Compact Guide Cylinder With Air Cushion

MGP Series

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.

With air cushion

Cylinder stroke [mm]
Refer to Standard Strokes on page 453.

Auto switch

Nil	Without auto switch (Built-in magnet)

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

Number of auto switches

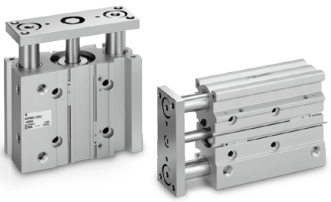
Nil	2 pcs.
S	1 pc.
n	n pcs.

Made to Order
For details, refer to page 453.

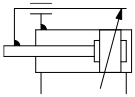
Applicable Auto Switches/Refer to pages 1119 to 1245 for further information on auto switches.

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

∗1: Water resistant type auto switches are mountable on the above models, but in such case SMC cannot guarantee water resistance. A water resistant type cylinder is recommended for use in an environment which requires water resistance. However, please contact SMC for water resistant products of ø12 and ø16.
∗2: The D-P3DWA□ is mountable on bore size ø25 to ø100.
∗3: 1 m type lead wire is only applicable to the D-A93.
∗: Lead wire length symbols: 0.5 m·····Nil (Example) M9NW
1 m····· M (Example) M9NWM
3 m····· L (Example) M9NWL
5 m····· Z (Example) M9NWZ
∗: Solid state auto switches marked with "○" are produced upon receipt of order.
∗: Other than the auto switches listed above, the D-P4DW type can be mounted. Refer to page 489 for details.
∗: For details about auto switches with pre-wired connector, refer to pages 1192 and 1193.
∗: Auto switches are shipped together, (but not assembled).



Symbol
Air cushion



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

Symbol	Specifications
-X867	Side porting type (Plug location changed)

Made to Order **Made to Order**
Click here for details

Symbol	Specifications
-XA□	Change of guide rod end shape
-XC19	Intermediate stroke (Spacer type)
-XC79	Tapped hole, drilled hole, pinned hole machined additionally
-XC85	Grease for food processing equipment

Refer to pages 486 to 490 for cylinders with auto switches.

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

Specifications

Bore size [mm]	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 *1	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								

*1: Maximum speed with no load. Depending on the operating conditions, the piston speed may not be satisfied. Make a model selection, considering a load according to the graph on pages 456 to 462.

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 in 1 mm increments are available by replacing collars of a standard stroke cylinder. Minimum manufacturable stroke ø16 to ø63: 15 mm ø80, ø100: 20 mm Select a rubber bumper type, because the cushion effect is not obtainable for less than this stroke.	
Model no.	Add "-XC19" to the end of standard part number.	
Applicable stroke [mm]	ø16	15 to 249
	ø20 to ø63	15 to 399
	ø80, ø100	20 to 399
Example	Part no.: MGPM20-35AZ-XC19 A collar 15 mm in width is installed in the MGPM20-50AZ. C dimension is 112 mm.	

*: Intermediate stroke (in 1 mm increments) based on an exclusive body will be available upon request for special.

Theoretical Output

OUT IN

[N]

Bore size [mm]	Rod size [mm]	Operating direction	Piston area [mm²]	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

*: Theoretical output [N] = Pressure [MPa] x Piston area [mm²]

Weights

Slide Bearing: MGPM16 to 100

[kg]

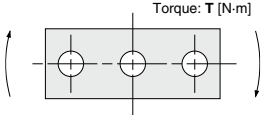
Bore size [mm]	Standard stroke [mm]											
	25	50	75	100	125	150	175	200	250	300	350	400
16	0.48	0.62	0.74	0.86	1.01	1.14	1.26	1.38	1.62	—	—	—
20	0.78	1.02	1.20	1.39	1.57	1.75	1.94	2.12	2.55	2.92	3.29	3.65
25	1.07	1.43	1.67	1.92	2.17	2.41	2.66	2.91	3.50	4.00	4.49	4.99
32	1.65	2.10	2.45	2.81	3.16	3.52	3.87	4.23	5.11	5.82	6.53	7.24
40	1.95	2.43	2.83	3.22	3.61	4.00	4.40	4.79	5.75	6.54	7.32	8.10
50	3.28	4.03	4.63	5.22	5.82	6.41	7.00	7.60	9.10	10.29	11.48	12.67
63	4.13	4.97	5.65	6.34	7.02	7.71	8.39	9.07	10.76	12.13	13.50	14.86
80	—	7.48	8.36	9.24	10.12	11.00	11.88	12.76	15.06	16.82	18.58	20.33
100	—	12.13	13.40	14.67	15.94	17.21	18.48	19.75	22.92	25.46	28.00	30.55

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

[kg]

Bore size [mm]	Standard stroke [mm]											
	25	50	75	100	125	150	175	200	250	300	350	400
16	0.48	0.59	0.69	0.84	0.94	1.05	1.15	1.25	1.46	—	—	—
20	0.82	0.98	1.14	1.35	1.51	1.67	1.82	1.98	2.34	2.65	2.97	3.29
25	1.16	1.36	1.57	1.83	2.03	2.24	2.44	2.65	3.11	3.52	3.93	4.34
32	1.59	2.01	2.29	2.67	2.95	3.24	3.53	3.81	4.48	5.05	5.61	6.18
40	1.87	2.33	2.65	3.07	3.39	3.71	4.04	4.36	5.10	5.74	6.38	7.03
50	3.10	3.82	4.32	4.93	5.43	5.93	6.43	6.93	8.10	9.10	10.10	11.09
63	3.95	4.75	5.35	6.06	6.66	7.25	7.84	8.44	9.79	10.98	12.17	13.36
80	—	7.63	8.38	9.12	9.87	10.62	11.37	12.11	14.03	15.52	17.02	18.51
100	—	12.07	13.17	14.28	15.38	16.49	17.59	18.70	21.32	23.53	25.74	27.95

Allowable Rotational Torque of Plate



T [N·m]

Bore size [mm]	Bearing type	Stroke											
		25	50	75	100	125	150	175	200	250	300	350	400
16	**MGPM**	0.53	0.84	0.69	0.58	0.50	0.44	0.40	0.36	0.30	—	—	—
	MGPL/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	1.57	1.34	1.17	1.03	0.93	0.76	0.65	0.56	0.49
25	**MGPM**	1.64	3.51	2.96	2.57	2.26	2.02	1.83	1.67	1.42	1.24	1.09	0.98
	MGPL/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

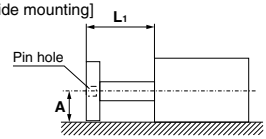
High Precision Ball Bushing/MGPA

⚠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]

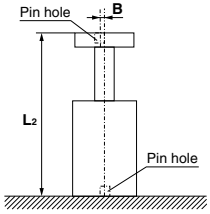


A = Catalog dimension ± (0.1 + **L1** x 0.0008)*1 [mm]

*1: To be 0.15 for ø80, ø100

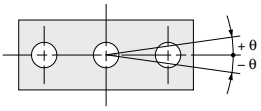
*: Displacement by load and self-weight deflection by plate and guide rod are not included.

