

Compact Guide Cylinder

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

Up to
17%
Weight
reduced!

- With air cushion
- Water resistant cylinder are now available.

New



With air cushion

New



Water resistant cylinder



Weight reduced by up to 17% with
a shorter guide rod and thinner plate



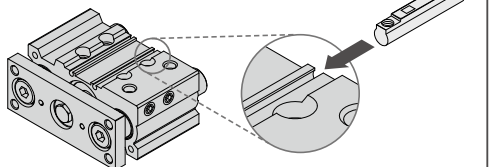
Guide rod shortened
for MGPM40-25 stroke

Max. **22**mm

Space required between the
bottom of the cylinder body and
your equipment is reduced.

Space saving

Round type and magnetic field resistant
auto switches are mountable directly
without spacer.



3 types of bearing can be selected.

- Slide bearing Series MGPM
- Ball bushing Series MGPL
- High precision ball bushing Series MGPA

Made to Order

Change of guide rod end shape (-XA□), intermediate stroke (-XB10), low speed cylinder (-XB13), side porting type (-X867), made of stainless steel (-XC6), adjustable stroke cylinder/adjustable extension type (-XC8), and with coil scraper (-XC35) etc. are now available.

Air Cylinders

CJ2

CM2

CG1

MB

CA2

CQ2

CQS

Lube-
retainer

JA

MXH

MXQ

MGP

C□Y

C□X

CK□1

C(L)K□

C(L)KU

CKQ

CKZ2N

WRF

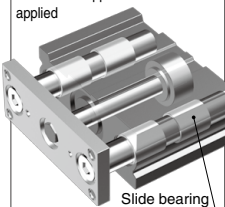
Series MGP



3 types of bearing can be selected.

Slide bearing
Series MGPM

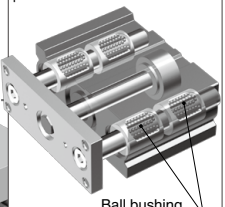
Suitable for lateral load applications such as a stopper where shock is applied



Slide bearing

Ball bushing
Series MGPL

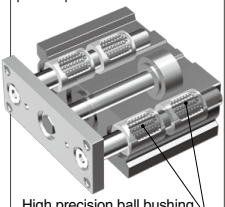
Smooth operation suitable for pusher and lifter



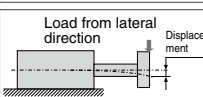
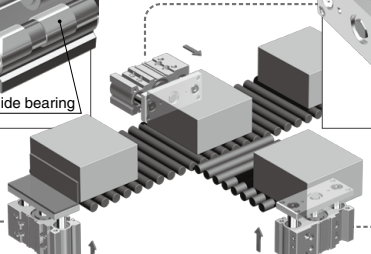
Ball bushing

High precision ball bushing
Series MGPA

Suitable for minimizing plate displacement



High precision ball bushing



Basic Type

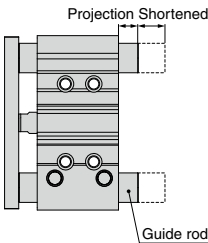
●Weight reduced

Bore size (mm)	Reduction rate (%)	Weight (kg)
ø12	11	0.25
ø16	3	0.37
ø20	12	0.59
ø25	12	0.84
ø32	17	1.41
ø40	16	1.64
ø50	17	2.79
ø63	17	3.48
ø80	17	5.41
ø100	13	9.12

* Compared with the slide bearing type, ø12 to ø25-20 stroke

* Compared with the slide bearing type, ø32 to ø100-25 stroke

●Guide rod shortened



Bore size	Guide rod (mm)	
	Shortened by	New dimension
ø32	22	15.5
ø40	22	9
ø50	18	16.5
ø63	18	11.5
ø80	10.5	8
ø100	10.5	10.5

* Compared with the slide bearing type, 25 stroke (ø32 to ø100)
(No projection for ø12 to ø25-25 stroke)

●Performance and strength (rigidity) are equivalent to the conventional MGP series.

●Mounting dimensions are equivalent to the conventional MGP series.

Series MGP (Basic Type), Stroke Variations

Bearing type	Bore size (mm)	Stroke (mm)																Made to Order
		10	20	25	30	40	50	75	100	125	150	175	200	250	300	350	400	
MGPM Slide bearing	12	●																-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) -XC6 : Made of stainless steel -XC8 : Adjustable stroke cylinder/Adjustable extension type -XC22 : Fluororubber seal -XC35 : With coil scraper -XC79 : Machining tapped hole, drilled hole and pin hole additionally -XC82 : Bottom mounting type -X144 : Symmetrical port position -X867 : Side porting type (Plug location changed)
	16	●	●															
	20		●	●														
	25			●	●													
MGPL Ball bushing	32				●	●												
	40					●	●											
	50						●	●										
MGPA High precision ball bushing	63							●	●									
	80								●	●								
										●	●							
	100										●	●						

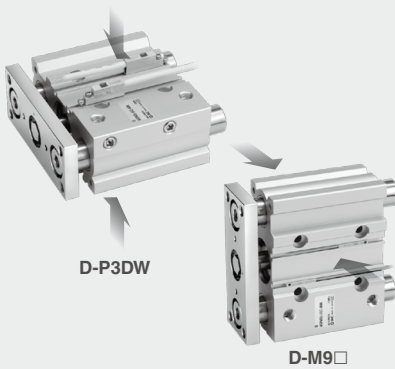
Small auto switches or magnetic field resistant auto switches can be mounted on 2 surfaces.

D-M9□

D-A9□

D-P3DW

* The D-Y7 and D-Z7 auto switches are not mountable.

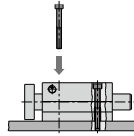


D-P3DW

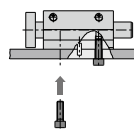
D-M9□

4 types of mounting are possible.

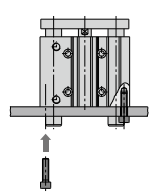
1. Top mounting



2. Side mounting

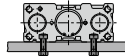
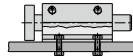


4. Bottom mounting



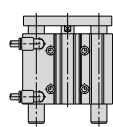
3. T-slot side mounting

Easy adjustment of workpiece and cylinder mounting

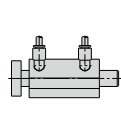


Piping is possible from 2 directions.

1. Top ported



2. Side ported



Air Cylinders

CJ2

CM2

CG1

MB

CA2

CQ2

CQS

Lube-retainer

JA

MXH

MXQ

MGP

C□Y

C□X

CK□1

C(L)□

C(L)XU

CKQ

CKZ2N

WRF

New With Air Cushion

● Weight reduced by up to 24%

Bore size (mm)	Reduction rate (%)	Weight (kg)
φ16	12	1.28
φ20	18	1.91
φ25	22	2.52
φ32	24	3.57
φ40	23	4.13
φ50	23	6.56
φ63	22	8.04
φ80	21	11.35
φ100	19	17.72

* Compared with the conventional MGPM with air cushion, 200 stroke

● Guide rod shortened by up to 35.5 mm (MGPM100-50)

Bore size	Guide rod	
	Shortened by	New dimension
φ32	33.5	9
φ40	33.5	2.5
φ50	22	12.5
φ63	22	7.5
φ80	35.5	10
φ100	35.5	10.5

* Compared with the conventional MGPM with air cushion, 50 stroke

● Performance and strength are equivalent to the conventional MGP series with air cushion.

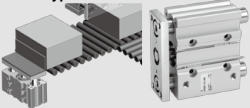
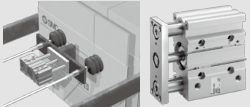
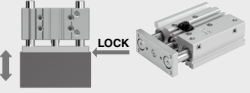
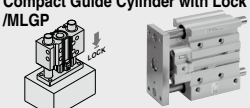
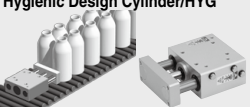
● Mounting dimensions are equivalent to the conventional MGP series with air cushion.

Series MGP (With Air Cushion), Stroke Variations

Bearing type	Bore size (mm)	Stroke (mm)												Made to Order
		25	50	75	100	125	150	175	200	250	300	350	400	
MGPM-□A Slide bearing	16	●	●	●	●	●	●	●	●	●	●	●	●	-XC19: Intermediate stroke (Spacer type) -XC79: Tapped hole, drilled hole, pinned hole machined additionally -X867: Side porting type (Plug location changed)
	20	●	●	●	●	●	●	●	●	●	●	●	●	
	25	●	●	●	●	●	●	●	●	●	●	●	●	
MGPL-□A Ball bushing	32	●	●	●	●	●	●	●	●	●	●	●	●	
	40	●	●	●	●	●	●	●	●	●	●	●	●	
	50	●	●	●	●	●	●	●	●	●	●	●	●	
MGPA-□A High precision ball bushing	63	●	●	●	●	●	●	●	●	●	●	●	●	
	80	●	●	●	●	●	●	●	●	●	●	●	●	
	100	●	●	●	●	●	●	●	●	●	●	●	●	
	100	●	●	●	●	●	●	●	●	●	●	●	●	

* Refer to page 1004 for details.

Compact Guide Cylinders, Series Variations

Series MGP-Z		★ New												
Series	Bearing type	Bore size										Page		
		6	10	12	16	20	25	32	40	50	63		80	100
Basic type/MGP 	Slide bearing Ball bushing			●	●	●	●	●	●	●	●	●		Page 1007
With air cushion/MGP-A 	High precision ball bushing				★	★	★	★	★	★	★	★	★	Page 1029
Clean series/12/13-MGP 	Ball bushing			●	●	●	●	●	●	●	●			Page 1011
Water resistant cylinder/MGP R/V 	Slide bearing					★	★	★	★	★	★	★	★	Page 1011
Series MGP												For details, refer to the WEB catalog or the following page.		
With end lock/MGP-H/R 	Slide bearing Ball bushing High precision ball bushing					●	●	●	●	●	●	●		 Best Pneumatics Page 380
Heavy duty guide rod/MGPS 	Slide bearing									●		●		 Best Pneumatics Page 390
Miniature Guide Rod Cylinder/MGJ 			●	●										
Compact Guide Cylinder with Lock /MLGP 	Slide bearing Ball bushing					●	●	●	●	●	●	●	●	 Best Pneumatics Page 995
Hygienic Design Cylinder/HYG 	Slide bearing					●	●	●	●	●	●			 Best Pneumatics Page 1095

Combination of Standard Products and Made to Order Specifications

Series MGP

- : Standard
- ⊙: Made to Order
- : Special product (Please contact SMC for details.)
- : Not available

●: Standard ⦿: Made to Order ○: Special product (Please contact SMC for details.) —: Not available		Type	Basic type			With air cushion		
		Bearing type	Slide bearing	Ball bushing	High precision ball bushing	Slide bearing	Ball Bushing	High precision ball bushing
			Model	MGPM	MGPL	MGPA	MGPM	MGPL
Symbol	Specifications	Applicable bore size	ø12 to ø100			ø16 to ø100		
Standard	Basic type		●	●	●	●	●	●
12-/13-	Clean series	ø12 to ø63	—	●	—	—	—	—
25A-	Copper (Cu) and Zinc (Zn)-free Note 1)	ø12 to ø100	●	●	○	○	○	○
20-	Copper and Fluorine-free Note 1)		●	● Note 3)	● Note 3)	●	● Note 3)	● Note 3)
R/V	Water resistant	ø20 to ø100	●	—	—	○	—	—
MGP□M	Cylinder with Stable Lubrication Function (Lube-retainer)		●	●	○	○	○	○
-XA□	Change of guide rod end shape	ø12 to ø100	⦿	⦿	⦿	○	○	○
-XB6	Heat resistant cylinder (−10 to 150°C) Note 2)		⦿	—	—	○	—	—
-XB10	Intermediate stroke (Using exclusive body)		⦿	⦿	⦿	○	○	○
-XB13	Low speed cylinder (5 to 50 mm/s)		⦿	⦿	○	○	○	○
-XC4	With heavy duty scraper	ø20 to ø100	⦿	⦿	⦿	○	○	○
-XC6	Made of stainless steel	ø12 to ø100	⦿	⦿	—	○	○	—
-XC8	Adjustable stroke cylinder/Adjustable extension type		⦿	⦿	⦿	—	—	—
-XC9	Adjustable stroke cylinder/Adjustable retraction type Note 2)		⦿	⦿	⦿	—	—	—
-XC19	Intermediate stroke (Spacer type)	ø16 to ø100	—	—	—	⦿	⦿	⦿
-XC22	Fluororubber seal Note 2)	ø12 to ø100	⦿	—	—	○	—	—
-XC35	With coil scraper	ø20 to ø100	⦿	⦿	⦿	○	○	○
-XC79	Tapped hole, drilled hole, pinned hole machined additionally	ø12 to ø100	⦿	⦿	⦿	⦿	⦿	⦿
-XC82	Bottom mounting type		⦿	—	—	○	—	—
-XC85	Grease for food processing equipment		⦿	⦿	⦿	⦿	⦿	⦿
-XC98	Guide unit with Lube-retainer	ø20 to ø100	⦿	○	○	○	○	○
-X144	Symmetrical port position	ø12 to ø100	⦿	⦿	⦿	○	○	○
-X867	Side porting type (Plug location changed)		⦿	⦿	⦿	⦿	⦿	⦿

Note 1) Refer to the **WEB catalog** for details.

Note 2) Without cushion

Note 3) Copper and fluorine-free are available as standard products.

Air Cylinders

CJ2

CM2

CG1

MB

CA2

CQ2

CQS

Lube-retainer

JA

MXH

MXQ

MGP

□Y

□X

CK□1

□(L)□

□(L)KU

CKQ

CKZ2N

WRF

INDEX



Series MGP

Specific Product Precautions 1

Be sure to read before handling. Refer to page 1574 for Safety Instructions.

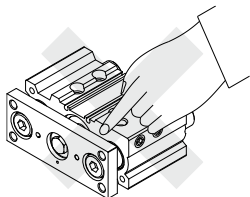
For Actuator and Auto Switch Precautions, refer to "Handling Precautions for SMC Products" and the Operation Manual on SMC website, <http://www.smcworld.com>

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 operating 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. **Pay attention to the operating speed when the product is mounted vertically.**

When using the product in the vertical direction, if the load factor is large, the operating speed can be faster than the control speed of the speed controller (i.e. quick extension). In such cases, it is recommended to use a dual speed controller.

3. **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.

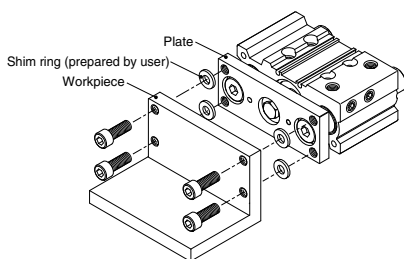
4. **Do not dent or scratch the mounting surface of the body and the plate.**

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

5. **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.

If it is difficult to maintain a flatness of 0.05 or less, put a thin shim ring (prepared by user) between the plate and workpiece mounting surface to prevent the sliding resistance from increasing.

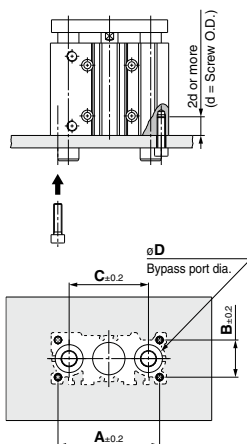


Mounting

⚠ Caution

6. **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 cap screws which are used for mounting. Moreover, in applications where impact occurs from a stopper etc., the mounting screws should be inserted to a depth of 2d or more.



Bore size (mm)	A (mm)	B (mm)	C (mm)	D (mm)		Hexagon socket head cap screw
				MGPM	MGPL/A	
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

* Air cushions are not available for bore size 12.



Series MGP

Specific Product Precautions 2

Be sure to read before handling. Refer to page 1574 for Safety Instructions.

For Actuator and Auto Switch Precautions, refer to "Handling Precautions for SMC Products" and the Operation Manual on SMC website, <http://www.smcworld.com>

Piping

⚠ Caution

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

1. M5

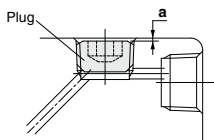
After tightening by hand, tighten additional 1/6 to 1/4 rotation with a tightening tool.

2. Tapered thread for Rc port (MGP) and NPT port (MGP□□TN)

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 (dimension "a" 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



3. Parallel pipe thread for G port (MGP□□TF)

Screw in the plug to the surface of the body (dimension "a" in the drawing) by checking visually instead of using the tightening torque shown in the table.

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, 20, 25, 32, 40	JIS B4648 hexagon wrench key 1.5
50, 63, 80, 100	JIS B4648 hexagon wrench key 3

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

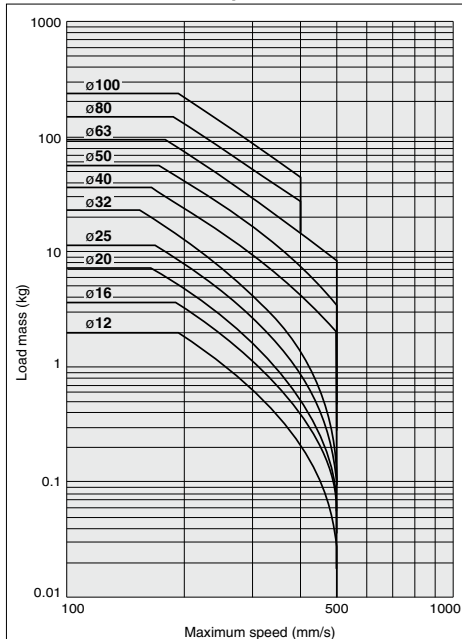
If it is not operated to the end of the stroke, the effect of the air cushion will not be fully exhibited. Consequently, in cases where the stroke is regulated by an external stopper etc., caution must be exercised, as the air cushion may become completely ineffective.

Allowable Kinetic Energy

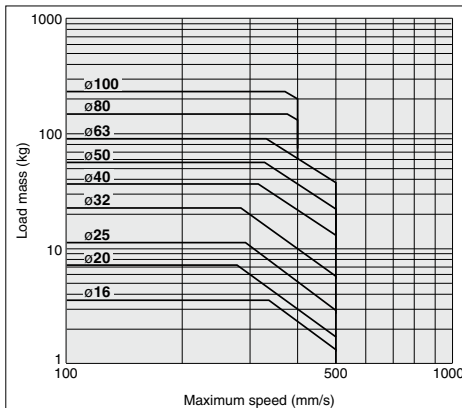
⚠ Caution

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

MGP with Rubber Bumper



MGP with Air Cushion



Air Cylinders

CJ2

CM2

CG1

MB

CA2

CQ2

CQS

Lube-
retainer

JA

MXH

MXQ

MGP

□Y

□X

CK□1

□L□□

□L□KU

CKQ

CK2ZN

WRF

INDEX

Compact Guide Cylinder

Series *MGP*

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

How to Order

MGP M 25 - 30 Z - M9BW -

Compact Guide Cylinder

Bearing type

M	Slide bearing
L	Ball bushing
A	High precision ball bushing

Bore size

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

Port thread type

Nil	M5 x 0.8
	Rc
TN	NPT
TF	G

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

• **Made to Order**
For details, refer to page 1008.

Number of auto switches

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

Auto switch

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

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

Cylinder stroke (mm)

Refer to "Standard Strokes" on page 1008.

Applicable Auto Switches/Refer to the WEB catalog or the Best Pneumatics No. 3 for further information on auto switches.

Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage		Auto switch model		Lead wire length (m)				Pre-wired connector	Applicable load	
					DC	AC	Perpendicular	In-line	0.5 (Nil)	1 (M)	3 (L)	5 (Z)			
Solid state auto switch	—	Grommet	Yes	3-wire (NPN)	5 V, 12 V	—	M9NV	M9N	●	●	○	○	○	IC circuit	
	3-wire (PNP)			M9PV			M9P	●	●	○	○				
	2-wire			12 V	M9BV		M9B	●	●	○	○	○	—		
	3-wire (NPN)			5 V, 12 V	M9NVW		M9NW	●	●	○	○				
	3-wire (PNP)				M9PWV		M9PW	●	●	○	○	○	IC circuit		
	2-wire			12 V	M9BWW		M9BW	●	●	○	○				
	Water resistant (2-color display)			3-wire (NPN)	5 V, 12 V		M9NAV***	M9NA***	○	○	●	○	○	IC circuit	
				3-wire (PNP)			M9PAV***	M9PA***	○	○	●	○			
2-wire		12 V	M9BAV***	M9BA***		○	○	○	○						
Magnetic field resistant (2-color display)	2-wire (Non-polar)	—	—	P3DWA**	●	—	●	○	—	—					
Reed auto switch	—	Grommet	Yes	3-wire (NPN equivalent)	—	5 V	—	A96V	A96	●	—	●	—	○	—
				No	2-wire	24 V	12 V	100 V or less	A93V	A93	●	—	●	—	
								A90V	A90	●	—	●	—	—	Relay, PLC

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

A water resistant type cylinder is recommended for use in an environment which requires water resistance.

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

* Lead wire length symbols: 0.5 m..... Nil (Example) M9NW

1 m..... M (Example) M9NWM

3 m..... L (Example) M9NWL

5 m..... Z (Example) M9NWW

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

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

* Since there are other applicable auto switches than listed above, refer to the WEB catalog or the Best Pneumatics No. 3 for details.

* For details about auto switches with pre-wired connector, refer to the WEB catalog or the Best Pneumatics No. 3.

* For the D-P3DWA, refer to the WEB catalog.

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

Specifications

Bore size (mm)	12	16	20	25	32	40	50	63	80	100
Action	Double acting									
Fluid	Air									
Proof pressure	1.5 MPa									
Maximum operating pressure	1.0 MPa									
Minimum operating pressure	0.12 MPa		0.1 MPa							
Ambient and fluid temperature	-10 to 60°C (No freezing)									
Piston speed ^{Note)}	50 to 500 mm/s								50 to 400 mm/s	
Cushion	Rubber bumper on both ends									
Lubrication	Not required (Non-lube)									
Stroke length tolerance	^{+1.5} ₋₀ mm									

Note) Maximum speed with no load.

Make a model selection, considering a load according to the graph on pages 1015 to 1021.

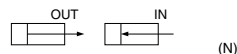
Standard Strokes

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

Manufacture of Intermediate Strokes

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

Theoretical Output

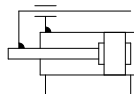


Bore size (mm)	Rod size (mm)	Operating direction	Piston area (mm ²)	Operating pressure (MPa)									
				0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	
12	6	OUT	113	23	34	45	57	68	79	90	102	113	
		IN	85	17	25	34	42	51	59	68	76	85	
16	8	OUT	201	40	60	80	101	121	141	161	181	201	
		IN	151	30	45	60	75	90	106	121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

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

Symbol

Rubber bumper



Made to Order

(For details, refer to pages 1050 to 1062.)

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)
-XC4	With heavy duty scraper
-XC6	Made of stainless steel
-XC8	Adjustable stroke cylinder/Adjustable extension type
-XC9	Adjustable stroke cylinder/Adjustable retraction type
-XC22	Fluororubber seal
-XC35	With coil scraper
-XC79	Tapped hole, drilled hole, pinned hole machined additionally
-XC82	Bottom mounting type
-XC85	Grease for food processing equipment
-XC98	Guide unit with Lube-retainer
-X144	Symmetrical port position
-X867	Side porting type (Plug location changed)

Refer to pages 1046 to 1048 for cylinders with auto switches.

