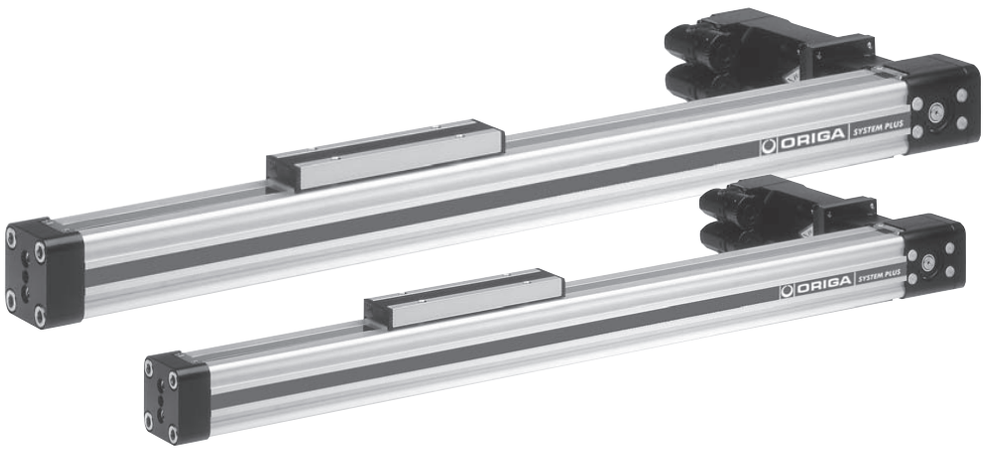
Linear Drive with Toothed Belt
Series OSP-E..B



Contents

ELECTRIC LINEAR DRIVE
FOR POINT-TO-POINT APPLICATIONS

A completely new generation of linear drives which can be integrated into any machine layout neatly and simply.

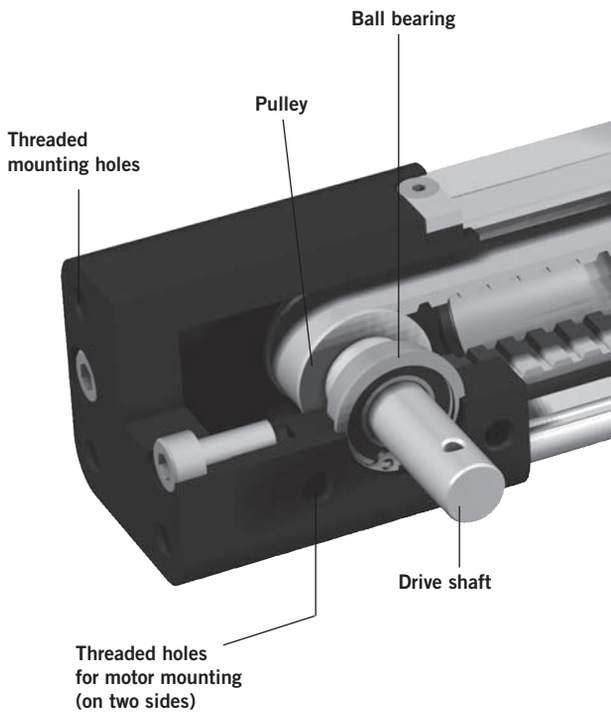
Linear Drive with Toothed Belt and internal Plain Bearing Guide

Advantages

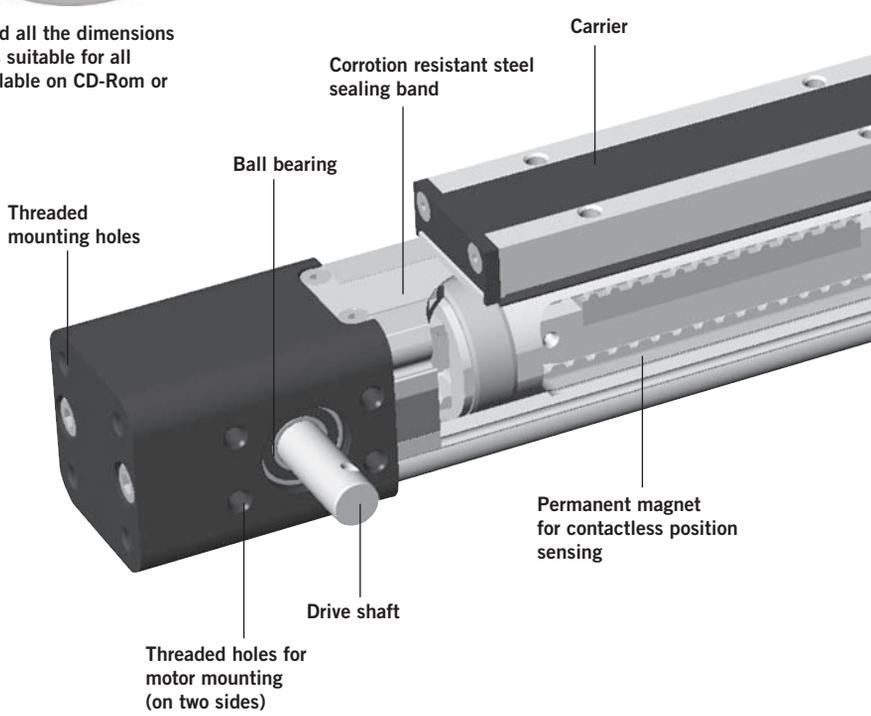
- Precise path and position control
- High speed operation
- Easy installation
- Low maintenance
- Ideal for precise point-to-point applications

