



# Square Tube Type Air Cylinder Series MB1

ø32, ø40, ø50, ø63, ø80, ø100



Single rod type  
Series MB1

Double rod type  
Series MB1W

Non-rotating rod type  
Series MB1K



CJ1

CJP

CJ2

CM2

C85

C76

CG1

MB

**MB1**

CP95

C95

C92

CA1

CS1

**Employs a square tube with enclosed tie-rods**

# Series **MB1**

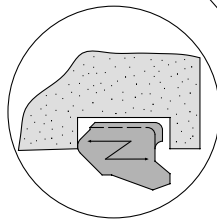
Double Acting Single Rod Type

# **MB1W**

Double Acting Double Rod Type

## **Improved cushion capacity**

Piston rod lurching, due to cracking pressure at start up, has been eliminated by means of a floating seal mechanism.

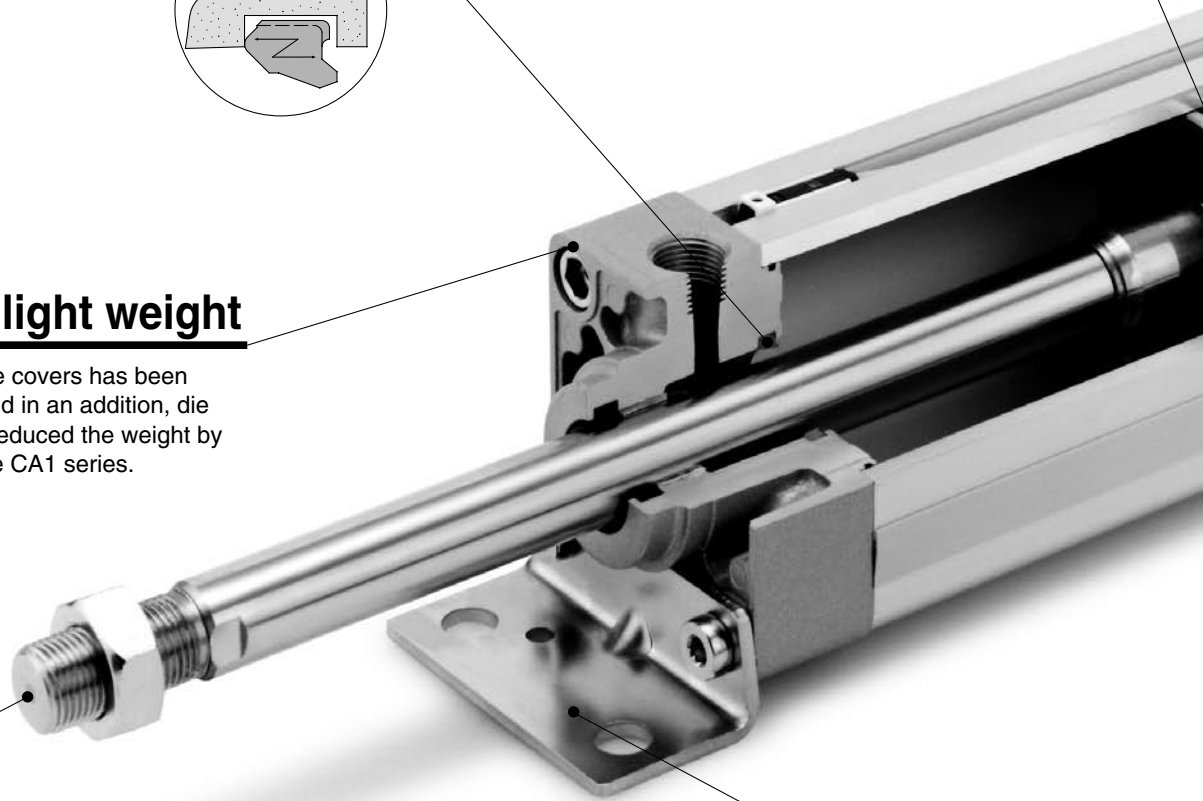


## **Increased kinetic energy absorption**

The absorption of kinetic energy has been increased by nearly 30% compared to the CA1 series, through increased cushion volume and the use of a new cushion seal. In addition, the life of the cushion seal is approximately 5 times longer.

## **Compact and light weight**

The height and width of the covers has been reduced by nearly 10%, and in addition, die casting of the covers has reduced the weight by 10 to 25% compared to the CA1 series.

