

Compact Guide Cylinders, Series Variations

Series	Bearing	Bore size												Page
		6	10	12	16	20	25	32	40	50	63	80	100	
Basic type/MGP  														Page 3 of this catalog
With air cushion/MGP-A  	Slide bearing													
	Ball bushing													Best Pneumatics  P.289
	High precision ball bushing													
With end lock/MGP-H/R  														Best Pneumatics  P.307
Clean series/12/13-MGP  	Ball bushing													Best Pneumatics  P.283
Water-resistant/MGP R/V  														Best Pneumatics  P.283
Heavy duty guide rod/MGPS  	Slide bearing													Best Pneumatics  P.319
Miniature Guide Rod Cylinder/MGJ  														Best Pneumatics  P.255
Compact Guide Cylinder with Lock/MLGP  	Slide bearing													Best Pneumatics  P.881
	Ball bushing													
Hygienic Design Cylinder/HYG  	Slide bearing													Best Pneumatics  P.873

Series MGP (Basic type), Stroke Variations

Bearing type	Bore size (mm)	Stroke (mm)															
		10	20	25	30	40	50	75	100	125	150	175	200	250	300	350	400
MGPM Slide bearing	12																
	16																
	20																
	25																
MGPL Ball bushing	32																
	40																
	50																
MGPA High precision ball bushing	63																
	80																
	100																

Compact Guide Cylinder

Series MGP

ø12, ø16, ø20, ø25, ø32, ø40, ø50, ø63, ø80, ø100

How to Order

Compact Guide Cylinder **MGP** **M** **25** **30** **Z** **M9BW**

Compact Guide Cylinder

Bearing type

M	Slide bearing
L	Ball bushing
A	High precision ball bushing

Bore size

12	12 mm	40	40 mm
16	16 mm	50	50 mm
20	20 mm	63	63 mm
25	25 mm	80	80 mm
32	32 mm	100	100 mm

Port thread type

Nil	M5 x 0.8
TN	NPT
TF	G

Number of auto switches

Nil	2 pcs.
S	1 pc.
n	n pcs.

Auto switch

Nil	Without auto switch (Built-in magnet)
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Cylinder stroke (mm)
Refer to "Standard Strokes" on page 4.

* For bore sizes with ø12 and ø16, only M5 x 0.8 is available.

Applicable Auto Switches/Refer to pages 1719 to 1827 in Best Pneumatics No. 3 for further information on auto switches.

Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage		Auto switch model		Lead wire length (m)				Pre-wired connector	Applicable load			
					DC	AC	Perpendicular	In-line	0.5 (Nil)	1 (M)	3 (L)	5 (Z)					
Solid state auto switch	—	Grommet	Yes	3-wire (NPN)	5 V, 12 V	—	M9NV	M9N	●	●	●	○	○	IC circuit	Relay PLC		
				3-wire (PNP)			M9PV	M9P	●	●	●	○	○				
	2-wire			12 V	M9BV		M9B	●	●	●	○	○	—				
	Diagnostic indication (2-color display)			3-wire (NPN)	5 V, 12 V		M9NWV	M9NW	●	●	●	○	○	IC circuit			
				3-wire (PNP)	5 V, 12 V		M9PWV	M9PW	●	●	●	○	○				
	Water-resistant (2-color display)			2-wire	12 V		M9BWV	M9BW	●	●	●	○	○	—			
				3-wire (NPN)	5 V, 12 V		M9NAV***	M9NA***	○	○	●	○	○			IC circuit	
	Magnetic field resistant (2-color display)			3-wire (PNP)	5 V, 12 V		M9PAV***	M9PA***	○	○	●	○	○	—			
				2-wire	12 V		M9BAV***	M9BA***	○	○	●	○	○				
							2-wire (Non-polar)	—	—	—	P3DW**	●	—	●		●	○
Reed auto switch	—	Grommet	Yes	3-wire (NPN equivalent)	—	5 V	—	A96V	A96	●	—	●	—	—	IC circuit	—	
				2-wire	24 V	12 V	100 V	A93V	A93	●	—	●	●	—	—	—	Relay
						100 V or less	A90V	A90	●	—	●	—	—	—	—	IC circuit	PLC

***Water-resistant type auto switch can be mounted to the models with the above mentioned part numbers, but this does not guarantee the water resistance of the cylinder. A water-resistant type cylinder is recommended for use in an environment which requires water resistance. However, please contact SMC for water-resistant products of ø12 and ø16.

