

OSP-E..SB Ball Screw Actuator with Internal Plain Bearing Guide



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The right to introduce technical modifications is reserved

Autoryzowany dystrybutor Parker:

ARA
PNEUMATIK

53-012 Wrocław tel. 71 364 72 82
ul. Wyścigowa 38 fax 71 364 72 83
www.arapneumatik.pl



BALL SCREW ACTUATOR WITH INTERNAL PLAIN BEARING GUIDE FOR HIGH ACCURACY APPLICATIONS

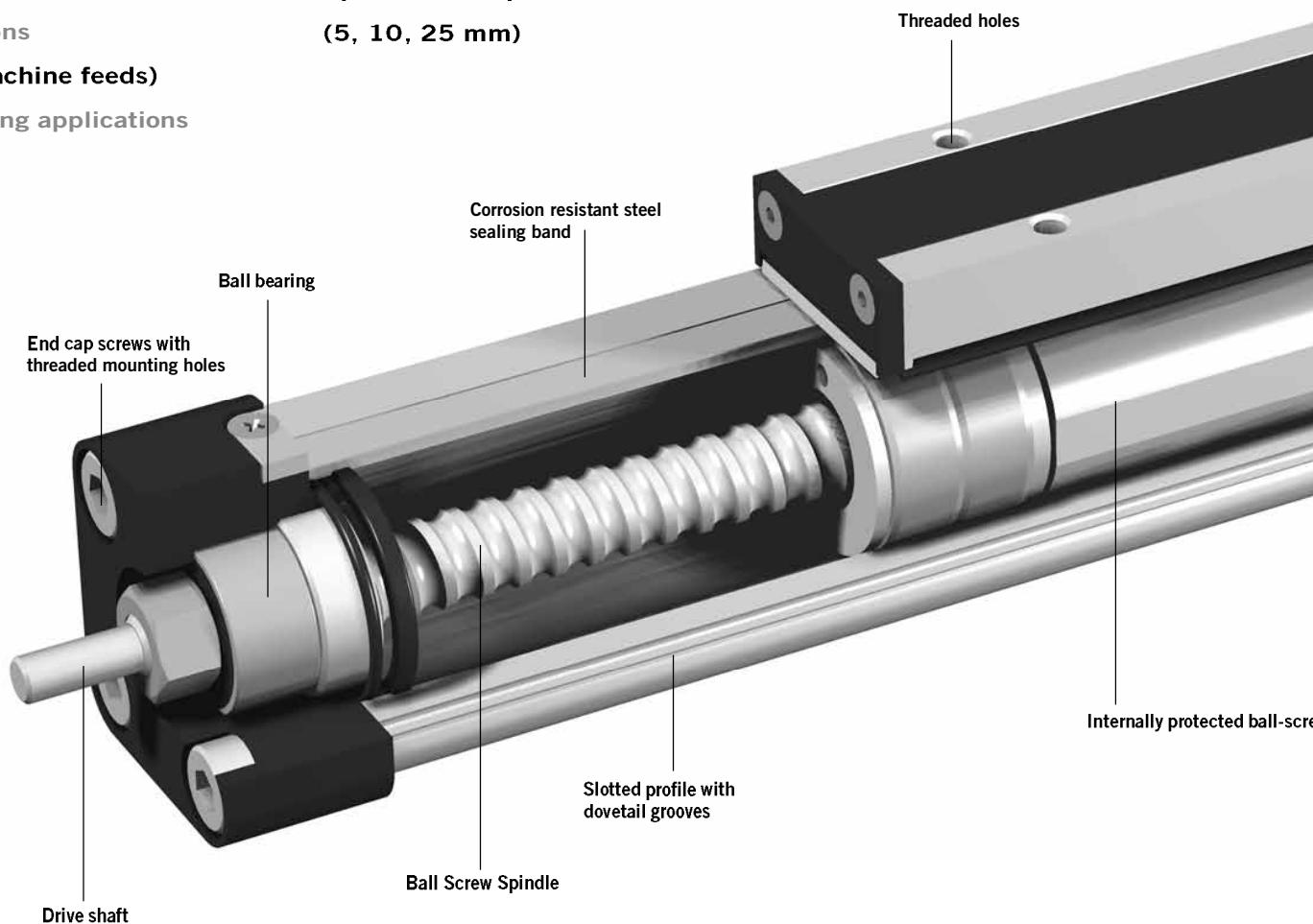
A completely new generation of actuators which can be integrated into any machine layout neatly and simply.

