

Compact Guide Cylinder

Series MGP

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

Series MGP standard type and series MGPA high precision ball bushing bearing type (except with end lock) products have been remodeled for a lightweight design. When selecting a product, refer to the new MGP-Z series.



Series Variations

Series	Bearing type	Cushion	Bore size (mm)										Page		
			12	16	20	25	32	40	50	63	80	100			
Standard type MGP	Slide bearing Ball bushing bearing	Rubber bumper	●	●	●	●	●	●	●	●	●	●	●	●	P. 343
With air cushion MGP		Air cushion		●	●	●	●	●	●	●	●	●	●	●	P. 363
With end lock MGP		Rubber bumper			●	●	●	●	●	●	●	●	●	●	P. 380
Heavy duty guide rod type MGPS		Slide bearing	Rubber bumper							●		●			P. 390
High precision ball bushing bearing type MGPA		Ball bushing bearing	Rubber bumper/ Air cushion	●	●	●	●	●	●	●	●	●	●	●	P. 399

MGJ

MGP
-Z

MGP

MGPW

MGQ

MGG

MGC

MGF

MGT

MGT

Page

D-□

-X□

Combinations of Standard Products and Made

Series MGP

● : Standard ◎ : Made to Order specifications ○ : Special product (Contact SMC for details.) — : Not available

Bearing		Basic type		Air cushion	
		Slide bearing	Ball bushing	Slide bearing	Ball bushing
		MGPM	MGPL	MGPM	MGPL
Type					
Bore size		ø12 to 100		ø16 to 100	
Basic type		●	●	—	—
With air cushion		—	—	●	●
With end lock		—	—	○	○
12-	Clean series <small>Note 1</small>	—	●	—	○
13-	Clean series <small>Note 1</small>	—	●	—	○
25-	Copper (Cu)-free <small>Note 7</small>	●	●	○	○
25A-	Copper (Cu) and zinc (Zn)-free <small>Note 7</small>	●	●	○	○
20-	Copper <small>Note 5</small> /Fluorine-free	●	●	●	●
21-	Copper-free/Clean series <small>Note 1</small>	—	●	—	○
R/V	Water resistant <small>Note 2</small>	●	—	○	—
XB6	Heat resistant cylinder (–10 to 150°C) <small>Note 3</small>	◎	—	○	—
XB9	Low speed cylinder (10 to 50 mm/s)	○	○	○	○
XB10	Intermediate stroke (Exclusive body)	◎	◎	○	○
XB13	Low speed cylinder (5 to 50 mm/s)	◎	◎	○	○
XB22	Shock absorber/Soft type	◎	◎	—	—
XC4□	With heavy duty scraper <small>Note 4</small>	◎	◎	○	○
XC6□	Made of stainless steel	◎	◎	○	○
XC8	Adjustable stroke cylinder/Adjustable extension type	◎	◎	—	—
XC9	Adjustable stroke cylinder/Adjustable retraction type	◎	◎	—	—
XC19	Intermediate stroke (Spacer type)	—	—	◎	◎
XC22	Fluororubber seals <small>Note 5</small>	◎	—	○	—
XC35□	With coil scraper <small>Note 4</small>	◎	◎	○	○
XC69	With shock absorber	◎	◎	—	—
XC79	Machining tapped hole, drilled hole and pin hole additionally	◎	◎	◎	◎
XC82	Bottom mounting style	◎	—	○	—
XC92	Dust resistant cylinder	◎	○	○	○
X144	Symmetrical port position	◎	◎	○	○
X867	Lateral piping type (Change of plug position)	◎	◎	◎	◎

Note 1) MGPL: 12 to 63 only

Note 2) MGPL: 20 to 100 only

Note 3) Without cushion, MGPL: (—), (○): With auto switch

Note 4) For ø20 to ø100 only

Note 5) Without cushion, MGPL: (—).

Note 6) Copper-free for the externally exposed part.

Note 7) For details, refer to the SMC website.

to Order Specifications

Series **MGP**

	With end lock		Heavy duty guide type	High precision ball bushing type		
	Slide bearing	Ball bushing	Slide bearing	Basic type	Air cushion	With end lock
	MGPM	MGPL	MGPS	MGPA	MGPA	MGPA
	ø20 to 100		ø50, ø80	ø12 to 100	ø16 to 100	ø20 to 100
	—	—	●	●	—	—
	○	○	○	—	●	○
	●	●	○	—	○	●
	—	○	—	—	—	—
	—	○	—	—	—	—
	○	○	○	○	○	○
	○	○	○	○	○	○
	○	○	○	●	○	○
	—	○	—	—	—	—
	○	—	○	—	—	—
	○	—	○	—	—	—
	○	○	○	○	○	○
	○	○	○	⊙	⊙	○
	○	○	○	○	○	○
	—	—	—	⊙	—	—
	○	○	○	⊙	○	○
	○	○	○	—	—	—
	—	—	○	⊙	—	—
	—	—	○	⊙	—	—
	—	—	—	—	⊙	—
	○	—	○	—	—	—
	○	○	○	⊙	○	○
	—	—	○	⊙	—	—
	⊙	⊙	○	⊙	⊙	⊙
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	○	○	○	○	○	○
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	⊙	⊙	⊙	⊙	⊙	⊙

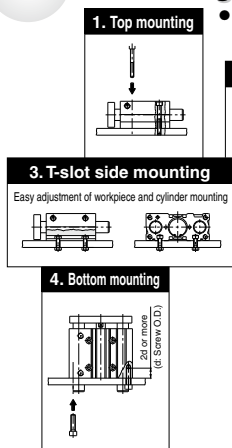
- MGJ
- MGP-Z
- MGP**
- MGPW
- MGQ
- MGG
- MGC
- MGF
- MGZ
- MGT

- D-□
- X□

Compact Guide Cylinder Series *MGP*

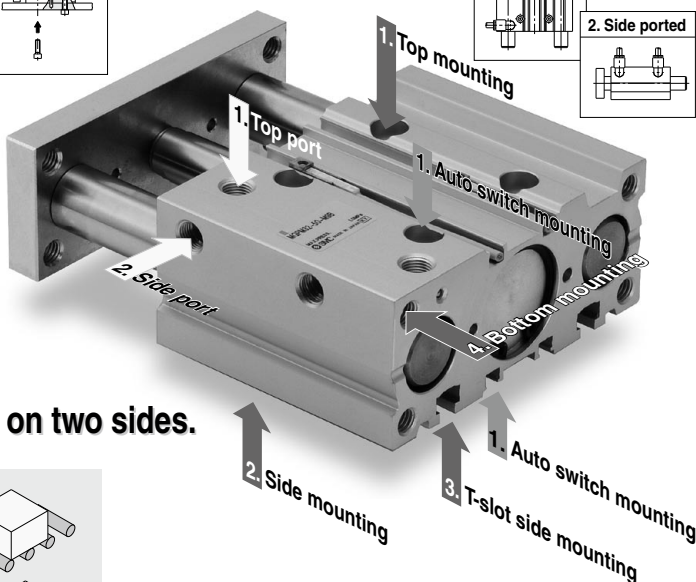
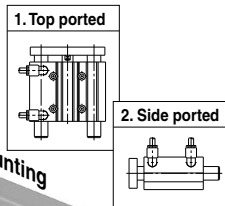
∅12, ∅16, ∅20, ∅25, ∅32, ∅40, ∅50, ∅63, ∅80, ∅100

Four mounting styles provided

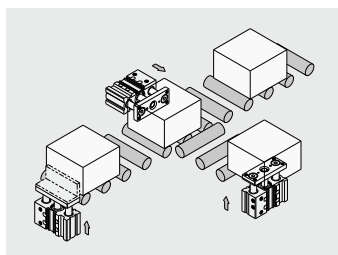


- Easy positioning
Knock pin holes provided on each mounting surface

Piping is possible from two directions



Auto switches can be mounted on two sides.



Two types of guide rod bearing to accommodate various applications

Slide bearing

The lateral withstand load is more than twice that of a conventional stopper cylinder (round bar type), and is suitable for use with lateral loads accompanied by impact, as in stoppers.

Ball bushing bearing

Suitable for use as a pusher and lifter.

Long strokes up to 400 mm are standardized.

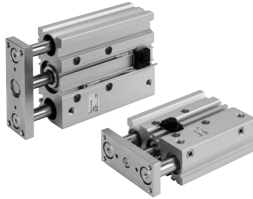
Stroke Variations

Bearing type	Bore size (mm)	Stroke (mm)																Intermediate stroke	
		10	20	25	30	40	50	75	100	125	150	175	200	250	300	350	400		
MGPM Slide bearing	12	•	•																Spacer installation type Available by the 1 mm & 5 mm interval. Exclusive body (-XB10) in stroke increments of 1 mm
	16																		
	20																		
	25																		
	32																		
MGPL Ball bushing bearing	40																		
	50																		
	63																		
	80																		
	100																		

● With end lock type

- Holds the cylinder's home position even if the air supply is cut off.
- Compact body $\phi 20$ to $\phi 63$ Standard + 25 mm body length
 $\phi 80$, $\phi 100$ Standard + 50 mm body length

■ Stroke Variations

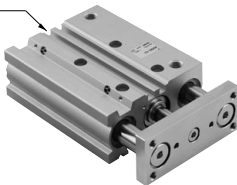


Bearing type	Bore size (mm)	Stroke (mm)																	Intermediate stroke	Lock direction	Manual release	
		25	50	75	100	125	150	175	200	250	300	350	400									
MGPM Slide bearing	20	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	Spacer type available by the 5 mm stroke interval.	Rod end lock	Non-lock type
	25	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•			
	32	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•			
	40	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•			
MGPL Ball bushing bearing	50	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	Head end lock	Lock type	
	63	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•			
	80	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•			
	80	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•			
	100	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•			
	100	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•			•

● With air cushion type

- An air cushion has been added to the compact guide cylinder to suppress vibration and noise at the stroke end. It can absorb nearly three times as much kinetic energy as a rubber bumper.

Cushion valve is built into the body



■ Stroke Variations

Bearing type	Bore size (mm)	Stroke (mm)														Intermediate stroke				
		25	50	75	100	125	150	175	200	250	300	350	400							
MGPM Slide bearing	16	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	Strokes available by the 1 mm interval by changing the collar.
	20	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
	25	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
	32	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
MGPL Ball bushing bearing	40	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
	50	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
	63	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
	80	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
	80	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
	100	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	

● Heavy duty guide rod type with improved load resistance



■ Stroke Variations

Bearing type	Bore size (mm)	Stroke (mm)								
		25	50	75	100	125	150	175	200	
MGPS Slide bearing	50	•	•	•	•	•	•	•	•	•
	80	•	•	•	•	•	•	•	•	•

- Anti-lateral load: $\Delta 10\%$ increase
- Eccentric load resistance: $\Delta 25\%$ increase
- Impact load resistance: $\Delta 140\%$ increase
(Compared with MGPM50 compact guide cylinder)

Bore size (mm)	Guide rod diameter (mm)	
	MGPS	MGPM
50	30	25
80	45	30

MGJ

MGZ

MGW

MGQ

MG

MG

MG

MG

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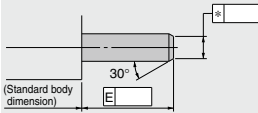
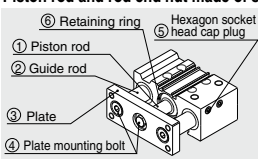
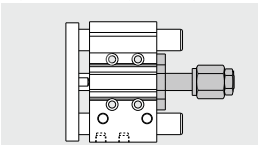
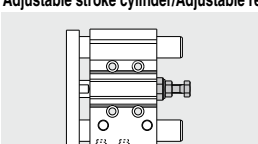
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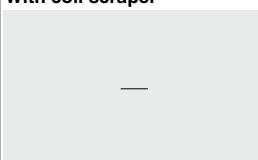
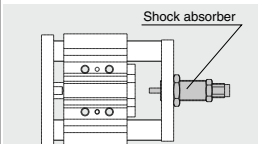
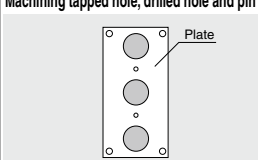
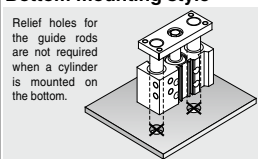
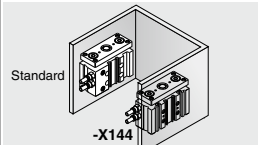
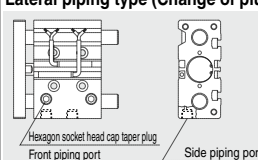
MG

MG

MG

Full Made to Order Variation

Description	
Heat resistant cylinder (-10 to 150°C) Symbol -XB6 An air cylinder with special seal material and grease, so that it can be used even at an ambient temperature range from -10°C up to 150°C. (MGPM only)	
Intermediate stroke (Using exclusive body) Symbol -XB10 When intermediate strokes other than standard strokes are used, this cylinder could shorten the full length and reduce the mounting space with an exclusive body without a spacer.	
Low speed cylinder (5 to 50mm/s) Symbol -XB13 Smooth operation is possible with minimal sticking and slipping at low speeds of 5 to 50 mm.	
With heavy duty scraper Symbol -XC4 A cylinder with a heavy duty scraper is used for the wiper ring is suitable for use in an environment where there is a lot of dust in the surrounding area or where the equipment is exposed to earth and sand (die-casting equipment, construction machinery, industrial vehicles, etc.).	
Change of guide rod end shape Symbol -XA1,6,17,21  Some patterns of guide rod end shape. 4 diagrams are available. Specify dimensions on a drawing and order the desired product.	
Piston rod and rod end nut made of stainless steel Symbol -XC6  These are suitable for cases where rust or corrosion due to being immersed in water are likely. Use stainless steel for parts ① to ⑥.	
Adjustable stroke cylinder/Adjustable extension type Symbol -XC8  Install a stroke adjusting unit on the head side to adjust strokes at the outlet. (After adjusting stroke, both-side cushion style is changed into single side cushion style.)	
Adjustable stroke cylinder/Adjustable retraction type Symbol -XC9  The retract stroke of the cylinder can be adjusted with the adjusting bolt.	
Intermediate stroke (Spacer type) Symbol -XC19 When intermediate strokes other than standard strokes are used, this cylinder could shorten the full length and reduce the mounting space with a spacer.	
Fluororubber seals Symbol -XC22 Fluororubber is used for seals.	

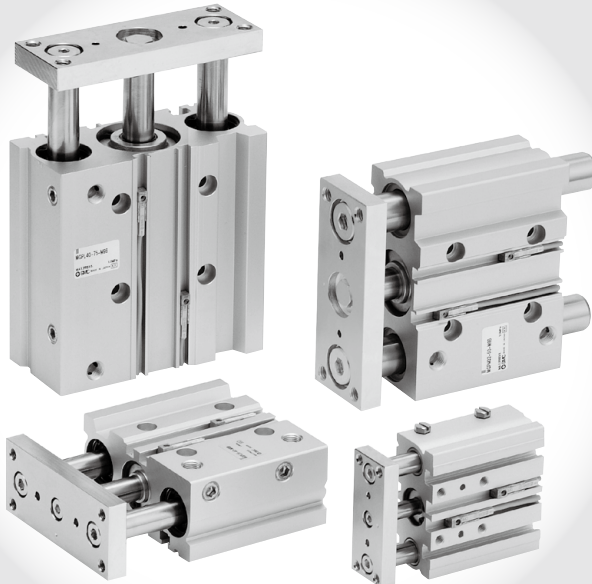
Description	
With coil scraper Symbol -XC35  It gets rid of frost, ice, weld spatter, cutting chips adhered to the piston rod, and protects the seals, etc.	
With shock absorber Symbol -XC69 -XB22  A shock absorber reduces the impact on the stroke extended side end.	
Machining tapped hole, drilled hole and pin hole additionally Symbol -XC79  Tapped, drilled and pin holes are additionally machined to install a workpiece to the plate.	
Bottom mounting style Symbol -XC82  Relief holes for the guide rods are not required when a cylinder is mounted on the bottom. The guide rod does not protrude from the bottom when the rod is retracting.	
Symmetrical port position Symbol -X144  This makes it easy to remove and rotate piping when it is mounted on a wall where mounting space is limited.	
Lateral piping type (Change of plug position) Symbol -X867  A type which plugs the piping port on the top in order to use it on the side.	

Compact Guide Cylinder

Series MGP

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

Series MGP standard type has been remodeled for a lightweight design. When selecting a product, refer to the new MGP-Z series.



- MGJ
- MGP-Z
- MGP**
- MGPW
- MGQ
- MGG
- MGX
- MGF
- MGZ
- MGY

Stroke Variations

Bearing type	Bore size (mm)	Stroke (mm)																	Intermediate stroke
		10	20	25	30	40	50	75	100	125	150	175	200	250	300	350	400		
MGPM Slide bearing	12																		Spacer installation type Available by the 1 mm & 5 mm interval. Exclusive body (-XB10) in stroke increments of 1 mm
	16																		
	20																		
	25																		
	32																		
MGPL Ball bushing bearing	40																		
	50																		
	63																		
	80																		
	100																		

- D-□
- X□



Series MGP Specific Product Precautions 1

Be sure to read before handling.

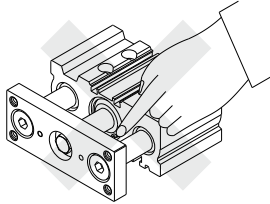
Refer to front matter 39 for Safety Instructions and pages 3 to 12 for Actuator and Auto Switch Precautions.

Mounting

Warning

1. **Never place your hands or fingers between the plate and the body.**

Be very careful to prevent your hands or fingers from getting caught in the gap between the cylinder body and the plate when air is applied.



Caution

1. **Use cylinders within the piston speed range.**

An orifice is set for this cylinder, but the piston speed may exceed the operating range if the speed controller is not used. If the cylinder is used outside the allowable speed range, it may cause damage to the cylinder and shorten the service life. Adjust the speed by installing the speed controller and use the cylinder within the limited range.

2. **Do not scratch or gouge the sliding portion of the piston rod and the guide rod.**

Damaged seals, etc. will result in leakage or malfunction.

3. **Do not dent or scratch the mounting surface of a body and a plate.**

The flatness of the mounting surface may not be maintained, which would cause an increase in sliding resistance.

4. **Make sure that the cylinder mounting surface has a flatness of 0.05 mm or less.**

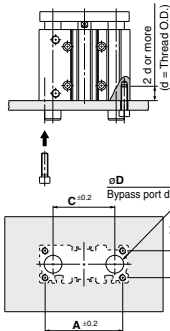
If the flatness of the workpieces and brackets mounted on the plate is not appropriate, sliding resistance may increase.

5. **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 bypass ports in the mounting surface for the guide rods, as well as holes for the hexagon socket head screws which are used for mounting.

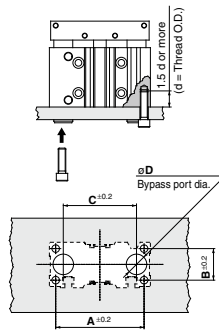
Moreover, in applications where impact occurs from a stopper, etc., the mounting bolts should be inserted to a depth of 2 d or more (1.5 d or more for MGPS).

Series MGP



Bore size (mm)	A (mm)	B (mm)	C (mm)	D (mm)		Hexagon socket head cap screw
				MGP	MGPL	
12	50	18	41	10	8	M4 x 0.7
16	56	22	46	12	10	M5 x 0.8
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 head cap screw
50	140	50	116	32	M12 x 1.75
80	214	66	170	47	M16 x 2

Cushion

With air cushion

Warning

1. **Do not open the cushion valve excessively.**

Air leakage will occur if operated after opening by 4 rotations or more. Furthermore, a stopper mechanism is provided for the cushion valve, and it should not be forced open beyond that position. Be aware that the cushion valve may jump up from the cover when the air is supplied.

Caution

1. **Be sure to use the cylinder after the air cushion has been adjusted appropriately.**

First, fully close the cushion valve. Start the operation at the cylinder speed to be used with the load applied, and then open the cushion valve gradually to make the adjustment. The optimal adjustment is that the piston reaches its stroke end and the collision sound is minimized. If the cushion valve is used without adjusting the air cushion appropriately, this may cause damage to the retaining ring or piston.

Bore size (mm)	Applicable tool
16	Flat head watchmakers' screwdriver 3 mm
20,25,32,40	JIS B 4648 hexagon wrench key 1.5
50,63	JIS B 4648 hexagon wrench key 2.5
80,100	JIS B 4648 hexagon wrench key 4

2. **Be sure to operate a cylinder equipped with air cushion to the end of the stroke.**

If it is not operated to the end of the stroke, the effect of the air cushion will not be fully exhibited. Consequently, in cases where the stroke is regulated by an external stopper, etc., caution must be exercised, as the air cushion may become completely ineffective.

Piping

Caution

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

1. **For M5**

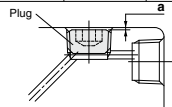
After tightening by hand, tighten additional 1/6 to 1/4 rotation with a tightening tool.

2. **For taper thread**

Use the correct tightening torques listed below. Before tightening the plug, wrap pipe tape around it. Also, with regard to the sunk dimension of a plug (a dimension in the drawing), use the stipulated figures as a guide and confirm the air leakage before operation.

* If tightening plugs on the top mounting port with more than the proper tightening torque, plugs will be screwed much deeply and air passage will be squeezed. Consequently, the cylinder speed will be restricted.

Connection thread (plug) size	Proper tightening torque (N·m)	a dimension
1/8	7 to 9	0.5 mm or less
1/4	12 to 14	1 mm or less
3/8	22 to 24	1 mm or less





Series MGP Specific Product Precautions 2

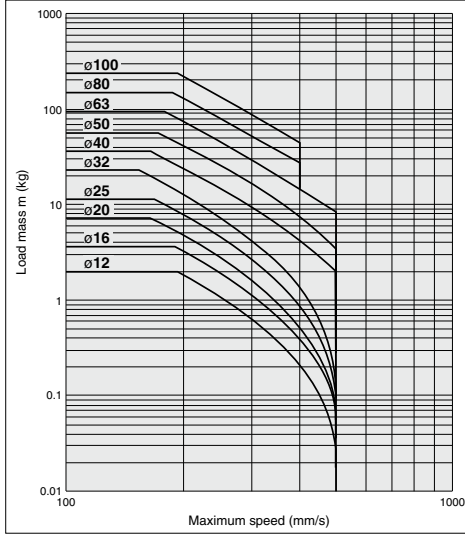
Be sure to read before handling.

Refer to front matter 39 for Safety Instructions and pages 3 to 12 for Actuator and Auto Switch Precautions.

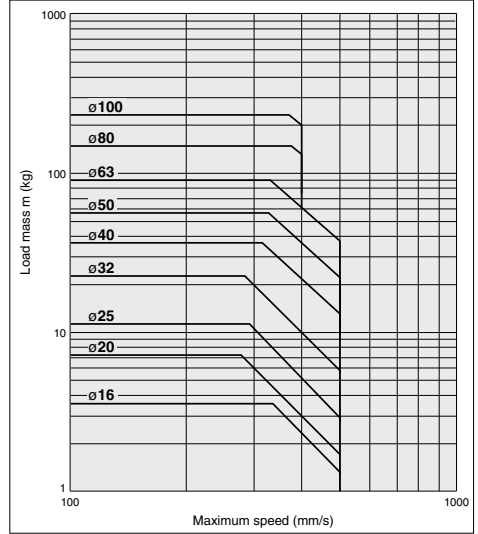
Allowable Kinetic Energy

Load mass and a maximum speed must be within the ranges shown in the graphs below.

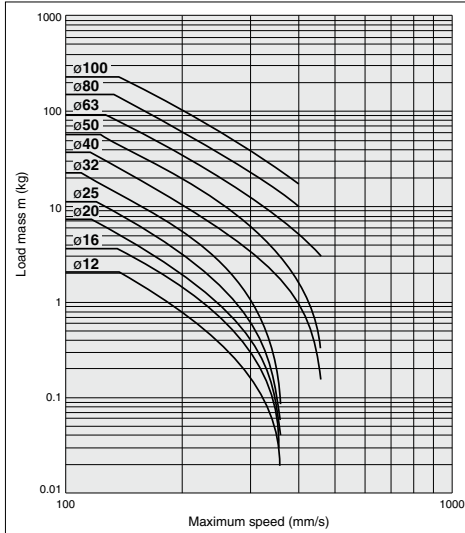
MGP with rubber bumper



MGP with air cushion



MGP without cushion (MGP-□V (Water resistant), XB6, XC9, XC22)



MGJ

MGP
-Z

MGP

MGPW

MGQ

MGG

MGC

MGF

MGZ

MGT

D-□

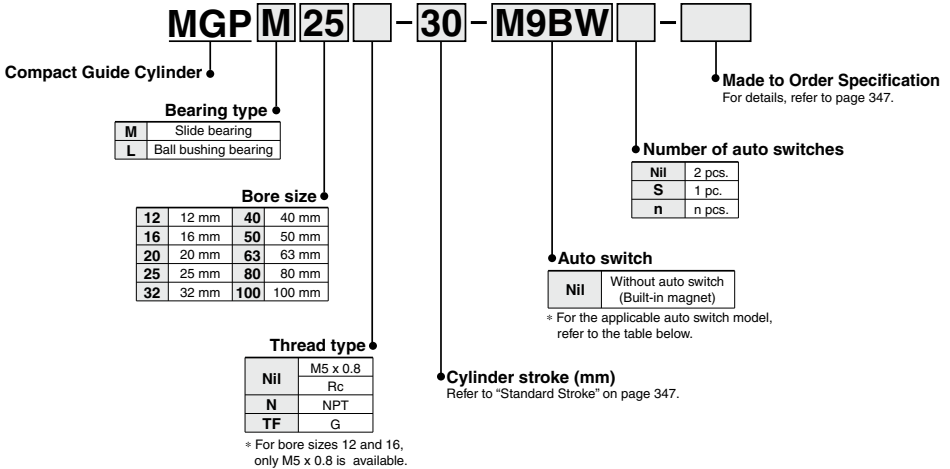
-X□

Compact Guide Cylinder Series MGP

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

Series MGP standard type has been remodeled for a lightweight design. When selecting a product, refer to the new MGP-Z series.

How to Order



Applicable Auto Switches

Refer to pages 1893 to 2007 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)	IC circuit		Relay, PLC	
																5 V, 12 V
Solid state auto switch	—	Grommet	Yes	3-wire (NPN)	24 V	12 V	—	M9NV	M9N	●	●	●	○	○	IC circuit	Relay, PLC
				3-wire (PNP)				M9PV	M9P	●	●	●	○	○		
	2-wire			M9BV	M9B	●	●	●	○	○	—					
	3-wire (NPN)			M9NVV	M9NW	●	●	●	○	○	IC circuit					
	3-wire (PNP)			M9PWW	M9PW	●	●	●	○	○	IC circuit					
	2-wire			M9BWW	M9BW	●	●	●	○	○	—					
	3-wire (NPN)			M9NAV***	M9NA***	○	○	●	○	○	IC circuit					
	3-wire (PNP)			M9PAV***	M9PA***	○	○	●	○	○	IC circuit					
	2-wire			M9BAV***	M9BA***	○	○	●	○	○	—					
	2-wire (Non-polar)			—	P3DW**	●	●	●	○	○	—					
Reed auto switch	—	Grommet	Yes	3-wire (NPN equivalent)	24 V	12 V	100 V 100 V or less	A96V	A96	●	●	●	—	—	IC circuit	Relay, PLC
				2-wire				A93V	A93	●	●	●	—	—		
				No				A90V	A90	●	●	●	—	—	IC circuit	

*** Water resistant type auto switches can be mounted 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. Consult with SMC regarding water resistant types for ø12 and ø16.

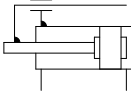
- * Lead wire length symbols: 0.5 m..... Nil (Example) M9NV * Solid state auto switches marked with "○" are produced upon receipt of order.
- 1 m..... M (Example) M9NWM * Bore sizes 32 to 100 are available for D-P4DW.
- 3 m..... L (Example) M9NWL * Bore sizes 25 to 100 are available for D-P3DW.
- 5 m..... Z (Example) M9NWL

- * Since there are other applicable auto switches than listed, refer to page 406 for details.
- * For details about auto switches with pre-wired connector, refer to pages 1960 and 1961. For D-P3DW, refer to pages 1948 and 1949.
- * Auto switches are shipped together (not assembled).



Symbol

Rubber bumper



Made to Order: Individual Specifications
(For details, refer to pages 407 and 408.)

Symbol	Specifications
-X144	Symmetrical port position
-XB67	Lateral piping type (Change of plug position)

Made to Order Specification
(For details, refer to pages 2009 to 2152.)

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 Series RJ 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 seats
-XC35	With coil scraper
-XC69	With shock absorber
-XC79	Machining tapped hole, drilled hole and pin hole additionally.
-XC82	Bottom mounting style
-XC92	Dust resistant cylinder

Refer to pages 404 to 406 for cylinders with auto switches.

- Minimum auto switch mounting stroke
- Proper auto switch mounting position (detection at stroke end) and mounting height
- Operating range
- Auto switch mounting bracket: Part no.

Specifications

Bore size	ø12	ø16	ø20	ø25	ø32	ø40	ø50	ø63	ø80	ø100
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 ^(Note)	50 to 500 mm/s								50 to 400 mm/s	
Cushion	Rubber bumper on both ends									
Lubrication	Not required (Non-lube)									
Stroke length tolerance	± 1.5 mm									

Note) Maximum speed with no load.

Make a model selection, considering a load according to the graph on pages 349 to 355.

