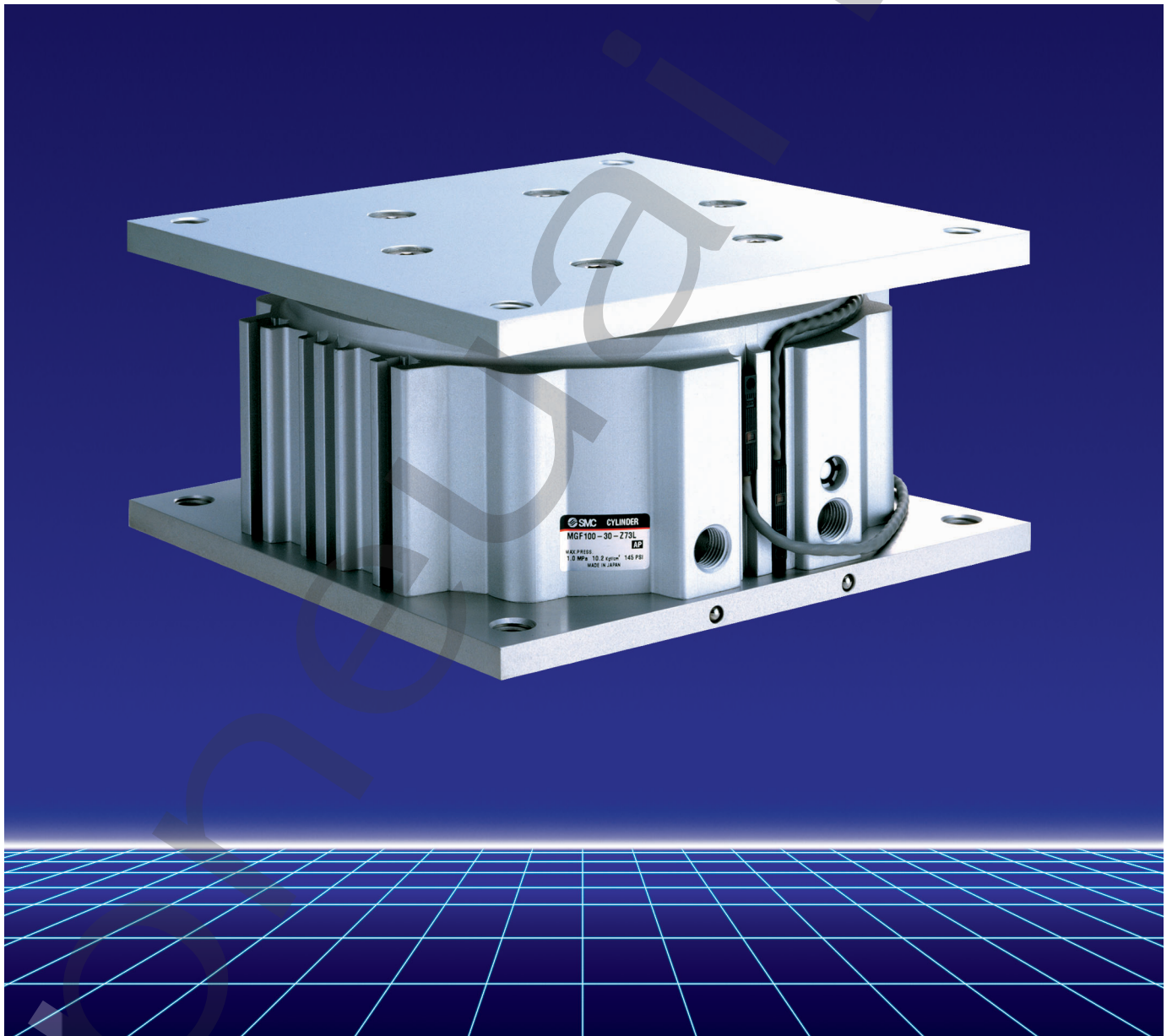




Guide Table

Series **MGF**

ø40, ø63, ø100



Low-profile compact cylinder utilizes a large concentric guiding sleeve to provide excellent eccentric load resistance.

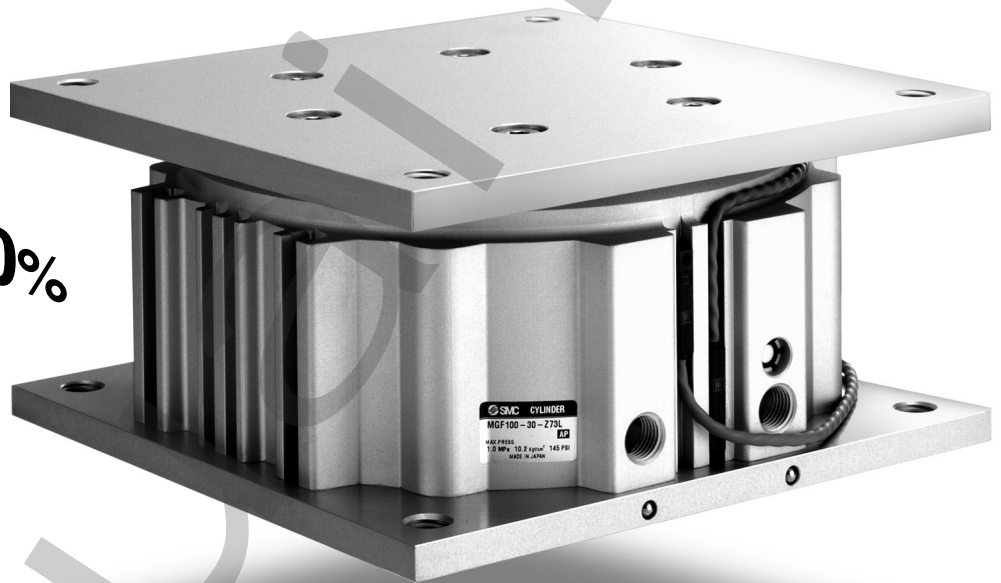
Low-profile compact cylinder

Large concentric guiding sleeve provides superior eccentric load resistance

■ Mounting height greatly reduced

Low-profile cylinder enables compact machine design.

Mounting height
Reduction by **15 to 20%**
(Compared to P/A series MGQ)



Guide Table

Series MGF

■ Built-in non-rotating mechanism

Internal guide pin prevents table rotation.

Non-rotating accuracy

Bore Size (mm)	Non-rotating accuracy
40	±0.08°
63	±0.06°
100	±0.05°

Note) Within allowable rotation torque.

