

Low Profile Guide Cylinder with Lock

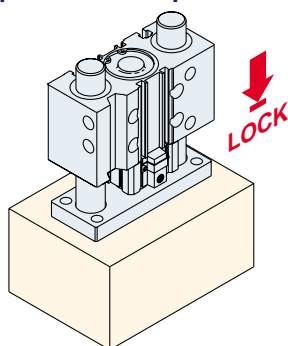
Series *MLGP*

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

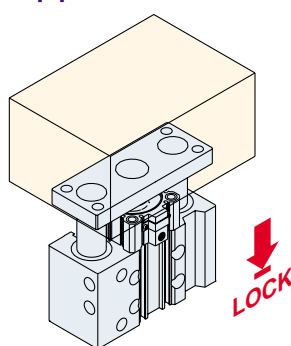


Drop prevention when supply pressure falls or residual pressure is released

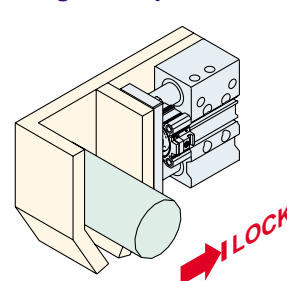
Drop prevention for press fitting jig



Drop prevention for lifter



Holding a clamped condition



Locking is possible at any

Can be locked at any desired position

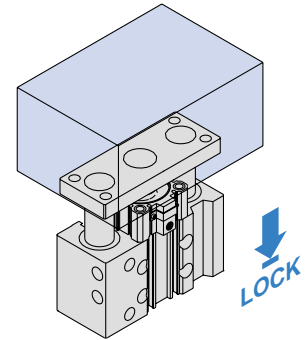
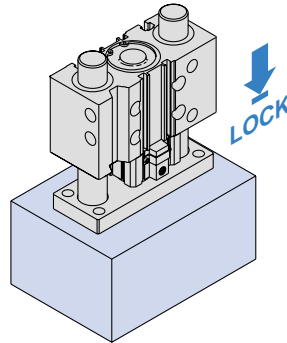
- Drop prevention for mid-stroke emergency stops
- Locking position can be changed to accommodate external stopper positions and thickness of clamped work pieces

← Extension locking

→ Retraction locking

Drop prevention for press fitting jig

Drop prevention for lifter

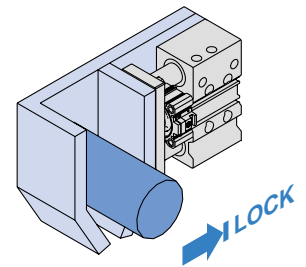


Holding a clamped condition

Low Profile Guide Cylinder with Lock

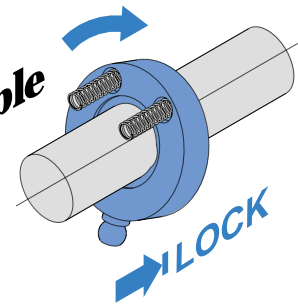
Series *MLGP*

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



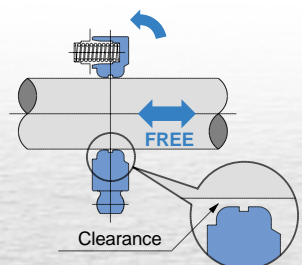
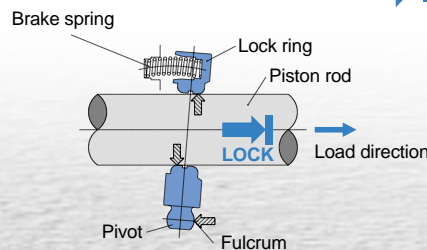
Simple construction

Simple and reliable locking system



Locked

Unlocked



Unlocking port: Air exhausted

1. The lock ring is tilted by the spring force.
2. The tilting is increased by the load and the piston rod is securely locked.

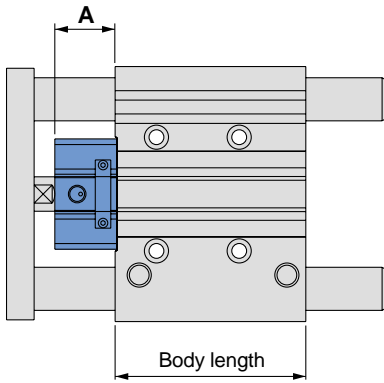
Unlocking port: Air supplied

1. The lock ring becomes perpendicular to the piston rod, creating clearance between the piston rod and lock ring, which allows the piston rod to move freely.

position within the entire stroke

Low profile with compact lock unit

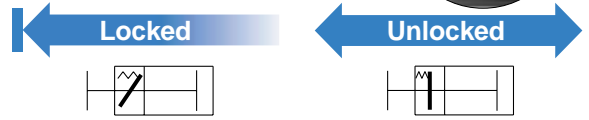
Lock unit length: A/26.5mm to 51.5mm



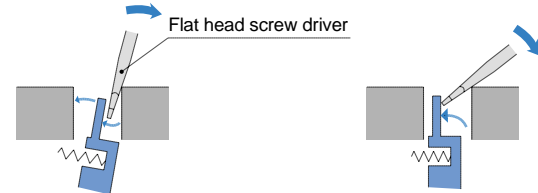
Bore size (mm)	A (mm)
20	26.5
25	30.5
32	31.5
40	34
50	35
63	38
80	43
100	51.5

Body length is the same as the standard MGP

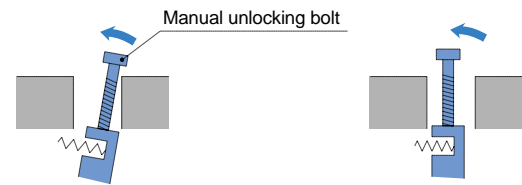
Easy manual unlocking



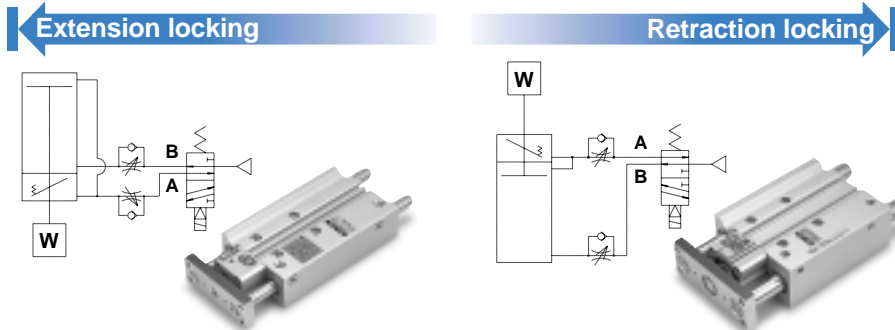
Ø40 to Ø100



Ø20 to Ø32



Locking direction is selectable



Two types of guide rod bearing for different applications

Slide bearing

Excellent wear resistance allows use with high loads.

Ball bushing

Provides high precision and smooth operation.

Four types of mounting

- Easy positioning
- Knock pin holes provided on each mounting surface

Top mount Side mount
Side mount using T-slot
Bottom mount

Wide variations from Ø20 to Ø100

Series	Bearing	Locking direction	Bore size (mm)	Standard stroke (mm)													
				20	25	30	40	50	75	100	125	150	175	200	250	300	350
MLGP	Slide bearing	Extension locking	20	•		•	•	•	•	•	•	•	•	•	•	•	•
			25	•		•	•	•	•	•	•	•	•	•	•	•	•
		32		•			•	•	•	•	•	•	•	•	•	•	•
		40		•			•	•	•	•	•	•	•	•	•	•	•
	Ball bushing	Retraction locking	50		•			•	•	•	•	•	•	•	•	•	•
			63		•			•	•	•	•	•	•	•	•	•	•
		80		•			•	•	•	•	•	•	•	•	•	•	•
		100					•	•	•	•	•	•	•	•	•	•	•



Features 2

Series MLGP Model Selections

Model Selection Precautions

⚠ Caution

1. To prevent exceeding the maximum speed during the selection, be sure to adjust the speed controller so that moving the entire load transfer distance takes no less than the transfer time.
2. For an intermediate stroke product with spacers installed, select using the base model stroke.

Step 1 Find the maximum load speed V.

Find the maximum load speed V [mm/s] with formula (1) below.

The maximum load speed V [mm/s] is approximately equal to $V_1 \times 1.4 \dots (1)$

V_1 : Average load speed [mm/s]

$$V_1 = st/t$$

st : Load transfer distance [mm]

t : Load transfer time [s]

Step 2 Find the cylinder bore size.

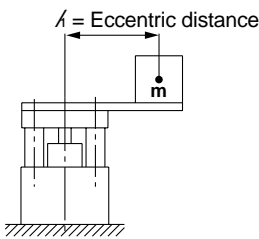
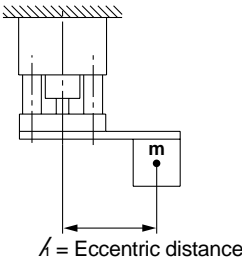
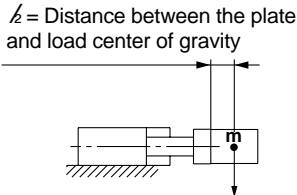
1. For vertical mounting

- (1) From Table 1, find applicable selection graphs based on the maximum load speed "V", mounting orientation, and bearing type.
- (2) From the graphs chosen in (1), select the appropriate graph based on the stroke, and then find the intersecting point of the load weight "m" and eccentric distance " λ ".
- (3) Compare the intersecting point with the line chart for the operating pressure "P". Select the bore size from the line chart above the intersecting point.

2. For horizontal mounting

- (1) From Table 1, find applicable selection graphs based on the maximum load speed "V" and bearing type.
- (2) From the graphs chosen in (1), select the appropriate graph based on the distance " λ " between the plate and load center of gravity, then find the intersecting point of the load weight "m" and stroke.
- (3) Compare the intersecting point with the line chart. Select the bore size from the line chart above the intersecting point.

Selecting Conditions/Table 1

	Vertical				Horizontal	
	Upward facing		Downward facing			
Mounting orientation						
Maximum load speed V	50 to 200mm/s	201 to 400mm/s	50 to 200mm/s	201 to 400mm/s	50 to 200mm/s	201 to 400mm/s
Graph (Slide bearing type)	1, 2	3, 4	13, 14	15, 16	25, 26	27, 28
Graph (Ball bushing type)	5 to 8	9 to 12	17 to 20	21 to 24	29, 30	31, 32

Selection Example 1 (Vertical Upward Mounting)

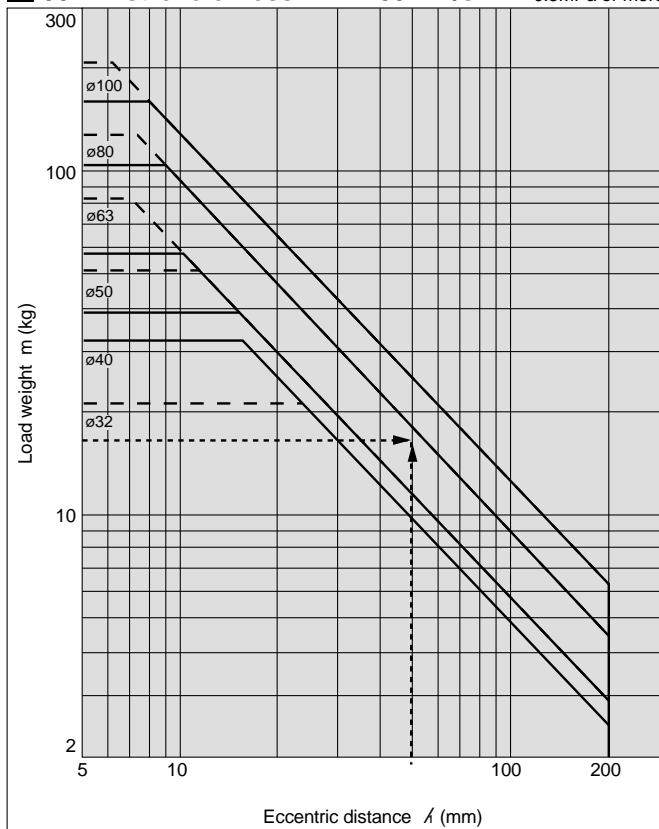
Selecting conditions

- Mounting:** Vertical upward facing
- Bearing type:** Ball bushing
- Stroke:** 50mm
- Load transfer time t:** 0.5s
- Load weight m:** 15kg
- Eccentric distance λ :** 50mm
- Operating pressure P:** 0.5MPa

Step 1: Find the maximum load speed "V" from formula (1).
Based on the stroke (load transfer distance) of 50mm and load transfer time of 0.5s, the maximum load speed is approximately equal to $50/0.5 \times 1.4$, which is approximately 140mm/s.

Step 2: Based on the maximum load speed found in Step 1, mounting orientation, and guide type, graphs 5 to 8 are selected. Then, based on the 50mm stroke, graph 7 is selected from the group. Find the intersecting point of the load weight of 15kg and the eccentric distance of 50mm. Since the operating pressure is 0.5MPa, the bore size of $\phi 80$ mm, model MLGPL80-50-B, is selected.

7 50mm stroke or less $V = 200\text{mm/s}$ — 0.4MPa
--- 0.5MPa or more



Selection Example 2 (Horizontal Mounting)

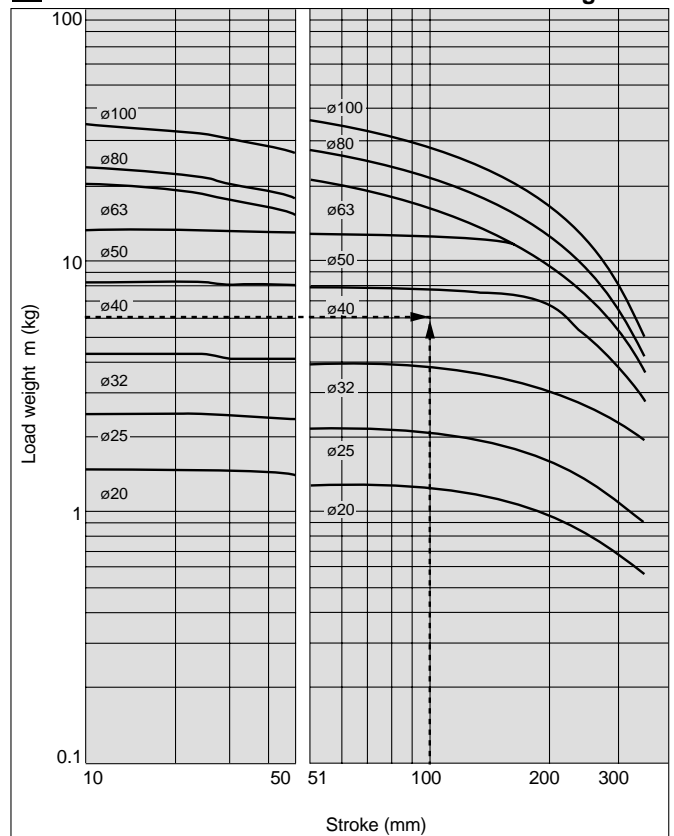
Selecting conditions

- Mounting:** Horizontal
- Bearing type:** Slide bearing
- Stroke:** 100mm
- Load transfer time t:** 0.5s
- Load weight m:** 6kg
- Eccentric distance between the plate and load center of gravity λ :** 50mm
- Operating pressure P:** 0.4MPa

Step 1: Find the maximum load speed "V" from formula (1).
Based on the stroke (load transfer distance) of 100mm and load transfer time of 0.5s, the maximum load speed is approximately equal to $100/0.5 \times 1.4$, which is approximately 280mm/s.

Step 2: Based on the maximum load speed found in Step 1, mounting orientation, and guide type, graphs 27 and 28 are selected. Then, based on the distance of 50mm between the plate and load center of gravity, graph 27 is selected from the two graphs. Find the intersecting point of the load weight of 6kg and the 100mm stroke. The bore size of $\phi 40$ mm, model MLGPM40-50-□, is selected.

27 $\lambda = 50\text{mm}$ $V = 400\text{mm/s}$ Horizontal mounting



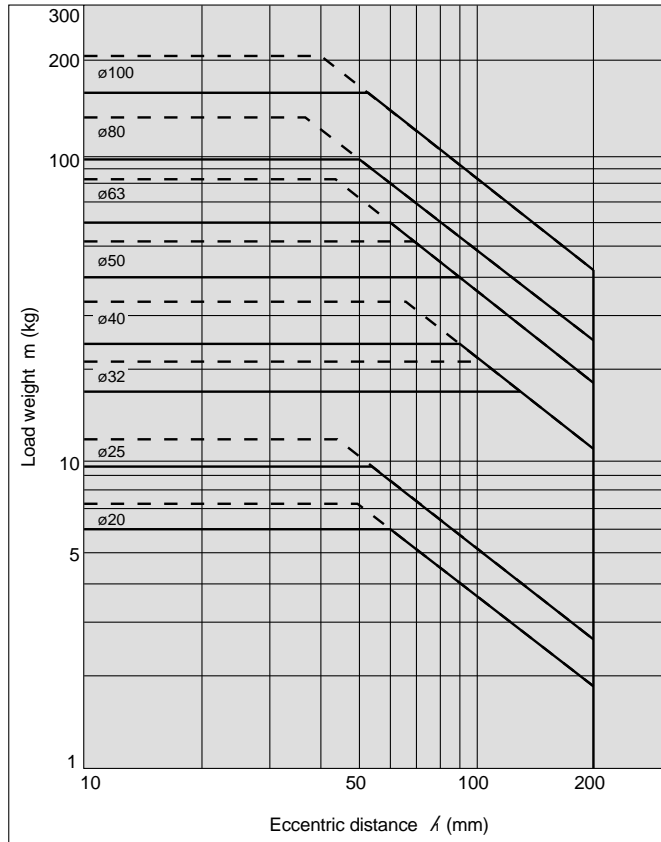
Series MLGP

Vertical Upward Mounting Slide Bearing

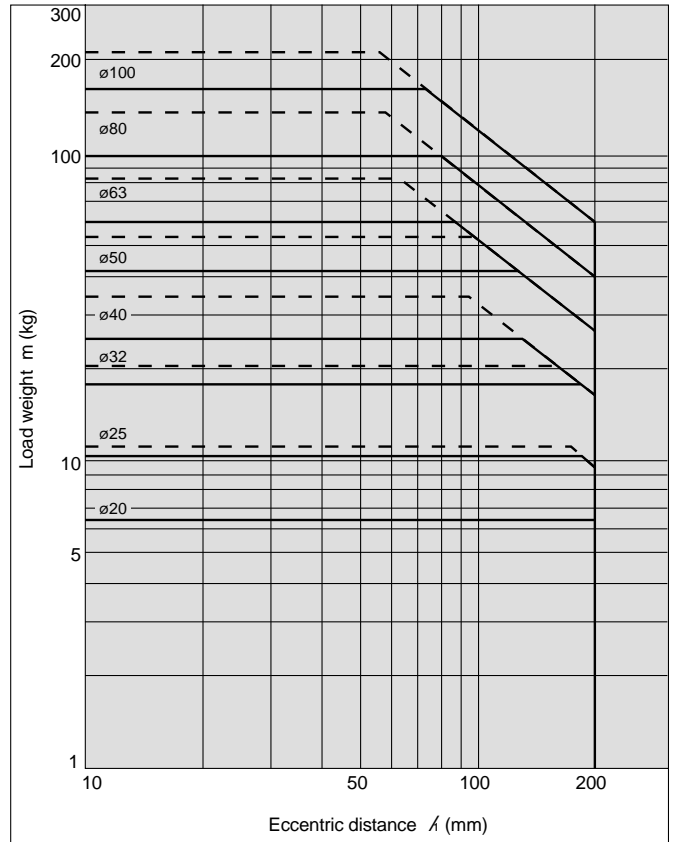
— Operating pressure: 0.4MPa
 - - - - - Operating pressure: 0.5MPa or more

