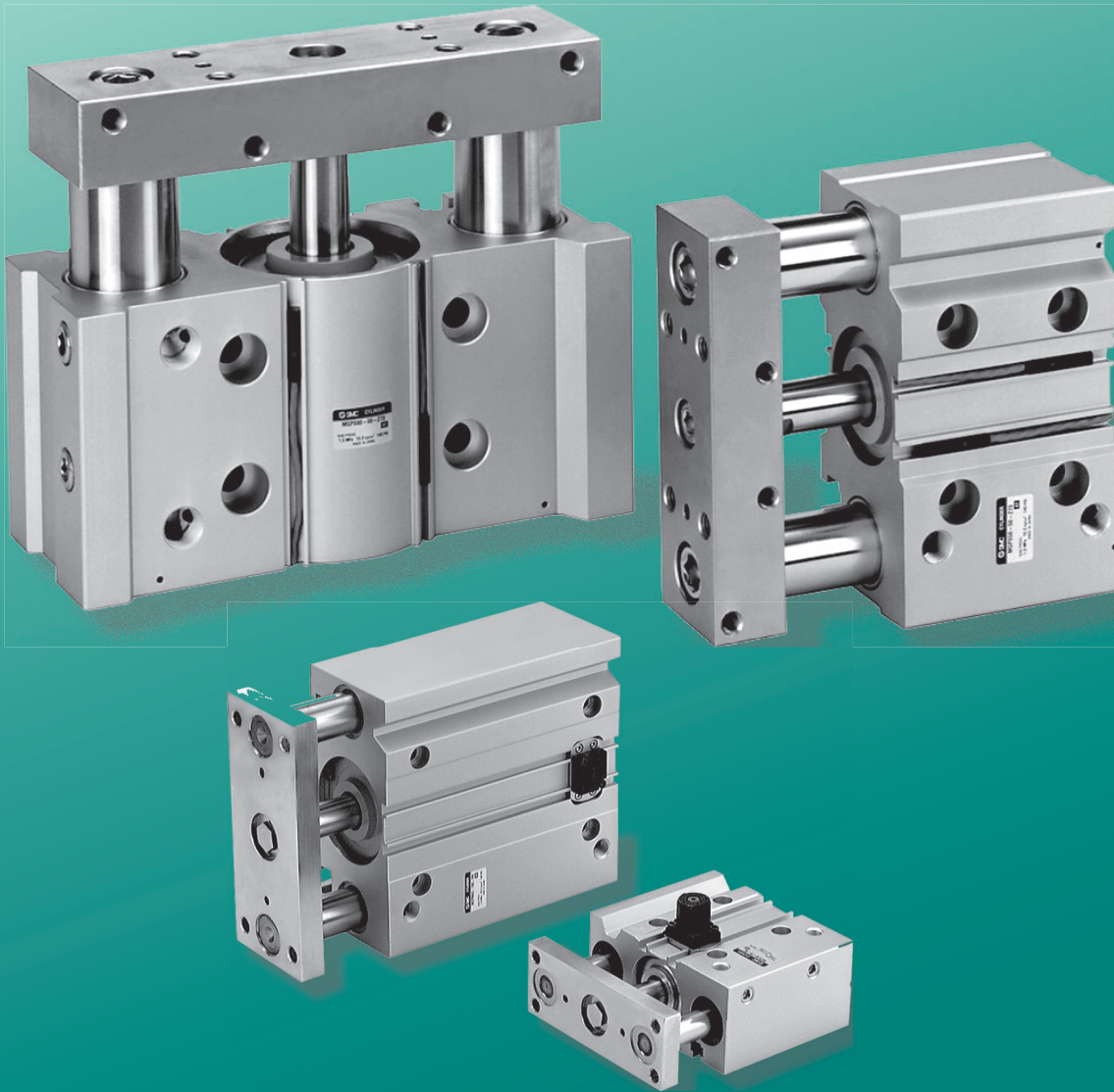


Compact Guide Cylinder

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



Series MGP

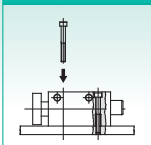


CAT.EUS20-117Cc-UK

Series MGP

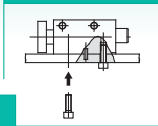
Four mounting types provided

1. Top mount



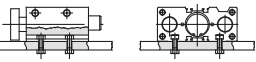
- Easy positioning
Knock pin holes provided on each mounting surface

2. Side mount

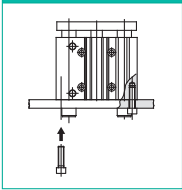


3. T-slot side mount

Easy adjustment of work piece and cylinder mounting

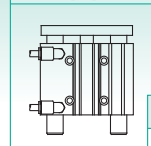


4. Bottom mount

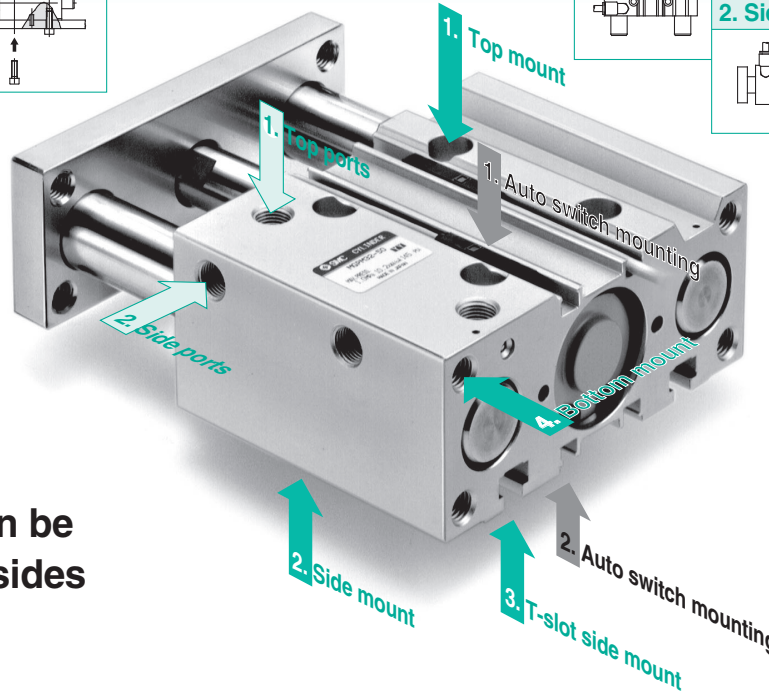
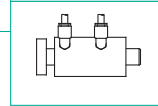


Piping is possible from two directions

1. Top ports

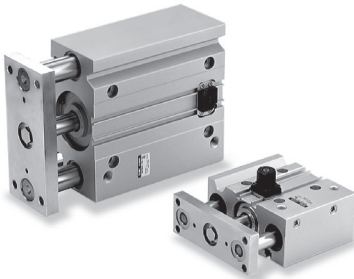


2. Side ports



Auto switches can be mounted on two sides

• End lock type



Stroke Variations

Bearing type	Bore size [mm]	Stroke [mm]	Intermediate strokes	Locking direction	Manual release
MGPM Slide bearing	20	25 50 75 100 125 150 175 200 250 300 350 400	Spacer type available in 5 mm stroke increments.	Front lock	Non-locking type
	25				
	32				
	40				
	50				
MGPL Ball bushing	63	25 50 75 100 125 150 175 200 250 300 350 400	Rear lock	Locking type	
	80				
	80				
	100				

- Holds the cylinder's home position even if the air supply is cut off.
- Compact body length is only 25 mm longer than standard.

• Heavy duty guide rod type with improved load resistance



- Lateral load resistance: 10% increase
- Eccentric load resistance: 25% increase
- Impact load resistance: 140% increase
(Compared with MGPM50 compact guide cylinder)

Stroke Variations

Bearing type	Bore size [mm]	Stroke [mm]
MGPS Slide bearing	50	25 50 75 100 125 150 175 200
	80	25 50 75 100 125 150 175 200

Bore size [mm]	Guide rod diameter [mm]	
	MGPS	MGPM
50	30	25
80	45	30

Series Variations

Series	Bearing type	Cushion	Bore size [mm]							
			20	25	32	40	50	63	80	100
With end lock MGP	Slide bearing Ball bushing	Rubber bumper	●	●	●	●	●	●	●	●
Heavy duty guide rod type MGPS	Slide bearing	Rubber bumper					●		●	

Compact Guide Cylinder: With end lock

Series *MGP*

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

How to Order

Compact Guide Cylinder

MGP M 32 - 100 - H N - M9BW

- Compact guide cylinder**
- Bearing type**

M	Slide bearing
L	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**

—	M5 x 0.8
	Rc
N	NPT
TF	G
- Cylinder stroke [mm]**
Refer to the standard stroke table on page 2.
- Number of auto switches**

—	2 pcs.
S	1 pc.
n	n pcs.
- Auto switch**

—	Without auto switch (Built-in magnet)
---	---------------------------------------

* For applicable auto switch model, refer to the table below.
- Manual release type**

N	Non-locking type
L	Locking type
- Lock position**

H	Rear lock
R	Front lock

Applicable Auto Switches/Refer to Auto Switch Guide 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 (—)	1 (M)	3 (L)	5 (Z)					
Solid state auto switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	M9NV	M9N	●	●	●	○	○	IC circuit		
				3-wire (PNP)				M9PV	M9P	●	●	●	○	○			
	2-wire			5 V, 12 V	—	M9BV	M9B	●	●	●	○	○	IC circuit				
	3-wire (NPN)					M9N WV	M9N W	●	●	●	○	○					
	3-wire (PNP)			12 V	—	M9PWV	M9PW	●	●	●	○	○	IC circuit				
	2-wire					M9B WV	M9B W	●	●	●	○	○					
	Water-resistant (2-colour display)			5 V, 12 V	—	M9NAV***	M9NA***	○	○	●	○	○	IC circuit				
						3-wire (PNP)	M9PAV***	M9PA***	○	○	●	○		○			
	Magnetic field resistant (2-colour display)			12 V	—	2-wire (Non-polar)	—	—	—	M9BAV***	M9BA***	○	○	●	○	○	—
						—				P3DW	●	—	●	●	○		
Reed auto switch	—	Grommet	Yes	3-wire (NPN equivalent)	24 V	5 V	—	A96V	A96	●	—	●	—	—	IC circuit	—	
				2-wire				100 V	A93V	A93	●	—	●	●	—		—

***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.

* Lead wire length symbols: 0.5 m..... — (Example) M9NV
 1 m..... M (Example) M9NWM
 3 m..... L (Example) M9NWL
 5 m..... Z (Example) M9N WZ

* Solid state auto switches marked with “○” are produced upon receipt of order.
 * Bore sizes ø32 to ø100 are available for the D-P4DW.
 * Bore sizes ø25 to ø100 are available for the D-P3DW.

* Since there are other applicable auto switches than listed, refer to Auto Switch Guide for details.
 * For details about auto switches with pre-wired connector, refer to Auto Switch Guide.
 For D-P3DW, refer to the D-P3DW catalogue.
 * Auto switches are shipped together, (but not assembled).



Specifications

Action	Double acting	
Fluid	Air	
Proof pressure	1.5 MPa	
Maximum operating pressure	1.0 MPa	
Minimum operating pressure	0.15 MPa *	
Ambient and fluid temperature	-10 to 60°C (with no freezing)	
Piston speed	ø20 to ø63	50 to 500 mm/s
	ø80, ø100	50 to 400 mm/s
Cushion	Rubber bumper at both ends	
Lubrication	Non-lube	
Stroke length tolerance	$^{+1.5}_0$ mm	

* 0.1 MPa except for the lock unit.

Lock Specifications

Lock position	Rear, Front side							
Holding force (max.) [N]	ø20	ø25	ø32	ø40	ø50	ø63	ø80	ø100
	215	330	550	860	1340	2140	3450	5390
Backlash	2 mm or less							
Manual release	Non-locking type, Locking type							

Adjust switch positions for operation at both the stroke end and backlash (2 mm) movement positions.

Standard Strokes

Bore size [mm]	Standard stroke [mm]
20, 25, 32, 40, 50, 63, 80, 100	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400

Manufacture of Intermediate Strokes

Modification method	Spacer installation type Spacers are installed in a standard stroke cylinder. Available in 5 mm stroke increments
Part number	Refer to page 1 for standard part numbers and ordering procedure.
Applicable stroke [mm]	5 to 395
Example	Part no.: MGPM50-35-HN A spacer 15 mm in width is installed in a MGPM50-50-HN . C dimension is 119 mm.

Note 1) The minimum stroke for mounting auto switches is 10 mm or more for two switches, and 5 mm or more for one switch.

Note 2) Intermediate strokes (in 1 mm increments) with a special body are available by special order.

Theoretical Output

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	
20	10	OUT	314	63	94	126	157	188	220	251	283	314	
		IN	236	47	71	94	118	142	165	189	212	236	
25	12	OUT	491	98	147	196	246	295	344	393	442	491	
		IN	378	76	113	151	189	227	265	302	340	378	
32	16	OUT	804	161	241	322	402	482	563	643	724	804	
		IN	603	121	181	241	302	362	422	482	543	603	
40	16	OUT	1257	251	377	503	629	754	880	1006	1131	1257	
		IN	1056	211	317	422	528	634	739	845	950	1056	
50	20	OUT	1963	393	589	785	982	1178	1374	1570	1767	1963	
		IN	1649	330	495	660	825	990	1154	1319	1484	1649	
63	20	OUT	3117	623	935	1247	1559	1870	2182	2494	2805	3117	
		IN	2803	561	841	1121	1402	1682	1962	2242	2523	2803	
80	25	OUT	5027	1005	1508	2011	2514	3016	3519	4022	4524	5027	
		IN	4536	907	1361	1814	2268	2722	3175	3629	4082	4536	
100	30	OUT	7854	1571	2356	3142	3927	4712	5498	6283	7069	7854	
		IN	7147	1429	2144	2859	3574	4288	5003	5718	6432	7147	

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

Weights

Slide bearing: MGPM20 to 100 (Basic weight)

[kg]

Bore size [mm]	Model	Standard stroke [mm]											
		25	50	75	100	125	150	175	200	250	300	350	400
20	MGPM20	0.86	1.12	1.32	1.52	1.71	1.91	2.11	2.31	2.78	3.18	3.57	3.97
25	MGPM25	1.18	1.56	1.83	2.10	2.38	2.65	2.92	3.19	3.85	4.39	4.94	5.48
32	MGPM32	1.92	2.32	2.70	3.09	3.47	3.85	4.23	4.61	5.56	6.32	7.09	7.85
40	MGPM40	2.20	2.66	3.08	3.51	3.93	4.36	4.78	5.20	6.24	7.10	7.95	8.80
50	MGPM50	3.73	4.46	5.10	5.74	6.38	7.02	7.66	8.30	9.91	11.2	12.5	13.8
63	MGPM63	4.61	5.45	6.21	6.96	7.72	8.47	9.23	9.99	11.8	13.3	14.8	16.3
80	MGPM80	7.88	8.70	9.49	10.3	11.2	12.0	12.8	13.9	15.5	17.2	18.8	20.5
100	MGPM100	12.1	13.2	14.4	15.6	16.8	18.0	19.1	20.6	22.9	25.3	27.6	30.0

Ball bushing: MGPL20 to 100 (Basic weight)

[kg]

Bore size [mm]	Model	Standard stroke [mm]											
		25	50	75	100	125	150	175	200	250	300	350	400
20	MGPL20	0.93	1.10	1.27	1.48	1.65	1.83	2.00	2.17	2.55	2.90	3.25	3.60
25	MGPL25	1.27	1.50	1.74	2.01	2.24	2.47	2.70	2.94	3.44	3.91	4.37	4.83
32	MGPL32	1.74	2.19	2.51	2.88	3.20	3.51	3.83	4.15	4.84	5.47	6.10	6.73
40	MGPL40	2.02	2.51	2.87	3.29	3.65	4.01	4.37	4.73	5.51	6.23	6.95	7.67
50	MGPL50	3.46	4.21	4.76	5.40	5.95	6.50	7.05	7.60	8.83	9.92	11.1	12.2
63	MGPL63	4.33	5.20	5.86	6.62	7.28	7.95	8.61	9.27	10.7	12.1	13.4	14.7
80	MGPL80	8.05	8.87	9.66	10.5	11.4	12.2	13.0	14.1	15.7	17.4	19.0	20.7
100	MGPL100	12.4	13.5	14.7	15.9	17.1	18.3	19.4	20.9	23.2	25.6	27.9	30.3

