OSP-P Series

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

A new modular linear drive system

With this second generation linear drive the OSP-P series offers design engineers complete flexibility.

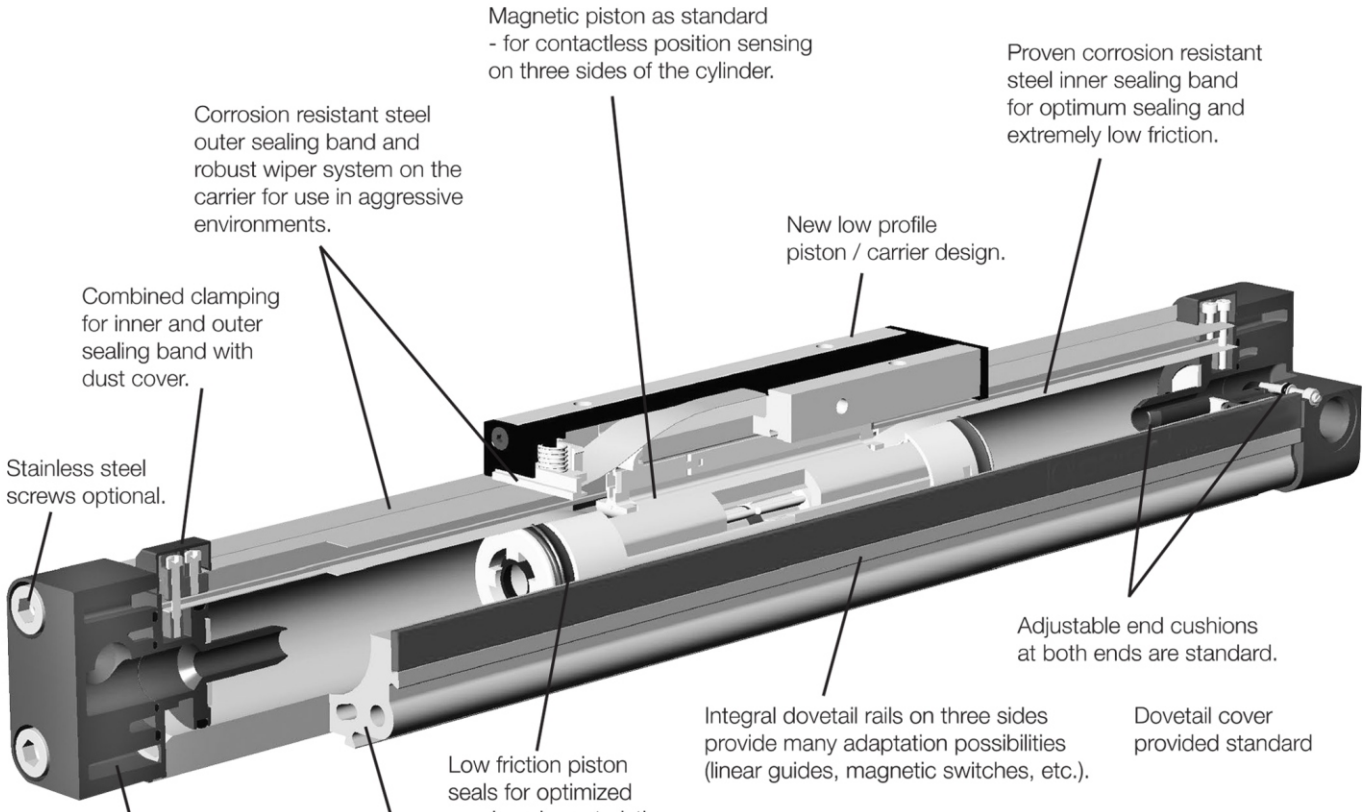
The cylinder has been further developed into a combined linear actuator, guidance and control package. It forms the basis for the OSP-P linear drive system.

All additional functions are designed into modular system components which replace the previous series of cylinders.

