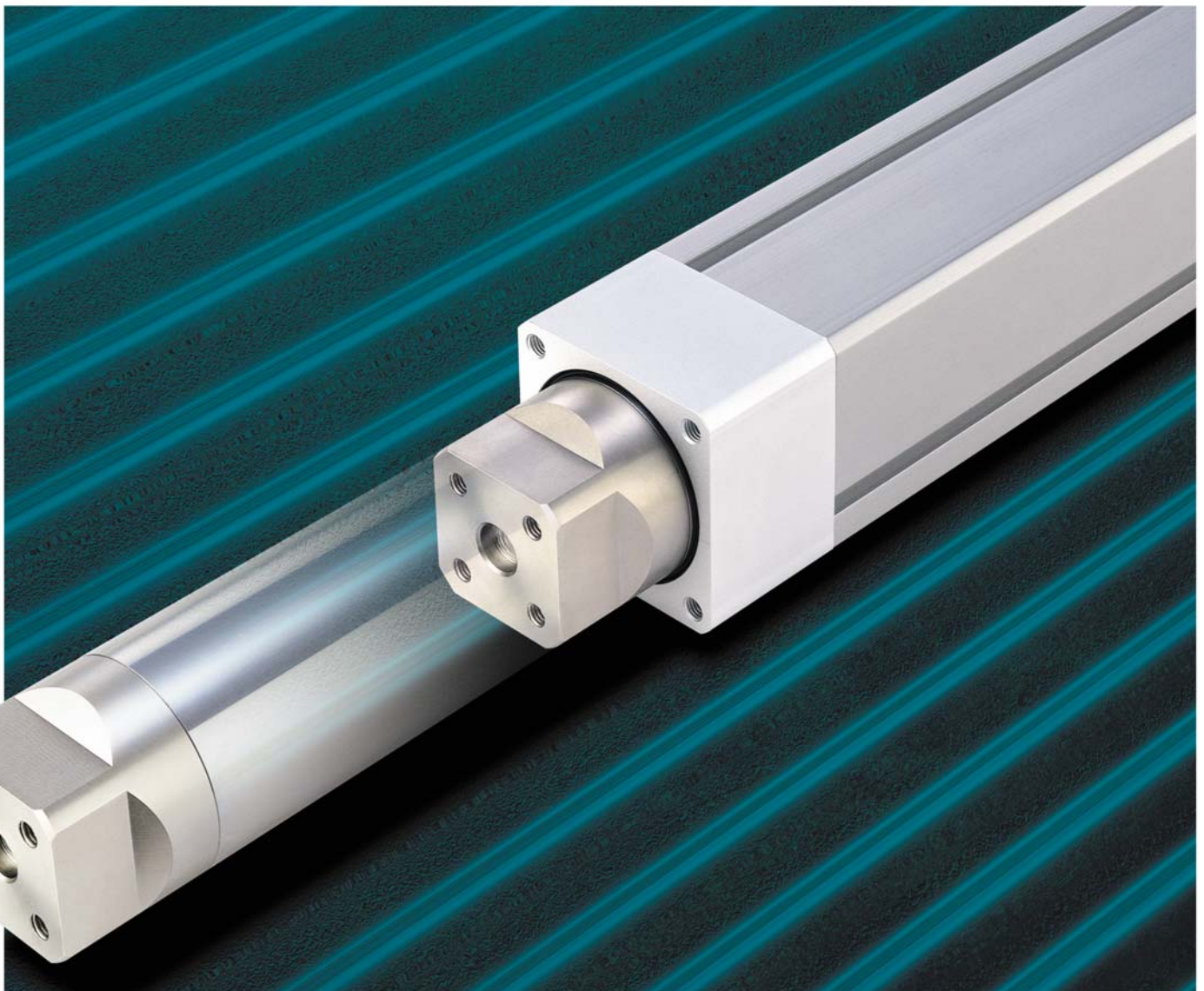


# Non-rotating Double Power Cylinder Double Power Cylinder (without Non-rotation Mechanism)



Now also available in  $\varnothing 20$  and  $\varnothing 25$ .



Non-rotating Double Power Cylinder    Double Power Cylinder

**Series MGZ/series MGZR**  
(without Non-rotation Mechanism)

# Non-rotating Double Power Cylinder

# Series MGZ

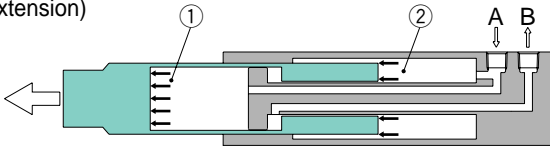
Ø20, Ø25, Ø32, Ø40, Ø50, Ø63, Ø80

## Double extension output power

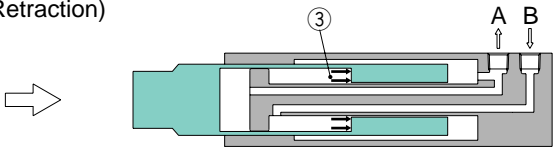
Our unique construction doubles the extended piston area. An ideal cylinder for lifting and press applications.

## New Ø20 are n are n

Air pressure supplied from A operates on both surfaces ① and ②.  
(Extension)



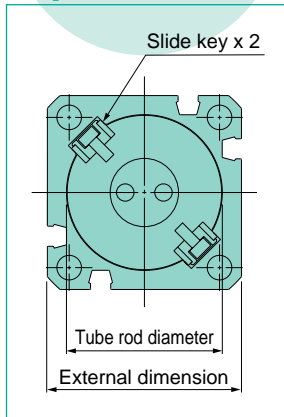
Air pressure supplied from B operates on surfaces ③.  
(Retraction)



## Improved work piece mounting accuracy

Positioning holes on the work piece mounting surface allow easy alignment.

## Say goodbye to non-rotation guides!! (Series MGZ)

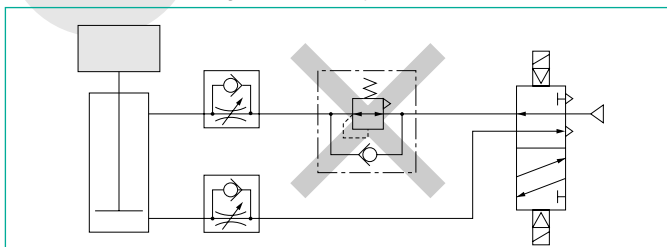


Series MGZ employs a slide bearing and a large bore tube rod that accounts for approximately 80% of the cylinder's external diameter. In addition, a built-in non-rotation mechanism using slide keys allows loads to be mounted directly.



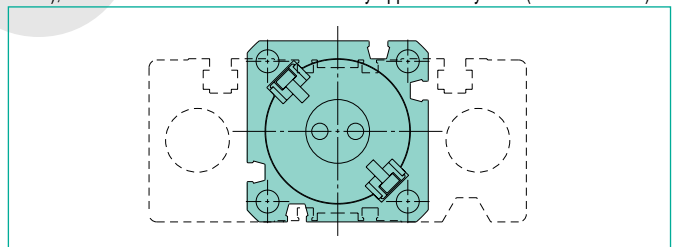
## Regulator with check valve is not required.

A regulator with check valve, normally required for a lifting circuit, is no longer necessary.



## Excellent strength delivered in a small package.

Although moment resistance is equivalent to that of a guided cylinder (cylinder + 2 guide shafts), the installation area has been reduced by approximately 40% (for Series MGZ).

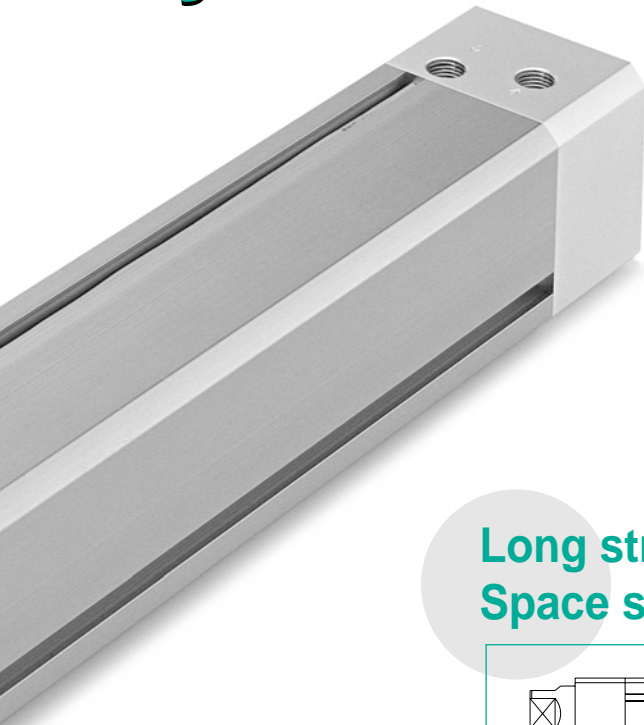


# Double Power Cylinder

# Series *MGZR* (without non-rotation mechanism)

ø20, ø25, ø32, ø40, ø50, ø63, ø80

and ø25 sizes  
newly added.

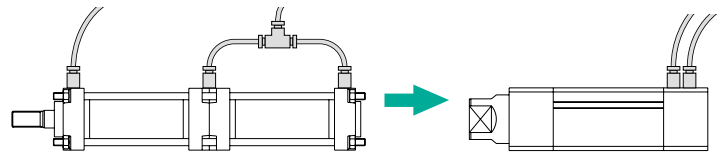


## Flush, unencumbered appearance

Auto switches can be housed in grooves on 4 sides.



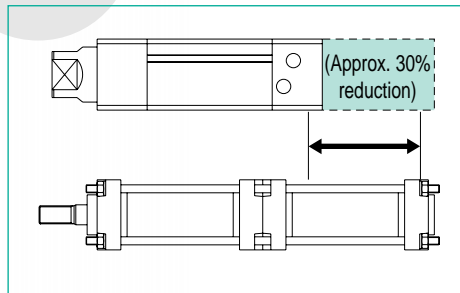
Piping is concentrated in the head cover.



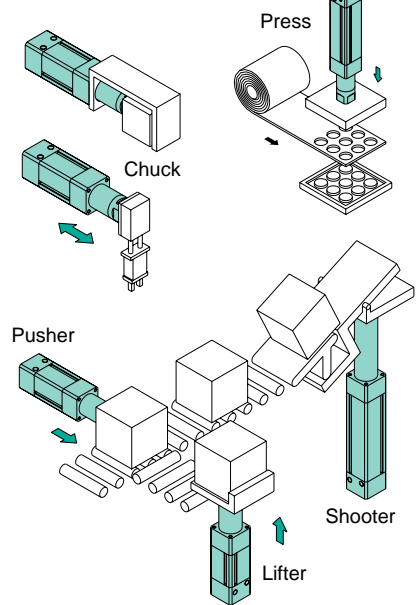
## Long strokes available Space saving

Note)  
Strokes up to 1,000 mm are available. Unlike conventional tandem type double output cylinders, whose length is more than twice the stroke length, our double output cylinders are markedly more compact.

Note) Strokes up to 800mm are available in bore sizes ø20 and ø25.



## Application examples



## Variations

Name	Model	Bore size (mm)	End lock	Coil scraper	Mounting bracket			
					Transaxial foot type	Front flange type	Rear flange type	Double clevis
Non-rotating double power cylinder	<b>MGZ</b>	20, 25, 32, 40 50, 63, 80	Note) ●	●	●	●	●	—
Double power cylinder	<b>MGZR</b> (without non-rotation mechanism)		—	●	●	●	●	●

Note) Except for ø20, ø25, ø32 and ø80.

**Type with front end lock**  
**Drop protection**  
(MGZ only)



**Double clevis type**  
**For rotating applications.**  
(MGZR only)



**With coil scraper**

# Series MGZ/MGZR Model Selection



Theoretical output must be confirmed separately. Refer to the theoretical output table on page 6.

## Series MGZ

### 1. Confirmation of allowable load weight by each application

Selection conditions: Determine which of the conditions below matches your intended application, then choose one of the selection graphs that follow.

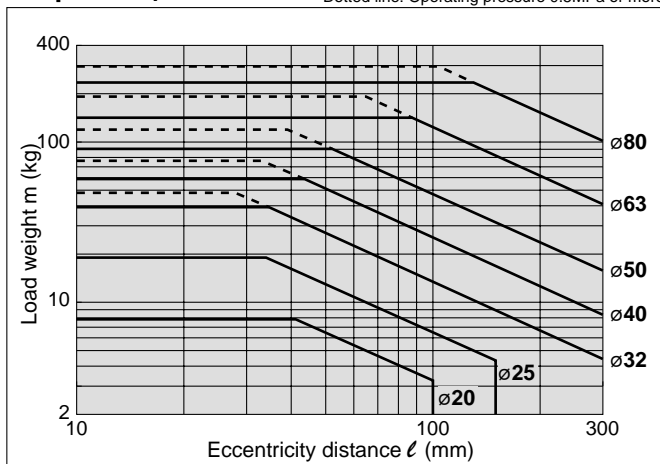
Vertical upward: Lifter			Vertical downward: Press		Horizontal: Chucking		
Maximum speed (mm/s)			Maximum speed (mm/s)		Load center of gravity position $l$ (mm)		
up to 300	up to 500	up to 700	up to 300	up to 500	up to 100	up to 200	up to 300
Graph 1	Graph 2	Graph 3	Graph 4	Graph 5	Graph 6	Graph 7	Graph 8

\* $l$ : This dimension indicates the position of the load center of gravity when the cylinder is retracted.

### Selection Graphs 1 to 3 (Vertical Upward Mounting)

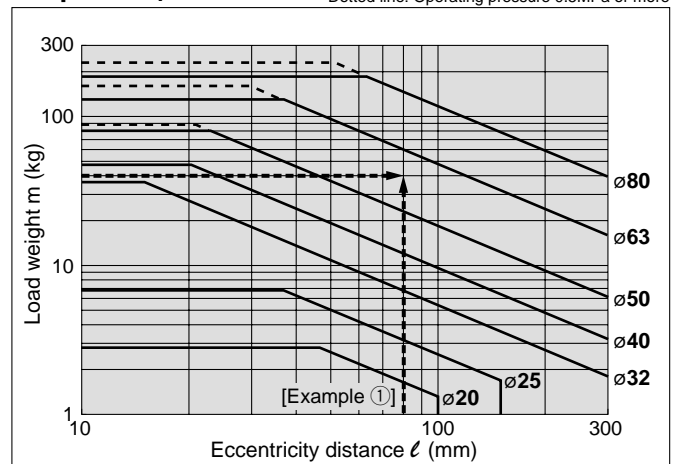
Graph 1 up to 300mm/s

Solid line: Operating pressure 0.4MPa or more  
Dotted line: Operating pressure 0.5MPa or more



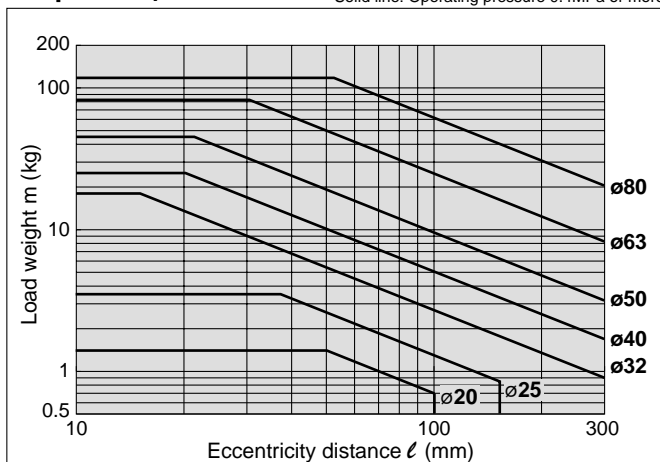
Graph 2 up to 500mm/s

Solid line: Operating pressure 0.4MPa or more  
Dotted line: Operating pressure 0.5MPa or more



Graph 3 up to 700mm/s

Solid line: Operating pressure 0.4MPa or more



### Selection Example: Vertical Upward Mounting

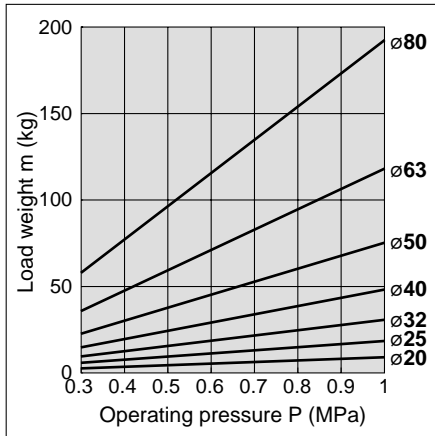
- ① Selection conditions
- Mounting: Vertical upward (Lifter)
  - Maximum speed: 500mm/s
  - Load weight: 40kg
  - Eccentricity distance: 80mm

Since the conditions are vertical upward mounting with a speed of 500mm/s, use graph 2. In the graph, find where the lines representing a load weight of 40kg and an eccentric distance of 80mm intersect. From the graph, a  $\phi 63$  bore size is selected.

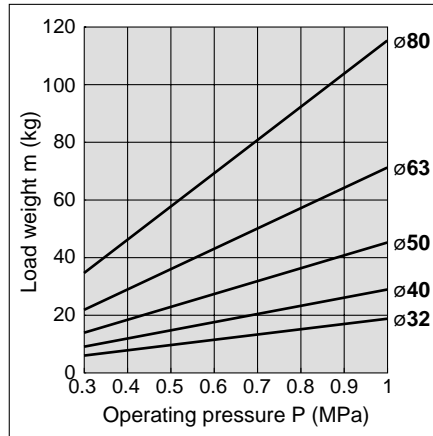


## Selection Graph 4 and 5 (Vertical Downward Mounting)

**Graph 4** up to 300mm/s



**Graph 5** up to 500mm/s



## Selection Example: Horizontal Mounting

② Selection conditions

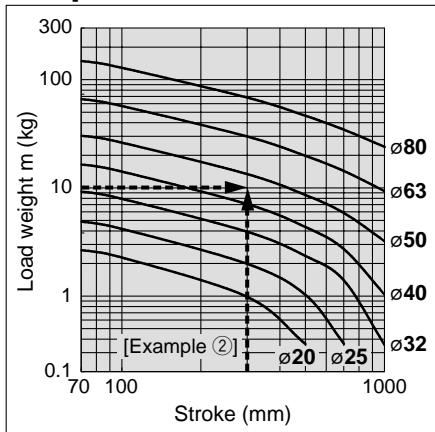
- Mounting: Horizontal (Chucking)
- Stroke: 300mm
- Load center of gravity position: 100mm
- Load weight: 10kg
- Operating pressure: 0.5MPa

Refer to graph 6 based on the horizontal mounting and the load center of gravity position. In the graph, find where the lines representing a load weight of 10kg and a stroke of 300mm intersect. A ø50 bore size is selected.