Lock unit additional weight

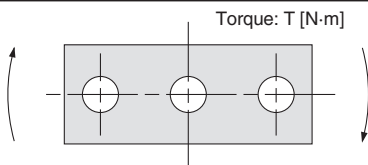
[kg]

Bore size [mm]	With rear lock		With front lock	
	HN	HL	RN	RL
20	0.05	0.07	0.05	0.06
25	0.06	0.07	0.05	0.07
32	0.09	0.10	0.09	0.10
40	0.15	0.18	0.14	0.18
50	0.24	0.27	0.23	0.27

Bore size [mm]	With rear lock		With front lock	
	HN	HL	RN	RL
63	0.36	0.40	0.35	0.39
80	0.90	0.97	1.03	1.10
100	1.52	1.60	1.60	1.68

Calculation (example) MGPM50-100-HN
 • Basic weight + Lock unit additional weight
 • 5.74 + 0.24 = 5.99 kg

Allowable Rotational Torque of Plate

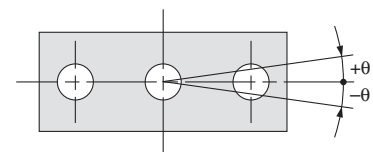


T [N·m]

Bore size [mm]	Bearing type	Stroke [mm]											
		25	50	75	100	125	150	175	200	250	300	350	400
20	MGPM	0.99	0.75	1.88	1.63	1.44	1.28	1.16	1.06	0.90	0.78	0.69	0.62
	MGPL	2.66	1.94	1.52	1.25	1.34	1.17	1.03	0.93	0.76	0.65	0.56	0.49
25	MGPM	1.64	1.25	2.96	2.57	2.26	2.02	1.83	1.67	1.42	1.24	1.09	0.98
	MGPL	4.08	3.02	2.38	1.97	2.05	1.78	1.58	1.41	1.16	0.98	0.85	0.74
32	MGPM	6.35	5.13	5.69	4.97	4.42	3.98	3.61	3.31	2.84	2.48	2.20	1.98
	MGPL	5.95	4.89	5.11	4.51	6.34	5.79	5.33	4.93	4.29	3.78	3.38	3.04
40	MGPM	7.00	5.66	6.27	5.48	4.87	4.38	5.98	3.65	3.13	2.74	2.43	2.19
	MGPL	6.55	5.39	5.62	4.96	6.98	6.38	5.87	5.43	4.72	4.16	3.71	3.35
50	MGPM	13.0	10.8	12.0	10.6	9.50	8.60	7.86	7.24	6.24	5.49	4.90	4.43
	MGPL	9.17	7.62	9.83	8.74	11.6	10.7	9.83	9.12	7.95	7.02	6.26	5.63
63	MGPM	14.7	12.1	13.5	11.9	10.7	9.69	8.86	8.16	7.04	6.19	5.52	4.99
	MGPL	10.2	8.48	11.0	9.74	13.0	11.9	11.0	10.2	8.84	7.80	6.94	6.24
80	MGPM	21.9	18.6	22.9	20.5	18.6	17.0	15.6	14.5	12.6	11.2	10.0	9.11
	MGPL	15.1	23.3	22.7	20.6	18.9	17.3	16.0	14.8	12.9	11.3	10.0	8.94
100	MGPM	38.8	33.5	37.5	33.8	30.9	28.4	26.2	24.4	21.4	19.1	17.2	15.7
	MGPL	27.1	30.6	37.9	34.6	31.8	29.3	27.2	25.3	22.1	19.5	17.3	15.5

Note) Model selection is the same as MGP/Standard.

Non-rotating Accuracy of Plate



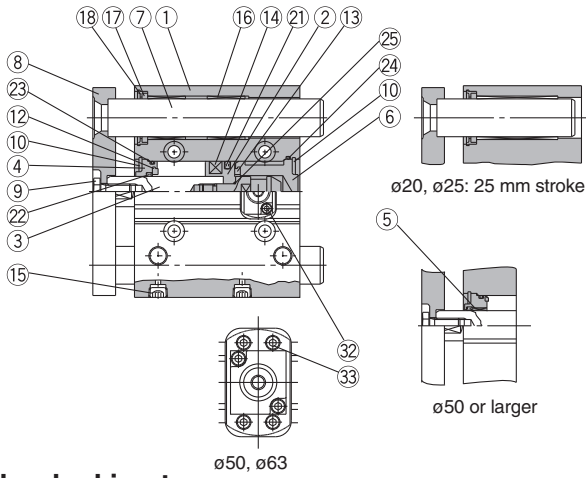
For non-rotating accuracy θ without load, use a value no more than the values in the table as a guide.

Bore size [mm]	Non-rotating accuracy θ	
	MGPM	MGPL
20	$\pm 0.07^\circ$	$\pm 0.09^\circ$
25	$\pm 0.07^\circ$	$\pm 0.09^\circ$
32	$\pm 0.06^\circ$	$\pm 0.08^\circ$
40	$\pm 0.06^\circ$	$\pm 0.08^\circ$
50	$\pm 0.05^\circ$	$\pm 0.06^\circ$
63	$\pm 0.05^\circ$	$\pm 0.06^\circ$
80	$\pm 0.04^\circ$	$\pm 0.05^\circ$
100	$\pm 0.04^\circ$	$\pm 0.05^\circ$

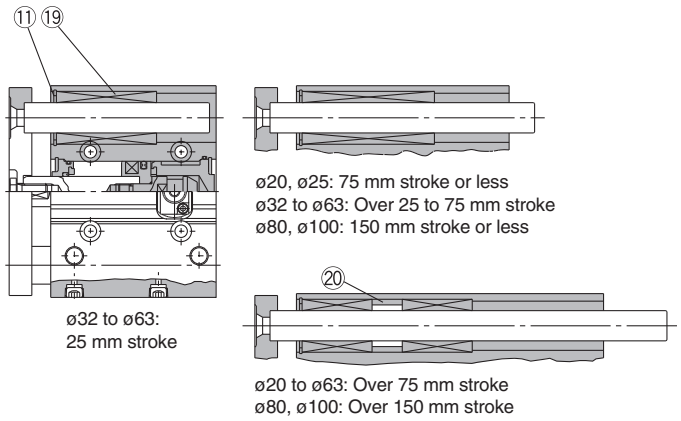
Series MGP

Construction

Series MGPM

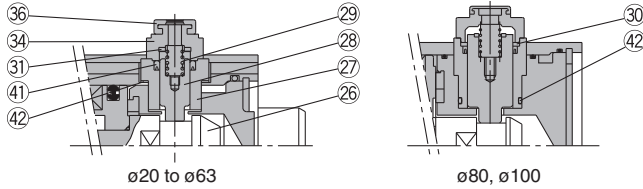


Series MGPL

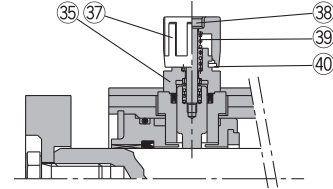


Non-locking type

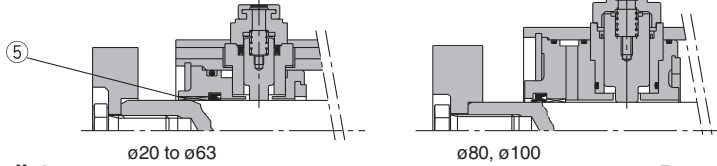
(Rear side lock)



Locking type



(With front lock)



Parts list

No.	Description	Material	Note
1	Body	Aluminium alloy	Hard anodised
2	Piston	Aluminium alloy	Chromated
3	Piston rod	Stainless steel ø20, ø25	Hard chrome plated with front end lock only
		Carbon steel ø32 to ø100	Hard chrome plated
4	Collar	Aluminium alloy	Clear anodised
5	Bushing	Lead bronze casting	
6	Head cover	Aluminium alloy	Colorless chromated
7	Guide rod	Carbon steel	Hard chrome plated
8	Plate	Carbon steel	Nickel plated
9	Plate mounting bolt	Carbon steel	Nickel plated
10	Snap ring	Carbon tool steel	Phosphate coated
11	Snap ring	Carbon tool steel	Phosphate coated
12	Bumper A	Urethane	
13	Bumper B	Urethane	
14	Magnet	Synthetic rubber	
15	Hexagon socket head taper plug	Carbon steel	Nickel plated
16	Slide bearing	Lead bronze casting	
17	Felt	Felt	
18	Holder	Resin	
19	Ball bushing		
20	Spacer	Aluminium alloy	
21*	Piston seal	NBR	

Replacement parts: Seal kits

Bore size [mm]	Kit No.	Contents
20	MGP20-B-PS	Kits include items 21, 22, 23, 24, 32, 33, 41 and 42 from the table above.
25	MGP25-B-PS	
32	MGP32-B-PS	
40	MGP40-B-PS	
50	MGP50-B-PS	

* Seal kits are sets consisting of items 21 through 24, 32, 33, 41 and 42 above, and can be ordered using the kit number for each bore size.

Parts list

No.	Description	Material	Note
22*	Rod seal	NBR	
23*	Gasket A	NBR	
24*	Gasket B	NBR	
25	Piston gasket	NBR	ø32 to ø100 only
26	Lock bolt	Carbon steel	Zinc chromated
27	Lock holder	Brass	Electroless nickel plated
28	Lock piston	Carbon steel	Nickel plated
29	Lock spring	Stainless steel	
30	Seal retainer	Carbon steel	Zinc chromated (ø80, ø100 only)
31	Bumper	Urethane	
32*	Hexagon socket head cap screw	Carbon steel	Black zinc chromated
33*	Hexagon socket head cap screw	Carbon steel	Nickel plated (ø50, ø63 only)
34	Cap A	Die-cast Aluminium	Black coated
35	Cap B	Carbon steel	SQ treated
36	Rubber cap	Synthetic rubber	
37	M/O knob	Die-cast zinc	Black coated
38	M/O bolt	Alloy steel	Black zinc chromated
39	M/O spring	Steel wire	Chromated
40	Stopper ring	Carbon steel	Chromated
41*	Lock piston seal	NBR	
42*	Lock holder gasket	NBR	

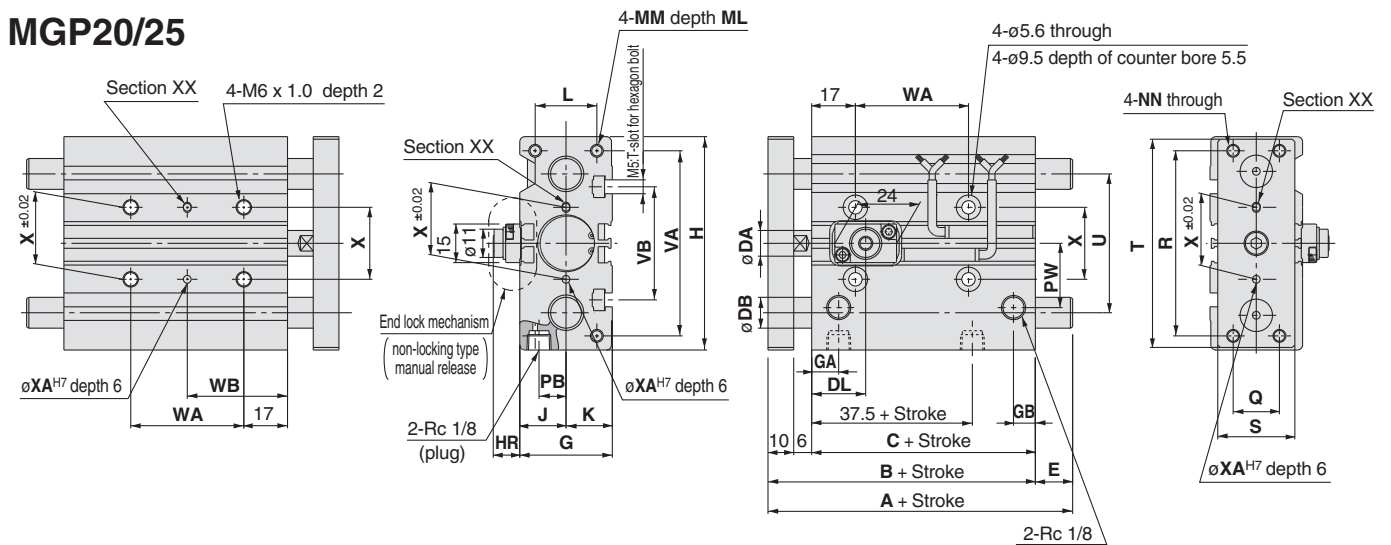
Replacement parts: Seal kits

Bore size [mm]	Kit no.	Contents
63	MGP63-B-PS	Kits include items 21, 22, 23, 24, 32, 33, 41 and 42 from the table above.
80	MGP80-B-PS	
100	MGP100-B-PS	

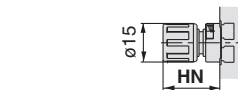
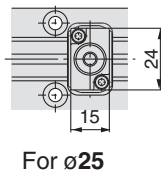
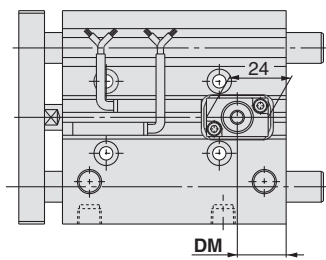
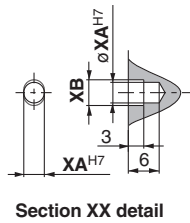
* Items 32 and 33 are not included for bores sizes 80 and 100.

Dimensions

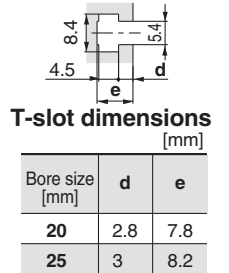
MGP20/25



With front lock



**End lock mechanism
(Locking type manual release)**



Note) Refer to "Manufacture of Intermediate Strokes" on page 2 for intermediate strokes.