MLGPM20 to 100

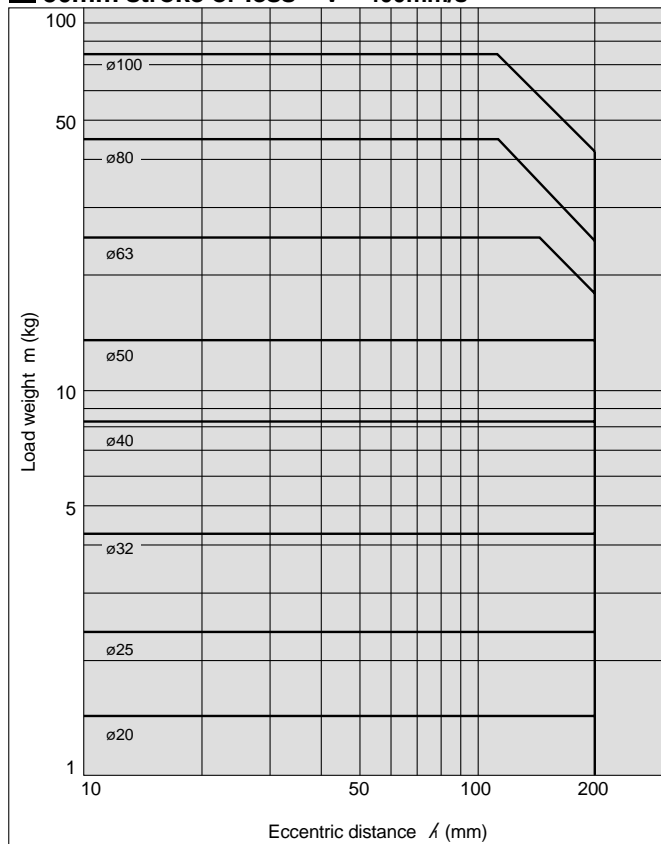
1 50mm stroke or less V = 200mm/s



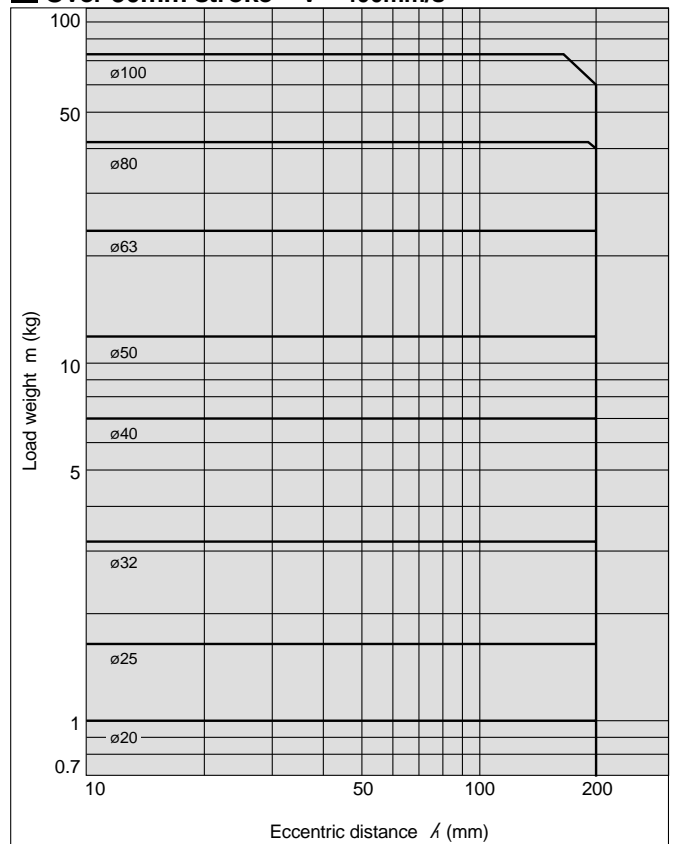
2 Over 50mm stroke V = 200mm/s



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



4 Over 50mm stroke V = 400mm/s

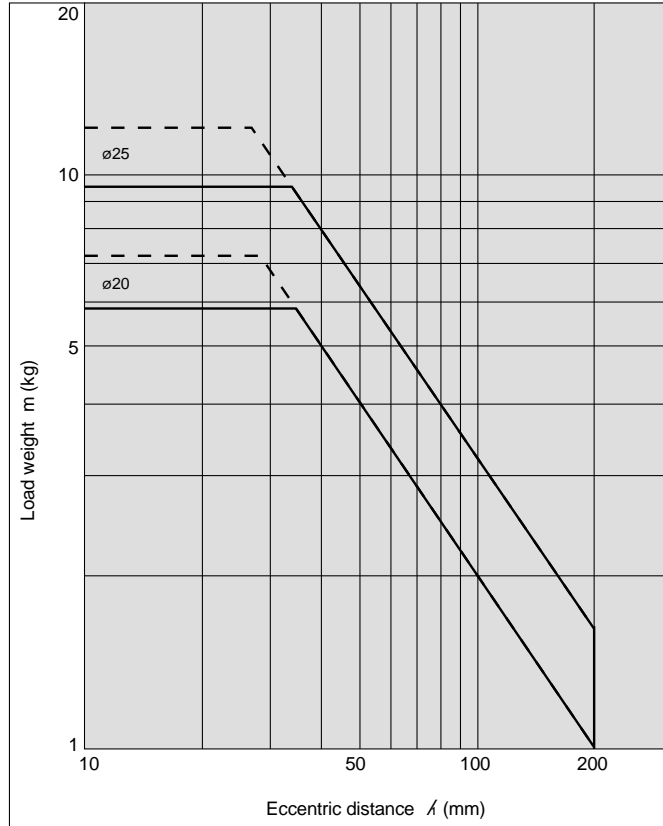


Vertical Upward Mounting **Ball Bushing**

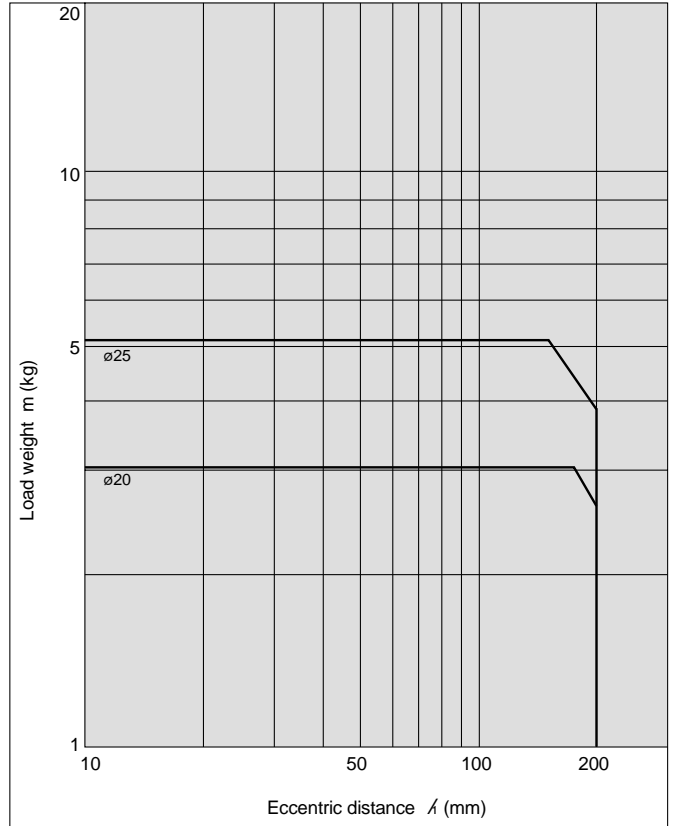
—— Operating pressure: 0.4MPa
 - - - - Operating pressure: 0.5MPa or more

MLGPL20, 25

5 30mm stroke or less V = 200mm/s

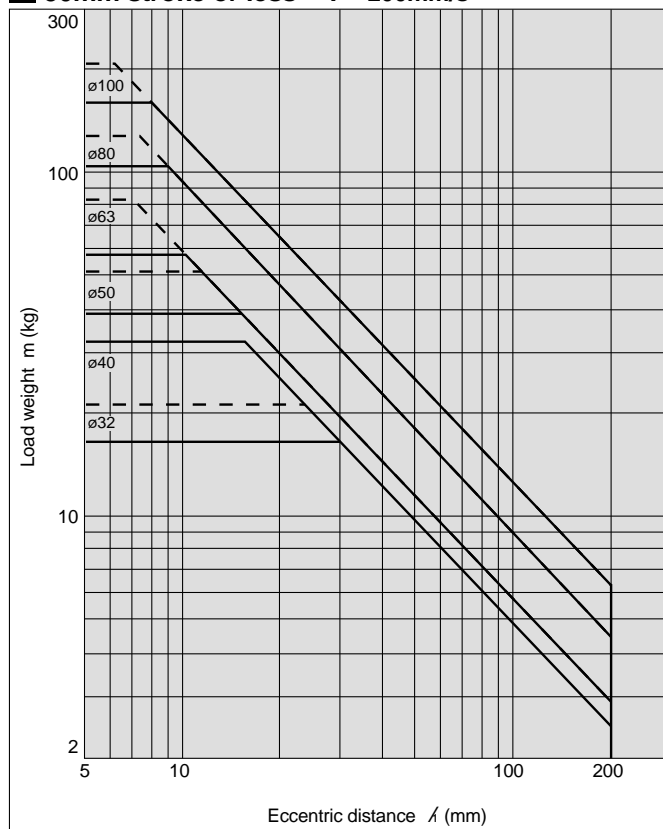


6 Over 30mm stroke V = 200mm/s

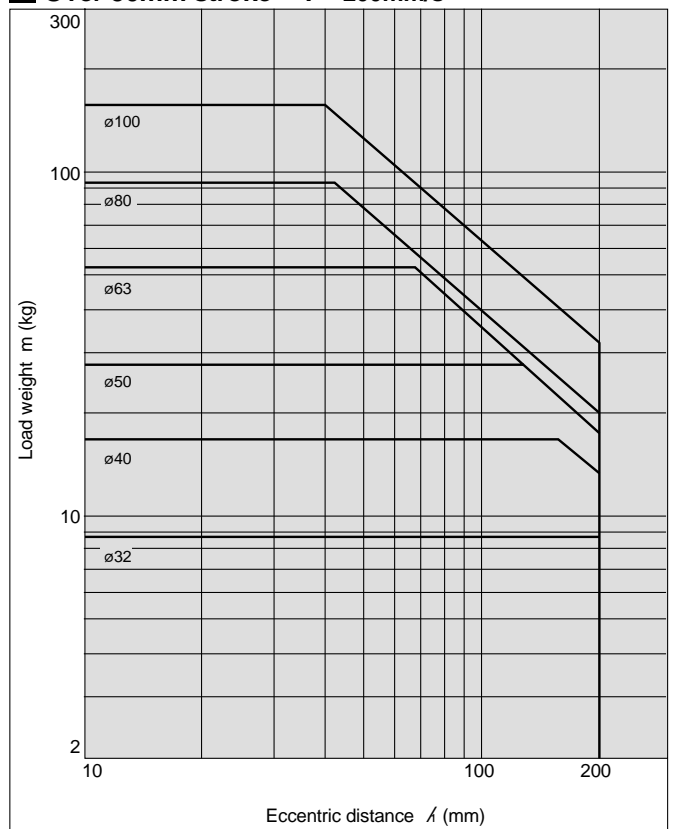


MLGPL32 to 100

7 50mm stroke or less V = 200mm/s



8 Over 50mm stroke V = 200mm/s



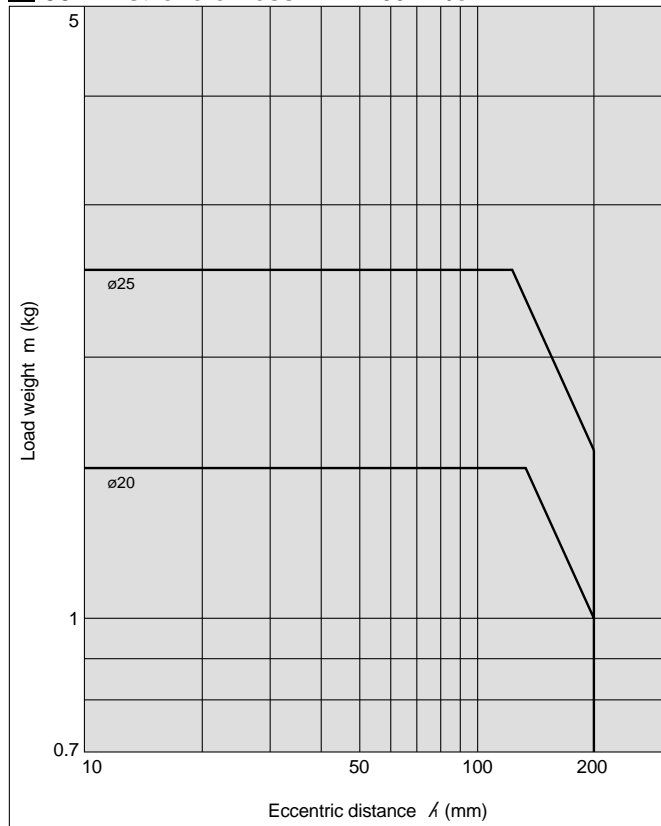
Series MLGP

Vertical Upward Mounting **Ball Bushing**

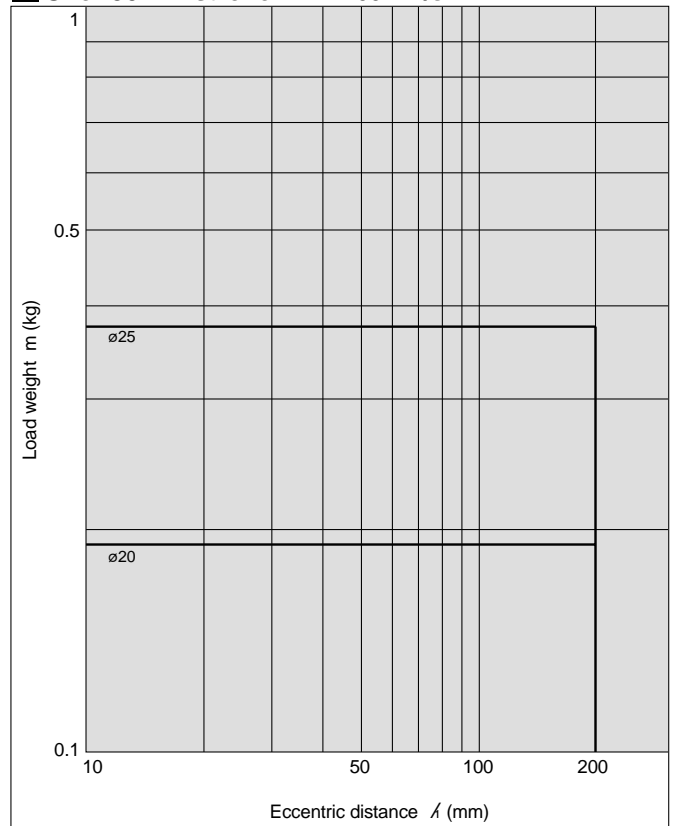
Operating pressure: 0.4MPa

MLGPL20, 25

9 30mm stroke or less V = 400mm/s

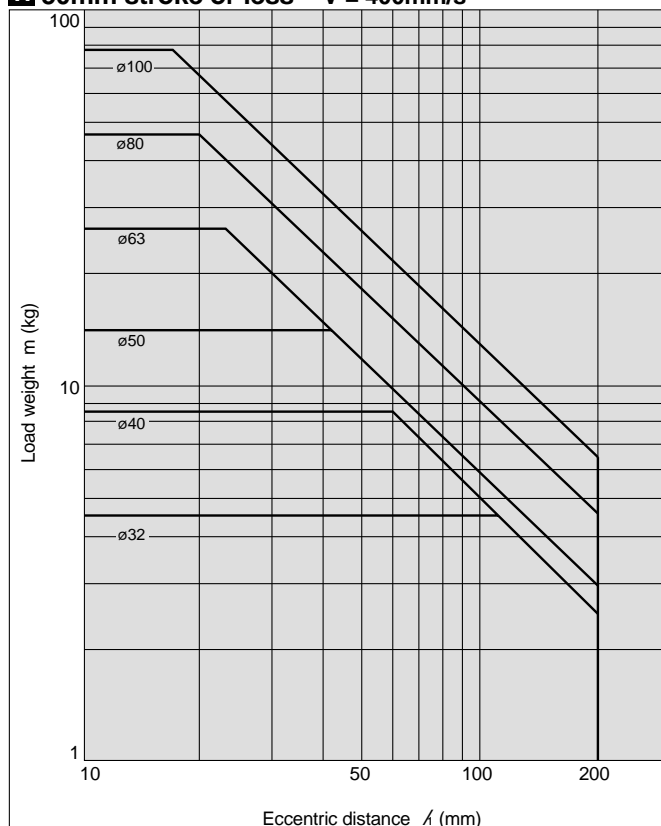


10 Over 30mm stroke V = 400mm/s

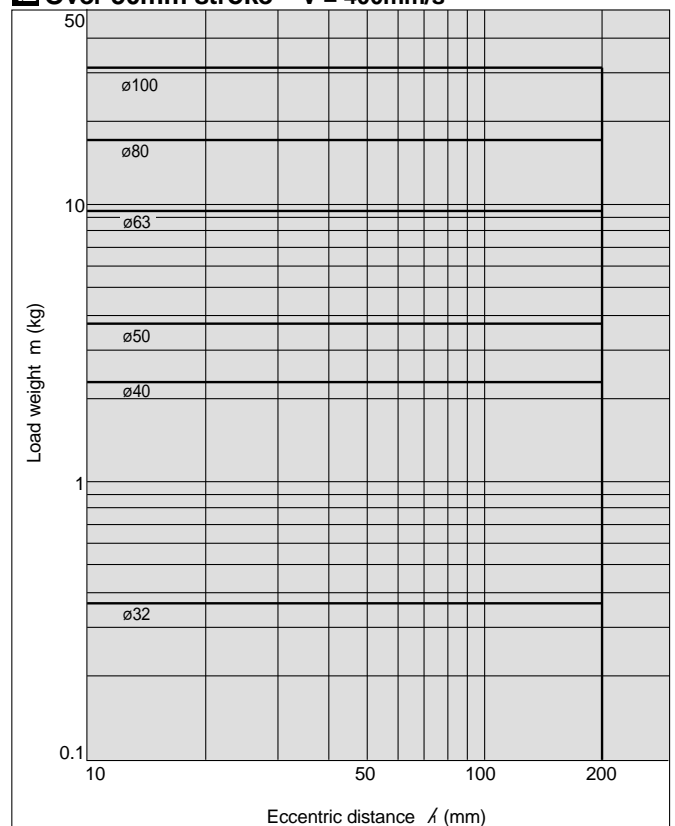


MLGPL32 to 100

11 50mm stroke or less V = 400mm/s



12 Over 50mm stroke V = 400mm/s

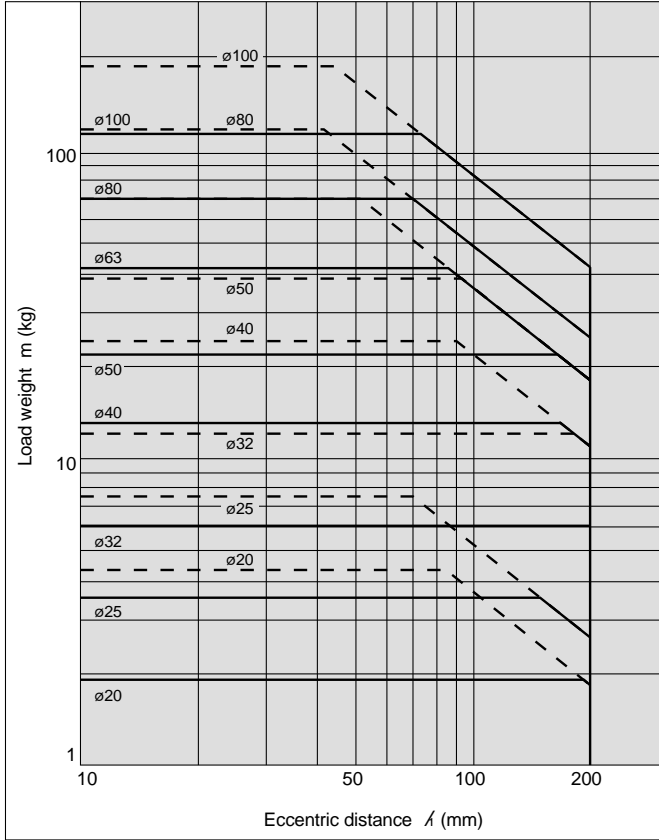


Vertical Downward Mounting **Slide Bearing**

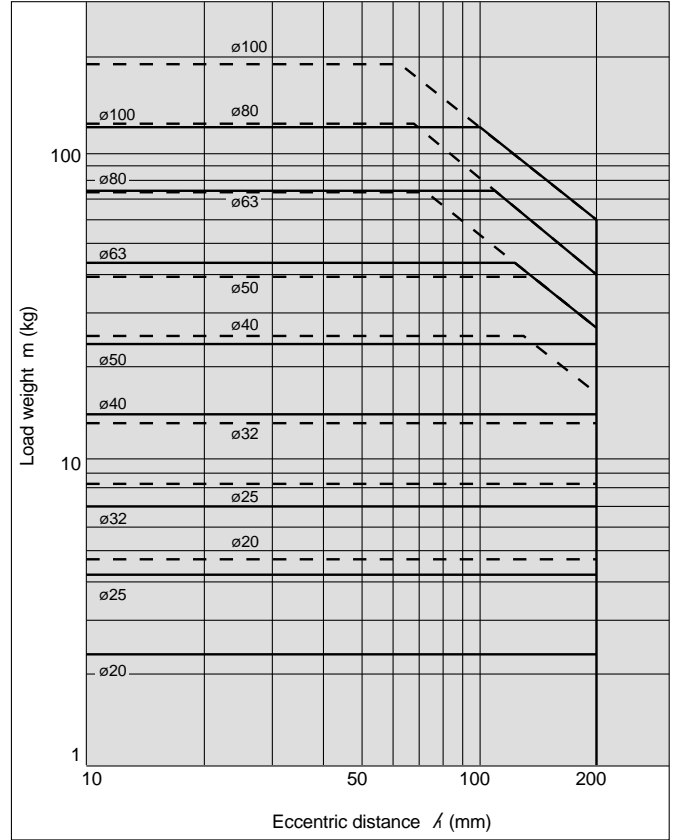
— Operating pressure: 0.4MPa
 - - - - - Operating pressure: 0.5MPa or more

