

Linear Drive with Ball Screw Drive Series OSP-E..SB



Contents

Description	Data Sheet No.	Page
Overview	1.30.001E	47-50
Technical Data	1.30.002E-1 to 5	51-55
Dimensions	1.30.002E-6, -7	56-57
Order instructions	1.30.002E-8	58

ELECTRIC LINEAR DRIVE FOR HIGH ACCURACY APPLICATIONS

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

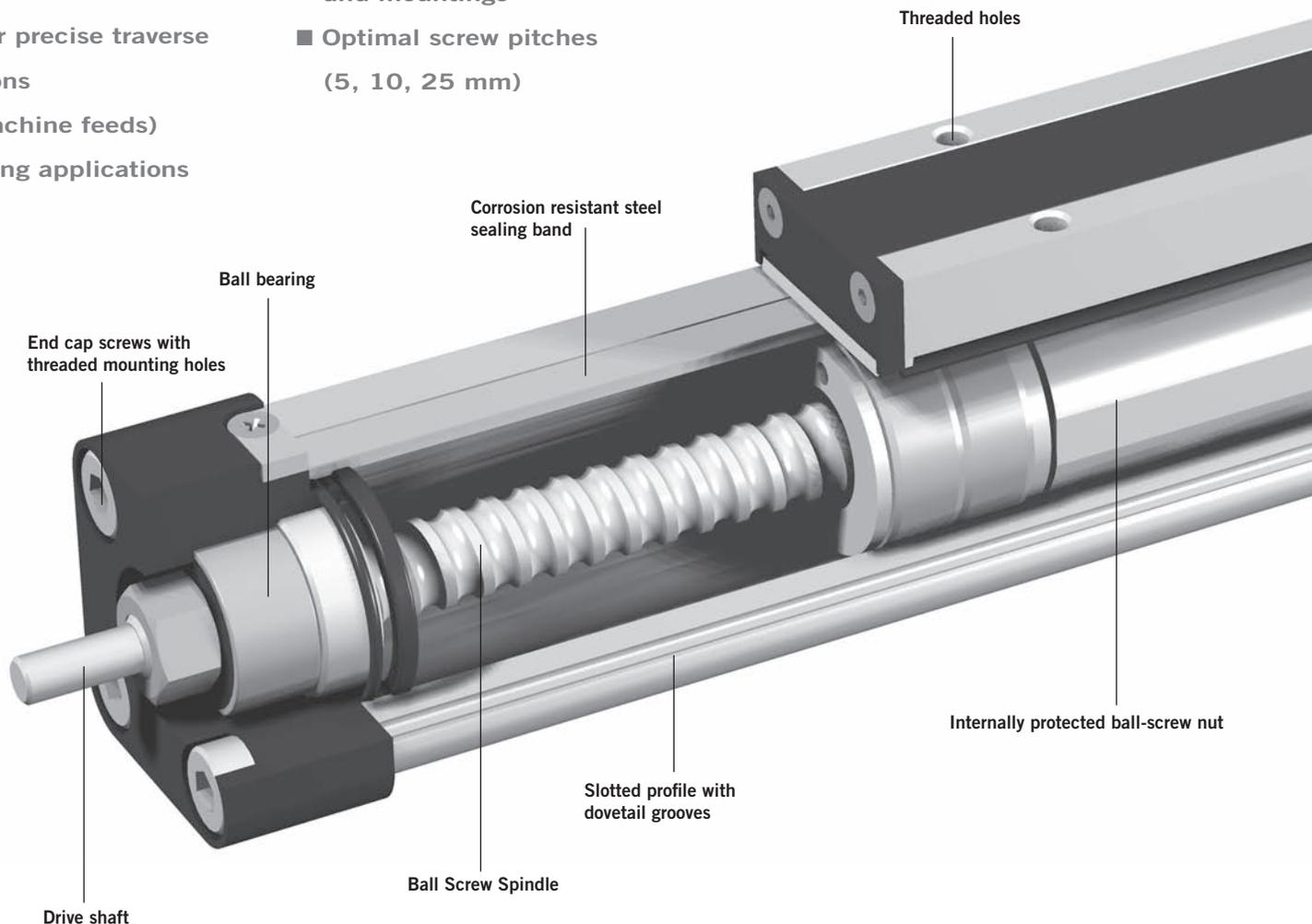
Linear Drive with Ball Screw Drive and internal Plane Bearing Guide

Advantages

- Accurate path and position control
- High force output
- Easy installation
- Excellent slow speed characteristics
- Ideal for precise traverse operations (e.g. machine feeds) and lifting applications

Features

- Integrated drive and guidance system
- Complete motor and control packages
- Diverse range of accessories and mountings
- Optimal screw pitches (5, 10, 25 mm)



Clean Room-Version
certified to DIN EN ISO 14644-1



SLIDELINE
Combination with
linear guides
provides for heavier
loads.