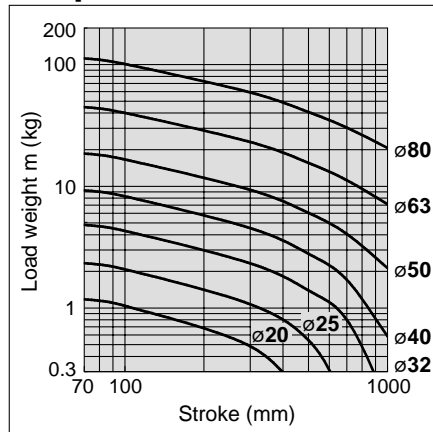
The theoretical output for the extension stroke is 1924 N, from the theoretical output table on page 6.

## Selection Graph 6 to 8 (Horizontal Mounting)

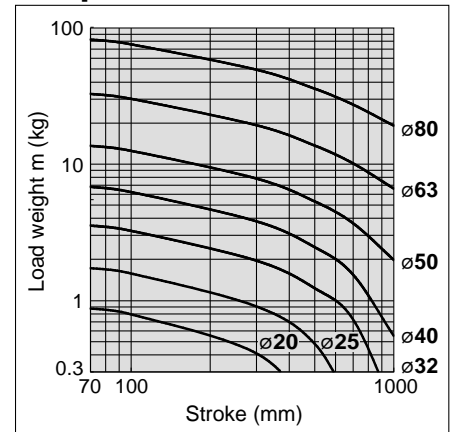
**Graph 6**  $l$ : 100mm or less



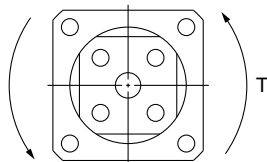
**Graph 7**  $l$ : 101 to 200mm



**Graph 8**  $l$ : 201 to 300mm



### 2. Confirmation of allowable rotating torque

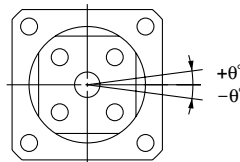


#### Allowable rotating torque

Bore size (mm)	Allowable rotating torque T (N·m)
20	2.7
25	4
32	5
40	7
50	15
63	20
80	30

### 3. Confirmation of non-rotating accuracy

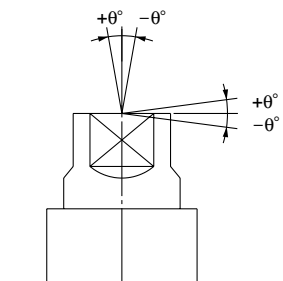
#### 3-1 Rolling direction



#### Non-rotating accuracy

Bore size (mm)	Non-rotating accuracy (±θ)
20	±0.4 or less
25	
32	
40	±0.3 or less
50	
63	
80	

#### 3-2 Pitching direction



#### Deflection angle of eccentric load

Bore size (mm)	Non-rotating accuracy (±θ)
20	±0.12 or less
25	
32	
40	
50	
63	
80	

## Series MGZR (without non-rotation mechanism)

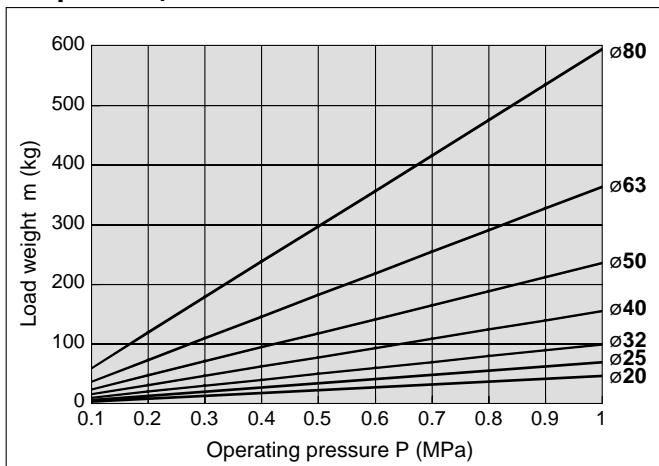
### 1. Find the bore size of the cylinder tube

Selection conditions: Determine which of the conditions below matches your intended application, then choose one of the selection graphs that follow.

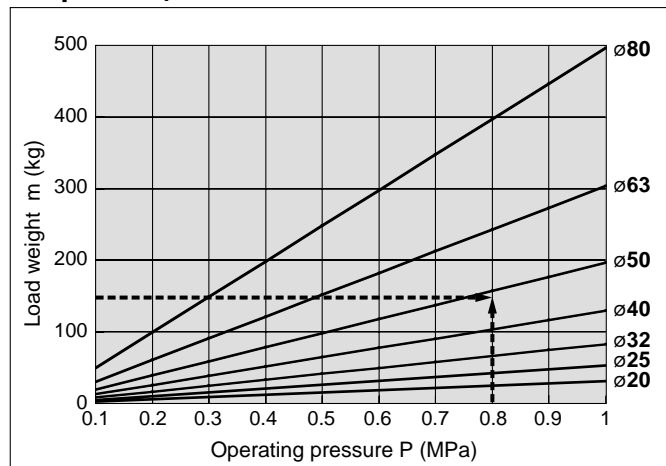
Vertical upward load			Load extended horizontally			Load retracted horizontally	
Maximum speed (mm/s)			Maximum speed (mm/s)			Maximum speed (mm/s)	
up to 300	up to 500	up to 700	up to 300	up to 500	up to 700	up to 300	up to 450
Graph 1	Graph 2	Graph 3	Graph 4	Graph 5	Graph 6	Graph 7	Graph 8

### Selection Graphs 1 to 3 (Vertical Upward Load)

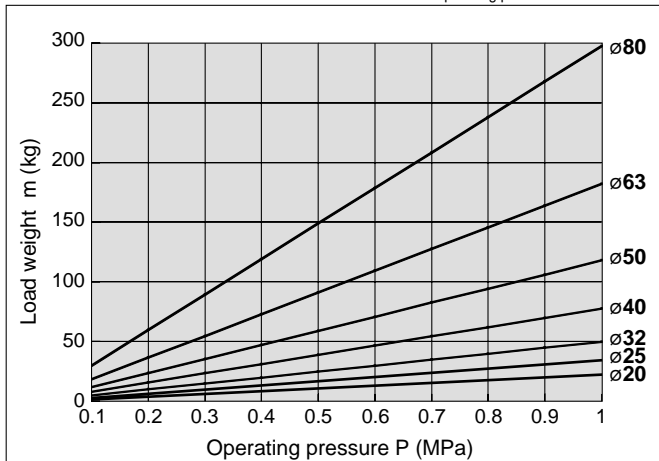
Graph 1 up to 300mm/s



Graph 2 up to 500mm/s



Graph 3 up to 700mm/s Continuous line: Operating pressure 0.4MPa or more



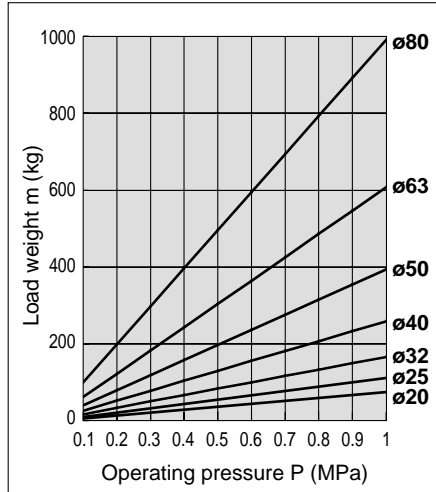
### Selection Example: Vertical Upward Load

- ① Selection conditions
- Mounting: Vertical upward
  - Maximum speed: 500mm/s
  - Operating pressure : 0.8MPa
  - Load weight: 150kg

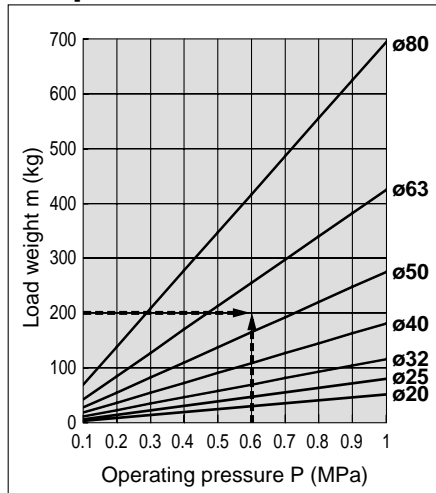
Since the conditions are vertical upward mounting with a speed of 500mm/s, use graph 2. In the graph, find where the lines representing an operating pressure of 0.8MPa and a load weight of 150kg intersect. A ø50 bore size is selected.

## Selection Graphs 4, 5, and 6 (Load Extended Horizontally)

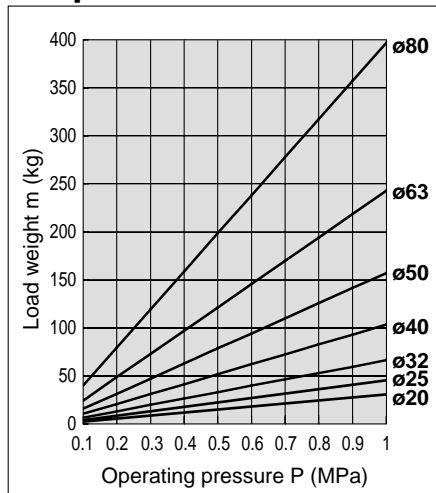
### Graph 4 up to 300mm/s



### Graph 5 up to 500mm/s

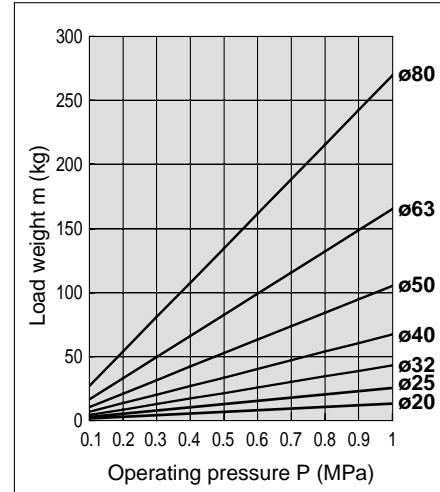


### Graph 6 up to 700mm/s

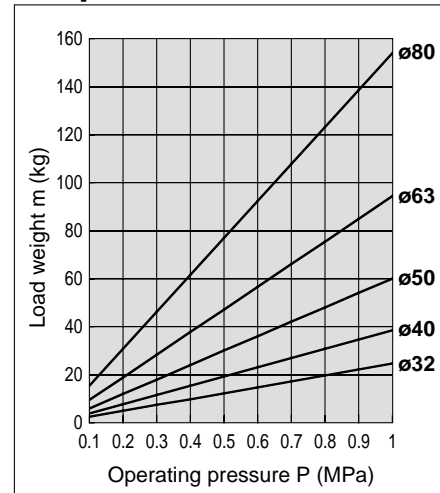


## Selection Graphs 7 and 8 (Load Retracted Horizontally)

### Graph 7 up to 300mm/s



### Graph 8 up to 450mm/s



## Selection Example: Load extended horizontally

### ② Selection conditions

Mounting: Horizontal extrusion  
Maximum speed: 500mm/s  
Operating pressure: 0.6MPa  
Load weight: 200kg

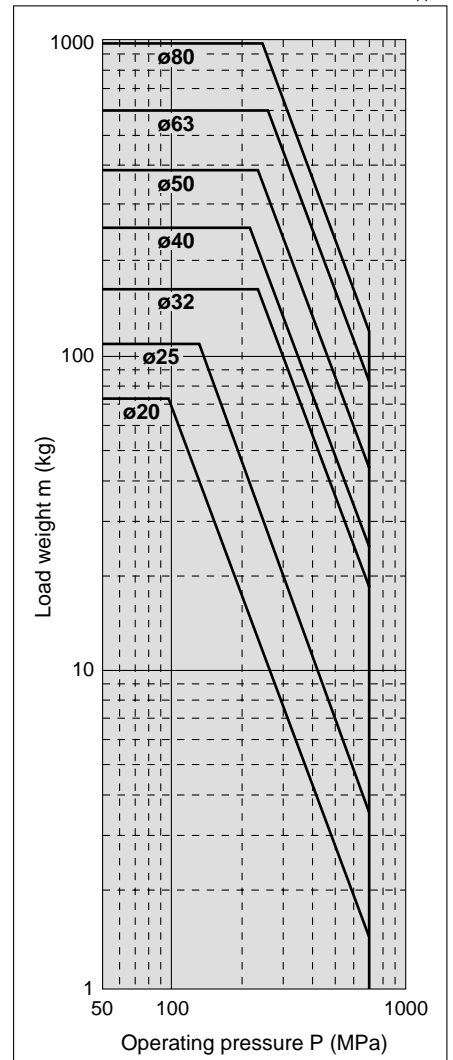
Since the conditions are horizontal extension with a speed of 500mm/s, use graph 5. In the graph, find where the lines representing an operating pressure of 0.6MPa and a load weight of 200kg intersect. A ø63 bore size is selected.

## 2. Confirmation of allowable kinetic energy

Confirm the strength of the built-in stopper (rubber bumper) based on the correlation of load weight and the maximum speed. If the value is

Below the line in the graph: A built-in stopper can be used.

Above the line in the graph: Either use a cylinder with a larger bore size or install an external stopper



# Non-rotating Double Power Cylinder

# Series MGZ

∅20, ∅25, ∅32, ∅40, ∅50, ∅63, ∅80

## How to Order

### Standard

**Mounting types**

Nil	Basic type
L	Transaxial foot type
F	Front flange type
G	Rear flange type

MGZ    40    Z 100 Z73   

**Bore size**

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

**Port thread type**

Nil	M5 x 0.8	∅20
	Rc	∅25
TN	NPT	∅32
		∅40
TF	G	∅50
		∅63
		∅80

**Number of auto switches**

Nil	2 pcs.
S	1 pc.

**Auto switch type**

Nil	Without auto switch (cylinder with built-in magnet)
-----	---

\*Select applicable auto switch models from the table below.

\*Auto switches are packed together when shipped (unassembled).

**Stroke (mm)**

Refer to the standard stroke table on page 6.

**Coil scraper**

Nil	Without
Z	With

### Applicable auto switches: ∅20, ∅25, ∅32

Type	Special function	Electrical entry	Indicator light	Wiring (output)	Load voltage			Auto switch type		Lead wire length (m)*			Applicable load	
					DC	AC	Electrical entry direction		0.5 (Nil)	3 (L)	5 (Z)			
							Perpendicular	In-line						
Reed switch	—	Grommet	No	2-wire	24V	5V, 12V 12V	100V or less 100V	A90V	A90	●	●	○	IC circuit	Relay PLC
								A93V	A93	●	●	—	—	—
Solid state switch	—	Grommet	Yes	3-wire (NPN)	24V	5V, 12V	—	M9NV	M9N	●	●	○	IC circuit	Relay PLC
				3-wire (PNP)				M9PV	M9P	●	●	○	—	
Solid state switch	Diagnostic indication (2-colour display)	Grommet	Yes	2-wire	24V	5V, 12V	—	M9BV	M9B	●	●	○	—	Relay PLC
				3-wire (NPN)				M9NV	M9N	●	●	○	IC circuit	
				3-wire (PNP)				M9PV	M9P	●	●	○	—	
				2-wire				M9BW	M9B	●	●	○	—	
Solid state switch	Improved water resistance (2-colour display)	Grommet	Yes	3-wire (NPN)	24V	5V, 12V	—	M9NWV	M9NW	●	●	○	IC circuit	Relay PLC
				3-wire (PNP)				M9PWV	M9PW	●	●	○	—	
Solid state switch	Improved water resistance (2-colour display)	Grommet	Yes	2-wire	24V	12V	—	M9BWV	M9BW	●	●	○	—	Relay PLC
				—				M9BA	—	●	○	—		

### Applicable auto switches: ∅40, ∅50, ∅63, ∅80

Type	Special function	Electrical entry	Indicator light	Wiring (output)	Load voltage			Auto switch type		Lead wire length (m)*			Applicable load	
					DC	AC	Electrical entry direction		0.5 (Nil)	3 (L)	5 (Z)			
							Perpendicular	In-line						
Reed switch	—	Grommet	Yes	3-wire (NPN equiv.)	24V	5V	—	—	Z76	●	●	—	IC circuit	Relay PLC
				2-wire				—	Z73	●	●	●	—	
Solid state switch	—	Grommet	No	2-wire	24V	5V, 12V	100V or less	—	Z80	●	●	—	IC circuit	Relay PLC
								—	—	—	—	—		
Solid state switch	—	Grommet	Yes	3-wire (NPN)	24V	5V, 12V	—	Y69A	Y59A	●	●	○	IC circuit	Relay PLC
				3-wire (PNP)				Y7PV	Y7P	●	●	○	—	
				2-wire				Y69B	Y59B	●	●	○	—	
				3-wire (NPN)				Y7NWV	Y7NW	●	●	○	IC circuit	
Solid state switch	Diagnostic indication (2-colour display)	Grommet	Yes	3-wire (PNP)	24V	5V, 12V	—	Y7PWV	Y7PW	●	●	○	—	Relay PLC
				2-wire				Y7BWV	Y7BW	●	●	○	—	
Solid state switch	Improved water resistance (2-colour display)	Grommet	Yes	2-wire	24V	12V	—	—	Y7BA	—	●	○	—	Relay PLC
				—				—	—	—	—			

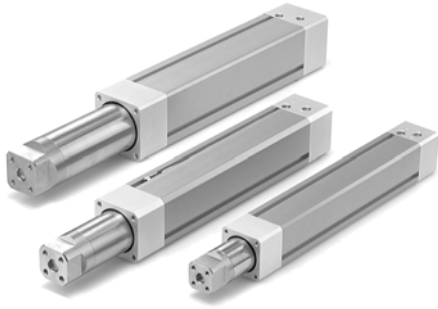
\*Lead wire length symbols: 0.5m ..... Nil (Example) Y69B  
 3m ..... L (Example) Y69BL  
 5m ..... Z (Example) Y69BZ

Notes) • Solid state switches marked "○" are produced upon receipt of order.  
 • Retrofitting of an auto switch on a cylinder that is originally ordered without one requires a switch spacer per the next page.