MLGPM20 to 100

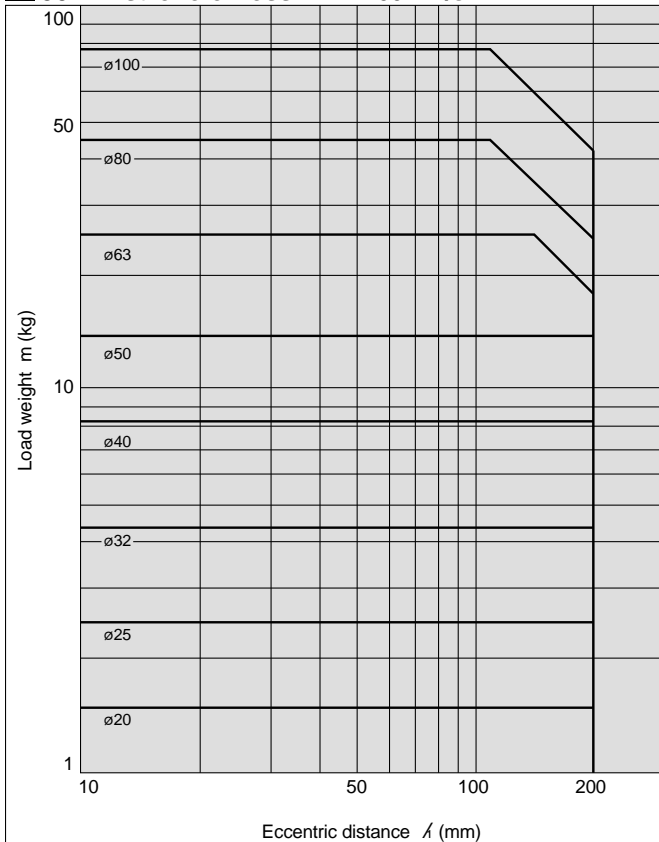
13 50mm stroke or less V = 200mm/s



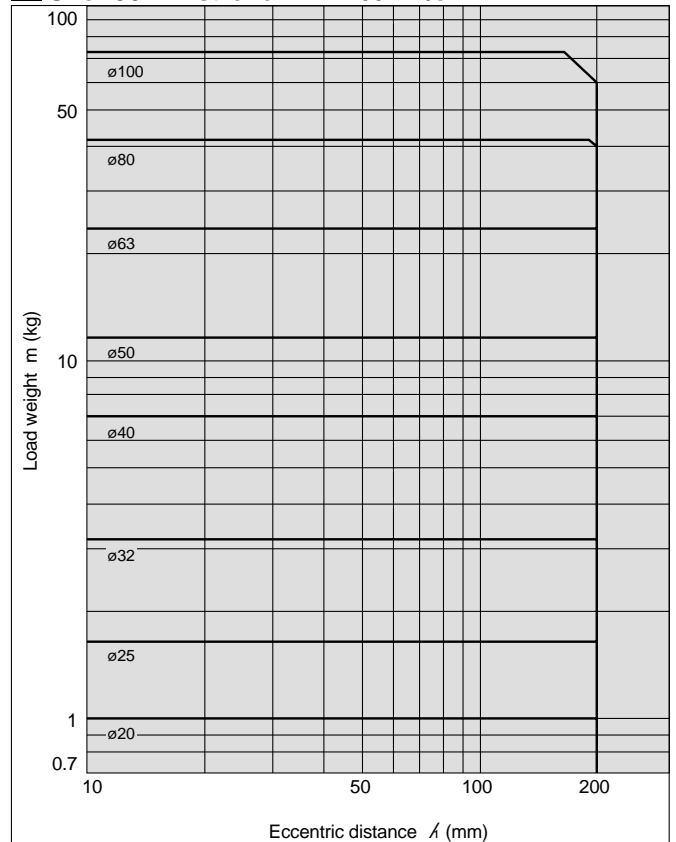
14 Over 50mm stroke V = 200mm/s



15 50mm stroke or less V = 400mm/s



16 Over 50mm stroke V = 400mm/s



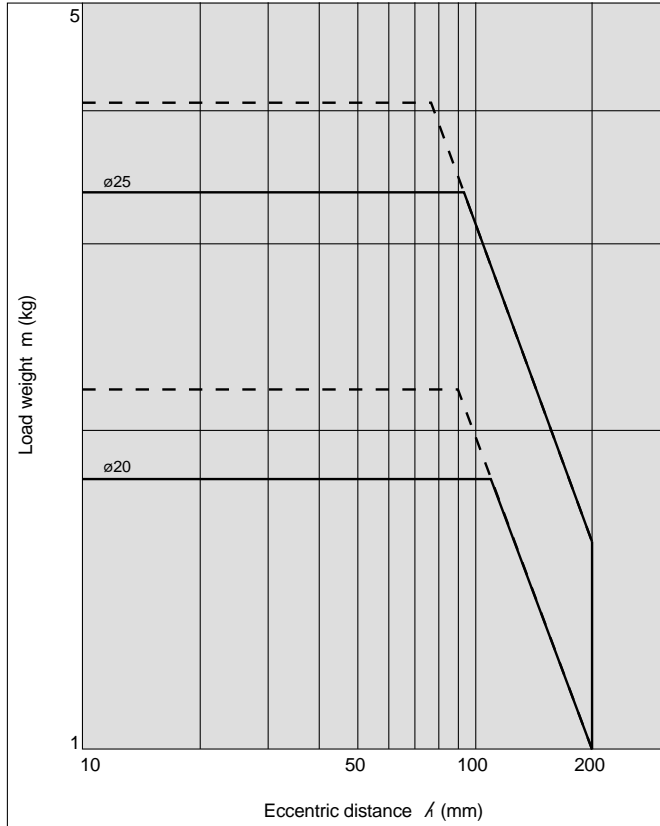
Series MLGP

Vertical Downward Mounting **Ball Bushing**

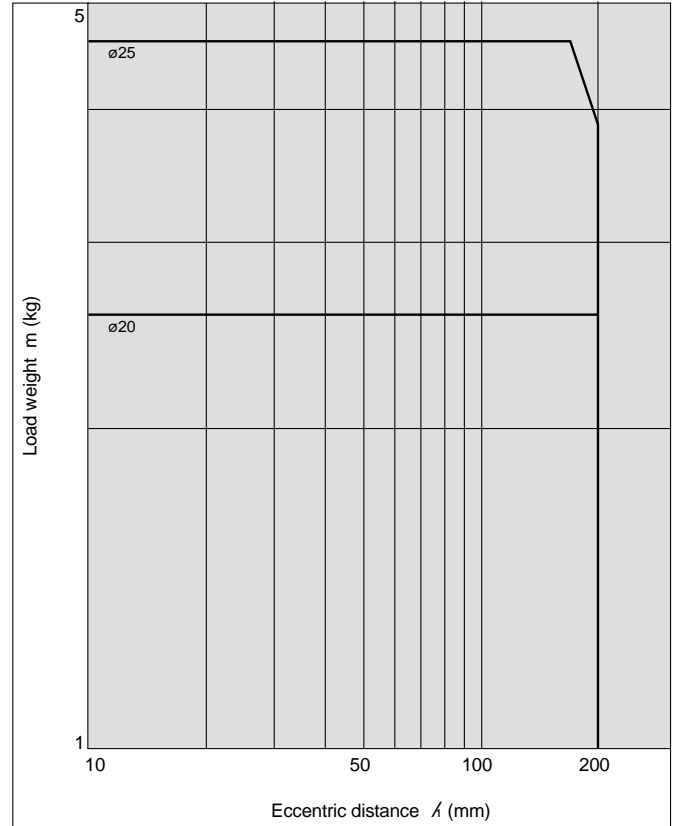
—— Operating pressure: 0.4MPa
 - - - - Operating pressure: 0.5MPa or more