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.



Heavy Duty guide HD
linear guides for heavy
duty applications

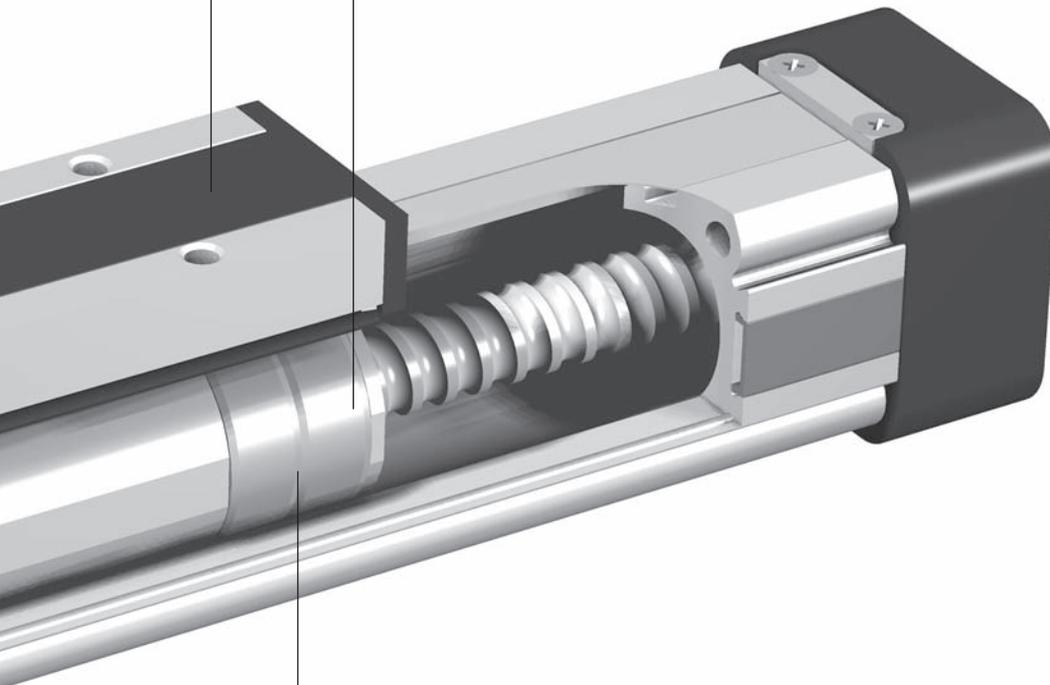


SFI-plus
displacement
measuring system



Low friction support rings

Carrier

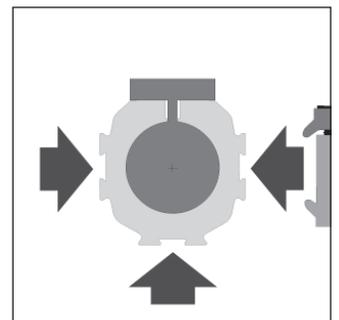


Permanent magnet for
contactless sensing



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

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.



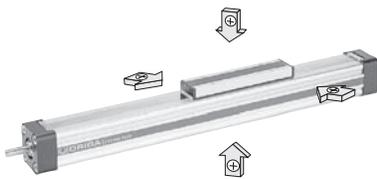
OPTIONS AND ACCESSORIES

SERIES OSP-E, LINEAR DRIVE WITH BALL SCREW DRIVE AND INTERNAL PLAIN BEARING GUIDE

STANDARD VERSION OSP-E..SB

Data Sheet 1.30.002E

Standard carrier with internal guidance and integrated magnet set for contactless position sensing. Dovetail profile for mounting of accessories and the actuator itself.



BALL SCREW PITCH

The ball screws spindles are available in various pitches:

- OSP-E25SB: 5 mm
- OSP-E32SB: 5, 10 mm
- OSP-E50SB: 5, 10, 25 mm

OPTIONS

TANDEM

Data Sheet 1.30.002E-6
For higher moment support.



CLEAN ROOM

certified to DIN EN ISO 14644-1



DISPLACEMENT MEASURING SYSTEM SFI-plus

Data Sheet 1.44.035E
Incremental measuring system with practically relevant resolution.



ACCESSORIES

MOTOR MOUNTINGS

Data Sheet 1.44.006E-5



END CAP MOUNTING

Data Sheet 1.44.010-3
For end-mounting of the drive.