[Bottom mounting]



B = ± (0.045 + **L2** x 0.0016) [mm]

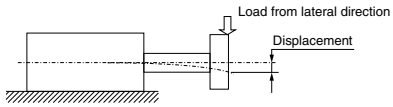
Non-rotating Accuracy of Plate



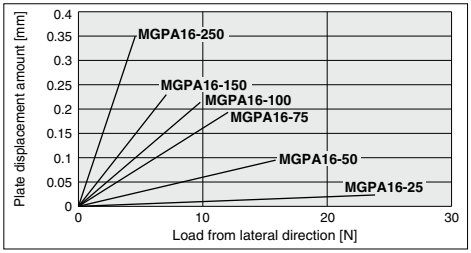
Non-rotating accuracy θ when retracted and when no load is applied should be not more than the values shown in the table.

Bore size [mm]	Non-rotating accuracy θ		
	MGPM	**MGPL**	**MGPA**
16	±0.07°	±0.05°	±0.01°
20	±0.06°	±0.04°	
25			
32	±0.05°	±0.03°	
40			
50	±0.04°	±0.03°	
63			
80	±0.03°	±0.03°	
100			

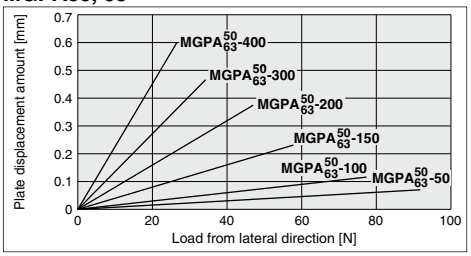
High Precision Ball Bushing/MGPA Plate Displacement Amount (Reference Values)



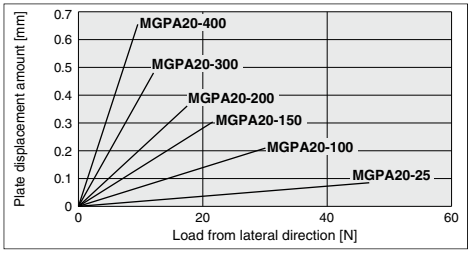
MGPA16



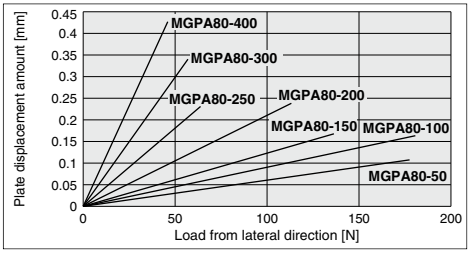
MGPA50, 63



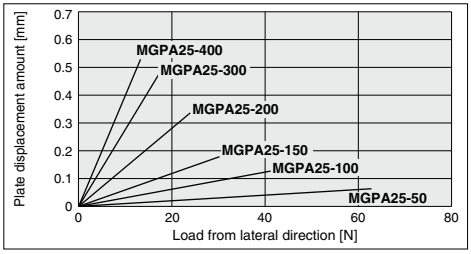
MGPA20



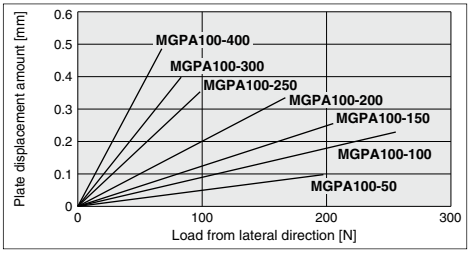
MGPA80



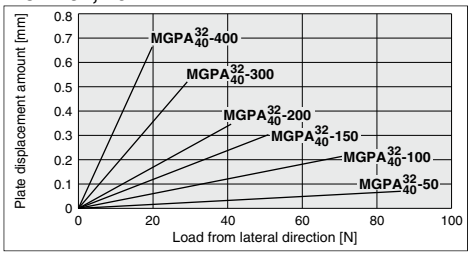
MGPA25



MGPA100



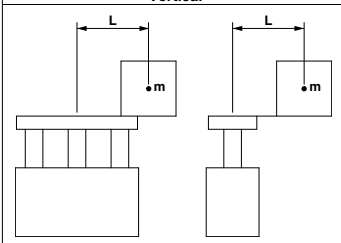
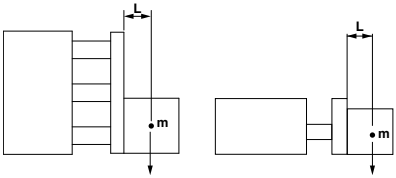
MGPA32, 40



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

With Air Cushion
MGP Series
Model Selection

Selection Conditions

	Vertical		Horizontal	
Mounting orientation				
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)

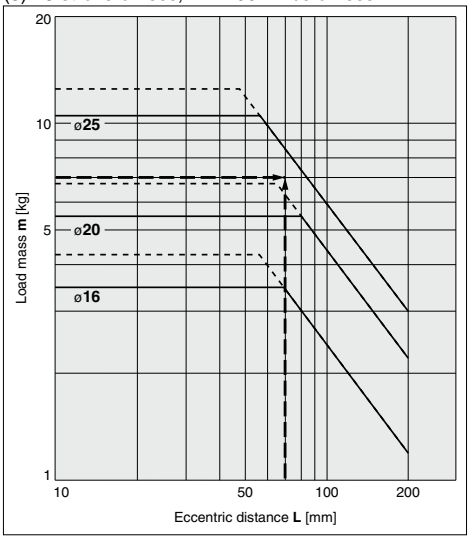
Selection conditions

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)