MLGPL20, 25

17 30mm stroke or less V = 200mm/s

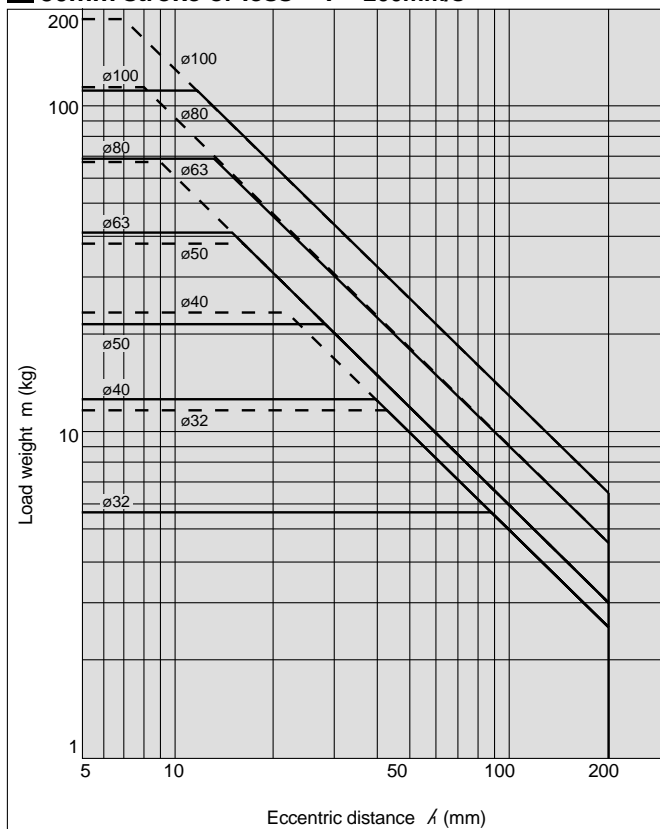


18 Over 30mm stroke V = 200mm/s

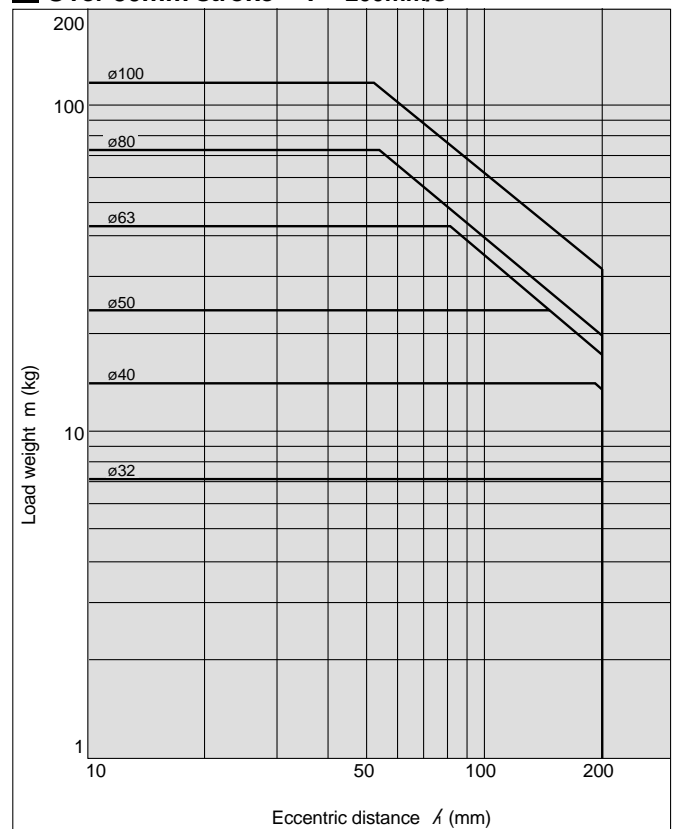


MLGPL32 to 100

19 50mm stroke or less V = 200mm/s



20 Over 50mm stroke V = 200mm/s

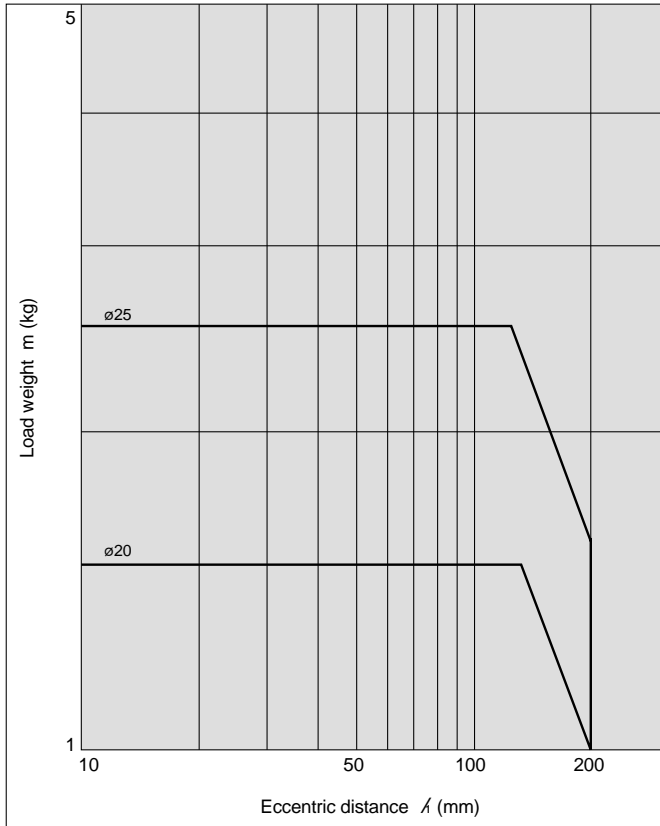


Vertical Downward Mounting **Ball Bushing**

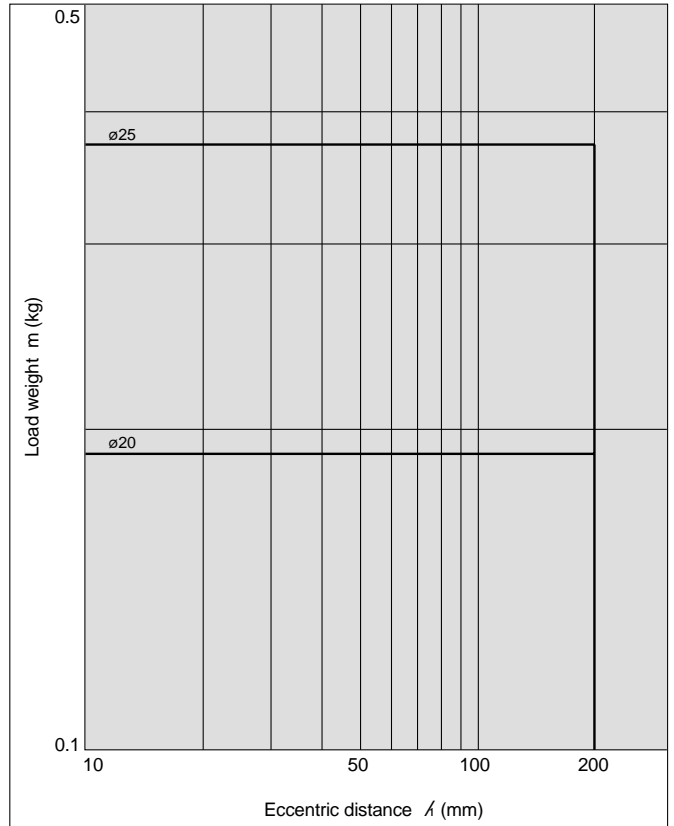
— Operating pressure: 0.4MPa

MLGPL20, 25

21 30mm stroke or less V = 400mm/s

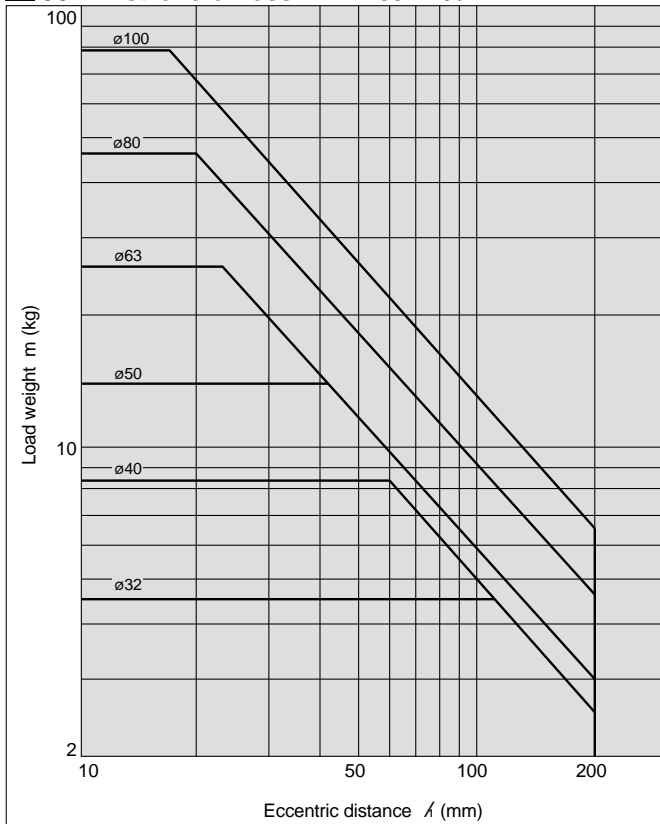


22 Over 30mm stroke V = 400mm/s

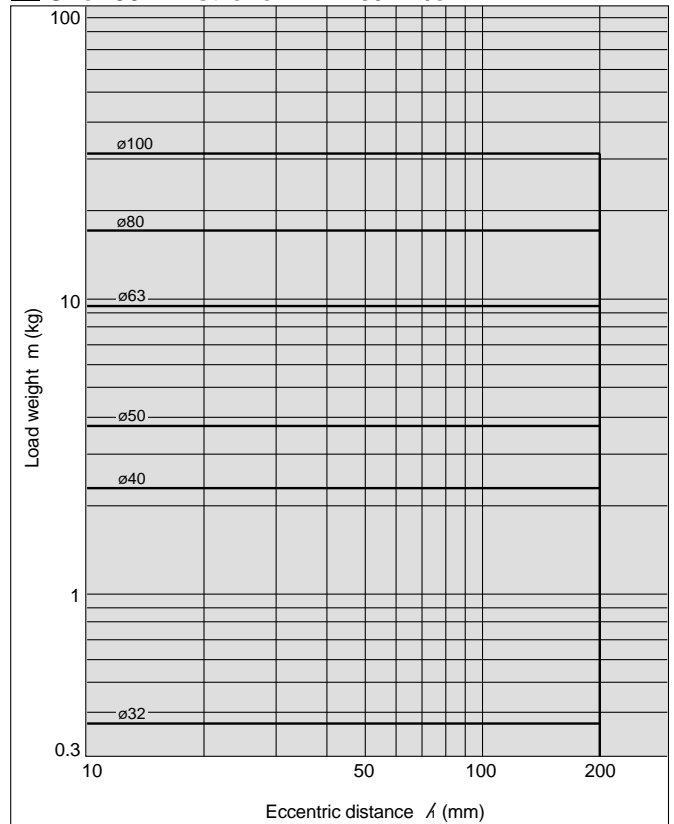


MLGPL32 to 100

23 50mm stroke or less V = 400mm/s



24 Over 50mm stroke V = 400mm/s

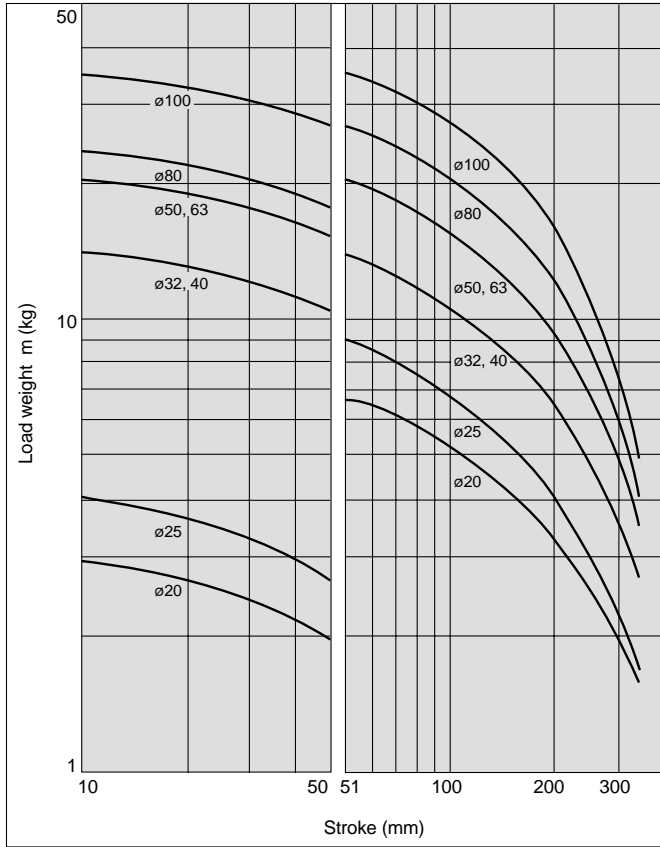


Series MLGP

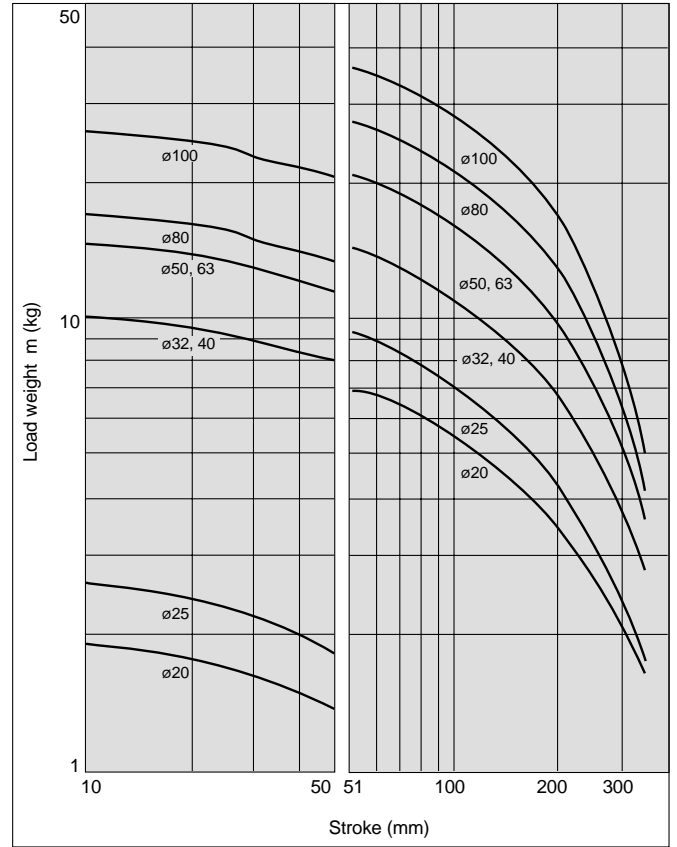
Horizontal Mounting **Slide Bearing**

MLGPM20 to 100

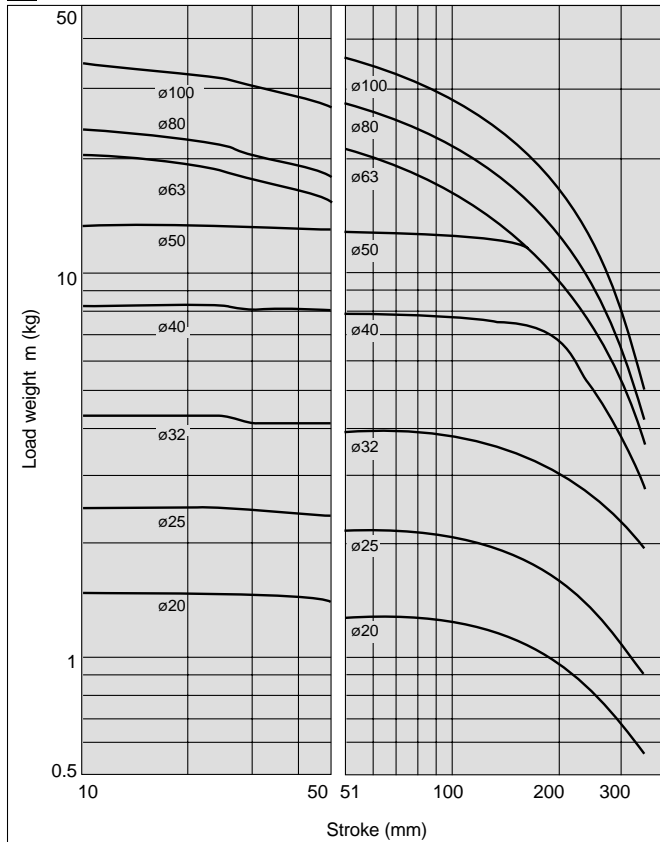
25 $l = 50\text{mm}$ $V = 200\text{mm/s}$



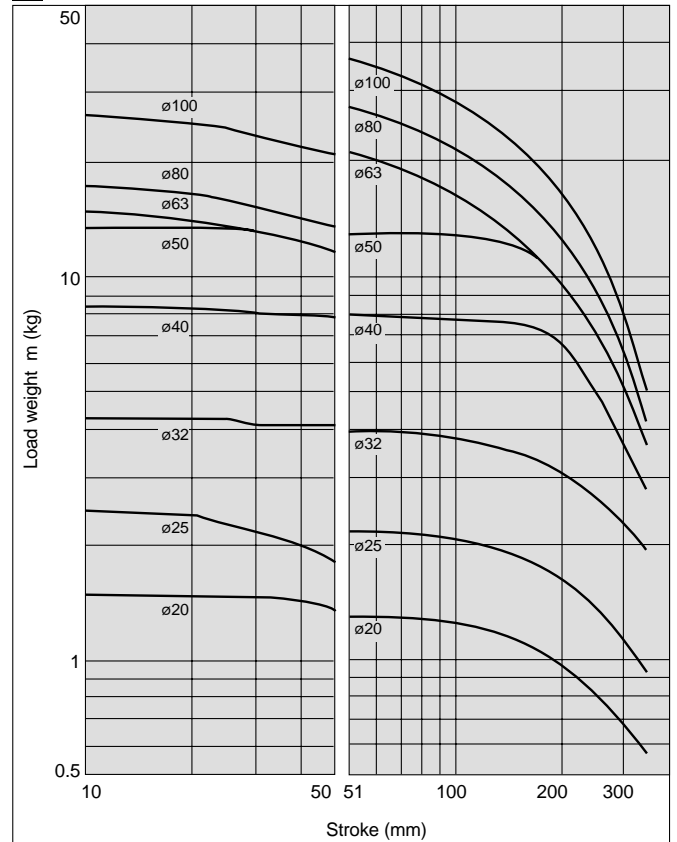
26 $l = 100\text{mm}$ $V = 200\text{mm/s}$



27 $l = 50\text{mm}$ $V = 400\text{mm/s}$

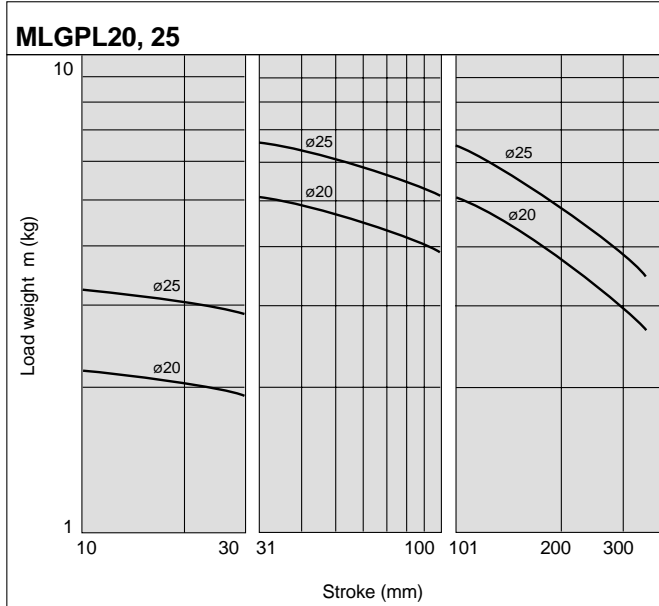


28 $l = 100\text{mm}$ $V = 400\text{mm/s}$

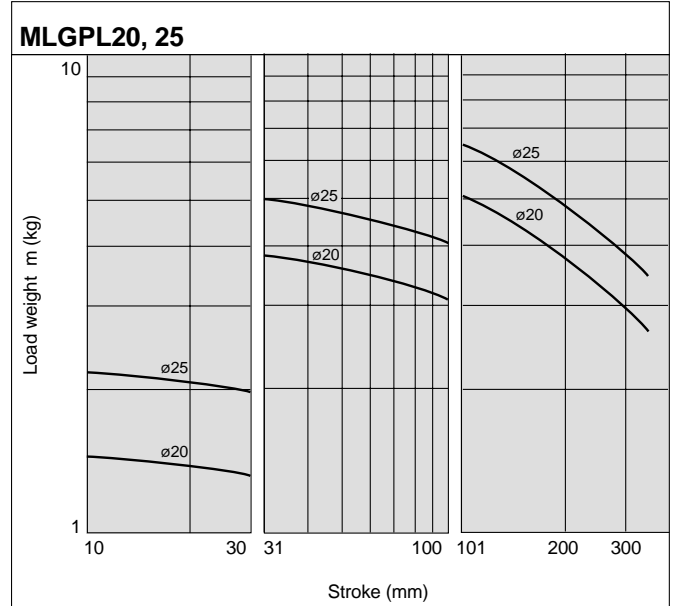


Horizontal Mounting **Ball Bushing**

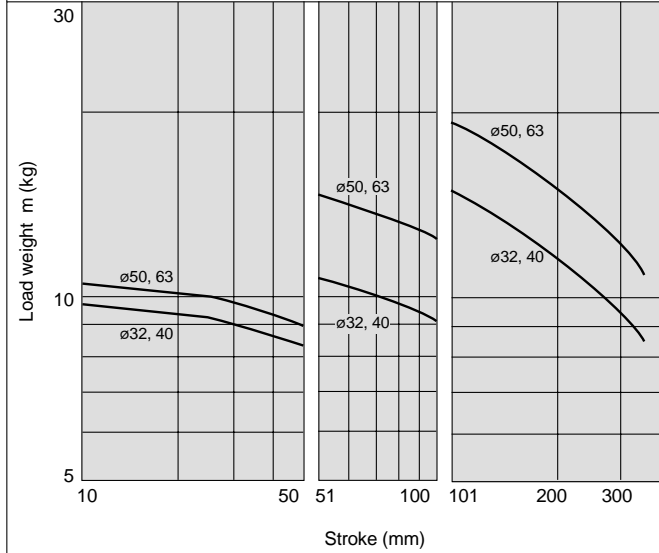
29 $l = 50\text{mm}$, $V = 200\text{m/s}$



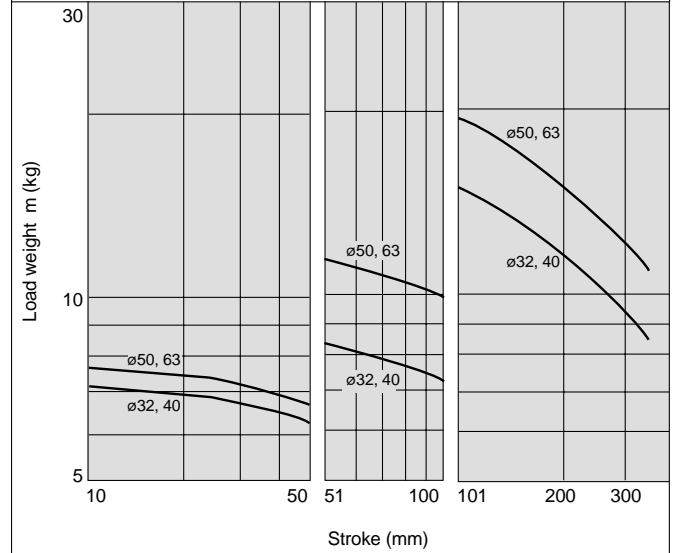
30 $l = 100\text{mm}$, $V = 200\text{m/s}$



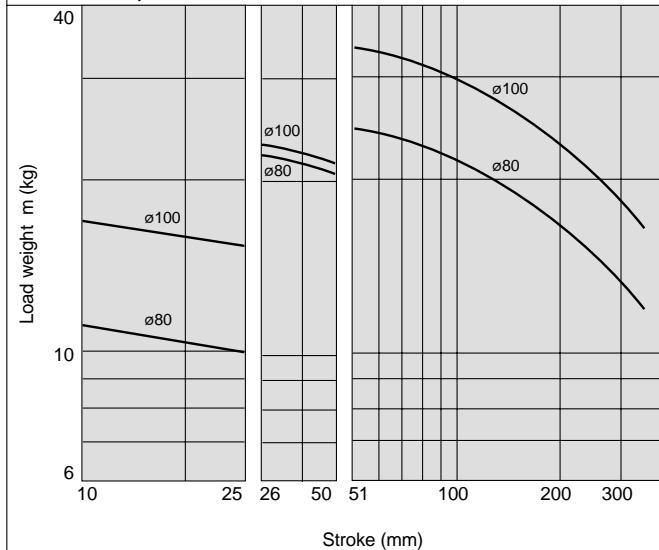
MLGPL32 to 63



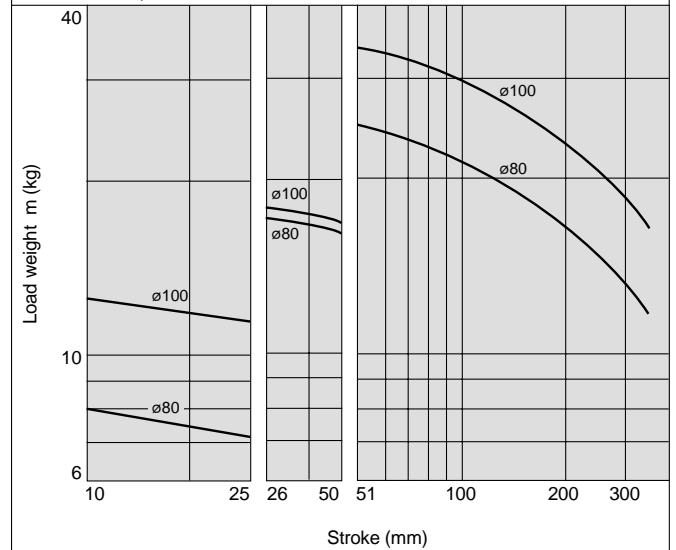
MLGPL32 to 63



MLGPL80, 100



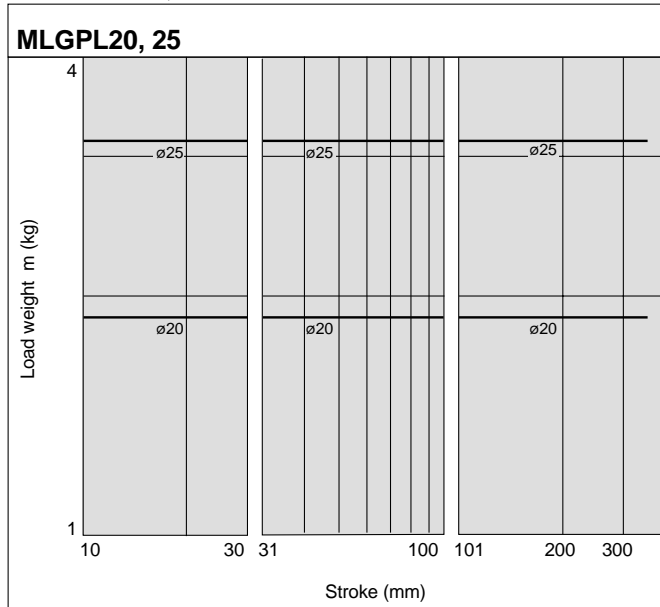
MLGPL80, 100



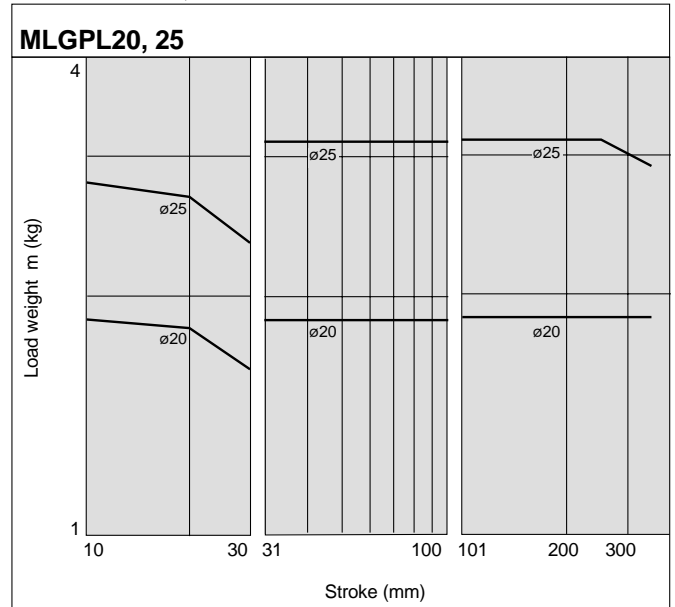
Series MLGP

Horizontal Mounting **Ball Bushing**

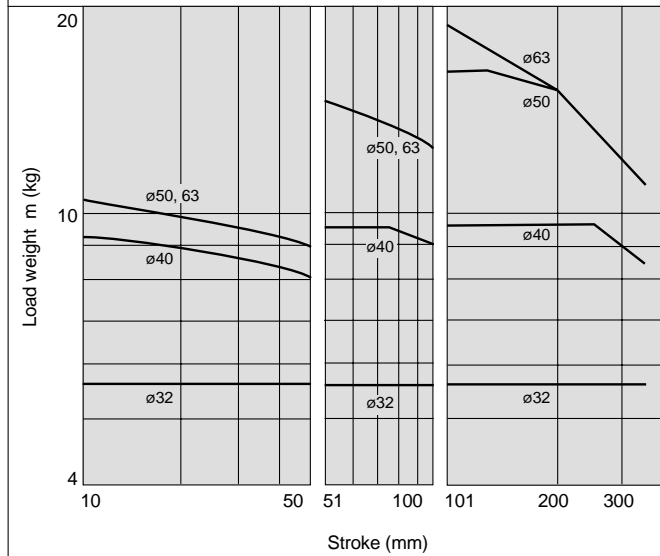
31 $l = 50\text{mm}$, $V = 400\text{m/s}$



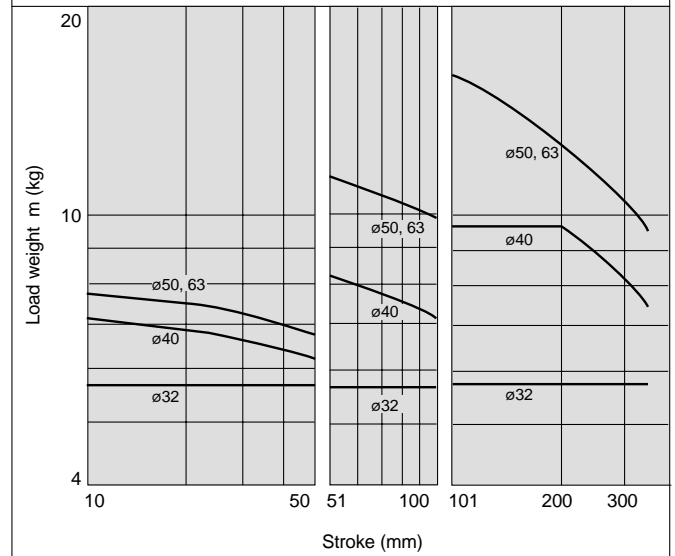
32 $l = 100\text{mm}$, $V = 400\text{m/s}$



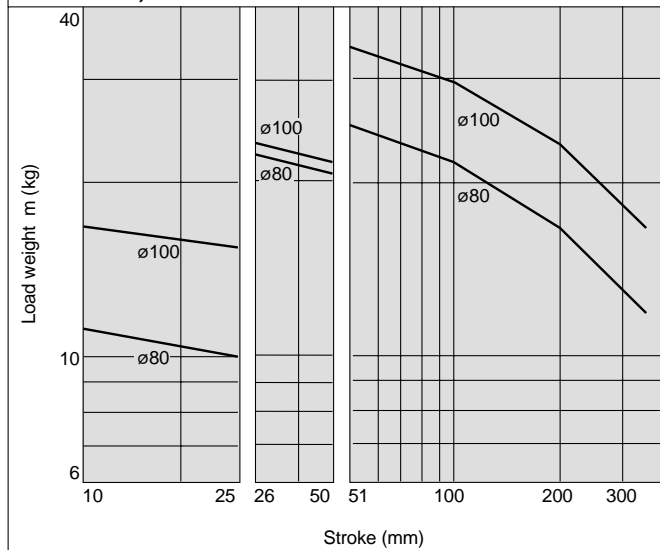
MLGPL32 to 63



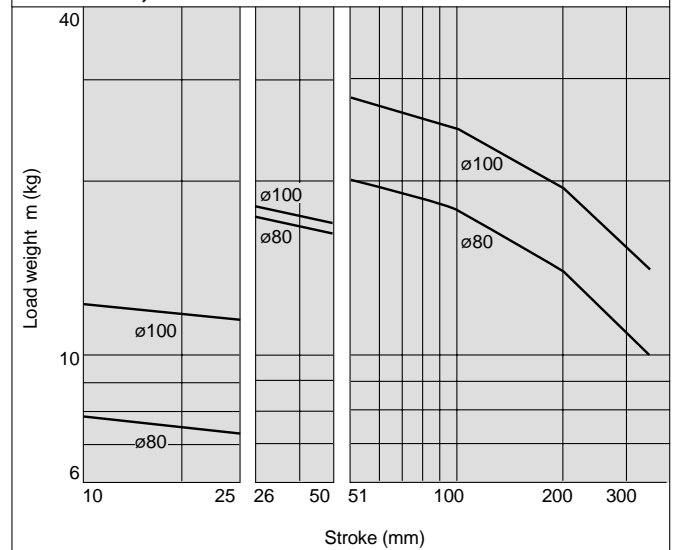
MLGPL32 to 63



MLGPL80, 100



MLGPL80, 100



Operating Range when Used as Stopper

⚠ Warning

1. When using the cylinder as a stopper, do not allow work pieces to collide in the locked condition. If work pieces collide in the locked condition, the lock may disengage due to the shock, or the lock mechanism and piston rod may be damaged, causing a dramatic decrease of the product life and/ or further damage.