Bore size [mm]	Standard stroke [mm]	B	C	DA	G	GA	GB	H	J	K	L	MM	ML	NN	PB	PW	Q	R
20	25, 50, 75, 100, 125, 150, 175	78	62	10	36	10.5	8.5	83	18	18	24	M5 x 0.8	13	M5 x 0.8	10.5	25	18	70
25	200, 250, 300, 350, 400	78.5	62.5	12	42	11.5	9	93	21	21	30	M6 x 1.0	15	M6 x 1.0	13.5	28.5	26	78

Bore size [mm]	S	T	U	VA	VB	WA				WB				X	XA	XB
						75 st or less	Over 75 st to 175 st	Over 175 st to 250 st	Over 250 st	75 st or less	Over 75 st to 175 st	Over 175 st to 250 st	Over 250 st			
20	30	81	54	72	44	44	120	200	300	39	77	117	167	28	3	3.5
25	38	91	64	82	50	44	120	200	300	39	77	117	167	34	4	4.5

End lock mechanism dimensions [mm]

Bore size [mm]	DL	DM	HR	HN
20	21	19	10.5	22
25	26.5	16	8	19.5

MGPM (slide bearing)/Dimensions A, DB, E [mm]

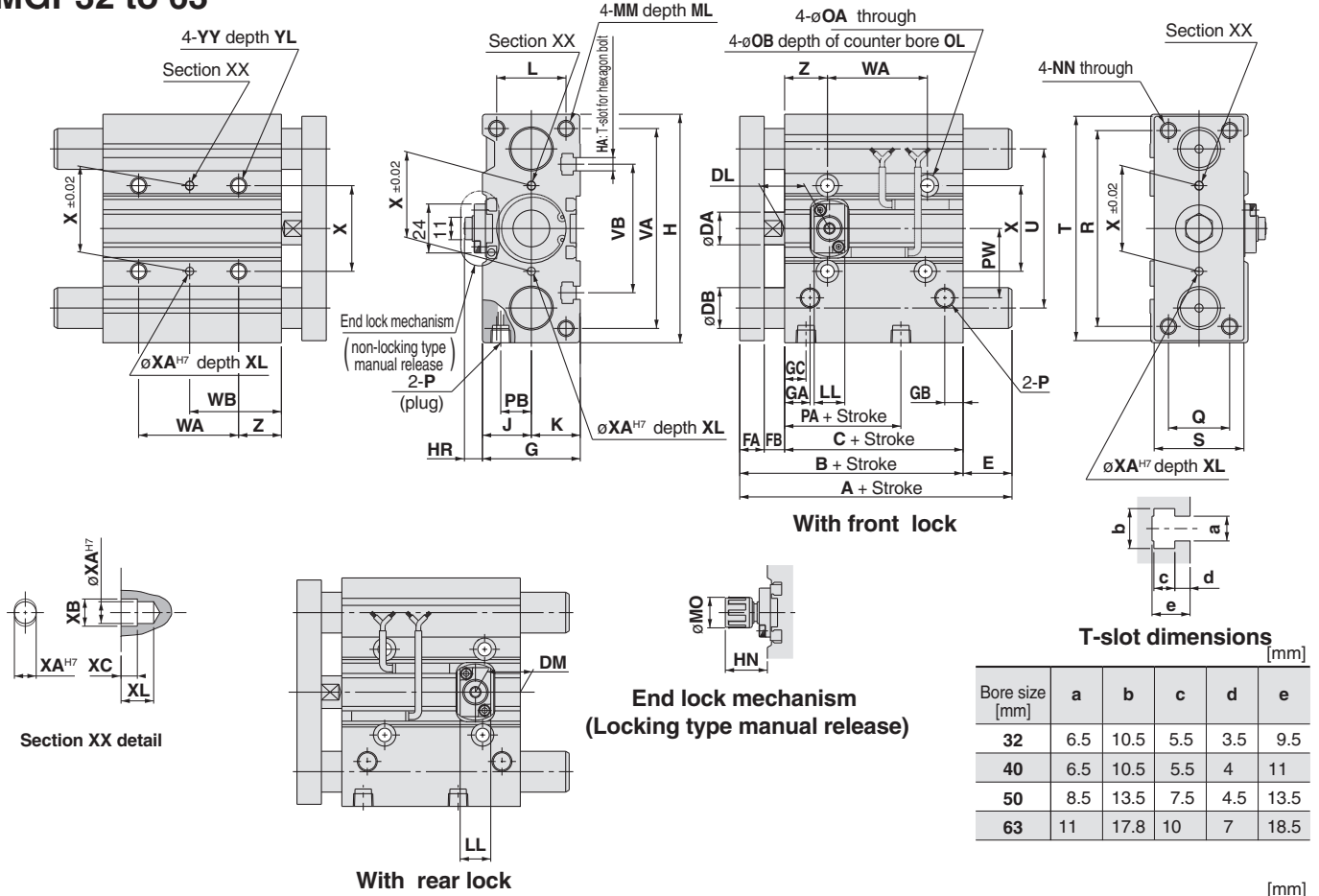
Bore size [mm]	A			DB	E		
	25 st or less	Over 25 st to 175 st	Over 175 st		25 st or less	Over 25 st to 175 st	Over 175 st
20	78	84.5	122	12	0	6.5	44
25	78.5	85	122	16	0	6.5	43.5

MGPL (ball bushing)/Dimensions A, DB, E [mm]

Bore size [mm]	A			DB	E		
	75 st or less	Over 75 st to 175 st	Over 175 st		75 st or less	Over 75 st to 175 st	Over 175 st
20	80	104	122	10	2	26	44
25	85.5	104.5	122	13	7	26	43.5

Dimensions

MGP32 to 63



Bore size [mm]	Standard stroke [mm]	B	C	DA	FA	FB	G	GA	GB	GC	H	HA	J	K	L	MM	ML	NN	OA
32	25, 50, 75, 100	84.5	62.5	16	12	10	48	12.5	9	12.5	112	M6	24	24	34	M8 x 1.25	20	M8 x 1.25	6.6
40	125, 150, 175	91	69	16	12	10	54	14	10	14	120	M6	27	27	40	M8 x 1.25	20	M8 x 1.25	6.6
50	200, 250, 300	97	69	20	16	12	64	14	11	12	148	M8	32	32	46	M10 x 1.5	22	M10 x 1.5	8.6
63	350, 400	102	74	20	16	12	78	16.5	13.5	16.5	162	M10	39	39	58	M10 x 1.5	22	M10 x 1.5	8.6

Bore size [mm]	OB	OL	P	PA	PB	PW	Q	R	S	T	U	VA	VB	WA				WB			
														75 st or less	Over 75 st to 175 st	Over 175 st to 275 st	Over 275 st	75 st or less	Over 75 st to 175 st	Over 175 st to 275 st	Over 275 st
32	11	7.5	Rc 1/8	32	15	34	30	96	44	110	78	98	63	48	124	200	300	45	83	121	171
40	11	7.5	Rc 1/8	38	18	38	30	104	44	118	86	106	72	48	124	200	300	46	84	122	172
50	14	9	Rc 1/4	34	21.5	47	40	130	60	146	110	130	92	48	124	200	300	48	86	124	174
63	14	9	Rc 1/4	39	28	55	50	130	70	158	124	142	110	52	128	200	300	50	88	124	174

Bore size [mm]	X	XA	XB	XC	XL	YY	YL	Z
32	42	4	4.5	3	6	M8 x 1.25	16	21
40	50	4	4.5	3	6	M8 x 1.25	16	22
50	66	5	6	4	8	M10 x 1.5	20	24
63	80	5	6	4	8	M10 x 1.5	20	24

MGPM (slide bearing)/Dimensions A, DB, E [mm]

Bore size [mm]	A			DB	E		
	25 st or less	Over 25 st to 75 st	Over 75 st to 175 st		25 st or less	Over 25 st to 75 st	Over 75 st to 175 st
32	97	102	140	20	12.5	17.5	55.5
40	97	102	140	20	6	11	49
50	106.5	118	161	25	9.5	21	64
63	106.5	118	161	25	4.5	16	59

End lock mechanism [mm]

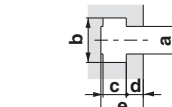
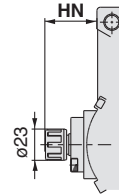
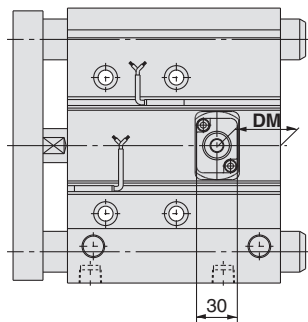
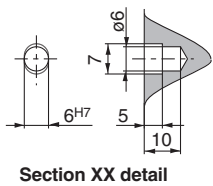
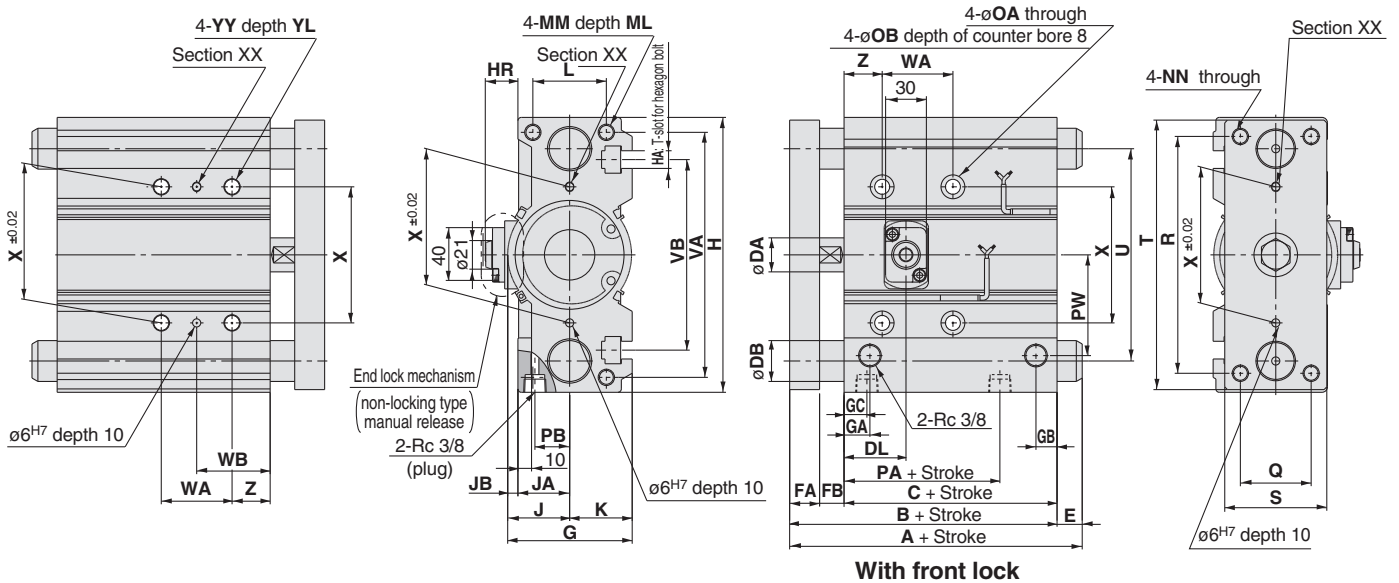
Bore size [mm]	DL	DM	HR	HN (max.)	LL	MO
32	22	22	9.5	21	15	15
40	26	23	11.5	25.5	21	19
50	24	23	13	27	21	19
63	25	25.5	11	25	21	19

MGPL (ball bushing)/Dimensions A, DB, E [mm]

Bore size [mm]	A				DB	E			
	25 st or less	Over 25 st to 75 st	Over 75 st to 175 st	Over 175 st		25 st or less	Over 25 st to 75 st	Over 75 st to 175 st	Over 175 st
32	84.5	98	118	140	16	0	13.5	33.5	55.5
40	91	98	118	140	16	0	7	27	49
50	97	114	134	161	20	0	17	37	64
63	102	114	134	161	20	0	12	32	59

Dimensions

MGP80/100



Bore size [mm]	[mm]				
	a	b	c	d	e
80	13.3	20.3	12	8	22.5
100	15.3	23.3	13.5	10	30

Bore size [mm]	Standard stroke [mm]	[mm]															
		B	C	DA	FA	FB	G	GA	GB	GC	H	HA	J	JA	JB	K	L
80	25, 50, 75, 100, 125, 150, 175	146.5	106.5	25	22	18	91.5	19	15.5	14.5	202	M12	45.5	38	7.5	46	54
100	200, 250, 300, 350, 400	166	116	30	25	25	111.5	23	19	18	240	M14	55.5	45	10.5	56	62

Bore size [mm]	MM	ML	NN	OA	OB	PA	PB	PW	Q	R	S	T	U	VA	VB	[mm]				
																WA				
																	50 st or less	Over 50 st to 150 st	Over 150 st to 250 st	Over 250 st
80	M12 x 1.75	25	M12 x 1.75	10.6	17.5	64.5	25.5	74	52	174	75	198	156	180	140	52	128	200	300	
100	M14 x 2.0	31	M14 x 2.0	12.5	20	67.5	32.5	89	64	210	90	236	188	210	166	72	148	220	320	

Bore size [mm]	WB				X	YY	YL	Z
	50 st or less	Over 50 st to 150 st	Over 150 st to 250 st	Over 250 st				
80	54	92	128	178	100	M12 x 1.75	24	28
100	47	85	121	171	124	M14 x 2.0	28	11

End lock mechanism dimensions [mm]				
Bore size [mm]	DL	DM	HR	HN
80	45.5	40.5	24	38.5
100	49	43.5	26.5	41

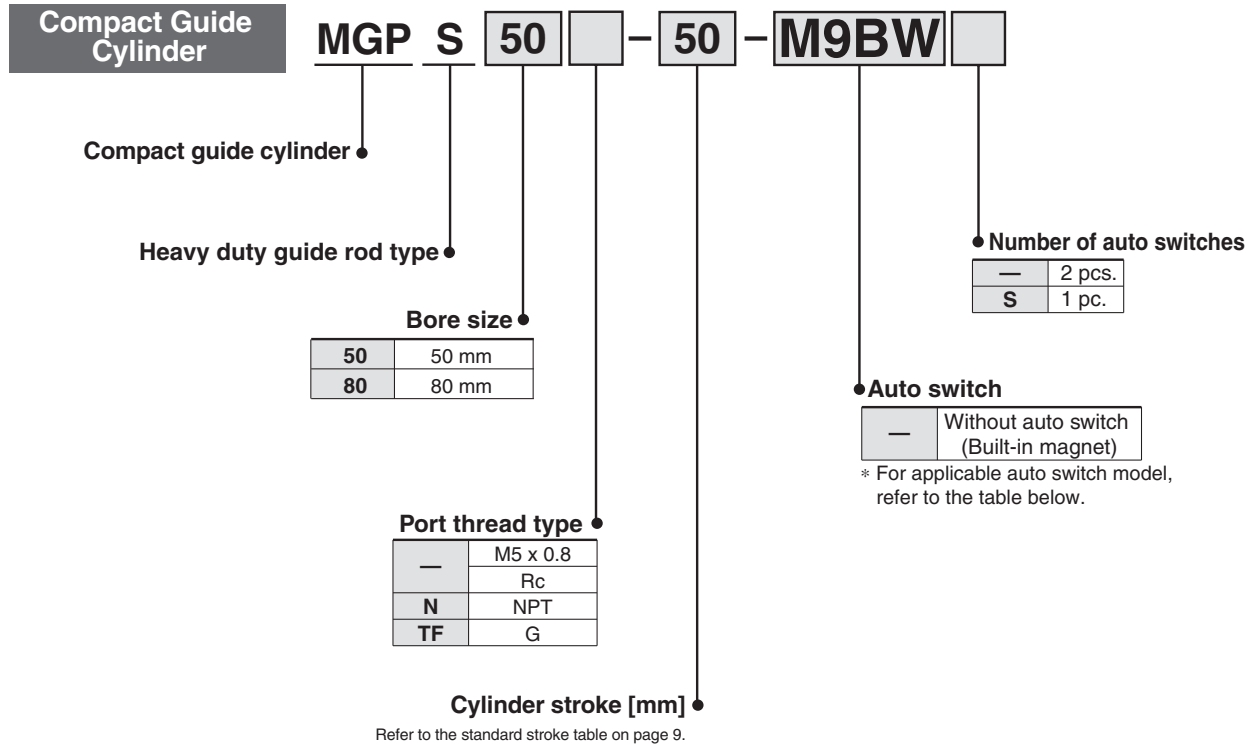
MGPM (slide bearing)/Dimensions/A, DB, E [mm]					
Bore size [mm]	A		DB	E	
	150 st or less	Over 150 st		150 st or less	Over 150 st
80	146.5	193	30	0	46.5
100	166	203	36	0	37

MGPL (ball bushing)/Dimensions A, DB, E [mm]					
Bore size [mm]	A		DB	E	
	150 st or less	Over 150 st		150 st or less	Over 150 st
80	160	193	25	13.5	46.5
100	180	203	30	14	37

Compact Guide Cylinder: Heavy Duty Guide Rod Type Series **MGPS**

ø50, ø80

How to Order



Applicable Auto Switches/Refer to Auto Switch Guide 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 (—)	1 (M)	3 (L)	5 (Z)					
Solid state auto switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	M9NV	M9N	●	●	●	○	○	IC circuit		
				3-wire (PNP)				M9PV	M9P	●	●	●	○	○			
	2-wire			5 V, 12 V	—	M9BV	M9B	●	●	●	○	○	IC circuit				
	3-wire (NPN)					M9NWV	M9NW	●	●	●	○	○					
	Diagnostic indication (2-colour display)			3-wire (PNP)	5 V, 12 V	—	M9PWV	M9PW	●	●	●	○	○	IC circuit			
				2-wire			M9B WV	M9B W	●	●	●	○	○				
	Water-resistant (2-colour display)			3-wire (NPN)	5 V, 12 V	—	M9NAV***	M9NA***	○	○	●	○	○	IC circuit			
				3-wire (PNP)			M9PAV***	M9PA***	○	○	●	○	○				
	Magnetic field resistant (2-colour display)			2-wire	12 V	—	M9BAV***	M9BA***	○	○	●	○	○	—			
				2-wire (Non-polar)			—	P3DW	—	—	●	●	○				
Reed auto switch	—	Grommet	Yes	3-wire (NPN equivalent)	24 V	5 V	100 V or less	A96V	A96	●	—	●	—	—	IC circuit	—	
				2-wire				A93V	A93	●	—	●	●	—	—		Relay, PLC
								A90V	A90	●	—	●	—	—	—		IC circuit

***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.

* Lead wire length symbols: 0.5 m..... — (Example) M9NW
 1 m..... M (Example) M9NWM
 3 m..... L (Example) M9NWL
 5 m..... Z (Example) M9NWZ

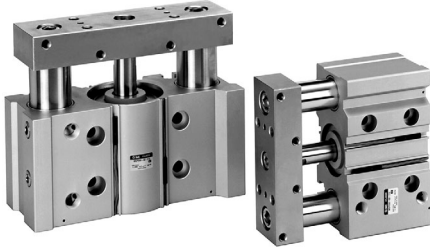
* Solid state auto switches marked with “○” are produced upon receipt of order.

