OSP-E..B
Belt Actuator with
Internal Plain Bearing Guide

Content

Parker Hannifin Corporation
Pneumatic Division - Europe

Belt actuator with Internal Plain Bearing Guide for Point-to-Point Applications

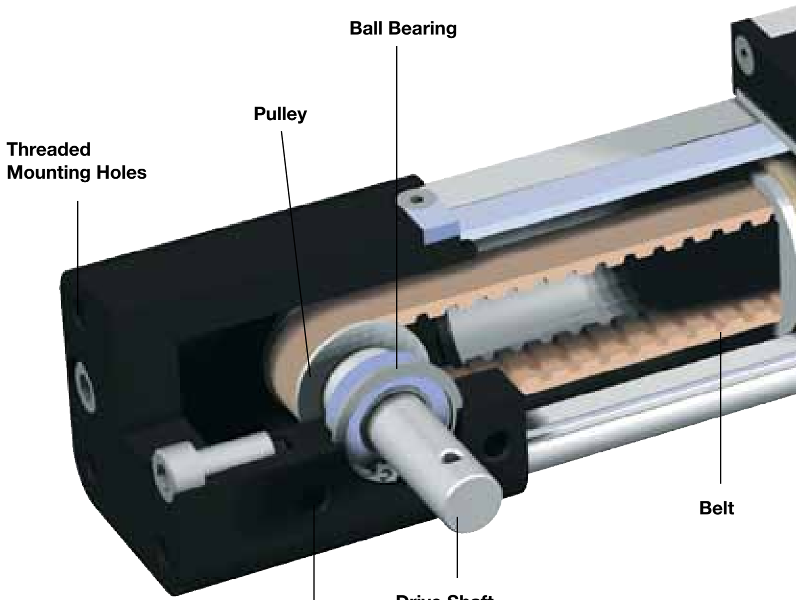
A completely new generation of actuators which can be integrated into any machine layout neatly and simply.

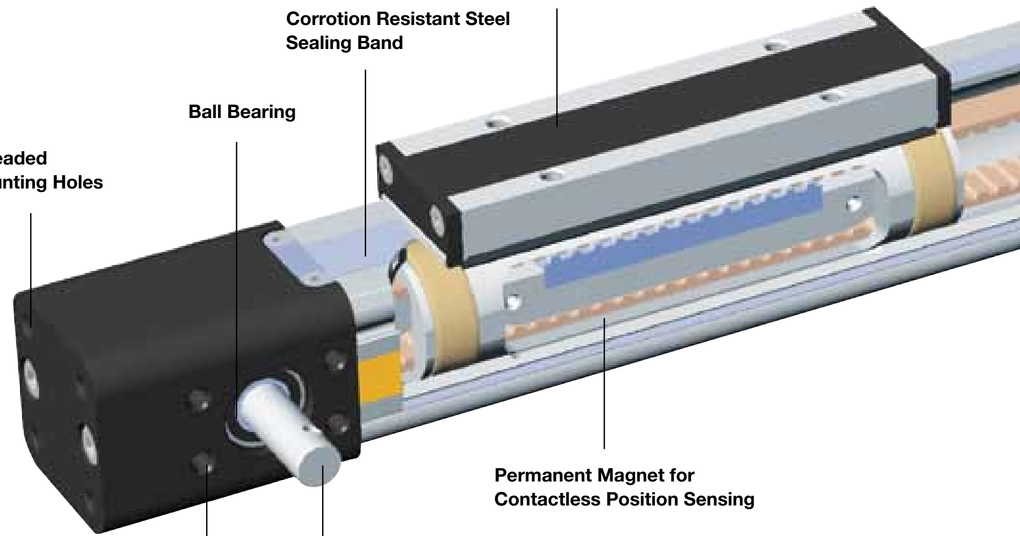
Advantages

- Precise Path and Position Control
- High Speed Operation
- Easy Installation
- Low Maintenance
- Ideal for Precise Point-to-Point Applications