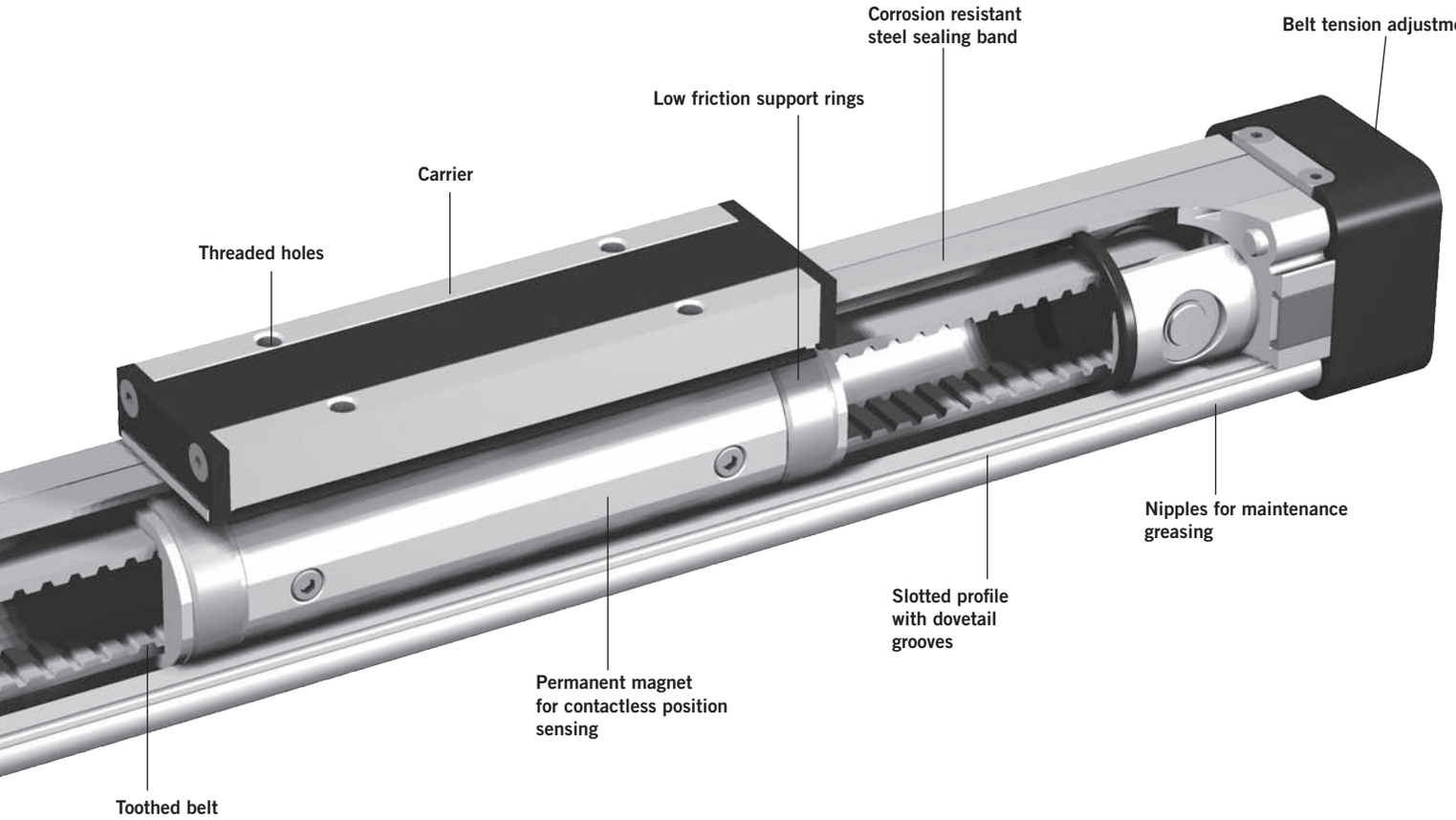
Features

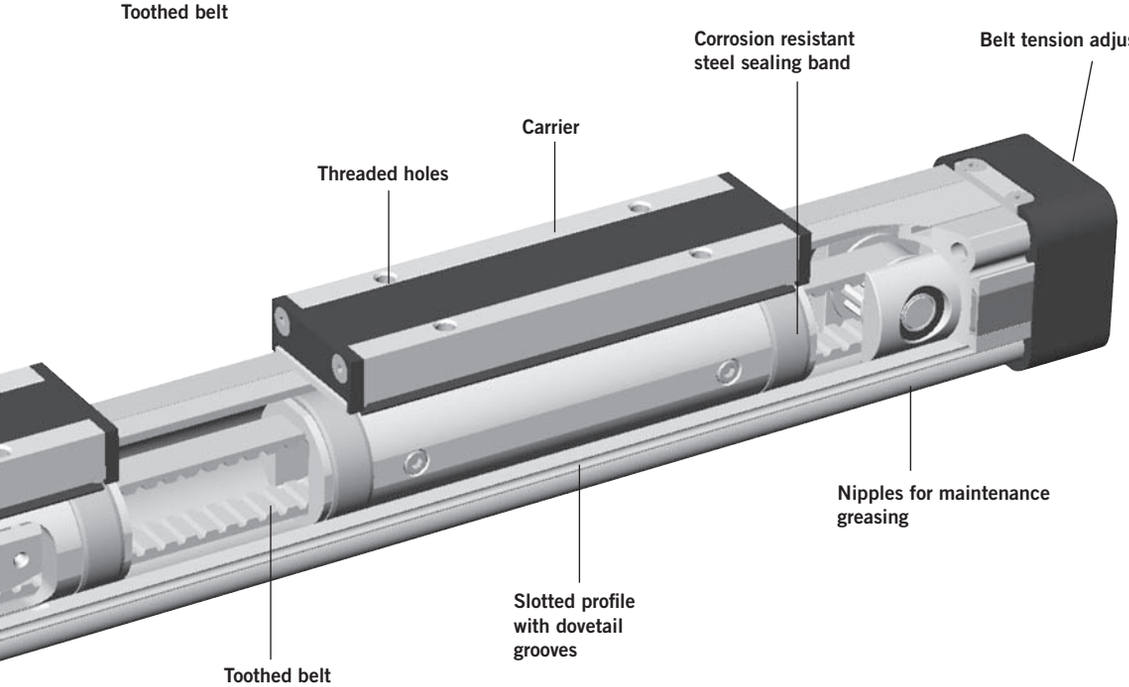
- Integrated drive and guidance system
- Tandem configuration with increased carrier distance for higher moment supports
- Long available strokes
- Complete motor and control packages
- Diverse range of accessories and mountings
- Bi-parting and special options available