Mounting rails on 3 sides

Mounting rails on 3 sides of the cylinder enable modular components such as linear guides, brakes, valves, magnetic switches etc. to be fitted to the cylinder itself. This solves many installation problems, especially where space is limited.

The modular system concept forms an ideal basis for additional customer-specific functions.



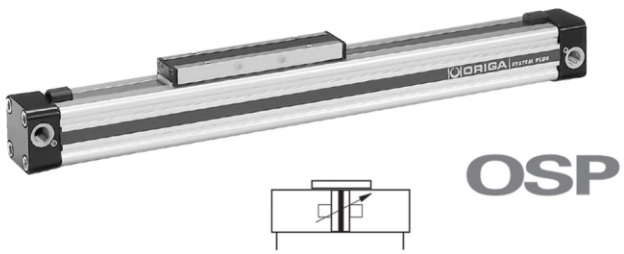
Features

Standard Features:

- Double-acting with adjustable cushions
- With magnetic piston for position sensing
- Standard stroke lengths to 5500mm, long stroke versions available upon request
- End cap can be rotated 4 x 90° to position ports as desired

Optional Features:

- Clean room cylinders
- Stainless steel screws
- 0.005 to 0.2 M/S
- Fluorocarbon seals -14°F to 212°F (-10°C to 100°C)
- Single end porting
- Integrated valves
- Integrated bearing options



Operating information

Operating pressure:	116 PSIG (8 bar)
Temperature range:	14°F to 176°F (-10°C to 80°C)
Filtration requirements:	Filtered, nonlubricated compressed air

Specifications

• Type	Rodless cylinder
• Series	OSP-P
• Stroke length	5.5m (216 inches), Minimum 5mm
• System	Double-acting, with cushions and magnetic piston
• Mounting	See drawings
• Air connection	Threaded
• Weight (mass)	See table
• Installation	In any position
• Lubrication	Prelubricated at the factory (additional oil mist lubrication not required)
• Option:	special slow speed grease

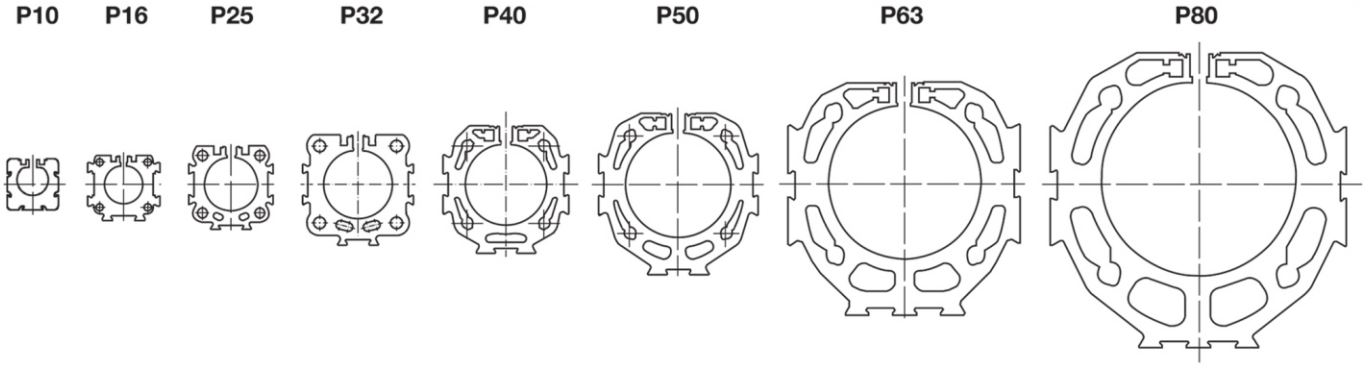
Material specifications

Cylinder profile	Anodized aluminum
Carrier (piston)	Anodized aluminum
End caps	Aluminum, lacquered / plastic (P10)
Sealing bands	Corrosion resistant steel
Seals	NBR (Option: Fluorocarbon)
Screws	Galvanized steel Option: stainless steel
Dust covers, wipers	Composite