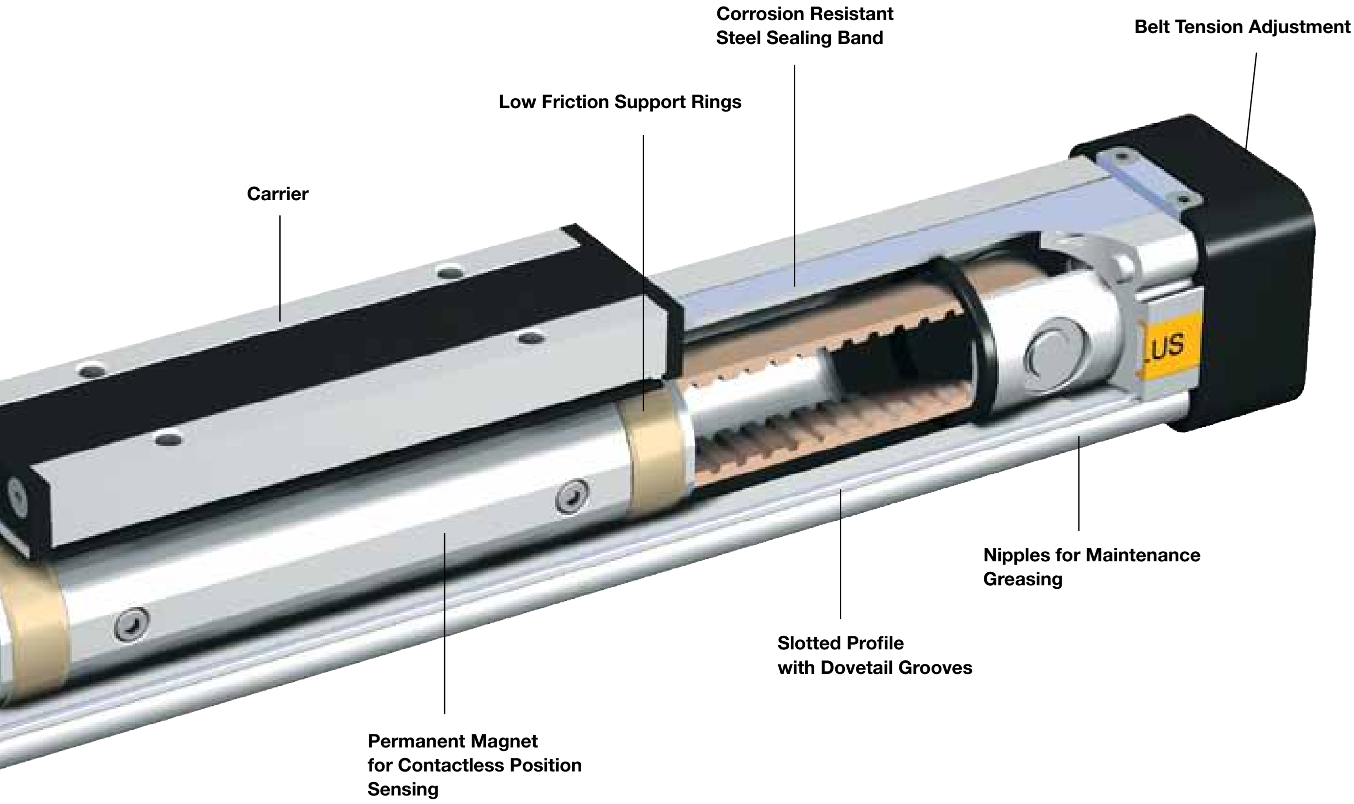
Features

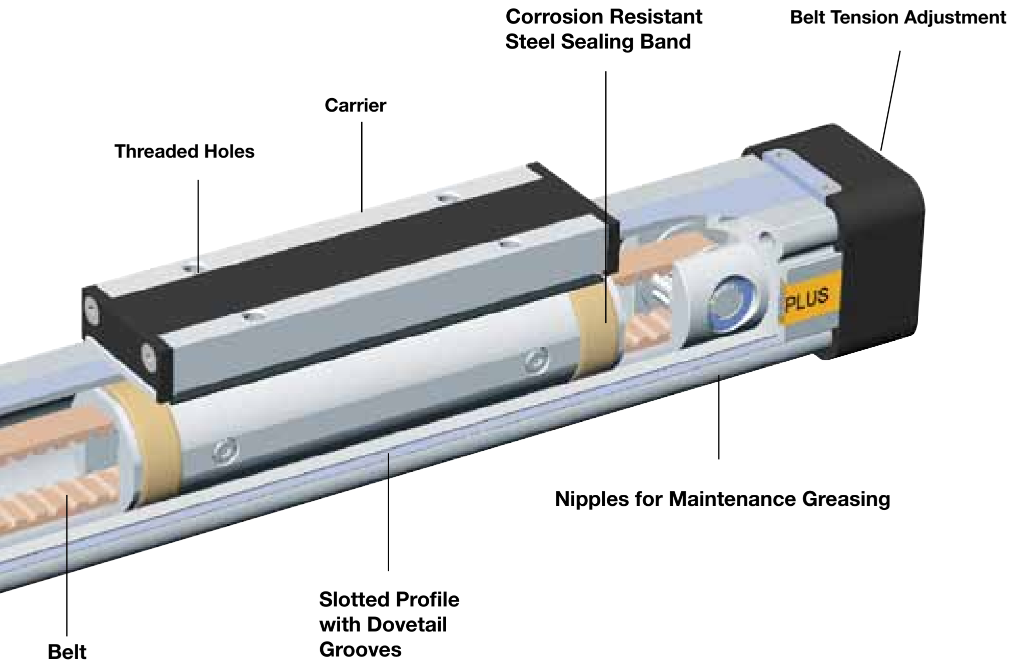
- Integrated Drive and Guidance System
- Tandem Configuration with Increased Carrier Distance for Higher Moment Supports
- Long Available Strokes
- Complete Motor and Control Packages
- Diverse Range of Accessories and Mountings
- Bi-Parting and Special Options Available





