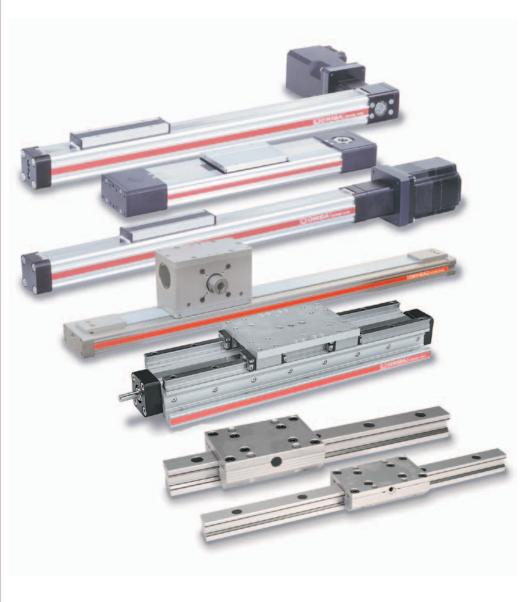




aerospace
climate control
electromechanical
filtration
fluid & gas handling
hydraulics
pneumatics
process control
sealing & shielding





OSP-E Series Electric Linear Drives and Guides

Catalog 0950-2







⚠ WARNING

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2D & 3D
CAD Drawings
can be downloaded
from website
www.parkeroriga.com

ATTENTION!

Contact PARKER-ORIGA for sizing software and/or technical assistance
1-877-321-4736
Application Sheet on Page 162

All dimensions are in European-Standard.

Please convert all in US-Standard.

Conversion Table

Multiply	Ву	To Obtain
Millimeters	.03937	Inches
Newtons	.2248	Lbs.(F)
Newton-Meters	8.8512	In-Lbs
Kilograms	2.205	Lbs.
Inches	25.4	Millimeters
Lbs.(F)	4.448	Newtons
In-Lbs	.113	Newtons-Meters
Lbs.	.45359	Kilograms







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The System Concept

Based on the concept of the rodless pneumatic cylinder, well proven worldwide, Parker-Origa now offers the complete solution for actuator systems. Developed for absolute reliability, high performance, easy handling and optimized design, ORIGA SYSTEM PLUS can master even the most difficult installation requirements.

ORIGA SYSTEM PLUS

is a completely modular concept, enabling pneumatic and electric actuators to be combined with guides and control modules for all kinds of applications. The main system carriers are the actuators themselves, consisting of extruded aluminum profiles with double dovetail slots on three sides,

providing direct mounting for all modular options.



MODULAR SYSTEM

- · Electric Belt Actuator
 - For applications with higher speeds and precise movement and positioning for longer travel.
- · Electric Screw Actuator
 - For higher actuator power and precise movement and positioning.

Pneumatic Drive

- For a wide variety of applications with simple handling, combined with simple control possibilities and a broad power spectrum.
- Ideal for fast, repetitive movements and simple positioning duties.

For additional information on rodless pneumatic actuators, please contact factory for OSP-P literature.

- 18 additional guide variants provide any required precision, performance and load capacity.
- Compact solutions, easy to install and simple to retrofit.
- Valves and control elements can be mounted directly on the pneumatic actuator.
- A wide range of mounting options provides great installation flexibility.



The System Concept

Basic Actuator Standard Version · Series OSP-P* • Series OSP-E Toothed Belt with internal Plain Bearing Guide Toothed Belt with Integrated Guides Vertical Toothed Belt with Integrated Recirculating Ball Bearing Guide Screw (Ball Screw, Trapezoidal Screw) Air Connection on the End-face or both at One End · Series OSP-P* Clean Room Cylinder certified to DIN EN ISO 146644-1 · Series OSP-P* · Series OSP-E..SB Products in ATEX-Version Series OSP-P* (2x)Rodless Cylinders Products in ATEX-Version · Series OSP-P* Rodless Cylinders with $\langle \epsilon_x \rangle$ Plain Bearing SLIDELINE Cylinders for Syncronized Counter-rotation of the Cylinders · Series OSP-P* Integrated 3/2-Way Valves · Series OSP-P* Clevis Mounting · Series OSP-P* · Series OSP-E Belt · Series OSP-E Screw **End Cap Mounting** · Series OSP-P* · Series OSP-E Belt · Series OSP-E Screw Mid-Section Support · Series OSP-P* · Series OSP-E Belt Series OSP-E Screw

_		
	Inversion Mounting • Series OSP-P* • Series OSP-E Belt • Series OSP-E Screw	
	Duplex-Connection • Series OSP-P*	To a
	Multiplex-Connection • Series OSP-P*	
	Linear Guides - SLIDELINE • Series OSP-P* • Series OSP-E Screw	
	Linear Guides - POWERSLIDE • Series OSP-P* • Series OSP-E Belt • Series OSP-E Screw	
	Linear Guides - PROLINE • Series OSP-P • Series OSP-E Belt drive* • Series OSP-E Screw drive*	
	Linear Guides – STARLINE • Series OSP-P*	
	Heavy Duty Guides – HD • Series OSP-P* • Series OSP-E Screw	
	Brakes • Active Brakes* • Passive Brakes*	
	Magnetic Switches • Series OSP-P* • Series OSP-E Belt • Series OSP-E Screw	rus
	SFI-Plus Displacement Measuring Systems • Series OSP-P*	

ORIGA



· Series OSP-E Screw

^{*} Information on Pneumatic Linear Drives, contact factory for literature

Overview

Drives	OSP-E20 -BHD 1)	OSP-E25 -BHD 1), 2)	OSP-E32 -BHD ^{1), 2)}	OSP-E50 -BHD 1), 2)	OSP-E20 -BV 3)	OSP-E25 -BV ³⁾	OSP-E25 -B ⁴⁾	OSP-E32 -B 4)	OSP-E50 -B ⁴⁾	
Effective action force FA [N]	450 - 550	550 - 1070	1030 - 1870	1940 - 3120	450 - 650	1050 - 1490	50	100 - 150	300 - 425	
Max. Velocity v [m/s]	3.0	10.0 / 5	10.0 / 5	10.0 / 5	3.0	5.0	2.0	3.0	5.0	
Integrated Magnets	0	0	0	0	_	_	0	0	0	
Free choice of stroke length [mm] **	1 - 5760	1 - 7000	1 - 7000	1 - 7000	1 - 1000	1 - 1500	1 - 3000	1 - 5000	1 - 5000	
Temperature range [°C]	-30 - +80	-30 - +80	-30 - +80	-30 - +80	-30 – +80	-30 - +80	-30 – +80	-30 - +80	-30 – +80	
Tandem Version	0	0	0	0	0	0	0	0	0	
Bi-parting Version	0	0	0	0	_	_	0	0	0	
Stainless steel parts	Χ	Χ	Х	Χ	Χ	Χ	Х	Χ	X	
Integrated planetary gearbox LPB***	-	0	0	0	_	-	_	-	-	
Self-Guidance										
F [N]	1600	3000 / 986	10000 / 1348	15000 / 3704	1600	3000	160	300	850	
Mx [Nm]	21	50 / 11	120 / 19	180 / 87	20	50	2	8	16	
My [Nm]	150	500 / 64	1000 / 115	1800 / 365	100	200	12	25	80	
Mz [Nm]	150	500 / 64	1400 / 115	2500 / 365	100	200	8	16	32	
Slideline										
F [N]	_	-	-	-	_	_	-	-	-	
Mx [Nm]	_	_	-	-	_	-	-	_	-	
My [Nm]	-	-	-	-	-	-	-	-	-	
Mz [Nm]	-	_	-	_	_	_	-	_	-	
Proline			,		'		,		'	
F[N]	_	_	I-	-	_	_	986	1348	3582	
Mx [Nm]	_	_	-	_	_	_	19	33	128	
My [Nm]	-	_	-	_	_	_	44	84	287	
Mz [Nm]	_	_	-	_	_	_	44	84	287	
Powerslide				ı						
F [N]	_	_	Ī-	_	_	_	910 - 1190	1400 - 2300	3000 - 4000	
Mx [Nm]	_	_	-	_	_	_	14 - 20	20 - 50	90 - 140	
My [Nm]	_	_	-	_	_	_	63 - 175	70 - 175	250 - 350	
Mz [Nm]	_	_	-	_	_	_	63 - 175	70 - 175	250 - 350	
HD-Guide (Heavy Duty)										
F [N]	_	_	I_	-	_	_	_	_	I_	
Mx [Nm]	_	_	_	_	_	_	_	_	_	
My [Nm]	_	_	_	_	_	_	_	_	-	
Mz [Nm]	_	_	-	_	_	_	-	_	-	
Accessories										
Multi-Axis System										
Connecting elements	0	0	0	0	О	0	О	0	О	
Connecting shaft	0	0	0	0	0	0	0	0	0	
Special Drives		U					10			
Clean Room Cylinders	Х	Χ	Х	Χ	Х	Х	Х	Χ	Х	
Mountings		,	_ ^	٨		-1		Λ		
Clevis Mounting	Х	Х	Х	Х	Х	Χ	0	0	О	
End Cap Mounting / Midsection Support	0	0	0	0	X	X	0	0	0	
Inversion Mounting	Х	Х	Х	Х	X	X	0	0	0	
Adapter Profile / T-Nut Profile	0	0	0	0	X	X	0	0	0	
Magnetic switches	10	U	10	J	^	٨	10	U	10	1
Reed Switches RS (NO, NC)	0	0		0	0	0	0	0	О	
Electronic Switches ES (PNP, NPN)	0	0	0	0	0	0	0	0	0	
	l O	U	10	U	10	U	10	U	10	
Measuring systems	V	V	lv	V	V	V	l v	V	l v	
	Х	Х	X	X	X	X	X	X	X	
Motor package (stepper / servo)	0	0	0	0	0	0	0	0	0	
Gearbox										
Planetary gear and angular gear	0	0	0	0	0	0	-	-	-	
 Standard version 	1) = Lie	noor Drive with Toothe	ed Belt and Integrated	Desiroulating Dall Da	and a contract of a					

- = Standard version
- = Option

- Currently not available
 other temperature ranges on request
 exc. safety clearance from mechanical end position other stroke lengths on request
 ratio i = 3, 5, 10

- 1 = Linear Drive with Toothed Belt and Integrated Recirculating Ball Bearing Guide
 2 = Linear Drive with Toothed Belt and Integrated Roller Guide
 3 = Vertical Linear Drive with Toothed Belt and Integrated Recirculating Ball Bearing Guide
 4 = Linear Drive with Toothed Belt and Internal Plain Bearing Guide
 5 = Linear Drive with Ball Screw Drive and Internal Plain Bearing Guide
 6 = Linear Drive with Toated Screw Drive and Internal Plain Bearing Guide
 7 = Linear Drive with Ball Screw Drive, Internal Plain Bearing Guide and Piston Rod
 8 = Linear Drive with Trapezoidal Screw Drive, Internal Plain Bearing Guide and Piston Rod



Overview

OSP-E25 -SB ⁵⁾	OSP-E32 -SB ⁵⁾	OSP-E50 -SB ⁵⁾	OSP-E25 -ST ⁶⁾	OSP-E32 -ST ⁶⁾	OSP-E50 -ST ⁶⁾	OSP-E25 -SBR 7)	OSP-E32 -SBR 7)	OSP-E50 -SBR 7)	OSP-E25 -STR 8)	OSP-E32 -STR 8)	OSP-E50 -STR 8)
250	600	1500	600	1300	2500	260	900	1200	800	1600	3300
0.25	0.5	1.25	0.1	0.1	0.15	0.25	0.5	1.25	0.075	0.1	0.125
0	0	0	0	0	0	0	0	0	0	0	0
1 - 1100	1 - 2000	1 - 3200	1 - 1100	1 - 2000	1 - 2500	1 - 500	1 - 500	1 - 500	1 - 500	1 - 500	1 - 500
-20 - +80	-20 - +80	-20 - +80	-20 - +70	-20 - +70	-20 - +70	-20 - +80	-20 - +80	-20 - +80	-20 - +70	-20 - +70	-20 - +70
0	0	0	0	0	0	-	-	-	-	-	-
Х	Χ	Х	Χ	Х	Χ	Х	Χ	Х	Χ	Х	Χ
_	_	-	_	_	_	_	_	-	_	-	_
									1		
500	1200	3000	500	1000	1500	-	_	 	_	I -	_
2	8	16	2	6	13	İ-	_	İ -	_	-	_
12	25	80	24	65	155	İ-	_	-	_	-	-
8	16	32	7	12	26	ļ_	_	İ -	_	-	_
'									1		
675	925	2000	675	925	2000	T -	_	I -	_	Ī-	_
14	29	77	14	29	77	ļ_	_	Ī -	_	-	_
34	60	180	34	60	180	ļ_	_	İ -	_	-	_
34	60	180	34	60	180	İ-	_	 	_	-	_
									1		
986	1348	3582	986	1348	3582	-	_	1 -	_	-	_
19	33	128	19	33	128	-	_	-	_	-	-
44	84	287	44	84	287	-	-	-	-	-	-
44	84	287	44	84	287	-	-	-	-	-	-
910-1190	1400-2300	3000-4000	900-1190	1400-2300	3000-4000	_	-	_	-	-	-
14-20	20-50	90-140	14-20	20-50	90-140	-	-	-	-	-	-
63-175	70-175	250-350	63-175	70-175	250-350	-	-	-	-	-	-
63-175	70-175	250-350	63-175	70-175	250-350	-	-	-	-	-	-
	•		<u>'</u>		<u>'</u>						
6000	6000	18000	6000	6000	18000	_	_	-	-	-	-
320	475	1400	320	475	1400	_	_	-	-	-	-
260	285	1100	260	285	1100	_	_	-	-	-	-
320	475	1400	320	475	1400	_	_	-	-	-	-
0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	Χ	Χ	Χ	X	Χ	X	Χ	X	Χ
0	0	0	0	0	0	_	-	-	-	-	-
0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	-	-	-	-	-	-
0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	_	-	_	-	-	-
0	0	0	0	0	0	0	0	0	0	0	0
 1-	_	I _	_	I _	_	l _	_	I _	_	I _	_



Drive Options

Linear Drive with Toothed Belt and integrated Recirculating Ball Bearing Guide or Roller Guide Series OSP-E..BHD







Linear Drive with Ball Screw Drive, internal Plain Bearing Guide and Piston Rod Series OSP-E..SBR



OORIGA

Vertical Linear Drive with Toothed Belt and integrated Recirculating Ball Bearing Guide Series OSP-E..BV



Linear Drive with Trapezoidal Screw Drive and internal Plain Bearing Guide Series OSP-E..ST







Standard Versions

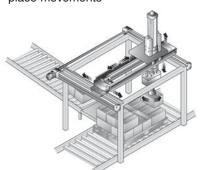
Description	Toothed Belt-Driven – Basic Versions							
Decemption	Toothed Belt-Driven with Integrated Guide	Vertical Linear Drive with Too- thed Belt	Toothed Belt-Driven					
Standard Versions	Direction of motion Position of the drive shaft	Position of the drive shaft	– Position of the drive shaft					
Options	TandemBi-directionalIntegrated Planetary Gearb	- Tandem	TandemBi-directionalNiro					
Mountings								
Clevis Mounting	_	_	0					
End Cap Mounting	0	_	0					
Mid-Section Support	0	-	0					
Inversion Mounting	_	-	0					
Accessories								
Magnetic Switches	0	0	0					
Motor Mountings	0	0	0					
Linear Guides	_	_	0					
Multi-Axis Connection	0	0	0					
System								
Description		Screw-Driven – Basic Version	S					
	Ball Screw -Driven	Trapezoidal Screw- Driven	Screw-Driven with extending Rod – with Trapezoidal Screw – wit h Ball Screw					
Standard Versions	- Spindle pitch of the ball screws	-						
Options	Clean room versionDisplacement Measuring System SFI-plus	Displacement Measuring System SFI-plus						
Mountings								
Clevis Mounting	0	0	-					
End Cap Mounting	0	0	0					
Mid-Section Support	0	0	0					
Inversion Mounting	0	0	-					
Accessories								
Magnetic Switches	0	0	0					
Motor Mounting	0	0	0					
Flansh Mounting	_	_	0					
Trunnion Mounting	_	_	0					
	_	_	Ω					
Piston Rod Mounting	-	-	0					
	- 0 0	- 0 0	0 - 0					



Features

Auto Handling

- high speed pick and place movements



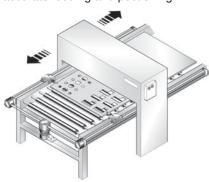
Material Handling Systems

– vertical and horizontal transfer movements

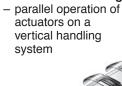


Punching Machines

- accurate feeding and postioning

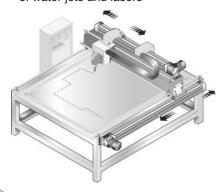


Mechanical Handling



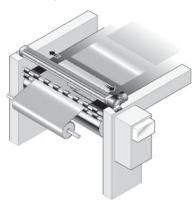


- intricate profile movements of water jets and lasers



Slitting Machines

-high speed traverse applications for the slicing of papers and textiles

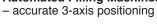


Spray Coating

- synchronized high speed bi-parting movements



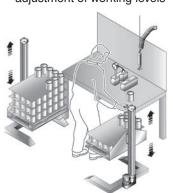
Automated Filling Machines





Ergonomic Workstations

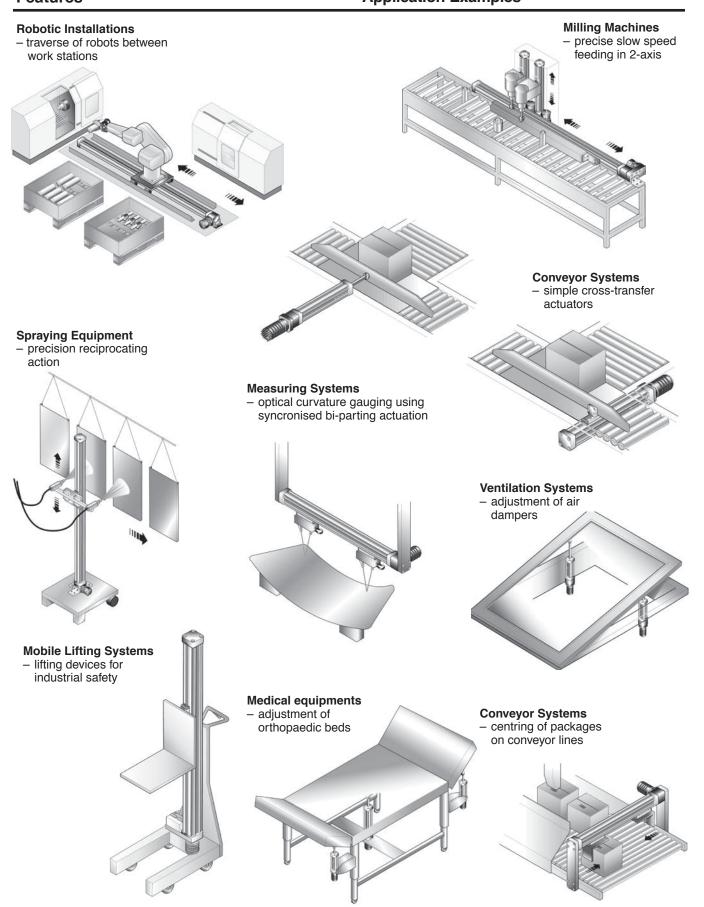
- adjustment of working levels







Features







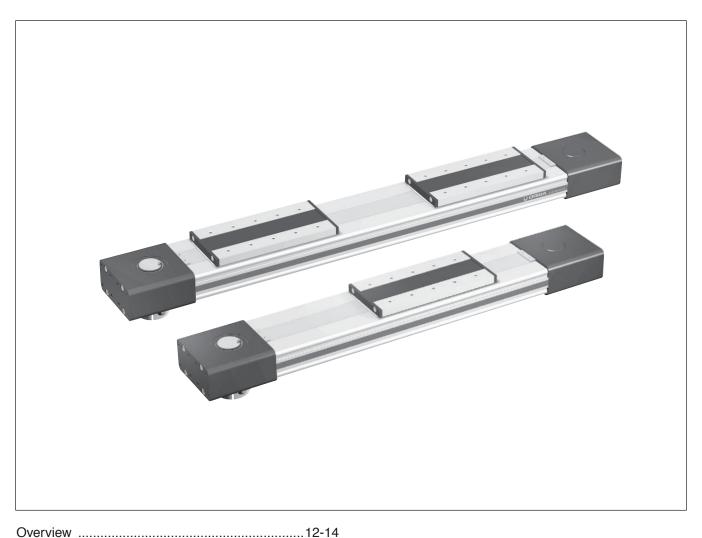


ORIGA

Linear Drive with Toothed Belt and Integrated Guide

with Recirculating Ball Bearing Guidewith Roller Guide

Series OSP-E..BHD



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Version with Recirculating Ball E	Bearing Guide
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Version with Roller Guide	
Technical Data	20-22
Dimensions	23



Linear Drive with Toothed Belt - selective with Integrated Recirculating Ball Bearing Guide or Integrated Roller Guide

The latest generation of high capacity linear drives, the OSP-E..BHD series combines robustness, precision and high performance. The aesthetic design is easily integrated into any machine constructions by virtue of extremely adaptable mountings.

Advantages:

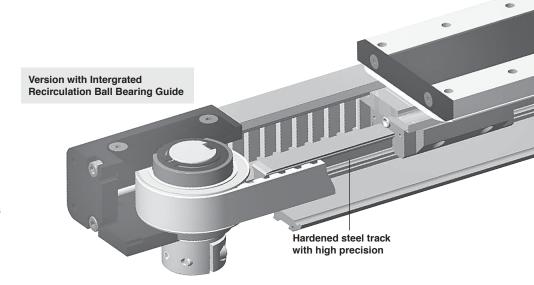
- Accurate path and position control
- · High force output
- · High speed operation
- · High load capacity
- · Easy installation
- · Low maintenance
- · Ideal for multi-axis applications

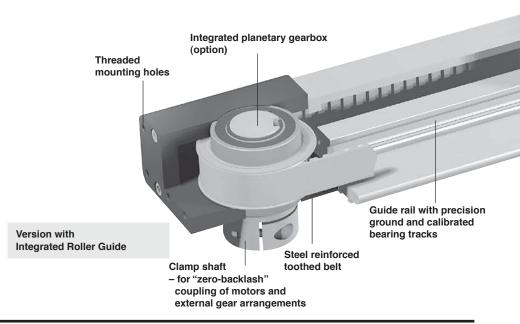
Features:

- Integrated recirculating ball bearing guide or integrated roller guide
- Diverse range of multi-axis connection elements
- Diverse range of accessories and mountings
- Complete motor and control packages
- Optional integrated planetary gearbox
- · Special options on request

To simplify design work OSP-E system CAD files are available, which are compatible with most common CAD systems









Features

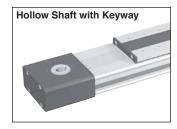






Drive Shaft OPTIONS



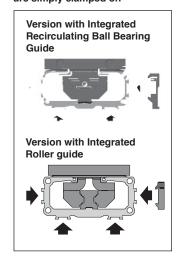


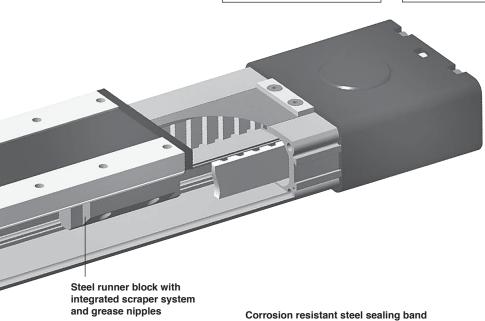
OPTION Integrated planetary gearbox

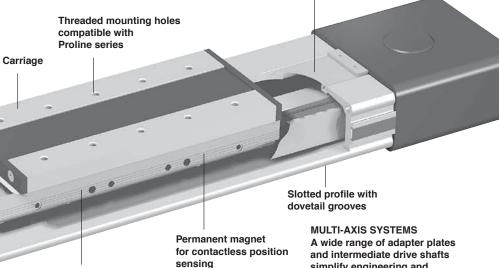


- · Highly compact and rigid solution fully integrated in the drive cap housing
- · Purpose designed for the BHD series
- · Available with three standard ratios (3, 5 and 10)
- · Very low backlash
- · A wide range of available motor flanges

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







Rollers on needle bearings for smooth operation up to 10 m/s.

> **BI-PARTING Version** for perfectly synchronised bi-parting movements.



simplify engineering and installation



SERIES OSP-E, LINEAR DRIVE WITH TOOTHED BELT AND INTEGRATED GUIDE

STANDARD VERSIONS OSP-E..BHD

Version with Recirculating Ball Bearing Guide

Pages 15-19

Version with Roller Guide

Pages 20-23

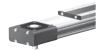
Standard carrier with integrated guide and magnets for contactless position sensing. Dovetail profile for mounting of accessories and the actuator itself.



DRIVE SHAFT WITH CLAMP SHAFT

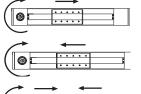


DRIVE SHAFT WITH PLAIN SHAFT



ACTUATING DIRECTION

Page 160 Important in parallel operations, e.g. with intermediate drive shaft



Standard



Standard – Bi-Parting Version

OPTIONS

TANDEM Page 18

For higher moment support.



BI-PARTING VERSION

Page 18

For perfectly synchronised bi-parting movements.



DRIVE SHAFT WITH CLAMP SHAFT AND PLAIN SHAFT For connections with intermediate drive shaft



HOLLOW SHAFT WITH KEYWAY For close coupling of motors and external gears.



INTEGRATED PLANETARY GEARBOX Page 19

For compact installation and very low backlash.



ACCESSORIES

MOTOR MOUNTINGS

Page 116



END CAP MOUNTING

Page 124

For mounting the drives on the end cap.



MID-SECTION SUPPORT

Page 130

For supporting long drives or mounting the linear drives on dovetail grooves.



MAGNETIC SWITCHES TYPE RS AND ES

Page 148

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



MULTI-AXIS SYSTEMS

Page 86

For modular assembly of linear drives up to multi-axis systems.





Technical Data

Characteristics								
Characteristics Symbol Unit		Unit	Description					
General Features								
Se	eries			OSP-EBHD				
Na	ame			Linear drive with toothed belt and integrated recirculating ball bearing guide				
mo	ounting			See drawings				
' ''	nbient mperature range	ϑ_{min} ϑ_{max}	°C °C	-30 +80				
W	eight (mass)		kg	See table				
Ins	stallation			In any position				
	Slotted Profile			Extruded anodized aluminum				
	Toothed belt			Steel-corded polyurethane				
	Pulley			Aluminum				
М	Guide			Recirculating ball bearing guide				
a t e	Guide rail			Hardened steel rail with high precision, accuracy class N				
r i a l	Guide carrier			Steel carrier with integrated wiper system, grease nipples, preloaded 0.02 x C, accuracy class H				
	Sealing Band			Hardened, corrosion resistant steel				
	Screws, nuts			Zinc plated steel				
	Mountings			Zinc plated steel and aluminum				
Er	Encapsulating class IP 54							

Weight (mass) and Inertia									
Series	We	eight (Mass) (k	(g)	Inertia (x 10 ⁻⁶ kgm ²)					
	At stroke 0 m	Add per meter stroke	Moving mass	At Stroke 0 m	Add per meter stroke	per kg mass			
OSP-E20BHD	2.8	4	0.8	280	41	413			
OSP-E25BHD	4.3	4.5	1.5	1229	227	821			
OSP-E32BHD	8.8	7.8	2.6	3945	496	1459			
OSP-E50BHD	26	17	7.8	25678	1738	3103			
OSP-E20BHD*	4.3	4	1.5	540	41	413			
OSP-E25BHD*	6.7	4.5	2.8	2353	227	821			
OSP-E32BHD*	13.5	7.8	5.2	7733	496	1459			
OSP-E50BHD*	40	17	15	49180	1738	3103			

^{*} Version: Tandem and Bi-parting (Option)

Installation Instructions

Use the threaded holes in the end cap for mounting the linear drive. Check if mid-section supports are needed using the maximum allowable unsupported length graph on page 17. At least one end cap must be secured to prevent axial sliding when mid-section support is used.

Maintenance

Depending on operating conditions, inspection of the linear drive is

recommended after 12 months or 3000 km operation.

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 Drive with Toothed Belt

and
Integrated
Recirculating Ball
Bearing Guide
Series OSP-E..BHD
Size 20 to 50



Standard Versions

- Toothed Belt Drive with integrated Recirculating Ball Bearing Guide
- Drive Shaft with clamp shaft or plain shaft
- · Choice of motor mounting side
- Dovetail profile for mounting of accessories and the drive itself

Options

- · Tandem version for higher moments
- Bi-parting version for synchronised movements
- · Integrated planetary gearbox
- · Drive shaft with
 - clamp shaft and plain shaft
 - hollow shaft with keyway
- Special drive shaft versions on request





Sizing Performance Overview **Maximum Loadings**

Sizing of Linear Drive

The following steps are recommended:

- 1. Determination of the lever arm length I, I, and I, from m to the center axis of the linear drive.
- 2. Calculation of the load F, or F, to the carrier caused by m $F = m_{a} \cdot g$
- 3. Calculation of the static and dynamic force F, which must be transmitted by the toothed belt. $F_{A(horizontal)} = F_a + F_0 = m_a \cdot a + M_n \cdot 2\pi / U_{7R}$ $\begin{array}{ll} \textbf{F}_{A(\text{vertical})} & = \textbf{F}_{g} + \textbf{F}_{a} + \textbf{F}_{0} \\ & = \textbf{m}_{g} \cdot \textbf{g} + \textbf{m}_{g} \cdot \textbf{a} + \textbf{M}_{0} \cdot 2\pi \ / \ \textbf{U}_{ZR} \end{array}$
- 4. Calculation of all static and dynamic moments M, M, and M, which occur in the application. $M = F \cdot I$
- 5. Selection of maximum permissible loads via Table T3.
- 6. Calculation and checking of the combined load, which must not be higher than 1.
- 7. Checking of the maximum torque that occurs at the drive shaft in Table T2.
- 8. Checking of the required action force F_A with the permissible load value from Table T1.

For motor sizing, the effective torque must be determined, taking into account the cycle time.

Legend

= distance of a mass in the x-, y- and z-direction from the guide [m]

m_e = external moved mass [kg]

 $m_{IA} = moved mass of linear drive [kg]$

m_a = total moved mass $(m_e + m_{LA})$ [kg]

 $F_{x/y}$ = load excerted on the carrier in dependence of the installation position [N]

 F_A = action force [N]

 M_0 = no-load torque [Nm]

 U_{70} = circumference of the pulley (linear movement per revolution) [m]

= gravity [m/s²]

a_{max.} = maximum acceleration [m/s²]

Performance (Overview					(T1)		
Characteristics		Unit	Description					
Series			OSP-E20BHD	OSP-E25BHD	OSP-E32BHD	OSP-E50BHD		
Max. speed		(m/s)	3 ¹⁾	5 ¹⁾	5 ¹⁾	5 ¹⁾		
Linear motion per revolution of drive shaft		(mm)	125	180	240	350		
Max. rpm on dr	ive shaft	(min ⁻¹)	2000	1700	1250	860		
Max. effective	< 1 m/s:	(N)	550	1070	1870	3120		
Action force	1-3 m/s:	(N)	450	890	1560	2660		
F _A at speed	> 3 m/s:	(N)	_	550	1030	1940		
No-load torque		(Nm)	0.6	1.2	2.2	3.2		
Max. acceleration/deceleration		(m/s ²)	50	50	50	50		
Repeatability		(mm/m)	±0.05	±0.05	±0.05	±0.05		

5760²⁾

(mm)

5700²⁾

5600²⁾

5500²⁾

Maximum Permissible Torque on Drive Shaft T2 Speed / Stroke OSP-E20BHD OSP-E25BHD OSP-E32BHD OSP-E50BHD Torque Stroke Torque Speed Torque Torque Stroke Torque Stroke Torque Speed Stroke Torque Speed Torque Speed (m/s) (Nm) (m) (Nm) (m/s) (Nm) (m) (Nm) (m/s) (Nm) (m) (Nm) (m/s) (Nm) (m) (Nm) 71 71 11 31 1 31 1 1 174 174 1 11 1 2 10 2 11 2 28 2 31 2 65 2 71 2 159 2 174 3 9 3 8 3 **(25)** 3 31 3 59 3 60 3 153 3 138 4 4 7 4 23 4 25 4 56 4 47 4 4 108 143 5 5 5 5 22 5 (21)5 52 5 5 5 38 135 89

Important:

The maximum permissible moment on the drive shaft is the lowest value of the speedor stroke-dependent moment value.

Example above:

OSP-E25BHD, stroke 5 m, required speed 3 m/s from table T2 speed 3 m/s gives 25 Nm and stroke 5 m gives 21 Nm. Max. torque for this application is 21 Nm.

When sizing Bi-parting units: for ordering stroke see page 18.

Maximum Permissible Loads **T3** Max. applied load Max. moments (Nm) Series Mx Fy (N) Fz (N) My Mz OSP-E20BHD 1600 1600 21 150 150 OSP-E25BHD 2000 3000 50 500 500 5000 10000 120 1000 1400 OSP-E32BHD OSP-E50BHD 12000 15000 180 1800 2500

Tightening for Clamp Hub							
	20	25	32	50			
BHD	_	9.5	17	40			
BHDII	4.8	9.5	17	40			
BV	4.8	9.5	_	_			

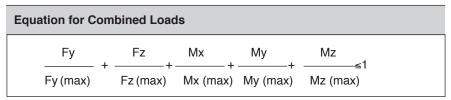


Max. standard stroke length 1) up to 10 m/s on request

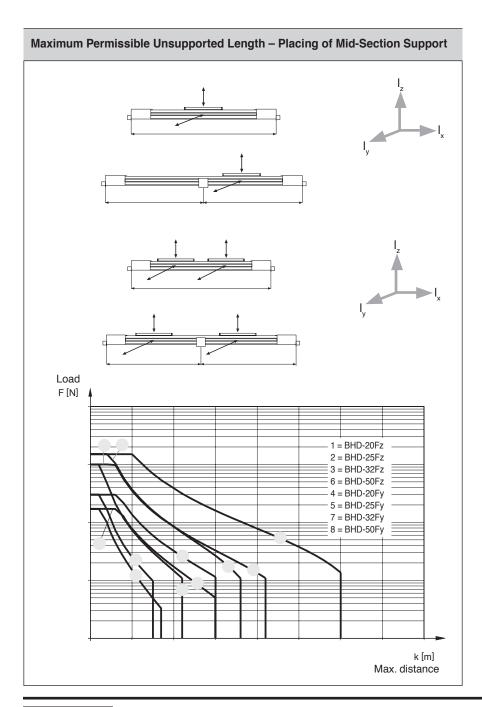
²⁾ longer strokes on request

Combined Loads

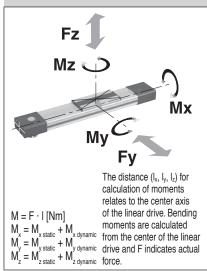
If the linear drive is subjected to several forces, loads and moments at the same time, the maximum load is calculated with the equation shown here. The maximum permissible loads must not be exceeded.



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



Forces, loads and moments



Maximum Permissible Unsupported Length

Stroke Length

The stroke lengths of the linear drives are available in multiples of 1 mm up to 5700 mm.

Other stroke lengths are available on request.

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

Allow an additional safety clear-ance at both ends equivalent to the linear movement of one revolution of the drive shaft, but at least 100 mm.

The use of an AC motor with frequency converter normally requires a larger clearance than that required for servo systems.

For advice, please contact your local PARKER-ORIGA technical support department.

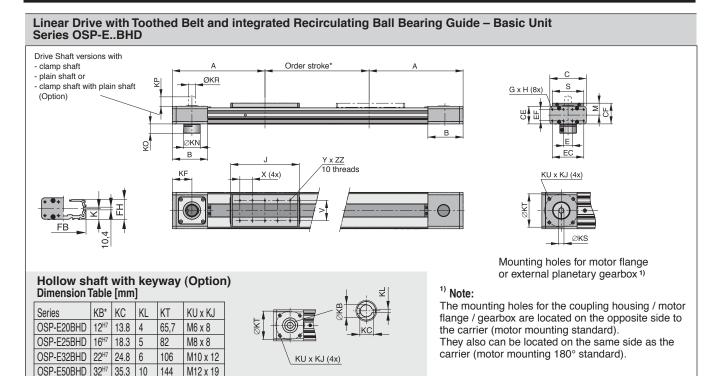
* For Bi-parting version the max. load (F) is the total load of both carriers F = F_{carrier 1} + F_{carrier 2}

k = Max. permissible distance between

mountings/mid-section support for a given load F.

When loadings are below or up to the curve in the graph below the deflection will be max. 0.01 % of distance k.

Technical Data

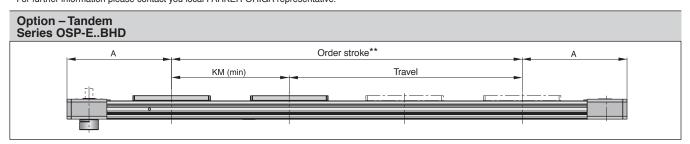


* Note:

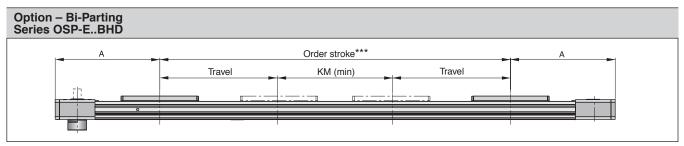
The mechanical end position must not be used as a mechanical end stop. Allow an additional safety clearance at both ends equivalent to the linear movement of one revolution of the drive shaft, but at least 100 mm.

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.



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



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

Dimension	Dimension Table [mm]																											
Series	Α	В	С	E	GxH	J	K	M	S	٧	Х	YxZZ	CE	CF	EC	EF	FB	FH	KF	KM _{min}	KM _{rec.}	KN	КО	KP	KR	KS	KT	KUxKJ
OSP-E20BHD	185	76.5	73	18	M5x8.5	155	21.1	27.6	67	51	30	M5x8	38	49	60	27	73	36	42.5	180	220	27	18	25	12 _{h7}	12 ^{H7}	65.7	M6x8
OSP-E25BHD	DSP-E25BHD 218 88 93 25 M5x10 178 21.5 31 85 64 40 M6x8 42 52.5 79 27 92 39.5 49 210 250 34 21.7 30 16 _{h7} 16 ^{H7} 82 M8x8																											
OSP-E32BHD	262	112	116	28	M6x12	218	28.5	38	100	64	40	M6x10	56	66.5	100	36	116	51.7	62	250	300	53	30	30	22 _{h7}	22 ^{H7}	106	M10x12
OSP-E50BHD	347	147	175	18	M6x12	288	43	49	124	90	60	M6x10	87	92.5	158	70	164	77	79.5	354	400	75	41	35	32 _{h7}	32 ^{H7}	144	M12x19
(Other dimens	Other dimensions for KS and KB for special drive shafts on request – see order instructions.)																											



Series OSP-E..BHD – with Integrated Planetary Gearbox (Option)



Performance Overview Characteristics Unit Description Series OSP-E25BHD | OSP-E32BHD | OSP-E50BHD Ratio (1-stage) i 3/5/10 $F_{am\underline{ax}}$ 1550 1900 4000 Max. axial load (N) 9 (Nm/arcmin) 24 Torsional rigidity (i=5) $C_{t.21}$ 3.3 7.5 Torsional rigidity (i=3/10) (Nm/arcmin) 2.8 20.5 $C_{t.21}$ Torsional backlash J_t (arcmin) <12 Linear motion per revolution 220 280 360 (mm) of drive shaft Nominal input speed (min⁻¹) 3700 3400 2600 n_{nom} Max. input speed (min-1) 6000 n_{1max} No-load torque T_{012} (Nm) < 0.14 < 0.51 <1.5 at nominal input speed Lifetime 20 000 (h) Efficiency (%) >97 η Noise level (db) <70 <72 <74 L_{PA} $(n_1=3000 \text{ min}^{-1})$

Dimensions NA NA NC NC NC NC NC

Dimension Tal	Dimension Table [mm] and additional Weight												
Series	NA	NB	NC	Weight (Mass) [kg]									
OSP-E25BHD	49	43	76	2.6									
OSP-E32BHD	62	47	92	4.9									
OSP-E50BHD	79.5	49.5	121	9.6									

OORIGA

Integrated Planetary Gearbox

Features

- Highly compact and rigid solutio fully integrated in the drive cap housing
- Purpose designed for the BHD series.
- Available with three standard ratios (3, 5 and 10)
- Very low backlash
- A wide range of available motor flanges

Please contact your local PARKER-ORIGA technical support for available motor flanges.

Material: Aluminium (AL-H) / Steel (St-H)

Standard Version:

• Gearbox on opposite side to carrier.

Note:

When ordering, specify model/ type of motor and manufacturer for correct motor flange.