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)



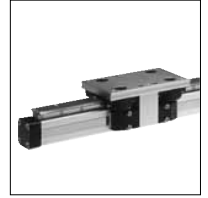
Clean Room-Version
certified to DIN EN ISO 14644-1



SLIDELINE
Combination with
linear guides
provides for heavier
loads.



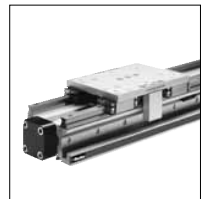
POWERSLIDE
Roller bearing
precision guidance
for smooth travel and
high dynamic or static
loads.



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



Heavy Duty guide HD
linear guides for heavy
duty applications

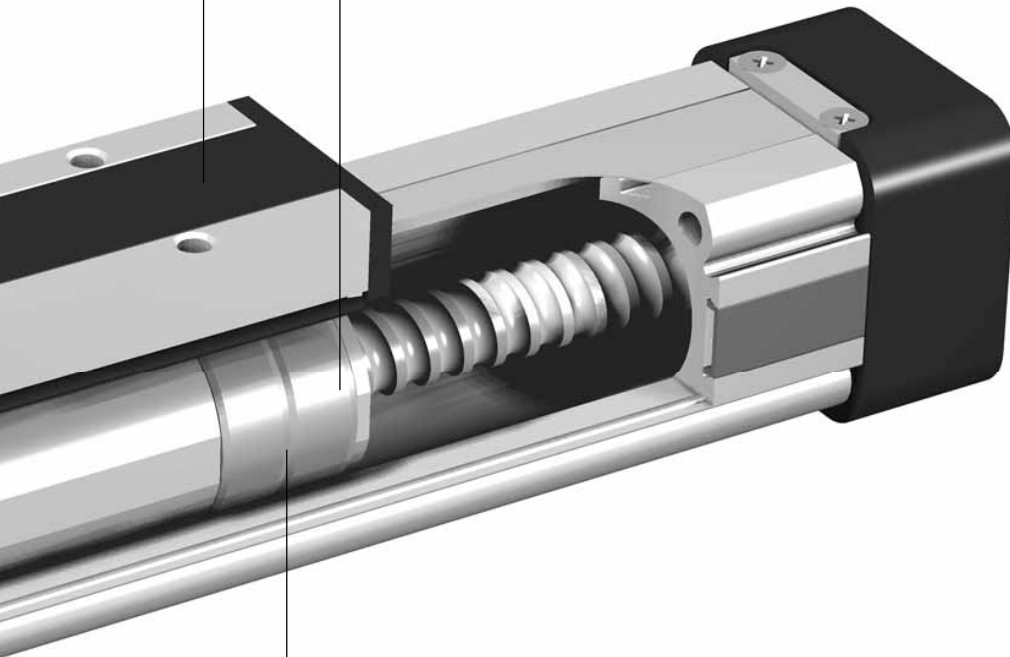


SFI-plus
displacement
measuring system



Low friction support rings

Carrier



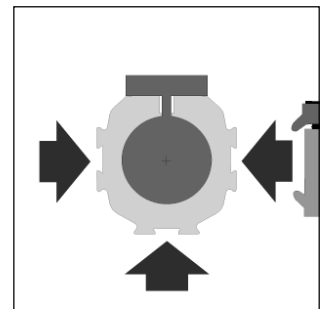
Permanent magnet for
contactless sensing



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

ew nut

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

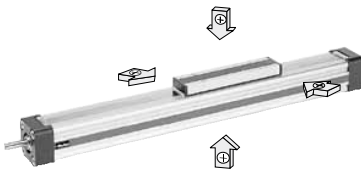


OPTIONS AND ACCESSORIES

OSP-E..SB BALL SCREW ACTUATOR WITH INTERNAL PLAIN BEARING GUIDE

STANDARD VERSION OSP-E..SB

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

For higher moment support.