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

Weights

Slide Bearing: MGPM12 to 100

(kg)

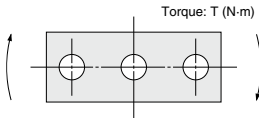
Bore size (mm)	Standard stroke (mm)															
	10	20	25	30	40	50	75	100	125	150	175	200	250	300	350	400
12	0.22	0.25	—	0.29	0.33	0.36	0.46	0.55	0.66	0.75	0.84	0.93	1.11	—	—	—
16	0.32	0.37	—	0.42	0.46	0.51	0.66	0.78	0.94	1.06	1.18	1.31	1.55	—	—	—
20	—	0.59	—	0.67	0.74	0.82	1.06	1.24	1.43	1.61	1.80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

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

(kg)

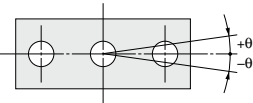
Bore size (mm)	Standard stroke (mm)															
	10	20	25	30	40	50	75	100	125	150	175	200	250	300	350	400
12	0.21	0.24	—	0.27	0.32	0.35	0.43	0.50	0.59	0.67	0.75	0.83	0.99	—	—	—
16	0.31	0.35	—	0.40	0.47	0.51	0.62	0.72	0.85	0.96	1.06	1.17	1.38	—	—	—
20	—	0.60	—	0.66	0.79	0.85	1.01	1.17	1.36	1.52	1.68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

Allowable Rotational Torque of Plate



T (N·m)																	
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/A	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/A	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/A	—	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/A	—	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	3.98	3.61	3.31	2.84	2.48	2.20	1.98
	MGPL/A	—	—	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/A	—	—	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/A	—	—	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/A	—	—	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/A	—	—	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/A	—	—	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



Non-rotating accuracy θ when retracted and when no load is applied should be not more than the values shown in the table.

Bore size (mm)	Non-rotating accuracy θ		
	MGPM	MGPL	MGPA
12	$\pm 0.07^\circ$	$\pm 0.05^\circ$	$\pm 0.01^\circ$
16			
20	$\pm 0.06^\circ$	$\pm 0.04^\circ$	
25			
32	$\pm 0.05^\circ$	$\pm 0.03^\circ$	
40			
50	$\pm 0.04^\circ$	$\pm 0.03^\circ$	
63			
80	$\pm 0.03^\circ$	$\pm 0.03^\circ$	
100			

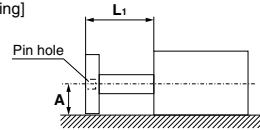
High Precision Ball Bushing/MGPA

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. Values below are referred as a guide.

[Side mounting]

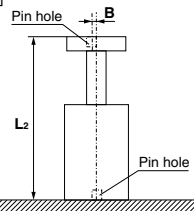


$$A = \text{Catalog dimension} \pm \sqrt{(0.1 + L_1 \times 0.0008)} \text{ [mm]}$$

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

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

[Bottom mounting]



$$B = \pm (0.045 + L_2 \times 0.0016) \text{ [mm]}$$

Series MGP

① 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.



How to Order

12 — MGPL Bore size — Stroke Z

Clean room specifications

12	Relief port type
13	Vacuum port type

Thread type

NII	M5 x 0.8
Rc	Rc
N	NPT
TF	G

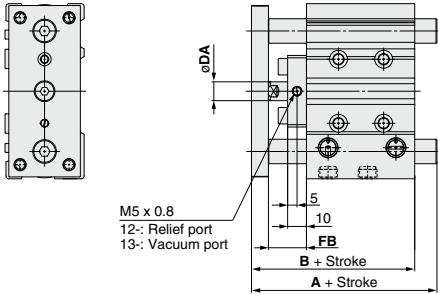
* For bore sizes 12 and 16, M5 x 0.8 is only available.

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	25 to 400	25 to 400	25 to 400	25 to 400	25 to 400

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

Dimensions



* Other dimensions are the same as standard products. * The dimensions in () are the same as standard type. (mm)

Bore size (mm)	A				B	DA	FB
	30 st or less	Over 30 st and up to 100 st	Over 100 st and up to 200 st	Over 200 st			
12	56	68	97.5	97.5	55	(6)	19
16	62	78	107.5	107.5	59	(8)	19
20	72	89	113	130.5	66	(10)	21
25	78.5	94.5	113.5	130.5	66.5	(10)	20

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

* For bore size ø20 or more, choice of Rc, NPT, G port is available. (Refer to page 1007.)

Bore size (mm)	A				B	DA	FB
	50 st or less	Over 50 st and up to 100 st	Over 100 st and up to 200 st	Over 200 st			
32	91.5	108.5	128.5	150.5	71.5	(14)	24
40	91.5	108.5	128.5	150.5	78	(14)	24
50	102.5	123.5	143.5	170.5	83	20	27
63	102.5	123.5	143.5	170.5	88	20	27

* Choice of Rc, NPT, G port is available. (Refer to page 1007.)

Refer to clean series (the WEB catalog) for details.

② Water Resistant Cylinder

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.



How to Order

MGPM Bore size — R — Stroke Z — M9□A(V)L

Thread type

NII	Rc
TN	NPT
TF	G

Water Resistant Cylinder

R	NBR seals (Nitrile rubber)
V	FKM seals (Fluororubber)

Water resistant 2-color indication solid state auto switch

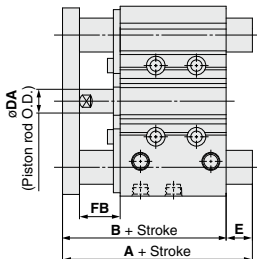
* Stainless steel parts are available as made-to-order products.
* Piston rod and guide rod are made of stainless steel.

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.

Dimensions



* Other dimensions are the same as standard products. * The dimensions in () are the same as standard type. (mm)

Bore size (mm)	A			B	DA	E			FB
	50 st or less	Over 50 st and up to 200 st	Over 200 st			50 st or less	Over 50 st and up to 200 st	Over 200 st	
20	66	90.5	123	66	(10)	(0)	(24.5)	(57)	21
25	67.5	91.5	123.5	67.5	(10)	(0)	(24)	(56)	21
32	87	105.5	141.5	71.5	(14)	(15.5)	(34)	(70)	24
40	87	105.5	141.5	78	(14)	(9)	(27.5)	(63.5)	24
50	99.5	120.5	161.5	83	20	(16.5)	(37.5)	(78.5)	27
63	99.5	120.5	161.5	88	20	(11.5)	(32.5)	(73.5)	27
80	110.5	137.5	186.5	102.5	25	(8)	(35)	(84)	30
100	130.5	155.5	194.5	120	30	(10.5)	(35.5)	(74.5)	35

Refer to the WEB catalog for details.

③ **Cylinder with Stable Lubrication Function (Lube-retainer)**

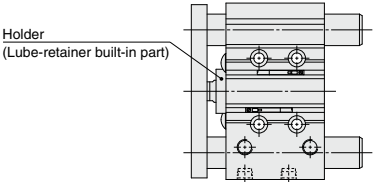
How to Order

MGP Bearing type Bore size Port thread type **M** — Stroke **Z** — Auto switch

• Cylinder with stable lubrication function (Lube-retainer)



Dimensions (Dimensions are the same as the standard type.)



Refer to the **WEB catalog** for details.

Specifications

Bore size (mm)	20, 25, 32, 40, 50, 63, 80, 100
Action	Double acting
Minimum operating pressure	0.15 MPa
Cushion	Rubber bumper on both ends

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

Air Cylinders

CJ2

CM2

CG1

MB

CA2

CQ2

CQS

Lube-retainer

JA

MXH

MXQ

MGP

CY

CX

CK□1

C(L)K□

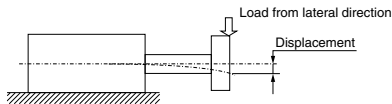
C(L)KU

CKQ

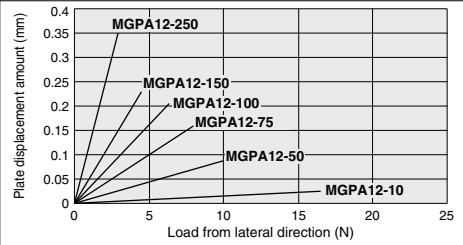
CKZ2N

WRF

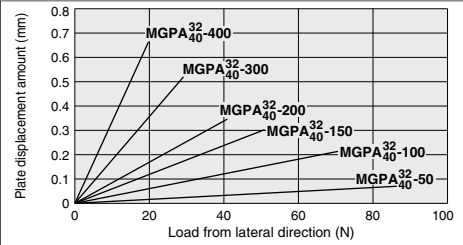
High Precision Ball Bushing/MGPA Plate Displacement Amount (Reference Values)



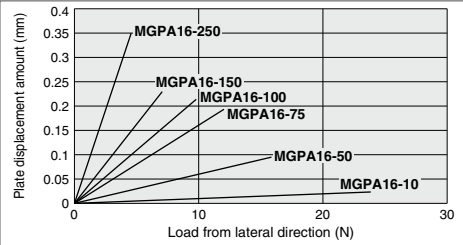
MGPA12



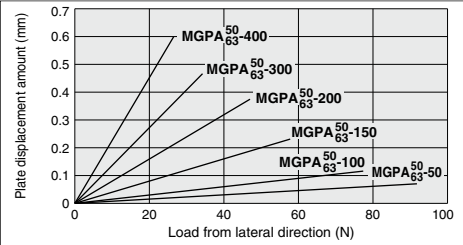
MGPA32, 40



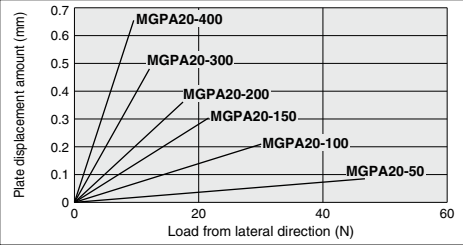
MGPA16



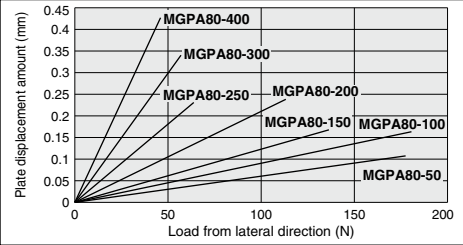
MGPA50, 63



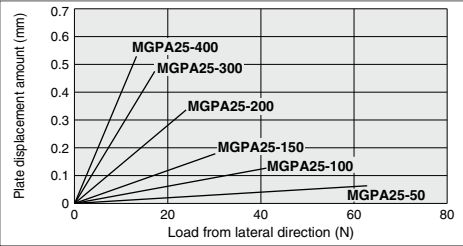
MGPA20



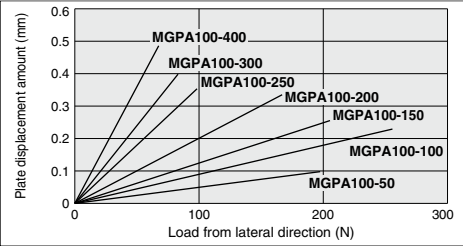
MGPA80



MGPA25



MGPA100



Note 1) The guide rod and self-weight for the plate are not included in the above displacement values.
Note 2) Allowable rotating torque, and operating range when used as a lifter, are the same as those of the MGPL series.

Air Cylinders
CJ2
CM2
CG1
MB
CA2
CQ2 CQS
Lube- retainer
JA
MXH
MXQ
MGP
C□Y C□X
CK□1
C(L)K□
C(L)KU
CKQ
CKZ2N
WRF

INDEX

Basic Type 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)	(1), (2)	(3), (4)	(13), (14)	(15), (16)
Graph (Ball bushing)	(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.

→ **MGPL25-30Z** 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

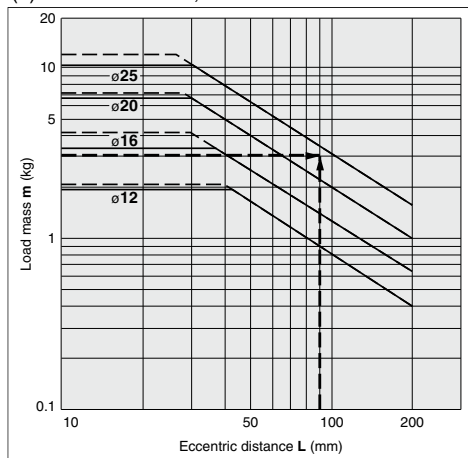
Load mass: 2 kg

Stroke: 30 stroke

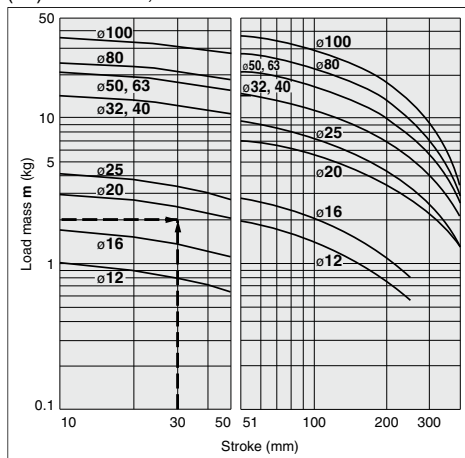
Find the point of intersection for the load mass of 2 kg and 30 stroke on graph (13), based on horizontal mounting, slide bearing, the distance of 50 mm between the plate and load center of gravity, and the speed of 200 mm/s.

→ **MGPM20-30Z** is selected.

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



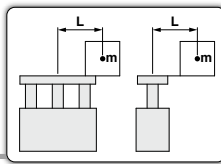
(13) $L = 50$ mm, $V = 200$ mm/s or less



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.

Max. speed	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.



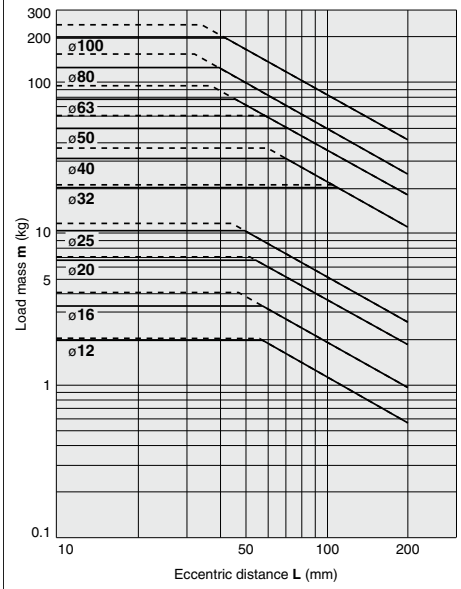
Model Selection *Series MGP*

Vertical Mounting **Slide Bearing**

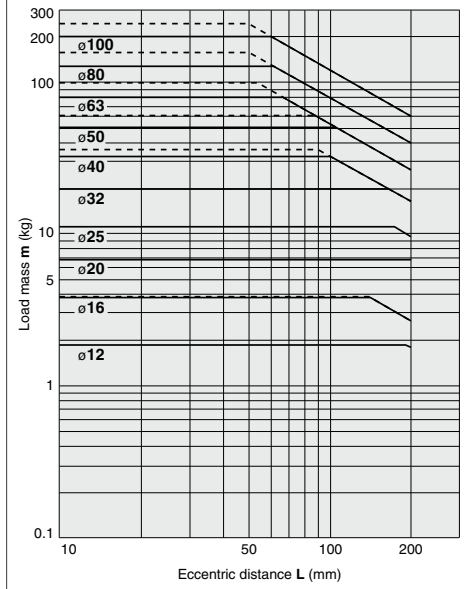
— Operating pressure 0.4 MPa
 - - - - - Operating pressure 0.5 MPa or more

MGPM12 to 100

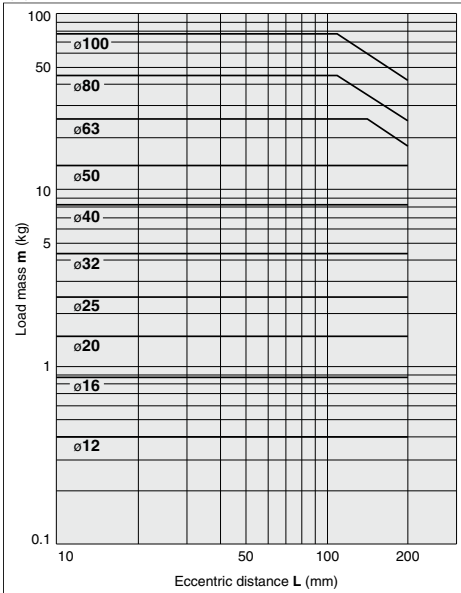
(1) 50 stroke or less, $V = 200$ mm/s or less



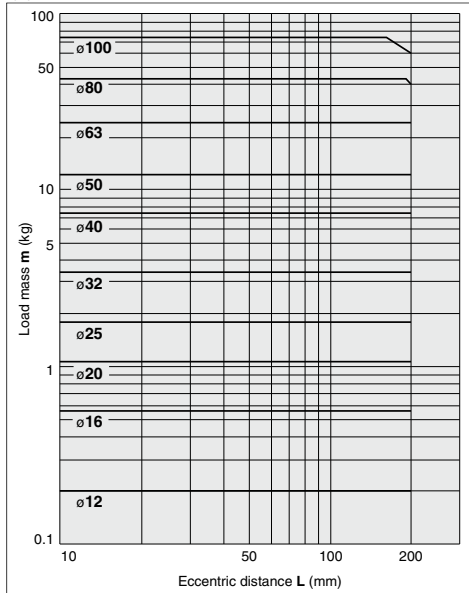
(2) Over 50 stroke, $V = 200$ mm/s or less



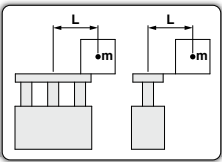
(3) 50 stroke or less, $V = 400$ mm/s



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



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

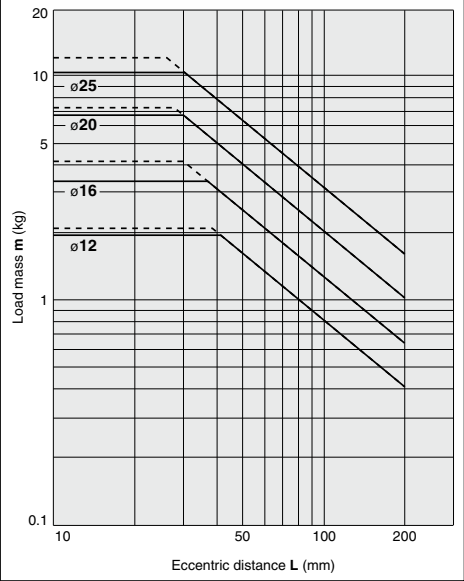


Vertical Mounting **Ball Bushing**

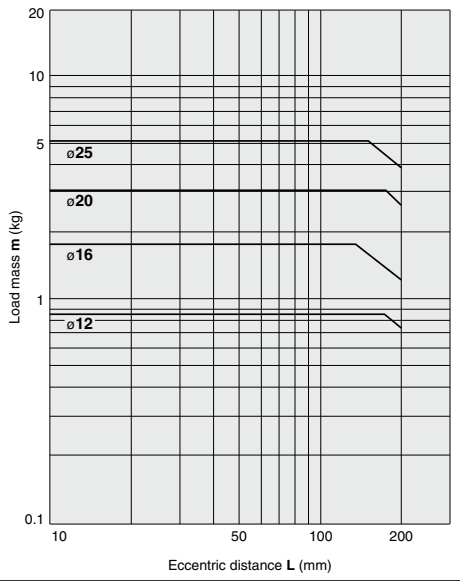
—— Operating pressure 0.4 MPa
----- Operating pressure 0.5 MPa or more

MGPL12 to 25, MGPA12 to 25

(5) 30 stroke or less, $V = 200 \text{ mm/s}$ or less

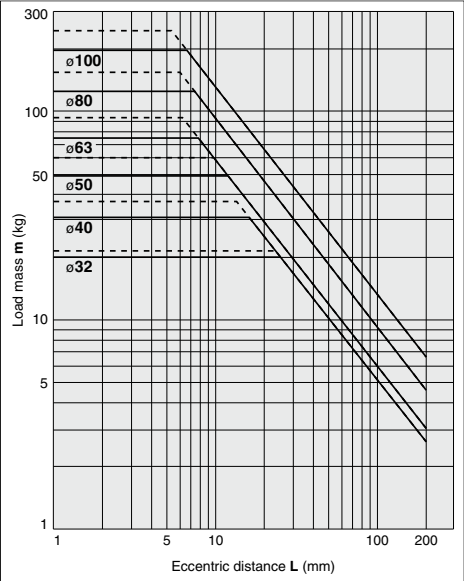


(6) Over 30 stroke, $V = 200 \text{ mm/s}$ or less

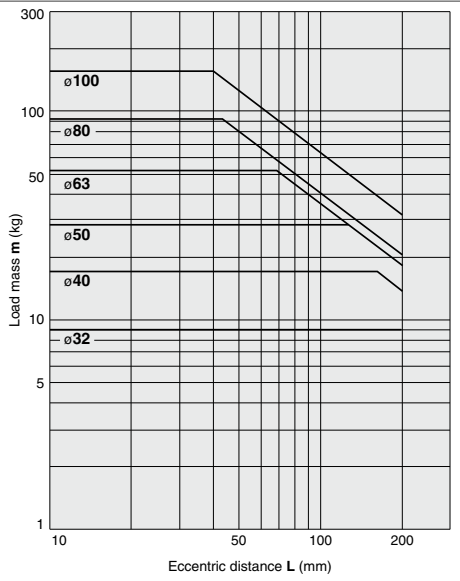


MGPL32 to 100, MGPA32 to 100

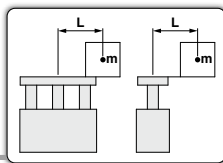
(7) 50 stroke or less, $V = 200 \text{ mm/s}$ or less



(8) Over 50 stroke, $V = 200 \text{ mm/s}$ or less



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

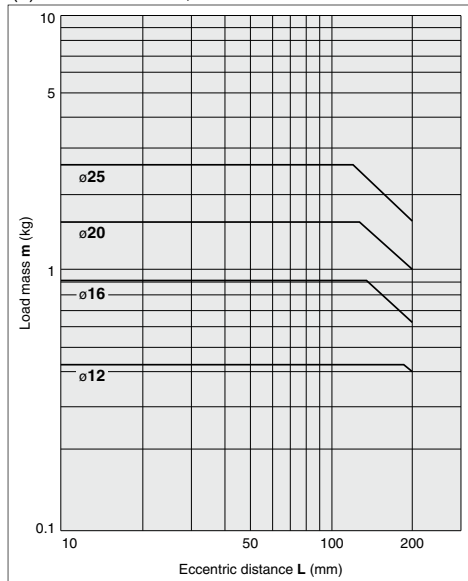


Vertical Mounting **Ball Bushing**

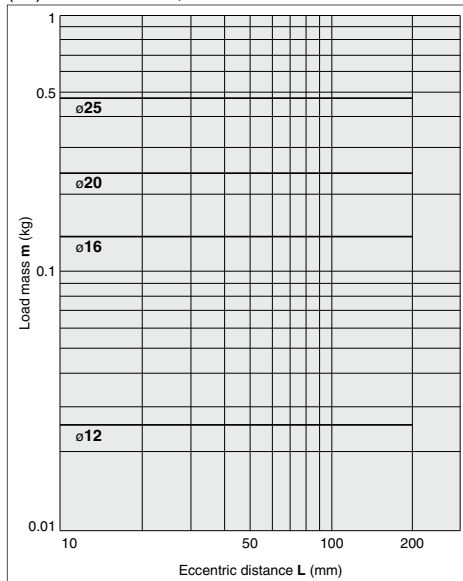
Operating pressure 0.4 MPa

MGPL12 to 25, MGPA12 to 25

(9) 30 stroke or less, $V = 400$ mm/s

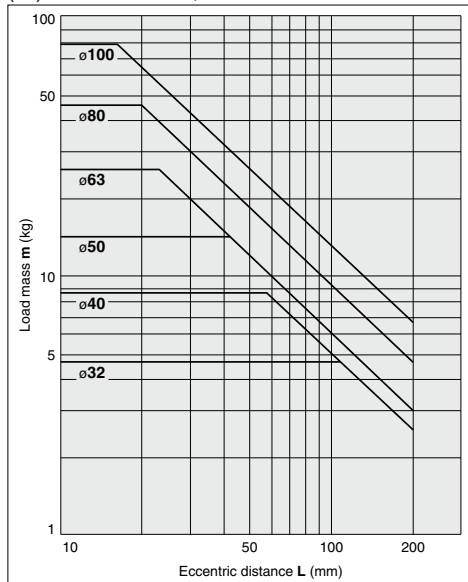


(10) Over 30 stroke, $V = 400$ mm/s

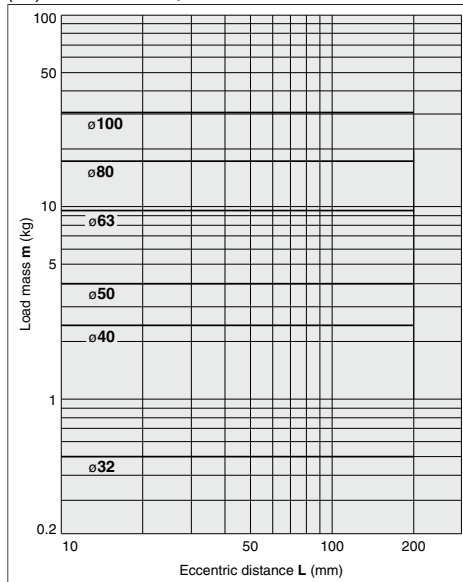


MGPL32 to 100, MGPA32 to 100

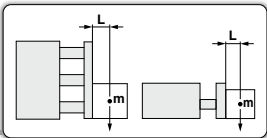
(11) 50 stroke or less, $V = 400$ mm/s



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

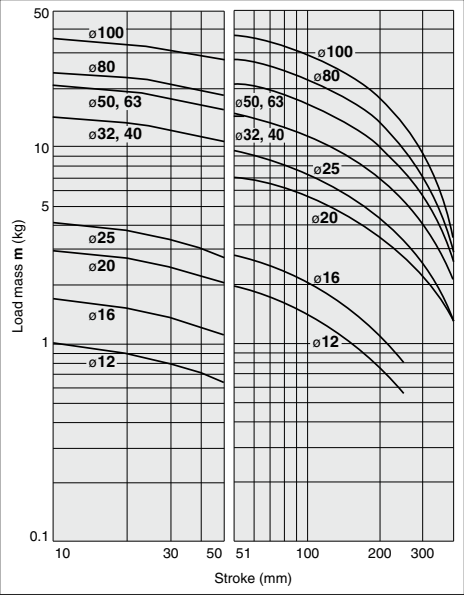


· Use the "Guide Cylinder Selection Software", when the eccentric distance is 200 mm or more.

