

Compact Guide Cylinder High Precision Ball Bushing Type

Series **MGPA**

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



New series MGPA added to compact guide cylinder series MGP.

This new series achieves improved non-rotating accuracy of the plate and reduced plate displacement.



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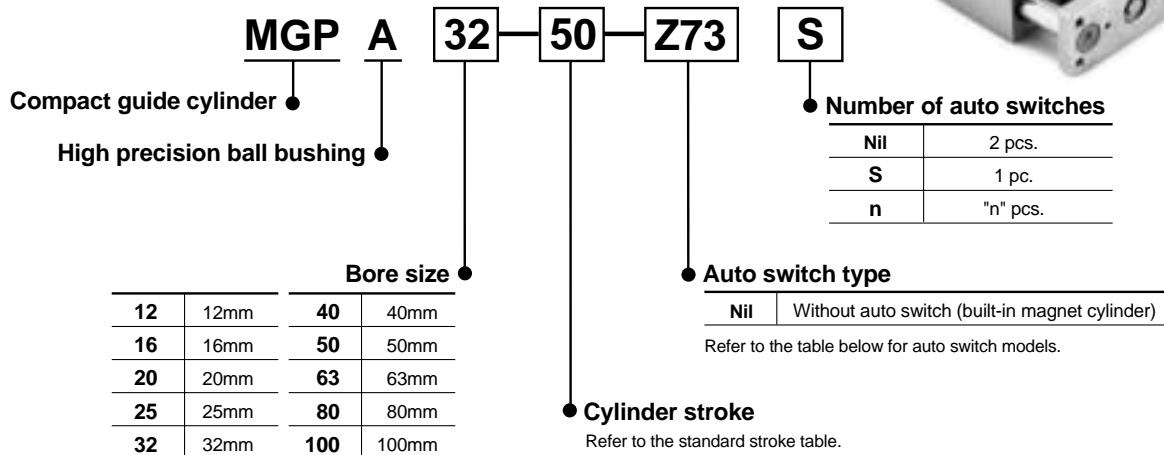
New series MGPA added to compact guide cylinder series MGP. This new series achieves improved non-rotating accuracy of the plate and reduced plate displacement.

Non-rotating accuracy of plate : ±0.01°

Plate displacement : 0.05mm

(With MGPA ø12, 10mm stroke, load weight 1.7kg)

How to Order



Applicable auto switches

Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage		Auto switch model		Lead wire length (m)			Applicable load		
					DC	AC	Electrical entry direction	Perpendicular	In-line	0.5 (Nil)	3 (L)	5 (Z)		
Reed switch	—	Grommet	Yes	3 wire	—	5V	—	—	Z76	●	●	—	IC circuit	Relay, PLC
				2 wire	12V	100V	—	Z73	●	●	●	—	—	
					5V,12V	100V or less	—	Z80	●	●	—	—	—	
Solid state switch	Diagnostic indication (2 colour indicator)	Grommet	Yes	3 wire (NPN)	24V	5V	—	Y69A	Y59A	●	●	○	IC circuit	Relay, PLC
				3 wire (PNP)		12V		Y7PV	Y7P	●	●	○	IC circuit	
				2 wire		12V		Y69B	Y59B	●	●	○	—	
				3 wire (NPN)		5V		Y7NWW	Y7NW	●	●	○	IC circuit	
				3 wire (PNP)		12V		Y7PWV	Y7PW	●	●	○	—	
				Water resistant (2 colour indicator)		—		—	—	—	—	—	Y7BWV	
	Magnetic field resistant (2 colour indicator)	—	—		—	—	—	—	Y7BAL	—	●	○	—	
—		—	—	—	—	—	—	P5DW	—	●	●	—		

Note 1) Lead wire length symbols 0.5m Nil (Example) Y69B
3m L Y69BL
5m Z Y69BZ

Note 2) Solid state switches marked with a "○" symbol are produced upon receipt of order.

Note 3) Type P5DW is applicable only to bore sizes ø40 through ø100. Also, with bore sizes ø40 through ø63 with 25mm stroke, one auto switch is mounted on each side of the body.