■ Series Variations

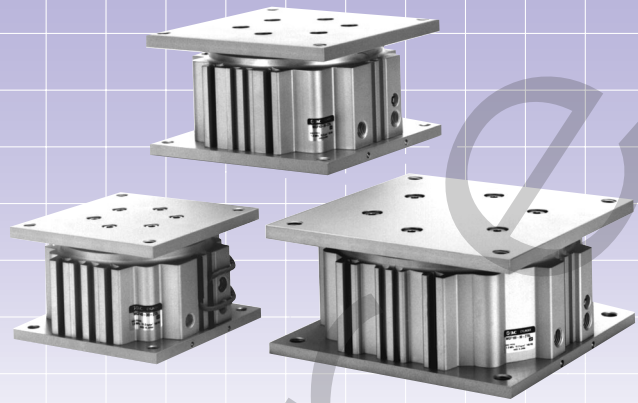
Model	Bore size (mm)	Standard stroke (mm)				Applicable auto switches
		30	50	75	100	
MGF 40	40	●	●	●	●	Reed: D-Z7, D-Z8 Solid state: D-Y5, D-Y6, D-Y7 2-color indication solid state: D-Y7 Water resistant 2-color indication solid state: D-Y7BA
MGF 63	63	●	●	●	●	
MGF100	100	●	●	●	●	
		●	●	●	●	

ø40, ø63, ø100

■ Built in T-slots

T-slots are provided on 3 faces of the body (except port face), allowing mounting for various brackets.

(Not suitable for mounting the cylinder itself.)



Large diameter concentric guide rod (Eccentric load resistant)

Large diameter guide rod enables the cylinder to handle eccentric loads applied from any direction within a 360° angle.

Allowable moment

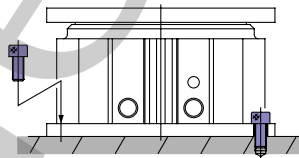
Bore size (mm)	Allowable moment (N·m)
40	10
63	40
100	110

* Values at cylinder speed of 100mm/s.

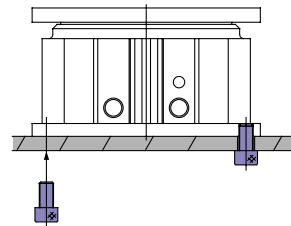
Auto switch can be mounted on 4 lateral faces of the body.

Mounting from two directions is possible.

Mounting from top

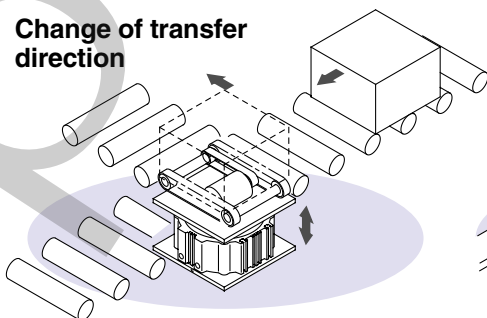


Mounting from bottom

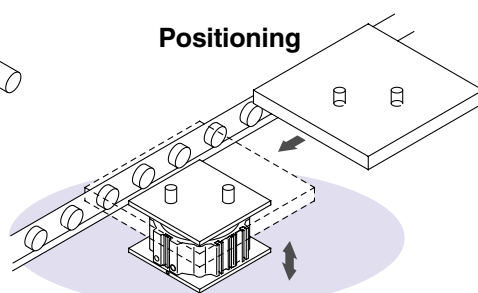


Typical application

Change of transfer direction



Positioning

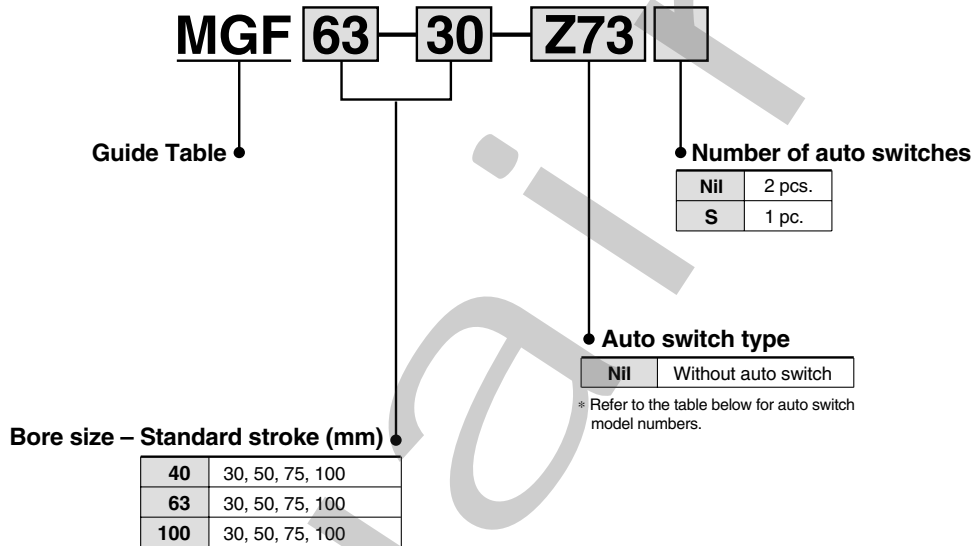


Guide Table

Series MGF

Ø40, Ø63, Ø100

How to Order

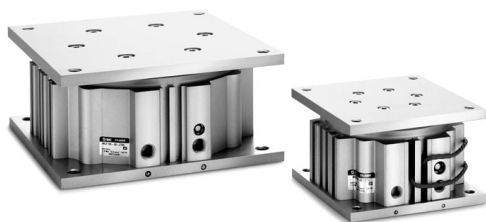


Applicable auto switches

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

* Lead wire symbols 0.5m Nil (Example) Y59A
 3m L Y59AL
 5m Z Y59AZ

* Refer to pages 8 and 9 for information related to auto switches.



Specifications

Action	Double acting
Fluid	Air
Proof pressure	1.5MPa
Maximum operating pressure	1.0MPa
Minimum operating pressure	0.1MPa
Ambient and fluid temperature	-10° to 60°C
Piston speed	20 to 200mm/s
Cushion	Rubber bumper at both ends
Lubrication	Non-lube
Stroke length tolerance	+1.0 0 mm

Standard Strokes

Model	Standard stroke (mm)	Intermediate stroke
MGF 40	30, 50, 75, 100	Intermediate strokes (at increments of 5mm) other than standard strokes are available with spacers of 5, 10, 15, 20 and 25mm. Example) In case an MGF63-15 specification is required, a spacer of 15mm is installed in the MGF63-30. Therefore, the total length is same as that of 30mm stroke.
MGF 63		
MGF100		

Minimum Strokes for Mounting Auto Switches

(mm)

Switch type Number of pcs.	D-Z7, D-Z8	D-Y5, D-Y6, D-Y7
	1 pc.	10
2 pcs.	15	10

Theoretical Output

Bore size (mm)	Rod size (mm)	Operating direction	Piston area (mm ²)	Operating pressure (MPa)									
				0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	
40	25	OUT	1256	251	376	502	628	753	879	1004	1130	1256	
		IN	765	153	229	306	382	459	535	612	688	765	
63	36	OUT	3117	623	935	1246	1558	1870	2182	2493	2805	3117	
		IN	2099	419	629	839	1049	1259	1469	1679	1889	2099	
100	36	OUT	7853	1570	2356	3141	3926	4711	5497	6282	7067	7853	
		IN	6835	1367	2050	2734	3417	4101	4784	5468	6151	6835	

