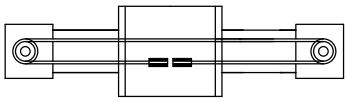
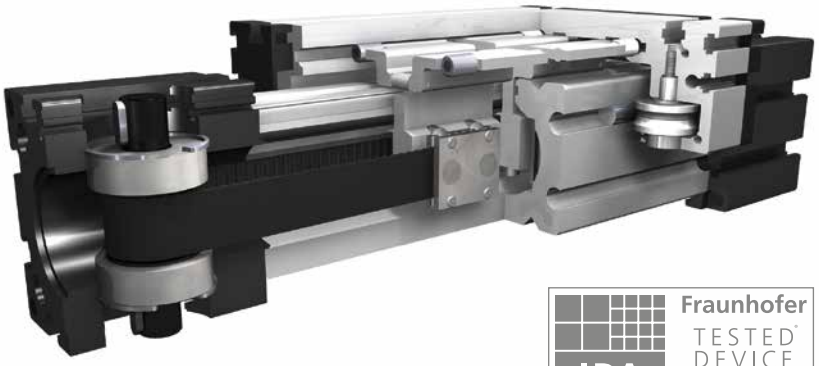
Linear system **ELVZ 60, 60S, 80, 80S, 100, 125**

TECHNICAL SUMMARY
REFERENCE ONLY

INTERNAL BELT DRIVE

- CLEAN ROOM
- TOOTHED BELT VERTICAL
- HIGH DYNAMICS



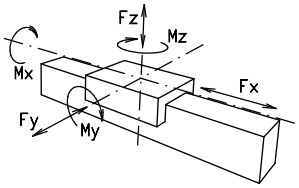


Fraunhofer IPA TESTED DEVICE Linearreinheit ELVZ 60

Function:
This linear unit consists of an aluminium square profile with integrated, hardened steel guide rods. The carriage, which has internal linear ball bearings that can be adjusted free of play, is driven along the guide rods by a toothed belt. Toothed pulley has maintenance-free ball bearings. Belt tension can be readjusted by a simple screw adjustment device in the carriage. This device can also be used for symmetrical adjustment of two or more linear units running parallel. This linear unit is suitable for application in clean rooms of clean-room classification 1.000 (corresponding to US Fed. Standard 209 E).

Fitting position: As required. Max. length 3.000 mm.
Carriage mounting: By T-slots.
Unit mounting: By tapped holes or tapped holes in the bearing block, mounting sets.
Belt type: HTD with steel reinforcement, no backlash when changing direction, repeatability ± 0,1 mm.

Forces and torques



Size	ELVZ 60		ELVZ 60 S		ELVZ 80		ELVZ 80 S		ELVZ 100		ELVZ 125	
Forces/Torques	static	dynamic	static	dynamic	static	dynamic	static	dynamic	static	dynamic	static	dynamic
F_x (N)	700	580	700	580	1000	840	1000	840	3100	2600	5000	4950
F_y (N)	3000	2000	4100	3100	3000	2000	4600	3600	8000	6500	12000	9000
F_z (N)	1700	1100	2160	1600	1700	1100	3000	1800	3600	2200	6000	4500
M_x (Nm)	67	43	88	65	90	55	170	140	300	230	600	450
M_y (Nm)	90	70	190	140	110	80	270	230	400	270	750	600
M_z (Nm)	120	100	230	170	150	120	300	220	750	500	1350	1150

All forces and torques relate 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	0,5	0,5	0,8	1,2	1,2	1,6
Speed						
(m/s) max	3	4	4	4	5	6
Tensile force						
permanent (N)	700	700	1000	1000	3100	5000
0,2 s (N)	800	800	1150	1150	3400	5450
Geometrical moments of inertia of aluminium profile						
I_x mm^4	6,79x10^5	6,79x10^5	18,99x10^5	18,99x10^5	44,4x10^5	101,5x10^5
I_y mm^4	6,97x10^5	6,97x10^5	18,97x10^5	18,97x10^5	44,8x10^5	101,5x10^5
E-Modulus N/mm^2	70000	70000	70000	70000	70000	70000

For life-time calculation of rollers use our homepage.

