

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
TF	Rc
TN	NPT
TF	G

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

•Made to Order
For details, refer to page 433.

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

•Cylinder stroke [mm]

Refer to Standard Strokes on page 433.

Applicable Auto Switches

Refer to pages 1119 to 1245 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	●	●	●	○	○	—		
	3-wire (NPN)			5 V, 12 V	M9NVW		M9NW	●	●	●	○	○		IC circuit	
	3-wire (PNP)			5 V, 12 V	M9PWV		M9PW	●	●	●	○	○	IC circuit		
	2-wire			12 V	M9BWW		M9BW	●	●	●	○	○		—	
	3-wire (NPN)			5 V, 12 V	M9NAV*1		M9NA*1	○	○	●	○	○			
	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 or less	A93V*3	A93	●	●	●	—	—	Relay, PLC
								A90V	A90	●	—	●	—	—	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.

However, please contact SMC for water resistant products of ø12 and ø16.

*2: The D-P3DWA□ is mountable on bore size ø25 to ø100.

*3: 1 m type lead wire is only applicable to the D-A93.

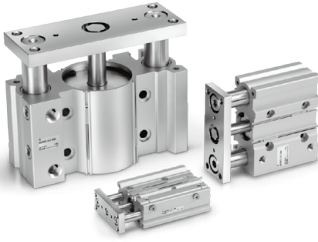
*: Lead wire length symbols: 0.5 m..... Nil (Example) M9NV
1 m..... M (Example) M9NWM
3 m..... L (Example) M9NWL
5 m..... Z (Example) M9NWX

*: Solid state auto switches marked with "○" are produced upon receipt of order.

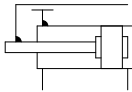
*: Other than the auto switches listed above, the D-P4DW type can be mounted. Refer to page 489 for details.

*: For details about auto switches with pre-wired connector, refer to pages 1192 and 1193.

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



Symbol
Rubber bumper



Made to Order: Individual Specifications
(For details, refer to page 491.)

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



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 *1
-XC79	Tapped hole, drilled hole, pinned hole machined additionally
-XC82	Bottom mounting type
-XC85	Grease for food processing equipment
-XC88	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	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 486 to 490 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 439 to 445.

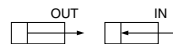
Standard Strokes

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 ø20, ø25, ø32 1 to 399 ø40 to ø100 5 to 395	ø12, ø16 11 to 249 ø20, ø25 21 to 399 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 [mm ²]	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] × Piston area [mm²]

Weights

Slide Bearing: MGPM12 to 100

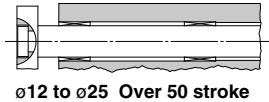
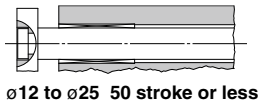
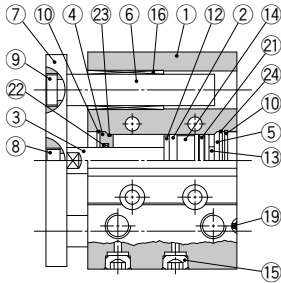
Bore size [mm]	Standard stroke [mm]																[kg]
	10	20	25	30	40	50	75	100	125	150	175	200	250	300	350	400	
12	0.22	0.25	—	0.29	0.33	0.36	0.46	0.55	0.66	0.75	0.84	0.93	1.11	—	—	—	
16	0.32	0.37	—	0.42	0.46	0.51	0.66	0.78	0.94	1.06	1.18	1.31	1.55	—	—	—	
20	—	0.59	—	0.67	0.74	0.82	1.06	1.24	1.43	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

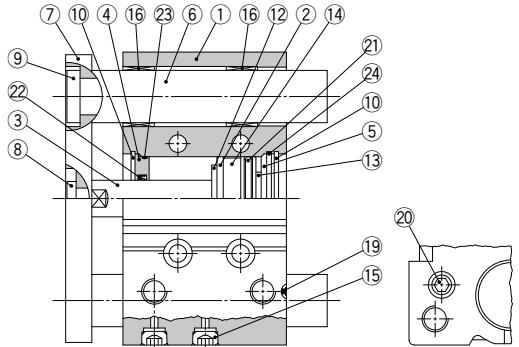
Bore size [mm]	Standard stroke [mm]																[kg]
	10	20	25	30	40	50	75	100	125	150	175	200	250	300	350	400	
12	0.21	0.24	—	0.27	0.32	0.35	0.43	0.50	0.59	0.67	0.75	0.83	0.99	—	—	—	
16	0.31	0.35	—	0.40	0.47	0.51	0.62	0.72	0.85	0.96	1.06	1.17	1.38	—	—	—	
20	—	0.60	—	0.66	0.79	0.85	1.01	1.17	1.36	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	