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

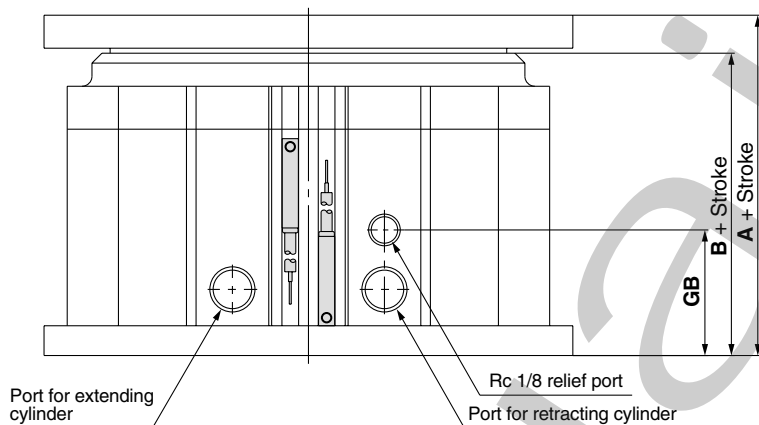
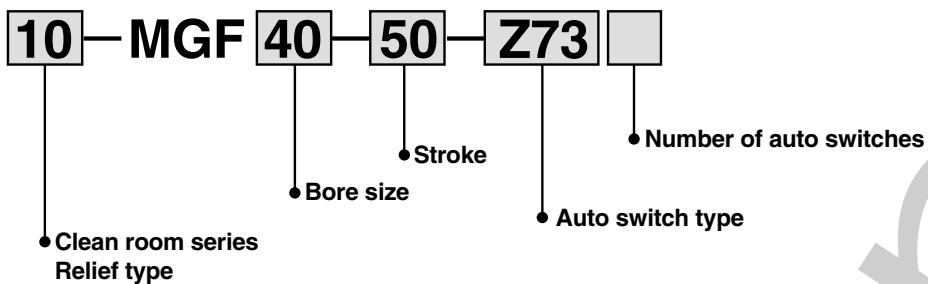
Weights

(kg)

Model	Bore size (mm)	Standard stroke (mm)			
		30	50	75	100
MGF 40	40	2.1	2.6	3.2	3.8
MGF 63	63	4.3	5.1	6.1	7.1
MGF100	100	7.0	8.2	9.6	11.0

Series MGF

Clean Room Series

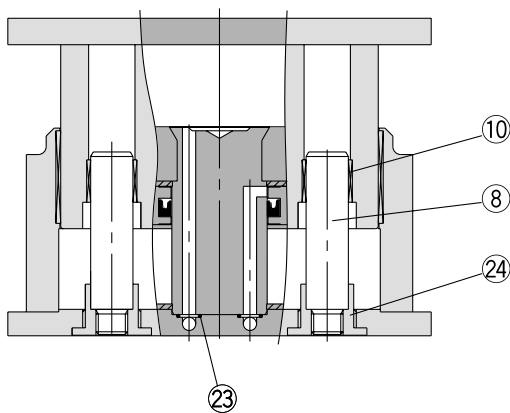


Dimensions (mm)

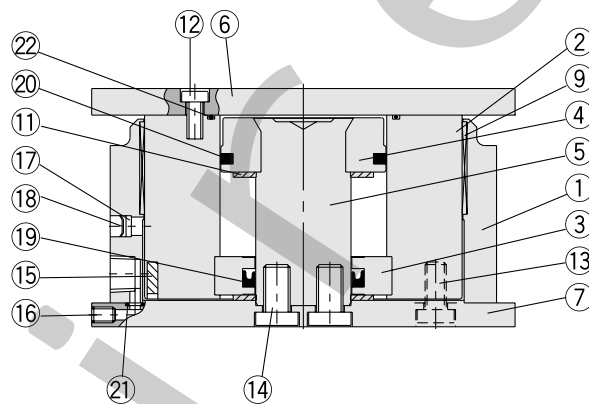
Bore size	A	B	GB
40	58	48.5	36.5
63	73	61.5	38
100	78	66.5	38

Dimensions not listed above are the same as the standard model.

Construction



When the cylinder is extended



When the cylinder is retracted

Parts list

No.	Description	Material	Note
1	Body	Aluminum alloy	Clear anodized
2	Tube	Aluminum alloy	Hard anodized
3	Rod cover	Aluminum alloy	Clear anodized
4	Piston	Aluminum alloy	Chromated
5	Piston rod	Carbon steel	Electroless nickel plated
6	Plate	Aluminum alloy	Anodized
7	End plate	Aluminum alloy	Anodized
8	Non-rotating rod	Stainless steel	Hard chrome plated
9	Bushing	Resin	
10	Bushing (for non-rotating rod)	Lead-bronze casting	
11	Bumper	Urethane rubber	
12	Hexagon socket head cap screw A	Carbon steel	Nickel plated

Parts list

No.	Description	Material	Note
13	Hexagon socket head cap screw B	Carbon steel	Nickel plated
14	Hexagon socket head cap screw C	Carbon steel	Nickel plated
15	Magnet	Magnet	
16	Plug	Carbon steel	
17	Element	Resin	
18	Snap ring	Spring steel	
19	Rod seal	NBR	
20	Piston seal	NBR	
21	O-ring A	NBR	
22	O-ring B	NBR	
23	O-ring C	NBR	
24	Reinforcement ring	Carbon steel	Electroless nickel plated

