

# Linear axes and axis systems HX

Linear tables HT-L

## 9. Linear tables HT-L

### 9.1 Properties of linear tables HT-S with linear motor

The HIWIN linear axes with linear motor are flexible positioning modules with integrated HIWIN double guide. They are especially suitable for precise positioning at high speed and with great dynamics.

Cleanroom-compatible linear motor axes HT-L up to ISO class 4 are available on request.

FUNCTIONAL SAFETY

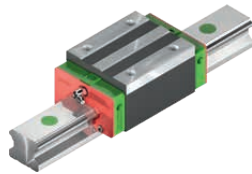
IPA

CLEAN ROOM ISO 4



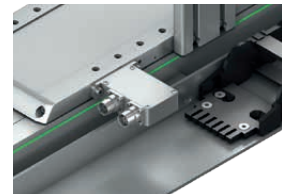
### Linear guideway

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 SynchMotion™ technology with ball chain also ensures good synchronisation and smooth running in the HT150L, HT200L and HT250L sizes.



### 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.



### 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.



### 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

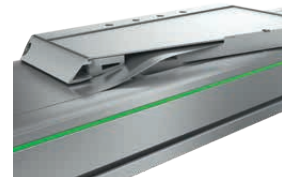
The carriages have additional bore holes on each mounting hole to ensure ideal, reproducible alignment of the adjacent construction. You will find the matching centring sleeves in the accessories on Page 231.

A grease nipple is provided on the carriage for each lubrication point for convenient maintenance of the linear axis.



### Cover strip

The steel cover strip prevents dirt and dust from entering the axis interior. In addition, the cover strip allows the axes to be used in areas with coarse, sharp-edged or hot foreign bodies. The magnetic strips integrated in the axis profile hold the belt securely in position and increase the sealing effect.



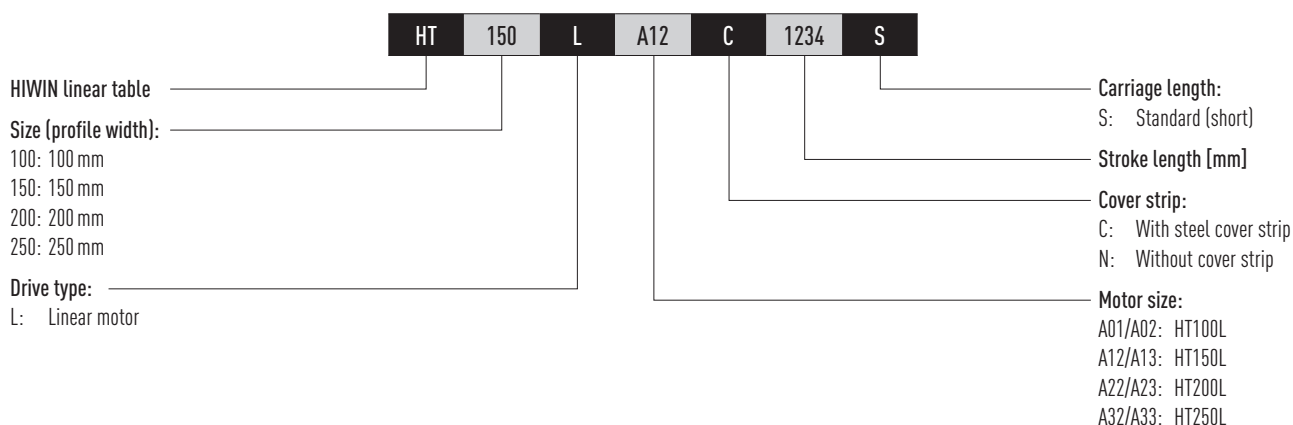
### Positioning measuring systems

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.

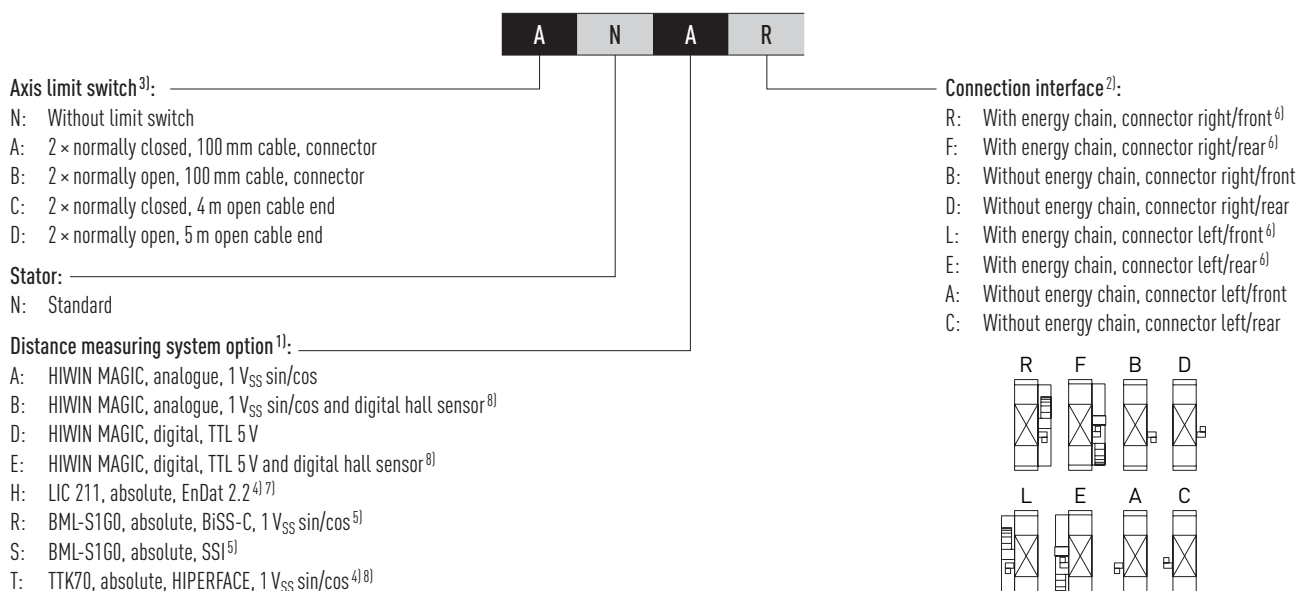
Optionally also with functional safety encoder.