* Since there are other applicable auto switches than listed, refer to Auto Switch Guide for details.

* For details about auto switches with pre-wired connector, refer to Auto Switch Guide. For D-P3DW, refer to the D-P3DW catalogue.

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

Compact Guide Cylinder: Heavy Duty Guide Rod Type *Series MGPS*



Specifications

Action	Double acting
Fluid	Air
Proof pressure	1.5 MPa
Maximum operating pressure	1.0 MPa
Minimum operating pressure	0.1 MPa
Ambient and fluid temperature	-10 to 60°C (with no freezing)
Piston speed	50 to 400 mm/s
Cushion	Rubber bumper at both ends
Lubrication	Non-lube
Stroke length tolerance	$^{+1.5}_0$ mm

Standard Strokes

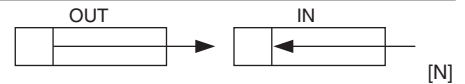
Bore size [mm]	Standard stroke [mm]
50, 80	25, 50, 75, 100, 125, 150, 175, 200

Manufacture of Intermediate Strokes

Modification method	Spacer installation type Spacers are installed in a standard stroke cylinder. Available in 5 mm stroke increments
Part number	Refer to page 8 for standard part numbers and ordering procedure.
Applicable stroke [mm]	5 to 195
Example	Part no.: MGPS50—35 A spacer 15 mm in width is installed in a MGPS50—50 . C dimension is 94 mm.

Note 1) The minimum stroke for mounting auto switches is 10 mm or more for two switches, and 5 mm or more for one switch.
Note 2) Intermediate strokes (in 1 mm increments) with a special body are available by special order.

Theoretical Output



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
50	20	OUT	1963	393	589	785	982	1178	1374	1571	1767	1963
		IN	1649	330	495	660	825	990	1155	1319	1484	1649
80	25	OUT	5027	1005	1508	2011	2513	3016	3519	4021	4524	5027
		IN	4536	907	1361	1814	2268	2721	3175	3629	4082	4536

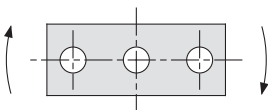
Note) Theoretical output (N) = Pressure (MPa) x Piston area (mm²)

Weights

Bore size [mm]	Model	Standard stroke [mm]							
		25	50	75	100	125	150	175	200
50	MGPS50	3.90	4.68	5.74	6.52	7.30	8.08	8.86	9.64
80	MGPS80	9.21	10.7	13.0	14.5	15.9	17.9	18.9	20.3

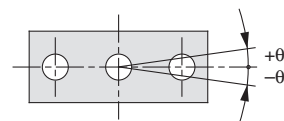
Allowable Rotational Torque of Plate

Torque: T [N·m]



Bore size [mm]	Model	Standard stroke [mm]							
		25	50	75	100	125	150	175	200
50	MGPS50	15	12	16	15	13	12	11	9.8
80	MGPS80	49	41	51	45	41	38	35	32

Non-rotating Accuracy of Plate



For non-rotating accuracy θ without load, use a value no more than the values in the table as a guide.

Bore size [mm]	Model	Non-rotating accuracy θ
50	MGPS50	$\pm 0.05^\circ$
80	MGPS80	$\pm 0.04^\circ$

Series MGPS Model Selection

Selecting Conditions

Mounting orientation	Vertical		Horizontal	
Maximum speed [mm/s]	200	400	200	400
Graph (Slide bearing type)	1, 2	3, 4	5, 6	7, 8

Selection Example 1 (Vertical Mounting)

Selecting conditions

Mounting: Vertical
Stroke: 50 mm
Maximum speed: 200 mm/s
Load weight: 100 kg
Eccentric distance: 100 mm

Find the point of intersection for the load weight of 100 kg and the eccentric distance of 100 mm on graph **1**, based on vertical mounting, 50 mm stroke, and the speed of 200 mm/s.

→MGPS80-50 is selected.

Selection Example 2 (Horizontal Mounting)

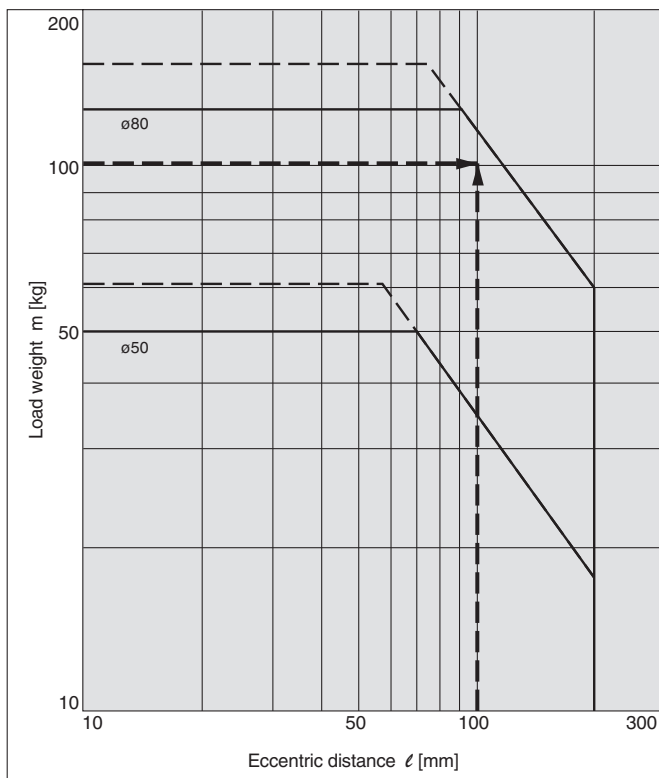
Selecting conditions

Mounting: Horizontal
Distance between plate and load center of gravity: 50 mm
Maximum speed: 200 mm/s
Load weight: 30 kg
Stroke: 100 mm

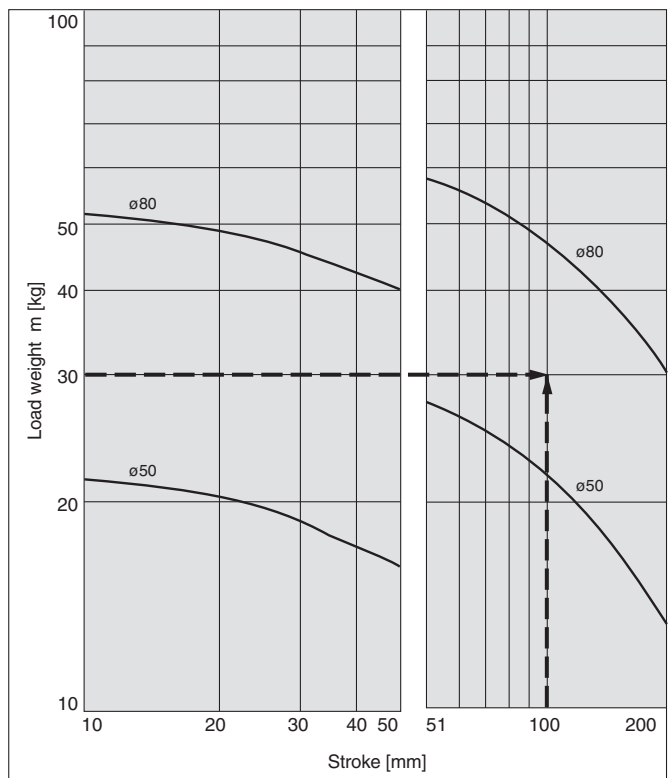
Find the point of intersection for the load weight of 30 kg and stroke of 100 mm on graph **5**, based on horizontal mounting, the distance of 50 mm between the plate and load center of gravity, and the speed of 200 mm/s.

→MGPS80-100 is selected.

1 50 mm stroke or less $V = 200$ mm/s



5 $l = 50$ mm $V = 200$ mm/s

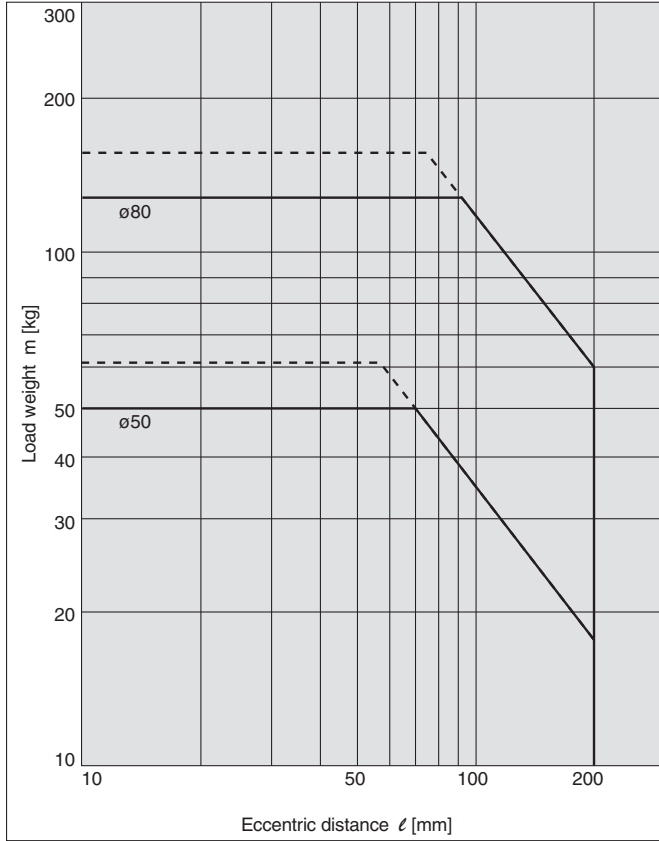


Vertical Mounting **Slide Bearing**

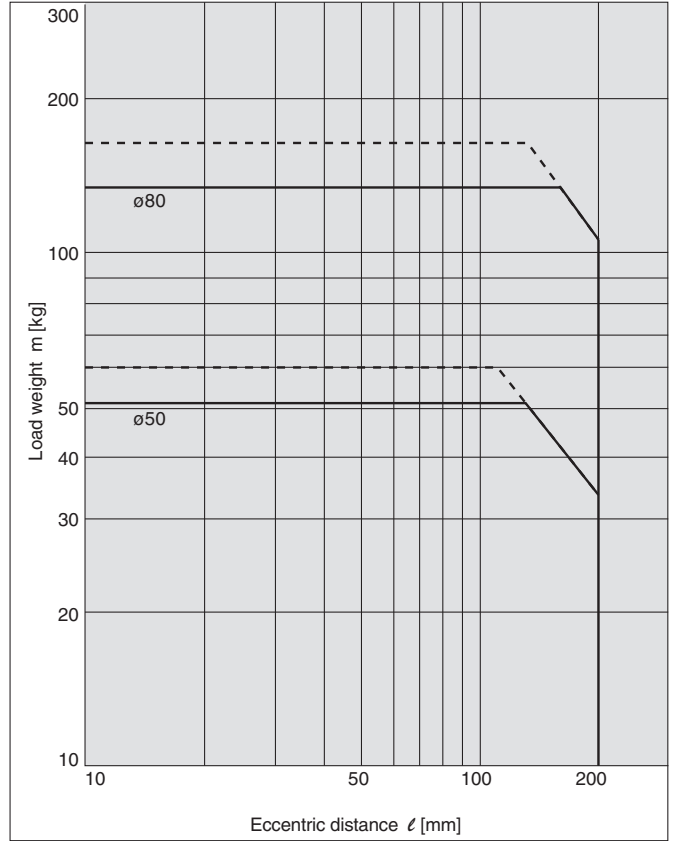
— Operating pressure: 0.4 MPa
- - - Operating pressure: 0.5 MPa or more