Weight (mass) kg

Cylinder Series (Basic cylinder)	Weight (Mass) kg	
	at 0mm Stroke	per 100mm Stroke
OSP-P10	0.087	0.052
OSP-P16	0.22	0.1
OSP-P25	0.65	0.197
OSP-P32	1.44	0.354
OSP-P40	1.95	0.415
OSP-P50	3.53	0.566
OSP-P63	6.41	0.925
OSP-P80	12.46	1.262

Size Comparison



Ordering information for OSP-P rodless standard pneumatic series

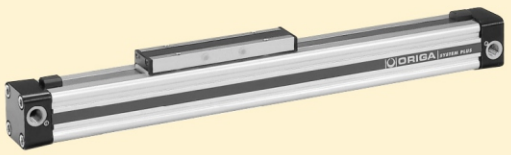
1-4	5-6
OSPP	25

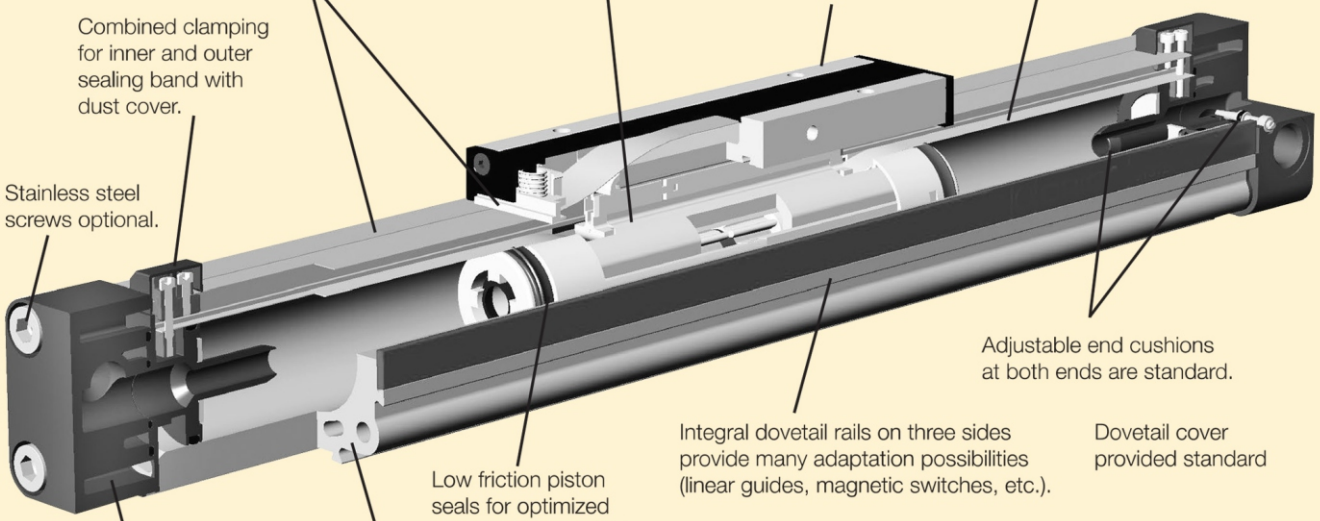
Bore
10
16
25
32
40
50
63
80

12-16
01100

Stroke
xxxxx

5 digits in whole millimeters (ex. 1100mm = 01100)





Magnetic piston as standard - for contactless position sensing on three sides of the cylinder.

Proven corrosion resistant steel inner sealing band for optimum sealing and extremely low friction.

Corrosion resistant steel outer sealing band and robust wiper system on the carrier for use in aggressive environments.

New low profile piston / carrier design.

Combined clamping for inner and outer sealing band with dust cover.

Stainless steel screws optional.

Adjustable end cushions at both ends are standard.

Integral dovetail rails on three sides provide many adaptation possibilities (linear guides, magnetic switches, etc.).