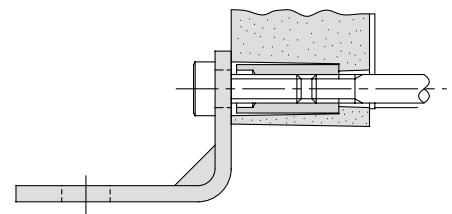


## **Improved mounting accuracy**

High precision has been achieved in the cylinder unit and the mounting brackets. Improved mounting accuracy simplifies the mounting process and also extends cylinder life.

## **Piston rod sagging reduced**

Sagging of the piston rod has been reduced by increasing the precision of the bushing and piston rod, and reducing their clearances.



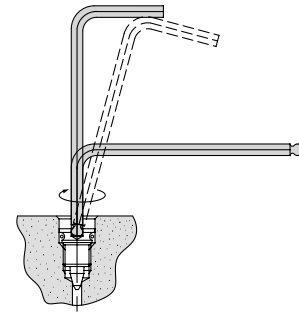
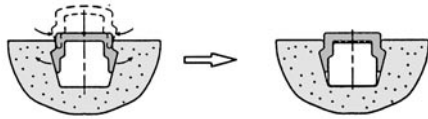
# MB1K

Double Acting Non-Rotating Rod

ø32, ø40, ø50, ø63, ø80, ø100

## Space saving auto switch mounting

Space is saved by setting switches into grooves provided on 4 surfaces. This is also effective to prevent loosening and damage, etc.



## Easy cushion valve adjustment

Since adjustment of the cushion valve is performed with a hexagon wrench key, even fine control can be easily accomplished. Furthermore, the cushion valve has been recessed so that it does not protrude from the cover.

## Appearance improved by enclosing the tie-rods

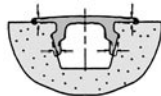
Tie-rods are enclosed in a rectangular tube, which is integrated with both covers to achieve an attractive, unified appearance.

### A full range of order made specifications

No.	Symbol	Specification/Content
1	-XA0 to XA30	Modification of rod end shape
2	-XB5	Heavy duty rod
3	-XB6	Heat resistant cylinder (to 150°C)
4	-XB13	Low speed cylinder
5	-XC3	Special port locations
6	-XC4	With heavy duty scraper
7	-XC5	Heat resistant cylinder (to 110°C)
8	-XC6	Stainless steel piston rod and rod end nut
9	-XC7	Stainless steel tie-rods, tie-rod nuts, cushion valve, etc.
10	-XC8	Adjustable stroke cylinder (adjustable extension type)
11	-XC9	Adjustable stroke cylinder (adjustable retraction type)
12	-XC10	Dual stroke cylinder (double rod type)
13	-XC11	Dual stroke cylinder (single rod type)
14	-XC12	Tandem type cylinder
15	-XC18	NPT ports
16	-XC22	Fluro rubber seals
17	-XC30	Front trunnion mounted on front of rod cover
18	-XC35	With coil scraper
19	-X846	Fastener strips mounted on switch mounting grooves

## Dust accumulation can be prevented with fastener strips

Auto switch mounting grooves can be covered with resin fastener strips, which adhere tightly to the tube (optional) to prevent the entry and accumulation of dirt.