Replacement parts: Seal kits

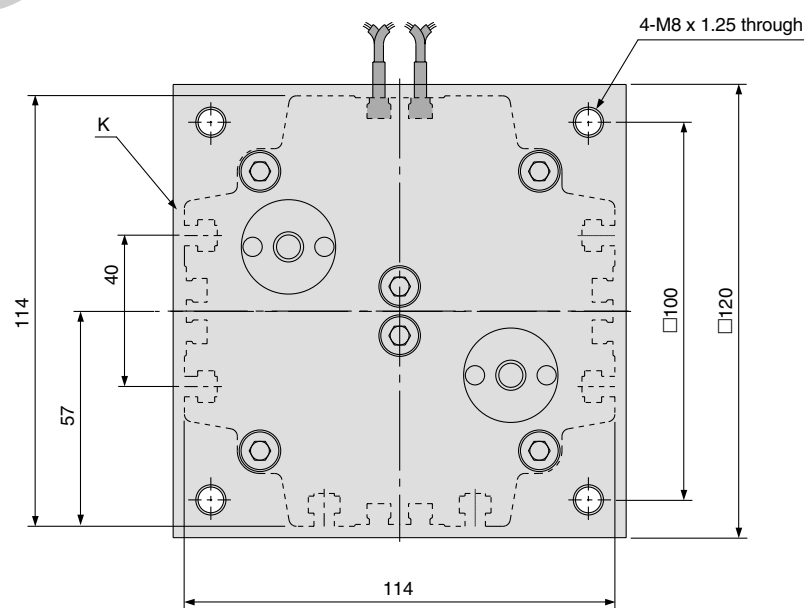
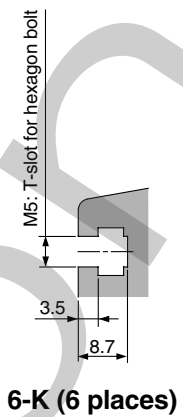
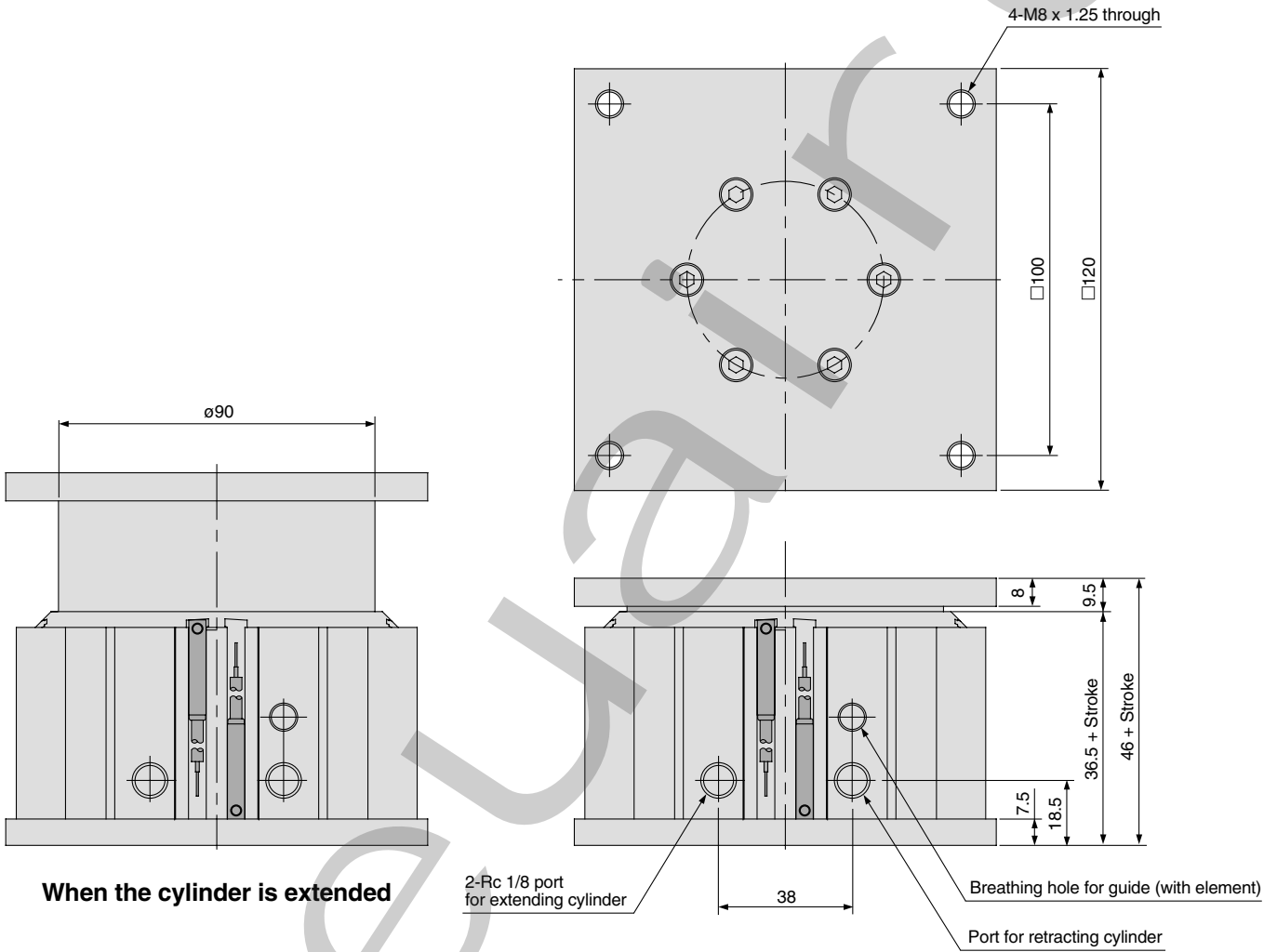
Bore size (mm)	Order no.	Kit components
40	MGF 40-PS	Items 19 through 23 from the table above.
63	MGF 63-PS	
100	MGF100-PS	

