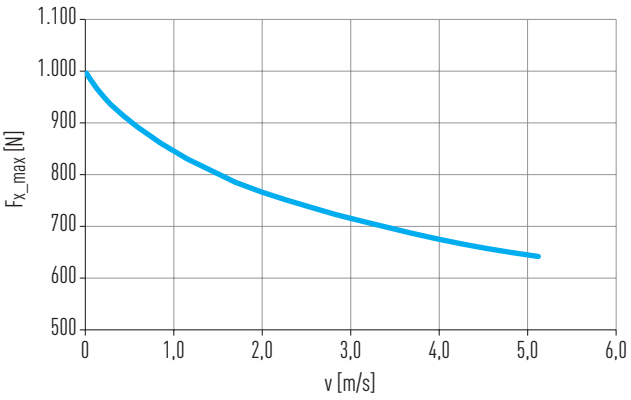


Fig. 13.5 **Max. feed force F_{x_max} depending on axis speed v**

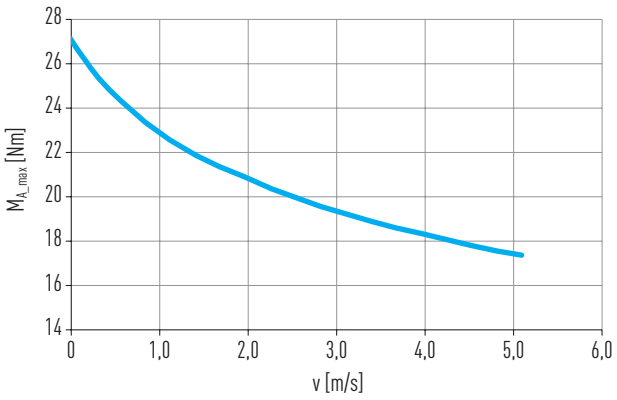
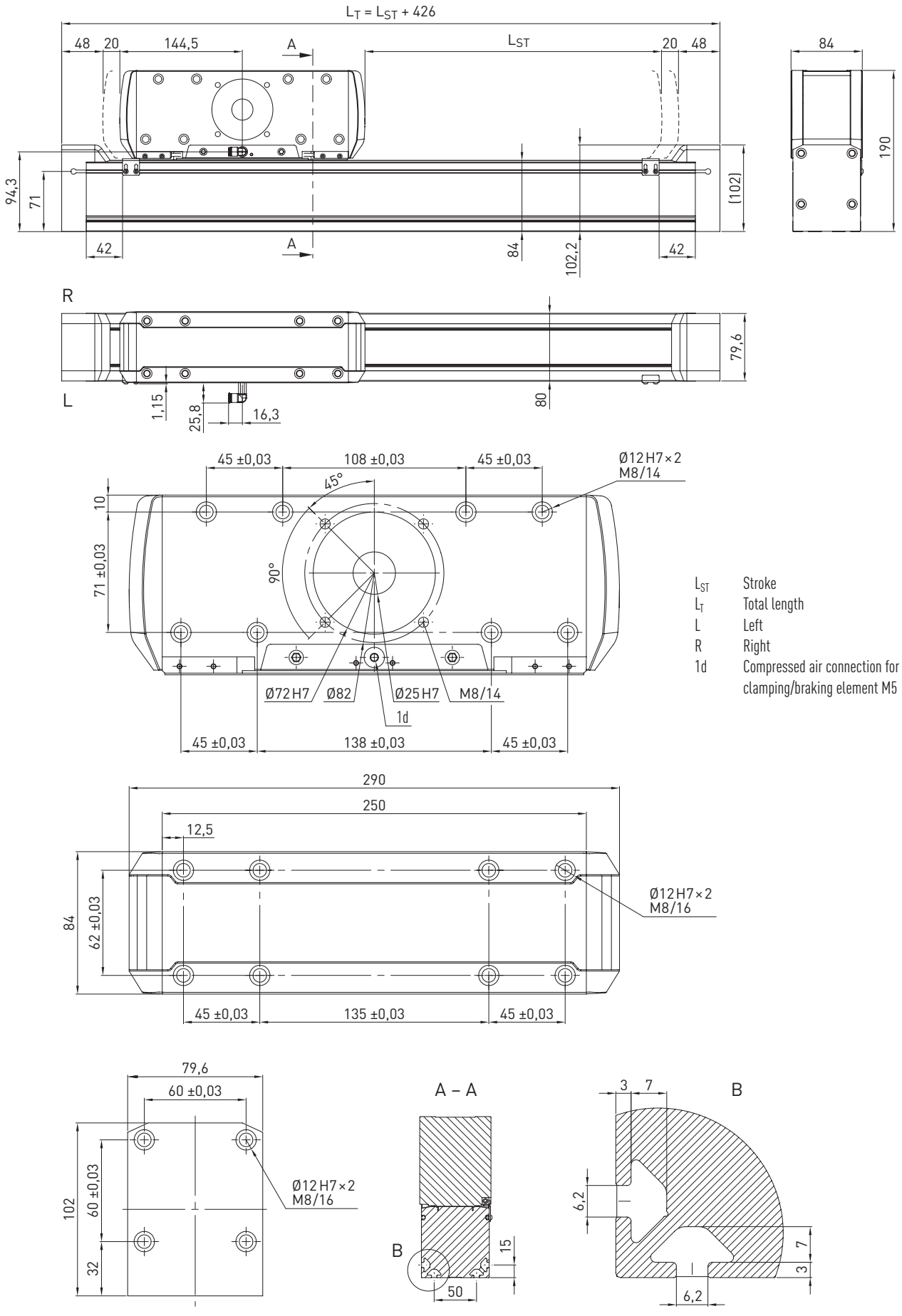