MGPS50, 80

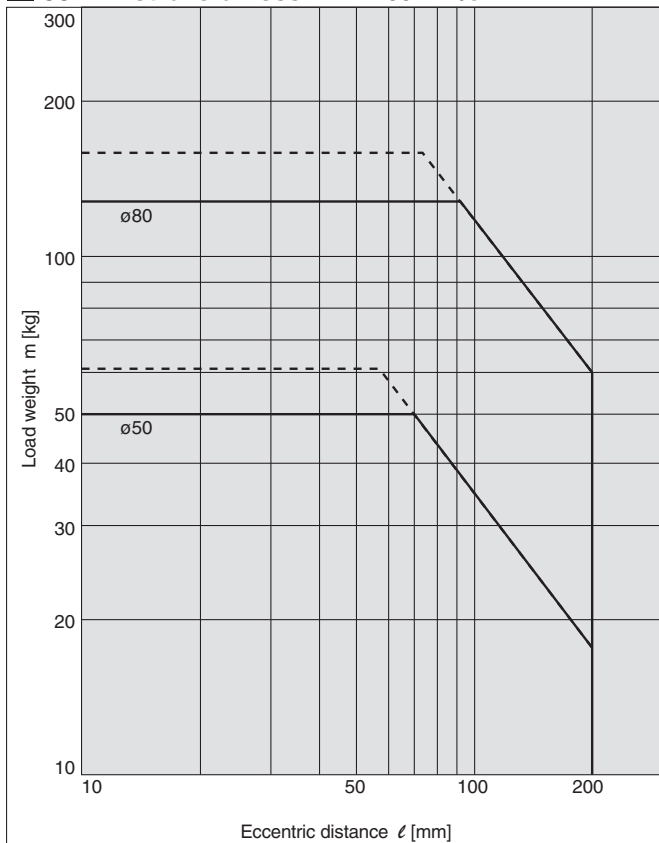
1 50 mm stroke or less V = 200 mm/s



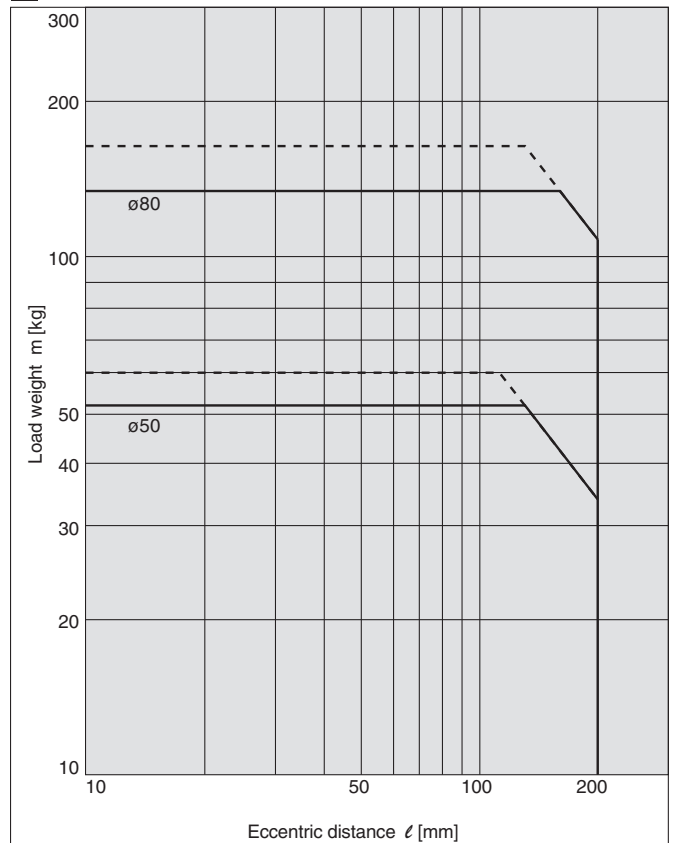
2 Over 50 mm stroke V = 200 mm/s



3 50 mm stroke or less V = 400 mm/s



4 Over 50 mm stroke V = 400 mm/s

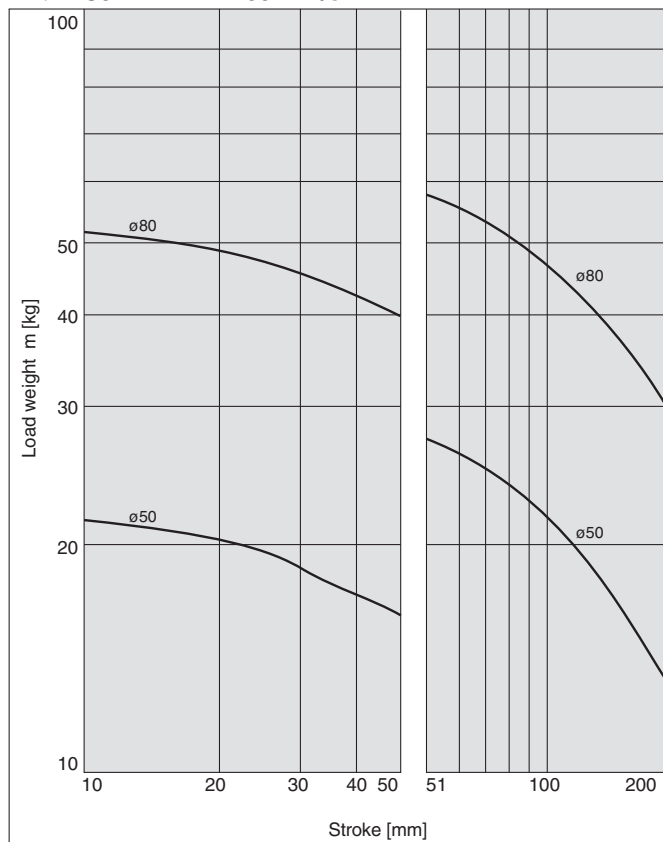


Series MGPS

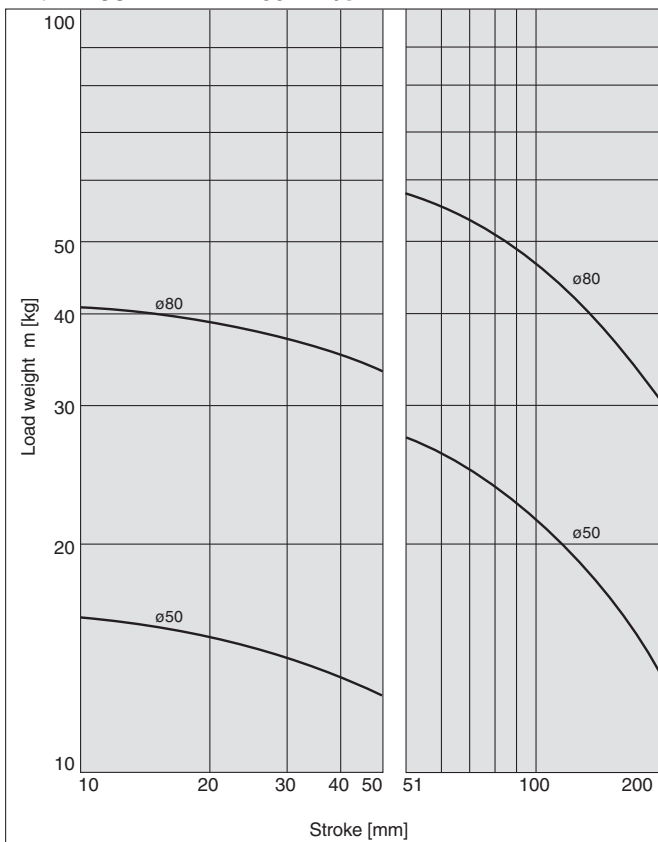
Horizontal Mounting Slide Bearing

MGPS50, 80

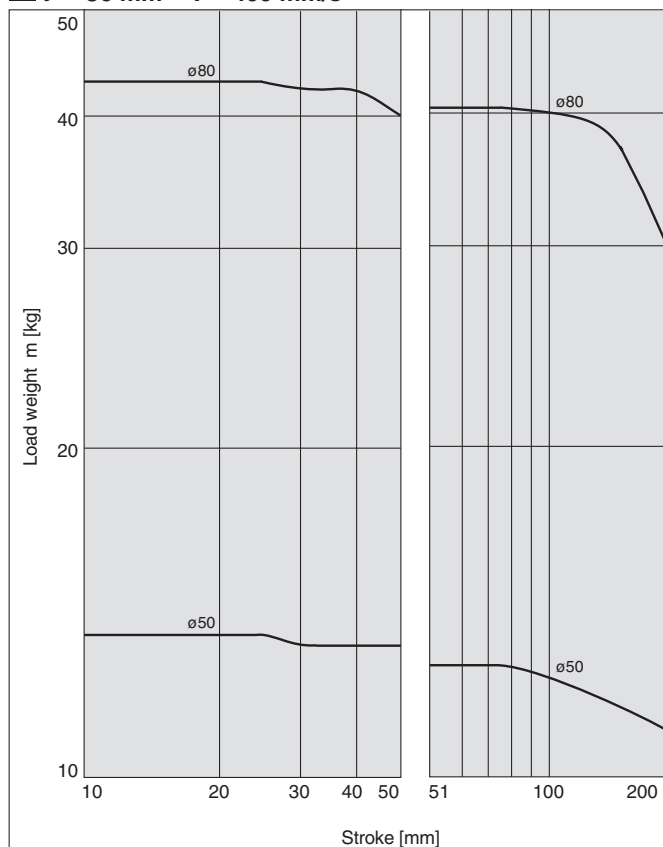
5 $\ell = 50 \text{ mm}$ $V = 200 \text{ mm/s}$



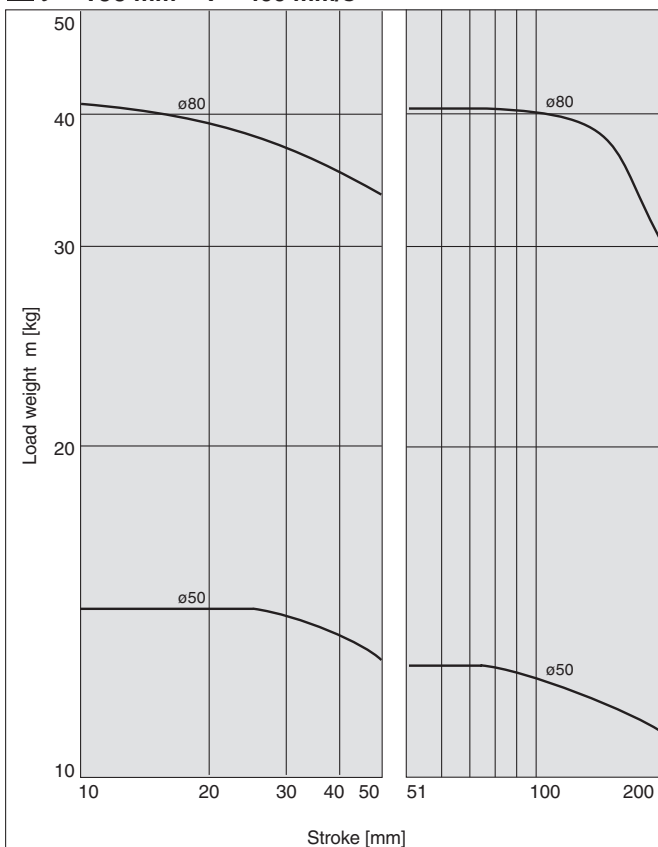
6 $\ell = 100 \text{ mm}$ $V = 200 \text{ mm/s}$



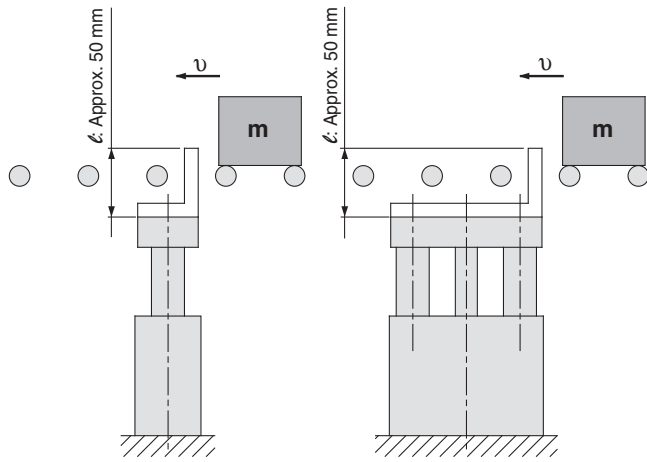
7 $\ell = 50 \text{ mm}$ $V = 400 \text{ mm/s}$



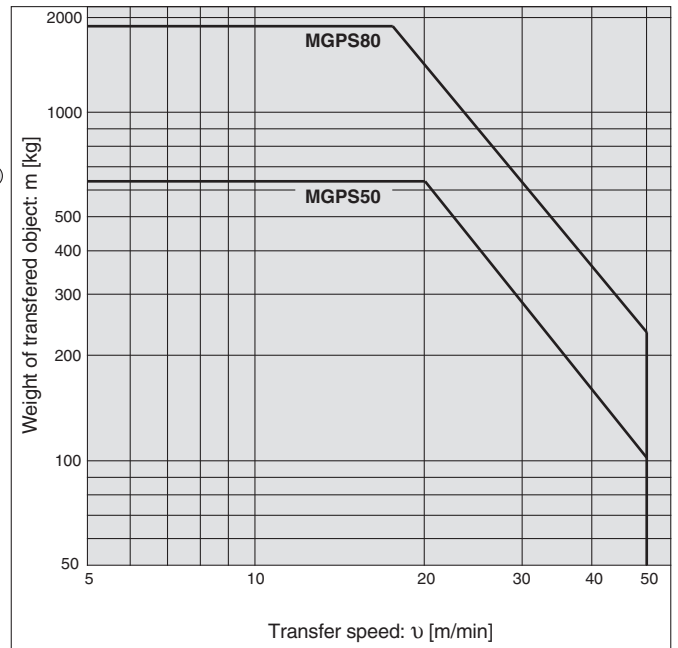
8 $\ell = 100 \text{ mm}$ $V = 400 \text{ mm/s}$



Operating Range when Used as Stopper



* When selecting a model with a longer l dimension, be sure to choose a bore size which is sufficiently large.



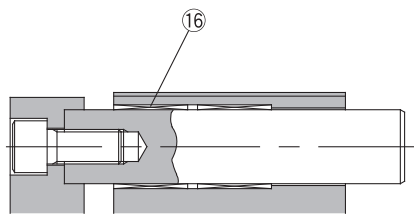
Caution

Handling precautions

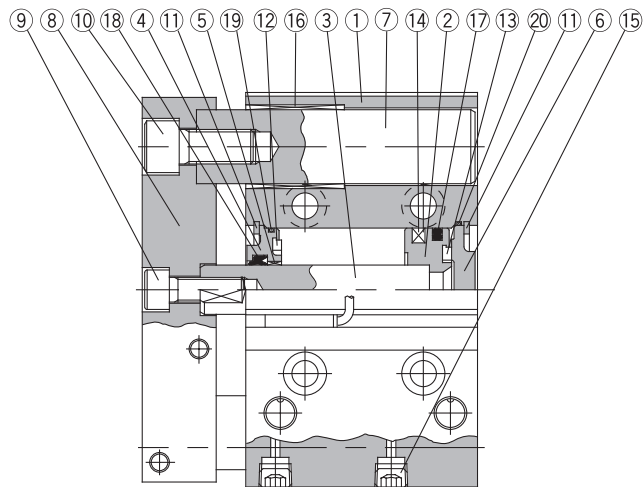
Note) When using as a stopper, select a model with a stroke of 50 mm or less.

Series MGPS

Construction



Over 50 mm stroke



50 mm stroke or less

Parts list

No.	Description	Material	Note	
1	Body	Aluminium alloy	Hard anodised	
2	Piston	Aluminium alloy	Chromated	
3	Piston rod	Carbon steel	Hard chrome plated	
4	Collar	Aluminium alloy casting	Coated	
5	Bushing	Lead bronze casting		
6	Head cover	Aluminium alloy	ø50	Colorless chromated
			ø80	Coated
7	Guide rod	Carbon steel	Hard chrome plated	
8	Plate	Carbon steel	Nickel plated	
9	Plate mounting bolt A	Carbon steel	Nickel plated	For piston rod
10	Plate mounting bolt B	Carbon steel	Nickel plated	For guide rod

Parts list

No.	Description	Material	Note
11	Snap ring	Carbon tool steel	Phosphate coated
12	Bumper A	Urethane	
13	Bumper B	Urethane	
14	Magnet	Synthetic rubber	
15	Hexagon socket head taper plug	Carbon steel	Nickel plated
16	Slide bearing	Lead bronze casting	
17*	Piston seal	NBR	
18*	Rod seal	NBR	
19*	Gasket A	NBR	
20*	Gasket B	NBR	

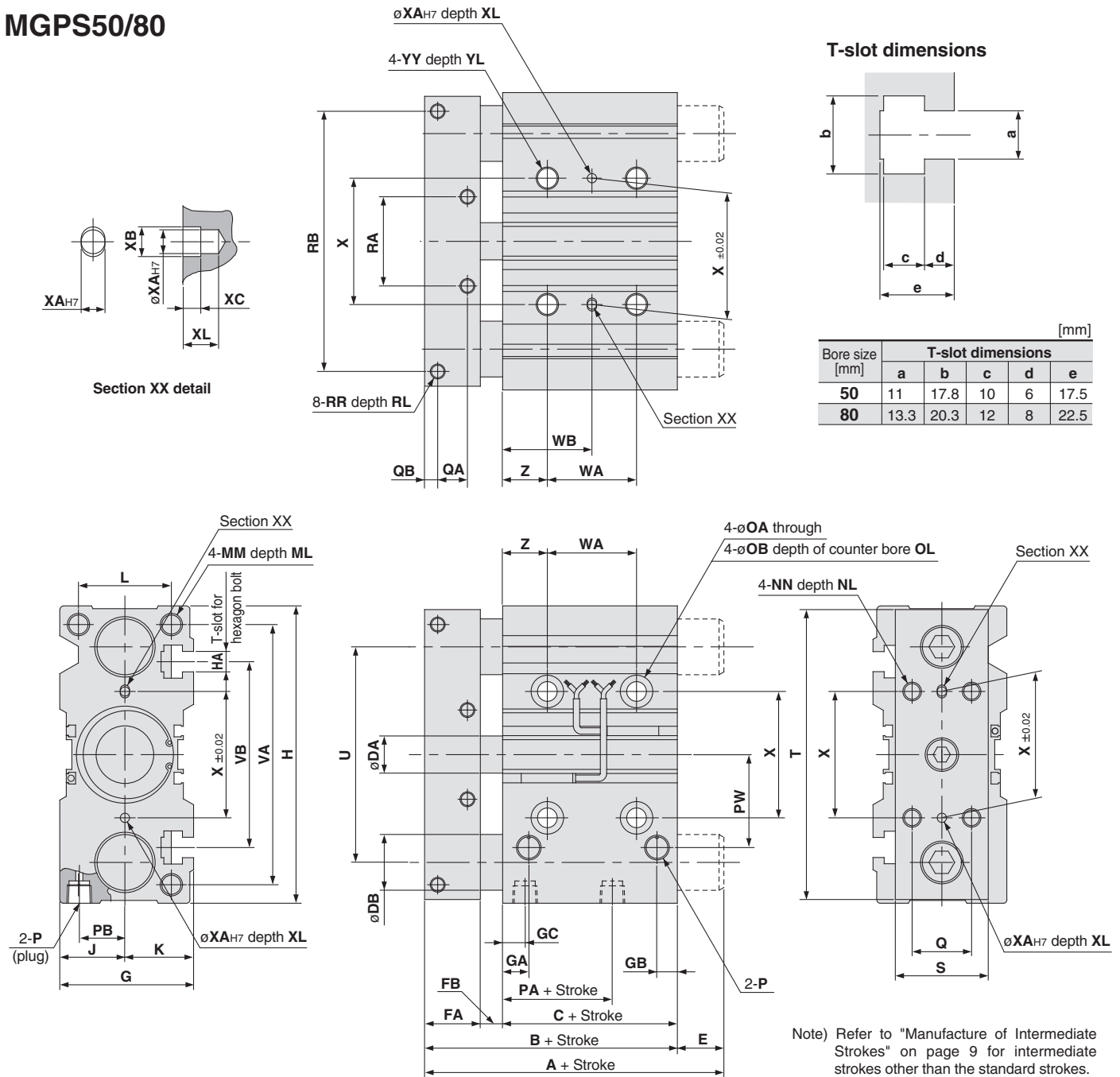
Replacement parts: Seal kits

Bore size [mm]	Kit no.	Contents
50	MGP50-PS	Kits include items 17, 18, 19 and 20 from the table above.
80	MGP80-PS	

* Seal kits are sets consisting of items 17 through 20 above, and can be ordered using the kit number for each bore size.