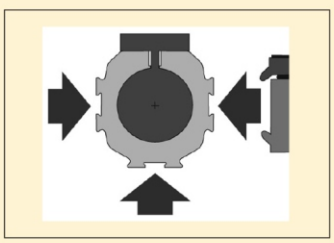
Dovetail cover provided standard

Low friction piston seals for optimized running characteristics

Modular system components are simply clamped on.

End cap can be rotated to any one of the four positions (before or after delivery) so that the air connection can be in any desired position.

Optimized cylinder profile for maximum stiffness and minimum weight. Integral air passages enable both air connections to be positioned at one end, if desired.



Loads, Forces and Moments

When sizing an OSP cylinder, consideration must be given to:

- Loads, forces and moments
- Performance of the pneumatic end cushions. The main factors are the mass to be cushioned and the piston speed (unless external cushioning is used, e. g. hydraulic shock absorbers)

To determine the maximum values for light, shock-free operation, which must not be exceeded even in dynamic operation.

Load and moment data are based on speeds v ≤ 0.5 m/s.

When working out the action force required, it is essential to take into account the friction forces generated by the specific application or load.

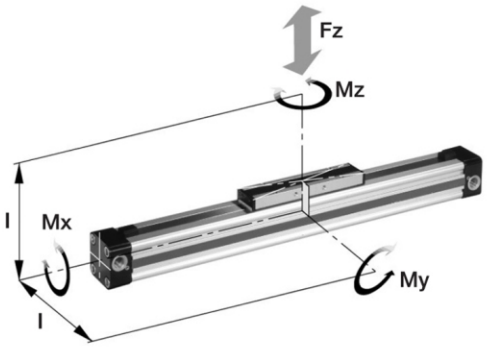
The sum total of each of these types of moments, divided by each of the maximum values, determines a Load-Moment Factor (LMF) should be equal to or less than 1.0. On horizontal mountings, the total load (L) should also be divided by the maximum load allowable and factored into the equation.

Horizontal Mountings:

$$\frac{L}{[L]} + \frac{M}{[M]} + \frac{Ms}{[Ms]} + \frac{Mv}{[Mv]} = LMF \leq 1.0$$

Vertical Mountings:

$$\frac{M}{[M]} + \frac{Ms}{[Ms]} + \frac{Mv}{[Mv]} = LMF \leq 1.0$$



M = F · l

Bending moments are calculated from the center of the linear actuator

Cylinder Series (mm Ø)	Theoretical Output Force at 6 bar N (lb)	Actual Output Force F_A at 6 bar N (lb)	Max. Moments Mx Nm (in lb)	My Nm (in lb)	Mz Nm (in lb)	Max. Load F N (lb)	Cushion Length (mm)
OSP-P10	47 (10.6)	32 (7.2)	0.2 (1.8)	1 (8.9)	0.3 (2.7)	20 (4.5)	2.5 * (.09)
OSP-P16	120 (26.9)	78 (17.5)	0.45 (3.9)	4 (35.4)	0.5 (4.4)	120 (26.9)	11 (.43)
OSP-P25	295 (66.3)	250 (56.2)	1.5 (13.3)	15 (132.8)	3 (26.6)	300 (67.4)	17 (.67)
OSP-P32	483 (108.6)	420 (94.4)	3 (26.6)	30 (265.5)	5 (44.3)	450 (101.2)	20 (.79)
OSP-P40	754 (169.5)	640 (143.9)	6 (53.1)	60 (531)	8 (70.8)	750 (168.6)	27 (1.06)
OSP-P50	1178 (264.8)	1000 (224.8)	10 (88.5)	115 (1017.8)	15 (132.8)	1200 (269.8)	30 (1.18)
OSP-P63	1870 (420.4)	1550 (348.5)	12 (106.2)	200 (1771)	24 (212.4)	1650 (370.9)	32 (1.26)
OSP-P80	3016 (678)	2600 (584.5)	24 (212.4)	360 (3186)	48 (424.8)	2400 (539.5)	39 (1.54)

* A rubber element (non-adjustable) is used for end cushioning.
To deform the rubber element enough to reach the absolute end position would require a Δp of 4 bar!