## 9.2 Order code for linear tables HT-L



Continuation, order code for linear tables HT-L



<sup>1)</sup> More detailed information in chapter 21 from page 156 or in the “HIWIN MAGIC Distance Measuring Systems” assembly instructions”.

<sup>2)</sup> Details on connector orientation and position of the energy chain in section 22.4 from page 225.

<sup>3)</sup> Additional reference switches on request.

<sup>4)</sup> Limitations of the maximum stroke possible, see Table 21.1 on page 156.

<sup>5)</sup> The distance measuring system has a safety-related, analogue, incremental real-time signal.

<sup>6)</sup> Max. possible stroke: 5,000 mm.

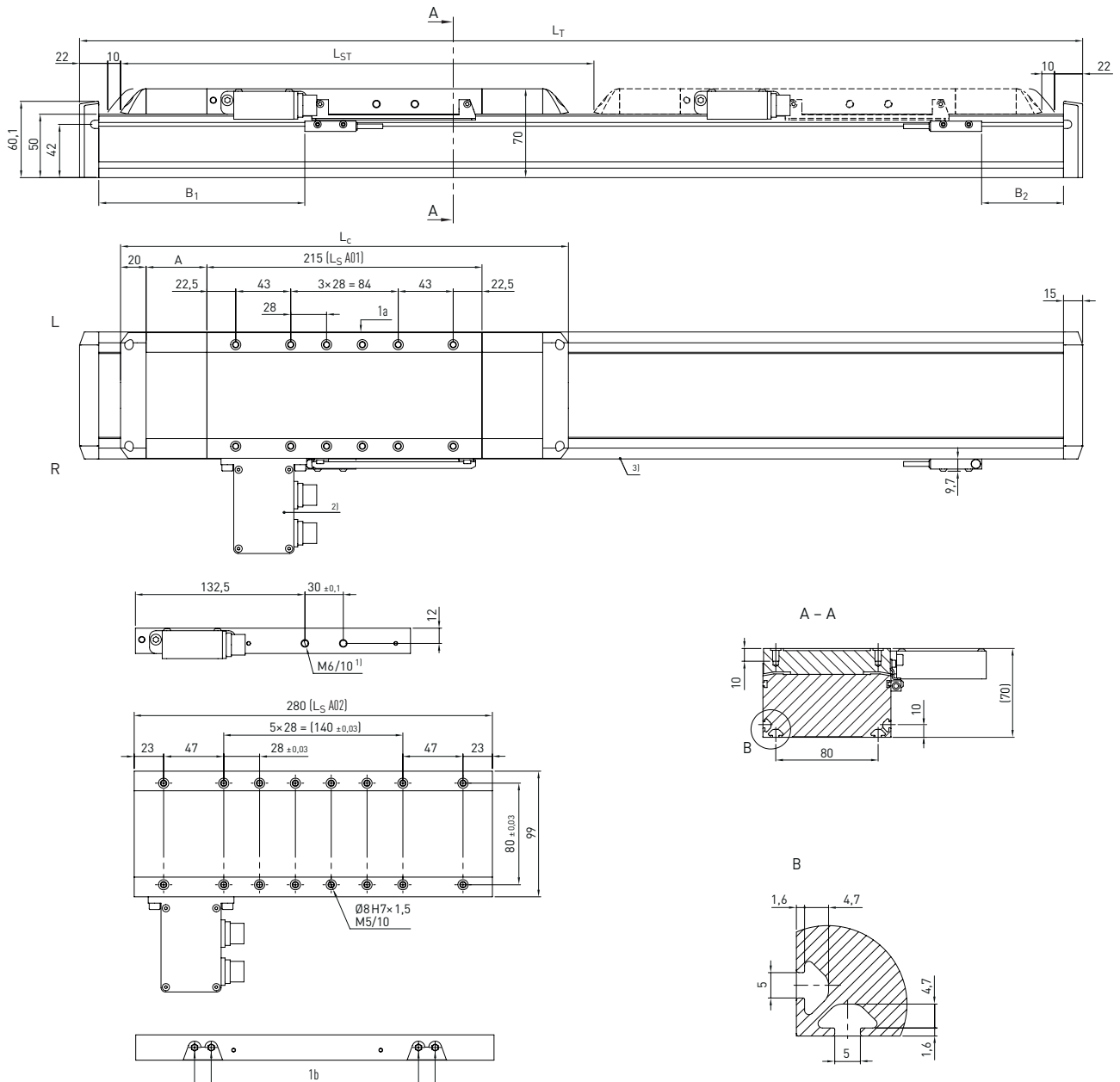
<sup>7)</sup> If the installation position is horizontal, the axis must be arranged so that the distance measuring system is at the top.

<sup>8)</sup> Option not available for HT100L.