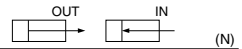
Standard Stroke

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 Stroke

Description	Spacer installation type Spacers are installed in the standard stroke cylinder. • ø12 to 32: Available by the 1 mm stroke interval. • ø40 to 100: Available by the 5 mm stroke interval.	Exclusive body (-XB10) Dealing with the stroke by making an exclusive body. • All bore sizes are available by the 1 mm interval.												
Part no.	Refer to "How to Order" for the standard model numbers.	Suffix "-XB10" to the end of standard part number. ^(Note)												
Applicable stroke (mm)	<table border="1"> <tr> <td>ø12, ø16</td> <td>1 to 249</td> </tr> <tr> <td>ø20, ø25, ø32</td> <td>1 to 399</td> </tr> <tr> <td>ø40 to ø100</td> <td>5 to 395</td> </tr> </table>	ø12, ø16	1 to 249	ø20, ø25, ø32	1 to 399	ø40 to ø100	5 to 395	<table border="1"> <tr> <td>ø12, ø16</td> <td>11 to 249</td> </tr> <tr> <td>ø20, ø25</td> <td>21 to 399</td> </tr> <tr> <td>ø32 to ø100</td> <td>26 to 399</td> </tr> </table>	ø12, ø16	11 to 249	ø20, ø25	21 to 399	ø32 to ø100	26 to 399
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.: MGP20-39 A spacer 1 mm in width is installed in a MGP20-40. C dimension is 77 mm.	Part no.: MGP20-39-XB10 Special body manufactured for 39 stroke. C dimension is 76 mm.												

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	
12	6	OUT	113	23	34	45	57	68	79	90	102	113	
		IN	85	17	26	34	43	51	60	68	77	85	
16	8	OUT	201	40	60	80	101	121	141	161	181	201	
		IN	151	30	45	60	76	91	106	121	136	151	
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)

Series MGP

Weight

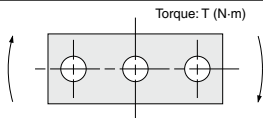
Slide Bearing: MGPM12 to 100

Bore size (mm)	Model	Standard stroke (mm)															
		10	20	25	30	40	50	75	100	125	150	175	200	250	300	350	400
12	MGPM12	0.24	0.28	—	0.31	0.35	0.39	0.50	0.59	0.70	0.79	0.89	0.98	1.17	—	—	—
16	MGPM16	0.33	0.38	—	0.43	0.48	0.53	0.68	0.80	0.97	1.09	1.22	1.35	1.60	—	—	—
20	MGPM20	—	0.67	—	0.75	0.83	0.91	1.17	1.37	1.57	1.76	1.96	2.16	2.63	3.03	3.42	3.82
25	MGPM25	—	0.95	—	1.05	1.16	1.27	1.65	1.92	2.19	2.47	2.74	3.01	3.67	4.21	4.76	5.30
32	MGPM32	—	—	1.69	—	—	2.07	2.47	2.85	3.24	3.62	4.00	4.38	5.33	6.09	6.86	7.62
40	MGPM40	—	—	1.95	—	—	2.37	2.83	3.25	3.68	4.10	4.53	4.95	5.99	6.85	7.70	8.55
50	MGPM50	—	—	3.36	—	—	4.00	4.73	5.37	6.01	6.65	7.29	7.93	9.54	10.8	12.1	13.4
63	MGPM63	—	—	4.18	—	—	4.94	5.78	6.54	7.29	8.05	8.80	9.56	11.4	12.9	14.4	15.9
80	MGPM80	—	—	6.49	—	—	7.43	8.67	9.61	10.5	11.5	12.4	13.4	15.8	17.7	19.5	21.4
100	MGPM100	—	—	10.5	—	—	11.9	13.6	14.9	16.3	17.6	18.9	20.2	23.6	26.2	28.9	31.5

Ball Bushing Bearing: MGPL12 to 100

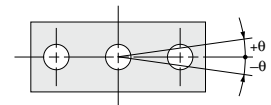
Bore size (mm)	Model	Standard stroke (mm)															
		10	20	25	30	40	50	75	100	125	150	175	200	250	300	350	400
12	MGPL12	0.24	0.27	—	0.30	0.35	0.39	0.47	0.56	0.66	0.74	0.83	0.91	1.08	—	—	—
16	MGPL16	0.34	0.39	—	0.43	0.51	0.56	0.67	0.79	0.93	1.04	1.16	1.28	1.50	—	—	—
20	MGPL20	—	0.70	—	0.77	0.89	0.97	1.14	1.31	1.52	1.69	1.87	2.04	2.42	2.77	3.12	3.47
25	MGPL25	—	0.98	—	1.07	1.25	1.34	1.57	1.81	2.08	2.31	2.54	2.77	3.27	3.74	4.20	4.66
32	MGPL32	—	—	1.54	—	—	1.85	2.30	2.62	2.99	3.31	3.62	3.94	4.63	5.26	5.89	6.52
40	MGPL40	—	—	1.79	—	—	2.15	2.64	3.00	3.42	3.78	4.14	4.50	5.28	6.00	6.72	7.44
50	MGPL50	—	—	3.11	—	—	3.66	4.41	4.96	5.60	6.15	6.70	7.25	8.48	9.57	10.7	11.8
63	MGPL63	—	—	3.93	—	—	4.59	5.46	6.12	6.88	7.54	8.21	8.87	10.3	11.7	13.0	14.3
80	MGPL80	—	—	6.25	—	—	7.39	8.69	9.51	10.3	11.1	12.0	12.8	14.7	16.3	18.0	19.6
100	MGPL100	—	—	9.89	—	—	11.6	13.4	14.5	15.7	16.9	18.1	19.3	21.9	24.2	26.6	28.9

Allowable Rotational Torque of Plate



Bore size (mm)	Bearing type	Stroke (mm)															
		10	20	25	30	40	50	75	100	125	150	175	200	250	300	350	400
12	MGPM	0.39	0.32	—	0.27	0.24	0.21	0.43	0.36	0.31	0.27	0.24	0.22	0.19	—	—	—
	MGPL	0.61	0.45	—	0.35	0.58	0.50	0.37	0.29	0.24	0.20	0.18	0.16	0.12	—	—	—
16	MGPM	0.69	0.58	—	0.49	0.43	0.38	0.69	0.58	0.50	0.44	0.40	0.36	0.30	—	—	—
	MGPL	0.99	0.74	—	0.59	0.99	0.86	0.65	0.52	0.43	0.37	0.32	0.28	0.23	—	—	—
20	MGPM	—	1.05	—	0.93	0.83	0.75	1.88	1.63	1.44	1.28	1.16	1.06	0.90	0.78	0.69	0.62
	MGPL	—	1.26	—	1.03	2.17	1.94	1.52	1.25	1.34	1.17	1.03	0.93	0.76	0.65	0.56	0.49
25	MGPM	—	1.76	—	1.55	1.38	1.25	2.96	2.57	2.26	2.02	1.83	1.67	1.42	1.24	1.09	0.98
	MGPL	—	2.11	—	1.75	3.37	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	3.96	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	3.98	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

Non-rotating Accuracy of Plate



For non-rotating accuracy 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
12	$\pm 0.08^\circ$	$\pm 0.10^\circ$
16		
20	$\pm 0.07^\circ$	$\pm 0.09^\circ$
25		
32		
40	$\pm 0.06^\circ$	$\pm 0.08^\circ$
50		
63	$\pm 0.05^\circ$	$\pm 0.06^\circ$
80		
100	$\pm 0.04^\circ$	$\pm 0.05^\circ$

Series MGP

Model Selection

Selection Conditions

Mounting orientation	Vertical		Horizontal	
Maximum speed (mm/s)	200 or less	400	200 or less	400
Graph (Slide bearing type)	(1), (2)	(3), (4)	(13), (14)	(15), (16)
Graph (Ball bushing bearing type)	(5) to (8)	(9) to (12)	(17), (18)	(19), (20)

Selection Example 1 (Vertical Mounting)

Selection conditions

Mounting: Vertical
 Bearing type: Ball bushing
 Stroke: 30 stroke
 Maximum speed: 200 mm/s
 Load mass: 3 kg
 Eccentric distance: 90 mm

Find the point of intersection for the load mass of 3 kg and the eccentric distance of 90 mm on graph (5), based on vertical mounting, ball bushing, 30 stroke, and the speed of 200 mm/s.

→ MGPL25-30 is selected.

Selection Example 2 (Horizontal Mounting)

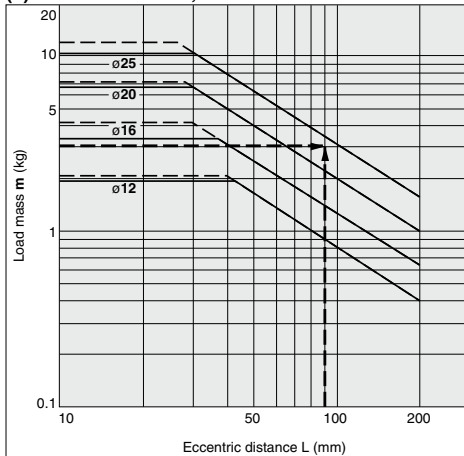
Selection conditions

Mounting: Horizontal
 Bearing type: Slide bearing
 Distance between plate and load center of gravity: 50 mm
 Maximum speed: 200 mm/s
 Load mass: 2 kg
 Stroke: 30 stroke

Find the point of intersection for the load mass of 2 kg and 30 stroke on graph (13), based on horizontal mounting, slide bearing, the distance of 50 mm between the plate and load center of gravity, and the speed of 200 mm/s.

→ MGPM20-30 is selected.

(5) 30 stroke or less, V = 200 mm/s or less

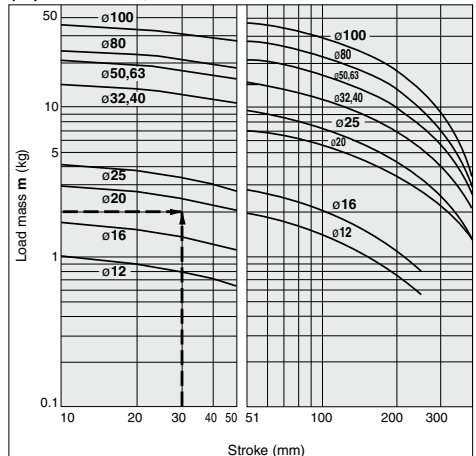


· When the maximum speed exceeds 200 mm/s, the allowable load mass is determined by multiplying the value shown in the graph at 400 mm/s by the coefficient listed in the table below.

Maximum	Up to 300 mm/s	Up to 400 mm/s	Up to 500 mm/s
Coefficient	1.7	1	0.6

· Use the "Guide Cylinder Selection Software", when the eccentric distance is 200 mm or more.

(13) L = 50 mm, V = 200 mm/s or less



MGJ

MGP
-Z

MGP

MGPW

MGQ

MGG

MGC

MGF

MGZ

MGT

D-□

-X□

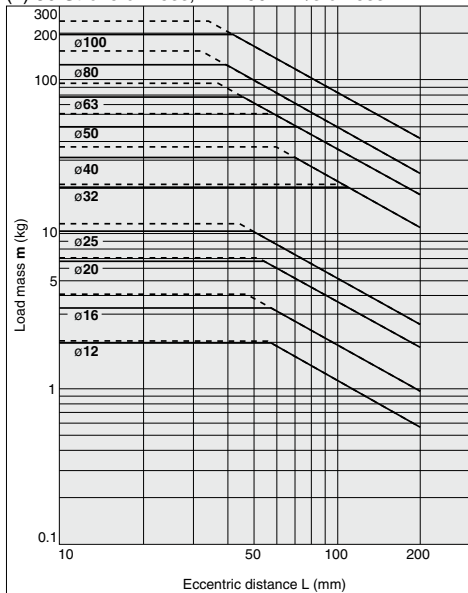
Series MGP

Vertical Mounting (Slide Bearing)

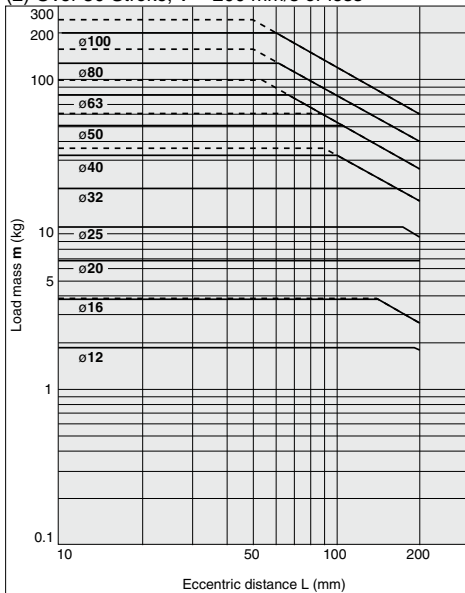
— Operating pressure 0.4 MPa
 - - - - Operating pressure 0.5 MPa or more

MGPM12 to 100

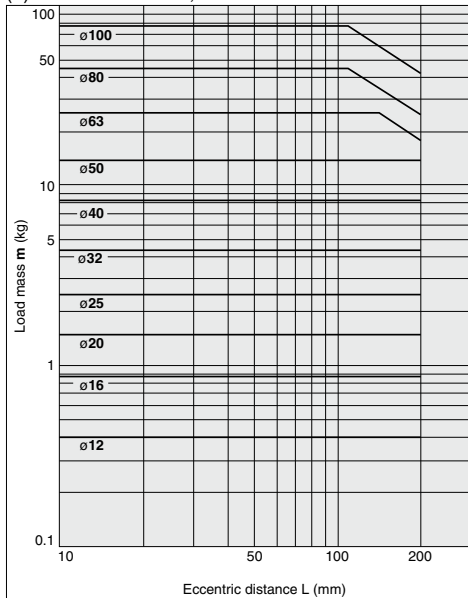
(1) 50 Stroke or Less, V = 200 mm/s or less



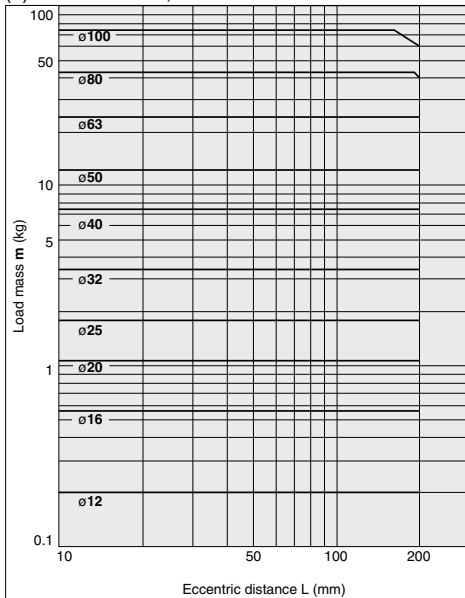
(2) Over 50 Stroke, V = 200 mm/s or less



(3) 50 Stroke or Less, V = 400 mm/s



(4) Over 50 Stroke, V = 400 mm/s



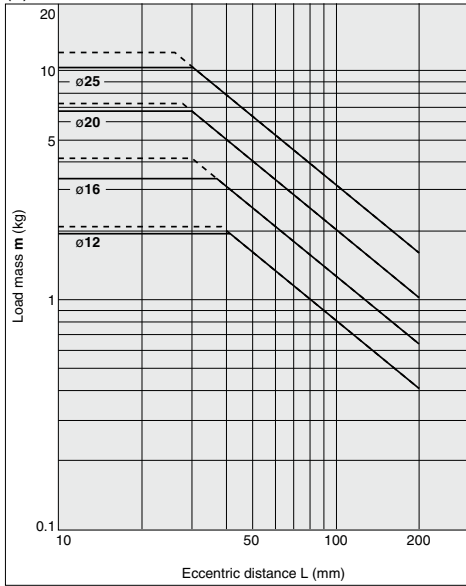
· Use the "Guide Cylinder Selection Software", when the eccentric distance is 200 mm or more.

Vertical Mounting (Ball Bushing)

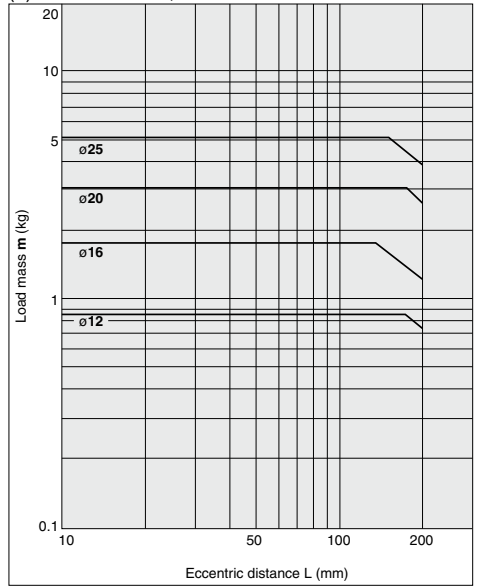
— Operating pressure 0.4 MPa
 - - - - - Operating pressure 0.5 MPa or more

MGPL12 to 25

(5) 30 Stroke or Less, V = 200 mm/s or less

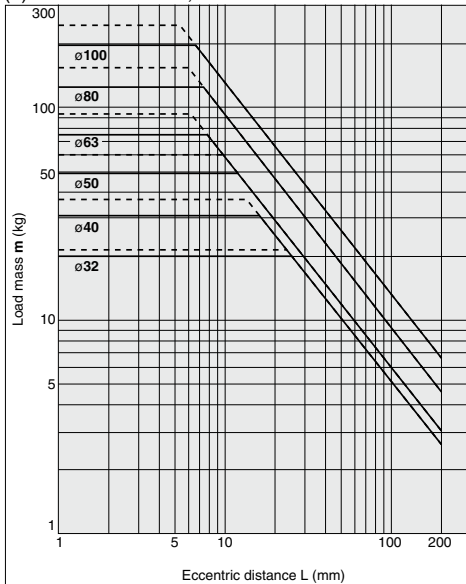


(6) Over 30 Stroke, V = 200 mm/s or less

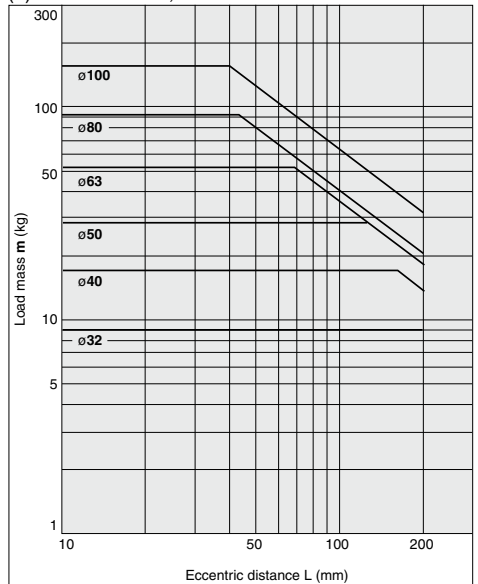


MGPL32 to 100

(7) 50 Stroke or Less, V = 200 mm/s or less



(8) Over 50 Stroke, V = 200 mm/s or less



MGJ

MGP

-Z

MGP

MGPW

MGQ

MGG

MGC

MGF

MGZ

MGT

D-□

-X□

· Use the "Guide Cylinder Selection Software", when the eccentric distance is 200 mm or more.

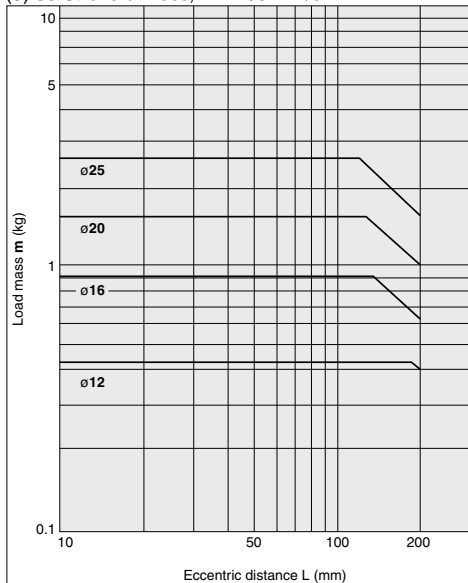
Series MGP

Vertical Mounting (Ball Bushing)

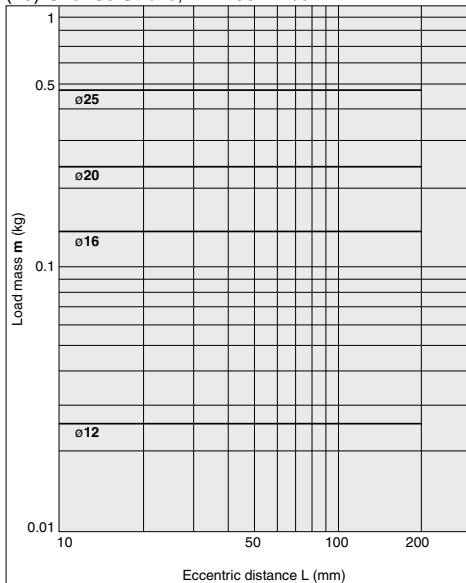
Operating pressure 0.4 MPa

MGPL12 to 25

(9) 30 Stroke or Less, V = 400 mm/s

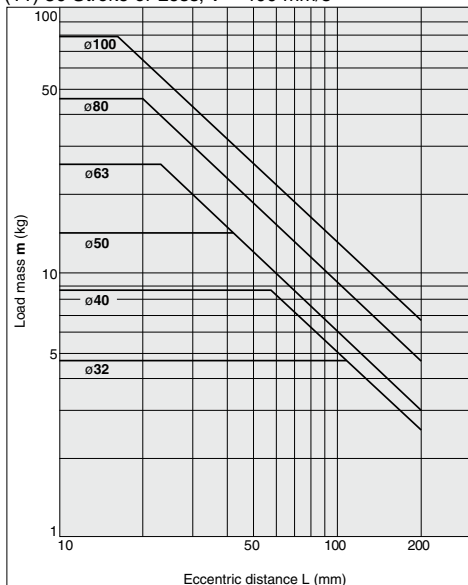


(10) Over 30 Stroke, V = 400 mm/s

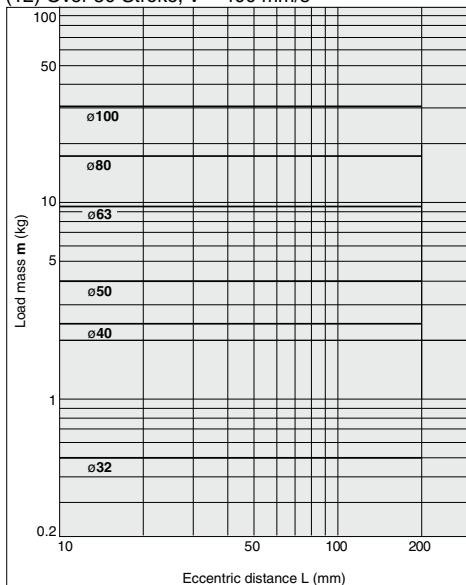


MGPL32 to 100

(11) 50 Stroke or Less, V = 400 mm/s



(12) Over 50 Stroke, V = 400 mm/s

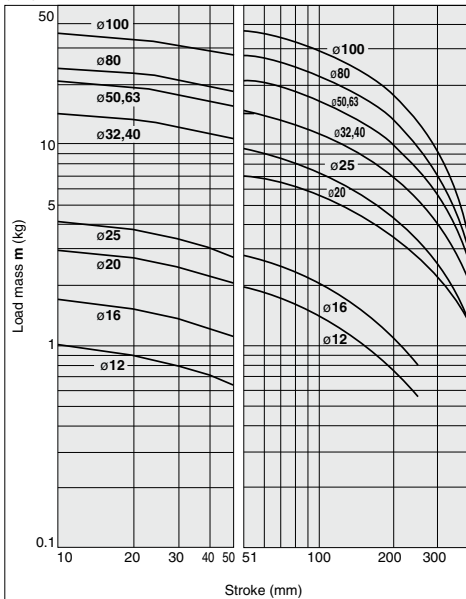


· Use the "Guide Cylinder Selection Software", when the eccentric distance is 200 mm or more.

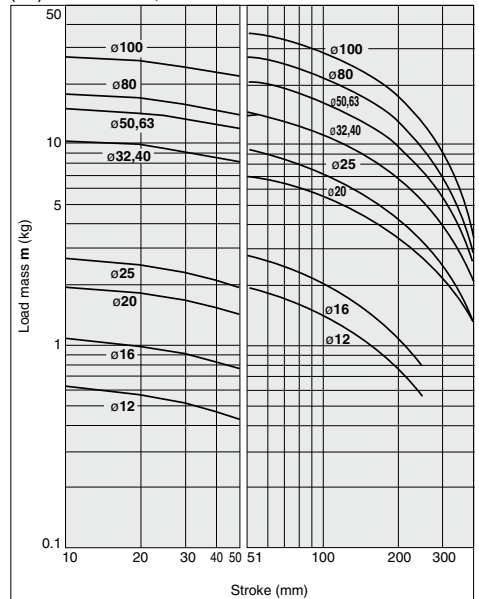
Horizontal Mounting (Slide Bearing)

MGPM12 to 100

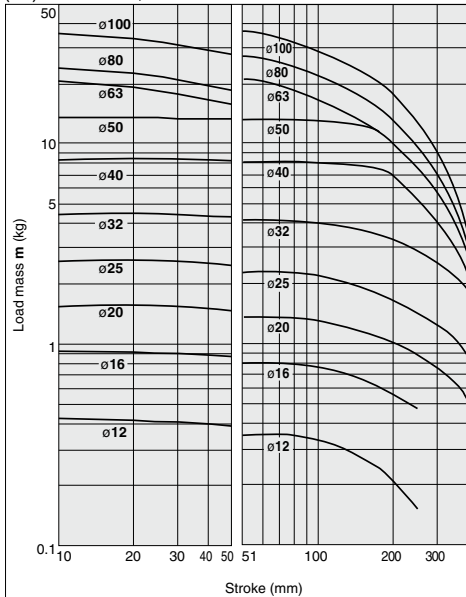
(13) L = 50 mm, V = 200 mm/s or less



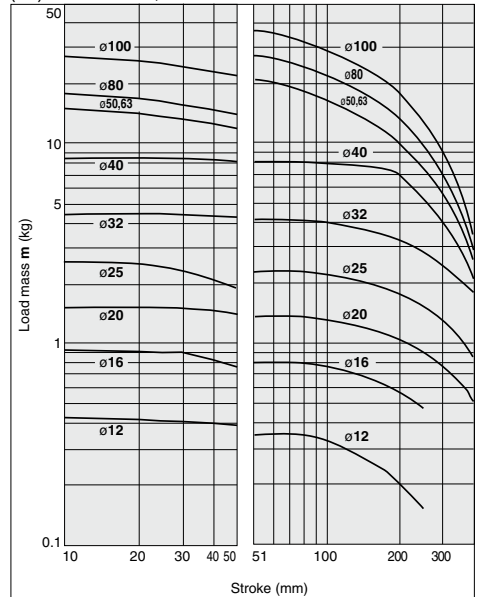
(14) L = 100 mm, V = 200 mm/s or less



(15) L = 50 mm, V = 400 mm/s



(16) L = 100 mm, V = 400 mm/s



MGJ

MGP
-Z

MGP

MGPW

MGQ

MGG

MGC

MGF

MGZ

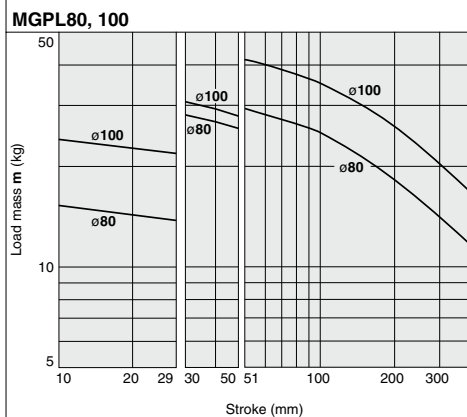
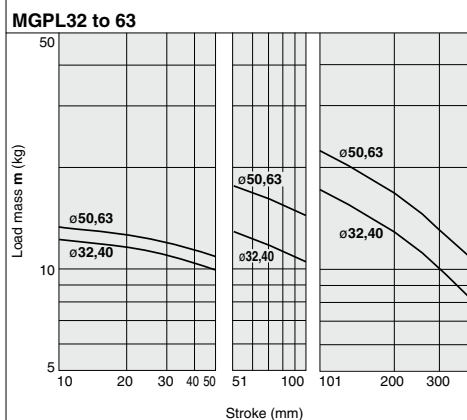
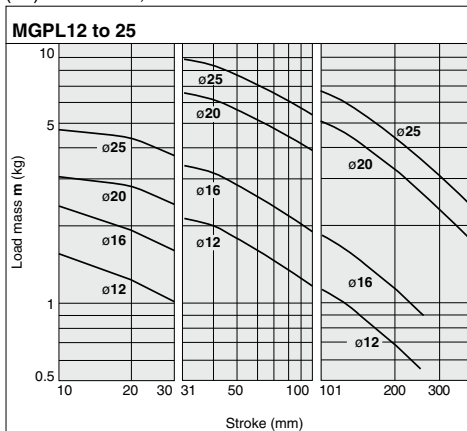
MGT