The System Concept



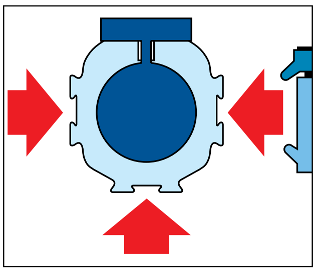


POWERSLIDE
Roller bearing precision guidance for smooth travel and high dynamic or static loads.

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 actuator expand its function into that of a universal system carrier.
Modular system components are simply clamped on.

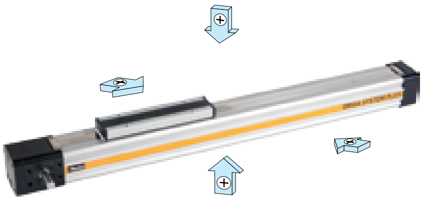


OSP-E..B Belt Actuator with internal Plain Bearing Guide

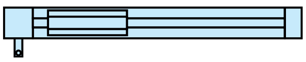
STANDARD VERSIONS

OSP-E..B

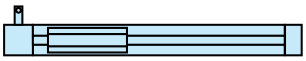
Carrier with internal guidance and magnet packet for contactless position sensing. Dovetail profile for mounting of accessories and the actuator itself.



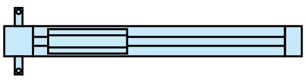
Drive Shaft Versions
– Plain shaft or
– Double plain shaft (Option) e.g. to drive two actuators in parallel.



Standard



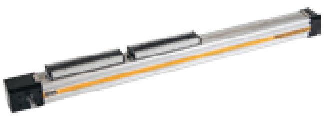
Standard



Option

OPTIONS

Tandem
For higher moment support.



Bi-parting
For perfectly synchronised bi-parting movements.

Accessories

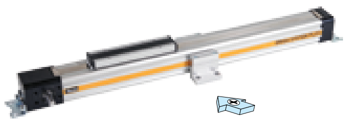
Motor Mounting

End Cap Mounting

For end-mounting of the actuator.

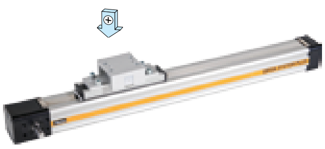
Profile Mounting

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



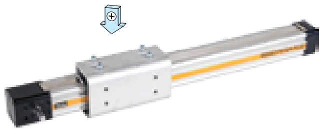
Clevis Mounting

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 Sensors Series RST and EST

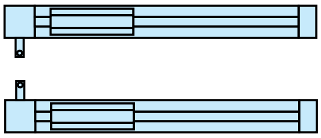
For contactless position sensing of end stop and intermediate carrier positions.

Parker Hannifin Corporation
Pneumatic Division - Europe

OSP-E..B Belt Actuator with Internal Plain Bearing Guide - Size 25, 32, 50

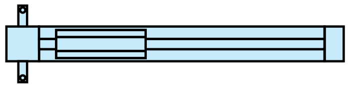
Standard Version

- 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 Synchronised Movements
- Drive shaft with double plain shaft



Characteristics

		Symbol	Unit	Description
General Features				
Series				OSP-E..BHD
Name				Belt Actuator with Internal Plain Bearing Guide
Mounting				see drawings
Temperature Range		ϑ_{min} ϑ_{max}	°C °C	-30 +80
Weight (mass)			kg	see table
Installation				see table
	Slotted Profile			Extruded Anodized Aluminium
Material	Belt			Steel-corded Polyurethane
Material	Pulley			Aluminium
Material	Guide Bearings			Low Friction Plastic
Material	Sealing Band			Hardened Corrosion Resistant Steel
Material	Screws, Nuts			Zinc Plated Steel
Material	Mountings			Zinc Plated Steel and Aluminium
Encapsulation Class			IP	54

Weight (mass) and Inertia

Series	Weight (mass) [kg]			Inertia [x 10^{-6} kgm²]	
	at stroke 0 m	ad per metre stroke	moving mass	at stroke 0 m	ad per metre stroke
OSP-E25B	0.9	1.6	0.2	25	6.6
OSP-E32B	1.9	3.2	0.4	43	10
OSP-E50B	5.2	6.2	1.0	312	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 actuator. See if profile mountings are needed using the maximum allowable unsupported length graph on page 45.
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.