### Series variations

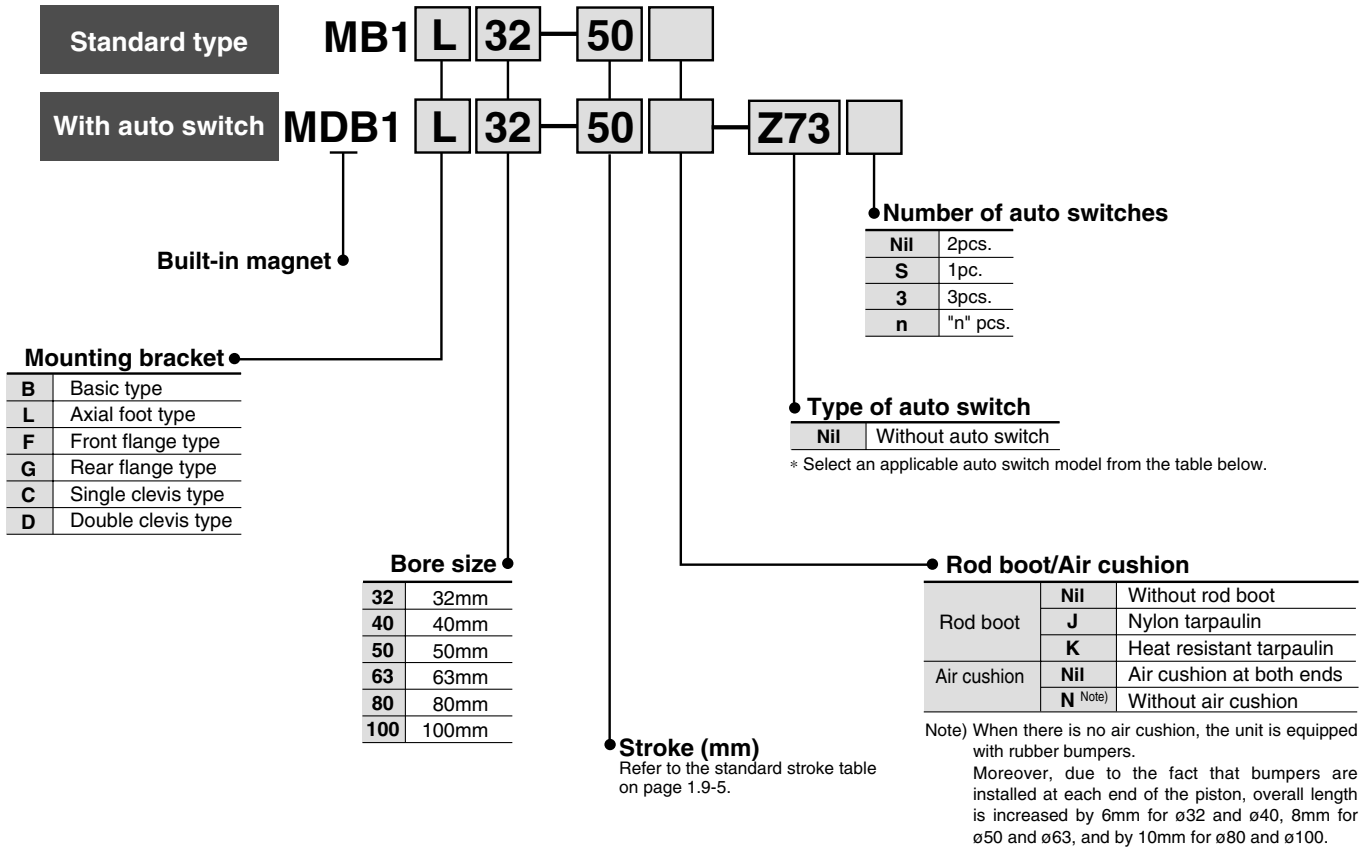
Standard type/double acting	JIS symbol	Standard stroke (mm)								Built-in magnet Rod boot	Mounting brackets	Accessories	Page				
		Bore size	25	50	75	100	125	175	250					350	450	600	
		32	•	•	•	•	•	•	•					•	•	•	•
Single rod type Series MB1		40	•	•	•	•	•	•	•	•	•	•	•	•	•	<ul style="list-style-type: none"> <li>Basic type</li> <li>Axial foot type</li> <li>Front flange type</li> <li>Rear flange type</li> <li>Single clevis type</li> <li>Double clevis type</li> <li>Centre trunnion type</li> </ul> (Standard) Rod end nut (Optional) Knuckle joint pin Clevis pin Single knuckle joint Double knuckle joint Trunnion mounting bracket Double clevis mounting plate	Page 1
		50	•	•	•	•	•	•	•	•	•	•	•	•	<ul style="list-style-type: none"> <li>Basic type</li> <li>Foot type</li> <li>Flange type</li> <li>Centre trunnion type</li> </ul> (Standard) Rod end nut (Optional) Knuckle joint pin Single knuckle joint Double knuckle joint Trunnion mounting bracket		
Double rod type Series MB1W		63	•	•	•	•	•	•	•	•	•	•	•	•		<ul style="list-style-type: none"> <li>Basic type</li> <li>Axial foot type</li> <li>Front flange type</li> <li>Rear flange type</li> <li>Single clevis type</li> <li>Double clevis type</li> <li>Centre trunnion type</li> </ul> (Standard) Rod end nut (Optional) Knuckle joint pin Clevis pin Single knuckle joint Double knuckle joint Trunnion mounting bracket Double clevis mounting bracket	Page 18
		80	•	•	•	•	•	•	•	•	•	•	•	•			
Non-Rotating Rod Series MB1K		100	•	•	•	•	•	•	•	•	•	•	•	•			
		125	•	•	•	•	•	•	•	•	•	•	•	•			