D-□

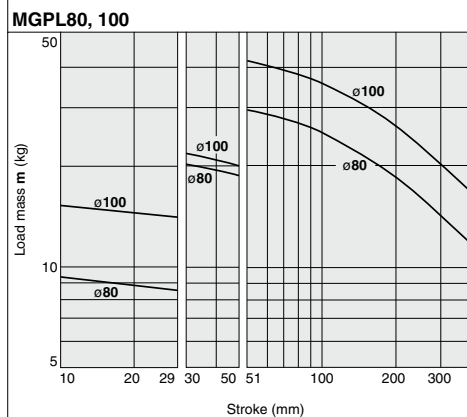
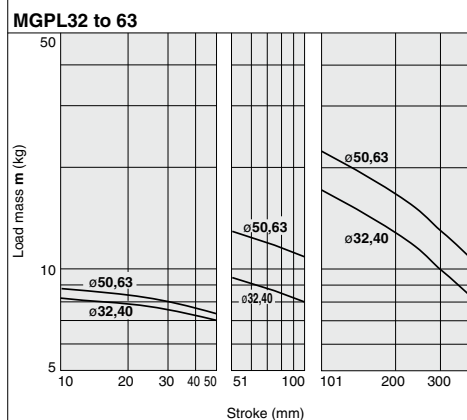
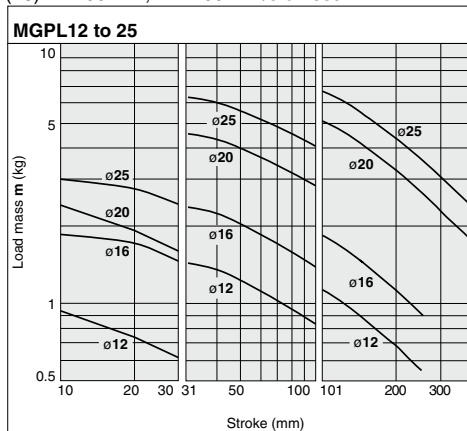
-X□

Horizontal Mounting (Ball Bushing)

(17) L = 50 mm, V = 200 mm/s or less

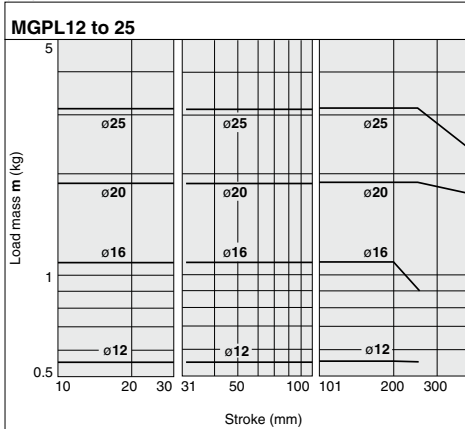


(18) L = 100 mm, V = 200 mm/s or less

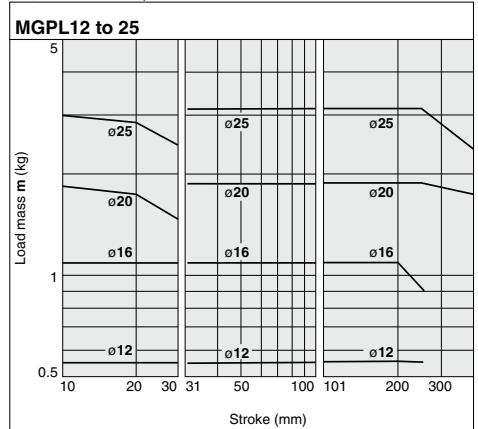


Horizontal Mounting (Ball Bushing)

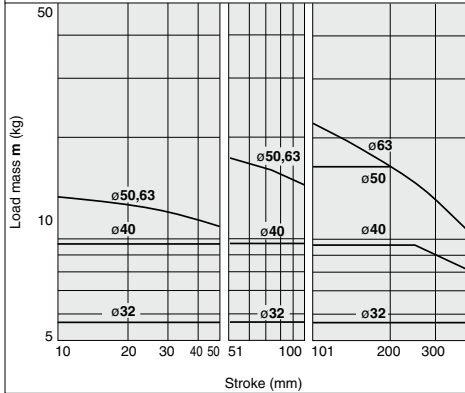
(19) L = 50 mm, V = 400 mm/s



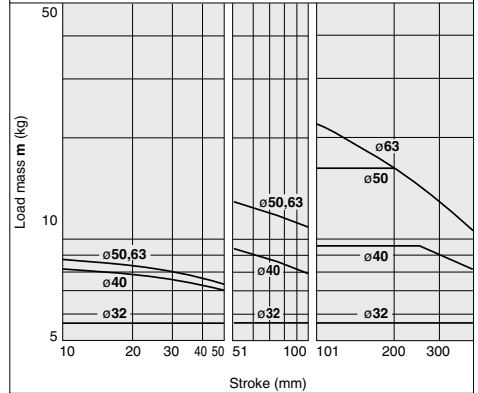
(20) L = 100 mm, V = 400 mm/s



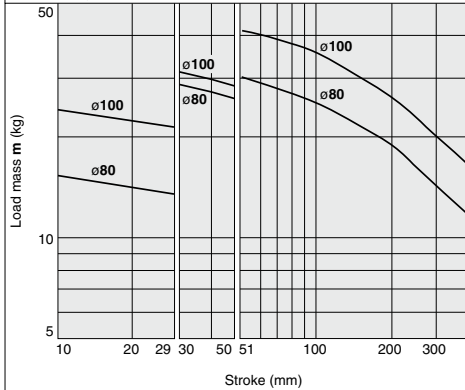
MGPL32 to 63



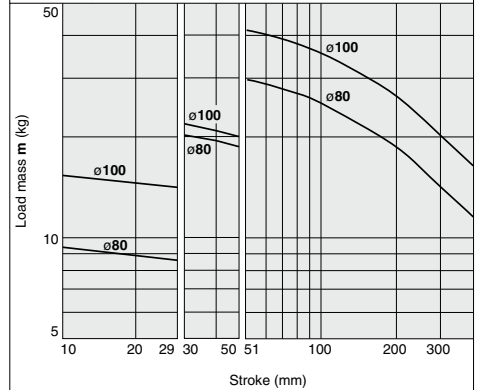
MGPL32 to 63



MGPL80, 100



MGPL80, 100



MGJ

MGP

-Z

MGP

MGPW

MGQ

MGG

MGC

MGF

MGZ

MGT

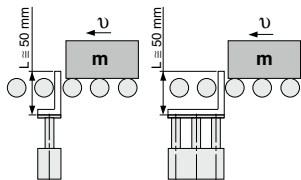
D-□

-X□

Series MGP

Operating Range when Used as Stopper

Bore Size: $\phi 12$ to 25/MGPM12 to 25 (Slide bearing)



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

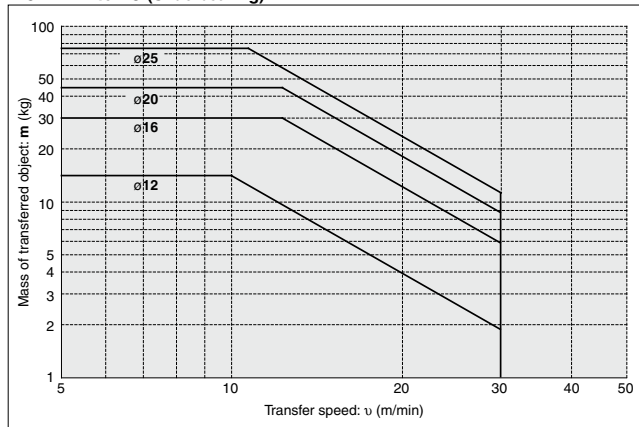
⚠ Caution

Caution on handling

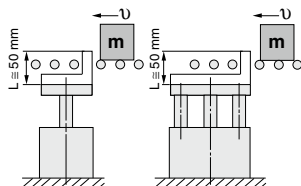
Note 1) When using as a stopper, select a model with 30 stroke or less.

Note 2) Model MGPL (Ball bushing bearing) cannot be used as a stopper.

MGPM12 to 25 (Slide bearing)



Bore Size: $\phi 32$ to 100/MGPM32 to 100 (Slide bearing)



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

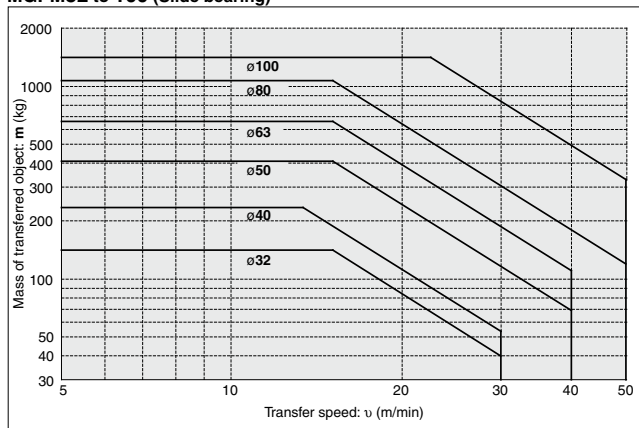
⚠ Caution

Caution on handling

Note 1) When using as a stopper, select a model with 50 stroke or less.

Note 2) Model MGPL (Ball bushing bearing) cannot be used as a stopper.

MGPM32 to 100 (Slide bearing)



1. Water Resistant

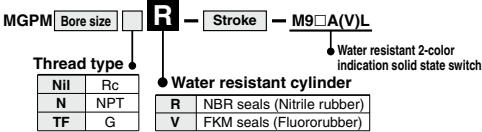
Ideal for use in a machine tool environment exposed to coolants. Applicable for use in an environment with water splashing such as food processing and car wash equipment, etc.

Specifications

Applicable series	MGPM	
Bearing type	Slide bearing	
Bore size (mm)	20, 25, 32, 40, 50, 63, 80, 100	
Cushion	MGPM□□R	Rubber bumper
	MGPM□□V	Without cushion

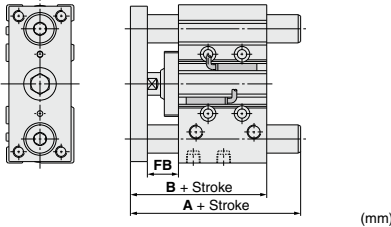
* Specifications other than above are the same as standard, basic style.
Note) Refer to Best Pneumatics No. 2 for details.

How to Order



* Stainless steel parts are available as made-to-order products.
* Piston rod and guide rod are made of stainless steel.

Dimensions



Bore size (mm)	A			B	FB
	50 st or less	Over 50 st to 200 st	Over 200 st		
20	66	97.5	135	66	19
25	67.5	99	136	67.5	20
32	109	114	152	71.5	22
40	109	114	152	78	22
50	117.5	129	172	83	23
63	117.5	129	172	88	23
80	121	148	199	102.5	24
100	141	166	207	120	29

* Other dimensions are the same as standard type.

2. Clean Series

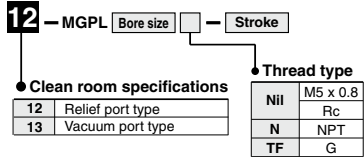
Applicable in a clean room environment. Ideal for use in conveyor lines for semiconductor (LSI), liquid crystal (LCD), food processing, pharmaceutical, and electronic parts, etc.

Specifications

Applicable series	MGPL							
Bearing type	Ball bushing bearing							
Bore size (mm)	12	16	20	25	32	40	50	63
Stroke (mm)	10 to 250			20 to 400		25 to 400		

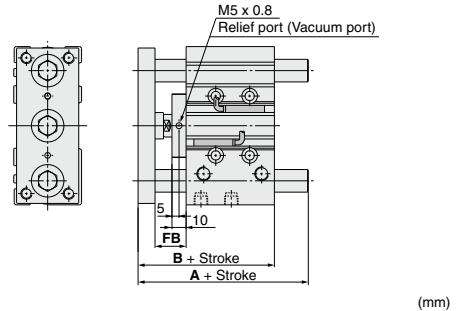
* Specifications other than above are the same as standard, basic style.

How to Order



* For bore sizes 12 and 16, M5 x 0.8 is only available.

Dimensions



Bore size (mm)	A				B	FB
	30 st or less	Over 30 st to 100 st	Over 100 st to 200 st	Over 200 st		
12	56	68	98	98	55	18
16	62	78	108	108	59	18
20	76	93	117	135	66	19
25	82.5	98.5	117.5	135	66.5	19

* Other dimensions are the same as standard products.

Bore size (mm)	A				B	FB
	50 st or less	Over 50 st to 100 st	Over 100 st to 200 st	Over 200 st		
32	93	110	130	152	71.5	22
40	93	110	130	152	78	22
50	104	125	145	172	83	23
63	104	125	145	172	88	23

* Other dimensions are the same as standard products.

MGJ

MGP-Z

MGP

MGPW

MGQ

MGG

MGC

MGF

MGZ

MGT

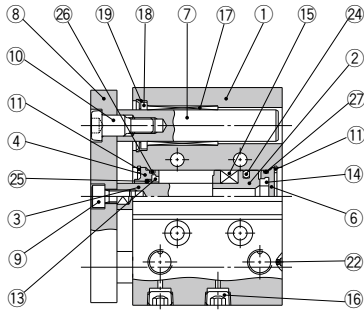
D-□

-X□

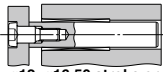
Series MGP

Construction/Series MGPM

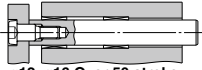
MGPM12 to 25



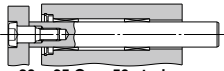
50 stroke or less



ø12, ø16 50 stroke or less

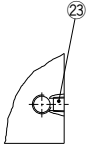
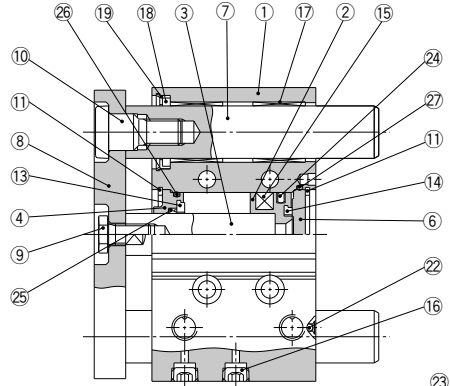


ø12, ø16 Over 50 stroke

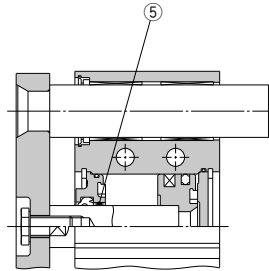


ø20, ø25 Over 50 stroke

MGPM32 to 100



ø63 or more



ø50 or more

Component Parts

No.	Description	Material	Note
1	Body	Aluminum alloy	Hard anodized
2	Piston	Aluminum alloy	Chromated
3	Piston rod	Stainless steel	ø12 to ø25
		Carbon steel	ø32 to ø100
4	Collar	Aluminum bearing alloy	ø12 to ø40
		Aluminum alloy casted	ø50 to ø100
5	Bushing	Bearing alloy	ø50 to ø100
6	Head cover	Aluminum alloy	ø12 to ø63
			ø80 to ø100
7	Guide rod	Carbon steel	Hard chrome plated
8	Plate	Carbon steel	Nickel plated
9	Plate mounting bolt	Carbon steel	Nickel plated
10	Guide bolt	Carbon steel	Nickel plated
11	Retaining ring	Carbon tool steel	Phosphate coated
12	Retaining ring	Carbon tool steel	Phosphate coated
13	Bumper A	Urethane	
14	Bumper B	Urethane	
15	Magnet	-	
16	Plug	Carbon steel	ø12, ø16
			ø20 to ø100
17	Slide Bearing	Bearing alloy	Nickel plated

Component Parts

No.	Description	Material	Note
18	Felt	Felt	
19	Holder	Resin	
20	Ball bushing		
21	Spacer	Aluminum alloy	
22	Steel ball	Carbon steel	ø12 to ø50
23	Plug	Carbon steel	ø63 to ø100
24 ⁵	Piston seal	NBR	Nickel plated
25 ⁵	Rod seal	NBR	
26 ⁵	Gasket A	NBR	
27 ⁵	Gasket B	NBR	

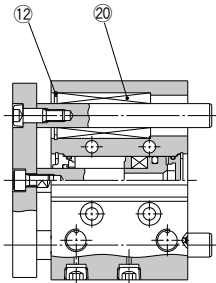
Replacement Parts: Seal Kit

Bore size (mm)	Kit no.	Contents	Bore size (mm)	Kit no.	Contents
12	MGP12-PS	Set of nos. above ②, ③, ④, ⑤, ⑦	40	MGP40-PS	Set of nos. above ②, ③, ④, ⑤, ⑦
16	MGP16-PS		50	MGP50-PS	
20	MGP20-PS		63	MGP63-PS	
25	MGP25-PS		80	MGP80-PS	
32	MGP32-PS		100	MGP100-PS	

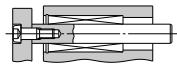
- * Seal kit includes ② to ⑦. Order the seal kit, based on each bore size.
- * Since the seal kit does not include a grease pack, order it separately. Grease pack part no.: GR-S-010 (10 g)

Construction/Series MGPL

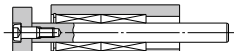
MGPL12 to 25



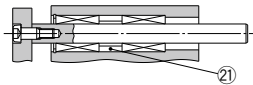
30 stroke or less



$\phi 12, \phi 16$ 30 stroke or less

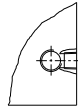
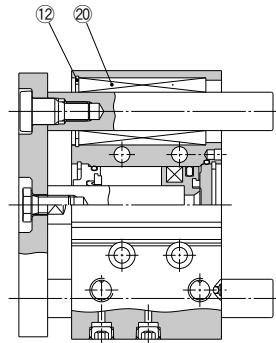


$\phi 12, \phi 16$ Over 30 stroke

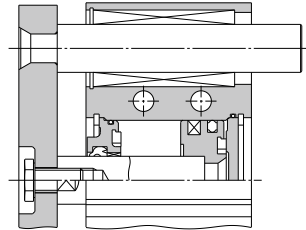


$\phi 20, \phi 25$ Over 100 stroke

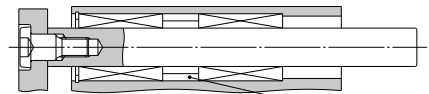
MGPL32 to 100



$\phi 63$ or more



$\phi 50$ or more



$\phi 32$ to $\phi 63$ Over 100 stroke

MGJ

MGP
-Z

MGP

MGPW

MGQ

MGG

MGC

MGF

MGZ

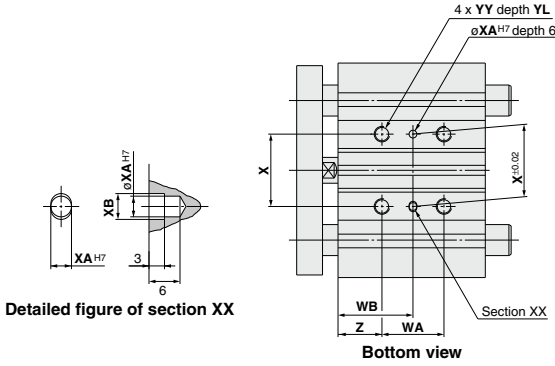
MGT

D-□

-X□

Series MGP

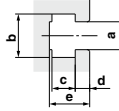
MGPM, MGPL: $\phi 12$ to $\phi 25$



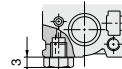
Detailed figure of section XX

Bottom view

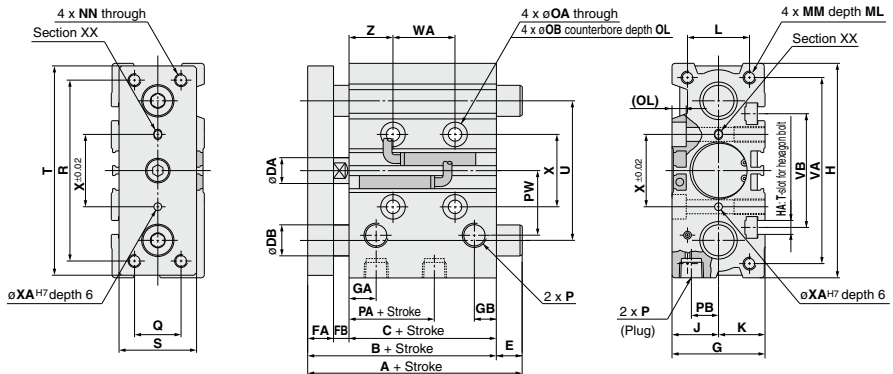
T-slot dimensions



Bore size (mm)	T-slot dimensions				
	a	b	c	d	e
12	4.4	7.4	3.7	2	6.2
16	4.4	7.4	3.7	2.5	6.7
20	5.4	8.4	4.5	2.8	7.8
25	5.4	8.4	4.5	3	8.2



$\phi 12, \phi 16$



• For intermediate strokes other than standard strokes, refer to "Manufacture of Intermediate Stroke" on page 347.

• For bore sizes with $\phi 12$ and $\phi 16$ only, M5 x 0.8 is available.
• Rc, NPT, G port can be selected for bore sizes with $\phi 20$ or more. (Refer to page 346.)

MGPM, MGPL Common Dimensions

Bore size (mm)	Standard stroke (mm)																			P			
	B	C	DA	FA	FB	G	GA	GB	H	HA	J	K	L	MM	ML	NN	OA	OB	OL	N	N	TF	
12	10, 20, 30, 40, 50, 75, 100	42	29	6	8	5	26	11	7.5	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	8	5	30	11	8	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, 175, 200, 250, 300, 350, 400	53	37	10	10	6	36	10.5	8.5	83	M5	18	18	24	M5 x 0.8	13	M5 x 0.8	5.4	9.5	5.5	Rc 1/8	NPT 1/8	G 1/8
25		53.5	37.5	12	10	6	42	11.5	9	93	M5	21	21	30	M6 x 1.0	15	M6 x 1.0	5.4	9.5	5.5	Rc 1/8	NPT 1/8	G 1/8

Bore size (mm)	WA																			WB					X	XA	XB	YY	YL	Z
	PA	PB	PW	Q	R	S	T	U	VA	VB	30 st or less	Over 30 st to 100 st	Over 100 st to 200 st	Over 200 st to 300 st	Over 300 st to 50 st or less	Over 50 st to 100 st	Over 100 st to 200 st	Over 200 st to 300 st	Over 300 st to 50 st or less											
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	15	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	12.5	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				

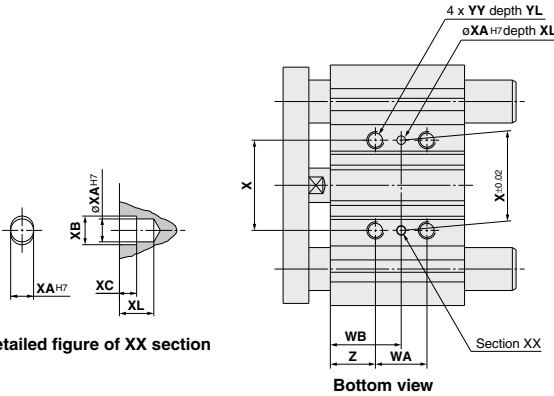
MGPM (Slide bearing) A, DB, E Dimensions

Bore size (mm)	A				DB	E			
	50 st or less	Over 50 st to 100 st	Over 100 st to 200 st	Over 200 st		50 st or less	Over 50 st to 100 st	Over 100 st to 200 st	Over 200 st
12	42	60.5	85	85	8	0	18.5	43	43
16	46	64.5	95	95	10	0	18.5	49	49
20	53	84.5	84.5	122	12	0	31.5	31.5	69
25	53.5	85	85	122	16	0	31.5	31.5	68.5

MGPL (Ball bushing bearing) A, DB, E Dimensions

Bore size (mm)	A				DB	E			
	30 st or less	Over 30 st to 100 st	Over 100 st to 200 st	Over 200 st		30 st or less	Over 30 st to 100 st	Over 100 st to 200 st	Over 200 st
12	43	55	85	85	6	1	13	43	43
16	49	65	95	95	8	3	19	49	49
20	63	80	104	122	10	10	27	51	69
25	69.5	85.5	104.5	122	13	16	32	51	68.5

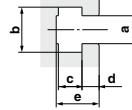
MGPM, MGPL: $\phi 32$ to $\phi 63$



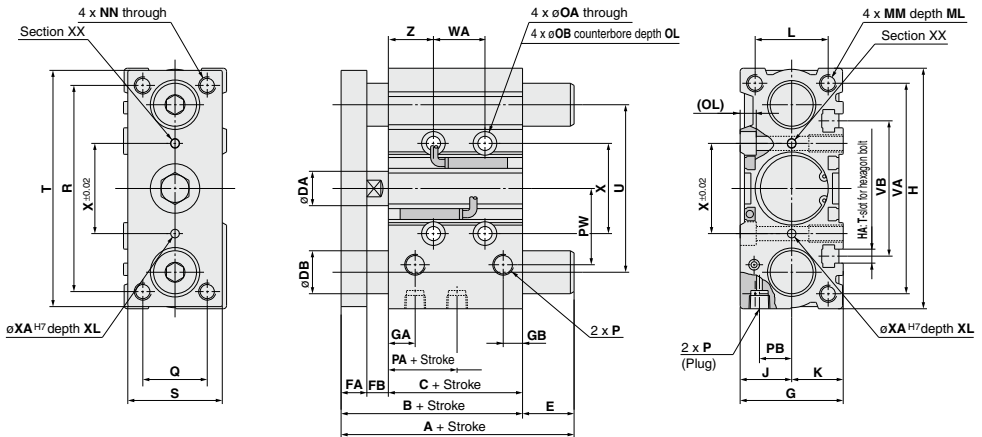
Detailed figure of XX section

Bottom view

T-slot dimensions



Bore size (mm)	T-slot dimensions (mm)			
	a	b	c	e
32	6.5	10.5	5.5	3.5
40	6.5	10.5	5.5	4
50	8.5	13.5	7.5	4.5
63	11	17.8	10	7



• For intermediate strokes other than standard strokes, refer to "Manufacture of Intermediate Stroke" on page 347.

• Choice of Rc, NPT, G port is possible. (Refer to page 346.)

MGPM, MGPL Common Dimensions

Bore size (mm)	Standard stroke (mm)																P										
	B	C	DA	FA	FB	G	GA	GB	H	HA	J	K	L	MM	ML	NN	OA	OB	OL	Nil	N	TF					
32	25, 50, 75	59.5	37.5	16	12	10	48	12.5	9	112	M6	24	24	34	M8 x 1.25	20	M8 x 1.25	6.6	11	7.5	Rc 1/8	NPT 1/8	G 1/8				
40	100, 125, 150	66	44	16	12	10	54	14	10	120	M6	27	27	40	M8 x 1.25	20	M8 x 1.25	6.6	11	7.5	Rc 1/8	NPT 1/8	G 1/8				
50	175, 200, 250	72	44	20	16	12	64	14	11	148	M8	32	32	46	M10 x 1.5	22	M10 x 1.5	8.6	14	9	Rc 1/4	NPT 1/4	G 1/4				
63	300, 350, 400	77	49	20	16	12	78	16.5	13.5	162	M10	39	39	58	M10 x 1.5	22	M10 x 1.5	8.6	14	9	Rc 1/4	NPT 1/4	G 1/4				

MGPM (Slide bearing) A, DB, E Dimensions (mm)

Bore size (mm)	A				DB	E		
	50 st or less	Over 50 st to 200 st	Over 200 st	50 st or less		Over 50 st to 200 st	Over 200 st	
32	97	102	140	20	37.5	42.5	80.5	
40	97	102	140	20	31	36	74	
50	106.5	118	161	25	34.5	46	89	
63	106.5	118	161	25	29.5	41	84	

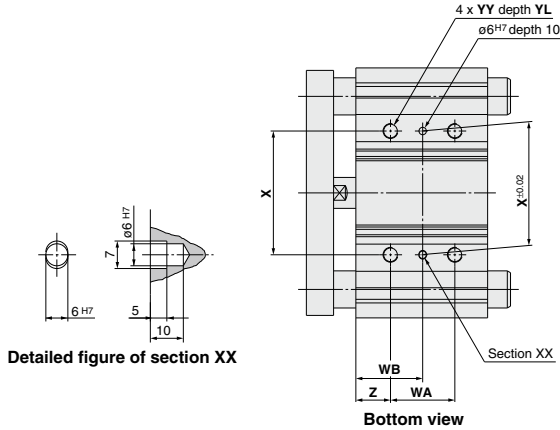
MGPL (Ball bushing bearing) A, DB, E Dimensions (mm)

Bore size (mm)	A				DB	E		
	50 st or less	Over 50 st to 100 st	Over 100 st to 200 st	Over 200 st		50 st or less	Over 50 st to 100 st	Over 100 st to 200 st
32	81	98	118	140	16	21.5	38.5	58.5
40	81	98	118	140	16	15	32	52
50	93	114	134	161	20	21	42	62
63	93	114	134	161	20	16	37	57

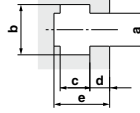
- MGJ
- MGP-Z
- MGP
- MGPW
- MGQ
- MGG
- MGC
- MGF
- MGZ
- MGT

- D-□
- X-□

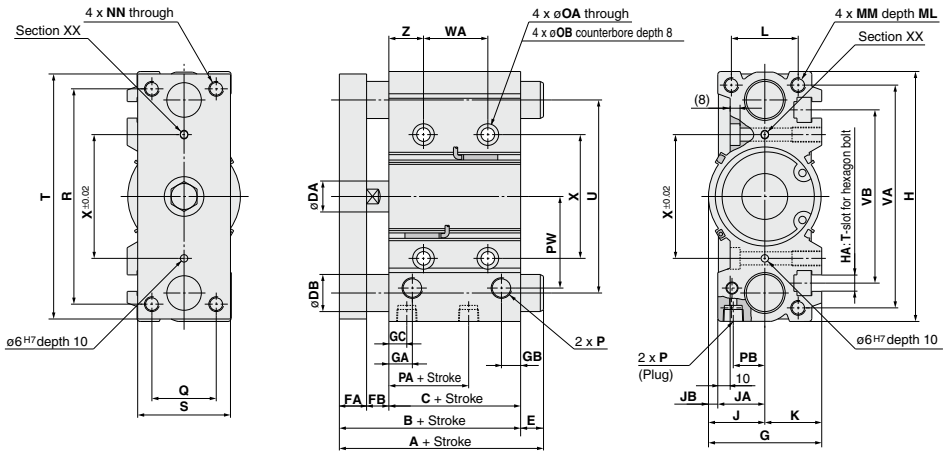
MGPM, MGPL: $\phi 80, \phi 100$



T-slot dimensions



Bore size (mm)	T-slot dimensions (mm)				
	a	b	c	d	e
80	13.3	20.3	12	8	22.5
100	15.3	23.3	13.5	10	30



• For intermediate strokes other than standard strokes, refer to "Manufacture of Intermediate Stroke" on page 347.