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 recommends a check and lubrication of the actuator, and if necessary a change of the 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 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.

Sizing of Actuator

The following steps are recommended for selection:

1. Required acceleration see table
2. Required torque is shown on page 46 and 47.
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 page 45).

Performance Overview

T1

Characteristics		Unit	Description		
Size			**OSP-E 25B**	**OSP-E 32B**	**OSP-E 50B**
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]	3,000	5,000	5,000
Max. Stroke Length OSP-E..B*		[mm]	2 x 1,500	2 x 2,500	2 x 2,500

*Bi-parting version

Maximum Permissible Torque on Drive Shaft Speed / Stroke

T2

OSP-E-25B				OSP-E-32B				OSP-E-32B			
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 torque on the drive shaft is the lowest value of the speed- or stroke-dependent torque 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.

Maximum Permissible Loads

T3

Series	Max. applied load F_z [N]	Max. moments [Nm] M_x	M_y	M_z
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

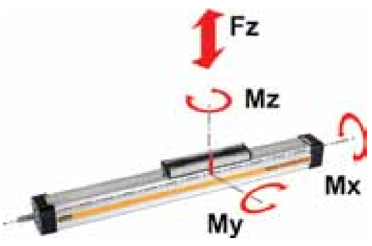
If the actuator is subjected to several forces, loads and moments at the same time, the maximum load is calculated with the equation shown here.
The maximum permissible loads must not be exceeded.

Equation of Combined Loads

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

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

Forces, Loads and Moments



M = F · l [Nm]

$M_x = M_{x\ stically} + M_{x\ dynamically}$

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

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

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

Stroke Length

The stroke lengths of the actuators 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 *

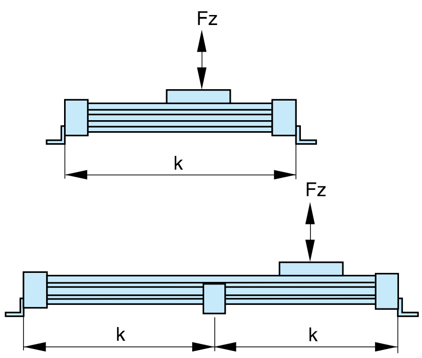
* Version: Bi-partional

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 technical support department.

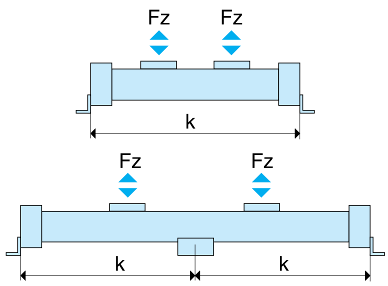
Maximum Permissible Unsupported Length – Placing of Profile Mounting

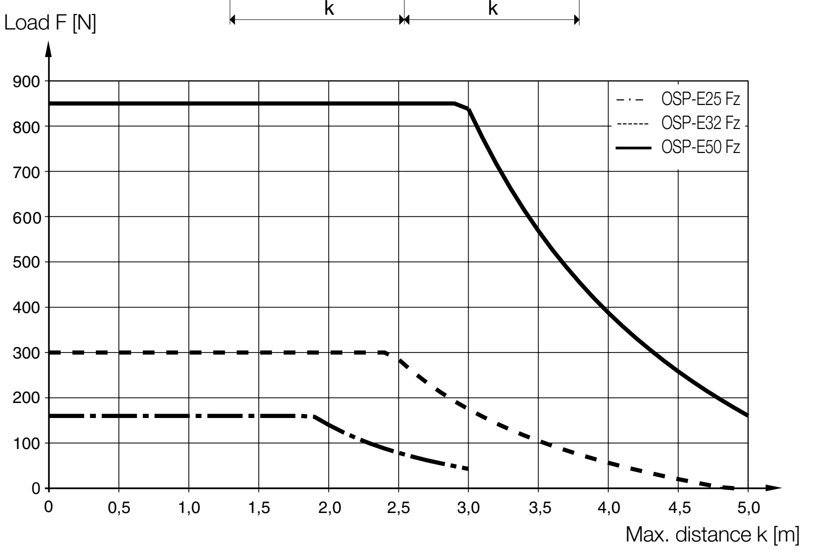
Series OSP-E..B



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

Series OSP-E..B
Bi-parting version





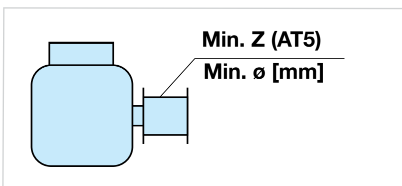
(Up to the curve in the above graph the deflection will be max. 0.2 % of distance k)

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.