# Linear axes and axis systems HX

Linear tables HT-L

## 9.3 Dimensions and specifications of HT100L



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

<sup>1)</sup> Omitted for variant with energy chain <sup>2)</sup> Drive interface shown: Option "D"; for other series, see section 22.4 from page 225

<sup>3)</sup> 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

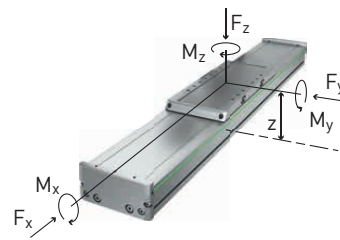
	Variant without cover		Variant with cover	
	A01	A02	A01	A02
<b>Motor size</b>	A01	A02	A01	A02
<b>Total carriage length <math>L_C</math> [mm]</b>	255	320	350	415
<b>Cover strip deflection <math>A</math> [mm]</b>	—	—	47.5	47.5
<b>Switch distance <math>B_1</math> [mm]</b>	113.5	113.5	161	161
<b>Switch distance <math>B_2</math> [mm]</b>	36.5	101.5	84	149
<b>Max. stroke length <math>L_{ST}</math> [mm]</b>	5,511	5,446	5,416	5,351
<b>Total length <math>L_T</math> [mm]</b>	$L_T = L_{ST} + 319$	$L_T = L_{ST} + 384$	$L_T = L_{ST} + 414$	$L_T = L_{ST} + 479$

	Motor size A01	Motor size A02
$F_{y\text{dynmax}}^{1)}$ [N]	1,101	860
$F_{z\text{dynmax}}^{1)}$ [N]	1,101	860
$M_{x\text{dynmax}}$ [Nm]	35	27
$M_{y\text{dynmax}}$ [Nm]	96	103
$M_{z\text{dynmax}}$ [Nm]	96	103
$z^{2)}$ [mm]	53.5	53.5

<sup>1)</sup> Force must only act free of torque

<sup>2)</sup> Carriage upper edge – centre guide

See section 3.3.2 on page 17 (lifetime reference value)



Repeatability <sup>2)</sup> [mm]	± 0.005
Max. speed [m/s]	5
Typical load capacity [kg]	20
Maximum total length <sup>2)3)</sup> [mm]	5,830
Flatness <sup>1)</sup> [mm/300 mm]	± 0.03
Straightness <sup>1)</sup> [mm/300 mm]	± 0.03
Area moment of inertia of profile cross section $I_x$ [mm <sup>4</sup> ]	282,903
Area moment of inertia of profile cross section $I_y$ [mm <sup>4</sup> ]	1,541,419

<sup>1)</sup> Values apply with specified screw-on surface or mounting plate

<sup>2)</sup> Depending on distance measuring system (chapter 21) and energy chain (section 22.4)

<sup>3)</sup> Long axes on request

Guide type	MGN09H
Static load rating $C_0$ [N]	4,020
Dynamic load rating $C_{\text{dyn}}$ [N]	2,550

	Motor size A01	Motor size A02
Motor type	LMSA01	LMSA02
Continuous force [N]	52	104
Peak force [N]	112	224
Max. acceleration [m/s <sup>2</sup> ]	50	50

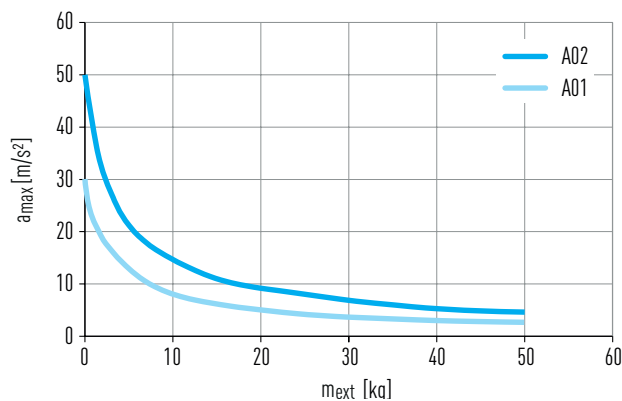


Fig. 9.1 Max. acceleration  $a_{\text{max}}$  as a function of the external payload  $m_{\text{ext}}$