• Choice of Rc, NPT, G port is possible. (Refer to page 346.)

MGPM, MGPL Common Dimensions

Bore size (mm)	Standard stroke (mm)	B	C	DA	FA	FB	G	GA	GB	GC	H	HA	J	JA	JB	K	L	MM	ML	NN	OA	OB	P		
																							Nil	N	TF
80	25, 50, 75, 100 125, 150, 175, 200 250, 300, 350, 400	96.5	56.5	25	22	18	91.5	19	15.5	14.5	202	M12	45.5	38	7.5	46	54	M12 x 1.75	25	M12 x 1.75	10.6	17.5	Rc 3/8	NPT 3/8	G 3/8
100		116	66	30	25	25	111.5	23	19	18	240	M14	55.5	45	10.5	56	62	M14 x 2.0	31	M14 x 2.0	12.5	20	Rc 3/8	NPT 3/8	G 3/8

Bore size (mm)	PA	PB	PW	Q	R	S	T	U	VA	VB	WA					WB					X	YY	YL	Z
											25 st or less	Over 25 st to 100 st	Over 100 st to 200 st	Over 200 st to 300 st	Over 300 st	25 st or less	Over 25 st to 50 st	Over 50 st to 200 st	Over 200 st	Over 25 st to 50 st				
80	14.5	25.5	74	52	174	75	198	156	180	140	28	52	128	200	300	42	54	92	128	178	100	M12 x 1.75	24	28
100	17.5	32.5	89	64	210	90	236	188	210	166	48	72	148	220	320	35	47	85	121	171	124	M14 x 2.0	28	11

MGPM (Slide bearing) A, DB, E Dimensions

Bore size (mm)	A			DB	E		
	50 st or less	Over 50 st to 200 st	Over 200 st		50 st or less	Over 50 st to 200 st	Over 200 st
80	115	142	193	30	18.5	45.5	96.5
100	137	162	203	36	21	46	87

MGPL (Ball bushing bearing) A, DB, E Dimensions

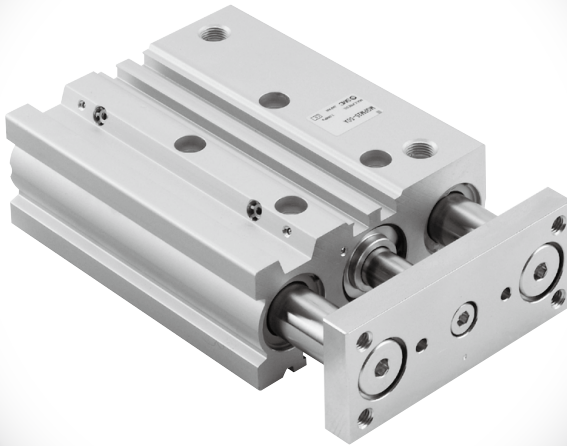
Bore size (mm)	A				DB	E		
	25 st or less	Over 25 st to 50 st	Over 50 st to 200 st	Over 200 st		25 st or less	Over 25 st to 50 st	Over 50 st to 200 st
80	109.5	130	160	193	25	13	33.5	96.5
100	121	147	180	203	30	5	31	87

Compact Guide Cylinder/With Air Cushion

Series MGP

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

Series MGP with air cushion type has been remodeled for a lightweight design. When selecting a product, refer to the new **MGP-Z** series.



MGJ

MGP
-Z

MGP

MGPW

MGQ

MGG

MGC

MGF

MGZ

MGT

Stroke Variations

Bearing type	Bore size (mm)	Stroke (mm)													Intermediate stroke			
		25	50	75	100	125	150	175	200	250	300	350	400					
MGPM Slide bearing	16	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	Strokes available by the 1 mm interval by changing the collar.
	20	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
	25	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
	32	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
MGPL Ball bushing bearing	40	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
	50	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
	63	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
	80	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
	100	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	

D-□

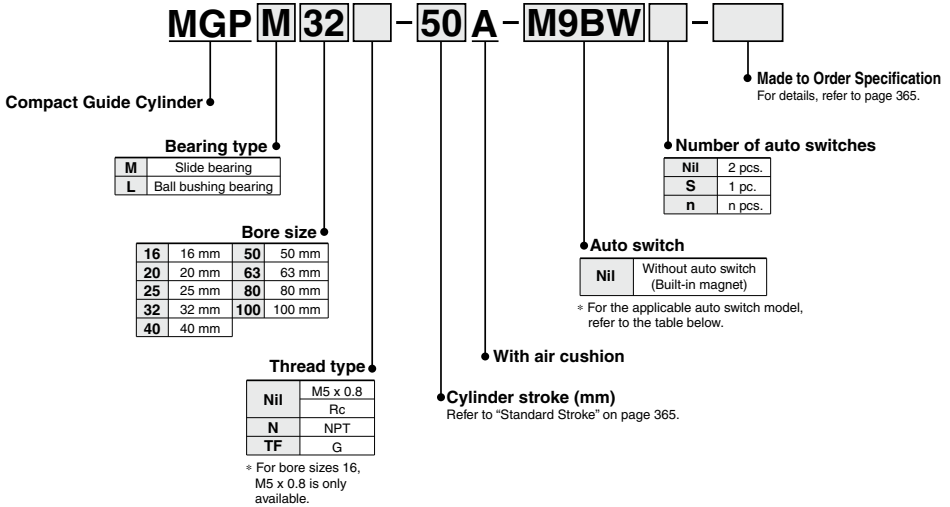
-X□

Compact Guide Cylinder/With Air Cushion Series MGP

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

Series MGP with air cushion type has been remodeled for a lightweight design. When selecting a product, refer to the new MGP-Z series.

How to Order



Applicable Auto Switches

Refer to pages 1839 to 2007 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)				M9PVW		M9PW	●	●	○	○	○	○		—		
	2-wire			12 V	M9BWW		M9BW	●	●	○	○	○	○		—		
	Water resistant (2-color indication)			5 V, 12 V	M9NAV***		M9NA***	○	○	●	○	○	○		○	IC circuit	
					M9PAV***		M9PA***	○	○	●	○	○	○		○	IC circuit	
	Magnetic field resistant (2-color indication)			12 V	2-wire		—	M9BAV***	M9BA***	○	○	○	○		○	○	—
					2-wire (Non-polar)			—	P3DW***	●	●	●	●		○	○	—
—		P4DW	—		—	●		●	●	●	○	—					
—		—	—		—	—		—	—	—	—	—					
Reed auto switch	—	Grommet	Yes	3-wire (NPN equivalent)	—	5 V	A96V	A96	●	●	●	—	—	IC circuit	—		
				No			2-wire	24 V	12 V	100 V	A93V	A93	●	●	●	—	—
						100 V or less	A90V	A90	●	●	●	—	—	IC circuit	—		

*** Water resistant type auto switches can be mounted on the above models, but in such case SMC cannot guarantee water resistance. Consult with SMC regarding water resistant types with the above model numbers.

* Lead wire length symbols: 0.5 m..... Nil (Example) M9NW * Solid state auto switches marked with "○" are produced upon receipt of order.
 1 m..... M (Example) M9NWM * Bore sizes 32 to 100 are available for D-P4DW.
 3 m..... L (Example) M9NWL ** Bore sizes 25 to 100 are available for D-P3DW.
 5 m..... Z (Example) M9NWX

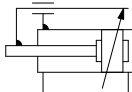
* Since there are other applicable auto switches than listed, refer to page 406 for details.
 * For details about auto switches with pre-wired connector, refer to pages 1960 and 1961. For D-P3DW, refer to pages 1948 and 1949.
 * Auto switches are shipped together (not assembled).

Specifications



Symbol

Air cushion



Bore size	ø16	ø20	ø25	ø32	ø40	ø50	ø63	ø80	ø100
Action	Double acting								
Fluid	Air								
Proof pressure	1.5 MPa								
Maximum operating pressure	1.0 MPa								
Minimum operating pressure	0.15 MPa	0.12 MPa							
Ambient and fluid temperature	-10 to 60°C (No freezing)								
Piston speed	50 to 500 mm/s							50 to 400 mm/s	
Cushion	Air cushion on both ends (Without bumper)								
Lubrication	Not required (Non-lube)								
Stroke length tolerance	$^{+1.5}$ ₀ (mm)								

Standard Stroke

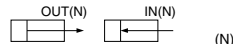
Bore size (mm)	Standard stroke (mm)
16	25, 50, 75, 100, 125, 150, 175, 200, 250
20 to 63	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400
80, 100	50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400

Manufacture of Intermediate Stroke

Description	Intermediate strokes by the 1 mm interval are available by replacing collars of a standard stroke cylinder. Minimum manufacturable stroke ø16 to ø63: 15 mm ø80, ø100: 20 mm Select a rubber bumper type, because the cushion effect is not obtainable for less than this stroke.	
Part no.	Suffix "-XC19" to the end of standard part number.	
Applicable stroke (mm)	ø16	15 to 249
	ø20 to ø63	15 to 399
	ø80, ø100	20 to 399
Example	Model: MGP20-35A-XC19 A collar 15 mm in width is installed in a MGP20-50A C dimension is 112 mm.	

Note) Intermediate stroke (by the 1 mm interval) based on an exclusive body will be available upon request for special.

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		
16	8	OUT	201	40	60	80	101	121	141	161	181	201		
		IN	151	30	45	60	76	91	106	121	136	151		
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)



Made to Order: Individual Specifications
(For details, refer to pages 407 and 408.)

Symbol	Specifications
-X144	Symmetrical port position
-X867	Lateral piping type (Change of plug position)

Made to Order Specifications
(For details, refer to pages 209 to 2152.)

Symbol	Specifications
-XC19	Intermediate stroke (Spacer type)
-XC79	Machining tapped hole, drilled hole and pin hole additionally.

Refer to pages 404 to 406 for cylinders with auto switches.

- Minimum auto switch mounting stroke
- Proper auto switch mounting position (detection at stroke end) and mounting height
- Operating range
- Auto switch mounting bracket: Part no.

MGJ

MGP-Z

MGP

MGPW

MGQ

MGG

MGC

MGF

MGT

MGT

D-□

-X□

Series MGP

Weight

Slide bearing: MGPM16 to 100

(kg)

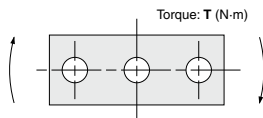
Bore size (mm)	Model	Standard stroke (mm)											
		25	50	75	100	125	150	175	200	250	300	350	400
16	MGPM16	0.51	0.69	0.78	0.91	1.07	1.20	1.32	1.45	1.70	—	—	—
20	MGPM20	0.89	1.14	1.34	1.54	1.74	1.94	2.13	2.33	2.80	3.20	3.59	3.99
25	MGPM25	1.23	1.60	1.87	2.14	2.41	2.68	2.95	3.23	3.89	4.43	4.97	5.51
32	MGPM32	1.98	2.51	2.77	3.15	3.53	3.91	4.29	4.68	5.63	6.39	7.15	7.92
40	MGPM40	2.34	2.91	3.21	3.64	4.06	4.49	4.92	5.34	6.38	7.23	8.09	8.94
50	MGPM50	3.92	4.75	5.29	5.93	6.57	7.21	7.85	8.49	10.1	11.4	12.7	13.9
63	MGPM63	4.94	5.89	6.54	7.29	8.05	8.81	9.56	10.3	12.2	13.7	15.2	16.7
80	MGPM80	—	8.98	9.64	10.6	11.5	12.5	13.4	14.3	16.8	18.7	20.5	22.4
100	MGPM100	—	14.2	15.1	16.5	17.8	19.1	20.5	21.8	25.1	27.8	30.4	33.1

Ball bushing bearing: MGPL16 to 100

(kg)

Bore size (mm)	Model	Standard stroke (mm)											
		25	50	75	100	125	150	175	200	250	300	350	400
16	MGPL16	0.56	0.66	0.78	0.89	1.03	1.15	1.26	1.38	1.61	—	—	—
20	MGPL20	0.97	1.12	1.30	1.47	1.68	1.85	2.03	2.20	2.57	2.92	3.27	3.62
25	MGPL25	1.34	1.54	1.78	1.96	2.19	2.46	2.69	2.92	3.33	3.83	4.30	4.76
32	MGPL32	1.81	2.34	2.57	2.88	3.26	3.58	3.89	4.21	4.91	5.54	6.17	6.80
40	MGPL40	2.15	2.73	3.01	3.36	3.78	4.14	4.50	4.86	5.65	6.37	7.08	7.80
50	MGPL50	3.65	4.47	4.95	5.49	6.14	6.69	7.24	7.79	9.02	10.1	11.2	12.3
63	MGPL63	4.66	5.60	6.20	6.85	7.61	8.28	8.95	9.61	11.1	12.4	13.7	15.1
80	MGPL80	—	8.88	9.63	10.5	11.3	12.1	12.9	13.7	15.6	17.3	18.9	20.5
100	MGPL100	—	13.7	14.9	16.1	17.2	18.4	19.6	20.8	23.4	25.7	28.1	30.4

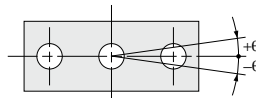
Allowable Rotational Torque of Plate (Air Cushion)



T (N · m)

Bore size (mm)	Bearing type	Stroke											
		25	50	75	100	125	150	175	200	250	300	350	400
16	MGPM	0.53	0.84	0.69	0.58	0.50	0.44	0.40	0.36	0.30	—	—	—
	MGPL	1.27	0.86	0.65	0.52	0.43	0.37	0.32	0.28	0.23	—	—	—
20	MGPM	0.99	2.23	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	1.57	1.34	1.17	1.03	0.93	0.76	0.65	0.56	0.49
25	MGPM	1.64	3.51	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	2.41	2.05	1.78	1.58	1.41	1.16	0.98	0.85	0.74
32	MGPM	6.35	6.64	5.69	4.97	4.42	3.98	3.61	3.31	2.84	2.48	2.20	1.98
	MGPL	5.95	5.89	5.11	6.99	6.34	5.79	5.33	4.93	4.29	3.78	3.38	3.04
40	MGPM	7.00	7.32	6.27	5.48	4.87	4.38	3.98	3.65	3.13	2.74	2.43	2.19
	MGPL	6.55	6.49	5.62	7.70	6.98	6.38	5.87	5.43	4.72	4.16	3.71	3.35
50	MGPM	13.0	13.8	12.0	10.6	9.50	8.60	7.86	7.24	6.24	5.49	4.90	4.43
	MGPL	9.17	11.2	9.80	12.8	11.6	10.7	9.80	9.10	7.95	7.02	6.26	5.63
63	MGPM	14.7	15.6	13.5	11.9	10.7	9.69	8.86	8.16	7.04	6.19	5.52	4.99
	MGPL	10.2	12.5	11.0	14.3	13.0	11.9	11.0	10.2	8.84	7.80	6.64	6.24
80	MGPM	—	26.0	22.9	20.5	18.6	17.0	15.6	14.5	12.6	11.2	10.0	9.11
	MGPL	—	25.2	22.7	20.6	18.9	17.3	16.0	14.8	12.9	11.3	10.0	8.94
100	MGPM	—	41.9	37.5	33.8	30.9	28.4	26.2	24.4	21.4	19.1	17.2	15.7
	MGPL	—	41.7	37.9	34.6	31.8	29.3	27.2	25.3	22.1	19.5	17.3	15.5

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
16	$\pm 0.08^\circ$	$\pm 0.10^\circ$
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	$\pm 0.04^\circ$	$\pm 0.05^\circ$

Compact Guide Cylinder/With Air Cushion

Series MGP

Model Selection

Selection Conditions

Mounting orientation	Vertical		Horizontal	
Maximum speed (mm/s)	200 or less	400	200 or less	400
Graph (Slide bearing type)	(1), (2)	(3), (4)	(15), (16)	(17), (18)
Graph (Ball bushing bearing type)	(5) to (9)	(10) to (14)	(19), (20)	(21), (22)

Selection Example 1 (Vertical Mounting)

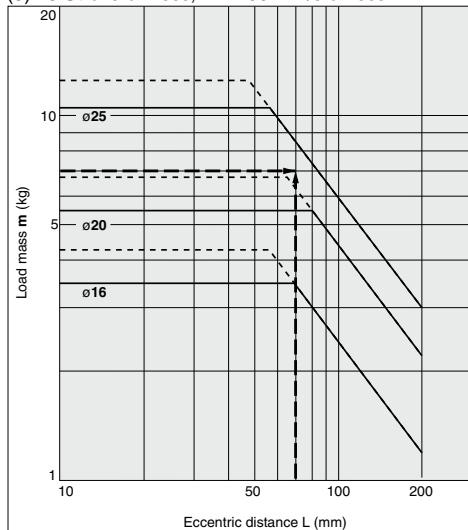
Selection conditions

Mounting: Vertical
 Bearing type: Ball bushing
 Stroke: 75 stroke
 Maximum speed: 200 mm/s
 Load mass: 7 kg
 Eccentric distance: 70 mm

Find the point of intersection for the load mass of 7 kg and the eccentric distance of 70 mm on graph (5), based on vertical mounting, ball bushing, 75 mm stroke, and the speed of 200 mm/s.

→ MGPL25-75A is selected.

(5) 75 Stroke or Less, $V = 200$ mm/s or less



Selection Example 2 (Horizontal Mounting)

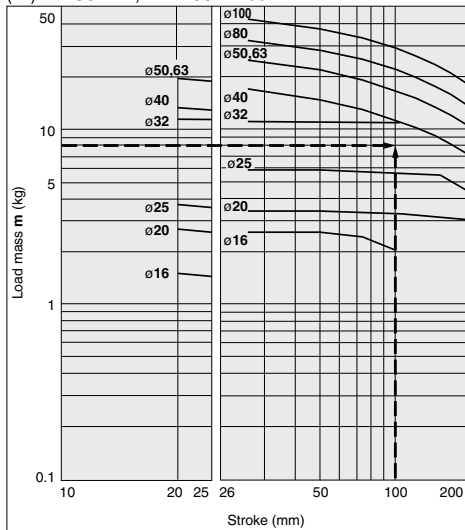
Selection conditions

Mounting: Horizontal
 Bearing type: Slide bearing
 Distance between plate and load center of gravity: 40 mm
 Maximum speed: 400 mm/s
 Load mass: 8 kg
 Stroke: 100 stroke

Find the point of intersection for the load mass of 8 kg and 100 stroke on graph (17), based on horizontal mounting, slide bearing, the distance of 40 mm between the plate and load center of gravity, and the speed of 400 mm/s.

→ MGPM32-100A is selected.

(17) $L = 50$ mm, $V = 400$ mm/s



· When the maximum speed exceeds 200 mm/s, the allowable load mass is determined by multiplying the value shown in the graph at 400 mm/s by the coefficient listed in the table below.

Maximum	Up to 300 mm/s	Up to 400 mm/s	Up to 500 mm/s
Coefficient	1.7	1	0.6

· Use the "Guide Cylinder Selection Software", when the eccentric distance is 200 mm or more.

MGJ

MGP
-Z

MGP

MGPW

MGP

MGPQ

MGG

MGC

MGF

MGZ

MGT

D-□

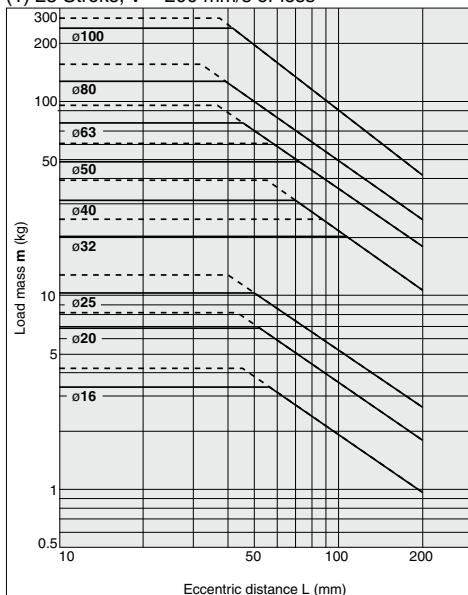
-X□

Vertical Mounting (Slide Bearing)

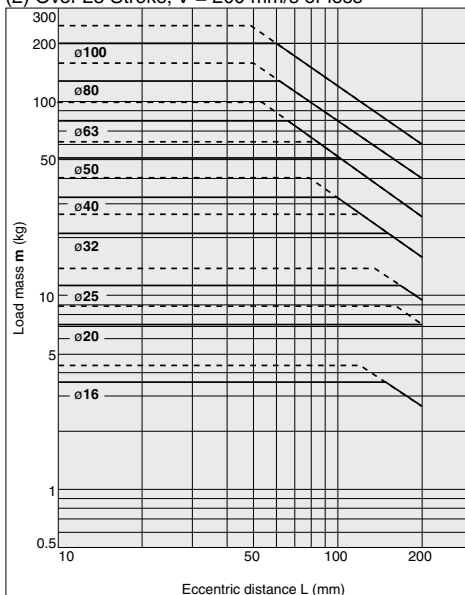
— Operating pressure 0.4 MPa
 - - - Operating pressure 0.5 MPa or more

MGPM16 to 100

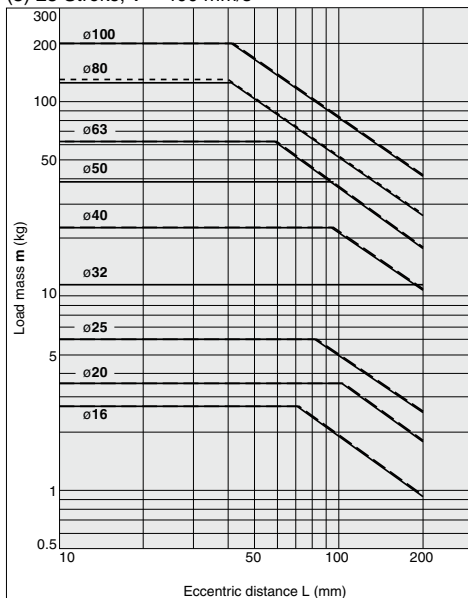
(1) 25 Stroke, V = 200 mm/s or less



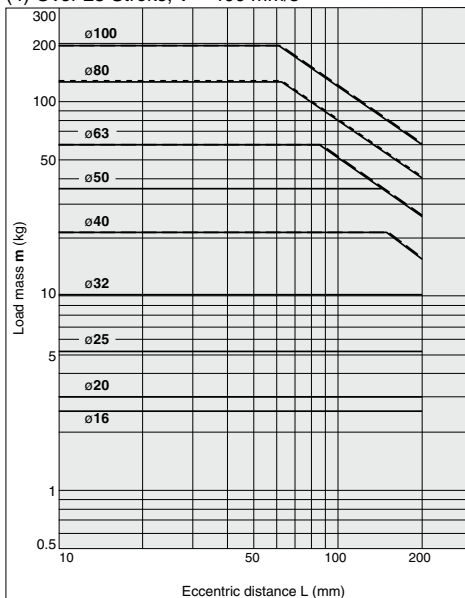
(2) Over 25 Stroke, V = 200 mm/s or less



(3) 25 Stroke, V = 400 mm/s



(4) Over 25 Stroke, V = 400 mm/s



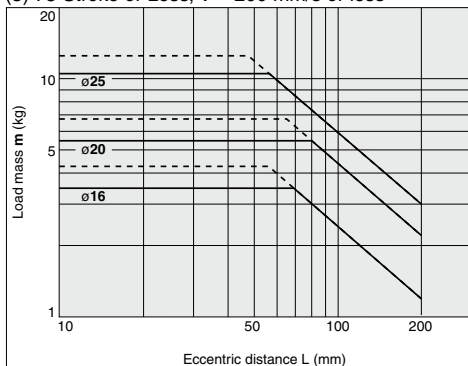
· Use the "Guide Cylinder Selection Software", when the eccentric distance is 200 mm or more.

Vertical Mounting (Ball Bushing)

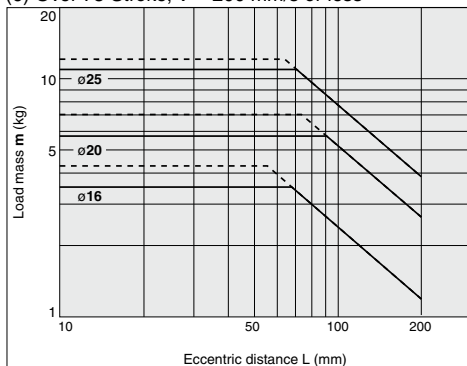
— Operating pressure 0.4 MPa
 - - - Operating pressure 0.5 MPa or more

MGPL16 to 25

(5) 75 Stroke or Less, $V = 200$ mm/s or less

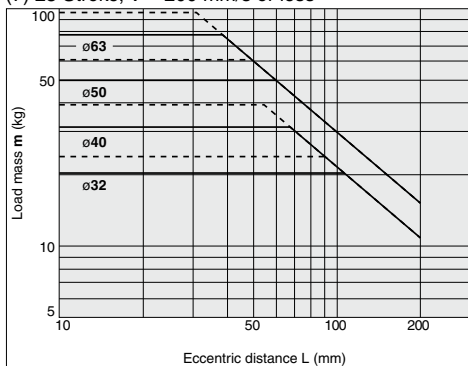


(6) Over 75 Stroke, $V = 200$ mm/s or less

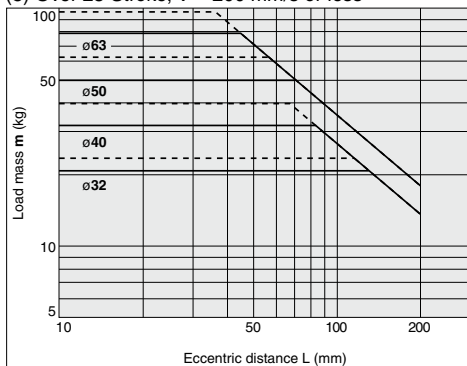


MGPL32 to 63

(7) 25 Stroke, $V = 200$ mm/s or less

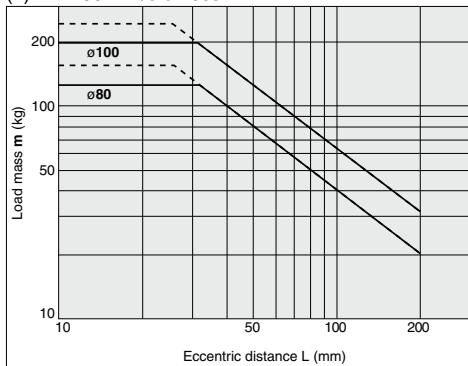


(8) Over 25 Stroke, $V = 200$ mm/s or less



MGPL80, 100

(7) $V = 200$ mm/s or less



- MGJ
- MGP-Z
- MGP**
- MGPW
- MGQ
- MGG
- MGC
- MGF
- MGZ
- MGT

- D-□
- X□

· Use the "Guide Cylinder Selection Software", when the eccentric distance is 200 mm or more.