CLEAN ROOM

certified to DIN EN ISO 14644-1



ACCESSORIES

MOTOR MOUNTINGS



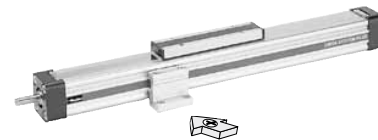
END CAP MOUNTING

For end-mounting of the actuator.



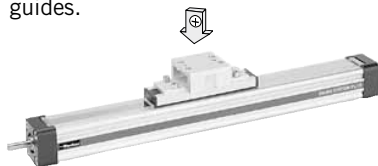
PROFILE MOUNTING

For supporting long actuators or mounting the actuator on the dovetail grooves.



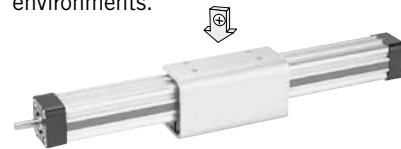
CLEVIS MOUNTING

Carrier with tolerance and parallelism compensation to drive external linear guides.



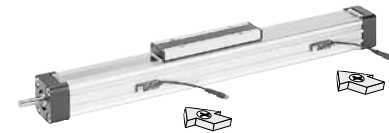
INVERSION MOUNTING

The inversion mounting, mounted on the carrier, transfers the driving force to the opposite side, e.g. for dirty environments.



MAGNETIC SWITCHES SERIES RST AND EST

For contactless position sensing of end stop and intermediate carrier positions.



MEASURING SYSTEM - SFI-PLUS

Incremental measuring system with practically relevant resolution.



Characteristics			
Characteristics	Symbol	Unit	Description
General Features			
Series			OSP-E..SB
Name			Ball Screw Actuator with internal Plain Bearing Guide
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
OSP-E32SB	2.0	4.4	0.4	8.4	32
OSP-E50SB	5.2	9.4	1.2	84.0	225

Installation Instructions

Use the threaded holes in the free end cap and a Profile Mounting close to the motor end for mounting the actuator.

See if Profile Mountings are needed using the maximum permissible unsupported length graph on page 59. At least one end cap must be secured to prevent axial sliding when Profile Mounting is used.

When the actuator is moving an externally guided load, the Compensation must be used (see page 109). The actuators can be fitted with the standard carrier mounting facing in any direction.

To prevent contamination such as fluid ingress, the actuator should be fitted with its sealing band facing downwards.

The inversion mounting can be fitted to transfer the driving force to the opposite side.

Maintenance

All moving parts are long-term lubricated for a normal operational environment. Parker Origa recommends a check and lubrication of the actuator, 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 actuator.

First service start-up

The maximum values specified in the technical data sheet for the different products must not be exceeded. Before taking the actuator as a machine into service, the user must ensure the adherence to the EC Machine Directive 2006/42/EG.

OSP-E..SB Ball Screw Actuator with internal Plain Bearing Guide Size 25, 32, 50



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



Sizing Performance Overview

Maximum Loadings

Sizing of Actuator

The following steps are recommended for selection :

1. Recommended maximum acceleration is shown in graphs on page 61.
2. Required torque is shown in graphs
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 page 59 ff)

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		±0.05		
Max. Standard stroke length	[mm]	1100	2000		3200		

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 (l_x, l_y, l_z) for calculation of moments relates to the centre axis of the actuator.

Maximum permissible Loads				
Series	Max. applied load [N] Fz	Max. moments [Nm]		
		Mx	My	Mz
OSP-E25SB	500	2	12	8
OSP-E32SB	1200	8	25	16
OSP-E50SB	3000	16	80	32

Combined Loads

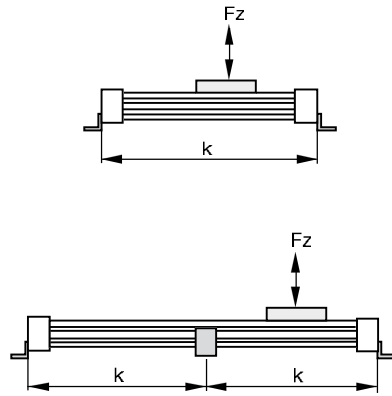
If the actuator is subjected to several forces, loads and moments at the same time, the maximum load is calculated with the equation shown here. The maximum permissible loads must not be exceeded.