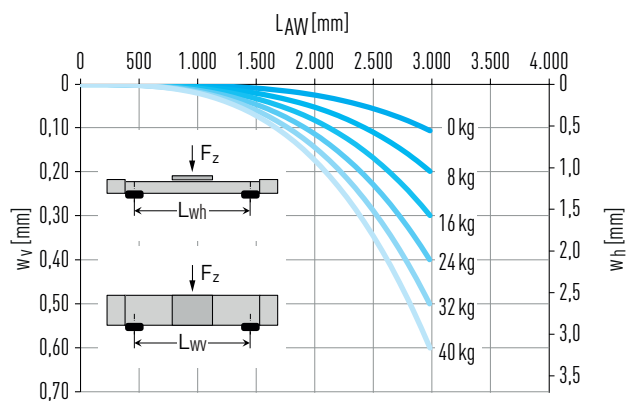


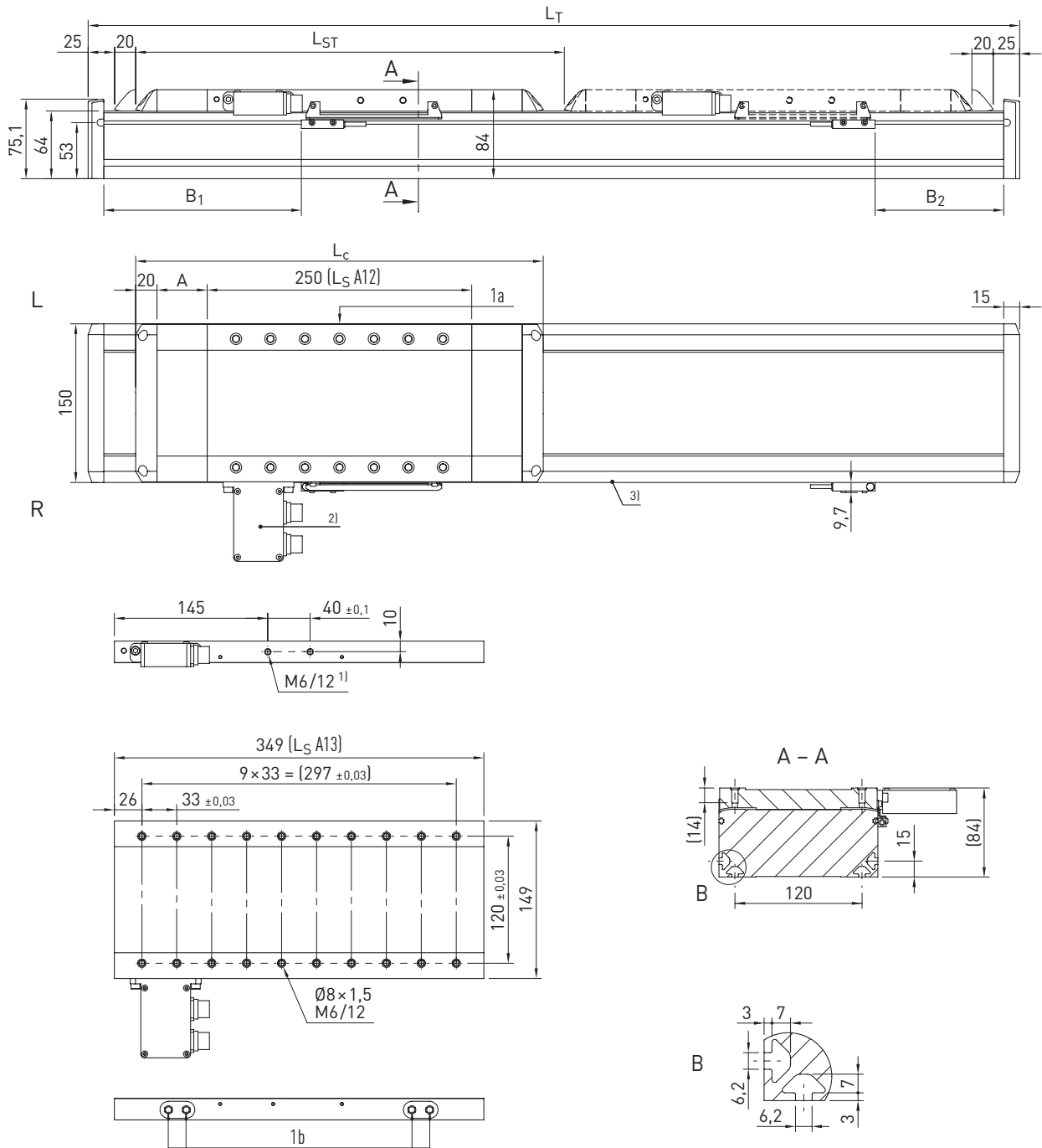
Fig. 9.2 Deflection  $w$  over unsupported axis length  $L_{\text{AW}}$  under load capacity  $F_z$

	Variant without cover		Variant with cover	
	Motor size A01	Motor size A02	Motor size A01	Motor size A02
Mass of the carriage [kg]	1.97	2.78	2.26	3.06
Mass at 0-stroke [kg]	4.15	5.42	5.02	6.30
Mass per 1 m stroke [kg/m]	6.45		6.61	
Breakaway force $F_l$ [N]	2.00		3.00	

# Linear axes and axis systems HX

Linear tables HT-L

## 9.4 Dimensions and specifications of HT150L



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

<sup>1)</sup> Does not apply to version with energy chain <sup>2)</sup> Drive interface shown: Option "D"; for other versions, see section 22.4 from page 225

<sup>3)</sup> 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

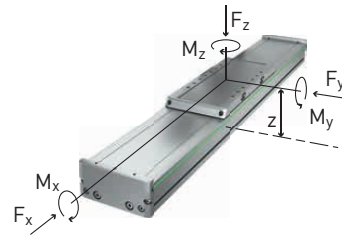
	Variant without cover		Variant with cover	
	A12	A13	A12	A13
<b>Motor size</b>				
<b>Total carriage length <math>L_C</math> [mm]</b>	290	389	385	484
<b>Cover strip deflection <math>A</math> [mm]</b>	—	—	48	48
<b>Switch distance <math>B_1</math> [mm]</b>	138	138	185.5	185.5
<b>Switch distance <math>B_2</math> [mm]</b>	73	172	121	220
<b>Max. stroke length <math>L_{ST}</math> [mm]</b>	5,450	5,351	5,355	5,256
<b>Total length <math>L_T</math> [mm]</b>	$L_T = L_{ST} + 380$	$L_T = L_{ST} + 479$	$L_T = L_{ST} + 475$	$L_T = L_{ST} + 574$

	Motor size A12	Motor size A13
$F_{y\text{dynmax}}^{1)}$ [N]	3,350	3,350
$F_{z\text{dynmax}}^{1)}$ [N]	4,270	3,789
$M_{x\text{dynmax}}$ [Nm]	201	178
$M_{y\text{dynmax}}$ [Nm]	414	555
$M_{z\text{dynmax}}$ [Nm]	325	491
$z^{2)}$ [mm]	51.5	51.5