Specifications

Action	Double acting	
Fluid	Air	
Proof pressure	1.5MPa	
Maximum operating pressure	1.0MPa	
Minimum operating pressure	ø12, ø16	0.12MPa
	ø20 to ø100	0.1MPa
Ambient and fluid temperature	-10 to 60°C (with no freezing)	
Piston speed	ø12 to ø63	50 to 500mm/s
	ø80, ø100	50 to 400mm/s
Cushion	Double side rubber bumper	
Lubrication	Non-lube	
Stroke length tolerance	${}^{+1.5}_0$ mm	
Bearing type	High precision ball bushing	

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

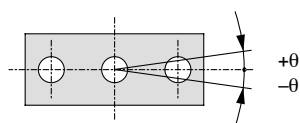
Manufacture of Intermediate Strokes

Modification method	Installation of spacers Spacers are installed in a standard stroke cylinder to modify the stroke. ø12 to 32: Available in 1mm stroke increments ø40 to 100: Available in 5mm stroke increments	
Part number	Refer to standard part numbers and ordering procedure.	
Applicable stroke (mm)	ø12, ø16	1 to 249
	ø20 to ø32	1 to 399
	ø40 to ø100	5 to 395
Example	Part no.: MGPA20-39 A spacer 1mm in width is installed in a MGPA20-40. The C dimension is 77mm.	

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

Non-rotating Accuracy of Plate

Use the table below as a guide for non-rotating accuracy θ without load.



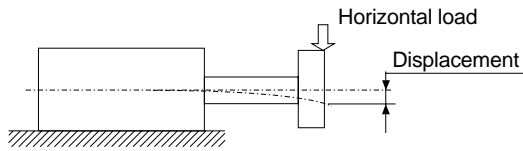
Bore size (mm)	Non-rotating accuracy θ
12	$\pm 0.01^\circ$
16	
20	
25	
32	
40	
50	
63	
80	
100	

Dimensions

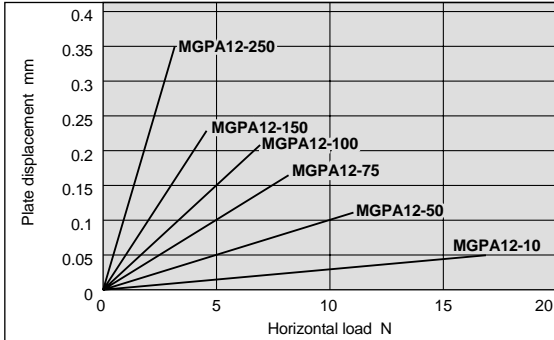


Dimensions are the same as the standard series MGPL. Refer to "Best Pneumatics" No. 2 pages 3.17-1 through 3.17-34 for more details.

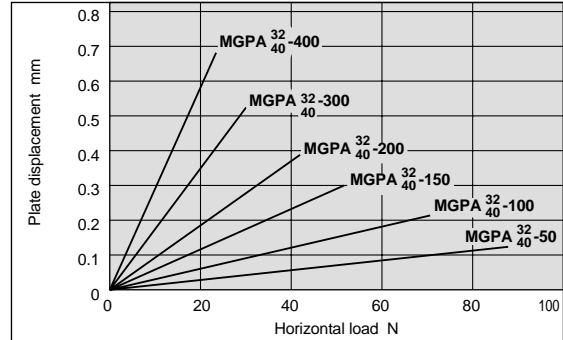
Plate Displacement (Reference Values)