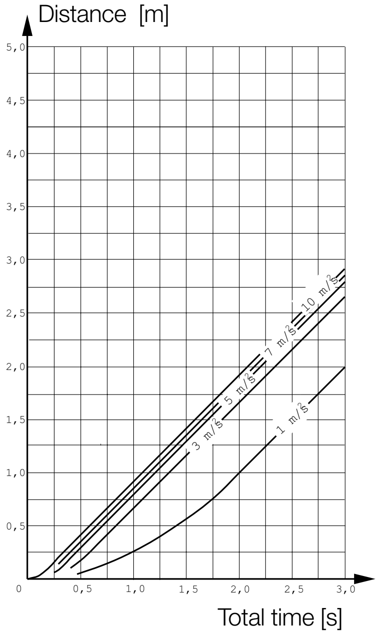
Series	Min. Z	Min Ø
OSP-E25B	24	38
OSP-E32B	24	38
OSP-E50B	36	57

Distance / Time Graph

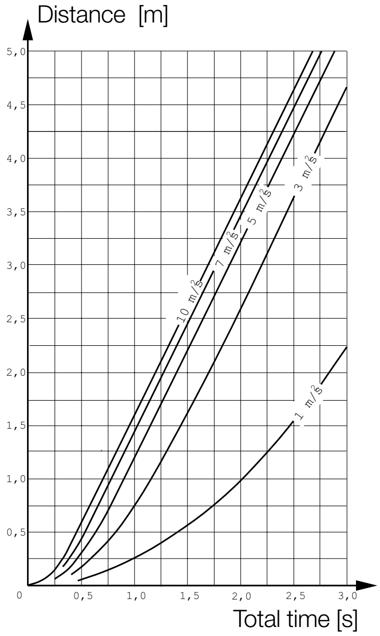
Using the required travel distance and total time, the adjacent graphs show the required acceleration based on maximum speed.

The graphs assume that acceleration and deceleration are equal. Please note that specifying non-essential high accelera-tion or short cycle time will result in an oversized motor.

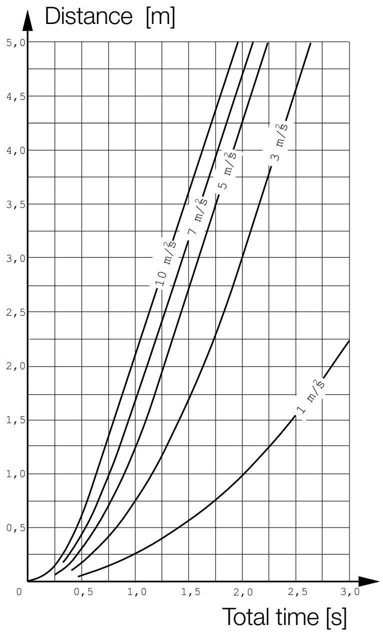
Max. Speed 1 m/s



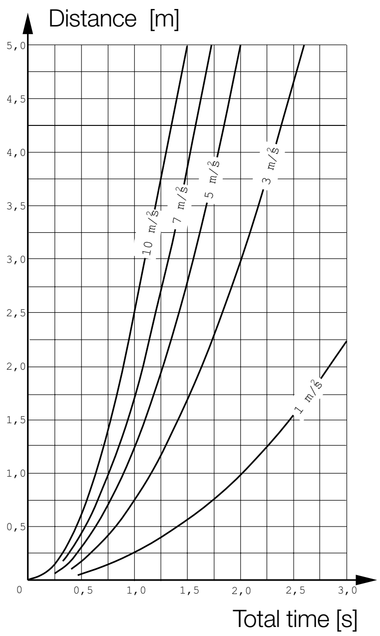
Max. Speed 2 m/s



Max. Speed 3 m/s



Max. Speed 5 m/s

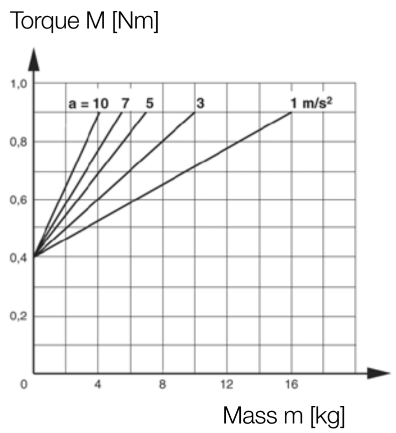


Required Torque / Mass

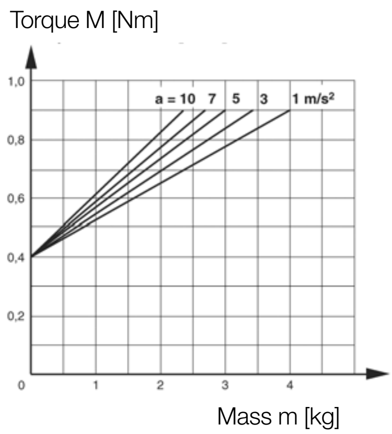
Using the known mass, the direction of the application and the required acceleration from the distance-time graphs, the actuator can be sized and the required torque is shown in the adjacent graphs.
Mass in graphs = Load + moving mass of the actuator (according to the weight chart on data sheet 43 ff).

