Compact Guide Cylinder

MGP Series

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

How to Order

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
	Rc
TN	NPT
TF	G

∗: For bore sizes ø12 and ø16, only M5 x 0.8 is available.

Cylinder stroke [mm]
Refer to Standard Strokes on page 537.

Auto switch

Nil	Without auto switch (Built-in magnet)

∗: For applicable auto switches, refer to the table below.

Number of auto switches

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

Made to Order
For details, refer to page 537.

Proposals for Improving Water and Dust-resistance
SMC offers a wide range of models suitable for various operating environments. This includes models that can be used in environments that the basic model cannot, such as those where coolant liquid, water droplets/splashing, dust, etc., are present. See below for details.
- Water resistant cylinder (➡ Refer to page 540.)
- Cylinder with stable lubrication function (Lube-retainer) (➡ Refer to page 541.)
- Dust resistant cylinder ➡(**Web Catalog**)

Applicable Auto Switches/Refer to pages 1289 to 1383 for further information on auto switches.

Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage DC	Load voltage DC	Load voltage AC	Auto switch model: Perpendicular	Auto switch model: In-line	Lead wire length [m]: 0.5 (Nil)	1 (M)	3 (L)	5 (Z)	Pre-wired connector	Applicable load	
Solid state auto switch	—	Grommet	Yes	3-wire (NPN)	24 V	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 indicator)			3-wire (NPN)		5 V, 12 V		M9NWV	M9NW	●	●	●	○	○	IC circuit	
				3-wire (PNP)				M9PWV	M9PW	●	●	●	○	○		
				2-wire		12 V		M9BWV	M9BW	●	●	●	○	○	—	
	Water resistant (2-color indicator)			3-wire (NPN)		5 V, 12 V		M9NAV∗1	M9NA∗1	○	○	●	○	○	IC circuit	
				3-wire (PNP)				M9PAV∗1	M9PA∗1	○	○	●	○	○		
				2-wire		12 V		M9BAV∗1	M9BA∗1	○	○	●	○	○		
	Magnetic field resistant (2-color indicator)			2-wire (Non-polar)		—		—	P3DWA∗2	●	—	●	●	○	—	
Reed auto switch	—	Grommet	Yes	3-wire (NPN equivalent)	—	5 V	—	A96V	A96	●	●	●	●	○	IC circuit	—
			No	2-wire	24 V	12 V	100 V	A93V	A93	●	●	●	●	○∗3	—	Relay, PLC
							100 V or less	A90V	A90	●	●	●	●	○∗3	IC circuit	

∗1: Water resistant type auto switches are mountable on the above models, but in such case SMC cannot guarantee water resistance. A water resistant type cylinder is recommended for use in an environment which requires water resistance.
∗2: The D-P3DWA□ is mountable on bore size ø25 to ø100.
∗3: The load voltage used is 24 VDC.

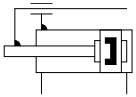
∗: Lead wire length symbols: 0.5 m·····Nil (Example) M9NW
1 m·····M (Example) M9NWM
3 m·····L (Example) M9NWL
5 m·····Z (Example) M9NWZ

∗: Auto switches marked with "○" are produced upon receipt of order.

∗: Other than the auto switches listed above, the D-P4DW type can be mounted. Refer to page 595 for details.
∗: For details about auto switches with pre-wired connector, refer to pages 1358 and 1359.
∗: Auto switches are shipped together, (but not assembled).



Symbol
Rubber bumper



Made to Order

Made to Order: Individual Specifications
(For details, refer to pages 597 and 598.)

Symbol	Specifications
-X144	Symmetrical port position
-X471	Enlarged plate and body gap dimensions
-X867	Side porting type (Plug location changed)

Made to Order

Made to Order
Click here for details

Symbol	Specifications
-XA□	Change of guide rod end shape
-XB6	Heat resistant cylinder (–10 to 150°C)
-XB10	Intermediate stroke (Using exclusive body)
-XB13	Low speed cylinder (5 to 50 mm/s)
-XB22	Shock absorber soft type ***RJ series*** type
-XC4	With heavy duty scraper
-XC6	Made of stainless steel
-XC8	Adjustable stroke cylinder/Adjustable extension type
-XC9	Adjustable stroke cylinder/Adjustable retraction type
-XC22	Fluororubber seal
-XC35	With coil scraper
-XC69	With shock absorber
-XC79	Tapped hole, drilled hole, pinned hole machined additionally
-XC82	Bottom mounting type
-XC85	Grease for food processing equipment
-XC88(W)	Spatter resistant coil scraper, Lube-retainer, Grease for welding (Rod parts: Stainless steel 304)
-XC89W	Spatter resistant coil scraper, Lube-retainer, Grease for welding (Rod parts: S45C)
-XC91(W)	Spatter resistant coil scraper, Grease for welding (Rod parts: S45C)
-XC92	Dust resistant actuator ∗1

∗1: The shape is the same as the current product.

Refer to pages 592 to 596 for cylinders with auto switches.