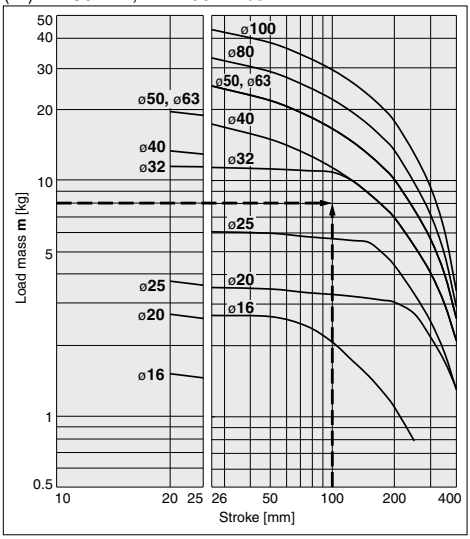
Selection conditions

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

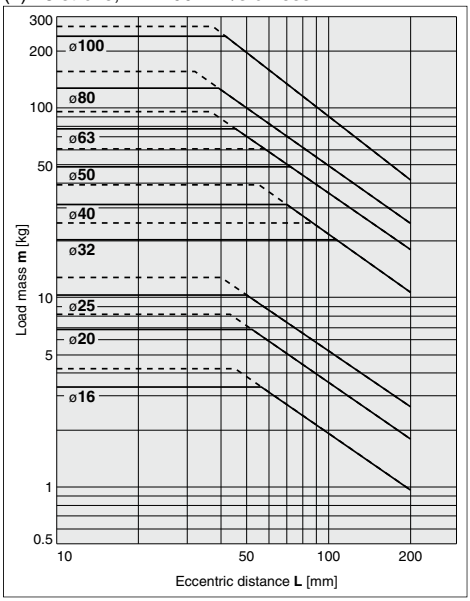
· Use the Guide Cylinder Selection Software, when the eccentric distance is 200 mm or more.

Vertical Mounting Slide Bearing

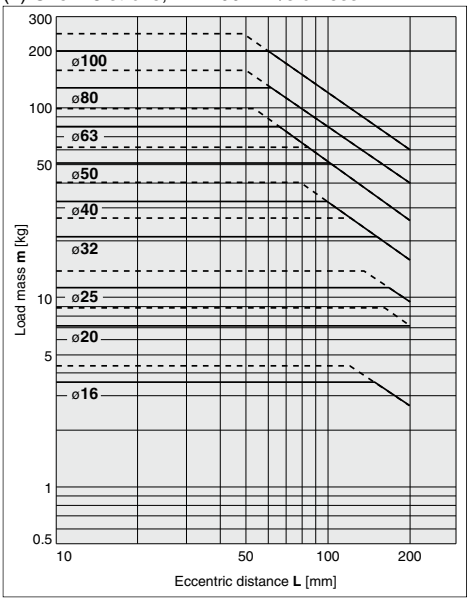
——— Operating pressure 0.4 MPa
- - - - - Operating pressure 0.5 MPa or more

MGPM16 to 100

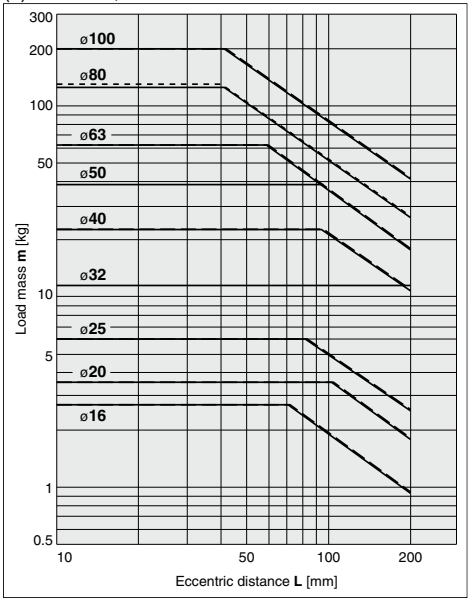
(1) 25 stroke, V = 200 mm/s or less



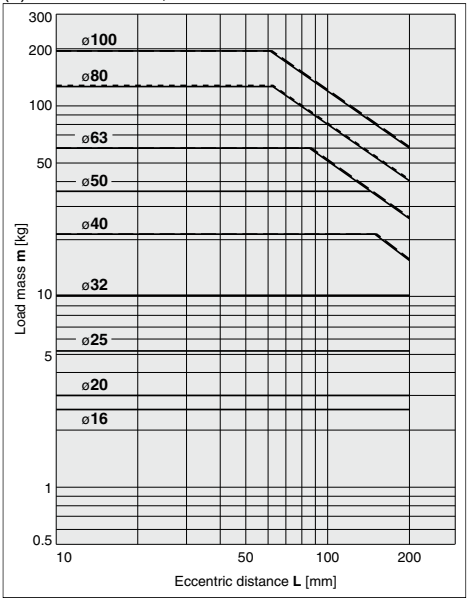
(2) Over 25 stroke, V = 200 mm/s or less



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



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



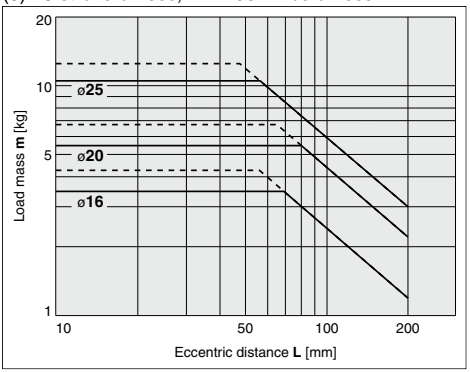
· Use the Guide Cylinder Selection Software, when the eccentric distance is 200 mm or more.

Vertical Mounting **Ball Bushing**

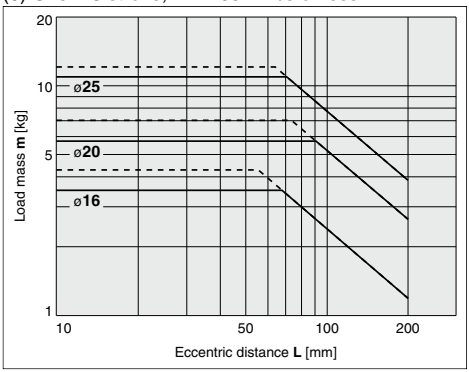
——— Operating pressure 0.4 MPa
- - - - - Operating pressure 0.5 MPa or more