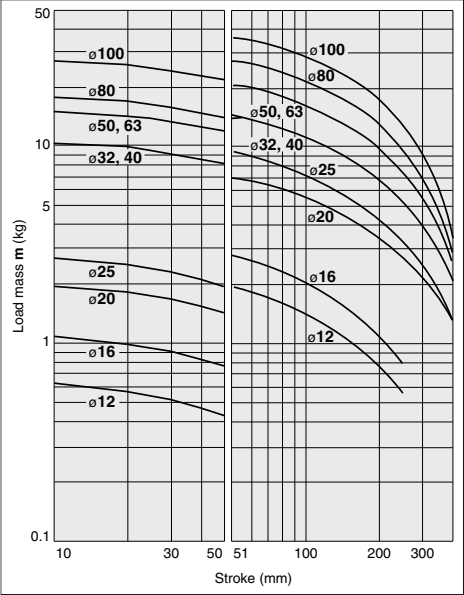


MGPM12 to 100

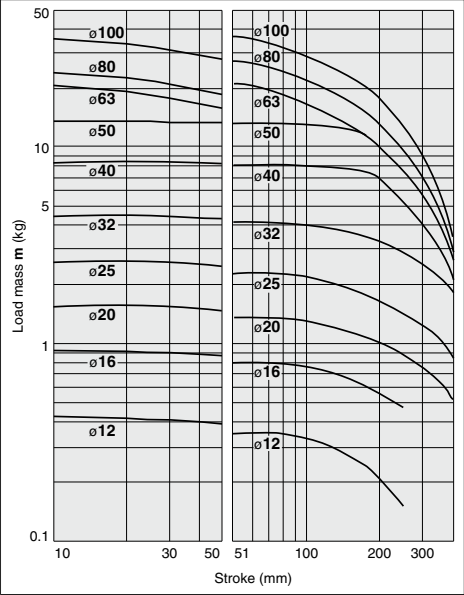
(13) L = 50 mm, V = 200 mm/s or less



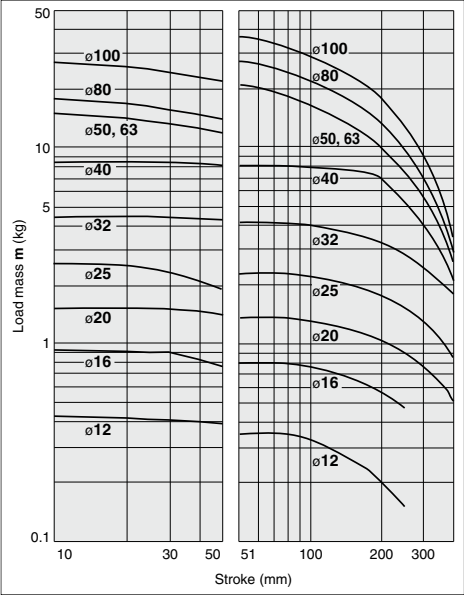
(14) L = 100 mm, V = 200 mm/s or less

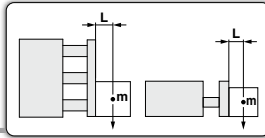


(15) L = 50 mm, V = 400 mm/s



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

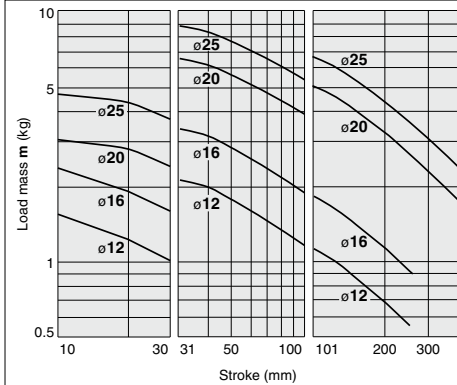




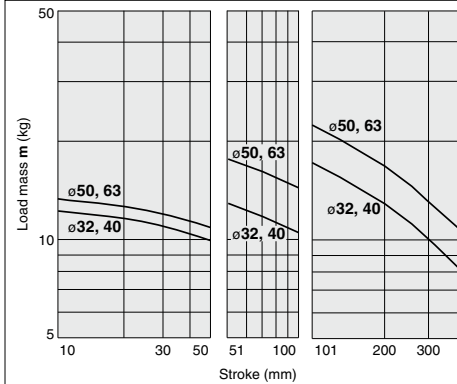
Horizontal Mounting Ball Bushing

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

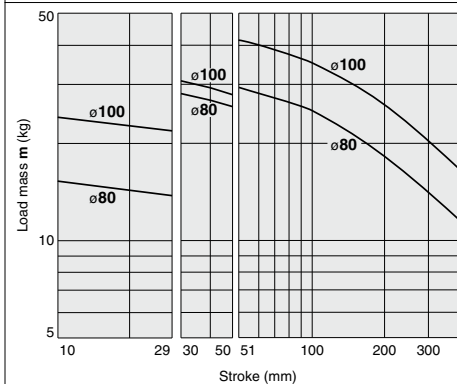
MGPL12 to 25, MGPA12 to 25



MGPL32 to 63, MGPA32 to 63

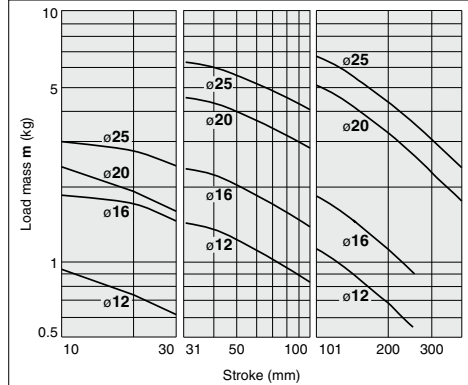


MGPL80/100, MGPA80/100

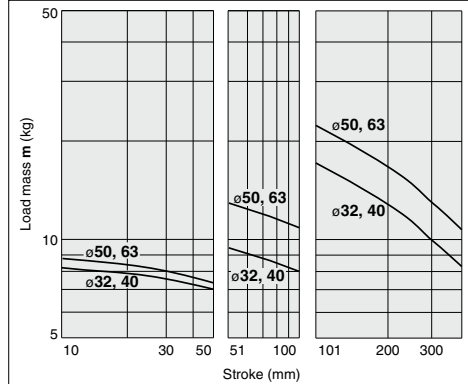


(18) L = 100 mm, V = 200 mm/s or less

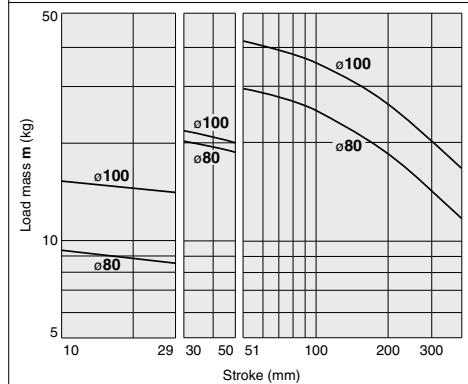
MGPL12 to 25, MGPA12 to 25



MGPL32 to 63, MGPA32 to 63



MGPL80/100, MGPA80/100



Air Cylinders

CJ2

CM2

CG1

MB

CA2

CQ2

CQS

Lube-retainer

JA

MXH

MXQ

MGP

☐ Y

☐ X

CK□1

G(L)□

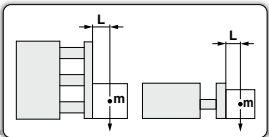
G(L)KU

CKQ

CKZ2N

WRF

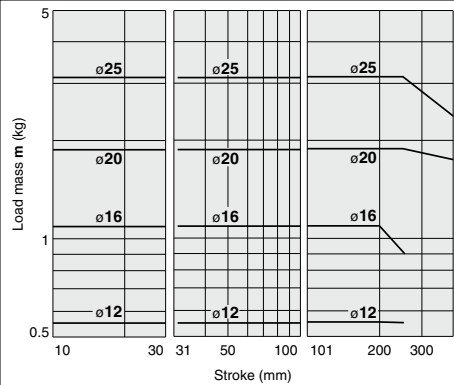
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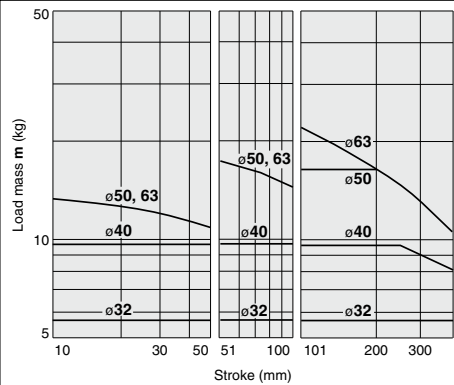
Horizontal Mounting **Ball Bushing**

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

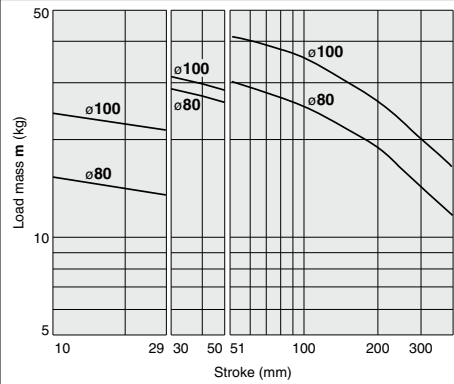
MGPL12 to 25, MGPA12 to 25



MGPL32 to 63, MGPA32 to 63

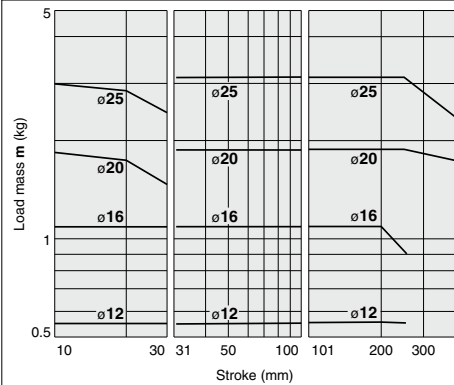


MGPL80/100, MGPA80/100

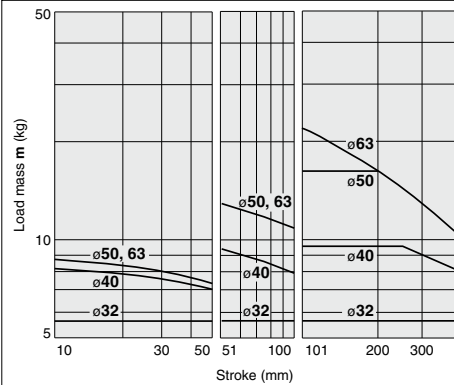


(20) L = 100 mm, V = 400 mm/s

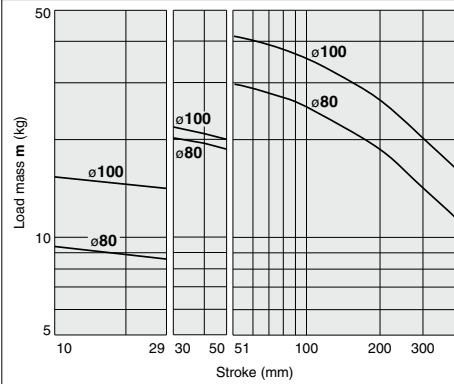
MGPL12 to 25, MGPA12 to 25



MGPL32 to 63, MGPA32 to 63

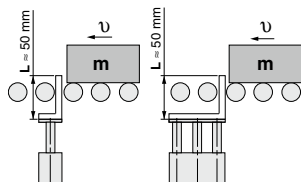


MGPL80/100, MGPA80/100



Operating Range when Used as Stopper

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



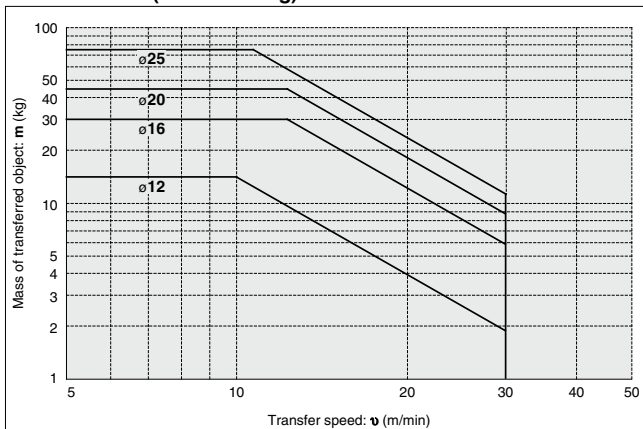
* When selecting a model with a longer **L** dimension, be sure to choose a bore size which is sufficiently large.

Caution

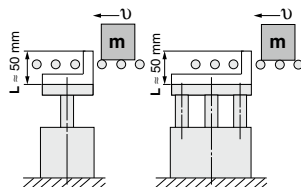
Caution on handling

- Note 1) When using as a stopper, select a model with 30 stroke or less.
 Note 2) The MGPL (Ball bushing) and the MGPA (High precision ball bushing) cannot be used as a stopper.

MGPM12 to 25 (Slide Bearing)



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



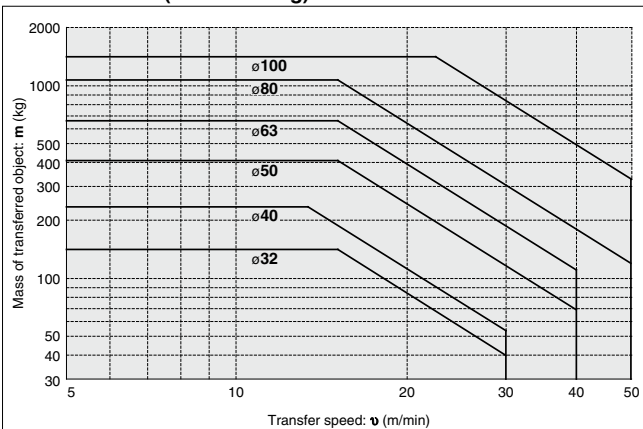
* When selecting a model with a longer **L** dimension, be sure to choose a bore size which is sufficiently large.

Caution

Caution on handling

- Note 1) When using as a stopper, select a model with 50 stroke or less.
 Note 2) The MGPL (Ball bushing) and the MGPA (High precision ball bushing) cannot be used as a stopper.

MGPM32 to 100 (Slide Bearing)



* Refer to graphs (13) and (15) if line pressure is applied by a roller conveyor after the workpiece is stopped.

Air Cylinders

CJ2

CM2

CG1

MB

CA2

CQ2

CQS

Lube-retainer

JA

MXH

MXQ

MGP

C□Y

C□X

CK□1

C(L)□

C(L)□U

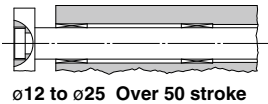
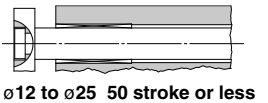
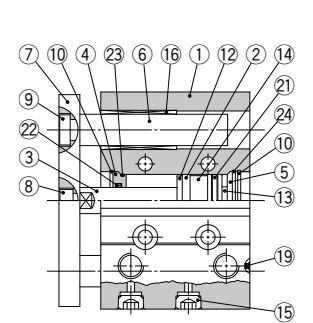
CKQ

CKZ2N

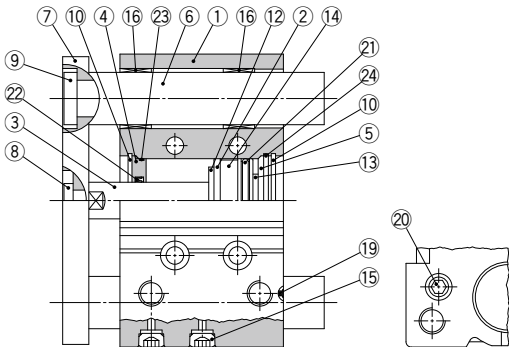
WRF

Construction/Series **MGPM**

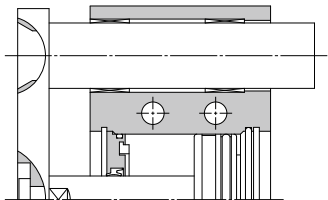
MGPM12 to 25



MGPM32 to 100



$\phi 63$ or more



Component Parts

No.	Description	Material	Note
1	Body	Aluminum alloy	Hard anodized
2	Piston	Aluminum alloy	Chromated
3	Piston rod	Stainless steel	$\phi 12$ to $\phi 25$
4	Collar	Carbon steel	$\phi 32$ to $\phi 100$ Hard chrome plating
5	Head cover	Aluminum alloy	Chromated
6	Guide rod	Carbon steel	$\phi 12$ to $\phi 63$ Hard chrome plating
7	Plate	Carbon steel	$\phi 80$, $\phi 100$ Chromated
8	Plate mounting bolt	Carbon steel	Painted
9	Guide bolt	Carbon steel	Nickel plating
10	Retaining ring	Carbon tool steel	Phosphate coated
11	Retaining ring	Carbon tool steel	Phosphate coated
12	Bumper A	Urethane	
13	Bumper B	Urethane	
14	Magnet	—	
15	Plug	Carbon steel	$\phi 12$, $\phi 16$ Nickel plating
16	Hexagon socket head plug	Carbon steel	$\phi 20$ to $\phi 100$ Nickel plating
17	Slide bearing	Bearing alloy	

Component Parts

No.	Description	Material	Note
17	Ball bushing	Aluminum alloy	
18	Spacer	Aluminum alloy	
19	Steel ball	Carbon steel	$\phi 12$ to $\phi 50$
20	Plug	Carbon steel	$\phi 63$ to $\phi 100$ Nickel plating
21*	Piston seal	NBR	
22*	Rod seal	NBR	
23*	Gasket A	NBR	
24*	Gasket B	NBR	

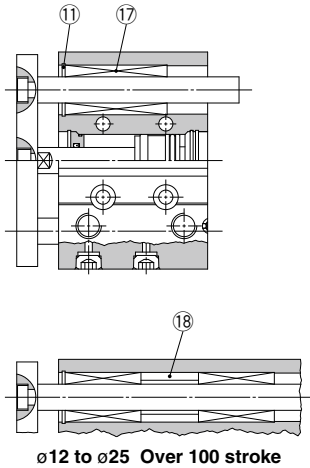
Replacement Parts/Seal Kit

Bore size (mm)	Kit no.	Contents	Bore size (mm)	Kit no.	Contents
12	MGP12-Z-PS	Set of nos.	40	MGP40-Z-PS	Set of nos.
16	MGP16-Z-PS	above	50	MGP50-Z-PS	above
20	MGP20-Z-PS	above	63	MGP63-Z-PS	above
25	MGP25-Z-PS	$\phi 1$, $\phi 2$, $\phi 3$, $\phi 4$	80	MGP80-Z-PS	$\phi 1$, $\phi 2$, $\phi 3$, $\phi 4$
32	MGP32-Z-PS	$\phi 1$, $\phi 2$, $\phi 3$, $\phi 4$	100	MGP100-Z-PS	$\phi 1$, $\phi 2$, $\phi 3$, $\phi 4$

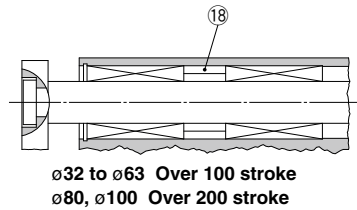
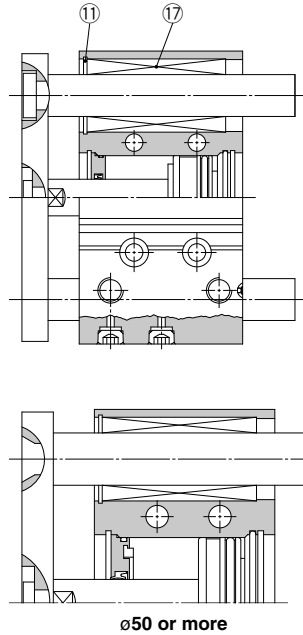
* Seal kit includes $\phi 1$ to $\phi 4$. Order the seal kit, based on each bore size.
* Since the seal kit does not include a grease pack, order it separately.
Grease pack part number: GR-S-010 (10 g)

Construction/Series MGPL, Series MGPA

**MGPL12 to 25
MGPA12 to 25**



**MGPL32 to 100
MGPA32 to 100**



Air Cylinders

CJ2

CM2

CG1

MB

CA2

CQ2

CQS

Lube-
retainer

JA

MXH

MXQ

MGP

☐ Y

☐ X

CK ☐ 1

C(L)K ☐

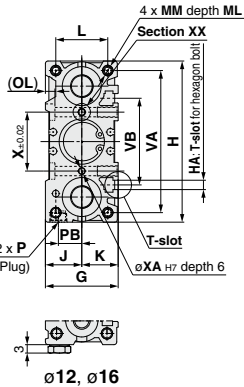
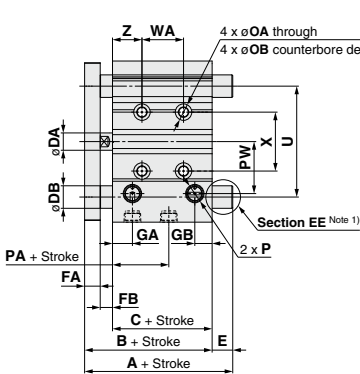
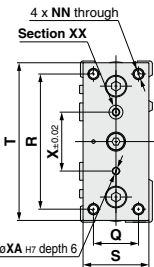
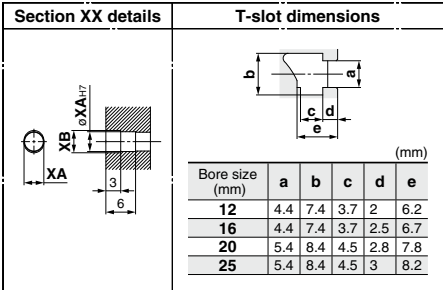
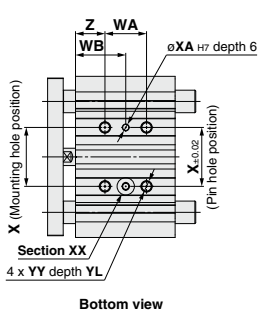
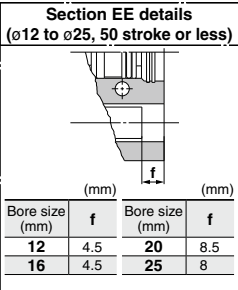
C(L)KU

CKQ

CKZ2N

WRF

ø12 to ø25/MGPM, MGPL, MGPA



Note 1) Refer to "Section EE details" for the shape of ø12 to ø25 with stroke of 50 or less.