# Non-rotating Double Power Cylinder *Series MGZ*

## Specifications



Bore size (mm)	20	25	32	40	50	63	80
Action	Double acting/Single rod						
Fluid	Air						
Proof pressure	1.5MPa						
Max. operating pressure	1.0MPa						
Min. operating pressure	Standard stroke: 0.08MPa						
	Long stroke: 0.12MPa						
Ambient and fluid temperature	Without auto switch: -10° to 70°C (with no freezing)						
	With auto switch: -10° to 60°C (with no freezing)						
Lubrication	Non-lube						
Piston speed	OUT	50 to 700mm/s					
	IN	50 to 350mm/s	50 to 450mm/s				
Stroke length tolerance	Up to 250 <sup>+1.0</sup> <sub>0</sub> , 251 to 1000 <sup>+1.4</sup> <sub>0</sub>						
Cushion	Rubber bumper						
Screw tolerance	JIS class 2						
Mounting	Basic type, Transaxial foot type, Front flange type, Rear flange type						

## Standard Strokes

Bore sizes (mm)	Standard strokes (mm)	Long strokes (mm)
<b>20, 25</b>	75, 100, 125, 150, 175 200, 250, 300	350, 400, 450, 500 600, 700, 800
<b>32, 40, 50 63, 80</b>	75, 100, 125, 150, 175 200, 250, 300	350, 400, 450, 500, 600 700, 800, 900, 1000

Intermediate strokes and strokes shorter than 75 mm are also available.

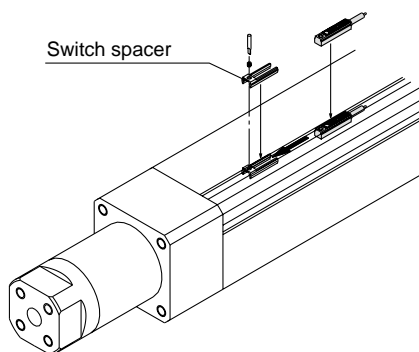
## Switch Spacer

Applicable bore size (mm)	<b>20, 25, 32</b>	<b>40, 50, 63, 80</b>
Switch spacer model	BM Y3-016	BMP1-032

## Mounting Bracket Part Nos.

Bore size (mm)	20	25	32	40
Foot	MGZ-L02	MGZ-L25	MGZ-L03	MGZ-L04
Flange	MGZ-F02	MGZ-F25	MGZ-F03	MGZ-F04

Bore size (mm)	50	63	80
Foot	MGZ-L05	MGZ-L06	MGZ-L08
Flange	MGZ-F05	MGZ-F06	MGZ-F08



## Weights

(kg)

Bore size (mm)		20	25	32	40	50	63	80
Standard weight	Basic type	0.47	0.69	1.04	1.90	3.03	4.83	8.63
	Foot	0.63	0.86	1.34	2.39	3.92	6.08	10.61
	Flange	0.58	0.83	1.32	2.34	3.79	5.83	9.92
Weight per each 50mm of stroke	All mounting brackets	0.18	0.21	0.28	0.39	0.59	0.78	1.17

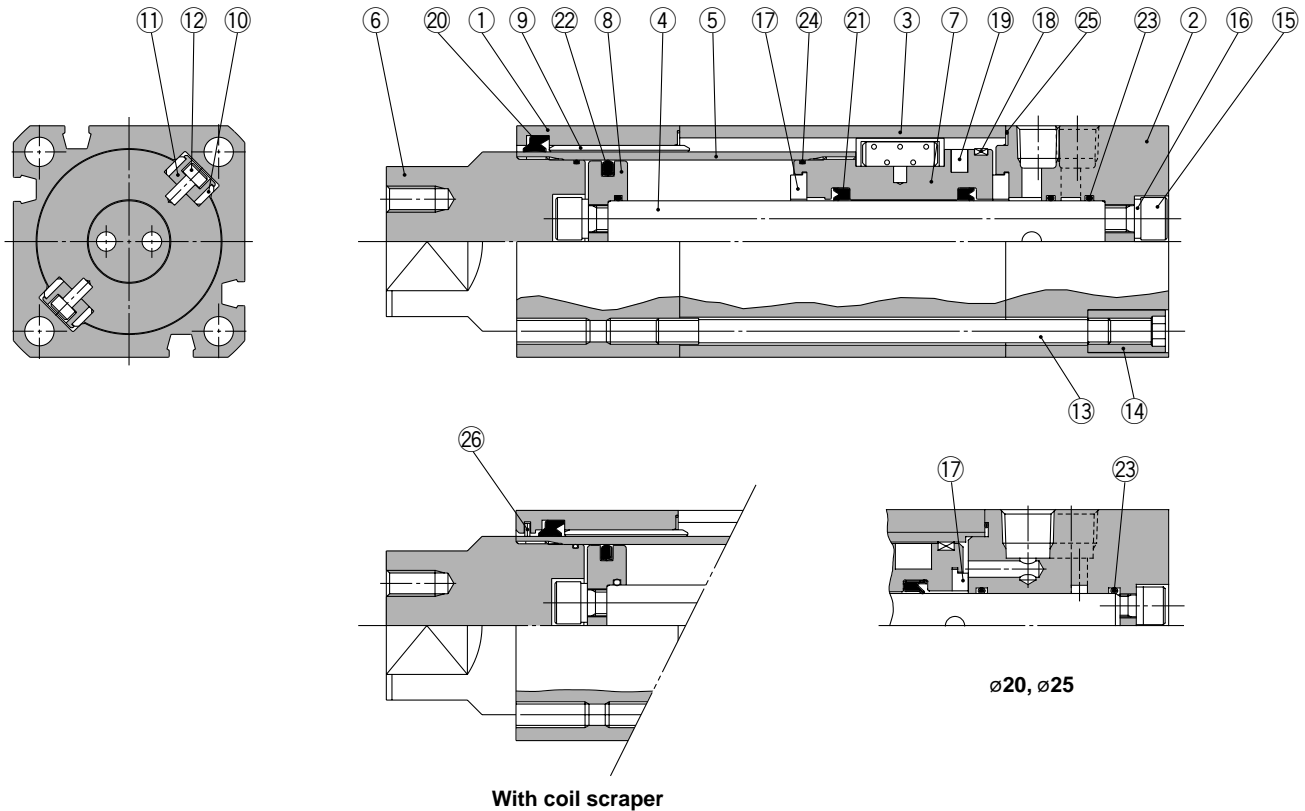
## Theoretical Output

(N)

Model	Bore size (mm)	Rod size (mm)	Operating direction	Piston area (mm <sup>2</sup> )	Operating pressure (MPa)									
					0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	
<b>MGZ20</b>	20 × 25	10	OUT	726	145	218	290	363	436	508	581	653	726	
			IN	236	47	71	94	118	141	165	189	212	236	
<b>MGZ25</b>	25 × 30	12	OUT	1085	217	326	434	543	651	760	868	977	1085	
			IN	378	76	113	151	189	227	265	302	340	378	
<b>MGZ32</b>	36 × 32	16	OUT	1621	324	486	648	811	973	1135	1297	1459	1621	
			IN	603	121	181	241	302	362	422	482	543	603	
<b>MGZ40</b>	45 × 40	20	OUT	2533	507	760	1013	1267	1520	1773	2026	2280	2533	
			IN	942	188	283	377	471	565	659	754	848	942	
<b>MGZ50</b>	55 × 50	25	OUT	3848	770	1154	1539	1924	2309	2694	3078	3463	3848	
			IN	1473	295	442	589	737	884	1031	1178	1326	1473	
<b>MGZ63</b>	68 × 63	32	OUT	5945	1189	1784	2378	2973	3567	4162	4756	5351	5945	
			IN	2313	463	694	925	1157	1388	1619	1850	2082	2313	
<b>MGZ80</b>	87 × 80	40	OUT	9715	1943	2915	3886	4858	5829	6801	7772	8744	9715	
			IN	3770	754	1131	1508	1885	2262	2639	3016	3393	3770	

# Series MGZ

## Construction



### Parts list

No.	Description	Material	Note
1	Rod cover	Aluminum alloy	Clear anodized
2	Head cover	Aluminum alloy	Clear anodized
3	Cylinder tube	Aluminum alloy	Hard anodized
4	Piston rod	Aluminum alloy	Hard anodized
5	Tube rod	Carbon steel tube	Hard chromium electronplated
6	Tube rod cover	Carbon steel	Electroless nickel plated
7	Piston	Aluminum alloy	Chromated
8	Stationary piston	Aluminum alloy	Chromated
9	Bushing	Lead-bronze casting	
10	Thrust plate	Lead-bronze casting	
11	Holder	Aluminum alloy	Chromated
12	Pin	Carbon steel	Zinc chromated
13	Tie rod	Carbon steel	Corrosion resistant chromated

No.	Description	Material	Note
14	Tie rod nut	Carbon steel	Nickel plated
15	Hexagon socket head screw	Chrome molybdenum steel	Nickel plated
16	Spring washer	Steel wire	Nickel plated
17	Bumper	Urethane rubber	
18	Wear ring	Resin	
19	Magnet	Magnet	
20*	Rod seal A	NBR	
21	Rod seal B	NBR	
22	Piston seal	NBR	
23	Piston gasket	NBR	
24	Tube rod gasket	NBR	
25*	Cylinder tube gasket	NBR	
26	Coil scraper	Metal	

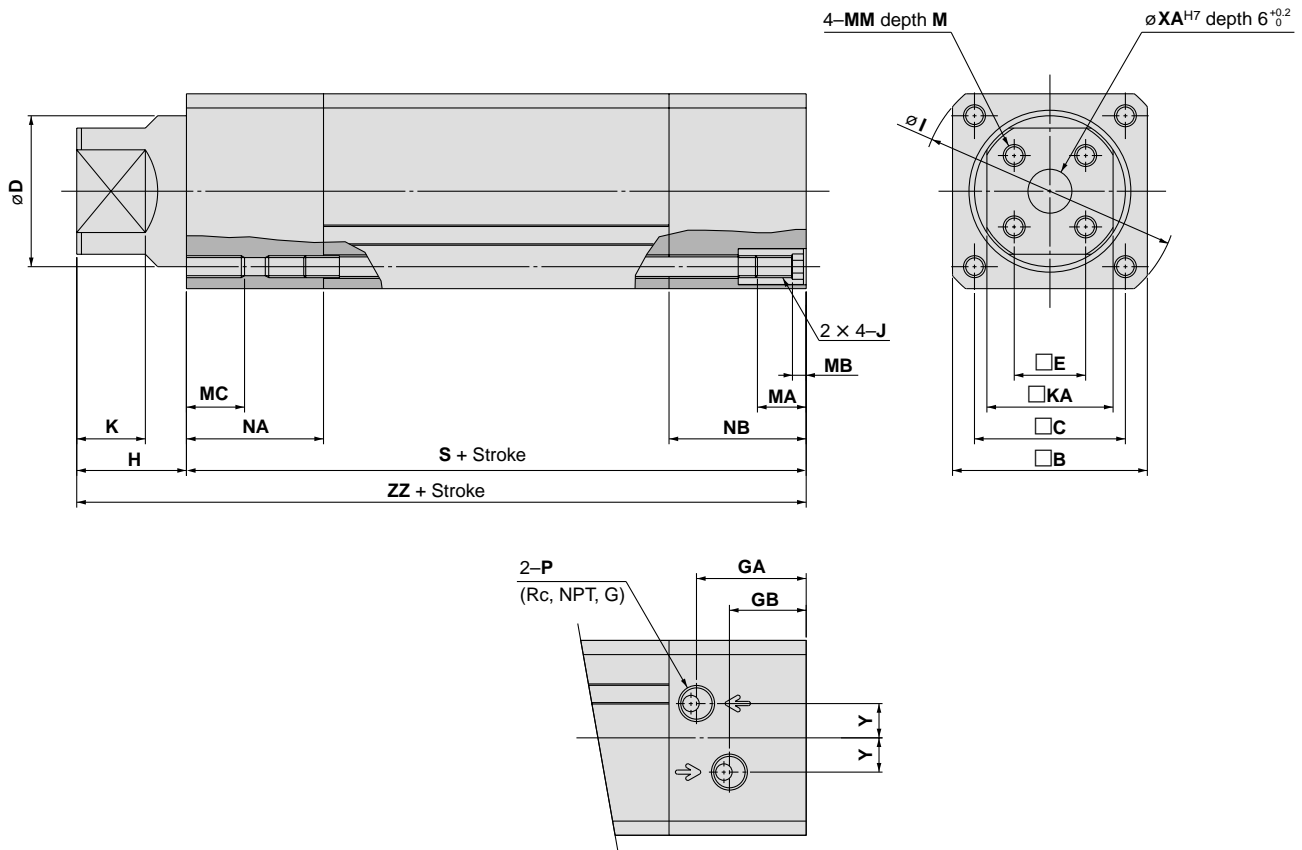
### Replacement parts: Seal kits

Bore size (mm)	Seal kit no.	Kit components
20	MGZ20-PS	Items 20 and 25 from the above chart
25	MGZ25-PS	
32	MGZ32-PS	
40	MGZ40-PS	
50	MGZ50-PS	
63	MGZ63-PS	
80	MGZ80-PS	

\* Seal kits consist of items 20 and 25, and can be ordered by using the seal kit number corresponding to each bore size.

## Dimensions

### Basic type



The allowable angle difference of  $\square E$  to  $\square B$  should be limited to  $\pm 1.5^\circ$ .

														(mm)
Bore size (mm)	Stroke range	B	C	D	E	KA	GA	GB	H	I	J	K	M	
20	to 800	39	29	25	11	21	16	12.5	20	51	M5	11	8	
25	to 800	43	33	30	12	24	26	18	21	57	M5	12	8	
32	to 1000	49	38	36	16	30	28.5	19.5	35	66	M6	22	10	
40	to 1000	59	46	45	21	36	34.5	23.5	40	78	M6	25	10	
50	to 1000	71	55	55	26	46	40	28	45	92	M8	25	14	
63	to 1000	82	66	68	32	53	46.5	34.5	50	110	M8	25	14	
80	to 1000	106	86	87	36	65	54	36	50	144	M12	25	20	

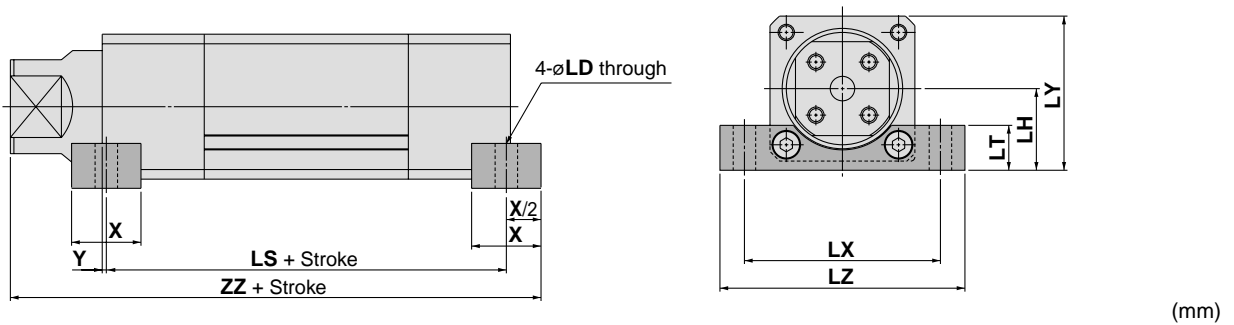
  

Bore size (mm)	Stroke range	MA	MB	MC	MM	NA	NB	P	S	XA	Y	ZZ
20	to 800	11	4	10	M5	19	21	M5	86	6	5	106
25	to 800	11	4	10	M5	26	34	1/8	107	6	6.5	128
32	to 1000	16	4	12	M6		37	1/8	120	12	8.5	155
40	to 1000	16	4	12	M6		44	1/4	138	12	9.5	178
50	to 1000	16	5	15	M8		50	1/4	150	16	12.5	195
63	to 1000	16	5	15	M8		56	1/4	171	16	15	221
80	to 1000	20	6	23	M12		66	3/8	198	20	20	248

# Series MGZ

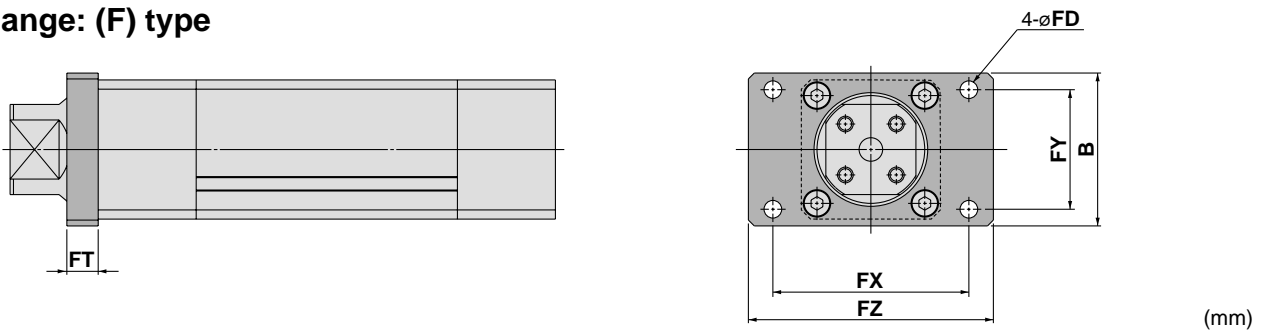
## Dimensions: With Mounting Bracket

### Transaxial foot: (L) type



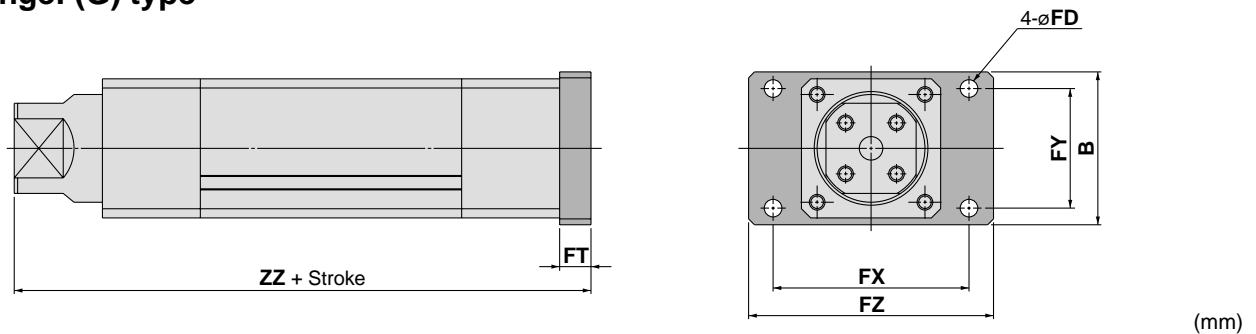
Bore size (mm)	Stroke range	X	Y	LD	LH	LT	LX	LY	LZ	LS	ZZ
20	to 800	16	0	6.6	22	13	58	41.5	72	86	114
25	to 800	16	0	6.6	24	14	62	45.5	75	107	136
32	to 1000	22	0	9	27.5	16	70	52	88	120	166
40	to 1000	24	0	9	34	19	80	63.5	100	138	190
50	to 1000	32	1	11	40	22	96	75.5	120	148	210
63	to 1000	36	3	13	47	24	110	88	140	165	236
80	to 1000	40	3	17	59	30	146	112	180	192	265

### Front flange: (F) type



Bore size (mm)	Stroke range	B	FD	FT	FX	FY	FZ
20	to 800	44	5.5	8	50	34	60
25	to 800	48	6.6	8	57	36	70
32	to 1000	60	9	12	64	46	78
40	to 1000	74	9	12	80	58	100
50	to 1000	78	9	16	100	61	125
63	to 1000	100	12	16	112	75	138
80	to 1000	120	14	16	132	95	155

### Rear flange: (G) type



Bore size (mm)	Stroke range	B	FD	FT	FX	FY	FZ	ZZ
20	to 800	44	5.5	8	50	34	60	114
25	to 800	48	6.6	8	57	36	70	136
32	to 1000	60	9	12	64	46	78	167
40	to 1000	74	9	12	80	58	100	190
50	to 1000	78	9	16	100	61	125	211
63	to 1000	100	12	16	112	75	138	237
80	to 1000	120	14	16	132	95	155	264



# Non-rotating Double Power Cylinder with Rod-Side End Lock

## Series **MGZ**

ø40, ø50, ø63

### How to Order

**End lock** MGZ    40    100 R Z73   

**Mounting types**

Nil	Basic type
L	Transaxial foot type
F	Front flange type
G	Rear flange type

**Bore size**

40	40mm
50	50mm
63	63mm

**Port thread type**

Nil	Rc
TN	NPT
TF	G

**Number of auto switches**

Nil	2 pcs.
S	1 pc.