Take the easy route and load all the dimensions into your system. The file is suitable for all current CAD systems – available on CD-Rom or at www.parker-origa.com



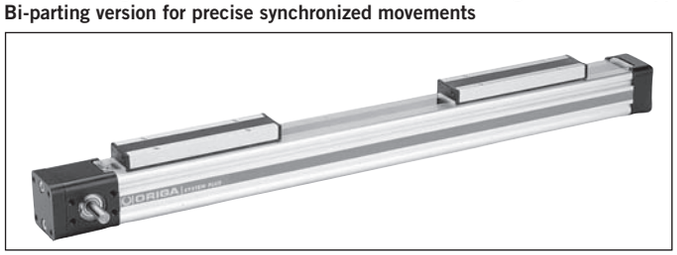




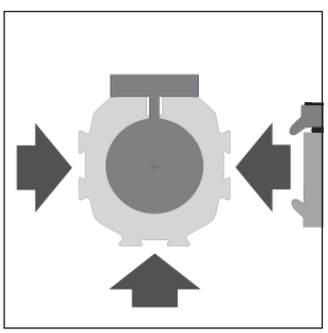
POWERSLIDE
Roller bearing precision guidance for smooth travel and high dynamic or static loads.

PROLINE
The compact aluminium roller guide for high loads and velocities.

Tandem configuration with increased carrier distance for higher moment supports.
Bi-parting version for precise synchronized movements



The dovetailed mounting rails of the new linear drive expand its function into that of a universal system carrier.
Modular system components are simply clamped on.



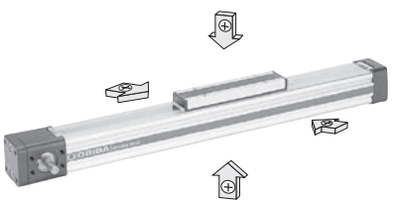
OPTIONS AND ACCESSORIES

SERIES OSP-E, LINEAR DRIVE WITH TOOTHED BELT AND INTERNAL PLAIN BEARING GUIDE

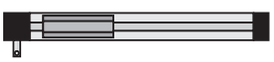
STANDARD VERSIONS OSP-E..B

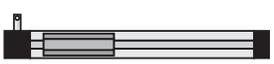
Data sheets 1.20.002E-1, -2

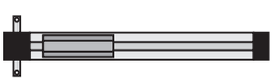
Carrier with internal guidance and magnet packet for contactless position sensing. Dovetail profile for mounting of accessories and the actuator itself.



DRIVE SHAFT VERSIONS
– Plain shaft or
– double plain shaft (Option)
e.g. to drive two linear drives in parallel.

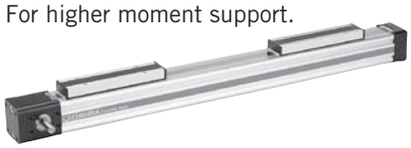




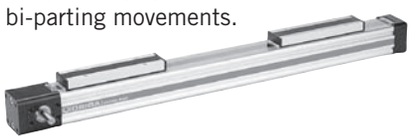


OPTIONS

TANDEM
Data sheet 1.20.002E-1, -2
For higher moment support.



BI-PARTING
Data sheet 1.20.002E-1, -2
For perfectly synchronised bi-parting movements.



ACCESSORIES

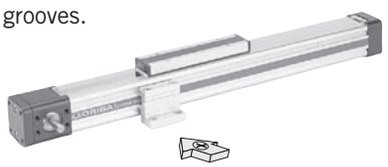
MOTOR MOUNTING
Data sheet 1.44.006E-4

END CAP MOUNTING

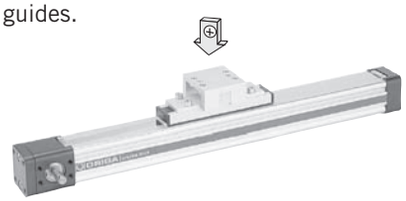
Data sheet 1.44.010E-3
For end-mounting of the drive.

MID-SECTION SUPPORT

Data sheet 1.44.010E-8
For supporting long drives or mounting the linear drive on the dovetail grooves.

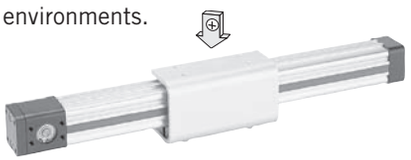


CLEVIS MOUNTING
Data sheet 1.44.010E-13,-14
Carrier with tolerance and parallelism compensation to drive external linear guides.



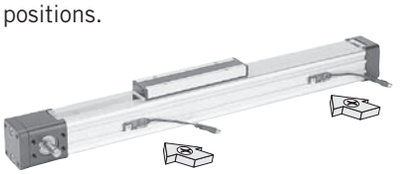
INVERSION MOUNTING

Data sheet 1.44.010E-15
The inversion mounting, mounted on the carrier, transfers the driving force to the opposite side, e.g. for dirty environments.



MAGNETIC SWITCHES SERIES RS AND ES

Data sheet 1.44.030E
For contactless position sensing of end stop and intermediate carrier positions.