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

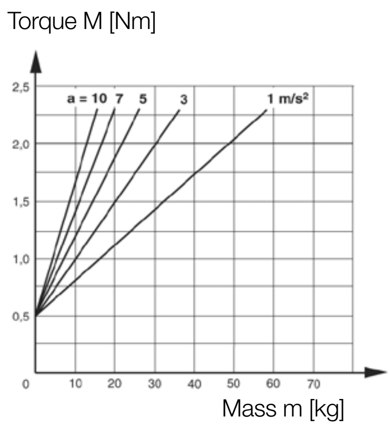
Size OSP-E25B, Horizontal Application



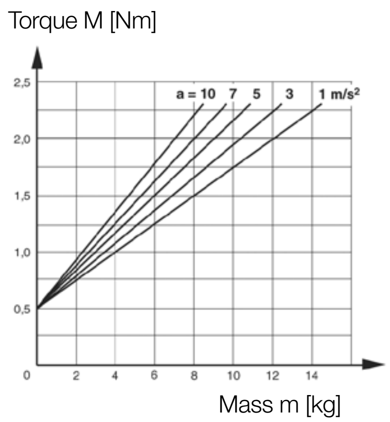
Size OSP-E25B, Vertical Application



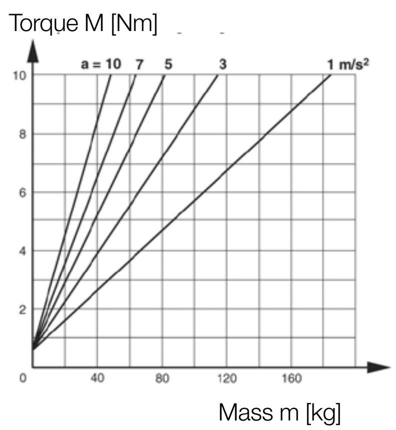
Size OSP-E32B, Horizontal Application



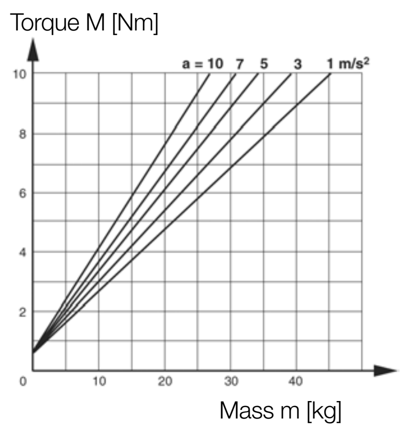
Size OSP-E32B, Vertical Application



Size OSP-E50B, Horizontal Application

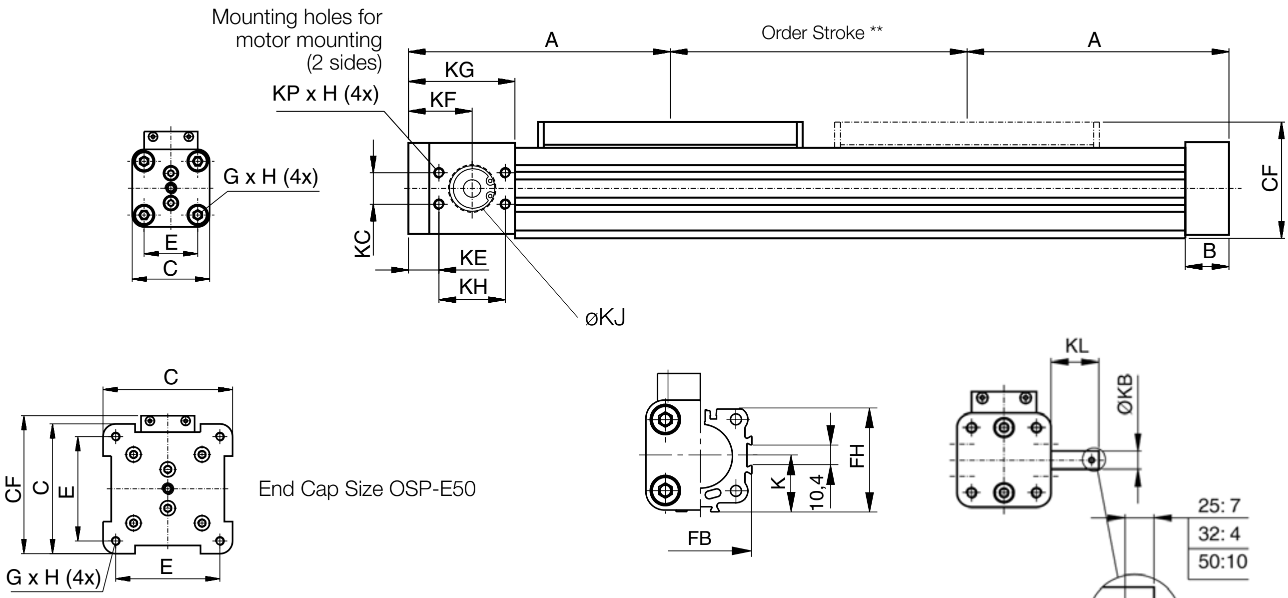


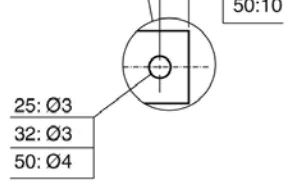
Size OSP-E50B, Vertical Application



OSP-E Belt Actuator with Internal Plain Bearing Guide

OSP-E..B - Basic Unit