**Auto switch type**

Nil	Without auto switch (cylinder with built-in magnet)
-----	---

**With rod-side end lock**

**Stroke (mm)**  
Refer to the standard stroke table on page 12.

### Applicable auto switches: Direct mounting type

Type	Special function	Electrical entry	Indicator light	Wiring (output)	Load voltage		Auto switch type		Lead wire length (m)*			Applicable load				
					DC	AC	Electrical entry direction		0.5 (Nil)	3 (L)	5 (Z)					
							Perpendicular	In-line								
Reed switch	—	Grommet	Yes	3-wire (NPN equip.)	—	5V	—	Z76	●	●	—	IC circuit	—			
				2-wire	24V	12V	100V	—	Z73	●	●	●	—	Relay PLC		
					5V, 12V	100V or less	—	Z80	●	●	—	IC circuit	PLC			
Solid state switch	—	Grommet	Yes	3-wire (NPN)	24V	5V, 12V	—	Y69A	Y59A	●	●	○	IC circuit	Relay PLC		
				3-wire (PNP)				Y7PV	Y7P	●	●	○	—			
				2-wire				Y69B	Y59B	●	●	○	—			
	Diagnostic indication (2-colour display)			3-wire (NPN)				5V, 12V	—	Y7N WV	Y7N W	●	●		○	IC circuit
	Improved water resistance (2-colour display)			3-wire (PNP)				12V	Y7P WV	Y7P W	●	●	○		—	
				2-wire					Y7B WV	Y7B W	●	●	○		—	
				—					Y7BA	—	●	○	—			

\*Lead wire length symbols: 0.5m.....Nil (Example) Y69B  
 3m.....L (Example) Y69BL  
 5m.....Z (Example) Y69BZ

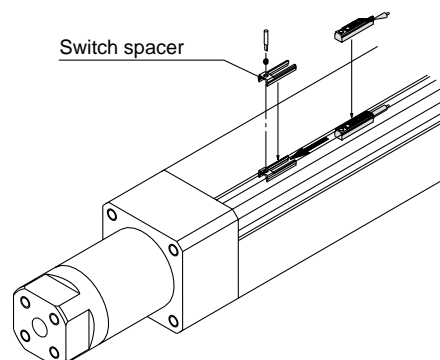
(Notes) • Solid state switches marked "○" are produced upon receipt of order.  
 • Retrofitting of an auto switch on a cylinder that is originally ordered without one requires a switch spacer per the table below.

#### Switch Spacer

Applicable bore size (mm)	40, 50, 63
Switch spacer model	BMP1-032

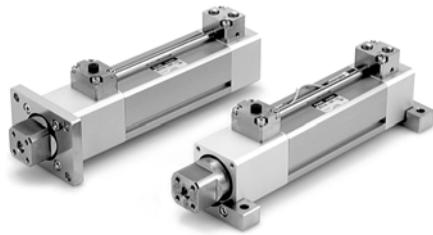
#### Mounting Bracket Part Nos.

Bore size (mm)	40	50	63
Foot	MGZ-L04	MGZ-L05	MGZ-L06
Flange	MGZ-F04	MGZ-F05	MGZ-F06





# Non-rotating Double Power Cylinder with Rod-Side End Lock **Series MGZ**



## Cylinder Specifications

Bore size (mm)	40	50	63
Action	Double acting/Single rod		
Fluid	Air		
Proof pressure	1.5MPa		
Max. operating pressure	1.0MPa		
Min. operating pressure	0.2MPa*		
Ambient and fluid temperature	Without auto switch: -10° to 70°C (with no freezing)		
	With auto switch: -10° to 60°C (with no freezing)		
Lubrication	Non-lube		
Piston speed	OUT 50 to 700mm/s		
	IN 50 to 450mm/s		
Stroke length tolerance	Up to 250 <sup>+1.0</sup> <sub>0</sub> , 251 to 1000 <sup>+1.4</sup> <sub>0</sub>		
Cushion	Rubber bumper		
Screw tolerance	JIS class 2		
Mounting	Basic type, Transaxial foot type, Front flange type, Rear flange type		

\*0.08MPa (or 0.12MPa for long strokes) except for the lock part.

## Lock Specifications

End lock position	Rod side only		
Holding force (max) N	ø40	ø50	ø63
	1770	2690	4160
Backlash	2mm or less		
Manual release	Non-locking type		

Adjust the switch position so that it operates upon movement to both the stroke end and backlash (2mm) position.

## Standard Strokes

Bore sizes (mm)	Standard strokes (mm)	Long strokes (mm)
40, 50, 63	75, 100, 125, 150, 175 200, 250, 300	350, 400, 450, 500, 600 700, 800, 900, 1000

Intermediate strokes and strokes shorter than 75mm are also available.

## Weights

(kg)

Bore size (mm)		40	50	63
Standard weight	Basic type	2.80	4.08	6.13
	Foot type	3.29	4.97	7.39
	Flange type	3.24	4.84	7.13
Weight per each 50mm of stroke	All mounting brackets	0.41	0.61	0.80

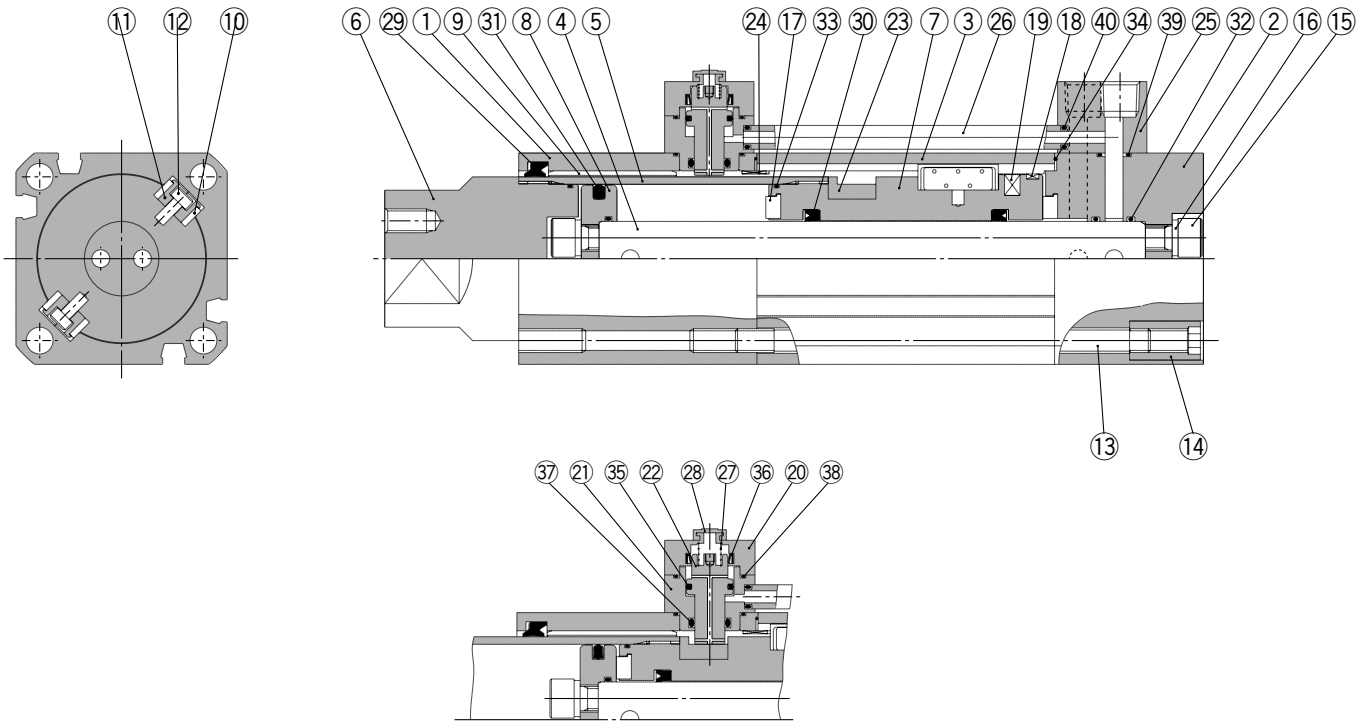
## Theoretical Output

(N)

Model	Bore size (mm)	Rod size (mm)	Operating direction	Piston area (mm <sup>2</sup> )	Operating pressure (MPa)								
					0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
MGZ40	45 × 40	20	OUT	2533	507	760	1013	1267	1520	1773	2026	2280	2533
	40		IN	942	188	283	377	471	565	659	754	848	942
MGZ50	55 × 50	25	OUT	3848	770	1154	1539	1924	2309	2694	3078	3463	3848
	50		IN	1473	295	442	589	737	884	1031	1178	1326	1473
MGZ63	68 × 63	32	OUT	5945	1189	1784	2378	2973	3567	4162	4756	5351	5945
	63		IN	2313	463	694	925	1157	1388	1619	1850	2082	2313

# Series MGZ

## Construction



End lock

### Parts list

No.	Description	Material	Note
1	Rod cover	Aluminum alloy	Clear anodized
2	Head cover	Aluminum alloy	Clear anodized
3	Cylinder tube	Aluminum alloy	Hard anodized
4	Piston rod	Aluminum alloy	Hard anodized
5	Tube rod	Carbon steel tube	Hard chromium electroplated
6	Tube rod cover	Carbon steel	Electroless nickel plated
7	Piston	Aluminum alloy	Chromated
8	Stationary piston	Aluminum alloy	Chromated
9	Bushing	Lead-bronze casting	
10	Thrust plate	Lead-bronze casting	
11	Holder	Aluminum alloy	Chromated
12	Pin	Carbon steel	Zinc chromated
13	Tie rod	Carbon steel	Corrosion resistant chromated
14	Tie rod nut	Carbon steel	Nickel plated
15	Hexagon socket head screw	Chrome molybdenum steel	Nickel plated
16	Spring washer	Steel wire	Nickel plated
17	Bumper	Urethane rubber	
18	Wear ring	Resin	
19	Magnet	Magnet	
20	Cap	Bronze alloy	Electroless nickel plated

No.	Description	Material	Note
21	Lock holder	Stainless steel	
22	Lock piston	Carbon steel	Quenched, hard chromium electroplated
23	Stopper	Carbon steel	Quenched
24	Collar	Lead-bronze casting	
25	Port block	Bronze alloy	Electroless nickel plated
26	Pipe	Bronze alloy	
27	Lock spring	Steel wire	
28	Rubber cap	Synthetic rubber	
29*	Rod seal A	NBR	
30	Rod seal B	NBR	
31	Piston seal	NBR	
32	Piston gasket	NBR	
33	Tube rod gasket	NBR	
34*	Cylinder tube gasket	NBR	
35*	Locking piston seal A	NBR	
36*	Locking piston seal B	NBR	
37*	Locking piston seal C	NBR	
38*	Lock holder gasket	NBR	
39*	Port block gasket	NBR	
40*	Pipe gasket	NBR	

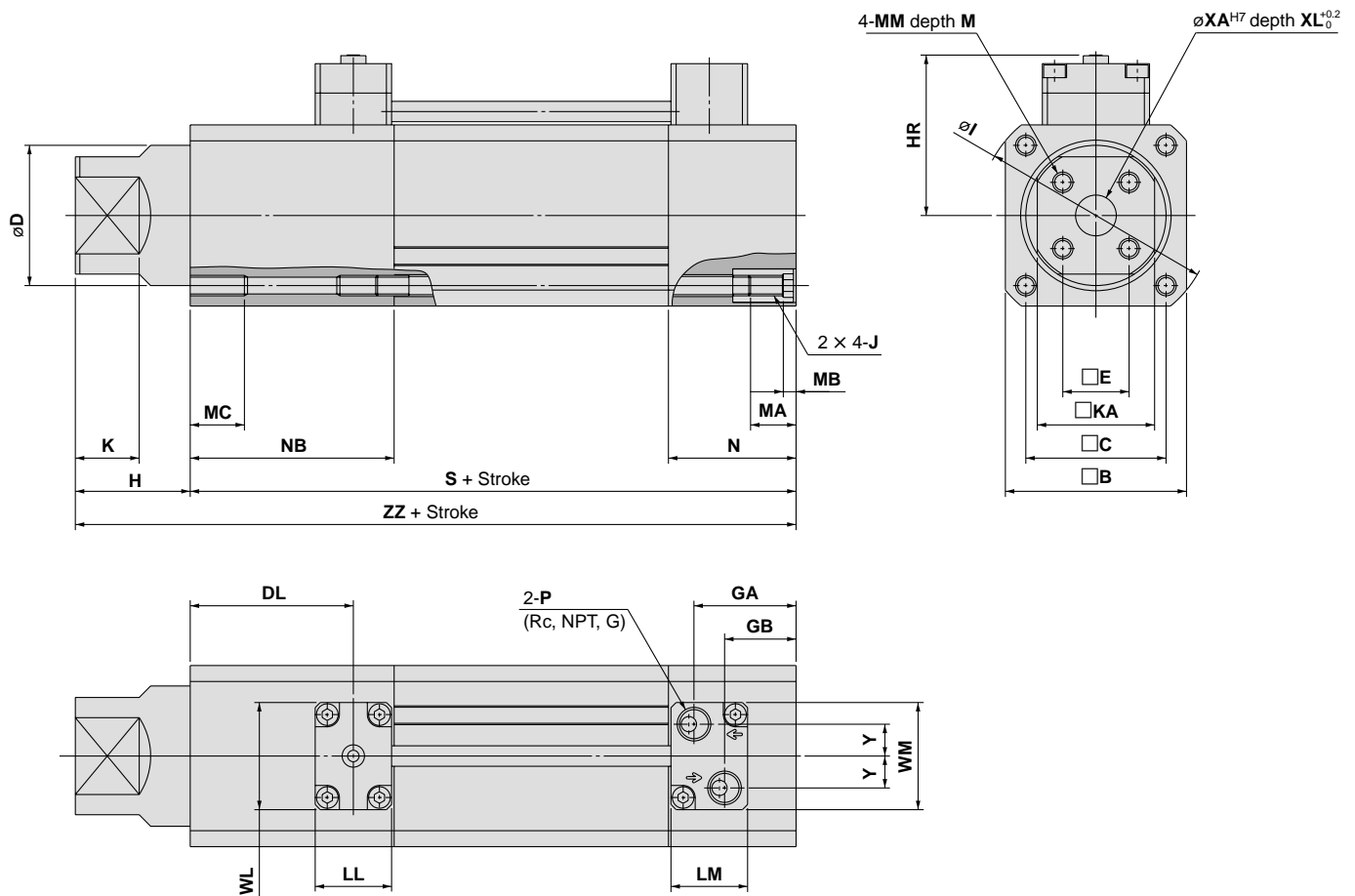
### Replacement parts: Seal kits

Bore size (mm)	Seal kit no.	Kit components
40	MGZ40R-PS	Items 29, and 34 to 40 from the above chart
50	MGZ50R-PS	
63	MGZ63R-PS	

\*Seal kits consist of items 29 and 34 to 40, and can be ordered by using the seal kit number corresponding to each bore size.