Linear Drive with Toothed Belt

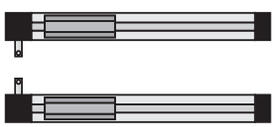
Series OSP-E..B

Size 25, 32, 50

OSP
ORIGA SYSTEM PLUS

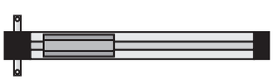
Standard Versions:

- Standard carrier with internal plain bearing guide
- Dovetail profile for mounting of accessories and the actuator itself
- Position of Drive Shafts



Options:

- Tandem-Version
- Bi-parting version for synchronized movements
- Drive shaft with double plain shaft



Characteristics

Characteristics		Symbol	Unit	Description
General Features				
Series				OSP-E..B
Name				Linear Drive with Toothed Belt
Mounting				See drawings
Temperature range		ϑ_{min} ϑ_{max}	°C °C	-30 +80
Weight (mass)			kg	See table
Installation				See table
Material	Slotted profile			Extruded anodized aluminium
	Toothed belt			Steel-corded polyurethane
	Pulley			Aluminium
	Guide bearings			Low friction plastic
	Sealing band			Hardened corrosion resistant steel
	Screws, nuts			Zinc plated steel
	Mountings			Zinc plated steel and aluminium
Encapsulation class		IP	54	

Weight (mass) and Inertia

Series	Weight (mass) [kg]			Inertia [x 10^{-6} kgm^2]	
	at stroke 0 m	ad per meter stroke	moving mass	at stroke 0 m	ad per meter stroke
OSP-E25B	0.9	1.6	0.2	25.3	6.6
OSP-E32B	1.9	3.2	0.40	43.3	10
OSP-E50B	5.2	6.2	1.0	312.2	45
OSP-E25B*	1.2	1.6	0.5	48	6.6
OSP-E32B*	2.3	3.2	0.8	83	10
OSP-E50B*	6.3	6.2	2.1	585	45

* Version: Tandem and Bi-parting (Option)

Installation Instructions

Use the threaded holes in the end cap for mounting the linear drive.
See if mid-section supports are needed using the maximum allowable unsupported length graph on data sheet 1.20.002E-3
At least one end cap must be secured to prevent axial sliding when mid-section support is used.
When the linear drive is moving an externally guided load, the clevis mounting must be used (see on data sheet 1.44.010E-13,-14).

The linear drives can be fitted with the standard carrier mounting facing in any direction.
To prevent contamination such as fluid ingress, the drive should be fitted with its sealing band facing downwards.
The inversion mounting can be fitted to transfer the driving force to the opposite side (see on data sheet 1.44.010E-15).

Maintenance

All moving parts are long-term lubricated for a normal operational environment. Parker Origa recommends a check and lubrication of the linear drive, and if necessary a change of the toothed belt and wear parts, after an operation time of 12 months of operation or
3 000 km travel of distance.
Additional greasing is easily done by using nipples in the slotted profile.
Please refer to the operating instructions supplied with the drive.

First service start-up

The maximum values specified in the technical data sheet for the different products must not be exceeded. Before taking the linear drive machine into service, the user must ensure the adherence to the EC Machine Directive 91/368/EEC.

Linear guides see 1.40.020E to 024E
Magnetic switches see 1.44.030E
Mountings and accessories see 1.44.006E, 1.44.010E

Data Sheet No.1.20.002E-1

Sizing Performance Overview Maximum Loadings

Sizing of Linear Drive

The following steps are recommended for selection:

1. Required acceleration is shown in graphs on data sheet 1.20.002-4E.
2. Required torque is shown on data sheet 1.20.002-5E.
3. Check that maximum values in the table 3 are not exceeded
4. Drive shaft by using table T2. (Pay attention to note under table) If value is lower than required, overview the moving profile or select if possible a bigger unit.
5. Before sizing and specifying the motor, the average torque must be calculated using the cycle time of the application.
6. Check that the maximum allowable unsupported length is not exceeded (see on data sheet 1.20.002-3E).

Performance Overview

Characteristics		Unit	Description		
Size			**OSP-E25B**	**OSP-E32B**	**OSP-E50B**
Max. speed		[m/s]	2	3	5
Linear motion per revolution, drive shaft		[mm]	60	60	100
Max. rpm drive shaft		[min^{-1}]	2 000	3 000	3 000
Max. effective action force F_A at speed	< 1 m/s:	[N]	50	150	425
	1- 2 m/s:	[N]	50	120	375
	> 2 m/s:	[N]	–	100	300
No-load torque		[Nm]	0.4	0.5	0.6
Max. acceleration/deceleration		[m/s^2]	10	10	10
Repeatability		[mm/m]	±0.05	±0.05	±0.05
Max. stroke length OSP-E..B		[mm]	3000	5000	5000
Max. stroke length OSP-E..B*		[mm]	2 x 1500	2 x 2500	2 x 2500

* Bi-parting version

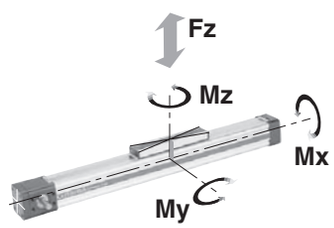
Maximum Permissible Torque on Drive Shaft Speed / Stroke (T2)

OSP-E25B				OSP-E32B				OSP-E50B			
Speed [m/s]	Torque [Nm]	**Stroke** [m]	Torque [Nm]	**Speed.** [m/s]	Torque [Nm]	**Stroke** [m]	Torque [Nm]	**Speed.** [m/s]	Torque [Nm]	**Stroke** [m]	Torque [Nm]
1	0.9	1	0.9	1	2.3	1	2.3	1	10.0	1	10.0
2	0.9	2	0.9	2	2.0	2	(2.3)	2	9.5	2	10.0
		3	0.9	3	(1.8)	3	2.3	3	9.0	3	9.0
						4	2.3	4	8.0	4	7.0
						5	1.8	5	7.5	5	6.0

Important:
The maximum permissible moment on the drive shaft is the lowest value of the speed- or stroke-dependent moment value.

Example above:
OSP-E32B stroke 2 m, required speed 3 m/s;
From table T2: speed 3 m/s gives 1.8 Nm and stroke 2 m gives 2.3 Nm.
Max. torque for this application is 1.8 Nm.

Forces, loads and moments



$M = F \cdot l$ [Nm]

$M_x = M_{x\,statically} + M_{x\,dynamically}$

$M_y = M_{y\,statically} + M_{y\,dynamically}$

$M_z = M_{z\,statically} + M_{z\,dynamically}$

The distance l (lx, ly, lz) for calculation of moments relates to the centre axis of the linear drive.