Linear Drive with Toothed Belt

and
Integrated Roller
Guide

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



Standard Versions

- Toothed Belt Drive with integrated Recirculating Ball Bearing Guide
- Drive Shaft with clamp shaft or plain shaft
- · Choice of motor mounting side
- Dovetail profile for mounting of accessories and the drive itself

Options

- · Tandem version for higher moments
- Bi-parting version for synchronised movements
- · Integrated planetary gearbox
- Drive shaft with
 - -clamp shaft and plain shaft
 - hollow shaft with keyway
- Special drive shaft versions on request



OORIGA

Cł	Characteristics											
Cr	naracteristics	Symbol	Unit	Description								
Ge	eneral Features											
Se	eries			OSP-EBHD								
Na	ame			Linear Drive with Toothed Belt and integrated Roller Guide								
М	ounting			See drawings								
	nbient mperature range	ϑ_{min} ϑ_{max}	°C °C	-30 +80								
W	eight (mass)		kg	See table								
Ins	stallation			In any position								
	Slotted profile			Extruded anodized aluminum								
	Toothed belt			Steel-corded polyurethane								
	Pulley			Aluminum								
M a	Guide			Roller guide								
t e	Guide rail			Aluminum								
r	Track			High alloyed steel								
ą	Roller cartridge			Steel rollers in aluminum housing								
'	Sealing band			Hardened, corrosion resistant steel								
	Screws, nuts			Zinc plated steel								
	Mountings			Zinc plated steel and aluminum								
Er	capsulating class		IP	54								

Weight (mass)	Weight (mass) and Inertia												
	We	ight (Mass) (kg))	Inertia (x 10 ⁻⁶ kgm ²)									
Series	At stroke 0 m	Add per meter stroke	Moving mass	At Stroke 0 m	Add per meter stroke								
OSP-E25BHD	3.8	4.3	1.0	984	197								
OSP-E32BHD	7.7	6.7	1.9	3498	438								
OSP-E50BHD	22.6	15.2	4.7	19690	1489								
OSP-E25BHD*	5.7	4.3	2.0	1805	197								
OSP-E32BHD*	11.3	6.7	3.8	6358	438								
OSP-E50BHD*	31.7	15.2	9.4	34274	1489								

^{*} Version: Tandem and Bi-parting (Option)

Installation Instructions

Use the threaded holes in the end cap for mounting the linear drive. Check if mid-section supports are needed using the maximum allowable unsupported length graph on page 17. At least one end cap must be secured to prevent axial sliding when mid-section support is used.

Maintenance

All moving parts are lifetime-lubricated. Depending on operating conditions, inspection of the linear drive is recommended after 12 months or 3000 km operation.

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.



Technical Data

Performance (Overview				(T1)				
Characteristics		Unit		Description					
Series			OSP-E25BHD	OSP-E32BHD	OSP-E50BHD				
Max. speed		(m/s)	10	10	10				
Linear motion pof drive shaft	per revolution	(mm)	180	240	350				
Max. rpm on dr	rive shaft	(min ⁻¹)	3000	2500	1700				
Max. effective	< 1 m/s:	(N)	1070	1870	3120				
Action force	1-3 m/s:	(N)	890	1560	2660				
F _A at speed	> 3 m/s:	(N)	550	1030	1940				
No-load torque		(Nm)	1.2	2.2	3.2				
Max. accelerati	on/deceleration	(m/s²)	40	40	40				
Repeatability		(mm/m)	±0.05	±0.05	±0.05				
Max. standard	stroke length	(mm)	7000	7000	7000				

Maximum Permissible Torque on Drive Shaft Speed / Stroke



	OSP-E	25BHC)	(OSP-E	32BHD)	OSP-E50BHD					
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	31	1	31	1	71	1	71	1	174	1	174		
2	28	2	31	2	65	2	71	2	159	2	174		
3	25)	3	31	3	59	3	60	3	153	3	138		
4	23	4	25	4	56	4	47	4	143	4	108		
5	22	5	21)	5	52	5	38	5	135	5	89		
6	21	6	17	6	50	6	32	6	132	6	76		
7	19	7	15	7	47	7	28	7	126	7	66		
8	18			8	46			8	120				
9	17			9	44			9	116				
10	16			10	39			10	108				

Important:

The maximum permissible moment on the drive shaft is the lowest value of the speedor stroke-dependent moment value.

Example above:

OSP-E25BHD, stroke 5 m, required speed 3 m/s from table T2 speed 3 m/s gives 25 Nm and stroke 5 m gives 21 Nm. Max. torque for this application is 21 Nm.

When sizing Bi-parting units: for ordering stroke see page 23.

Maximum Permiss	Maximum Permissible Loads											
Series	Max. applied load Fy, Fz [N]	Max. mome Mx	ents [Nm] My	Mz								
OSP-E25BHD	986	11	64	64								
OSP-E32BHD	1348	19	115	115								
OSP-E50BHD	3704	87	365	365								

Tightening for	Tightening for Clamp Hub											
	20	25	32	50								
BHD	_	9.5	17	40								
BHDII	4.8	9.5	17	40								
BV	4.8	9.5	_	_								

Sizing Performance Overview Maximum Loadings

Sizing of Linear Drive

The following steps are recommended:

- 1. Determination of the lever arm length I_x, I_y and I_z from m_e to the center axis of the linear drive.
- 2. Calculation of the load F_x or F_y to the carrier caused by m_e $F = m_e \cdot g$
- Calculation of the static and dynamic force F_A which must be transmitted by the toothed belt.

$$\begin{aligned} F_{A(\text{horizontal})} &= F_a + F_0 \\ &= m_g \cdot a + M_0 \cdot 2\pi / U_{ZR} \\ F_{A(\text{vertical})} &= F_g + F_a + F_0 \\ &= m_g \cdot g + m_g \cdot a + M_0 \cdot 2\pi / U_{ZR} \end{aligned}$$

- Calculation of all static and dynamic bending moments M_x, M_y and M_z which occur in the application M = F · I
- 5. Selection of maximum permissible loads via Table T3.
- Calculation and checking of the combined load, which must not be higher than 1.
- Checking of the maximum torque that occurs at the drive shaft in Table T2.
- Checking of the required action force F_A with the permissible load value from Table T1.

For motor sizing, the effective torque must be determined, taking into account the cycle time.

Legend

I = distance of a mass in the x-, y- and z-direction from the guide [m]

m = external moved mass [kg]

 $m_{IA} = moved mass of linear drive [kg]$

 $m_g = total moved mass$ $<math>(m_e + m_{LA}) [kg]$

F_{x/y} = load excerted on the carrier in dependence of the installation position [N]

 F_A = action force [N]

 M_0 = no-load torque [Nm]

U_{ZR} = circumference of the pulley (linear movement per revolution) [m]

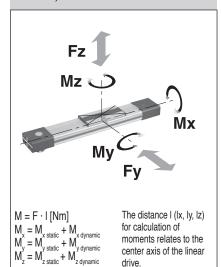
 $g = gravity [m/s^2]$

a_{max.} = maximum acceleration [m/s²]



Technical Data

Forces, loads and moments



moments relates to the center axis of the linear

Maximum Permissible Unsupported Length

Stroke Length

The stroke lengths of the linear drives are available in multiples of 1 mm up to 5700 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 at both ends equivalent to the linear movement of one revolution of the drive shaft, but at least 100 mm.

The use of an AC motor with frequency converter normally requires a larger clearance than that required for servo systems.

For advice, please contact your local PARKER-ORIGA technical support department.

* For the bi-parting version the maximum load (F) complies with the total of the load at both carriers. $F = F_{\text{carriage 1}} + F_{\text{carriage 2}}$

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

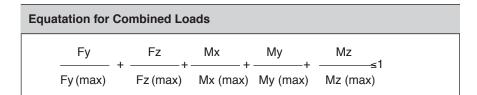
If the loads are below or up to the curve in the graph the deflection will be max. 0.01 % of distance k.

ORIGA

Combined Loads

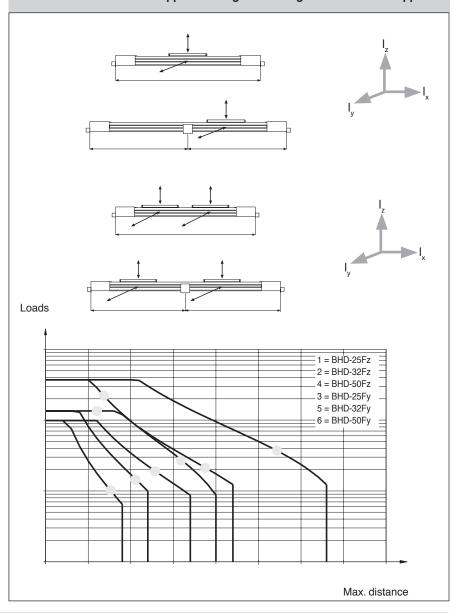
If the linear drive is subjected to several forces, loads and moments at the same time, the maximum load is

calculated with the equation shown here. The maximum permissible loads must not be exceeded.

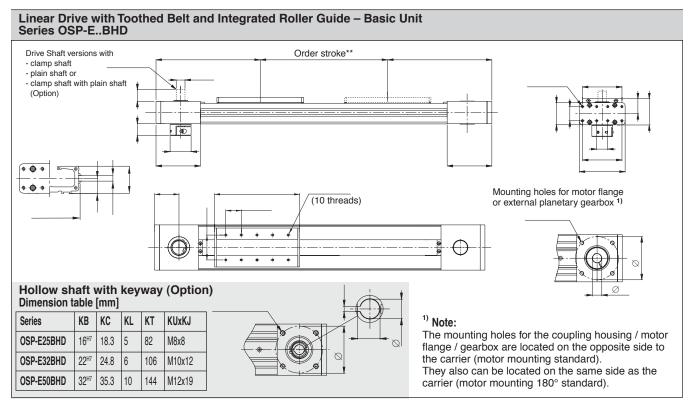


The total of the loads must not exceed >1 under any circumstances.

Maximum Permissible Unsupported Length - Placing of Mid-Section Support



Dimensions



* Note

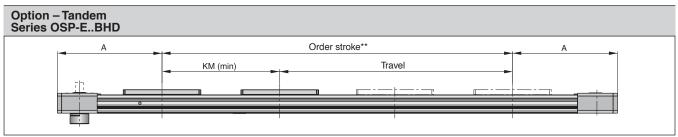
The mechanical end position must not be used as a mechancial end stop.

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.

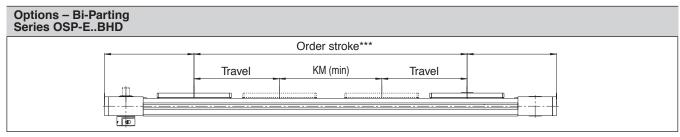
Order stroke = required travel + 2 x safety distance.

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-ORIGA representative.



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



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

Dimensio	Dimension Table [mm]																											
Series	Α	В	С	Е	GxH	J	K	M	S	٧	Х	YxZZ	CE	CF	EC	EF	FB	FH	KF	KM _{min}	KM _{rec.}	KN	КО	KP	KR	KS	KT	KUxKJ
OSP-E25BHD	218	88	93	25	M5x10	178	21.5	31	85	64	40	M6x8	42	52.5	79	27	92	39.5	49	210	250	34	21.7	30	16 _{h7}	16 ^{H7}	82	M8x8
OSP-E32BHD	262	112	116	28	M6x12	218	28.5	38	100	64	40	M6x10	56	66.5	100	36	116	51.7	62	250	300	53	30	30	22 _{h7}	22 ^{H7}	106	M10x12
OSP-E50BHD	347	147	175	18	M6x12	263	43	49	124	90	60	M6x10	87	92.5	158	70	164	77	79.5	295	350	75	41	35	32 _{h7}	32 ^{H7}	144	M12x19

(Other dimensions for KS and KB for special drive shafts on request – see order instructions.)







ORIGA

Vertical Linear Drive with Toothed Belt and Integrated Recirculating Ball Bearing Guide Series OSP-E..BV



 Overview
 25-28

 Technical Data
 29-31

 Dimensions
 32-33



TOOTHED BELT DRIVE FOR VERTICAL MOVEMENTS IN MULTI-AXIS SYSTEMS

The OSP-E..BV vertical linear drive with toothed belt and integrated recirculating ball bearing guide has been specially developed for lifting movements in the Z-axis.

The especially low vibration OSP-E..BV vertical drive in combination with the heavy duty series OSP-E..BHD meets the highest demands in portal and handling applications.

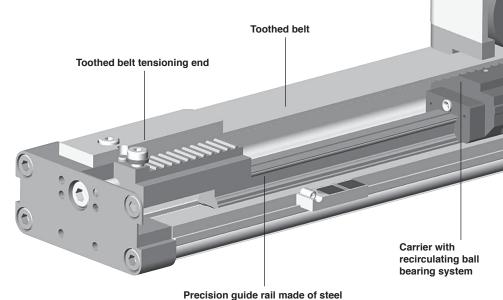
Vertical Linear Drive with Toothed Belt and integrated Recirculating Ball Bearing Guide

Advantages

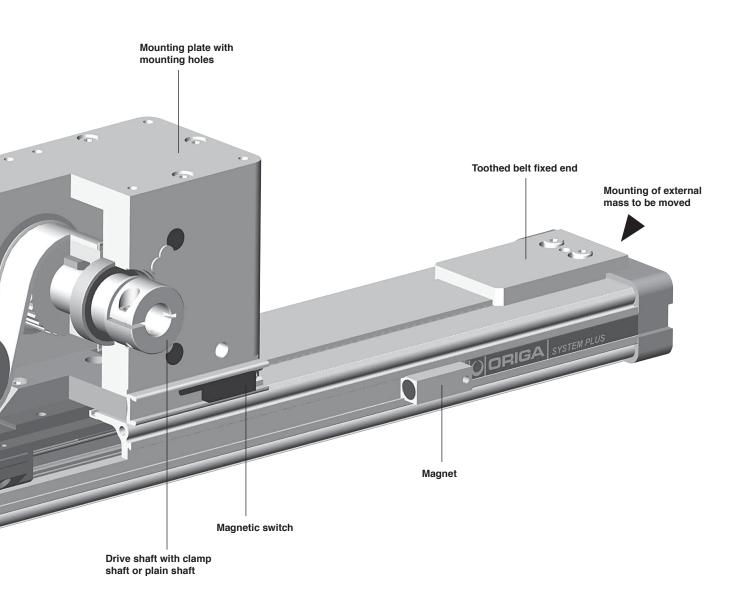
- Fixed drive head for low moving mass
- Integrated recirculating ball bearing guide for high bending moments
- Magnetic switch set fo contactless position sensing
- · Easy to install
- Low maintenance

Features

- · High acceleration and speed
- Drive Shaft versions with clamp shaft or plain shaft
- Power transmission by toothed belt
- · Moving axis profile
- Complete motor and control packages







To simplify design work OSP-E system CAD files are available, which are compatible with most common CAD systems





ACCESSORIES

MOTOR MOUNTINGS

For connection of gearbox or motor

direct to drive shaft with clamp shaft,

or with a motor coupling to drive shaft

Page 117

with plain shaft.

SERIES OSP-E, VERTICAL LINEAR DRIVE WITH TOOTHED BELT AND INTEGRATED RECIRCULATING BALL BEARING GUIDE

STANDARD VERSION OSP-E..BV

Pages 29 & 30

Standard drive head with clamp shaft or tenon and integrated recirculating ball bearing guide with two carriers. Choice of side on which gearbox or motor is to be mounted.

Drive Shaft with Clamp Shaft



OPTIONS

Pages 32 & 33

Additional drive head and two

additional carriers for higher bending

TANDEM

moments.

Drive Shaft with Plain Shaft





"CLAMP SHAFT AND PLAIN SHAFT" OR "DOUBLE PLAIN SHAFT"

e.g. for parallel operation of two Z-axes with an intermediate drive shaft.

Drive Shaft with Clamp Shaft and Plain Shaft

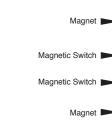
DRIVE SHAFT



Drive Shaft with Double Plain Shaft



Magnetic switches with connector, mounting rail and magnets for contactless sensing of the end positions. Cable (suitable for cable chain) can be ordered separately in 5 m, 10 m or 15 m length.



HOLLOW SHAFT WITH KEYWAY For direct connection of gearbox or motor with keyway.





MULTI-AXIS SYSTEMS

Page 86

For modular assembly of linear drives up to multi-axis systems.





Technical Data

CI	naracteristics			
Cł	naracteristics	Symbol	Unit	Description
G	eneral Features			
Se	eries			OSP-EBV
Na	ame			Vertical linear drive with toothed ball belt and integrated recirculating ball bearing guide
M	ounting			See drawings
Те	mperature range	ϑ_{min} ϑ_{max}	°C °C	-30 +80
W	eight (mass)		kg	See table
Ins	stallation			Vertical
	Profile			Extruded anodized aluminum
	Toothed belt			Steel-corded polyurethane
М	Pulley			Aluminum
a t	Guide			Ball bearing guide
e r i	Guide rail			Hardened steel rail with high precision, accuracy class N
a	Guide carrier			Steel carrier with integrated wiper system, grease nipples, preloaded 0.08 x C, accuracy class N
	Screws, nuts			Zinc plated steel
Er	capsulating class		IP	20

Weight (mass) and Inertia												
Series	Total (Mass	weight s) (kg)		g mass (g)	()	Inertia x 10 ⁻⁶ kgm	l ²)					
	At stroke 0 m	Drive head	At stroke 0 m	Add per meter stroke	At Stroke 0 m	Add per meter stroke	Add per kg mass					
OSP-E20BV	3.4	1.9	1.6	4.0	486	1144	289					
OSP-E25BV	7.7	5.3	2.4	4.4	1695	2668	617.5					
OSP-E20BV*	5.3	2 x 1.9	1.6	4.0	533	1144	289					
OSP-E25BV*	13	2 x 5.3	2.4	4.4	1915	2668	617.5					

^{*} Version: Tandem (Option)

Installation Instructions

Make sure that the OSP-E..BV is always operated with a brake on the drive side. For the mounting of the external mass to be moved there are threaded holes in the end caps. Before mounting, check the correct center of gravity distance from the table on page 31.

Mount the external mass on the toothed belt fixed end, so that the belt tension can be checked and adjusted at the toothed belt tensioning end without dismantling.

Maintenance

Depending on operating conditions, inspection of the linear drive is recommended after 12 months or 3000 km operation.

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.

Vertical Linear Drive with Toothed Belt and Integrated Recirculating Ball Bearing Guide

Series OSP-E..BV Size 20, 25



Standard Version:

- Toothed Belt drive with integrated recirculating ball bearing guide
- Drive shaft with clamp shaft or plain shaft
- · Choice of motor mounting side

Options:

- · Tandem version for higher moments
- Drive shaft with
- clamp shaft and plain shaft or double plain shaft
- hollow shaft with keyway
- Special drive shaft versions on request.



Sizing Performance Overview Maximum Loadings

Sizing of Linear Drive

The following steps are recommended:

- Determination of the lever arm length I_x, I_y and I_z from m_e to the center axis of the linear drive.
- 2. Calculation of the static and dynamic force F_A which must be transmitted by the toothed belt. $FA = F_g + F_a + F_0 \\ = m_g \cdot g + m_g \cdot a + M_0 \cdot 2\pi / U_{ZR}$
- Calculation of all static and dynamic moments M_x, M_y and M_z which occur in the application. M = F · I
- 4. Selection of maximum permissible loads via Table T3.
- Calculation and checking of the combined load, which must not be higher than 1.
- Checking of the maximum moment that occurs at the drive shaft in Table T2.
- Checking of the required action force F_A with the permissible load value from Table T1.

For motor sizing, the effective torque must be determined, taking into account the cycle time.

Legend

 I = distance of a mass in the x-, y- and z-direction from the guide [m]

m_e = external moved mass [kg]

m_{LA} = moved mass of linear drive [kg]m_{LA} = total moved mass

 \mathbf{m}_{g} = total moved mass $(\mathbf{m}_{e} + \mathbf{m}_{LA})$ [kg]

F_A = action force [N] **M**₀ = no-load torque [Nm]

U_{zR} = circumference of the pulley (linear movement per revolution) [m]

g = gravity [m/s²]

 $\mathbf{a}_{\text{max.}}$ = maximum acceleration [m/s²]

ORIGA

Performance Overview				T1
Characteristics		Unit	Description	
Series			OSP-E20BV	OSP-E25BV
Max.Speed		[m/s]	3.0	5.0
Linear motion per revolution of drive shaft	tion	[mm/U]	108	160
Toothed Belt			35ATL3	40 ATL5
Max. rpm.drive shaft		[min ⁻¹]	1700	1875
Max effective	1m/s	[N]	650	1430
action force F _A	1-2m/s	[N]	450	1200
atspeed	>3-5 m/s	[N]	_	1050
No-load torque 2)		[Nm]	0.6	1.2
Max.acceleration/decele	ration	[m/s ²]	20	20
Repeatability	+/- [mm/m]	0.05	0.05	
Max. standard stroke leng	jth 1)	[mm]	1000	1500
Max. recomended permis	ssible mass 3)	[kg]	10	20

¹⁾ Longer strokes on request and only with profile stiffening

³⁾ vertical

Max. PermissibleTorque on Drive Shaft Speed/Stroke							
OSP-E-20BV			OSP-E-25BV				
Speed [m/s]	Torque [Nm]	Stroke [m]	Torque [Nm]	Speed [m/s]	Torque [Nm]	Stroke [m]	Torque [Nm]
1	19	1	17	1	36	1	36
2	17	2	10.5	2	30	2	36
3	15.5			3	30		
				4	28		
				5	27		

Important:

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

Example above:

OSP-E25BV required speed v = 3 m/s and stroke = 1 m.

Accordingly Table T2 shows permissible moments of 30 Nm for the speed and 36 Nm for the stroke. Therefore the maximum moment at the drive shaft is determined by the speed and must not exceed 30 Nm.

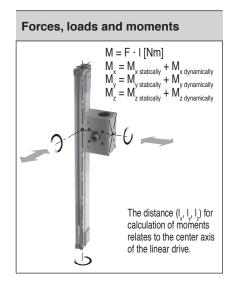
Tightening for Clamp Hub						
	20	25	32	50		
BHD	_	9.5	17	40		
BHDII	4.8	9.5	17	40		
BV	4.8	9.5	_	_		



²⁾ As a result of static friction force

Technical Data

Maximum Permissible Loads T3						
Series	Max.applied	load	Max.moments			
	Fy[N]	Fz[N]	Mx [Nm]	My [Nm]	Mz [Nm]	
OSP-E20BV	1600	1600	20	100	100	
OSP-E25BV	2000	3000	50	200	200	



Equation	for Combi	ned Loads			
F	у	Fz	Mx	Му	Mz
	+	+ -	+	+ -	≤ 1
Fy (r	nax) Fz	(max) M	x (max) M	y (max) N	Iz (max)

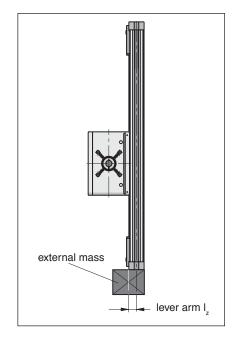
The total of the loads must not exceed > 1 under any circumstances.

Combined Loads

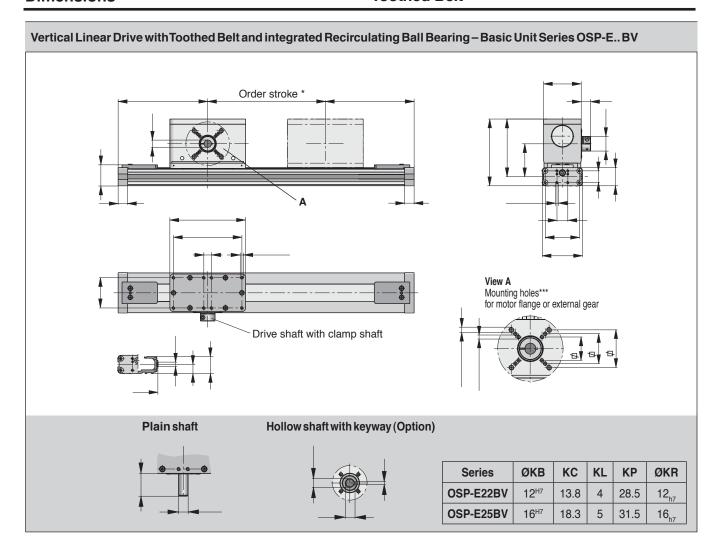
If the linear drive is subjected to several forves, loads and moments at the same time, the maximum load is calculated with the equation shown here.

The maximum permissible loads must not be exceeded.

Distance of Center of Gravity of External Mass from Mid-Point of Drive					
	OS	SP-E20BV	OSP-E25BV		
Mass [kg]	Lever arm I _z [mm]	Max. permissible acceleration/ deceleration [m/s²]	Lever arm I _z [mm]	Max. permissible acceleration/ deceleration [m/s²]	
> 3 to 5	0	20	50	20	
>5 to 10	0	20	40	20	
>10 to 15	-	-	35	20	
>15 to 20	-	-	30	15	



Dimensions

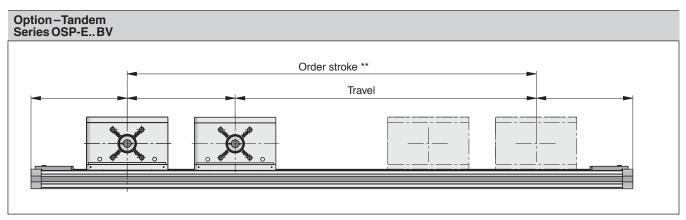


* Note:

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-ORIGA representative.



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



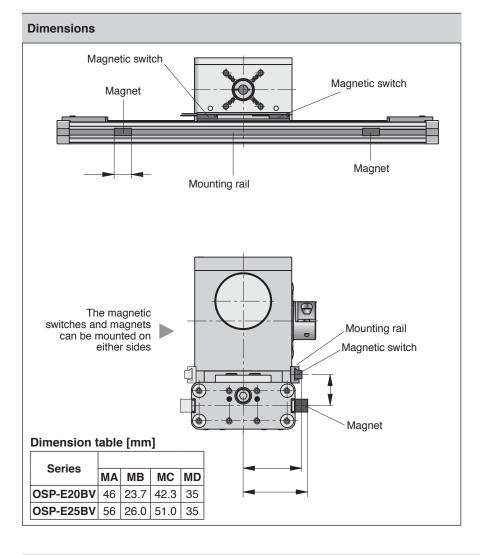
Dimensions

DimensionTable [mm]																
Series	Α	В	С	Е	GxH	J	K	М	S	٧	W	X	Υ	CD	CE	CF
OSP-E20BV	148	22	93	25	M5x12	139	21.1	102.3	68	51	40	120	M6	40.4	34	123.3
OSP-E25BV	210	22	93	25	M5x12	175	21.5	133.5	87	70	18	158	M6	49	42	154.5

Series	EC	EF	FB	FH	KDxKX	KF	KM min	KN	КО	KS	KT	KUxKJ	ΚV	KW	ZZ
OSP-E20BV	59	21	73	36.0	_	61.3	155	27	16	12 ^{H7}	46.5	M6x10	36	_	10
OSP-E25BV	79	27	92	39.5	M6x16	76	225	34	21.5	16 ^{H7}	58	M8x16	46	36	10

^{***} The mounting holes for the coupling housing are on the motor-mounting side. Therefore please ensure that the motor-mounting side is correctly stated when ordering the drive.

(For special drive shafts, other dimensions for KS and KB are available on request – see Order Instructions.)



Contactless Position Sensing with Magnetic Switches

The magnetic switch set, comprising two magnetic switches, a mounting rail and two magnets, is for contactless sensing of the end positions. The mounting rail and magnetic switches are mounted on the drive head and the magnets are mounted in the dovetail slot on the profile.

The magnetic switches are the RS-S type (connector version). For the connecting cable PARKER-ORIGA recommends the use of cable suitable for cable chain.

Order instructions	
Description	Ident-No.
Magnetic switch set, obtaining: - 2 magnetic switches - KL3087, TypRS-S - 1 mounting rail - 2 magnets	15886
Connecting cable, suitable for cable chain	
5 m	KL3186
10 m	KL3217
15 m	KL3216





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







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

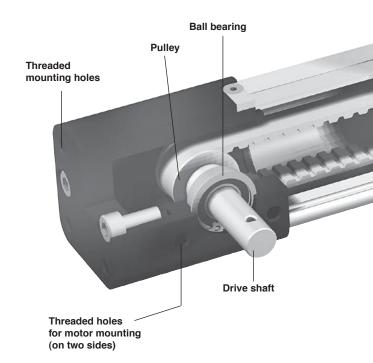
- Precise path and position control
- · High speed operation
- Easy installation
- Low maintenance
- Ideal for precise point-to- point applications

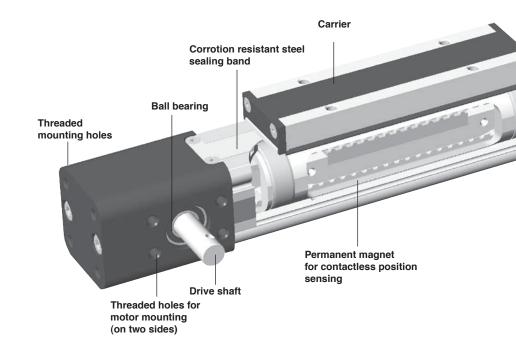
Features

- 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



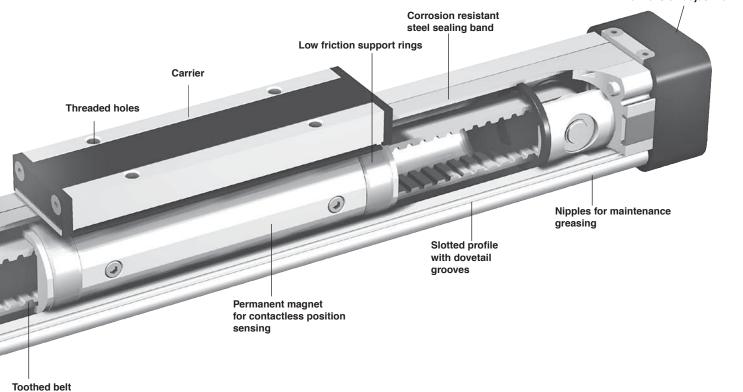
To simplify design work OSP-E system CAD files are available, which are compatible with most common CAD systems

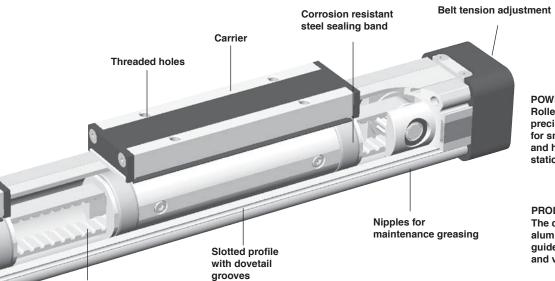






Features Toothed Belt Drive Belt tension adjustment steel sealing band





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

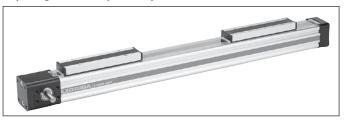


PROLINE
The compact
aluminium roller
guide for high loads
and velocities.



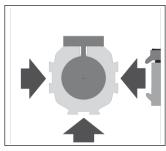
Tandem configuration with increased carrier distance for higher moment supports.

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.





Toothed belt



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

STANDARD VERSIONS OSP-E..B

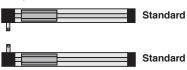
Pages 39 & 40

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 Pages 44-45



BI-PARTING Pages 44-45 For perfectly synchronised bi-parting movements.

ACCESSORIES

MOTOR MOUNTING Page 118



END CAP MOUNTING

Page 125 For end-mounting of the drive.



MID-SECTION SUPPORT

Page 130

For supporting long drives or mounting the linear drive on the dovetail grooves.

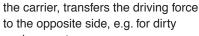


CLEVIS MOUNTING

13 someone

Page 136

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



INVERSION MOUNTING



The inversion mounting, mounted on

MAGNETIC SWITCHES SERIES RS AND ES

Page 148

Page 138

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





Technical Data

Cł	naracteristics			
Ch	naracteristics	Symbol	Unit	Description
Ge	eneral Features			
Se	eries			OSP-EB
Na	ame			Linear drive with toothed belt
М	ounting			See drawings
1	nbient	ϑ_{min}	°C	-30 +80
-	mperature range	ϑ_{max}		
VV	eight (mass)		kg	See table
Ins	stallation			See table
	Slotted profile			Extruded anodized aluminum
M	Toothed belt			Steel-corded polyurethane
l a	Pulley			Aluminum
e	Guide bearings			Low friction plastic
j	Sealing band			Hardened, corrosion resistant steel
a	Screws, nuts			Zinc plated steel
	Mountings			Zinc plated steel and aluminum
Er	capsulating class		IP	54

Weight (mass) and Inertia										
	Wei	ight (Mass) (kg)	Inertia (x 10 ⁻⁶ kgm²)							
Series	At stroke 0 m	Add per meter stroke	Moving mass	At Stroke 0 m	Add per meter stroke					
OSP-E25B	0.9	1.6	0.2	25.3	6.6					
OSP-E32B	1.9	3.2	0.4	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 page 41. 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 pages 136-137).

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 page 138).

ORIGA

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 3000 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

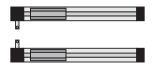
The maximum values specified in the technical data sheet for the different products must not be exceeded. Before taking the linear drive machine into service, the user must ensure the adherence to the EC Machine Directive 91/368/EEC.

Linear Drive with Toothed Belt Series OSP-E..B Size 25, 32, 50



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







2 x 2500

2 x 2500

Sizing Performance Overview Maximum Loadings

Sizing of Linear Drive

The following steps are recommended for selection:

- 1. Required acceleration is shown in graphs on page 42.
- 2. Required torque is shown on page 43.
- 3. Check that maximum values in the table 3 are not exceeded
- 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.
- Before sizing and specifying the motor, the average torque must be calculated using the cycle time of the application.
- Check that the maximum allowable unsupported length is not exceeded (see page 41).

Performance	Overview							
Characteristics	;	Unit	Description					
Series			OSP-E25B	OSP-E32B	OSP-E50B			
Max. speed		(m/s)	2	3	5			
Linear motion of drive shaft	per revolution	(mm)	60	60	100			
Max. rpm on d	rive shaft	(min ⁻¹)	2000	3000	3000			
Max. effective	< 1 m/s:	(N)	50	150	425			
action force	1-2 m/s:	(N)	50	120	375			
F _A at speed	> 2 m/s:	(N)	-	100	300			
No-load torque)	(Nm)	0.4	0.5	0.6			
Max. accelerat	ion/deceleration	(m/s ²)	10	10	10			
Repeatability		(mm/m)	±0.05	±0.05	±0.05			
Max. stroke ler	ngth OSP-EB	(mm)	3000	5000	5000			

^{*} Bi-parting version

Max. stroke length OSP-E..B*

Maximum Permissible Torque on Drive Shaft Speed / Stroke

	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	

(mm)

2 x 1500

Important

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

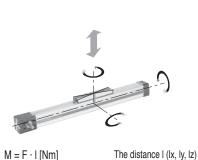
Example above:

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



for calculation of

ORIGA

M'_z = M'_{z statically} + M'_{z dynamically} Combined Loads

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

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

 $M_y = M_y$ statically $M_y = M_y$ of ynamically statically $M_y = M_y$ of ynamically center axis of the linear

The maximum permissible loads must not be exceeded.

Maximum Pern	Maximum Permissible Loads T3									
Series	Max. applied load Fz [N]	Max. mome Mx	nts [Nm] My	Mz						
OSP-E25B	160	2	12	8						
OSP-E32B	300	8	25	16						
OSP-E50B	850	16	80	32						
OSP-EB Bi-partional	The maximum load F must be equally distributed among the two carriers.									

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. Load F [N] OSP-E25 Fz OSP-E32 Fz OSP-E50 Fz Max. distance k [m]

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.

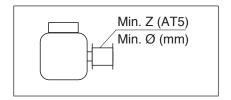
When mechanical stops are required, external shock absorbers should be used (see separate data sheet). Align the center line of the shock absorber as closely as possible with the object's center of gravity (see separate data sheet).

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



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

Required Acceleration

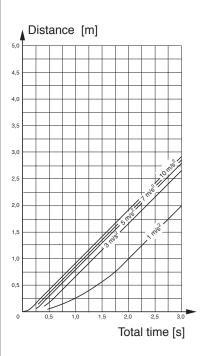
Distance / Time Graph

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

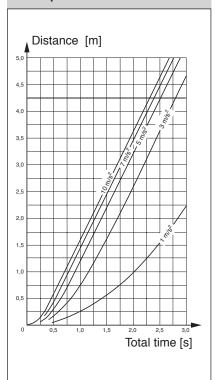
The graphs assume that acceleration and deceleration are equal.

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

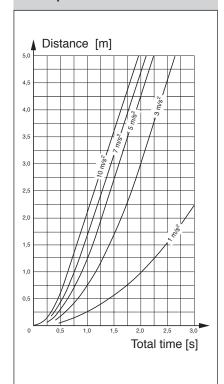




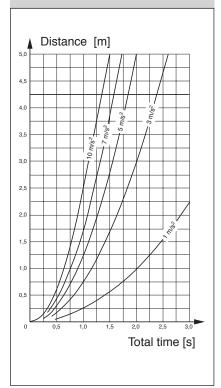
Max. speed 2 m/s



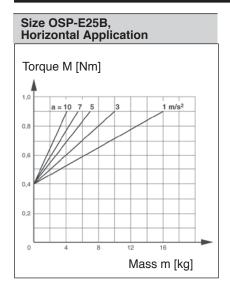
Max. speed 3 m/s

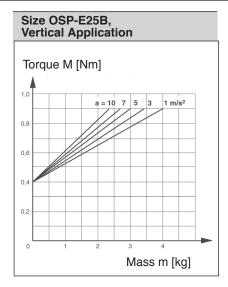


Max. speed 5 m/s



Technical Data

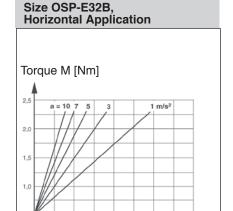




Required Torque / Mass

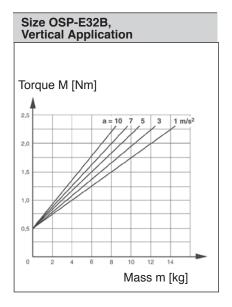
Using the known mass, the direction of the application and the required acceleration from the distance-time graphs, the linear drive can be sized and the required torque is shown in the adjacent graphs.

Mass in graphs = Load + moving mass of the linear drive (according to the weight chart on page 39).



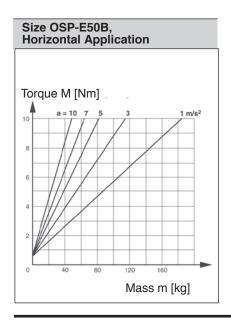
Mass m [kg]

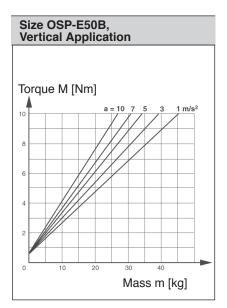
ORIGA



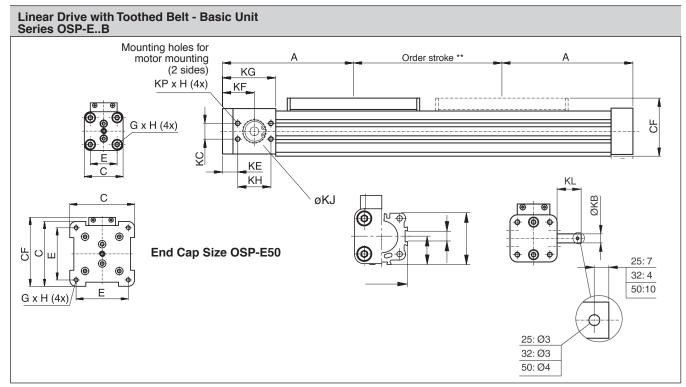
Please note:

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





Dimensions

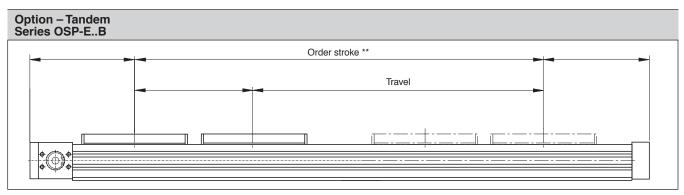


* Note:

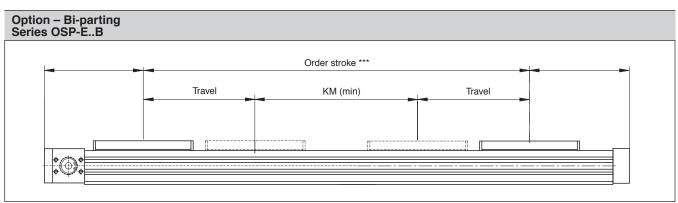
The mechanical end position must not be used as a mechancial end stop. Allow an additional safety clearance at both ends equivalent to the linear movement of one revolution of the drive shaft, but at least 100 mm.

Order stroke = required travel + 2x 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.