<sup>1)</sup> Force must only act free of torque

<sup>2)</sup> Carriage upper edge – centre guide

See section 3.3.2 on page 17 (lifetime reference value)



Repeatability <sup>2)</sup> [mm]	± 0.005
Max. speed [m/s]	5
Typical load capacity [kg]	80
Maximum total length <sup>2)3)</sup> [mm]	5,830
Flatness <sup>1)</sup> [mm/300 mm]	± 0.03
Straightness <sup>1)</sup> [mm/300 mm]	± 0.03
Area moment of inertia of profile cross section $I_x$ [mm <sup>4</sup> ]	907,754
Area moment of inertia of profile cross section $I_y$ [mm <sup>4</sup> ]	7,417,610

<sup>1)</sup> Values apply with correspondingly specified screw-on surface or mounting plate

<sup>2)</sup> Depending on distance measuring system (chapter 21) and energy chain (section 22.4)

<sup>3)</sup> Long axes on request

Guide type	QEH15CA
Static load rating $C_0$ [N]	15,280
Dynamic load rating $C_{\text{dyn}}$ [N]	12,530

	Motor size A12	Motor size A13
Motor type	LMSA12	LMSA13
Continuous force [N]	205	308
Peak force [N]	579	868
Max. acceleration [m/s <sup>2</sup> ]	60	80

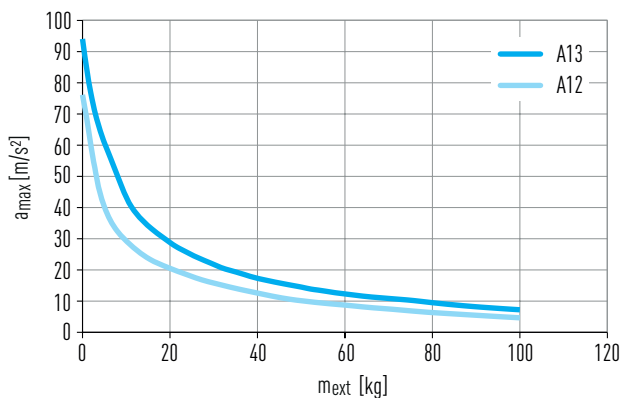


Fig. 9.3 Max. acceleration  $a_{\text{max}}$  as a function of the external payload  $m_{\text{ext}}$

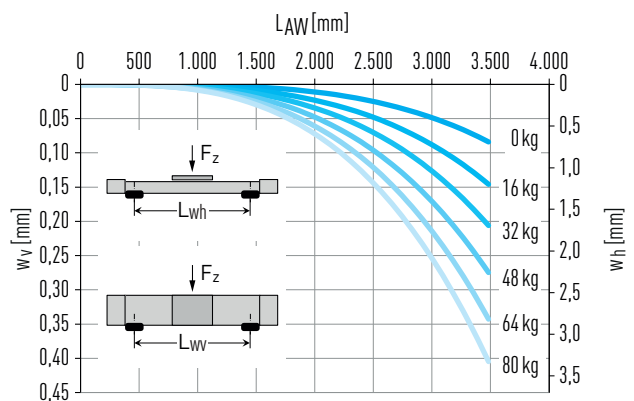


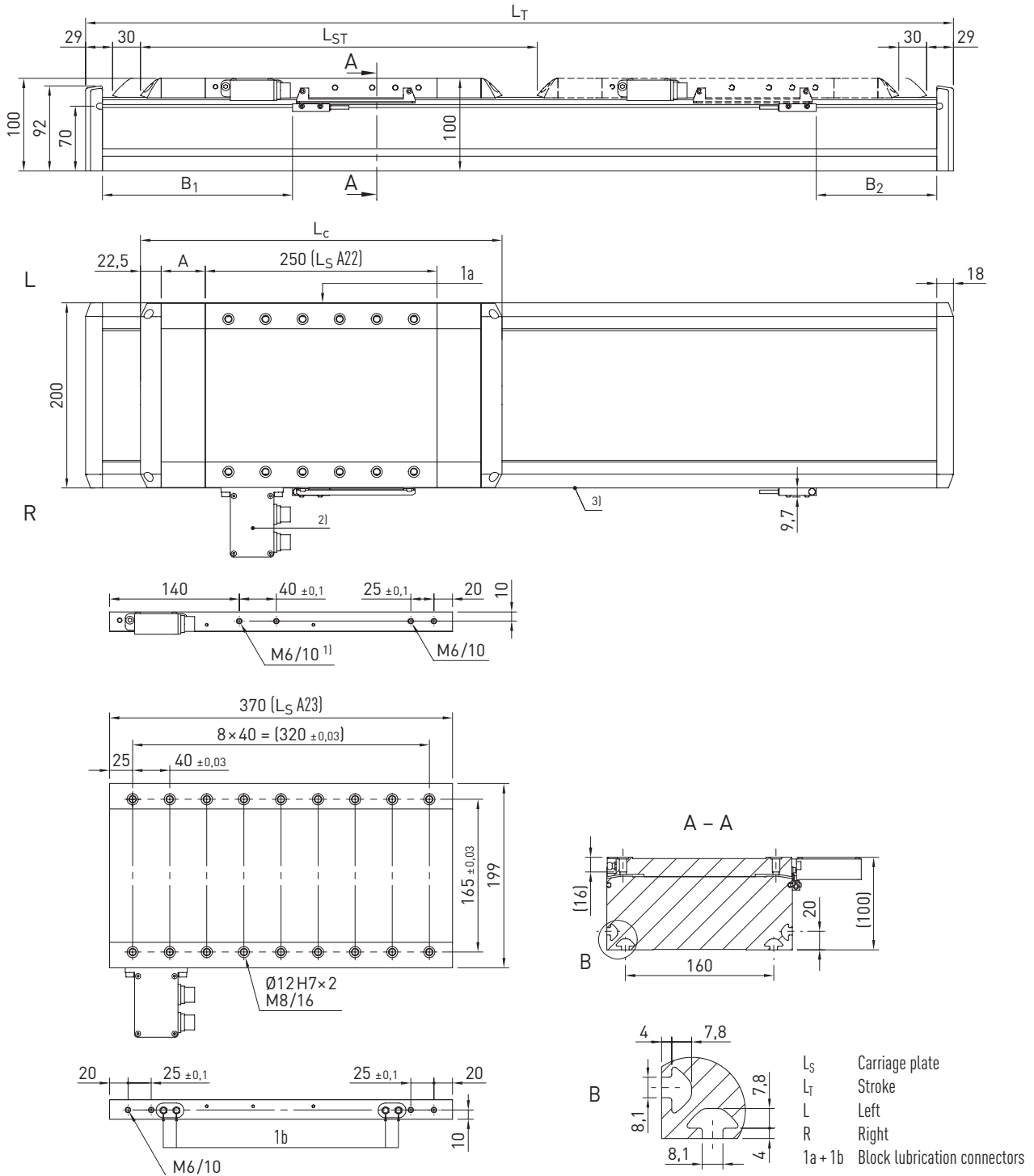
Fig. 9.4 Deflection  $w$  over unsupported axis length  $L_{\text{AW}}$  under load capacity  $F_z$