Maximum Permissible Loads (T3)

Series	Max. applied load Fz [N]	Max. moments [Nm] Mx	My	Mz
OSP-E25B	160	2	12	8
OSP-E32B	300	8	25	16
OSP-E50B	850	16	80	32
OSP-E..B Bi-partional	The maximum load F must be equally distributed among the two carriers.			

Combined Loads

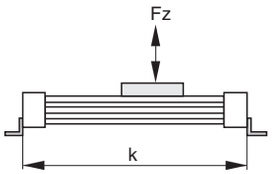
If the linear drive is subjected to several forces, loads and moments at the same time, the maximum load is calculated with the equation shown here.
The maximum permissible loads must not be exceeded.

Equation for Combined Loads

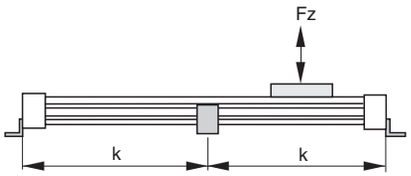
$$\frac{Fz}{Fz\,(max)} + \frac{Mx}{Mx\,(max)} + \frac{My}{My\,(max)} + \frac{Mz}{Mz\,(max)} \leq 1$$

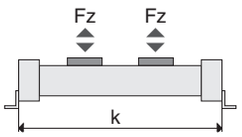
The total of the loads must not exeed >1 under any circumstances.

Maximum permissible unsupported length – Placing of Mid-Section Support

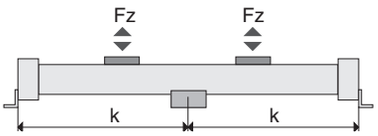


Series OSP-E..B

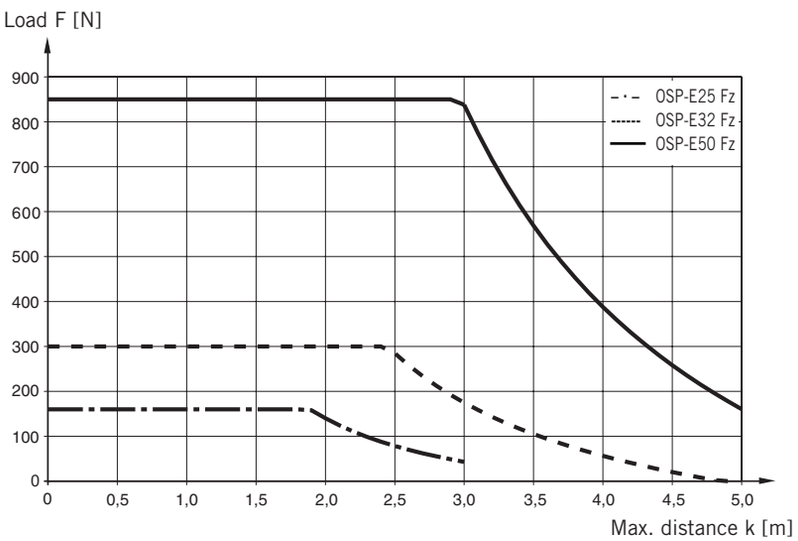




Series OSP-E..B
Bi-parting version



k = Maximum permissible distance between mountings/mid-section support for a given load F.



(Up to the curve in the above graph the deflection will be max. 0.2 % of distance k)

Maximum Permissible Unsupported Length

Stroke Length

The stroke lengths of the linear drives are available in multiples of 1 mm up to max.
OSP-E25B: 3 m / 2 x 1.5 m *
OSP-E32B: 5 m / 2 x 2.5 m *
OSP-E50B: 5 m / 2 x 2.5 m *
* Version: Bi-partional

Other stroke lengths are available on request.

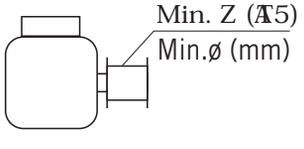
The end of stroke must not be used as a mechanical stop.
Allow an additional safety clearance at both ends equivalent to the linear movement of one revolution of the drive shaft.
The use of an AC motor with frequency converter normally requires a larger safety clearance than that required for servo systems.
For advise, please contact your local Parker Origa technical support department.
When mechanical stops are required, external shock absorbers should be used (see separate data sheet).
Align the centre line of the shock absorber as closely as possible with the object's centre of gravity (see separate data sheet).

Mounting on the Drive Shaft

Do not expose the drive shaft to uncontrolled axial or radial forces when mounting coupler or pulley, a steadying block should be used.

Pulley

Minimum allowable number of teeth Z (AT5) at maximum applied torque.



Series	Min. Z	Min. ø
OSP-E25B	24	38
OSP-E32B	24	38
OSP-E50B	36	57

Required Acceleration

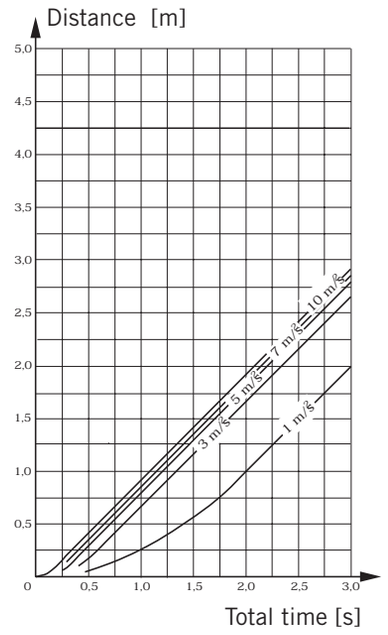
Distance / Time Graph

Using the required travel distance and total time, the adjacent graphs show the required acceleration based on maximum speed.

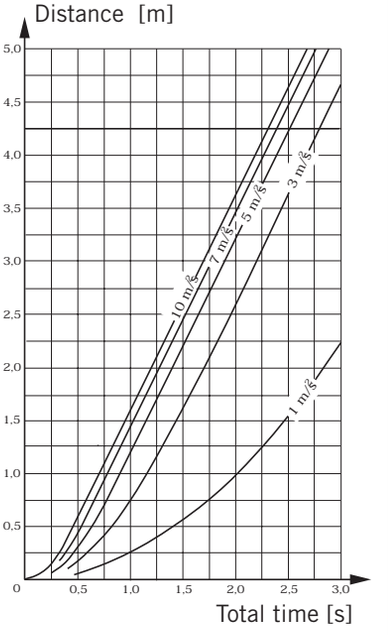
The graphs assume that acceleration and deceleration are equal.