Dimensions

MGPS50/80



Dimensions

Bore size [mm]	Standard stroke [mm]	A		B	C	DA	DB	E		FA	FB	G	GA	GB	GC	H	HA	J	K	L
		25, 50 st	Over 50 st					25, 50 st	Over 50 st											
50	25, 50, 75, 100, 125, 150, 175, 200	86	110	86	44	20	30	0	24	30	12	72	14	11	12	160	M10	35	37	50
80	125, 150, 175, 200	118	151	118	65	25	45	0	33	35	18	95	19	24	14.5	242	M12	47	48	66
Bore size [mm]	Standard stroke [mm]	MM	ML	NN	NL	OA	OB	OL	P	PA	PB	PW	Q	QA	QB	RA	RB	RR	RL	
50	25, 50, 75, 100, 125, 150, 175, 200	M12 x 1.75	20	M10 x 1.5	20	10.6	17.5	13	Rc 1/4	9	24.5	50	32	16	7	48	140	M8 x 1.25	14	
80	125, 150, 175, 200	M16 x 2	32	M12 x 1.75	24	12.5	20	17.5	Rc 3/8	14.5	29	77	40	18	9	80	200	M10 x 1.5	20	
Bore size [mm]	Standard stroke [mm]	S	T	U	VA	VB	WA			WB			X	XA	XB	XC	XL			
							25 st	50, 75, 100 st	Over 100 st	25 st	50, 75, 100 st	Over 100 st								
50	25, 50, 75, 100, 125, 150, 175, 200	50	156	116	140	100	24	48	124	36	48	86	68	5	6	4	8			
80	125, 150, 175, 200	65	228	170	214	138	28	52	128	42	54	92	100	6	7	5	10			
Bore size [mm]	Standard stroke [mm]	YY	YL	Z																
50	25, 50, 75, 100, 125, 150, 175, 200	M12 x 1.75	24	24																
80	125, 150, 175, 200	M14 x 2	28	28																

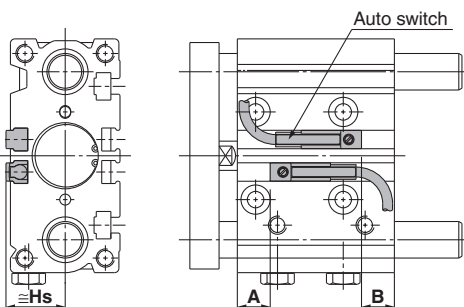
Series MGP

Auto Switch Mounting 1

Auto Switch Proper Mounting Position (Detection at Stroke End) and Its Mounting Height

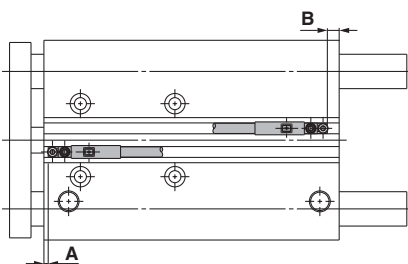
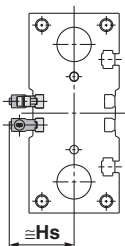
Heavy Duty Guide Rod Type

- | | | |
|-------------|-------------|----------|
| For D-A9□ | For D-Z7□ | ∅50, ∅80 |
| For D-A9□V | For D-Z80 | |
| For D-M9□ | For D-Y59□ | |
| For D-M9□V | For D-Y69□ | |
| For D-M9□W | For D-Y7P | |
| For D-M9□WV | For D-Y7PV | |
| For D-M9□A | For D-Y7□W | |
| For D-M9□AV | For D-Y7□WV | |
| | For D-Y7BA | |

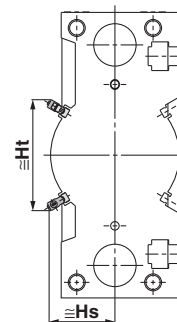


For D-P3DW□

∅50

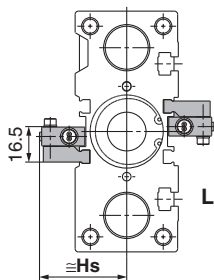
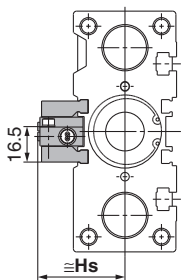


∅80



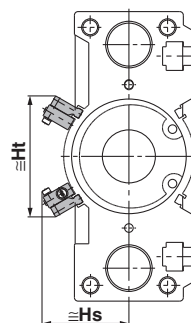
For D-P4DW

∅50



Less than 25 to 75 strokes

∅80



Auto Switch Proper Mounting Position

[mm]

Auto switch model Bore size [mm]	D-M9□ D-M9□V D-M9□W D-M9□WV D-M9□A D-M9□AV		D-A9□ D-A9□V		D-Z7□/Z80 D-Y59□/Y7P D-Y69□/Y7PV D-Y7□W D-Y7□WV D-Y7BA		D-P3DW		D-P4DW	
	A	B	A	B	A	B	A	B	A	B
50	12.5	16.5	8.5	12.5	7.5	11.5	4.5	8.5	7	11
80	18	23.5	14	19.5	13	18.5	10	15.5	12.5	18

Note) Adjust the auto switch after confirming the operating conditions in the actual setting.

Auto Switch Mounting Height

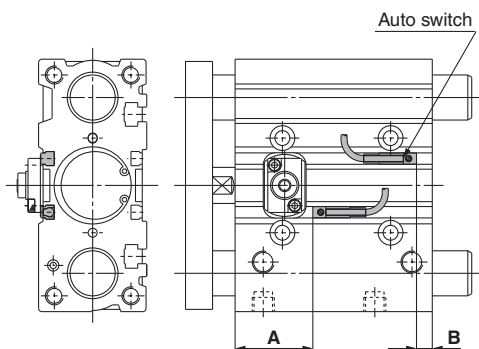
[mm]

Auto switch model Bore size [mm]	D-A9□/M9□/M9□W/M9□A D-Z7□/Z80/Y59□/Y7P D-Y7□W/Y7BA		D-A9□V		D-M9□V D-M9□WV D-M9□AV		D-Y69□ D-Y7PV D-Y7□WV		D-P3DW		D-P4DW	
	Hs	Ht	Hs	Ht	Hs	Ht	Hs	Ht	Hs	Ht	Hs	Ht
50	32.5	—	36	—	38.5	—	34	—	42.5	—	50	—
80	40	—	43	71.5	45	74	41	70	48	78.5	61	84.5

Auto Switch Proper Mounting Position (Detection at Stroke End) and Its Mounting Height

With rod end lock

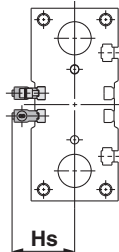
- | | |
|-------------|-------------|
| For D-A9□ | For D-Z7□ |
| For D-A9□V | For D-Z80 |
| For D-M9□ | For D-Y59□ |
| For D-M9□V | For D-Y69□ |
| For D-M9□W | For D-Y7P |
| For D-M9□WV | For D-Y7PV |
| For D-M9□A | For D-Y7□W |
| For D-M9□AV | For D-Y7□WV |
| | For D-Y7BA |



For D-P3DW

(* Cannot be mounted on bore sizes $\phi 20$.)

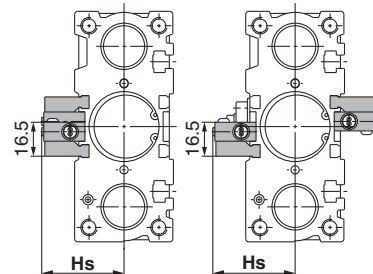
$\phi 25$ to $\phi 63$



For D-P4DW

(* Cannot be mounted on bore sizes $\phi 25$ or less.)

$\phi 32$ to $\phi 63$



Auto Switch Proper Mounting Position

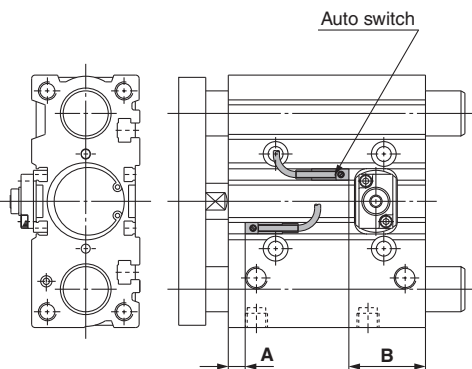
[mm]

Auto switch model	D-M9□ D-M9□V D-M9□W D-M9□WV D-M9□A D-M9□AV		D-A9□ D-A9□V		D-Z7□/Z80 D-Y59□/Y7P D-Y69□/Y7PV D-Y7□W D-Y7□WV D-Y7BA		D-P3DW		D-P4DW	
	A	B	A	B	A	B	A	B	A	B
20	40	7	36	3	35	2	—	—	—	—
25	40.5	7	36.5	3	35.5	2	32.5	0	—	—
32	37.5	10	33.5	6	32.5	5	29.5	2	32	4.5
40	43.5	10.5	39.5	6.5	38.5	5.5	35.5	2.5	38	5
50	44.5	9.5	40.5	5.5	39.5	4.5	36.5	1.5	39	4
63	47	12	43	8	42	7	39	4	41.5	6.5
80	68	23.5	64	19.5	63	18.5	60	15.5	62.5	18
100	72.5	28.5	68.5	24.5	67.5	23.5	64.5	20.5	67	23

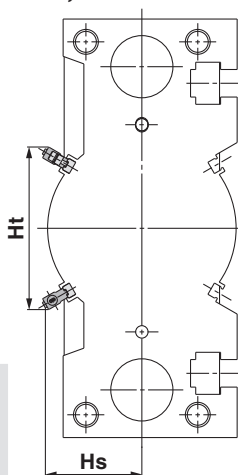
(Note) Adjust the auto switch after confirming the operating conditions in the actual setting.

With head end lock

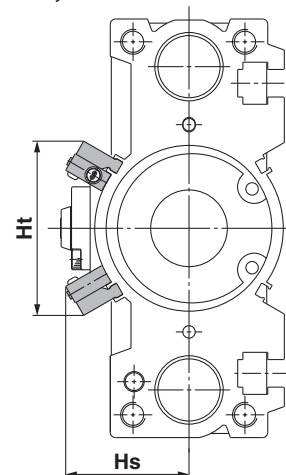
- | | |
|-------------|-------------|
| For D-A9□ | For D-Z7□ |
| For D-A9□V | For D-Z80 |
| For D-M9□ | For D-Y59□ |
| For D-M9□V | For D-Y69□ |
| For D-M9□W | For D-Y7P |
| For D-M9□WV | For D-Y7PV |
| For D-M9□A | For D-Y7□W |
| For D-M9□AV | For D-Y7□WV |
| | For D-Y7BA |



$\phi 80, \phi 100$



$\phi 80, \phi 100$



Auto Switch Mounting Height

Bore size	Hs	Ht
25	30	—
32	33	—
40	37	—
50	42.5	—
63	49.5	—
80	48	78.5
100	58	90

Auto Switch Mounting Height

Bore size	Hs	Ht
32	41.5	—
40	44.5	—
50	50	—
63	57	—
80	61	84.5
100	71	96.5

Auto Switch Proper Mounting Position

[mm]

Auto switch model	D-M9□ D-M9□V D-M9□W D-M9□WV D-M9□A D-M9□AV		D-A9□ D-A9□V		D-Z7□/Z80 D-Y59□/Y7P D-Y69□/Y7PV D-Y7□W D-Y7□WV D-Y7BA		D-P3DW		D-P4DW	
	A	B	A	B	A	B	A	B	A	B
20	9	38	5	34	4	33	—	—	—	—
25	9.5	38	5.5	34	4.5	33	1.5	30	—	—
32	10.5	37	6.5	33	5.5	32	2.5	29	5	31.5
40	14.5	39.5	10.5	35.5	9.5	34.5	6.5	31.5	9	34
50	12.5	41.5	8.5	37.5	7.5	36.5	4.5	33.5	7	36
63	15	44	11	40	10	39	7	36	9.5	38.5
80	18	73.5	14	69.5	13	68.5	10	65.5	12.5	68
100	22.5	78.5	18.5	74.5	17.5	73.5	14.5	70.5	17	73

(Note) Adjust the auto switch after confirming the operating conditions in the actual setting.

Mounting of Auto Switch

⚠ Caution

In the case of 25 st or less with head side end lock type, it might not insert auto switch from the rod side. In this case, install it after removing the plate temporarily.

Regarding the plate removal and the way of assembly, please consult with SMC.

Auto Switch Mounting 2

Minimum Auto Switch Mounting Stroke

Auto switch model	No. of auto switches mounted	ø20	ø25	ø32	ø40	ø50	ø63	ø80	ø100	
D-A9□	1 pc.					5				
	2 pcs.					10				
D-A9□V D-M9□V	1 pc.					5				
	2 pcs.					10				
D-M9□	1 pc.	5 Note 1)				5				
	2 pcs.					10				
D-M9□W	1 pc.					5 Note 1)				
	2 pcs.					10				
D-M9□WV D-M9□AV	1 pc.					5 Note 2)				
	2 pcs.					10				
D-M9□A	1 pc.					5 Note 2)				
	2 pcs.					10 Note 2)				
D-Z7□ D-Z80	1 pc.	5 Note 1)				5				
	2 pcs.					10				
D-Y59□ D-Y7P	1 pc.	5 Note 1)				5				
	2 pcs.					10				
D-Y69□ D-Y7PV	1 pc.					5				
	2 pcs.					5				
D-Y7□W D-Y7□WV	1 pc.					5 Note 2)				
	2 pcs.					10 Note 2)				
D-Y7BA	1 pc.					5 Note 2)				
	2 pcs.					10 Note 2)				
D-P3DW	1 pc.	—			15					
	2 pcs.	—			15					
D-P4DW	1 pc.	—			5 Note 2), Note 3)					
	2 pcs., different side	—			10 Note 2), Note 3)					
	2 pcs., same side	—			75			10		

Note 1) Confirm that it is possible to secure the minimum bending radius of 10 mm of the auto switch lead wire before use. Note 2) Confirm that it is possible to securely set the auto switch(es) within the range of indicator green light ON range before use. Note 3) The minimum bending radius of the D-P4DW is 20 mm. Note 4) The heavy duty guide rod type is available in ø50 and ø80. For in-line entry type, please also consider Note 1) shown above.

Operating Range

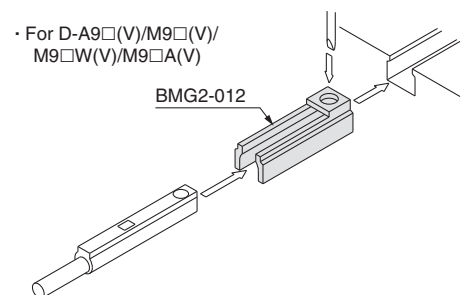
Auto switch model	Bore size [mm]							
	20	25	32	40	50	63	80	100
D-A9□/A9□V	9	9	9	9.5	9.5	11	10.5	10.5
D-M9□/M9□V D-M9□W/M9□WV D-M9□A/M9□AV	5.5	5	6	5.5	6	6.5	6	7
D-Z7□/Z80	10	10	10.5	10.5	10.5	11.5	11.5	12
D-Y59□/Y69□ D-Y7P/Y7PV D-Y7□W/Y7□WV D-Y7BA	7.5	7	6.5	6	7	8	9.5	10
D-P3DW	—	6	5.5	5.5	5.5	6.5	7.5	7.5
D-P4DW	—	—	5	4	4	5	4	4

* Since the operating range is provided as a guideline including hysteresis, it cannot be guaranteed (assuming approximately ±30% dispersion). It may vary substantially depending on an ambient environment.
* Cylinders with an end lock are available in ø20 to ø100.
* The heavy duty guide rod type is available in ø50 and ø80.

Auto Switch Mounting Bracket: Part No.

Auto switch model	Bore size [mm]			
	ø20	ø25	ø32 to ø100	
D-A9□/A9□V D-M9□/M9□V D-M9□W/M9□WV D-M9□A/M9□AV	BMG2-012			
D-P3DW	—	BMG6-025S		
D-P4DW	—	BMG1-040		

* Cylinders with an end lock are available in ø20 to ø100.
* The heavy duty guide rod type is available in ø50 and ø80.