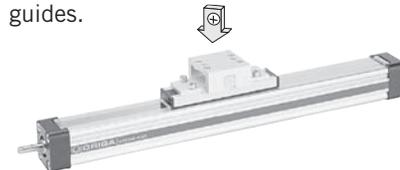
MID-SECTION SUPPORT

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.



A3P107E 00GAG0X

The right to introduce technical modifications is reserved

Linear Drive with Ball Screw Drive

Series OSP-E..SB Size 25, 32, 50



Characteristics			
Characteristics	Symbol	Unit	Description
General Features			
Series			OSP-E..SB
Name			Linear Drive with Ball Screw Drive
Mounting			See drawings
Temperature Range	ϑ_{\min} ϑ_{\max}	°C °C	-20 +80
Weight (mass)		kg	See table
Installation			In any position
Material	Slotted profile		Extruded anodized aluminium
	Ball screw		Hardened steel
	Ball screw nut		Hardened steel
	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	At stroke 0 m	Weight (mass) [kg]		Inertia [$\times 10^{-6}$ kgm ²]	
		Add per metre stroke	Moving mass	At stroke 0 m	Add per metre
OSP-E25SB	0.8	2.3	0.2	2.2	11.3
OSP-E32SB	2.0	4.4	0.4	8.4	32
OSP-E50SB	5.2	9.4	1.2	84	225

Installation Instructions

Use the threaded holes in the free end cap and a mid-section support close to the motor end for mounting the linear drive.

See if mid-section supports are needed using the maximum permissible unsupported length graph on data sheet 1.30.002E-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 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 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 wear parts, after an operation time of 12 months or 3000 km travel of distance. 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.

Standard Versions:

- Standard carrier with internal plain bearing guide
- Dovetail profile for mounting of accessories and the actuator itself
- Pitches of Ball Screw Spindle
Type OSP-E25 : 5 mm
Type OSP-E32: 5, 10 mm
Type OSP-E50: 5, 10, 25 mm

Options:

- Tandem-Version
- Clean room-version, according to DIN EN ISO 14644-1
- Displacement Measuring System SFI-plus (Data Sheet 1.40.035E)

The right to introduce technical modifications is reserved



For **linear guides** see 1.40.020E to 024E
For **magnetic switches** see 1.44.030E
For **mountings and accessories** see 1.44.006E, 1.44.010E

Sizing Performance Overview

Maximum Loadings

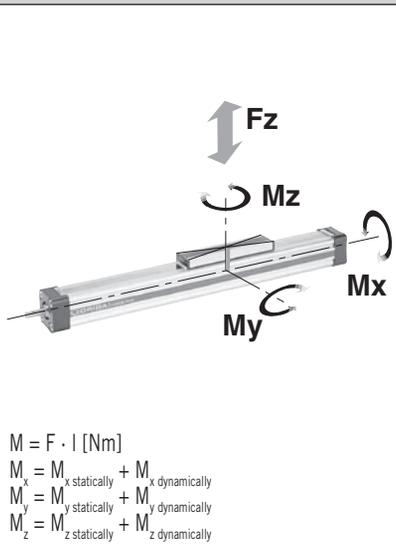
Sizing of Linear Drive

The following steps are recommended for selection :

1. Recommended maximum acceleration is shown in graphs on data sheet 1.30.002E-4
2. Required torque is shown in graphs on data sheet 1.30.002E-5
3. Check that maximum values in the adjacent charts are not exceeded.
4. When sizing and specifying the motor, the RMS-average torque must be calculated using the cycle time of the application.
5. Check that the maximum allowable unsupported length is not exceeded (see on data sheet 1.30.002E-3)

Performance Overview							
Characteristics	Unit	Description					
Series		OSP-E25SB	OSP-E32SB		OSP-E50SB		
Pitch	[mm]	5	5	10	5	10	25
Max. speed	[m/s]	0.25	0.25	0.5	0.25	0.5	1.25
Linear motion per revolution drive shaft	[mm]	5	5	10	5	10	25
Max. rpm, drive shaft	[min ⁻¹]	3 000	3 000		3 000		
Max. effective action force F _A	[N]	250	600		1 500		
Corresponding torque on drive shaft	[Nm]	0.35	0.75	1.3	1.7	3.1	7.3
No-load torque	[Nm]	0.2	0.2	0.3	0.3	0.4	0.5
Max. allowable torque on drive shaft	[Nm]	0.6	1.5	2.8	4.2	7.5	20
Repeatability	[mm/m]	±0.05		±0.05			
Max. Standard stroke length	[mm]	1100	2000		3200		

Forces, loads and moments



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.