## Dimensions

### Basic type



(mm)

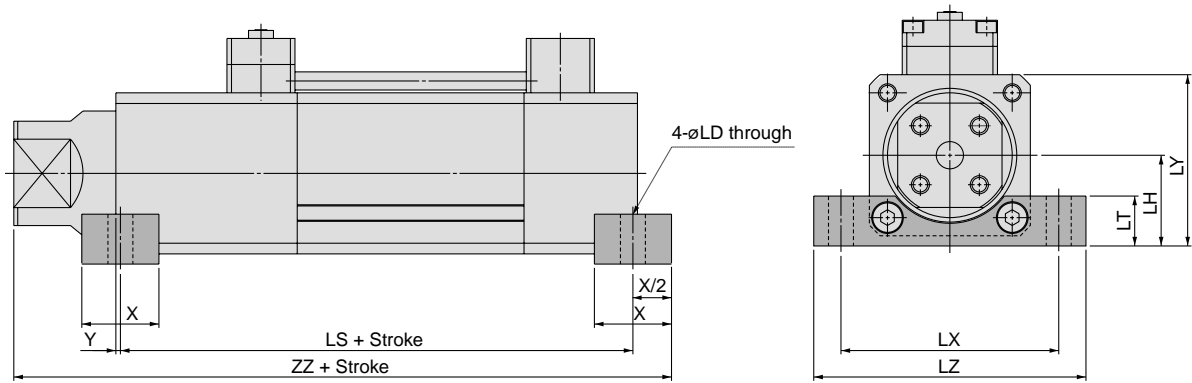
Bore size (mm)	Stroke range	B	C	D	DL	E	GA	GB	H	HR	I	J	K	KA	LL	LM
40	to 1000	59	46	45	58	21	34.5	23.5	40	57.5	78	M6	25	36	30	30
50	to 1000	71	55	55	67	26	40	28	45	63.5	92	M8	25	46	30	30
63	to 1000	82	66	68	73	32	46.5	34.5	50	69	110	M8	25	53	30	30

Bore size (mm)	Stroke range	M	MA	MB	MC	MM	N	NB	P	S	XA	XL	Y	WL	WM	ZZ
40	to 1000	10	16	4	12	M6	44	74	1/4	168	12	6	9.5	42	39	208
50	to 1000	14	16	5	15	M8	50	83	1/4	183	16	6	12.5	42	42	228
63	to 1000	14	16	5	15	M8	56	89	1/4	204	16	6	15	52	52	254

# Series MGZ

## Dimensions: With Mounting Bracket

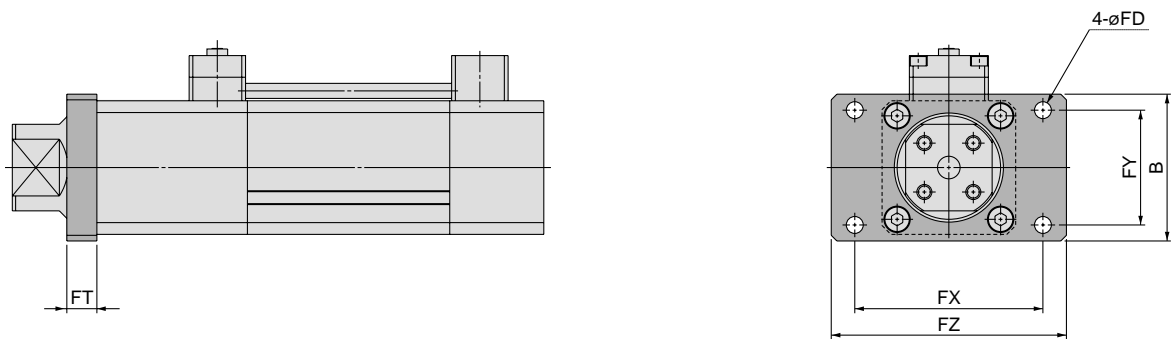
### Transaxial foot: (L) type



(mm)

Bore size (mm)	Stroke range	X	Y	LD	LH	LT	LX	LY	LZ	LS	ZZ
40	to 1000	24	0	9	34	19	80	63.5	100	168	220
50	to 1000	32	1	11	40	22	96	75.5	120	181	243
63	to 1000	36	3	13	47	24	110	88	140	198	269

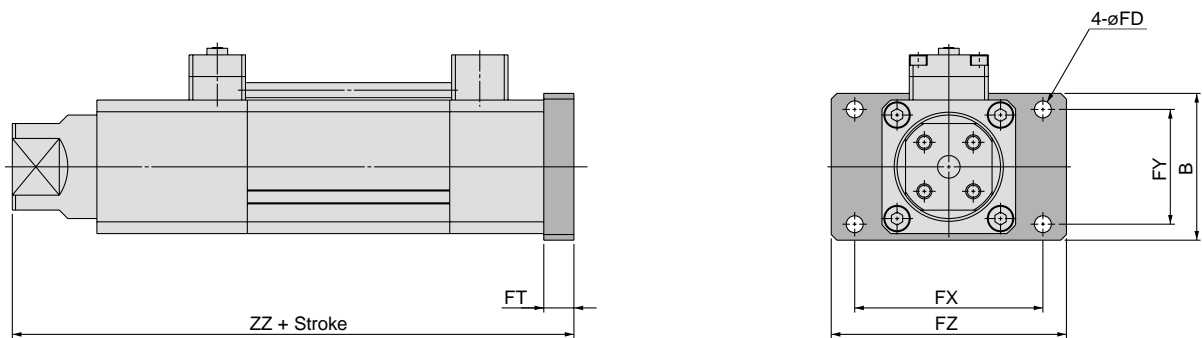
### Front flange: (F) type



(mm)

Bore size (mm)	Stroke range	B	FD	FT	FX	FY	FZ
40	to 1000	74	9	12	80	58	100
50	to 1000	78	9	16	100	61	125
63	to 1000	100	12	16	112	75	138

### Rear flange: (G) type



(mm)

Bore size (mm)	Stroke range	B	FD	FT	FX	FY	FZ	ZZ
40	to 1000	74	9	12	80	58	100	220
50	to 1000	78	9	16	100	61	125	244
63	to 1000	100	12	16	112	75	138	270



# Double Power Cylinder

# Series *MGZR*

(without non-rotation mechanism)

∅20, ∅25, ∅32, ∅40, ∅50, ∅63, ∅80

## How to Order

**Standard** MGZ R 40 Z 100 Z73

Without non-rotation mechanism

**Mounting types**

Nil	Basic type
L	Transaxial foot type
F	Front flange type
G	Rear flange type
D	Double clevis type

**Bore size**

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

**Port thread type**

Nil	M5 × 0.8	∅20
	Rc	∅25
TN	NPT	∅32
		∅40
		∅50
TF	G	∅63
		∅80

**Number of auto switches**

Nil	2 pcs.
S	1 pc.

**Auto switch type**

Nil	Without auto switch (cylinder with built-in magnet)
-----	---

\* Select applicable auto switch models from the table below.  
\* Auto switches are packed together when shipped (unassembled).

**Stroke (mm)**  
Refer to the standard stroke table on page 18.

**Coil scraper**

Nil	Without coil scraper
Z	With coil scraper

### Applicable auto switches: ∅20, ∅25, ∅32

Type	Special function	Electrical entry	Indicator light	Wiring (output)	Load voltage			Auto switch type		Lead wire length (m)*			Applicable load	
					DC	AC	Electrical entry direction		0.5 (Nil)	3 (L)	5 (Z)			
							Perpendicular	In-line						
Reed switch	—	Grommet	No	2-wire	24V	5V, 12V	100V or less	A90V	A90	●	●	○	IC circuit	Relay PLC
						12V	100V	A93V	A93	●	●	○		
				Yes	3-wire (NPN equiv)	—	5V	—	A96V	A96	●	●	—	IC circuit
Solid state switch	—	Grommet	Yes	3-wire (NPN)	24V	5V, 12V	—	M9NV	M9N	●	●	—	IC circuit	Relay PLC
				3-wire (PNP)				M9PV	M9P	●	●	○		
				2-wire	M9BV	M9B	●	●	○	—				
				3-wire (NPN)	M9NVV	M9NV	●	●	○	IC circuit				
				3-wire (PNP)	M9PVV	M9PV	●	●	○	IC circuit				
				2-wire	M9BVV	M9BV	●	●	○	—				
				—	M9BVV	M9BV	●	●	○	—				
Improved water resistance (2-colour display)	—	M9BA	—	●	○	—								

### Applicable auto switches: ∅40, ∅50, ∅63, ∅80

Type	Special function	Electrical entry	Indicator light	Wiring (output)	Load voltage			Auto switch type		Lead wire length (m)*			Applicable load	
					DC	AC	Electrical entry direction		0.5 (Nil)	3 (L)	5 (Z)			
							Perpendicular	In-line						
Reed switch	—	Grommet	Yes	3-wire (NPN equiv.)	24V	5V	—	—	Z76	●	●	—	IC circuit	Relay PLC
				2-wire				—	Z73	●	●	●		
				No	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
				3-wire (PNP)				Y7PV	Y7P	●	●	○		
				2-wire	Y69B	Y59B	●	●	○	—				
				3-wire (NPN)	Y7NVV	Y7NV	●	●	○	IC circuit				
				3-wire (PNP)	Y7PVV	Y7PV	●	●	○	IC circuit				
				2-wire	Y7BVV	Y7BV	●	●	○	—				
				—	Y7BA	—	●	○	—					

\*Lead wire length symbols: 0.5m..... Nil (Example) Y69B  
3m..... L (Example) Y69BL  
5m..... Z (Example) Y69BZ

Notes) • Solid state switches marked "○" are produced upon receipt of order.  
• Retrofitting of an auto switch on a cylinder that is originally ordered without one requires a switch spacer per the next page.



# Double Power Cylinder (without non-rotation mechanism) *Series MGZR*



## Specifications

Bore size (mm)		20	25	32	40	50	63	80
Action		Double acting/Single rod						
Fluid		Air						
Proof pressure		1.5MPa						
Max. operating pressure		1.0MPa						
Min. operating pressure		Standard stroke: 0.08MPa						
		Long stroke: 0.12MPa						
Ambient and fluid temperature		Without auto switch: -10° to 70°C (with no freezing)						
		With auto switch: -10° to 60°C (with no freezing)						
Lubrication		Non-lube						
Piston speed	OUT	50 to 700mm/s						
	IN	50 to 350mm/s	50 to 450mm/s					
Stroke length tolerance		Up to 250 <sup>+1.0</sup> <sub>0</sub> , 251 to 1000 <sup>+1.4</sup> <sub>0</sub>						
Cushion		Rubber bumper						
Screw tolerance		JIS class 2						
Mounting		Basic type, Transaxial foot type, Front flange type Rear flange type, Double clevis type						

## Switch Spacer Model

Applicable bore size (mm)	20, 25, 32	40, 50, 63, 80
Switch spacer model	BM Y3-016	BMP1-032

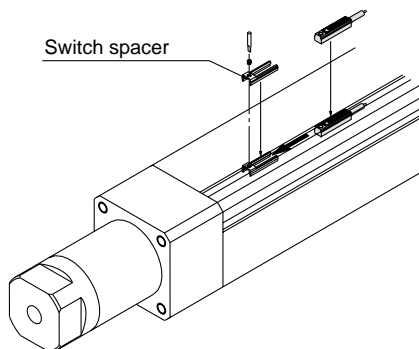
## Mounting Bracket Part Nos.

Bore size (mm)	20	25	32	40
Foot	MGZ-L02	MGZ-L25	MGZ-L03	MGZ-L04
Flange	MGZ-F02	MGZ-F25	MGZ-F03	MGZ-F04
<sup>Note)</sup> Double clevis	MGZ-D02	MGZ-D25	MGZ-D03	MGZ-D04

Bore size (mm)	50	63	80
Foot	MGZ-L05	MGZ-L06	MGZ-L08
Flange	MGZ-F05	MGZ-F06	MGZ-F08
<sup>Note)</sup> Double clevis	MGZ-D05	MGZ-D06	MGZ-D08

Note) Double clevis bracket is provided with clevis pins and cotter pins.



## Standard Strokes

Bore sizes (mm)	Standard strokes (mm)	Long strokes (mm)
20, 25	75, 100, 125, 150, 175 200, 250, 300	350, 400, 450, 500 600, 700, 800
32, 40, 50 63, 80	75, 100, 125, 150, 175 200, 250, 300	350, 400, 450, 500, 600 700, 800, 900, 1000

Intermediate strokes and strokes shorter than 75mm are also available.

## Weights

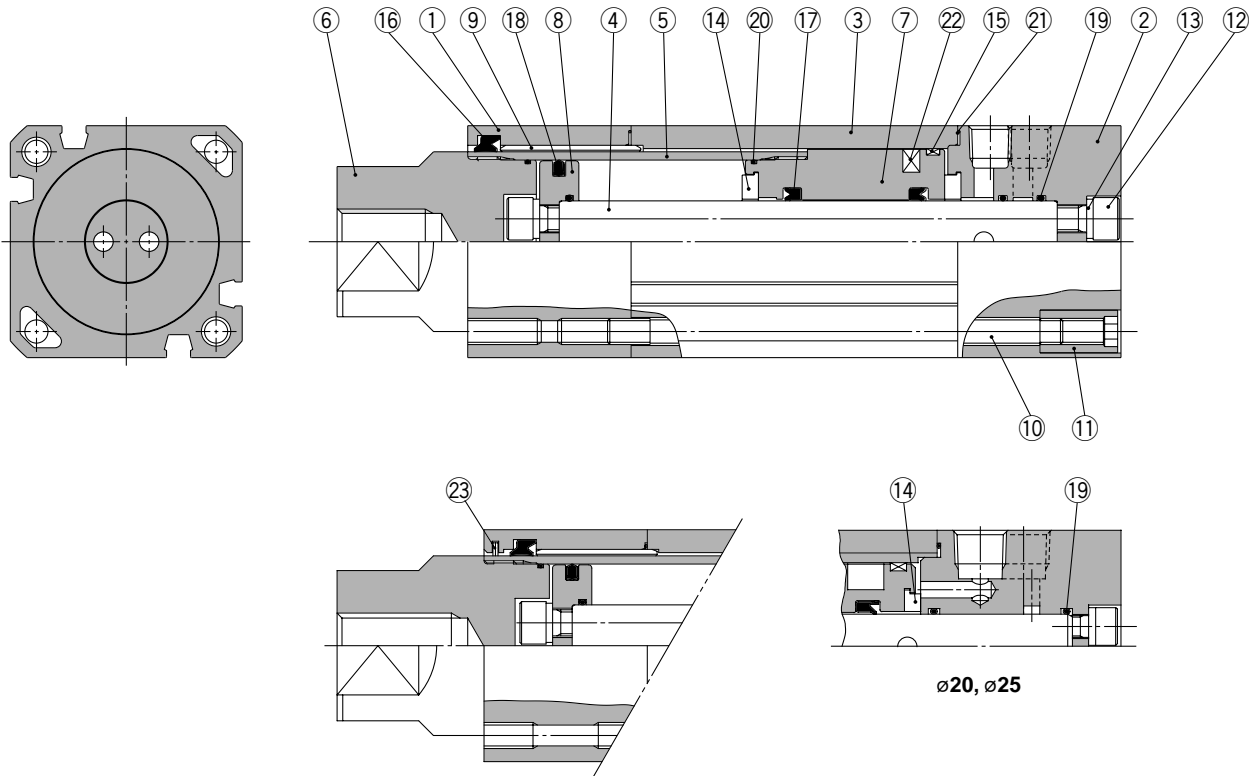
Bore size (mm)		20	25	32	40	50	63	80
Standard weight	Basic type	0.48	0.70	1.09	1.91	3.03	4.83	8.85
	Foot type	0.63	0.86	1.34	2.39	3.92	6.08	10.61
	Flange type	0.59	0.83	1.32	2.34	3.79	5.83	9.92
	Double clevis type	0.58	0.83	1.32	2.19	3.47	5.62	10.66
Weight per each 50mm of stroke	All mounting brackets	0.19	0.22	0.29	0.39	0.59	0.78	1.21

## Theoretical Output

Model	Bore size (mm)	Rod size (mm)	Operating direction	Piston area (mm <sup>2</sup> )	Operating pressure (MPa)								
					0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
MGZ20	20 × 25	10	OUT	726	145	218	290	363	436	508	581	653	726
			IN	236	47	71	94	118	141	165	189	212	236
MGZ25	25 × 30	12	OUT	1085	217	326	434	543	651	760	868	977	1085
			IN	378	76	113	151	189	227	265	302	340	378
MGZ32	36 × 32	16	OUT	1621	324	486	648	811	973	1135	1297	1459	1621
			IN	603	121	181	241	302	362	422	482	543	603
MGZ40	45 × 40	20	OUT	2533	507	760	1013	1267	1520	1773	2026	2280	2533
			IN	942	188	283	377	471	565	659	754	848	942
MGZ50	55 × 50	25	OUT	3848	770	1154	1539	1924	2309	2694	3078	3463	3848
			IN	1473	295	442	589	737	884	1031	1178	1326	1473
MGZ63	68 × 63	32	OUT	5945	1189	1784	2378	2973	3567	4162	4756	5351	5945
			IN	2313	463	694	925	1157	1388	1619	1850	2082	2313
MGZ80	87 × 80	40	OUT	9715	1943	2915	3886	4858	5829	6801	7772	8744	9715
			IN	3770	754	1131	1508	1885	2262	2639	3016	3393	3770

# Series MGZ

## Construction



### Parts list

No.	Description	Material	Note
1	Rod cover	Aluminum alloy	Clear anodized
2	Head cover	Aluminum alloy	Clear anodized
3	Cylinder tube	Aluminum alloy	Hard anodized
4	Piston rod	Aluminum alloy	Hard anodized
5	Tube rod	Carbon steel	Hard chromium electroplated
6	Tube rod cover	Carbon steel	Electroless nickel plated
7	Piston	Aluminum alloy	Chromated
8	Stationary piston	Aluminum alloy	Chromated
9	Bushing	Lead bronze casting	
10	Tie rod	Carbon steel	Corrosion resistant chromated
11	Tie rod nut	Carbon steel	Nickel plated
12	Hexagon socket head screw	Chrome molybdenum steel	Nickel plated

No.	Description	Material	Note
13	Spring washer	Steel wire	Nickel plated
14	Bumper	Urethane rubber	
15	Wear ring	Resin	
16	Rod seal A	NBR	
17*	Rod seal B	NBR	
18	Piston seal	NBR	
19	Piston gasket	NBR	
20	Tube rod gasket	NBR	
21	Cylinder tube gasket	NBR	
22*	Magnet	Magnet	
23	Coil scraper	Metal	

### Replacement parts: Seal kits

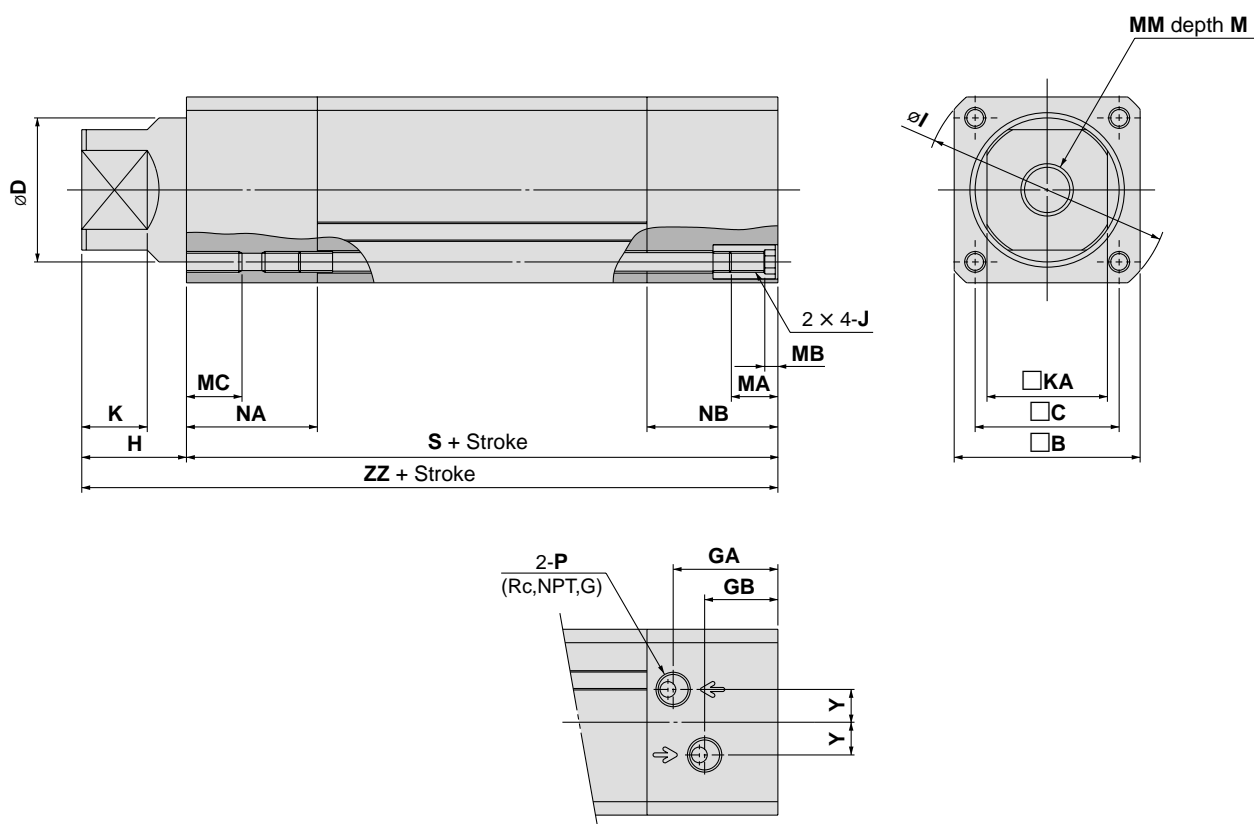
Bore size (mm)	Seal kit no.	Kit components
20	MGZ20-PS	Items 16 and 21 from the above chart
25	MGZ25-PS	
32	MGZ32-PS	
40	MGZ40-PS	
50	MGZ50-PS	
63	MGZ63-PS	
80	MGZ80-PS	

\* Seal kits consist of items 16 and 21, and can be ordered by using the seal kit number corresponding to each bore size.