Driving torque:

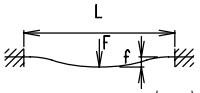
$$M_a = \frac{F * P * S_i}{2000 * \pi} + M_n$$

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

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:

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

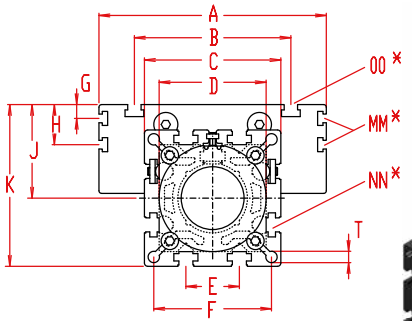


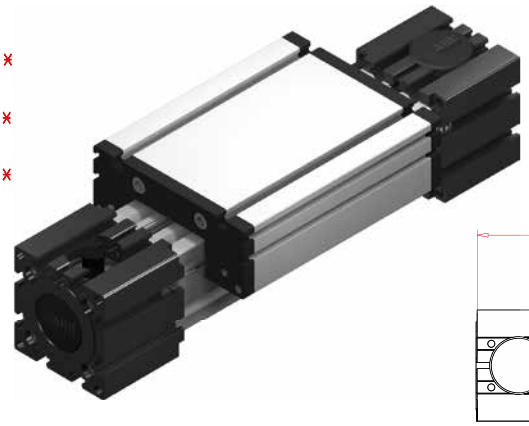
f = deflection (mm)
F = load (N)
L = free length (mm)
E = elastic modulus 70000 (N/mm^2)
I = second moment of area (mm^4)

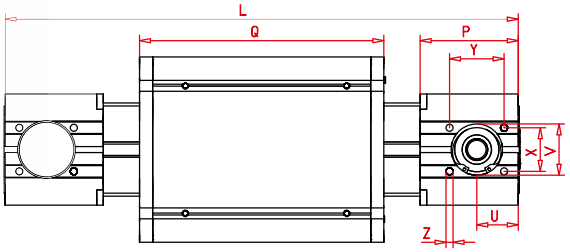
Our policy is one of continued research and development.
We therefore reserve the right to amend,without notice, the specifications given in this document. © 2023 Bahr Modultechnik GmbH

Linear system **ELVZ 60, 60S, 80, 80S, 100, 125**

Dimensions (mm)



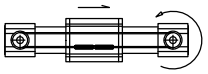
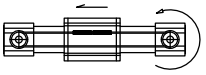




Increasing the carriage length will increase the basic length by the same amount.

Size ❒	Basic length L	A	B	C	D ± 0,05	E	F	G	H	J	K	MM for	NN for	OO for	P	Q	T	U	V - 0,05	W¹	X	Y	Z	Basic weight	Weight per 100 mm
ELVZ 60	290	144	96	82	62x1	30	69	--	-	49	90	-	M 8	M 8	59	168	8,5	23	37	14	30	36	M 6	4,8 kg	0,62 kg
ELVZ 60S	315	170	108	82	62x1	30	69	--	-	53	94	-	M 8	M 8	59	194	8,5	23	37	14	30	36	M 6	5,8 kg	0,62 kg
ELVZ 80	375	170	117	102	80x1	40	88	10,5	30,5	70	121	M 6	M10	M10	90	194	8,5	38	47	18	40	50	M 8	10,0 kg	1,00 kg
ELVZ 80S	395	190	126	102	80x1	40	88	12,5	30	71	122	M 6	M10	M 8	90	214	8,5	38	47	18	40	50	M 8	11,0 kg	1,00 kg
ELVZ 100	530	230	155	130	110x1	50	112	-	29	89	154	M10	M10	M10	110	300	10,5	45	68	19	50	64	M10	24,0 kg	1,60 kg
ELVZ 125	630	295	200	165	130x2	60	142	-	30	107,5	190	M10	M10	M12	130	365	13	58	90	35	60	85	M10	37,0 kg	2,10 kg