Cushioning diagram

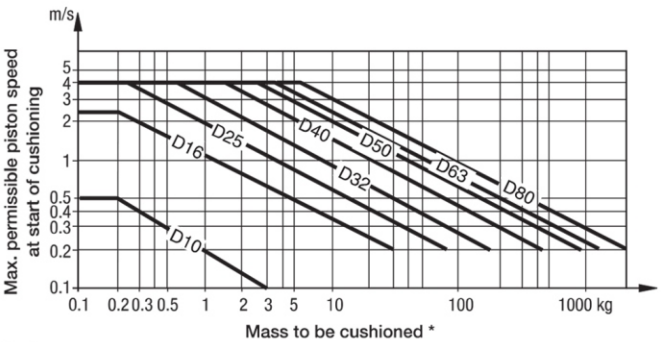
Determine the moving mass and follow the chart below to determine the maximum cylinder velocity.

Alternatively, take your desired velocity and moving mass to determine the required cylinder diameter.

If these maximum permissible values are exceeded, additional shock absorbers must be used.

For sizing a basic cylinder, use the adjacent chart. To size a cylinder with guide bearing, use the charts on the following page.

The peak piston velocity can be determined by assuming it is 50% greater than the average velocity. The peak velocity should be used in sizing the cylinder cushions.



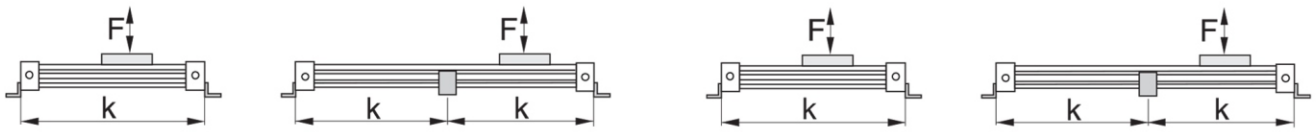
Includes piston mass.

* For cylinders with linear guides or brakes, please be sure to take the mass of the carriage or the brake housing into account.

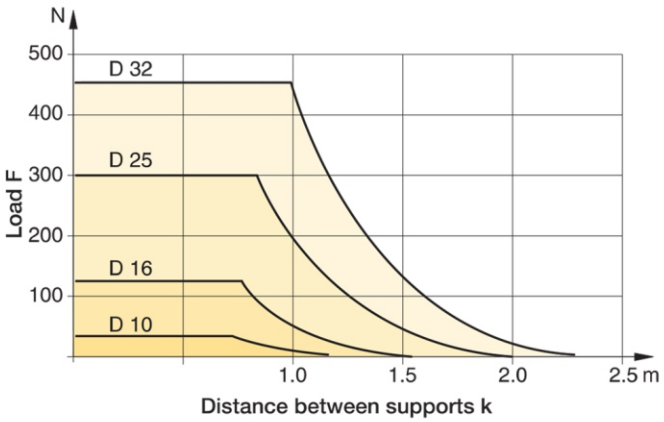
Mid-Section Supports

To avoid excessive bending and oscillation of the cylinder, intermediate supports may be required. The diagrams below show the maximum permissible support spacing based upon load.

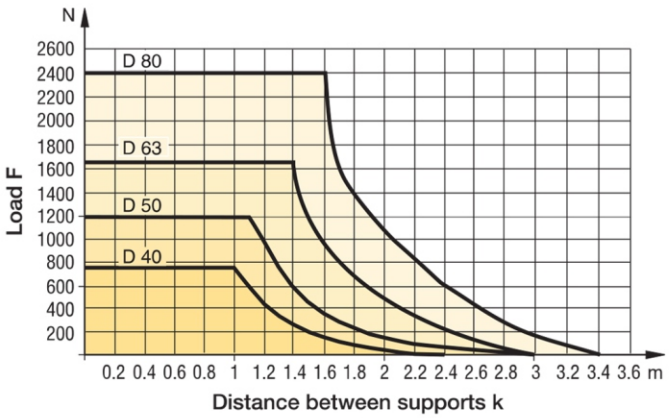
Bending up to 0.5 mm is permissible between supports. The mid-section supports are clamped on to the dovetail profile of the cylinder tube. They are also able to take the axial forces.