Maximum Permissible Loads

T3

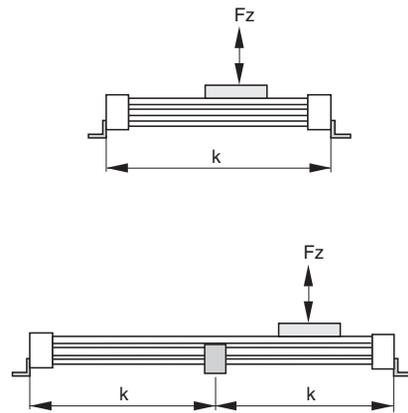
Series	Max. applied load [N] Fz	Max. moments [Nm]		
		Mx	My	Mz
OSP-E25SB	500	2	12	8
OSP-E32SB	1 200	8	25	16
OSP-E50SB	3 000	16	80	32

Equation for combined loads

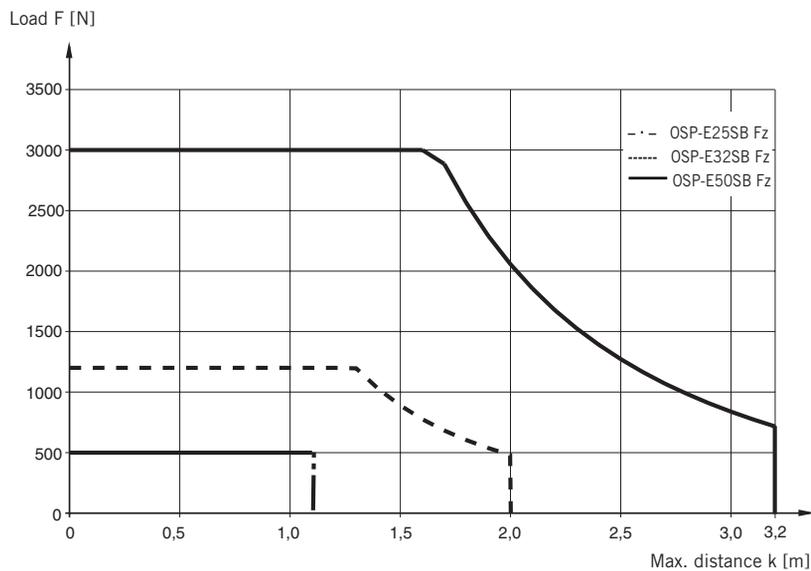
$$\frac{F_z}{F_z \text{ (max)}} + \frac{M_x}{M_x \text{ (max)}} + \frac{M_y}{M_y \text{ (max)}} + \frac{M_z}{M_z \text{ (max)}} \leq 1$$

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

Maximum Permissible Unsupported Length – Placing of Mid-Section Support



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 above maximum stroke lengths.

OSP-E25SB: max. 1100 mm

OSP-E32SB: max. 2000 mm

OSP-E50SB: max. 3200 mm

Other stroke lengths are available on request.

The end of stroke must not be used as a mechanical stop.

Allow an additional safety clearance of minimum 25 mm at both ends.

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 catalogue).

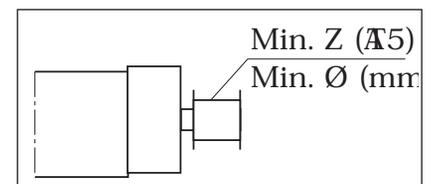
Align the centreline of the shock absorber as closely as possible with the object's centre of gravity.

Mounting on the Drive Shaft

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

Belt wheels

Minimum allowable number of teeth (AT5) and diameter of belt wheel at maximum applied torque.

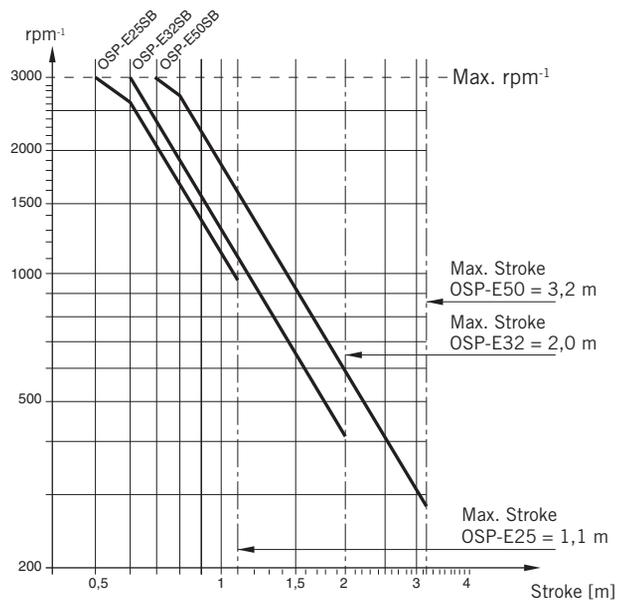


Size	Min. Z	Min. Ø
OSP-E25SB	24	38
OSP-E32SB	24	38
OSP-E50SB	36	57

Maximum rpm / Stroke

At longer strokes the speed has to be reduced according to the adjacent graphs.