MGPL16 to 25

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

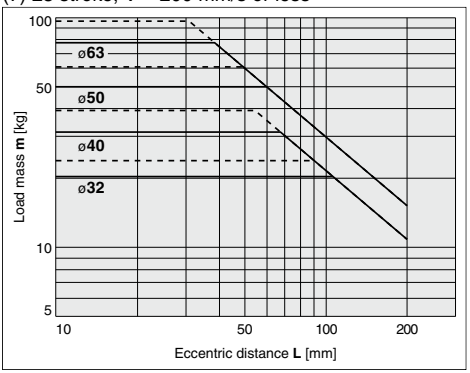


(6) Over 75 stroke, V = 200 mm/s or less

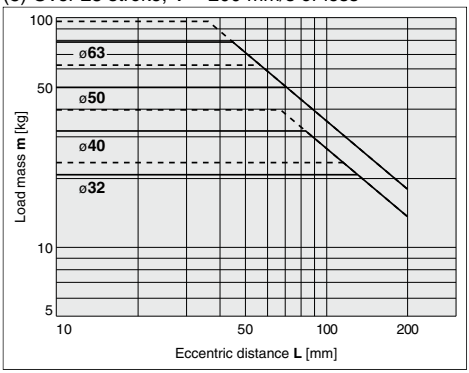


MGPL32 to 63

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

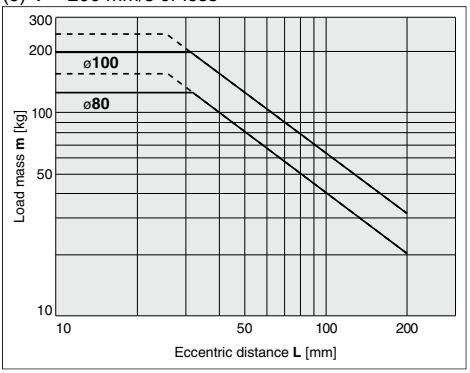


(8) Over 25 stroke, V = 200 mm/s or less



MGPL80/100

(9) V = 200 mm/s or less



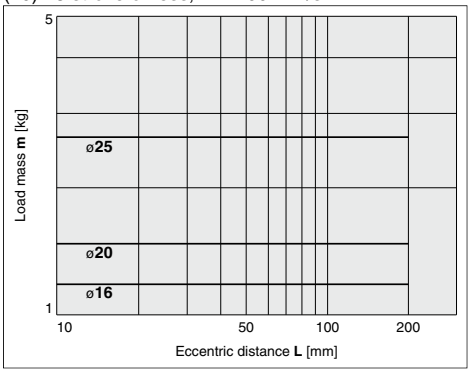
· Use the Guide Cylinder Selection Software, when the eccentric distance is 200 mm or more.

Vertical Mounting **Ball Bushing**

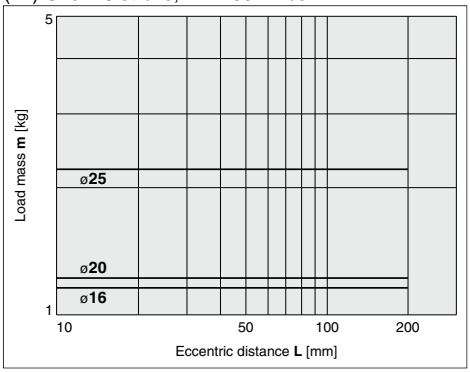
——— Operating pressure 0.4 MPa

MGPL16 to 25

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

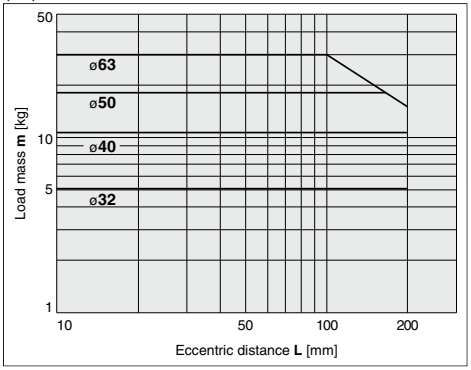


(11) Over 75 stroke, V = 400 mm/s

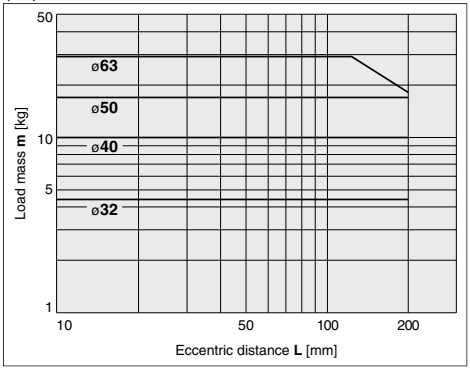


MGPL32 to 63

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

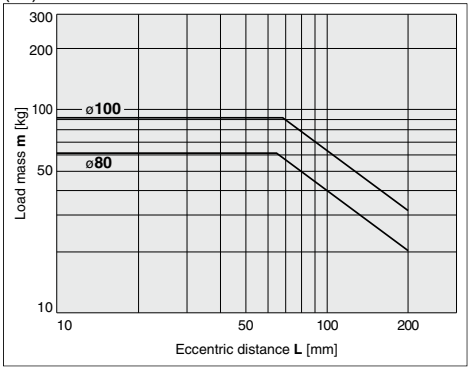


(13) Over 25 stroke, V = 400 mm/s



MGPL80/100

(14) V = 400 mm/s

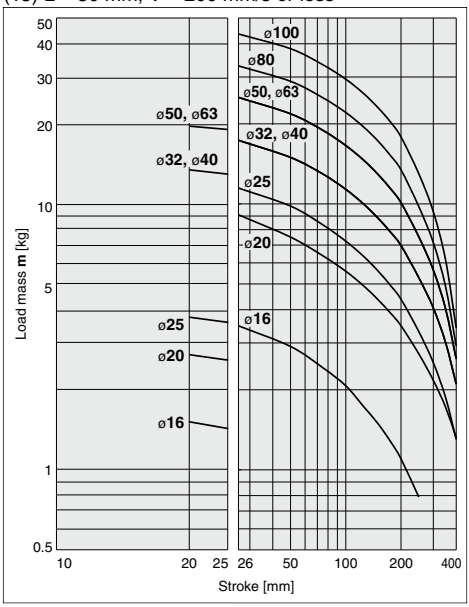


· Use the Guide Cylinder Selection Software, when the eccentric distance is 200 mm or more.