Construction/MGPM Series

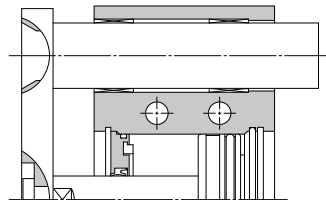
MGPM12 to 25



MGPM32 to 100



ø63 or more



Component Parts

No.	Description	Material	Note
1	Body	Aluminum alloy	Hard anodized
2	Piston	Aluminum alloy	
3	Piston rod	Stainless steel	ø12 to ø25
4	Collar	Carbon steel	ø32 to ø100 Hard chrome plating
5	Head cover	Aluminum alloy	Chromated ø12 to ø63 ø80, ø100 Painted
6	Guide rod	Carbon steel	Hard chrome plating
7	Plate	Carbon steel	Nickel plating
8	Plate mounting bolt	Carbon steel	Nickel plating
9	Guide bolt	Carbon steel	Nickel plating
10	Retaining ring	Carbon tool steel	Phosphate coated
11	Retaining ring	Carbon tool steel	Phosphate coated
12	Bumper A	Urethane	
13	Bumper B	Urethane	
14	Magnet	—	
15	Plug	Carbon steel	ø12, ø16 ø20 to ø100 Nickel plating
16	Hexagon socket head plug	Carbon steel	ø20 to ø100 Nickel plating
17	Slide bearing	Bearing alloy	

※: A felt is not installed on the slide bearing.

Component Parts

No.	Description	Material	Note
17	Ball bushing		
18	Spacer	Aluminum alloy	
19	Steel ball	Carbon steel	ø12 to ø50
20	Plug	Carbon steel	ø63 to ø100 Nickel plating
21*	Piston seal	NBR	
22*	Rod seal	NBR	
23*	Gasket A	NBR	
24*	Gasket B	NBR	

Replacement Parts/Seal Kit

Bore size [mm]	Kit no.	Contents	Bore size [mm]	Kit no.	Contents
12	MGP12-Z-PS	Set of nos.	40	MGP40-Z-PS	Set of nos.
16	MGP16-Z-PS	above	50	MGP50-Z-PS	above
20	MGP20-Z-PS	above	63	MGP63-Z-PS	above
25	MGP25-Z-PS	②1, ②2, ②3, ②4	80	MGP80-Z-PS	②1, ②2, ②3, ②4
32	MGP32-Z-PS	②3, ②4	100	MGP100-Z-PS	②3, ②4

※: Seal kit includes ②1 to ②4. Order the seal kit, based on each bore size.

※: Since the seal kit does not include a grease pack, order it separately.

Grease pack part number: GR-S-010 (10 g)

MGJ

JMGP

MGP

MGPW

MGQ

MGG

MGC

MGF

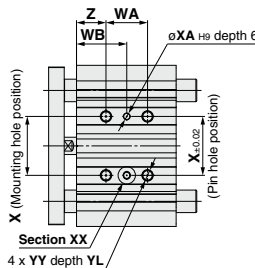
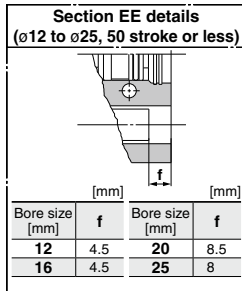
MGZ

MGT

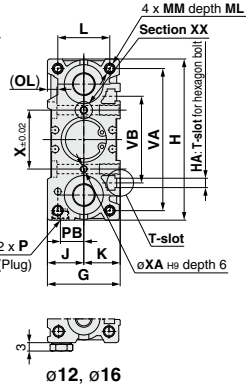
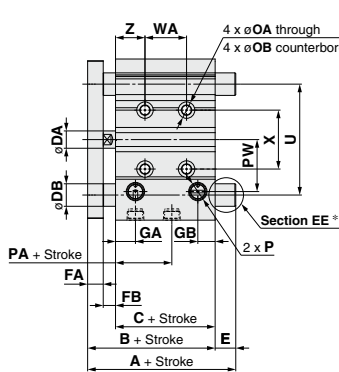
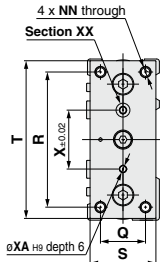
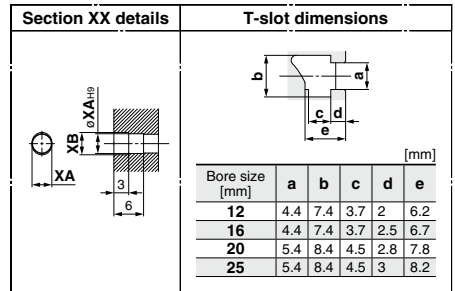
D-□

-X□

ø12 to ø25/MGPM, MGPL, MGPA



Bottom view



*1: Refer to Section EE details for the shape of ø12 to ø25 with stroke of 50 or less.