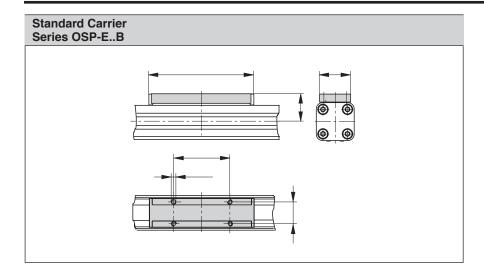
** Order stroke = required travel + KM min + 2 x safety distance



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



Dimensions



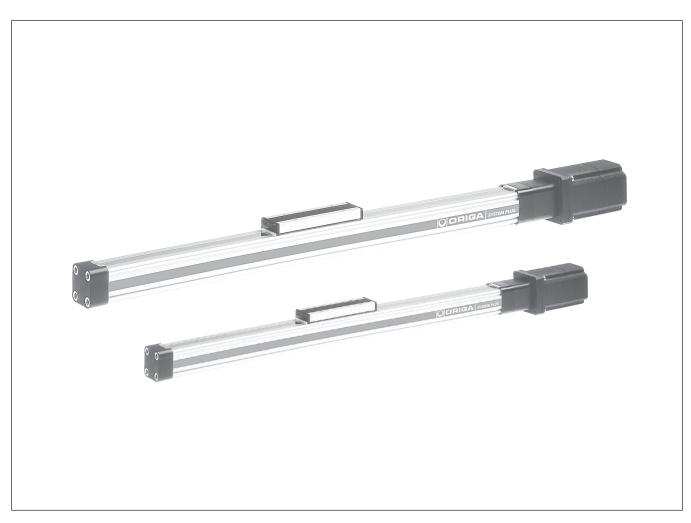
Dimension	Dimension Table [mm]												
Series	Α	В	С	E	GxH	J	K	М	S	٧	Х	Υ	CF
OSP-E25B	125	22	41	27	M5 x 10	117	21.5	31	33	25	65	M5	52.5
OSP-E32B	150	25	52	36	M6 x 12	152	28.5	38	36	27	90	M6	66.5
OSP-E50B	200	25	87	70	M6 x 12	200	43	49	36	27	110	M6	92.5

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





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



 Overview
 .47-50

 Technical Data
 .51-55

 Dimensions
 .56-57



Threaded holes

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

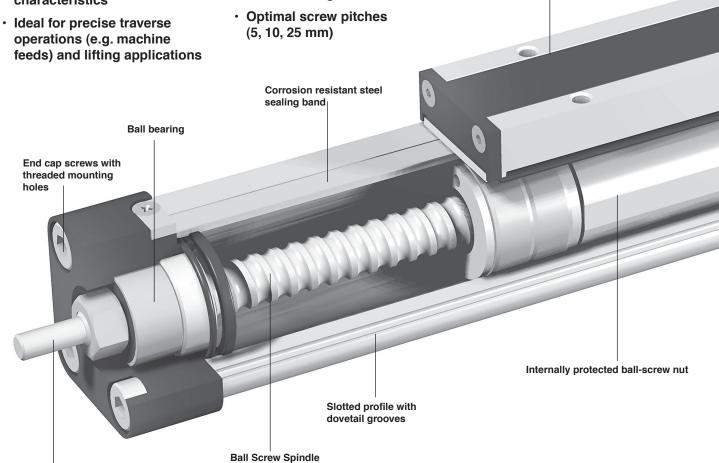
- · Accurate path and position control
- · High force output
- · Easy installation
- · Excellent slow speed characteristics
- operations (e.g. machine

Features

- · Integrated drive and guidance system
- · Complete motor and control packages

and mountings

· Diverse range of accessories





OORIGA

Drive shaft

Low friction support rings

Features

Carrier



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.



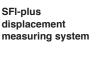
for heavy duty applications



SFI-plus displacement



Heavy Duty guide **HD** linear guides



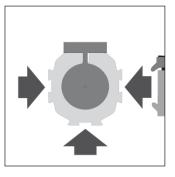


Permanent magnet for contactless sensing



To simplify design work OSP-E system CAD files are available, which are compatible with most common CAD systems

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.







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

STANDARD VERSION OSP-E..SB

Page 51

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 Page 56

For higher moment support.



CLEAN ROOM certified to DIN EN ISO 14644-1



OORIGA

DISPLACEMENT MEASURING SYSTEM SFI-plus

Page 152

Incremental measuring system with practically relevant resolution.



ACCESSORIES

MOTOR MOUNTINGS

Page 119



END CAP MOUNTING

Page 125

For end-mounting of the drive.



MID-SECTION SUPPORT

Page 130

For supporting long drives or mounting the linear drive on the dovetail grooves.



CLEVIS MOUNTING

Page 136

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



INVERSION MOUNTING

Page 138

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

Page 148

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



Technical Data

Cł	naracteristics			
Cł	naracteristics	Symbol	Unit	Description
Ge	eneral Features			
Se	eries			OSP-ESB
Na	ame			Linear drive with ball screw drive
М	ounting			See drawings
Те	mperature range	$\vartheta_{min} \ \vartheta_{max}$	°C °C	-20 +80
W	eight (mass)		kg	See table
Ins	stallation			In any position
	Slotted profile			Extruded anodized aluminum
М	Ball screw			Hardened steel
a	Ball screw nut			Hardened steel
e r	Guide bearings			Low friction plastic
i a	Sealing band			Hardened, corrosion resistant steel
Ĩ	Screws, nuts			Zinc plated steel
	Mountings			Zinc plated steel and aluminum
Er	capsulating class		IP	54

Linear Drive with Ball Screw Drive

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



Weight (mass) and Inertia						
	W	/eight (Mass) (kg)	Inertia	(x 10 ⁻⁶ kgm ²)	
Series	At stroke 0 m	Add per meter stroke	Moving mass	At Stroke 0 m	Add per meter stroke	
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 page 53. 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 pages 136-137).

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 page 138).

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 (page 152)





Technical Data

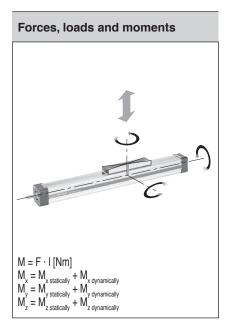
Sizing Performance Overview Maximum Loadings

Sizing of Linear Drive

The following steps are recommended for selection :

- Recommended maximum acceleration is shown in graphs on page 54
- 2. Required torque is shown in graphs on page 55
- 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 page 53)

Performance Overview							
Characteristics	Unit		Desc	cription			
Series		OSP-E25SB	OSP-E	32SB	os	P-E5(SB
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 of drive shaft	(mm)	5	5	10	5	10	25
Max. rpm on drive shaft	(min ⁻¹)	3000	30	00		3000	
Max. effective action force F _A Corresponding torque on drive shaft	(N) (Nm)	250 0.35	600 0.75	1.3	1.7	1500 3.1	7.3
No-load torque	(Nm)	0.2	0.2	0.3	0.3	0.4	0.4
Max. allowable torque on drive shaft	(m/s²)	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	20	00		3200	



Maximum Pe		T3		
Corios	Max. applied load (N)	Max. momen	nts (Nm)	
Series	Fz	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 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.

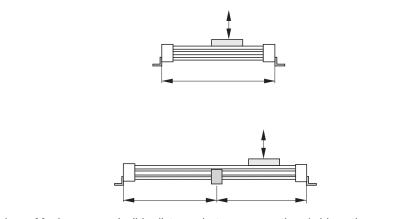
ORIGA

Equation for combined I	oads		
Fz	Mx	My	Mz
+		++	≤ 1
Fz (max)	Mx (max)	My (max)	Mz (max)

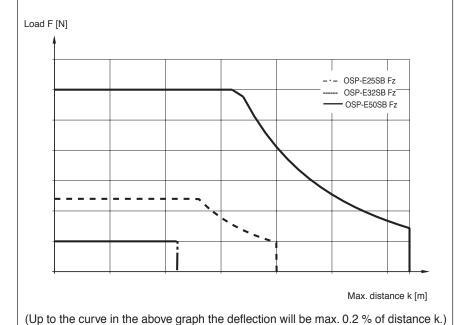
The total of loads must not exceed > 1 under any circumstances.



Maximum Permissible Unsupported Length - Placing of Mid-Section Support



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



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

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

The use of an AC motor with frequency converter normally requires a larder safety clearance than that required for servo systems. For advise, please contact your local PARKER-ORIGA technical support

When mechanical stops are required, external shock absorbers should be used (see separate catalogue). Align the centerline of the shock absorber as closely as possible with the object's center of gravity.

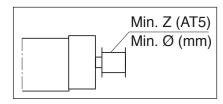
Mounting on the Drive Shaft

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

department.

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





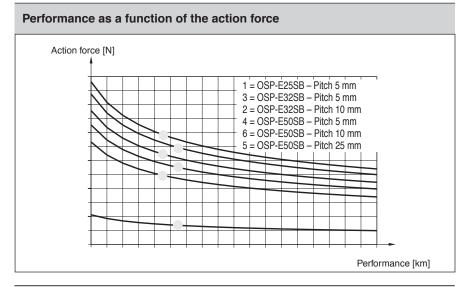
Maximum rpm / Stroke

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

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.

Max. Stroke OSP-E32 = 2,0 m Max. Stroke OSP-E25 = 1,1 m

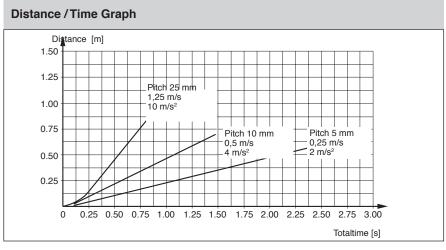


The maximum rpm shown in the graph, is 80% of the critical rpm.

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.

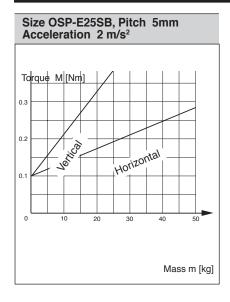
ORIGA

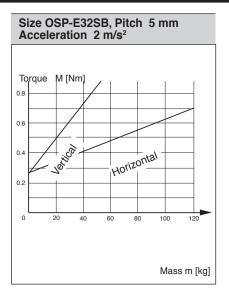




Stroke [m]

Technical Data





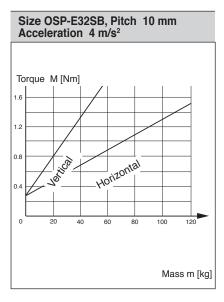
Required Torque / Mass

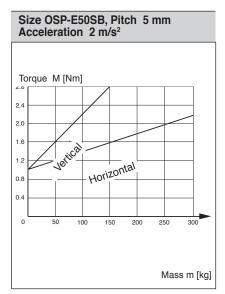
Using the known mass, the direction of the application and the recommended acceleration, the linear drive can be sized and the required torque is shown in the adjacent graphs.

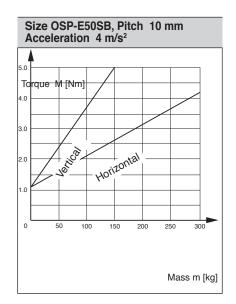
Mass in graphs = Load + moving mass of the linear drive according to the weight chart (see table on page 51)

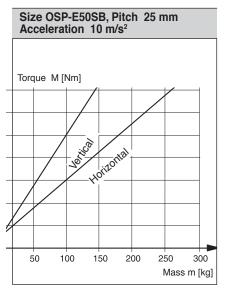
Please mind:

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



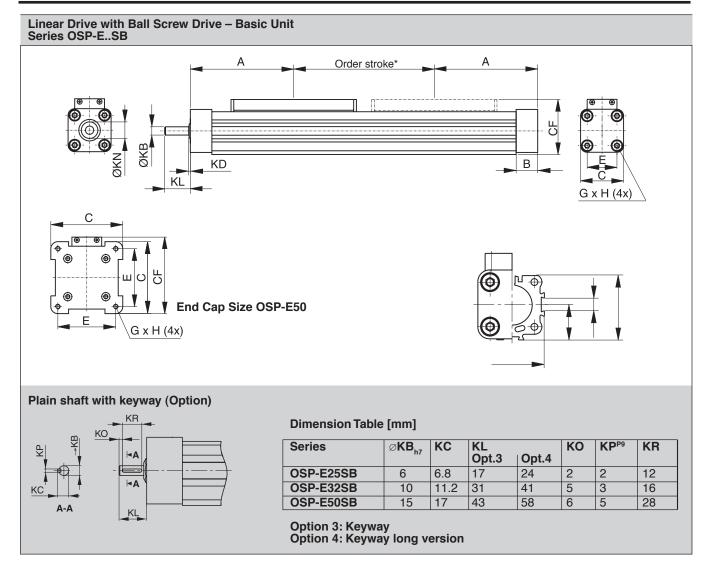








Dimensions

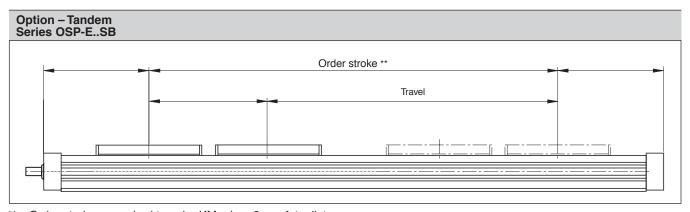


* Note:

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 25 mm.

Order stroke = required travel + $2 \times \text{safety distance}$.

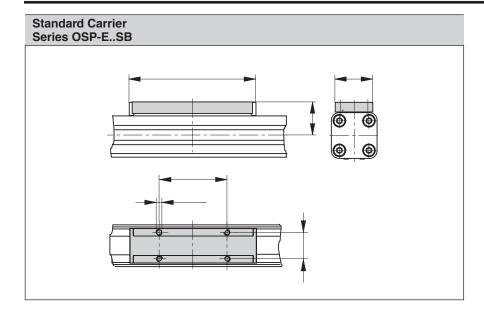
The use of an AC motor with frequency converter normally requires a larger safety clearance than that required for servo systems. For further information, please contact your local PARKER-ORIGA representative.



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



Dimensions



Dimensio	Dimension table [mm]																				
Series	Α	В	С	E	G x H	J	K	M	S	٧	X	Υ	CF	FB	FH	КВ	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



ORIGA

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OORIGA

Linear Drive with Trapezoidal Screw Drive Series OSP-E..ST







FLECTRIC LINEAR DRIVE FOR INTERMITTENT APPLICATIONS

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

Linear Drive with Trapezoidal Screw Drive and Internal Plain Bearing Guide

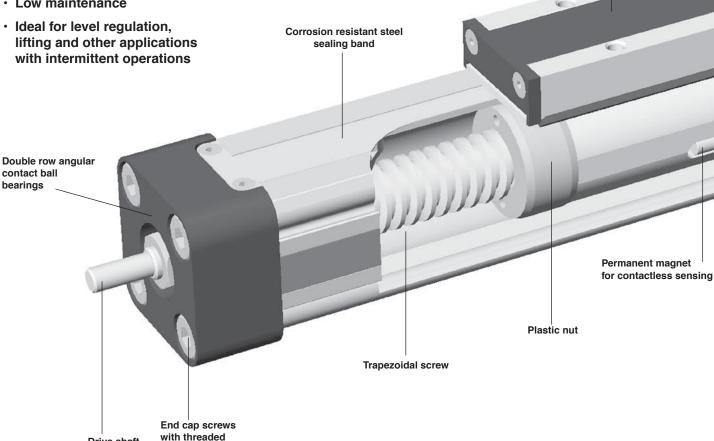
Advantages

- · Accurate path and position control
- · High force output
- · Self-locking
- · Excellent slow speed characteristics
- · Easy installation
- Low maintenance
- lifting and other applications with intermittent operations

Features

- · Integrated drive and guidance system
- · Complete motor and control packages
- · Diverse range of accessories and mountings





Carrier

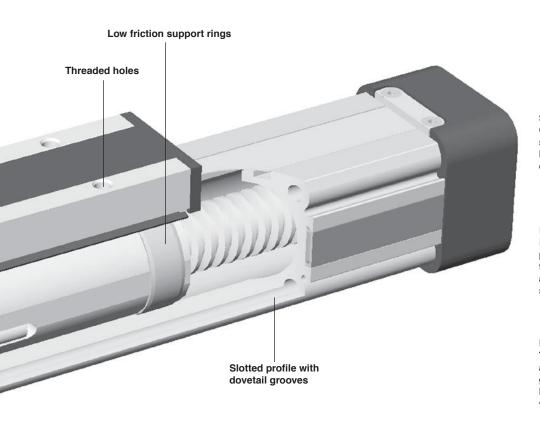
mounting holes

Drive shaft

Features



To simplify design work OSP-E system CAD files are available, which are compatible with most common CAD systems



SLIDELINE **Combination with** sliding guide for heavy-duty operation



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

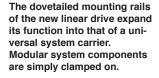


SFI-plus



displacement measuring system





ORIGA





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

STANDARD VERSIONS OSP-E..ST

Pages 63 & 64

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



ACCESSORIES

MOTOR MOUNTINGS

Page 119



END CAP MOUNTING

Page 126

For end-mounting of the actuator



MID-SECTION SUPPORT

Page 131

For supporting long drives or mounting the linear drive on the dovetail grooves.



CLEVIS MOUNTING

Page 136

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



INVERSION MOUNTING

Page 138

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



MAGNETIC SWITCHES SERIES RS UND ES

Page 148

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



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Technical Data

Cł	Characteristics								
Cł	naracteristics	Symbol	Unit	Description					
Ge	eneral Features								
Se	eries			OSP-EST					
Na	ame			Linear drive with trapezoidal screw drive					
М	ounting			See drawings					
Те	mperature range	ϑ_{min} ϑ_{max}	°C	-20 +70					
W	eight (mass)		kg	See table					
Ins	stallation			In any position					
	Slotted profile			Extruded anodized aluminum					
М	Trapezoidal screw			Cold rolled steel					
a t	Drive nut			Thermoplastic polyester					
e	Guide bearings			Low friction plastic					
i	Sealing band			Hardened, corrosion resistant steel					
۱	Screws, nuts			Zinc plated steel					
	Mountings			Zinc plated steel and aluminum					
Er	ncapsulating class		IP	54					

Linear Drive with Trapezoidal Screw Drive

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



Weight (mass) and Inertia						
	V	/eight (Mass) (kg)	Inertia	(x 10 ⁻⁶ kgm²)	
Series	At stroke 0 m	Add per meter stroke	Moving mass	At Stroke 0 m	Add per meter stroke	
OSP-E25ST	0.9	2.8	0.2	6	29.6	
OSP-E32ST	2.1	5.0	0.5	21.7	81	
OSP-E50ST	5.1	10.6	1.3	152	400	

Standard Versions:

- Standard carrier with internal plain bearing guide
- Dovetail profile for mounting of accessories and the actuator itself
- Pitch of Trapezoidal Spindle: Type OSP-E25ST:4 mm Type OSP-E32ST:4 mm Type OSP-E50ST:6 mm

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 page 65. 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 pages 136-137).

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 page 138).

ORIGA_

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 300 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.

Options:

- Displacement Measuring System SFI-plus (page 152)
- Keyway



Sizing Performance Overview Maximum Loadings

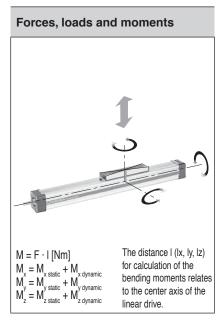
Sizing of Linear Drive

The following steps are recommended for selection :

- 1. Check that maximum values in the table T3 are not exceeded.
- 2. Check the maximum values in graph on page 66 are not exceeded.
- When sizing and specifying the motor, the RMS-average torque must be calculated using the cycle time of the application.
- 4. Check that the maximum allowable unsupported length is not exceeded (see page 65).

Performance Overview								
Characteristics	Unit		Description					
Series		OSP-E25ST	OSP-E32ST	OSP-E50ST				
Pitch	(mm)	4	4	5				
Max. speed	(m/s)	0.1	0.1	0.15				
Linear motion per revolution of drive shaft	(mm)	4	4	6				
Max. rpm on drive shaft	(min ⁻¹)	1500	1500	1500				
Max. effective action force F _A Corresponding torque on drive shaft	(N) (Nm)	600 1.35	1300 3.2	2500 8.8				
No-load torque	(Nm)	0.3	0.4	0.5				
Max. allowable torque on drive shaft	(m/s²)	1.55	4.0	9.4				
Self-locking force F _L ¹⁾	(N)	600	1300	2500				
Repeatability	(mm/m)	±0.05	±0.05	±0.05				
Max. standard stroke length	(mm)	1100	2000	2500				

- ¹⁾ Related to screw types Tr 16x4, Tr 20x4, TR 30x6 see data sheet 1.35.002E-1 for inertia.
- * For strokes longer than 2000 mm in horizontal applications, please contact our customer support.



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.

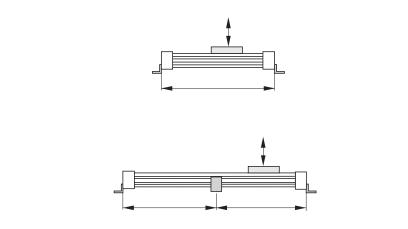
ORIGA

Maximum Permissible Loads							
Size	Max. applied load [N] Fz	Max. mome Mx	nts [Nm] My	Mz			
OSP-E25ST	500	2	24	7			
OSP-E32ST	1000	6	65	12			
OSP-E50ST	1500	13	155	26			

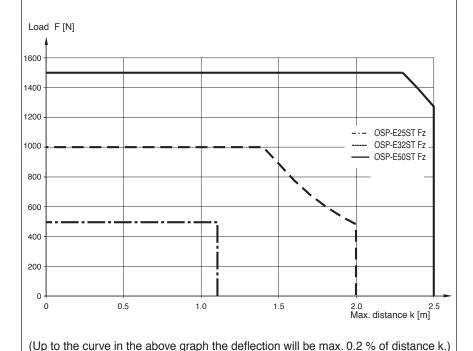
Equation for Combined Loads							
	Fz	Mx	My	Mz			
	+	+	+	≤ 1			
	Fz (max)	Mx (max)	My (max)	Mz (max)			

The total of the 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.



Maximum Permissible Unsupported Length

Stroke Length

The stroke lengths of the linear drives are available in multiples of 1 mm up to the following maximum stroke lengths.

OSP-E25ŠT: max. 1100 mm OSP-E32ST: max. 2000 mm OSP-E50ST: max. 2500 mm * Other stroke lengths are available on request.

* For strokes longer than 2000 mm in horizontal applications, please contact our customer support

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.

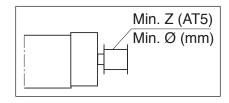
When mechanical stops are required, external shock absorbers should be used (see separate data sheet). Align the centerline of the shock absorber as closely as possible with the object's center of gravity.

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.



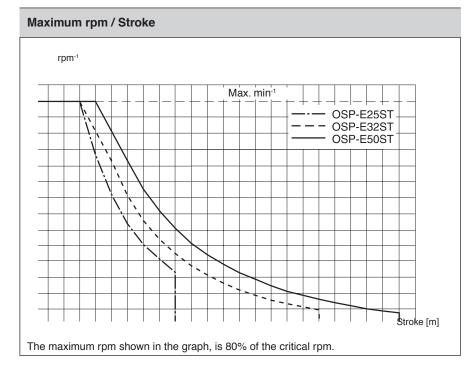
Size	Min. Z	Min. ø
OSP-E25ST	24	38
OSP-E32ST	24	38
OSP-E50ST	36	57





Maximum rpm / Stroke

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

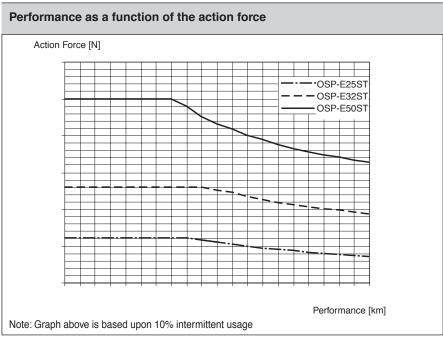


Performance / Action Force

The Linear Drives are designed for a 10% intermittent usage.

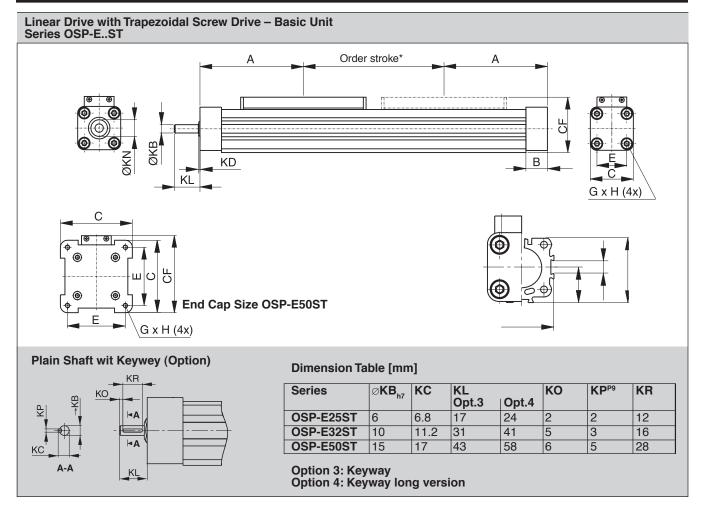
The performance to be expected depends on the maximum required actions force of the application.

An increase of the action force will lead to a reduced performance.





Dimensions



* NOTE:

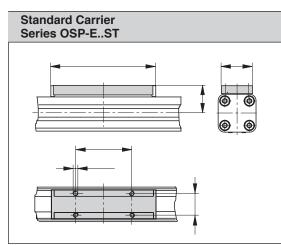
The mechanical end position must not be used as a mechancial end stop. Allow an additional safety clearance at both ends equivalent to the linear movement of one revolution of the drive shaft, but at least 25 mm.

Order stroke = required travel + 2×3 safety distance.

ORIGA

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.



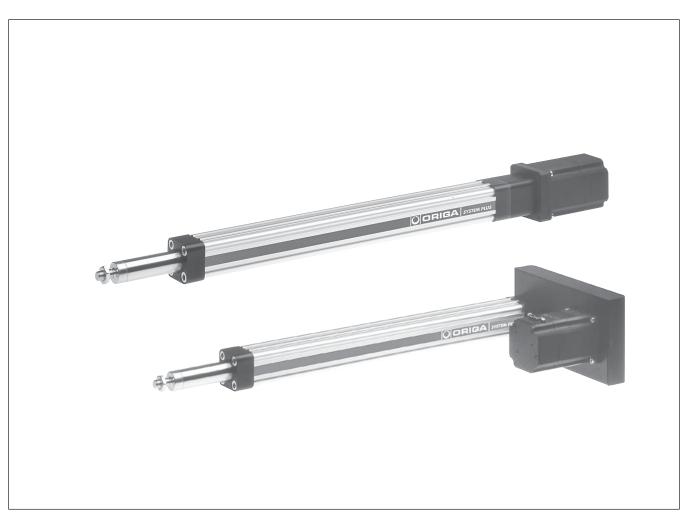
Dimension Table [mm]																				
Series	Α	В	С	E	GxH	J	K	М	S	٧	Х	Υ	CF	FB	FH	KB	KD	KL	KN	ZZ
OSP-E25ST	100	22	41	27	M5 x 10	117	21.5	31	33	25	65	M5	52.5	40	39.5	6 _{h7}	2	17	13	8
OSP-E32ST	125	25.5	52	36	M6 x 12	152	28.5	38	36	27	90	M6	66.5	52	51.7	10 _{h7}	2	31	20	10
OSP-E50ST	175	33	87	70	M6 x 12	200	43	49	36	27	110	M6	92.5	76	77	15 _{h7}	3	43	28	10







Linear Drive with Ball Screw Drive and Piston Rod Series OSP-E..SBR



Overview	69-72
Technical Data	73-75
Dimensions	75



ELECTRIC LINEAR DRIVE FOR PRECISE AND HIGH SPEED POSITIONING OF HIGH MASSES

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

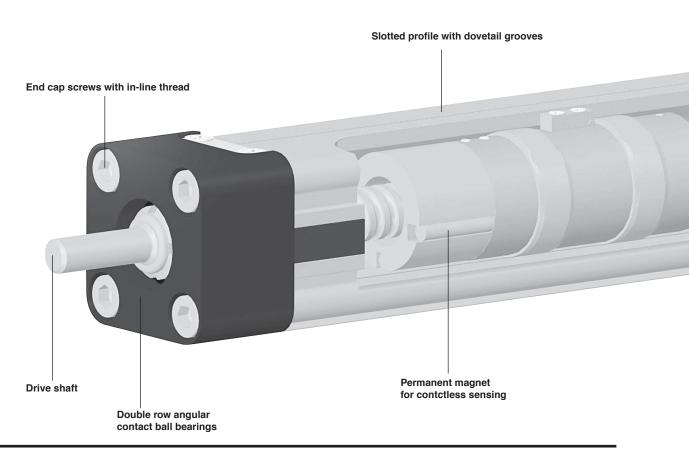
Linear Drive with Ball Screw Drive, Internal Plain Bearing Guide and Piston Rod

Advantages

- · High output force
- Excellent running characteristics
- Accurate path and position control
- High levels of repeatability

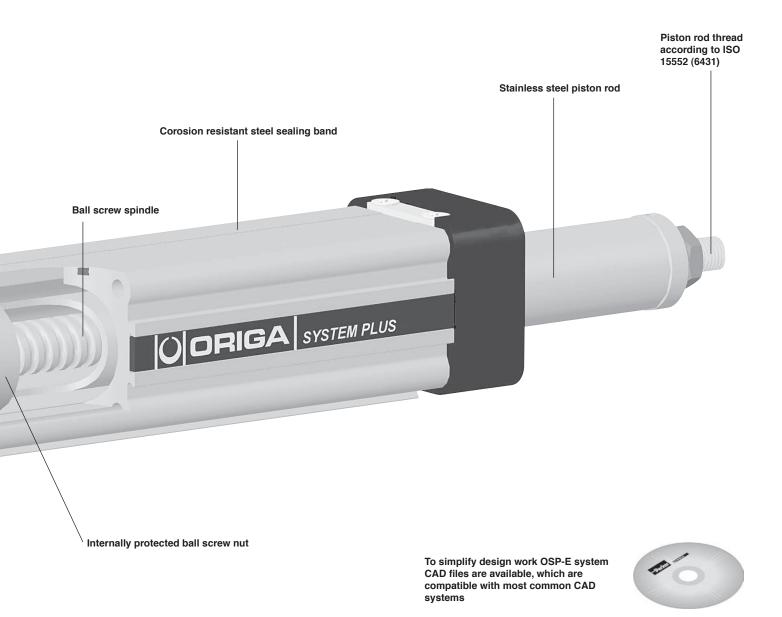
Features

- · Extending drive rod
- · Ball screw spindle
- · Non-rotating drive rod
- Continuous duty operation
- · Large range of accessories





Linear Drive with Ball Screw Drive and Piston Rod Series OSP-E..SBR





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

STANDARD VERSIONS OSP-E..SBR

Pages 73-75

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-E25SBR: 5 mm OSP-E32SBR: 5, 10 mm OSP-E50SBR: 5, 10, 25 mm

ACCESSORIES

MOTOR MOUNTINGS

Page 119



END CAP MOUNTING

Page 127

For end-mounting the actuator on the extending rod side

MID SECTION SUPPORT

Page 131

For mounting the actuator on the dovetail grooves and on the motor end



FLANGE MOUNTING C

Page 128

For end-mounting the actuator on the extending rod side.



TRUNNION MOUNTING EN

Page 135

Trunning mounting EN in combination with pivot mounting EL.

steplessly adjustable in axial direction.



PISTON ROD EYE Page 144



PISTON ROD CLEVIS

Page 144



PISTON ROD COMPENSATING COUPLING

Page 145

raye 145

For compensating of radial and angular misaligments



MAGNETIC SWITCHES SERIES RS AND ES

Page 148

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



Features

Cł	Characteristics										
Cł	naracteristics	Symbol	Unit	Description							
Ge	eneral Features										
Se	eries			OSP-ESBR							
Na	ame			Linear drive with ball screw drive bear and piston rod							
М	ounting			See drawings							
Temperature range		$\vartheta_{min} \ \vartheta_{max}$	°C °C	-20 +80							
Weight (mass)			kg	See table							
Ins	stallation			In any position							
	Slotted profile			Al anodized							
	Ball screw			Steel							
M a	Ball nut			Steel							
t e	Piston rod			Stainless steel							
r	Guide bearings			Low friction plastic							
a	Sealing band			Hardened, corrosion resistant steel							
	Screws, nuts			Zinc plated steel							
	Mountings			Zinc plated steel and aluminum							
Er	capsulating class		IP	54							

Weight (mass) and Inertia												
	Weight (Mass) (kg)	Moving	Mass (kg)	Inertia (x 10 ⁻⁶ kgm ²)							
Series	At stroke 0 m	Add per meter stroke	At stroke 0 m	meter		Add per meter stroke						
OSP-E25SBR	0.7	3.0	0.2	0.9	1.2	11.3						
OSP-E32SBR	1.7	5.6	0.6	1.8	5.9	32.0						
OSP-E50SBR	4.5	10.8	1.1	2.6	50.0	225.0						

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 actuator.

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.

OORIGA

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 Drive with Ball Screw Drive and Piston Rod

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



Standard Version:

- Standard carrier with internal plain bearing guide
- Pitches of Ball Screw Spindle:
 Type OSP-E25SBR:5 mm
 Type OSP-E32SBR: 5, 10 mm
 Type OSP-E50SBR: 5, 10, 25 mm

Option:

· Key way version



Sizing Performance Overview Maximum Loadings

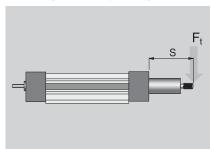
Sizing of Linear Drive

The following steps are recommended for selection :

- Check that the maximum values in the adjacent chart and transverse force/stroke graph below are not exceeded.
- 2. Check the lifetime/travel distance in graph below.
- When sizing and specifying the motor, the RMS-average torque must be calculated using the cycle time in application.

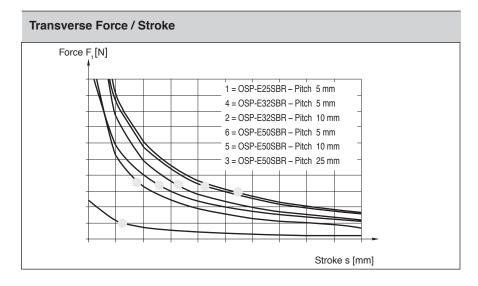
Transverse Force / Stroke

The permissible transverse force is reduced with increasing stroke length. according to the adjacent graphs.



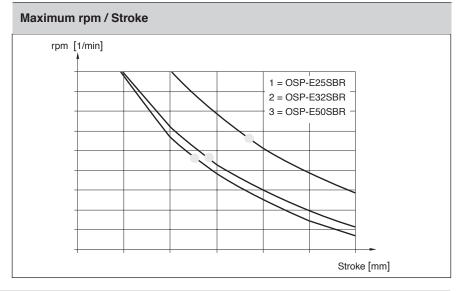
Characteristics	Unit	Description							
Series		OSP-E25SBR	OSP-E	32SBR	OSP-E50SBR				
Pitch	[mm]	5	5 5 1				25		
Max. speed	[m/s]	0.25	0.25	0.5	0.25	0.5	1.25		
Linear motion per revolution drive shaft	[mm]	5	5	10	5	10	25		
Max. rpm drive shaft	[min ⁻¹]	3000	3000		3000				
Max. effective action force F _A Corresponding torque drive shaft	[N] [Nm]	260 0.45	900 1.1	1.8	1200 1.3	2.8	6.0		
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		
Max. allowable acceleration	[m/s ²]	5	5		5				
Typical repeatability	[mm/m]	±0.05	±0.05	±0.05 ±0			0.05		
Max.Standard stroke length	[mm]	500	500		500				

Porformance everyious



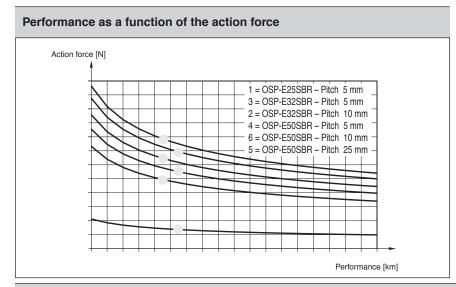
Maximum rpm / Stroke

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





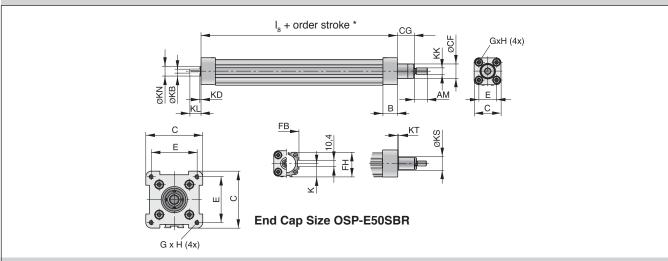
Technical Data



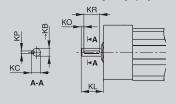
Performance / Action force

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.

Linear Drive with Ball Screw Drive and Piston Rod – Basic Unit Series OSP-E..SBR



Plain shaft with keyway (Option)



Dimension Table [mm]

Series	ØKB _{h7}	KC	KL Opt.3 Opt.4		КО	KP ^{P9}	KR
OSP-E25SBR	6	6.8	17	24	2	2	12
OSP-E32SBR	10	11.2	31	41	5	3	16
OSP-E50SBR	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.

Dimension 1	Dimension Table [mm]																	
Series	В	С	E	GxH	K	l ₈	AM	ØCF	CG	FB	FH	ØKB	KD	KK	KL	ØKN	ØKS	KT
OSP-E25SBR	22	41	27	M5 x 10	21.5	110	20	22	26	40	39.5	6 _{h7}	2	M10x1.25	17	13	-	_
OSP-E32SBR	25.5	52	36	M6 x 12	28.5	175.5	20	28	26	52	51.7	10 _{h7}	2	M10x1.25	31	20	33	2
OSP-E50SBR	33	87	70	M6 x 12	43	206	32	38	37	76	77	15 _{h7}	3	M16x1.5	43	28	44	3

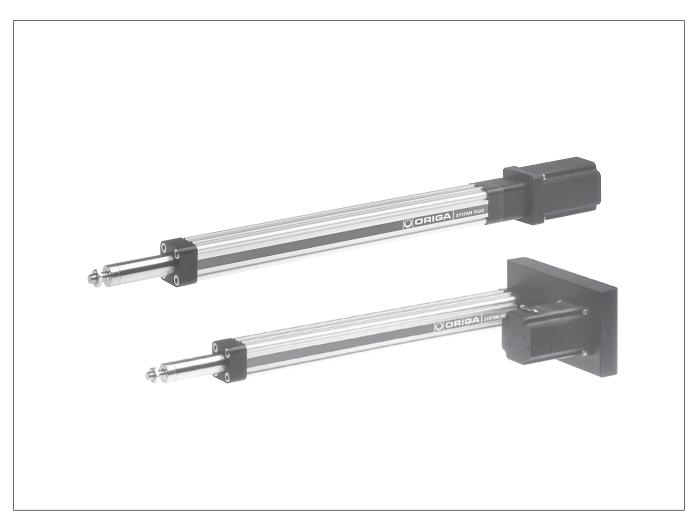






OORIGA

Linear Drive with Trapezoidal Screw Drive and Piston Rod Series OSP-E..STR



Overview	77-80
Technical Data	81-82
Dimensions	83



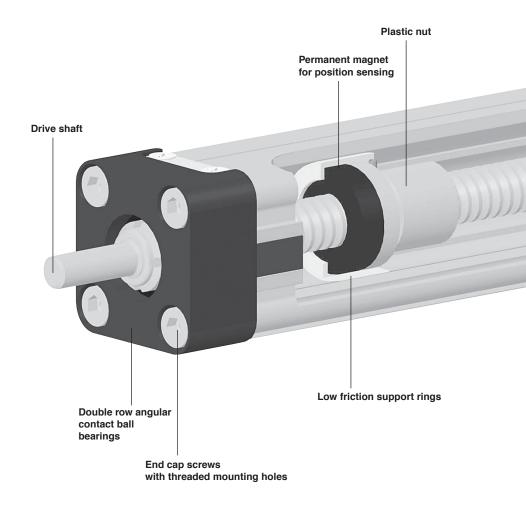
ELECTRIC LINEAR DRIVE FOR INTERMITTENT APPLICATIONS

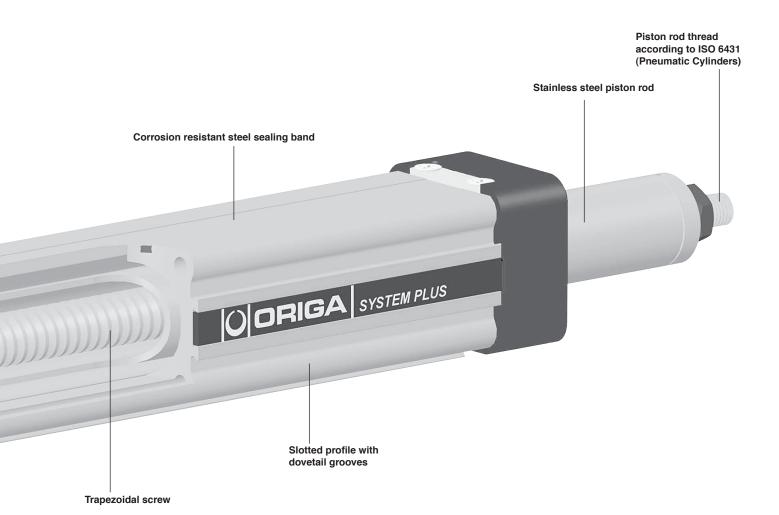
A completely new generation of linear drives which can be integrated into any machine layout neatly and simply.