Fig. 13.6 **Max. drive force M_{A_max} depending on axis speed v**

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] [kgcm²]	2.41
Idle torque at 0-stroke [Nm]	0.60

[1] Rotational moment of inertia

13.6 Dimensions and specifications of HC080B



L_{ST}	Stroke
L_T	Total length
L	Left
R	Right
1d	Compressed air connection for clamping/braking element M5

Table 13.17 **Load data**	
$F_{ydynmax}$ [1] [N]	3,855
$F_{zdynmax}$ [1] [N]	5,447
$M_{xdynmax}$ [Nm]	66
$M_{ydynmax}$ [Nm]	444
$M_{zdynmax}$ [Nm]	314

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

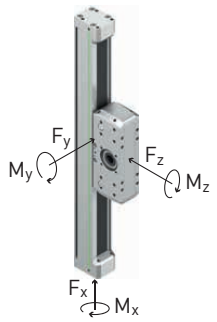


Table 13.18 **General technical data**	
Repeatability [mm]	± 0.05
Max. feed force F_{x_max} [N]	1,330
Max. speed [m/s]	5
Max. acceleration [m/s²]	30
Max. drive torque M_{A_max} [Nm]	42.3
Typical load capacity [kg]	30
Maximum vertical stroke length [mm]	1,200
Maximum horizontal stroke length [mm]	800
Area moment of inertia of profile cross section I_x [mm⁴]	1,394,922
Area moment of inertia of profile cross section I_y [mm⁴]	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.