Series MGF

Dimensions $\varnothing 40$

MGF40

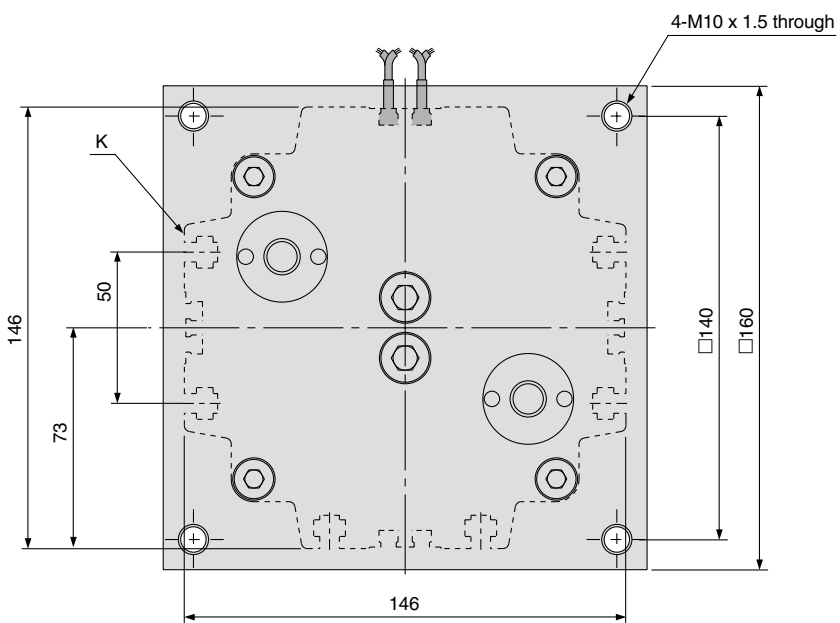
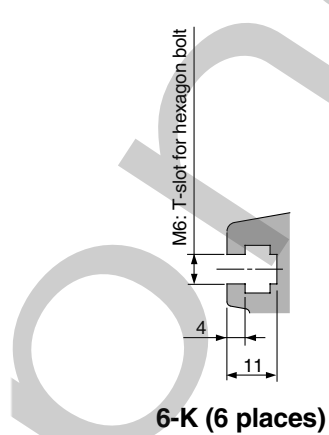
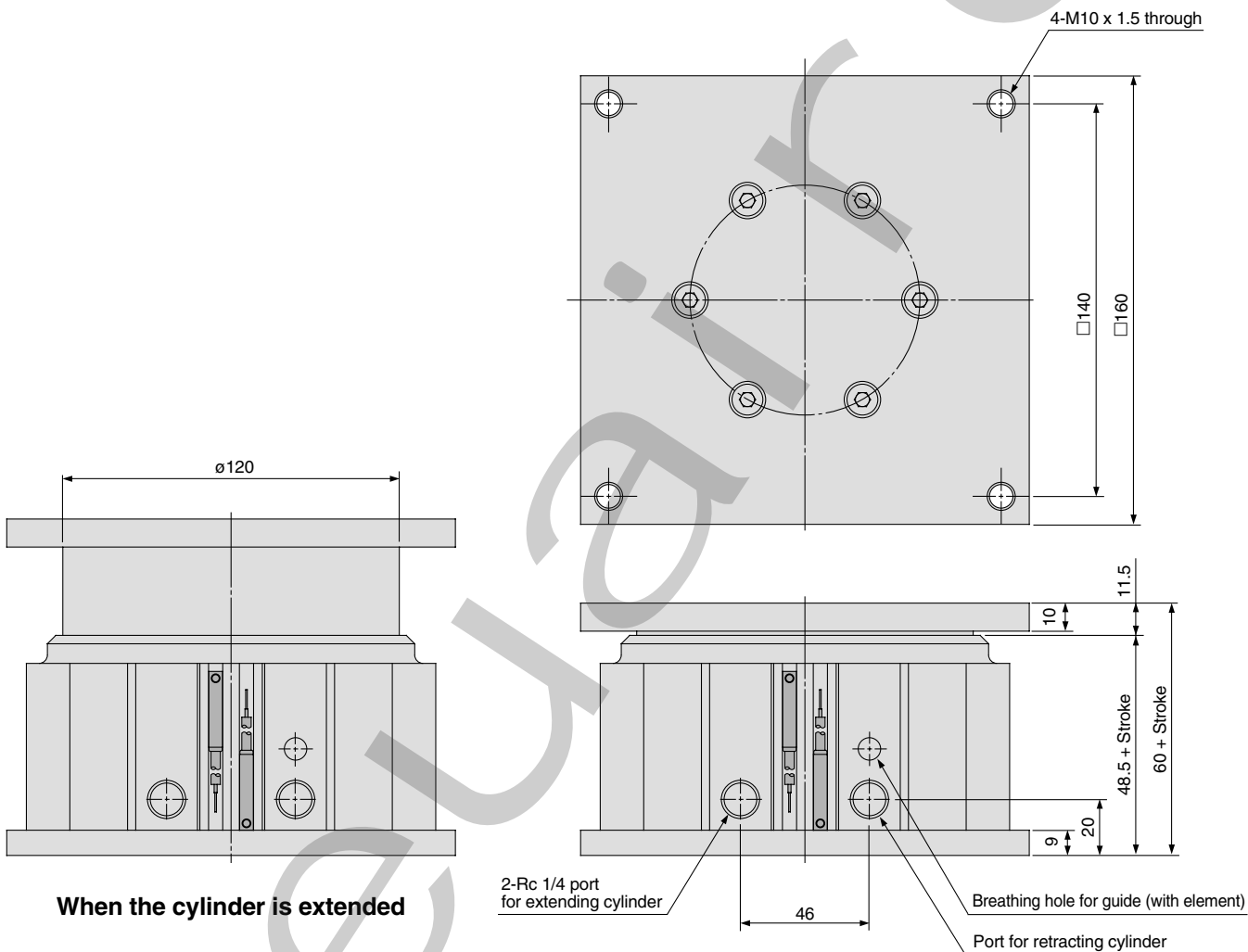
Scale: 50%



ø63

MGF63

Scale: 40%

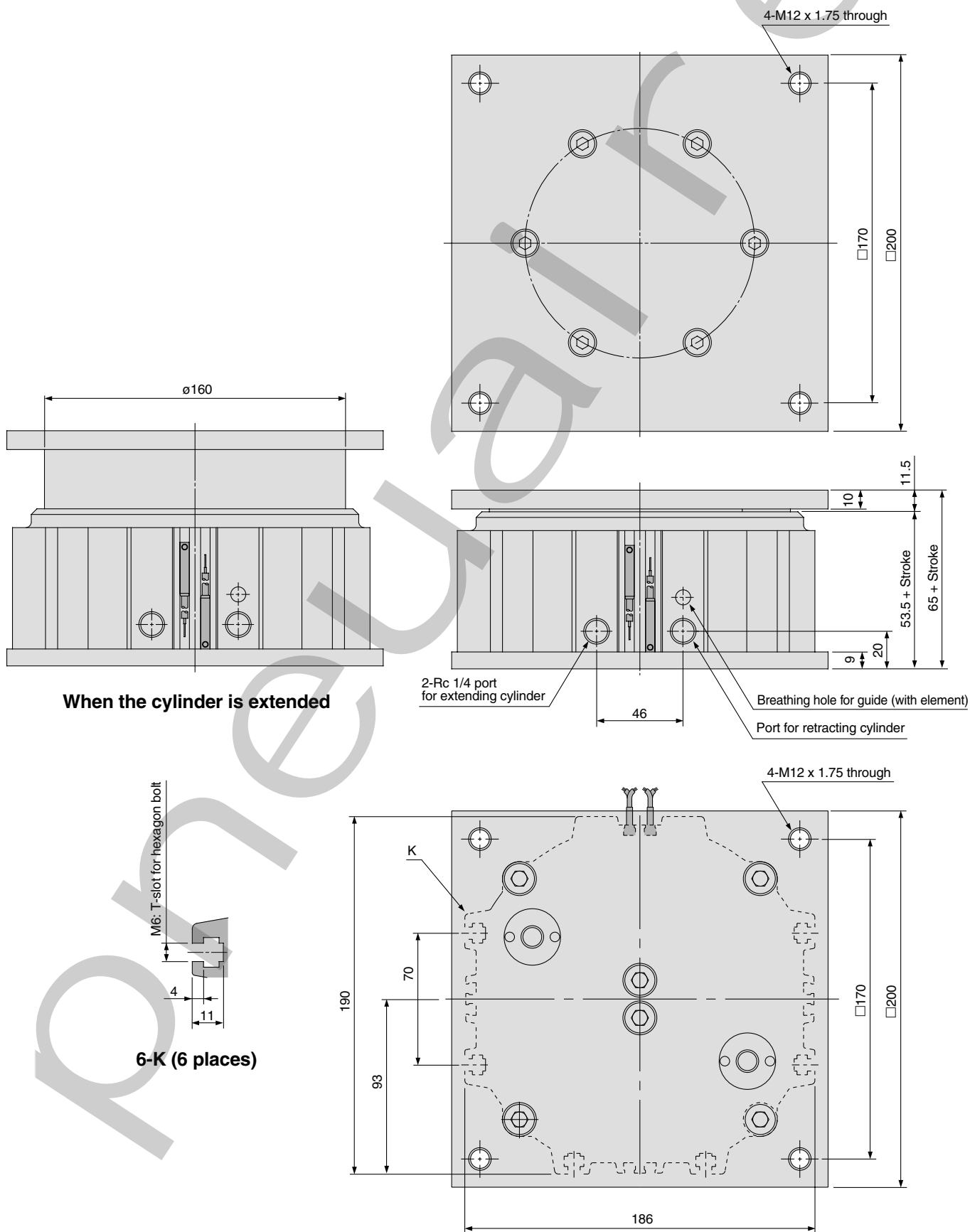


Series MGF

Dimensions $\varnothing 100$

MGF100

Scale: 35%

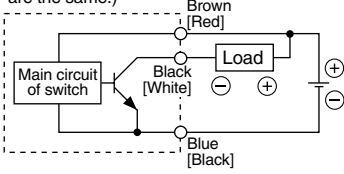


Solid State Switch Connections and Examples

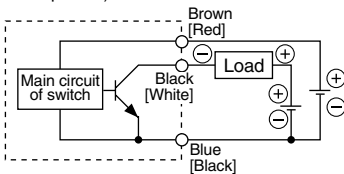
Basic Wiring

3-wire, NPN

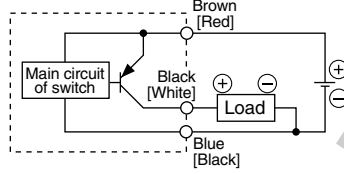
(Power supplies for switch and load are the same.)