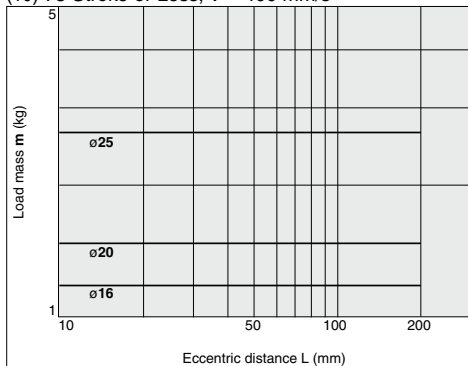
Series MGP

Vertical Mounting (Ball Bushing)

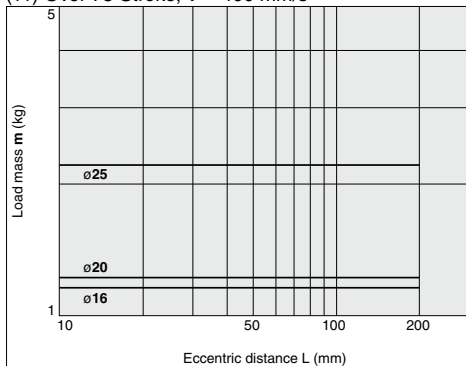
Operating pressure 0.4 MPa

MGPL16 to 25

(10) 75 Stroke or Less, $V = 400$ mm/s

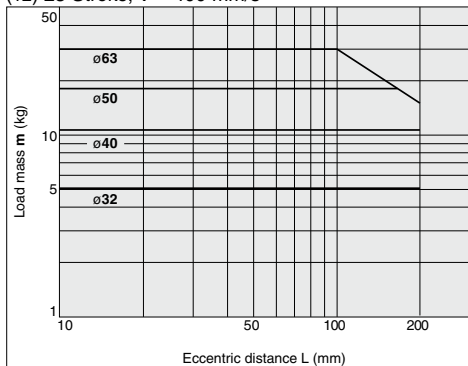


(11) Over 75 Stroke, $V = 400$ mm/s

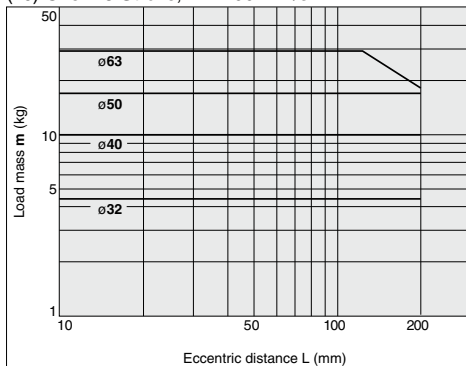


MGPL32 to 63

(12) 25 Stroke, $V = 400$ mm/s

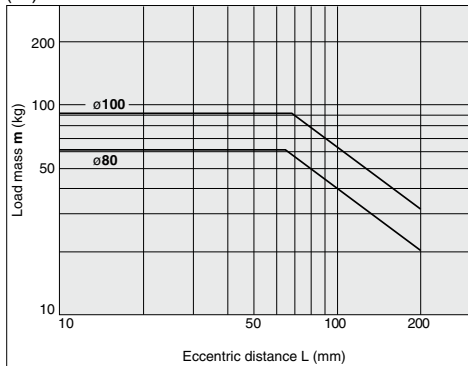


(13) Over 25 Stroke, $V = 400$ mm/s



MGPL80, 100

(14) $V = 400$ mm/s

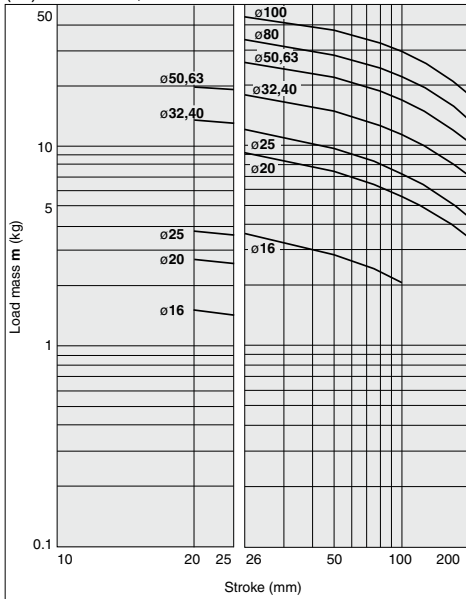


· Use the "Guide Cylinder Selection Software", when the eccentric distance is 200 mm or more.

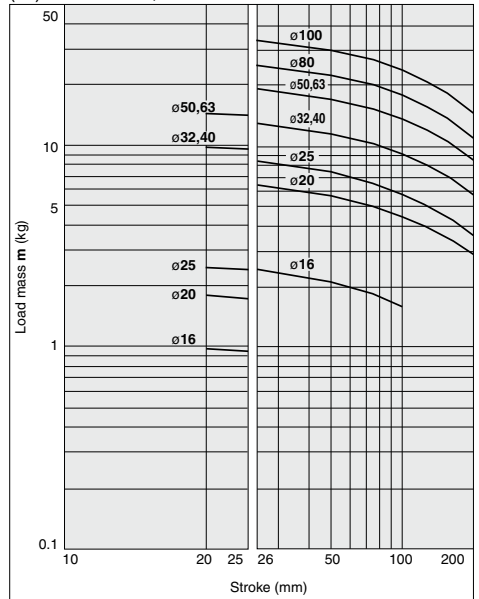
Horizontal Mounting (Slide Bearing)

MGPM16 to 100

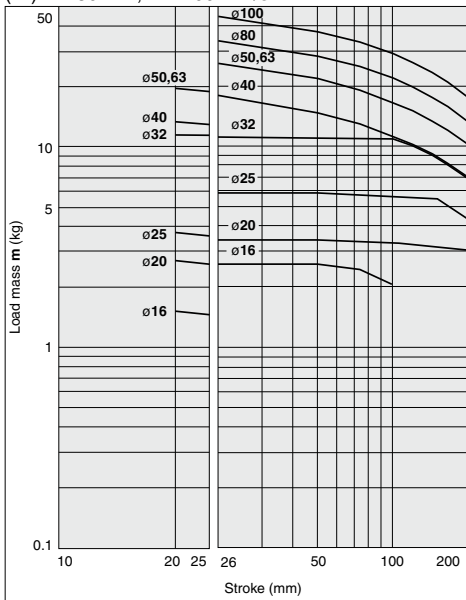
(15) L = 50 mm, V = 200 mm/s or less



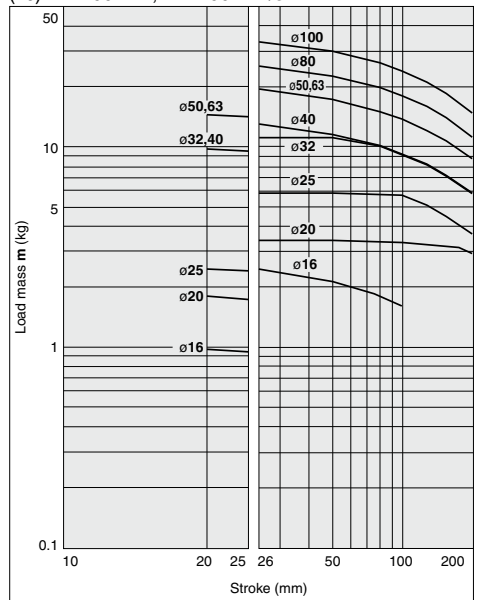
(16) L = 100 mm, V = 200 mm/s or less



(17) L = 50 mm, V = 400 mm/s



(18) L = 100 mm, V = 400 mm/s



MGJ

MGP

-Z

MGP

MGPW

MGQ

MGG

MGC

MGF

MGZ

MGT

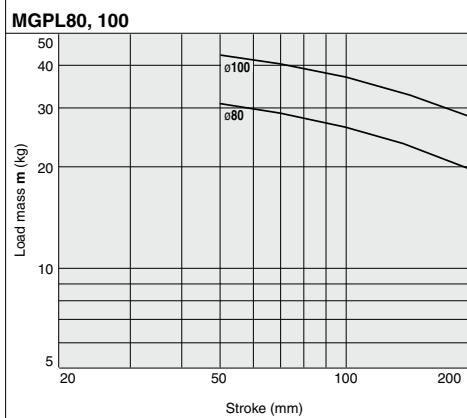
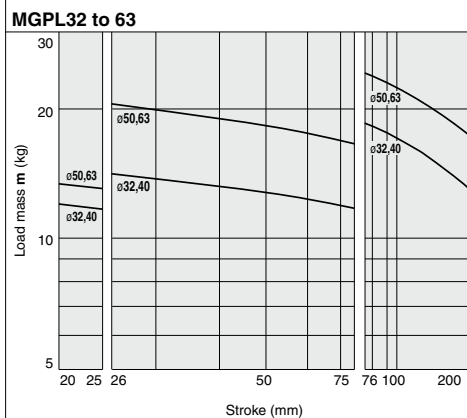
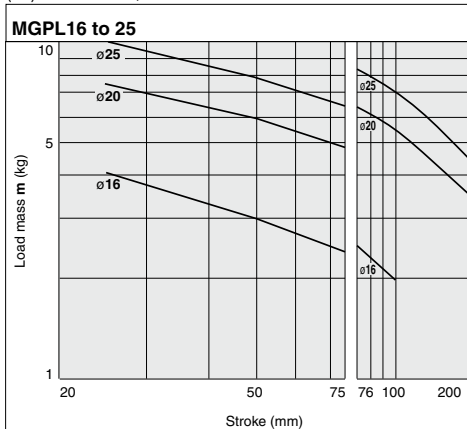
D-□

-X□

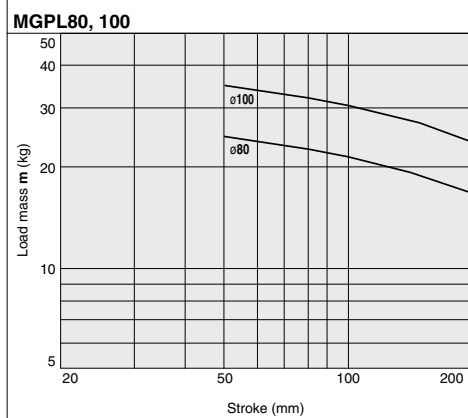
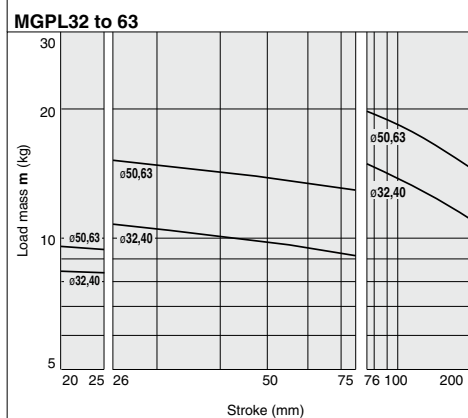
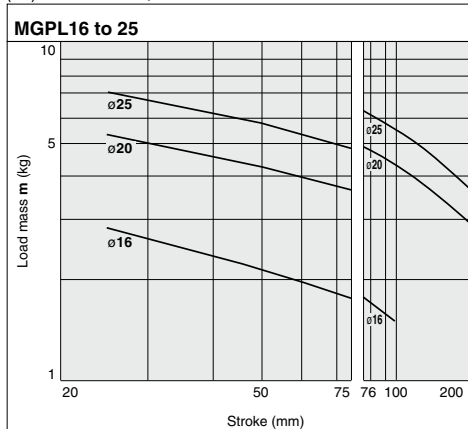
Series MGP

Horizontal Mounting (Ball Bushing)

(19) L = 50 mm, V = 200 mm/s or less

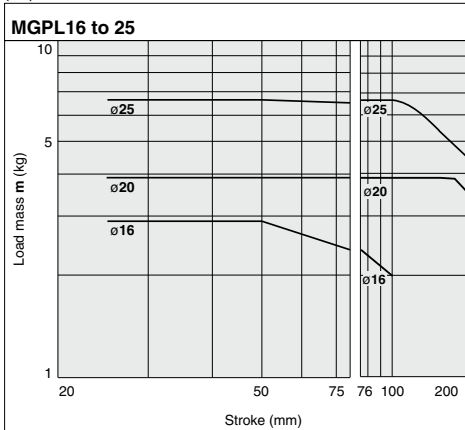


(20) L = 100 mm, V = 200 mm/s or less

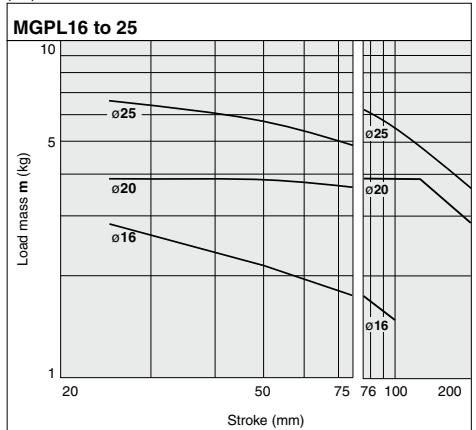


Horizontal Mounting (Ball Bushing)

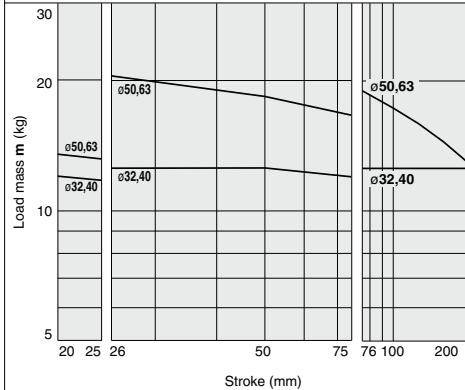
(21) L = 50 mm, V = 400 mm/s



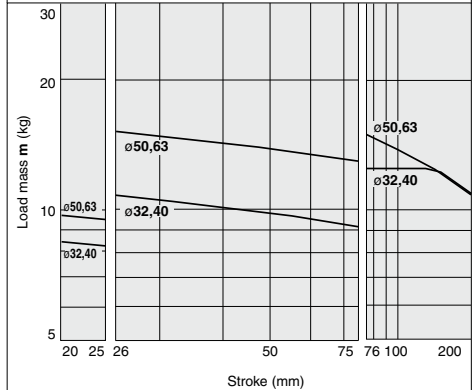
(22) L = 100 mm, V = 400 mm/s



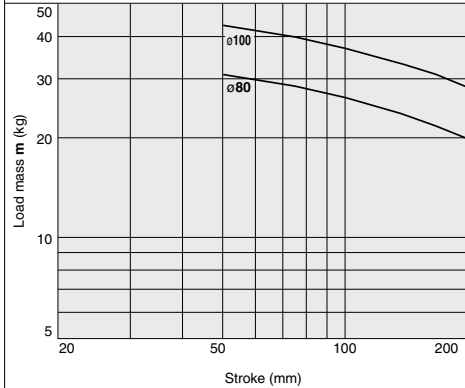
MGPL32 to 63



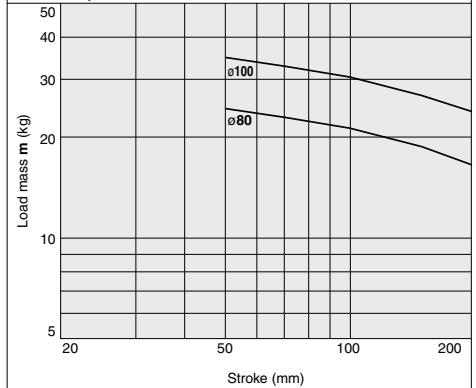
MGPL32 to 63



MGPL80, 100



MGPL80, 100



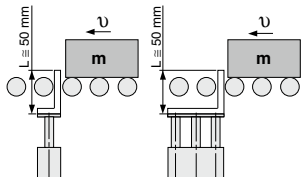
- MGJ
- MGP-Z
- MGP
- MGPW
- MGQ
- MGG
- MGC
- MGF
- MGZ
- MGT

- D-
- X

Series MGP

Operating Range when Used as Stopper

Bore size $\phi 16$ to 25/MGPM16 to 25 (Slide bearing)



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

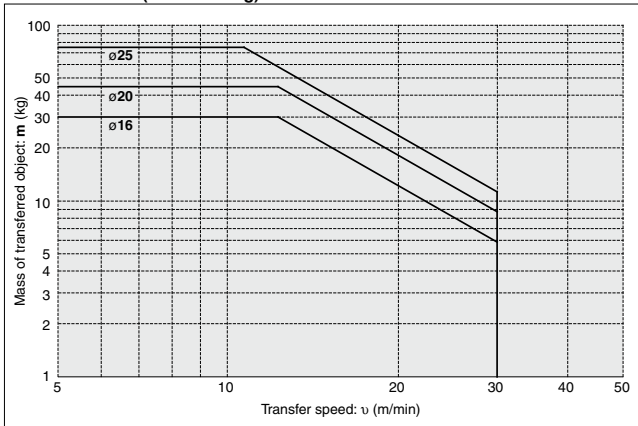
⚠ Caution

Caution on handling

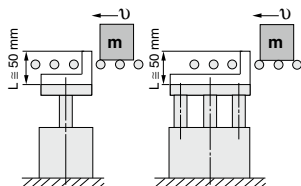
Note 1) When using as a stopper, select a model with 25 stroke or less.

Note 2) Model MGPL (Ball bushing bearing) cannot be used as a stopper.

MGPM16 to 25 (Slide bearing)



Bore Size $\phi 32$ to 100/MGPM32 to 100 (Slide bearing)



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

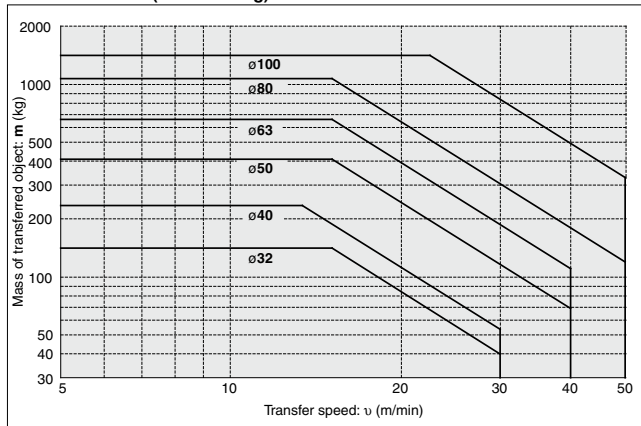
⚠ Caution

Caution on handling

Note 1) When using as a stopper, select a model with 50 stroke or less.

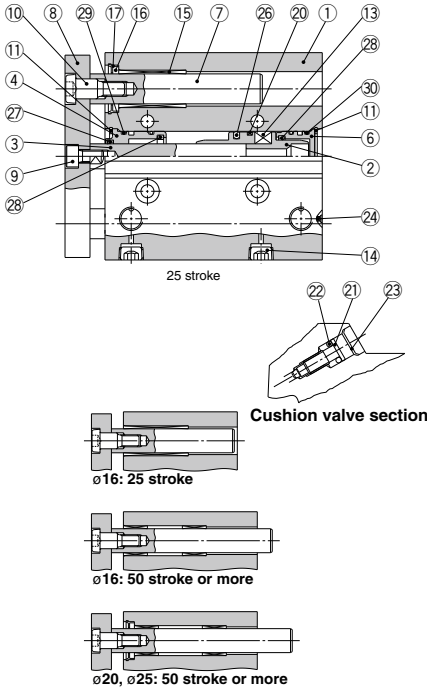
Note 2) Model MGPL (Ball bushing bearing) cannot be used as a stopper.

MGPM32 to 100 (Slide bearing)

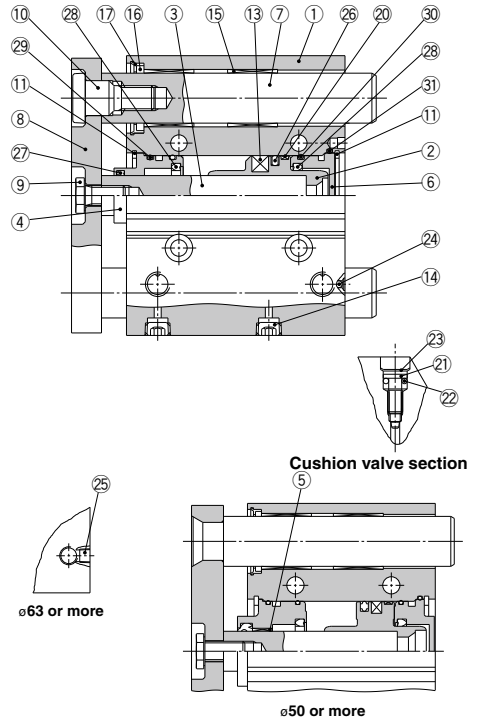


Series MGPM/Construction (With air cushion)

MGPM16 to 25



MGPM32 to 100



Component Parts

No.	Description	Material	Note
1	Body	Aluminum alloy	Hard anodized
2	Piston	Aluminum alloy	Chromated
3	Piston rod	Stainless steel	ø16 to ø25
		Carbon steel	ø32 to ø100 Hard chrome plated
4	Collar	Aluminum alloy	ø16 to ø63 Clear anodized ø80, ø100 Painted
5	Bushing	Bearing alloy	
6	Head cover	Aluminum alloy	ø16 to ø25 Clear anodized
			ø32 to ø100 Painted
7	Guide rod	Carbon steel	Hard chrome plated
8	Plate	Carbon steel	Nickel plated
9	Plate mounting bolt	Carbon steel	Nickel plated
10	Guide bolt	Carbon steel	Nickel plated
11	Retaining ring	Carbon tool steel	Phosphate coated
12	Retaining ring	Carbon tool steel	Phosphate coated
13	Magnet	—	
14	Plug Hexagon socket head cap plug	Carbon steel	ø16 Nickel plated
			ø20 to ø100
15	Slide Bearing	Bearing alloy	
16	Felt	Felt	
17	Holder	Resin	
18	Ball bushing		
19	Spacer	Aluminum alloy	

Component Parts

No.	Description	Material	Note
20	Wear ring	Resin	
21	Cushion valve	Steel	
22	Gasket	NBR	
23	Retaining ring	Carbon tool steel	Except ø16
24	Steel ball	Carbon steel	ø16 to ø50
25	Plug	Carbon steel	ø63 to ø100 Nickel plated
26*	Piston seal	NBR	
27*	Rod seal	NBR	
28*	Cushion seal	Urethane	
29*	Gasket A	NBR	
30*	Gasket B	NBR	
31*	Gasket C	NBR	

Replacement Parts: Seal Kit

Bore size (mm)	Kit no.	Contents	Bore size (mm)	Kit no.	Contents
16	MGP16-A-PS	Set of nos. above	50	MGP50-A-PS	Set of nos. above
20	MGP20-A-PS		63	MGP63-A-PS	
25	MGP25-A-PS		80	MGP80-A-PS	
32	MGP32-A-PS		100	MGP100-A-PS	
40	MGP40-A-PS				

* Seal kit includes 26 to 31. 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 no.: GR-S-010 (10 g)

MGJ

MGP-Z

MGP

MGPW

MGQ

MGG

MGC

MGF

MGZ

MGT

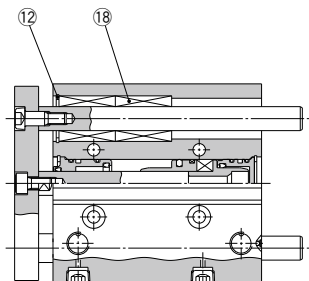
D-□

-X□

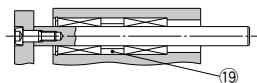
Series MGP

Series MGPL/Construction (With Air Cushion)

MGPL16 to 25

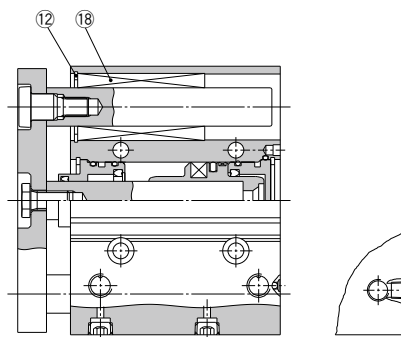


ø20,ø25: 75 stroke or less

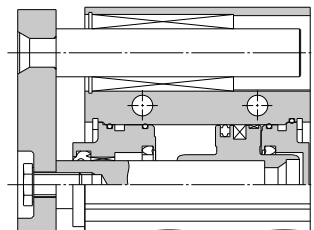


ø20,ø25: 100 stroke or more

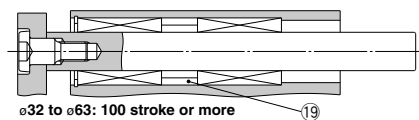
MGPL32 to 100



ø63 or more

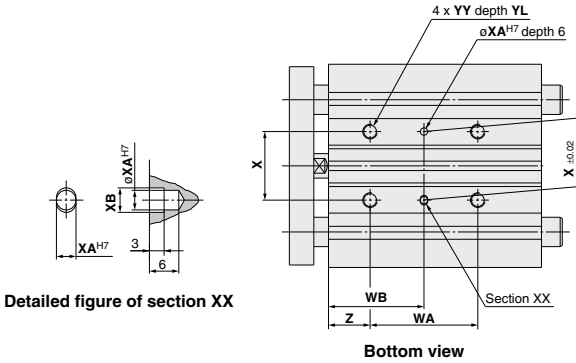


ø50 or more



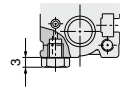
ø32 to ø63: 100 stroke or more

MGPM, MGPL (With Air Cushion): $\phi 16$ to $\phi 25$

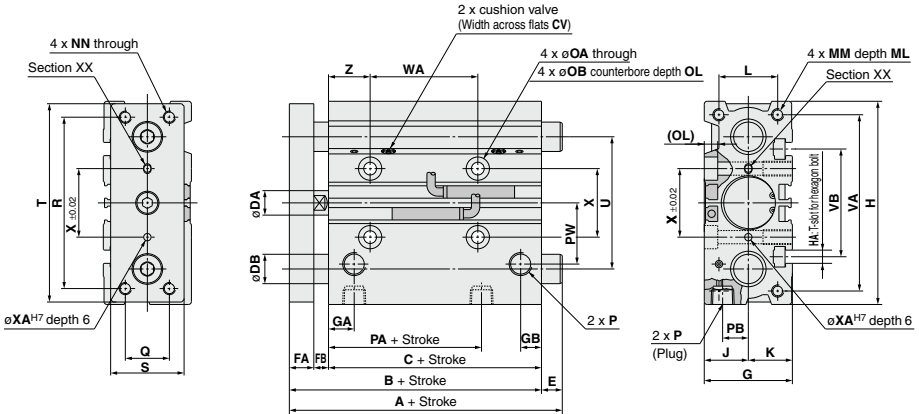


T-slot dimensions

Bore size (mm)	T-slot dimensions (mm)				
	a	b	c	d	e
16	4.4	7.4	3.7	2.5	6.7
20	5.4	8.4	4.5	2.8	7.8
25	5.4	8.4	4.5	3	8.2



$\phi 16$



Note 1) For the intermediate strokes, refer to "Manufacture of Intermediate Stroke" on page 365.
Note 2) When adjusting the $\phi 16$ cushion valve, use a 3 mm flat head watchmakers' screwdriver.

- For bore size with $\phi 16$, M5 x 0.8 is only available.
- Rc, NPT, G port can be selected for bore sizes with $\phi 20$ or more. (Refer to page 364.)

MGPM, MGPL Common Dimensions

Bore size (mm)	Standard stroke (mm)																			P				
	B	C	CV	DA	FA	FB	G	GA	GB	H	HA	J	K	L	MM	ML	NN	OA	OB	OL	N1	N2	TF	
16	25, 30, 75, 100, 125, 150, 175, 200, 250	71	58	—	8	8	5	30	11	8	64	M4	15	15	22	M5 x 0.8	12	M5 x 0.8	4.3	8	4.5	M5 x 0.8	—	—
20	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400	78	62	1.5	10	10	6	36	10.5	8.5	83	M5	18	18	24	M5 x 0.8	13	M5 x 0.8	5.4	9.5	5.5	Rc 1/8	NPT 1/8	G 1/8
25	—	78.5	62.5	1.5	12	10	6	42	11.5	9	93	M5	21	21	30	M6 x 1.0	15	M6 x 1.0	5.4	9.5	5.5	Rc 1/8	NPT 1/8	G 1/8

Bore size (mm)	PA	PB	PW	Q	R	S	T	U	VA	VB	WA				WB				X	XA	XB	YY	YL	Z
											75 st or less	100 to 175 st	200, 250 st	300 st or more	75 st or less	100 to 175 st	200, 250 st	300 st or more						
16	40	10	19	16	54	25	62	46	56	38	44	110	200	—	27	60	105	—	24	3	3.5	M5 x 0.8	10	5
20	37.5	10.5	25	18	70	30	81	54	72	44	44	120	200	300	39	77	117	167	28	3	3.5	M6 x 1.0	12	17
25	37.5	13.5	30	26	78	38	91	64	82	50	44	120	200	300	39	77	117	167	34	4	4.5	M6 x 1.0	12	17

MGPM (Slide bearing) A, DB, E Dimensions

Bore size (mm)	A					DB	E				
	25 st	50 st	75, 100 st	125 to 200 st	250 st or more		25 st	50 st	75, 100 st	125 to 200 st	250 st or more
16	71	89.5	71	95	95	10	0	18.5	0	24	24
20	78	86.5	84.5	84.5	122	12	0	8.5	6.5	6.5	44
25	78.5	87	85	85	122	16	0	8.5	6.5	6.5	43.5

MGPL (Ball bushing bearing) A, DB, E Dimensions

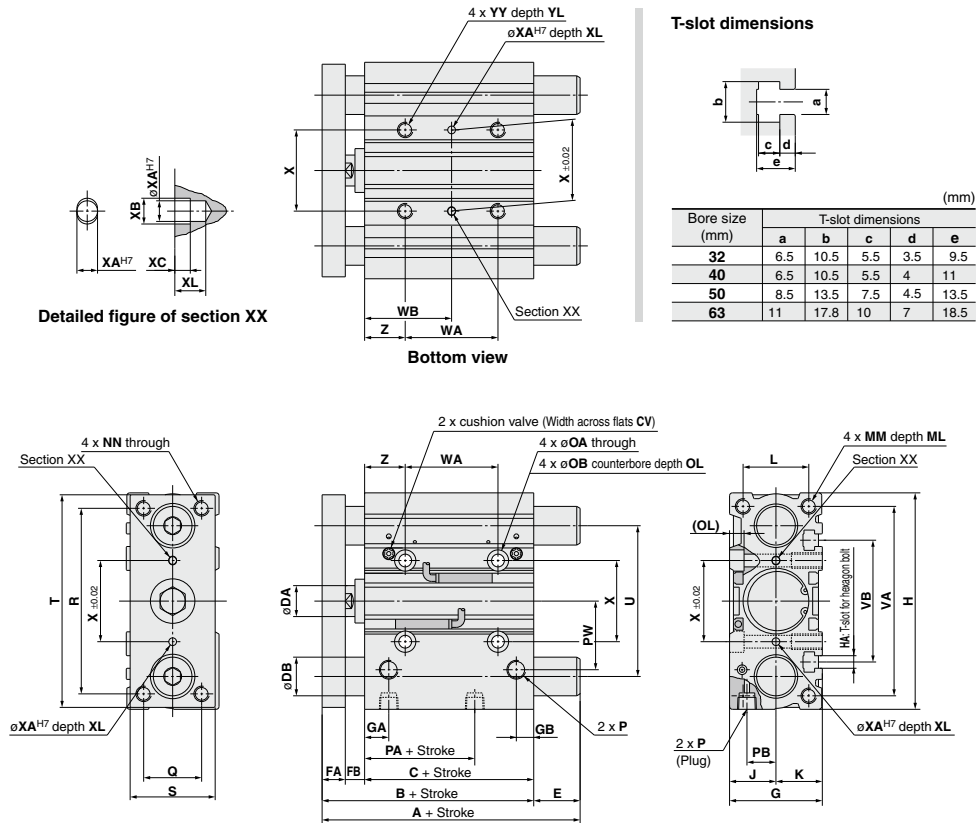
Bore size (mm)	A					DB	E				
	25 st	50, 75 st	100 st	125 to 200 st	250 st or more		25 st	50, 75 st	100 st	125 to 200 st	250 st or more
16	80	71	71	95	95	8	9	0	24	24	
20	95	80	99	104	122	10	17	2	21	26	
25	100.5	85.5	104.5	104.5	122	13	22	7	26	26	

- MGJ
- MGP-Z
- MGP
- MGPW
- MGQ
- MGG
- MGC
- MGF
- MGZ
- MGT

- D-□
- X-□

Series MGP

MGPM, MGPL (With Air Cushion): $\phi 32$ to $\phi 63$



For the intermediate strokes, refer to "Manufacture of Intermediate Stroke" on page 365.