- * The use of a slot (width XA, length XB, depth 3) allows for a relaxed pin pitch tolerance, with the pin hole (øXA_{H7}, depth 6) as the reference, without affecting mounting accuracy.
- * For intermediate strokes other than standard strokes, refer to "Manufacture of Intermediate Strokes" on page 1008.
- * For bore size ø12 and ø16, only M5 x 0.8 port is available.
- * For bore size ø20 or more, choice of Rc, NPT, G port is available. (Refer to page 1007.)

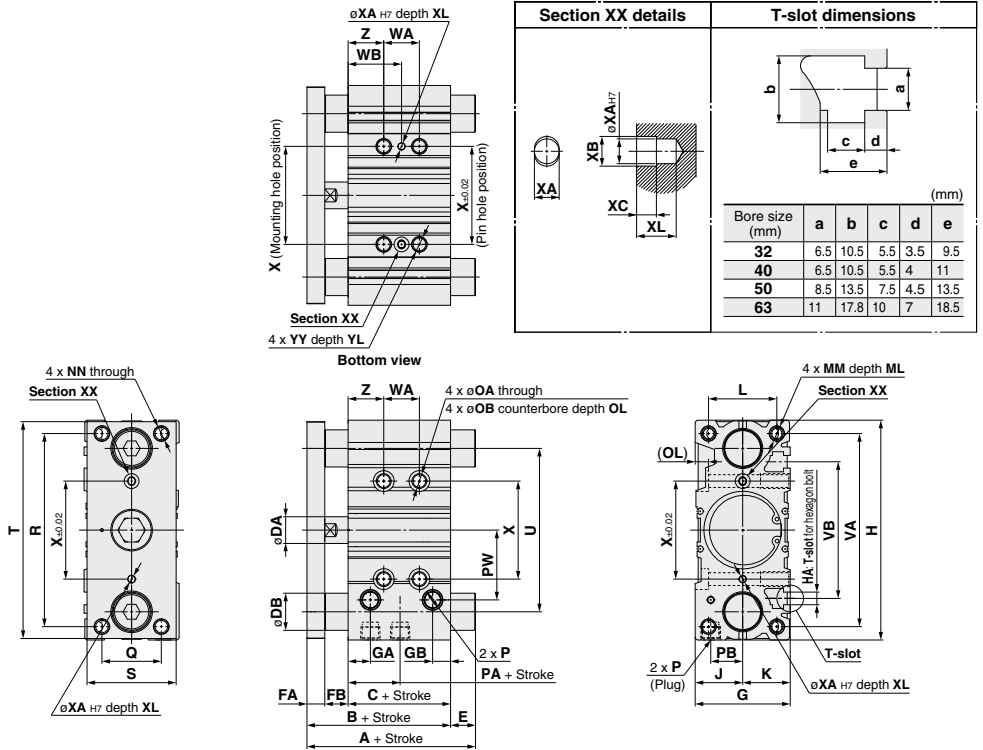
MGPM, MGPL, MGPA Common Dimensions

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

Bore size (mm)	PA	PB	PW	Q	R	S	T	U	VA	VB	WA					WB					X	XA	XB	YY	YL	Z						
											30 st or less					Over 30 st or less																
											Over 50 st or less	Over 100 st or less	Over 200 st or less	Over 300 st or less	Over 400 st or less	Over 50 st or less	Over 100 st or less	Over 200 st or less	Over 300 st or less	Over 400 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	14.5	10	19	16	54	25	62	46	56	38	24	44	110	200	—	17	27	60	105	—	24	3	3.5	M5 x 0.8	10	5						
20	13.5	10.5	25	18	70	30	81	54	72	44	24	44	120	200	300	29	39	77	117	167	28	3	3.5	M6 x 1.0	12	17						
25	12.5	13.5	30	26	78	38	91	64	82	50	24	44	120	200	300	29	39	77	117	167	34	4	4.5	M6 x 1.0	12	17						

MGPM (Slide bearing) A, DB, E Dimensions (mm)										MGPL (Ball bushing) MGPA (High precision ball bushing) A, DB, E Dimensions (mm)									
Bore size (mm)	A				DB	E				Bore size (mm)	A				DB	E			
	50 st or less	Over 50 st or less	Over 100 st or less	Over 200 st or less		50 st or less	Over 50 st or less	Over 100 st or less	Over 200 st or less		30 st or less	Over 30 st or less	Over 100 st or less	Over 200 st or less		30 st or less	Over 30 st or less	Over 100 st or less	Over 200 st or less
12	42	60.5	82.5	82.5	8	0	18.5	40.5	40.5	12	43	55	84.5	84.5	6	1	13	42.5	42.5
16	46	64.5	92.5	92.5	10	0	18.5	46.5	46.5	16	49	65	94.5	94.5	8	3	19	48.5	48.5
20	53	77.5	77.5	110	12	0	24.5	24.5	57	20	59	76	100	117.5	10	6	23	47	64.5
25	53.5	77.5	77.5	109.5	16	0	24	24	56	25	65.5	81.5	100.5	117.5	13	12	28	47	64

ø32 to ø63/MGPM, MGPL, MGPA



- * The use of a slot (width XA, length XB, depth XC) allows for a relaxed pin pitch tolerance, with the pin hole (øXA_{H7}, depth XL) as the reference, without affecting mounting accuracy.
- * For intermediate strokes other than standard strokes, refer to "Manufacture of Intermediate Strokes" on page 1008.
- * Choice of Rc, NPT, G port is available. (Refer to page 1007.)

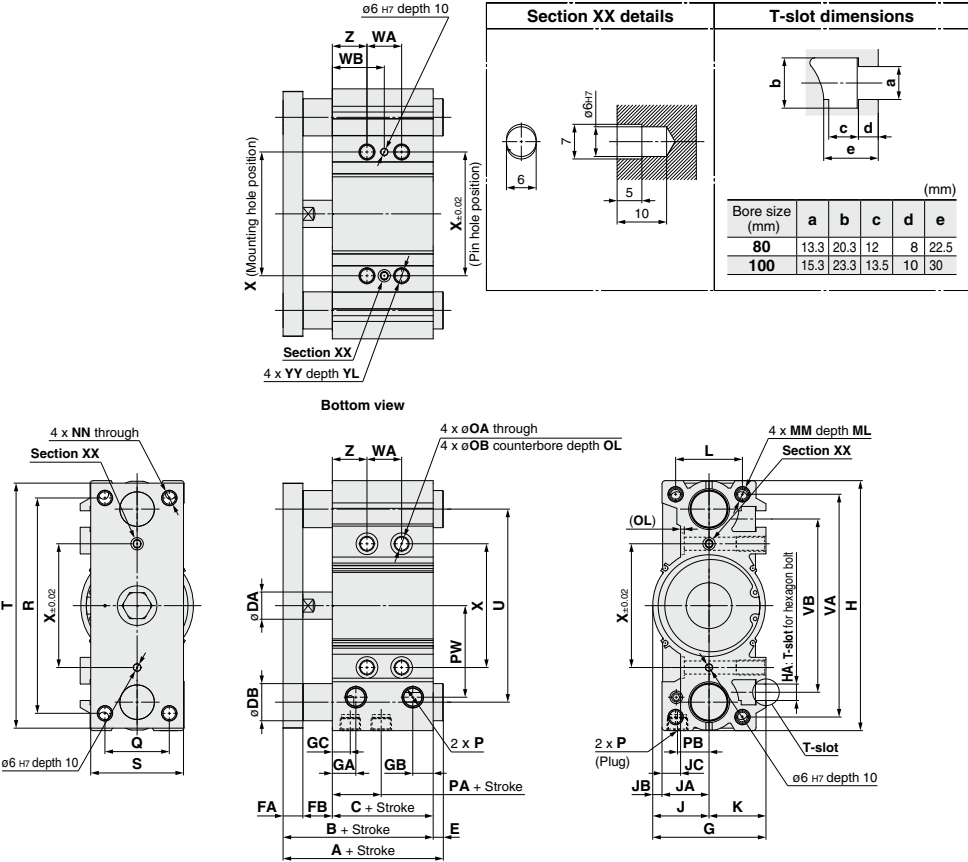
MGPM, MGPL, MGPA Common Dimensions

Bore size (mm)	Standard stroke (mm)	B	C	DA	FA	FB	G	GA	GB	H	HA	J	K	L	MM	ML	NN	OA	OB	OL	P		
																					Nil	TN	TF
32	25, 50, 75	59.5	37.5	14	10	12	48	12	9	112	M6	24	24	34	M8 x 1.25	20	M8 x 1.25	6.7	11	7.5	Rc1/8	NPT1/8	G1/8
40	100, 125, 150	66	44	14	10	12	54	15	12	120	M6	27	27	40	M8 x 1.25	20	M8 x 1.25	6.7	11	7.5	Rc1/8	NPT1/8	G1/8
50	175, 200, 250	72	44	18	12	16	64	15	12	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	300, 350, 400	77	49	18	12	16	78	15.5	13.5	162	M10	39	39	58	M10 x 1.5	22	M10 x 1.5	8.6	—	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
											25 at or less	Over 25 at 100 or less	Over 100 at 200 or less	Over 200 at 300 or less	25 at or less	Over 25 at 100 or less	Over 100 at 200 or less	Over 200 at 300 or less	25 at or less	Over 25 at 100 or less	Over 100 at 200 or less	Over 200 at 300 or less								
32	6.5	16	35.5	30	96	44	110	78	98	63	24	48	124	200	300	33	45	83	121	171	42	4	4.5	3	6	M8 x 1.25	16	21		
40	13	18	39.5	30	104	44	118	86	106	72	24	48	124	200	300	34	46	84	122	172	50	4	4.5	3	6	M8 x 1.25	16	22		
50	9	21.5	47	40	130	60	146	110	130	92	24	48	124	200	300	36	48	86	124	174	66	5	6	4	8	M10 x 1.5	20	24		
63	13	28	58	50	130	70	158	124	142	110	28	52	128	200	300	38	50	88	124	174	80	5	6	4	8	M10 x 1.5	20	24		

MGPM (Slide bearing) A, DB, E Dimensions (mm)								MGPA (High precision ball bushing) A, DB, E Dimensions (mm)									
Bore size (mm)	A			DB	E			Bore size (mm)	A			DB	E				
	50 at or less	Over 50 at or less	Over 200 at or less		50 at or less	Over 50 at or less	Over 200 at or less		50 at or less	Over 100 at or less	Over 200 at or less		50 at or less	Over 50 at or less	Over 100 at or less	Over 200 at or less	
32	75	93.5	129.5	20	15.5	34	70	32	79.5	96.5	116.5	138.5	16	20	37	57	79
40	75	93.5	129.5	20	9	27.5	63.5	40	79.5	96.5	116.5	138.5	16	13.5	30.5	50.5	72.5
50	88.5	109.5	150.5	25	16.5	37.5	78.5	50	91.5	112.5	132.5	159.5	20	19.5	40.5	60.5	87.5
63	88.5	109.5	150.5	25	11.5	32.5	73.5	63	91.5	112.5	132.5	159.5	20	14.5	35.5	55.5	82.5

Ø80, Ø100/MGPM, MGPL, MGPA



* The use of a slot (width X6, length 7, depth 5) allows for a relaxed pin pitch tolerance, with the pin hole (ø6H7, depth 10) as the reference, without affecting mounting accuracy.
* For intermediate strokes other than standard strokes, refer to "Manufacture of Intermediate Strokes" on page 1008.
* Choice of Rc, NPT, G port is available. (Refer to page 1007.)

MGPM, MGPL, MGPA Common Dimensions

Bore size (mm)	Standard stroke (mm)	B	C	DA	FA	FB	G	GA	GB	GC	H	HA	J	JA	JB	JC	K	L	MM	ML	NN	OA	OB	OL	P		
																									Nil	TN	TF
80	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400	96.5	56.5	22	16	24	91.5	19	16.5	14.5	202	M12	45.5	38	7.5	15	46	54	M12 x 1.75	25	M12 x 1.75	10.6	17.5	3	Rc3/8	NPT3/8	G3/8
100		116	66	26	19	31	111.5	22.5	20.5	18	240	M14	55.5	45	10.5	10	56	62	M14 x 2.0	31	M14 x 2.0	12.5	20	8	Rc3/8	NPT3/8	G3/8

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	25 st or less	Over 25 st										
80	14.5	25.5	74	52	174	75	198	156	180	140	28	52	128	200	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	Over 200 st		50 st or less	Over 50 st	Over 200 st
80	104.5	131.5	180.5	30	8	35	84
100	126.5	151.5	190.5	36	10.5	35.5	74.5

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

Bore size (mm)	A			DB	E		
	25 st or less	Over 25 st	Over 50 st		25 st or less	Over 25 st	Over 50 st
80	104.5	128.5	158.5	25	8	32	62
100	119.5	145.5	178.5	30	3.5	29.5	85.5

Air Cylinders
CJ2
CM2
CG1
MB
CA2
CQ2 CQS
Lube- retainer
JA
MXH
MXQ
MGP
C□Y C□X
CK□1
C(L)K□
C(L)KU
CKQ
CKZ2N
WRF

Compact Guide Cylinder With Air Cushion

Series *MGP*

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

How to Order

MGP **M** **32** **50** **AZ** **M9BW**

Compact Guide Cylinder

Bearing type

M	Slide bearing
L	Ball bushing
A	High precision ball bushing

Bore size

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

Port thread type

Nil	M5 x 0.8
	Rc
TN	NPT
TF	G

* For bore size 16, only M5 x 0.8 is available.

Made to Order

For details, refer to page 1030.

Number of auto switches

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

Auto switch

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

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

With air cushion

Cylinder stroke (mm)

Refer to "Standard Strokes" on page 1030.

Applicable Auto Switches Refer to the **WEB catalog** or the Best Pneumatics No. 3 for further information on auto switches.

Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage		Auto switch model		Lead wire length (m)				Pre-wired connector	Applicable load		
					DC	AC	Perpendicular	In-line	0.5 (Nil)	1 (M)	3 (L)	5 (Z)				
Solid state auto switch	—	Grommet	Yes	3-wire (NPN)	5 V, 12 V	—	M9NV	M9N	●	●	●	○	○	IC circuit	Relay, PLC	
	3-wire (PNP)			M9PV			M9P	●	●	○	○					
	2-wire			M9BV			M9B	●	●	○	○					
	3-wire (NPN)			M9NWV			M9NW	●	●	○	○					
	Diagnostic indication (2-color display)			3-wire (PNP)	M9PWV		M9PW	●	●	○	○	IC circuit				
				2-wire	M9BWV		M9BW	●	●	○	○					
	Water resistant (2-color display)			3-wire (NPN)	M9NAV***		M9NA***	○	○	○	○	IC circuit				
				3-wire (PNP)	M9PAV***		M9PA***	○	○	●	○					
Magnetic field resistant (2-color display)	2-wire	M9BAV***	M9BA***	○	○	●	○	—								
	2-wire (Non-polar)	—	P3DWA**	●	—	●	○									
Reed auto switch	—	Grommet	Yes	3-wire (NPN equivalent)	—	5 V	—	A96V	A96	●	—	●	—	—	IC circuit	—
				No	2-wire	24 V	12 V	100 V or less	A93V	A93	●	—	●	—	—	
									A90V	A90	●	—	●	—	—	

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

A water resistant type cylinder is recommended for use in an environment which requires water resistance.

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

* 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.

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

* Since there are other applicable auto switches than listed above, refer to the **WEB catalog** or the Best Pneumatics No. 3 for details.

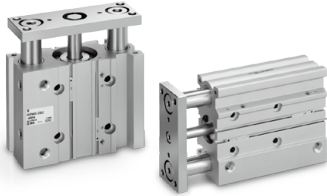
* For details about auto switches with pre-wired connector, refer to the **WEB catalog** or the Best Pneumatics No. 3.

* For the D-P3DWA, refer to the **WEB catalog**.

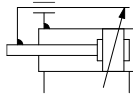
* Auto switches are shipped together, (but not assembled).

Specifications

Bore size (mm)	16	20	25	32	40	50	63	80	100
Action	Double acting								
Fluid	Air								
Proof pressure	1.5 MPa								
Maximum operating pressure	1.0 MPa								
Minimum operating pressure	0.15 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								



Symbol
Air cushion



Made to Order

(For details, refer to pages 1050 to 1062.)

Symbol	Specifications
-XC19	Intermediate stroke (Spacer type)
-XC79	Tapped hole, drilled hole, pinned hole machined additionally
-XC85	Grease for food processing equipment
-X867	Side porting type (Plug location changed)

Refer to pages 1046 to 1048 for cylinders with auto switches.

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

Standard Strokes

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 Strokes

Description	Intermediate strokes by the 1 mm interval are available by replacing collars of a standard stroke cylinder. Minimum manufacturable stroke $\phi 16$ to $\phi 63$: 15 mm $\phi 80$, $\phi 100$: 20 mm Select a rubber bumper type, because the cushion effect is not obtainable for less than this stroke.	
Model no.	Add "-XC19" to the end of standard part number.	
Applicable stroke (mm)	$\phi 16$	15 to 249
	$\phi 20$ to $\phi 63$	15 to 399
	$\phi 80$, $\phi 100$	20 to 399
Example	Part no.: MGP20-35AZ-XC19 A collar 15 mm in width is installed in the MGP20-50AZ. 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	75	90	106	121	136	151	
20	10	OUT	314	63	94	126	157	188	220	251	283	314	
		IN	236	47	71	94	118	141	165	188	212	236	
25	10	OUT	491	98	147	196	245	295	344	393	442	491	
		IN	412	82	124	165	206	247	289	330	371	412	
32	14	OUT	804	161	241	322	402	483	563	643	724	804	
		IN	650	130	195	260	325	390	455	520	585	650	
40	14	OUT	1257	251	377	503	628	754	880	1005	1131	1257	
		IN	1103	221	331	441	551	662	772	882	992	1103	
50	20	OUT	1963	393	589	785	982	1178	1374	1571	1767	1963	
		IN	1649	330	495	660	825	990	1154	1319	1484	1649	
63	20	OUT	3117	623	935	1247	1559	1870	2182	2494	2806	3117	
		IN	2803	561	841	1121	1402	1682	1962	2242	2523	2803	
80	25	OUT	5027	1005	1508	2011	2513	3016	3519	4021	4524	5027	
		IN	4536	907	1361	1814	2268	2722	3175	3629	4082	4536	
100	30	OUT	7854	1571	2356	3142	3927	4712	5498	6283	7069	7854	
		IN	7147	1429	2144	2859	3574	4288	5003	5718	6432	7147	

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

Weights

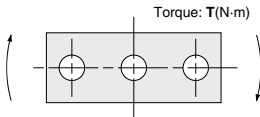
Slide Bearing: MGPM16 to 100

Bore size (mm)	Standard stroke (mm)											
	25	50	75	100	125	150	175	200	250	300	350	400
16	0.46	0.62	0.74	0.83	1.02	1.10	1.19	1.28	1.46	—	—	—
20	0.77	1.02	1.21	1.35	1.49	1.63	1.77	1.91	2.55	2.83	3.11	3.39
25	1.06	1.43	1.68	1.84	2.01	2.18	2.35	2.52	3.50	3.84	4.18	4.51
32	1.66	2.06	2.42	2.65	2.88	3.11	3.34	3.57	5.07	5.53	5.99	6.46
40	1.95	2.40	2.79	3.06	3.33	3.59	3.86	4.13	5.71	6.25	6.78	7.32
50	3.26	3.96	4.55	4.96	5.36	5.76	6.16	6.56	9.03	9.83	10.63	11.43
63	4.11	4.90	5.58	6.07	6.56	7.05	7.54	8.04	10.68	11.66	12.64	13.63
80	—	7.47	8.35	8.95	9.55	10.15	10.75	11.35	15.04	16.24	17.44	18.65
100	—	12.10	13.37	14.24	15.11	15.98	16.85	17.72	22.88	24.62	26.36	28.10

Ball Bushing: MGPL16 to 100, High Precision Ball Bushing: MGPA16 to 100

Bore size (mm)	Standard stroke (mm)											
	25	50	75	100	125	150	175	200	250	300	350	400
16	0.48	0.58	0.66	0.83	0.94	1.02	1.11	1.19	1.36	—	—	—
20	0.82	0.97	1.10	1.35	1.50	1.63	1.76	1.89	2.33	2.59	2.84	3.10
25	1.16	1.34	1.49	1.83	2.03	2.18	2.34	2.49	3.11	3.41	3.72	4.02
32	1.58	2.00	2.29	2.67	2.95	3.15	3.36	3.57	4.47	4.88	5.29	5.70
40	1.87	2.33	2.65	3.06	3.38	3.63	3.87	4.11	5.09	5.57	6.06	6.54
50	3.10	3.81	4.30	4.92	5.42	5.79	6.17	6.55	8.08	8.83	9.58	10.33
63	3.94	4.74	5.34	6.05	6.64	7.11	7.58	8.05	9.77	10.71	11.65	12.59
80	—	7.61	8.35	8.91	9.46	10.02	10.57	11.13	13.99	15.10	16.21	17.32
100	—	12.04	13.14	13.97	14.79	15.62	16.44	17.27	21.14	22.80	24.45	26.10

Allowable Rotational Torque of Plate



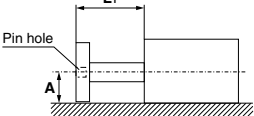
Bore size (mm)	Bearing type	Stroke											
		25	50	75	100	125	150	175	200	250	300	350	400
16	MGPM	0.53	0.84	0.69	0.58	0.50	0.44	0.40	0.36	0.30	—	—	—
	MGPL/A	1.27	0.86	0.65	0.52	0.43	0.37	0.32	0.28	0.23	—	—	—
20	MGPM	0.99	2.23	1.88	1.63	1.44	1.28	1.16	1.06	0.90	0.78	0.69	0.62
	MGPL/A	2.66	1.94	1.52	1.17	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/A	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/A	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/A	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/A	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/A	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/A	—	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/A	—	41.7	37.9	34.6	31.8	29.3	27.2	25.3	22.1	19.5	17.3	15.5

High Precision Ball Bushing/MGPA

⚠ 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. Values below are referred as a guide.

[Side mounting]

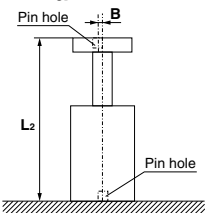


$A = \text{[Catalog dimension]} \pm \text{[} \pm (0.1 + L_1 \times 0.0008) \text{ [mm]}}$

*: To be 0.15 for ø80, ø100

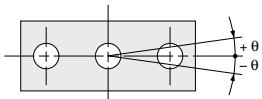
Note) Displacement by load and self-weight deflection by plate and guide rod are not included.

[Bottom mounting]



$B = \pm (0.045 + L_2 \times 0.0016) \text{ [mm]}$

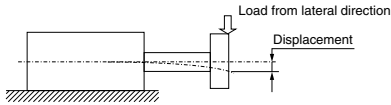
Non-rotating Accuracy of Plate



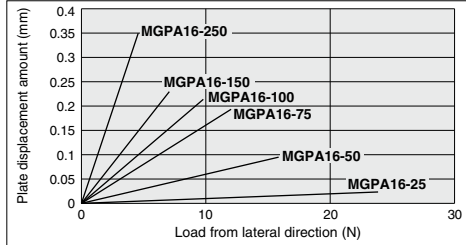
Non-rotating accuracy θ when retracted and when no load is applied should be not more than the values shown in the table.