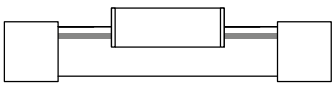
W¹ = standard shaft

1 **(1)** Belt connection right  **(2)** Belt connection left 

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:**

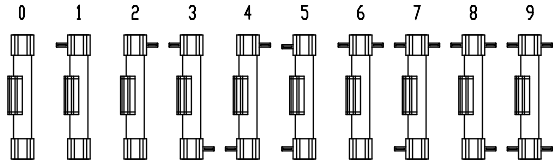
(0)



(1)

Size	Version 1	
	Q	L
60	184	306
60S	214	336
80	210	391
80S	234	415
100	316	546
125	389	649

0 **Drive version:**



The standard version 0 is supplied with 4 flush mounted shafts.

Belt table

Code No.		Size	Belt	mm/rev.	Number of teeth
0	**4**	**60 (S)**	5M 25	80	16
0	**4**	**80 (S)**	5M 25	110	22
0	**9**	**100**	8M 48	144	18
0	**9**	**125**	8M 50	192	24

Shaft dimensions

Size	Shaft ø h6 x length	Key
60 (S)	14 x 35	5x5x28
80 (S)	18 x 45	6x6x40
100	22 x 45	6x6x40
125	30 x 55	8x7x50

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

Basic length + stroke = total length

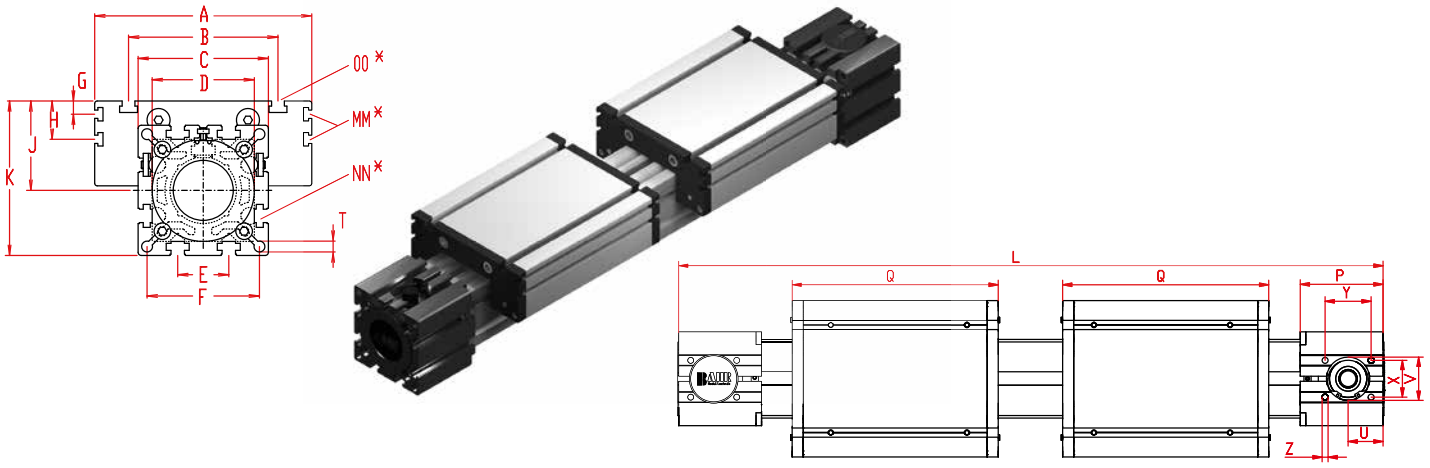
Sample ordering code:
ELVZ 60 with belt connection right, standard body profile, standard carriage and 4 flush mounted shafts, 1210 mm stroke

Our policy is one of continued research and development.
We therefore reserve the right to amend,without notice, the specifications given in this document. © 2023 Bahr Modultechnik GmbH