Maximum rpm / Stroke

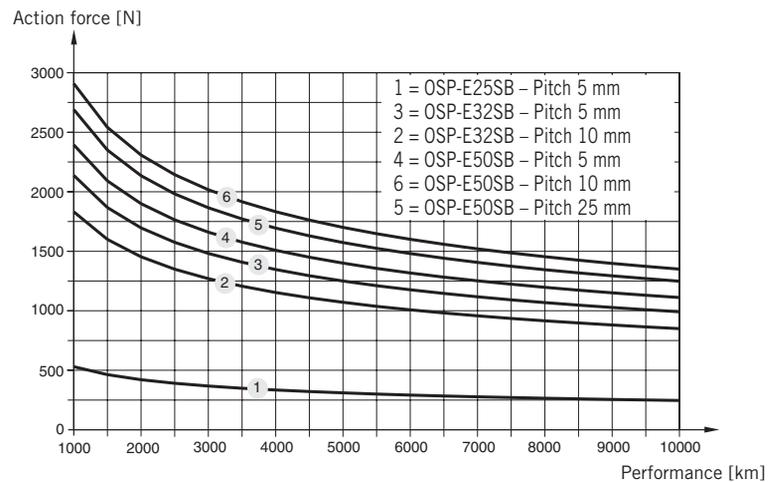


The maximum rpm shown in the graph, is 80% of the critical rpm.

Performance / Action force

The performance to be expected depends on the maximum required actions force of the application. An increase of the action force will lead to a reduced performance.

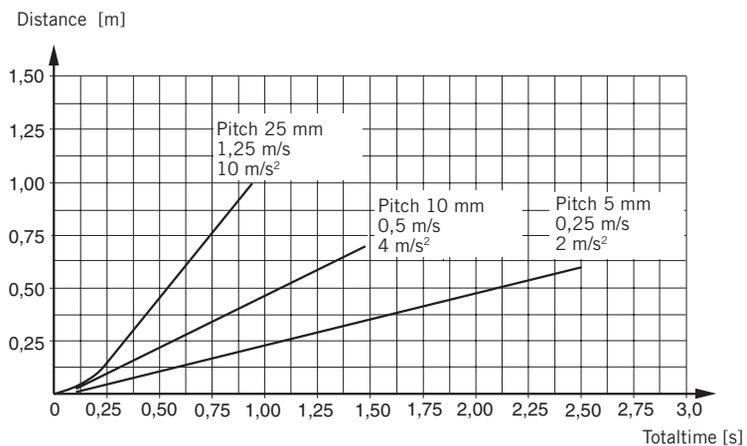
Performance as a function of the action force



Distance / Time Graph

The adjacent graphs show travel distance and total time at maximum speed and recommended maximum acceleration. The graph assumes that acceleration and deceleration are equal.