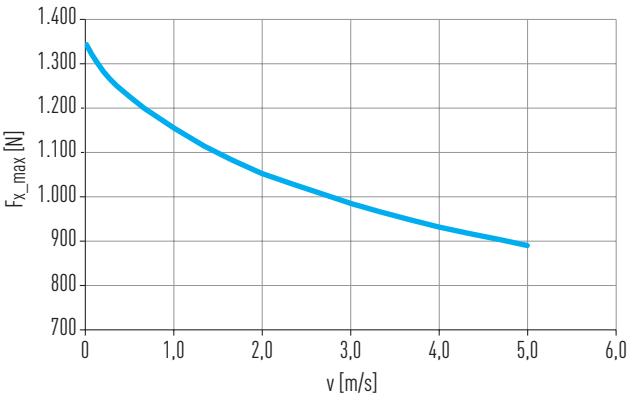


Fig. 13.7 **Max. feed force F_{x_max} as a function of axis speed v**

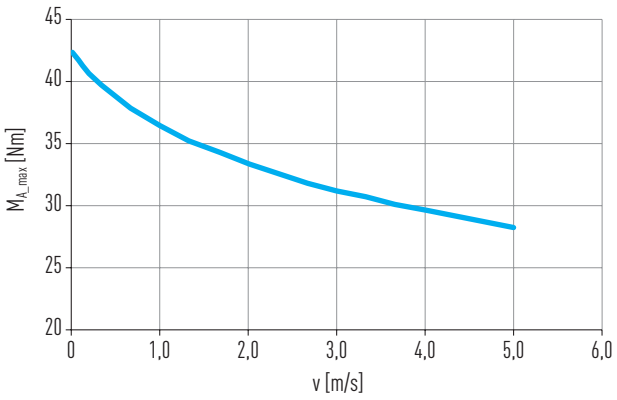
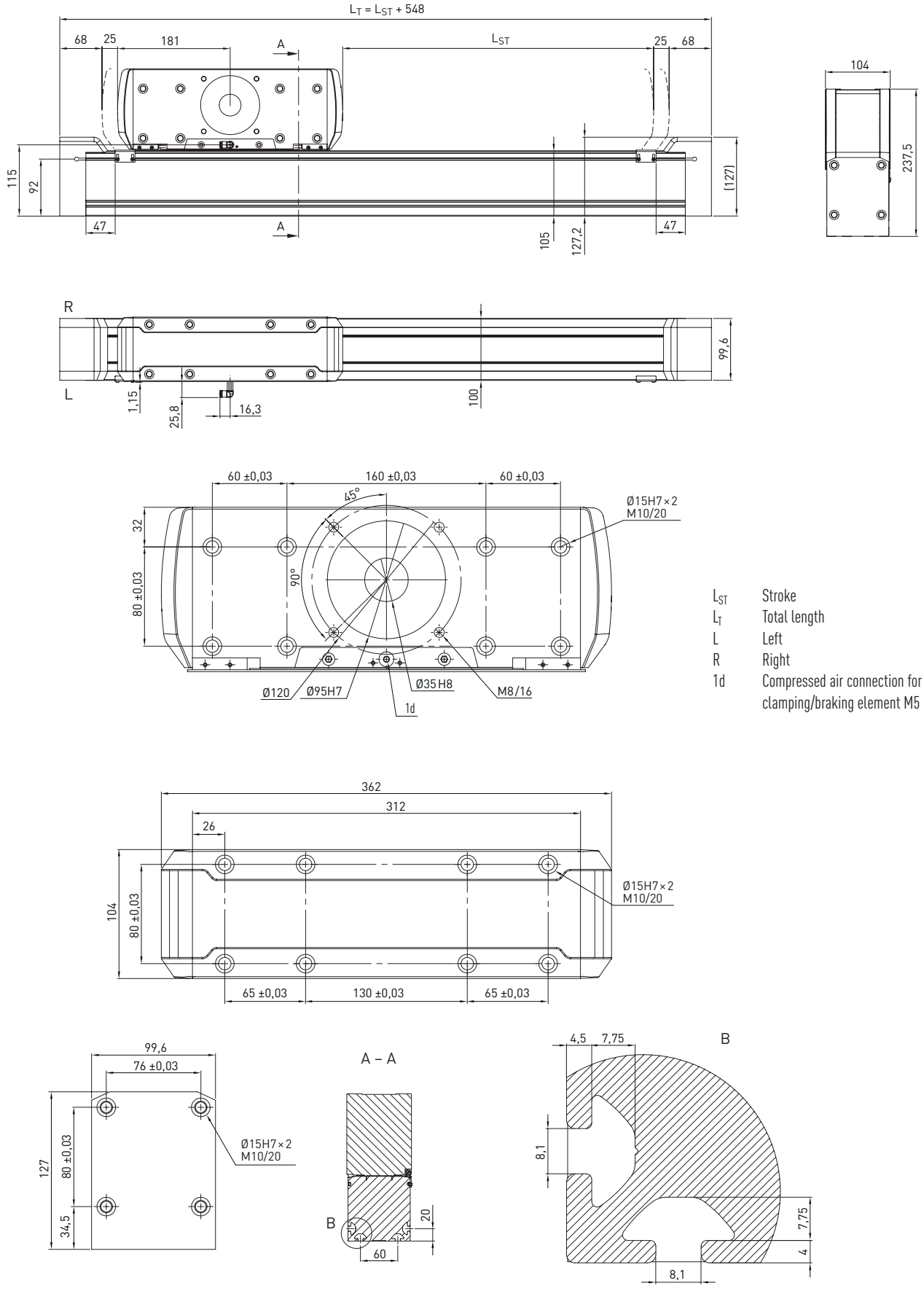