Linear Drive with Trapezoidal Screw Drive, Internal Plain Bearing Guide and Piston Rod

Advantages

- Accurate path and position control
- · High force output
- · Self-locking
- Excellent slow speed characteristics
- · Easy installation
- · Low maintenance
- Ideal for level regulation, lifting and other applications with intermittent operations





To simplify design work OSP-E system CAD files are available, which are compatible with most common CAD systems





SERIES OSP-E, LINEAR DRIVE WITH TRAPEZOIDAL SCREW DRIVE, INTERNAL PLAIN BEARING GUIDE AND PISTON ROD

STANDARD VERSIONS OSP-E..STR

Pages 80-83

Standard carrier with internal guidance and integrated magnet for contactless position sensing.

Dovetail profile for mounting of accessories and the actuator itself.



ACCESSORIES

MOTOR-MOUNTINGS

Page 119



END CAP MOUNTING

Page 126

For end-mounting the actuator on the extending rod side.

MID SECTION SUPPORT

Page 130

For mounting the actuator on the dovetail grooves and on the motor end.



FLANGE MOUNTING C

Page 128

For end-mounting the actuator on the extending rod side



PISTON ROD CLEVIS

Page 144



TRUNNION MOUNTING EN

Page 135

Trunning mounting EN in combination with pivot mounting EL.

steplessly adjustable in axial direction.



PISTON ROD COMPENSATING COUPLING

Page 145

For compensating of radial and angular misaligment.



PISTON ROD EYE

Page 144



MAGNETIC SWITCHES SERIES RS AND ES

Page 148

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





Technical Data

Cha	Characteristics										
Cha	aracteristics	Symbol	Unit	Description							
Ger	neral Features		•								
Ser	ies			OSP-ESTR							
Nar	ne			Linear Drive with Trapezoidal Screw Drive and Piston Rod							
Mou	unting			See drawings							
Ten	nperature Range	ϑ_{\max}	°C °C	-20 +70							
Wei	ight (mass)		kg	See table							
Inst	allation			In any position							
	Slotted profile			Extruded anodized aluminium							
	Trapezoidal screw			Cold rolled steel							
<u>'ā</u>	Drive nut			Thermoplastic polyester							
Materia	Piston rod			Stainless steel							
Σ	Sealing band			Hardened, corrosion resistant steel							
	Guide bearings			Low friction plastic							
	Screws, nuts			zinc plated steel							
	Mountings			zinc plated steel and aluminium							
Enc	apsulation class		IP	54							

Weight (ma	Weight (mass) and Inertia													
Series	Weight (mass)[kg] At stroke 0 m Add per metre stroke		Moving m At stroke 0 m	ass [kg] Add per metre stroke	Inertia [x 10-6 kgm2] At stroke 0 m Add per metre									
OSP-E25STR	0.4	2.9	0.1	0.7	1.1	10.3								
OSP-E32STR	0.9	5.4	0.2	1.2	3.9	29.6								
OSP-E50STR	2.4	10.6	0.8	1.6	24.6	150								

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 actuator.

The linear actuator can be fitted in any position. To prevent contamination such as fluid ingress, the actuator should be fitted with its sealing band facing downwards.

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 300 km travel of distance. Please refer to the operating instructions supplied with the drive.

OORIGA

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.

Contactless position sensing

Please use the magnetic switch mentioned below:

KL3096 (Type RS-K, normaly closed, Reed-contact, with cable) **KL3098** (Type ES-S, Magnetic

electronic, PNP-switch with DIN-plug)

For more information see page 148.

Linear Drive with Trapezoidal Screw Drive and Piston Rod

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



Standard Version:

- Dovetail profile for mounting of accessories and the actuator itself
- Pitch of Trapezoidal Spindle: Type OSP-E25STR:3 mm Type OSP-E32STR:4 mm Type OSP-E50STR:5 mm





±0,5

500

±0,5

500

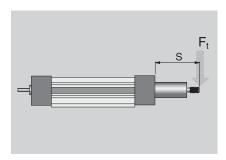
Sizing **Performance Overview Maximum Loadings**

Sizing of Linear Drive

The following steps are recommended for selection:

- 1. Check that the maximum values in the adjacent chart and transverse force/stroke graph below are not
- 2. Check the lifetime/travel distance in graph below.
- 3. When sizing and specifying the motor, the RMS-average torque must be calculated using the cycle time in application

Transverse Force / Stroke



Performance Overview				
Characteristics	Unit	Description		
Size		OSP-E25STR	OSP-E32STR	OSP-E50STR
Pitch	[mm]	3	4	5
Max. speed	[m/s]	0.075	0.1	0.125
Linear motion per revolution, drive shaft	[mm]	3	4	5
Max. rpm, drive shaft	[min ⁻¹]	1500 ²⁾	1500	1500
Max. effective action force F _A Corresponding torque on drive shaft	[N] [Nm]	800 1.35	1600 3.4	3300 9.25
No-load torque	[Nm]	0.3	0.4	0.5
Max. allowable torque on drive shaft	[Nm]	1.7	4.4	12
Self-locking force F _L ¹⁾	[N]	800	1600	3300

 $[mm/m] \pm 0.5$

500

[mm]

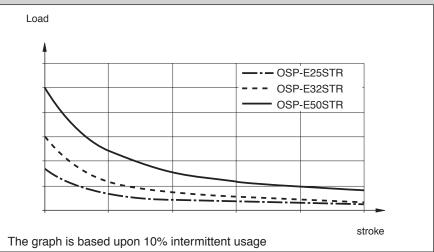
1) Related to screw types Tr 12x3, Tr 16x4, Tr 24x5 see data sheet 1.35.011-1 - for inertia

Typical repeatability

Max.Standard stroke length

²⁾ from 0,4 m stroke max. 1200 min-1 permissible

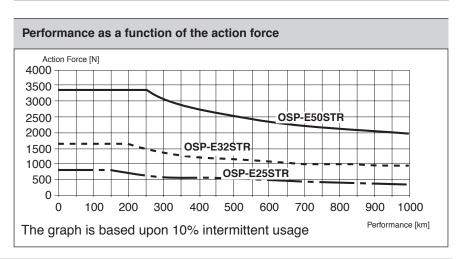
Transverse Force / Stroke Load



Performance / **Action Force**

The Linear Drives are designed for a 10% intermittent usage.

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.





Linear Drive with Trapezoidal Screw Drive and Piston Rod – Basic Unit Series OSP-E..STR l_s + order stroke* **End Cap Size OSP-E50STR** (10) Plain shaft with keyway (Option) **Dimension Table [mm]** KO **Series** ØKB_{h7} KC KO KP^{P9} KR Opt.3 Opt.4 OSP-E25STR 24 6.8 17 2 12 6 2 OSP-E32STR 10 11.2 31 41 5 3 16 OSP-E50STR 5 15 17 43 58 6 28

* 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 25 mm.

Option 3: Keyway Option 4: Keyway long version

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.

Dimension Table [mm]																
Series	В	С	E	GxH	K	I ₈	AM	CF	CG	FB	FH	KB	KD	KK	KL	KN
OSP-E25STR	22	41	27	M5 x10	21.5	83	20	22	26	40	39.5	6 _{h7}	2	M10x1.25	17	13
OSP-E32STR	25.5	52	36	M6 x12	28.5	94	20	28	26	52	51.7	10 _{h7}	2	M10x1.25	31	20
OSP-E50STR	33	87	70	M6 x12	43	120	32	38	37	76	77	15 _{h7}	3	M16x1.5	43	28







OORIGA

Multi-Axis System for Electrical Linear Drives Series OSP-E



Overview	85-88
Adapter Plates	89-97
Profile Mountings	129



MULTI-AXIS CONNECTION SYSTEM – SIMPLIFIES ENGINEERING AND INSTALLATION

A completely new system for easy connection of OSP-E linear drives in multi-axis systems.

MULTI-AXIS CONNECTIONS

With this highly adaptable system for connection of linear drives in multi-axis arrangements, PARKER-ORIGA offers design engineers complete flexibility. A wide range of adapter plates, profile mountings and intermediate drive shafts simplify engineering and installation.

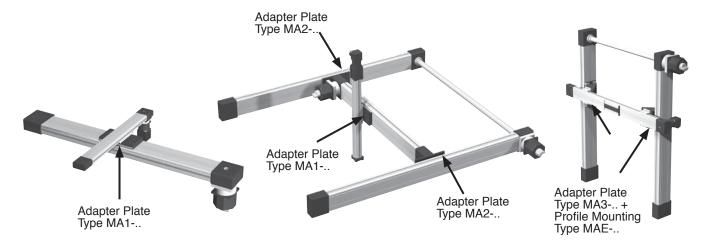
The connection system enables actuators to be mounted in carrier to carrier, carrier to profile, carrier to end cap mounting, carrier to end cap.

Developed for the heavy-duty toothed belt drive series OSP-E..BHD, the system provides cross-connection with the same series and also other linear drive series in the ORIGA SYSTEM PLUS range.





MULTI-AXIS CONNECTION SYSTEM

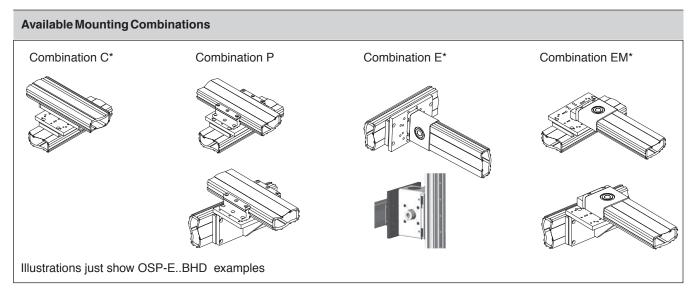


* For available standard combinations, see page 88

Adapter Plate	Combination C*	Combination P*	Combination EM*
Type MA1* For connecting carrier to carrier, carrier to profile mounting or carrier to end cap mounting.			
	Combination C*	Combination P*	Combination EM*
Adapter Plate	Combination E*	Combination E*	Combination E*
Type MA2* For connecting carrier to end cap.			9.
Adapter Plate Type MA3*	Combination P*	Combination P*	
For connecting 90° carrier to profile mounting or carrier to end cap mounting.			
	Combination EM*	Combination EM*	
Profile Mounting Type MAE			



AVAILABLE MOUNTING COMBINATIONS



0.1.																										
Series		25BHD		32BHD		50BHD		25BV	25BV 25B/SB/ST		32B/SB/ST			50B/SB/ST												
	Туре	C1	P ²	E ³	EM ⁴	C ⁵	P 6	E ⁷	EM 8	C 9	P 10	E11	EM 12	E11	C 13	P 14	E 15	EM 16	C 17	P 18	E 19	EM 20	C 21	P 22	E 23	EM ²⁴
OSP- E25BHD	MA1-25	χ	χ		Х	Х	χ		χ						χ	χ		Х	χ	χ		χ	χ	Х		Х
OSP- E32BHD	MA1-32	Χ	χ		Х	Х	χ		Χ	χ	Х		χ						χ	χ		Χ	χ	Х		Х
OSP- E50BHD	MA1-50	Χ	Х		Х	Х	Х		Х	Х	Х		Х						Х				χ	Х		Х
OSP- E25BHD	MA2-25			Х				Х																	Χ	
	MA2-32													χ												
OSP- E32BHD	MA2-32			Х				Х				Х		Х											χ	
OSP- E50BHD	MA2-50			Х				Х				Х		Х											Χ	
OSP- E25BHD	MA3-25		Х		Х		Χ		Х							χ		χ		Χ		χ		Х		Х
OSP- E32BHD	MA3-32		χ		Х		χ		χ		Х		χ							χ		χ		Х		Х
OSP- E50BHD	MA3-50		Х		χ		Χ		Х		Х		χ											Х		Х

Abbreviations:

C = MAn to Carrier,

P = MAn to Profile mounting,

E = MAn to End cap,

EM = MAn to End cap mounting (n=1,2,3)

* For type OSP-E..SBR / ..STR only combination P is available.

ORIGA

Values in superscript refer to corresponding adapter plate dimensions on pages 89-97.

e.g. Dimensions corresponding to combination option "C" for adapter plate MA1-50 connected to an OSP-E32BHD carrier are shown with Superscript number 5 on the MA1-50 adapter plate on page 91

Other combinations on request.



Dimensions [mm] Adapter PlateType MA1-25 45 M5 (26x) M6 (8x) 32.5 32.5 10 10 Ø5.50 (4x) Φ ***** \oplus 0 641, 5, 8) 92¹⁸⁾ 80¹⁴⁾ 118²²⁾ 132²⁾ 156⁶⁾ 160 524) -(⊕)-40 40 110

Adapter Plate for OSP-E25



Type: MA1-25



Dimensions with superscript values refer to the corresponding available options

detailed on page 88.
e.g. Dimensions with superscript number 5 correspond to the option "C" for OSP-E32BHD actuator.

Order Instructions and Weight		
Description	Weight(mass) [kg]	Order-No.
Adapter Plate Type MA1-25	0.7	12269

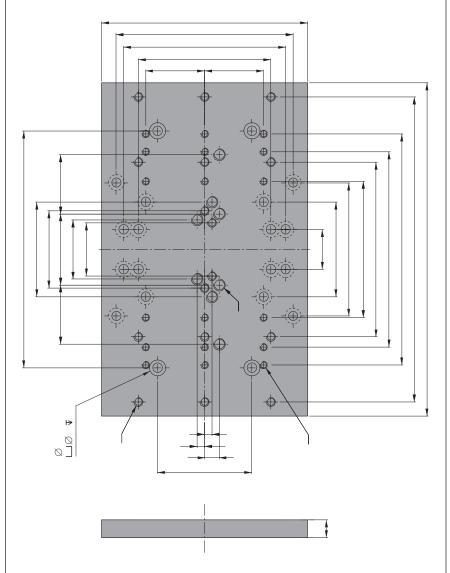
Adapter Plate for OSP-E32



Type: MA1-32



Dimensions [mm] Adapter PlateType MA1-32



Dimensions with superscript values refer to the corresponding available

options detailed on page 88.
e.g. Dimensions with superscript number 5 correspond to the option "C" for OSP-E32BHD actuator.

Order Instructions and Weight		
Description	Weight (mass) [kg]	Order No.
Adapter Plate Type MA1-32	1.0	12272

Dimensions [mm Adapter PlateType MA1-50 ${\mathbb Q}_{\varnothing}$ \bigoplus +(∰)\ Dimensions with superscript values refer to the corresponding available options detailed on page 88.

Adapter Plate for OSP-E50



Type: MA1-50



e.g. Dimensions with superscript number 5 correspond to the option "C" for OSP-E32BHD actuator.

Order Instructions and Weight		
Description	Weight (mass) [kg]	Order No.
Adapter Plate Type MA1-50	1.1	12275

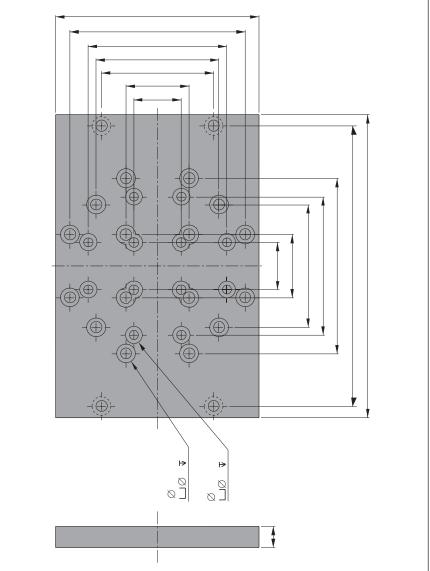
Adapter Plate for OSP-E25



Type: MA2-25



Dimensions [mm] Adapter PlateType MA2-25



Dimensions with superscript values refer to the corresponding available

options detailed on page 88.
e.g. Dimensions with superscript number 5 correspond to the option "C" for OSP-E32BHD actuator.

Order Instructions and Weight		
Description	Weight (mass) [kg]	Order No.
Adapter Plate Type MA2-25	0.6	12270

Dimensions [mm] Adapter PlateType MA2-32 **(** (H) Dimensions with superscript values refer to the corresponding available options detailed on page 88.

Adapter Plate for OSP-E32



Type: MA2-32



e.g. Dimensions with superscript number 5 correspond to the option "E" for OSP-E32BHD actuator.

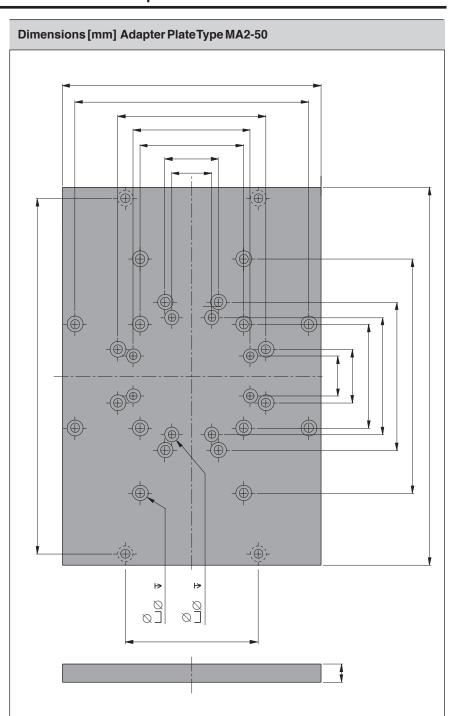
Order Instructions and Weight		
Description	Weight (mass) [kg]	Order No.
Adapter Plate Type MA2-32	1.1	12273

Adapter Plate for OSP-E50



Type: MA2-50



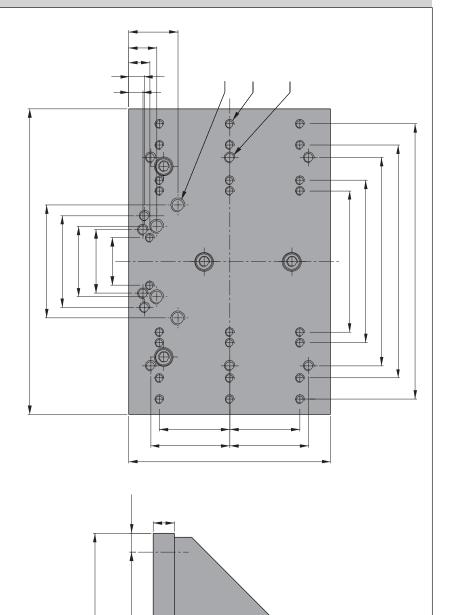


Dimensions with superscript values refer to the corresponding available

options detailed on page 88.
e.g. Dimensions with superscript number 5 correspond to the option "E" for OSP-E32BHD actuator.

Order Instructions and Weight		
Description	Weight (mass) [kg]	Order No.
Adapter Plate Type MA2-50	1.4	12276

Dimensions [mm] Adapter PlateType MA3-25



Adapter Plate for OSP-E25



Type: MA3-25



Dimensions with superscript values refer to the corresponding available

options detailed on page 88.
e.g. Dimensions with superscript number 5 correspond to the option "EM" for OSP-E32BHD actuator.

Order Instructions and Weight

Description	Weight(mass) [kg]	Order No.
Adapter Plate Type MA3-25	1.3	12271



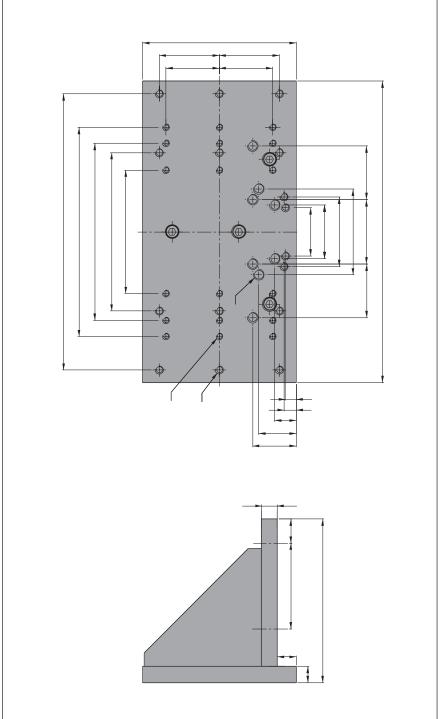
Adapter Plate for OSP-E32



Type: MA3-32



Dimensions [mm Adapter PlateType MA3-32



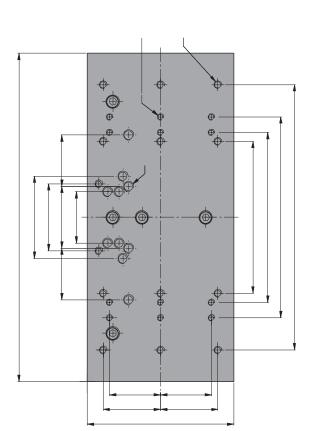
Dimensions with superscript values refer to the corresponding available

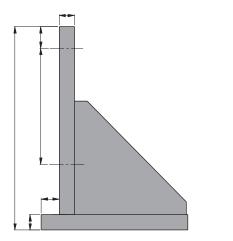
options detailed on page 88.
e.g. Dimensions with superscript number 5 correspond to the option "EM" for OSP-E32BHD actuator.

Order Instructions and Weight						
Description	Weight (mass) [kg]	Order No.				
Adapter Plate Type MA3-32	1.8	12274				



Dimensions [mm] Adapter PlateType MA3-50





Dimensions with superscript values refer to the corresponding available options detailed on page 88.

e.g. Dimensions with superscript number 4 correspond to the option "EM" for OSP-E25BHD actuator.

Order Instructions and Weight

Description	Weight (mass) [kg]	Order No.
Adapter Plate Type MA3-50	2.3	12277

Adapter Plate for OSP-E50



Type: MA3-50

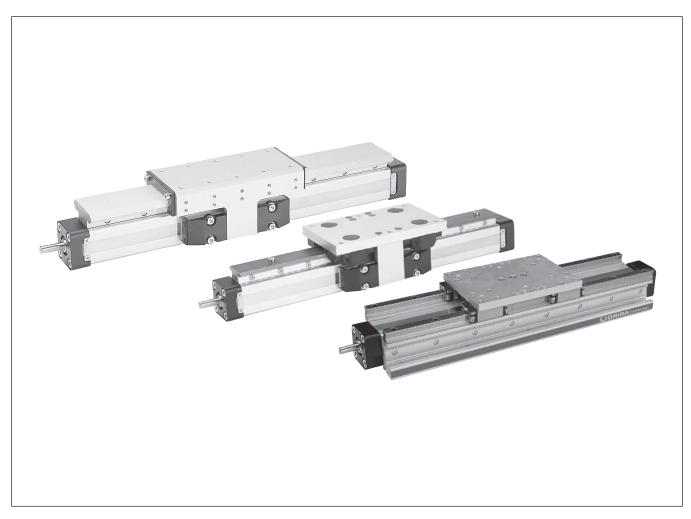








Linear Guides Series OSP-E



Overview	99-100
Plain Bearing SLIDELINE	101-102
Roller Guide POWERSLIDE	103-106
Aluminium Roller Guide PROLINE	107-109
Heavy-duty guide HD NEW	111-113





Linear Guides

Electric linear drive

- Series OSP-E..B (Toothed Belt Driven)
- Series OSP-E..SB (Ball Screw Driven)
- Series OSP-E..ST (Trapezoidal Screw Driven)



Adaptive modular system

The Origa system plus – OSP – provides a comprehensive range of linear guides for the pneumatic and electric linear drives.

Versions:

Electric Linear Drive

Series:

- · OSP-E..B
- · OSP-E..SB
- · OSP-E..ST

· Sizes:

25 - 32 - 50

Advantages:

- · Takes high loads and moments
- · High precision
- · Smooth operation
- · Can be retrofitted
- · Can be installed in any position

SLIDELINE

The cost-effective plain bearing guide for medium loads.

 for spindle drives only Series OSP-E..SB, OSP-E..ST

See page 101



POWERSLIDE

The roller guide for heavy loads.

See page 103



PROLINE

The ball bushing guide for heavy loads and speed.

See page 107



HD-Guide (heavy-duty guide)

The recirculating ball bearing guide for the heaviest loads and greatest accuracy.

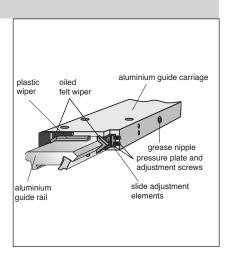
 for Screw Drives only Series OSP-E..SB, OSP-E..ST

See page 111





- for electric linear drive: Series OSP-E Screw



Technical Data

The table shows the maximum permissible values for smooth operation, which must not be exceeded even under dynamic conditions.

The load and moment figures apply to speeds v < 0.2 m/s.

Loads, forces and moments

Series	Max.N	noments [Nm]	Mz	Max. Load [N]	Mass of D with guide with 0 mm stroke OSP-EScrew		Mass of guide carriage [kg]	Ident-Nr. SLIDELINE ¹⁾ without brake for OSP-EScrew		
SL 25	14	34	34	675	1.8	0.42	0.61	20342		
SL 32	29	60	60	925	3.6	0.73	0.95	20196		
SL50	77	180	180	2000	8.7	1.44	2.06	20195		

¹⁾ Corrosion resistant fixtures available on request

ORIGA

Plain Bearing Guide SLIDELINE



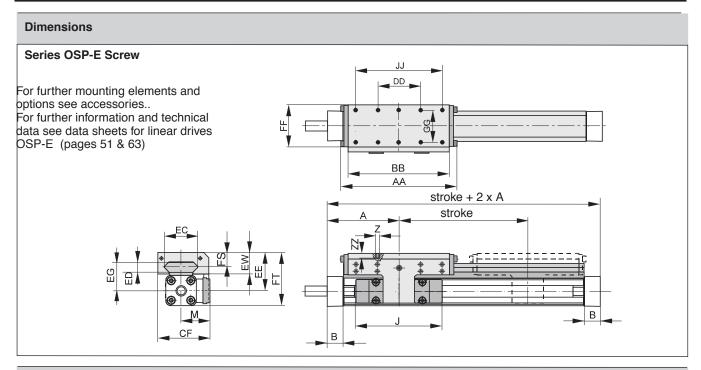
Series SL 25 to 50 for Linear Drive

· Series OSP-E Screw

Features:

- Anodised aluminium guide rail with prism-shaped slideway arrangement
- · Adjustable plastic slide elements
- Composite sealing system with plastic and felt wiper elements to remove dirt and lubricate the slideways.
- Corrosion-resistant version available on request

Dimensions

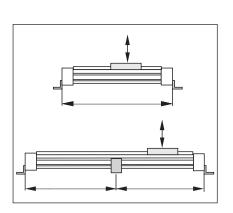


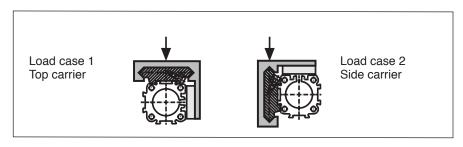
Dimension Table [mm]																				
Series	Α	В	J	М	Z	AA	ВВ	DD	CF	EC	ED	EE	EG	EW	FF	FT	FS	GG	JJ	ZZ
SL 25	100	22	117	40.5	M6	162	142	60	72.5	47	12	53	39	30	64	73.5	20	50	120	12
SL32	125	25.5	152	49	M6	205	185	80	91	67	14	62	48	33	84	88	21	64	160	12
SL50	175	33	200	62	M6	284	264	120	117	94	14	75	56	39	110	118.5	26	90	240	16

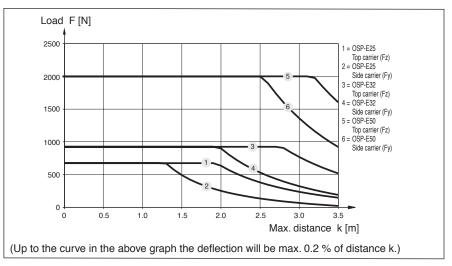
Mid-Section Support

(for versions see page 142)

Mid-section supports are required from a certain stroke length to prevent excessive deflection and vibration of the linear drive. The diagrams show the maximum permissible unsupported length in relation to loading.



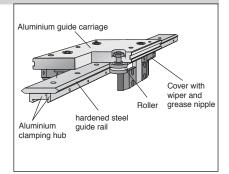






Features





Roller Guide-POWERSLIDE



Series PS 25 to 50 for Linear Drive

- · Series OSP-E Belt *
- · Series OSP-E Screw

Technical Data

The Table shows the maximum permissible values for smooth operation, which must not be exceeded even under dynamic conditions.

Example: PS 25/35 width of guide rail (35 mm) Size of drive (OSP-E25)

Features:

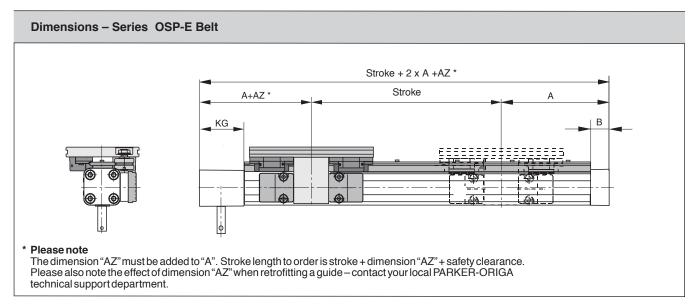
- anodised aluminium guide carriage with vee rollers having 2 rows of ball bearings
- · hardened steel guide rail
- several guide sizes can be used on the same drive
- max. speed v = 3 m/s
- tough roller cover with wiper and grease nipple
- any length of stroke up to 3500 mm (longer strokes on request).
 The maximum stroke lengths of drives OSP-E..B, OSP-E..SB and OSP-E..ST must be observed.

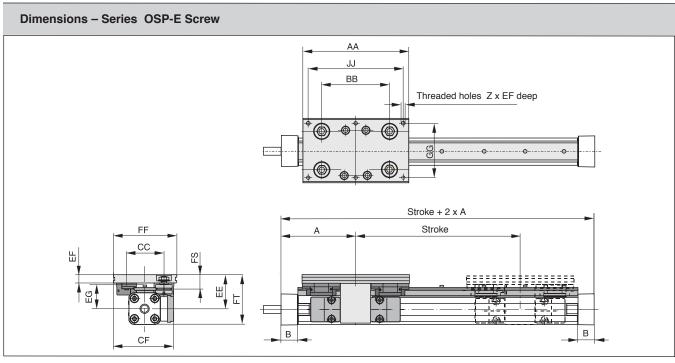
OSP-E Belt:

For position of guides see page 105

* Series PS for OSP-E Bi-parting version on request

Series	Max Mon [Nm]	nents	[N]	Max. Load with	Mass of dri with guide		of guide for	Mass* Powerslide	Order No.		
	Mx	My Mz		Fy, Fz	O mm stroke OSP-E OSP-E Belt Screw		100 mm stro OSP-E Belt	ke OSP-E Screw	[kg]	OSP-E* Belt	OSP-E Screw
PS 25/25	14	63	63	910	1.9	1.8	0.30	0.37	0.7	20304	20015
PS 25/35	17	70	70	1010	2.1	1.9	0.34	0.41	0.8	20305	20016
PS 25/44	20	175	175	1190	3.0	2.7	0.42	0.49	1.5	20306	20017
PS 32/35	20	70	70	1400	3.1	3.2	0.51	0.63	0.8	20307	20286
PS 32/44	50	175	175	2300	4.0	4.1	0.59	0.70	1.5	20308	20287
PS 50/60	90	250	250	3000	8.8	8.7	1.04	1.36	2.3	20309	20288
PS 50/76	140	350	350	4000	12.2	12.0	1.28	1.6	4.9	20310	20289





Dimensi	Dimension Table [mm]																		
	Α		В																
Series	OSP-E Belt	OSP-E Screw	OSP-E Belt	OSP-E Screw	Z	AA	ΑZ	вв	СС	CF	EE	EF	EG	FF	FS	FT	GG	JJ	KG
PS 25/25	125	100	22	22	6xM6	145	5	90	47	79.5	53	11	39	80	20	73,5	64	125	57
PS 25/35	125	100	22	22	6xM6	156	10	100	57	89.5	52.5	12.5	37.5	95	21.5	73	80	140	57
PS 25/44	125	100	22	22	6xM8	190	27	118	73	100	58	15	39	116	26	78.5	96	164	57
PS 32/35	150	125	25	25.5	6xM6	156	_	100	57	95.5	58.5	12.5	43.5	95	21.5	84.5	80	140	61
PS 32/44	150	125	25	25.5	6xM8	190	6	118	73	107	64	15	45	116	26	90	96	164	61
PS 50/60	200	175	25	33	6xM8	240	5	167	89	130.5	81	17	61	135	28.5	123.5	115	216	85
PS 50/76	200	175	25	33	6xM10	280	25	178	119	155.5	93	20	64	185	39	135.5	160	250	85

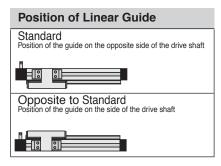


OSP-E Belt - If combined with a linear guide, please also state position of linear guide

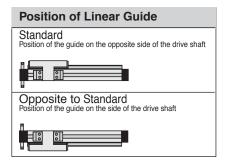
Position of Drive Shaft Standard = 0

Position of Linear Guide Standard Position of the guide on the opposite side of the drive shaft Opposite to Standard

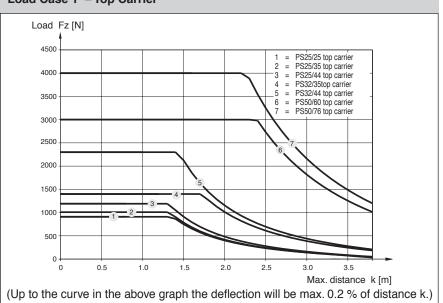
Position of Drive Shaft Opposite to Standard = 1



Position of Drive Shaft Both Sides = 2



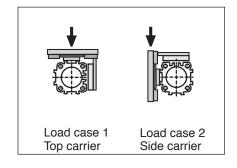
Load Case 1 - Top Carrier



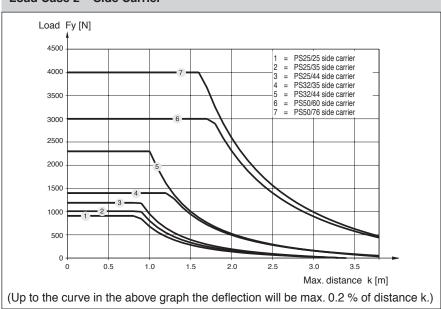
Mid-Section **Support**

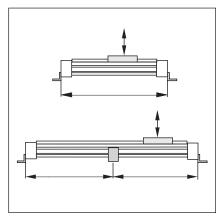
(for versions see page 142)

Mid-section supports are required from a certain stroke length to prevent excessive deflection and vibration of the linear drive. The diagrams show the maximum permissible unsupported length in relation to loading.



Load Case 2 - Side Carrier







Technical Data

Service Life

Calculation of service life is achieved in two stages:

- Determination of load factor
 L_E from the loads to be carried
- Calculation of service life in km

1. Calculation of load factor L

$$L_{F} = \frac{Fy}{Fy_{max}} + \frac{Fz}{Fz_{max}} + \frac{Mx}{Mx_{max}} + \frac{My}{My_{max}} + \frac{Mz}{Mz_{max}}$$

with combined loads, L must not exceed the value 1

Lubrication

For maximum system life, lubrication of the rollers must be maintained at all times.

Only high quality lithium-based greases should be used.

Lubrication intervals are dependent on environmental conditions (temperature, running speed, grease quality etc.) therefore the installation should be regularly inspected.

2. Calculation of service life

For PS 25/25, PS 25/35 Service life [km] = $\frac{106}{(L_F + 0.02)^3}$

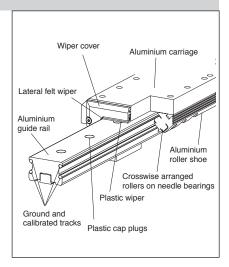
For PS 25/44, PS 32/44 Service life [km] = $\frac{314}{(L_F + 0.015)^3}$ and PS 50/60:

• For PS 50/76: Service life [km] = $\frac{680}{(L_F + 0.015)^3}$



Versions

- For electric Linear Drive:
Series OSP-E Belt
Series OSP-E Screw



Aluminium Roller Guide PROLINE



Series PL 25 to 50 for Linear Drive

- · Series OSP-E Belt *
- · Series OSP-E Screw

Technical Data

The table shows the maximum permissible loads. If multiple moments and forces act upon the cylinder simultaneously, the following equation applies:

$$\frac{Fy}{Fy_{max}} + \frac{Fz}{Fz_{max}} + \frac{Mx}{Mx_{max}} + \frac{My}{My_{max}} + \frac{Mz}{Mz_{max}} \le 1$$

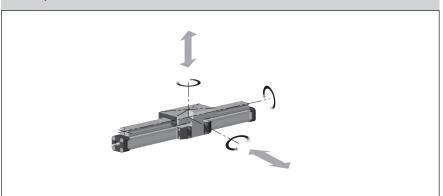
The table shows the maximum permissible values for light, shock-free operation, which must not be exceeded even under dynamic conditions.

With a load factor of < 1, the service life is 5000 km.
The sum of the loads must not exceed >1

Features:

- · High precision
- High velocities (10 m/s)
- · Smooth operation low noise
- · Integated wiper system
- Compact dimensions compatible to Slideline plain bearing guide
- Stainless steel version available on request
- Any length of stroke up to 3750 mm
 The maximum stroke lengths of drives OSP-E..B, OSP-E..SB and OSP-E..ST must be observed
- * Series PL for OSP-E Bi-parting version on request

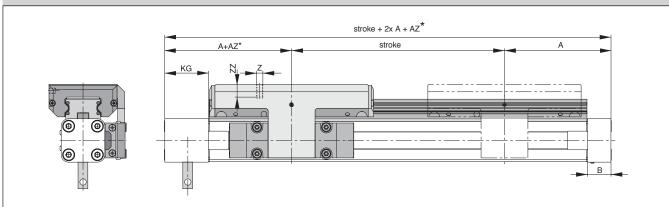
Loads, Forces and Moments



Series		ents[Nm]	Max. Load [N]	Mass of Drive with guide [kg]			Mass guide-	Order N PROLII	-	
					with 0 mm st OSP-E		increas 100 mm OSP-E	stroke	carriage [kg]	for OSP-E	OSP-E
	Mx	Му	Mz	Fy, Fz	Belt	Screw	Belt	Screw		Belt*	Screw
PL 25	19	44	44	986	1.9	1.8	0.33	0.40	0.75	20874	20856
PL32	33	84	84	1348	3.6	3.7	0.58	0.70	1.18	20875	20857
PL50	128	287	287	3582	8.9	8.8	1.00	1.32	2.50	20876	20859

¹⁾ Stainless steel version on request

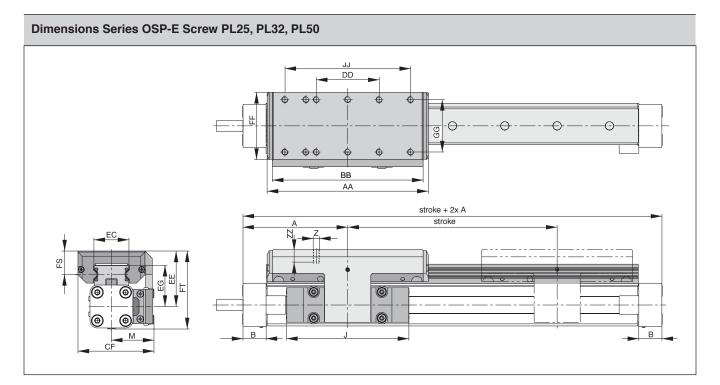
Dimensions Series OSP-E Belt PL25, PL32, PL50



* Please observe:

 $\label{lem:decomposition} Dimension ``AZ" must be added to dimension ``AZ" + additional length. \\ Please observe the effect of dimension ``AZ" when retrofitting a guide. \\ Please contact our application engineers.$

Dimen	Dimension Table (mm) Series OSP-E Belt PL25, PL32, PL50																			
Series	Α	В	J	M	Z	AA	AZ	ВВ	DD	CF	EC	EE	EG	FF	FS	FT	GG	JJ	KG	ZZ
PL25	125	22	117	40.5	M6	154	10	144	60	72.5	32.5	53	39	64	23	73.5	50	120	57	12
PL32	150	25	152	49	M6	197	11	187	80	91	42	62	48	84	25	88	64	160	61	12
PL50	200	25	200	62	M6	276	24	266	120	117	63	75	57	110	29	118.5	90	240	85	16

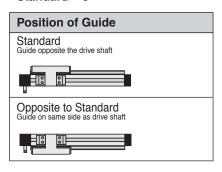


Dimens	Dimension Table (mm) OSP-E Screw PL25, PL32, PL50																	
Series	Α	В	J	M	Z	AA	ВВ	DD	CF	EC	EE	EG	FF	FS	FT	GG	JJ	ZZ
PL25	100	22	117	40.5	M6	154	144	60	72.5	32.5	53	39	64	23	73.5	50	120	12
PL32	125	25.5	152	49	M6	197	187	80	91	42	62	48	84	25	88	64	160	12
PL50	175	33	200	62	M6	276	266	120	117	63	75	57	110	29	118.5	90	240	16

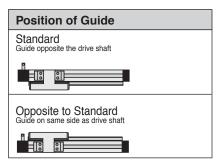


OSP-E Belt - If combined with a linear guide, please also state position of linear guide

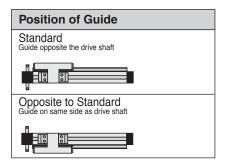
Position of Drive Shaft Standard = 0

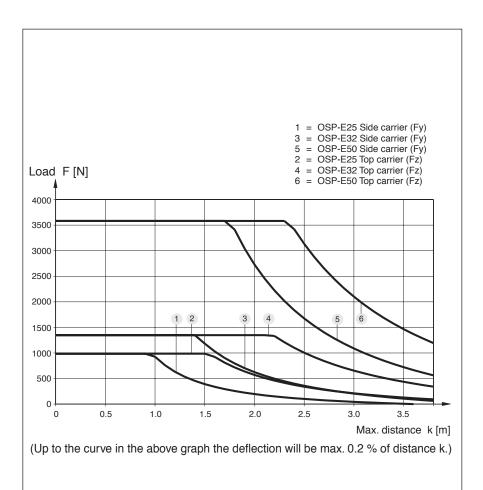


Position of Drive Shaft Opposite to Standard = 1



Position of Drive Shaft Both Sides = 2

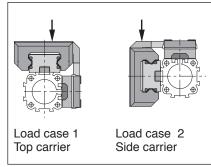


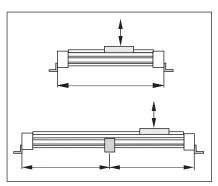


Mid-Section Support

(for versions see page 142)

Mid-section supports are required from a certain stroke length to prevent excessive deflection and vibration of the linear drive. The diagrams show the maximum permissible unsupported length in relation to loading.