	Variant without cover		Variant with cover	
	Motor size A12	Motor size A13	Motor size A12	Motor size A13
Mass of the carriage [kg]	4.33	5.97	4.80	6.45
Mass at 0-stroke [kg]	9.80	12.77	11.56	14.57
Mass per 1 m stroke [kg/m]	13.31		13.59	
Breakaway force $F_l$ [N]	3.00		4.00	

# Linear axes and axis systems HX

Linear tables HT-L

## 9.5 Dimensions and specifications of HT200L



<sup>1)</sup> Omitted for variant with energy chain <sup>2)</sup> Drive interface shown: Option "D"; for other series, see section 22.4 from page 225

<sup>3)</sup> 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

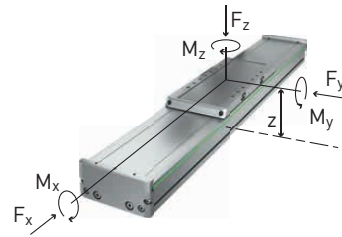
	Variant without cover		Variant with cover	
	A22	A23	A22	A23
Motor size	A22	A23	A22	A23
Total carriage length $L_C$ [mm]	295	415	390	510
Cover strip deflection $A$ [mm]	—	—	48	48
Switch distance $B_1$ [mm]	156.5	156.5	204	204
Switch distance $B_2$ [mm]	82	202	129	249
Max. stroke length $L_{ST}$ [mm]	5,423	5,303	5,328	5,208
Total length $L_T$ [mm]	$L_T = L_{ST} + 413$	$L_T = L_{ST} + 533$	$L_T = L_{ST} + 508$	$L_T = L_{ST} + 628$

	Motor size A22	Motor size A23
$F_{y\text{dynmax}}^{1)}$ [N]	7,800	7,800
$F_{z\text{dynmax}}^{1)}$ [N]	10,602	9,640
$M_{x\text{dynmax}}$ [Nm]	721	656
$M_{y\text{dynmax}}$ [Nm]	1,007	1,494
$M_{z\text{dynmax}}$ [Nm]	741	1,209
$z^{2)}$ [mm]	58.5	58.5

<sup>1)</sup> Force must only act free of torque

<sup>2)</sup> Carriage upper edge – centre guide

See section 3.3.2 on page 17 (lifetime reference value)



Repeatability [mm] <sup>2)</sup>	± 0.005
Max. speed [m/s]	5
Typical load capacity [kg]	150
Maximum total length <sup>2) 3)</sup> [mm]	5,836
Flatness <sup>1)</sup> [mm/300 mm]	± 0.03
Straightness <sup>1)</sup> [mm/300 mm]	± 0.03
Area moment of inertia of profile cross section $I_x$ [mm <sup>4</sup> ]	2,071,928
Area moment of inertia of profile cross section $I_y$ [mm <sup>4</sup> ]	19,658,810

<sup>1)</sup> Values apply with specified screw-on surface or mounting plate

<sup>2)</sup> Depending on distance measuring system (chapter 21) and energy chain (section 22.4)

<sup>3)</sup> Long axes on request

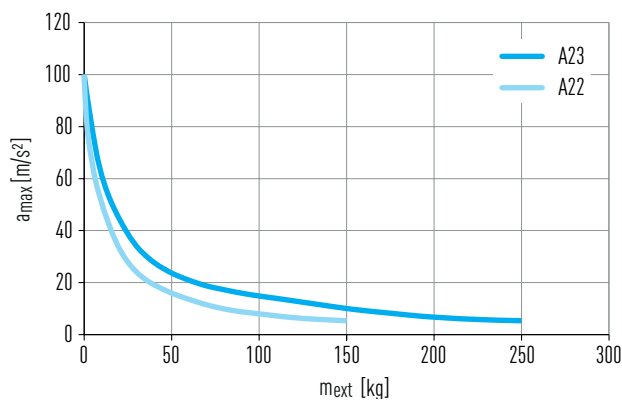


Fig. 9.5 Max. acceleration  $a_{\text{max}}$  as a function of the external payload  $m_{\text{ext}}$