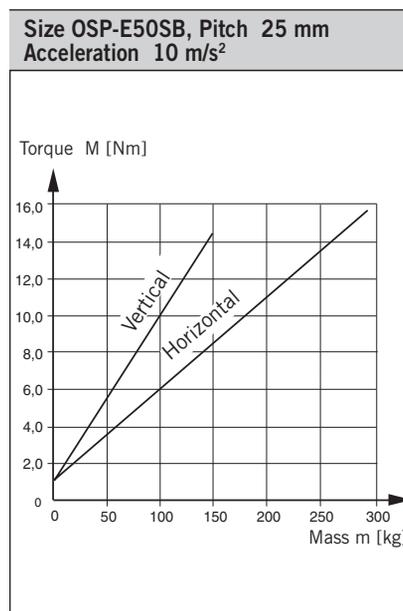
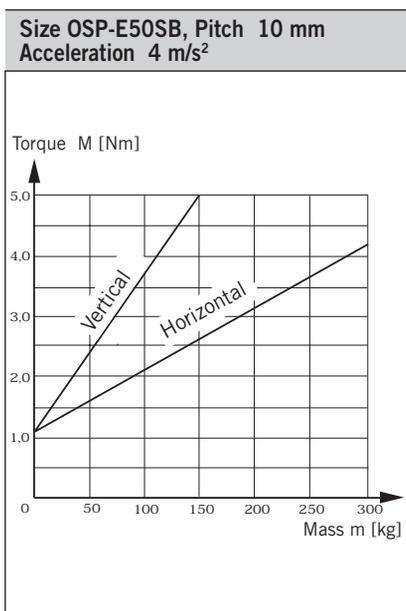
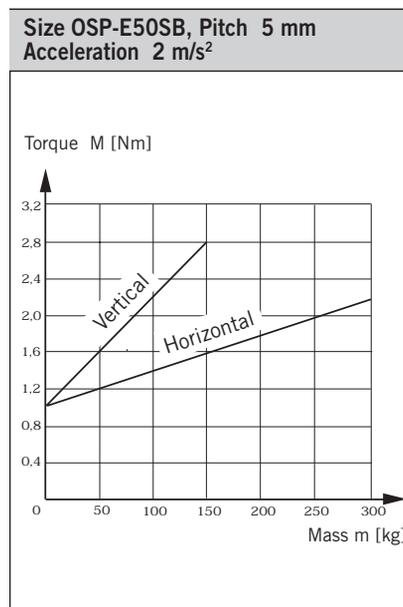
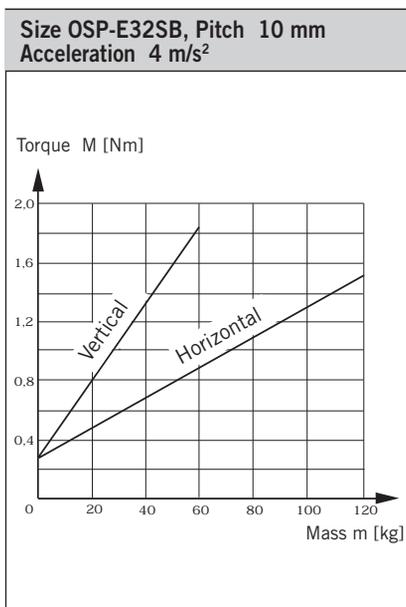
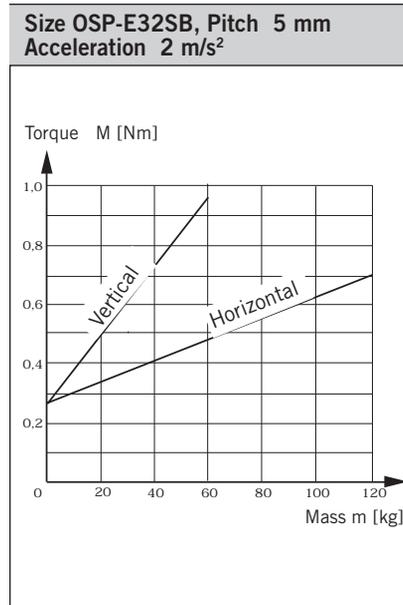
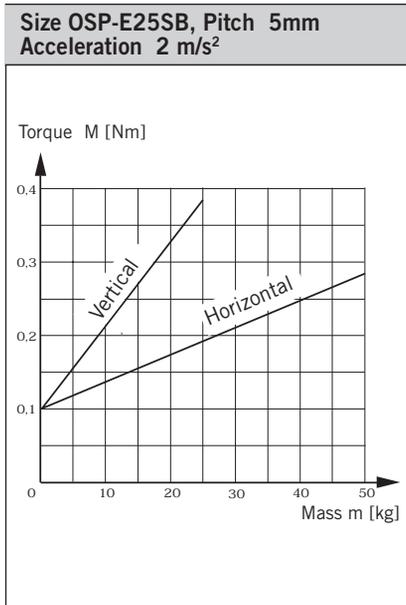
Distance / Time Graph



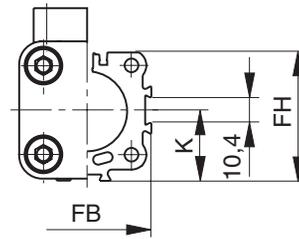
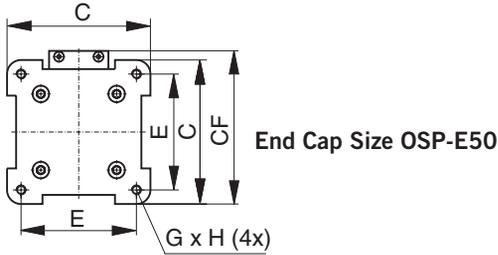
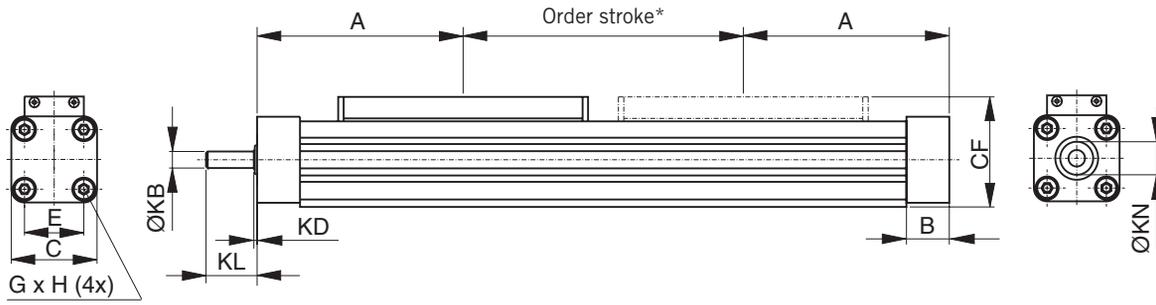
Required Torque / Mass