Al-guide carriage integrated wiper magnet for magnetic sensor carrier T-slot for fitting

Heavy-duty-Guide HD

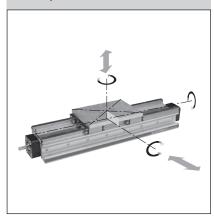


Series HD 25 to 50

for Linear Drive

· Series OSP-E..SB, ..ST

Loads, forces and moments



OSP-E..SB, ..ST



Features:

- Guide system
 4-row recirculating ball bearing guide
- polished and hardened guide rails of steel
- · for highest loads in all directions
- · highest precision
- · integrated wiper
- grease nipple for relubrication
- anodized guide carriage with the same connecting dimensions as OSP-guide GUIDELINE
- maximum velocity v = 5 m/s

Technical Data

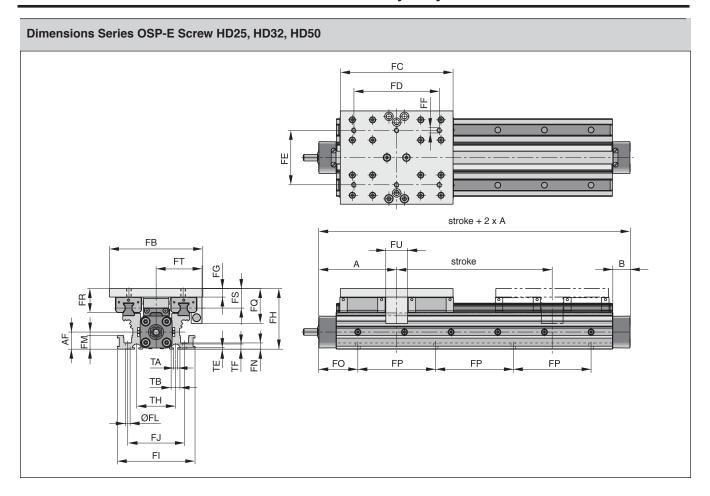
For the maximum permissible loads please refer to the table below. If several forces and moments loads act upon the guide simultaneously, the following equation will apply:

$$\frac{Fy}{Fy_{max}} + \frac{Fz}{Fz_{max}} + \frac{Mx}{Mx_{max}} + \frac{My}{My_{max}} + \frac{Mz}{Mz_{max}} \le 1$$

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

The table shows the maximum permissible values for light, shock-free operation which must not be exceeded even under dynamic conditions.

Series	Series Max. Moments Max. Load [Nm]			d	Mass of drive with guide [k at 0 mm strol	g]	Mass guide- carrier	Order No HD-guide for OSP-E			
	Mx	Му	Mz	Fy	Fz	OSP-ESB	SP-ESB OSP-EST OSP-ESB OSP-I		OSP-EST	[kg]	03F-L
HD 25	260	320	320	6000	6000	3.215	3.315	0.957	1.007	1.289	21246
HD 32	285	475	475	6000	6000	4.868	4.968	1.198	1.258	1.367	21247
HD 50	1100	1400	1400	18000	18000	13.218	13.318	2.554	2.674	3.551	21249



Hint:

The heavy-duty guide HD must be fitted to a level surface over the entire length.

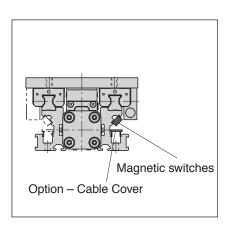
If T-nuts are used, the distance between them must not exceed 100 mm.

Arrangement of magnetic switches:

The magnetic switches can be fitted to either side over the entire length.

More Information:

Magnet switch see page 148 Cable cover see page 155



Dimensions

Dimens	Dimension Table [mm]												
Series	Α	В	AF	FB	FC	FD	FE	FF	FG	FH	FI	FJ	ØFL
HD25	100	22	22	120	145	110	70	M6	11	78	100	73	6
HD32	125	25.5	30	120	170	140	80	M6	11	86	112	85	6
HD50	175	33	48	180	200	160	120	M8	14	118	150	118	7.5
Series	FM	FN	FP	FQ	FR	FS	FT	FU	TA	ТВ	TE	TF	TH
HD25	17.5	8	100	45	31	25	59	28	5.2	11.5	1.8	6.4	50
HD32	17.5	8	100	45	31	25	63	30	5.2	11.5	1.8	6.4	60
HD50	22	10	100	58	44	35.5	89	30	8.2	20	4.5	12.3	76

11030	22	10	100
		FO	
	OSP-	ESB,ST	•
x	HD25	HD32	HD50
00	50.0	75.0	75.0
01	50.5	75.5	75.5
02	51.0	76.0	76.0
03	51.5	76.5	76.5
04	52.0	77.0	77.0
05	52.5	77.5	77.5
06	53.0	78.0	78.0
07	53.5	78.5	78.5
08	54.0	79.0	79.0
09	54.5	79.5	79.5
10	55.0		80.0
11	55.5	80.0 80.5	80.5
12	56.0	81.0	81.0
13	56.5	81.5	81.5
14	57.0	82.0	82.0
15	57.5	82.5	82.5
16	58.0	83.0	83.0
17	58.5	83.5	83.5
18	59.0	84.0	84.0
19	59.5	84.5	84.5
20	60.0	85.0	85.0
21	60.5	85.5	85.5
22	61.0	36.0	86.0
23	61.5	365	86.5
24	62.0	37.0	87.0
25	62.5	37.5	87.5
26	63.0	38.0	88.0
27	63.5	38.5	88.5
28	64.0	39.0	89.0
29	64.5	39.5	89.5
30	65.0	40.0	90.0
31	65.5	40.5	90.5
32	66.0	41.0	91.0
33	66.5	41.5	91.5
34	67.0	42.0	92.0
35	67.5	42.5	92.5
36	68.0	43.0	93.0
37	68.5	43.5	43.5
38	69.0	44.0	44.0
39	69.5	44.5	44.5
40	70.0	45.0	45.0
41	70.5	45.5	45.5
42	71.0	46.0	46.0
43	71.5	46.5	46.5
44	71.5	47.0	47.0
45	72.0	47.5	47.5
	73.0		
46		48.0	48.0
47	73.5	48.5	48.5
48	74.0	49.0	49.0
49	74.5	49.5	49.5

	44	35.5	89	30		
			0			
		OSP-E	SB,ST			
x		HD25	HD32	HD50		
50		75.0	50.0	50.0		
51		75.5	50.5	50.5		
52		76.0	51.0	51.0		
53		76.5	51.5	51.5		
54		77.0	52.0	52.0		
55		77.5	52.5	52.5		
56		78.0	53.0	53.0		
57		78.5	53.5	53.5		
58		79.0	54.0	54.0		
59		79.5	54.5	54.5		
60		80.0	55.0	55.0		
61		80.5	55.5	55.5		
62		81.0	56.0	56.0		
63		81.5	56.5	56.5		
64		82.0	57.0	57.0		
65		32.5	57.5	57.5		
66		33.0	58.0	58.0		
67		33.5	58.5	58.5		
68		34.0	59	59.0		
69		34.5	59.5	59.5		
70		35.0	60.0	60.0		
71		35.5	60.5	60.5		
72		36.0	61.0	61.0		
73		36.5	61.5	61.5		
73 74		37.0	62.0	62.0		
75		37.5	62.5	62.5		
75 76		38.0	63.0	63.0		
77			63.5	63.5		
		38.5				
78		39.0	64.0 64.5	64.0 64.5		
79		39.5				
80		40.0	65.0	65.0		
81		40.5	65.5	65.5		
82		41.0	66.0	66.0		
83		41.5	66.5	66.5		
84		42.0	67.0	67.0		
85		42.5	67.5	67.5		
86		43.0	68.0	68.0		
87		43.5	68.5	68.5		
88		44.0	69.0	69.0		
89		44.5	69.5	69.5		
90		45.0	70.0	70.0		
91		45.5	70.5	70.5		
92		46.0	71.0	71.0		
93		46.5	71.5	71.5		
94		47.0	72.0	72.0		
95		47.5	72.5	72.5		
96		48.0	73.0	73.0		
97		48.5	73.5	73.5		
98		49.0	74.0	74.0		
99		49.5	74.5	74.5		
_						

NOTE:

The dimension FO is derived from the last two digits of the stroke:

Sample:



For a cylinder OSP-E25 the table shows that for x = 25 mm: FO = 62.5 mm

Accessories for Electric Linear Drives Series OSP-E

Description	Illustration	Page
Motor Mounting		116-121
(Coupling housing, motor flange, motor coupling)		
Belt Gear		122
End Cap Mountings, Standard	000	123-127
End Cap Mountings for OSP-E with guides		140, 141
Flange Mountings C		128
Profile Mounting for Multi-Axis systems		129
Mid-Section Support, Standard		130, 131
Mid-Section Support for OSP-E with guides		142
Profile connections (Adaptor Profile,		132-134
T-nut Profile, Connection Profile)	00	
Trunnion Mounting EN		135
Pivot Mounting EL		
Clevis Mounting		136, 137
Inversion Mounting		138
Piston Rod Eye	€6	144
Piston Rod Clevis		144
Piston Rod Compensating Coupling	(145
Magnetic Switches	1	148 - 151
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Cable Cover		155





ORIGA

Accessories for Electric Linear Drives Series OSP-E Motor Mountings



Coupling housing (OSP-EBHD)116	
Motor flanges (OSP-EBHD)116	
Coupling housing (OSP-EBV)117	
Motor flanges (OSP-EBV)117	
Coupling housing (OSP-EB)118	
Motor flanges (OSP-EB)118	
Motor Coupling (OSP-EB)118	
Coupling housing (OSP-ESB,ST,SBR,STR). 119	
Motor flanges (OSP-ESB,ST,SBR,STR) 119	

Motor Coupling (OSP-ESB,ST,SBR,STR) 119
Motor flanges for freely selectable mounting dimensions
(OSP-EB,SB,ST,SBR,STR) 120, 12
Belt Gear for freely selectable mounting dimensions
(OSP-EB,SB,ST,SBR,STR)



Coupling Housing Motor Flange

Size 20, 25, 32, 50



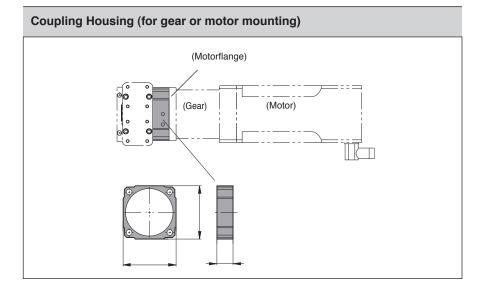
Series OSP-E..BHD
 Linear Drive with toothed belt and integrated guide

Via the coupling housing the gear or the motor can be fitted directly to the drive and the drive shafts by means of a motor flange.

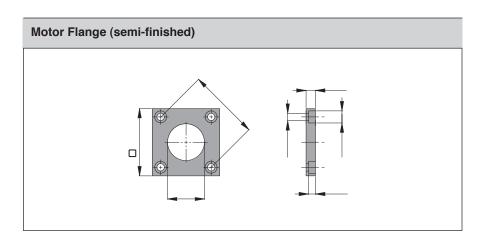


The motor flange matches the above mentioned coupling housing and has to be reworked to match the respective type of motor.

Motor flanges for the available range of gears, servo and stepper motors are included in the respective data sheet, including technical data and dimensions. Please refer to the respective catalogues.



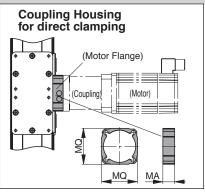
Dimension Table [mm] and Order Instructions									
Series	Description	MA	MQ	Order No.					
OSP-E20BHD	Coupling Housing	19	60	16215					
OSP-E20BHD	Motor Flange LP050	_	_	16224					
OSP-E25BHD	Coupling Housing	22	76	12300					
OSP-E25BHD	Motor Flange LP070	_	_	12311					
OSP-E32BHD	Coupling Housing	30	98	12301					
OSP-E32BHD	Motor Flange LP090	_	_	12312					
OSP-E50BHD	Coupling Housing	41	128	12302					
OSP-E50BHD	Motor Flange LP120	_	_	12313					

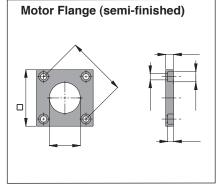


Dimension Table [mm] and Order Instructions										
Series	MB	МС	MD	ME	МН	MU	MV	Order No.		
OSP-E20BHD	10	75	25	65.8	6.8	6.6	11	16216		
OSP-E25BHD	14	90	36	82	8.5	9	15	12308		
OSP-E32BHD	14	100	55	106	10.5	11	18	12309		
OSP-E50BHD	18	125	77	144	12.5	13.5	20	12310		



Motor Mountings for OSP-E..BV with drive shaft, clamping hub, version 2-51)





Coupling Housing **Motor Flange Motor Coupling**

Size 20, 25



· Series OSP-E..BV **Vertical Linear Drive with** toothed belt and integrated recirculating ball bearing guide

The coupling housing with suitable motor flange allows proper connection between the drive shaft of the linear drive and the gear shaft or motor shaft. The gear or motor can either be fitted to the linear drive directly or indirectly. If a PARKER-ORIGA gear is used, direct clamping of the gear shaft into to the drive shaft with clamping hub. As an alternative the gear or motor can be fitted to the linear drive via a motor coupling.

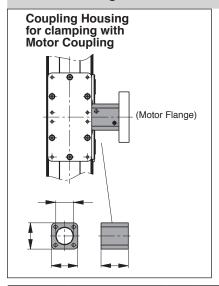
1) Hint:

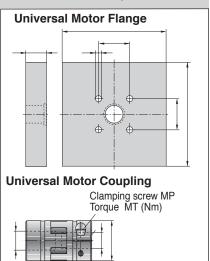
when selecting the type of motor mounting please observe the respective drive shaft versions in accordance with the ordering code of the linear drive (page 168).

Dimension Table [mm] and Order Instructions

Series	Description I		MB	MC	MD	ME	МН	MQ	MU	MV	Order-No.
OSP-E20BV	Coupling Housing		-	_	-	-	_	60	-	-	16215
OSP-E20BV	OSP-E20BV Motor flange semi-finished		10	75	25	65,8	6,8	-	6,6	11	16216
OSP-E20BV	SP-E20BV Motor flange LP050		_	_	_	_	_	_	_	_	16224
OSP-E25BV	OSP-E25BV Coupling Housing		_	_	_	_	_	76	_	_	12300
OSP-E25BV Motor flange semi-finished		-	14	90	36	82	8,5	-	9	15	12308
OSP-E25BV	Motor flange LP070	_	_	_	_	_	_	-	-	-	12311

Motor Mountings for OSP-E..BV with drive shaft and tenon, version A-D1)





Dimension Table [mm] and Order Instructions											
Series	Description	Α	В	С	E	E,	E ₂	MA	MR	Order-No.	
OSP-E20BV	Coupling Housing	-	-	60	-	-	-	79	46,5	16269	
OSP-E20BV	BV Universal-Motor Flange		15	_	46,5	46,5	6,6	_	_	16267	
OSP-E25BV	OSP-E25BV Coupling Housing		-	87	-	_	_	84	48	20139	
OSP-E25BV	Universal-Motor Flange	120	15	_	46	46	6,6	_	_	12069	

Dimension Table [mm] and Order Instructions for Universal Motor Coupling

Series	MF	ML	МН	МО	MT [Nm]	Order-No.
OSP-E20BV	12 ^{H7}	66	9,5 ^{H7}	40	10,5	16268
OSP-E25BV	16 ^{H7}	66	9,5 ^{H7}	40	10,5	10845





Coupling Housing Motor Flange Motor Coupling

Size 25, 32, 50



Series OSP-E..B Linear Drive with Belt

The coupling housing with suitable motor flange allows easy and inherently stable connection of the gear or the motor to the linear drive.

Hint:

Let us know the mounting dimensions of your motor. Upon request we will be pleased to check and manufacture a motor flange that will come up to your individual needs.

(Also see "motor flange for freely selectable mounting dimensions" page 120)



OORIGA

Coupling Housing (for gear or motor mounting) (Motor)

Dimension Table [mm] and Order Instructions										
Series	Тур	MA	MP	MQ	MR	Order No.				
OSP-E25B	250	47	30	40	25	20606				
OSP-E32B	320	49	38	49	33	20607				
OSP-E50B	500	76	54	65	48	20608				

Universal Motor Flange Universal Motor Coupling Clamping screw MP Torque MT [Nm]

Dimension Table [mm] and Order Instructions für Universal Motor Flange										
Series	Α	В	E	E ₁	E ₂	Order No.				
OSP-E25B	100	20	30	15	5.5	12050				
OSP-E32B	100	20	38	18	6.6	12053				
OSP-E50B	120	15	50	32	9.0	12056				

Dimension Table [mm] and Order Instructions für Universal Motor Coupling										
Series	MF ^{H7}	ML	MH ^{H7} *	МО	MT [Nm]	Order No.				
OSP-E25B	10	30	4	20	0.76	15231				
OSP-E32B	10	35	6	30	1.34	15197				
OSP-F50B	16	66	9.5	40	10.5	10845				

^{*} can be bored out to motor shaft diameter by customer. Other dimensions on request



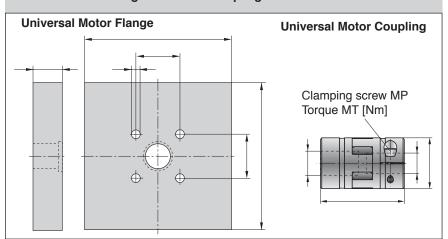
Coupling Housing (for motor) (Motor)

Dimension Table [mm] and Order Instructions

Series	Тур	MA	С	MR	Order No.
OSP-E25*	251	38	41	25	20137
OSP-E32*	321	54	52	33	20138
OSP-E50*	501	84	87	48	20139

^{* ..}SB, ..ST, ..SBR, ..STR

Universal Motor Flange and Motor Coupling



Dimension Table [mm] and Order Instructions for Universal Motor Flange

Series	Α	В	E	E ₁	E ₂	Order No.
OSP-E25*	100	20	27	27	5.5	12060
OSP-E32*	100	20	36	36	6.6	12064
OSP-E50*	120	15	46	46	6.6	12069

^{* ..}SB, ..ST, ..SBR, ..STR

Dimension Table [mm] and Order Instructions for Universal Motor Coupling

Series	MF ^{H7}	ML	MH ^{H7} **	МО	MT [Nm]	Order No.
OSP-E25*	6	30	6	20	0.76	12073
OSP-E32*	10	35	6	30	1.34	15197
OSP-E50*	15	66	9.5	40	10.5	12079

Coupling Housing **Motor Flange Motor Coupling**

Size 25, 32, 50



· Series OSP-E..SB, ..ST, ..SBR, ..STR **Linear Drive with Screw**

The coupling housing with suitable motor flange allows easy and inherently stable connection of the gear or the motor to the linear drive.

Let us know the mounting dimensions of your motor. Upon request we will be pleased to check and manufacture a motor flange that will come up to your individual needs.

(Also see "motor flange for freely selectable mounting dimensions" page 120)





^{..}SB, ..ST, ..SBR, ..STR can be bored out to motor shaft diameter by customer. Other dimensions on request.

Motor Flange

for freely selectable mounting dimensions

Size 25, 32, 50



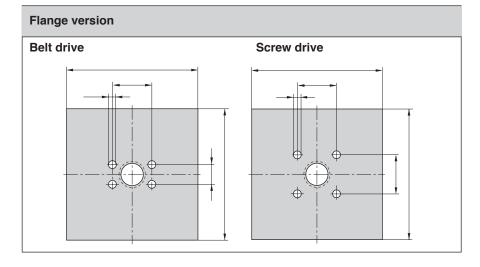
- Series OSP-E..B Linear Drive with Belt
- OSP-E..SB, ..ST, ..SBR, ..STR Linear Drive with Screw

The motor flange for motors with freely selectable mounting dimensions offers flexible possibilities to connect most different types of motors to the electric linear drives OSP-E. The drive shafts of linear drive and motor are connected with a motor coupling in the coupling housing and the motor flange is centered.

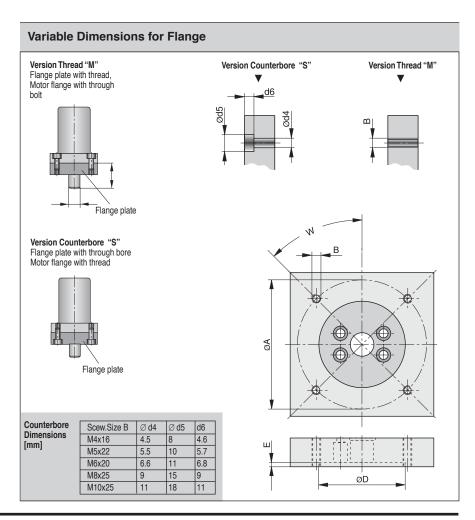
Hint

Please check the following data for the connection of the motor to the freely selectable motor flange and state when ordering:

- 1. mounting angle W of the motor
- 2. bore hole version B as thread M or counterbore S
- 3. pitch circle diameter A as a function of M or S
- 4. Diameter of centring spigot
- 5. Length of motor shaft G



Dimension Table [mm] and Order Instructions										
Size	BA1	BA2	ØBB	вс	SA	ØSB	sc	Order No.		
25	30	15	5.5	100	27	5.5	100	Contact Factory		
32	38	18	6.6	100	36	6.6	100	Contact Factory		
50	50	32	9.0	120	46	6.6	120	Contact Factory		



Dimensions

Dim	Dimension table of the variable dimensions [mm] – Version for Belt drive											
W			45 °			90 °						
Size		25	32	50	25	32	50					
Α	min. Vers. S	48 + Ød5	60 + Ød5	80 + Ød5	40 + Ød5	49 + Ød5	65 + Ød5					
	max. Vers. S	135 - Ød5	135 - Ød5	160 - Ød5	100 - Ød5	100 - Ød5	120 - Ød5					
	min. Vers. M	45 + B	55 + B	75 + B	40 + B	48 + B	50 + B					
	max. Vers. M	135 - B	135 - B	160 - B	96 - B	96 - B	116 - B					
В	max.		M10		M10							
D	min.	20	30	40	20	30	40					
	max.	98	98	118	85	85	105					
G	min.	18	21	32	18	21	32					
	max.	33	35	45	33	35	45					

Dim	ension table of the	e variable dime	nsions [mm] – V	ersion for Screw	v drive				
W			45 °			90°			
Size		25	32	50	25	32	50		
Α	min. Vers. S	58 + Ød5	74 + Ød5	123 + Ød5	41 + Ød5	52 + Ød5	87 + Ød5		
	max. Vers. S	135 - Ød5	135 - Ød5	160 - Ød5	100 - Ød5	100 - Ød5	120 - Ød5		
min. Vers. M		525 + B	68 + B	82 + B	30 + B	40 + B	50 + B		
	max. Vers. M	135 - B	135 - B	160 - B	96 - B	96 - B	116 - B		
В	max.		M10			M10			
D	min.	20	30	40	20	30	40		
	max.	98	98	118	85	85	105		
G	min.	18	21	32	18	210	32		
	max.	33	35	45	33	35	45		

Legend

W [°] = Angle of fastening boreholes A [mm] = Pitch circle diameter B = Thread size of fastening screw

(version: M = thread, S = counterbore)

D [mm] = Diameter of centring spigot

E [mm] = Depth of centring spigot

F [mm] = Diameter of motor shaft

G [mm] = Length of motor shaft



Belt Gear

for freely selectable mounting dimensions

Size 25, 32, 50



Series OSP-E..SB, ..ST, ..SBR, ..STR Linear Drive with Screw

The toothed belt gear with its freely selectable mounting dimensions offers the possibility to fit most different types of motors to the linear drive parallel to the motor axis. After the flange dimensions of the motor had been checked, the mounting side of the motor will be prepared for the individual demands of the customer.

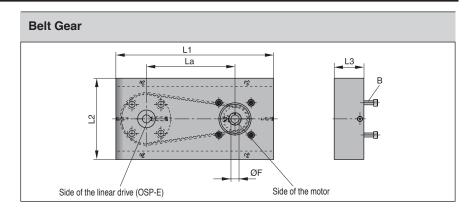
When ordering please observe the version of the drive shaft of the linear drive OSP-E with spindle. This version can either be ordered with plain shaft or plain shaft with keyway (Option). (If the version keyway is selected, the delivery period may be elongated.)

Max. allowed Moments M [Nm] for Belt Gear

Size	Transm 1:1	ission ratio 2:1
25	5	5
32	10	10
50	20	20

Beware of the max. allowed moments of the corresponding linear drive.





Dimension Table [mm] and Order Instructions L1 L2 L3 La Order No. Series 1:1 2:1 OSP-E25 109.3 6, 7, 8, 9, 10, 11 15576 186 101 30 110 OSP-E32 15576 196 101 37 110 111.4 M4 – M10 8, 9, 10, 11, 12, 14

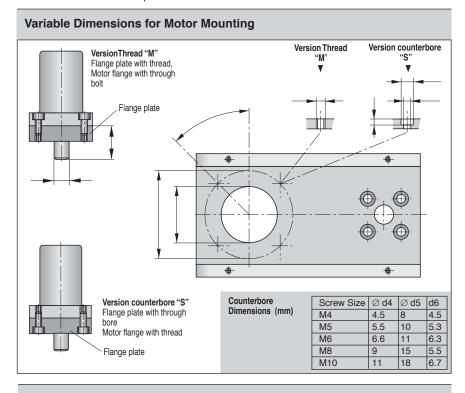
12, 14, 16, 19

15576

133.7

101 | 50 | 135

OSP-E50 234



Dimension table of the variable dimensions [mm]

W			45 °			90°				
Size)	25	32	50	25	32 50				
Α	min.		30		30					
	max. Vers. S		110 - Ød5	5	70 - Ød5 70 - Ød5 80 - Ød					
	max. Vers. M		110 - Ød4	1	70 - Ød4	70 - Ød4	80 - Ød4			
В	max.		M 8		M 8					
D	min.		20			20	80 - Ød5 80 - Ød4 70 30 40			
	max.	80 80 100			60					
G	min.	16	20	30	16	20	30			
	max.	23	30	40	23	30	40			
ØF	[mm]	6, 7, 8, 9, 10, 11	8, 9, 10, 11, 12, 14	12, 14, 16, 19	6, 7, 8, 9, 10, 11	8, 9, 10, 11, 12, 14	12, 14, 16, 19			

^{*} other diameters on request



OORIGA

Accessories for Electric Linear Drives Series OSP-E Mountings, Sensors



End Cap Mounting (OSP-EBHD)124,	125
End Cap Mounting (OSP-EB,SB,ST) 126,	127
Flange Mounting C (OSP-ESBR,STR)	128
Profile Mounting for Multi-Axis systems (OSP-E)	129
Mid-Section Support (OSP-EBHD)	130
Mid-Section Support (OSP-E)	131
Adaptor Profile (OSP-E)	132
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Trunnion Mounting EN (OSP-ESBR,STR)	135
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Clevis Mounting (OSP-EB,SB,ST)	136
Clevis Mounting, low backlash (OSP-EB,SB,ST)	137
Inversion Mounting (OSP-EB,SB,ST)	138



End Cap Mounting

Size 20, 25, 32, 50



Series OSP-E..BHD
 For Linear Drive with Toothed Belt and integrated Guides

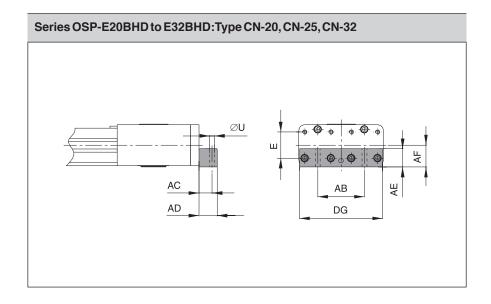
On the end-face of each end cap there are eight threaded holes for mounting the actuator.

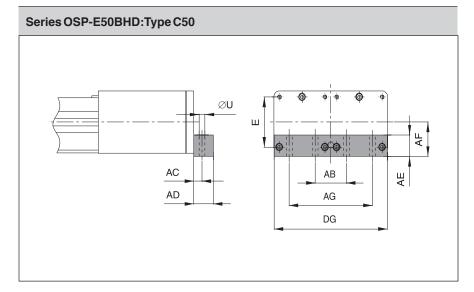
Material:

Anodized aluminium.

The mountings are supplied in pairs.

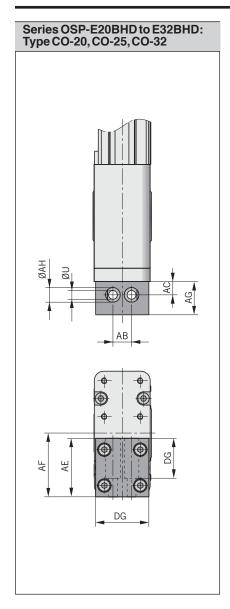


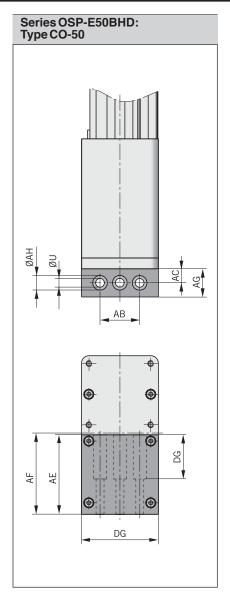




Dimension	Table [mm]	and C	Order	Instru	ction	s								
Series	Series Type E ØU AB AC AD AE AF AG DG Order No.*)														
OSP-E20BHD	CN-20	27	6,6	40	10	20	20	22	_	74	16213				
OSP-E25BHD	CN-25	27	6,6	52	16	25	25	22	_	91	12266				
OSP-E32BHD	CN-32	36	9	64	18	25	25	30	_	114	12267				
OSP-E50BHD	CN-50	70	9	48	12,5	30	30	48	128	174	12268				

*) = Pair





End Cap Mounting

Size 20, 25, 32, 50

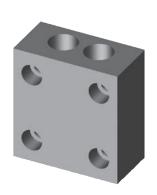


 Series OSP-E..BHD Linear Drive with Belt and Integrated Guide

On the end-face of each end cap there are eight threaded holes each for mounting the actuator.

Material: Anodized aluminium.

The mountings are supplied in pairs.



DimensionTa	DimensionTable [mm] and Order Instructions														
Series Type ØU AB AC AD AE AF AG ØAH DG Order No.*)															
OSP-E20BHD	CO-20	6,6	18	15	22	42	45	39	11	40	16241				
OSP-E25BHD	CO-25	6,6	14	10	25	44	48	30	11	40	16245				
OSP-E32BHD	CO-32	9	19	12	28	60	62	42	15	56	16246				
OSP-E50BHD	CO-50	9	45	16	32	90	92	50	15	87	16247				

*) = Pair

End Cap Mounting

Size 25, 32, 50



 Series OSP-E..SBR, ..STR Linear Drive with Screw and extending rod

On the end-face of each end cap there are four threaded holes for mounting the actuator.

The hole layout is square, so that the mounting can be fitted to the bottom, top or either side.

Material:

Series OSP-25 to 32:

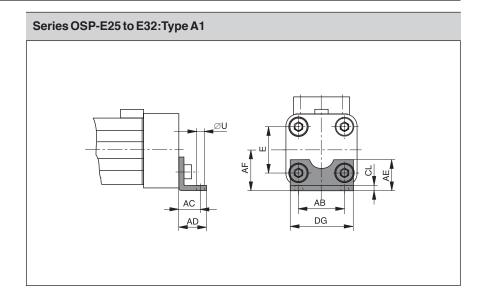
Galvanised steel.

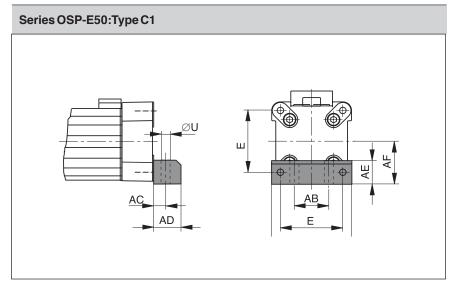
Series OSP-50:

Anodized aluminium.

The mountings are supplied as pairs







Dimensio	DimensionTable [mm] and Order Instruction														
Series E ØU AB AC AD AE AF CL DG Order N															
OSP-E25	E25 27 5,8			16	22	18	22	2,5	39	2010	_				
OSP-E32	36	6,6	36	18	26	20	30	3	50	3010	_				
OSP-E50	70	9	40	12,5	24	30	48	_	86	_	5010				

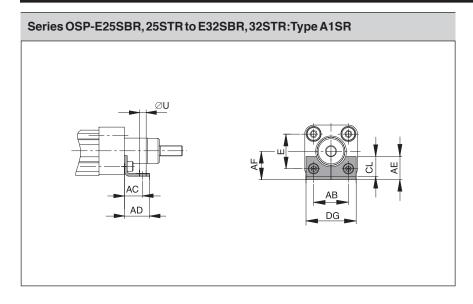
*)=Pair

Important:

With the OSP-E Screw series, the end cap mounting can only be used at the end opposite to the drive shaft.

We recommend the application of two mid section supports (page 131) at the drive shaft end of the actuator.





Series OSP-E50SBR, 50STR:Type C1SR

DimensionTa	DimensionTable [mm] and Order Instruction														
Series									Order No.*) Type A1SR	Type C1SR					
OSP-E25SBR,STR	27	5,8	27	16	22	18	22	2,5	39	_	_	12263	-		
OSP-E32SBR,STR	36	6,6	36	18	26	20	30	3	50	_	_	12264	-		
OSP-E50SBR,STR	70	9	40	12,5	24	30	48	_	86	15	15	_	12265		

*)=single

End Cap Mounting



 Series OSP-E..SBR, ..STR Linear Drive with Screw and extending rod

On the end-face of each end cap there are four threaded holes for mounting the actuator.

The hole layout is square, so that the mounting can be fitted to the bottom, top or either side.

Material:

Series OSP-25 to 32: Galvanised steel. Series OSP-50: Anodized aluminium.

The mountings are supplied as pairs





With the OSP-E Screw series, the end cap mounting can only be used at the end opposite to the drive shaft.

We recommend the application of two mid section supports (page 131) at the drive shaft end of the actuator.



Flange Mounting C

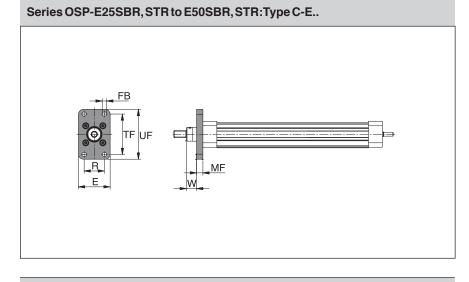
Size 25, 32, 50



 Series OSP-E..SBR, ..STR Linear Drive with Screw and extending rod

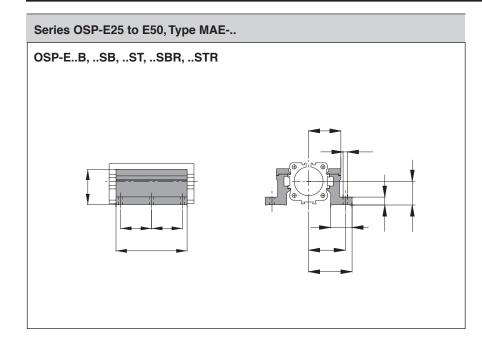
The flange mounting C-E can only be mounted at the piston rod end of the linear drive.

Material: Aluminium



Dimension Table [mm] and Order Instructions													
Series Type Ø FB E MF R TF UF W Order													
OSP-E25SBR, STR	C-E25	7	50	10	32	64	79	16	12232				
OSP-E32SBR, STR	C-E32	9	56	10	36	72	90	16	12233				
OSP-E50SBR, STR	C-E50	12	100	16	63	126	153	21	12234				





Profile Mountings for Multi-Axis Systems

Size 20, 25, 32, 50



· Series OSP-E

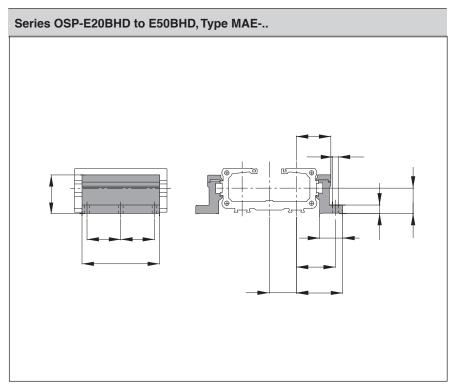
Material: Anodized aluminum

Stainless steel version on request.

The mountings are supplied in pairs.

Weight (mass	s)[kg]
Series	Weight (mass) [kg] (pair)
MAE-20	0,3
MAE-25	0,3
MAE-32	0,4
MAE-50	0,8





Dimensi	Dimension Table [mm] and Order Instructions																			
Series	Туре	R	U	AF	DF	DH	DK	DM	DN	DO	DP	DQ	DR	DT	EF	ЕМ	EN	EQ	RE	Order No.
OSP-E20	MAE-20	M5	5.5	22	27	38	26	33.5	41	40	92	28	8	10	41,5	28.5	49	36	26	12278
OSP-E25	MAE-25	M5	5.5	22	27	38	26	40	47.5	40	92	34.5	8	10	41.5	28.5	49	36	26	12278
OSP-E32	MAE-32	M5	5.5	30	33	46	27	46	54.5	40	92	40.5	10	10	48.5	35.5	57	43	32	12279
OSP-E50	MAE-50	M6	7	48	40	71	34	59	67	45	112	52	10	11	64	45	72	57	44	12280

Mid-Section Support

Size 20, 25, 32, 50



Series OSP-E ..BHD
 Linear Drive with Toothed Belt and integrated guide

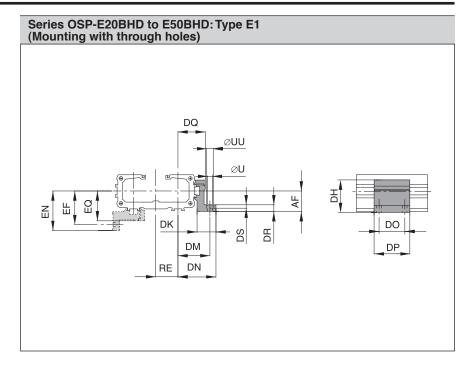
Note on Types E1 and D1: The mid-section support can also be mounted on the underside of the actuator, in which case its distance from the center of the actuator is different.

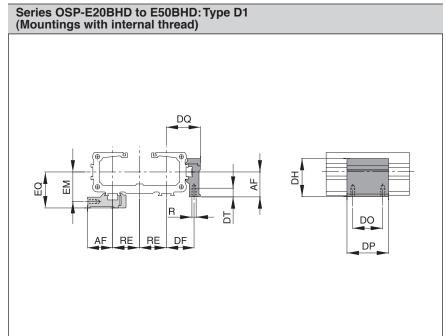
For design notes, see page 17

Stainless steel version on request.