Basic cylinder 10 to 32mm bore mid-section supports



Basic cylinder 40 to 80mm bore mid-section supports



Dimensional Data

Cylinder Stroke and Dead Length A

- Free choice of stroke length up to 5500mm in 1mm steps.
- Longer strokes available on request.

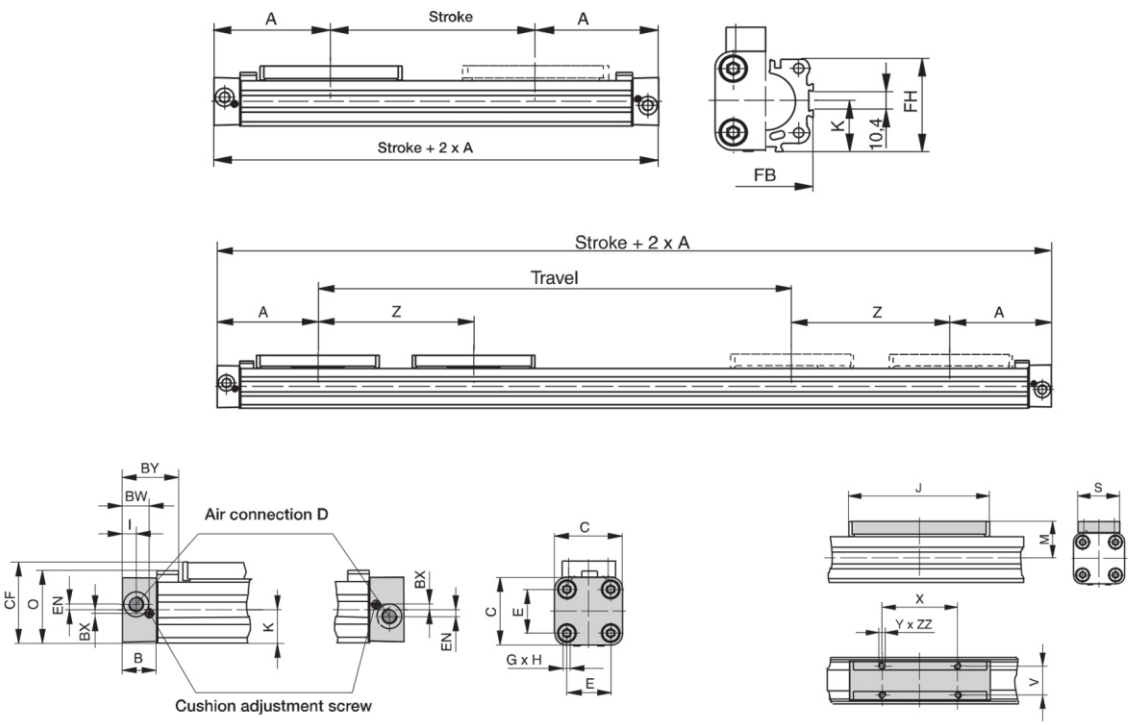
Tandem Cylinder

Two pistons are fitted : dimension “Z” is optional. Please note minimum distance “Zmin”.

- Free choice of stroke length up to 5500mm in 1mm steps.
- Longer strokes available on request.
- Stroke length to order is stroke + dimension “Z”.

Please note:
To avaoid multiple actuation of magmetic switches, the second piston is not equipped with magnets.