Please note that specifying non-essential high acceleration or short cycle time will result in an oversized motor.

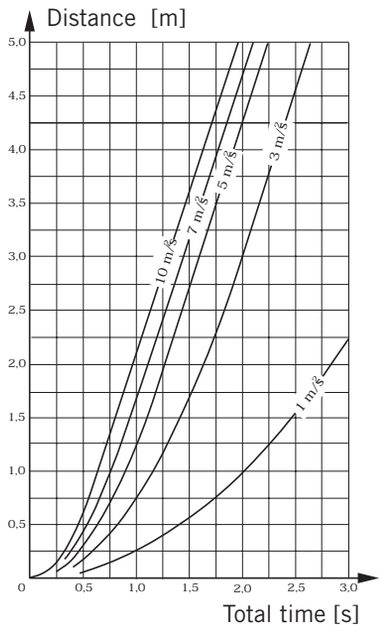
Max. speed 1 m/s



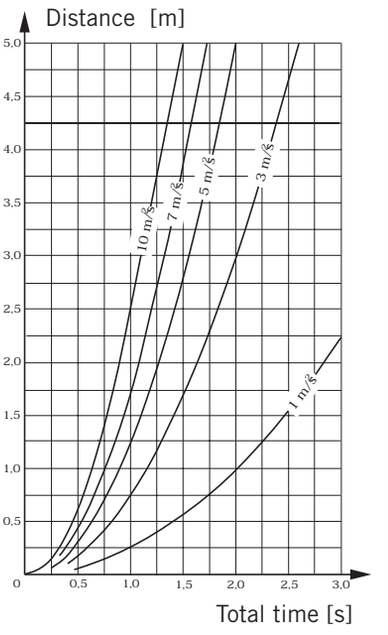
Max. speed 2 m/s



Max. speed 3 m/s



Max. speed 5 m/s

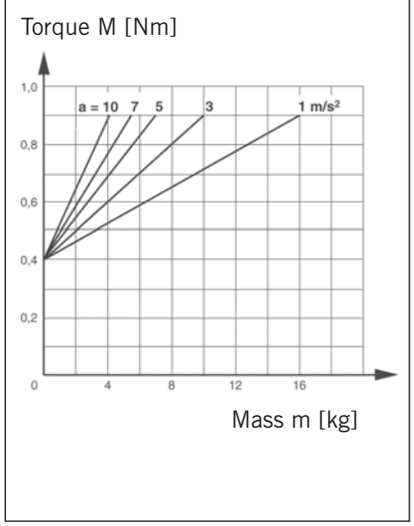


Required Torque / Mass

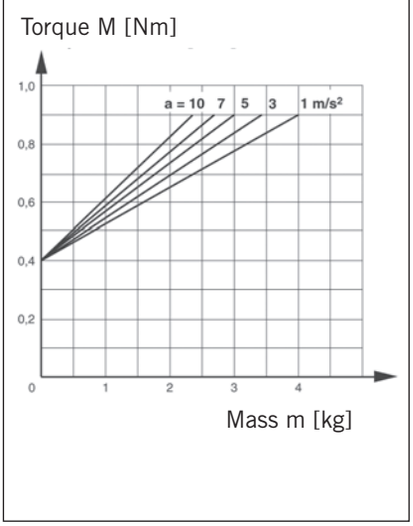
Using the known mass, the direction of the application and the required acceleration from the distance-time graphs, the linear drive can be sized and the required torque is shown in the adjacent graphs. Mass in graphs = Load + moving mass of the linear drive (according to the weig ht chart on data sheet 1.20.002E-1).

Please note:
When using an additional guide, please add the mass of the carriage to the total moving mass.