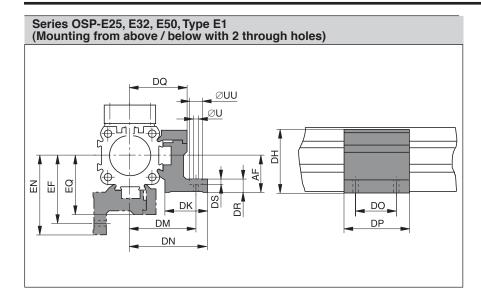
The mountings are supplied singly.

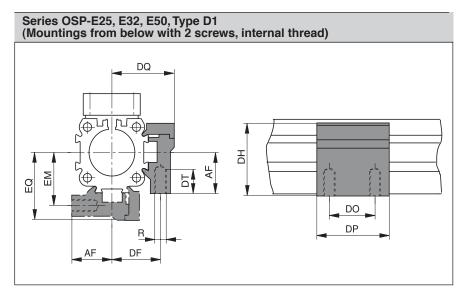






Dimens	ion	Table	e [mn	n] an	d Or	der lı	nstru	ctior	าร													
Series	R	U	UU	AF	DF	DH	DK	DM	DN	DO	DP	DQ	DR	DS	DT	EF	EM	EN	EQ	RE	Order Type E1	No. Type D1
OSP-E20	M5	5.5	10	22	20.5	38	26	33.5	41	36	50	28	8	5.7	10	41.1	28.1	48.6	35.6	23	20009	20008
OSP-E25	M5	5.5	10	22	27	38	26	40	47.5	36	50	34.5	8	5.7	10	41.5	28.5	49	36	26	20009	20008
OSP-E32	M5	5.5	10	30	33	46	27	46	54.5	36	50	40.5	10	5.7	10	48.5	35.5	57	43	32	20158	20157
OSP-E50	M6	7	-	48	40	71	34	59	67	45	60	52	10	-	11	64	45	72	57	44	15536	15534





Mid-Section Support

Size 25, 32, 50



- Series OSP-E..B Linear Drive with toothed Belt and intergrated Guides
- Series OSP-E..SB, ..ST, ..SBR, ..STR

Linear Drive with Screw

Note on Types E1 and D1: The mid-section support can also be mounted on the underside of the actuator, in which case its distance from the center of the actuator is different.

Stainless steel version on request.

Dimens	ion 1	able	[mm] and	d Or	der lı	nstru	ctior	าร												
Series																r No.					
																				Type E1	Type D1
OSP-E25	M5	5.5	10	22	27	38	26	40	47.5	36	50	34,5	8	5.7	10	41.5	28.5	49	36	20009	20008
OSP-E32	M5	5.5	10	30	33	46	27	46	54.5	36	50	40,5	10	5.7	10	48.5	35.5	57	43	20158	20157
OSP-E50	M6	7	_	48	40	71	34	59	67	45	60	52	10	_	11	64	45	72	57	20163	20162





Adaptor Profile

Size 20, 25, 32, 50



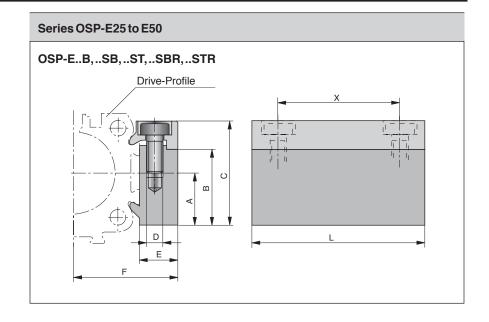
· Series OSP-E

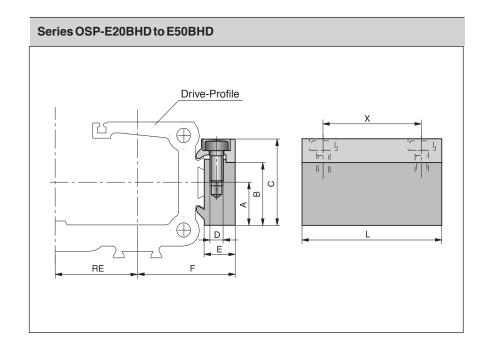
Adaptor Profile OSP

- A universal attachment for mounting of additional items
- Solid material

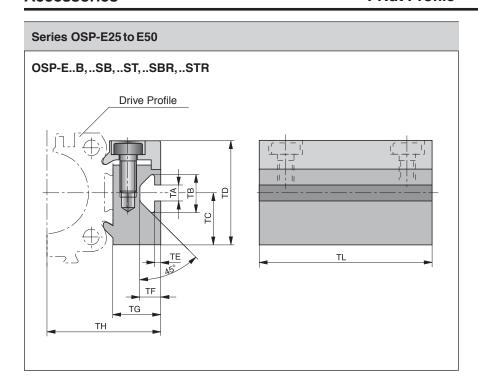
The mountings are supplied singly.







Dimensi	onTa	able	[mm]and	d Ord	erInst	ructi	ons							
Series	Standard Stainless														
OSP-E20	16	23	32	M5	10.5	24	50	36	23	20006	20186				
OSP-E25	16	23	32	M5	10.5	30.5	50	36	26	20006	20186				
OSP-E32	16	23	32	M5	10.5	36.5	50	36	32	20006	20186				
OSP-E50	20	33	43	M6	14	52	80	65	44	20025	20267				



T-Nut Profile

Size 20, 25, 32, 50

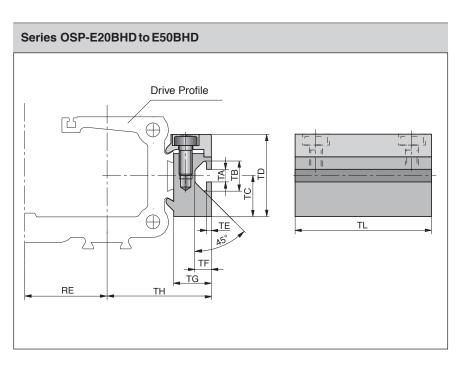


· Series OSP-E

T-Nut Profile OSP

 A universal attachment for mounting with standard T-nuts.

The mountings are supplied singly.





Dimensio	n Tal	ole [m	nm] a	and	Orde	r Inst	ructio	ons							
Series	Standard Stainless														
OSP-E20	23	5	11.5	16	32	1.8	6.4	14.5	28	50	20007	20187			
OSP-E25	26	5	11.5	16	32	1.8	6.4	14.5	34.5	50	20007	20187			
OSP-E32	32	5	11.5	16	32	1.8	6.4	14.5	40.5	50	20007	20187			
OSP-E50	44	8,2	20	20	43	4.5	12.3	20	58	80	20026	20268			



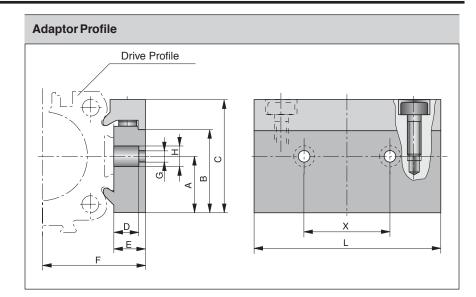
Adaptor Profile

Size 25, 32, 50



to connect

- · Series OSP-E with system profiles
- Series OSP-E with Series OSP-E or OSP-P



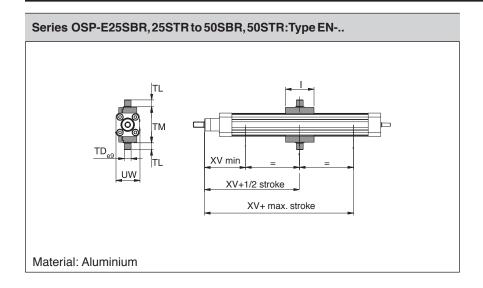
Dimension	Table [mm] an	d Order I	nstructi	ons								
Series	for the connection to the driver of	A	В	С	D	E	F	G	Н	L	Х	Order No.
OSP-E25	OSP32-50	16	23	32	8.5	10.5	30.5	6.6	11	60	27	20850
OSP-E32	OSP32-50	16	23	32	8.5	10.5	36.5	6.6	11	60	27	20850
OSP-E50	OSP32-50	20	33	43	8	14	52	6.6	11	60	27	20851

The mountings are supplied singly.



Connecting possibilities





Dimension Tal	ble [mn	n] an	d Ord	er Ins	struc	tions	– fo	r Trunnic	n Mounti	ng EN				
Series Type I øTD TL TM UW XV XV+ XV+ min 1/2 Stroke Max. Stroke Order No.														
OSP-E25SBR, STR	EN-E25	50	12	12	63	42	73	83	62	12235				
OSP-E32SBR, STR	EN-E32	50	16	16	75	52	76.5	90	69.5	12236				
OSP-E50SBR, STR	EN-E50	80	20	20	108	87	110	110	84	12237				

Trunnion Mounting EN Pivot Mounting EL

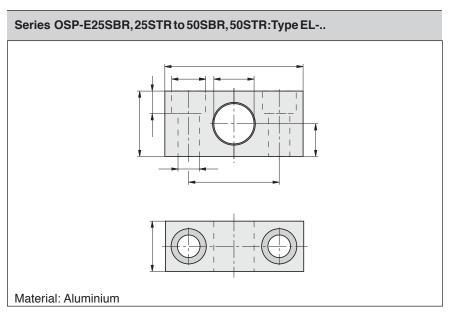
Size 25, 32, 50



 Series OSP-E..SBR, ..STR
 For Linear Drive
 with spindle drive and piston rod

The trunnion mounting is fitted to the dovetail rails of the actuator profile and is continuously adjustable in axial direction.

The mountings are supplied in pairs.



DimensionTa	ble [mm] aı	nd O	rder	Inst	ruct	ions	-for	Pivot	Mou	nti	ng EL	·
Series	Туре	Α	A,	В	С	C ₁	øD ^{H7}	øD ₁	øD ₂	E	Weight (mass) (kg)	
OSP-E25SBR,STR	EL-032	55	36	20	26	13	12	13.5	8.4	9	0.06	PD 23381
OSP-E32SBR,STR	EL-040/050	55	36	20	26	13	16	13.5	8.4	9	0.06	PD 23382
OSP-E50SBR,STR	EL-063/080	65	42	25	30	15	20	16.5	10.5	11	0.10	PD 23383





Pivot Mounting EL



Clevis Mounting

Size 25, 32, 50



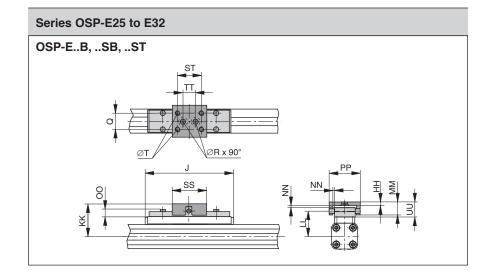
- Series OSP-E..B
 For Linear Drives with Belt
- Series OSP-E-..SB, ..ST
 For Linear Drives with Screw

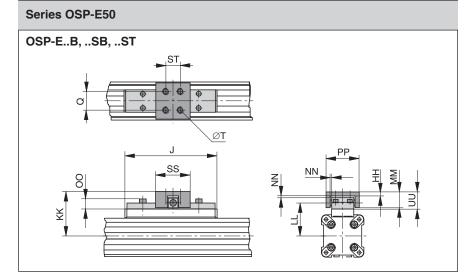
When external guides are used, parallelism deviations can lead to mechanical strain on the piston. This can be avoided by the use of a clevis mounting.

Freedom of movement is provided as follows:

- Tilting in direction of movement
- · Vertical compensation
- · Tilting sideways
- · Horizontal compensation

A stainless steel version is also available.

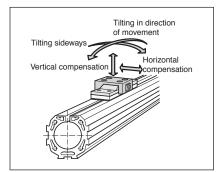




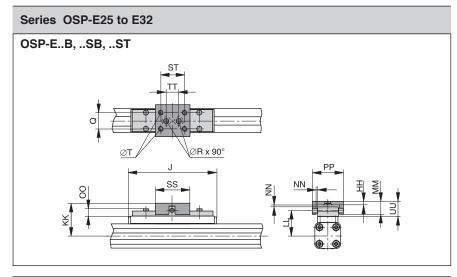
Dimensio	nTable	e[mm]	and Or	der li	nstru	ctions	1										
Series J Q T ØR HH KK LL MM NN* OO PP SS ST TT UU Order No. Standard Stainless																	
OSP-E25	117	16	M5	5.5	3.5	52	39	19	2	9	38	40	30	16	21	20005	20092
OSP-E32	152	25	M6	6.6	6	68	50	28	2	13	62	60	46	40	30	20096	20094
OSP-E50	200	25	M6	_	6	79	61	28	2	13	62	60	46	_	30	20097	20095

* Dimension NN gives the possible plus and minus play in horizontal and vertical movement, which also makes tilting sideways possible.









Series OSP-E.B, ..SB, ..ST

Clevis Mounting, Low Backlash

Size 25, 32, 50



- Series OSP-E..B Linear Drives with Belt
- Series OSP-E-..SB, ..ST Linear Drives with Screw

When external guides are used, parallelism deviations can lead to mechanical strain on the piston. This can be avoided by the use of a clevis mounting.

In the drive direction the clevis mounting has a low backlash fit.

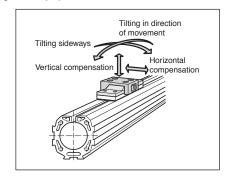
Freedom of movement is provided as follows:

- · Tilting in direction of movement
- Vertical compensation
- · Tilting sideways
- Horizontal compensation

A stainless steel version is also available.

Dimension	nTable	[mm]	and Or	der In	struc	tions											
Series J Q T ØR HH KK LL MM NN* OO PP SS ST TT UU Order No. Standard Stainles																	
OSP-E25	117	16	M5	5.5	3.5	52	39	19	2	9	49	40	30	16	21	20496	20498
OSP-E32	152	25	M6	6.6	6	68	50	28	2	13	69	60	46	40	30	20497	20499
OSP-E50	200	25	M6	-	6	79	61	28	2	13	69	60	46	-	30	20812	20818

* Dimension NN gives the possible plus and minus play in horizontal and vertical movement, which also makes tilting sideways possible







Inversion Mounting

Size 25, 32, 50



- Series OSP-E..B For Linear Drive with Belt
- Series OSP-E-..SB, ..ST
 For Linear Drive with Screw

In dirty environments, or where there are special space problems, inversion of the cylinder is recommended. The inversion bracket transfers the driving force to the opposite side of the cylinder. The size and position of the mounting holes are the same as on the standard cylinder

Stainless steel version on request.

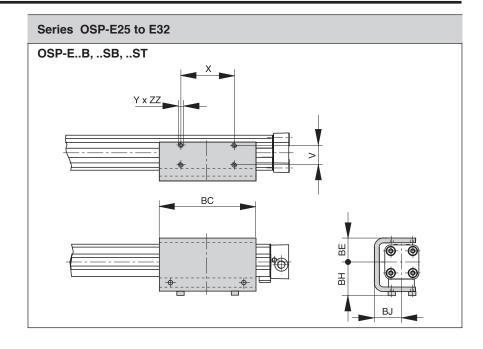
Please note:

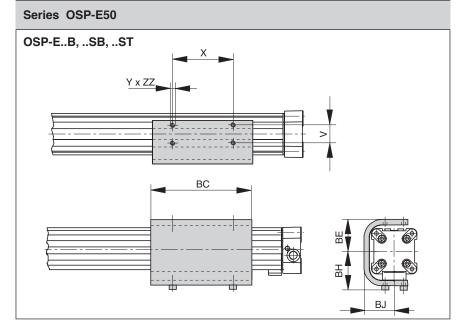
Other components of the OSP system such as mid-section supports, magnetic switches can still be mounted on the free side of the cylinder.

Important Note:

May be used in combination with Clevis Mounting, ref. dimensions on pages 136 & 137



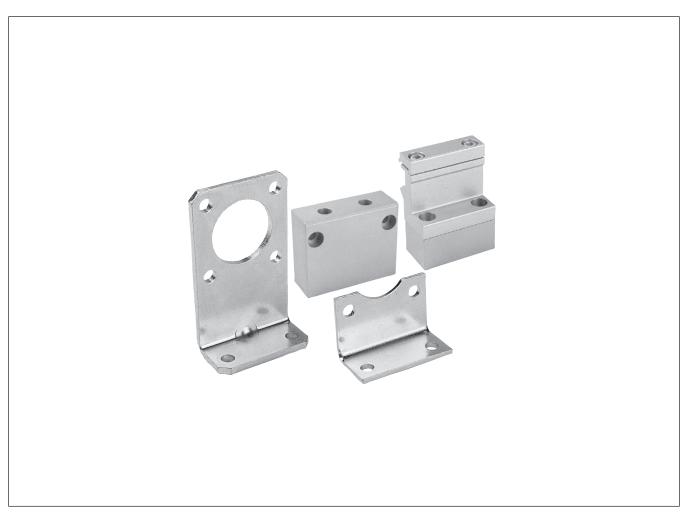




Dimension [*]	Table (r	nm) and	d Order	Instru	ctions				
Series	V	Х	Υ	вс	BE	вн	BJ	ZZ	Order No.
OSP-E25	25	65	M5	117	31	43	33.5	6	20037
OSP-E32	27	90	M6	150	38	51	39.5	6	20161
OSP-E50	27	110	M6	200	55	65	52	8	20166



Accessories for Electric Linear Drives Series OSP-E Mountings for Linear drive with guide







Overview

Mountings for Linear Drives with OSP-Guides



- Series OSP-E..B Linear Drive with Belt
- Series OSP-E..SB, ..ST Linear Drive with Screw *



Overview											
Type of mounting the Cylinders	Туре	SLIE	ions - DELIN DLINE TIBR	E	P-guid	le VERS	LIDE				
		25	32	50	25/ 25	25/ 35	25/ 44	32/ 35	32/ 44	50/ 60	50/ 76
End Cap Mounting	Type A1										
1.40 10	Type A2	o	o								
A	Type A3				o	0		o			
End Cap Mounting reinforced	Type B1	х	X		X	x	x	x	x		
	Type B3										
A	Type B4						o		o		
End Cap Mounting	Type C1			X						X	х
	Type C2			O							
	Type C3									0	
	Type C4										0
Mid-Section Support narrow	Type D1	х	х	x	х	х	x	x	x	х	х
Mid-Section Support wide	Type E1	х	X	х	Х	x	x	x	х	х	Х
	Type E2	o	o	o							
	Type E3				o	0		o		O	
	Type E4						0		o		0

X = mounting position carriage top (12 clock position)

O = mounting position carriage side (3 or 9 clock position)

= available components

* Please note:

With series OSP-E-Spindle the end cap mountings A, B and C can only be fitted to the side opposite to the drive shaft. On the side of the drive shaft we recommend to use our mid-section supports (page 142).



Accessories

Series OSP – E25, E32:Type A OSP-E..B,..SB,..ST Typ A1 Typ A2 Typ A3 AD AD DG

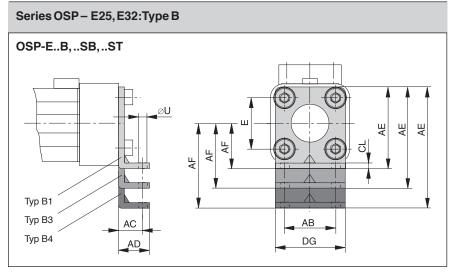
End Cap Mounting * At the end face of each end caps

At the end face of each end caps there are four holes with internal threads to fix the drive. The hole layout is square so that the drive can be fitted on the bottom, the top or either side.

Material: series OSP-25, 32:

steel, zinc galvanized series OSP-50: aluminium, anodized

The mountings are supplied in pairs.





Dimension Table [mm] - Dimension AE and AF (Depending on type of mounting)

D	011010117	L una Ai	(Dopona	9 o typ	o or inoun	9/
Type of mount.	Dimens AE at size	ion		AF at size		
	25	32	50	25	32	50
A1	18	20	-	22	30	-
A2	33	34	-	37	44	-
A3	45	42	-	49	52	-
B1	42	55	-	22	30	-
B3	-	-	-	-	-	-
B4	80	85	-	60	60	-
C1	-	-	30	-	-	48
C2	-	-	39	-	-	57
C3	-	-	54	-	-	72
C4	_	_	77	_	_	95

Series OSP – E50:Type C	
Typ C1 Typ C2 Typ C3 Typ C4 AC AD	AB E DG

DimensionTable[mm]							
Series	E	øU	AB	AC	AD	CL	D
OSP-E25	27	5.8	27	16	22	2.5	39
OSP-E32	36	6.6	36	18	26	3	50
OSP-E50	70	9	40	12.5	24	-	86

^{*} see survey for mounting types on page 140



Dimensions, Ordering Information

Mid-Section Support

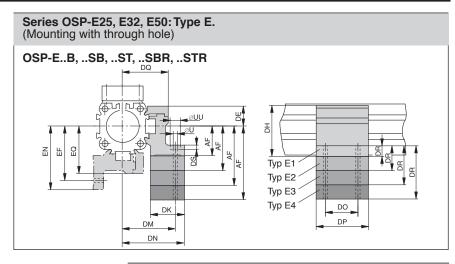
Information on type E1 and D1:

The mid-section supports can also be fitted to the bottom side of the drive. In this case please observe the new center line dimensions of the drive.

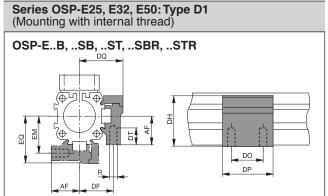
For layout information please refer to pages 102, 105 & 109

Stainless version on request.





Dimension Table [mm] - Dimension DR and AF (Depending on type of mounting) Туре **Dimensions** DR ΑF of mount. at size at size 25 32 25 32 50 50 D1 30 48 22 E1 8 10 10 22 30 48 **E2** 23 24 19 37 44 57 35 32 52 72 **E**3 31 49 E4 40 57 60 95 46 60



Dimensio	nTable	[mm]																
Series	R	U	UU	DE	DF	DH	DK	DM	DN	DO	DP	DQ	DS	DT	EF	EM	EN	EQ
OSP-E25	M5	5.5	10	16	27	38	26	40	47.5	36	50	34.5	5.7	10	41.5	28.5	49	36
OSP-E32	M5	5.5	10	16	33	46	27	46	54.5	36	50	40.5	5.7	10	48.5	35.5	57	43
OSP-E50	M6	7	-	23	40	71	34	59	67	45	60	52	-	11	64	45	72	57

Order Instructions for Mountings Type A – Typ	e B – Type C – Type D – Type E		
Type of mounting (Versions)		Order No. Size	
	25	32	50
A1 *1)	2010	3010	_
A2*1)	2040	3040	_
A3*1)	2060	3060	_
B1 *1)	20311	20313	_
B3*1)	_	_	_
B4*1)	20312	20314	_
C1 *1)	_	_	5010
C2*1)	-	_	20349
C3*1)	_	_	20350
C4*1)	_	_	20351
D1*2)	20008	20157	20162
E1*2)	20009	20158	20163
E2*2)	20352	20355	20361
E3*2)	20353	20356	20362
E4*2)	20354	20357	20363

^{*1)} The mountings are supplied in pairs



^{*2)} The mountings are supplied simply



Accessories for Linear Drives Series OSP-E Piston Rod Mountings



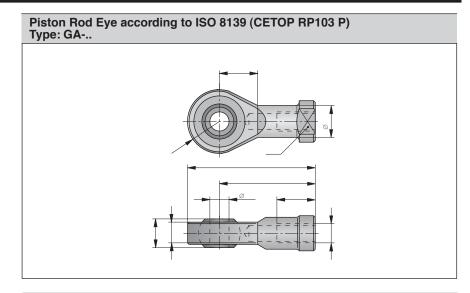


Piston Rod Eye according to ISO 8139



 Series OSP-E..SBR, ..STR Linear Drive with Screw and Piston Rod





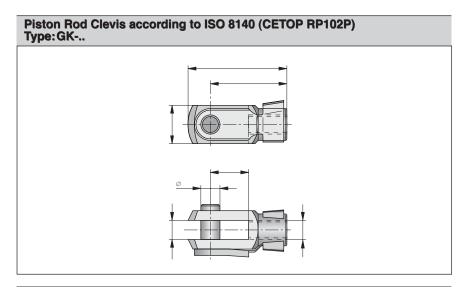
Order Instructions, Dimension Table [mm], Weight														
Series	Туре	Α	CE	øCN	EN	ER	KK	LE	SW	U	W	øZ ₁	Weight [kg]	Order No.
OSP-E25SBR,STR	GA-M10 x 1.25	20	43	10	14	14	M10x1.25	15	17	10.5	57	15	0.072	KY6147
OSP-E32SBR,STR	GA-M10 x 1.25	20	43	10	14	14	M10x1.25	15	17	10.5	57	15	0.072	KY 6147
OSP-E50SBR,STR	GA-M16 x 1.5	28	64	16	21	21	M16x1.5	22	22	15	85	22	0.21	KY6150

Piston Rod Clevis according to ISO 8140



 Series OSP-E..SBR, ..STR Linear Drive with Screw and Piston Rod

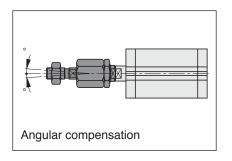


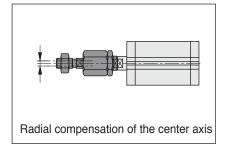


Order Instruct	Order Instructions, Dimension Table [mm], Weight										
Series	Туре	øCK	CE	CL	СМ	KK	LE	W	Weight[kg]	Order No.	
OSP-E25SBR, STR	GK-M10x1.25	10	40	20	10	M10x1.25	20	52	0.08	KY6135	
OSP-E32SBR, STR	GK-M10x1.25	10	40	20	10	M10x1.25	20	52	0.08	KY6135	
OSP-E50SBR, STR	GK-M16x1.5	16	64	32	16	M16x1.5	32	83	0.30	KY6139	



Dimensions & Ordering Information



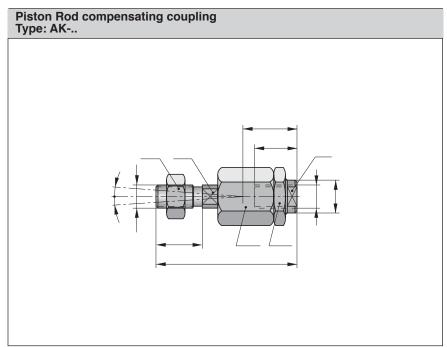


Piston Rod Compensating Coupling



 Series OSP-E..SBR, ..STR Linear Drive with Screw and Piston Rod





Order Instruction	Order Instructions, Dimension Table [mm], Weight													
Series	Туре	В	С	D ±2	E	ØF	KK	SW1	SW2	SW3	SW4	SW5	Weight [kg]	Order No.
OSP-E25SBR,STR	AK-M10x1.25	20	23	73	31	21,5	M10x1.25	12	30	30	19	17	0.218	KY 1129
OSP-E32SBR,STR	AK-M10x1.25	20	23	73	31	21,5	M10x1.25	12	30	30	19	17	0.218	KY 1129
OSP-E50SBR,STR	AK-M16x1.5	40	32	108	45	33,5	M16x1.5	19	41	41	30	30	0.637	KY 1133





Accessories for Electric Linear Drives Series OSP-E

Magnetic Switches SFI-plus Displacement Measuring System



Magnetic Switches Types RS, ES148-151
SFI-plus Displacement Measuring System152-154
Cable Cover155



Characteristics

Characteristics		Symbol	Unit	Description
Electrical Characteristic	S			Type RSType ES
Operating voltage	U _B	V	10-240 AC/DC (NO) 10-150 AC/DC (NC) 10-70 AC/DC (NO/NC)**	10-30 DC
Connection			Two wire	Three wire
Switching function			Normally open (NO) Normally closed (NC)	NPN (NO) PNP (NC)
Max. permanent switching current	Dmax	mA	200	200
Max. switching capacity	VA (W)	10 VA	_	
Residual voltage at I _{Lmax}		V	< 3	< 3
Max. current consumption		mA	_	< 20
Status indicator			LED, yellow	
Typical switching time		ms	On:<2	On:<2
Switch-off delay		ms	_	approx.25
Pole reversal			LED without function	_
Pole reversal protection			_	builtin
Short circuit protection			_	builtin
Switchable capacity		μ F	0.1 at 100 Ω, 24 VDC	
Switching distance		mm	approx.15	approx.15
Hysteresis for OSP		mm	approx.8	approx.3
Mechanical Characterist	ics		1	1
Housing			Macrolon, grey	
Insulation class			F to VDE 0580	
Connection*) Type RS-K			Cable, 5 m long	
Type RS-S			3-pole Connector M8, Cable length ca. 100mm**	3-pole Connector M8 Cable length ca. 100mr
Cable cross section (highly flexible)		mm²	2x0.14	3x0.14
Cable (highly flexible *)			PVC	PUR, black
Wire colors			brown AC/DC+ blue or white signal output	Pin 1 = +, brown Pin 3 = 0 V, blue Pin 4 = Signal black or white
Minimum permissible bending radius fixed moving		mm mm	≥20 ≥70	
Switching point accuracy	mm	±0.2		
Temperature range *) 1)	$artheta_{ ext{min}}^{ ext{min}}$	°C °C	-25 other temperatu +80 on request	re ranges
Service life, switching cycles			3x10 ⁶ up to 6x10 ⁶	theoretically unlimited
Electrical protection		IP	67 according to DIN	EN 60529
Shock resistance			m/s² (contact switches)	100 500
			+	1

^{*)} other versions on request

Magnetic Switches



Type RS-. Type ES-.

For electrical sensing of the carrier position, e.g. at the end positions, magnetic switches may be fitted. The magnetic switches can as well be used as cut-out switches for a lot of intermediate positions.

Position sensing is contactless and is based on magnets fitted as standard to the carrier. A yellow LED indicates operating status.

Piston speed and switching distance affect signal duration and should be considered in conjunction with the minimum reaction time of ancillary control equpiment.

In accordance to this, the contact travel must be included in the calculation.

$$\label{eq:min.reaction} \mbox{Min.reaction time} = \frac{\mbox{Switching distance}}{\mbox{Piston speed}}$$





^{**)}RS with connector (RS-S)

 $^{^{\}rm 10}$ $^{\prime}$ for the magnetic switch temperature range, please take into account the surface temperature and the self-heating properties of the linear drive.

Technical Data

Magnetic Switches RS and ES

Electrical Service Life Protective Measures

Type RS magnetic switches are sensitive to excessive currents and inductions. With high switching frequencies and inductive loads such as relays, solenoid valves or lifting magnets, service life will be greatly reduced.

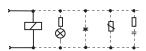
With **resistive** and **capacitative** loads with high switch-on current, such as light bulbs, a protective resistor should be fitted. This also applies to long cable lengths and voltages over 100 V.

In the switching of inductive loads such as relays, solenoid valves and lifting magnets, voltage peaks (transients) are generated which must be suppressed by protective diodes, RC loops or varistors.

Connection Examples

Load with protective circuits

- (a) Protective resistor for light bulb
- (b) Freewheel diode on inductivity
- (c) Varistor on inductivity
- (d) RC element on inductivity



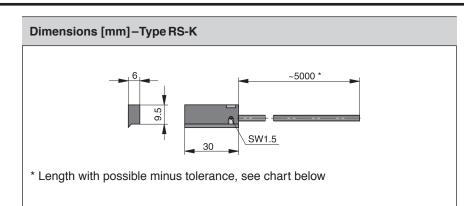
For the type ES, external protective circuits are not normally needed.

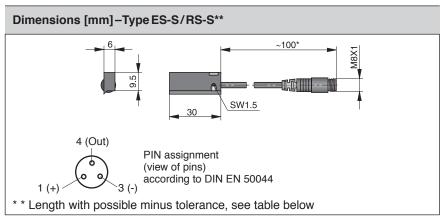
Type RS

In the type RS contact is made by a mechanical reed switch encapsulated in glass.

Type ES

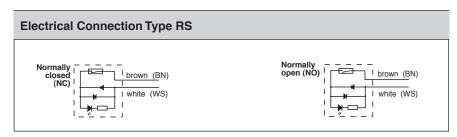
In the type ES contact is made by an electronic switch – without bounce or wear and protected from pole reversal. The output is short circuit proof and insensitive to shocks and vibrations.

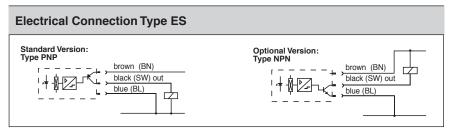




^{**}Operating voltage max. 70 V

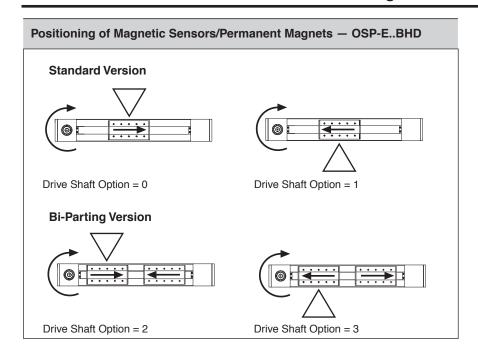
Length of connection ca	ble with length tolerance	
Sensor Order No.	Nominal cable length	max. Length tolerance
KL3087	100 mm	-20 mm
KL3047	100 mm	-20 mm
KL3054	100 mm	-20 mm
KL3060	145 mm	±5mm
KL3048	5000 mm	-50 mm
KL3045	5000 mm	-50 mm





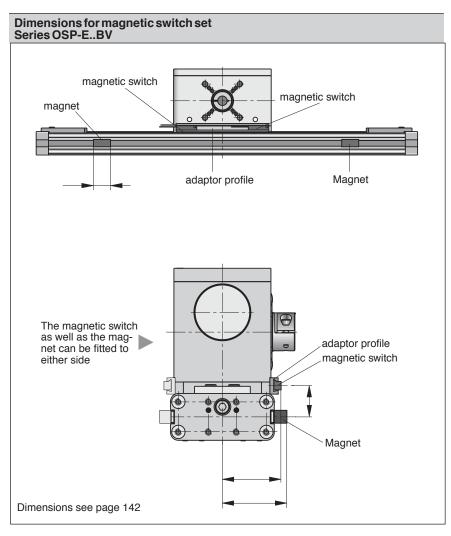


Technical Data



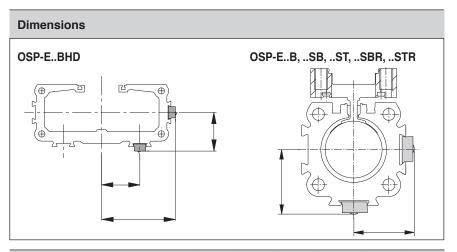
When arranging the magnetic switches, please mind the position of the magnets integrated in the carrier as a function of the operating direction.

"M" indicates where magnet is fitted in carrier.



Magnetic switch and magnet are externally fitted to the OSP-E..BV.

For this purpose please order the magnetic switch set (consisting of 2 magnetic switches, 1 fastening rail and 2 magnets) for contactless position sensing.



Dimension Table (mm)											
Series	Dimension										
	RC	RD	RE	MA	MB	MC	MD				
OSP-E20BHD	41.5	26.6	23	_	_	_	_				
OSP-E25BHD	51	27	26	_	_	_	_				
OSP-E32BHD	63	34	32	-	_	_	_				
OSP-E50BHD	87	48	34	1-	_	_	_				
OSP-E20BV	-	_	1-	46	23.7	42.3	35				
OSP-E25BV	1-	_	1-	56	26	51	35				
OSP-E25*	25	27	1-	1-	_	_	-				
OSP-E32*	31	34	1-	1-	_	-	-				
OSP-E50*	43	48	1-	-	_	_	-				
* =B,SB,ST,SBR,STR											

Order Instructions					
Description	Function	Series	Cable Length [mm]	Туре	Order No.
Magnetic switches, Reed contact, with M8-Connector PIN 3 neutral	NC 1+ 4	all*	100	RS-S	KL3087
(ES-S compatible connector)	NO 1+ 4	all*	100	RS-S	KL3047
Magnetic switches, Reed contact, with cable	NC bn+	all*	5000	RS-K	KL3048
	NO bn+	all*	5000	RS-K	KL3045
	NC bn+	OSP-ESTR	5000	RS-K	KL3096
Magnetic switches, electronical with M8-connector	NPN (NO)	all*	100	ES-S	KL 3060
	PNP (NC)	all*	100	ES-S	KL 3054
	PNP (NC)	OSP-ESTR	100	ES-S	KL 3098
Magnetic switch set **	NC 1+ 4	OSP-EBV	2 x 100	RS-S	15886
Connecting cable					
suitable for cable chain			5000		KL3186
suitable for cable chain			10000		KL3217
suitable for cable chain			15000		KL3216
standard			5000		4041
standard			10000		KL9074

^{* =} except for OSP-E..STR

^{** =} consisting of 2 magnetic switches KL 3087, 1 fastening rail, 2 magnets



Technical Data

	1	
Characteristics	Unit	Description
Туре		21210
Output function		I
Resolution	mm	0.1
Pole length scale	mm	5
Max. speed	m/s	10
Repeating accuracy		± 1 increment
Distance sensor/scale mm	_	≤ 4
Tangential deviation	≤ 5°	
Possible lateral deviation	mm	≤ ± 1.5
Switching output		PNP
Electrical Characteristics		
Operating voltage U _b	V DC	18 – 30
Voltage drop	V	≤ 2
Continuous current per output	mA	≤ 20
Power consumption at $U_b = 24V$, switched on, no-load	mA	≤ 50
Short-circuit protection	1	yes
Reverse voltage protection		yes
Protection against inductive switch-off peak		yes
Power-up pulse suppression		yes
ЕМС		
Electrostatic discharge	kV	6, B, according to EN 61000-4-2
Electromagnetic field	V/m	10, A, according to EN61000-4-3
Fast transients signals, burst (signal connections)	kV	1, B, according to EN 61000-4-4
Fast transients signals, burst (DC-connections)	kV	2, B, according to EN 61000-4-4
EMC immunity, surge (signal-connections)	kV	1, B, according to EN 61000-4-5
EMC immunity, surge (DC-connections)	kV	0,5, B, according to EN 61000-4-5
HF cable fed	V	10, A, according to EN 61000-4-6
Magnetic field at 50 Hz	A/m	30, A, according to EN 61000-4-8
Radio frequency interference	7 7111	according to EN 61000-6-4
Radiated disturbances	+	according to EN 55011, group 1, A
Mechanical parameters	1	
Housing		Aluminium
Cable length	m	5.0 – fixed, open end
Cable cross-section	mm ²	4 x 0.14
Type of cable	111111	
	mm	PUR, black
Bending radius	mm	≥ 36
Weight (mass)	kg	approx. 0.165
Ambient conditions/shock resis		C7 according to ENGOSCO
Encapsulation class	IP	67 according to EN60529 °C -25 to +80
Ambient temperature range Broad band noise	g	°C -25 to +80 5.5 Hz to 2 kHz, 0.5 h per axis
according to EN 60068-2-64 Vibration according to EN 60068-2-6	g	12, 10 Hz to 2 kHz, 2 mm, 5 h per axis
Shock acc. EN 60068-2-27	0	100, 6 ms, 50 shocks per axis
	9	1 1
Continuous shock according to EN 60068-2-29	g	5, 2 ms, 8000 shocks per axis

Displacement Measuring System

for automated movement

ORIGA-Sensoflex

(Incremental Displacement Measuring System)

Series SFI-plus

- Series OSP-E..SB Linear Drive with with ball screw
- Series OSP-E..ST
 Linear Drive with trapezoidal screw

Special properties:

- contactless, magnetic displacement measuring system
- freely selectable displacement length up to 32 m
- resolution 0,1 mm
- displacement speed up to 10 m/s
- suited for linear and gyratory movements
- for almost all control and display units with suitable counter input

The magnetic displacement measuring system SFI-plus consists of 2 main components:

- Measuring scale self-adhesive, magnetic measuring scale
- Sensing head converts the magnetic poles into electric signals which are then processed by counter inputs downstream (e.g. PLC, PC, digital counters)

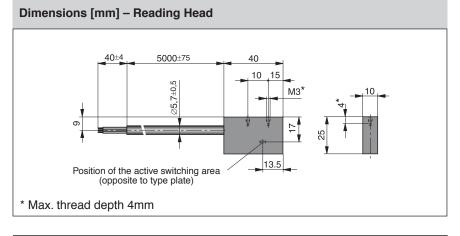




Dimensions

Sensing head

The sensing head supplies two pulsating, 90° out of phase counter signals (phase A/B) with a resolution of 0,4 mm (option 4 mm). External pulse edge control can improve the resolution to 0.1.mm (option 1 mm). The counting direction automatically results from the phase shift of the counter signal.



Electric connection					
colour	Designation				
bn = brown	+ DC				
bl = blue	– DC				
bk = black	phase A				
wt = white	phase B				

SFI-plus in connection with electric linear drives of series OSP-E..ST

The SFI-plus can be mounted directly to the electric linear drive of series OSP-E..ST by means of a special mounting kit.

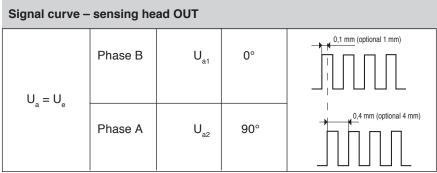
The position of the sensing head is generally staggered by 90° to the carrier.