Equation for combined loads

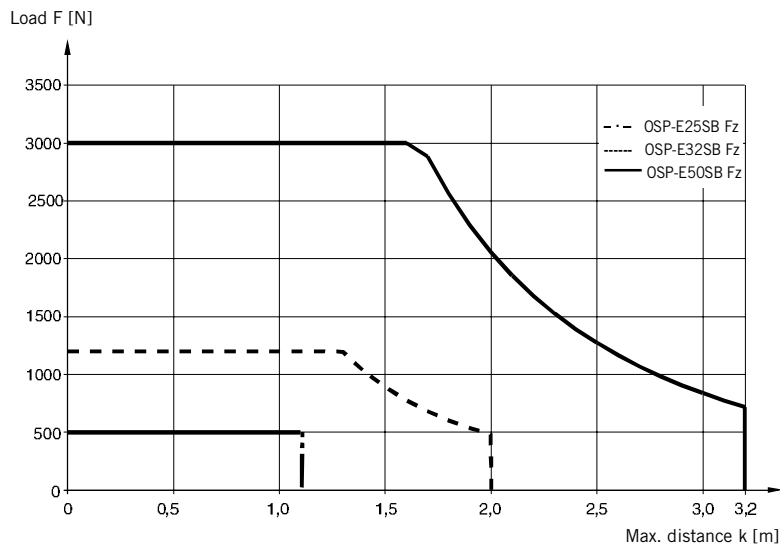
$$\frac{F_z}{F_z \text{ (max)}} + \frac{M_x}{M_x \text{ (max)}} + \frac{M_y}{M_y \text{ (max)}} + \frac{M_z}{M_z \text{ (max)}} \leq 1$$

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

Maximum Permissible Unsupported Length – Placing of Profile Mounting



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 actuators 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.

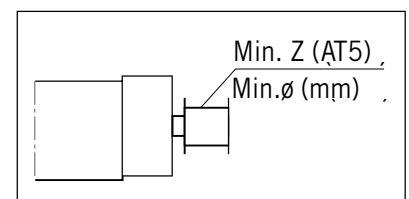
For advise, please contact your local Parker Origa technical support department.