Linear system **ELVZ 60, 60S, 80, 80S, 100, 125**

TECHNICAL SUMMARY
REFERENCE ONLY

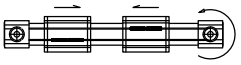
INTERNAL BELT DRIVE - TWO CARRIAGES MOVING IN OPPOSITE DIRECTIONS



Increasing the carriage length will increase the basic length by the same amount

Size ❒	Basic length L	A	B	C	D ± 0,05	E	F	G	H	J	K	MM for	NN for	OO for	P	Q	T	U	V - 0,05	W¹	X	Y	Z	Basic weight	Weight per 100 mm
ELVZ 60	460	144	96	82	62x1	30	69	--	--	49	90	--	M 8	M 8	59	168	8,5	23	37	14	30	36	M 6	6,5 kg	0,62 kg
ELVZ 60S	510	170	108	82	62x1	30	69	--	--	53	94	--	M 8	M 8	59	194	8,5	23	37	14	30	36	M 6	8,5 kg	0,62 kg
ELVZ 80	570	170	117	102	80x1	40	88	10,5	30,5	70	121	M 6	M10	M10	90	194	8,5	38	47	18	40	50	M 8	13,0 kg	1,00 kg
ELVZ 80S	610	190	123	102	80x1	40	88	12,5	30	71	122	M 6	M10	M 8	90	214	8,5	38	47	18	40	50	M 8	15,0 kg	1,00 kg
ELVZ 100	830	230	155	130	110x1	50	112	--	29	89	154	M10	M10	M10	110	300	10,5	45	68	19	50	64	M10	31,0 kg	1,60 kg
ELVZ 125	990	295	200	165	130x2	60	142	--	30	107,5	190	M10	M10	M12	130	365	13	58	90	35	60	85	M10	50,5 kg	2,10 kg

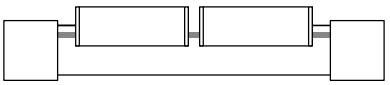
W¹ = standard shaft

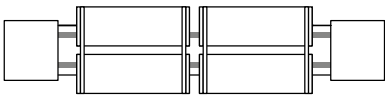
7 **(7)** Belt connection right  **(8)** Belt connection left

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)

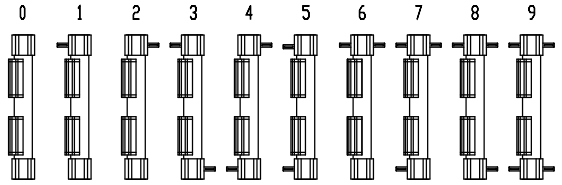
Size	Version 1	
	Q	L
60	184	492
60S	214	542
80	210	602
80S	234	650
100	316	862
125	389	1038

0 **Choice of carriages:**

(0) 

(1) 

0 **Drive version:**



The standard version 0 is supplied with 4 flush mounted shafts.

Belt table:

Code No.		Size	Belt	mm/rev.	Number of teeth
0	**4**	**60 (S)**	5M 25	80	16
0	**4**	**80 (S)**	5M 25	110	22
0	**9**	**100**	8M 48	144	18
0	**9**	**125**	8M 50	192	24

Shaft dimensions:

Size	Shaft ø h6 x length	Key
60 (S)	14 x 35	5x5x28
80 (S)	18 x 45	6x6x40
100	22 x 45	6x6x40
125	30 x 55	8x7x50

ELVZ	**60**	**7**	**0**	**0**	**0**	**0**	**4**	**1**	**1500**
	Pos.	1	2	3	4	5	6	7	

Basic length + stroke = total length

Sample ordering code:
ELVZ 60 right-/left-hand with belt connection right, standard body profile, standard carriage and 4 flush mounted shafts, 1040 mm stroke

Our policy is one of continued research and development.
We therefore reserve the right to amend,without notice, the specifications given in this document. © 2023 Bahr Modultechnik GmbH