2. Model MLGPL (ball bushing) cannot be used as a stopper. When MLGPL (ball bushing) is used as a stopper, the impact will cause damage to the bearing unit and guide rod.

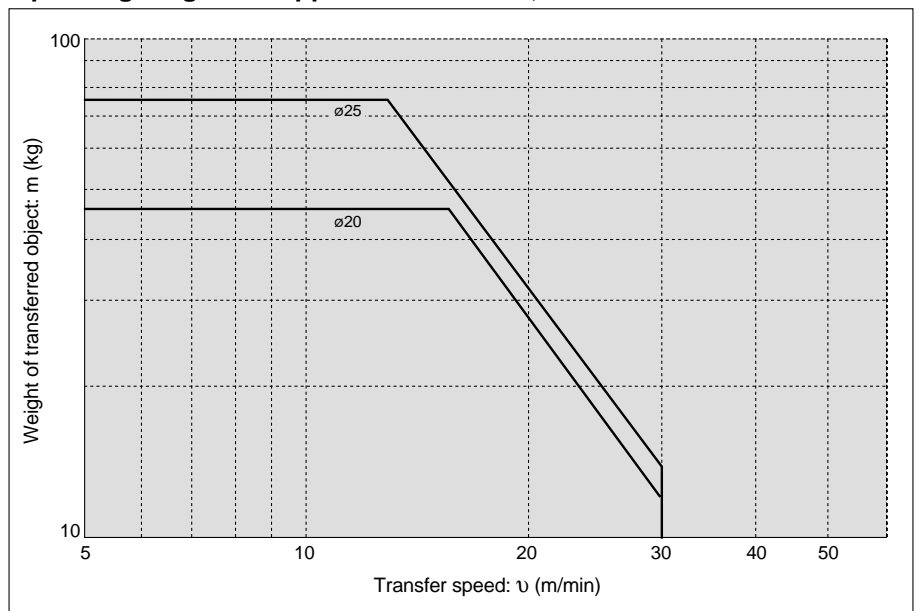
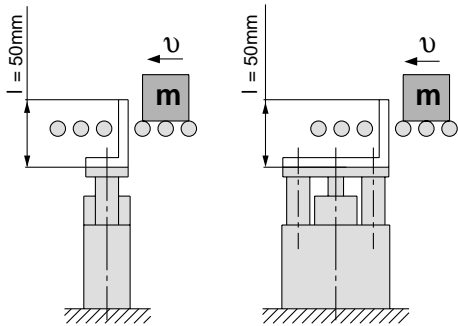
⚠ Caution

1. When using as a stopper, select a model with a stroke of 30mm or less for bore sizes $\varnothing 20$ and $\varnothing 25$, and 50mm or less for bore sizes $\varnothing 32$ to $\varnothing 100$.

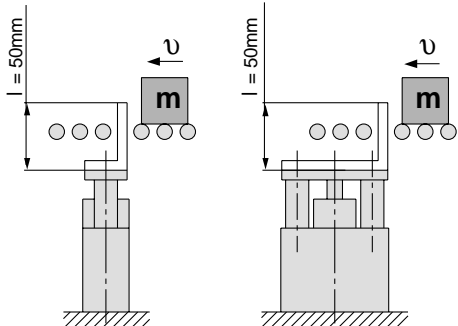
2. When selecting a model with a longer /dimension, be sure to choose a bore size which is sufficiently large.

Bore Sizes $\varnothing 20$ and $\varnothing 25$ /MLGPM20, 25 (Slide bearing)

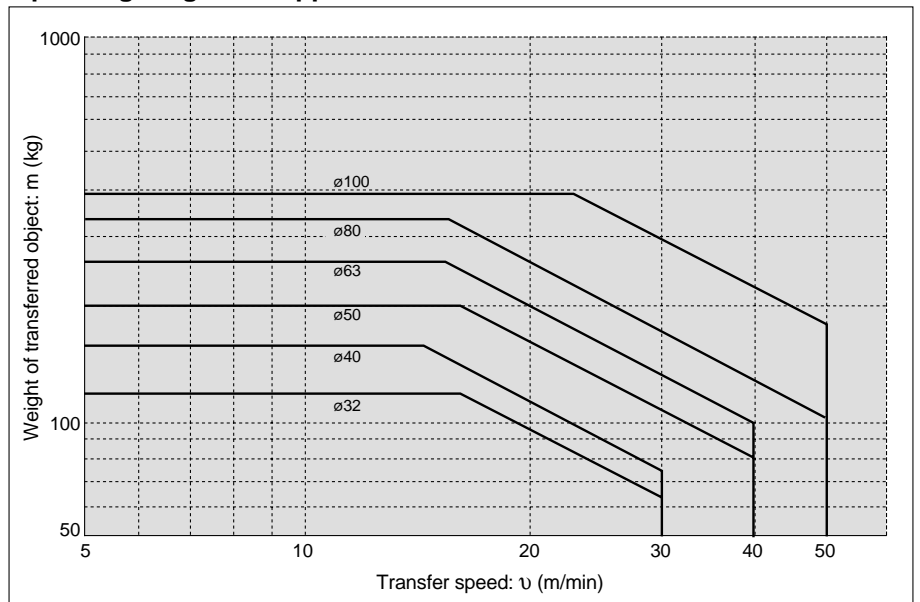
Operating range as stopper for MLGPM20, 25



Bore Sizes $\varnothing 32$ to $\varnothing 100$ /MLGPM32 to 100 (Slide bearing)



Operating range as stopper for MLGPM32 to 100

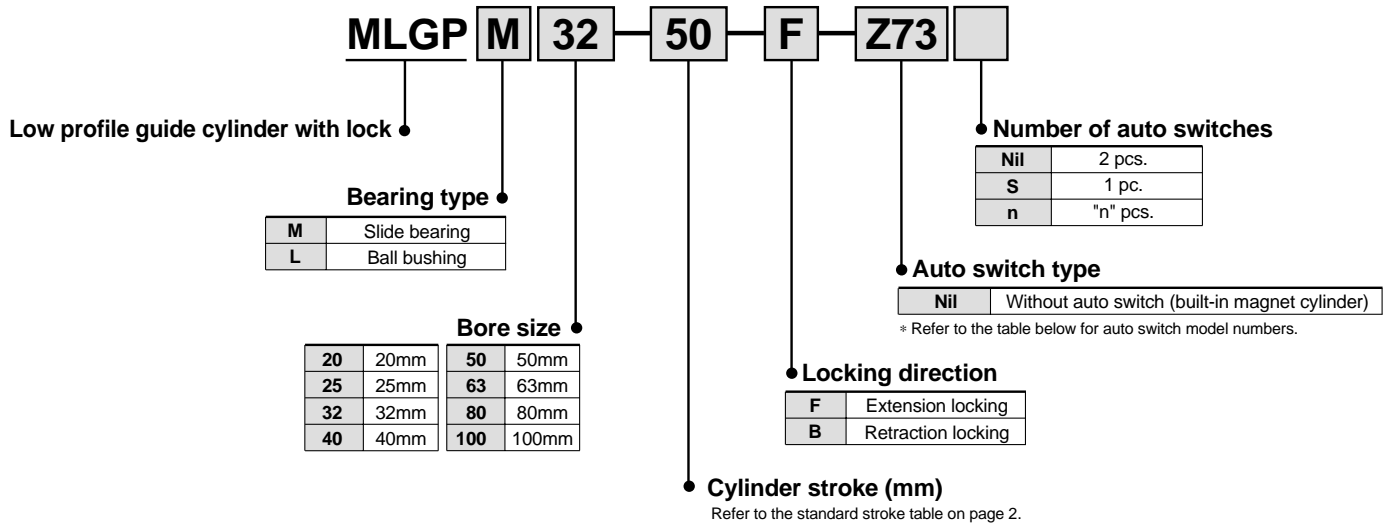


Low Profile Guide Cylinder with Lock

Series **MLGP**

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

How to Order



Applicable auto switches

Type	Special function	Electrical entry	Indicator light	Wiring (output)	Load voltage		Auto switch model		Lead wire length (m) ^{Note 1)}			Applicable load		Detailed specifications	
					DC	AC	Electrical entry direction	0.5 (Nil)	3 (L)	5 (Z)	IC circuit	Relay, PLC			
		Perpendicular	In-line												
Reed switch	—	Grommet	Yes	3 wire	—	5V	—	—	Z76	●	●	—	IC circuit	Relay, PLC	P. 12
				2 wire	12V	100V	—	Z73	●	●	●	—			
					5V 12V	100V or less	—	Z80	●	●	—	IC circuit			
Solid state switch	—	Grommet	Yes	3 wire (NPN)	24V	5V 12V	—	Y69A	Y59A	●	●	○	IC circuit	Relay, PLC	P. 13
				3 wire (PNP)		12V		Y7PV	Y7P	●	●	○	IC circuit		
				2 wire				Y69B	Y59B	●	●	○	—		
	Diagnostic indication (2 color indicator)	Grommet	Yes	3 wire (NPN)	24V	5V 12V	—	Y7NWV	Y7NW	●	●	○	IC circuit	Relay, PLC	P. 14
				3 wire (PNP)		12V		Y7PWV	Y7PW	●	●	○	IC circuit		
				2 wire				Y7BWV	Y7BW	●	●	○	—		
						Water resistant (2 color indicator)		Grommet	Yes	2 wire	12V	—	—		
Magnetic field resistant (2 color indicator)	—	^{Note 3)} P5DW	—	●	●	—	P. 16								

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

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

Note 3) Type D-P5DW cannot be mounted on bore sizes of ø32 or less.

Cylinder Specifications



Action	Double acting
Fluid	Air
Proof pressure	1.5MPa
Maximum operating pressure	1.0MPa
Minimum operating pressure	0.2MPa <small>Note)</small>
Ambient and fluid temperature	-10 to 60°C (with no freezing)
Piston speed	50 to 400mm/s
Cushion	Rubber bumper at both ends
Lubrication	Non-lube
Stroke length tolerance	$^{+1.5}_0$ mm

Note) When the unlocking air and cylinder operating air are not common, the minimum operating pressure is 0.15MPa. (The minimum operating pressure for the cylinder alone is 0.15MPa.)

Lock Specifications

Bore size (mm)	20	25	32	40	50	63	80	100
Locking action	Spring locking (exhaust locking)							
Unlocking pressure	0.2MPa or more							
Locking pressure	0.05MPa or less							
Locking direction	One direction (extension locking, retraction locking)							
Maximum operating pressure	1.0MPa							
Unlocking port size	M5 x 0.8			Rc 1/8				Rc 1/4
Holding force (maximum static load) N	157	245	402	629	982	1559	2513	3927

Standard Strokes

Bore size (mm)	Standard stroke (mm)
20, 25	20, 30, 40, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350
32 to 80	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350
100	50, 75, 100, 125, 150, 175, 200, 250, 300, 350

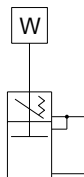
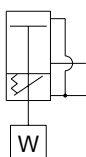
Manufacture of Intermediate Strokes

Modification method	Spacers installed Spacers are installed in standard stroke cylinders. ø20 to 32: Stroke can be modified in 1mm increments. ø40 to 100: Stroke can be modified in 5mm increments.						
Part number	Refer to standard part numbers and ordering.						
Applicable stroke (mm)	<table border="1"> <tr> <td>ø20, ø25, ø32</td> <td>1 to 349</td> </tr> <tr> <td>ø40 to ø80</td> <td>5 to 345</td> </tr> <tr> <td>ø100</td> <td>25 to 345</td> </tr> </table>	ø20, ø25, ø32	1 to 349	ø40 to ø80	5 to 345	ø100	25 to 345
ø20, ø25, ø32	1 to 349						
ø40 to ø80	5 to 345						
ø100	25 to 345						
Example	Part no.: MLGPM20-39-F A 1mm spacer is installed in MLGPM20-40-F . Dimension C is 77mm.						

Symbols

Extension locking

Retraction locking



Minimum Auto Switch Mounting Stroke (mm)

Number of auto switches	D-Z7□ D-Z80 D-Y59□ D-Y7P D-Y7□W	D-Y69□ D-Y7PV	D-Y7□WV	D-Y7BAL	D-P5DWL
1 pc.	15	5	10	20	25
2 pcs.	15	5	15	20	25

Note) Model D-P5DW can only be mounted with bore sizes ø40 to ø100.

Auto switch mounting bracket part number for D-P5DW

Bore size (mm)	Mounting bracket part no.	Notes
40, 50, 63, 80, 100	BMG1-040	Switch mounting bracket Hexagon socket head cap screw (M2.5 x 0.45 x 8 / 2 pcs. Hexagon socket head cap screw (M3 x 0.5 x 16 / 2 pcs. Spring washer (nominal size 3)

Theoretical Output



Bore size (mm)	Rod size (mm)	Operating direction	Piston area (mm ²)	Operating pressure (MPa)								
				0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
20	10	OUT	314	63	94	126	157	188	220	251	283	314
		IN	236	47	71	94	118	142	165	189	212	236
25	12	OUT	491	98	147	196	246	295	344	393	442	491
		IN	378	76	113	151	189	227	265	302	340	378
32	16	OUT	804	161	241	322	402	482	563	643	724	804
		IN	603	121	181	241	302	362	422	482	543	603
40	16	OUT	1257	251	377	503	629	754	880	1006	1131	1257
		IN	1056	211	317	422	528	634	739	845	950	1056
50	20	OUT	1963	393	589	785	982	1178	1374	1570	1767	1963
		IN	1649	330	495	660	825	990	1154	1319	1484	1649
63	20	OUT	3117	623	935	1247	1559	1870	2182	2494	2805	3117
		IN	2803	561	841	1121	1402	1682	1962	2242	2523	2803
80	25	OUT	5027	1005	1508	2011	2514	3016	3519	4022	4524	5027
		IN	4536	907	1361	1814	2268	2722	3175	3629	4082	4536
100	30	OUT	7854	1571	2356	3142	3927	4712	5498	6283	7069	7854
		IN	7147	1429	2144	2859	3574	4288	5003	5718	6432	7147

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

Series **MLGP**

Weights

Slide bearing: **MLGPM20 to 100**

(kg)

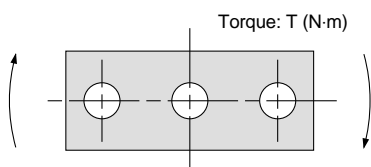
Bore size (mm)	Standard stroke (mm)													
	20	25	30	40	50	75	100	125	150	175	200	250	300	350
20	0.84	—	0.92	1.00	1.08	1.34	1.54	1.74	1.93	2.13	2.33	2.80	3.20	3.59
25	1.22	—	1.32	1.43	1.54	1.92	2.19	2.46	2.74	3.01	3.28	3.94	4.48	5.03
32	—	2.09	—	—	2.47	2.87	3.25	3.64	4.02	4.40	4.78	5.73	6.49	7.26
40	—	2.44	—	—	2.86	3.32	3.74	4.17	4.59	5.02	5.44	6.48	7.34	8.19
50	—	4.13	—	—	4.77	5.50	6.14	6.78	7.42	8.06	8.70	10.4	11.6	12.9
63	—	5.23	—	—	5.99	6.83	7.59	8.34	9.10	9.85	10.7	12.5	14.0	15.5
80	—	8.50	—	—	9.44	10.7	11.7	12.6	13.6	14.5	15.5	17.9	19.8	21.6
100	—	—	—	—	15.3	17.0	18.3	19.7	21.0	22.3	23.6	27.0	29.6	32.3

Ball bushing: **MLGPL20 to 100**

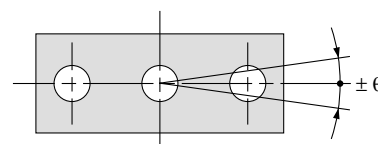
(kg)

Bore size (mm)	Standard stroke (mm)													
	20	25	30	40	50	75	100	125	150	175	200	250	300	350
20	0.86	—	0.93	1.05	1.13	1.30	1.47	1.68	1.85	2.03	2.20	2.58	2.93	3.28
25	1.22	—	1.31	1.49	1.58	1.81	2.05	2.32	2.55	2.78	3.01	3.51	3.98	4.44
32	—	1.89	—	—	2.20	2.65	2.97	3.34	3.66	3.97	4.29	4.98	5.61	6.24
40	—	2.16	—	—	2.58	3.07	3.43	3.85	4.21	4.57	4.93	5.71	6.43	7.15
50	—	3.69	—	—	4.33	5.08	5.63	6.27	6.82	7.37	7.92	9.15	10.3	11.4
63	—	4.77	—	—	5.53	6.40	7.06	7.82	8.48	9.15	9.81	11.3	12.7	14.0
80	—	8.11	—	—	9.25	10.6	11.4	12.2	13.0	13.9	14.7	16.6	18.2	19.9
100	—	—	—	—	14.7	16.5	17.6	18.8	20.0	21.2	22.4	25.0	27.3	29.7

Allowable Rotational Torque of Plate



Non-rotating Accuracy of Plate



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

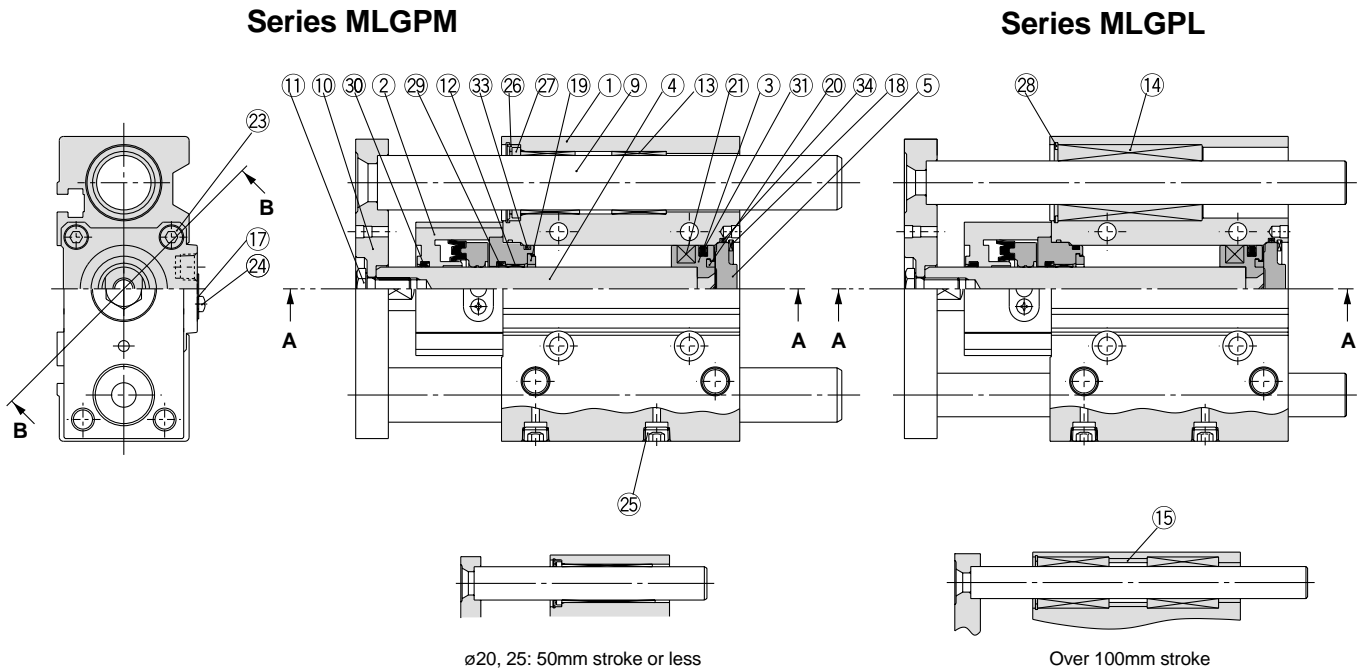
T (N-m)