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

	Motor size A22	Motor size A23
Motor type	LMSA22	LMSA23
Continuous force [N]	362	544
Peak force [N]	1,023	1,535
Max. acceleration [m/s <sup>2</sup> ]	60	80

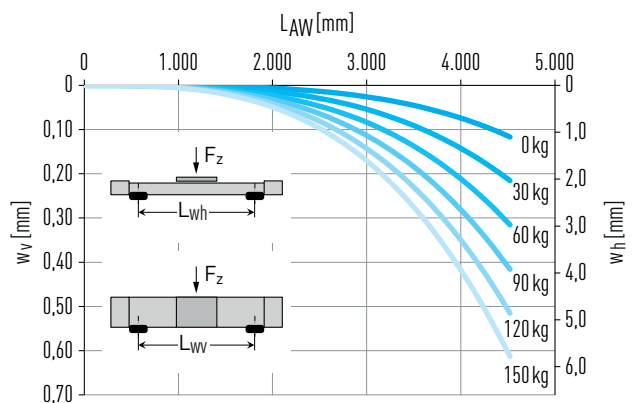


Fig. 9.6 Deflection  $w$  over unsupported axis length  $L_{\text{AW}}$  under load capacity  $F_z$

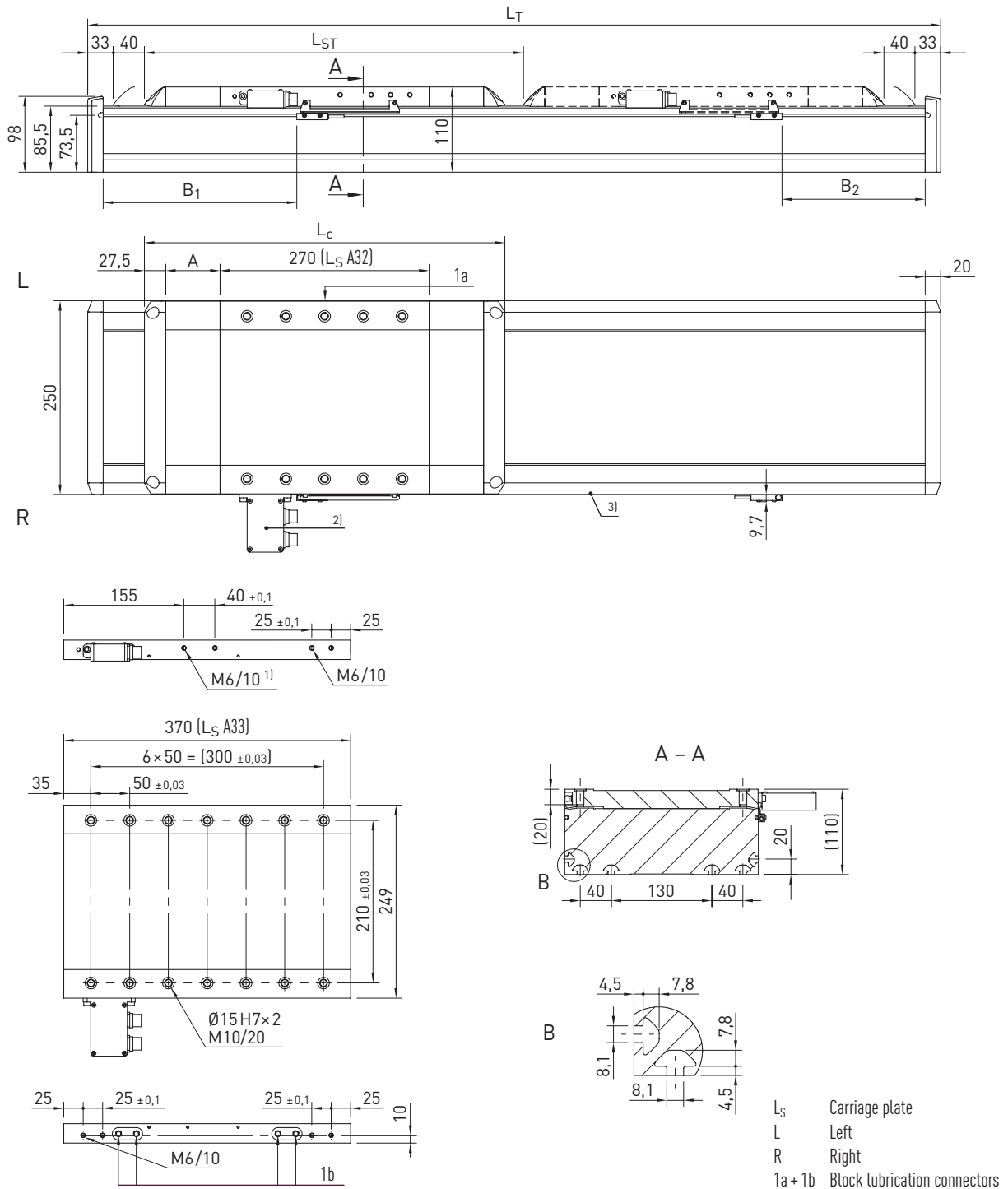
	Variant without cover		Variant with cover	
	Motor size A22	Motor size A23	Motor size A22	Motor size A23
Mass of the carriage [kg]	6.80	9.64	7.39	10.24
Mass at 0-stroke [kg]	16.33	21.71	18.85	24.28
Mass per 1 m stroke [kg/m]	21.49		21.81	
Breakaway force $F_l$ [N]	5.00		7.00	