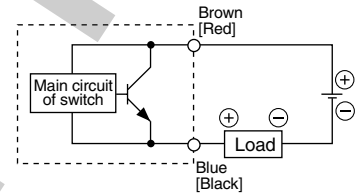
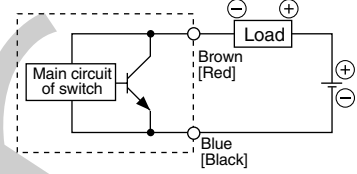
(Power supplies for switch and load are separate.)



3-wire, PNP



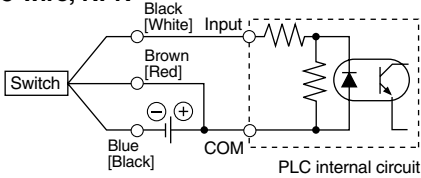
2-wire



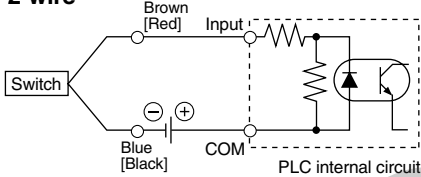
Examples of Connection to PLC

Sink input specifications

3-wire, NPN

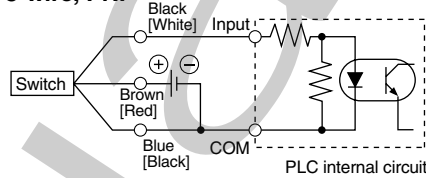


2-wire

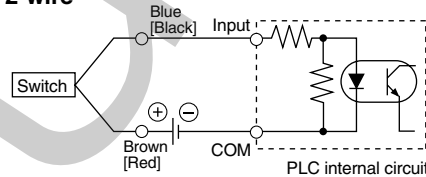


Source input specifications

3-wire, PNP



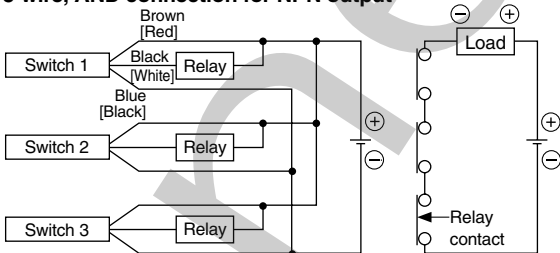
2-wire



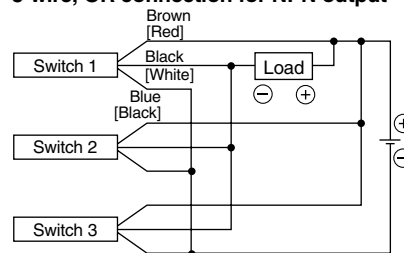
Connect according to the applicable PLC input specifications, as the connection method will vary depending on the PLC input specifications.

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

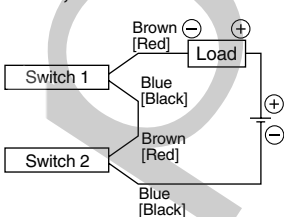
3-wire, AND connection for NPN output



3-wire, OR connection for NPN output



2-wire, with 2-switch AND connection

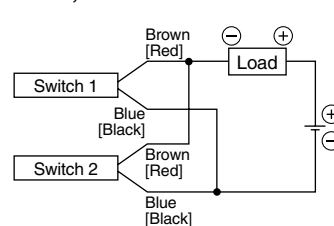


When two switches are connected in series, a load may malfunction because the load voltage will decline when in the ON state. The indicator lights will light up when both of the switches are in the ON state.

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

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

2-wire, with 2-switch OR connection



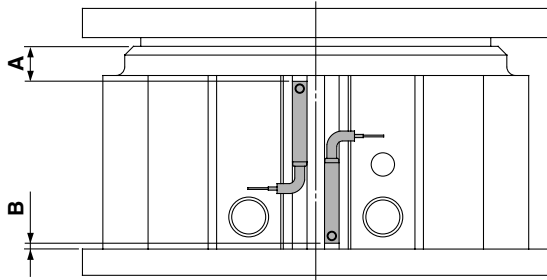
When two switches are connected in parallel, malfunction may occur because the load voltage will increase when in the OFF state.

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

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

Series MGF

Auto Switches Proper Mounting Position for Stroke End Detection



Proper mounting position (mm)

Bore size (mm)	A	B
40	4	0
63	14.5	0
100	19.5	0

Above dimensions are for standard strokes. Adjustment on A dimension is required for intermediate strokes.

Auto Switch Mounting

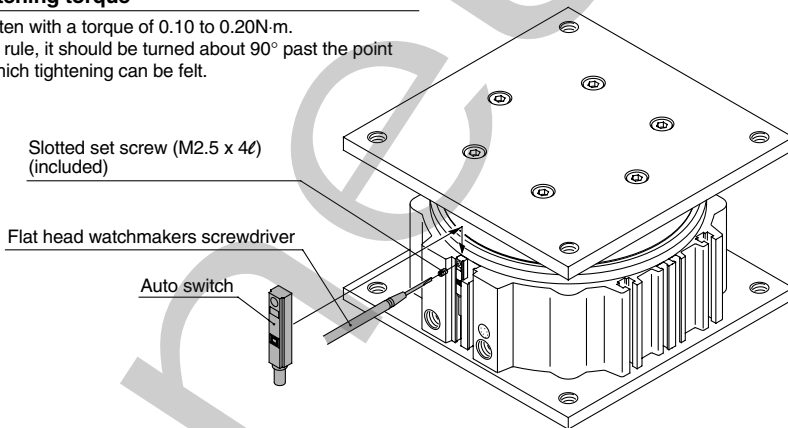
⚠ Caution

Auto switch mounting tool

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

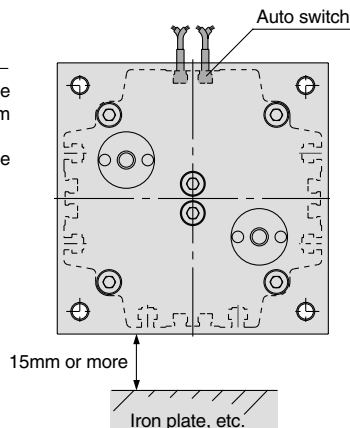
Tightening torque

- Tighten with a torque of 0.10 to 0.20N·m. As a rule, it should be turned about 90° past the point at which tightening can be felt.