Bore size (mm)	Bearing type	Stroke (mm)													
		20	25	30	40	50	75	100	125	150	175	200	250	300	350
20	MLGPM	0.77	—	0.70	0.64	0.59	1.62	1.42	1.27	1.15	1.05	0.97	0.83	0.73	0.65
	MLGPL	0.75	—	0.68	1.49	1.41	1.24	1.11	1.29	1.18	1.08	1.00	0.86	0.76	0.67
25	MLGPM	1.24	—	1.13	1.04	0.97	2.49	2.20	1.98	1.79	1.64	1.51	1.30	1.15	1.02
	MLGPL	1.23	—	1.14	2.26	2.14	1.90	1.71	1.96	1.79	1.65	1.53	1.33	1.17	1.04
32	MLGPM	—	4.89	—	—	4.13	4.82	4.29	3.87	3.53	3.24	2.99	2.60	2.30	2.06
	MLGPL	—	4.22	—	—	3.64	4.07	3.67	5.37	4.97	4.62	4.31	3.80	3.39	3.06
40	MLGPM	—	5.29	—	—	4.49	5.25	4.68	4.23	3.86	3.54	3.28	2.85	2.52	2.26
	MLGPL	—	4.53	—	—	3.93	4.41	3.98	5.84	5.41	5.03	4.70	4.15	3.70	3.34
50	MLGPM	—	10.06	—	—	8.66	10.13	9.12	8.29	7.60	7.01	6.51	5.70	5.06	4.56
	MLGPL	—	6.40	—	—	5.57	7.76	7.04	9.75	9.05	8.43	7.88	6.96	6.22	5.60
63	MLGPM	—	11.13	—	—	9.60	11.27	10.15	9.24	8.48	7.83	7.28	6.37	5.67	5.11
	MLGPL	—	6.91	—	—	6.02	8.48	7.69	10.73	9.95	9.27	8.67	7.65	6.83	6.14
80	MLGPM	—	16.70	—	—	14.67	19.10	17.41	15.99	14.79	13.75	12.85	11.36	10.18	9.23
	MLGPL	—	9.44	—	—	16.88	17.92	16.51	15.28	14.20	13.24	12.37	10.89	9.66	8.62
100	MLGPM	—	—	—	—	26.17	30.70	28.23	26.12	24.31	22.73	21.35	19.03	17.17	15.64
	MLGPL	—	—	—	—	21.11	29.10	26.98	25.10	23.43	21.93	20.57	18.21	16.22	14.53

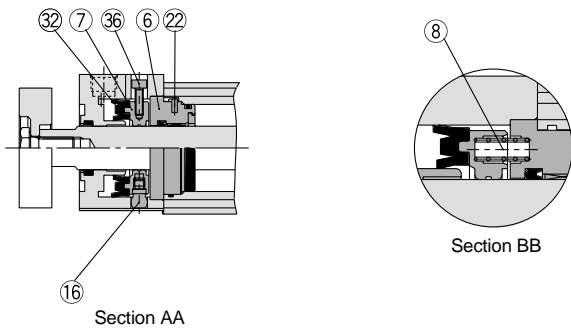
Bore size (mm)	Non-rotating accuracy θ	
	MLGPM	MLGPL
20	±0.07°	±0.09°
25	±0.07°	±0.09°
32	±0.06°	±0.08°
40	±0.06°	±0.08°
50	±0.05°	±0.06°
63	±0.05°	±0.06°
80	±0.04°	±0.05°
100	±0.04°	±0.05°

Note) Do not apply rotational force in a locked condition, as this will cause damage to the lock mechanism or decrease of the product life.

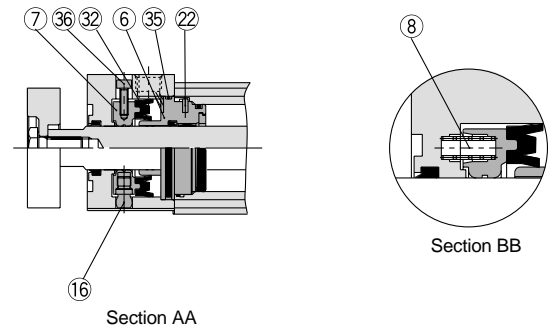
Construction/ø20, ø25, ø32



Extension locking (Type F)



Retraction locking (Type B)



Parts list

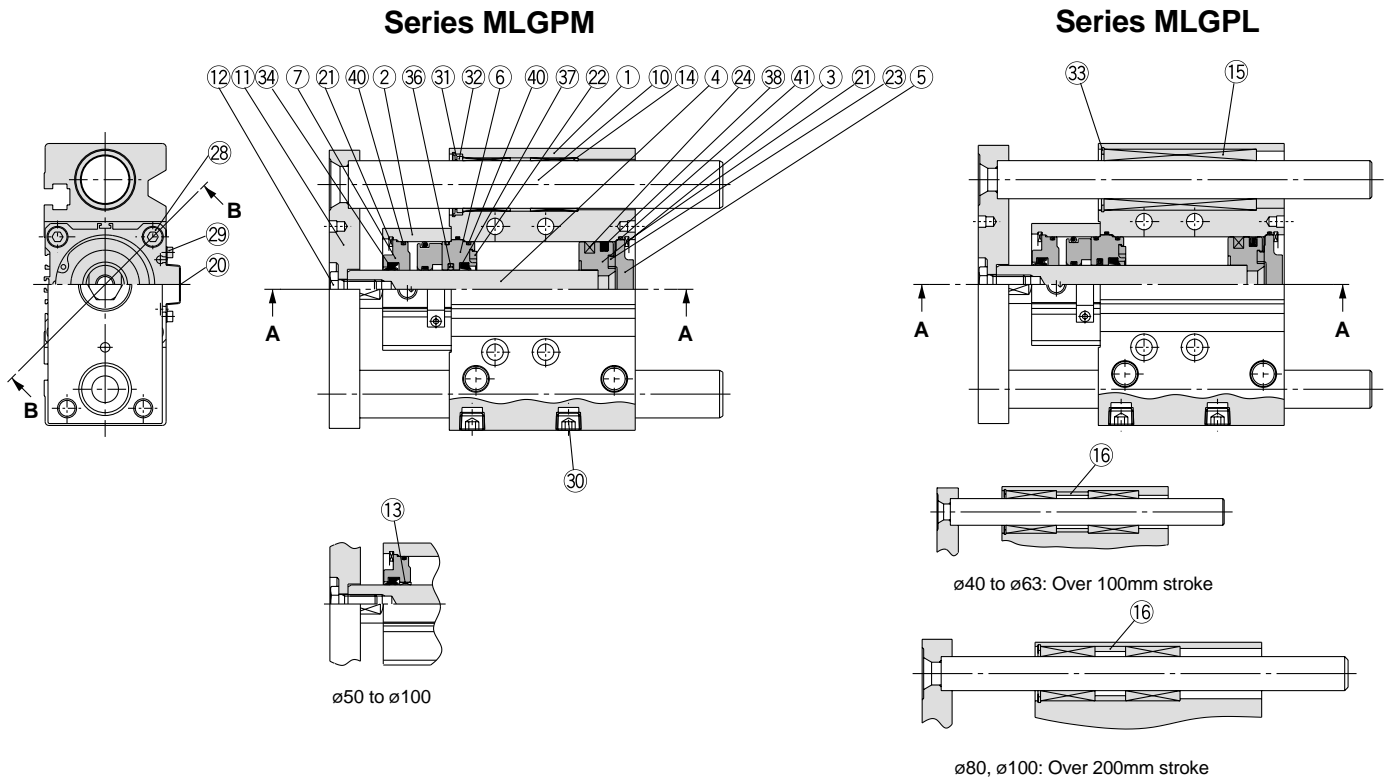
No.	Description	Material	Note
1	Body	Aluminum alloy	Hard anodized
2	Lock body	Aluminum alloy	Hard anodized
3	Piston	Aluminum alloy	Chromated
4	Piston rod	ø20, 25 Stainless steel ø32 Carbon steel	Hard chrome plated
5	Head cover	Aluminum alloy	Coated
6	Intermediate collar	Type F Aluminum alloy Type B	Chromated Hard anodized
7	Lock ring	Carbon steel	Heat treated
8	Brake spring	Steel wire	Zinc chromated
9	Guide rod	Type M Carbon steel Type L High carbon chromium bearing steel	Hard chrome plated Heat treated/Hard chrome plated
10	Plate	Roller steel	Nickel plated
11	Plate mounting bolt	Chrome molybdenum steel	Nickel plated
12	Bushing	ø20, 25 Oil-impregnated sintered alloy ø32 Lead bronze casting	
13	Slide bearing	Lead bronze casting	
14	Ball busing	—	
15	Spacer	Aluminum alloy	Chromated
16	Pivot	Chrome molybdenum steel	Heat treated/Electroless nickel plated

Parts list

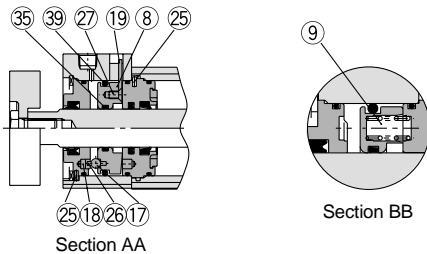
No.	Description	Material	Note
17	Dust cover	Stainless steel	
18	C type snap ring for hole	Carbon tool steel	Phosphate coated
19	Bumper A	Urethane	
20	Bumper B	Urethane	
21	Plastic magnet	—	
22	Parallel pin	Carbon steel	
23	Hexagon socket head cap screw	Chrome molybdenum steel	Nickel plated
24	Dust cover holding bolt	Carbon steel	Nickel plated
25	Hexagon socket head taper screw plug	Carbon steel	Nickel plated
26	Holder	Resin	
27	Felt	Felt	
28	C type snap ring for hole	Carbon tool steel	Phosphate coated
29	Rod seal	NBR	
30	Scraper	NBR	
31	Piston seal	NBR	
32	Lock ring seal	NBR	
33	Gasket A	NBR	
34	Gasket B	NBR	
35	Lock body gasket	NBR	
36	Unlocking bolt	Chrome molybdenum steel	Nickel plated

Series MLGP

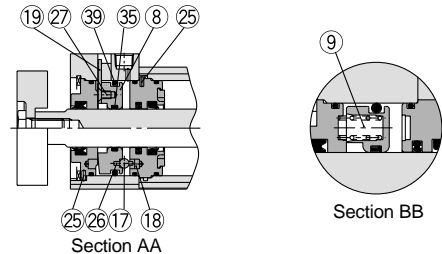
Construction/ø40 to ø100



Extension locking (Type F)



Retraction locking (Type B)



Parts list

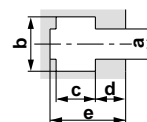
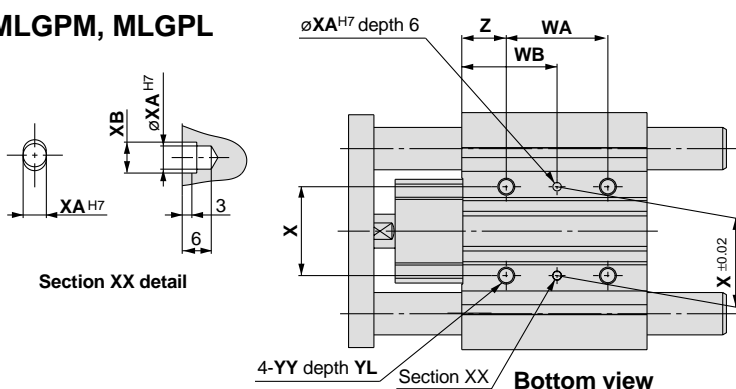
No.	Description	Material	Note	
1	Body	Aluminum alloy	Hard anodized	
2	Lock body	Aluminum alloy	Hard anodized	
3	Piston	Aluminum alloy	Chromated	
4	Piston rod	Carbon steel	Hard chrome plated	
5	Head cover	ø40 to 63	Aluminum alloy	Coated
		ø80, 100	Aluminum alloy casting	Chromated/Coated
6	Intermediate collar	Aluminum alloy	Chromated	
7	Collar	ø40	Aluminum alloy	Hard anodized
		ø50 to 100	Aluminum alloy casting	Chromated/Coated
8	Lock ring	Carbon steel	Heat treated	
9	Brake spring	Steel wire	Zinc chromated	
10	Guide rod	Type M	Carbon steel	Hard chrome plated
		Type L	High carbon chromium bearing steel	Heat treated/Hard chrome plated
11	Plate	Rolled steel	Nickel plated	
12	Plate mounting bolt	Chrome molybdenum steel	Nickel plated	
13	Bushing	Lead bronze casting	ø50 to 100	
14	Slide bearing	Lead bronze casting		
15	Ball busing	—		
16	Spacer	Aluminum alloy	Chromated	
17	Pivot pin	Carbon steel	Heat treated/Zinc chromated	
18	Pivot key	Carbon steel	Heat treated/Zinc chromated	
19	Lever	Stainless steel		
20	Dust cover	ø40 to 63	Rolled steel	Nickel plated
		ø80, 100	Stainless steel	

Parts list

No.	Description	Material	Note	
21	C type snap ring for hole	Carbon tool steel	Phosphate coated	
22	Bumper A	Urethane		
23	Bumper B	Urethane		
24	Plastic magnet	—		
25	Parallel pin	Carbon steel		
26	Spring pin	Carbon steel		
27	Hexagon socket countersunk head screw	Chrome molybdenum steel	Nickel plated	
28	Hexagon socket head cap screw	Chrome molybdenum steel	Nickel plated	
29	Dust cover holding bolt	ø40 to 63	Chrome molybdenum steel	Nickel plated
		ø80, 100	Carbon steel	Nickel plated
30	Hexagon socket head taper screw plug	Carbon steel	Nickel plated	
31	Holder	Resin		
32	Felt	Felt		
33	C type snap ring for hole	Carbon tool steel	Phosphate coated	
34	Rod seal A	NBR		
35	Rod seal B	NBR		
36	Rod seal C	NBR		
37	Scraper	NBR		
38	Piston seal	NBR		
39	Brake piston seal	NBR		
40	Gasket A	NBR		
41	Gasket B	NBR		

Dimensions/ø20, ø25, ø32

MLGPM, MLGPL



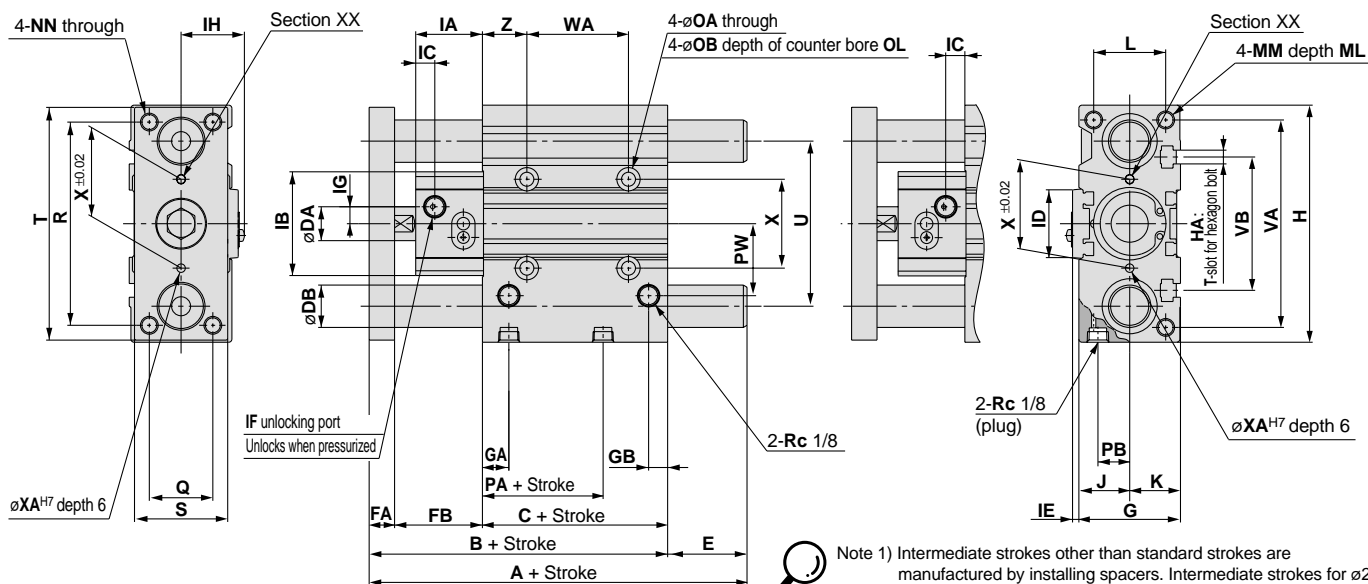
T-slot dimensions

Bore size (mm)	a	b	c	d	e
20	5.4	8.4	4.5	2.8	7.8
25	5.4	8.4	4.5	3	8.2
32	6.5	10.5	5.5	3.5	9.5

Extension locking



Retraction locking



Note 1) Intermediate strokes other than standard strokes are manufactured by installing spacers. Intermediate strokes for ø20 to ø32 are available in 1mm increments.

Note 2) For intermediate strokes, dimensions A, B, C, E, WA, and WB will be the same as the longer of the standard strokes.