Bore size (mm)	Non-rotating accuracy θ		
	MGPM	MGPL	MGPA
16	$\pm 0.07^\circ$	$\pm 0.05^\circ$	$\pm 0.01^\circ$
20	$\pm 0.06^\circ$	$\pm 0.04^\circ$	
25			
32	$\pm 0.05^\circ$	$\pm 0.03^\circ$	
40			
50	$\pm 0.04^\circ$	$\pm 0.03^\circ$	
63			
80	$\pm 0.03^\circ$	$\pm 0.03^\circ$	
100			

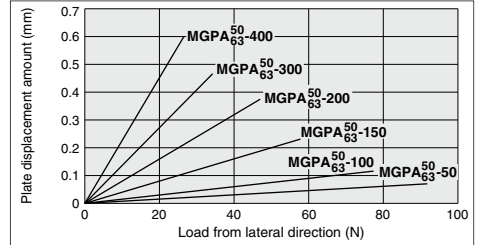
High Precision Ball Bushing/MGPA Plate Displacement Amount (Reference Values)



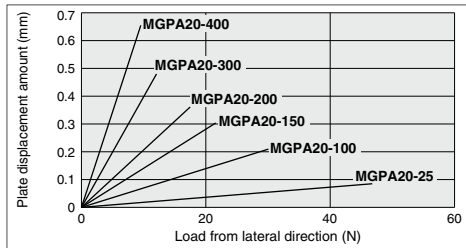
MGPA16



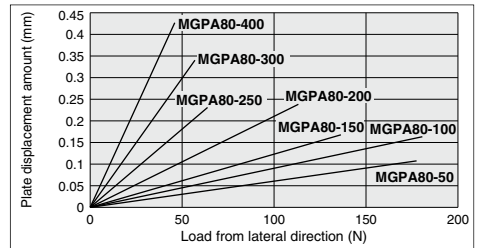
MGPA50, 63



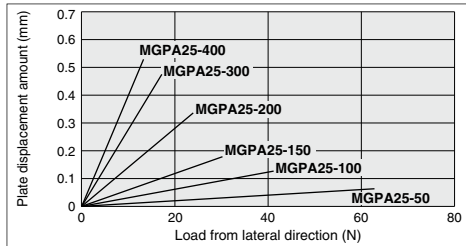
MGPA20



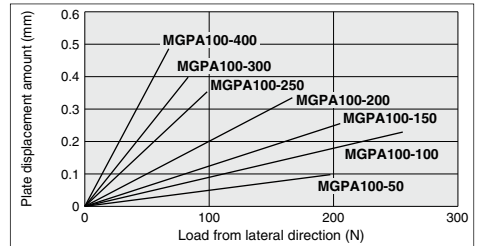
MGPA80



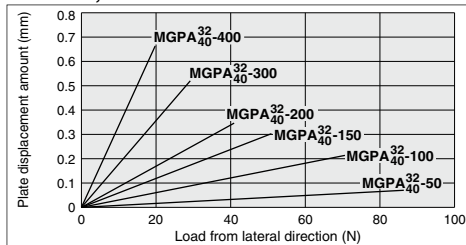
MGPA25



MGPA100



MGPA32, 40



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

Note 2) Allowable rotating torque, and operating range when used as a lifter, are the same as those of the MGPL series.

Air Cylinders

CJ2

CM2

CG1

MB

CA2

CQ2

CQS

Lube-
retainer

JA

MXH

MXQ

MGP

☐ Y

☐ X

CK□1

C(L)K□

C(L)KU

CKQ

CK2ZN

WRF

INDEX

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)	(1), (2)	(3), (4)	(15), (16)	(17), (18)
Graph (Ball bushing)	(5) to (9)	(10) to (14)	(19), (20)	(21), (22)

Selection Example 1 (Vertical Mounting)

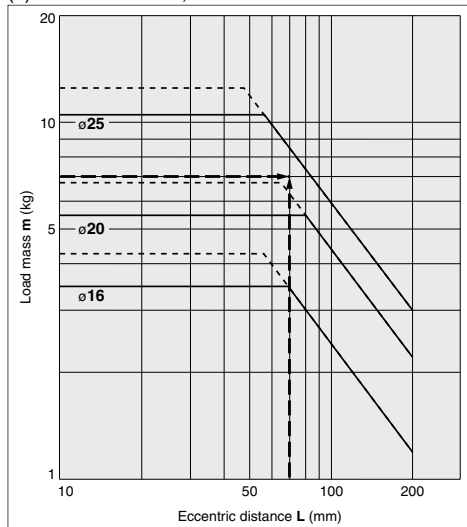
Selection conditions

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.

→ **MGPL25-75AZ** is selected.

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



Selection Example 2 (Horizontal Mounting)

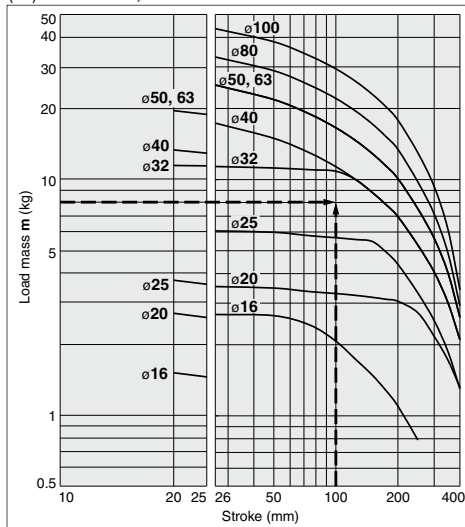
Selection conditions

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.

→ **MGPM32-100AZ** 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

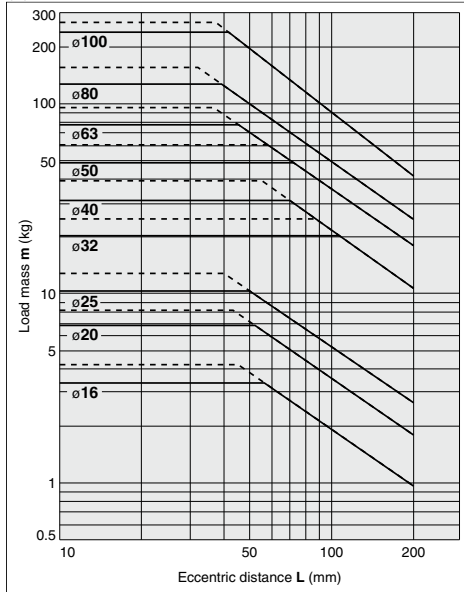
· Use the "Guide Cylinder Selection Software", when the eccentric distance is 200 mm or more.

Vertical Mounting **Slide Bearing**

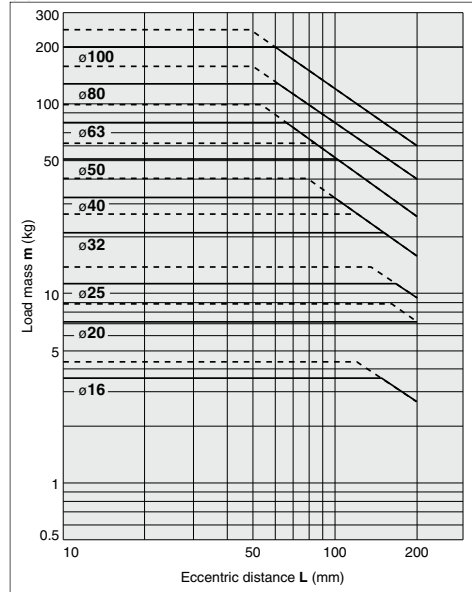
— Operating pressure 0.4 MPa
 - - - - - Operating pressure 0.5 MPa or more

MGPM16 to 100

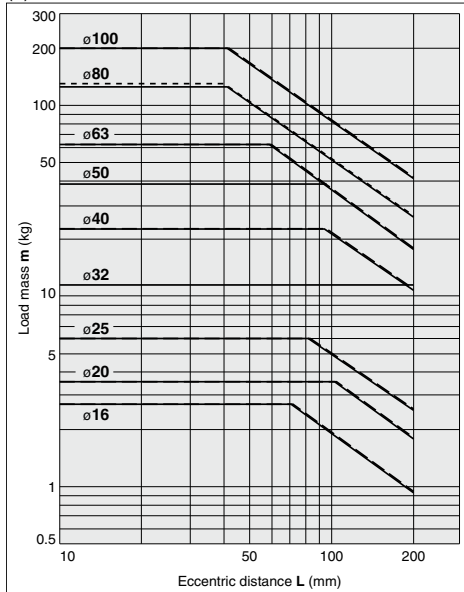
(1) 25 stroke, $V = 200$ mm/s or less



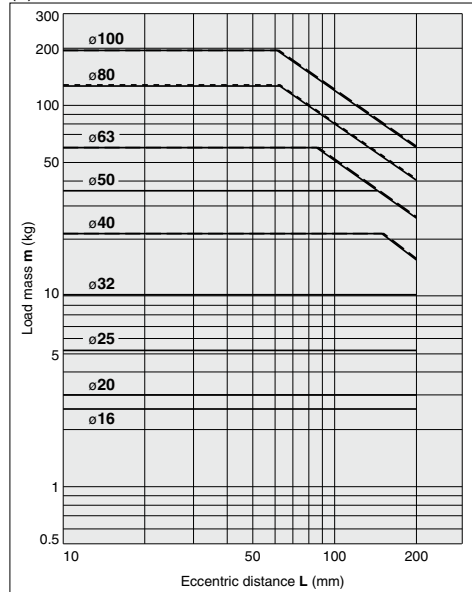
(2) Over 25 stroke, $V = 200$ mm/s or less



(3) 25 stroke, $V = 400$ mm/s



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



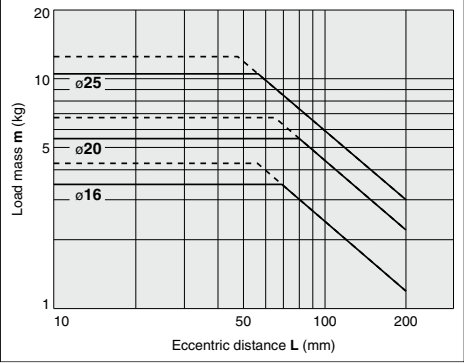
· Use the "Guide Cylinder Selection Software", when the eccentric distance is 200 mm or more.

Vertical Mounting **Ball Bushing**

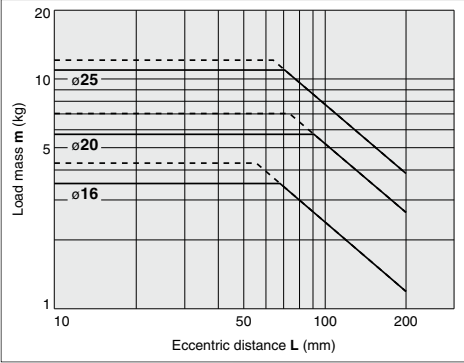
—— Operating pressure 0.4 MPa
----- Operating pressure 0.5 MPa or more

MGPL16 to 25

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

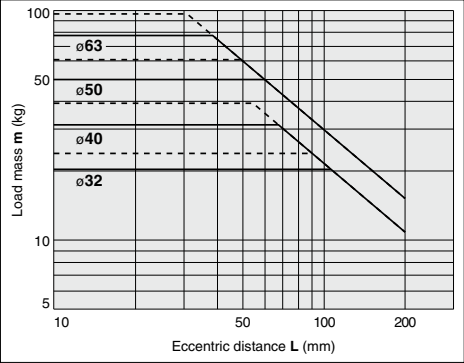


(6) Over 75 stroke, $V = 200$ mm/s or less

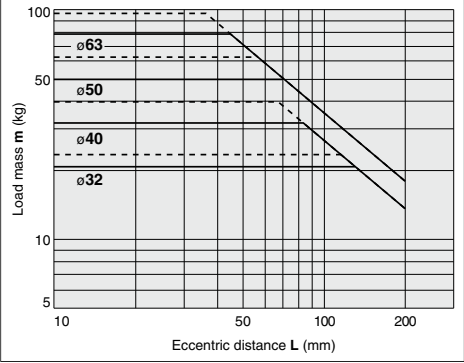


MGPL32 to 63

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

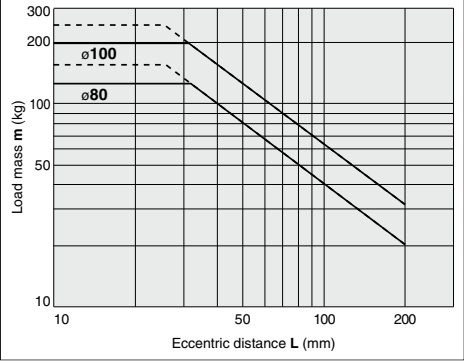


(8) Over 25 stroke, $V = 200$ mm/s or less



MGPL80/100

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



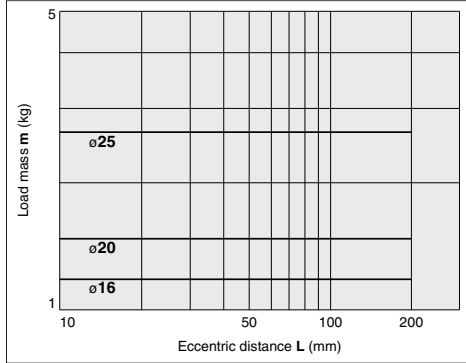
· Use the "Guide Cylinder Selection Software", when the eccentric distance is 200 mm or more.

Vertical Mounting **Ball Bushing**

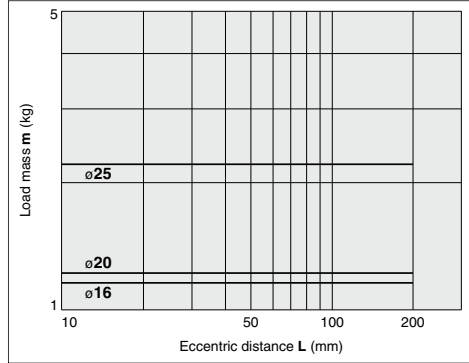
— Operating pressure 0.4 MPa

MGPL16 to 25

(10) 75 stroke or less, $V = 400$ mm/s

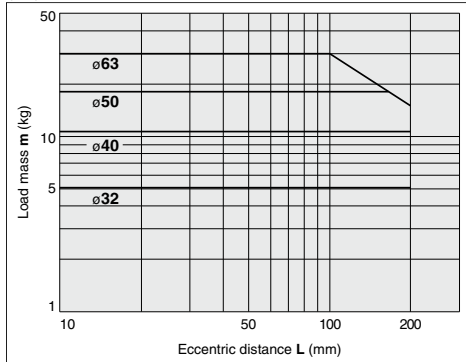


(11) Over 75 stroke, $V = 400$ mm/s

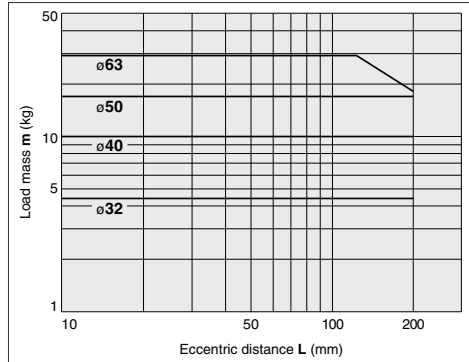


MGPL32 to 63

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

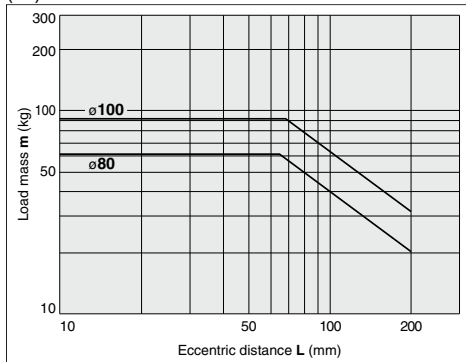


(13) Over 25 stroke, $V = 400$ mm/s



MGPL80/100

(14) $V = 400$ mm/s

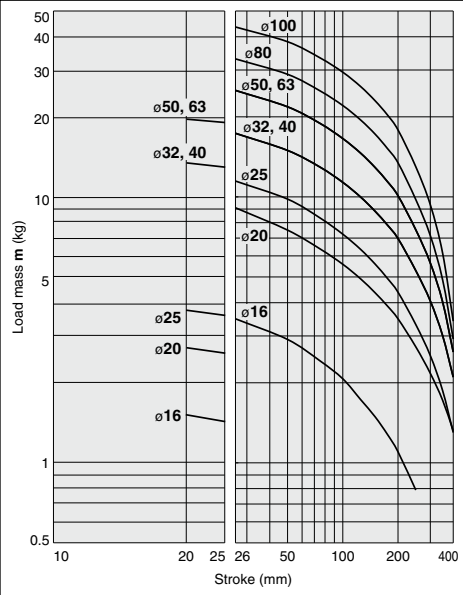


· Use the "Guide Cylinder Selection Software", when the eccentric distance is 200 mm or more.

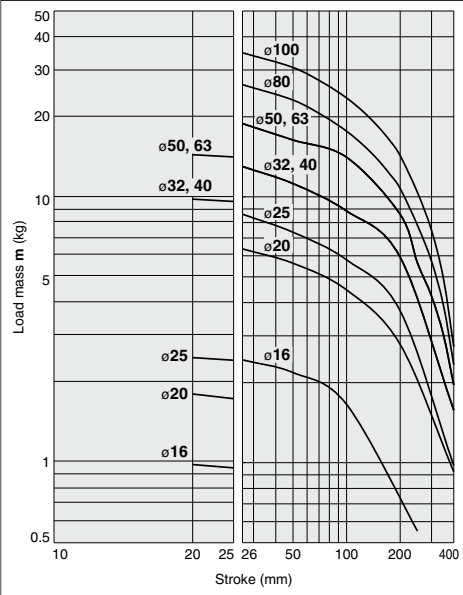
Horizontal Mounting **Slide Bearing**

MGPM16 to 100

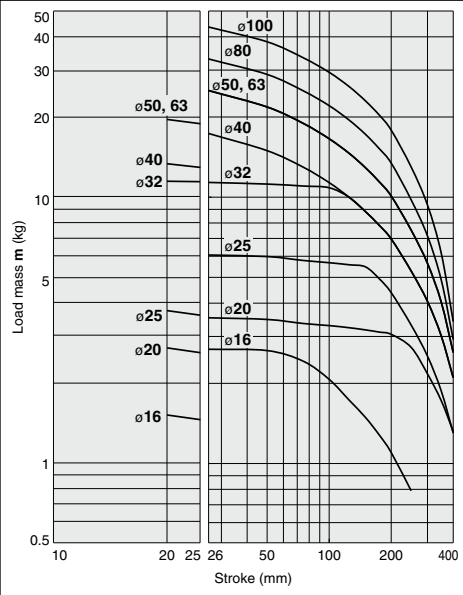
(15) L = 50 mm, V = 200 mm/s or less



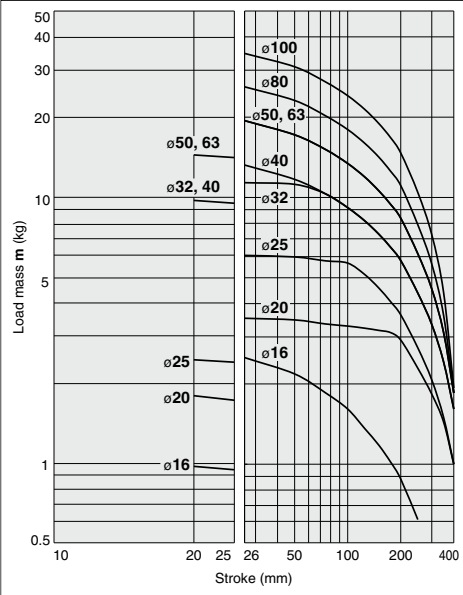
(16) L = 100 mm, V = 200 mm/s or less



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

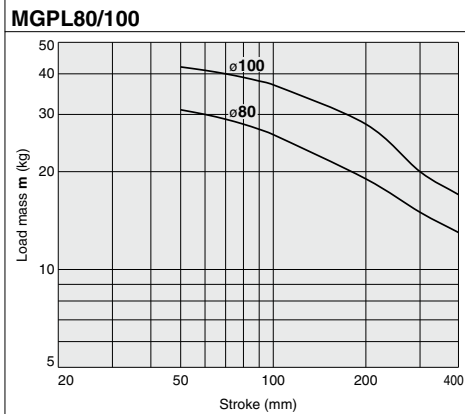
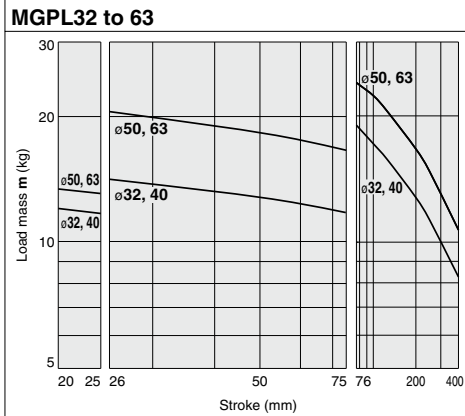
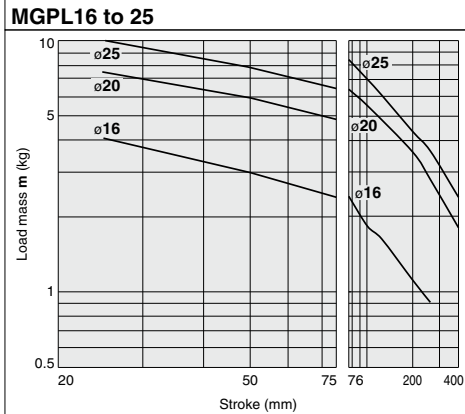


(18) L = 100 mm, V = 400 mm/s

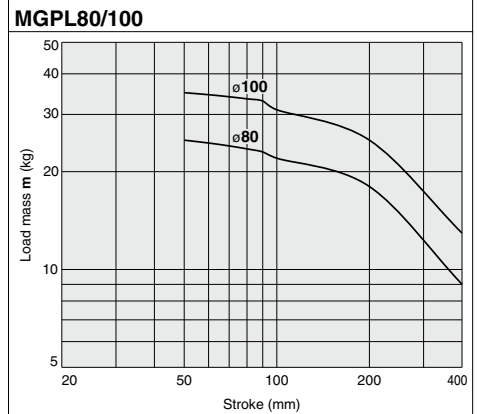
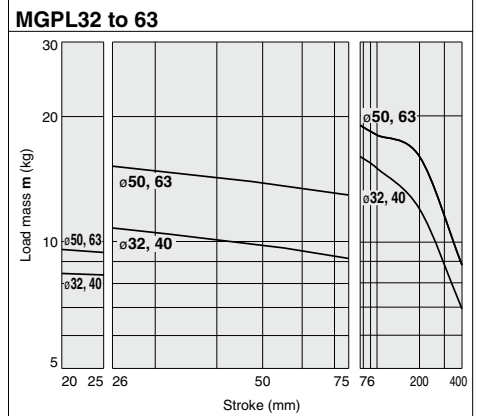
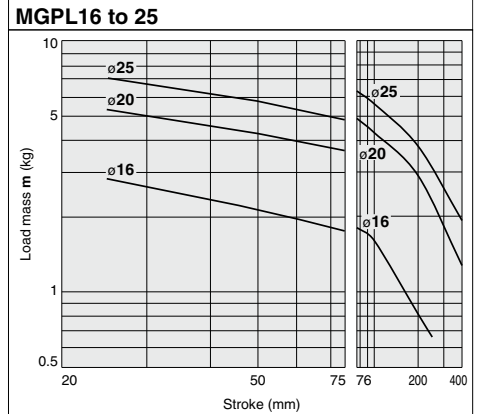