Auto switch mounting surface

Magnetic substances such as an iron plate should be separated at least 15mm away from auto switch mounting surface. Magnetic substances may cause unstable operation of the auto switch. There is no problem if a magnetic substance is close to any side where an auto switch is not mounted.



Contact Protection Boxes/CD-P11, CD-P12

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

A contact protection box should be used in any of the following cases.

- The operated load is an induction load.
- The length of wiring to the load is 5m or more.
- The load voltage is 100V or 200VAC.

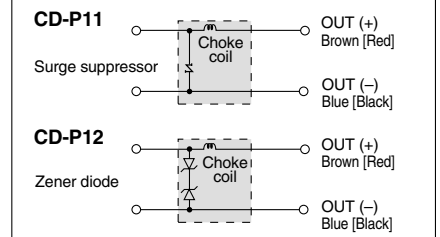
Contact protection box specifications

Part no.	CD-P11		CD-P12
	Load voltage	100VAC	200VAC
Max. load current	25mA	12.5mA	50mA

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



Contact protection box internal circuits

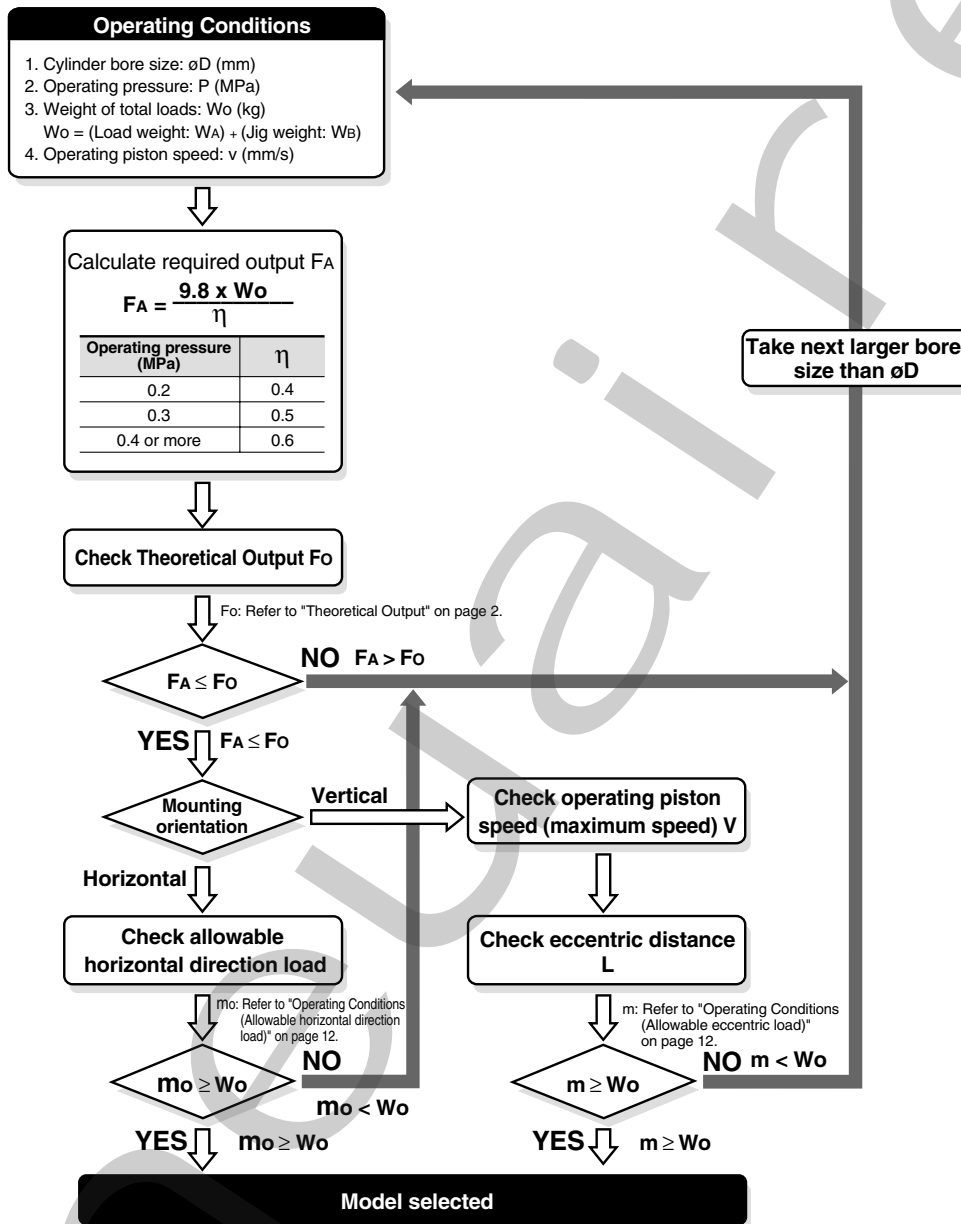


Contact Protection Box/Connection

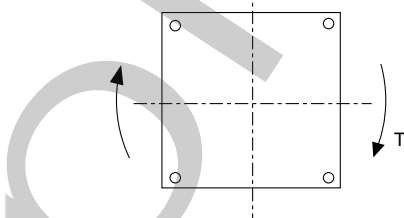
To connect a switch unit to a contact protection box, connect the lead wire from the side of the contact protection box marked "SWITCH" to the lead wire coming out of the switch unit.

The length of the lead wires between the switch unit and contact protection box should be no more than 1m, and they should be placed as close together as possible.

Series MGF Model Selection



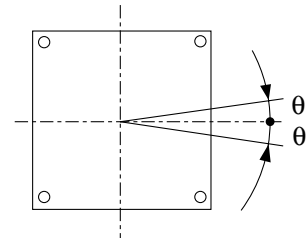
Allowable rotational torque



T (N·m)

Bore size (mm)	Stroke (mm)			
	30	50	75	100
40	7	5	4	3
63	22	16	12	10
100	30	22	17	13

Non-rotating accuracy

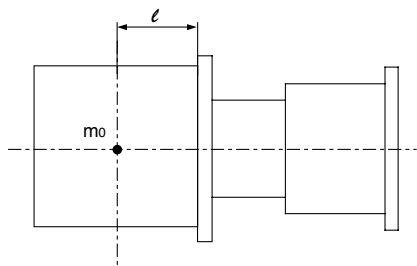


Bore size (mm)	Non-rotating accuracy θ
40	± 0.08
63	± 0.06
100	± 0.05

Note) The value given for the non-rotating accuracy is applicable below the allowable rotation torque. If a greater rotational torque is applied, the non-rotating rod (page 4) bends, exceeding the value of the non-rotating accuracy.