Using the known mass, the direction of the application and the recommended acceleration, 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 weight chart (see table on data sheet 1.30.002E-1).

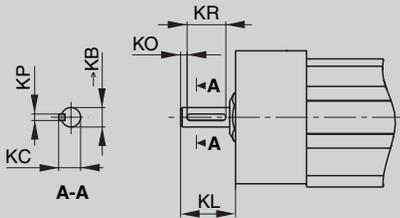
Please mind:
 If an additional guide is used, mind the weight of the guide carriage.



**Linear Drive with Ball Screw Drive – Basic Unit
Series OSP-E..SB**



Plain shaft with keyway (Option)



Dimension Table [mm]

Series	ØKB _{n7}	KC	KL Opt.3	Opt.4	KO	KP ^{P9}	KR
OSP-E25SB	6	6.8	17	24	2	2	12
OSP-E32SB	10	11.2	31	41	5	3	16
OSP-E50SB	15	17	43	58	6	5	28

**Option 3: Keyway
Option 4: Keyway long version**

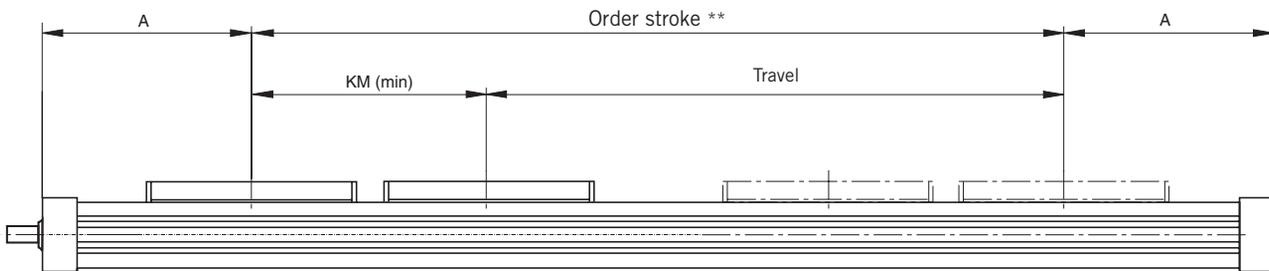
*** Note:**

The mechanical end position must not be used as a mechanical end stop. Allow an additional safety clearance at both ends equivalent to the linear movement of one revolution of the drive shaft, but at least 25 mm.

Order stroke = required travel + 2 x safety distance.

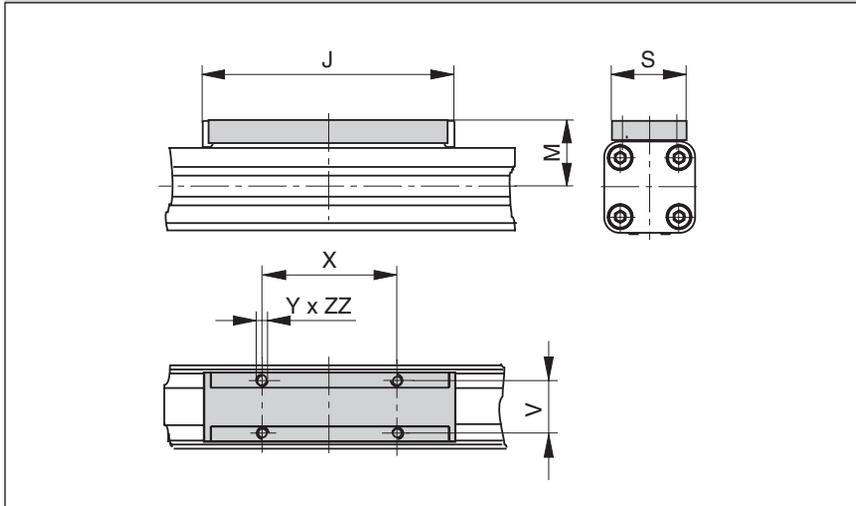
The use of an AC motor with frequency converter normally requires a larger safety clearance than that required for servo systems. For further information, please contact your local Parker Origa representative.