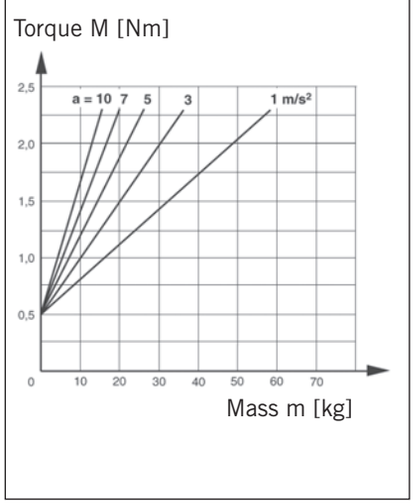
Size OSP-E25B, Horizontal Application



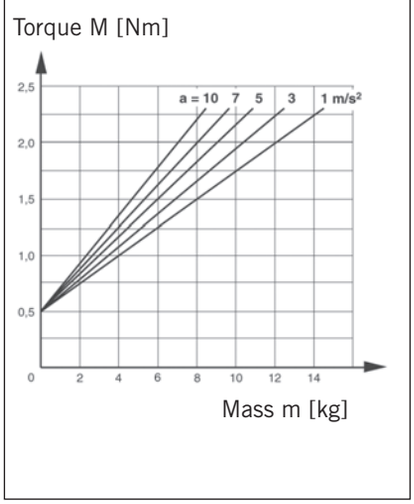
Size OSP-E25B, Vertical Application



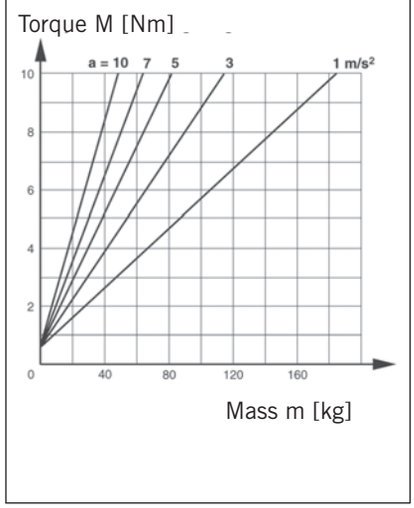
Size OSP-E32B, Horizontal Application



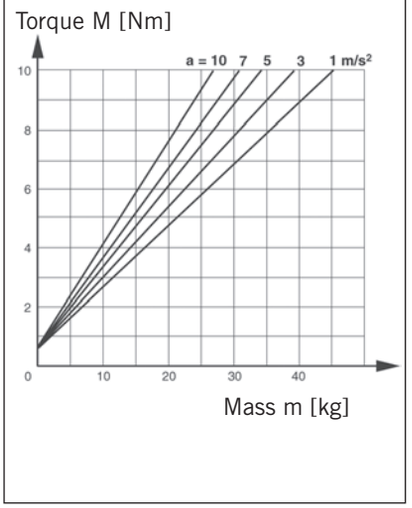
Size OSP-E32B, Vertical Application



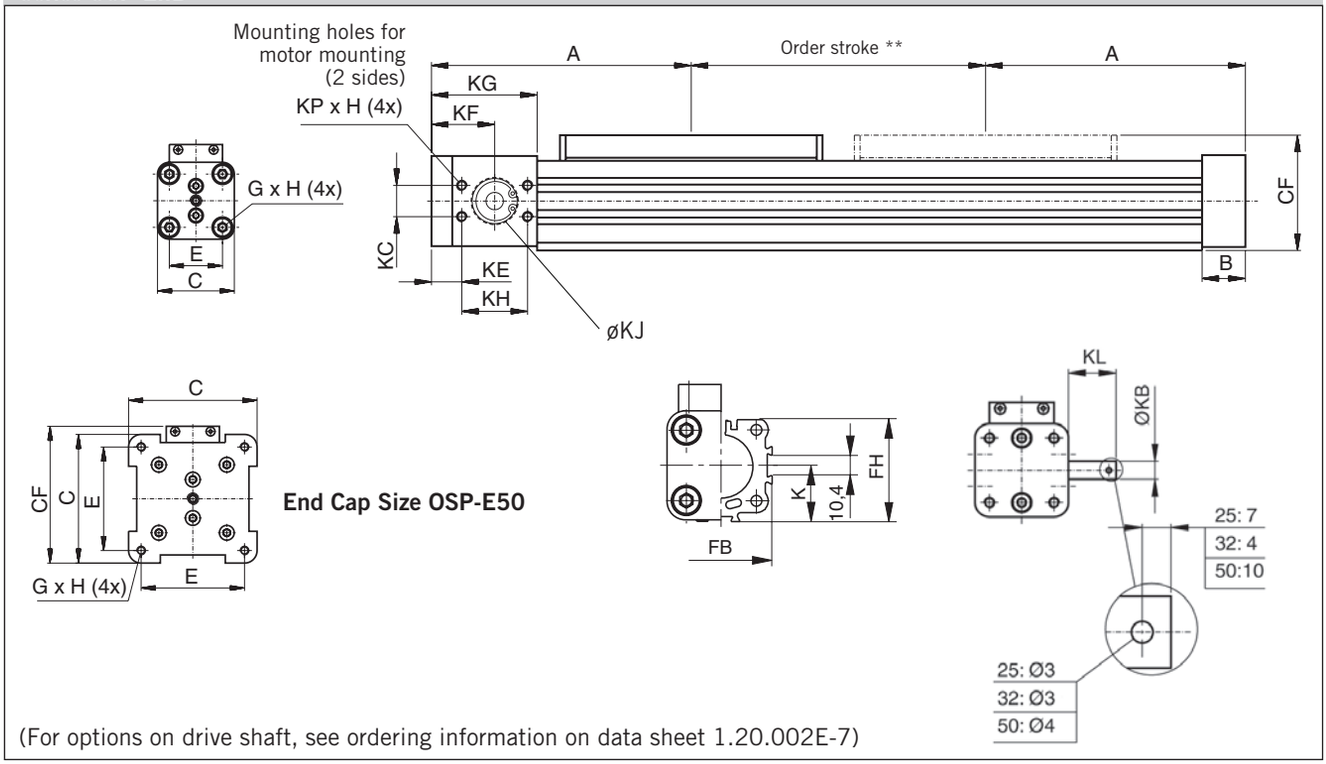
Size OSP-E50B, Horizontal Application



Size OSP-E50B, Vertical Application



Linear Drive with Toothed Belt - Basic Unit
Series OSP-E..B



(For options on drive shaft, see ordering information on data sheet 1.20.002E-7)

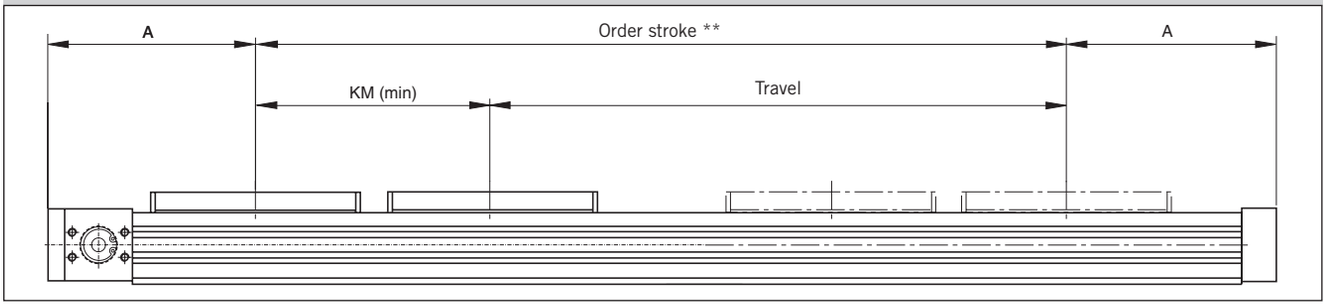
*** Note:**

The mechanical end position must not be used as a mechancial end stop. Allow an additional safety clearance at both ends equivalent to the linear move ment of one revolution of the drive shaft, but at least 100 mm.