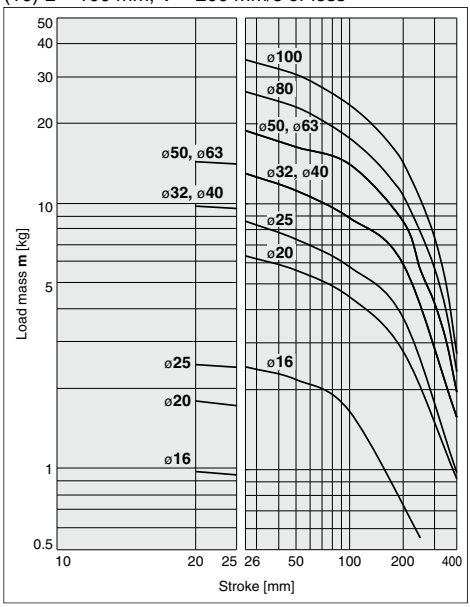
Horizontal Mounting Slide Bearing

MGPM16 to 100

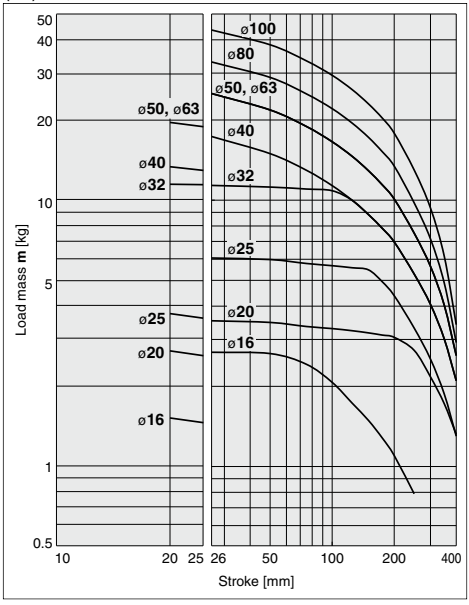
(15) L = 50 mm, V = 200 mm/s or less



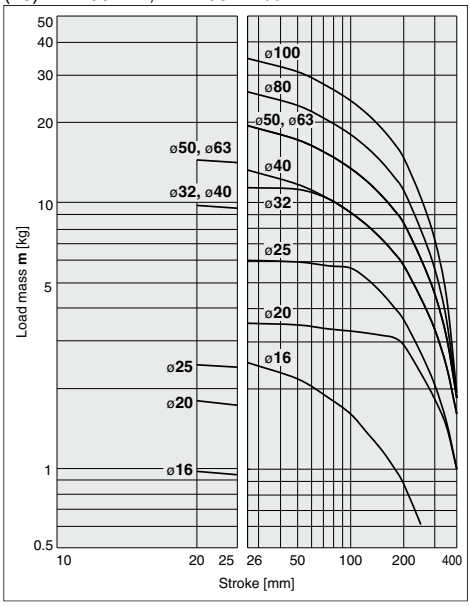
(16) L = 100 mm, V = 200 mm/s or less



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



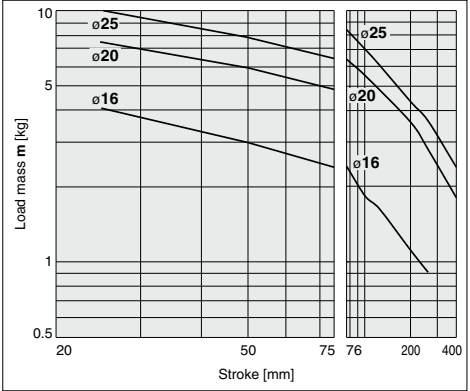
(18) L = 100 mm, V = 400 mm/s



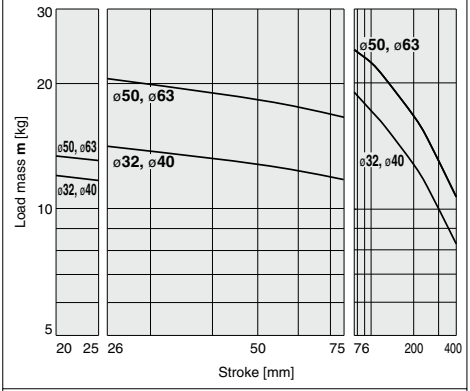
Horizontal Mounting **Ball Bushing**

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

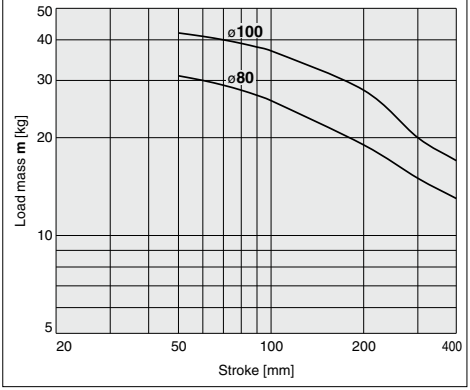
MGPL16 to 25



MGPL32 to 63

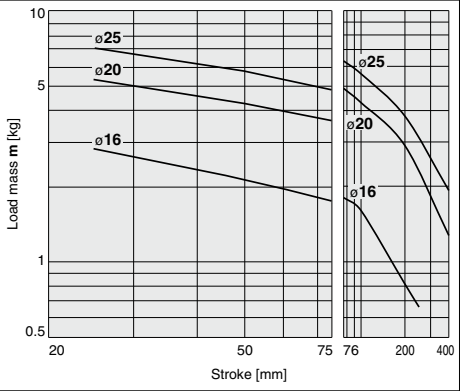


MGPL80/100

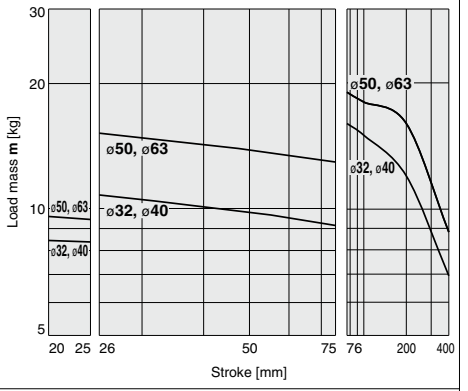


(20) L = 100 mm, V = 200 mm/s or less

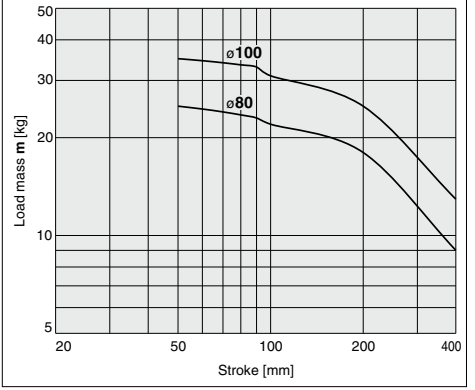
MGPL16 to 25



MGPL32 to 63



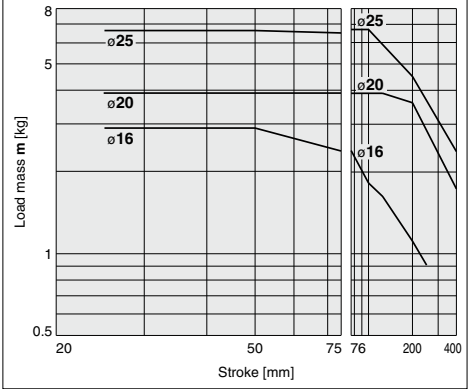
MGPL80/100



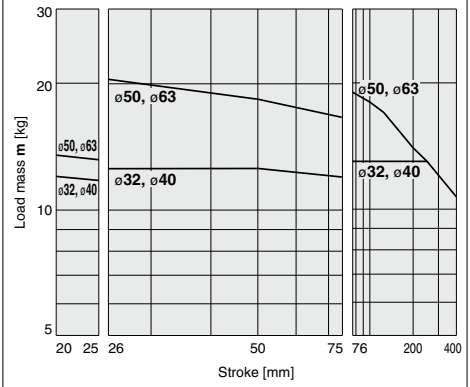
Horizontal Mounting Ball Bushing

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