*2: The use of a slot (width XA, length XB, depth 3) allows for a relaxed pin pitch tolerance, with the pin hole (øXA_{Hø}, depth 6) as the reference, without affecting mounting accuracy.

*3: For intermediate strokes other than standard strokes, refer to Manufacture of Intermediate Strokes on page 433.

*4: For bore size ø12 and ø16, only M5 x 0.8 port is available.

*5: For bore size ø20 or more, choice of Rc, NPT, G port is available. (Refer to page 432.)

MGPM, MGPL, MGPA Common Dimensions

Bore size [mm]	Standard stroke [mm]	B	C	DA	FA	FB	G	GA	GB	H	HA	J	K	L	MM	ML	NN	OA	OB	OL	P			
																					NII	TN	TF	
12	10, 20, 30, 40, 50, 75, 100	42	29	6	7	6	26	10	7	58	M4	13	13	18	M4 x 0.7	10	M4 x 0.7	4.3	8	4.5	M5 x 0.8	—	—	—
16	125, 150, 175, 200, 250	46	33	8	7	6	30	10.5	7.5	64	M4	15	15	22	M5 x 0.8	12	M5 x 0.8	4.3	8	4.5	M5 x 0.8	—	—	—
20	20, 30, 40, 50, 75, 100, 125, 150	53	37	10	8	8	36	11.5	9	83	M5	18	18	24	M5 x 0.8	13	M5 x 0.8	5.4	9.5	5.5	Rc1/8	NPT1/8	G1/8	
25	175, 200, 250, 300, 350, 400	53.5	37.5	10	9	7	42	11.5	10	93	M5	21	21	30	M6 x 1.0	15	M6 x 1.0	5.4	9.5	5.5	Rc1/8	NPT1/8	G1/8	

Bore size [mm]	PA	PB	PW	Q	R	S	T	U	VA	VB	WA					WB					X	XA	XB	YY	YL	Z
											30 st or less	Over 30 at 100 st or less	Over 100 at 200 st or less	Over 200 at 300 st or less	Over 300 at	30 st or less	Over 30 at 100 st or less	Over 100 at 200 st or less	Over 200 at 300 st or less	Over 300 at						
12	13	8	18	14	48	22	56	41	50	37	20	40	110	200	—	15	25	60	105	—	23	3	3.5	M5 x 0.8	10	5
16	14.5	10	19	16	54	25	62	46	56	38	24	44	110	200	—	17	27	60	105	—	24	3	3.5	M5 x 0.8	10	5
20	13.5	10.5	25	18	70	30	81	54	72	44	24	44	120	200	300	29	39	77	117	167	28	3	3.5	M6 x 1.0	12	17
25	12.5	13.5	30	26	78	38	91	64	82	50	24	44	120	200	300	29	39	77	117	167	34	4	4.5	M6 x 1.0	12	17

MGPL (Ball bushing)

MGPM (Slide bearing) A, DB, E Dimensions

Bore size [mm]	A				DB	E			
	50 st or less	Over 50 at 100 st or less	Over 100 at 200 st or less	Over 200 st		50 st or less	Over 50 at 100 st or less	Over 100 at 200 st or less	Over 200 st
12	42	60.5	82.5	82.5	8	0	18.5	40.5	40.5
16	46	64.5	92.5	92.5	10	0	18.5	46.5	46.5
20	53	77.5	110	110	12	0	24.5	24.5	57
25	53.5	77.5	109.5	109.5	16	0	24	24	56

MGPA (High precision ball bushing) A, DB, E Dimensions

Bore size [mm]	A				DB	E			
	30 st or less	Over 30 at 100 st or less	Over 100 at 200 st or less	Over 200 st		30 st or less	Over 30 at 100 st or less	Over 100 at 200 st or less	Over 200 st
12	43	55	84.5	84.5	6	1	13	42.5	42.5
16	49	65	94.5	94.5	8	3	19	48.5	48.5
20	59	76	100	117.5	10	6	23	47	64.5
25	65.5	81.5	100.5	117.5	13	12	28	47	64