• Rc, NPT and G ports can be selected. (Refer to page 364.)

MGPM, MGPL Common Dimensions

Bore size (mm)	Standard stroke (mm)	B	C	CV	DA	FA	FB	G	GA	GB	H	HA	J	K	L	MM	ML	NN	OA	OB	OL	P		
																						Nil	N	TF
32	25, 50, 75, 100	84.5	62.5	1.5	16	12	10	48	12.5	9	112	M6	24	24	34	M8 x 1.25	20	M8 x 1.25	6.6	11	7.5	Rc 1/8	NPT 1/8	G 1/8
40	125, 150, 175	91	69	1.5	16	12	10	54	14	10	120	M6	27	27	40	M8 x 1.25	20	M8 x 1.25	6.6	11	7.5	Rc 1/8	NPT 1/8	G 1/8
50	200, 250, 300	97	69	2.5	20	16	12	64	14	11	148	M8	32	32	46	M10 x 1.5	22	M10 x 1.5	8.6	14	9	Rc 1/4	NPT 1/4	G 1/4
63	350, 400	102	74	2.5	20	16	12	78	16.5	13.5	162	M10	39	39	58	M10 x 1.5	22	M10 x 1.5	8.6	14	9	Rc 1/4	NPT 1/4	G 1/4

Bore size (mm)	PA	PB	PW	Q	R	S	T	U	VA	WA			WB			X	XA	XB	XC	XL	YY	YL	Z			
										75 st or less	100 to 175 st	200, 250 st	300 st or more	75 st or less	100 to 175 st									200, 250 st	300 st or more	
32	32	15	35.5	30	96	44	110	78	98	63	48	124	200	300	45	83	121	171	42	4	4.5	3	6	M8 x 1.25	16	21
40	38	18	39.5	30	104	44	118	86	106	72	48	124	200	300	46	84	122	172	50	4	4.5	3	6	M8 x 1.25	16	22
50	34	21.5	47	40	130	60	146	110	130	92	48	124	200	300	48	86	124	174	66	5	6	4	8	M10 x 1.5	20	24
63	39	28	58	50	130	70	158	124	142	110	52	128	200	300	50	88	124	174	80	5	6	4	8	M10 x 1.5	20	24

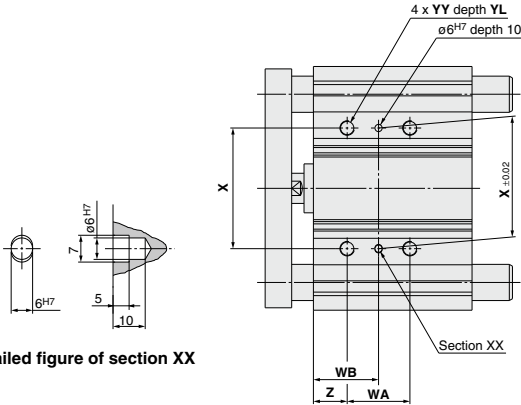
MGPM (Slide bearing) A, DB, E Dimensions (mm)

Bore size (mm)	A				DB	E			
	25st	50st	75 to 200 st	250 st or more		25st	50st	75 to 200 st	250 st or more
32	97	127	102	140	20	12.5	42.5	17.5	55.5
40	97	127	102	140	20	6	36	11	49
50	106.5	131.5	118	161	25	9.5	34.5	21	64
63	106.5	131.5	118	161	25	4.5	29.5	16	59

MGPL (Ball bushing bearing) A, DB, E Dimensions (mm)

Bore size (mm)	A					DB	E						
	25st	50st	75st	100st	125 to 200 st		250 st or more	25st	50st	75st	100st	125 to 200 st	250 st or more
32	84.5	123	98	115.5	118	140	16	0	38.5	13.5	31	33.5	55.5
40	91	123	98	115.5	118	140	16	0	32	7	24.5	27	49
50	97	127.5	114	159	134	161	20	0	30.5	17	62	37	64
63	102	127.5	114	159	134	161	20	0	25.5	12	57	32	59

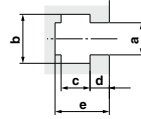
MGPM, MGPL (With Air Cushion): $\phi 80, \phi 100$



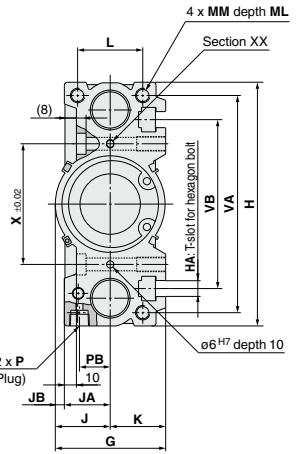
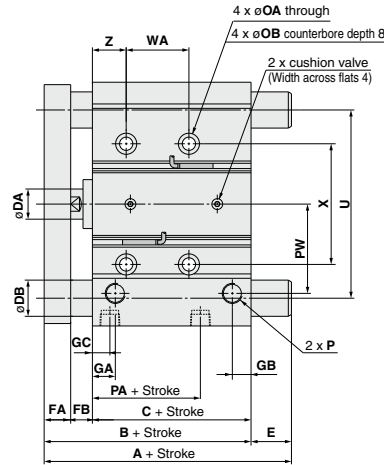
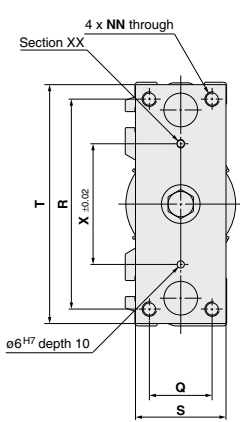
Detailed figure of section XX

Bottom view

T-slot dimensions



Bore size (mm)	T-slot dimensions (mm)				
	a	b	c	d	e
80	13.3	20.3	12	8	22.5
100	15.3	23.3	13.5	10	30



For the intermediate strokes, refer to "Manufacture of Intermediate Stroke" on page 365.

• Rc, NPT and G ports can be selected. (Refer to page 364.)

MGPM, MGPL Common Dimensions

Bore size (mm)	Standard stroke (mm)	B	C	DA	FA	FB	G	GA	GB	GC	H	JA	JA	JB	K	L	MM	ML	NN	OA	OB	P			
																						Nil	N	TF	
80	50,75,100,125,150,175,200,250,300,350,400	121.5	81.5	25	22	18	91.5	19	15.5	14.5	202	M12	45.5	38	7.5	46	54	M12 x 1.75	25	M12 x 1.75	10.6	17.5	Rc 3/8	NPT 3/8	G 3/8
100		141	91	30	25	25	111.5	23	19	18	240	M14	55.5	45	10.5	56	62	M14 x 2.0	31	M14 x 2.0	12.5	20	Rc 3/8	NPT 3/8	G 3/8

Bore size (mm)	PA	PB	PW	Q	R	S	T	U	VA	VB	WA			WB			X	YY	YL	Z		
											50, 75 st	100 to 175 st	200, 250 st	300 st or more	50, 75 st	100 to 175 st					200, 250 st	300 st or more
80	39.5	25.5	74	52	174	75	198	156	180	140	52	128	200	300	54	92	128	178	100	M12 x 1.75	24	28
100	42.5	32.5	89	64	210	90	236	188	210	166	72	148	220	320	47	85	121	171	124	M14 x 2.0	28	11

MGPM (Slide bearing) A, DB, E Dimensions

Bore size (mm)	A			DB	E		
	50 st	75 to 200 st	250 st or more		50 st	75 to 200 st	250 st or more
80	167	142	193	30	45.5	20.5	71.5
100	187	162	203	36	46	21	62

MGPL (Ball bushing bearing) A, DB, E Dimensions

Bore size (mm)	A			DB	E		
	50 st	75 to 200 st	250 st or more		50 st	75 to 200 st	250 st or more
80	168.5	160	193	25	47	38.5	71.5
100	178.5	180	203	30	37.5	39	62

- MGJ
- MGP-Z
- MGP
- MGPW
- MGQ
- MGG
- MGC
- MGF
- MGZ
- MGT

- D-□
- X□

Compact Guide Cylinder/With End Lock

Series *MGP*

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



Stroke Variations

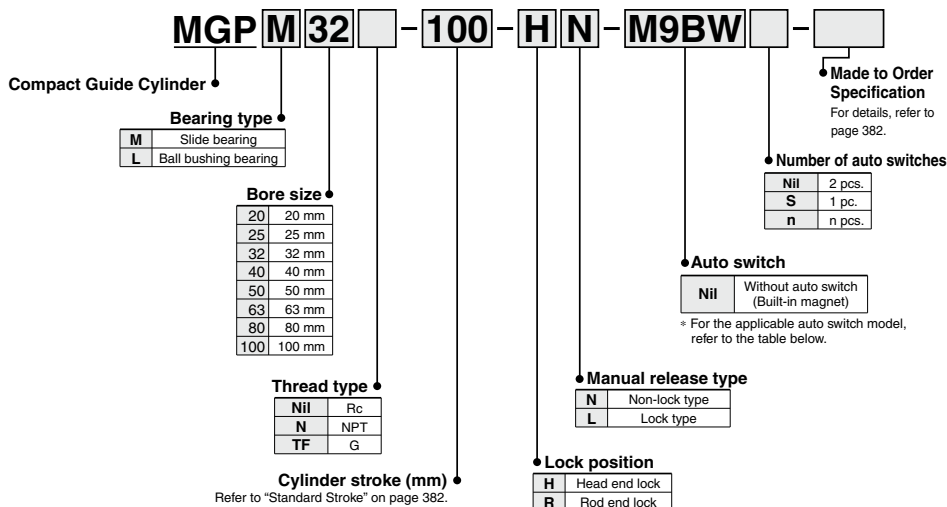
Bearing type	Bore size (mm)	Stroke (mm)																Intermediate stroke	Locking direction	Manual release
		25	50	75	100	125	150	175	200	250	300	350	400							
MGPM Slide bearing	20	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	Spacer installation type Available by the 5 mm interval.	Rod end lock	Non-lock type
	25	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•			
	32	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•			
	40	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•			
MGPL Ball bushing bearing	50	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	Head end lock	Lock type	
	63	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•			
	80	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•			
	100	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•			

Compact Guide Cylinder/With End Lock

Series MGP

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

How to Order



Applicable Auto Switches

Refer to pages 1893 to 2007 for further information on auto switches.

Type	Special function	Electrical entry	Indicator sign	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			
				3-wire (PNP)			M9PV	M9P	●	●	○	○				
				2-wire	12 V		M9BV	M9B	●	●	○	○		—		
				3-wire (NPN)	5 V, 12 V		M9NWV	M9NW	●	●	○	○				
	3-wire (PNP)			12 V			M9P WV	M9PW	●	●	○	○	IC circuit			
	2-wire				5 V, 12 V		M9B WV	M9B W	●	●	○	○				
	Water resistant (2-color indication)			3-wire (NPN)	5 V, 12 V		M9NAV**	M9NA**	○	○	●	○	○	IC circuit		
				3-wire (PNP)			M9PAV**	M9PA**	○	○	●	○	○			
Magnetic field resistant (2-color indication)	2-wire	12 V	M9BAV**	M9BA**	○	○	●	○	○	—						
	2-wire (Non-polar)	—	—	P3DW	●	—	●	○	○							
Reed auto switch	—	Grommet	Yes	3-wire (NPN equivalent)	—	5 V	—	A96V	A96	●	—	●	—	IC circuit	Relay, PLC	
				2-wire	24 V	12 V	100 V	A93V	A93	●	—	●	—	—		Relay, PLC
				2-wire	24 V	12 V	100 V or less	A90V	A90	●	—	●	—	—		

** Water resistant type auto switches can be mounted on the above models, but in such case SMC cannot guarantee water resistance. Consult with SMC regarding water resistant types with the above model numbers.

- * Lead wire length symbols: 0.5 m..... Nil (Example) M9NW
- 1 m..... M (Example) M9NWM
- 3 m..... L (Example) M9NWL
- 5 m..... Z (Example) M9NWX
- * Solid state auto switches marked with "○" are produced upon receipt of order.
- * Bore sizes 32 to 100 are available for D-P4DW.
- * Bore sizes 25 to 100 are available for D-P3DW.

- * Since there are other applicable auto switches than listed, refer to page 406 for details.
- * For details about auto switches with pre-wired connector, refer to pages 1960 and 1961. For D-P3DW, refer to pages 1948 and 1949.
- * Auto switches are shipped together (not assembled).

MGJ

MGP-Z

MGP

MGPW

MGQ

MGG

MGC

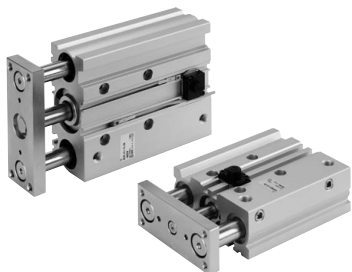
MGF

MGZ

MGT

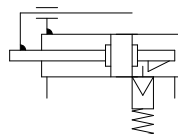
D-□

-X□



Symbol

Rubber bumper



Made to Order: Individual Specifications
(For details, refer to page 408.)

Symbol	Specifications
-X867	Lateral piping type (Change of plug position)

Made to Order Specifications
(For details, refer to pages 209 to 215.)

Symbol	Specifications
-XC79	Machining tapped hole, drilled hole and pin hole additionally.

Refer to pages 404 to 406 for cylinders with auto switches.

- Minimum auto switch mounting stroke
- Proper auto switch mounting position (detection at stroke end) and mounting height
- Operating range
- Auto switch mounting bracket: Part no.

Specifications

Bore size	ø20	ø25	ø32	ø40	ø50	ø63	ø80	ø100
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 (No freezing)							
Piston speed	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							

* 0.1 MPa except the lock unit.

Lock Specifications

Lock position	Head end, Rod end							
	ø20	ø25	ø32	ø40	ø50	ø63	ø80	ø100
Holding force (Max.) N	215	330	550	860	1340	2140	3450	5390
Backlash	2 mm or less							
Manual release	Non-lock type, Lock type							

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

Standard Stroke

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 Stroke

Description	Spacer installation type. Dealing with the stroke by the 5 mm interval is available by installing spacer with standard stroke cylinder. When a spacer is mounted on the cylinder with an end lock on the rod side, use a special piston rod.
Part no.	Refer to "How to Order" for the standard model numbers on page 381.
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 stroke or more for two switches, and 5 stroke or more for one switch.

Note 2) Intermediate stroke (by the 1 mm interval) based on an exclusive body will be available upon request for special.

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	
				OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN
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)

Weight

Slide Bearing: MGPM20 to 100 (Basic weight)

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 Bearing: MGPL20 to 100 (Basic weight)

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

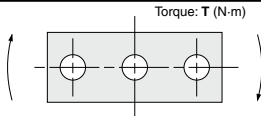
Lock Unit Additional Weight

Bore size (mm)	Head end lock		Rod end 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)	Head end lock		Rod end 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 = 5.98 kg

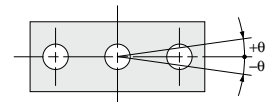
Allowable Rotational Torque of Plate



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

Model selection is the same as MGP/standard type.
 Refer to pages 349 to 355.

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	$\pm 0.04^\circ$	$\pm 0.05^\circ$

MGJ

MGPM

MGZ

MGF

MGPW

MGP

MGQ

MGG

MGC

MGF

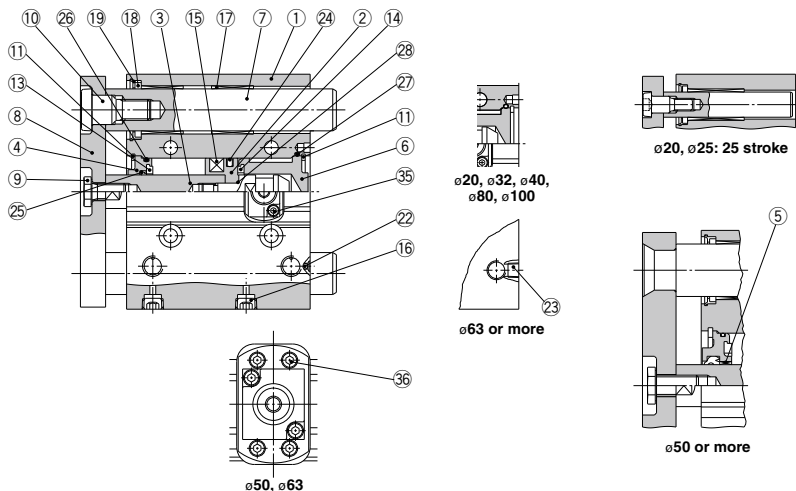
MGZ

MGT

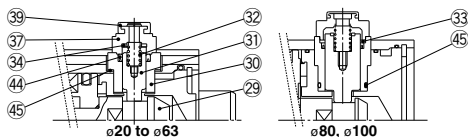
D-□

-X□

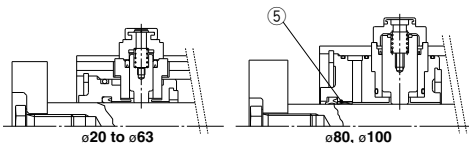
Construction/Series MGPM



Non-locking type (Head end lock)



(Rod end lock)



Component Parts

No.	Description	Material	Note
1	Body	Aluminum alloy	Hard anodized
2	Piston	Aluminum alloy	Chromated
3	Piston rod	Stainless steel ø20, ø25	Hard chrome plated with rod end lock only
		Carbon steel ø32 to ø100	
4	Collar	Aluminum alloy	Chromated
5	Bushing	Bearing alloy	
6	Head cover	Aluminum alloy	Chromated
7	Guide rod	Carbon steel	Hard chrome plated
8	Plate	Carbon steel	Nickel plated
9	Plate mounting bolt	Carbon steel	Nickel plated
10	Guide bolt	Carbon steel	Nickel plated
11	Retaining ring	Carbon tool steel	Phosphate coated
12	Retaining ring	Carbon tool steel	Phosphate coated
13	Bumper A	Urethane	
14	Bumper B	Urethane	
15	Magnet	—	
16	Hexagon socket head cap plug	Carbon steel	Nickel plated
17	Slide Bearing	Bearing alloy	
18	Felt	Felt	
19	Holder	Resin	
20	Ball bushing		
21	Spacer	Aluminum alloy	
22	Steel ball	Carbon steel	ø20 to ø50
23	Plug	Carbon steel	ø63 to ø100 Nickel plated
24*	Piston seal	NBR	
25*	Rod seal	NBR	
26*	Gasket A	NBR	
27*	Gasket B	NBR	

Component Parts

No.	Description	Material	Note
28	Piston gasket	NBR	ø32 to ø100 only
29	Lock bolt	Carbon steel	Zinc chromated
30	Lock holder	Brass	Electroless nickel plated
31	Lock piston	Carbon steel	Hard chrome plated
32	Lock spring	Stainless steel	
33	Seal retainer	Carbon steel	Zinc chromated (ø80, ø100 only)
34	Bumper	Urethane	
35†	Hexagon socket head cap screw	Carbon steel	Black zinc chromated
36†	Hexagon socket head cap screw	Carbon steel	Zinc chromated (ø50, ø63 only)
37	Cap A	Aluminum die-casted	Black painted
38	Cap B	Carbon steel	SQ treated
39	Rubber cap	Synthetic rubber	
40	M/O knob	Zinc die-casted	Black painted
41	M/O bolt	Alloy steel	Black zinc chromated
42	M/O spring	Steel wire	chromated
43	Stopper ring	Carbon steel	chromated
44*	Lock piston seal	NBR	
45†	Lock holder gasket	NBR	

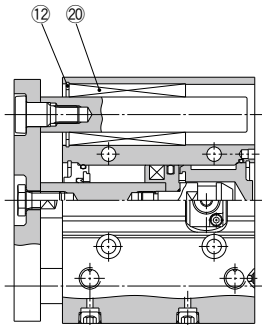
Replacement Parts/Seal Kit

Bore size (mm)	Kit no.	Contents	Bore size (mm)	Kit no.	Contents
20	MGP20-B-PS	Set of nos. above	50	MGP50-B-PS	Set of nos. 24, 25, 26, 27, 35, 36, 44, 45
25	MGP25-B-PS		63	MGP63-B-PS	
32	MGP32-B-PS	24, 25, 26, 27, 35, 44, 45	80	MGP80-B-PS	Set of nos. 24, 25, 26, 27, 35, 44, 45
40	MGP40-B-PS		100	MGP100-B-PS	

* Each seal kit includes the parts listed above. 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 no.: GR-S-010 (10 g)

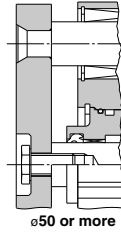
Construction/Series MGPL



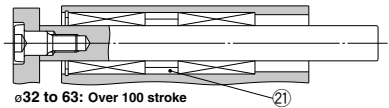
ø20, ø32, ø40,
ø80, ø100



ø63 or more

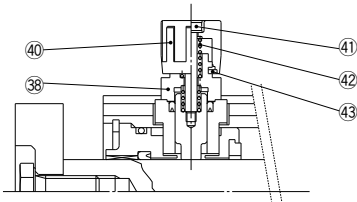


ø50 or more



ø32 to 63: Over 100 stroke

Lock type

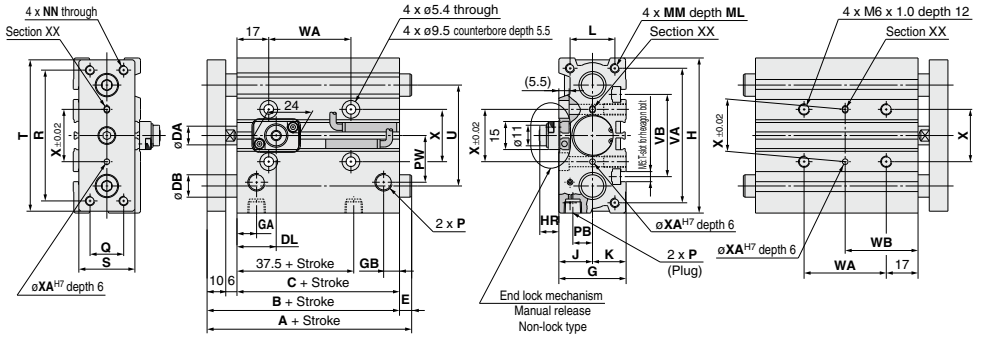


MGJ
MGP -Z
MGP
MGPW
MGQ
MGG
MGC
MGF
MGZ
MGT

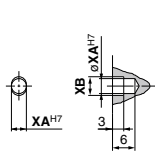
D-□
-X□

Series MGP

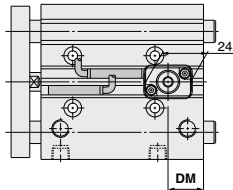
Dimensions: $\phi 20$, $\phi 25$



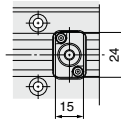
With rod end lock



Detailed figure of section XX

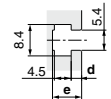
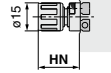


With head end lock



$\phi 25$

End lock mechanism
(Manual release lock type)



T-slot dimensions
(mm)

Bore size (mm)	T-slot dimensions	
	d	e
20	2.8	7.8
25	3	8.2

- For intermediate strokes other than standard strokes, refer to the Manufacture of Intermediate Stroke on page 382.

- Rc, NPT and G ports can be selected. (Refer to page 381.)

MGPM, MGPL Common Dimensions

Bore size (mm)	Standard stroke (mm)	B	C	DA	G	GA	GB	H	J	K	L	MM	ML	NN	P			PB	PW	Q	R	S
															Nil	N	TF					
20	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400	78	62	10	36	10.5	8.5	83	18	18	24	M5 x 0.8	13	M5 x 0.8	Rc 1/8	NPT 1/8	G 1/8	10.5	25	18	70	30
25		78.5	62.5	12	42	11.5	9	93	21	21	30	M6 x 1.0	15	M6 x 1.0	Rc 1/8	NPT 1/8	G 1/8	13.5	30	26	78	38

Bore size (mm)	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	81	54	72	44	44	120	200	300	39	77	117	167	28	3	3.5
25	91	64	82	50	44	120	200	300	39	77	117	167	34	4	4.5

MGPM (Side bearing) A, DB, E Dimensions

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

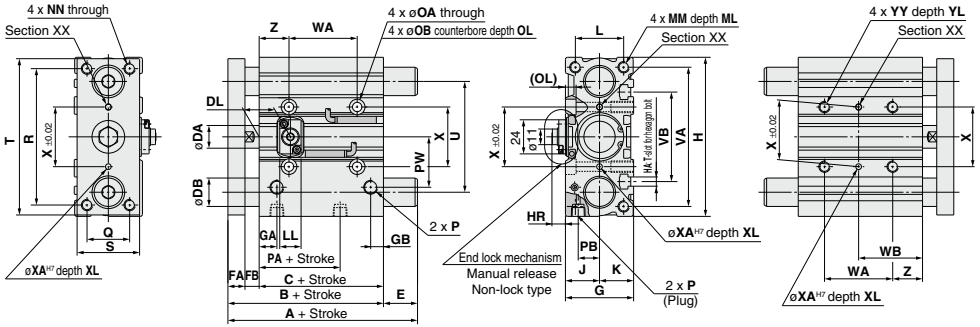
MGPL (Ball bushing bearing) A, DB, E Dimensions

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

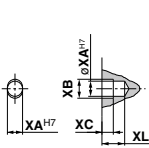
End Lock Mechanism Dimensions

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

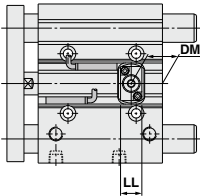
Dimensions: $\phi 32$ to $\phi 63$



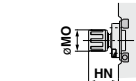
With rod end lock



Detailed figure of section XX



With head end lock



End lock mechanism (Manual release lock type)



T-slot dimensions (mm)

Bore size (mm)	T-slot dimensions				
	a	b	c	d	e
32	6.5	10.5	5.5	3.5	9.5
40	6.5	10.5	5.5	4	11
50	8.5	13.5	7.5	4.5	13.5
63	11	17.8	10	7	18.5

• For intermediate strokes other than standard strokes, refer to the Manufacture of Intermediate Stroke on page 382.

• Rc, NPT and G ports can be selected. (Refer to page 381.)