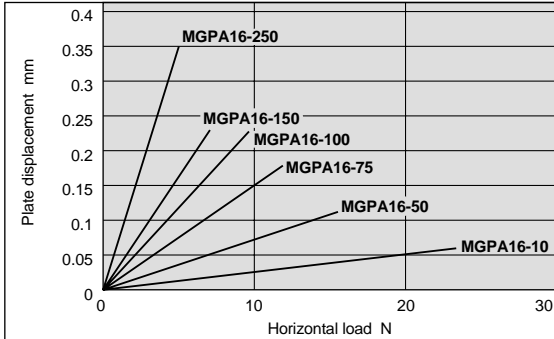
MGPA12



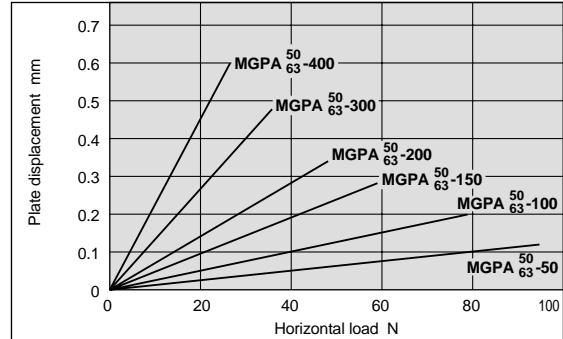
MGPA32, 40



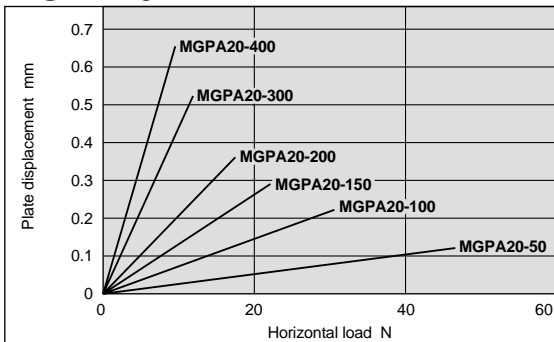
MGPA16



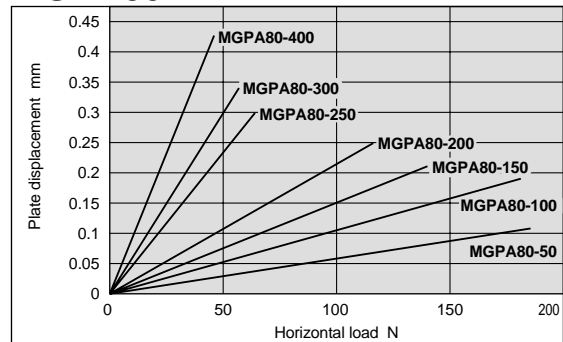
MGPA50, 63



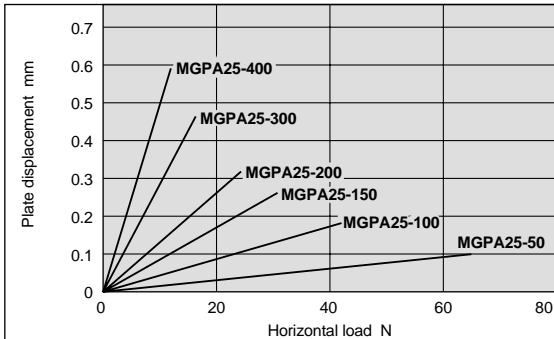
MGPA20



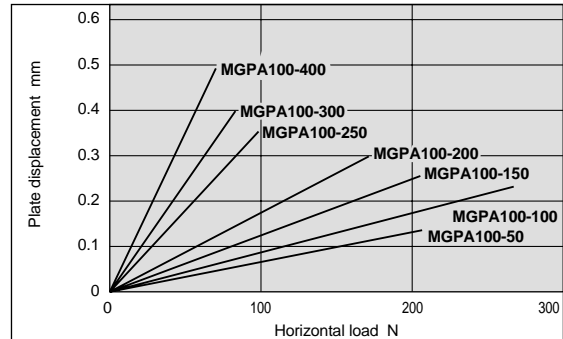
MGPA80



MGPA25



MGPA100



Note 1) Displacements shown above do not include deflection from the self-weight of the guide rod and the plate.

Note 2) Allowable rotational torque and operating range when used as a lifter are identical to the standard series MGPL; refer to "Best Pneumatics" No. 2. pages 3.17-7 through 3.17-9.

⚠ Specific Product Precautions

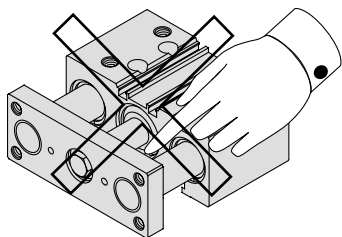
Be sure to read before handling. Consult SMC when outside the specifications.