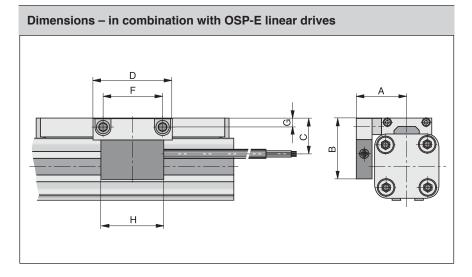


For later installation a corresponding carrier kit with threaded holes can be ordered.

SFI-plus in connection with electric linear drives of series OSP-E..SB

The displacement measuring system in connection with series OSP-E..SB can only be retrofitted, if the system is reconditioned by the manufacturer.





Dimension Table [mm]											
Series	Α	В	С	D	F	G	Н				
OSP-E25SB, ST	32	39	23	50	38	5.5	40				
OSP-E32SB, ST	37.5	46	30	50	38	6.5	40				
OSP-E50SB, ST	49.5	55	39	50	38	6.5	40				



Ordering Information

Order Instructions	
Description	Order No.
Sensing head with measuring scale – resolution 0.1 mm (please indicate scale length)	21240
Sensing head - resolution 0.1 mm (spare part)	21210
Measuring scale per meter for (to be replaced)	21235
Mounting kit for OSP-P25	21213
Mounting kit for OSP-P32	21214
Mounting kit for OSP-P50	21216

^{*} The overall length of the measuring scale results from the dead length of the linear drive and the stroke length. For dead lengths for linear drives of series OSP-E see table.

Series	Dead lengths
	[mm]
OSP-E25SB, ST	154
OSP-E32SB, ST	196
OSP-E50SB, ST	280

Example:

Linear Drive OSP-E, Ø25 mm, stroke 1000 mm

Dead length + stroke = overall length of the measuring scale 154 mm + 1000 mm = 1154 mm



Cable Cover

Size 20, 25, 32, 50



For clean guidance of magnetic switch cables along the cylinder body.

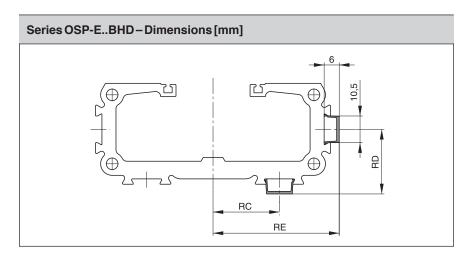
Contains a maximum of 3 cables with diameter 3 mm.

Material: Plastic Colour: Red

Temperature Range: -10 bis +80°C



Series OSP-E..B, ..SB, ..ST, ..SBR, ..STR – Dimensions [mm]



DimensionTable [mm] and Order Instructions										
for Series	RC	RD	RE	Order No.						
OSP-E25*	23.5	25.5	_	13039						
OSP-E32*	29.5	32	_							
OSP-E50*	41.5	46.5	_	Minimum length: 1m Max. profile length: 2m						
OSP-E20BHD	23	25	40	Multiple profiles can						
OSP-E25BHD	26	25.5	49.5	be used.						
OSP-E32BHD	32	32	61.5							
OSP-E50BHD	44	46.5	85.5							

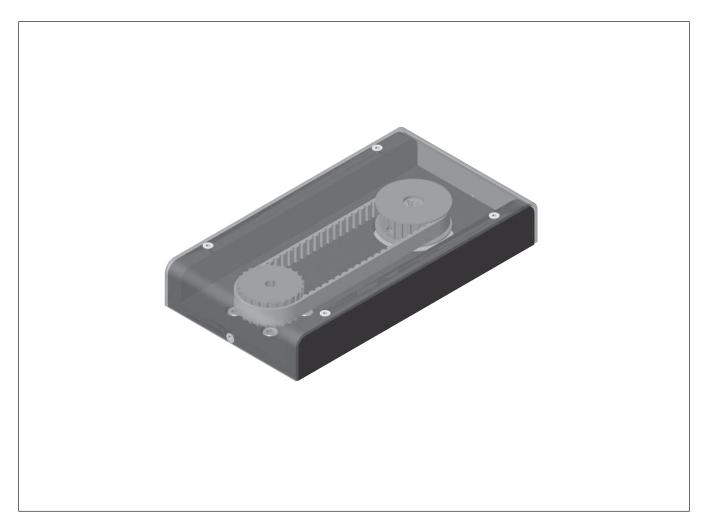
^{*} B, SB, ST, SBR, STR





Motor Mounts

ORIGA

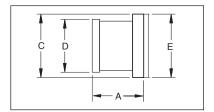


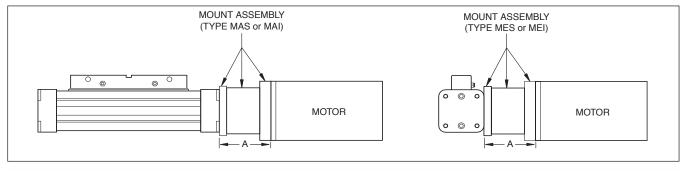


Dimensions

The coupling housing is the mounting base for the motor and includes a self aligning coupling.

Motor flanges and couplings suitable for the available range of servo and stepper motors will be found together with technical data and dimensions on motors and drives, see separate data sheet.



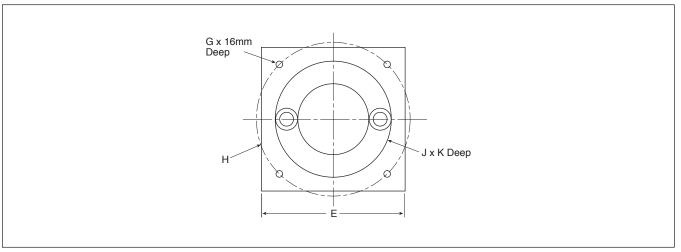


Motor Mount	Motor Shaft Diameter	Size	Туре	Motor Type	Α	С	D	E
MES-2504	14mm	25	Belt	Metric 04	95.7	70	70	70
MES-3204	14mm	32	Belt	Metric 04	86.7	70	70	70
MES-5004	14mm	50	Belt	Metric 04	86.7	70	90	70
MES-5008	16mm	50	Belt	Metric 08	114.7	90	90	90
MEI-2523	.250"	25	Belt	Nema 23	76.7	70	70	70
MEI-3234	.375"	32	Belt	Nema 34	88.7	90	70	90
MEI-5034	.375"	50	Belt	Nema 34	83	90	90	90
MGM-3234	.750"	32	Belt	Nema 34	88.7	90	70	90
MGM-5034	.750"	50	Belt	Nema 34	88.7	90	90	90
MAS-2501	8mm	25	Screw	Metric 01	51.4	42	42	42
MAS-3204	14mm	32	Screw	Metric 04	86.7	70	70	70
MAS-5004P	14mm	50	Screw	Metric 04P**	88.7	90	90	90
MAS-5008	14mm	50	Screw	Metric 08	88.7	90	90	90
MAI-2517	5mm	25	Screw	Nema 17	51.4	42	42	42
MAI-3223	.250"	32	Screw	Nema 23	76.7	70	70	70
MAI-5034	.375"	50	Screw	Nema 34	88.7	90	90	90
MAS-5008P	16mm	50	Screw	Metric 08P**	88.7	120	90	120
MEI-5042	.625"	50	Belt	Nema 42	88.7	120	90	120
MAI-3101	.500"	32	Screw	Nema 34	86.7	90	70	90
MAI-3234	.375"	32	Screw	Nema 34	86.7	90	70	90
MEI-3223	.250"	32	Belt	Nema 23	76.7	70	70	70
MAI-2523	.250"	25	Screw	Nema 23	51.4	70	42	70
MGM-3223	.500"	32	Belt	Nema 23	76.7	70	70	70
MGM-5034S	.750"	50	Screw	Nema 34	88.7	90	90	90
MGM-3223S	.500"	32	Screw	Nema 23	86.7	70	70	70
MES-3208	14mm	32	Belt	Metric 08	88.7	90	90	90

Dimensions are for reference purposes only
Nema mounts match IMS stepper motors or equivalent
Metric mounts match Yaskawa SGM Servo motors or equivalent
**Drilled & counterbored for 4-40 socket head cap screw from opposite side
MGM = Gearbox mount



Dimensions



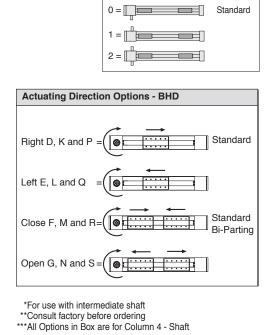
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Motor Mount	Size	Туре	Motor Type	G	Н	J	K
MES-2504	25	Belt	Metric 04	10-32 UNF	70	50	3.5
MES-3204	32	Belt	Metric 04	10-32 UNF	70	50	3.5
MES-5004	50	Belt	Metric 04	10-32 UNF	70	50	3.5
MES-5008	50	Belt	Metric 08	10-32 UNF	90	70	3.5
MEI-2523	25	Belt	Nema 23	10-32 UNF	66.68	38.1	2
MEI-3234	32	Belt	Nema 34	10-32 UNF	98.42	73.08	2
MEI-5034	50	Belt	Nema 34	10-32 UNF	98.42	73.08	2
MGM-3234	32	Belt	Nema 34	10-32 UNF	98.42	73.08	2
MGM-5034	50	Belt	Nema 34	10-32 UNF	98.42	73.08	2
MAS-2501	25	Screw	Metric 01	M4	46	30	3
MAS-3204	32	Screw	Metric 04	10-32 UNF	70	50	3.5
MAS-5004P	50	Screw	Metric 04P**	10-32 UNF	90	70	3.5
MAS-5008	50	Screw	Metric 08	10-32 UNF	90	70	3.5
MAI-2517	25	Screw	Nema 17	*	43.8	22	2.5
MAI-3223	32	Screw	Nema 23	10-32 UNF	66.68	38.1	2
MAI-5034	50	Screw	Nema 34	10-32 UNF	98.42	73.08	2
MAS-5008P	50	Screw	Metric 08P**	M8 X125	145	110	4
MEI-5042	50	Belt	Nema 42	.25-20 UNC	127	55.58	2
MAI-3101	32	Screw	Nema 34	10-32 UNF	98.42	73.08	2
MAI-3234	32	Screw	Nema 34	10-32 UNF	98.42	73.08	2
MEI-3223	32	Belt	Nema 23	10-32 UNF	66.68	38.1	2
MAI-2523	25	Screw	Nema 23	10-32 UNF	66.68	38.1	2
MGM-3223	32	Belt	Nema 23	10-32 UNF	66.68	38.1	2
MGM-5034S	50	Screw	Nema 34	10-32 UNF	98.42	73.08	2
MGM-3223S	32	Screw	Nema 23	10-32 UNF	66.68	38.1	2
MES-3208	32	Belt	Metric 08	10-32 UNF	90	70	3.5
	1	1	l .			1	l .

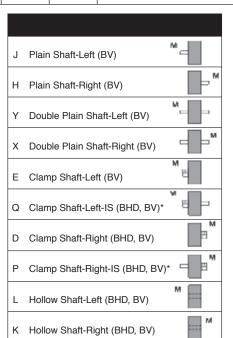
Dimensions are for reference purposes only
Nema mounts match IMS stepper motors or equivalent
Metric mounts match Yaskawa SGM Servo motors or equivalent
*Drilled & counterbored for 4-40 socket head cap screw from opposite side
MGM = Gearbox mount

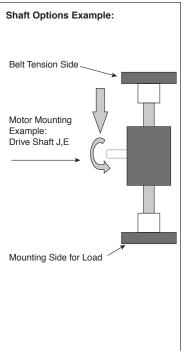


Ordering Information

1		2		3		4		5		6	
serie	S	bore		lead		shaft		mour	nt single mount	moun	t double mount
Е	Electric	0	20 25	0 1	belt	0	right (belt) left (belt)	0	if double (all and BHD) std mnt (nr20) (all and BHD)	0	if single (all and BHD) std mnt (nr20) (all and BHD)
Н	Heavy Duty	3	32 50	2	5mm BS	2	double (belt)	2	floating mount (nr25) (all) invert mount (nr30) (all)	2	floating mount (nr25) (all) invert mount (nr30) (all)
	Roller			4	10mm BS	4	BHD Integrated Gearbox 3:1**	4	invert float mount (nr35) (all)		invert float mount (nr35) (all)
	Guide (BHD)			5 6	25mm BS	5 6	BHD Integrated Gearbox 5:1** BHD Integrated Gearbox 10:1	** 6	slideline (Ball Screw Only) powerslide ps25 (25)	5 6	slideline (Ball Screw Only) ps25 (one mount, two carriages)(25)
R	Heavy			7 8		7 8		/ 8	powerslide ps35 (25,32) powerslide ps44 (25,32)	7 8	ps35 (one mount, two carriages)(25, ps44 (one mount, two carriages)(25,
11	Duty			9		9		9	powerslide ps60 (50)	9	ps60 (one mount, two carriages)(50)
	Ball Guide			A B	BP (belt Bi-parting)	A B	STD (screw) 2 end (screw)	A B	powerslide ps76 (50)	A B	ps76 (one mount, two carriages)(50)
	(BHD-II)			C	Dr (Bon Dr parting)	С	, ,	C		Č	
S	Extending			D E		D E	Clamp Shaft-Right (BHD, BV) Clamp Shaft-Left (BHD, BV)	D E		D F	
J	Rod			F		F	Clamp Shaft-Close (BHD)	F		F	
	Ball Screw (OSP-SBR)			G H		G H	Clamp Shaft-Open (BHD) Plain Shaft-Right (BV)	G H		G H	
		,		J		J	Plain Shaft-Left (BV)	j		j	
V	Belt Rack Drive			K		K	Hollow Shaft-Right (BHD, BV) Hollow Shaft-Left (BHD, BV)	K L		K I	
	(OSP-BV)			M		M	Hollow Shaft-Close (BHD)	M		M	
				N P		N P	Hollow Shaft-Open (BHD) Clamp Shaft-Right-IS (BHD, BV)	N * P		N P	
				Q		Q	Clamp Shaft-Left-IS (BHD, BV)*	Q	Proline/GDL (all)	Q	Proline/GDL (all)
				R S		R S	Clamp Shaft-Close-IS (BHD)* Clamp Shaft-Open-IS (BHD)*	R S		R S	
				Τ		Τ	Obsolete (BHD)	T	000 000	Τ	
				U V		U V	Obsolete (BHD) Obsolete (BHD)	U V	OSP-BV Reserved OSP-BV Size 20	U V	
				W		W	Obsolete (BHD)	W	OSP-BV Size 25	W	
				X Y		Χ Υ	Double Plain Shaft-Right (BV) Double Plain Shaft-Left (BV)	X Y	HD Heavy Duty Series Screw	X Y	
				Ż	special	Ż	special		(25,32,50)	Ž	special
							↑ ↑ ↑	Z	special		
				.	01 (10 11 12)) D E'			Sha	aft Ont	ions Example:
				Drive	Shaft Options (OS	oP-E)			- Citi		







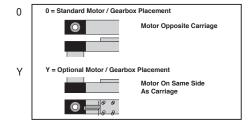


Ordering Information

7*		8		9*		10 cente	r	11		12	13	14	15	16	17	18
motor mount		screws coatin		suppo	rt	suppo qty		switch	1	switch qty		stro	ke (ı	nm)		
			•			''				",			• (,		
0	none and Standard BHD	0	std	0	none and BHD	0	none	0	none	0	-	0	0	0	0	0
1	mes-2504 (belt)(25)	1	stainless hardware	1				1	no reed KL3045 (all)		-					
2	mes-3204 (belt)(32)	2	xylan coated aluminum	2				2	nc reed KL3048 (all)		-					
3	mes-5004 (belt)(50)	3	stainless/xylan	3				3	pnp KL3054+4041(all)		-					
	mes-5008 (belt)(50)	4	purge ports	4				4	npn KL3060+4041 (all)		-					
5	mei-2523 (belt)(25)	5	purge / stainless	5				5			-					
	mei-3234 (belt)(32)	6	purge / stainless / xylan	6				6			-					
7	mei-5034 (belt)(50)	7		7				7			-					
8	mgm-3234 (belt)(32)	8		8				8			-					
9	mgm-5034 (belt)(50)	9		9				9			-					
Α	mas-2501 (screw)(25)	Α		Α				Α			-					
В	mas-3204(screw)(32)	В		В	D1 (all)			В			-					
С	mas-5004P(screw)(50)	С		С	E1 (all)			С			-					
D	mas-5008(screw)(50)	D		D	E2 (all)			D			-					
Е	mai-2517 (screw)(25)	Ε		Ε	E3 (all)			Ε			-					
F	mai-3223 (screw)(32)	F		F	E4 (all)			F			-					
G	mai-5034 (screw)(50)	G		G	A1+D1 (25,32)			G			-					
Н	mas-5008p (screw)(50)	Н		Н	B1+D1 (25,32)			Н			-					
J	mei-5042 (belt)(50)	J		J	C1+D1 (50)			J			-					
K	mai-3101 (screw)(32)	K		K	A1+E1 (25,32)			K			-					
L	mai-3234 (screw)(32)	L		L	B1+E1 (25,32)			L			-					
M	mei-3223 (belt)(32)	M		M	C1+E1 (50)			M			-					
N	mai-2523 (screw)(25)	N		N	A2+E2 (25,32)			N			-					
Р	mgm-3223 (belt)(32)	Р		Р	C2+E2 (50)			Р			-					
Q	mgm-5034S (screw)(50)	Q		Q	A3+E3 (25,32)			Q			-					
R	mgm-3223S (screw)(32)	R		R				R			-					
S	mes-3208 (belt)(32)	S		S	C3+E3 (50)			S			-					
T	Belt Gear 1:1 (Screw Only)	T		T	B4+E4 (25,32)			Τ			-					
U	Belt Gear 2:1 (Screw Only)	U		U	C4+E4 (50)			U			-					
V		V		V				V			-					
W		W		W				W			-					
Χ		Χ		Χ				Χ			-					
Υ	Optional BHD (see below)	Υ		Υ				Υ			-					
Z	special	Z	special	Z	special			Z	special		-					

- 7* (BHD) Non-standard KB and KL dimensions must be specified on a separate line item (use "Z" in part number).
- 7* (BHD) Order motor mount and/or gearbox as a separate line item (contact customer service).
 7* Contact customer service if non-standard motor mounting holes are required.

- 9* (BHD) Order supports as a separate line item.
 9* Only one end support is supplied in the OSP-E part number. If more than one is required, please order additional end supports as a separate line item.





Electric Actuator Application Sheet

Distributor:		End-User:	
Salesperson:			
Phone:		Fax:	
Stroke:	Time to make move:	Load:	Incline:
☐ Check if load is	s externally supported		
Actuator type:			
		M =	
		MS =	
*		MV =	
	0 0	Description:	
	for info /a additional info		
Special Features	Required:		
□ Switches	Type Oty		
☐ Controller Nee	ded		
☐ Servo Motor N	eeded		
☐ Stepper Motor	Needed		



☐ Customer Supplied Motor



GDL Aluminum Roller Guides



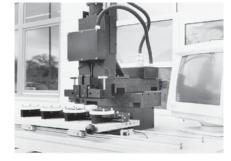
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Light, Smooth and FAST

Aluminum roller guides in a cutting machine for spectacle lenses. Both the work piece carriers and the motorized X - Y table axis are equipped with roller guides. The smooth operation and precision of the equipment ensures a fine cutting action.



Aluminum roller guides in an automatic vibrator for flattening printed sheets of paper. To guarantee even pressure on the sheets of paper, the roller bridge is supported by precision roller guides.

(Baumann company photo)

Handling units for medical equipment. Smooth, easy movement with guideline roller guides.

(Dräger company photo)

Aluminum roller guides in the sliding carriage of a machine for producing cables. The projecting arm of the carriage is guided by two double rails each with two roller cassettes and can be moved manually with minimal force because of the low friction properties.

(Kabelmat company photo)

Single rail and roller shoe versions of the aluminum roller guide in a handling arrangement for stacks of paper. Various fittings and limit stops for stacking are moved on two axes horizontally and vertically. The robustness and reliability of the roller guides allows for continuous operation under high load conditions.

(Solms company photo)









- Light weight (anodized aluminum)
- · Smooth and quiet operation
- · Speeds up to 10 m/s
- Acceleration/deceleration up to 40 m/s²
- · Loading from any direction
- Permanently lubricated guidance system
- Broad product range in various series high performance, standard and stainless steel versions
- · High load and moment capacities
- · Very cost effective
- Flexible mounting dimensions



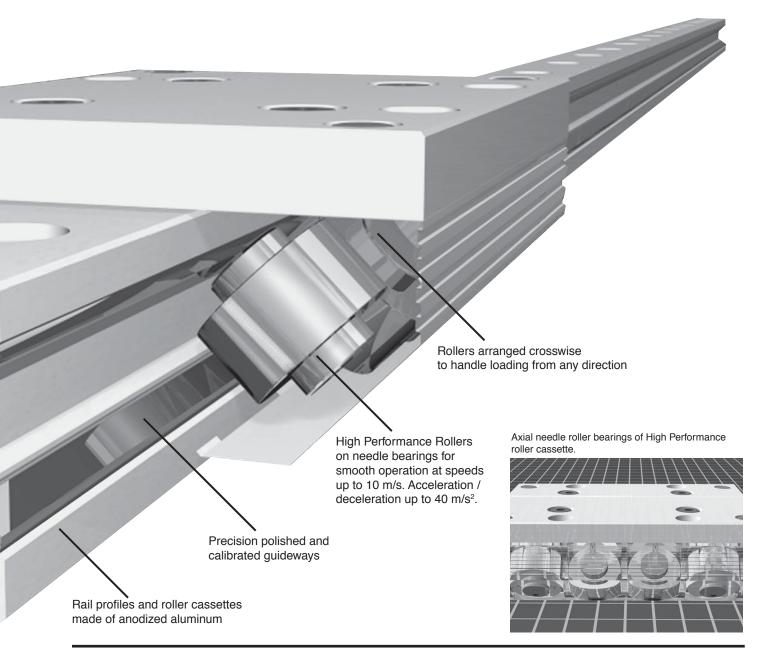


GDL Linear Guides Offer a Variety of Series and Options — High Performance... "Smooth Guidance"

Aluminum roller guides provide smooth operation and high load carrying capacity for industrial automation.

By the use of lightweight aluminum components the moving masses are minimized, travel speeds are increased and actuation energy is saved. Aluminum roller guides are designed to carry medium weight loads economically. Their smooth action and speeds up to 10 m/s make them ideal for widespread use in many areas of application.

Aside from a main featured High Performance guide, others such as the Standard, Corrosion Resistant, High Dynamics and Grease-free versions are also available. Aluminum roller guides are available in sizes 12, 15, 20, 25, 35 and 45mm. Rail lengths are from 200 mm to 4000 mm. For longer travel lengths, guide rails can be butt-jointed together.





GDL Product Line Overview

Characteristic	Unit	Description
Full profile wipers		Rollershoes and cassette are provided with snap-on full profile wipers. The snap-on full profile wipers are easily replaceable with available wipers kits. See page 8 for respective wiper kit order numbers.
Mounting		Rollershoes and cassettes use ISO screw quality 8.8 and DIN 433 washers. ISO screw quality 8.8 is recommended for mounting the rails also.
Loads		See load and moment rating tables on page 6 for respective load, moment and weight data per size and series.
Acceleration and Deceleration	m/s² (ft/sec²)	40 m/s ² maximum (131 ft/s ² maximum)
Guide installation		Possible in any position. See technical information on page 10 for specific instructions on installing various guide configurations.
Drog adjustment		Cassettes can be adjusted at the factory or by the customer.
Drag adjustment set screw		Rollershoes can be set-up by the customer to incorporate the drag adjustment set screw feature. The drag adjustment set screw components are supplied with each pair of rollershoes.
Coefficient of friction		Variable, but .001 set at standard slide resistance adjustment.
Standard Lubrication		Lifetime lubrication with standard grease-packed roller bearings.
Speed	m/s (ft/s)	Up to 10 m/s (or up to 33 ft/s)
		Rail: Aluminum alloy
Materials for High		Guideways: Hardened high alloy spring steel
Performance or Standard versions		Cassettes/rollershoes/top plates: Aluminum alloy
		Rollers: Bearing steel
Materials for		Rail: Aluminum alloy
Materials for Corrosion Resistant		Guideways: Stainless steel spring steel
High Performance &		Cassettes/rollershoes/top plates: Aluminum alloy
Standard versions		Rollers: Stainless steel bearing steel
Bearing types		Steel axial needle, Specials on request (ex: anti-magnetic, grease free, high dynamics) - consult factory
Operating temperature	C (F)	-10° to 80°C (+14 to 176°F) temperature range
		Custom length cassettes and rollershoes for 100 piece lots minimum.
		Keyed butt-jointed rail sections for continuous rail lengths over 4000mm.
Chasiala available		Solid continuous length rails between 4000.
Specials available		Offset or non-standard "L11" dimensions on opposite ends of cut rails.
		Integrated metal scraper with standard full profile wiper currently available.
		Rail underside blind mounting holes.

Descriptions of the Various GDL Series Available:

High Performance Series:

(Sizes FDC12HP-... thru FDC45HP-...)

The High Performance series is the basis for GDL's development, which is used in the majority of applications. High Performance guides consist of 8 axial needle roller bearings, running on precision polished and hardened alloy spring steel guideways. These guide bearings are grease packed and shielded, while offering the highest load and moment rating capacities within the GDL product line.

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Standard Performance Series:

(Sizes FDC12SP-... thru FDC45SP-...)

The Standard Performance series is intended for minor loads and moments for particularly economical guidance solutions. Standard Performance guides consist of 8 radial ball roller bearings, running on precision polished and hardened alloy spring steel guideways. These guide bearings are grease packed and sealed, while offering the lowest load and moment ratings available within the GDL product line, with the exception of the Grease-Free and the Anti-Friction / Corrosion Resistant series. Standard Performance series is the second most commonly used GDL guides for various applications and also provides excellent running behavior.



Features

General Facts Pertaining to all Series:

Snap-on full profile wipers: Rollershoes and cassettes can be provided with snap-on full profile wipers. The snap-on full profile wipers are easily replaceable with available wiper kits. See page C14 for respective wiper kit order numbers.

Cassette adjustment: Cassettes can be adjusted at the factory or by the customer.

Fasteners: Rollershoes and cassettes use ISO screw quality 8.8 and DIN 433 washers. ISO screw quality 8.8 is recommended for mounting the rails also. Special stainless steel fasteners can be requested as necessary.

Carrying Capacity: See load and moment rating tables on page C6 for your guide series of interest.

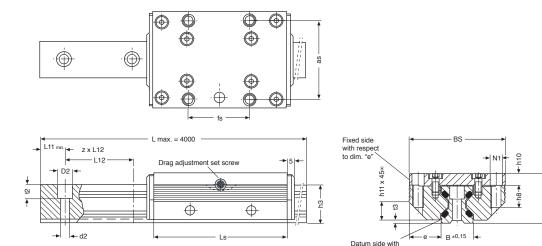
Guide mounting position: Optional.

Lengths: For longer than standard rail lengths, see keyed butt-jointed rail option on page C8.

Lubrication: GDL Aluminum Roller Guides are permanently lubricated with contained roller bearings grease.

See part numbering schemes on pages C14 to define your desired GDL guide features for ordering.

Cassette with Double Sided Rail



Dimensions for both Standard FDC Version Guides

Size	Length Ls	Width BE	В	BS	В1	Height B2	h1	h3	h9	as	d2	D2	е	fs	h7	h8	h10	h11	L8	L9	L11 min.	L12	t2	t3	N1	N2	N3	PF1	PF2	S1	S2	S3
12	64	12.00	12.0	37	24.4	11.9	15.0	14.7	19	30	3.4	6	12.50	25	6.0	8	4.0	6	29	57	10	40	5.5	1.4	M4	М3	M4	5.5	3.4	3.4	4.9	9.7
15	78	15.25	15.5	47	30.9	15.2	19.0	18.7	24	38	4.5	8	15.75	30	7.5	10	5.0	8	34	68	10	60	6.0	2.0	M5	M4	M6	7.0	4.4	4.9	5.9	12.4
20	92	20.00	21.0	63	40.9	20.4	23.0	22.6	30	53	5.5	10	21.00	40	8.0	12	7.0	11	42	80	10	60	7.0	2.0	M6	M5	M6	9.5	4.9	5.9	5.9	16.9
25	98	25.00	23.0	70	48.4	22.9	27.5	27.0	36	57	6.6	11	23.50	45	5.0	16	8.5	13	48	84	10	60	10.0	2.5	M8	M5	M8	12.0	6.4	7.4	8.9	19.4
35	135	35.00	32.0	100	68.9	32.9	37.5	37.0	48	82	9.0	15	34.00	62	7.5	20	10.5	20	67	117	12	80	11.5	3.5	M10	M6	M8	17.0	8.9	8.9	8.9	28.4
45	165	45.00	45.0	120	82.4	36.4	46.5	46.0	60	100	11.0	18	37.50	80	9.5	24	13.5	22	83	146	16	105	14.5	4.0	M12	M8	M8	22.0	9.9	9.9	8.9	30.9

Dimensions (mm)

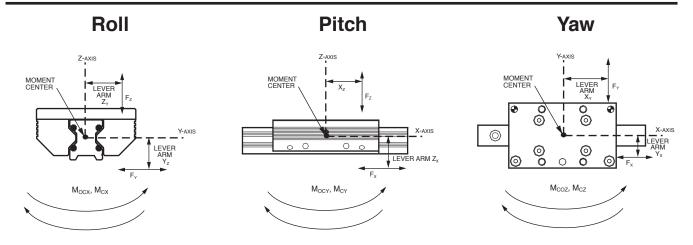
Dimensions for both Underside Mounting Hole FDC Version Guides

(Ref. ordering instructions)

Size	Length Ls	Width BE	В	BS	В1	Height B2	h1	h3	h9	as	d2	D2	е	fs	h7	h8	h10	h11	L8	L9	L11 min.	L12	t2	t3	N1	N2	N3	PF1	PF2	S1	S2	S3
12	64	12.00	12.0	37	24.4	11.9	15.0	14.7	19	30	3.4	6	12.50	29	6.0	8	4.0	6	29	57	10	40	5.5	1.4	M4	М3	M4	5.5	3.4	3.4	4.9	9.7
15	78	15.25	15.5	47	30.9	15.2	19.0	18.7	24	38	4.5	8	15.75	34	7.5	10	5.0	8	34	68	10	60	6.0	2.0	M5	M4	M6	7.0	4.4	4.9	5.9	12.4
20	92	20.00	21.0	63	40.9	20.4	23.0	22.6	30	53	5.5	10	21.00	40	8.0	12	7.0	11	42	80	10	60	7.0	2.0	M6	M5	M6	9.5	4.9	5.9	5.9	16.9
25	98	25.00	23.0	70	48.4	22.9	27.5	27.0	36	57	6.6	11	23.50	45	5.0	16	8.5	13	48	84	10	60	10.0	2.5	M8	M5	M8	12.0	6.4	7.4	8.9	19.4
35	135	35.00	32.0	100	68.9	32.9	37.5	37.0	48	82	9.0	15	34.00	62	7.5	20	10.5	20	67	117	12	80	11.5	3.5	M10	M6	M8	17.0	8.9	8.9	8.9	28.4
45	165	45.00	45.0	120	82.4	36.4	46.5	46.0	60	100	11.0	18	37.50	90	9.5	24	13.5	22	83	146	16	105	14.5	4.0	M12	M8	M8	22.0	9.9	9.9	8.9	30.9

Dimensions (mm)





Load & Moment Rating Capacities

(for cassettes on double sided rail)

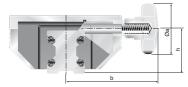
0	Dynamic Load	Static Load	_	Static Moment Rating Capacities:			Dynamic Moment Rating Capacities:		Cassette	Rail
Cassette Series	Rating C (N)	Rating Co (N)	Roll Mocx (Nm)	Pitch Mocy (Nm)	Yaw Mocz (Nm)	Roll Mcx (Nm)	Pitch Mcy (Nm)	Yaw Mcz (Nm)	Weight (kg)	Weight (kg)
High Performance	Series									
FDC12HP	2800	3000	27	43	43	25	40	40	0.1	0.4
FDC15HP	4200	3400	37	58	58	45	72	72	0.3	0.8
FDC20HP	5400	5400	76	111	111	76	111	111	0.4	0.9
FDC25HP	9000	10100	158	222	222	142	198	198	0.6	1.8
FDC35HP	12500	18000	423	559	559	294	388	388	1.5	3.2
FDC45HP	21200	25900	827	983	983	678	806	806	2.9	5.5

GDL Aluminum Roller Guides

High Performance cassettes with lock device

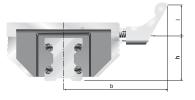


Special cassette types



The locking cassette with star grip handle can be stopped at any desired location on the rail. The clamping device does not exert forces on the rail guideways.

The clamping device is used in fixtures which are movable manually, clamping and stop ledgers, feeding of tools and work pieces. Also available with L-ratchet handle.



Star Grip Handle Dimensions

Size	Øа	b	h	Clamp Force	Part Numbers Star grip knob
12	N/A				
15	25	41	19.0	200	FDC15HP-00020000
20	25	49	23.0	250	FDC20HP-00020000
25	32	56	28.0	250	FDC25HP-00020000
35	50	83	38.5	350	FDC35HP-00020000
45	63	101	48.0	750	FDC45HP-00020000

Dimensions (mm), Force (N) with normal manual tightening.

L-Ratchet Handle Dimensions

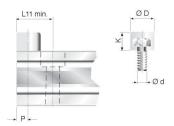
Size	ı	b	h	Clamp Force	Part Numbers L-ratchet handle
12				N/A	\
15	45	59.5	19.0	200	FDC15HP-00010000
20	45	67.5	23.0	250	FDC20HP-00010000
25	45	71	28.0	250	FDC25HP-00010000
35	63	96	38.5	350	FDC35HP-00010000
45	78	116	48.0	750	FDC45HP-00010000

Size	d	D	K	L11 min.	Р	Order Number
12	M5	12	8	15.0	6.0	63504A
15	M5	12	8	16.0	6.0	63504A
20	M5	12	8	17.0	6.0	63504A
25	M6	15	10	20.5	7.5	63505A
35	M8	19	13	26.5	9.5	63506A
45	M10	24	16	33.0	12.0	63507A

Dimensions (mm)

End of Stroke Stop screws





The stop screws are screwed into threads (option) on the guide rails. The end of stroke stopping energy is reduced by a rubber cap. With guide rails where the L11 is less than the standard minimum, we offset the mounting hole by half of its diameter.

Note: Customer must drill and tap the holes for the stop screws.

GDL Accessories

Rail Mounting Screw Covers





Material: Wear resistant plastic, resistant to oil and aging.

Mounting: Put a plastic plate on top and pound in uniformly. Remove residual burrs with a soft brush

or fingernail.

Note: Use respective order numbers for ordering separately or include in rail part number.

Size	Cylindrical Screw DIN912	D	Order Number
12	M3	6	87752A
15	M4	8	87753A
20	M5	10	87754A
25	M6	11	87755A
35	M8	15	87756A
45	M10	18	87757A

Dimensions (mm)





GDL Aluminum Roller Guides

Version with wipers

Integrated into an additional cover, a felt wiper is saturated with oil. Although dependent on the degree of contaminants, these wipers last for some 6000km, after which the

felt wipers can either be washed or replaced.

For optimal cassette rolling performance, all holes in the guide rails should be filled with the plastic rail mounting screw covers (see page C7).

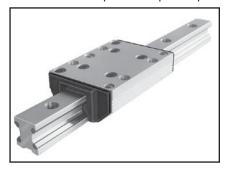
Order numbers for replacement wiper kits

FDC Series and Size	Respective Order Number
12	84457B
15	84480B
20	84481B
25	84482B
35	84483B
45	84484B

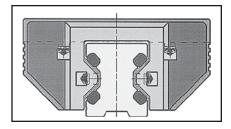
^{*}wiper kits are sold in pairs

NOTE: Use respective order numbers for ordering separately as replacements, or specify in cassette part number. See cassette part numbering on pages C14.

Cassette with full profile snap-on wipers



Full profile snap-on wiper



GDL's Keyed Butt-Jointed Rail Option

GUIDELINE rails can be precisely fastened together using a factory offered keyed butt-joint option for continuous rail lengths, as shown in Figures 1 & 2.

Two rail sections are clamped together with mating round bar stock pieces that seat tangent to both rail section guideways on each side of the rail. While the rail sections are clamped together, a keyway slot is machined in the top and bottom sides of the rail, across the butt- joint. Screw holes are then drilled through the rail inside the keyway slot, so the opposing keyways can be drawn together tightly with screws. The round bar stock clamp is then removed, providing a rigid and well aligned keyed butt-joint.

The keyed butt-joint option provides optimum alignment of all guideways from one rail section to the next. This allows for optimum "smooth" guidance of the cassette bearings, while crossing rail butt-joints.

The keyed butt-jointed rail option is currently available in the FDR version 25, 35, & 45 mm rail sizes. For a keyed butt-joint on rail sizes 25, 35 or 45 mm, specify P/N:# GDL-BJK

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Consult factory for other size possibilities.



Figure 1

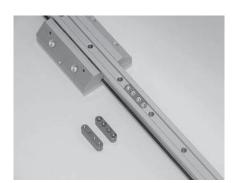


Figure 2

GDL Coupled with structural aluminum extrusion material and OSP-E actuator

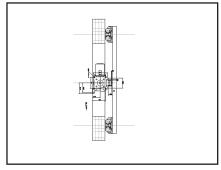


Figure 3

GDL linear guides couple well with various structural aluminum extrusions and Parker-Origa OSP-P and OSP-E actuators. Mounting can be easily accomplished using standard fasteners and mounting brackets. See Figure 3 above.



Units Conversion Tables

Force Conversions:

Multiply	By Conversion Factor	Result
pound-force	4.448	Newton
Newton	0.225	pound-force
kilogram-force	9.807	Newton
Newton	0.102	kilogram-force

Acceleration Conversions:

Multiply	By Conversion Factor	Result
feet/section ²	0.305	meter/second ²
meter/second ²	3.281	feet/second ²
inch/second ²	0.025	meter/second ²
meter/second ²	39.370	inch/second ²

Mass Conversions:

Multiply	By Conversion Factor	Result
ounce	28.349	gram
gram	0.035	ounce
kilogram	35.279	ounce
gram	0.001	kilgram
pound	0.453	kilogram
kilogram	2.205	pound

Bending Moment or Torque Conversions:

Multiply	By Conversion Factor	Result
pound-foot	1.356	Newton-meter
Newton-meter	0.737	pound-foot
Newton-meter	0.102	kilogram-meter
Kilogram-meter	9.807	Newton-meter

Velocity Conversions:

Multiply	By Conversion Factor	Result
mile/hour	1.609	kilometer/hour
kilometer/hour	0.621	mile/hour
feet/second	0.305	meter/second
meter/second	3.281	feet/second
inch/minute	0.025	meter/minute
meter/minute	39.370	inch/minute

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Length Conversions:

Multiply	By Conversion Factor	Result
inch	25.4	millimeter
millimeter	0.039	inch
inch	0.025	meter
meter	39.370	inch
foot	0.305	meter
meter	3.281	foot



1. Features of the Guide System

Aluminum roller guides consist of a double sided rail and a roller cassette or two single sided rails and two roller shoes. Aluminum roller guide rails and cassettes are made of aluminum alloy. The rollers are very smooth running on precision polished guideways made of high alloy spring steel. The special cross pattern orientation of the running rollers provides high load and moment capacity in all directions.

Their special features are: light weight, small dimensions, and high speed of displacement. Aluminum roller guides are economical and universal handling components, which are mostly or all corrosion-resistant and available at a favorable price.

2. Size of the Guide System

To select the right guide size, first the moments and forces acting on the bearing have to be determined.

Recommended safety factors (with ISO screws quality 8.8):

Thrust load S > 1.3Tensile load S > 4.0Moment load S > 6.0

3. Material

The basic body of GDL aluminum roller guides is made of aluminum alloy. The guideways consist of hardened, high alloy spring steel or of stainless steel. By using basic bodies of aluminum, the moved masses are reduced which allows light-weight construction requiring lower moving forces and reduced energy consumption. Still the integrated GDL system sustains high load and moment ratings.

4. Operating Temperature

GDL linear guides can be operated within a temperature range from -10 $^{\circ}$ C up to + 80 $^{\circ}$ C. For other temperatures, please consult factory.

5. Screwed Connections

GDL linear guides are fixed to the mating structure by the mounting holes in the rails and the cassettes. ISO screw quality 8.8 should be used with DIN 433 washers.

To secure the screwed connections, we recommend that suitable locking means be utilized as necessary.

Mounting screw torque specifications:

	Quality 8.8 (Nm)
M3	1.1
M4	2.5
M5	5.0
M6	8.5
M8	21.0
M10	41.0
M12	71.0

6. Wipers

The guideways of aluminum roller guides are equipped with wipers to protect against coarse environmental contamination.

7. Slide Resistance / Adjustment

Follow the steps on how to adjust GDL cassettes to the rail.