Mounting on the Drive Shaft

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

Pulleys

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

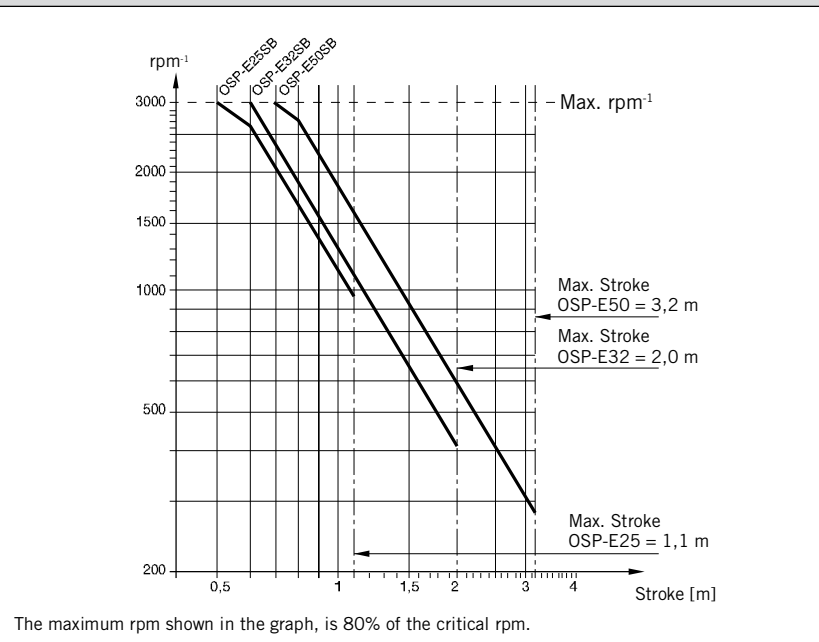


Size	Min. Z	Min. Ø
OSP-E25SB	24	38
OSP-E32SB	24	38
OSP-E50SB	36	57

Maximum rpm / Stroke

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

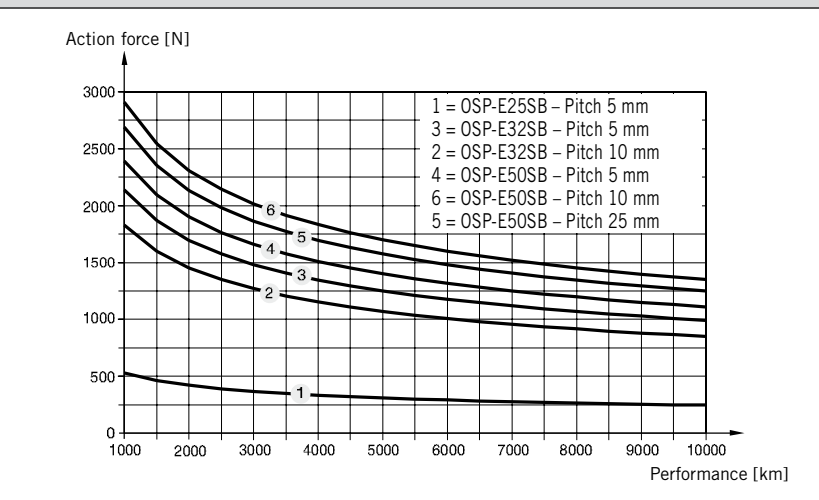
Maximum rpm / Stroke



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.

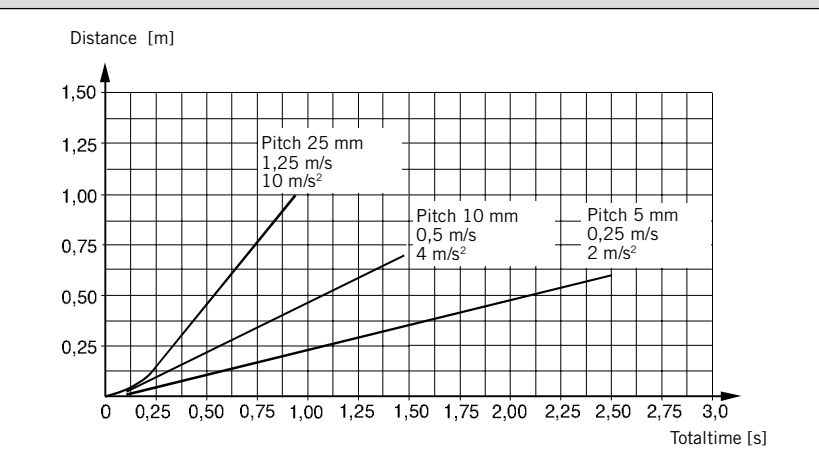
Performance as a function of the action force



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

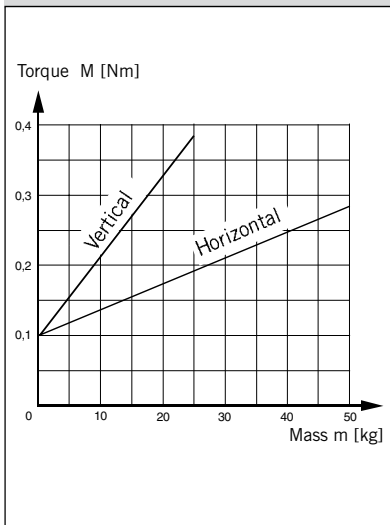


Required Torque / Mass

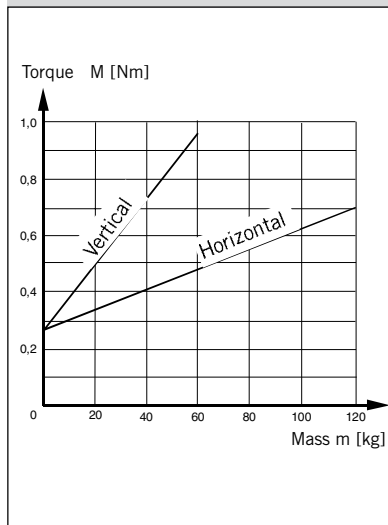
Using the known mass, the direction of the application and the recommended acceleration, the actuator can be sized and the required torque is shown in the adjacent graphs.
 Mass in graphs = Load + moving mass of the actuator according to the weight chart (see table on page 61).