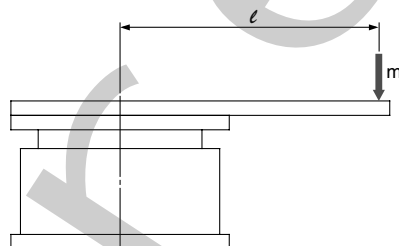
Operating Conditions

Allowable horizontal direction load



Allowable eccentric load

The maximum value of load which can be applied at an eccentric position at a distance of l (mm) from the cylinder center.

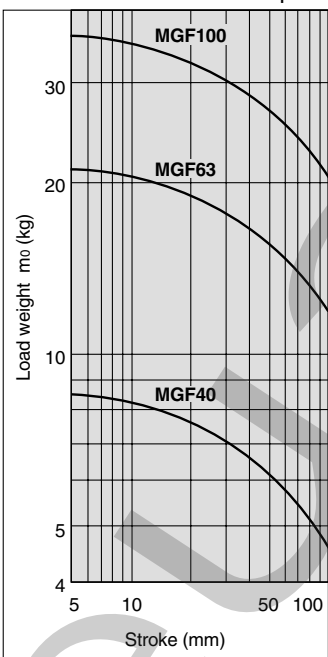
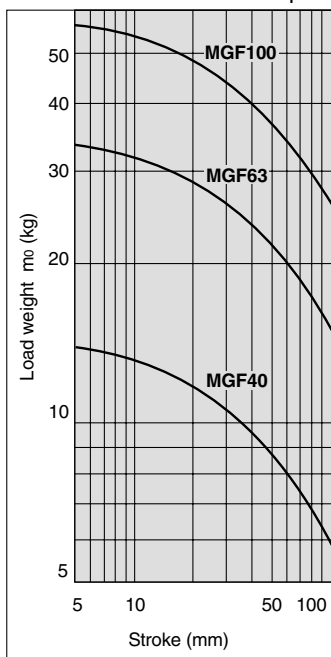


$l = 50\text{mm}$

Graph 1

$l = 100\text{mm}$

Graph 2

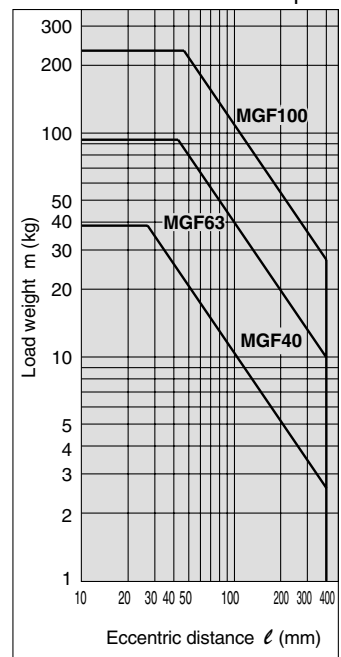
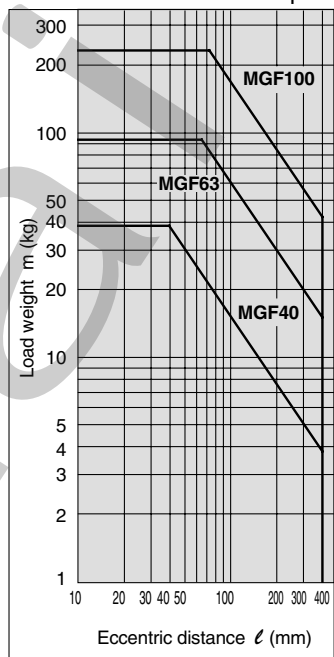


$v = 50\text{mm/s}$ or less

Graph 5

$v = 100\text{mm/s}$ or less

Graph 6

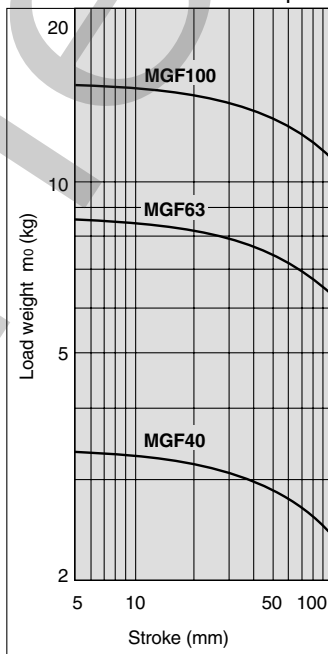
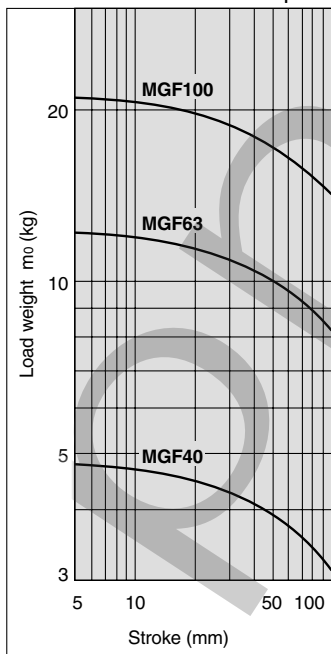


$l = 200\text{mm}$

Graph 3

$l = 300\text{mm}$

Graph 4

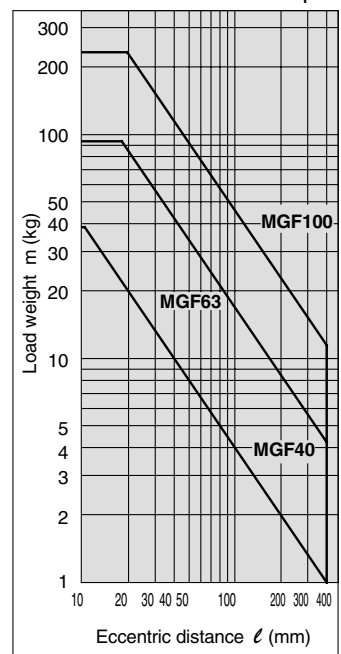
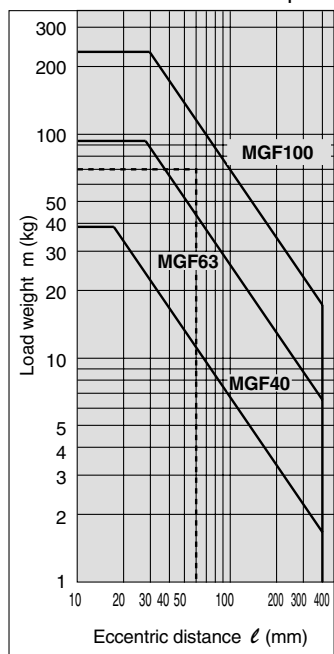


$v = 150\text{mm/s}$ or less

Graph 7

$v = 200\text{mm/s}$ or less

Graph 8



How to read the graph

- 1) When the load weight is 70kg, eccentric distance is 60mm, and the maximum speed is 150mm/s → Select MGF100 from Graph 7.
- 2) When MGF63 is operated with a load weight 30kg and 100mm eccentric distance → From Graph 6, the cylinder can be used at a maximum speed of 100mm/s or less.