* Lead wire length symbols: 0.5 m..... Nil (Example) M9NW
1 m..... M (Example) M9NWM
3 m..... L (Example) M9NWL
5 m..... Z (Example) M9NWX

* Solid state auto switches marked with "○" are produced upon receipt of order.
** Bore sizes ø25 to ø100 are available for the D-P3DW.

* Since there are other applicable auto switches than listed, refer to page 22 for details.

* For details about auto switches with pre-wired connector, refer to pages 1784 and 1785 in Best Pneumatics No. 3.

For D-P3DW□, refer to the catalog CAT. ES20-201.

* Auto switches are shipped together, (but not assembled).

Specifications



Bore size	ø12	ø16	ø20	ø25	ø32	ø40	ø50	ø63	ø80	ø100
Action	Double acting									
Fluid	Air									
Proof pressure	218psi (1.5 MPa)									
Maximum operating pressure	145psi (1.0 MPa)									
Minimum operating pressure	17psi (0.12 MPa)		14.5psi (0.1 MPa)							
Ambient and fluid temperature	14 to 140°F (−10 to 60°C) (No freezing)									
Piston speed ^{Note)}	50 to 500 mm/s								50 to 400 mm/s	
Cushion	Rubber bumper on both ends									
Lubrication	Not required (Non-lube)									
Stroke length tolerance	^{+1.5} ₀ mm									

Note) Maximum speed with no load.

Make a model selection, considering a load according to the graph on pages 8 to 14.

Standard Strokes

Bore size (mm)	Standard stroke (mm)
12, 16	10, 20, 30, 40, 50, 75, 100, 125, 150, 175, 200, 250
20, 25	20, 30, 40, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400
32 to 100	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400

Manufacture of Intermediate Strokes

Refer to pages 21 to 23 for cylinders with auto switches.

- Auto switch proper mounting position (detection at stroke end) and mounting height
- Minimum stroke for auto switch mounting
- Operating range
- Auto switch mounting brackets/Part no.

Description	Spacer installation Spacers are installed in the standard stroke cylinder. • ø12 to ø32: Available by the 1 mm stroke interval. • ø40 to ø100: Available by the 5 mm stroke interval.	
Part no.	Refer to "How to Order" for the standard model numbers.	
Applicable stroke (mm)	ø12, ø16	1 to 249
	ø20 to ø32	1 to 399
	ø40 to ø100	5 to 395
Example	Part no.: MGPM20-39 A spacer 1 mm in width is installed in a MGPM20-40. C dimension is 77 mm.	

Theoretical Output



Bore size (mm)	Rod size (mm)	Operating direction	Piston area (mm ²)	Operating pressure psi (MPa)									
				29 (0.2)	44 (0.3)	58 (0.4)	73 (0.5)	87 (0.6)	102 (0.7)	116 (0.8)	131 (0.9)	145 (1.0)	
12	6	OUT	113	23	34	45	57	68	79	90	102	113	
		IN	85	17	25	34	42	51	59	68	76	85	
16	8	OUT	201	40	60	80	101	121	141	161	181	201	
		IN	151	30	45	60	75	90	106	121	136	151	
20	10	OUT	314	63	94	126	157	188	220	251	283	314	
		IN	236	47	71	94	118	141	165	188	212	236	
25	10	OUT	491	98	147	196	245	295	344	393	442	491	
		IN	412	82	124	165	206	247	289	330	371	412	
32	14	OUT	804	161	241	322	402	483	563	643	724	804	
		IN	650	130	195	260	325	390	455	520	585	650	
40	14	OUT	1257	251	377	503	628	754	880	1005	1131	1257	
		IN	1103	221	331	441	551	662	772	882	992	1103	
50	18	OUT	1963	393	589	785	982	1178	1374	1571	1767	1963	
		IN	1709	342	513	684	855	1025	1196	1367	1538	1709	
63	18	OUT	3117	623	935	1247	1559	1870	2182	2494	2806	3117	
		IN	2863	573	859	1145	1431	1718	2004	2290	2576	2863	
80	22	OUT	5027	1005	1508	2011	2513	3016	3519	4021	4524	5027	
		IN	4646	929	1394	1859	2323	2788	3252	3717	4182	4646	
100	26	OUT	7854	1571	2356	3142	3927	4712	5498	6283	7069	7854	
		IN	7323	1465	2197	2929	3662	4394	5126	5858	6591	7323	

Note) Theoretical output (N) = Pressure (MPa) x Piston area (mm²)

(1N = 0.22 lbf)