Order stroke = required travel + 2 x safety distance.

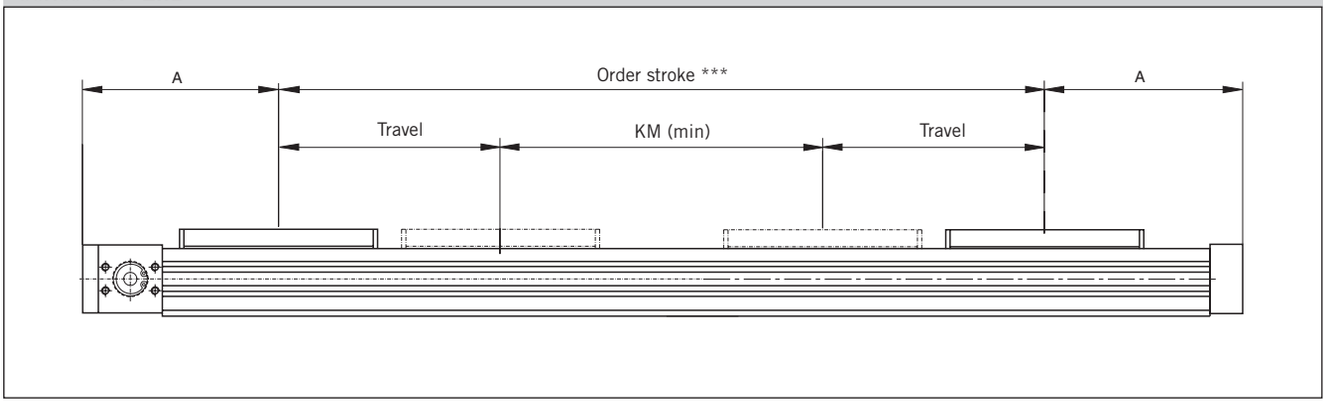
The use of an AC motor with frequency converter normally requires a larger safety clearance than that required for servo systems.
For further information please contact you local Parker Origa representative.

Option – Tandem
Series OSP-E..B



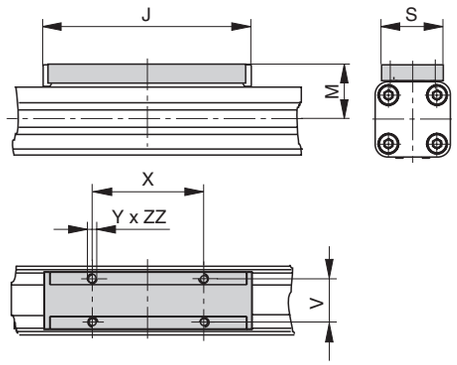
** Order stroke = required travel + KM min + 2 x safety distance

Option – Bi-parting
Series OSP-E..B



*** Order stroke = 2 x required travel + KM min + 2 x safety distance

Standard Carrier
Series OSP-E..B



Dimension Table [mm]

Series	A	B	C	E	G x H	J	K	M	S	V	X	Y	CF
OSP-E25B	125	22	41	27	M5 x 10	117	21.5	31	33	25	65	M5	52.5
OSP-E32B	150	25	52	36	M6 x 12	152	28.5	38	36	27	90	M6	66.5
OSP-E50B	200	25	87	70	M6 x 12	200	43	49	36	27	110	M6	92.5

Series	FB	FH	KB	KC	KE	KF	KG	KH	KJ	KL	KM_{min}	$KM_{empf.}$	KP x H	ZZ
OSP-E25B	40	39.5	10_{j6}	15	22	37	57	30	19^{H7}	24	130	190	M5 x 10	8
OSP-E32B	52	51.7	10_{j6}	18	17.5	36.5	61	38	26^{H7}	26	170	230	M6 x 12	10
OSP-E50B	76	77	16_{h8}	32	23.5	48.5	85	50	40^{H7}	34	220	320	M8 x 12	10

Order Instructions

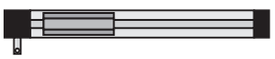
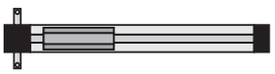
	OSP-E	25	-	0	0	0	0	0	-	00500	

Size	
25	Size 25
32	Size 25
50	Size 25

Type of Drive	
0	Toothed Belt

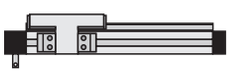
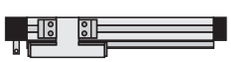
Carrier	
0	Standard
1	Tandem (Option)
2	Bi-Parting (Option)

Stroke
Input (five digits) in mm

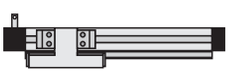
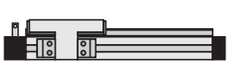
Position of Drive Shaft	
0	
1	
2	Double plain shaft (Option) 

If combined with a linear guide, please also state position of linear guide

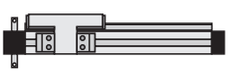
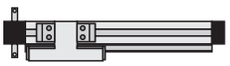
Position of Drive Shaft
Standard = 0

Position of Linear Guide
Standard Position of guide opposite to drive shaft 
Opposite to Standard Position of duide same as drive shaft 

Position of Drive Shaft
Opposite to Standard = 1

Position of Linear Guide
Standard Position of guide opposite to drive shaft 
Opposite to Standard Position of guide same as drive shaft 

Position of Drive Shaft
Both Sides = 2

Position of Linear Guide
Standard Position of guide opposite to drive shaft 
Opposite to Standard Position of guide same as drive shaft 

Accessories - please order separately

Description	For more Information see Data Sheet No.
Coupling Housing	1.44.006E-4
End Cap Mountings	1.44.010E-3
Mid-Section Support	1.44.010E-8
Adaptor Profile	1.44.010E-9
T-Slot Profile	1.44.010E-10
Clevis Mounting	1.44.010E-13, -14
Inversion Mounting	1.44.010E-15
Magnetic Switches	1.44.030E
Drive systems and components for electric linear drives OSP-E	A4P019E

Data Sheet No.1.20.002E-8