# Double Power Cylinder (without non-rotation mechanism) *Series MGZR*

## Dimensions

### Basic type



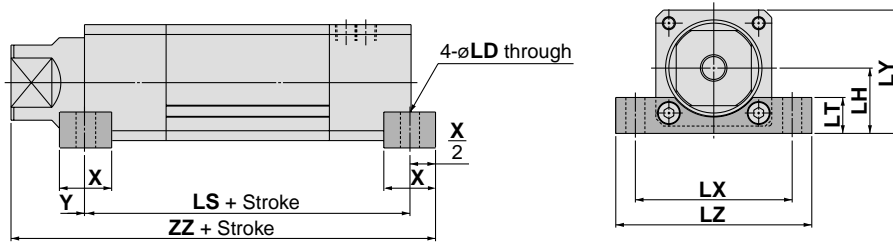
(mm)

Bore size (mm)	Stroke range	B	C	D	KA	GA	GB	H	I	J	K	M	MA	MB	MC	MM	NA	NB	P	S	Y	ZZ
<b>20</b>	to 800	39	29	25	21	16	12.5	20	51	M5	11	17	11	4	10	M8	19	21	M5 × 0.8	86	5	106
<b>25</b>	to 800	43	33	30	24	26	18	21	57	M5	12	17	11	4	10	M8	26	34	1/8	107	6.5	128
<b>32</b>	to 1000	49	38	36	30	28.5	19.5	35	66	M6	22	22	16	4	12	M10	37	1/8	120	8.5	155	
<b>40</b>	to 1000	59	46	45	36	34.5	23.5	40	78	M6	25	30	16	4	12	M16	44	1/4	138	9.5	178	
<b>50</b>	to 1000	71	55	55	46	40	28	45	92	M8	25	35	16	5	15	M20	50	1/4	150	12.5	195	
<b>63</b>	to 1000	82	66	68	53	46.5	34.5	50	110	M8	25	35	16	5	15	M20	56	1/4	171	15	221	
<b>80</b>	to 1000	106	86	87	65	54	36	50	144	M12	25	38	20	6	23	M22	66	3/8	198	20	248	

# Series MGZ

## Dimensions: With Mounting Bracket

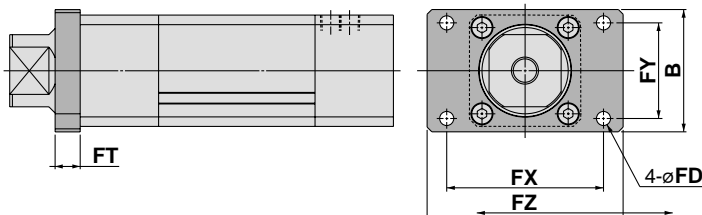
### Transaxial foot: (L) type



(mm)

Bore size (mm)	Stroke range	X	Y	LD	LH	LT	LX	LY	LZ	LS	ZZ
20	to 800	16	0	6.6	22	13	58	41.5	72	86	114
25	to 800	16	0	6.6	24	14	62	45.5	75	107	136
32	to 1000	22	0	9	27.5	16	96	52	88	120	166
40	to 1000	24	0	9	34	19	110	63.5	100	138	190
50	to 1000	32	1	11	40	22	146	75.5	120	148	210
63	to 1000	36	3	13	47	24	110	88	140	165	236
80	to 1000	40	3	17	59	30	146	112	180	192	265

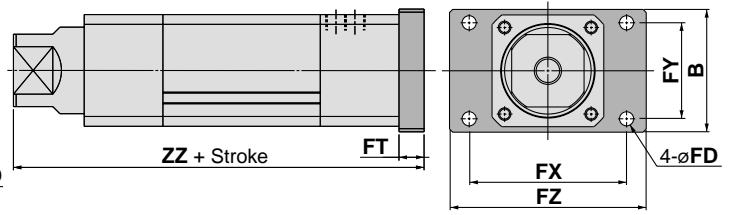
### Front flange: (F) type



(mm)

Bore size (mm)	Stroke range	B	FD	FT	FX	FY	FZ
20	to 800	44	5.5	8	50	34	60
25	to 800	48	6.6	8	57	36	70
32	to 1000	60	9	12	64	46	78
40	to 1000	74	9	12	80	58	100
50	to 1000	78	9	16	100	61	125
63	to 1000	100	12	16	112	75	138
80	to 1000	120	14	16	132	95	155

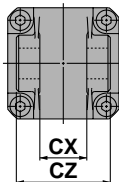
### Rear flange: (G) type



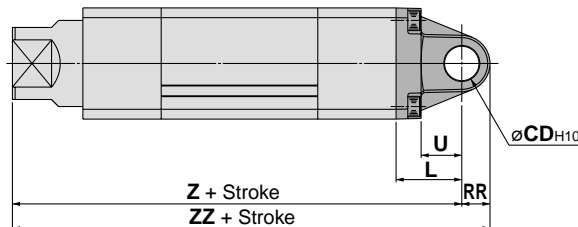
(mm)

Bore size (mm)	Stroke range	B	FD	FT	FX	FY	FZ	ZZ
20	to 800	44	5.5	8	50	34	60	114
25	to 800	48	6.6	8	57	36	70	136
32	to 1000	60	9	12	64	46	78	167
40	to 1000	74	9	12	80	58	100	190
50	to 1000	78	9	16	100	61	125	211
63	to 1000	100	12	16	112	75	138	237
80	to 1000	120	14	16	132	95	155	264

### Double clevis: (D) type



\*Clevis pins and cotter pins are included.

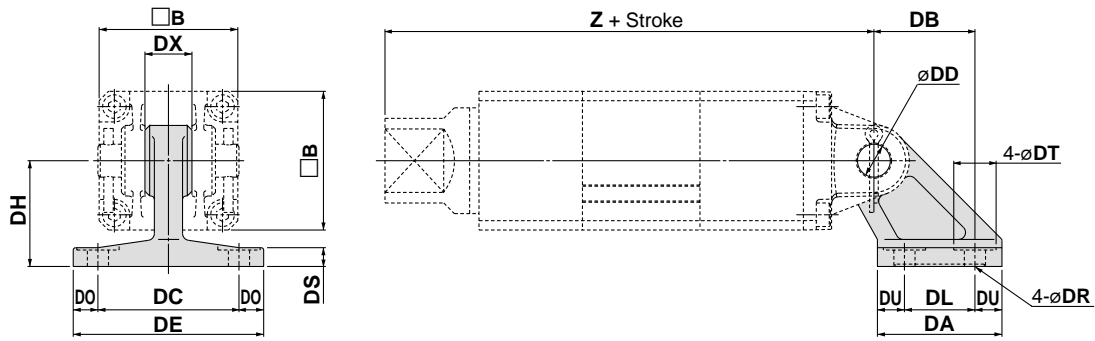


(mm)

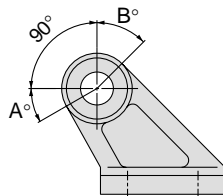
Bore size (mm)	Stroke range	L	RR	U	CD <sub>H10</sub>	CX <sup>+0.3</sup> / <sub>+0.1</sub>	CZ	Z	ZZ
20	to 250	23	8.5	14	10	14	28	129	137.5
25	to 350	23	11	14	10	14	28	151	162
32	to 600	30	12	17	14	20	40	185	197
40	to 600	30	15	17	14	20	40	208	223
50	to 700	42	18	26	22	30	60	237	255
63	to 900	42	23	26	22	30	60	263	286
80	to 900	50	28	30	25	32	64	298	326

# Double Power Cylinder (without non-rotation mechanism) *Series MGZR*

## Double Clevis Bracket



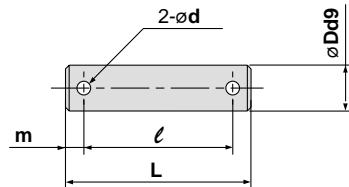
Model	Bore size (mm)	B	DA	DB	DC	DD <sub>H10</sub>	DE	DH	DL	DO	DR	DS	DT	DU	DX	Z
MB-B03	20	39	42	32	44	10 <sup>+0.058/0</sup>	62	33	22	9	6.6	7	15	10	14	129
	25	43	42	32	44	10 <sup>+0.058/0</sup>	62	33	22	9	6.6	7	15	10	14	151
MB-B05	32	49	53	43	60	14 <sup>+0.070/0</sup>	81	45	30	10.5	9	8	18	11.5	20	185
	40	59	53	43	60	14 <sup>+0.070/0</sup>	81	45	30	10.5	9	8	18	11.5	20	208
MB-B08	50	71	73	64	86	22 <sup>+0.084/0</sup>	111	65	45	12.5	11	10	22	14	30	237
	63	82	73	64	86	22 <sup>+0.084/0</sup>	111	65	45	12.5	11	10	22	14	30	263
MB-B12	80	106	90	78	110	25 <sup>+0.084/0</sup>	136	75	60	13	13.5	14	24	15	32	298



### Rotation

Bore size (mm)	A°	B°	A°+B°+90°
20	35	50	175
25	30	50	170
32, 40	30	50	170
50, 63	35	50	175

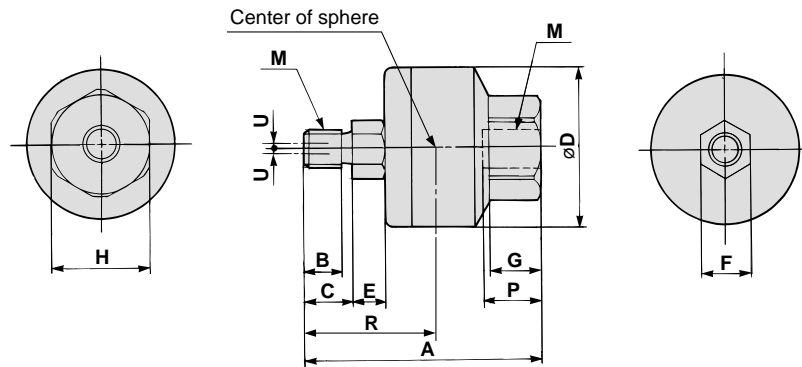
## Clevis Pin



Model	Bore size (mm)	Dd9	L	l	m	d (drill through)	Cotter pin <sup>Note)</sup>
CD-M03	20, 25	10 <sup>-0.040/-0.076</sup>	44	36	4	3	ø3 × 18 ℓ
CD-M05	32, 40	14 <sup>-0.050/-0.093</sup>	60	51	4.5	4	ø4 × 25 ℓ
CD-M08	50, 63	22 <sup>-0.065/-0.117</sup>	82	72	5	4	ø4 × 35 ℓ
CDP-7A	80	25 <sup>-0.065/-0.117</sup>	88	78	5	4	ø4 × 36 ℓ

Note) When using cotter pins, flat washers are used together.

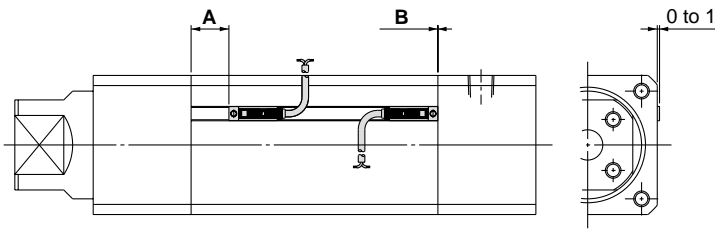
## Floating Joint



Applicable bore size	Model	M		A	B	C	D	E	F	G	H	Center of sphere R	Max. screw-in depth P	Allowable eccentricity U	Max. operating tension and compression N		Weight (kg)
		Nominal size	Pitch												Compression	Tension	
20, 25	JB40-8-125	8	1.25	51	8.5	11	31	6	11	11	22	29	13	0.75	6000	1300	0.15
32	JB63-10-150	10	1.5	62.5	10	13	41	7.5	14	13.5	27	35.5	15	1	11000	3100	0.29
40	JB80-16-200	16	2	80.5	16	20	50	9.5	19	16	32	47.5	18	1.25	18000	5000	0.56
50, 63	JB100-20-250	20	2.5	101	21	26	59.5	11.5	24	20	41	59	24	2	28000	7900	1.04
80	JB140-22-250	22	2.5	129	18	22	79	14	30	22	46	71.5	38	2.5	54000	15300	2.6

# Series MGZ/MGZR

## Proper Mounting Position for Stroke End Detection



Bore size (mm)	D-A9□, A9□V		D-M9N□, M9P□, M9B□ D-M9NW□, M9PW□, M9BW□		D-M9BAL	
	A	B	A	B	A	B
20	24	3	28	7	27	6
25	24	3	28	7	27	6
32	22	4	26	8	25	7

Bore size (mm)	D-Z7□, Z80 D-Y59□, Y69□, Y7P, Y7PV D-Y7□W, Y7□WV D-Y7BAL	
	A	B
40	23	0
50	23	0
63	32	0
80	37	4

## Operating range

Auto switch model	Bore size (mm)		
	20	25	32
D-A9□, A9□V	8	9.5	8
D-M9N□, M9P□, M9B□ D-M9NW□, M9PW□, M9BW□	5	5	4.5
D-M9BAL	5	6	5

Auto switch model	Bore size (mm)			
	40	50	63	80
D-Z7□, Z80	10	10	11	13
D-Y59□, Y69□, Y7P, Y7PV D-Y7□W, Y7□WV	6	5	6	8
D-Y7BAL	5.5	5.5	6	7

\*Hysteresis specifications are given as a guide, it is not a guaranteed range. (Tolerance  $\pm 30\%$ )  
Hysteresis may fluctuate due to the operating environment.

## Minimum Strokes for Mounting

Auto switch type	Model	No. of auto switches	Bore size (mm)	
			20, 25, 32	
Reed switch	D-A9□, A9□V	2 pcs. (same side)	50	
		1 or 2 pcs. (different sides)	15	
Solid state switch	D-M9N□, M9P□, M9B□	2 pcs. (same side)	55	
		1 or 2 pcs. (different sides)	15	
	D-M9NW□, M9PW□, M9BW□	2 pcs. (same side)	55	
		1 or 2 pcs. (different sides)	15	
	D-M9BAL	2 pcs. (same side)	70	
		1 or 2 pcs. (different sides)	25	

Auto switch type	Model	No. of auto switches	Bore size (mm)				
			32	40	50	63	80
Reed switch	D-Z7□, Z80	2 pcs. (same side)	60				
		1 or 2 pcs. (different sides)	20				
Solid state switch	D-Y59□, Y69□, Y7P, Y7PV	2 pcs. (same side)	60				
		1 or 2 pcs. (different sides)	20				
	D-Y7□W, Y7□WV	2 pcs. (same side)	70				
		1 or 2 pcs. (different sides)	25				
	D-Y7BAL	2 pcs. (same side)	70				
		1 or 2 pcs. (different sides)	25				

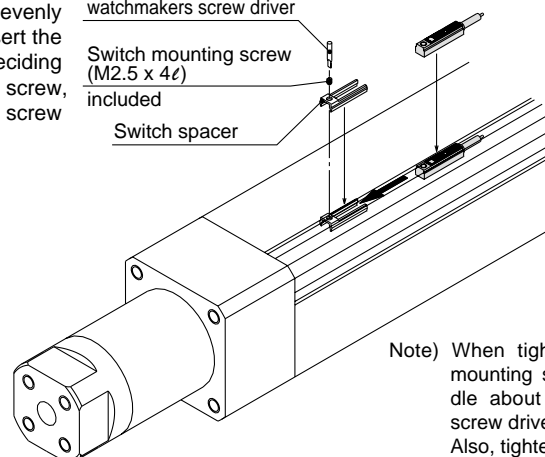
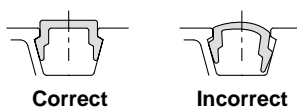
## Mounting

When mounting an auto switch, first hold the switch spacer with your fingers and push it into the groove. Confirm that it is aligned evenly within the groove and adjust the position if necessary. Then, insert the auto switch into the groove and slide it into the spacer. After deciding on the mounting position within the groove, slip in the mounting screw, which is included, and tighten it, using a flathead watchmakers screw driver.