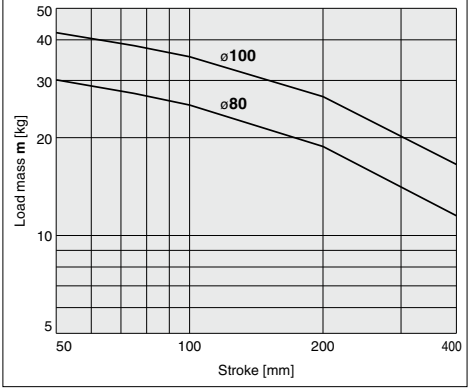
MGPL16 to 25



MGPL32 to 63

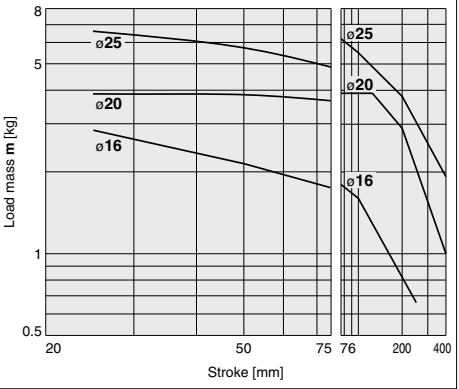


MGPL80/100

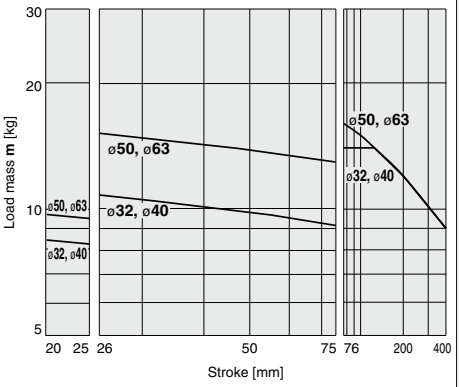


(22) L = 100 mm, V = 400 mm/s

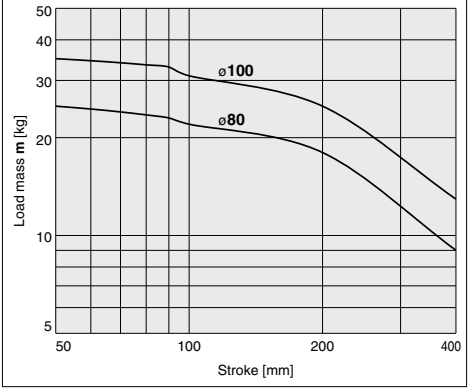
MGPL16 to 25



MGPL32 to 63

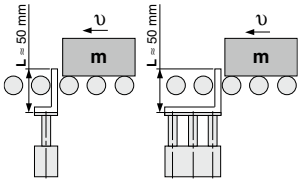


MGPL80/100



Operating Range when Used as Stopper

Bore Size ø16 to ø25/MGPM16 to 25 (Slide Bearing)



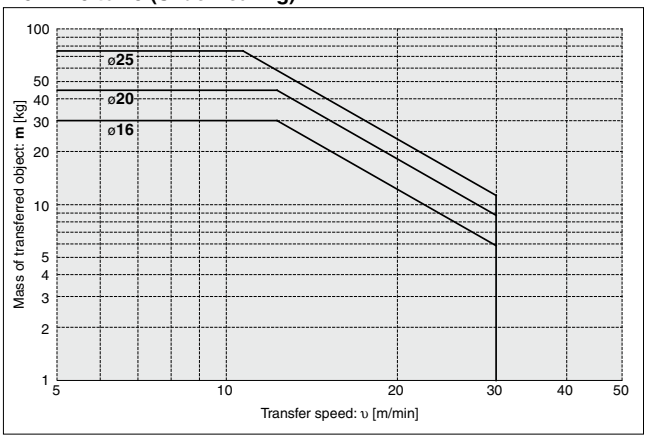
∗: When selecting a model with a longer **L** dimension, be sure to choose a bore size which is sufficiently large.

⚠Caution

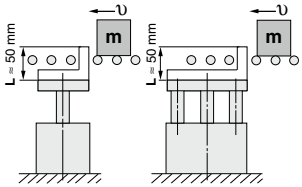
Caution on handling

1. When using as a stopper, select a model with 25 stroke or less.
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 ø32 to ø100/MGPM32 to 100 (Slide Bearing)



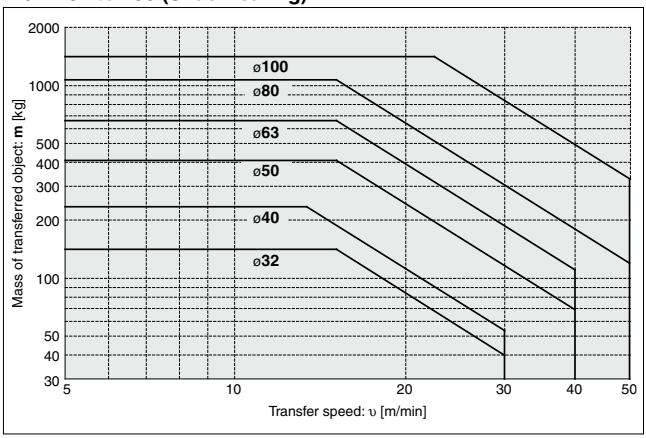
∗: When selecting a model with a longer **L** dimension, be sure to choose a bore size which is sufficiently large.