MGPM, MGPL Common Dimensions (mm)

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		
																					Nil	N	TF
32	25, 50, 75, 100, 125, 150	84.5	62.5	16	12	10	48	12.5	9	112	M6	24	24	34	M8 x 1.25	20	M8 x 1.25	6.6	11	7.5	Rc1/8	NPT1/8	G1/8
40	30, 60, 90, 120, 150	91	69	16	12	10	54	14	10	120	M6	27	27	40	M8 x 1.25	20	M8 x 1.25	6.6	11	7.5	Rc1/8	NPT1/8	G1/8
50	30, 60, 90, 120, 150, 175, 200, 250, 300, 350, 400	97	69	20	16	12	64	14	11	148	M8	32	32	46	M10 x 1.5	22	M10 x 1.5	8.6	14	9	Rc1/4	NPT1/4	G1/4
63		102	74	20	16	12	78	16.5	13.5	162	M10	39	39	58	M10 x 1.5	22	M10 x 1.5	8.6	14	9	Rc1/4	NPT1/4	G1/4

Bore size (mm)	PA	PB	PW	Q	R	S	T	U	VA	VB	WA				WB				X	XA	XB	XC	XL	YY	YL	Z
											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								
32	32	15	35.5	30	96	44	110	78	98	63	48	124	200	300	45	83	121	171	42	4	4.5	3	6	M8 x 1.25	16	21
40	38	18	39.5	30	104	44	118	86	106	72	48	124	200	300	46	84	122	172	50	4	4.5	3	6	M8 x 1.25	16	22
50	34	21.5	47	40	130	60	146	110	130	92	48	124	200	300	48	86	124	174	66	5	6	4	8	M10 x 1.5	20	24
63	39	28	58	50	130	70	158	124	142	110	52	128	200	300	50	88	124	174	80	5	6	4	8	M10 x 1.5	20	24

MGPM (Slide bearing) A, DB, E Dimensions (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
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

MGPL (Ball bushing bearing) A, DB, E Dimensions (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

End Lock Mechanism Dimensions (mm)

Bore size (mm)	DL	DM	HR	HN	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

MGJ

MGP-Z

MGP

MGPW

MGQ

MGG

MGC

MGF

MGZ

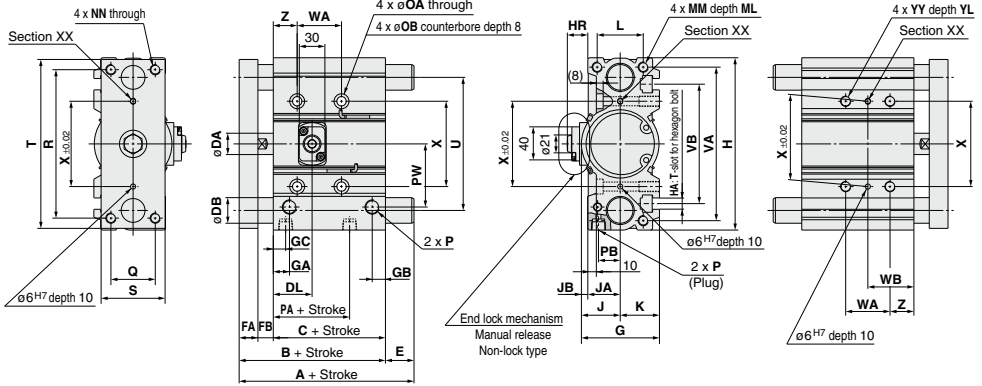
MGT

D-□

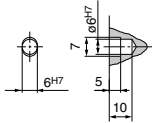
-X□

Series MGP

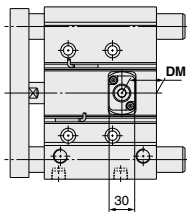
Dimensions: $\phi 80$, $\phi 100$



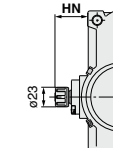
With rod end lock



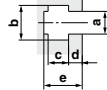
Detailed figure of section XX



With head end lock



End lock mechanism (Manual release lock type)



T-slot dimensions (mm)

Bore size (mm)	T-slot dimensions				
	a	b	c	d	e
80	13.3	20.3	12	8	22.5
100	15.3	23.3	13.5	10	30

• For intermediate strokes other than standard strokes, refer to the Manufacture of Intermediate Stroke on page 382.

• Rc, NPT and G ports can be selected. (Refer to page 381.)

MGPM, MGPL Common Dimensions (mm)

Bore size (mm)	Standard stroke (mm)	B	C	DA	FA	FB	G	GA	GB	GC	H	HA	J	JA	JB	K	L	MM	ML	NN	OA	OB
80	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400	146.5	106.5	25	22	18	91.5	19	15.5	14.5	202	M12	45.5	38	7.5	46	54	M12 x 1.75	25	M12 x 1.75	10.6	17.5
100		166	116	30	25	25	111.5	23	19	18	240	M14	55.5	45	10.5	56	62	M14 x 2.0	31	M14 x 2.0	12.5	20

Bore size (mm)	P				PA	PB	PW	Q	R	S	T	U	VA	VB	WA			WB			X	YY	YL	Z	
	Nil	N	TF	50 st or less											Over 50 st to 150 st	Over 150 st to 250 st	Over 250 st or less	50 st or less	Over 50 st to 150 st	Over 150 st to 250 st					
80	Rc3/8	NPT3/8	G3/8	64.5	25.5	74	52	174	75	198	156	180	140	52	128	200	300	54	92	128	178	100	M12 x 1.75	24	28
100	Rc3/8	NPT3/8	G3/8	67.5	32.5	89	64	210	90	236	188	210	166	72	148	220	320	47	85	121	171	124	M14 x 2.0	28	11

MGPM (Slide bearing) A, DB, E Dimensions (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 bearing) A, DB, E Dimensions (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

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



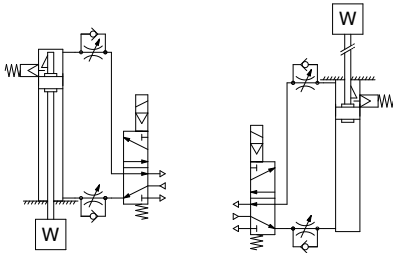
Series MGP With End Lock Specific Product Precautions

Be sure to read before handling. Refer to front matter 39 for Safety Instructions and pages 3 to 12 for Actuator and Auto Switch Precautions.

Use the Recommended Pneumatic Circuit

⚠ Caution

- This is necessary for the correct locking and unlocking actions.



Head end lock

Rod end lock

Operating Precautions

⚠ Caution

- 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.
- 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.)
- 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.
- 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.
- Do not operate multiple cylinders in synchronization.**
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.
- Use a speed controller with meter-out control.**
Lock cannot be released occasionally by meter-in control.
- 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.
- Do not use an air cylinder as an air-hydro cylinder. This will cause leakage of hydraulic fluid.**
- Adjust an auto switch's position so that it operates for movement to both the stroke and backlash (2 mm) positions.**
When a 2-color indication auto switch is adjusted for green indication at the stroke end, it may change to red for the backlash return, but this is not abnormal.

Operating Pressure

⚠ Caution

1. Supply air pressure of 0.15 MPa or higher to the port on the side that has the lock mechanism, as it is necessary for disengaging the lock.

Exhaust Speed

⚠ Caution

1. When the pressure on the side with the lock mechanism drops to 0.05 MPa or below, the lock engages automatically. If the piping on the side with the lock mechanism is thin and long, or if the speed controller is away from the cylinder port, the lock engagement may take some time due to decline of the exhaust speed. The same result will be caused by clogging of the silencer installed at the EXH port of the solenoid valve.

Releasing the Lock

⚠ Warning

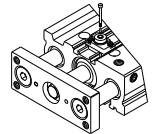
1. Before releasing the lock, be sure to supply air to the side without the lock mechanism, so that there is no load applied to the lock mechanism when it is released. (Refer to the Recommended pneumatic circuits.) If the lock is released when the port on the other side is in an exhaust state, and with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

Manual Release

⚠ Caution

1. Manual release (Non-lock type)

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.



These sizes, pulling forces and strokes are as shown below.

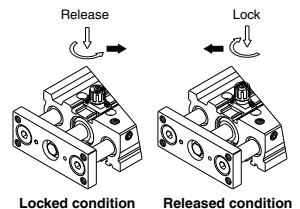
Bore size (mm)	Thread size	Pulling force	Stroke (mm)
20, 25, 32	M2.5 x 0.45 x 25 L or more	4.9 N	2
40, 50, 63	M3 x 0.5 x 30 L or more	10 N	3
80, 100	M5 x 0.8 x 40 L or more	24.5 N	3

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

2. Manual release, Lock type

While pushing the M/O knob, turn it 90° counterclockwise. 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.

When locking is desired, turn M/O button clockwise 90° while pushing fully, correspond ▲ on cap and ▼ ON mark on M/O button. The correct position is confirmed by a click sound "click". If not confirmed, locking is not done.



MGJ

MGP

-Z

MGP

MGPW

MGQ

MGG

MGC

MGF

MGZ

MGT

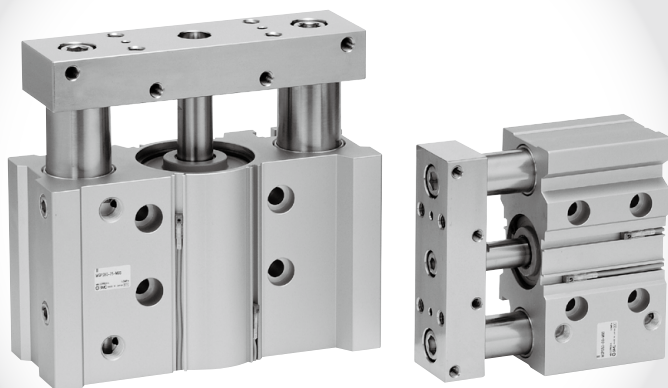
D-□

-X□

Compact Guide Cylinder/Heavy Duty Guide Rod Type

Series *MGPS*

ø50, ø80



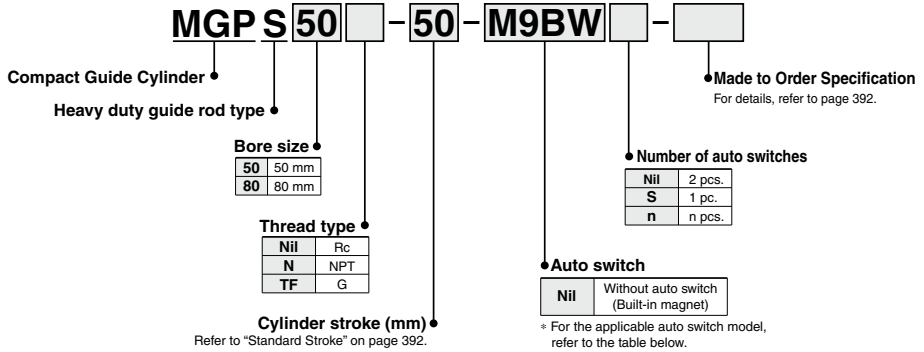
■ Stroke Variations

Bearing type	Bore size (mm)	Stroke (mm)							
		25	50	75	100	125	150	175	200
MGPS	50	●	●	●	●	●	●	●	●
Slide bearing	80	●	●	●	●	●	●	●	●

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

ø50, ø80

How to Order



Applicable Auto Switches/Refer to pages 1893 to 2007 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)	IC circuit	Relay, PLC	
Solid state auto switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	M9NV	M9N	●	●	○	○	IC circuit	Relay, PLC	
				3-wire (PNP)				M9PV	M9P	●	●	○	○			
	2-wire			5 V, 12 V	—	M9BV	M9B	●	●	○	○	—				
	3-wire (NPN)					M9NVV	M9NV	●	●	○	○					
	Diagnostic indication (2-color indication)			3-wire (PNP)	M9PVV	M9PV	●	●	○	○	IC circuit					
					2-wire	M9BWW	M9BW	●	●	○		○	—			
	Water resistant (2-color indication)			3-wire (NPN)	M9NAV**	M9NA**	○	○	●	●	IC circuit					
					3-wire (PNP)	M9PAV**	M9PA**	○	○	●		●				
Magnetic field resistant (2-color indication)	2-wire (Non-polar)	—	—	—	M9BAV**	M9BA**	○	○	●	●	—					
					—	P3DW	●	—	●	○						
					—	P4DW	—	—	●	●		○				
					—	—	—	—	—	—		○				
Reed auto switch	—	Grommet	Yes	3-wire (NPN equivalent)	24 V	12 V	100 V or less	A96V	A96	●	—	—	—	IC circuit	—	
				2-wire				A93V	A93	●	—	●	—	—		Relay, PLC
								A90V	A90	●	—	●	—	—		

** Water resistant type auto switches can be mounted on the above models, but in such case SMC cannot guarantee water resistance. Consult with SMC regarding water resistant types with the above model numbers.

* Lead wire length symbols: 0.5 m..... Nil (Example) M9NV
 1 m..... M (Example) M9NVV
 3 m..... L (Example) M9NVL
 5 m..... Z (Example) M9NVZ

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

* Since there are other applicable auto switches than listed, refer to page 406 for details.
 * For details about auto switches with pre-wired connector, refer to pages 1960 and 1961. For D-P3DW, refer to pages 1948 and 1949.
 * Auto switches are shipped together (not assembled).

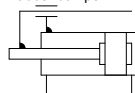
- MGJ
- MGZ
- MGW
- MGQ
- MGG
- MGK
- MGF
- MGZ
- MGT

- D-□
- X□

Series MGPS



Symbol
Rubber bumper



Made to Order
Made to Order: Individual Specifications
(For details, refer to page 408.)

Symbol	Specifications
-X867	Lateral piping type (Change of plug position)

Refer to pages 404 to 406 for cylinders with auto switches.

- Minimum auto switch mounting stroke
- Proper auto switch mounting position (detection at stroke end) and mounting height
- Operating range
- Auto switch mounting bracket: Part no.

Specifications

Bore size	ø50	ø80
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 (No freezing)	
Piston speed	50 to 400 mm/s	
Cushion	Rubber bumper on both ends	
Lubrication	Not required (Non-lube)	
Stroke length tolerance	+1.5 0 mm	

Standard Stroke

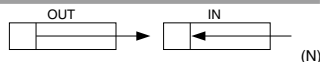
Bore size (mm)	Standard stroke (mm)
50, 80	25, 50, 75, 100, 125, 150, 175, 200

Manufacture of Intermediate Stroke

Description	Spacer installation type Spacers are installed in the standard stroke cylinder. Available by the 5 mm stroke interval.
Part no.	Refer to "How to Order" for the standard model numbers on page 391.
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) Intermediate stroke (by the 1 mm interval) based on an exclusive body will be available upon request for special.

Theoretical Output



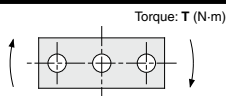
Bore size (mm)	Rod size (mm)	Operating direction	Piston area (mm ²)	Operating pressure (MPa)										
				0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0		
50	20	OUT	1963	393	589	785	982	1178	1374	1571	1767	1963		
		IN	1649	330	495	660	825	990	1155	1319	1484	1649		
80	25	OUT	5027	1005	1508	2011	2513	3016	3519	4021	4524	5027		
		IN	4536	907	1361	1814	2268	2721	3175	3629	4082	4536		

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

Weight

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

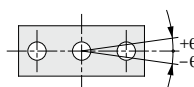
Allowable Rotational Torque of Plate



T (N-m)

Bore size (mm)	Model	Standard stroke (mm)							
		25	50	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

Selection Conditions

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

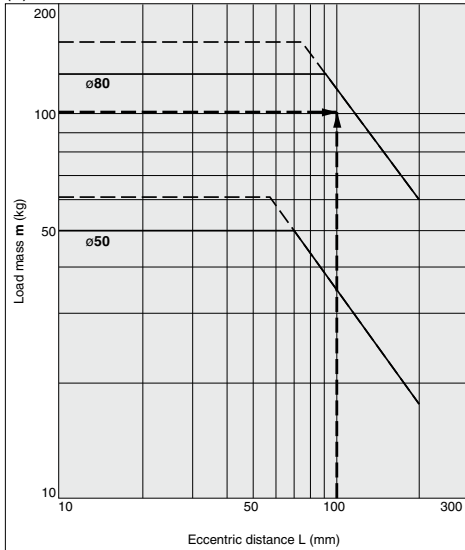
Selection Example 1 (Vertical Mounting)

Selection conditions

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

Find the point of intersection for the load mass 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.

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



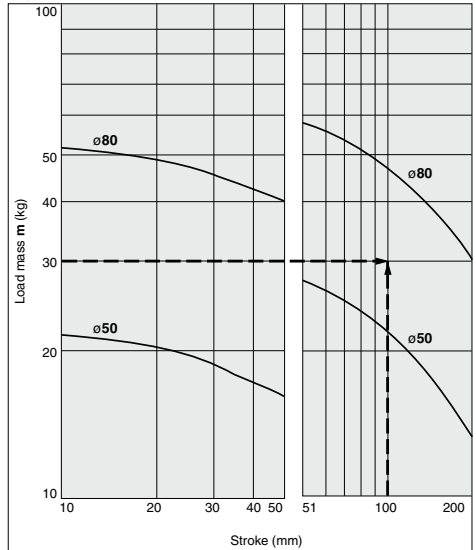
Selection Example 2 (Horizontal Mounting)

Selection conditions

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

Find the point of intersection for the load mass of 30 kg and 100 stroke 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.

(5) $L = 50$ mm, $V = 200$ mm/s or less



· When the maximum speed exceeds 200 mm/s, the allowable load mass is determined by multiplying the value shown in the graph at 400 mm/s by the coefficient listed in the table below.

Maximum	Up to 300 mm/s	Up to 400 mm/s	Up to 500 mm/s
Coefficient	1.7	1	0.6

· Use the "Guide Cylinder Selection Software", when the eccentric distance is 200 mm or more.

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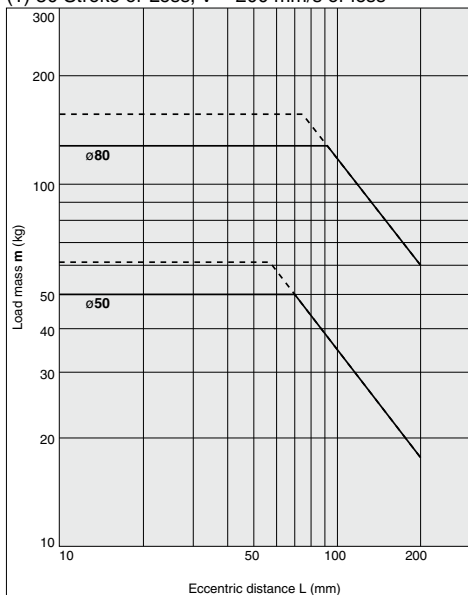
-X□

Vertical Mounting (Slide Bearing)

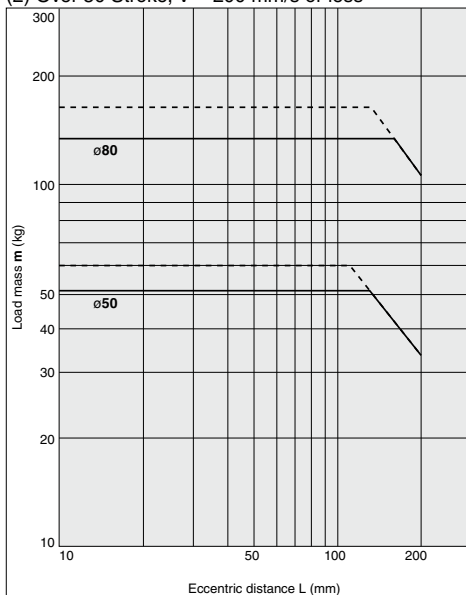
— Operating pressure 0.4 MPa
 - - - Operating pressure 0.5 MPa or more

MGPS50, 80

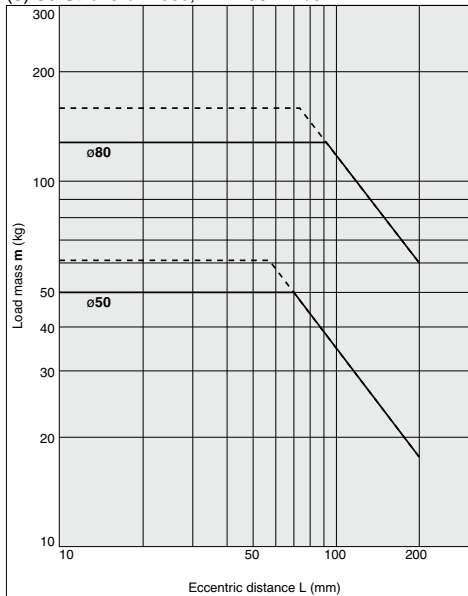
(1) 50 Stroke or Less, V = 200 mm/s or less



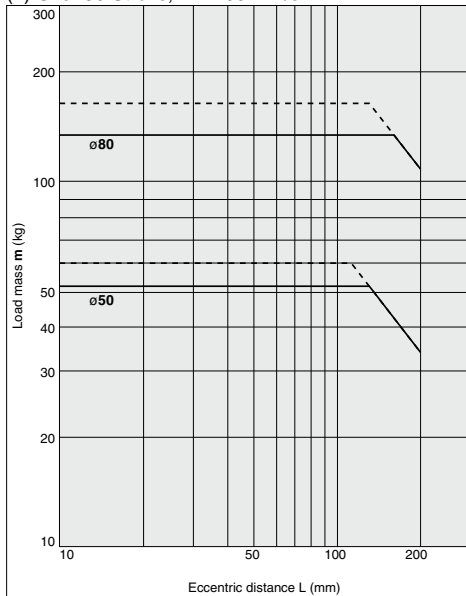
(2) Over 50 Stroke, V = 200 mm/s or less



(3) 50 Stroke or Less, V = 400 mm/s



(4) Over 50 Stroke, V = 400 mm/s

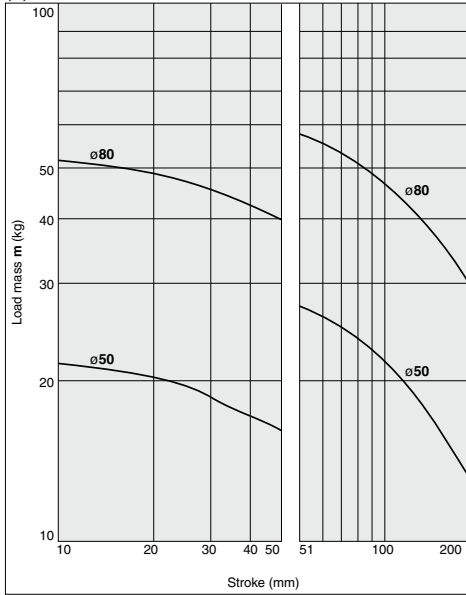


· Use the "Guide Cylinder Selection Software", when the eccentric distance is 200 mm or more.

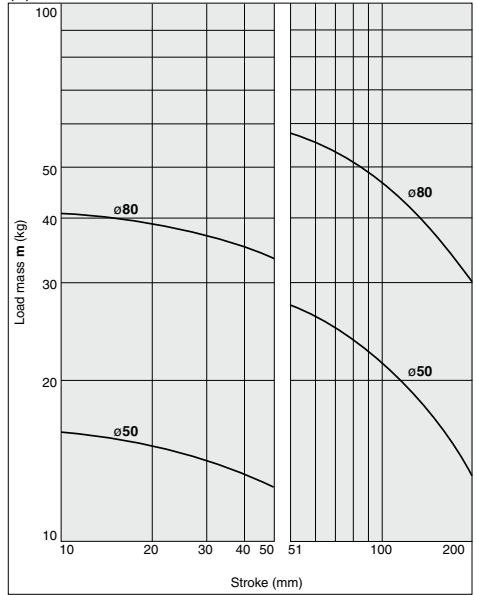
Horizontal Mounting (Slide Bearing)

MGPS50, 80

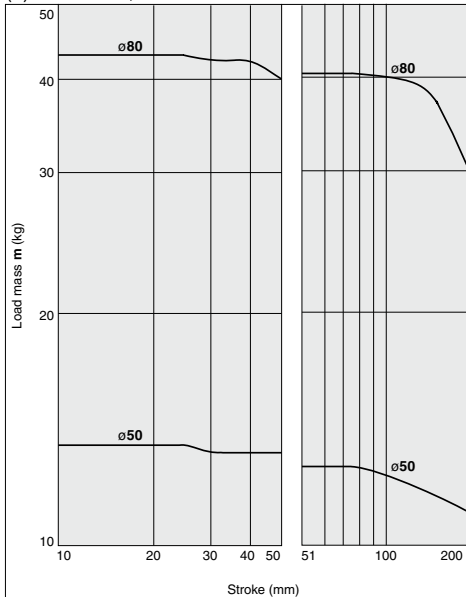
(5) L = 50 mm, V = 200 mm/s or less



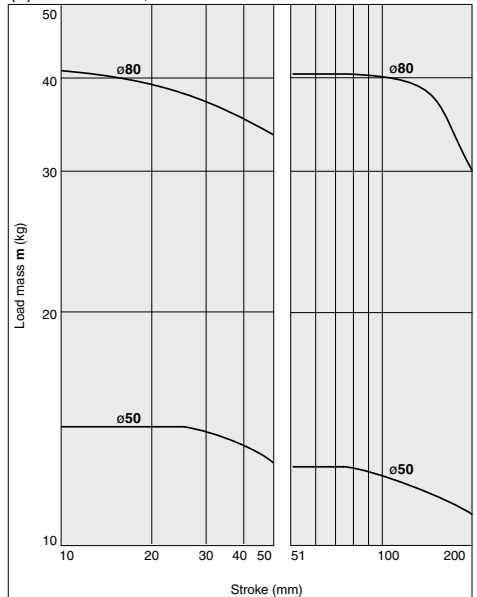
(6) L = 100 mm, V = 200 mm/s or less



(7) L = 50 mm, V = 400 mm/s



(8) L = 100 mm, V = 400 mm/s



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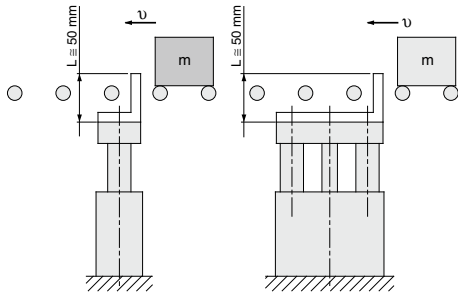
MGT

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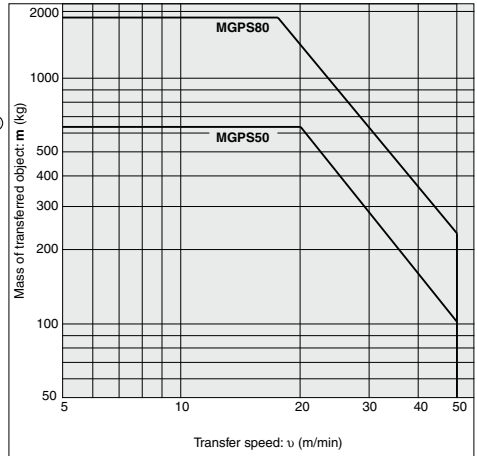
-X

Series MGPS

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.

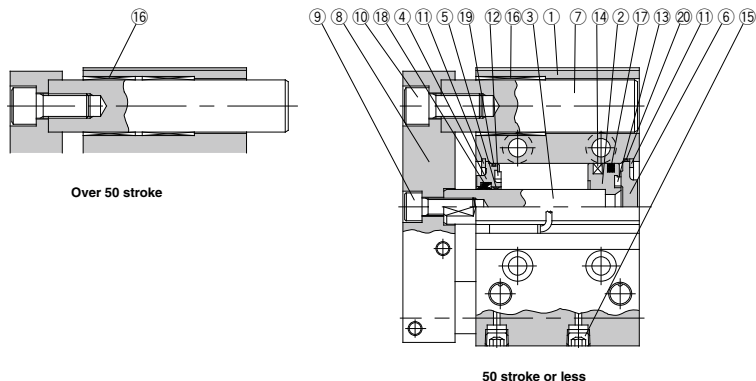


Caution

Caution on handling

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

Construction



Component Parts

No.	Description	Material	Note
1	Body	Aluminum alloy	Hard anodized
2	Piston	Aluminum alloy	Chromated
3	Piston rod	Carbon steel	Hard chrome plated
4	Collar	Aluminum alloy casted	Painted
5	Bushing	Bearing alloy	
6	Head cover	Aluminum alloy	ø50 Chromated
			ø80 Painted
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

Component Parts

No.	Description	Material	Note
11	Retaining ring	Carbon tool steel	Phosphate coated
12	Bumper A	Urethane	
13	Bumper B	Urethane	
14	Magnet	—	
15	Hexagon socket head taper plug	Carbon steel	Nickel plated
16	Slide Bearing	Bearing alloy	
17*	Piston seal	NBR	
18*	Rod seal	NBR	
19*	Gasket A	NBR	
20*	Gasket B	NBR	

Replacement Parts/Seal Kit

Bore size (mm)	Kit no.	Contents
50	MGP50-PS	Set of nos. above 17, 18, 19, 20
80	MGP80-PS	

* Seal kit includes 17 to 20. 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 no.: GR-S-010 (10 g)

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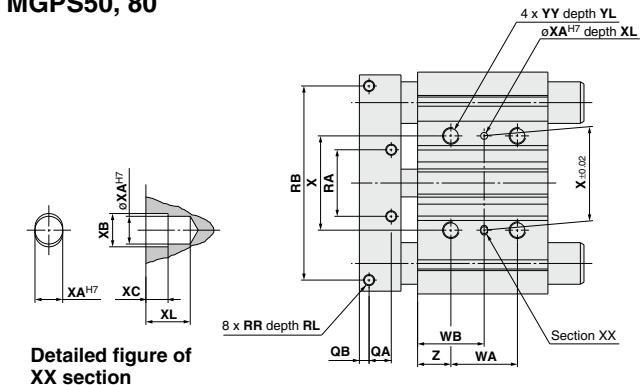
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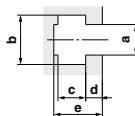
-X□

Dimensions

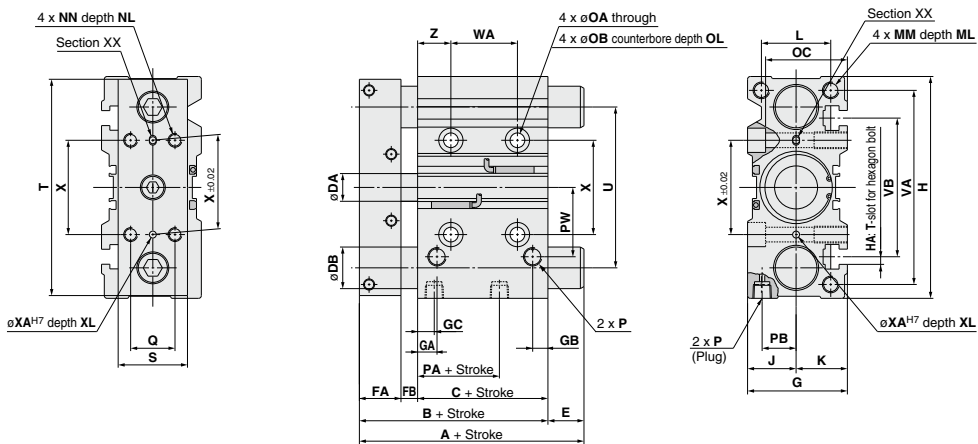
MGPS50, 80



T-slot dimensions



Bore size (mm)	T-slot dimensions (mm)				
	a	b	c	d	e
50	11	17.8	10	6	17.5
80	13.3	20.3	12	8	22.5



For intermediate strokes other than standard strokes, refer to "Manufacture of Intermediate Stroke" on page 392.