• For D-A9□(V)/M9□(V)/M9□W(V)/M9□A(V)

Besides the models listed in How to Order, the following auto switches are applicable. For detailed specifications, refer to the Auto Switch Guide.

Auto switch type	Model	Electrical entry (Fetching direction)	Features
Reed	D-Z73, Z76	Grommet (In-line)	—
	D-Z80		Without indicator light
Solid state	D-Y69A, Y69B, Y7PV	Grommet (Perpendicular)	—
	D-Y7NWV, Y7PWV, Y7BWV		Diagnostic indication (2-color indication)
	D-Y59A, Y59B, Y7P	Grommet (In-line)	—
	D-Y7NW, Y7PW, Y7BW		Diagnostic indication (2-color indication)
	D-Y7BA		Water resistant (2-color indication)
	D-P5DW		Magnetic field resistant (2-color indication)

* For solid state auto switches, auto switches with a pre-wired connector are also available. Refer to the Auto Switch Guide for details.
* Normally closed (NC = b contact), solid state auto switch (D-F9G/F9H/Y7G/Y7H type) are also available. For details, refer to the Auto Switch Guide.



Series MGP

Actuator Precautions 1

Be sure to read before handling.

Design

⚠ Warning

1. There is a danger of sudden or erratic action by cylinders if sliding parts of machinery are twisted and changes in forces occur.

In such cases, bodily injury may occur, e.g., by catching hands or feet in the machinery, or damage to the machinery itself may occur. Therefore, the machinery should be adjusted to operate smoothly and designed to prevent such dangers.

2. A protective cover is recommended to minimize the risk of bodily injury.

If a driven object and moving parts of a cylinder pose a serious danger of bodily injury, design the structure to avoid contact with the human body.

3. Securely tighten all stationary parts and connected parts so that they will not become loose.

Especially when a cylinder operates with high frequency or is installed where there is a lot of vibration, ensure that all parts remain secure.

4. A deceleration circuit or shock absorber may be required.

When a driven object is operated at high speed or the load is heavy, a cylinder's cushion will not be sufficient to absorb impact. Install a deceleration circuit to reduce the speed before cushioning, or install an external shock absorber to relieve impact. In this case, the rigidity of the machinery should also be examined.

5. Take into account a possible drop in operating pressure due to a power outage.

When a cylinder is used as a clamping mechanism, there is a danger of work pieces dropping if there is a decrease in clamping force due to a drop in circuit pressure caused by a power outage. Therefore, safety equipment should be installed to prevent damage to machinery and bodily injury. Suspension mechanisms and lifting devices also require drop prevention measures.

6. Take into account a possible loss of power source.

Measures should be taken to protect against bodily injury and equipment damage in the event that there is a loss of power to equipment controlled by air pressure, electricity, or hydraulics.

7. Design circuitry to prevent sudden lurching of driven objects.

Take special care when a cylinder is operated by an exhaust centre type directional control valve or when it is starting up after residual pressure is exhausted from the circuit. The piston and its driven object will lurch at high speed if pressure is applied to one side of the cylinder because of the absence of air pressure inside the cylinder. Therefore, equipment should be selected and circuits designed to prevent sudden lurching because when this occurs, there is a danger of bodily injury, particularly to limbs, and/or damage to equipment.

8. Take into account emergency stops.

Design the system so that bodily injury and/or damage to machinery and equipment will not occur when machinery is stopped by a manual emergency stop or a safety device triggered by abnormal conditions.

9. Consider a system's action when operation is restarted after an emergency or abnormal stop.

Design machinery so that bodily injury or equipment damage will not occur upon restart of operation.

When the cylinder has to be reset at the starting position, install safe manual control equipment.

Selection

⚠ Warning

1. Confirm the specifications.

The products featured in this catalog are designed for use in industrial compressed air systems. If the products are used in conditions where pressure and/or temperature are outside the range of specifications, damage and/or malfunction may occur. Do not use in these conditions. (Refer to specifications.)

Consult with SMC if fluid other than compressed air is to be used.

2. Intermediate stops

When intermediate stopping of a cylinder piston is performed with a 3-position closed centre type directional control valve, it is difficult to achieve stopping positions as accurately and precisely as with hydraulic pressure due to the compressibility of air.

Furthermore, since valves and cylinders are not guaranteed for zero air leakage, it may not be possible to hold a stopped position for an extended period of time. Contact SMC if it is necessary to hold a stopped position for an extended period.

⚠ Caution

1. Operate within the limits of the maximum usable stroke.

The piston rod will be damaged if operated beyond the maximum stroke. Refer to the cylinder model selection procedure for the maximum usable stroke.

2. Operate the piston in such a way that collision damage will not occur at the stroke end.

The operation range should prevent damage from occurring when a piston, having inertial force, stops by striking the cover at the stroke end. Refer to the cylinder model selection procedure for the maximum usable stroke.

3. Use a speed controller to adjust the cylinder drive speed, gradually increasing from a low speed to the desired speed setting.

Piping

⚠ Caution

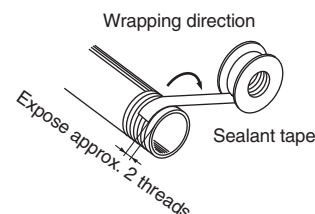
1. Preparation before piping

Before piping is connected, it should be thoroughly flushed out with air or water to remove chips, cutting oil, and other debris.

2. Wrapping of sealant tape

When screwing together pipes and fittings, be certain that chips from the pipe threads and sealing material do not get inside the piping.

Also, when sealant tape is used, leave 1.5 to 2 thread ridges exposed at the end of the threads.





Series MGP

Actuator Precautions 2

Be sure to read before handling.

Mounting

Caution

1. **Do not scratch or gouge the cylinder tube or the sliding parts of the piston rod by striking or grasping them with other objects.**

Cylinder bores are manufactured to precise tolerances, so that even a slight deformation may cause faulty operation.

Also, scratches or gouges in the piston rod may lead to damaged seals and cause air leakage.

2. **When attaching and tightening a work piece to the end of the plate, the plate should be secured while the piston rod is fully retracted to avoid excessive torque applied to the piston rod.**

3. **Do not use until you can verify that equipment can operate properly.**

Following mounting, repairs, or conversions, verify correct mounting by conducting suitable function and leakage tests after piping and power connections have been made.

4. **Instruction manual**

The product should be mounted and operated after thoroughly reading the manual and understanding its contents.

Keep the instruction manual where it can be readily referred to as needed.

Cushion

Caution

1. **Readjust using the cushion needle.**

Cushion needles are adjusted at the time of shipment. When the cylinder is put into service, the cushion needles on the housing should be readjusted based on factors such as the size of the load and the operating speed. When the cushion needles are turned clockwise, restriction of the air flow becomes greater and thus the cushioning effect also increases.

2. **Do not operate with the cushion needles fully closed.**

Seals may be damaged.

Lubrication

Caution

1. **Lubrication of non-lube type cylinder**

The cylinder is lubricated for life at the factory and can be used without any further lubrication.

However, in the event that additional cylinder lubrication is required, be sure to use ISO VG32 Class 1 turbine oil (with no additives).

Stopping lubrication later may lead to malfunctions because the new lubricant will cancel out the original lubricant. Therefore, additional lubrication must be continued once it has been started.

Air Supply

Warning

1. **Use clean air.**

Do not use compressed air containing chemicals, synthetic oils containing organic solvents, salt, or corrosive gases, as this can cause damage or malfunctions.

Air Supply

Caution

1. **Install air filters.**

Install air filters immediately upstream of valves. The filtration degree should be 5 μm or finer.

2. **Install an after-cooler, air dryer, or water separator (Drain Catch).**

Air that includes excessive drainage or condensate may cause malfunction of valves and other pneumatic equipment. To prevent this, install an after-cooler, air dryer, or water separator (Drain Catch).

3. **Use the product within the specified range of fluid and ambient temperature.**

Take measures to prevent freezing when below 5°C, since moisture in circuits can freeze and cause damage to seals and lead to malfunctions.

Refer to SMC's "Air Preparation System" catalog for further details on compressed air quality.

Operating Environment

Warning

1. **Do not use in environments where there is a danger of corrosion.**

Refer to the construction drawings regarding cylinder materials.

2. **In dusty locations or where water or oil splashing is a regular occurrence, protect the rod by installing a rod cover.**

In dusty locations, use a coil scraper type (available through special order). When there is splashing or spraying of liquid, use a water-resistant cylinder (available through special order).

3. **When using auto switches, do not operate in an environment where there are strong magnetic fields.**

Maintenance

Warning

1. **Perform maintenance inspection and service according to the procedures indicated in the instruction manual.**

Improper handling and maintenance may cause malfunctioning and damage of machinery or equipment to occur.

2. **Removal of components, and supply/exhaust of compressed air**

Before any machinery or equipment is removed, first ensure that the appropriate measures are in place to prevent the fall or erratic movement of driven objects and equipment, then cut off the electric power and reduce the pressure in the system to zero. Only then should you proceed with the removal of any machinery and equipment.

When machinery is restarted, proceed with caution after confirming that appropriate measures are in place to prevent cylinders from lurching.

Caution

1. **Filter drainage**

Drain out condensate from air filters regularly.



Series MGP

Auto Switch Precautions 1

Be sure to read before handling.

Design and Selection

Warning

1. Confirm the specifications.

Read the specifications carefully and use the product appropriately. The product may be damaged or malfunction if it is used outside the range of specifications for load current, voltage, temperature, or impact.

2. Take precautions when multiple cylinders are used close together.

When two or more auto switch cylinders are lined up in close proximity to each other, magnetic field interference may cause the switches to malfunction. Maintain a minimum cylinder separation of 40 mm. (When the allowable interval is specified for each cylinder series, use the indicated value.)

3. Monitor the length of time that a switch is ON at an intermediate stroke position.

When an auto switch is placed at an intermediate position of the stroke and a load is driven at the time the piston passes, the auto switch will operate, but if the speed is too great the operating time will be shortened and the load may not operate properly. The maximum detectable piston speed is:

$$V(\text{mm/s}) = \frac{\text{Auto switch operating range [mm]}}{\text{Load operating time [ms]}} \times 1000$$

4. Keep wiring as short as possible.

<Reed switches>

As the length of the wiring to a load gets longer, the rush current at switching ON becomes greater, and this may shorten the product's life. (The switch will stay ON all the time.)

- 1) For an auto switch without a contact protection circuit, use a contact protection box when the wire length is 5 m or longer.

<Solid state switches>

- 2) Although wire length should not affect switch function, use a wire that is 100 m or shorter.

5. Monitor the internal voltage drop of the switch.

<Reed switches>

- 1) Switches with an indicator light (except D-Z76)

- If auto switches are connected in series as shown below, take note that there will be a large voltage drop because of internal resistance in the light emitting diodes. (Refer to internal voltage drop in the auto switch specifications.)

[The voltage drop will be "n" times larger when "n" auto switches are connected.]

Even though an auto switch operates normally, the load may not operate.



- Similarly, when operating below a specified voltage, it is possible that the load may be ineffective even though the auto switch function is normal. Therefore, the formula below should be satisfied after confirming the minimum operating voltage of the load.

$$\text{Supply voltage} - \text{Internal voltage drop of switch} > \text{Minimum operating voltage of load}$$

- 2) If the internal resistance of a light emitting diode causes a problem, select a switch without an indicator light.

<Solid state switches>

- 3) Generally, the internal voltage drop will be greater with a 2-wire solid state auto switch than with a reed switch. Take the same precautions as in 1) above.

Also note that a 12 VDC relay is not applicable.

6. Monitor leakage current.

<Solid state switches>

With a 2-wire solid state auto switch, current (leakage current) flows to the load to operate the internal circuit even when in the OFF state.

If the condition given in the below formula is not met, the switch will not reset correctly (it stays ON).

Current to operate load (OFF condition) > Leakage current

Use a 3-wire switch if this condition cannot be satisfied. Moreover, leakage current flow to the load will be "n" times larger when "n" auto switches are connected in parallel.

7. Do not use a load that generates surge voltage.

<Reed switches>

If driving a load that generates surge voltage, such as a relay, use a switch with a built-in contact protection circuit or a contact protection box.

<Solid state switches>

Although a zener diode for surge protection is connected at the output side of a solid state auto switch, damage may still occur if a surge is applied repeatedly. When directly driving a load that generates surge, such as a relay or solenoid valve, use a switch with a built-in surge absorbing element.

8. Cautions for use in an interlock circuit

When an auto switch is used for an interlock signal requiring high reliability, devise a double interlock system to safeguard against malfunctions by providing a mechanical protection function, or by also using another switch (sensor) together with the auto switch.

Also perform periodic maintenance inspections and confirm proper operation.

9. Ensure sufficient clearance for maintenance activities.

When designing an application, be sure to allow sufficient clearance for maintenance and inspections.



Series MGP

Auto Switch Precautions 2

Be sure to read before handling.

Mounting and Adjustment

⚠ Warning

1. Do not drop or bump.

Do not drop, bump, or apply excessive impacts (300 m/s² or more for reed switches and 1000 m/s² or more for solid state switches) while handling. Although the body of the switch may not be damaged, the inside of the switch could be damaged and cause a malfunction.

2. Do not carry a cylinder by the auto switch lead wires.

Never carry a cylinder by its lead wires. This may not only cause broken lead wires, but it may cause internal elements of the switch to be damaged by the stress.

3. Mount switches using the proper tightening torque.

When a switch is tightened beyond the range of tightening torque, the mounting screws or switch may be damaged. On the other hand, tightening below the range of tightening torque may allow the switch to slip out of position.

4. Mount a switch at the center of the operating range.

Adjust the mounting position of an auto switch so that the piston stops at the center of the operating range (the range in which a switch is ON). (The mounting positions shown in the catalog indicate the optimum position at the stroke end.) If mounted at the end of the operating range (around the borderline of ON and OFF), the operation will be unstable.

Wiring

⚠ Warning

1. Avoid repeatedly bending or stretching lead wires.

Broken lead wires will result from repeatedly applying bending stress or stretching force to the lead wires.

2. Be sure to connect the load before power is applied.

<2-wire type>

If the power is turned on when an auto switch is not connected to a load, the switch will be instantly damaged because of excess current.

3. Confirm proper insulation of wiring.

Be certain that there is no faulty wiring insulation (such as contact with other circuits, ground fault, improper insulation between terminals). Damage may occur due to excess current flow into a switch.

4. Do not wire in conjunction with power lines or high voltage lines.

Wire separately from power lines or high voltage lines, avoiding parallel wiring or wiring in the same conduit with these lines. Control circuits containing auto switches may malfunction due to noise from these other lines.

Wiring

⚠ Warning

5. Do not allow short circuiting of loads.

<Reed switches>

If the power is turned on with a load in a short circuited condition, the switch will be instantly damaged because of excess current flow into the switch.

Take special care to avoid reverse wiring with the brown [red] power supply line and the black [white] output line on 3-wire type switches.

6. Avoid incorrect wiring.

<Reed switches>

A 24 VDC switch with indicator light has polarity. The brown [red] lead wire is (+), and the blue [black] lead wire is (-).

1) If connections are reversed, the switch will still operate, but the light emitting diode will not light up.

Also note that a current greater than the maximum specified one will damage a light emitting diode and make it inoperable.

<Solid state switches>

1) Even if connections are reversed on a 2-wire type switch, the switch will not be damaged because it is protected by a protection circuit, but it will remain in a normally ON state. However, it is still necessary to avoid reversed connections since the switch will be damaged if a load short circuits in this condition.

2) Even if (+) and (-) power supply line connections are reversed on a 3-wire type switch, the switch will still be protected by a protection circuit. However, if the (+) power supply line is connected to the blue [black] wire and the (-) power supply line is connected to the black [white] wire, the switch will be damaged.

* Lead wire colour changes

Lead wire colours of SMC switches have been changed in order to meet NECA Standard 0402 for production beginning September, 1996 and thereafter. Please refer to the tables provided. Special care should be taken regarding wire polarity during the time that the old colours still coexist with the new colours.