⚠Caution

Caution on handling

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

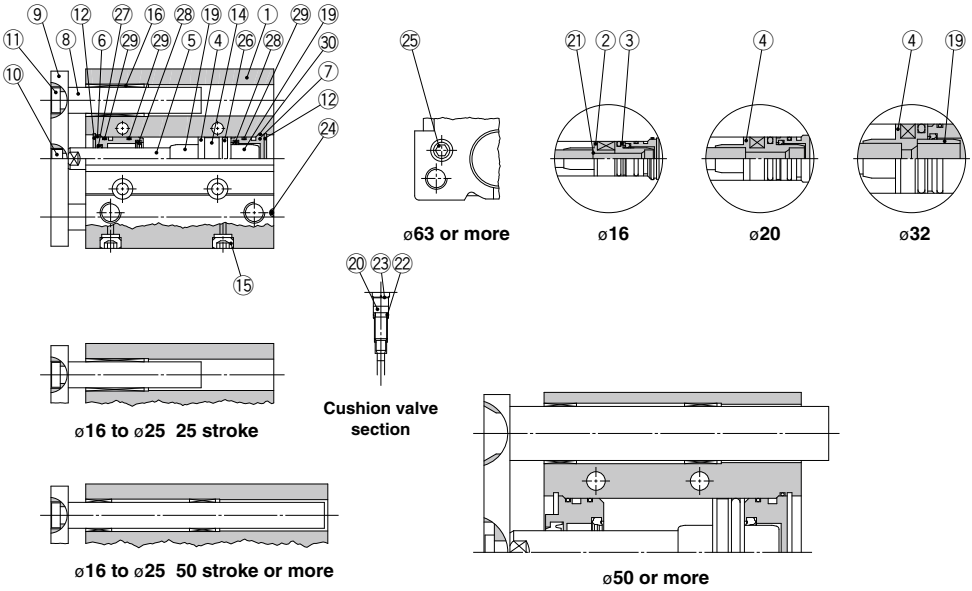
MGPM32 to 100 (Slide Bearing)



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

Construction (With Air Cushion)/MGPM Series

MGPM



Component Parts

No.	Description	Material	Note	
1	**Body**	Aluminum alloy	Hard anodized	
2	**Piston A**	Aluminum alloy	ø16	
3	**Piston B**	Aluminum alloy	ø16	
4	**Piston**	Aluminum alloy	ø20 to ø100	
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

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

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

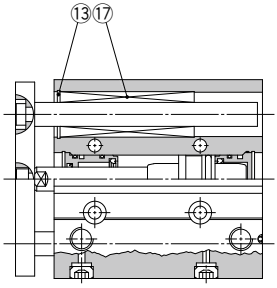
Bore size [mm]	Kit no.	Contents
16	MGP16-AZ-PS	Set of nos. above 26, 27, 28, 29, 30
20	MGP20-AZ-PS	
25	MGP25-AZ-PS	
32	MGP32-AZ-PS	
40	MGP40-AZ-PS	

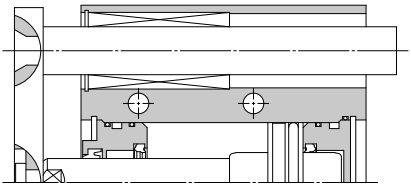
Bore size [mm]	Kit no.	Contents
50	MGP50-AZ-PS	Set of nos. above 26, 27, 28, 29, 30
63	MGP63-AZ-PS	
80	MGP80-AZ-PS	
100	MGP100-AZ-PS	

∗: 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)

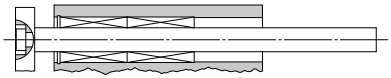
Construction (With Air Cushion)/MGPL Series

MGPL

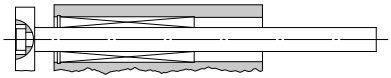




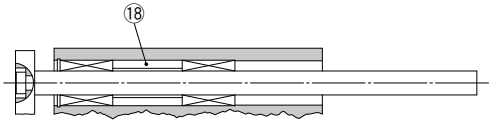
ø50 or more



ø16 75 stroke or less

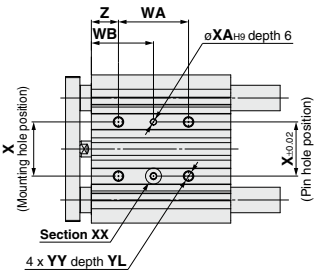


ø20 to ø63 75 stroke or less

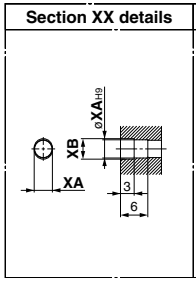


ø16 to ø63 100 stroke or more
ø80, ø100 250 stroke or more

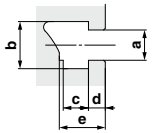
ø16 to ø25/MGPM, MGPL, MGPA (With Air Cushion)



Bottom view

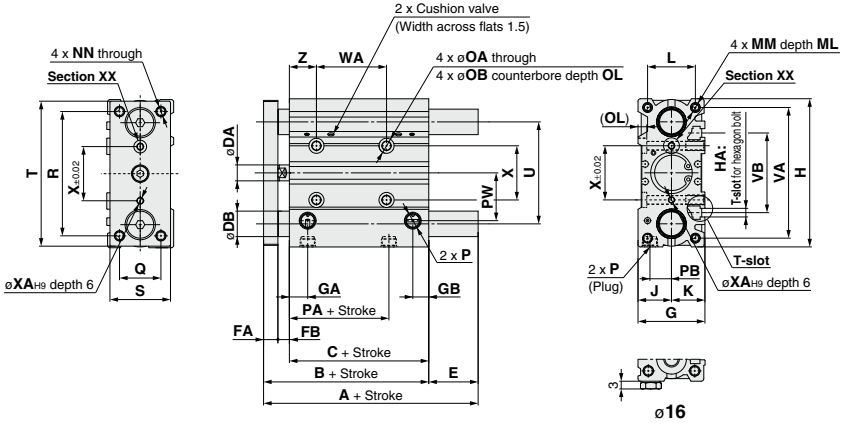


T-slot dimensions



[mm]

Bore size [mm]	a	b	c	d	e
16	4.4	7.4	3.7	2.5	6.7
20	5.4	8.4	4.5	2.8	7.8
25	5.4	8.4	4.5	3	8.2



∗: The use of a slot (width XA, length XB, depth 3) allows for a relaxed pin pitch tolerance, with the pin hole (øXA H9, depth 6) as the reference, without affecting mounting accuracy.
∗: For intermediate strokes other than standard strokes, refer to Manufacture of Intermediate Strokes on page 453.
∗: For bore size 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 452.)