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

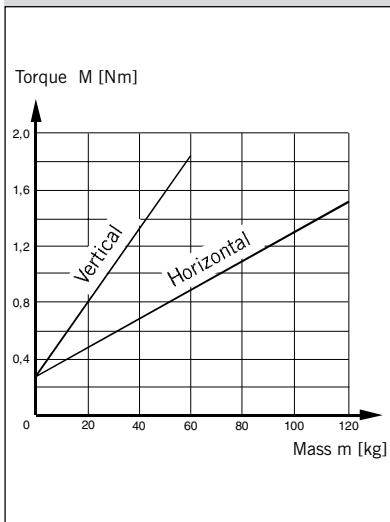
Size OSP-E25SB, Pitch 5mm
 Acceleration 2 m/s²



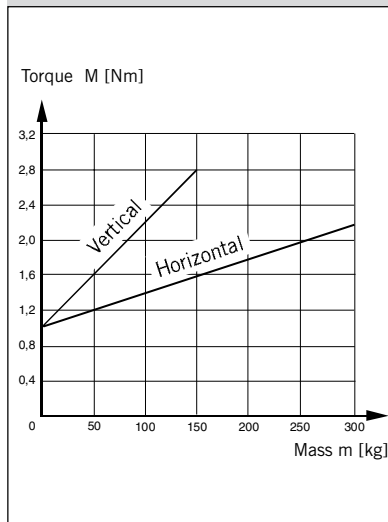
Size OSP-E32SB, Pitch 5 mm
 Acceleration 2 m/s²



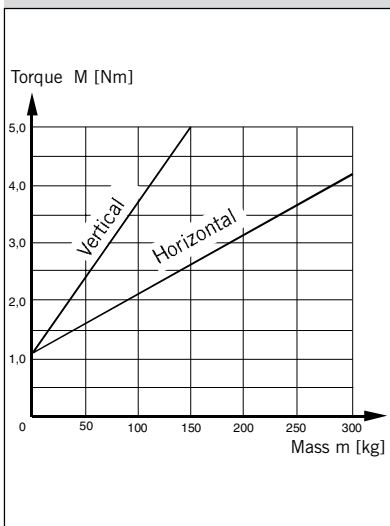
Size OSP-E32SB, Pitch 10 mm
 Acceleration 4 m/s²



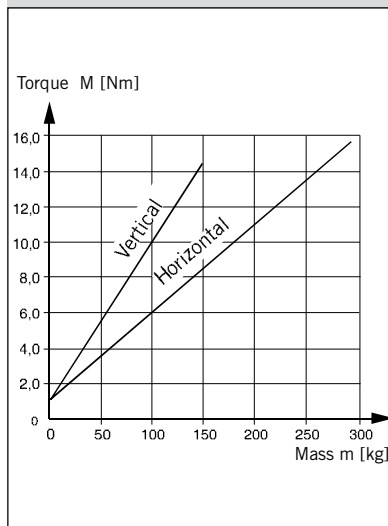
Size OSP-E50SB, Pitch 5 mm
 Acceleration 2 m/s²



