

Linear system **DLM 120, 160, 200**



LINEAR MOTOR DRIVE



- ROLLER GUIDE
- HIGH DYNAMICS
- HIGH REPEAT ACCURACY
- LONG TRAVERSE PATH
- INDEPENDENT CARRIAGES

Function:

This unit consists of a rectangular aluminium profile with 2 integrated roller guides. The linear motor DLM unit is based on the principle of a linear, synchronous AC motor. The guiding profile is fitted with permanent magnets as stator (secondary part). The carriage is fitted with the actuator (primary part). The magnetic attraction causes a force between carriage and guiding profile also in the absence of current. This force can be used for the initial tension of the bearings. Several carriages (primary parts) can be driven independently on one guiding profile.

- Fitting position:** As required. Max. length 6.000 mm without joints.
- Carriage mounting:** By T-slots.
- Unit mounting:** By T-slots and mounting sets. The linear axis can be combined with any T-slot profile.
- Carriage support:** In the standard version, the carriage runs on 10 or 12 rollers which can be adjusted and serviced at a central servicing position. For longer carriages the number of rollers can be increased.
Repeatability ± 0,05 mm. Repeated accuracy max. ± 0,05 bis 4.000 mm, ± 0,1 >4.000 mm.

Forces and torques	Size	120			160			200			
	Motor size	1	2	3	1	2	3	1	2	3	
<p>F_z = external force by load F_a = magnetic attraction force F_{zm} = maximum force in consideration of motor power $F_{zm} = F_z + F_a$</p>	Forces/Torques_{dyn}										
	F_z (N)	600	1200	1800	1200	1800	5500	3600	5500	11000	
	F_{zm} (N)	820	1640	2460	1590	8800	7030	5000	7500	13800	
	F_y (N)	700	700	470	1500	1000	450	3300	2200	1200	
	M_x (Nm)	180	90	60	280	190	130	600	400	220	
	M_y (Nm)	50	100	70	320	210	140	640	420	230	
	M_z (Nm)	22	33	50	90	100	120	200	170	210	
	Number of rollers	10	12	12	12	12	12	12	12	12	
	All forces and torques related to the following:										
	existing values $\frac{F_y}{F_{y_{dyn}}} + \frac{F_{zm}}{F_{zm_{dyn}}} + \frac{M_x}{M_{x_{dyn}}} + \frac{M_y}{M_{y_{dyn}}} + \frac{M_z}{M_{z_{dyn}}} \leq 1,5$										
table values $\frac{F_y}{F_{y_{dyn}}} + \frac{F_{zm}}{F_{zm_{dyn}}} + \frac{M_x}{M_{x_{dyn}}} + \frac{M_y}{M_{y_{dyn}}} + \frac{M_z}{M_{z_{dyn}}} \leq 1,5$											
Motor specifications Fx											
Motor size	1	2	3	1	2	3	1	2	3		
Carriage weight (kg)	1,7	2,5	3,1	5,1	4,7	5,4	9,4	10,5	12,7		
Weight primary part (kg)	0,7	1,4	2,0	1,4	3,7	5,2	4,5	6,4	8,4		
permanent (N)	61	115	173	115	271	406	383	574	766		
Max. (N) (1s)	162	323	485	323	607	911	868	1301	1735		
Moving force without current											
N	3	5	6	5	8	9	7	11	12		
Speed											
(m/s) max	4			6			6				
Geometrical moments of inertia of aluminium profile											
I_x mm ⁴	6,6x10 ⁵			22,2x10 ⁵			63,8x10 ⁵				
I_y mm ⁴	38,6x10 ⁵			122,0x10 ⁵			335,0x10 ⁵				
Elastic modulus N/mm ²	70000			70000			70000				

For life-time calculation use our homepage.

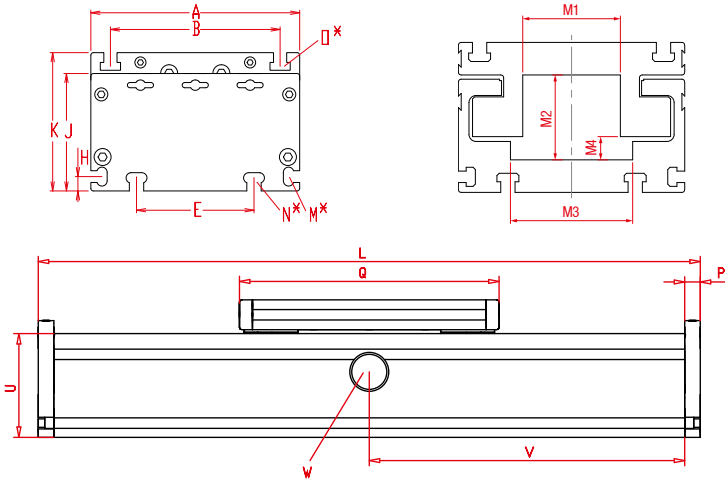
Deflection:

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

- f = deflection (mm)
- F = load (N)
- L = free length (mm)
- E = elastic modulus 70000 (N/mm²)
- I = second moment of area (mm⁴)

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Dimensions (mm)

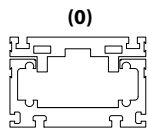


$V = Q + 100 \text{ mm}$
 $W = \text{servicing position}$

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

Size	Basic length L	A	B	E	H	J	K	M for	N for	O for	P	U	Basic weight Motor size 1/2/3	Weight per 100 mm Motor size 1/2/3
DLM 120	Q + 30	120	96	78	10	68	79	M 5	M 6	M 6	10	60	5,2/7,2/9,2 Kg	1,0/1,0/1,0 Kg
DLM 160	Q + 30	160	130	90	11	90	106	M 6	M 8	M 8	12	80	12,6/15,6/20,7 Kg	1,6/2,0/2,0 Kg
DLM 200	Q + 35	200	160	140	15	110	129	M 8	M 10	M 10	15	100	26,9/30,5/37,9 Kg	2,6/2,6/2,6 Kg

0 Choice of guide body profile: Stainless versions upon request.



without internal profile and cover bands



with bellows

Size	M1	M2	M3	M4
DL 120	52	45	64	12
DL 160	70	60	85	18
DL 200	85	77	100	15

Helper table for provided motors

1 Measurement system:

- (1) Measurement system LE100 5V
- (2) Measurement system LE100 10,5-30V
- (3) Hall sensor
- (4) Measurement system provided by customer

1 Plug:

- (1) Plug Pos. 1
- (2) Plug Pos. 2
- (3) open unconnected cable end



1 Motor size:

- (1) Motor size 1 with Q1
- (2) Motor size 2 with Q2
- (3) Motor size 3 with Q3
- (4) Supply with Q1*
- (5) Supply with Q2*
- (6) Supply with Q3*

* = provided by customer

Dimensioning criteria for motor output						
	I_p	b_p	h_{ps}	Q_1	Q_2	Q_3
120	Q - 70	55	38	196	276	372
160	Q - 70	71	50	316	360	461
200	Q - 70	85	62	410	444	610

I_p = length primary part; b_p = width primary part;
 h_{ps} = height primary part + height secondary part + interspaces primary-/secondary part

For standard carriage length see 'Q' in table.
 For linear encoder refer to chapter 9.1.

DLM 160 0 0 1 1 0 0 1 1500

Basic length + stroke = total length

Sample ordering code:

DLM160, Bahr Modultechnik Linearmotor, standard body profile, Measurement system LE100 5V, Plug Pos. 1, motor size 1, 1154 mm stroke.

