Linear system **LLN 60, 80**

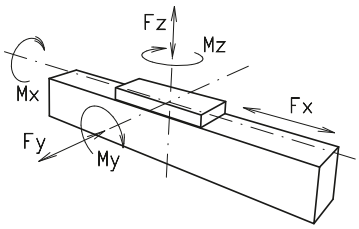
BELT DRIVE

- LOW OPERATING VOLUME
- INDEPENDENT INSTALLATION POSITION
- NUBBED BELT
- LOW-VIBRATION RUN

Function:
The guide body consists of an aluminium square profile, with an integrated roller guide. The carriage is moved by a revolving interior nobbed belt. The advantage of this system: The belt is guided within the profile, so that the system is independent of the mounting position. The nobbed belt is self-tracking and has a very low operating noise level thanks to its nobs being offset by 45°. Furthermore, it is almost vibration-free in the transition sections. At the front face there is a timing belt deflection unit containing a toothed pulley with two coupling claws in the standard version. On the opposite side there is a bearing piece plate containing a tensioning device for the timing belt.

Mounting position: Variable, max. one-piece-length: 6.000 mm.
Carriage connection: By threaded holes.
Fixation: By T-slots and mounting sets. The linear axis can be combined with any T-slot profile.
Timing belt: N10 with reinforcing steel mesh, no backlash when changing direction, repeatability ± 0.1 mm.
Carriage support: The carriage runs on 5 rollers which can be adjusted and serviced at each central servicing position. Two grease nipples at the carriage enable relubrication of the positioning system.

Forces and torques



Size	60		80	
Forces/Torques	static	dynamic	static	dynamic
F_x (N)	1073	960	1900	1800
F_y (N)	780	650	1900	1500
F_z (N)	1170	845	2100	1700
M_x (Nm)	20	13	85	60
M_y (Nm)	78	65	140	110
M_z (Nm)	52	39	110	90
All forces and torques related to the following: existing values / table values: $\frac{Fy}{Fy_{dyn}} + \frac{Fz}{Fz_{dyn}} + \frac{Mx}{Mx_{dyn}} + \frac{My}{My_{dyn}} + \frac{Mz}{Mz_{dyn}} \leq 1$				
No-load torque				
Nm	0,6		0,8	
Speed				
(m/s) max	6		10	
Geometrical moments of inertia of aluminium profile				
I_x mm^4	4,47x10^5		15,83x10^5	
I_y mm^4	5,59x10^5		20,68x10^5	
Elastic modulus N/mm^2	70000		70000	

For life-time calculation of rollers use our homepage.

Driving torque:

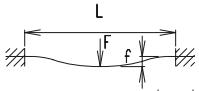
$$M_a = \frac{F * P * S_i}{2000 * \pi} + M_n$$

$$P_a = \frac{M_a * n}{9550}$$

F	= force	(N)
P	= pulley action perimeter	(mm)
Si	= safety factor 1,2 … 2	
M_n	= no-load torque	(Nm)
n	= rpm pulley	(min^{-1})
M_a	= driving torque	(Nm)
P_a	= motor power	(KW)

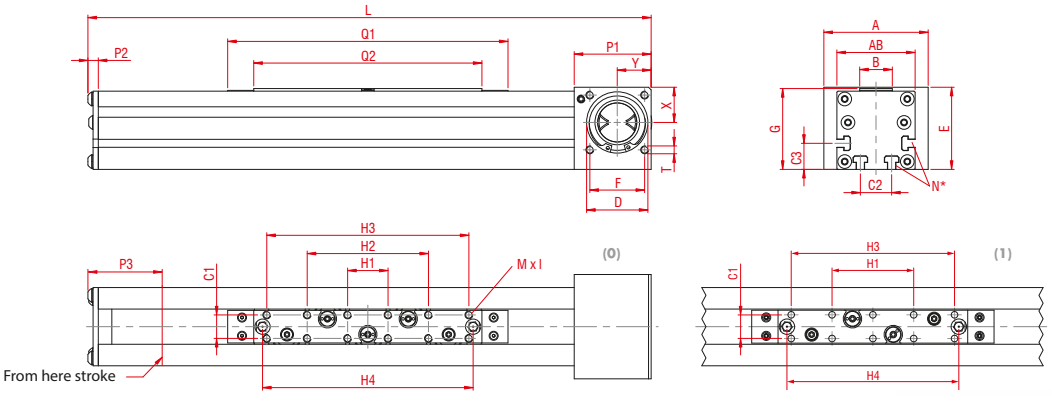
Deflection:

$$f = \frac{F * L^3}{E * I * 192}$$

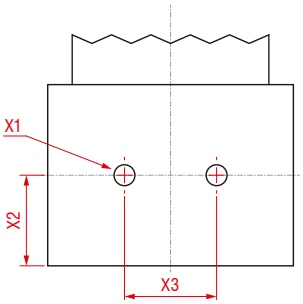


f = deflection	(mm)
F = load	(N)
L = free length	(mm)
E = elastic modulus 70000	(N/mm^2)
I = second moment of area	(mm^4)

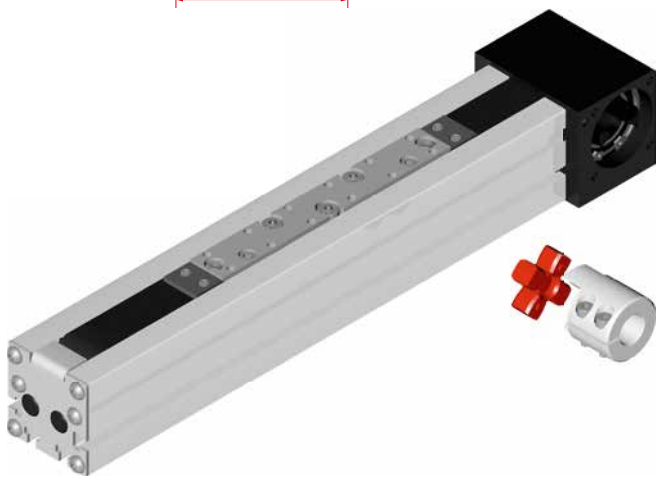
Linear system **LLN 60, 80**



pulley-block



Size	X1	X2	X3
LL 60	M8	29,5	30
LL 80	M10	47,5	40



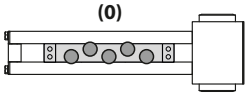
*For slide nuts refer to chapter 2.2 page 2

Size ❒	Basic length L	A	AB ❒	B	C1	C2	C3	D -0,05	E	F	G	M	N for	P1	P2	P3	T	X	Y	Basic weight	Weight per 100 mm
LLN 60	330	80	60	25	18	24	20	47	63	42	62,5	M6x6	M5	59	6	55	M6	27	26	2,75 kg	0,41 kg
LLN 80	495	100	80	25	18	30	22	68	93	60	83	M6x10	M6	90	9	84	M8	45	40	8,45 kg	0,90 kg

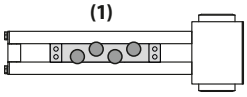
0 **Choice of guide body profile:**
(0) Standard **(2)** corrosion-protected guide rods and screws
(4) expanded corrosion-protected version (depending on the availability of components)

0 **Choice of carriages:**

(0)



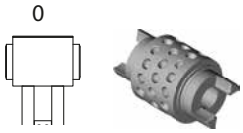
(1)



Carriage	L	Q1	Q2	H1	H2	H3	H4
LL 60 Vers. (0)	330	215	171	31	93	155	161,5
LL 60 Vers. (1)	299	184	140	62	---	124	130,5
LL 80 Vers. (0)	495	320	245	30	90	150	228
LL 80 Vers. (1)	435	260	185	40	---	120	168

0 **Drive version:**

0



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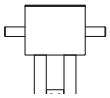

Belt table:

Code No.		Size	Belt	mm/rev.	Number of teeth
0	8	**60**	Nubbed belt N10	130	13
0	8	**80**	Nubbed belt N10	176	18

Shaft dimensions / Coupling claw:

Size	Shaft Ø h6 x length	Feather key	Coupling
60	14 x 35	5x5x28	14
80	18 x 45	6x6x45	19

LLN	60	1	0	0	0	0	8	1	1500
	Pos.	1	2	3	4	5	6	7	

Basic length + stroke = total length

Sample ordering code:
LLN60, standard body profile, double-sided coupling claw, 1170 mm stroke