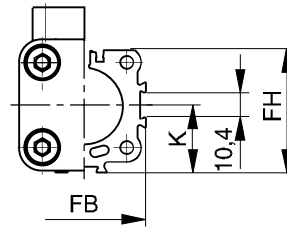
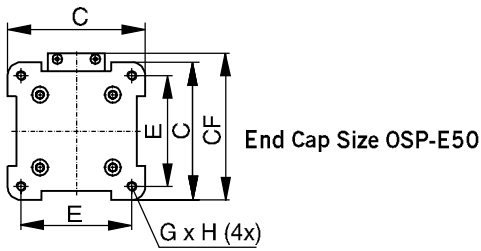
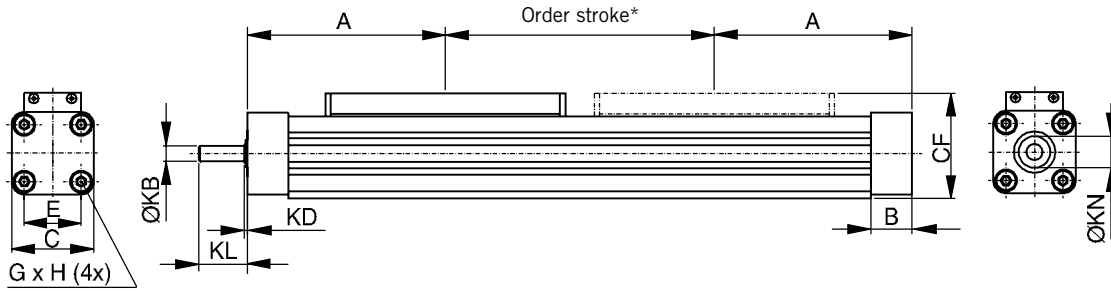
Size OSP-E50SB, Pitch 10 mm
 Acceleration 4 m/s²



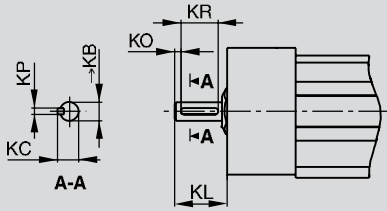
Size OSP-E50SB, Pitch 25 mm
 Acceleration 10 m/s²



OSP-E..SB
Ball Screw Actuator with internal Plain Bearing Guide – Basic Unit



Plain shaft with keyway (Option)



Dimension Table [mm]

Series	ØKB _{h7}	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	17.0	43	58	6	5	28

Option 3: Keyway
 Option 4: Keyway long version

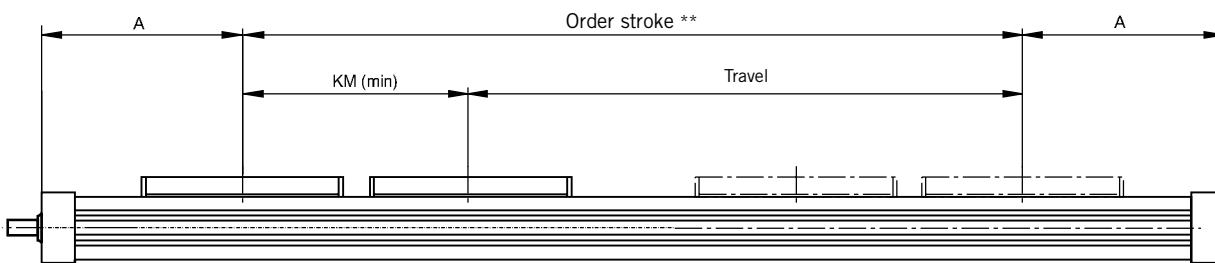
*** Note:**

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.

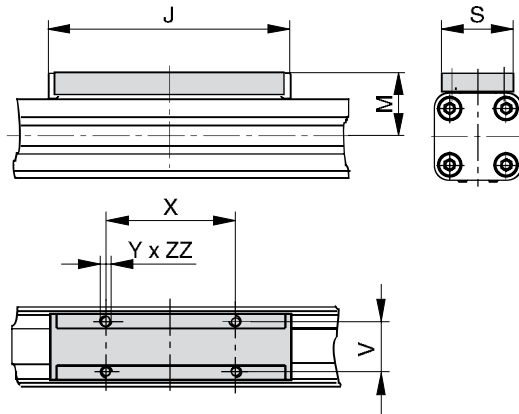
The use of an AC motor with frequency converter normally requires a larger safety clearance than that required for servo systems. For further information, please contact your local Parker Origa representative.