Fig. 13.8 **Max. drive force M_{A_max} as a function of axis speed v**

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] [kgcm²]	5.49
Idle torque at 0-stroke [Nm]	1.40

[1] Rotational moment of inertia

13.7 Dimensions and specifications of HC100B



L_{ST}	Stroke
L_T	Total length
L	Left
R	Right
1d	Compressed air connection for clamping/braking element M5

Table 13.23 **Load data**	
$F_{ydynmax}$ [1] [N]	6,979
$F_{zdynmax}$ [1] [N]	8,034
$M_{xdynmax}$ [Nm]	110
$M_{ydynmax}$ [Nm]	844
$M_{zdynmax}$ [Nm]	733

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

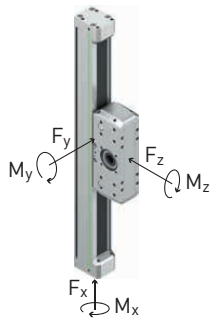


Table 13.24 **General technical data**	
Repeatability [mm]	± 0.05
Max. feed force F_{x_max} [N]	2,667
Max. speed [m/s]	5
Max. acceleration [m/s²]	30
Max. drive torque M_{A_max} [Nm]	118.8
Typical load capacity [kg]	60
Maximum vertical stroke length [mm]	1,800
Maximum horizontal stroke length [mm]	1,200
Area moment of inertia of profile cross section I_x [mm⁴]	3,290,845
Area moment of inertia of profile cross section I_y [mm⁴]	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.