MLGPM, MLGPL common dimensions

Bore size (mm)	Standard stroke (mm)													IC		ID	IE	IF	IG	IH	J	K	L
	B	C	DA	FA	FB	G	GA	GB	H	HA	IA	IB	Extension locking	Retraction locking									
20	20, 30, 40, 50, 75, 100, 125	79.5	37	10	10	32.5	36	10.5	8.5	83	M5	26.5	36	9.5	6	—	—	M5 x 0.8	6.5	21.2	18	18	24
25	150, 175, 200, 250, 300, 350	84	37.5	12	10	36.5	42	11.5	9	93	M5	30.5	40	10	7.5	—	—	M5 x 0.8	7	23.2	21	21	30
32	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350	91	37.5	16	12	41.5	48	12.5	9	112	M6	31.5	49	9	9	32	3	Rc 1/8	8	30.2	24	24	34

Bore size (mm)	MM	ML	NN	OA	OB	OL	PA	PB	PW	Q	R	S	T	U	VA	VB	WA						
																	st<25	st<30	25<st<100	30<st<100	100<st<200	200<st<300	300<st<350
20	M5 x 0.8	13	M5 x 0.8	5.6	9.5	5.5	12.5	10.5	25	18	70	30	81	54	72	44	—	24	—	44	120	200	300
25	M6 x 1.0	15	M6 x 1.0	5.6	9.5	5.5	12.5	13.5	28.5	26	78	38	91	64	82	50	—	24	—	44	120	200	300
32	M8 x 1.25	20	M8 x 1.25	6.6	11	7.5	15	34	30	96	44	110	78	98	63	24	—	48	—	124	200	300	

Bore size (mm)	WB						X	XA	XB	YY	YL	Z	
	st<25	st<30	25<st<100	30<st<100	100<st<200	200<st<350							
20	—	29	—	39	77	117	167	28	3	3.5	M6 x 1.0	12	17
25	—	29	—	39	77	117	167	34	4	4.5	M6 x 1.0	12	17
32	33	—	45	—	83	121	171	42	4	4.5	M8 x 1.25	16	21

MLGPM (slide bearing)/Dimensions A, DB, E (mm)

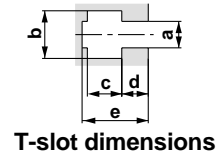
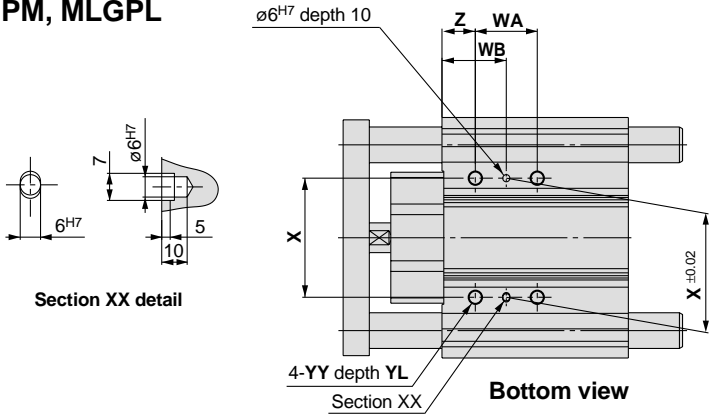
Bore size (mm)	A			DB	E		
	st<50	50<st<200	200<st		st<50	50<st<200	200<st
20	79.5	111	148.5	12	0	31.5	69
25	84	115.5	152.5	16	0	31.5	68.5
32	128.5	133.5	171.5	20	37.5	42.5	80.5

MLGPL (ball bushing)/Dimensions A, DB, E (mm)

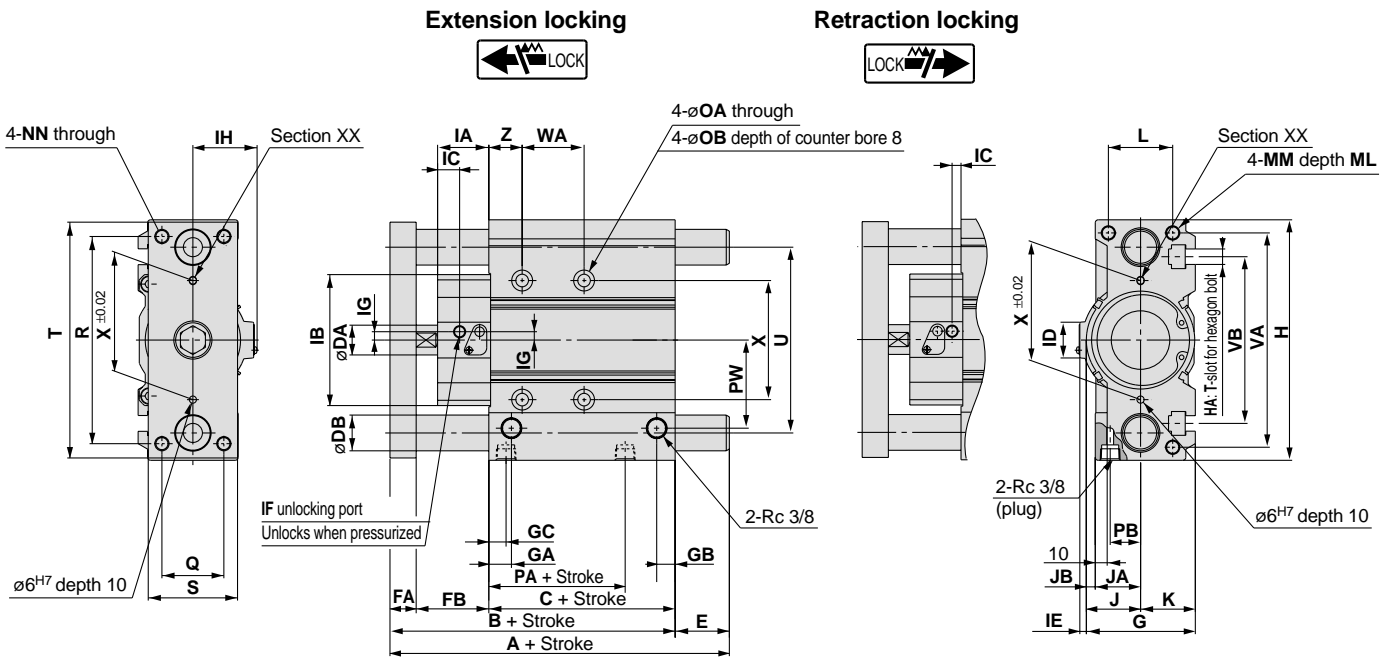
Bore size (mm)	A						DB	E					
	st<30	st<50	30<st<100	50<st<100	100<st<200	200<st<350		st<30	st<50	30<st<100	50<st<100	100<st<200	200<st<350
20	89.5	—	106.5	—	130.5	148.5	10	10	—	27	—	51	69
25	100	—	116	—	135	152.5	13	16	—	32	—	51	68.5
32	—	112.5	—	129.5	149.5	171.5	16	—	21.5	—	38.5	58.5	80.5

Dimensions/ø80, ø100

MLGPM, MLGPL



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



Note 1) Intermediate strokes other than standard strokes are manufactured by installing spacers. Intermediate strokes for ø80 and ø100 are available in 5mm increments.
 Note 2) For intermediate strokes, dimensions A, B, C, E, WA, and WB will be the same as the longer of the standard strokes.

MLGPM, MLGPL common dimensions

Bore size (mm)	Standard stroke (mm)	B	C	DA	FA	FB	G	GA	GB	GC	H	HA	IA	IB	IC		ID	IE	IF	IG	IH	J	JA
															Extension locking	Retraction locking							
80	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350	139.5	56.5	25	22	61	91.5	19	15.5	14.5	202	M12	43	110	18.5	7.5	30	5.5	Rc 1/8	7	54.2	45.5	38
100	50, 75, 100, 125, 150, 175, 200, 250, 300, 350	167.5	66	30	25	76.5	111.5	23	19	18	240	M14	51.5	137	23	11	50	5.5	Rc 1/4	15	64.2	55.5	45

Bore size (mm)	JB	K	L	MM	ML	NN	OA	OB	PA	PB	PW	Q	R	S	T	U	VA	VB	WA						
																			st≤25	st≤50	25<st≤100	50<st≤100	100<st≤200	200<st≤300	300<st≤350
80	7.5	46	54	M12 x 1.75	25	M12 x 1.75	10.6	17.5	14.5	25.5	74	52	174	75	198	156	180	140	28	—	52	—	128	200	300
100	10.5	56	62	M14 x 2.0	31	M14 x 2.0	12.5	20	17.5	32.5	89	64	210	90	236	188	210	166	—	50	—	72	124	200	300

Bore size (mm)	WB				X	YY	YL	Z			
	st≤25	st≤50	25<st≤100	50<st≤100							
80	42	—	54	—	92	128	178	100	M12 x 1.75	24	28
100	—	60	—	71	97	135	185	124	M14 x 2.0	28	35

MLGPM (slide bearing)/Dimensions A, DB, E (mm)

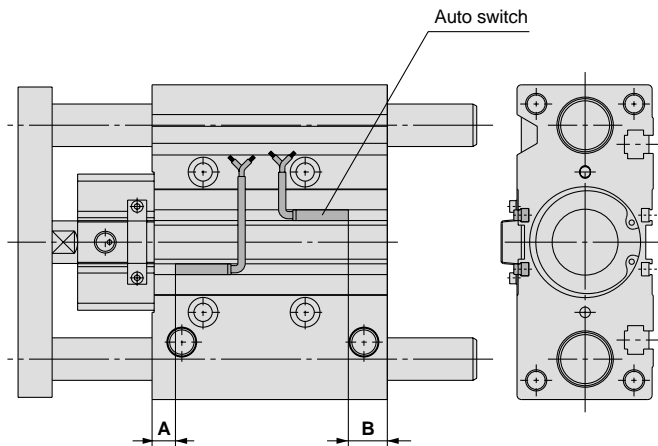
Bore size (mm)	A			DB	E		
	st≤50	50<st≤200	200<st≤350		st≤50	50<st≤200	200<st≤350
80	158	185	236	30	18.5	45.5	96.5
100	188.5	213.5	254.5	36	21	46	87

MLGPL (ball bushing)/Dimensions A, DB, E (mm)

Bore size (mm)	A				DB	E			
	st≤25	25<st≤50	50<st≤200	200<st≤350		st≤25	25<st≤50	50<st≤200	200<st≤350
80	152.5	173	203	236	25	13	33.5	63.5	96.5
100	—	198.5	231.5	254.5	30	—	31	64	87

Series MLGP

Auto Switches/Proper Mounting Position for Stroke End Detection



Proper mounting position (mm)

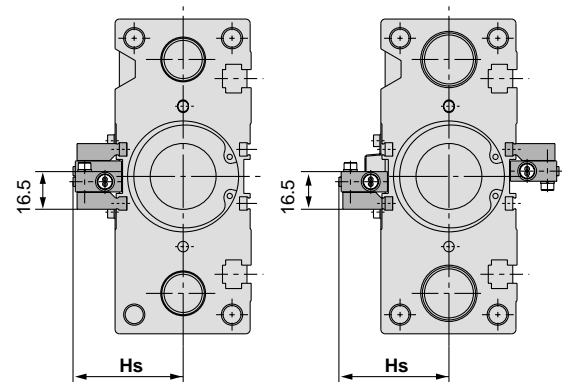
Bore size (mm)	A	B
20	4	8
25	4.5	8
32	5.5	7
40	9.5 (9)	9.5 (9)

Bore size (mm)	A	B
50	7.5 (7)	11.5 (11)
63	10 (9.5)	14 (13.5)
80	13 (12.5)	18.5 (18)
100	17.5 (17)	23.5 (23)

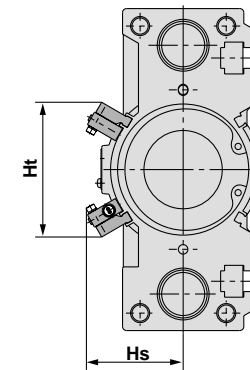
Note 1) Values inside () are for D-P5DW, which can only be mounted on bores sizes $\phi 40$ through $\phi 100$.

For D-P5DW (* Cannot be mounted on bore sizes $\phi 32$ or less.)

$\phi 40$ to $\phi 63$



$\phi 80, \phi 100$



For 25mm stroke

* For bore sizes $\phi 40$ through $\phi 63$ with two switches, one switch is mounted on each side.

Bore size (mm)	Hs	Ht
40	44.5	—
50	50	—
63	57	—
80	60.7	84.4
100	70.8	96.1

Auto Switch Mounting

⚠ Caution

Auto switch mounting tool

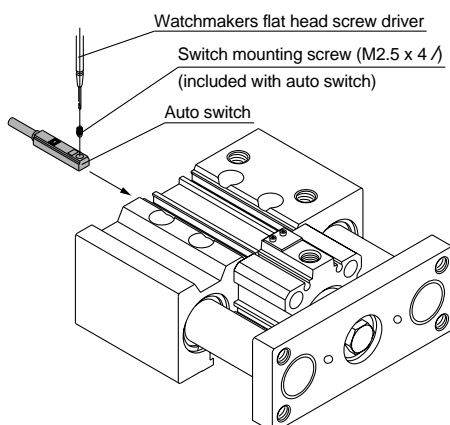
- When tightening the auto switch mounting screw (included with auto switch), use a watchmakers screw driver with a handle about 5 to 6mm in diameter.

Tightening torque

- Tighten with a torque of 0.05 to 0.1N·m. As a rule, it should be turned about 90° past the point at which tightening can be felt.

Inserting direction for mounting

- Auto switches can only be inserted from the rear side.



For D-P5DW

⚠ Caution

Auto switch mounting tool

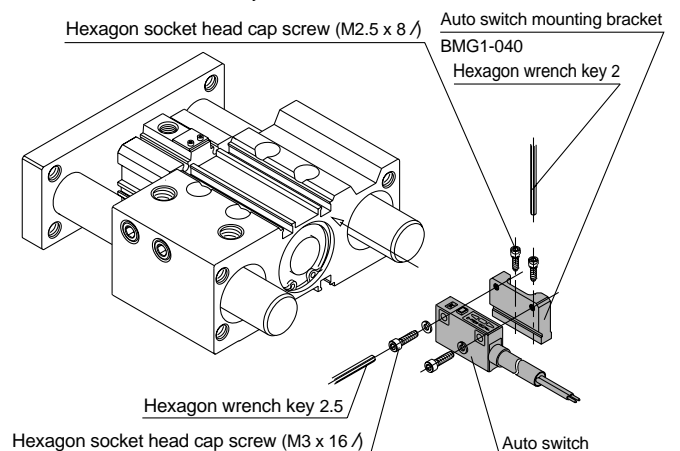
- When tightening the hexagon socket head cap screws of the auto switch, use hexagon wrench key 2 and 2.5 with the appropriate screws.

Tightening torque

- Tighten M2.5 screws with a torque of about 0.3 to 0.5N·m, and M3 screws with a torque of about 0.5 to 0.7 N·m.

Inserting direction for mounting

- Auto switches can only be inserted from the rear side.



Series MLGP

Auto Switch Common Specifications

Auto Switch Common Specifications

Type	Reed switch	Solid state switch
Leakage current	None	3 wire: 100μA or less, 2 wire: 0.8mA or less
Operating time	1.2ms	1ms or less
Impact resistance	300m/s ²	1000m/s ²
Insulation resistance	50MΩ or more at 500VDC (between lead wire and case)	
Withstand voltage	1500VAC for 1 min. (between lead wire and case)	1000VAC for 1 min. (between lead wire and case)
Ambient temperature	-10 to 60°C	
Enclosure	IEC529 standard IP67, JISC0920 watertight construction	

Lead Wire Length

Lead wire length indication

(Example)

D-Z73 L

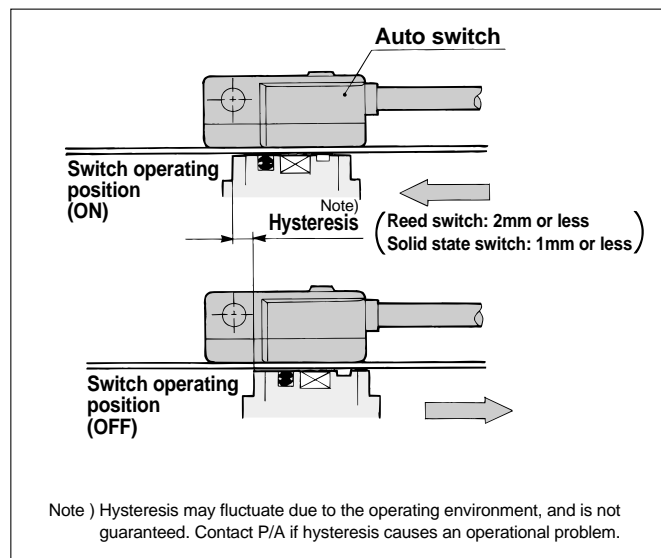
Lead wire length

Nil	0.5m
L	3m
Z	5m

Note 1) Lead wire length Z: 5m applicable auto switch
 Reed: D-Z73
 Solid state: D-P5DW and all other types are produced upon receipt of order (standard availability).

Auto Switch Hysteresis

Hysteresis is the distance from the position at which piston movement activates an auto switch to the position at which reverse movement turns the switch OFF. This hysteresis is included in part of the operating range (one side).



Contact Protection Boxes/CD-P11, CD-P12

D-Z7 and D-Z8 type switches do not have internal contact protection circuits.

1. The operating load is an induction load.
2. The length of wiring to the load is 5m or more.
3. The load voltage is 100VAC.

A contact protection box should be used in any of the above situations.

Contact protection box specifications

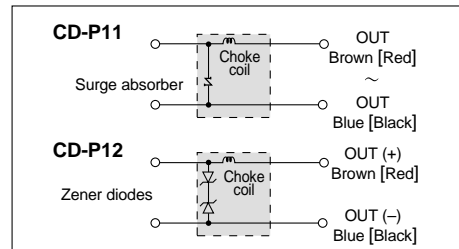
Part no.	CD-P11		CD-P12
Load voltage	100VAC or less	200VAC	24VDC
Maximum load current	25mA	12.5mA	50mA

* Lead wire length Switch connection side 0.5m
 Load connection side 0.5m

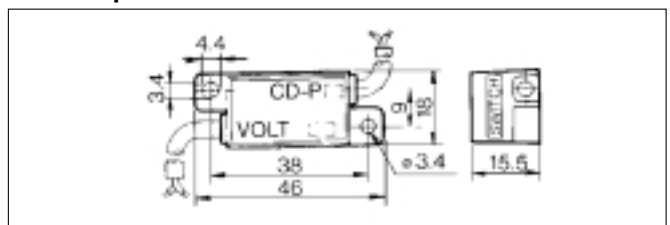


Contact protection box internal circuits

Lead wire colors inside [] are those prior to conformity with IEC standards.



Contact protection box dimensions



Contact Protection Box Connection

To connect a switch unit to a contact protection box, connect the lead wire from the side of the contact protection box marked SWITCH to the lead wire coming out of the switch unit.

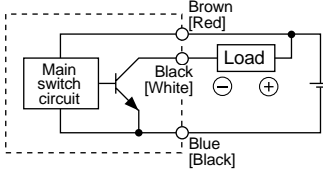
Furthermore, the switch unit should be kept as close as possible to the contact protection box, with a lead wire length of no more than 1 meter between them.

Series MLGP Auto Switch Connections and Examples

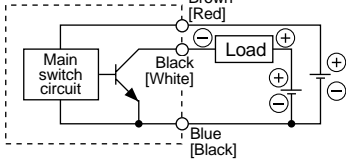
Basic Wiring

Lead wire colors inside [] are those prior to conformity with IEC standards.

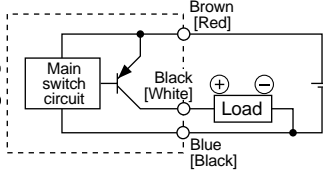
Solid state 3 wire, NPN



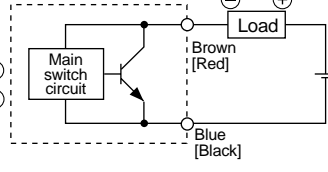
(Power supplies for switch and load are separate.)



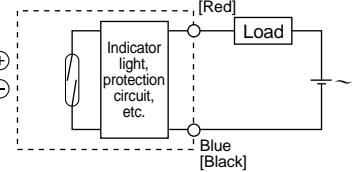
Solid state 3 wire, PNP



2 wire <Solid state>



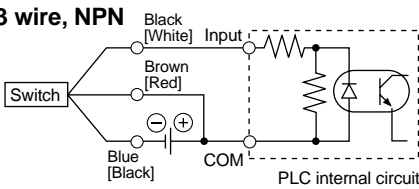
2 wire <Reed switch>



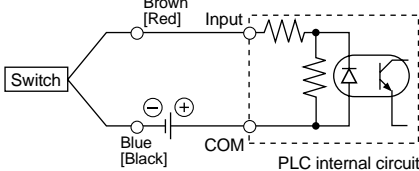
Examples of Connection to PLC

Sink input specifications

3 wire, NPN

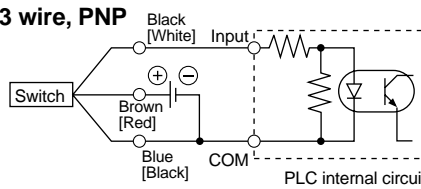


2 wire

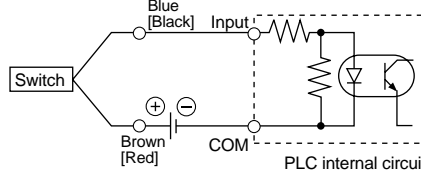


Source input specifications

3 wire, PNP



2 wire

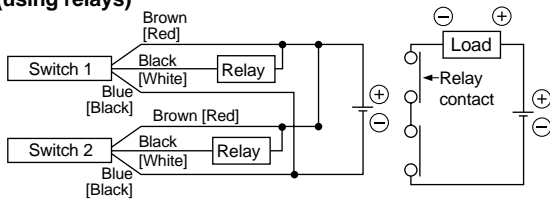


Connect according to the applicable PLC input specifications, as the connection method will vary depending on the PLC input specifications.

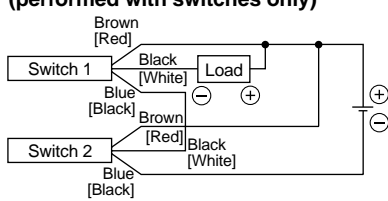
Connection Examples for AND (Series) and OR (Parallel)

3 wire

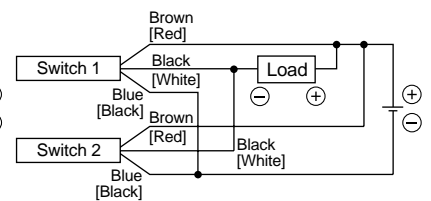
AND connection for NPN output (using relays)



AND connection for NPN output (performed with switches only)

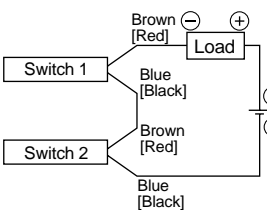


OR connection for NPN output



The indicator lights will light up when both switches are turned ON.