Flat head watchmakers screw driver

Switch mounting screw (M2.5 x 4ℓ) included

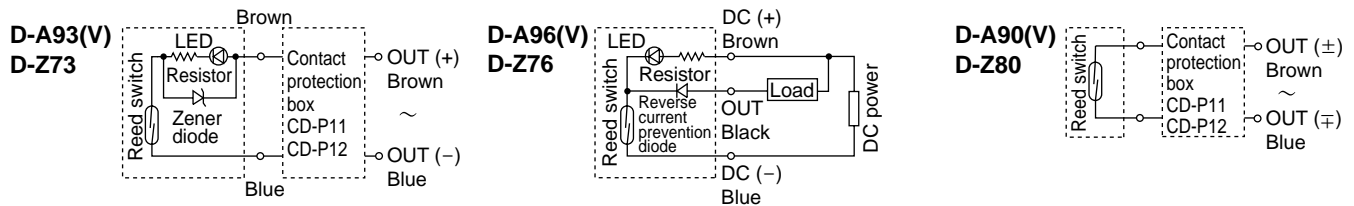
Switch spacer



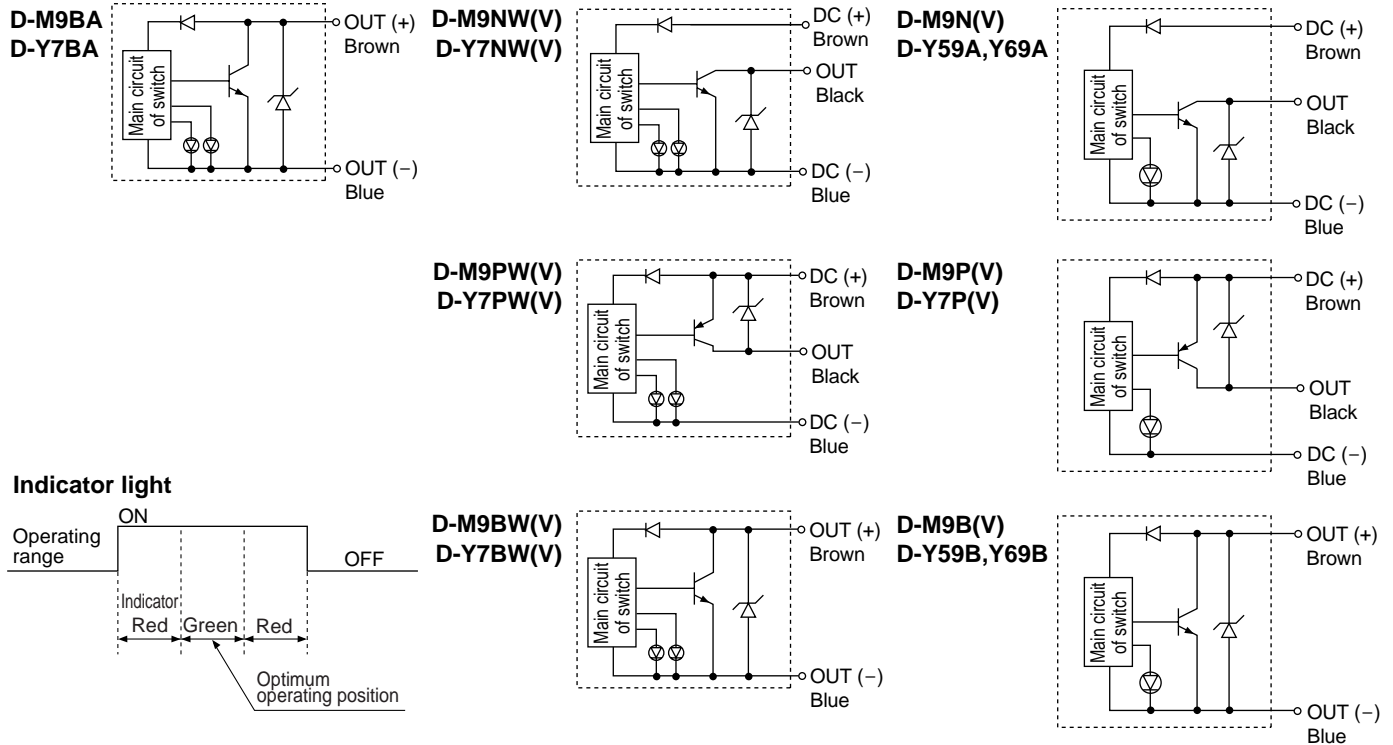
Note) When tightening the auto switch mounting screw, use a with a handle about 5 to 6mm in diameter screw driver watchmakers. Also, tighten with a torque of 0.05 to 0.1N·m. As a guide, turn about 90° past the point at which tightening can be felt.



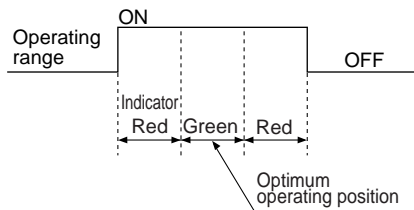
## Reed Switch Internal Circuit



## Solid State Switch Internal Circuit



### Indicator light



## Contact Protection Boxes: CD-P11, CD-P12

### <Applicable auto switches>

D-Z7, Z8

The above auto 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 100.

Use a contact protection box in any of the above situations.

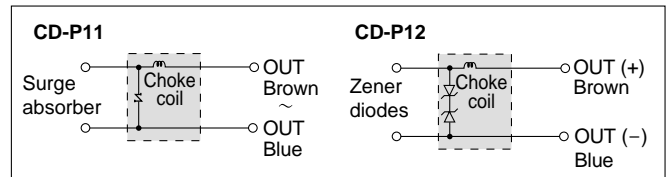
### Specifications

Part no.	CD-P11		CD-P12
Load voltage	100V AC or less	200V AC	24V DC
Max. load current	25mA	12.5mA	50mA

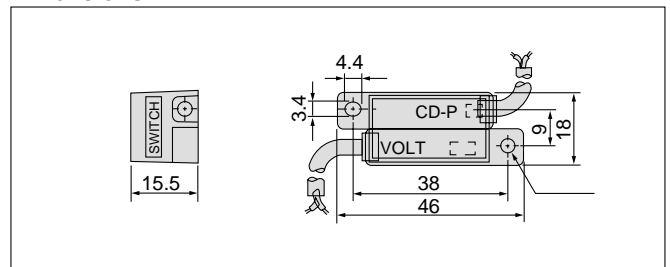
\*Lead wire length — Switch contacts side 0.5m  
Load connection side 0.5m



### Internal circuit



### Dimensions



### Connection

To connect a switch 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. 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 metre between them.



## Series **MGZ/MGZR**

# Safety Instructions

These safety instructions are intended to prevent a hazardous situation and/or equipment damage. These instructions indicate the level of potential hazard by a label of "**Caution**", "**Warning**" or "**Danger**". To ensure safety, be sure to observe ISO 4414 Note 1), JIS B 8370 Note 2) and other safety practices.

**⚠ Caution** : Operator error could result in injury or equipment damage.

**⚠ Warning** : Operator error could result in serious injury or loss of life.

**⚠ Danger** : In extreme conditions, there is a possible result of serious injury or loss of life.

Note 1) ISO 4414: Pneumatic fluid power – General Rules for Pneumatic Equipment

Note 2) JIS B 8370: Pneumatic system axiom

### **⚠ Warning**

**1. The compatibility of pneumatic equipment is the responsibility of the person who designs the pneumatic system or decides its specifications.**

Since the products specified here are used in various operating conditions, their compatibility for the specific pneumatic system must be based on specifications or after analysis and/or tests to meet your specific requirements. The expected performance and safety assurance will be the responsibility of the person who has determined the compatibility of the system. This person should continuously review the suitability of all items specified, referring to the latest catalogue information with a view to giving due consideration to any possibility of equipment failure when configuring a system.

**2. Only trained personnel should operate pneumatically operated machinery and equipment.**

Compressed air can be dangerous if handled incorrectly. Assembly, handling or repair of pneumatic systems should be performed by trained and experienced operators.

**3. Do not service machinery/equipment or attempt to remove components until safety is confirmed.**

1. Inspection and maintenance of machinery/equipment should only be performed after confirmation of safe locked-out control positions.
2. When equipment is to be removed, confirm the safety process as mentioned above. Cut the supply pressure for this equipment and exhaust all residual compressed air in the system.
3. Before machinery/equipment is restarted, take measures to prevent shooting-out of cylinder piston rod, etc. (Bleed air into the system gradually to create back pressure.)

**4. Contact SMC if the product is to be used in any of the following conditions:**

1. Conditions and environments beyond the given specifications, or if product is used outdoors.
2. Installation on equipment in conjunction with atomic energy, railway, air navigation, vehicles, medical equipment, food and beverages, recreation equipment, emergency stop circuits, press applications, or safety equipment.
3. An application which has the possibility of having negative effects on people, property, or animals, requiring special safety analysis.



# Series MGZ/MGZR Actuator Precautions 1

Be sure to read before handling.

## Design

### ⚠ Warning

#### 1. There is a danger of sudden action by air cylinders if sliding parts of machinery are twisted, etc., and changes in forces occur.

In such cases, bodily injury may occur, e.g., by having hands or get in the machinery, or damage to the machinery itself may occur. Therefore, the machine should be designed to prevent such dangers.

#### 2. A protective cover is recommended to minimize the risk personal injury.

If a driven object and moving parts of a cylinder pose a danger of personal injury, design the structure to avoid contact with the human body.

#### 3. Securely tighten all stationary parts and connected parts so that they will not become loose.

Particularly when a cylinder operates with high frequency or is installed where there is a lot of vibration, ensure that all parts remain secure.

#### 4. A deceleration circuit or shock absorber may be required.

When a driven object is operated at high speed or the load is heavy, a cylinder's cushion will not be sufficient to absorb the impact. Install a deceleration circuit to reduce the speed before cushioning, or install an external shock absorber to relieve the impact. In cases such as these, the rigidity of the machinery should also be examined.

#### 5. Consider a possible drop in operating pressure due to a power outage, etc.

When a cylinder is used as part of a clamping mechanism, there is a danger of work pieces dropping if there is a decrease in clamping force due to a drop in circuit pressure caused by a power outage, etc. Therefore, safety equipment should be installed to prevent human injury or damage to machinery. Suspension mechanisms and lifting devices also require for drop prevention measures.

#### 6. Consider a possible loss of power source.

Measures should be taken to protect against human injury and equipment damage in the event that there is a loss of power to equipment controlled by pneumatics, electricity or hydraulics, etc.

#### 7. Design circuitry to prevent sudden lurching of driven objects.

Take special care when a cylinder is driven by an exhaust center type directional control valve or when starting up after residual pressure is exhausted from the circuit, etc. The piston and its driven object will lurch at high speed if pressure is applied to one side of the cylinder because of the absence of air pressure inside the cylinder. Therefore, equipment should be selected and circuits designed to prevent sudden lurching because there is a danger of human injury particularly to limbs, and/or damage to equipment when this occurs.

#### 8. Consider emergency stops.

Design the system so that human injury and/or damage to machinery and equipment will not be caused when machinery is stopped by a safety device responding to abnormal conditions such as a power outage or a manual emergency stop.

#### 9. Consider the action when operation is restarted after an emergency stop or abnormal stop.

Design the machinery so that human injury or equipment damage will not occur upon restart of operation. When the cylinder has to be reset at the starting position, install safe manual control equipment.

## Selection

### ⚠ Warning

#### 1. Confirm the specifications.

The products featured in this catalogue are designed for use in industrial compressed air systems. If the products are used in conditions where pressure and/or temperature are out of the range of specifications, damage and/or malfunction may occur. Do not use in these conditions. (Refer to specifications.) Consult SMC if fluid other than compressed air is required.

#### 2. Intermediate stops

When intermediate stopping of a cylinder piston is performed with a 3-position closed centre type directional control valve, it is difficult to achieve stopping positions as accurate and precise as with hydraulic pressure due to the compressibility of air.

Furthermore, since valves and cylinders are not guaranteed for zero air leakage, it may not be possible to hold a stopped position for an extended period of time. Contact SMC in case it is necessary to hold a stopped position for an extended period.

### ⚠ Caution

#### 1. Operate within the limits of the maximum usable stroke.

The piston rod will be damaged if operated beyond the maximum stroke. Refer to the air cylinder model selection procedure for the maximum useable stroke.

#### 2. Operate the piston in such a way that collision damage will not occur at the stroke end.

Operate within such a range such that will prevent damage from occurring when a piston, having inertial force, stops by striking the cover at the stroke end. Refer to the cylinder model selection procedure for the maximum usable stroke.

#### 3. Use a speed controller to adjust the cylinder drive speed, gradually increasing from a low speed to the desired speed setting.

#### 4. Provide intermediate supports for long stroke cylinders.

Provide intermediate supports for cylinders with long strokes to prevent rod damage due to sagging of the rod, deflection of the tube, vibration and external loads.



# Series MGZ/MGZR Actuator Precautions 2

Be sure to read before handling.

## Mounting

### ⚠ Caution

#### 1. Be certain to align the rod axis with the load and direction of movement when connecting.

When a cylinder is not properly aligned, the rod and tube may be twisted. This can cause wear on areas such as the inner tube surface, bushings, rod surface, and seals cause damage on these areas.

#### 2. When an external guide is used, connect the rod end and the load in such a way that there is no interference at any point within the stroke.

#### 3. Do not scratch or gouge the sliding parts of the cylinder tube or piston rod by striking or grasping them with other objects.

Cylinder bores are manufactured to precise tolerances, so that even a slight deformation may cause faulty operation. Also, scratches or gouges in the piston rod may lead to damaged seals and cause air leakage.

#### 4. Prevent the sticking (through friction) of rotating parts.

Prevent the sticking of rotating parts (pin etc.) by applying sufficient lubrication.

#### 5. Do not use until you can verify that equipment can operate properly.

Following mounting repairs, or conversions, verify correct mounting by conducting suitable function and leakage tests after piping and power connections have been made.

#### 6. Instruction manual

The product should be mounted and operated after thoroughly reading the manual and understanding its contents. Keep the instruction manual where it can be referred to as needed.

## Piping

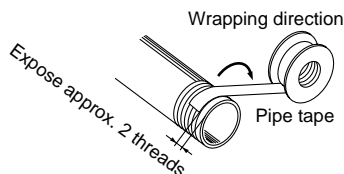
### ⚠ Caution

#### 1. Preparation before piping

Before piping is connected, it should be thoroughly flushed out with air or water to remove chips, cutting oil, and other debris from inside the pipe.

#### 2. Wrapping of sealant tape

When screwing together pipes and fittings, etc., be certain that chips from the pipe threads and sealing material do not get inside the piping. Also, when sealant tape is used, leave 1.5 to 2 thread ridges exposed at the end of the threads.



## Lubrication

### ⚠ Caution

#### 1. Lubrication of non-lube type cylinder

The cylinder is lubricated for life at the factory and can be used without any further lubrication.

However, in the event that it is lubricated additionally, be sure to use class 1 turbine oil (with no additives) ISO VG32.

Stopping lubrication later may lead to malfunction the new lubricant will cancel out the original lubricant. Therefore, lubrication must be continued once it has been started.

## Air Supply

### ⚠ Warning

#### 1. Use clean air.

Do not use compressed air containing chemicals, synthetic oils containing organic solvents, salt or corrosive gases, as this can cause damage or malfunction.

### ⚠ Caution

#### 1. Install air filters.

Install air filters at the inlet side of valves. The filtration degree should be 5µm or finer.

#### 2. Install an after-cooler, air dryer or water separator, etc.

Air that includes excessive drainage or condensate may cause malfunction of valves and other pneumatic equipment. To prevent this, install an after-cooler, air dryer or water separator, etc.

#### 3. Use the product within the specified range of fluid and ambient temperature.

Take measures to prevent freezing when 5°C or less, since moisture in circuits can freeze and cause damage to seals and lead to malfunction.

Refer to SMC's "Best Pneumatics" catalog vol.4 for further details on compressed air quality.

## Operating Environment

### ⚠ Warning

#### 1. Do not use in environments where there is a danger of corrosion.

Refer to the construction drawings regarding cylinder materials.

#### 2. In dusty conditions or where water or oil splashing is a regular occurrence, protect the rod by installing a rod cover.

#### 3. When using auto switches, do not operate in an environment where there are strong magnetic fields.

## Maintenance

### ⚠ Warning

#### 1. Perform maintenance inspection according to the procedure indicated in the instruction manual.

Improper handling and maintenance may cause malfunction and damage of machinery or equipment to occur.

#### 2. Removal of components, and supply/exhaust of compressed air.

When equipment is removed, first check measures to prevent dropping of driven objects and run-away of equipment, etc. Then cut off the supply pressure and electric power, and exhaust all compressed air from the system.

When machinery is restarted, proceed with caution after confirming measures to prevent cylinder lurching.

### ⚠ Caution

#### 1. Filter drainage

Drain out condensate from air filters regularly.



# Series MGZ/MGZR Auto Switch Precautions 1

Be sure to read before handling.

## Design and Selection

### Warning

#### 1. Confirm the specifications.

Read the specifications carefully and use this product appropriately. The product may be damaged or malfunction if it is used outside the range of specifications of current load, voltage, temperature or impact.

#### 2. Take precautions when multiple cylinders are used close together.

When multiple auto switch cylinders are used in close proximity, magnetic field interference may cause the switches to malfunction. Maintain a minimum cylinder separation of 40mm. (When the allowable separation is indicated for each cylinder series, use the specified value.)

#### 3. Monitor the length of time that a switch is on at an intermediate stroke position.

When an auto switch is placed at an intermediate position of the stroke and a load is driven at the time the piston passes, the auto switch will operate, but if the speed is too great the operating time will be shortened and the load may not operate properly. The maximum detectable piston speed is:

$$V \text{ (mm/s)} = \frac{\text{Auto switch operating range (mm)}}{\text{Load operating time (ms)}} \times 1000$$

#### 4. Keep wiring as short as possible.

##### <Reed switch>

As the length of the wiring to a load gets longer, the rush current at switching ON becomes greater, and this may shorten the product's life. (The switch will stay ON all the time.)

- 1) For an auto switch without a contact protection circuit, use a contact protection box when the wire length is 5 m or longer.
- 2) Even when an auto switch has a built-in contact protection circuit, if the lead wire length is 30 m or more, the rush current cannot be adequately absorbed and the life of the switch may be shortened. Contact SMC in such a case, as it will be necessary to connect a contact protection box to extend the life of the switch.

##### <Solid state switch>

- 3) Although wire length does not affect switch function, use wiring 100m or shorter.

#### 5. Monitor the internal voltage drop of the switch.

##### <Reed switch>

- 1) Switches with an indicator light (Except D-Z76)
    - If auto switches are connected in series as shown below, take note that there will be a large voltage drop because of internal resistance in the light emitting diodes. (Refer to internal voltage drop in the auto switch specifications.) [The voltage drop will be "n" times larger when "n" auto switches are connected.]
- Even though an auto switch operates normally, the load may not operate.



- Similarly, when operating below a specified voltage, it is possible that the load may be ineffective even though the auto switch function is normal. Therefore, the formula below should be satisfied after confirming the minimum operating voltage of the load.

$$\text{Supply voltage} - \text{Internal voltage drop of switch} > \text{Minimum operating voltage of load}$$

- 2) If the internal resistance of a light emitting diode causes a problem, select a switch without an indicator light (Model D-Z80).

##### <Solid state switch>

- 3) Generally, the internal voltage drop will be greater with a 2-wire solid state auto switch than with a reed switch. Take the same precautions as in 1).
- Also, note that a 12V DC relay is not applicable.

#### 6. Monitor leakage current.

##### <Solid state switch>

With a 2-wire solid state auto switch, current (leakage current) flows to the load to operate the internal circuit even when in the OFF state.

$$\text{Current to operate load (OFF condition)} > \text{Leakage current}$$

If the condition given in the above formula is not met, it will not reset correctly (stays ON). Use a 3-wire switch if this specification will not be satisfied.

Moreover, leakage current flow to the load will be "n" times larger when "n" auto switches are connected in parallel.