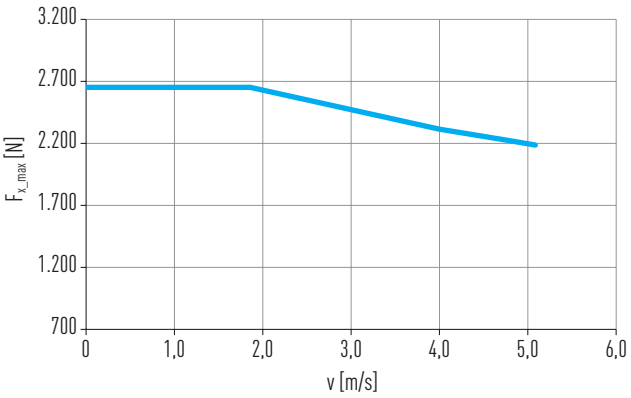


Fig. 13.9 **Max. feed force F_{x_max} depending on axis speed v**

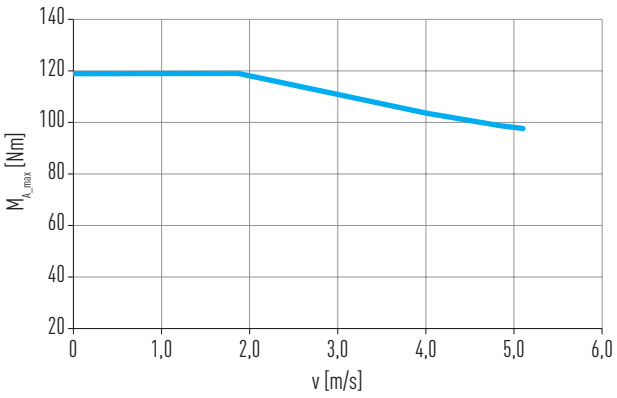
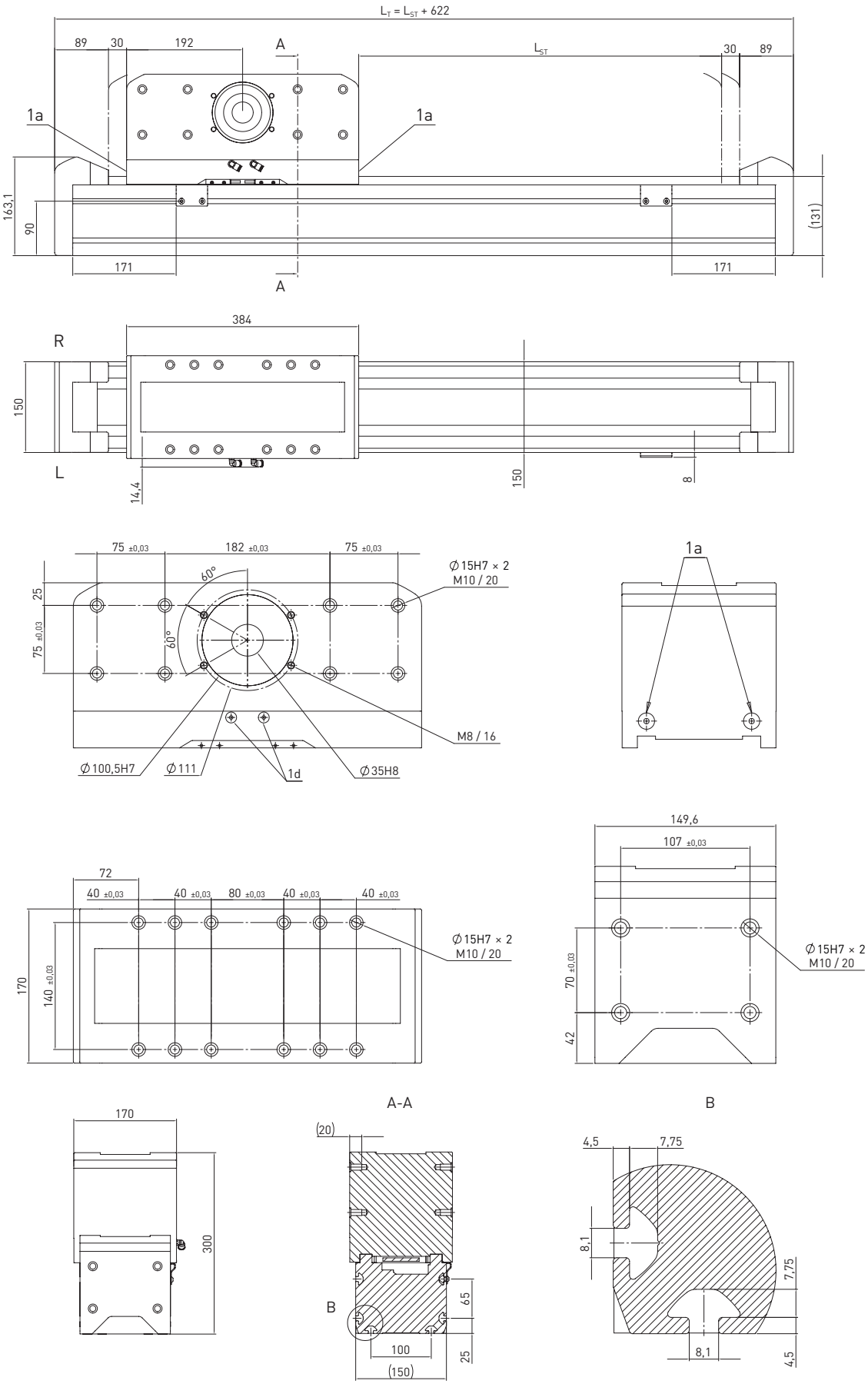