The new GDL catalog has many changes due to an expanded product line. The change to feature descriptive part numbering was done to accommodate all current and future offerings of the GDL product. The goal is to have standard features and options available, for a perfect fit into your application.

Included in the chart below are hex sizes, drag resistance and torque ratings for adjusting the cassette.

GDL CHART								
FDC FDC FDC FDC FDC FDC FDC FDC FDC FDC								
Top plate hex (mm)	2	3	4	4	5	6		
Top plate torque (in lbs)	n/a	22.1	44.3	44.3	75.2	186		
Adjustment hex (mm)	1	3	3	4	4	4		
Drag resistance (oz) HP, HC, GF, VA	1.8- 7.9	3.6- 10.8	5.4- 16.2	7.2- 21.6	10.8- 32.4	12.6- 37.7		
Drag resistance (oz) SP & SC	.7- 1.8	1.8- 3.6	3.6- 7.2	5.4- 10.8	7.2- 14.4	9- 18		
Drag resistance (oz) HD	n/a	n/a	n/a	9- 18	14.4 25	18- 28.7		

7.1 GDL Adjustment Procedure

Do not measure sliding resistance with wipers on.

 Lay the rail out on the flat surface with the *datum* line facing away from you. Anchor the rail to keep it from shifting when sliding resistance is applied to the cassette.

The datum line is a reference groove on one side of the rail.

Set the roller cassette on the rail with the adjustment screw facing towards you, while the datum line on the rail is away from you. Do not install the wipers on the cassette yet.

Do not install the wipers yet.

 Make sure the four bolts on the adjustable side of the cassette are slightly loose and the bolts on the fixed side are tight before adjusting the drag screw.

One side of the cassette is fixed and the other side is floating.

4) The drag hex screw is located on one side of the cassette. Adjust the screw in for more drag and out for less. Do not try to adjust cassette with top plates bolts tight.

See the chart for drag adjustment hex screw size.

- Adjust the drag on the cassette by sliding as it slides down the rail. Feel for an even amount of resistance as you turn the hex screw in and out.
- 6) Tighten down the top plate bolts to the proper torque specification. The tightening of the top plate bolts will add some resistance. If necessary, the adjustment procedure can be repeated for better sliding resistance for your application.

See the chart for top plate hex size and torque rating.

If the adjustment is done without a scale, it should move evenly. Some examples of improper adjustment are: If the





cassette "hops", it is too tight. If it is too loose, the top plate of the cassette will have play. Try to be in the middle.

8) To check your settings use a pull or push style scale. Slide the cassette down the entire rail at an even speed, measuring the drag resistance. Your highest drag rating should be referenced when looking at the chart.

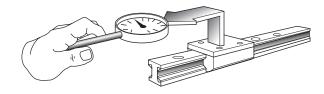
See the chart for drag resistance ratings for the size and type of cassette.

 Install the clip on wipers. The wipers will add between 1-3 ounces of resistance. The wipers do not add any additional roller preload to the rail.

The clip on wipers can be installed at this time.

7.2 Double Sided Rail and Cassette

Aluminum roller guides are adjusted in such a way that the required stiffness under load is obtained. If self adjustment is preferred, we recommend that you measure the slide resistance as shown below. Before doing so, the mating structure should be checked for dimensional accuracy and flatness.



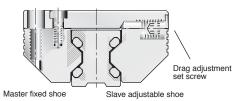
The cassettes which are mounted on the rails are adjusted clearance-free, without play. This adjusting method is required at the point on the rail where the cassette travels with the least slide resistance. Adjustment is completed in the non-loaded condition. The tolerances below refer to this condition.

Slide resistance adjusment tolerance (N)															
Series		_	_AM		H()G	,	· •					OC_I	HD		
Size	12	15	20	25	35	45	12	15	20	25	35	45	25	35	45
Adjust. value	0.5	1.0	1.5	2.0	3.0	3.5	0.2	0.5	1.0	1.5	2.0	2.5	2.5	4.0	5.0
Max. value	2.0	3.0	4.5	6.0	9.0	10.5	0.5	1.0	2.0	3.0	4.0	5.0	5.0	7.0	8.0

All values are without wipers

Tolerances in the guide system may cause slight variations in the slide resistance, when the adjusted cassette is moved along the guide rail.

7.3 Double Sided Rail and Roller Cassette



GDL Aluminum Roller Guides

Technical Data

To change the clearance setting, first the slave adjustable shoe screws on the cassette top plate are slightly loosened. Afterwards, the drag adjustment set screw is turned to increase or decrease slide resistance of the cassette. Turning the drag adjustment set screw effects a displacement of the roller shoe in relation to the cassette top plate.

After re-tightening of the cassette top plate, the slide resistance can be checked. This procedure can be repeated until the desired slide resistance is achieved.

7.4 Rails and Rollershoes

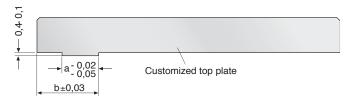
When installing, it is important to distinguish between the master fixed side and the slave adjustable side rollershoe and rail. The rail on the master fixed side is aligned to the mating structure and fastened securely by all screws.

The rail on the slave adjustable side should be lightly tightened and movable with light force during initial alignment of parallel rails. Gauge blocks should be used between the parallel rails, by locating off the aligned and mounted master rail, in order to align the slave rail parallel to the master rail. Slave rail mounting bolts should be tightened as the slave rail is aligned at each bolt position. See paragraph 11.3 for further instructions on mounting parallel single sided rails.

7.5 Centering Groove on the Master Fixed Shoe and Custom Top Plate

Each pair of rollershoes are provided with centering grooves for optimum alignment to their mating top plate during mounting.

One rollershoe should be designated as the master fixed rollershoe, even though both are designed with a centering groove on their top surface. The other shoe will serve as the slave adjustable side rollershoe. The mating customized top plate should be machined with a centering shoulder according to the following data.



Size	а	b
12	4,5	9,6
15	5,0	12,6
20	7,5	16,1
25	10,5	17,6
35	12,5	26,1





7.6 Adjusting Cassette Built with Rollershoes and Custom Top Plate

Assemble the adjustable rollershoe to the top plate also,

The centering shoulder on the top plate should be assembled with its respective fixed rollershoe centering groove and securely torqued to recommended specification. See cassette screw torque specifications under step 5, on page 172.

parallel to the fixed rollershoe on the same side of the top plate. Its fasteners should be lightly tightened so that the adjustable rollershoe can be moved with light finger pressure. As assembled cassette can then be slid onto parallel rails, while keeping the fixed rollershoe on the master fixed rail side. The incorporated drag adjustment set screw can then be turned clockwise to remove cassette play, or counter clockwise to reduce slide resistance while maintaining zero

Once the desired slide resistance is achieved with no cassette play, the adjustable rollershoe fasteners can also be torqued to specification.

8. Running accuracy

The running accuracy is measured from the top plate surface of the cassette, to the ideal straight line of travel. Running accuracy of the cassette to the rail is +/- .03mm (.0012") per meter, granted no greater than (.0024") straightness deviation per meter is maintained when mounting the rail.

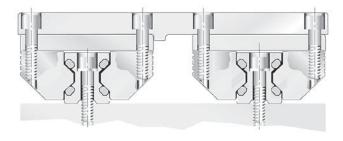
9. Contact and support surfaces

The contact and support surfaces have a substantial influence on functioning and precision of linear guides. Depending on the functional requirements of the system, the mating structure has to be machined with the corresponding degree of precision.

Machining errors on the mating structure will otherwise add to the running error of the guide system. In order to assure troublefree functioning, we recommend that a max. straightness deviation of ≤ 0.1 mm (.0039") per running meter be maintained when mounting the rail.

10. Design hints

10.1 Parallel double sided rails and cassettes



The master fixed rail should always be established straight and true first, within the maximum straightness deviation specified in paragraph 9. With parallel rail arrangements, both rails should be mounted on the same mounting surface elevation and treated with equal surface preparation and

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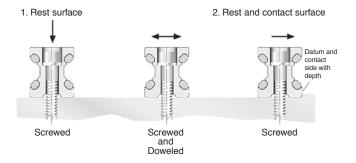
tolerancing practices. Precise alignment in terms of spacing, parallelism and height is very important.

When coupled parallel to a driving actuator system, the adjustable side of the cassette should be placed on the side closest to the driving actuator. This will minimize driving actuator torque transferred to the adjustable side of the cassette.

11. Guide mounting instructions

The useable load capacity is influenced by the connection between the guide elements and the mating structure. For this reason, a flat, straight and solid secure mounting surface should be provided. Adequate support of qualified loads and moments can then be achieved, along with desired running accuracy.

11.1 Mounting Double Sided Rails and Cassette
Depending on the load situation, certain double sided rails
should either be screwed or screwed and dowelled, and
respectively put into grooves or against a shoulder.



The rails can be secured best against shoulders and are screwed or screwed and dowelled to the mating structure. After final adjustment of rail straightness and parallelism, the rail mounting screws are tightened starting in the middle of the rail length. Rail mounting bolts should be torqued to specification by alternating between each bolt. The installer should start with the bolt in the center of the rail length and proceed by alternating between each bolt left of center and each bolt right of center, while working towards both ends of the rail.

Afterwards, the cassette should be moved back and forth along the total stroke distance of the rail. If the cassette travels smoothly, the mounting process can proceed or be completed.

11.2 Mounting Parallel Double Sided Rails and Cassettes With parallel double sided rail arrangements, we recommend that the master fixed rail side and slave adjustment rail sides of the guide system be identified. This allows optimum tolerances in parallelism to be achieved best by adjusting the slave adjustable rail, parallel to the master rail. The master fixed rail side should be mounted first to achieve the initial line of straight travel.



The example below displays a convenient method for adjusting the slave adjustable rail parallel to the fixed master rail. Once the cassette travel is smooth, without play, one can proceed with rail mounting.



Note that the top plate spanning across the cassettes on opposite rails is completely bolted down to the cassette on the master fixed side only. The top plate end over the slave adjustable side is only bolted in one location, in the center of the slave adjustment side cassette. With one bolt holding the top plate to the slave adjustment side cassette, this cassette can pivot while the slave adjustable rail self-aligns parallel to the fixed master rail side. The floating top plate setup is stroked along the entire rail length, to establish the parallelism between the two rails.

Calibrated gauge blocks can also be used to establish equal integrity in rail parallelism. The installer should seat and temporarily clamp short pieces of precision ground round stock, tangent to the two guideways on the inside of each rail.

Rail Size	Precision Round Stock Sizes Ø mm
12	11
15	11
20	14
25	16
35	27
45	35

The calibrated gauge blocks can then be used, to locate off the precision round stock on the master fixed rail, in order to set the slave adjustable rail parallel. The gauge blocks are then locating the same way that the floating top plate is, by referencing both the master and slave rail guideway surfaces to establish parallelism.

Once the slave adjustable rail has been self-aligned, its bolts should also be torqued to specification in the order mentioned in paragraph 11.1. The top spanning across both cassettes on opposite rails, can then be securely fastened using all cassette mounting bolt holes.

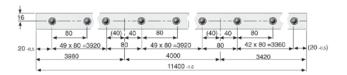
GDL Aluminum Roller Guides

Technical Data

12. Keyed Butt-jointing of Rail Sections

12.1 Rail Hole Spacing

Butt-jointed rails over L = 4000 mm are sectioned together according to the GDL standard. See "GDL's Keyed Butt-Jointed Rail Option" on page 170. Butt-jointed rails sections are cut so that the standard rail mounting hole spacing is maintained across all butt-joints.



Keyed butt-jointed rails are usually shipped completely assembled, but sometimes must be shipped partially assembled, due to shipping length limitations and shipping care. Partially assembled butt-jointed rails are supplied with a butt-jointing clamping fixture and the keyways and screws for fastening rail section together.

12.2 Mounting of butt-jointed rails

Clean mounting surfaces, then place rail sections loose on the guide path, one behind the other. Lay the rails in their correct sequence of the system design (i.e.: 1, 2, 3, 4...etc.). The orientation of the depth groove on the lower surface of the rail should always be on the same side for all rail sections being butt-jointed.

Any non-assembled rail sections should be aligned with the factory supplied butt-joint clamping fixture as displayed below.

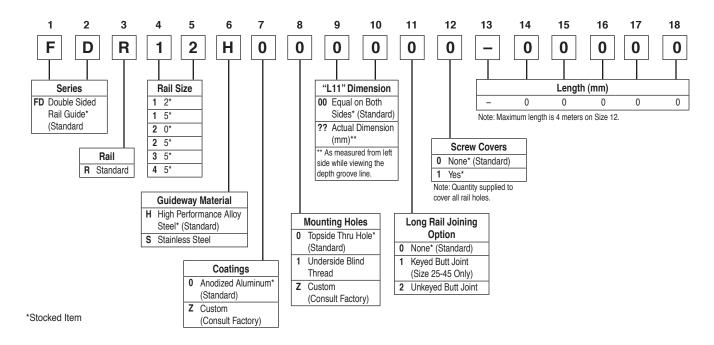


See explanation of "GDL's Keyed Butt-Jointed Rail Option" on page 170.

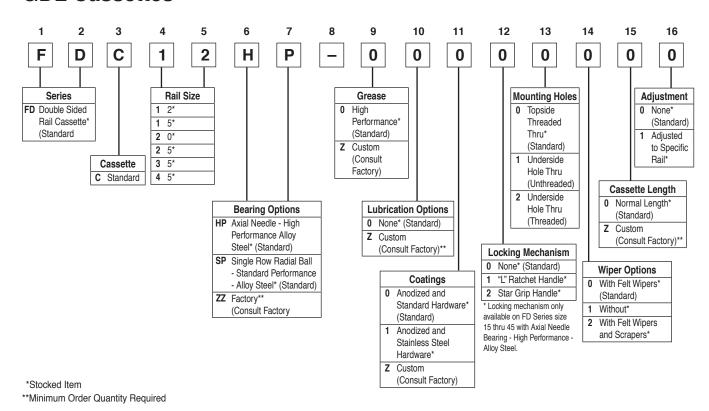
Once all rail sections are assembled, the complete guide path can be aligned and fastened. Alignment and fastening should be conducted according to the applicable guide arrangement and steps previously described in this technical information section.



Ordering Instructions / Part Numbering System for GDL Rails



Ordering Instructions / Part Numbering System for GDL Cassettes





GDL Application Sheet				
Distributor:	End-User:			
Phone:	Fax:	_ e-mail:		
Other Information:				
Roll				
Z-AXIS MOMENT CENTER LEVER ABM LEVER Fz	Roll load			
Z _V	X - Distance	Length of rails		
Y-AXIS LEVER ARM	Y - Distance	Distance between rails		
M _{OCX} , M _{CX}	Z - Distance	Distance between cassettes on each rail		
Pitch				
Z-AXIS I MOMENT CENTER L X,	Pitch load			
Fz	X - Distance	Technical Data:		
X-AXIS	Y - Distance	Stroke		
F _x	Z - Distance			
M _{OCY} , M _{CY}		Velocity / Speed		
		Acceleration		
Yaw		Load / Mass		
Y-AXIS MOMENT CENTER, LEVER F.	Vev. lead	Load Distances		
ARM X, V	Yaw load X - Distance	Lifetime Desired		
○	Y - Distance	Environment: (Dirt, Humidity)		
M _{COZ} , M _{CZ}	Z - Distance			







Safety Guide

Safety Guide for Selecting and Using Hydraulic, Pneumatic Cylinders and Their Accessories

WARNING: \triangle FAILURE OF THE CYLINDER, ITS PARTS, ITS MOUNTING, ITS CONNECTIONS TO OTHER OBJECTS, OR ITS CONTROLS CAN RESULT IN:

- Unanticipated or uncontrolled movement of the cylinder or objects connected to it.
- Falling of the cylinder or objects held up by it.
- Fluid escaping from the cylinder, potentially at high velocity.

THESE EVENTS COULD CAUSE DEATH OR PERSONAL INJURY BY, FOR EXAMPLE, PERSONS FALLING FROM HIGH LOCATIONS, BEING CRUSHED OR STRUCK BY HEAVY OR FAST MOVING OBJECTS, BEING PUSHED INTO DANGEROUS EQUIPMENT OR SITUATIONS, OR SLIPPING ON ESCAPED FLUID.

Before selecting or using Parker (The Company) cylinders or related accessories, it is important that you read, understand and follow the following safety information. Training is advised before selecting and using The Company's products.

1.0 General Instructions

- 1.1 Scope This safety guide provides instructions for selecting and using (including assembling, installing, and maintaining) cylinder products. This safety guide is a supplement to and is to be used with the specific Company publications for the specific cylinder products that are being considered for use
- 1.2 Fail Safe Cylinder products can and do fail without warning for many reasons. All systems and equipment should be designed in a fail-safe mode so that if the failure of a cylinder product occurs people and property won't be endangered.
- 1.3 Distribution Provide a free copy of this safety guide to each person responsible for selecting or using cylinder products. Do not select or use The Company's cylinders without thoroughly reading and understanding this safety guide as well as the specific Company publications for the products considered or selected.
- 1.4 User Responsibility Due to very wide variety of cylinder applications and cylinder operating conditions, The Company does not warrant that any particular cylinder is suitable for any specific application. This safety guide does not analyze all technical parameters that must be considered in selecting a product. The hydraulic and pneumatic cylinders outlined in this catalog are designed to The Company's design guidelines and do not necessarily meet the design guideline of other agencies such as American Bureau of Shipping, ASME Pressure Vessel Code etc. The user, through its own

analysis and testing, is solely responsible for:

- · Making the final selection of the cylinders and related accessories.
- Determining if the cylinders are required to meet specific design requirements as required by the Agency(s) or industry standards covering the design of the user's equipment.
- Assuring that the user's requirements are met, OSHA requirements are met, and safety guidelines from the applicable agencies such as but not limited to ANSI are followed and that the use presents no health or safety hazards.
- Providing all appropriate health and safety warnings on the equipment on which the cylinders are used.
- **1.5** Additional Questions Call the appropriate Company technical service department if you have any questions or require any additional information. See the Company publication for the product being considered or used, or call 1-800-CPARKER, or go to www.parker.com, for telephone numbers of the appropriate technical service department.

2.0 Cylinder and Accessories Selection

2.1 Seals – Part of the process of selecting a cylinder is the selection of seal compounds. Before making this selection, consult the "seal information page(s)" of the publication for the series of cylinders of interest.

The application of cylinders may allow fluids such as cutting fluids, wash down fluids etc. to come in contact with the external area of the cylinder. These fluids may attack the piston rod wiper and or the primary seal and must be taken into account when selecting and specifying seal compounds.

Dynamic seals will wear. The rate of wear will depend on many operating factors. Wear can be rapid if a cylinder is misaligned or if the cylinder has been improperly serviced. The user must take seal wear into consideration in the application of cylinders.

- 2.2 Piston Rods Possible consequences of piston rod failure or separation of the piston rod from the piston include, but are not limited to are:
- · Piston rod and or attached load thrown off at high speed.
- · High velocity fluid discharge.
- Piston rod extending when pressure is applied in the piston retract mode.

Piston rods or machine members attached to the piston rod may move suddenly and without warning as a consequence of other conditions occurring to the machine such as, but not limited to:

- Unexpected detachment of the machine member from the piston rod.
- Failure of the pressurized fluid delivery system (hoses, fittings, valves, pumps, compressors) which maintain cylinder position.
- Catastrophic cylinder seal failure leading to sudden loss of pressurized fluid.
- · Failure of the machine control system.

Follow the recommendations of the "Piston Rod Selection Chart and Data" in the publication for the series of cylinders of interest. The suggested piston rod diameter in these charts must be followed in order to avoid piston rod buckling.

Piston rods are not normally designed to absorb bending moments or loads which are perpendicular to the axis of piston rod motion. These additional loads can cause the piston rod to fail. If these types of additional loads are expected to be imposed on the piston rod, their magnitude should be made known to our engineering department.

The cylinder user should always make sure that the piston rod is securely attached to the machine member.

On occasion cylinders are ordered with double rods (a piston rod extended from both ends of the cylinder). In some cases a stop is threaded on to one of the piston rods and used as an external stroke adjuster. On occasions spacers are attached to the machine member connected to the piston rod and also used as a stroke adjuster. In both cases the stops will create a pinch point and the user should consider appropriate use of guards. If these external stops are not perpendicular to the mating contact surface, or if debris is trapped between the contact surfaces, a bending moment will be placed on the piston rod, which can lead to piston rod failure. An external stop will also negate the effect of cushioning and will subject the piston rod to impact loading. Those two (2) conditions can cause piston rod failure. Internal stroke adjusters are available with and without cushions. The use of external stroke adjusters should be reviewed with our engineering department

The piston rod to piston and the stud to piston rod threaded connections are secured with an anaerobic adhesive. The strength of the adhesive decreases with increasing temperature. Cylinders which can be exposed to temperatures above +250°F (+121°C) are to be ordered with a non studded piston rod and a pinned piston to rod joint.

2.3 Cushions – Cushions should be considered for cylinder applications when the piston velocity is expected to be over 4 inches/second.

Cylinder cushions are normally designed to absorb the energy of a linear applied load. A rotating mass has considerably more energy than the same mass moving in a linear mode. Cushioning for a rotating mass application should be review by our engineering department.

2.4 Cylinder Mountings – Some cylinder mounting configurations may have certain limitations such as but not limited to minimum stroke for side or foot mounting cylinders or pressure de-ratings for certain mounts. Carefully review the catalog for these types of restrictions.

Always mount cylinders using the largest possible high tensile alloy steel socket head cap screws that can fit in the cylinder mounting holes and torque them to the manufacturer's recommendations for their size.

2.5 Port Fittings – Hydraulic cylinders applied with meter out or deceleration circuits are subject to intensified pressure at piston rod end.

The rod end pressure is approximately equal to:

operating pressure x effective cap end area

effective rod end piston area

Contact your connector supplier for the pressure rating of individual connectors.

3.0 Cylinder and Accessories Installation and Mounting

3.1 Installation

3.1.1 – Cleanliness is an important consideration, and cylinders are shipped with the ports plugged to protect them from contaminants





Safety Guide

entering the ports. These plugs should not be removed until the piping is to be installed. Before making the connection to the cylinder ports, piping should be thoroughly cleaned to remove all chips or burrs which might have resulted from threading or flaring operations.

- 3.1.2 Cylinders operating in an environment where air drying materials are present such as fast-drying chemicals, paint, or weld splatter, or other hazardous conditions such as excessive heat, should have shields installed to prevent damage to the piston rod and piston rod seals
 - 3.1.3 Proper alignment of the cylinder piston rod and its mating component on the machine should be checked in both the extended and retracted positions. Improper alignment will result in excessive rod gland and/or cylinder bore wear. On fixed mounting cylinders attaching the piston rod while the rod is retracted will help in achieving proper alignment
 - 3.1.4 Sometimes it may be necessary to rotate the piston rod in order to thread the piston rod into the machine member. This operation must always be done with zero pressure being applied to either side of the piston. Failure to follow this procedure may result in loosening the piston to rod-threaded connection. In some rare cases the turning of the piston rod may rotate a threaded piston rod gland and loosen it from the

cylinder head. Confirm that this condition is not occurring. If it does, re-tighten the piston rod gland firmly against the cylinder head.

For double rod cylinders it is also important that when attaching or detaching the piston rod from the machine member that the torque be applied to the piston rod end of the cylinder that is directly attaching to the machine member with the opposite end unrestrained. If the design of the machine is such that only the rod end of the cylinder opposite to where the rod attaches to the machine member can be rotated, consult the factory for further instructions.

3.2 Mounting Recommendations

- 3.2.1 Always mount cylinders using the largest possible high tensile alloy steel socket head screws that can fit in the cylinder mounting holes and torque them to the manufacturer's recommendations for their size.
- **3.2.2** Side-Mounted Cylinders In addition to the mounting bolts, cylinders of this type should be equipped with thrust keys or dowel pins located so as to resist the major load.
- **3.2.3** Tie Rod Mounting Cylinders with tie rod mountings are recommended for applications where mounting space is limited. The standard tie rod extension is shown as BB in dimension tables. Longer or shorter extensions can be supplied. Nuts used for this mounting style should be torqued to the same value as the tie rods for that bore size.
- 3.2.4 Flange Mount Cylinders The controlled diameter of the rod gland extension on head end flange mount cylinders can be used as a pilot to locate the cylinders in relation to the machine. After alignment has been obtained, the flanges may be drilled for pins or dowels to prevent shifting.
- 3.2.5 Trunnion Mountings Cylinders require lubricated bearing blocks with minimum bearing clearances. Bearing blocks should be carefully aligned and rigidly mounted so the trunnions will not be subjected to bending moments. The rod end should also be pivoted with the pivot pin in line and parallel to axis of the trunnion pins.
- 3.2.6 Clevis Mountings Cylinders should be pivoted at both ends with centerline of pins parallel to each other. After cylinder is mounted, be sure to check to assure that the cylinder is free to swing through its working arc without interference from other machine parts.

4.0 Cylinder and Accessories Maintenance, Troubleshooting and Replacement

- **4.1 Storage** At times cylinders are delivered before a customer is ready to install them and must be stored for a period of time. When storage is required the following procedures are recommended.
 - 4.1.1 Store the cylinders in an indoor area which has a dry, clean and noncorrosive atmosphere. Take care to protect the cylinder from both internal corrosion and external damage.
 - 4.1.2 Whenever possible cylinders should be stored in a vertical position (piston rod up). This will minimize corrosion due to possible condensation which could occur inside the cylinder. This will also minimize seal damage.
 - **4.1.3** Port protector plugs should be left in the cylinder until the time of installation.
 - $\begin{tabular}{ll} \bf 4.1.4-lf \ a \ cylinder \ is \ stored \ full \ of \ hydraulic \ fluid, \ expansion \ of \ the \ fluid \ due \ to \ temperature \ changes \ must \ be \ considered. \ Installing \ a \ check \ valve \ with \ free \ flow \ out \ of \ the \ cylinder \ is \ one \ method. \end{tabular}$
 - 4.1.5 When cylinders are mounted on equipment that is stored outside for extended periods, exposed unpainted surfaces, e.g. piston rod, must be coated with a rust-inhibiting compound to prevent corrosion.

4.2 Cylinder Trouble Shooting

4.2.1 - External Leakage

4.2.1.1 – Rod seal leakage can generally be traced to worn or damaged seals. Examine the piston rod for dents, gouges or score marks, and replace piston rod if surface is rough.

Rod seal leakage could also be traced to gland wear. If clearance is excessive, replace rod bushing and seal. Rod seal leakage can also be traced to seal deterioration. If seals are soft or gummy or brittle, check compatibility of seal material with lubricant used if air cylinder, or operating fluid if hydraulic cylinder. Replace with seal material, which is compatible with these fluids. If the seals are hard or have lost elasticity, it is usually due to exposure to temperatures in excess of 165°F. (+74°C). Shield the cylinder from the heat source to limit temperature to 350°F. (+177°C.) and replace with fluorocarbon seals.

4.2.1.2 – Cylinder body seal leak can generally be traced to loose tie rods. Torque the tie rods to manufacturer's recommendation for that bore size.

Excessive pressure can also result in cylinder body seal leak. Determine maximum pressure to rated limits. Replace seals and retorque tie rods as in paragraph above. Excessive pressure can also result in cylinder body seal leak. Determine if the pressure rating of the cylinder has been exceeded. If so, bring the operating pressure down to the rating of the cylinder and have the tie rods replaced.

Pinched or extruded cylinder body seal will also result in a leak. Replace cylinder body seal and retorque as in paragraph above.

Cylinder body seal leakage due to loss of radial squeeze which shows up in the form of flat spots or due to wear on the O.D. or I.D. – Either of these are symptoms of normal wear due to high cycle rate or length of service. Replace seals as per paragraph above

4.2.2 - Internal Leakage

- **4.2.2.1** Piston seal leak (by-pass) 1 to 3 cubic inches per minute leakage is considered normal for piston ring construction. Virtually no static leak with lipseal type seals on piston should be expected. Piston seal wear is a usual cause of piston seal leakage. Replace seals as required.
- **4.2.2.2** With lipseal type piston seals excessive back pressure due to over-adjustment of speed control valves could be a direct cause of rapid seal wear. Contamination in a hydraulic system can result in a scored cylinder bore, resulting in rapid seal wear. In either case, replace piston seals as required.
- 4.2.2.3 What appears to be piston seal leak, evidenced by the fact that the cylinder drifts, is not always traceable to the piston. To make sure, it is suggested that one side of the cylinder piston be pressurized and the fluid line at the opposite port be disconnected. Observe leakage. If none is evident, seek the cause of cylinder drift in other component parts in the circuit.

4.2.3 - Cylinder Fails to Move the Load

- **4.2.3.1** Pneumatic or hydraulic pressure is too low. Check the pressure at the cylinder to make sure it is to circuit requirements.
- 4.2.3.2 Piston Seal Leak Operate the valve to cycle the cylinder and observe fluid flow at valve exhaust ports at end of cylinder stroke. Replace piston seals if flow is excessive.
- $\mbox{\bf 4.2.3.3}-\mbox{Cylinder}$ is undersized for the load Replace cylinder with one of a larger bore size.

4.3 Erratic or Chatter Operation

- **4.3.1** Excessive friction at rod gland or piston bearing due to load misalignment Correct cylinder-to-load alignment.
- 4.3.2 Cylinder sized too close to load requirements Reduce load or install larger cylinder.
- **4.3.3** Erratic operation could be traced to the difference between static and kinetic friction. Install speed control valves to provide a back pressure to control the stroke.
- 4.4 Cylinder Modifications, Repairs, or Failed Component Cylinders as shipped from the factory are not to be disassembled and or modified. If cylinders require modifications, these modifications must be done at company locations or by The Company's certified facilities. The Cylinder Division Engineering Department must be notified in the event of a mechanical fracture or permanent deformation of any cylinder component (excluding seals). This includes a broken piston rod, tie rod, mounting accessory or any other cylinder component. The notification should include all operation and application details. This information will be used to provide an engineered repair that will prevent recurrence of the failure.

It is allowed to disassemble cylinders for the purpose of replacing seals or seal assemblies. However, this work must be done by strictly following all the instructions provided with the seal kits.





Offer of Sale

The items described in this document and other documents and descriptions provided by Parker Hannifin Corporation, its subsidiaries and its authorized distributors ("Seller") are hereby offered for sale at prices to be established by Seller. This offer and its acceptance by any customer ("Buyer") shall be governed by all of the following Terms and Conditions. Buyer's order for any item described in its document, when communicated to Seller verbally, or in writing, shall constitute acceptance of this offer. All goods or work described will be referred to as "Products".

- Terms and Conditions. Seller's willingness to offer Products, or accept an order for Products, to or from Buyer is expressly conditioned on Buyer's assent to these Terms and Conditions and to the terms and conditions found on-line at www.parker.com/ saleterms/. Seller objects to any contrary or additional term or condition of Buyer's order or any other document issued by Buyer.
- 2. Price Adjustments: Payments. Prices stated on the reverse side or preceding pages of this document are valid for 30 days. After 30 days, Seller may change prices to reflect any increase in its costs resulting from state, federal or local legislation, price increases from its suppliers, or any change in the rate, charge, or classification of any carrier. The prices stated on the reverse or preceding pages of this document do not include any sales, use, or other taxes unless so stated specifically. Unless otherwise specified by Seller, all prices are F.O.B. Seller's facility, and payment is due 30 days from the date of invoice. After 30 days, Buyer shall pay interest on any unpaid invoices at the rate of 1.5% per month or the maximum allowable rate under applicable law.
- 3. <u>Delivery Dates: Title and Risk; Shipment.</u> All delivery dates are approximate and Seller shall not be responsible for any damages resulting from any delay. Regardless of the manner of shipment, title to any products and risk of loss or damage shall pass to Buyer upon tender to the carrier at Seller's facility (i.e., when it's on the truck, it's yours). Unless otherwise stated, Seller may exercise its judgment in choosing the carrier and means of delivery. No deferment of shipment at Buyers' request beyond the respective dates indicated will be made except on terms that will indemnify, defend and hold Seller harmless against all loss and additional expense. Buyer shall be responsible for any additional shipping charges incurred by Seller due to Buyer's changes in shipping, product specifications or in accordance with Section 13, herein.
- 4. Warranty. Seller warrants that the Products sold hereunder shall be free from defects in material or workmanship for a period of twelve months from the date of delivery to Buyer or 2,000 hours of normal use, whichever occurs first. This warranty is made only to Buyer and does not extend to anyone to whom Products are sold after purchased from Seller. The prices charged for Seller's products are based upon the exclusive limited warranty stated above, and upon the following disclaimer: DISCLAIMER OF WARRANTY: THIS WARRANTY COMPRISES THE SOLE AND ENTIRE WARRANTY PERTAINING TO PRODUCTS PROVIDED HERUNDER. SELLER DISCLAIMS ALL OTHER WARRANTIES, EXPRESS AND IMPLIED, INCLUDING MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.
- 5. Claims; Commencement of Actions. Buyer shall promptly inspect all Products upon delivery. No claims for shortages will be allowed unless reported to the Seller within 10 days of delivery. No other claims against Seller will be allowed unless asserted in writing within 60 days after delivery or, in the case of an alleged breach of warranty, within 30 days after the date within the warranty period on which the defect is or should have been discovered by Buyer. Any action based upon breach of this agreement or upon any other claim arising out of this sale (other than an action by Seller for any amount due to Seller from Buyer) must be commenced within thirteen months from the date of tender of delivery by Seller or, for a cause of action based upon an alleged breach of warranty, within thirteen months from the date within the warranty period on which the defect is or should have been discovered by Buyer.
- 6. LIMITATION OF LIABILITY, UPON NOTIFICATION, SELLER WILL, AT ITS OPTION, REPAIR OR REPLACE A DEFECTIVE PRODUCT, OR REFUND THE PURCHASE PRICE. IN NO EVENT SHALL SELLER BE LIABLE TO BUYER FOR ANY SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF, OR AS THE RESULT OF, THE SALE, DELIVERY, NON-DELIVERY, SERVICING, USE OR LOSS OF USE OF THE PRODUCTS OR ANY PART THEREOF, OR FOR ANY CHARGES OR EXPENSES OF ANY NATURE INCURRED WITHOUT SELLER'S WRITTEN CONSENT, EVEN IF SELLER HAS BEEN NEGLIGENT, WHETHER IN CONTRACT, TORT OR OTHER LEGAL THEORY. IN NO EVENT SHALL SELLER'S LIABILITY UNDER ANY CLAIM MADE BY BUYER EXCEED THE PURCHASE PRICE OF THE PRODUCTS.
- 7. <u>Contingencies.</u> Seller shall not be liable for any default or delay in performance if caused by circumstances beyond the reasonable control of Seller.
- 8. <u>User Responsibility.</u> The user, through its own analysis and testing, is solely responsible for making the final selection of the system and Product and assuring that all performance, endurance, maintenance, safety and warning requirements of the application are met. The user must analyze all aspects of the application and follow applicable industry standards and Product information. If Seller provides Product or system options, the user is responsible for determining that such data and specifications are suitable and sufficient for all applications and reasonably foreseeable uses of the Products or systems.
- 9. Loss to Buyer's Property. Any designs, tools, patterns, materials, drawings, confidential information or equipment furnished by Buyer or any other items which become Buyer's property, may be considered obsolete and may be destroyed by Seller after two consecutive years have elapsed without Buyer placing an order for the items which are manufactured using such property. Seller shall not be responsible for any loss or damage to such property while it is in Seller's possession or control.
- 10. <u>Special Tooling.</u> A tooling charge may be imposed for any special tooling, including without limitation, dies, fixtures, molds and patterns, acquired to manufacture Products. Such special tooling shall be and remain Seller's property notwithstanding payment of any charges by Buyer. In no event will Buyer acquire any interest in apparatus belonging to Seller which is utilized in the manufacture of the Products, even if such apparatus has been specially converted or adapted for such manufacture and notwithstanding any charges paid by Buyer. Unless otherwise agreed, Seller shall have the right to alter, discard or otherwise dispose of any special tooling or other property in its sole discretion at any time.

- 11. <u>Buyer's Obligation; Rights of Seller.</u> To secure payment of all sums due or otherwise, Seller shall retain a security interest in the goods delivered and this agreement shall be deemed a Security Agreement under the Uniform Commercial Code. Buyer authorizes Seller as its attorney to execute and file on Buyer's behalf all documents Seller deems necessary to perfect its security interest. Seller shall have a security interest in, and lien upon, any property of Buyer in Seller's possession as security for the payment of any amounts owed to Seller by Buyer.
- 12. Improper use and Indemnity. Buyer shall indemnify, defend, and hold Seller harmless from any claim, liability, damages, lawsuits, and costs (including attorney fees), whether for personal injury, property damage, patent, trademark or copyright infringement or any other claim, brought by or incurred by Buyer, Buyer's employees, or any other person, arising out of: (a) improper selection, improper application or other misuse of Products purchased by Buyer from Seller; (b) any act or omission, negligent or otherwise, of Buyer; (c) Seller's use of patterns, plans, drawings, or specifications furnished by Buyer to manufacture Product; or (d) Buyer's failure to comply with these terms and conditions. Seller shall not indemnify Buyer under any circumstance except as otherwise provided.
- 13. <u>Cancellations and Changes.</u> Orders shall not be subject to cancellation or change by Buyer for any reason, except with Seller's written consent and upon terms that will indemnify, defend and hold Seller harmless against all direct, incidental and consequential loss or damage. Seller may change product features, specifications, designs and availability with notice to Buyer.
- 14. <u>Limitation on Assignment.</u> Buyer may not assign its rights or obligations under this agreement without the prior written consent of Seller.
- 15. <u>Entire Agreement.</u> This agreement contains the entire agreement between the Buyer and Seller and constitutes the final, complete and exclusive expression of the terms of the agreement. All prior or contemporaneous written or oral agreements or negotiations with respect to the subject matter are herein merged.
- 16. Waiver and Severability. Failure to enforce any provision of this agreement will not waive that provision nor will any such failure prejudice Seller's right to enforce that provision in the future. Invalidation of any provision of this agreement by legislation or other rule of law shall not invalidate any other provision herein. The remaining provisions of this agreement will remain in full force and effect.
- 17. <u>Termination</u>. This agreement may be terminated by Seller for any reason and at any time by giving Buyer thirty (30) days written notice of termination. In addition, Seller may by written notice immediately terminate this agreement for the following: (a) Buyer commits a breach of any provision of this agreement (b) the appointment of a trustee, receiver or custodian for all or any part of Buyer's property (b) the filing of a petition for relief in bankruptcy of the other Party on its own behalf, or by a third party (c) an assignment for the benefit of creditors, or (d) the dissolution or liquidation of the Buyer.
- 18. Governing Law. This agreement and the sale and delivery of all Products hereunder shall be deemed to have taken place in and shall be governed and construed in accordance with the laws of the State of Ohio, as applicable to contracts executed and wholly performed therein and without regard to conflicts of laws principles. Buyer irrevocably agrees and consents to the exclusive jurisdiction and venue of the courts of Cuyahoga County, Ohio with respect to any dispute, controversy or claim arising out of or relating to this agreement. Disputes between the parties shall not be settled by arbitration unless, after a dispute has arisen, both parties expressly agree in writing to arbitrate the dispute.
- 19. Indemnity for Infringement of Intellectual Property Rights. Seller shall have no liability for infringement of any patents, trademarks, copyrights, trade dress, trade secrets or similar rights except as provided in this Section. Seller will defend and indemnify Buyer against allegations of infringement of U.S. patents, U.S. trademarks, copyrights, trade dress and trade secrets ("Intellectual Property Rights"). Seller will defend at its expense and will pay the cost of any settlement or damages awarded in an action brought against Buyer based on an allegation that a Product sold pursuant to this Agreement infringes the Intellectual Property Rights of a third party. Seller's obligation to defend and indemnify Buyer is contingent on Buyer notifying Seller within ten (10) days after Buyer becomes aware of such allegations of infringement, and Seller having sole control over the defense of any allegations or actions including all negotiations for settlement or compromise. If a Product is subject to a claim that it infringes the Intellectual Property Rights of a third party, Seller may, at its sole expense and option, procure for Buyer the right to continue using the Product, replace or modify the Product so as to make it noninfringing, or offer to accept return of the Product and return the purchase price less a reasonable allowance for depreciation. Notwithstanding the foregoing, Seller shall have no liability for claims of infringement based on information provided by Buyer, or directed to Products delivered hereunder for which the designs are specified in whole or part by Buyer, or infringements resulting from the modification, combination or use in a system of any Product sold hereunder. The foregoing provisions of this Section shall constitute Seller's sole and exclusive liability and Buyer's sole and exclusive remedy for infringement of Intellectual Property Rights.
- 20. <u>Taxes.</u> Unless otherwise indicated, all prices and charges are exclusive of excise, sales, use, property, occupational or like taxes which may be imposed by any taxing authority upon the manufacture, sale or delivery of Products.
- 21. <u>Equal Opportunity Clause.</u> For the performance of government contracts and where dollar value of the Products exceed \$10,000, the equal employment opportunity clauses in Executive Order 11246, VEVRAA, and 41 C.F.R. §§ 60-1.4(a), 60-741.5(a), and 60-250.4, are hereby incorporated.





Catalog 0950-2

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