# Linear axes and axis systems HX

Linear tables HT-L

## 9.6 Dimensions and specifications of HT250L



<sup>1)</sup> Omitted for variant with energy chain <sup>2)</sup> Drive interface shown: Option "D"; for other series, see section 22.4 from page 225

<sup>3)</sup> 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 9.19 HT250L dimensions

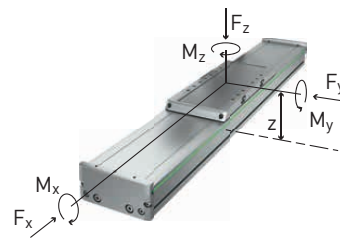
	Variant without cover		Variant with cover	
	A32	A33	A32	A33
Motor size	A32	A33	A32	A33
Total carriage length $L_c$ [mm]	325	425	465	565
Cover strip deflection $A$ [mm]	—	—	70	70
Switch distance $B_1$ [mm]	178.5	178.5	248.5	248.5
Switch distance $B_2$ [mm]	114	214	184	284
Max. stroke length $L_{ST}$ [mm]	5,469	5,369	5,329	5,229
Total length $L_T$ [mm]	$L_T = L_{ST} + 471$	$L_T = L_{ST} + 571$	$L_T = L_{ST} + 611$	$L_T = L_{ST} + 711$

	Motor size A32	Motor size A33
$F_{y\text{dynmax}}^{1)}$ [N]	11,600	11,600
$F_{z\text{dynmax}}^{1)}$ [N]	14,160	13,165
$M_{x\text{dynmax}}$ [Nm]	1,249	1,126
$M_{y\text{dynmax}}$ [Nm]	1,424	1,942
$M_{z\text{dynmax}}$ [Nm]	1,131	1,711
$z^{2)}$ [mm]	68.0	68.0

<sup>1)</sup> Force must only act free of torque

<sup>2)</sup> Carriage upper edge – centre guide

See section 3.3.2 on page 17 (lifetime reference value)



Repeatability <sup>2)</sup> [mm]	± 0.005
Max. speed [m/s]	5
Typical load capacity [kg]	250
Maximum total length <sup>2)3)</sup> [mm]	5,940
Flatness <sup>1)</sup> [mm/300 mm]	± 0.03
Straightness <sup>1)</sup> [mm/300 mm]	± 0.03
Area moment of inertia of profile cross section $I_x$ [mm <sup>4</sup> ]	3,265,771
Area moment of inertia of profile cross section $I_y$ [mm <sup>4</sup> ]	39,262,043

<sup>1)</sup> Values apply with correspondingly specified screw-on surface or mounting plate

<sup>2)</sup> Depending on distance measuring system (chapter 21) and energy chain (section 22.4)

<sup>3)</sup> Long axes on request

Guide type	QHH25CA
Static load rating $C_0$ [N]	48,750
Dynamic load rating $C_{\text{dyn}}$ [N]	41,900

	Motor size A32	Motor size A33
Motor type	LMSA32	LMSA33
Continuous force [N]	583	875
Peak force [N]	1,646	2,469
Max. acceleration [m/s <sup>2</sup> ]	60	80

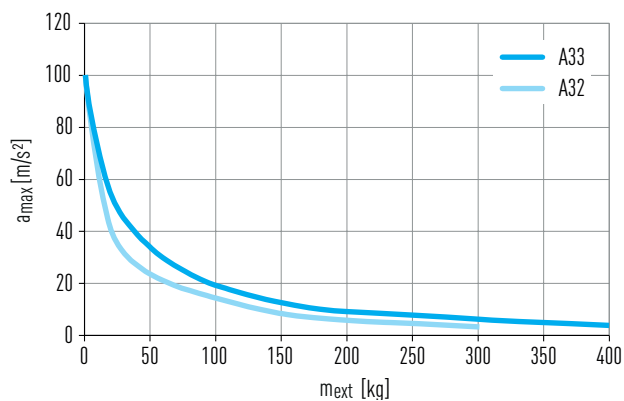


Fig. 9.7 Max. acceleration  $a_{\text{max}}$  as a function of the external payload  $m_{\text{ext}}$

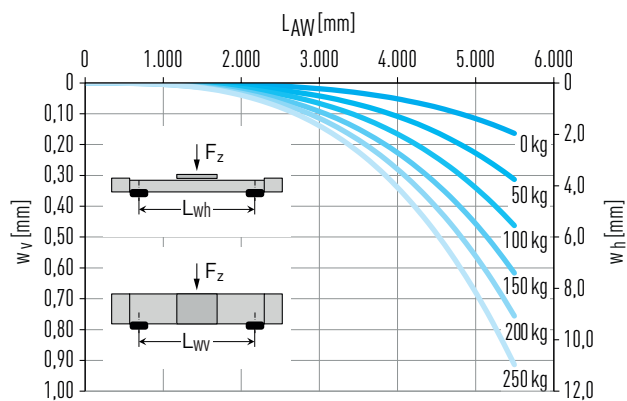


Fig. 9.8 Deflection  $w$  over unsupported axis length  $L_{\text{AW}}$  under load capacity  $F_z$

	Variant without cover		Variant with cover	
	Motor size A32	Motor size A33	Motor size A32	Motor size A33
Mass of the carriage [kg]	11.58	15.77	12.98	17.17
Mass at 0-stroke [kg]	26.35	33.57	31.58	38.85
Mass per 1 m stroke [kg/m]	30.15		30.54	
Breakaway force $F_l$ [N]	8.00		10.00	