# Square Tube Type Air Cylinder/Standard (Double Acting: Single Rod)

# Series MB1

ø32, ø40, ø50, ø63, ø80, ø100

## How to Order



### Applicable auto switches/direct mounting type

Type	Special function	Electrical entry	Indicator light	Wiring (output)	Load voltage		Auto switch model		Lead wire length (m) <sup>Note)</sup>			Applicable load			
					DC	AC	Electrical entry direction		0.5 (Nil)	3 (L)	5 (Z)				
							Vertical	Lateral							
Reed switch	—	Grommet	Yes	3 wire	—	5V	—	—	Z76	●	●	—	IC circuit	—	
				2 wire	24V	—	100V	—	Z73	●	●	●	—	—	Relay PLC
						5V, 12V	100V or less	—	Z80	●	●	—	—	—	IC circuit
Solid state switch	—	Grommet	Yes	3 wire (NPN)	24V	5V, 12V	—	Y69A	Y59A	●	●	○	—	IC circuit	
				3 wire (PNP)				Y7PV	Y7P	●	●	○	—	—	
				2 wire				Y69B	Y59B	●	●	○	—	—	
				3 wire (NPN)				Y7NWV	Y7NW	●	●	○	—	IC circuit	
				3 wire (PNP)				Y7PWV	Y7PW	●	●	○	—	—	
				Diagnostic indication (2 colour indicator)				5V, 12V	Y7BWV	Y7BW	●	●	○	—	—
									—	Y7BA	—	●	—	—	—
Water resistant (2 colour indicator)	12V	—	—	—	—	—	—	—	—	—	—	—			

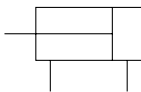
Note) Lead wire length symbol 0.5m ..... Nil (Example) Y69B  
3m ..... L (Example) Y69BL  
5m ..... Z (Example) Y69BZ

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

# Standard Type Double Acting: *Single Rod* Series **MB1**



**JIS symbol**  
Double acting type



## Minimum strokes for auto switch mounting

Refer to page 1.9-10 regarding the minimum strokes for the mounting of auto switches.

## Rod boot material

Symbol	Rod boot material	Max. ambient temp.
J	Nylon tarpaulin	60°C
K	Heat resistant tarpaulin	110°C <sup>Note)</sup>

Note) Maximum ambient temperature for the rod boot itself.

## Switch spacers

Applicable bore size (mm)	32, 40	50, 63	80, 100
Switch spacer	BMP1-032		

## Specifications

1MPa: Approx. 10.2kgf/cm<sup>2</sup>

Bore size (mm)	32	40	50	63	80	100
Type	Non-lube type					
Action	Double acting single rod					
Fluid	Air					
Proof pressure	1.5MPa {15.3kgf/cm <sup>2</sup> }					
Maximum operating pressure	1.0MPa {10.2kgf/cm <sup>2</sup> }					
Minimum operating pressure	0.05MPa {0.5kgf/cm <sup>2</sup> }					
Ambient and fluid temperature	Without auto switch -10 to 70°C (without freezing)					
	With auto switch -10 to 60°C (without freezing)					
Lubrication	Not required (non-lube)					
Piston speed	50 to 1000mm/s					
Stroke length tolerance	to 250 : $\begin{matrix} +1.0 \\ 0 \end{matrix}$ ; 251 to 1000 : $\begin{matrix} +1.4 \\ 0 \end{matrix}$ ; 1001 to 500 : $\begin{matrix} +1.8 \\ 0 \end{matrix}$					
Cushion	Both ends (air cushion) <sup>Note)</sup>					
Thread tolerance	JIS class 2					
Port size	Rc(PT)1/8	Rc(PT)1/4	Rc(PT)1/4	Rc(PT)3/8	Rc(PT)3/8	Rc(PT)1/2
Mounting bracket	Basic type, Foot type, Front flange type, Rear flange type Single clevis type, Double clevis type					

Note) When there is no air cushion, the unit is equipped with rubber bumpers. (Refer to Rod boot/Air cushion on page 1.9-4)

## Standard stroke table

Bore size (mm)	Standard stroke (mm)	Maximum stroke
32	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500	700
40	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500	800
50	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500, 600	1200
63	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500, 600	1200
80	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500, 600, 700, 800	1400
100	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500, 600, 700, 800	1500

Note) Intermediate strokes are also available.