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	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)	MM	ML	NN	NL	OA	OB	OC	OL	P			PA	PB	PW	Q	QA	QB	RA	RB	RR
									NII	N	TF									
50	M12 x 1.75	20	M10 x 1.5	20	10.6	17.5	59	13	Rc 1/4	NPT 1/4	G 1/4	9	24.5	50	32	16	7	48	140	M8 x 1.25
80	M16 x 2.0	32	M12 x 1.75	24	12.5	20	72	17.5	Rc 3/8	NPT 3/8	G 3/8	14.5	29	77	40	18	9	80	200	M10 x 1.5
Bore size (mm)	RL	S	T	U	VA	VB	WA			WB			X	XA	XB	XC	XL	YY	YL	Z
							25 st	50, 75, 100 st	Over 100 st	25 st	50, 75, 100 st	Over 100 st								
50	14	50	156	116	140	100	24	48	124	36	48	86	68	5	6	4	8	M12 x 1.75	24	24
80	20	65	228	170	214	138	28	52	128	42	54	92	100	6	7	5	10	M14 x 2.0	28	28

Compact Guide Cylinder/High Precision Ball Bushing Bearing Type

Series *MGPA*

Basic Type (Rubber Bumper): $\varnothing 12, \varnothing 16, \varnothing 20, \varnothing 25, \varnothing 32, \varnothing 40, \varnothing 50, \varnothing 63, \varnothing 80, \varnothing 100$

With Air Cushion: $\varnothing 16, \varnothing 20, \varnothing 25, \varnothing 32, \varnothing 40, \varnothing 50, \varnothing 63, \varnothing 80, \varnothing 100$

With End Lock: $\varnothing 20, \varnothing 25, \varnothing 32, \varnothing 40, \varnothing 50, \varnothing 63, \varnothing 80, \varnothing 100$

Series MGPA high precision ball bushing bearing type (except with end lock) product has been remodeled for a lightweight design. When selecting a product, refer to the new MGP-Z series.



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Compact Guide Cylinder/High Precision Ball Bushing Bearing Type

Series **MGPA**

Basic Type (Rubber Bumper): $\phi 12, \phi 16, \phi 20, \phi 25, \phi 32, \phi 40, \phi 50, \phi 63, \phi 80, \phi 100$

With Air Cushion: $\phi 16, \phi 20, \phi 25, \phi 32, \phi 40, \phi 50, \phi 63, \phi 80, \phi 100$

With End Lock: $\phi 20, \phi 25, \phi 32, \phi 40, \phi 50, \phi 63, \phi 80, \phi 100$

Series MGPA high precision ball bushing bearing type (except with end lock) product has been remodeled for a lightweight design. When selecting a product, refer to the new **MGP-Z** series.

How to Order

Basic type (Rubber bumper)
With air cushion

MGPA 50 [] - **50** [] - **M9BW** [] - []

Compact Guide Cylinder
High precision ball bushing bearing type

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

Thread type

Cylinder stroke

Refer to "Standard Stroke" on page 401.

Cushion type

Nil	Rubber bumper
A	Air cushion

* Air cushions are not available for $\phi 12$.

Made to Order Specification

For details, refer to page 401.

Number of auto switches

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

Auto switch

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

With end lock

MGPA 50 [] - **50** [] - **H N** - **M9BW** [] - []

Compact Guide Cylinder
High precision ball bushing bearing type

Bore size

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

Thread type

Nil	Rc
N	NPT
TF	G

Cylinder stroke

Refer to "Standard Stroke" on page 401.

Auto switch

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

Manual release type

N	Non-lock type
L	Lock type

Lock position

H	Head end lock
R	Rod end lock

Made to Order Specification

For details, refer to page 401.

Number of auto switches

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

Applicable Auto Switches

Refer to pages 1893 to 2007 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			M9BV	M9B	●	●	○	○	—							
	3-wire (NPN)			5 V, 12 V	M9NVV	M9NV	●	●	○	○	IC circuit						
	3-wire (PNP)				M9PVV	M9PV	●	●	○	○							
	2-wire			M9BWW	M9BW	●	●	○	○	—							
Water resistant (2-color indication)	—	Grommet	Yes	3-wire (NPN)	5 V, 12 V	—	M9NAV**	M9NA**	○	○	●	○	IC circuit	—			
				3-wire (PNP)			M9PAV**	M9PA**	○	○	●	○					
Magnetic field resistant (2-color indication)	—	Grommet	No	2-wire (Non-polar)	—	—	M9BAV**	M9BA**	○	○	●	○	—	—			
				—			P3DW	○	○	●	○						
—	—	—	—	—	—	—	—	P4DW	○	○	●	○	—	—			
Reed auto switch	—	Grommet	Yes	3-wire (NPN equivalent)	—	5 V	—	A96V	A96	●	●	—	—	IC circuit	—		
				2-wire				24 V	12 V	100 V	A93V	A93	●	●	—	—	Relay, PLC
				100 V or less						A90V	A90	●	●	—	—	IC circuit	

** Water resistant type auto switches can be mounted on the above models, but in such case SMC cannot guarantee water resistance.

Consult with SMC regarding water resistant types with the above model numbers.

* Lead wire length symbols: 0.5 m..... Nil (Example) M9NV * Solid state auto switches marked with "○" are produced upon receipt of order.

* 1 m..... M (Example) M9NWM * Bore sizes 32 to 100 are available for D-P4DW.

* 3 m..... L (Example) M9NWL * Bore sizes 25 to 100 are available for D-P3DW.

* 5 m..... Z (Example) M9NWZ

* Since there are other applicable auto switches than listed, refer to page 406 for details.

* For details about auto switches with pre-wired connector, refer to pages 1960 and 1961. For D-P3DW, refer to pages 1948 and 1949.

* Auto switches are shipped together (not assembled).

Compact Guide Cylinder High Precision Ball Bushing Bearing Type *Series MGPA*

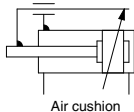
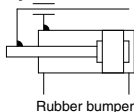


Non-rotating accuracy of plate: $\pm 0.01^\circ$

Plate displacement amount : 0.05 mm

(MGPA $\phi 12$ -10 st, when
Load mass is 1.7 kg.)

Symbol



Made to Order: Individual Specifications
(For details, refer to pages 407 and 408.)

Basic Type (Rubber Bumper)

Symbol	Specifications
-X144	Symmetrical port position
-X867	Lateral piping type (Change of plug position)

With Air Cushion

Symbol	Specifications
-X867	Lateral piping type (Change of plug position)

Made to Order Specifications

(For details, refer to pages 2009 to 2152.)

Basic Type (Rubber Bumper)

Symbol	Specifications
-XA□	Change of rod end shape
-XC4	With heavy duty scraper
-XC8	Adjustable stroke cylinder/Adjustable extension type
-XC9	Adjustable stroke cylinder/Adjustable retraction type
-XC35	With coil scraper
-XC69	With shock absorber
-XC79	Machining tapped hole, drilled hole and pin hole additionally.

With Air Cushion

Symbol	Specifications
-XC19	With air cushion, Intermediate stroke (Spacer type)
-XC79	Machining tapped hole, drilled hole and pin hole additionally.

With End Lock

Symbol	Specifications
-XC79	Machining tapped hole, drilled hole and pin hole additionally.

Refer to pages 404 to 406 for cylinders
with auto switches.

- Minimum auto switch mounting stroke
- Proper auto switch mounting position (detection at stroke end) and mounting height
- Operating range
- Auto switch mounting bracket: Part no.

Dimensions for all models are the same as the
ball bushing bearing type. Refer to the following
pages.

Basic Type (Rubber Bumper) → P.360 to 362

With Air Cushion → P.377 to 379

With End Lock → P.386 to 388

Specifications

Action	Double acting	
Fluid	Air	
Proof pressure	1.5 MPa	
Max. operating pressure	1.0 MPa	
Ambient and fluid temperature	-10 to 60°C (No freezing)	
Piston speed	$\phi 12$ to $\phi 63$	50 to 500 mm/s
	$\phi 80$, $\phi 100$	50 to 400 mm/s
Lubrication	Non-lube	
Stroke length tolerance	$^{+1.5}$ mm	

Minimum Operating Pressure

Basic Type (Rubber Bumper)

Bore size (mm)	Min. operating pressure
$\phi 12$, $\phi 16$	0.12 MPa
$\phi 20$ to $\phi 100$	0.1 MPa

With Air Cushion

Bore size (mm)	Min. operating pressure
$\phi 16$	0.15 MPa
$\phi 20$ to $\phi 100$	0.12 MPa

With End Lock

Bore size (mm)	Min. operating pressure
$\phi 20$ to $\phi 100$	0.15 MPa

Standard Stroke

Basic Type (Rubber Bumper)

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, 40, 50, 63, 80, 100	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400

With Air Cushion

Bore size (mm)	Standard stroke (mm)
16	25, 50, 75, 100, 125, 150, 175, 200, 250
20, 25, 32, 40, 50, 63	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400
80, 100	50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400

With End Lock

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 Stroke

Basic Type (Rubber Bumper)

Description	Spacer installation type Spacers are installed in the standard stroke cylinder.	
Part no.	Refer to "How to Order" for the standard specification.	
Applicable stroke	$\phi 12$, $\phi 16$	1 to 249
	$\phi 20$ to $\phi 32$	1 to 399
	$\phi 40$ to $\phi 100$	5 to 395
Example	Part no.: MGPA20-39 A spacer 1 mm in width is installed in a MGPA20-40. C dimension is 77 mm.	

With Air Cushion

Description	1 mm interval are available by replacing collars of a standard stroke cylinder.	
	Minimum manufacturable stroke $\phi 16$ to $\phi 63$: 15mm $\phi 80$, $\phi 100$: 20mm	
Select a rubber bumper type, because the cushion effect is not obtainable for less than this stroke.		
Part no.	Suffix "-XC19" to the end of standard part number.	
Applicable stroke	$\phi 16$	15 to 249
	$\phi 20$ to $\phi 63$	15 to 399
	$\phi 80$, $\phi 100$	20 to 399
Example	Part no.: MGPA20-35A-XC19 A 15 mm width collar is installed in MGPA20-50A. C dimension is 112 mm.	

With End Lock

Description	Spacer installation type 5 mm interval are available by installing a spacer on a standard stroke cylinder.	
Part no.	Refer to "How to Order" for the standard specification.	
Applicable stroke	5 to 395	
Example	Part no.: MGPA20-35-HN A spacer 15 mm in width is installed in a MGPA20-50-HN. C dimension is 112 mm.	

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MGT

MGT

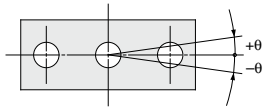
D-□

-X□

Series MGPA

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.



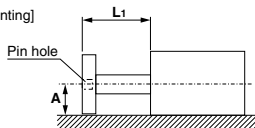
Bore size (mm)	Non-rotating accuracy θ
12	$\pm 0.01^\circ$
16	
20	
25	
32	
40	
50	
63	
80	
100	

⚠ Caution

Positioning accuracy for pin hole on the plate

Dispersion of dimensions when machining each component will be accumulated in the plate pin hole positioning accuracy when mounting this cylinder. Below values are referred as a guide.

[Side mounting]

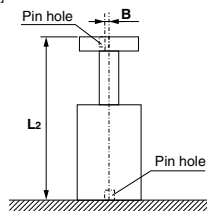


$$A = [\text{Catalog dimension}] \pm (0.1 + L1 \times 0.0008) \text{ [mm]}$$

* : To be 0.15 for $\phi 80, 100$.

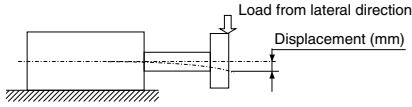
(Note) Displacement by load and self-weight deflection by plate and guide rod are not included.

[Bottom mounting]

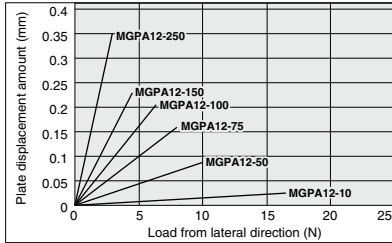


$$B = \pm (0.045 + L2 \times 0.0016) \text{ [mm]}$$

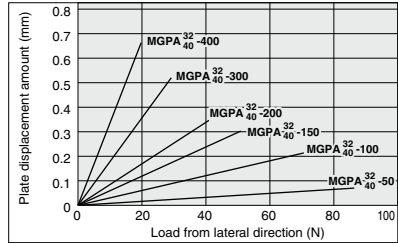
Plate Displacement Amount (Reference Values)



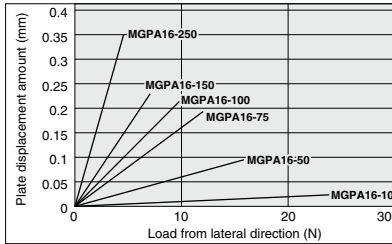
MGPA12



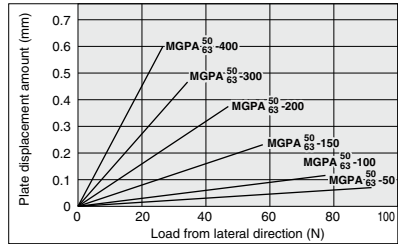
MGPA32/40



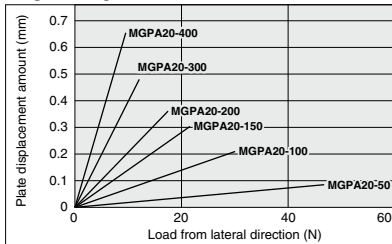
MGPA16



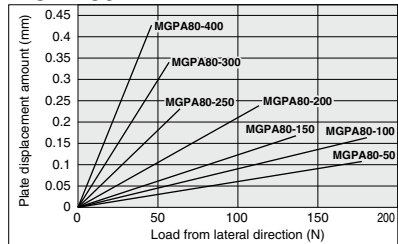
MGPA50/63



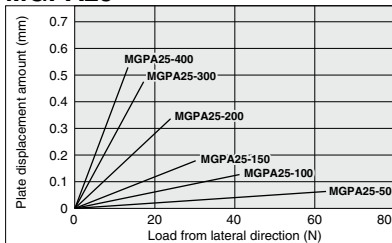
MGPA20



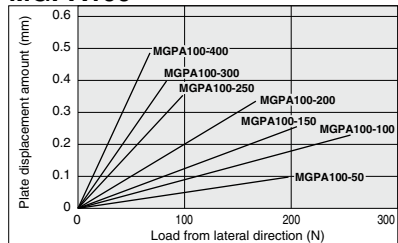
MGPA80



MGPA25



MGPA100



Note 1) The guide rod and self-weight for the plate are not included in the above displacement values.

Note 2) Regarding the allowable rotational torque and the operating range as a lifter, refer to pages 346 to 362 in the standard type of Series MGPA, since it is identical.

MGJ

MGP

-Z

MGF

MGV

MGQ

MGK

MGC

MGH

MGT

MGR

MGS

MGT

D-□

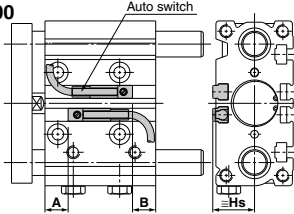
-X□

Auto Switch Mounting 1

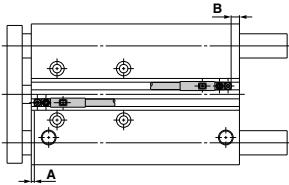
Auto Switch Proper Mounting Position (Detection at Stroke End) and Its Mounting Height

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

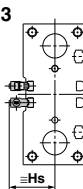
ø12 to ø100



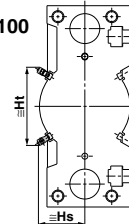
For D-P3DW□ (* Cannot be mounted on bore sizes ø20 or less.)



ø25 to ø63

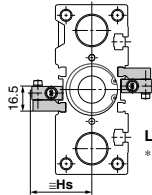
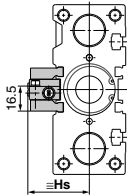


ø80, ø100



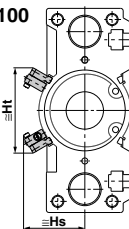
For D-P4DW (* Cannot be mounted on bore sizes ø25 or less.)

ø32 to ø63



Less than 25 to 75 strokes
* For bore sizes ø40 through 63 with two switches, one switch is mounted on each side.

ø80, ø100



Auto Switch Proper Mounting Position

Applicable cylinder series: MGP, MGPS (Heavy duty guide rod type)

MGPA (High precision ball bushing/Basic type) (mm)

Auto switch model	D-M9□		D-A9□		D-Z7□/Z80		D-P3DW		D-P4DW	
	A	B	A	B	A	B	A	B	A	B
12	6	8	2	4	1	3	—	—	—	—
16	9	9	5	5	4	4	—	—	—	—
20	9.5	12.5	5.5	8.5	4.5	7.5	—	—	—	—
25	9.5	13	5.5	9	4.5	8	1.5	5	—	—
32	10.5	12	6.5	8	5.5	7	2.5	4	5	6.5
40	14.5	14.5	10.5	10.5	9.5	9.5	6.5	6.5	9	9
50	12.5	16.5	8.5	12.5	7.5	11.5	4.5	8.5	7	11
63	15	19	11	15	10	14	7	11	9.5	13.5
80	18	23.5	14	19.5	13	18.5	10	15.5	12.5	18
100	22.5	28.5	18.5	24.5	17.5	23.5	14.5	20.5	17	23

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

Auto Switch Proper Mounting Position

Applicable cylinder series: MGP (Air cushion)

MGPA (High precision ball bushing/Air cushion) (mm)

Auto switch model	D-M9□		D-A9□		D-Z7□/Z80		D-P3DW		D-P4DW	
	A	B	A	B	A	B	A	B	A	B
16	22.5	20.5	18.5	16.5	17.5	15.5	—	—	—	—
20	31	16	27	12	26	11	—	—	—	—
25	27.5	20	23.5	16	22.5	15	19.5	12	—	—
32	21	26.5	17	22.5	16	21.5	13	18.5	15.5	21
40	31	23	27	19	26	18	23	15	25.5	17.5
50	32	22	28	18	27	17	24	14	26.5	16.5
63	33	26	29	22	28	21	25	18	27.5	20.5
80	30	36.5	26	32.5	25	31.5	22	28.5	24.5	31
100	33.5	42.5	29.5	38.5	28.5	37.5	25.5	34.5	28	37

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

Auto Switch Mounting Height

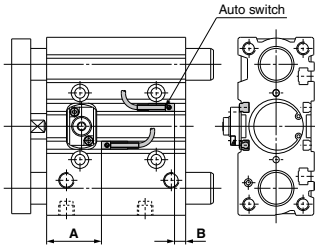
(mm)

Auto switch model	D-A9□/M9□/M9□W/M9□A		D-A9□V		D-M9□V		D-Y69□		D-P3DW		D-P4DW	
	D-Z7□/Z80/Y59□/Y7P		D-Y7□W/Y7BA		Hs	Ht	Hs	Ht	Hs	Ht	Hs	Ht
12	13.5		17		19.5		15		—		—	
16	16		19.5		—		17.5		—		—	
20	18.5		22		—		20		—		—	
25	20.5		24		—		21.5		30		—	
32	23		26.5		—		24.5		33		41.5	
40	27		30.5		—		28.5		37		44.5	
50	32.5		36		—		34		42.5		50	
63	39.5		43		—		41		49.5		57	
80	40		43		71.5	45	74	41	70	48	78.5	61
100	50		53		83	55	85.5	51	81.5	58	90	71

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

With rod end lock

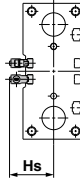
- For D-A9□ For D-Z7□
- For D-A9□V For D-Z80
- For D-M9□ For D-Y59□
- For D-M9□V For D-Y69□
- For D-M9□W For D-Y7P
- For D-M9□WV For D-Y7PV
- For D-M9□A For D-Y7□W
- For D-M9□AV For D-Y7□WV
- For D-Y7BA



For D-P3DW

(* Cannot be mounted on bore sizes ø20 or less.)

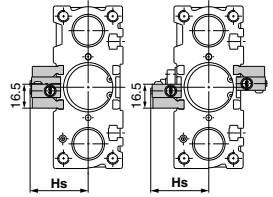
ø25 to ø63



For D-P4DW

(* Cannot be mounted on bore sizes ø25 or less.)

ø32 to ø63



Auto Switch Proper Mounting Position

(mm)

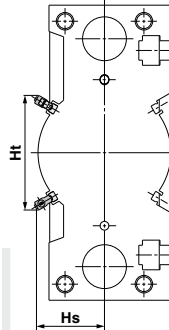
Bore size (mm)	D-M9□		D-A9□		D-Z7□/Z80		D-P3DW		D-P4DW	
	D-M9□V		D-A9□V		D-Y59□/Y7P					
	A	B	A	B	A	B	A	B	A	B
20	40	7	36	3	35	2	—	—	—	—
25	40.5	7	36.5	3	35.5	2	32.5	0	—	—
32	37.5	10	33.5	6	32.5	5	29.5	2	32	4.5
40	43.5	10.5	39.5	6.5	38.5	5.5	35.5	2.5	38	5
50	44.5	9.5	40.5	5.5	39.5	4.5	36.5	1.5	39	4
63	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.

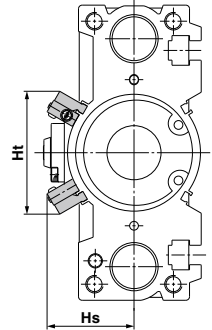
For 25 stroke

* For bore sizes ø40 to 63 with two auto switches, one switch is mounted on each side.

ø80, ø100

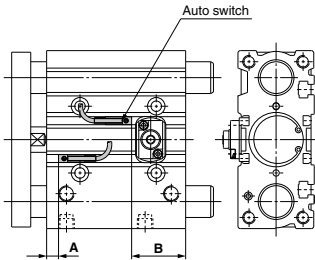


ø80, ø100



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



Auto Switch Mounting Height

(mm)

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

(mm)

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)

Bore size (mm)	D-M9□		D-A9□		D-Z7□/Z80		D-P3DW		D-P4DW	
	D-M9□V		D-A9□V		D-Y59□/Y7P					
	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.

MGJ

MGP

Z

MGP

MGPW

MGQ

MGG

MGC

MGF

MGZ

MGT

D-□

-X□

Auto Switch Mounting 2

Minimum Auto Switch Mounting Stroke

Auto switch model	No. of auto switches mounted	ø12	ø16	ø20	ø25	ø32	ø40	ø50	ø63	ø80	ø100
D-A9□	1 pc.	5 Note 1)		5							
	2 pcs.	10 Note 1)		10							
D-A9□V D-M9□V	1 pc.	5						10			
	2 pcs.	10									
D-M9□	1 pc.	5 Note 1)			10			5			
	2 pcs.	10 Note 1)	10								
D-M9□W	1 pc.	5 Note 1)						10			
	2 pcs.	10 Note 1)	10								
D-M9□WV D-M9□AV	1 pc.	5 Note 2)						10			
	2 pcs.	10 Note 2)									
D-M9□A	1 pc.	5 Note 2)						10			
	2 pcs.	10 Note 2)									
D-Z7□ D-Z80	1 pc.	5 Note 1)			10			5			
	2 pcs.	10 Note 1)	10								
D-Y59□ D-Y7P	1 pc.	5 Note 1)			10			5			
	2 pcs.	10 Note 1)	10								
D-Y69□ D-Y7PV	1 pc.	5						10			
	2 pcs.	10									
D-Y7□W D-Y7□WV	1 pc.	5 Note 2)						10			
	2 pcs.	10 Note 2)									
D-Y7BA	1 pc.	5 Note 2)						10			
	2 pcs.	10 Note 2)									
D-P3DW	1 pc.	—		15		15		10			
	2 pcs.	—		15		15		10			
D-P4DW	1 pc.	—		5 Note 2), Note 3)		10		10			
	2 pcs., different side	—		10 Note 2), Note 3)		75		10			
	2 pcs., same side	—		10		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.
 For in-line entry type, please also consider Note 1) shown above.

Note 3) The minimum bending radius of the D-P4DW is 20 mm.
 Note 4) The air cushion type is available in ø16 to ø100.
 Note 5) The heavy duty guide rod type is available in ø50 and ø80.

Operating Range

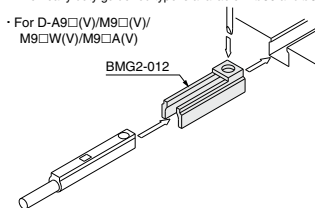
Auto switch model	Bore size (mm)									
	12	16	20	25	32	40	50	63	80	100
D-A9□/A9□V	7	9.5	9	9	9	9.5	9.5	11	10.5	10.5
D-M9□/M9□V D-M9□W/M9□WV D-M9□A/M9□AV	4	5	5.5	5	6	5.5	6	6.5	6	7
D-Z7□/Z80	7.5	10	10	10	10.5	10.5	10.5	11.5	11.5	12
D-Y59□/Y69□ D-Y7P/Y7PV D-Y7□W/Y7□WV D-Y7BA	5.5	7.5	7.5	7	6.5	6	7	8	9.5	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.
- * The air cushion type is available in ø16 to ø100
- * 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)			
	ø12 to 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		

- * The air cushion type is available in ø16 to ø100
- * 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 pages 1893 to 2007.

Auto switch type	Model	Electrical entry (Fetching direction)	Features
Reed	D-Z73, Z76 D-Z80	Grommet (In-line)	— Without indicator light
	D-Y69A, Y69B, Y7PV D-Y7NWV, Y7PWV, Y7BWW	Grommet (Perpendicular)	— Diagnostic indication (2-color indication)
Solid state	D-Y59A, Y59B, Y7P D-Y7NW, Y7PW, Y7BW D-Y7BA D-P5DW	Grommet (In-line)	— Diagnostic indication (2-color indication) Water resistant (2-color indication) Magnetic field resistant (2-color indication)

- * For solid state auto switches, auto switches with a pre-wired connector are also available. Refer to pages 1960 and 1961 for details.
- * Normally closed (NC = b contact), solid state auto switch (D-F9G/F9H/Y7G/Y7H type) are also available. For details, refer to pages 1911 and 1913.



1 Symmetrical Port Position

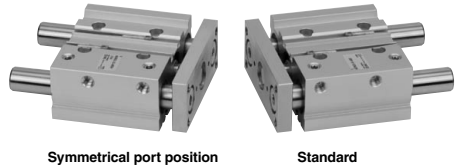
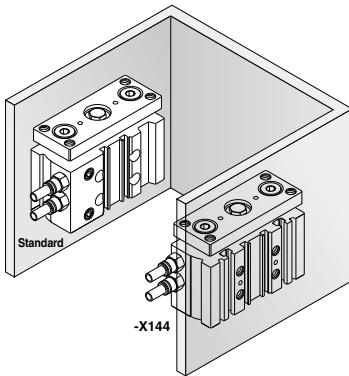
Symbol
-X144

How to Order

MGP ^M_L_A Bore size — Stroke — Auto switch type — Lead wire length — No. of auto switches — X144
 Symmetrical port position ↓

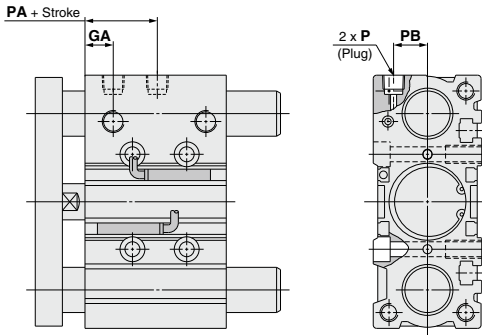
Ports are mounted symmetrically.

This makes it easy to remove and rotate piping when it is mounted on a wall where mounting space is limited.



- MGJ
- MGP-Z
- MGP**
- MGPW
- MGQ
- MGG
- MGC
- MGF
- MGZ
- MGT

Dimensions



Common Dimensions: MGPM, MGPL

Bore size (mm)	GA	PA	PB
12	11	13	8
16	11	15	10
20	10.5	12.5	10.5
25	11.5	12.5	13.5
32	12.5	7	15
40	14	13	18
50	14	9	21.5
63	16.5	14	28
80	14.5	14.5	25.5
100	18	17.5	32.5

- D-□
- X□



2 Lateral Piping Type (Plug location changed)

Symbol
-X867

Applicable Series

Series	Type	Model	Bearing type	Page for the standard type
MGP	Basic type Rubber bumper	MGPM	Slide bearing	③ P.346
		MGPL	Ball bushing	
		MGPS	Heavy duty guide rod type	③ P.391
		MGPA	High precision ball bushing type	③ P.400
	Air cushion	MGPM	Slide bearing	③ P.364
		MGPL	Ball bushing	
		MGPA	High precision ball bushing type	③ P.400
	End lock	MGPM	Slide bearing	③ P.381
		MGPL	Ball bushing	
		MGPA	High precision ball bushing type	③ P.400

How to Order

MGP Standard model no. — X867

- Lateral piping type (Plug location changed)

This is the type with the port on the top plugged in order to use the piping port on the side.