2 wire with 2 switch AND connection

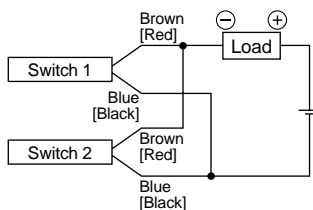


When two switches are connected in series, a load may malfunction because the load voltage will decline when in the ON state. The indicator lights will light up if both of the switches are in the ON state.

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

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

2 wire with 2 switch OR connection



<Solid state>

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

<Reed switch>

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

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

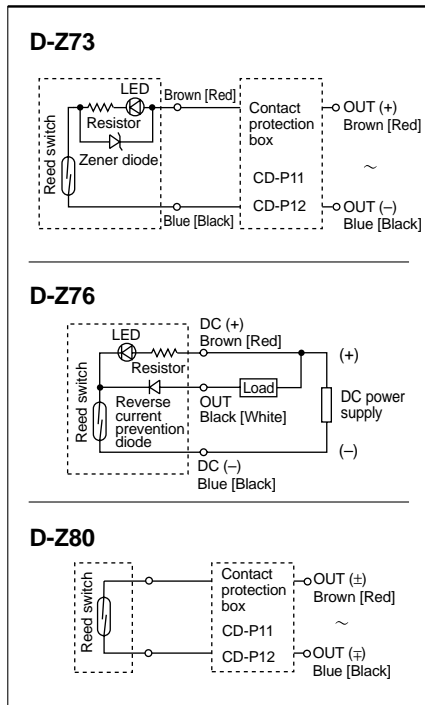
Example: Load impedance is 3kΩ
Leakage current from switch is 1mA

Reed Switches/Direct Mount Type D-Z73/Z76/Z80



Internal circuits

Lead wire colors inside [] are those prior to conformity with IEC standards.



- Note) 1. The load is an induction load.
2. The lead wire length to the load is 5m or more.
3. The load voltage is 100VAC.

Use a contact protection box in any of the above situations, as the life of the contacts may otherwise be reduced. (Refer to page 10 for detailed specifications of the contact protection boxes.)

Auto Switch Specifications

With indicator light

Auto switch part no.	D-Z73		D-Z76
Electrical entry direction	In-line		
Applicable load	Relay, PLC		IC circuit
Load voltage	24VDC	100VAC	4 to 8VDC
Maximum load current or current range	5 to 40mA	5 to 20mA	20mA
Contact protection circuit	None		
Internal voltage drop	2.4V or less (to 20mA)/3V or less (to 40mA)		0.8V or less
Indicator light	Red LED lights up when ON		

Without indicator light

Auto switch part no.	D-Z80		
Electrical entry direction	In-line		
Applicable load	Relay, PLC, IC circuit		
Load voltage	24V ^{AC} _{DC} or less	48V ^{AC} _{DC}	100V ^{AC} _{DC}
Maximum load current	50mA	40mA	20mA
Contact protection circuit	None		
Internal resistance	1Ω or less (including lead wire length of 3m)		

- Lead wire — Oil resistant heavy duty vinyl cord, $\phi 3.4$, 0.2mm², 2 wire (Brown, Blue [Red, Black]), 3 wire (Brown, Black, Blue [Red, White, Black]), 0.5m (D-Z73 only $\phi 2.7$, 0.18mm², 2 wire)

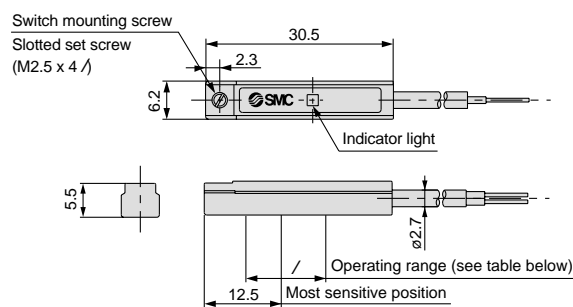
Note) Refer to page 10 for auto switch common specifications and lead wire lengths.

Weights

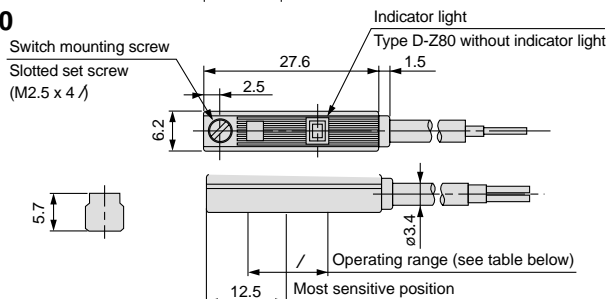
Model	Unit: g	
	Lead wire length 0.5m	Lead wire length 3m
D-Z73	6	31
D-Z76	10	55
D-Z80	9	49

Dimensions

D-Z73



D-Z76, Z80



Operating range	Bore size (mm)									
	12	16	20	25	32	40	50	63	80	100
Operating range / (mm)	7.5	10	10	10	10.5	10.5	10.5	11.5	11.5	12

Note) This is a standard including hysteresis, and is not guaranteed. There may be large variations depending on the surrounding environment (variations on the order of $\pm 30\%$).

Solid State Switches/Direct Mount Type D-Y59^A/_B/D-Y69^A/_B/D-Y7P(V)



Auto Switch Specifications

D-Y5, D-Y6, D-Y7P, D-Y7PV (with indicator light)

Auto switch part no.	D-Y59A	D-Y69A	D-Y7P	D-Y7PV	D-Y59B	D-Y69B
Electrical entry direction	In-line	Perpendicular	In-line	Perpendicular	In-line	Perpendicular
Wiring type	3 wire				2 wire	
Output type	NPN		PNP		-	
Applicable load	IC circuit, Relay, PLC				24VDC relay, PLC	
Power supply voltage	5, 12, 24VDC (4.5 to 28VDC)				-	
Current consumption	10mA or less				-	
Load voltage	28VDC or less		-		24VDC (10 to 28VDC)	
Load current	40mA or less		80mA or less		5 to 40mA	
Internal voltage drop	1.5V or less (0.8V or less at 10mA load current)		0.8V or less		4V or less	
Leakage current	100µA or less at 24VDC				0.8mA or less at 24VDC	
Indicator light	Red LED lights up when ON					

• Lead wire — Oil resistant, flexible heavy duty vinyl cord, $\phi 3.4$, 0.15mm², 2 wire (Brown, Blue [Red, Black]), 3 wire (Brown, Black, Blue [Red, White, Black]), 0.5m

(Note) Refer to page 10 for auto switch common specifications and lead wire lengths.

Weights

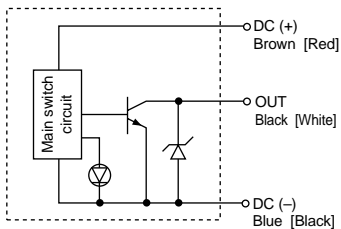
Unit: g

Model	Lead wire length	
	0.5m	3m
D-Y59A, Y69A, Y7P, Y7PV	10	53
D-Y59B, Y69B	9	50

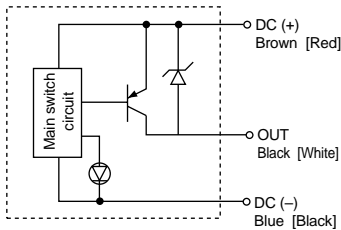
Internal circuits

Lead wire colors inside [] are those prior to conformity with IEC standards.

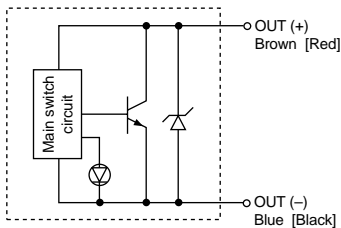
D-Y59A, Y69A



D-Y7P(V)

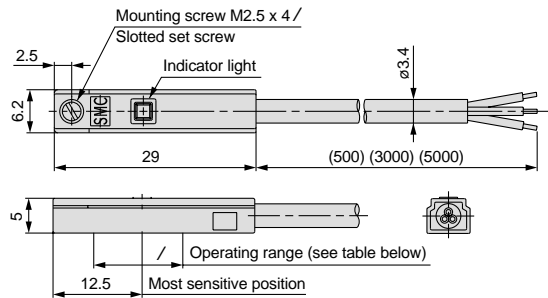


D-Y59B, Y69B

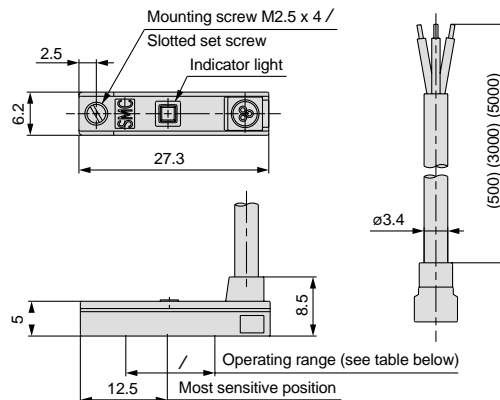


Dimensions

D-Y59A, Y59B D-Y7P



D-Y69A, Y69B D-Y7PV



Operating range	Bore size (mm)									
	12	16	20	25	32	40	50	63	80	100
Operating range / (mm)	5.5	7.5	7.5	7	6.5	6	7	8	9.5	10

(Note) This is a standard including hysteresis, and is not guaranteed. There may be large variations depending on the surrounding environment (variations on the order of $\pm 30\%$).

2 Color Indication Solid State Switches

Direct Mount Type

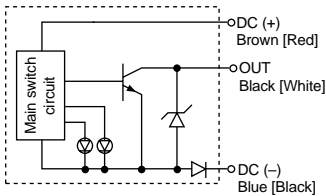
D-Y7NW(V)/Y7PW(V)/D-Y7BW(V)



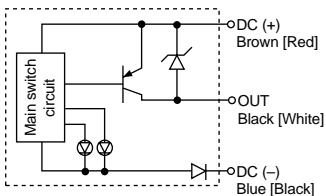
Internal circuits

Lead wire colors inside [] are those prior to conformity with IEC standards.

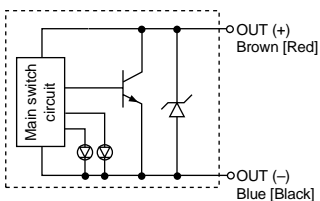
D-Y7NW(V)/3 wire NPN output



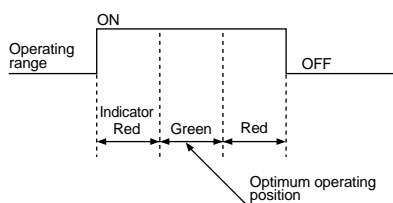
D-Y7PW(V)/3 wire PNP output



D-Y7BW(V)/2 wire



Indicator light/Display method



Auto Switch Specifications

D-Y7□W, D-Y7□WV (with indicator light)

Auto switch part no.	D-Y7NW	D-Y7NWV	D-Y7PW	D-Y7PWV	D-Y7BW	D-Y7BWV
Electrical entry direction	In-line	Perpendicular	In-line	Perpendicular	In-line	Perpendicular
Wiring type	3 wire				2 wire	
Output type	NPN		PNP		-	
Applicable load	IC circuit, Relay, PLC				24VDC relay, PLC	
Power supply voltage	5, 12, 24VDC (4.5 to 28VDC)				-	
Current consumption	10mA or less				-	
Load voltage	28VDC or less		-		24VDC (10 to 28VDC)	
Load current	40mA or less		80mA or less		5 to 40mA	
Internal voltage drop	1.5V or less (0.8V or less at 10mA load current)		0.8V or less		4V or less	
Leakage current	100μA or less at 24VDC				0.8mA or less at 24VDC	
Indicator light	Actuated position Red LED lights up				Optimum operating position Green LED lights up	

- Lead wire — Oil resistant, flexible heavy duty vinyl cord, $\phi 3.4$, 0.15mm², 3 wire (Brown, Black, Blue [Red, White, Black]), 2 wire (Brown, Blue [Red, Black]), 0.5m
- Note) Refer to page 10 for auto switch common specifications and lead wire lengths.

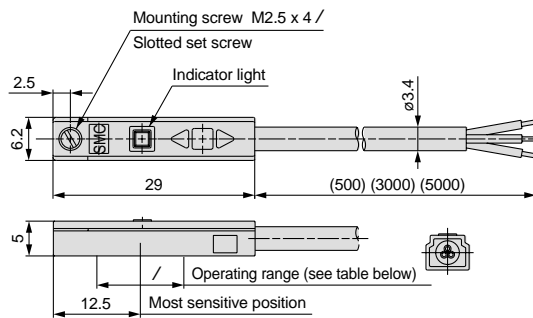
Weights

Model	Lead wire length	
	0.5m	3m
D-Y7NW, D-Y7NWV, Y7PW, Y7PWV	11	54
D-Y7BW, Y7BWV	11	54

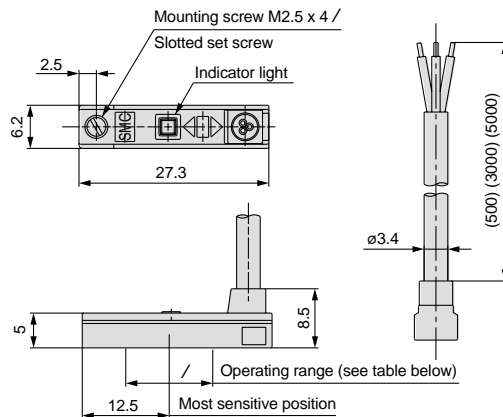
Unit: g

Dimensions

D-Y7□W



D-Y7□WV



Operating range	Bore size (mm)									
	12	16	20	25	32	40	50	63	80	100
Operating range /(mm)	5.5	7.5	7.5	7	6.5	6	7	8	9.5	10

Note) This is a standard including hysteresis, and is not guaranteed. There may be large variations depending on the surrounding environment (variations on the order of $\pm 30\%$).

Water Resistant 2 Color Indication Solid State Switches/Direct Mount Type D-Y7BAL

Water (coolant) resistant type



Auto Switch Specifications

D-Y7BAL (with indicator light)

Auto switch model no.	D-Y7BAL
Electrical entry direction	In-line
Wiring type	2 wire
Applicable load	24VDC relay, PLC
Load voltage	24VDC (10 to 28VDC)
Load current	5 to 40mA
Internal voltage drop	4V or less
Leakage current	1mA or less at 24VDC
Indicator light	Actuated position Red LED lights up Optimum operating position Green LED lights up

• Lead wire — Oil resistant, flexible heavy duty vinyl cord, $\phi 3.4$, 0.15mm², 2 wire (Brown, Blue [Red, Black]), 3m
Note) Refer to page 10 for auto switch common specifications and lead wire lengths.

Weights

Unit: g

Model	Lead wire length
	3m
D-Y7BAL	54

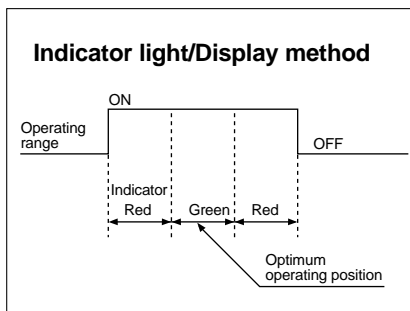
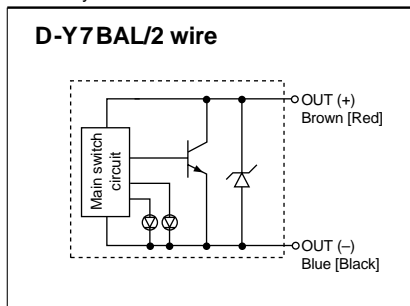
Operating Precautions

⚠ Caution

- Contact P/A if a solution other than water is to be used.

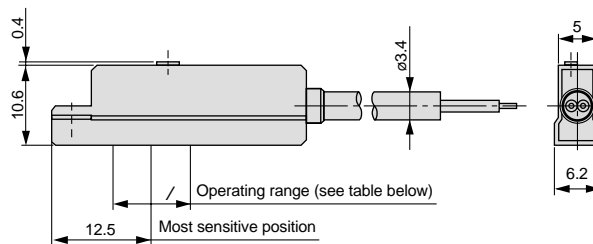
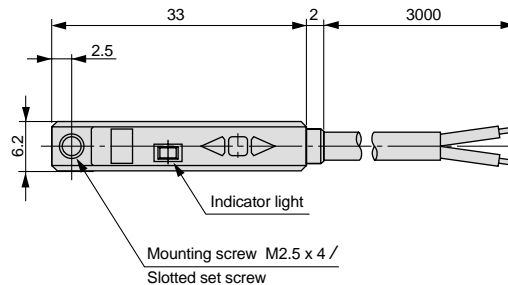
Internal circuits

Lead wire colors inside [] are those prior to conformity with IEC standards.



Dimensions

D-Y7BAL



Bore size	Bore size (mm)							
	20	25	32	40	50	63	80	100
Operating range								
Operating range / (mm)	5	5	6	6	6	6	6	6.5

Note) This is a standard including hysteresis, and is not guaranteed. There may be large variations depending on the surrounding environment (variations on the order of $\pm 30\%$).

Magnetic Field Resistant 2 Color Indication Solid State Switches/Rail Mount Type D-P5DWL

Grommet

Operational in an environment with magnetic field disturbance (AC magnetic field).



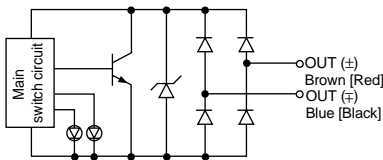
Caution

Handling Precautions

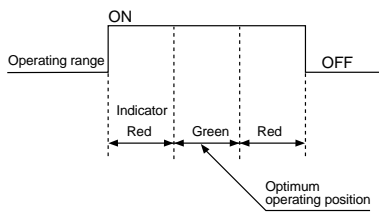
For use with single-phase AC welders. Cannot be used with DC inverter welder (includes rectifying type), arc welder, or condenser type welder.

Auto Switch Internal Circuit

Lead wire colors inside [] are those prior to conformity with IEC standards.



Indicator light/Display method



Auto Switch Specifications

D-P5DW (with indicator light)

Auto switch model no.	D-P5DWL
Wiring type	2 wire (non-polar)
Applicable load	24VDC relay, PLC
Load voltage	24VDC (20 to 28VDC)
Load current	6 to 40mA or less
Internal voltage drop	5V or less
Leakage current	1mA or less at 24VDC
Operating time	40ms or less
Indicator light	Actuated position Red LED lights up Optimum operating position ... Green LED lights up

• Lead wire — Oil resistant, heavy duty vinyl cord, $\phi 6$, 0.5mm², 2 wire (Brown, Blue [Red, Black]), 3m
Note) Refer to page 10 for auto switch common specifications and lead wire lengths.

Magnetic Field Resistance

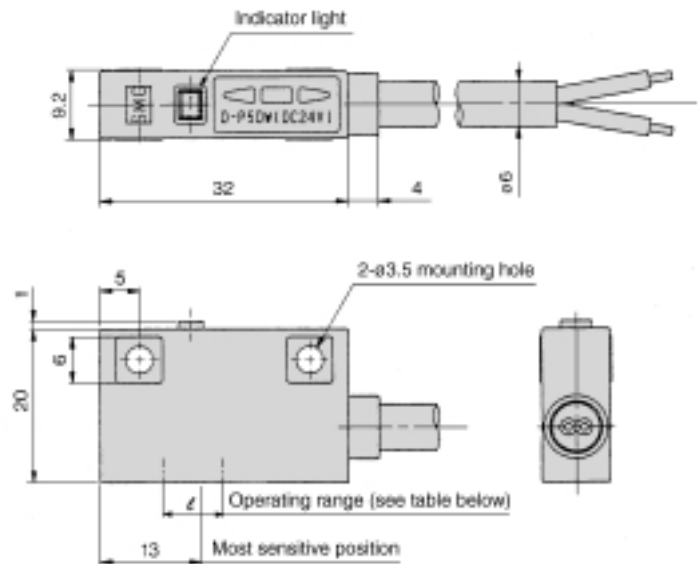
When the AC welding current is 16000A or less, the operational distance between the welding conductor (welding gun or cable) and the cylinder or auto switch can be 0mm. Consult P/A when exceeding 16000A.

Auto Switch Weights

Model	Lead wire length	
	3m	5m
D-P5DWL	150	240

Unit: g

Dimensions



Operating range	Bore size (mm)				
	40	50	63	80	100
Operating range / (mm)	4.1	3.9	4.8	4.2	4.2

Note) This is a standard including hysteresis, and is not guaranteed. There may be large variations depending on the surrounding environment (variations on the order of $\pm 30\%$).