Fig. 13.10 **Max. drive force M_{A_max} depending on axis speed v**

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] [kgcm²]	28.99
Idle torque at 0-stroke [Nm]	3.00

[1] Rotational moment of inertia

13.8 Dimensions and specifications of HC150B



L_{ST}	Stroke	L	Left	1d	Compressed air connection for clamping/braking element M5
L_T	Total length	R	Right		

Table 13.29 **Load data**	
$F_{ydynmax}$ [1] [N]	9,485
$F_{zdynmax}$ [1] [N]	13,789
$M_{xdynmax}$ [Nm]	446.0
$M_{ydynmax}$ [Nm]	1,755
$M_{zdynmax}$ [Nm]	1,207

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

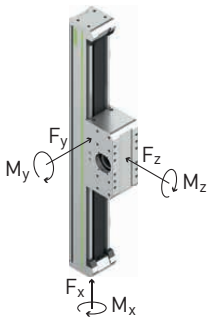


Table 13.30 **General technical data**	
Repeatability [mm]	± 0.05
Max. feed force F_{x_max} [N]	4,000
Max. speed [m/s]	5
Max. acceleration [m/s²]	30
Max. drive torque M_{A_max} [Nm]	183.3
Typical load capacity [kg]	80
Maximum vertical stroke length [mm]	2,000
Maximum horizontal stroke length [mm]	1,400
Area moment of inertia of profile cross section I_x [mm⁴]	7,556,719
Area moment of inertia of profile cross section I_y [mm⁴]	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

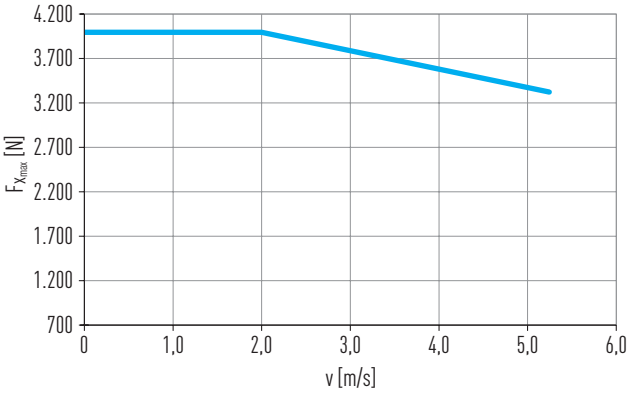


Fig. 13.11 **Max. feed force F_{x_max} depending on axis speed v**

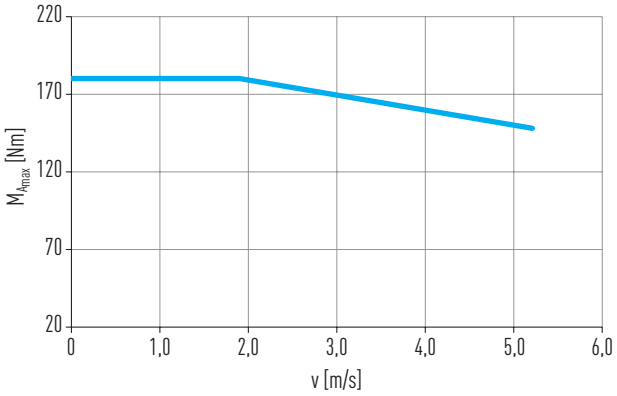


Fig. 13.12 **Max. drive force M_{A_max} depending on axis speed v**

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] [kgcm²]	48.37
Idle torque at 0-stroke [Nm]	5.50

[1] Rotational moment of inertia