Option – Tandem



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

Standard Carrier



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	22.0	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	33.0	87	70	M6 x 12	200	43.0	49	36	27	110	M6	92.5	76	77.0	15 _{h7}	3	43	235	28	10

Order Instructions OSPE25 — 1 0 3 0 0 — 00000 — 0 0 0 0 0 0

Size of actuator	
25	Size 25
32	Size 32
50	Size 50

Type of actuator	
1	Ball screw actuator with internal plain bearing guide

Carriage	
0	Standard
1 *	Tandem
3 *	Clean room
4 *	Position measurement system SFI-plus (see page 171 ff)

Pitch	
3	5 mm (size 25, 32 and 50)
4	10 mm (size 32 and 50)
5	25 mm (size 50)

* Option

Gear mounting *				
Size		25	32	50
0	without	x	x	x
1	LP050 i = 5	x	x	
2	LP050 i = 10	x	x	
3	LP070 i = 3		x	x
4	LP070 i = 5		x	x
5	LP070 i = 10		x	x

Info: For gears the mounting kit of the motor must be specified.
 LP050: A0, A1, A2
 LP070: A1, A2, A3

Order stroke
5 digits input in mm

Drive Shaft	
0 —	Plain Shaft
3 —*	Keyway
4 —*	Long with keyway

Mounting Kit for Motor and Gear *				
Size		25	32	50
A0	SY563T	x ¹	x ¹	
A1	SY873T	x ¹	x ¹	x ¹
A2	SMx60 xx xxx 8 11 ...	x ¹	x ¹	
A3	SMx82 xx xx 8 14 ...		x ¹	x ¹
A7	PS60		x ¹	x ¹
C0	LP050 / PV40-TA	x ¹	x ¹	
C1	LP070 / PV60-TA		x ¹	x ¹

x¹: If a mounting kit is selected the **drive shaft** is a plain shaft

Info: Motor and Gear mounting dimensions see page 193

Guide position	
0	Standard

External guide / carriage mounting	
0	Without
2	SL Slideline
6	PL Proline
D	HD Heavy duty
E	PS Powerslide 25/25
F	PS Powerslide 25/35, 32/35
G	PS Powerslide 25/44, 32/44
H	PS Powerslide 50/60
I	PS Powerslide 50/76
M	Inversion
R	Compensation
S	Compensation low back lash
see page 155 ff	

Niro	
0	Standard
1*	Niro screw

Accessories - please order separately	
Description	Page
Motor mounting	137 ff
Multi-axis system for actuators	177 ff

Magnetic switches *	
0	Without
1	1 pc. RST-K 2NO / 5m cable
2	1 pc. RST-K 2NC / 5m cable
3	2 pc. RST-K 2NC / 5m cable
4	2 pc. RST-K 2NC, 1 pc. RST-K 2NO / 5m cable
5	1 pc. RST-S 2NO / M8 plug
6	1 pc. RST-S 2NC / M8 plug
7	2 pc. RST-S 2NC / M8 plug
8	2 pc. RST-S 2NC, 1 pc. RST-S 2NO / M8 plug
A	1 pc. EST-S NPN / M8 plug
B	2 pc. EST-S NPN / M8 plug
C	3 pc. EST-S NPN / M8 plug
D	1 pc. EST-S PNP / M8 plug
E	2 pc. EST-S PNP / M8 plug
F	3 pc. EST-S PNP / M8 plug
see page 165 ff	

Profile mounting *	
0	Without
1	1 pair type E1
2	1 pair type D1
3	1 pair type MAE
4	2 pair type E1
5	2 pair type D1
6	2 pair type MAE
7	3 pair type E1
8	3 pair type D1
9	3 pair type MAE
K	1 pair type E2
L	1 pair type E3
M	1 pair type E4
N	2 pair type E2
P	2 pair type E3
Q	2 pair type E4
R	3 pair type E2
S	3 pair type E3
T	3 pair type E4
see pages 147 ff and 161 ff	

End cap mounting *	
0	Without
1	1 pc. type A1 (size 25 and 32) or C1 (size 50)
2	1 pc. type A2 (size 25 and 32) or C2 (size 50)
3	1 pc. type A3 (size 25 and 32) or C3 (size 50)
4	1 pc. type B1 (size 25 and 32) or C4 (size 50)
5	1 pc. type B4 (size 25 and 32)
see page 141 ff and 161 ff	

Autoryzowany dystrybutor Parker:

ARA
PNEUMATIK

53-012 Wrocław tel. 71 364 72 82
ul. Wyścigowa 38 fax 71 364 72 83

www.arapneumatik.pl