Horizontal Mounting **Ball Bushing**

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



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



Air Cylinders

CJ2

CM2

CG1

MB

CA2

CQ2

CQS

Lube-
retainer

JA

MXH

MXQ

MGP

☐ Y

☐ X

CK ☐ 1

C(L)K ☐

C(L)KU

CKQ

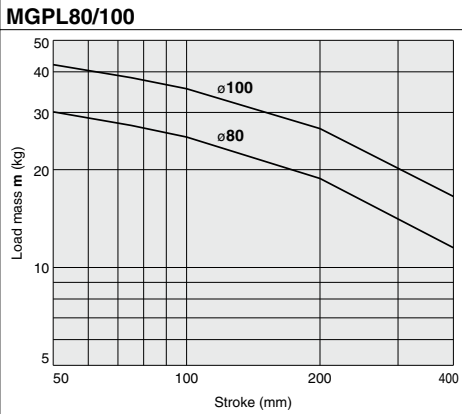
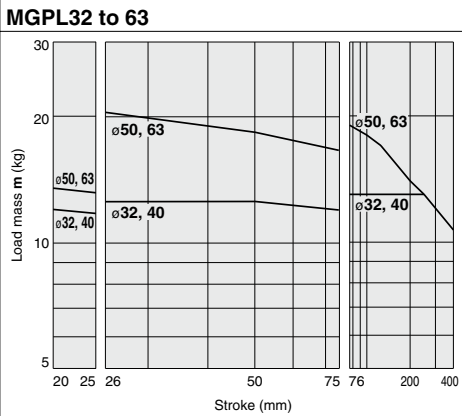
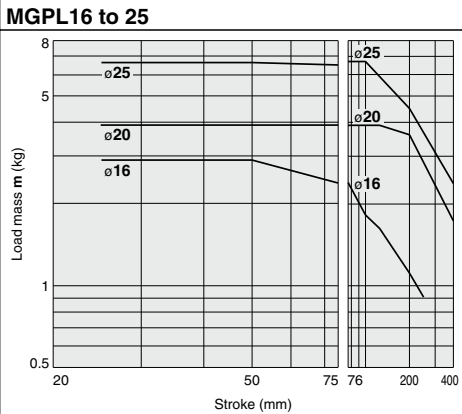
CKZ2N

WRF

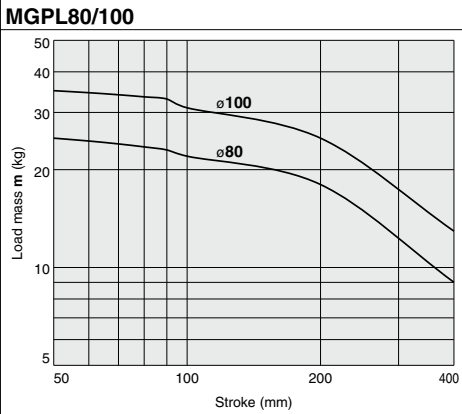
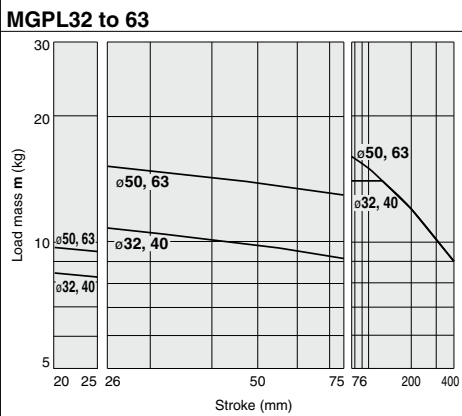
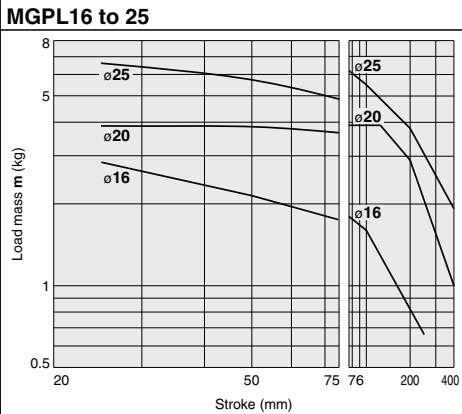
INDEX

Horizontal Mounting **Ball Bushing**

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

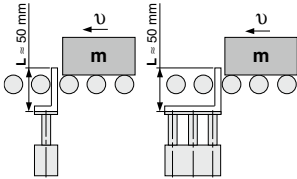


(22) L = 100 mm, V = 400 mm/s



Operating Range when Used as Stopper

Bore Size $\phi 16$ to $\phi 25$ /MGPM16 to 25 (Slide Bearing)



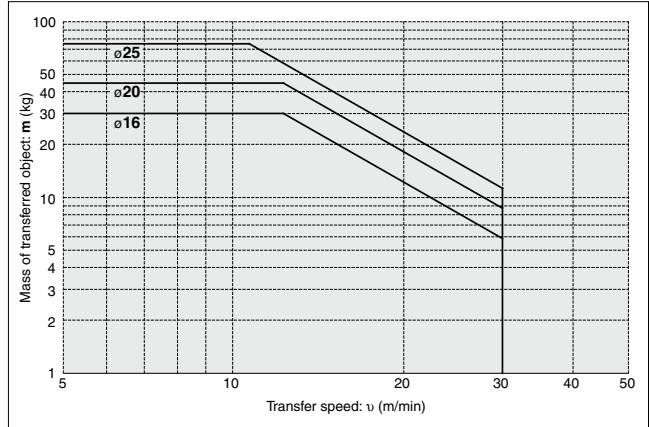
* When selecting a model with a longer **L** dimension, be sure to choose a bore size which is sufficiently large.

⚠ Caution

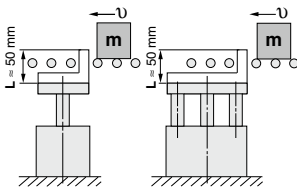
Caution on handling

- Note 1) When using as a stopper, select a model with 25 stroke or less.
 Note 2) The MGPL (Ball bushing) and the MGPA (High precision ball bushing) cannot be used as a stopper.

MGPM16 to 25 (Slide Bearing)



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



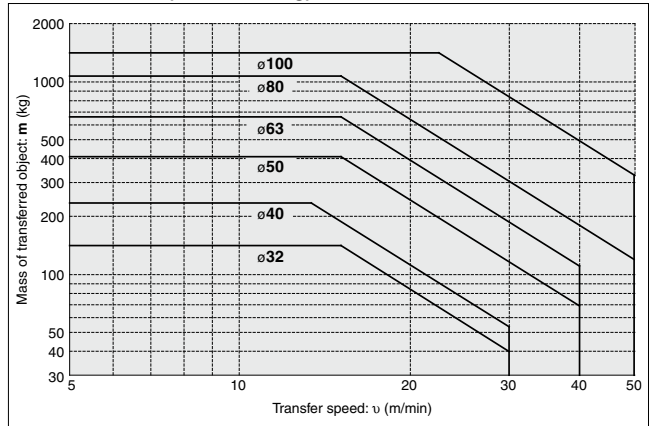
* When selecting a model with a longer **L** dimension, be sure to choose a bore size which is sufficiently large.

⚠ Caution

Caution on handling

- Note 1) When using as a stopper, select a model with 50 stroke or less.
 Note 2) The MGPL (Ball bushing) and the MGPA (High precision ball bushing) cannot be used as a stopper.

MGPM32 to 100 (Slide Bearing)



* Refer to graphs (15) and (17) if line pressure is applied by a roller conveyor after the workpiece is stopped.

Air Cylinders

CJ2

CM2

CG1

MB

CA2

CQ2
CQS

Lube-
retainer

JA

MXH

MXQ

MGP

C□Y
C□X

CK□1

C(L)□

C(L)KU

CKQ

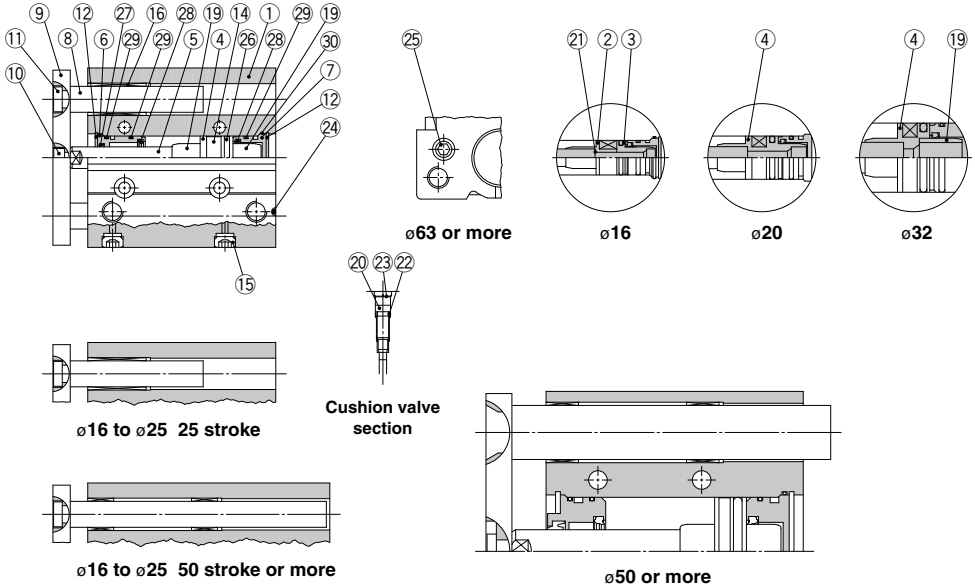
CKZ2N

WRF

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Construction (With Air Cushion)/Series MGPM

MGPM



Component Parts

No.	Description	Material	Note	
1	Body	Aluminum alloy	Hard anodized	
2	Piston A	Aluminum alloy	ø16	Chromated
3	Piston B	Aluminum alloy	ø16	Chromated
4	Piston	Aluminum alloy	ø20 to ø100	Chromated
5	Piston rod	Stainless steel	ø16 to ø25	
		Carbon steel	ø32 to ø100	Hard chrome plating
6	Collar	Aluminum alloy	Chromated	
7	Head cover	Aluminum alloy	Chromated	
8	Guide rod	Carbon steel	Hard chrome plating	
9	Plate	Carbon steel	Nickel plating	
10	Plate mounting bolt	Carbon steel	Nickel plating	
11	Guide bolt	Carbon steel	Nickel plating	
12	Retaining ring	Carbon tool steel	Phosphate coated	
13	Retaining ring	Carbon tool steel	Phosphate coated	
14	Magnet	—		
15	Plug	Carbon steel	ø16	Nickel plating
	Hexagon socket head plug		ø20 to ø100	
16	Slide bearing	Bearing alloy		
17	Ball bushing	—		
18	Spacer	Aluminum alloy		
19	Cushion ring	Aluminum alloy	ø25 to ø100	Anodized
20	Cushion valve		ø16 to ø32	Electroless nickel plating
			ø50 to ø100	Chromated
	Cushion needle		ø40 only	Electroless nickel plating

Component Parts

No.	Description	Material	Note	
21	Gasket	NBR	ø16	
22	Gasket	NBR		
23	Retaining ring	Carbon tool steel	ø50, ø63	Phosphate coated
24	Steel ball	Carbon steel	ø16 to ø50	
25	Plug	Carbon steel	ø63 to ø100	Nickel plating
26*	Piston seal	NBR		
27*	Rod seal	NBR		
28*	Cushion seal	Urethane		
29*	Gasket A	NBR		
30*	Gasket B	NBR		

Replacement Parts/Seal Kit

Bore size (mm)	Kit no.	Contents	Bore size (mm)	Kit no.	Contents
16	MGP16-AZ-PS	Set of nos. above 26, 27, 28, 29, 30	50	MGP50-AZ-PS	Set of nos. above 26, 27, 28, 29, 30
20	MGP20-AZ-PS		63	MGP63-AZ-PS	
25	MGP25-AZ-PS		80	MGP80-AZ-PS	
32	MGP32-AZ-PS		100	MGP100-AZ-PS	
40	MGP40-AZ-PS				

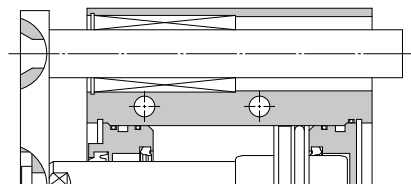
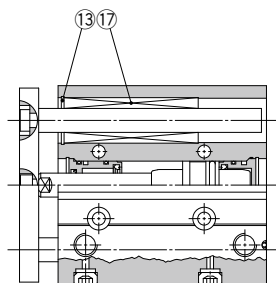
* Seal kit includes 26 to 30. Order the seal kit, based on each bore size.

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

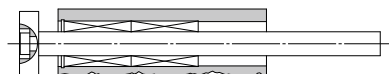
Grease pack part no.: GR-S-010 (10 g)

Construction (With Air Cushion)/Series MGPL

MGPL



ø50 or more



ø16 75 stroke or less



ø20 to ø63 75 stroke or less



ø16 to ø63 100 stroke or more
ø80, ø100 250 stroke or more

Air Cylinders

CJ2

CM2

CG1

MB

CA2

CQ2
CQS

Lube-
retainer

JA

MXH

MXQ

MGP

☐Y

☐X

CK☐1

C(L)K☐

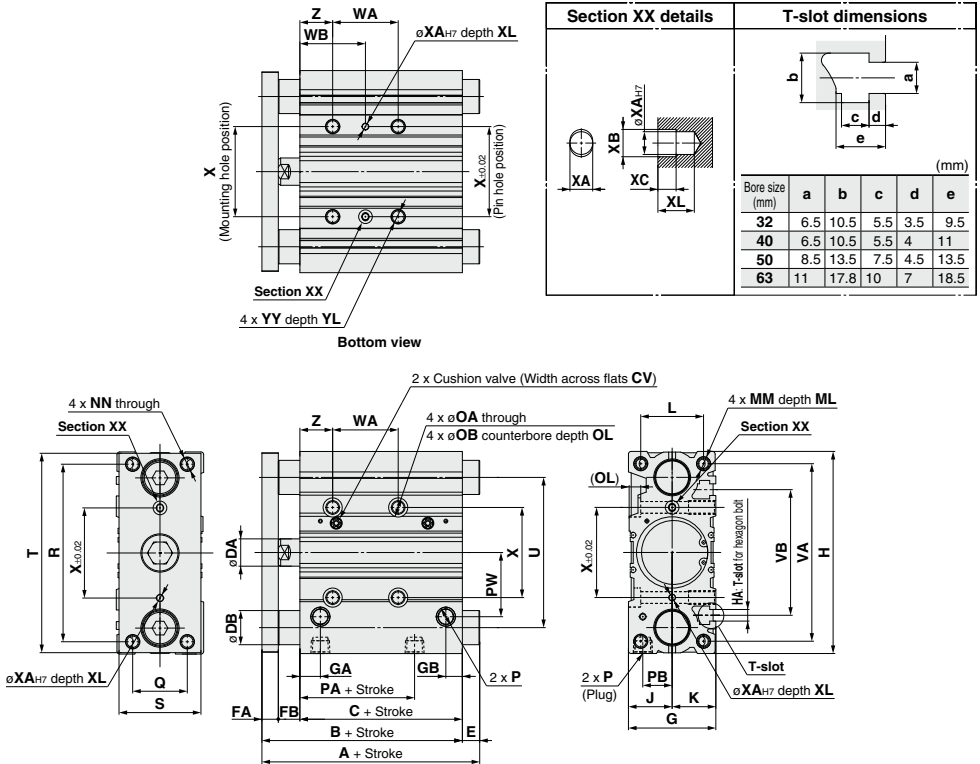
C(L)KU

CKQ

CKZ2N

WRF

ø32 to ø63/MGPM, MGPL, MGPA (With Air Cushion)



- * The use of a slot (width XA, length XB, depth XC) allows for a relaxed pin pitch tolerance, with the pin hole (øXA_{H7}, depth XL) as the reference, without affecting mounting accuracy.
- * For intermediate strokes other than standard strokes, refer to "Manufacture of Intermediate Strokes" on page 1030.
- * Choice of Rc, NPT, G port is available. (Refer to page 1029.)

MGPM, MGPL Common Dimensions

MGPM, MGPL Common Dimensions																					(mm)			
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	TN	TF
32	25, 50, 75, 100	84.5	62.5	1.5	14	10	12	48	12	9	112	M6	24	24	34	M8 x 1.25	20	M8 x 1.25	6.7	11	7.5	Rc1/8	NPT1/8	G1/8
40	125, 150, 175	91	69	1.5	14	10	12	54	15	12	120	M6	27	27	40	M8 x 1.25	20	M8 x 1.25	6.7	11	7.5	Rc1/8	NPT1/8	G1/8
50	200, 250, 300	97	69	3	20	12	16	64	15	12	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	350, 400	102	74	3	20	12	16	78	15.5	13.5	162	M10	39	39	58	M10 x 1.5	22	M10 x 1.5	8.6	—	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	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	31.5	16	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	38	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

MGPL (Ball bushing)

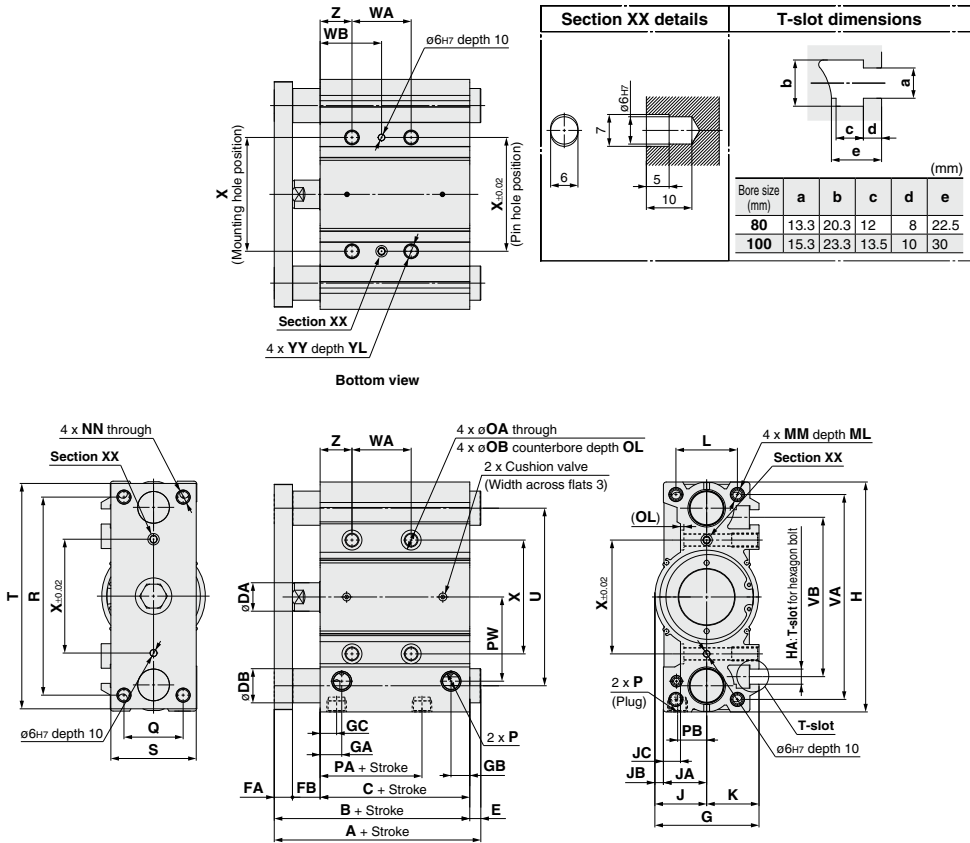
MGPM (Slide bearing)/A, DB, E Dimensions (mm)

Bore size (mm)	A				DB	E			
	25 st	50 to 200 st	250 st or more			25 st	50 to 200 st	250 st or more	
32	84.5	93.5	129.5	20	0	9	45		
40	91	93.5	129.5	20	0	2.5	38.5		
50	97	109.5	150.5	25	0	12.5	53.5		
63	102	109.5	150.5	25	0	7.5	48.5		

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

Bore size (mm)	A				DB	E			
	25 st	50, 75 st	100 to 200 st	250 st or more		25 st	50, 75 st	100 to 200 st	250 st or more
32	84.5	96.5	116.5	138.5	16	0	12	32	54
40	91	96.5	116.5	138.5	16	0	5.5	25.5	47.5
50	97	112.5	132.5	159.5	20	0	15.5	35.5	62.5
63	102	112.5	132.5	159.5	20	0	10.5	30.5	57.5

ø80, ø100/MGPM, MGPL, MGPA (With Air Cushion)



* The use of a slot (width X6, length 7, depth 5) allows for a relaxed pin pitch tolerance, with the pin hole (ø6H7, depth 10) as the reference, without affecting mounting accuracy.
* For intermediate strokes other than standard strokes, refer to "Manufacture of Intermediate Strokes" on page 1030.
* Choice of Rc, NPT, G port is available. (Refer to page 1029.)

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	JC	K	L	MM	ML	NN	OA	OB	OL	P		
																									Nil	TN	TF
80	50, 75, 100, 125, 150, 175	121.5	81.5	25	16	24	91.5	19	16.5	14.5	202	M12	45.5	38	7.5	15	46	54	M12 x 1.75	25	M12 x 1.75	10.6	17.5	3	Rc3/8	NPT3/8	G3/8
100	200, 250, 300, 350, 400	141	91	30	19	31	111.5	22.5	20.5	18	240	M14	55.5	45	10.5	10	56	62	M14 x 2.0	31	M14 x 2.0	12.5	20	8	Rc3/8	NPT3/8	G3/8

Bore size (mm)	WA										WB				X	YY	YL	Z				
	PA	PB	PW	Q	R	S	T	U	VA	VB	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 (mm)												MGPA (High precision ball bushing)/A, DB, E Dimensions (mm)											
Bore size (mm)	A		DB	E		Bore size (mm)	A		DB	E		Bore size (mm)	A		DB	E		Bore size (mm)	A		DB	E	
	50 to 200 st	250 st or more		50 to 200 st	250 st or more		50 to 200 st	250 st or more		50 to 200 st	250 st or more		50 to 200 st	250 st or more		50 to 200 st	250 st or more		50 to 200 st	250 st or more		50 to 200 st	250 st or more
80	131.5	180.5	30	10	59	80	158.5	191.5	25	37	70	80	158.5	191.5	25	37	70	100	178.5	201.5	30	37.5	60.5
100	151.5	190.5	36	10.5	49.5	100	178.5	201.5	30	37.5	60.5	100	178.5	201.5	30	37.5	60.5	100	178.5	201.5	30	37.5	60.5

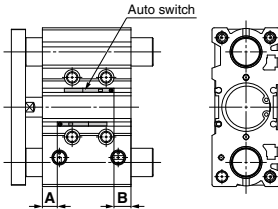
Auto Switch Mounting

Auto Switch Proper Mounting Position (Detection at stroke end) and Its Mounting Height

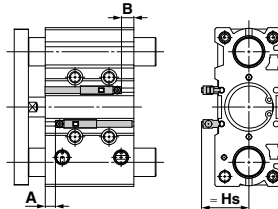
D-M9□/M9□V
D-M9□W/M9□WV
D-M9□A/M9□AV
D-A9□/A9□V

D-P3DWA

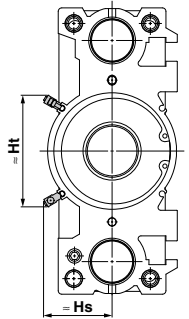
ø12 to ø100



ø25 to ø63



ø80, ø100



Auto Switch Proper Mounting Position

Applicable Cylinder Series: MGP

(mm)

Auto switch model	D-M9□ D-M9□V D-M9□W D-M9□WV D-M9□A D-M9□AV		D-A9□ D-A9□V		D-P3DWA	
	A	B	A	B	A	B
Bore size 12	7.5	9.5	3.5	5.5	—	—
16	10.5	10.5	6.5	6.5	—	—
20	12.5	12.5	8.5	8.5	—	—
25	11.5	14	7.5	10	7	9.5
32	12.5	13	8.5	9	8	8.5
40	15.5	16.5	11.5	12.5	11	12
50	14.5	17	10.5	13	10	12.5
63	16.5	20	12.5	16	12	15.5
80	18	26	14	22	13.5	21.5
100	21.5	32.5	17.5	28.5	17	28

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

Auto Switch Proper Mounting Height

(mm)

Auto switch model	D-M9□V D-M9□WV D-M9□AV		D-A9□V		D-P3DWA	
	Hs	Ht	Hs	Ht	Hs	Ht
Bore size 12	19.5	—	17	—	—	—
16	22	—	19.5	—	—	—
20	24.5	—	22	—	—	—
25	26	—	24	—	32.5	—
32	29	—	26.5	—	35	—
40	33	—	30.5	—	39	—
50	38.5	—	36	—	44.5	—
63	45.5	—	43	—	59.5	—
80	45	74	43	71.5	48.5	84
100	55	85.5	53	83	58.5	95

Auto Switch Proper Mounting Position

Applicable Cylinder Series: MGP-A (With air cushion) (mm)

Auto switch model	D-M9□ D-M9□V D-M9□W D-M9□WV D-M9□A D-M9□AV		D-A9□ D-A9□V		D-P3DWA	
	A	B	A	B	A	B
Bore size 16	25	20.5	21	16.5	—	—
20	27	23	23	19	—	—
25	27	23	23	19	22.5	18.5
32	21	29	17	25	16.5	24.5
40	25.5	31.5	21.5	27.5	21	27
50	26	30.5	22	26.5	21.5	26
63	30	31.5	26	27.5	25.5	27
80	30.5	38.5	26.5	34.5	26	34
100	34.5	44	30.5	40	30	39.5

Air Cylinders

CJ2

CM2

CG1

MB

CA2

CQ2

CQS

Lube-retainer

JA

MXH

MXQ

MGP

C□Y

C□X

CK□1

C(L)□

C(L)□U

CKQ

CK2ZN

WRF

INDEX

Minimum Stroke for Auto Switch Mounting

(mm)											
Auto switch model	Number of auto switches	ø12	ø16	ø20	ø25	ø32	ø40	ø50	ø63	ø80	ø100
D-M9□V	1 pc.	5									
	2 pcs.	5									
D-M9□	1 pc.	5 Note 1)					5				
	2 pcs.	10 Note 1)	10								
D-M9□W	1 pc.	5 Note 2)									
	2 pcs.	10 Note 2)	10								
D-M9□WV	1 pc.	5 Note 2)									
D-M9□AV	2 pcs.	10									
D-M9□A	1 pc.	5 Note 2)									
	2 pcs.	10 Note 2)									
D-A9□	1 pc.	5 Note 1)			5						
	2 pcs.	10 Note 1)			10						
D-A9□V	1 pc.	5									
	2 pcs.	10									
D-P3DWA	1 pc.	—				15					
	2 pcs.	—				15					

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, also consider Note 1) shown above.
Note 3) The D-P3DWA is mountable on bore size ø25 to ø100.