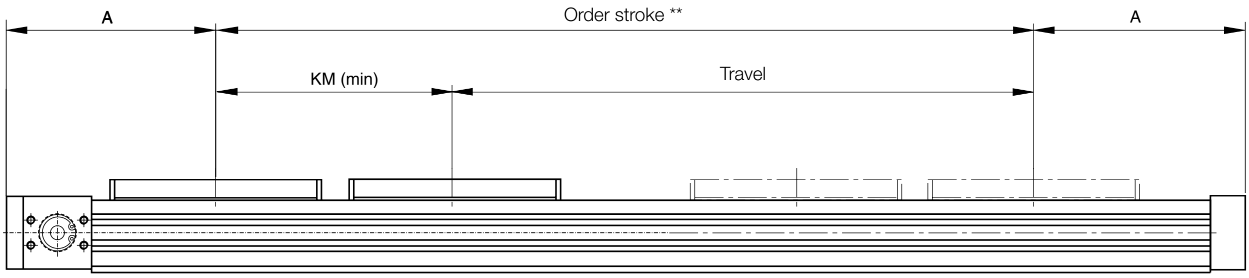




(For options on drive shaft, see ordering information on page 50)

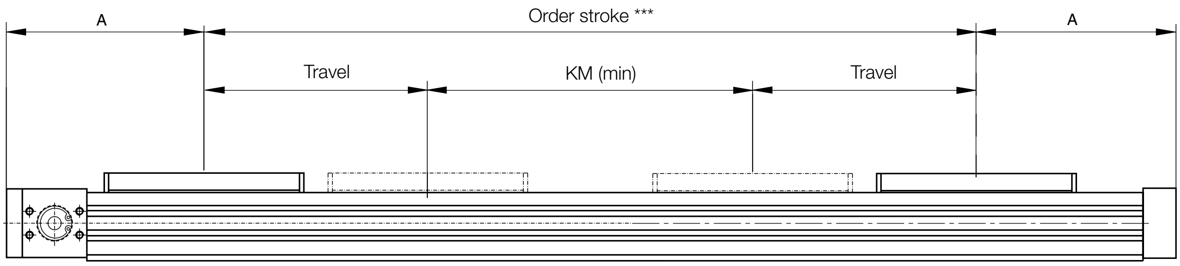
* **Note:** The mechanical end position must not be used as a mechancial end stop. Allow an additional safety clearance at both ends equivalent to the linear movement of one revolution of the drive shaft, but at least 100 mm. Order stroke = required travel + 2 x safety distance.
The use of an AC motor with frequency converter normally requires a larger safety clearance than that required for servo systems. For further information please contact you local Parker representative.