MGPM, MGPL Common Dimensions

[mm]

Bore size [mm]	Standard stroke [mm]	B	C	DA	FA	FB	G	GA	GB	H	HA	J	K	L	MM	ML	NN	OA	OB	OL	P		
																					Nil	TN	TF
16	25, 50, 75, 100, 125, 150, 175, 200, 250	71	58	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	25, 50, 75, 100, 125, 150, 175	78	62	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	200, 250, 300, 350, 400	78.5	62.5	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
											75 st or less	100 to 175 st	200, 250 st	300 st or more	75 st or less	100 to 175 st	200, 250 st	300 st or more						
16	39.5	10	19	16	54	25	62	46	56	38	44	110	200	—	27	60	105	—	24	3	3.5	M5 x 0.8	10	5
20	38.5	10.5	25	18	70	30	81	54	72	44	44	120	200	300	39	77	117	167	28	3	3.5	M6 x 1.0	12	17
25	37.5	13.5	30	26	78	38	91	64	82	50	44	120	200	300	39	77	117	167	34	4	4.5	M6 x 1.0	12	17

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

[mm]

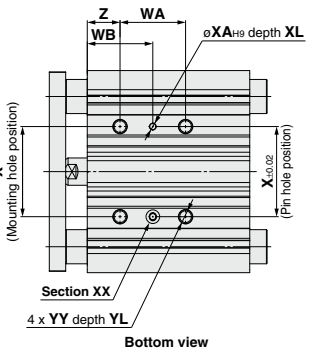
Bore size [mm]	A			DB	E		
	25 to 100 st	125 to 200 st	250 st or more		25 to 100 st	125 to 200 st	250 st or more
16	71	92.5	92.5	10	0	21.5	21.5
20	78	78	110	12	0	0	32
25	78.5	78.5	109.5	16	0	0	31

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

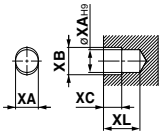
[mm]

Bore size [mm]	A			DB	E		
	25 to 75 st	100 to 200 st	250 st or more		25 to 75 st	100 to 200 st	250 st or more
16	71	94.5	94.5	8	0	23.5	23.5
20	78	100	117.5	10	0	22	39.5
25	81.5	100.5	117.5	13	3	22	39

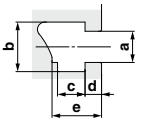
ø32 to ø63/MGPM, MGPL, MGPA (With Air Cushion)



Section XX details

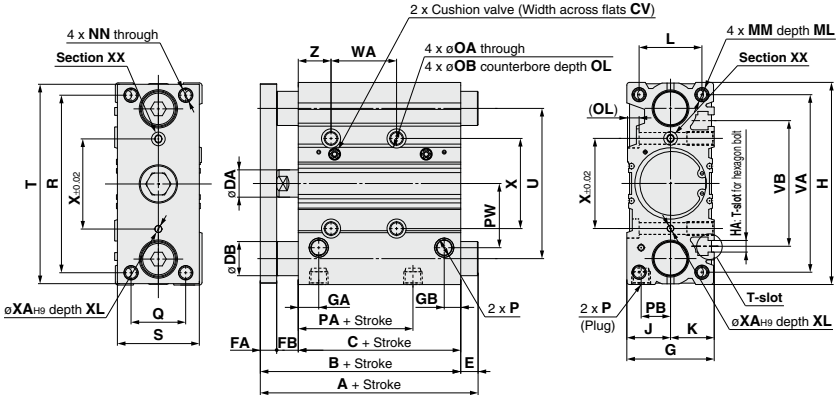


T-slot dimensions



[mm]

Bore size [mm]	a	b	c	d	e
32	6.5	10.5	5.5	3.5	9.5
40	6.5	10.5	5.5	4	11
50	8.5	13.5	7.5	4.5	13.5
63	11	17.8	10	7	18.5



∗: The use of a slot (width XA, length XB, depth XC) allows for a relaxed pin pitch tolerance, with the pin hole (øXAH9, depth XL) as the reference, without affecting mounting accuracy.
∗: For intermediate strokes other than standard strokes, refer to Manufacture of Intermediate Strokes on page 453.
∗: Choice of Rc, NPT, G port is available. (Refer to page 452.)

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

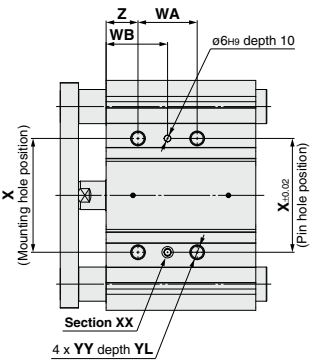
MGPM (Slide bearing)/A, DB, E Dimensions [mm]

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

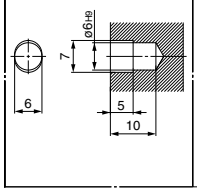
MGPL (Ball bushing)
MGPA (High precision ball bushing)/A, DB, E Dimensions [mm]

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

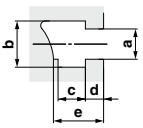
ø80, ø100/MGPM, MGPL, MGPA (With Air Cushion)



Section XX details

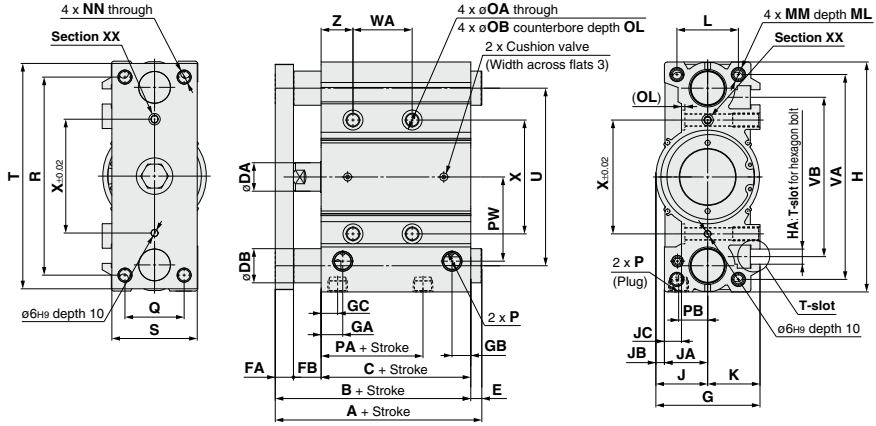


T-slot dimensions



[mm]

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



∗: The use of a slot (width X6, length 7, depth 5) allows for a relaxed pin pitch tolerance, with the pin hole (ø6H9, depth 10) as the reference, without affecting mounting accuracy.
∗: For intermediate strokes other than standard strokes, refer to Manufacture of Intermediate Strokes on page 453.
∗: Choice of Rc, NPT, G port is available. (Refer to page 452.)

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

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

[mm]

Bore size [mm]	A		DB	E	
	50 to 200 st	250 st or more		50 to 200 st	250 st or more
80	131.5	180.5	30	10	59
100	151.5	190.5	36	10.5	49.5

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

[mm]

Bore size [mm]	A		DB	E	
	50 to 200 st	250 st or more		50 to 200 st	250 st or more
80	158.5	191.5	25	37	70
100	178.5	201.5	30	37.5	60.5