Operating Range

(mm)										
Auto switch model	Bore size									
	12	16	20	25	32	40	50	63	80	100
D-M9□/M9□V D-M9□W/M9□WV D-M9□A/M9□AV	3.5	5	5	5	6	6	6	6.5	6	7
D-A9□/A9□V	7	9	9	9	9.5	9.5	9.5	11	10.5	10.5
D-P3DWA	—	—	—	5	6	6	6	6	6	7

* Values which include hysteresis are for guideline purposes only, they are not a guarantee (assuming approximately ±30% dispersion) and may change substantially depending on the ambient environment.

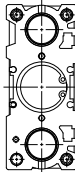
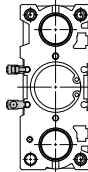
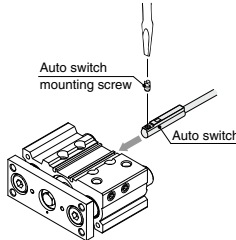
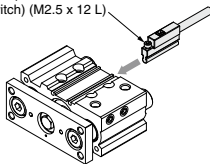
Other than the applicable auto switches listed in “How to Order”, the following auto switches are mountable.
Refer to the WEB catalog or the Best Pneumatics No. 3 for the detailed specifications.

Type	Model	Electrical entry	Features
Solid state	D-P4DW	Grommet (In-line)	Magnetic field resistant (2-color display) Bore size: ø32 to ø100

* With pre-wired connector is also available for solid state auto switches.
For details, refer to the WEB catalog or the Best Pneumatics No. 3.
* Normally closed (NC = b contact) solid state auto switches (D-F9G/F9H) are also available.
For details, refer to the WEB catalog or the Best Pneumatics No. 3.
* When installing the D-P4DW, use the BMG7-032 auto switch mounting bracket.

Auto Switch Mounting Brackets/Part No.

Applicable Cylinder Series: MGPM, MGPL, MGPA, MGPM-A, MGPL-A, MGPA-A

Applicable auto switches	D-M9□/M9□V D-M9□W/M9□WV D-M9□A/M9□AV D-A9□/A9□V	D-P3DWA						
Bore size (mm)	ø12 to ø100	ø25 to ø100						
Auto switch mounting surfaces	Surfaces with auto switch mounting slot	Surfaces with auto switch mounting slot						
								
Mounting of auto switch	 When tightening the auto switch mounting screw, use a watchmakers' screwdriver with a handle 5 to 6 mm in diameter. Tightening Torque for Auto Switch Mounting Screw (N·m) <table><tr><th>Auto switch model</th><th>Tightening torque</th></tr><tr><td>D-M9□(V) D-M9□W(V) D-M9□A(V)</td><td>0.05 to 0.15</td></tr><tr><td>D-A9□(V)</td><td>0.10 to 0.20</td></tr></table>	Auto switch model	Tightening torque	D-M9□(V) D-M9□W(V) D-M9□A(V)	0.05 to 0.15	D-A9□(V)	0.10 to 0.20	- Insert the mounting bracket into the mating groove of the cylinder tube. - Check the detecting position of the auto switch and fix the auto switch firmly with the hexagon socket head cap screw (M2.5 x 12 L).* - If the detecting position is changed, go back to step ①. Note 1) Ensure that the auto switch is covered with the mating groove to protect the auto switch. Note 2) The tightening torque for the hexagon socket head cap screw (M2.5 x 12 L) is 0.2 to 0.3 N·m.  Hexagon socket head cap screw (Included with auto switch) (M2.5 x 12 L)
Auto switch model	Tightening torque							
D-M9□(V) D-M9□W(V) D-M9□A(V)	0.05 to 0.15							
D-A9□(V)	0.10 to 0.20							

Note) Auto switch mounting brackets and auto switches are enclosed with the cylinder for shipment.
For an environment that needs the water-resistant auto switch, select the D-M9□A(V) type.

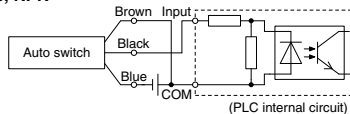
Air Cylinders
CJ2
CM2
CG1
MB
CA2
CQ2
CQS
Lube-retainer
JA
MXH
MXQ
MGP
C□Y C□X
CK□1
C(L)□
C(L)KU
CKQ
CKZ2N
WRF

Prior to Use

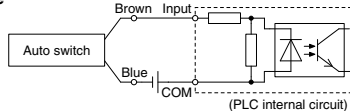
Auto Switch Connection and Example

Sink Input Specifications

3-wire, NPN



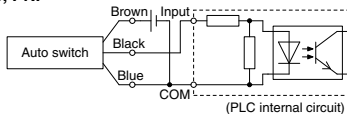
2-wire



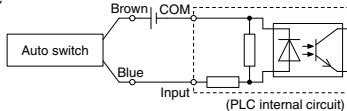
Connect according to the applicable PLC input specifications, as the connection method will vary depending on the PLC input specifications.

Source Input Specifications

3-wire, PNP



2-wire

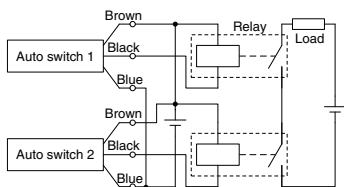


Example of AND (Series) and OR (Parallel) Connection

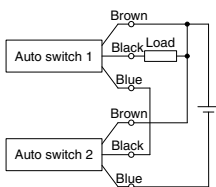
* When using solid state auto switches, ensure the application is set up so the signals for the first 50 ms are invalid.

3-wire AND connection for NPN output

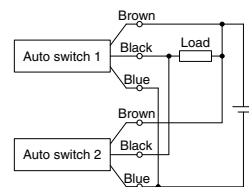
(Using relays)



(Performed with auto switches only)

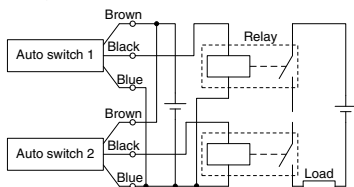


3-wire OR connection for NPN output

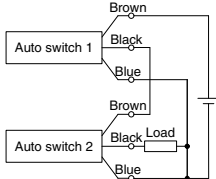


3-wire AND connection for PNP output

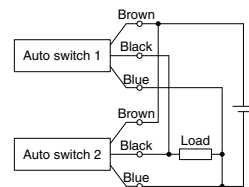
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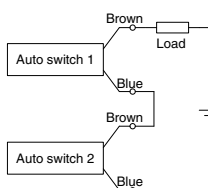
(Performed with auto switches only)



3-wire OR connection for PNP output



2-wire AND connection

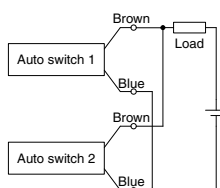


When two auto switches are connected in series, a load may malfunction because the load voltage will decline when in the ON state. The indicator lights will light up when both of the auto switches are in the ON state. Auto switches with load voltage less than 20 V cannot be used.

$$\begin{aligned} \text{Load voltage at ON} &= \text{Power supply voltage} - \\ &\quad \text{Residual voltage} \times 2 \text{ pcs.} \\ &= 24 \text{ V} - 4 \text{ V} \times 2 \text{ pcs.} \\ &= 16 \text{ V} \end{aligned}$$

Example: Power supply is 24 VDC
Internal voltage drop in auto switch is 4 V.

2-wire OR connection



(Solid state)
When two auto switches are connected in parallel, malfunction may occur because the load voltage will increase when in the OFF state.

(Reed)
Because there is no current leakage, the load voltage will not increase when turned OFF. However, depending on the number of auto switches in the ON state, the indicator lights may sometimes grow dim or not light up, due to the dispersion and reduction of the current flowing to the auto switches.

$$\begin{aligned} \text{Load voltage at OFF} &= \text{Leakage current} \times 2 \text{ pcs.} \times \\ &\quad \text{Load impedance} \\ &= 1 \text{ mA} \times 2 \text{ pcs.} \times 3 \text{ k}\Omega \\ &= 6 \text{ V} \end{aligned}$$

Example: Load impedance is 3 k Ω .
Leakage current from auto switch is 1 mA.

Simple Specials/Made to Order

Please contact SMC for detailed specifications, delivery and prices.



Simple Specials

The following special specifications can be ordered as a simplified Made-to-Order. There is a specification sheet available on paper and CD-ROM. Please contact your SMC sales representatives if necessary.

Symbol	Specifications	Basic type			With air cushion			Page
		Slide bearing	Ball bushing	High precision ball bushing	Slide bearing	Ball bushing	High precision ball bushing	
		MGPM	MGPL	MGPA	MGPM	MGPL	MGPA	
-XA□	Change of guide rod end shape	●	●	●				Page 1051
-XC79	Tapped hole, drilled hole, pinned hole machined additionally	●	●	●	●	●	●	Page 1052

Made to Order

Symbol	Specifications	Basic type			With air cushion			Page
		Slide bearing	Ball bushing	High precision ball bushing	Slide bearing	Ball bushing	High precision ball bushing	
		MGPM	MGPL	MGPA	MGPM	MGPL	MGPA	
-XB6	Heat resistant cylinder (−10 to 150°C)	●						Page 1053
-XB10	Intermediate stroke (Using exclusive body)	●	●	●				Page 1053
-XB13	Low speed cylinder (5 to 50 mm/s)	●	●					Page 1054
-XC4	With heavy duty scraper	●	●	●				Page 1055
-XC6	Made of stainless steel	●	●					Page 1056
-XC8	Adjustable stroke cylinder/Adjustable extension type	●	●	●				Page 1056
-XC9	Adjustable stroke cylinder/Adjustable retraction type	●	●	●				Page 1057
-XC19	Intermediate stroke (Spacer type)				●	●	●	Page 1058
-XC22	Fluororubber seal	●						Page 1058
-XC35	With coil scraper	●	●	●				Page 1059
-XC82	Bottom mounting type	●						Page 1060
-XC85	Grease for food processing equipment	●	●	●	●	●	●	Page 1060
-XC98	Guide unit with Lube-retainer	●						Page 1061
-X144	Symmetrical port position	●	●	●				Page 1062
-X867	Side porting type (Plug location changed)	●	●	●	●	●	●	Page 1062

Air Cylinders

CJ2

CM2

CG1

MB

CA2

CQ2

CQS

Lube-retainer

JA

MXH

MXQ

MGP

C□Y

C□X

CK□1

C(L)K□

C(L)KU

CKQ

CK2ZN

WRF

Series MGP

Simple Specials

These changes are dealt with Simple Specials System.

For details, refer to the **WEB catalog** or the Best Pneumatics No. 3.



Symbol

1 Change of Guide Rod End Shape

-XA1/6/17/21

Applicable Series

Series	Model	Action	Symbol for change of rod end shape
MGP-Z	Standard type	MGPM Double acting	XA1, 6, 17, 21
		MGPL Double acting	XA1, 6
		MGPA Double acting	XA1, 6

Precautions

- Ensure that the cylinder's overall length should not exceed the allowable overall length. In the case of exceeding the allowable overall length, it will be available as specials.
- In Fig. (1), (2) below, E' dimension cannot make it into E dimension or less of the standard products. Confirm by referring to catalog.
- SMC will make appropriate arrangements if no dimension, tolerance, or finish instructions are given in the diagram.
- * dimension should be the guide rod diameter (D) – 2 mm. In the case that the preferred dimension is different, fill in that dimension.

		(mm)	
		Bore size	Allowable overall length of cylinder
 Overall length of cylinder	 Overall length of cylinder	12,16	345
	20 to 32	540	
	40 to 63	561	
	80,100	603	

Fig. (1) XA1, XA6

Fig. (2) XA17, XA21

Fig. (1) XA1, XA6

Fig. (2) XA17, XA21

Guide Rod End Shape Pattern

-XA1 (Standard body dimensions) E	-XA6 (Standard body dimensions) E
-XA17 (Standard body dimensions) E A	-XA21 (Standard body dimensions) E A

Symbol

2 Tapped Hole, Drilled Hole, Pinned Hole Machined Additionally**-XC79**

This simple special is meant for machining additionally tapped hole, drilled hole, and pinned hole, as requested from customer, on parts designed largely for mounting a workpiece etc. in the combined air cylinders.

But, for each model, since they have the portions which are impossible to machine additionally, refer to the additional machining limitation.

Applicable Series

Series	Model	Action	Component parts applicable for additional machining
MGP-Z	Standard type	MGPM Double acting	Plate
		MGPL Double acting	
		MGPA Double acting	
	With air cushion	MGPM Double acting	
		MGPL Double acting	
		MGPA Double acting	

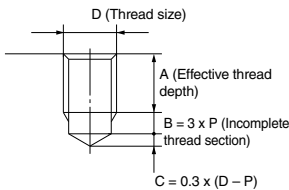
Precautions

- We cannot take any responsibility as for the intensity of holes machined additionally and the effects of decreased intensity for the product itself.
- It will not be plated again for the machined part additionally.
- Be sure to fill in "through" for through-hole, and "effective depth" for blind hole.
- When using by machining through-hole additionally, ensure that the tip of the bolt etc. for mounting workpiece should not stick into the cylinder side. It may result in an unexpected problem.
- Use caution not to interfere the existing mounting hole on the standard products with the hole to be machined additionally. But it is possible to drill additionally the larger size of hole at the same position as the existing hole.

Common Complementary Explanation/Holes which can be additionally machined are the following 3 types.**Tapped hole**

Designated nominal diameter and tapped hole of a pitch are machined additionally. (Maximum nominal thread diameter M20)

Blind hole is deep into the bottom of prepared hole which sums up A to C in the figure below in contrast to the effective depth of tapped hole. When there is a condition which does not allow through-hole etc., leave sufficient thickness in the inner part of hole.



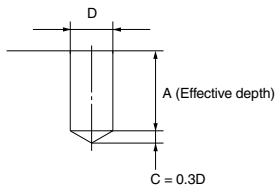
Note) P stands for thread pitch.

Drilled hole

Drilled hole of a designated internal diameter is machined.

(Maximum hole diameter 20 mm)

If you wish for blind hole, instruct us with effective depth. (Refer to the figure below.) Besides, dimensional accuracy for internal diameter will be ± 0.2 mm.

**Pinned hole**

Pinned hole of a designated diameter (reamer hole) is machined. (Maximum hole diameter 20 mm)

Internal dimension tolerates H7 tolerance to the designated hole diameter. (Refer to the table below.)

Hole dia.	3 or less	Over 3 to 6	Over 6 to 10	Over 10 to 18	Over 18 to 20
Tolerance	+0.01 0	+0.012 0	+0.015 0	+0.018 0	+0.021 0

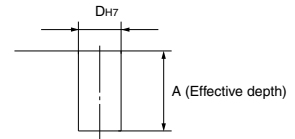
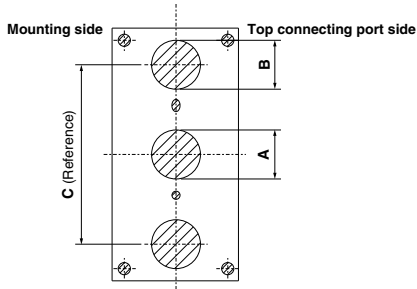
**Limitation for Machining Additionally** Since the slanted lines denote the restricted range for machining additionally, design the dimensions, referring to below.

Plate material: Steel

**Dimensional Range Not Possible to Machine Additionally**

(mm)

Bore size	A	B	C
12	8	11	41
16	10	13	46
20	12	15	54
25	14	21	64
32	25	25	78
40	25	25	86
50	30	30	110
63	30	30	124
80	34	34	156
100	42	42	188

Series MGP

Made to Order

Please contact SMC for detailed dimensions, specifications and lead times.



1 Heat Resistant Cylinder (−10 to 150°C)

Symbol

-XB6

Air cylinder which changed the seal material and grease, so that it could be used even at higher temperature up to 150 from −10°C.

Applicable Series

Series	Model	Action
MGP-Z	Standard type	MGPM Double acting

- Note 1) Operate without lubrication from a pneumatic system lubricator.
 Note 2) Please contact SMC for details on the maintenance intervals for this cylinder, which differ from those of the standard cylinder.
 Note 3) In principle, it is impossible to make built-in magnet type and the one with auto switch. But, as for the one with auto switch, and the heat resistant cylinder with heat resistant auto switch, since it will be differed depending on the series, please contact SMC.
 Note 4) Piston speed is ranged from 50 to 500 mm/s. But, for ø80 and ø100, it will be 50 to 400 mm/s.
 Note 5) No cushion is equipped. Check the kinetic energy.

How to Order

MGPM Standard model no. -XB6
 Heat resistant cylinder

Warning

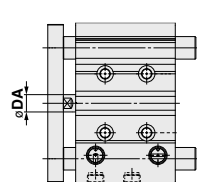
Precautions

Be aware that smoking cigarettes etc. after your hands have come into contact with the grease used in this cylinder can create a gas that is hazardous to humans.

Specifications

Ambient temperature range	−10°C to 150°C
Seal material	Fluororubber
Grease	Heat resistant grease
Specifications other than above	Same as standard type

Dimensions



(mm)	
Bore size (mm)	DA
12	(6)
16	(8)
20	(10)
25	(10)
32	(14)
40	(14)
50	20
63	20
80	25
100	30

The dimensions in () are the same as standard type.

2 Intermediate Stroke (Using exclusive body)

Symbol

-XB10

Cylinder which can reduce the mounting space by using an exclusive body which does not use a spacer to achieve that the full length dimension could be shortened when an intermediate stroke other than the standard stroke is required.

Applicable Series

Series	Model	Action
MGP-Z	Standard type	MGPM Double acting
		MGPL Double acting
		MGPA Double acting

How to Order

MGP^M_L^A Standard model no. -XB10
 Intermediate stroke

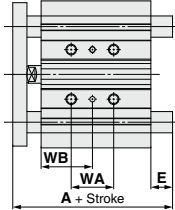
Specifications: Same as standard type

Symbol

2 Intermediate Stroke (Using exclusive body)

-XB10

Dimensions



Stroke Range

Bore size (mm)	Stroke range (mm)
12, 16	11 to 249
20, 25	21 to 399
32, 40, 50, 63, 80, 100	26 to 399

* Specifications except the stroke range are the same as standard.
Note) Applicable stroke available by the 1 mm interval.

MGPM, MGPL, MGPA/WA, WB Dimensions

Bore size (mm)	Stroke range (mm)	WA				WB			
		11 to 39 st	41 to 99 st	101 to 199 st	201 to 249 st	11 to 39 st	41 to 99 st	101 to 199 st	201 to 249 st
12	11 to 249	20	40	110	200	15	25	60	105
16		24	44	110	200	17	27	60	105

Bore size (mm)	Stroke range (mm)	WA				WB			
		21 to 39 st	41 to 124 st	126 to 199 st	201 to 299 st	21 to 39 st	41 to 124 st	126 to 199 st	201 to 299 st
20	21 to 399	24	44	120	200	29	39	77	117
25		24	44	120	200	29	39	77	117

Bore size (mm)	Stroke range (mm)	WA				WB			
		26 to 49 st	51 to 124 st	126 to 199 st	201 to 299 st	26 to 49 st	51 to 124 st	126 to 199 st	201 to 299 st
32	26 to 399	24	48	124	200	33	45	83	121
40		24	48	124	200	34	46	84	122
50		24	48	124	200	36	48	86	124
63		28	52	128	200	38	50	88	124
80		28	52	128	200	42	54	92	128
100		48	72	148	220	35	47	85	121

MGPM/A, E Dimensions

Bore size (mm)	A			E		
	11 to 74 st	76 to 99 st	101 to 249 st	11 to 74 st	76 to 99 st	101 to 249 st
12	42	60.5	82.5	0	18.5	40.5
16	46	64.5	92.5	0	18.5	46.5

Bore size (mm)	A			E		
	21 to 74 st	76 to 199 st	201 to 399 st	21 to 74 st	76 to 199 st	201 to 399 st
20	53	77.5	110	0	24.5	57
25	53.5	77.5	109.5	0	24	56

Bore size (mm)	A			E		
	26 to 74 st	76 to 199 st	201 to 399 st	26 to 74 st	76 to 199 st	201 to 399 st
32	75	93.5	129.5	15.5	34	70
40	75	93.5	129.5	9	27.5	63.5
50	88.5	109.5	150.5	16.5	37.5	78.5
63	88.5	109.5	150.5	11.5	32.5	73.5
80	104.5	131.5	180.5	8	35	84
100	126.5	151.5	190.5	10.5	35.5	74.5

* Dimensions except mentioned above are the same as standard type.

MGPL, MGPA/A, E Dimensions

Bore size (mm)	A			E		
	11 to 39 st	41 to 99 st	101 to 249 st	10 to 39 st	41 to 99 st	101 to 249 st
12	43	55	84.5	1	13	42.5
16	49	65	94.5	3	19	48.5

Bore size (mm)	A			E		
	21 to 39 st	41 to 124 st	126 to 199 st	21 to 39 st	41 to 124 st	126 to 199 st
20	59	76	100	117.5	6	23
25	65.5	81.5	100.5	117.5	12	28

Bore size (mm)	A			E		
	26 to 74 st	76 to 124 st	126 to 199 st	26 to 74 st	76 to 124 st	126 to 199 st
32	79.5	96.5	116.5	138.5	20	37
40	79.5	96.5	116.5	138.5	13.5	30.5
50	91.5	112.5	132.5	159.5	19.5	40.5
63	91.5	112.5	132.5	159.5	14.5	35.5

Bore size (mm)	A			E		
	26 to 49 st	51 to 74 st	76 to 199 st	26 to 49 st	51 to 74 st	76 to 199 st
80	104.5	128.5	158.5	191.5	8	32
100	119.5	145.5	178.5	201.5	3.5	29.5

Symbol

3 Low Speed Cylinder (5 to 50 mm/s)

-XB13

Even if driving at lower speeds 5 to 50 mm/s, there would be no stick-slip phenomenon and it can run smoothly.

Applicable Series

Series	Model	Action
MGP-Z	MGPM	Double acting
	MGPL	Double acting

How to Order

MGP^M **Standard model no.** **-XB13**
Low speed cylinder

Specifications

Piston speed	5 to 50 mm/s
Dimensions	Same as standard type
Specifications other than above	Same as standard type

Note 1) Operate without lubrication from a pneumatic system lubricator.
Note 2) For the speed adjustment, use speed controllers for controlling at lower speeds. (Series AS-FM/AS-M)

Warning Precautions

Be aware that smoking cigarettes etc. after your hands have come into contact with the grease used in this cylinder can create a gas that is hazardous to humans.