Option – Tandem



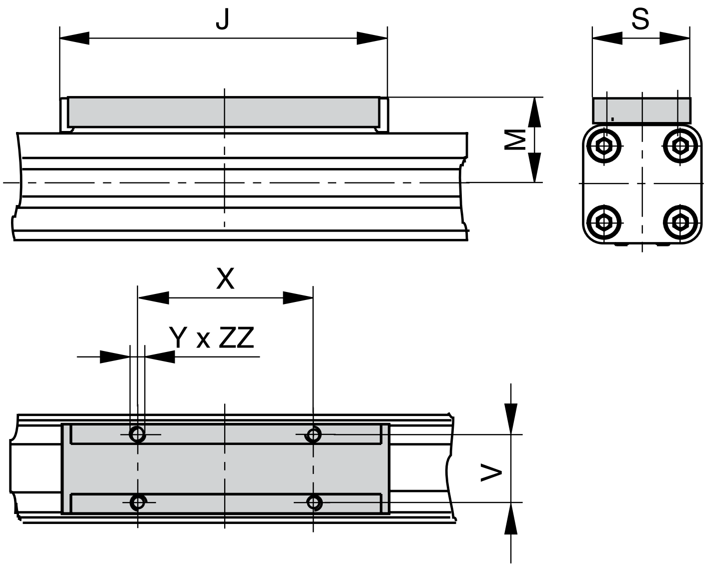
** Order stroke = required travel + KM min + 2 x safety distance

Option – Bi-parting



*** Order stroke = 2 x 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
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	43.0	49	36	27	110	M6	92.5

Series	FB	FH	KB	KC	KE	KF	KG	KH	KJ	KL	KM_{min}	$KM_{recc.}$	KP x H	ZZ
OSP-E25B	40	39.5	10_{j6}	15	22.0	37.0	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	77.0	16_{h8}	32	23.5	48.5	85	50	40^{H7}	34	220	320	M8 x 16	10

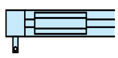
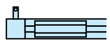
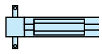
Parker Hannifin Corporation
Pneumatic Division - Europe

Order Instructions	OSPE25	–	0	0	0	0	0 –	00000	–	0	0	0	0	0	0

Size of Actuator	
25	Size 25
32	Size 32
50	Size 50

Type of Actuator	
0	Belt Actuator with Internal Plain Bearing Guide

Carriage	
0	Standard
1*	Tandem
2*	Bi-parting

Drive Shaft / Motor Mounting Position		
0	Plain Shaft / Motor Standard	
1	Plain Shaft / Motor 180° Standard	
2*	Double Plain Shaft	

Order Stroke
5 digits input in mm

Mounting Kit for Motor and Gear

Size		25	32	50
0 -	without	x	x	x
A 0	SY563T	x	x	
A 1	SY873T	x	x	x
A 2	SMx60 xx xxx 8 11 …	x	x	
A 3	SMx82 xx xx 8 14 …		x	x
A 4	SMx100 xx xx 5 19…			x
A 7	PS60		x	x
C 0	LP050 / PV40-TA	x	x	
C 1	LP070 / PV60-TA		x	x

Info: Motor and gear mounting dimensions see page 191

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

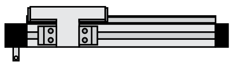
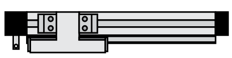
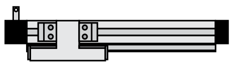
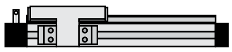
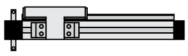
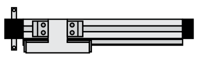
Info: For gears the mounting kit of the motor must be specified.
LP050: A0, A1, A2
LP070: A1, A2, A3

Magnetic Sensors *

see page 165 ff

0	without
1	1 pc. RST-K 2NO / 5 m Cable
2	1 pc. RST-K 2NC / 5 m Cable
3	2 pc. RST-K 2NC / 5 m Cable
4	2 pc. RST-K 2NC, 1 pc. RST-K 2NO / 5 m 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

Guide Position

0	Standard	
1	180° Standard	
0	Standard	
1	180° Standard	
0	Standard	
1	180° Standard	

External Guide / Carriage Mounting*

see page 99 ff

0	without
6	PL Proline
E	PS Power Slide 25/25
F	PS Power Slide 25/35, 32/35
G	PS Power Slide 25/44, 32/44
H	PS Power Slide 50/60
I	PS Power Slide 50/76
M	Inversion
R	Compensation
S	Compensation Low Back Lash

Profile Mounting *

see pages 147 ff and 161 ff

0	without
1	1 Pair Type E1
2	1 Pair Type D1
3	1 Pair Type MAE
4	2 Pair Type 1
5	2 Pair Type D1
6	2 Pair Type MAE
7	3 Pair Type 1
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

Niro

0	Standard
1*	Niro

Accessories - please order separately

Description	Page
Motor Mounting	136 ff
Multi-Axis System for Actuators	177 ff

End Cap Mounting *

see pages 147 and 161 ff

0	without
1	1 Pair Type A1 (size 25 and 32) or C1 (size 50)
2	1 Pair Type A2 (size 25 and 32) or C2 (size 50)
3	1 Pair Type A3 (size 25 and 32) or C3 (size 50)
4	1 Pair Type B1 (size 25 and 32) or C4 (size 50)
5	1 Pair Type B4 (size 25 and 32)

* Option