2-wire			3-wire		
	Old	New		Old	New
Output (+)	Red	Brown	Power supply (+)	Red	Brown
Output (-)	Black	Blue	Power supply GND	Black	Blue
			Output	White	Black

Solid state with diagnostic output			Solid state with latch type diagnostic output		
	Old	New		Old	New
Power supply (+)	Red	Brown	Power supply (+)	Red	Brown
Power supply GND	Black	Blue	Power supply GND	Black	Blue
Output	White	Black	Output	White	Black
Diagnostic output	Yellow	Orange	Latch type diagnostic output	Yellow	Orange



Series MGP

Auto Switch Precautions 3

Be sure to read before handling.

Operating Environment

Warning

1. Never use in the presence of explosive gases.

The construction of our auto switches does not make them explosion-proof. Never use them in the presence of an explosive gas, as this may cause a serious explosion

2. Do not use in an area where a magnetic field is generated.

Auto switches will malfunction or magnets inside cylinders will become demagnetized if used in such an environment.

3. Do not use in an environment where the auto switch will be continually exposed to water.

Auto switches satisfy IEC standard IP67 construction (JIS C0920: watertight construction). Nevertheless, they should not be used in applications where they are continually exposed to water splash or spray. This may cause deterioration of the insulation or swelling of the potting resin inside switches and may lead to a malfunction.

4. Do not use in an environment laden with oil or chemicals.

Consult with SMC if auto switches will be used in an environment laden with coolants, cleaning solvents, various oils, or chemicals. If auto switches are used under these conditions for even a short time, they may be adversely affected by a deterioration of the insulation, a malfunction due to swelling of the potting resin, or hardening of the lead wires.

5. Do not use in an environment with temperature cycles.

Consult with SMC if switches are to be used where there are temperature cycles other than normal temperature changes, as they may be adversely affected internally.

6. Do not use in an environment where there is excessive impact shock.

<Reed switches>

When excessive impact (300 m/s² or more) is applied to a reed switch during operation, the contact point may malfunction and generate or cut off a signal momentarily (1 ms or less). Consult with SMC regarding the need to use a solid state switch depending on the environment.

7. Do not use in an area where surges are generated.

<Solid state switch>

When there are units (such as solenoid type lifters, high frequency induction furnaces, motors) that generate a large amount of surge in the area around cylinders with solid state auto switches, their proximity may cause deterioration or damage to the internal circuit elements of the switches. Avoid and protect against sources of surge generation and crossed lines.

8. Avoid close contact with accumulated iron waste or magnetic substances.

When a large accumulated amount of ferrous waste such as machining chips or welding spatter, or a magnetic substance (something attracted by a magnet) is brought into close proximity to an cylinder with auto switches, this may cause the auto switches to malfunction due to a loss of the magnetic force inside the cylinder.

Maintenance

Warning

1. Perform the following maintenance inspection and services periodically in order to prevent possible danger due to unexpected auto switch malfunction.

1) Securely tighten switch mounting screws.

If screws become loose or the mounting position is dislocated, retighten screws securely after readjusting the mounting position.

2) Confirm that there is no damage to lead wires.

To prevent faulty insulation, replace switches or repair lead wires if damage is discovered.

3) Confirm that the green light on the 2-color indicator type switch lights up.

Confirm that the Green LED is ON when stopped at the set position. If the Red LED is ON when stopped at the set position, the mounting position is not appropriate. Readjust the mounting position until the Green LED lights up.

Other

Warning

1. Consult with SMC concerning water resistance, elasticity of lead wires, and usage at welding sites.



Series MGP Specific Product Precautions

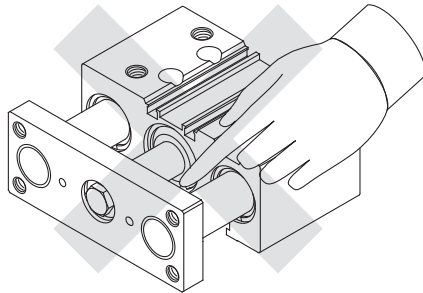
Be sure to read before handling.

Mounting

Warning

1. Do not put hands or fingers, etc. between the plate and body.

Be careful that hands or fingers, etc., do not get caught in the space between the cylinder body and the plate when air pressure is applied.



Caution

1. Do not scratch or nick the sliding parts of the piston rod and guide rods.

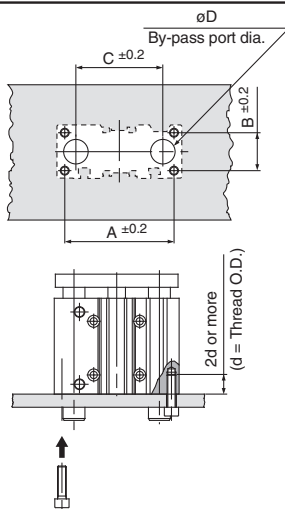
Damage to seals can cause air leaks or malfunction, etc.

2. Bottom of cylinder.

The guide rods protrude from the bottom of the cylinder at the end of the retracting stroke, and therefore, in cases where the cylinder is to be bottom mounted, it is necessary to provide by-pass ports in the mounting surface for the guide rods, as well as holes for the hexagon socket head screws which are used for mounting.

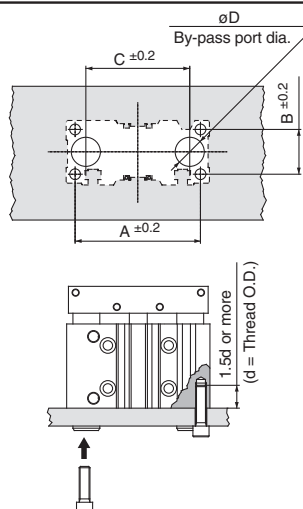
Moreover, in applications where impact occurs from a stopper, etc., the mounting bolts should be inserted to a depth of 2d or more (1.5d or more for MGPS).

Series MGP



Bore size [mm]	A [mm]	B [mm]	C [mm]	D [mm]		Hexagon socket mounting bolt
				MGPM	MGPL	
20	72	24	54	14	12	M5 x 0.8
25	82	30	64	18	15	M6 x 1.0
32	98	34	78	22	18	M8 x 1.25
40	106	40	86	22	18	M8 x 1.25
50	130	46	110	27	22	M10 x 1.5
63	142	58	124	27	22	M10 x 1.5
80	180	54	156	33	28	M12 x 1.75
100	210	62	188	39	33	M14 x 2.0

Series MGPS



Bore size [mm]	A [mm]	B [mm]	C [mm]	D [mm]	Hexagon socket mounting bolt
80	214	66	170	47	M16 x 2

Piping

Caution

Depending on the operating conditions, piping port positions can be changed by using a plug.

1. For M5

After tightening by hand, tighten an extra 1/6 to 1/4 rotation with a tightening tool.

2. For taper thread

Use the correct tightening torques listed below. Before tightening the plug, wrap pipe tape around it.

Connection thread size	Correct tightening torque N·m
R 1/8	7 to 9
R 1/4	12 to 14
R 3/8	22 to 24



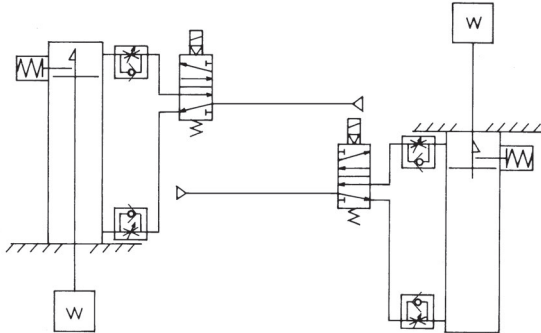
Series MGP Specific Product Precautions

Be sure to read before handling.

Use the recommended pneumatic circuits.

⚠ Caution

• This is necessary for proper operation and release of the lock.



With rear lock

With front lock

Operation

⚠ Caution

1. **Do not use 3 position solenoid valves.**

Avoid use in combination with 3 position solenoid valves (especially closed center metal seal types). If pressure is trapped in the port on the lock mechanism side, the cylinder cannot be locked.

Furthermore, even after being locked, the lock may be released after some time, due to air leaking from the solenoid valve and entering the cylinder.

2. **Back pressure is required when releasing the lock.**

Before starting operation, be sure to control the system so that air is supplied to the side without the lock mechanism as shown in the figure above. There is a possibility that the lock may not be released. (Refer to the section on releasing the lock.)

3. **Release the lock when mounting or adjusting the cylinder.**

If mounting or other work is performed when the cylinder is locked, the lock unit may be damaged.

4. **Operate with a load ratio of 50% or less.**

If the load ratio exceeds 50%, this may cause problems such as failure of the lock to release, or damage to the lock unit. Furthermore, do not exceed the operating ranges indicated in the series MGP catalog (Best Pneumatics No. 2) when making selections.

5. **Do not operate multiple synchronized cylinders.**

Avoid applications in which two or more end lock cylinders are synchronized to move one workpiece, as one of the cylinder locks may not be able to release when required.

6. **Use a speed controller with the meter-out function.**

It may not be possible to release the lock with meter-in control.

7. **Be sure to operate completely to the cylinder stroke end on the side with the lock.**

If the cylinder piston does not reach the end of the stroke, locking and unlocking may not be possible.

8. **Do not use an air cylinder as an air-hydro cylinder.**

This will cause leakage of hydraulic fluid.

9. **Adjust an auto switch's position so that it operates for movement to both the stroke and backlash (2 mm) positions.**

A 2 color indication switch adjusted for green indication at the stroke end may change to red indication after the backlash return, but this is not abnormal.

Operating Pressure

⚠ Caution

1. Use air pressure of at least 0.15 MPa for the port on the lock mechanism side. This is necessary to release the lock.

Exhaust Speed

⚠ Caution

1. Locking will occur automatically if the pressure applied to the port on the lock mechanism side falls to 0.05 MPa or less. In cases where the piping on the lock mechanism side is long and thin, or the speed controller is separated at some distance from the cylinder port, the exhaust speed will be reduced. Take note that some time may be required for the lock to engage. In addition, clogging of a silencer mounted on the solenoid valve exhaust port can produce the same effect.

Releasing the Lock

⚠ Warning

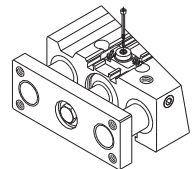
1. Before releasing the lock, be sure to supply air to the side without the lock mechanism, so that there is no load applied to the lock mechanism when it is released. (Refer to the recommended pneumatic circuits.) If the lock is released when the port on the other side is in an exhaust state, and with a load applied to the lock unit, the lock unit may be subjected to an excessive force and be damaged. Furthermore, sudden movement of the piston rod is very dangerous.

Manual Release

⚠ Caution

1. **Non-locking type manual release**

Insert the accessory bolt from the top of the rubber cap (it is not necessary to remove the rubber cap), and after screwing it into the lock piston, pull it to release the lock. If you stop pulling the bolt, the lock will return to an operational state. Thread sizes, pulling forces and strokes are as shown below.



Bore size [mm]	Thread size	Pulling force [N]	Stroke [mm]
20, 25, 32	M2.5 x 0.45 x 25 ℓ or more	4.9 N	2
40, 50, 63	M3 x 0.5 x 30 ℓ or more	10 N	3
80, 100	M5 x 0.8 x 40 ℓ or more	24.5 N	3

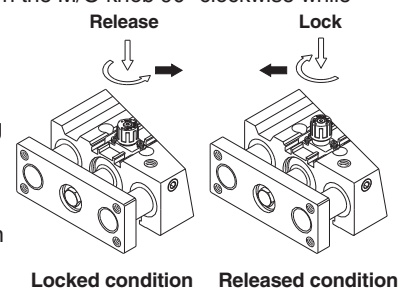
* Remove the bolt for normal operation. It can cause lock malfunction or faulty release.

2. **Locking type manual release**

While pushing the M/O knob turn it 90° counter clockwise. The lock is released (and remains in a released state) by aligning the ▲ mark on the cap with the ▼ OFF mark on the M/O knob.




To operate the lock, turn the M/O knob 90° clockwise while pushing it all the way down, and align the ▲

mark on the cap with the ▼ ON mark on the M/O knob. When doing this, be sure that it locks into place with a click. Failure to click into place properly, can cause the lock to disengage.



Safety Instructions

These safety instructions are intended to prevent hazardous situations and/or equipment damage. These instructions indicate the level of potential hazard with the labels of “Caution,” “Warning” or “Danger.” They are all important notes for safety and must be followed in addition to International Standards (ISO/IEC)*1), and other safety regulations.

-  **Caution:** Caution indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.
-  **Warning:** Warning indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.
-  **Danger:** Danger indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

- *1) ISO 4414: Pneumatic fluid power – General rules relating to systems.
- ISO 4413: Hydraulic fluid power – General rules relating to systems.
- IEC 60204-1: Safety of machinery – Electrical equipment of machines. (Part 1: General requirements)
- ISO 10218-1: Manipulating industrial robots - Safety. etc.

Warning

1. The compatibility of the product is the responsibility of the person who designs the equipment or decides its specifications.

Since the product specified here is used under various operating conditions, its compatibility with specific equipment must be decided by the person who designs the equipment or decides its specifications based on necessary analysis and test results. The expected performance and safety assurance of the equipment will be the responsibility of the person who has determined its compatibility with the product. This person should also continuously review all specifications of the product referring to its latest catalogue information, with a view to giving due consideration to any possibility of equipment failure when configuring the equipment.

2. Only personnel with appropriate training should operate machinery and equipment.

The product specified here may become unsafe if handled incorrectly. The assembly, operation and maintenance of machines or equipment including our products must be performed by an operator who is appropriately trained and experienced.

3. Do not service or attempt to remove product and machinery/equipment until safety is confirmed.

1. The inspection and maintenance of machinery/equipment should only be performed after measures to prevent falling or runaway of the driven objects have been confirmed.
2. When the product is to be removed, confirm that the safety measures as mentioned above are implemented and the power from any appropriate source is cut, and read and understand the specific product precautions of all relevant products carefully.
3. Before machinery/equipment is restarted, take measures to prevent unexpected operation and malfunction.

4. Contact SMC beforehand and take special consideration of safety measures if the product is to be used in any of the following conditions.

1. Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.
2. Installation on equipment in conjunction with atomic energy, railways, air navigation, space, shipping, vehicles, military, medical treatment, combustion and recreation, or equipment in contact with food and beverages, emergency stop circuits, clutch and brake circuits in press applications, safety equipment or other applications unsuitable for the standard specifications described in the product catalogue.
3. An application which could have negative effects on people, property, or animals requiring special safety analysis.
4. Use in an interlock circuit, which requires the provision of double interlock for possible failure by using a mechanical protective function, and periodical checks to confirm proper operation.

Limited warranty and Disclaimer/ Compliance Requirements

The product used is subject to the following “Limited warranty and Disclaimer” and “Compliance Requirements”.

Read and accept them before using the product.

Limited warranty and Disclaimer

1. The warranty period of the product is 1 year in service or 1.5 years after the product is delivered, whichever is first.*2)

Also, the product may have specified durability, running distance or replacement parts. Please consult your nearest sales branch.

2. For any failure or damage reported within the warranty period which is clearly our responsibility, a replacement product or necessary parts will be provided. This limited warranty applies only to our product independently, and not to any other damage incurred due to the failure of the product.
3. Prior to using SMC products, please read and understand the warranty terms and disclaimers noted in the specified catalogue for the particular products.

*2) Vacuum pads are excluded from this 1 year warranty.

A vacuum pad is a consumable part, so it is warranted for a year after it is delivered.

Also, even within the warranty period, the wear of a product due to the use of the vacuum pad or failure due to the deterioration of rubber material are not covered by the limited warranty.

Compliance Requirements

1. The use of SMC products with production equipment for the manufacture of weapons of mass destruction (WMD) or any other weapon is strictly prohibited.
2. The exports of SMC products or technology from one country to another are governed by the relevant security laws and regulations of the countries involved in the transaction. Prior to the shipment of a SMC product to another country, assure that all local rules governing that export are known and followed.

Caution

1. The product is provided for use in manufacturing industries.

The product herein described is basically provided for peaceful use in manufacturing industries.

If considering using the product in other industries, consult SMC beforehand and exchange specifications or a contract if necessary.

If anything is unclear, contact your nearest sales branch.

Caution

SMC products are not intended for use as instruments for legal metrology.

Measurement instruments that SMC manufactures or sells have not been qualified by type approval tests relevant to the metrology (measurement) laws of each country. Therefore, SMC products cannot be used for business or certification ordained by the metrology (measurement) laws of each country.

Safety Instructions

Be sure to read “Handling Precautions for SMC Products” (M-E03-3) before using.

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