4 With Heavy Duty Scraper

Symbol

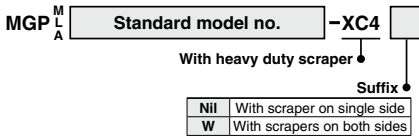
-XC4

It is suitable for using cylinders under the environment, where there are much dusts in a surrounding area by using a heavy duty scraper on the wiper ring, or using cylinders under earth and sand exposed to the die-casted equipment, construction machinery, or industrial vehicles.

Applicable Series

	Series	Model	Action
MGP-Z	Standard type	MGPM	Double acting
		MGPL	Double acting
		MGPA	Double acting

How to Order



Specifications

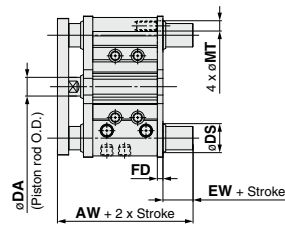
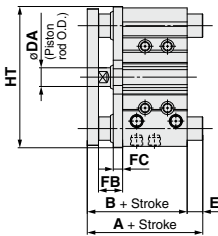
Applicable series		MGPM	MGPL/MGPA
Bearing type		Slide bearing	Ball bushing
Bore size (mm)		20, 25, 32, 40, 50, 63, 80, 100	
Minimum operating pressure	On single side	0.12 MPa	
	On both sides	0.14 MPa	
Specifications other than above		Same as standard type	

⚠ Caution

Do not replace heavy duty scrapers.

- Since heavy duty scrapers are press-fit, they must be replaced together with the holder plate assembly.

Dimensions (Dimensions other than below are the same as standard type.)



A cylinder with scrapers on both sides

MGPM, MGPL, MGPA Common Dimensions (mm)

Bore size (mm)	B	DA	FB	FC	
				MGPM	MGPL MGPA
20	63	(10)	18	9	5
25	63.5	(10)	17	9	5
32	69.5	(14)	22	9	5
40	76	(14)	22	9	5
50	82	20	26	10	8
63	87	20	26	10	5
80	106.5	25	34	15	6
100	126	30	41	15	6

The dimensions in () are the same as standard type.

MGPM (Slide bearing)/A, E, HT Dimensions (mm)

Bore size (mm)	A			E			HT
	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	
20	63	87.5	120	0	24.5	57	80
25	63.5	87.5	119.5	0	24	56	93
32	85	103.5	139.5	15.5	34	70	111.5
40	85	103.5	139.5	9	27.5	63.5	119
50	98.5	119.5	160.5	16.5	37.5	78.5	151
63	98.5	119.5	160.5	11.5	32.5	73.5	165
80	114.5	141.5	190.5	8	35	84	202
100	136.5	161.5	200.5	10.5	35.5	74.5	240

With Scrapers on Both Sides/AW, EW, FD, MT, DS Dimensions (mm)

Bore size (mm)	AW	EW	FD	MT	DS*	
					MGPM	MGPL MGPA
20	74	6	5	6	17	15
25	74.5	6	5	7	21	19
32	82.5	7	6	8.5	26	21
40	89	7	6	8.5	26	21
50	95	7	6	11	31	26
63	100	7	6	11	31	26
80	120.5	8	6	14	36	31
100	143	8	9	16	44	36

* Bypass port for guide rod with bottom mounting

MGPL, MGPA (Ball bushing)/A, E, HT Dimensions (mm)

Bore size (mm)	A				E				HT
	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	
20	69	86	110	127.5	6	23	47	64.5	80
25	75.5	91.5	110.5	127.5	12	28	47	64	93

Bore size (mm)	A				E				HT
	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	
32	89.5	106.5	126.5	148.5	20	37	57	79	110
40	89.5	106.5	126.5	148.5	13.5	30.5	50.5	72.5	118
50	101.5	122.5	142.5	169.5	19.5	40.5	60.5	87.5	146
63	101.5	122.5	142.5	169.5	14.5	35.5	55.5	82.5	160

Bore size (mm)	A				E				HT
	25 st or less	Over 25 st to 50 st	Over 50 st to 100 st	Over 100 st to 200 st	25 st or less	Over 25 st to 50 st	Over 50 st to 100 st	Over 100 st to 200 st	
80	114.5	138.5	168.5	201.5	8	32	62	95	199
100	129.5	155.5	188.5	211.5	3.5	29.5	62.5	85.5	236

5 Made of Stainless Steel

Symbol
-XC6

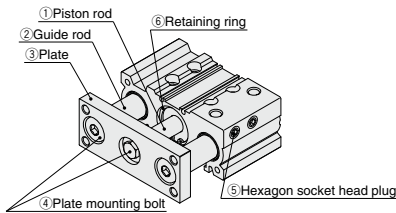
Suitable for the cases it is likely to generate rust by being immersed in the water and corrosion.

Applicable Series

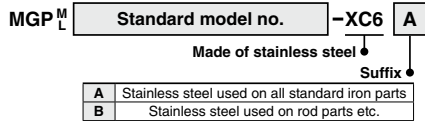
Series	Model	Action
MGP-Z	MGPM	Double acting
	MGPL	Double acting

Specifications

Parts material changed to stainless steel	A	①, ②, ③, ④, ⑤, ⑥
	B	①, ②, ⑤, ⑥
Specifications other than above and external dimensions	Same as standard type	



How to Order



Dimensions

Bore size (mm)	XC6A			XC6B	
	DA	FA	FB	DA	
12	(6)	8	5	(6)	
16	(8)	8	5	(8)	
20	(10)	9	7	(10)	
25	(10)	10	6	(10)	
32	(14)	12	10	(14)	
40	(14)	12	10	(14)	
50	20	16	12	20	
63	20	16	12	20	
80	25	19	21	25	
100	30	22	28	30	

The dimensions in () are the same as standard type.

6 Adjustable Stroke Cylinder/Adjustable Extension Type

Symbol
-XC8

It adjusts the extending stroke by the stroke adjustable mechanism equipped in the head side. (After the stroke is adjusted, with cushion on both sides is altered to single-sided, with cushion.)

Applicable Series

Series	Model	Action
MGP-Z	MGPM	Double acting
	MGPL	Double acting
	MGPA	Double acting

How to Order

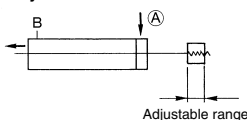


Precautions

Warning

- When the cylinder is operating, if something gets caught between the stopper bracket for adjusting the stroke and the cylinder body, it could cause bodily injury or damage the peripheral equipment. Therefore, take preventive measures as necessary, such as installing a protective cover.
- To adjust the stroke, make sure to secure the wrench flats of the stopper bracket by a wrench etc. before loosening the lock nut. If the lock nut is loosened without securing the stopper bracket, be aware that the area that joins the load to the piston rod or the area in which the piston rod is joined with the load side and the stopper bracket side could loosen first. It may cause an accident or malfunction.

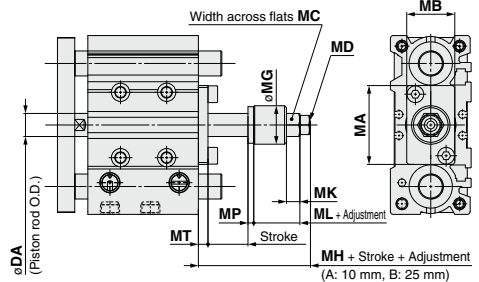
Symbol



Specifications

Stroke adjustment symbol	A	B
Stroke adjustment range (mm)	0 to 10	0 to 25
Specifications other than above	Same as standard type	

Dimensions (Dimensions other than below are the same as standard type.)



MGPM, MGPL, MGPA Common Dimensions (mm)											
Bore size (mm)	DA	MA	MB	MC	MD	eMG	MH	MK	ML	MP	MT
12	(6)	27	13	8	M4 x 0.7	14	20	5.5	10	3	3
16	(8)	28	16	10	M5 x 0.8	14	20	5.5	10	3	3
20	(10)	33	22	12	M6 x 1	20	26	7	14	3	4
25	12	41	25	12	M6 x 1	20	27	7	14	3	5
32	16	51	32	17	M8 x 1.25	25	35	9	18.5	4	6
40	16	60	32	19	M10 x 1.25	25	35	10	17	4	6
50	20	71	38	24	M14 x 1.5	35	46	13	21	4	8
63	20	84	50	24	M14 x 1.5	35	46	13	21	4	8
80	25	114	50	32	M20 x 1.5	45	55	16	30	4	9
100	30	140	65	32	M20 x 1.5	45	58	16	30	4	12

The dimensions in () are the same as standard type.

Air Cylinders

CJ2

CM2

CG1

MB

CA2

CQ2

CQS

Lube-retainer

JA

MXH

MXQ

MGP

CY

CX

CK1

CLK

CLKU

CKQ

CKZN

WRF

INDEX

7 Adjustable Stroke Cylinder/Adjustable Retraction Type

Symbol
-XC9

The retract stroke of the cylinder can be adjusted by the adjustment bolt.

Applicable Series

Series	Model	Action
MGP-Z	MGPM	Double acting
	MGPL	Double acting
	MGPA	Double acting

How to Order

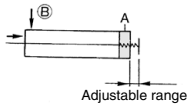
MGP ^M/_A **Bore size** - **Stroke** **Stroke adjustment symbol** **Z - XC9**
Adjustable stroke cylinder/Adjustable retraction type

Precautions

⚠ Caution

- When air is supplied to the cylinder, if the stroke adjustment bolt is loosened in excess of the allowable stroke adjustment amount, be aware that the stroke adjustment bolt could fly out or air could be discharged, which could injure personnel or damage the peripheral equipment.
- Adjust the stroke when the cylinder is not pressurized. If it is adjusted in the pressurized state, the seal of the adjustment section could become deformed, leading to air leakage.

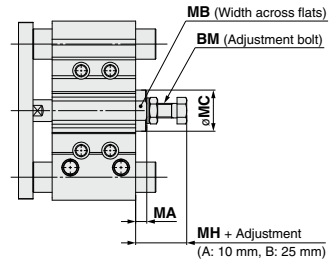
Symbol



Specifications

Stroke adjustment symbol	A	B
Stroke adjustment range (mm)	0 to 10	0 to 25
Specifications other than above	Same as standard type	

Dimensions (Dimensions other than below are the same as standard type.)



MGPM, MGPL, MGPA Common Dimensions (mm)

Bore size (mm)	BM	MA	MB	MC	MH
12	M5 x 0.8	5	8	12.5	17
16	M6 x 1	5	10	14	19
20	M8 x 1.25	6.5	13	16	25
25	M8 x 1.25	6.5	13	16	24
32	M8 x 1.25	6.5	19	21	25
40	M12 x 1.5	9	27	30	32.5
50	M12 x 1.5	9	30	34	32.5
63	M16 x 1.5	10	36	40	37
80	M20 x 1.5	15	41	46	48.5
100	M24 x 1.5	18	46	52	55.5

8 Intermediate Stroke (Spacer type)

Symbol
-XC19

Dealing with the intermediate stroke by installing a spacer with the standard stroke cylinder.

Applicable Series

Series	Model	Action
MGP-Z	With air cushion	MGPM Double acting
		MGPL Double acting
		MGPA Double acting

How to Order

MGP^M_A **Standard model no.** **-XC19**
Intermediate stroke (Spacer type)

Applicable Stroke

Description	Dealing with the stroke by the 1 mm interval by changing a collar of the standard stroke cylinder. Minimum manufacturable stroke	
	$\phi 16$ to $\phi 63$: 15 mm $\phi 80$, $\phi 100$: 20 mm Select a rubber bumper type, because the cushion effect is not obtainable for less than this stroke.	
Model no.	Add "-XC19" to the end of standard part number.	
Applicable stroke (mm)	$\phi 16$	15 to 249
	$\phi 20$ to $\phi 63$	15 to 399
	$\phi 80$, $\phi 100$	20 to 399
Example	Part no.: MGPM20-35AZ-XC19 15 mm width collar is installed in MGPM20-50AZ. C dimension is 112 mm.	

Note) Intermediate strokes (by the 1 mm interval) with a special body are available as special products.

9 Fluororubber Seal

Symbol
-XC22

Applicable Series

Series	Model	Action
MGP-Z	Standard type	MGPM Double acting

How to Order

MGPM **Standard model no.** **-XC22**
Fluororubber seal

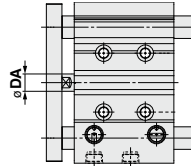
Specifications

Seal material	Fluororubber
Ambient temperature range	With auto switch Note 1): -10°C to 60°C (No freezing)
Specifications other than above	Same as standard type

Note 1) Please confirm with SMC, as the type of chemical and the operating temperature may not allow the use of this product.

Note 2) No cushion is equipped. Check the kinetic energy.

Dimensions



(mm)			
Bore size (mm)	DA	Bore size (mm)	DA
12	(6)	40	(14)
16	(8)	50	20
20	(10)	63	20
25	(10)	80	25
32	(14)	100	30

The dimensions in () are the same as standard type.

Air Cylinders

CJ2

CM2

CG1

MB

CA2

CQ2

CQS

Lube-retainer

JA

MXH

MXQ

MGP

C□Y

C□X

CK□1

C(L)K□

C(L)KU

CKQ

CKZ2N

WRF

10 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.

Applicable Series

Series	Model	Action
MGP-Z	MGPM	Double acting
	MGPL	Double acting
	MGPA	Double acting

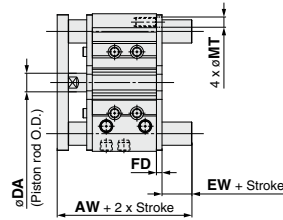
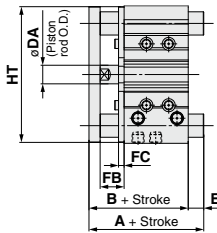
How to Order

MGP ^M _A	Standard model no.	-XC35	
		With coil scraper	
		Suffix	
	Nil	With scraper on single side	
	W	With scrapers on both sides	

Specifications

Applicable series	MGPM	MGPL/MGPA
Bearing type	Slide bearing	Ball bushing
Bore size (mm)	20, 25, 32, 40, 50, 63, 80, 100	
Minimum operating pressure	On single side	0.12 MPa
	On both sides	0.14 MPa
Specifications other than above	Same as standard type	

Dimensions (Dimensions other than below are the same as standard type.)



A cylinder with scrapers on both sides

MGPM, MGPL, MGPA Common Dimensions (mm)

Bore size (mm)	B	DA	FB	FC	
				MGPM	MGPL/MGPA
20	63	(10)	18	5	5
25	63.5	(10)	17	6	5
32	69.5	(14)	22	6	5
40	76	(14)	22	6	5
50	82	20	26	6	5
63	87	20	26	6	5
80	106.5	25	34	8	6
100	126	30	41	9	6

The dimensions in () are the same as standard type.

With Scrapers on Both Sides/AW, EW, FD, MT Dimensions (mm)

Bore size (mm)	AW	EW	FD	MT
20	74	6	5	6
25	74.5	6	5	7
32	82.5	7	6	9
40	89	7	6	8.5
50	95	7	6	11
63	100	7	6	11
80	120.5	8	6	14
100	143	8	9	16

MGPM (Slide bearing)/A, E, HT Dimensions (mm)

Bore size (mm)	A			E			HT
	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	
20	63	87.5	120	0	24.5	57	80
25	63.5	87.5	119.5	0	24	56	93
32	85	103.5	139.5	15.5	34	70	110
40	85	103.5	139.5	9	27.5	63.5	118
50	98.5	119.5	160.5	16.5	37.5	78.5	146
63	98.5	119.5	160.5	11.5	32.5	73.5	160
80	114.5	141.5	190.5	8	35	84	199
100	136.5	161.5	200.5	10.5	35.5	74.5	236

MGPL, MGPA (Ball bushing)/A, E, HT Dimensions (mm)

Bore size (mm)	A				E				HT
	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	
20	69	86	110	127.5	6	23	47	64.5	80
25	75.5	91.5	110.5	127.5	12	28	47	64	93

Bore size (mm)	A				E				HT
	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	
32	89.5	106.5	126.5	148.5	20	37	57	79	110
40	89.5	106.5	126.5	148.5	13.5	30.5	50.5	72.5	118
50	101.5	122.5	142.5	169.5	19.5	40.5	60.5	87.5	146
63	101.5	122.5	142.5	169.5	14.5	35.5	55.5	82.5	160

Bore size (mm)	A				E				HT
	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	Over 200 st	
80	114.5	138.5	168.5	201.5	8	32	62	95	199
100	129.5	155.5	188.5	211.5	3.5	29.5	62.5	85.5	236

11 Bottom Mounting Type

Symbol

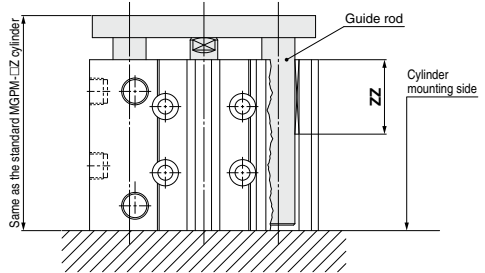
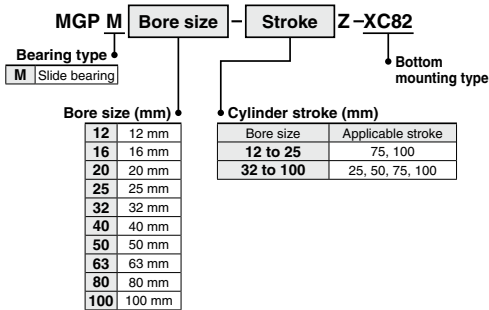
-XC82

Since the guide rod does not protrude from the bottom at the retraction of the rod, relief holes for guide rods are not required.

Applicable Series

Series	Model	Action
MGP-Z	Standard type	MGPM Double acting

How to Order



Note) The total length (ZZ) of the guide rod bushing is shorter than the standard products.

12 Grease for Food Processing Equipment

Symbol

-XC85

Food grade grease (certified by NSF-H1) is used as lubricant.

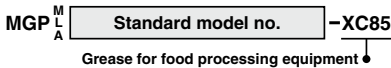
Applicable Series

Series	Model	Action
MGP-Z	Standard type	MGPM Double acting
		MGPL Double acting
		MGPA Double acting
	With air cushion	MGPM Double acting
		MGPL Double acting
		MGPA Double acting

Specifications

Ambient temperature range	0°C to 60°C
Seals material	Nitrile rubber
Grease	Grease for food
Auto switch	Mountable
Dimensions	Same as standard type
Specifications other than above	Same as standard type

How to Order



Warning Precautions

Be aware that smoking cigarettes etc. after your hands have come into contact with the grease used in this cylinder can create a gas that is hazardous to humans.

Not installable zone

Food zone An environment where food which will be sold as merchandize, directly touches the cylinder's components.

Splash zone An environment where food which will not be sold as merchandize, directly touches the cylinder's components.

Installable zone

Non-food zone An environment where there is no contact with food.

Note 1) Avoid using this product in the food zone. (Refer to the figure on the right.)

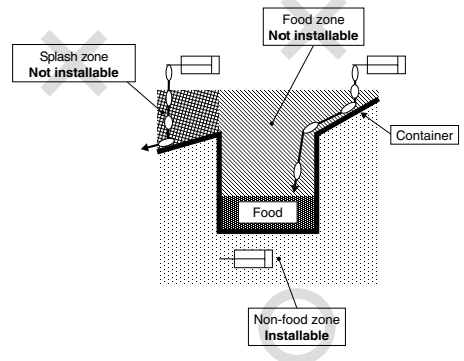
Note 2) When the product is used in an area of liquid splash, or a water resistant function is required for the product, please consult with SMC.

Note 3) Operate without lubrication from a pneumatic system lubricator.

Note 4) Use the following grease pack for the maintenance work.

GR-H-010 (Grease: 10 g)

Note 5) Please contact SMC for details about the maintenance intervals for this cylinder, which differ from those of the standard cylinder.



Air Cylinders

CJ2

CM2

CG1

MB

CA2

CQ2

CQS

Lube-retainer

JA

MXH

MXQ

MGP

CY

CX

CK1

CL

CLXU

CKQ

CK2ZN

WRF

INDEX

13 Guide unit with Lube-retainer

Symbol

-XC98

Lube-retainer suitable for retaining the lubrication is mounted on the guide unit.

Applicable Series

Series	Model	Action
MGP-Z	Standard type	MGPM
		Double acting

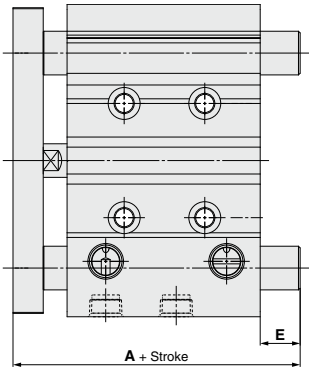
How to Order

MGPM **Standard model no.** **-XC98**

Guide unit with Lube-retainer

The dimensions in () are the same as standard type.

Dimensions (Dimensions other than below are the same as standard type.)



Bore size (mm)	A			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
20	(53)	83	115.5	(0)	30	62.5
25	(53.5)	83.5	115.5	(0)	30	62
32	82	100.5	136.5	22.5	41	77
40	82	100.5	136.5	16	34.5	70.5
50	95.5	116.5	157.5	23.5	44.5	85.5
63	95.5	116.5	157.5	18.5	39.5	80.5
80	113.5	140.5	189.5	17	44	93
100	135.5	160.5	199.5	19.5	44.5	83.5

The dimensions in () are the same as standard type.

14 Symmetrical Port Position

Symbol

-X144

Ports are mounted symmetrically.

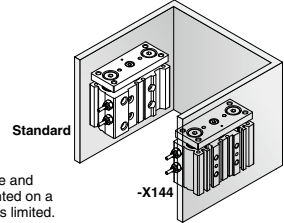
Applicable Series

Series	Model	Action
MGP-Z	Standard type	MGPM Double acting
		MGPL Double acting
		MGPA Double acting

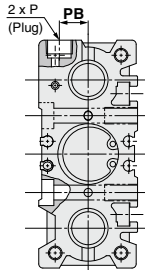
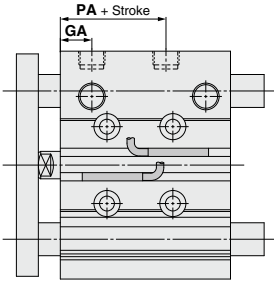
How to Order

MGP ^M_A Standard model no. **-X144**
 Symmetrical port position

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



Dimensions (Dimensions other than below are the same as standard type.)



MGPM, MGPL, MGPA Common Dimensions

Bore size (mm)	GA	PA	PB
12	10	13	8
16	10.5	14.5	10
20	11.5	13.5	10.5
25	11.5	12.5	13.5
32	12	6.5	16
40	15	13	18
50	15	9	21.5
63	15.5	13	28
80	19	14.5	25.5
100	22.5	17.5	32.5

15 Side Porting Type (Plug location changed)

Symbol

-X867

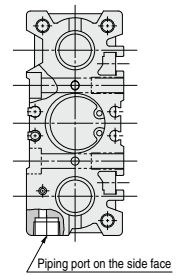
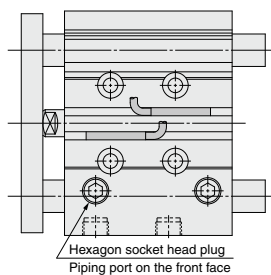
Ports on the top plugged in order to use the piping port on the side.

Applicable Series

Series	Model	Action
MGP-Z	Standard type	MGPM Double acting
		MGPL Double acting
		MGPA Double acting
	With air cushion	MGPM Double acting
		MGPL Double acting

How to Order

MGP ^M_A Standard model no. **-X867**
 Side porting type (Plug location changed)



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MGP

☐ Y

☐ X

CK

☐ 1

C(L)K

☐ U

CKQ

CKZ2N

WRF

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