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

Specifications

Bore size [mm]	12	16	20	25	32	40	50	63	80	100
Action	Double acting									
Fluid	Air									
Proof pressure	1.5 MPa									
Maximum operating pressure	1.0 MPa									
Minimum operating pressure	0.12 MPa		0.1 MPa							
Ambient and fluid temperature	–10 to 60°C (No freezing)									
Piston speed ∗1	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									

∗1: Maximum speed with no load. Depending on the operating conditions, the piston speed may not be satisfied.
Make a model selection, considering a load according to the graph on pages 545 to 551.

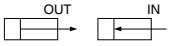
Standard Strokes

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

Description	Spacer installation type Spacers are installed in the standard stroke cylinder. • ø12 to ø32: Available in 1 mm stroke increments. • ø40 to ø100: Available in 5 mm stroke increments.		Exclusive body (-XB10) Dealing with the stroke by making an exclusive body. • All bore sizes are available in 1 mm increments.	
Model no.	Refer to How to Order for the standard model numbers.		Add "-XB10" to the end of standard model number. For details, refer to Made to Order.	
Applicable stroke [mm]	ø12, ø16	1 to 249	ø12, ø16	11 to 249
	ø20, ø25, ø32	1 to 399	ø20, ø25	21 to 399
	ø40 to ø100	5 to 395	ø32 to ø100	26 to 399
Example	Part no.: MGPM20-39Z A spacer 1 mm in width is installed in the MGPM20-40. C dimension is 77 mm.		Part no.: MGPM20-39Z-XB10 Special body manufactured for 39 stroke. C dimension is 76 mm.	

Theoretical Output



[N]

Bore size [mm]	Rod size [mm]	Operating direction	Piston area [mm²]	Operating pressure [MPa] 0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	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

∗: Theoretical output [N] = Pressure [MPa] x Piston area [mm²]

Weights

Slide Bearing: MGPM12 to 100

[kg]

Bore size [mm]	Standard stroke [mm]															
	10	20	25	30	40	50	75	100	125	150	175	200	250	300	350	400
12	0.22	0.25	—	0.29	0.33	0.36	0.46	0.55	0.66	0.75	0.84	0.93	1.11	—	—	—
16	0.32	0.37	—	0.42	0.46	0.51	0.66	0.78	0.94	1.06	1.18	1.31	1.55	—	—	—
20	—	0.59	—	0.67	0.74	0.82	1.06	1.24	1.43	1.61	1.80	1.99	2.42	2.79	3.16	3.53
25	—	0.84	—	0.94	1.04	1.14	1.50	1.75	2.00	2.25	2.50	2.75	3.35	3.85	4.34	4.84
32	—	—	1.41	—	—	1.77	2.22	2.57	2.93	3.29	3.65	4.00	4.90	5.61	6.33	7.04
40	—	—	1.64	—	—	2.04	2.52	2.92	3.32	3.71	4.11	4.50	5.47	6.26	7.06	7.85
50	—	—	2.79	—	—	3.38	4.13	4.71	5.30	5.89	6.47	7.06	8.55	9.73	10.9	12.1
63	—	—	3.48	—	—	4.15	4.99	5.67	6.34	7.02	7.69	8.37	10.0	11.4	12.7	14.1
80	—	—	5.41	—	—	6.26	7.41	8.26	9.10	9.95	10.8	11.6	13.9	15.6	17.3	19.0
100	—	—	9.12	—	—	10.3	12.0	13.2	14.4	15.6	16.9	18.1	21.2	23.6	26.1	28.5

Ball Bushing: MGPL12 to 100, High Precision Ball Bushing: MGPA12 to 100

[kg]

Bore size [mm]	Standard stroke [mm]															
	10	20	25	30	40	50	75	100	125	150	175	200	250	300	350	400
12	0.21	0.24	—	0.27	0.32	0.35	0.43	0.50	0.59	0.67	0.75	0.83	0.99	—	—	—
16	0.31	0.35	—	0.40	0.47	0.51	0.62	0.72	0.85	0.96	1.06	1.17	1.38	—	—	—
20	—	0.60	—	0.66	0.79	0.85	1.01	1.17	1.36	1.52	1.68	1.84	2.17	2.49	2.81	3.13
25	—	0.87	—	0.96	1.12	1.20	1.41	1.62	1.86	2.06	2.27	2.48	2.92	3.33	3.75	4.16
32	—	—	1.37	—	—	1.66	2.08	2.37	2.74	3.03	3.31	3.60	4.25	4.82	5.39	5.97
40	—	—	1.59	—	—	1.92	2.38	2.70	3.11	3.44	3.77	4.09	4.81	5.46	6.11	6.76
50	—	—	2.65	—	—	3.14	3.85	4.34	4.97	5.47	5.96	6.45	7.57	8.56	9.54	10.5
63	—	—	3.33	—	—	3.91	4.71	5.29	6.01	6.59	7.17	7.75	9.05	10.2	11.4	12.5
80	—	—	5.27	—	—	6.29	7.49	8.21	8.92	9.64	10.4	11.1	12.9	14.3	15.7	17.2
100	—	—	8.62	—	—	10.1	11.8	12.9	13.9	15.0	16.0	17.1	19.6	21.7	23.8	25.9