**Option – Tandem
Series OSP-E..SB**



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

**Standard Carrier
Series OSP-E..SB**

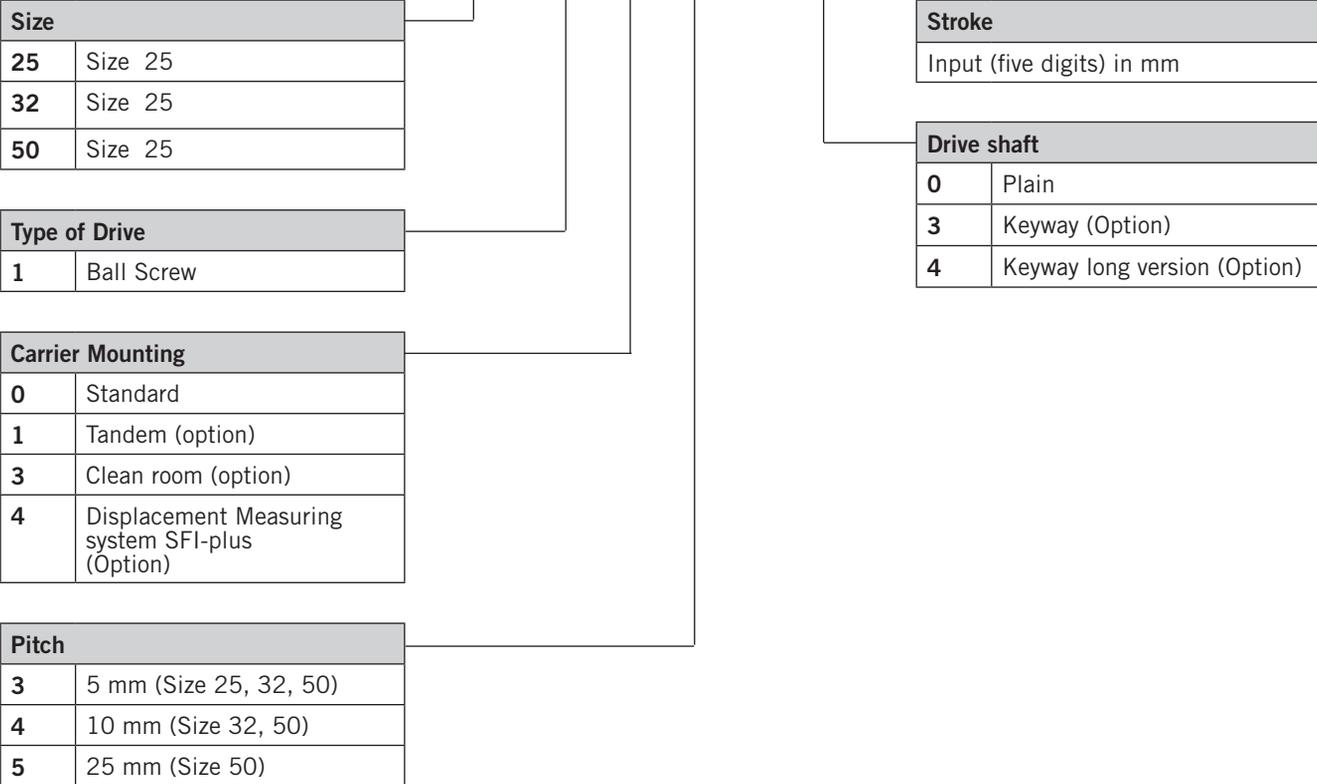


Dimension table [mm]

Series	A	B	C	E	G x H	J	K	M	S	V	X	Y	CF	FB	FH	KB	KD	KL	KM _{min}	KN	ZZ
OSP-E25SB	100	22	41	27	M5 x 10	117	21.5	31	33	25	65	M5	52.5	40	39.5	6 _{h7}	2	17	120	13	8
OSP-E32SB	125	25.5	52	36	M6 x 12	152	28.5	38	36	27	90	M6	66.5	52	51.7	10 _{h7}	2	31	165	20	10
OSP-E50SB	175	33	87	70	M6 x 12	200	43	49	36	27	110	M6	92.5	76	77	15 _{h7}	3	43	235	28	10

Order Instruction

OSP-E 25 - 1 0 3 0 0 - 00500



Accessories - please order separately

Description	For more informations see Data Sheet No.
Coupling Housing	1.44.006E-5
End Cap Mountings	1.44.010E-3
Mid-Section Support	1.44.010E-8
Adapter Profile	1.44.010E-9
T-Nut 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