Mounting

⚠ Warning

1. Do not put hands or fingers in between the plate and the cylinder body .

Be very careful that hands or fingers are not caught in the space between the plate and the cylinder body when air pressure is applied.



⚠ Caution

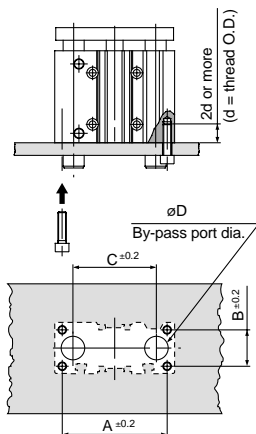
1. Do not scratch or gouge the sliding part of the piston rod or guide rod.

This will cause air leakage or malfunction due to damage of the seals.

2. Bottom mounting of cylinder

Since the guide rods project from the bottom of the cylinder at the end of the retraction stroke, provide by-pass ports in the mounting surface, as well as holes for the hexagon socket head mounting screws, when the cylinder is mounted from the bottom.

Furthermore, when subjected to impact in use as a stopper, etc., screw the mounting bolts in to a depth of 2d or more.



Bore size (mm)	A	B	C	D	Hexagon socket head mounting bolt
12	50	18	41	8	M4 x 0.7
16	56	22	46	10	M5 x 0.8
20	72	24	54	12	M5 x 0.8
25	82	30	64	15	M6 x 1.0
32	98	34	78	18	M8 x 1.25
40	106	40	86	18	M8 x 1.25
50	130	46	110	22	M10 x 1.5
63	142	58	124	22	M10 x 1.5
80	180	54	156	28	M12 x 1.75
100	210	62	188	33	M14 x 2.0

3. Do not use the cylinder for applications with impact applied to the plate end (e.g., as a stopper).
4. Do not operate in an environment with excessive dust or contact with liquids.
5. A pre-load is applied between the special ball bushing and the guide rod of the cylinder. Therefore, some ball rolling may be felt compared to series MGPL, but this is normal. Furthermore, the ball bushing is press fit and cannot be replaced individually.

6. Change the plug positions of the piping ports depending on the operating conditions.

1) For M5

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

2) For Rc screw

Tighten with the proper tightening torque listed below. Use pipe tape on the plugs when tightening.

Connecting threads	Proper tightening torque N·m
Rc 1/8	7 to 9
Rc 1/4	12 to 14
Rc 3/8	22 to 24

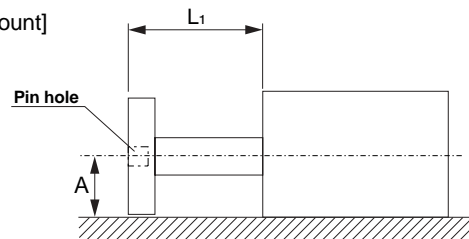
⚠ Caution

Plate pin hole position accuracy

When the cylinder is mounted, disparities in the machining dimensions of each part are accumulated in the plate pin hole accuracy.

Use the values below for reference.

[Side mount]

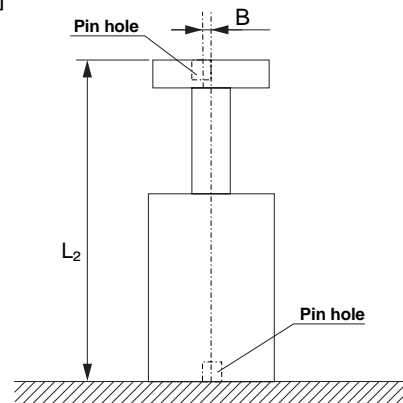


$$A = \text{Catalogue dimension} \pm (0.1^* + L_1 \times 0.0008) \text{ [mm]}$$

* For $\varnothing 80$ and $\varnothing 100$, this value is 0.15.

Note) Displacement due to the load and deflection from the self-weight of the plate and guide rod are not included.

[Bottom mount]



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

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