#### 7. Do not use a load that generates surge voltage.

##### <Reed switch>

If driving a load that generates surge voltage, such as a relay, use a switch with a built-in contact protection circuit or a contact protection box.

##### <Solid state switch>

Although a zener diode for surge protection is connected at the output side of a solid state auto switch, damage may still occur if a surge is applied repeatedly. When directly driving a load which generates surge, such as a relay or solenoid valve, use a type of switch with a built-in surge absorbing element.

#### 8. Cautions for use in an interlock circuit

When an auto switch is used for an interlock signal requiring high reliability, devise a double interlock system to safeguard against malfunctions by providing a mechanical protection function, or by also using another switch (sensor) together with the auto switch. Also perform periodic inspection and confirm proper operation.

#### 9. Ensure sufficient clearance for maintenance activities.

When designing an application, be sure to allow sufficient clearance for maintenance and inspections.



# Series MGZ/MGZR Auto Switch Precautions 2

Be sure to read before handling.

## Mounting and Adjustment

### Warning

#### 1. Do not drop or bump.

Do not drop, bump or apply excessive impacts (300m/s<sup>2</sup> or more for reed switches and 1000m/s<sup>2</sup> or more for solid state switches) while handling.

Although the body of the switch may not be damaged, the inside of the switch could be damaged and cause a malfunction.

#### 2. Do not carry a cylinder by the auto switch lead wires.

Never carry a cylinder by its lead wires. This may not only cause broken lead wires, but it may cause internal elements of the switch to be damaged by the stress.

#### 3. Mount switches using the proper tightening torque.

When a switch is tightened beyond the range of tightening torque, the mounting screws, mounting bracket or switch may be damaged. On the other hand, tightening below torque range may allow the switch to slip out of position. (Refer to page 23 for switch mounting, movement and tightening torque.)

#### 4. Mount a switch at the center of the operating range.

Adjust the mounting position of an auto switch so that the piston stops at the center of the operating range (the range in which a switch is ON). (The mounting positions shown in the catalog indicate the optimum position at stroke end.) If mounted at the end of the operating range (around the borderline of ON and OFF), operation will be unstable.

## Wiring

### Warning

#### 1. Avoid repeatedly bending or stretching lead wires.

Broken lead wires will result from repeatedly applying bending stress or stretching force to the lead wires.

#### 2. Be sure to connect the load before power is applied.

<2-wire type>

If the power is turned ON when an auto switch is not connected to a load, the switch will be instantly damaged because of excess current.

#### 3. Confirm proper insulation of wiring.

Be certain that there is no faulty wiring insulation (such as contact with other circuits, ground fault, improper insulation between terminals, etc.). Damage may occur due to excess current flow into a switch.

#### 4. Do not wire in conjunction with power lines or high voltage lines.

Wire separately from power lines or high voltage lines, avoiding parallel wiring or wiring in the same conduit with these lines. Control circuits containing auto switches may malfunction due to noise from these other lines.

## Wiring

#### 5. Do not allow short circuit of loads.

<Reed switch>

If the power is turned ON with a load in a short circuited condition, the switch will be instantly damaged because of excess current flow into the switch.

<Solid state switch>

D-J51 and all models of PNP output type switches do not have built-in short circuit protection circuits. If loads are short circuited, the switches will be instantly damaged, as in the case of reed switches.

Take special care to avoid reverse wiring with the brown [red] power supply line and the black [white] output line on 3-wire type switches.

#### 6. Avoid incorrect wiring.

<Reed switch>

A 24V DC switch with indicator light has polarity. The brown [red] lead wire is (+), and the blue [black] lead wire is (-).

1) If connections are reversed, the switch will still operate, but the light emitting diode will not light up.

Also note that a current greater than the maximum specified one will damage a light emitting diode and make it inoperable.

Applicable models: D-Z73

2) Note, however, in case of 2-color display type auto switch (D-A59W), if the wiring is reversed, the switch will remain in a normally on condition.

<Solid state switch>

1) Even if connections are reversed on a 2-wire type switch, the switch will not be damaged because it is protected by a protection circuit, but it will remain in a normally ON state. But reverse wiring in a load short circuit condition should be avoided to protect the switch from being damaged.

2) Even if (+) and (-) power supply line connections are reversed on a 3-wire type switch, the switch will be protected by a protection circuit. However, if the (+) power supply line is connected to the blue [black] wire and the (-) power supply line is connected to the black [white] wire, the switch will be damaged.

#### \* Lead wire colour changes

Lead wire colours of SMC switches have been changed in order to meet NECA Standard 0402 for production beginning September, 1996 and thereafter. Please refer to the tables provided. Special care should be taken regarding wire polarity during the time that the old colours still coexist with the new colours.

#### 2-wire

	Old	New
Output (+)	Red	Brown
Output (-)	Black	Blue

#### 3-wire

	Old	New
Power supply	Red	Brown
GND	Black	Blue
Output	White	Black

#### Solid state with diagnostic output

	Old	New
Power supply	Red	Brown
GND	Black	Blue
Output	White	Black
Diagnostic output	Yellow	Orange

#### Solid state with latch type diagnostic output

	Old	New
Power supply	Red	Brown
GND	Black	Blue
Output	White	Black
Latch type diagnostic output	Yellow	Orange



# Series MGZ/MGZR Auto Switch Precautions 3

Be sure to read before handling.

## Operating Environment

### ⚠ Warning

#### 1. Never use in an atmosphere of explosive gases.

The construction of auto switches is not intended to prevent explosion. Never use in an atmosphere with an explosive gas since this may cause a serious explosion.

#### 2. Do not use in an area where a magnetic field is generated.

Auto switches will malfunction or magnets inside actuators will become demagnetized. (Consult with SMC regarding the availability of magnetic field resistant auto switches.)

#### 3. Do not use in an environment where the auto switch will be continually exposed to water.

Switches satisfy IEC standard IP67 construction (JIS C 0920: watertight construction). Nevertheless, they should not be used in applications where they are continually exposed to water splash or spray. This may cause deterioration of the insulation or swelling of the potting resin inside switches may cause malfunction.

#### 4. Do not use in an environment with oil or chemicals.

Consult with SMC if auto switches will be used in an environment laden with coolant, cleaning solvent, various oils or chemicals. If auto switches are used under these conditions for even a short time, they may be adversely affected by a deterioration of the insulation, a malfunction due to swelling of the potting resin, or hardening of the lead wires.

#### 5. Do not use in an environment with temperature cycles.

Consult SMC if switches are to be used where there are temperature cycles other than normal air temperature changes, as they may be adversely affected internally.

#### 6. Do not use in an environment where there is excessive impact shock.

##### <Reed switch>

When excessive impact (300m/s<sup>2</sup> or more) is applied to a reed switch during operation, the contact point may malfunction and generate or cut off a signal momentarily (1ms or less). Consult with SMC regarding the need to use a solid state switch depending upon the environment.

#### 7. Do not use in an area where surges are generated.

##### <Solid state switch>

When there are units (such as solenoid type lifters, high frequency induction furnaces, motors, etc.) that generate a large amount of surge in the area around cylinders with solid state auto switches, their proximity or pressure may cause deterioration or damage to the internal circuit elements of the switches. Avoid sources of surge generation and crossed lines.

#### 8. Avoid accumulation of iron debris or close contact with magnetic substances.

When a large accumulated amount of ferrous waste such as machining chips or welding spatter, or a magnetic substance (something attracted by a magnet) is brought into close proximity to a cylinder with auto switches, this may cause the auto switches to malfunction due to a loss of the magnetic force inside the cylinder.

## Maintenance

### ⚠ Warning

#### 1. Perform the following maintenance periodically in order to prevent possible danger due to unexpected auto switch malfunction.

##### 1) Securely tighten switch mounting screws.

If screws become loose or the mounting position is dislocated, retighten them after readjusting the mounting position.

##### 2) Confirm that there is no damage to lead wires.

To prevent faulty insulation, replace switches or repair lead wires, etc., if damage is discovered.

##### 3) Confirm that the green light on the 2-color display type switch lights up.

Confirm that the green LED is ON when stopped at the set position. If the red LED is ON, when stopped at the set position, the mounting position is not appropriate. Readjust the mounting position until the green LED lights up.

## Other

### ⚠ Warning

#### 1. Consult with SMC concerning water resistance, elasticity of lead wires and usage at welding sites, etc.



# Series MGZ/MGZR Specific Product Precautions 1

Be sure to read before handling.

Refer to pages 25 through 30 for safety instructions, actuator precautions and auto switch precautions.

## Selection

### ⚠ Caution

#### 1. Operate load within the range of the operating limits.

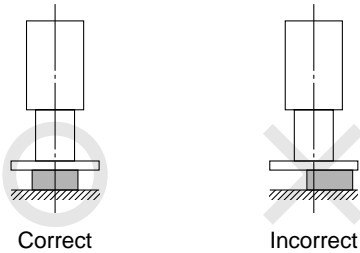
In accordance with the model selection procedure, operate within the operating limits of load weight, maximum speed, centre of gravity position and allowable rotating torque. Operation beyond the operating limits can cause wear of the bearings and loosening of connections, leading to damage of machinery.

#### 2. Compared to regular cylinders, at least twice the time is required for movement to begin in the retracting direction.

Cylinders featured in this catalogue are filled with twice the amount of air at the extending compared to regular cylinders, therefore a longer time is required to exhaust the air before movement in the retracting direction begins.

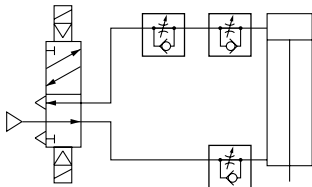
#### 3. Construct equipment so that reactive forces such as external stoppers and pressing are applied to the cylinder's central axis.

Design the external stopper or die so that when a cylinder stops before the stroke end on a stopper or press, the reactive force is applied to the cylinder's central axis. Off-center operation can cause wear of the bearings and loosening connections, leading to damage of machinery.



#### 4. Under horizontal or downward operating conditions, lurch prevention measures may be required for the cylinder's extending operation.

Because the output force of the cylinders featured in this catalogue in the extending direction is at least double that in the retracting direction, start-up operation for extension may exceed the control speed of the speed controller. In this case, provide a lurch prevention circuit within the pneumatic circuitry.



#### 5. Do not over throttle the meter-in speed controller of the lurch prevention circuit.

Throttling the meter-in speed controller will make the start-up time for output in the extending direction longer.

## Operation

### ⚠ Caution

#### 1. Do not apply more than the allowable rotating torque to the piston rod (for Series MGZ: with non-rotation mechanism).

If more than the allowable rotating torque is applied, the slide keys for non-rotation will be deformed and non-rotating accuracy will be lost. This may cause damage to machinery.

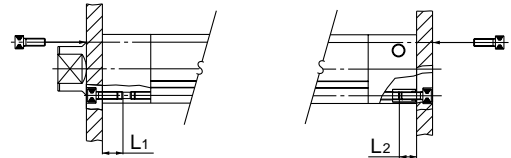
## Mounting

### ⚠ Caution

#### 1. When mounting the cylinder, use mounting bolts of a suitable length, and tighten them properly within the specified range of tightening torque.

Particularly in case of frequent operation or much vibration, employ measures to prevent loosening of the bolts, such as the application of a thread locker.

Model	Bolt	Proper tightening torque N·m	L <sub>1</sub>	L <sub>2</sub>
MGZ/MGZR20	M5	2.5 to 3.1	10	11
MGZ/MGZR25	M5	2.5 to 3.1	10	11
MGZ/MGZR32	M6	4.1 to 6.4	12	16
MGZ/MGZR40	M6	4.1 to 6.4	12	16
MGZ/MGZR50	M8	8.8 to 13.8	15	16
MGZ/MGZR63	M8	8.8 to 13.8	15	16
MGZ/MGZR80	M12	30.4 to 47.5	23	20

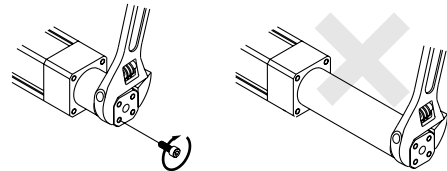


#### 2. Do not gouge or scratch the mounting surfaces of the rod cover and head cover.

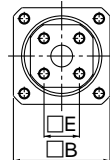
Evenness of mounting surfaces will be degraded, causing increased operating resistance and wear of the bearings etc.

#### 3. Mounting of work piece on the rod end

When screwing bolts into the threads of the table surface at the end of the piston rod, be sure the piston rod is fully retracted and use the wrench flats to hold the rod. Tighten the bolts in such a way that the tightening torque is not applied to the non-rotation slide keys. (for Series MGZ: with non-rotation mechanism).



#### 4. Allowable angle displacement of □E to □B is $\pm 1.5^\circ$ . (for Series MGZ: with non-rotation mechanism)



## Applicable Floating Joint

### ⚠ Caution

#### 1. When using a floating joint at the end of the tube rod, use the model specified in the table below. (for Series MGZR: without non-rotation mechanism)

Model	Applicable floating joint
MGZR20	JB40-8-125
MGZR25	
MGZR32	JB63-10-150
MGZR40	JB80-16-200
MGZR50	JB100-20-250
MGZR63	
MGZR80	JB140-22-250





# Series MGZ/MGZR Specific Product Precautions 2

Be sure to read before handling.

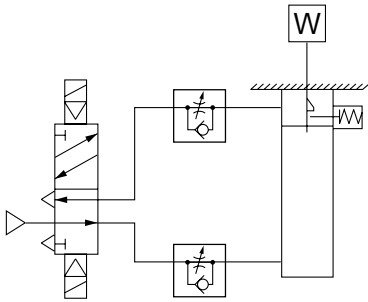
Refer to pages 25 through 30 for safety instructions, actuator precautions and auto switch precautions.

## End Lock Precautions

### Use the Recommended Pneumatic Circuit.

#### ⚠ Caution

This is necessary for proper operation and release of the lock.



#### 1. Do not use 3-position solenoid valve.

Avoid use in combination with 3-position solenoid valves (especially closed center metal seal types). If pressure is trapped in the port on the retracting side the cylinder cannot be locked. Furthermore, even after being locked, the lock may disengage after some time, due to air leaking from the solenoid valve and entering the cylinder.

#### 2. Back pressure is required when releasing the lock.

Before starting operation, be sure to control the system so that air is supplied to the extending side as shown in the figure above. Otherwise, there is a possibility that the lock may not be released. (Refer to the Releasing the Lock section.)

#### 3. Release the lock when mounting or adjusting the cylinder.

The lock unit may be damaged if mounting or other work is performed when the cylinder is locked.

#### 4. Operate with a load factor of 50% or less.

If the load ratio exceeds 50%, this may cause problems such as failure of the lock to release or damage to the lock unit.

#### 5. Do not operate multiple synchronized cylinders.

Avoid applications in which two or more end lock cylinders are synchronized to move one work piece, as one of the cylinder locks may not be able to be released when required.

#### 6. Use a speed controller with meter-out control.

It may not be possible to release the lock with meter-in control.

#### 7. Be sure to operate completely to the cylinder stroke end on the extending side.

If the cylinder piston does not reach the end of the stroke, locking and unlocking may not be possible.

#### 8. Adjust the auto switch's position so that it operates for movement to both the stroke end and backlash (2 mm) positions.

When a 2-colour display switch is adjusted for green indication at the stroke end, it may change to red after the backlash return, but this is not abnormal.

### Operating Pressure

#### ⚠ Caution

Apply air pressure of at least 0.20MPa to the port on the retracting side. This is necessary to release the lock.

### Exhaust Speed

#### ⚠ Caution

Locking will occur automatically if the pressure applied to the port on the retracting side falls down to 0.05MPa or less. In cases where the piping on the retracting side is long and thin, or the speed controller is some distance away from the cylinder port, the exhaust speed will be reduced and the lock may not engage right away. Furthermore, clogging of a silencer mounted on the exhaust port of the solenoid valve can produce the same result.

### Releasing the Lock

#### ⚠ Warning

Before releasing the lock, be sure to supply air to the extending side, so that there is no load applied to the lock mechanism when it is released. (Refer to the recommended pneumatic circuit.) If the lock is released when the port on the extending side is in an exhaust state and with a load applied to the lock mechanism, the lock mechanism may be subjected to an excessive force and be damaged. Also, remember that sudden erratic movement of the tube rod is very dangerous.

### Manual Release

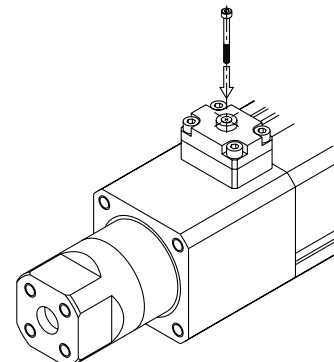
#### ⚠ Caution

##### Non-locking type manual release

Insert the accessory bolt from the top of the rubber cap (it is not necessary to remove the rubber cap), and after screw it into the lock piston, pull it to release the lock. If you stop pulling the bolt, the lock will return to an operational state. Thread sizes, pulling force and stroke are shown below.

Bore size (mm)	Screw size	Pulling force (N)	Stroke (mm)
40, 50, 63	M3 x 0.5 x 30ℓ or more	10	3

\*Remove the bolt for normal operation, otherwise it can cause lock malfunction or faulty release.



# Series **MGZ/MGZR**

## Made to Order Specifications

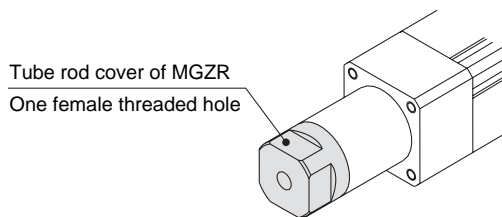
Please consult SMC for detailed specifications, delivery and prices.

### **1** -X1247 (Rod end one female threaded hole)

The tube rod cover of MGZR is the same as that mounted on MGZ.

**MGZ** Refer to How to Order. -X1247

\* The rod end shape and dimensions are identical to those of MGZR.

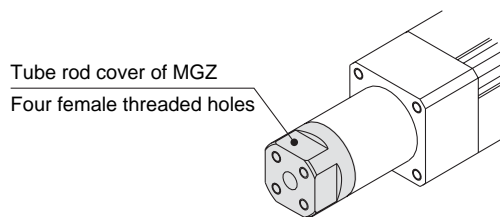


### **2** -X1248 (Rod end four female threaded holes)

The tube rod cover of MGZ is the same as that mounted on MGZR.

**MGZR** Refer to How to Order. -X1248

\* The rod end shape and dimensions are identical to those of MGZ.



#### SMC UK Contact Numbers

Head Office: SMC Pneumatics (UK) Ltd, Vincent Avenue, Crownhill, Milton Keynes MK8 0AN

#### THE NATIONAL SALES CENTRE FOR ENGLAND & WALES

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