Basic cylinder – 16 to 80mm bore

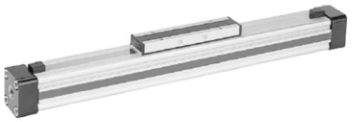


Dimensions (mm)

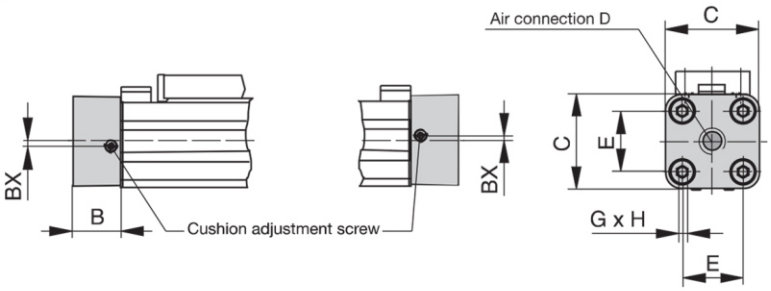
Series	A	B	C	D	E	G	H	I	J	K	M	O	S	V	X	Y	Z	BW	BX	BY	CF	EN	FB	FH	ZZ
OSP-P16	65	14	30	M5	18	M3	9	5.5	69	15	23	33.2	22	16.5	36	M4	81	10.8	1.8	28.4	38	3	30	27.2	7
OSP-P25	100	22	41	G1/8	27	M5	15	9	117	21.5	31	47	33	25	65	M5	128	17.5	2.2	40	52.5	3.6	40	39.5	8
OSP-P32	125	25.5	52	G1/4	36	M6	15	11.5	152	28.5	38	59	36	27	90	M6	170	20.5	2.5	44	66.5	5.5	52	51.7	1
OSP-P40	150	28	69	G1/4	54	M6	15	12	152	34	44	72	36	27	90	M6	212	21	3	54	78.5	7.5	62	63	10
OSP-P50	175	33	87	G1/4	70	M6	15	14.5	200	43	49	86	36	27	110	M6	251	27	–	59	92.5	11	76	77	10
OSP-P63	215	38	106	G3/8	78	M8	21	14.5	256	54	63	107	50	34	140	M8	313	30	–	64	117	12	96	96	16
OSP-P80	260	47	132	G1/2	96	M10	25	22	348	67	80	133	52	36	190	M10	384	37.5	–	73	147	16.5	122	122	20

Air Connection on the End-Face #5

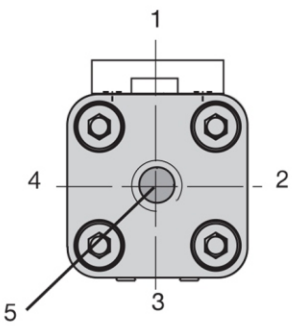
In some situations it is necessary or desirable to fit a special end cap with the air connection on the end-face instead of the standard end cap with the air connection on the side. The special end cap can also be rotated 4 x 90° to locate the cushion adjustment screw as desired.

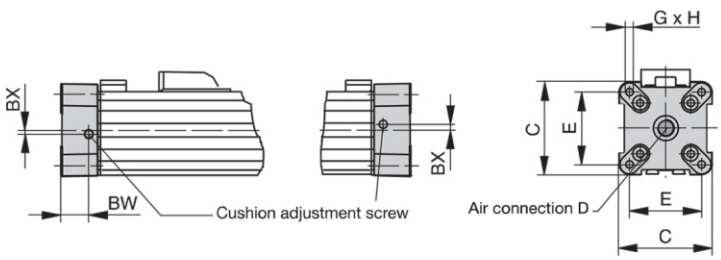


Series OSP-P16 to P32



Series OSP-P40 to P80





Note: Position #2 is the standard location.

Dimension (mm)

Series	B	C	D	E	G	H	BX	BW
OSP-P16	14	30	M5	18	M3	9	1.8	10.8
OSP-P25	22	41	G1/8	27	M5	15	2.2	17.5
OSP-P32	25.5	52	G1/4	36	M6	15	2.5	20.5
OSP-P40	28	69	G1/4	54	M6	15	3	21
OSP-P50	33	87	G1/4	70	M6	15	–	27
OSP-P63	38	106	G3/8	78	M8	21	–	30
OSP-P80	47	132	G1/2	96	M10	25	–	37.5