## Accessories

Mounting bracket		Basic type	Foot type	Front flange type	Rear flange type	Single clevis type	Double clevis type
Standard equipment	Rod end nut	●	●	●	●	●	●
	Clevis pin	—	—	—	—	—	●
Options	Single knuckle joint	●	●	●	●	●	●
	Double knuckle joint (with pin)	●	●	●	●	●	●
	Rod boot	●	●	●	●	●	●

## Mounting brackets

Bore size (mm)	32	40	50	63	80	100
<b>Foot</b> <sup>Note 1)</sup>	MB-L03	MB-L04	MB-L05	MB-L06	MB-L08	MB-L10
<b>Flange</b>	MB-F03	MB-F04	MB-F05	MB-F06	MB-F08	MB-F10
<b>Single clevis</b>	MB-C03	MB-C04	MB-C05	MB-C06	MB-C08	MB-C10
<b>Double clevis</b>	MB-D03	MB-D04	MB-D05	MB-D06	MB-D08	MB-D10

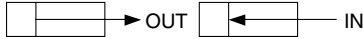
Note 1) When ordering foot type brackets, 2pcs. should be ordered for each cylinder.

Note 2) The parts included with each mounting bracket are as follows.

Foot, Flange, Single clevis: Body mounting bolts  
Double clevis: Clevis pin & Cotter pin

# Series MB1

## Theoretical output table

(Unit: N) 

Bore size (mm)	Rod diameter (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
32	12	OUT	804	161	241	322	402	482	563	643	724	804
		IN	691	138	207	276	346	415	484	553	622	691
40	16	OUT	1257	251	377	503	629	754	880	1006	1131	1257
		IN	1056	211	317	422	528	634	739	845	950	1056
50	20	OUT	1963	393	589	785	982	1178	1374	1570	1767	1963
		IN	1649	330	495	660	825	989	1154	1319	1484	1649
63	20	OUT	3117	623	935	1247	1559	1870	2182	2494	2805	3117
		IN	2803	561	841	1121	1402	1682	1962	2242	2523	2803
80	25	OUT	5027	1005	1508	2011	2514	3016	3519	4022	4524	5027
		IN	4536	907	1361	1814	2268	2722	3175	3629	4082	4536
100	30	OUT	7854	1571	2356	3142	3927	4712	5498	6283	7069	7854
		IN	7147	1429	2144	2859	3574	4288	5003	5718	6432	7147

1N: approx. 0.102kgf 1MPa: approx. 10.2kgf/cm<sup>2</sup>

Note) Theoretical output (N) = Pressure (MPa) x Piston area (mm<sup>2</sup>).

## Weight table

(kg)

Bore size (mm)		32	40	50	63	80	100
Basic weight	Basic type	0.53	0.72	1.24	1.54	2.84	3.83
	Foot type	0.65	0.86	1.46	1.82	3.34	4.49
	Flange type	0.82	1.09	1.69	2.33	4.29	7.14
	Single clevis type	0.78	0.95	1.58	2.17	3.95	7.0
	Double clevis type	0.79	0.99	1.67	2.33	4.24	7.52
Additional weight per 50mm stroke	All mounting brackets	0.16	0.21	0.33	0.37	0.56	0.72
Accessories	Single knuckle	0.15	0.23	0.26	0.26	0.60	0.83
	Double knuckle (with pin)	0.22	0.37	0.43	0.43	0.87	1.27

Calculation method

Example) **MB1B32-100** (basic type/ø32,100st)

- Basic weight ..... 0.53 (basic type, ø32)
  - Additional weight ..... 0.16/50mm stroke
  - Cylinder stroke ..... 100mm stroke
- 0.53 + 0.16 x 100/50 = 0.85kg

## Consideration of the cushion

Refer to "p.5.6-5" for further information on kinetic energy that can be absorbed by the cushion mechanism and regarding cylinders with air cushion.

## Kinetic energy absorbable by cushion mechanism

Bore size (mm)	Effective cushion length (mm)	Absorbable kinetic energy J
32	18.8	2.2
40	18.8	3.4
50	21.3	5.9
63	21.3	11
80	30.3	20
100	29.3	29

1J: approx. 10.2kgf·cm

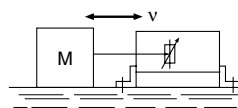
Cylinders with air cushion

At the stroke end, when stopping a large amount of kinetic energy generated by a large load and high speed operation, compression of air is used to absorb the impact without transmitting vibration to the surroundings. The purpose of an air cushion is not to reduce the speed of a piston as it nears the stroke end. The kinetic energy of a load can be found using the following formula.

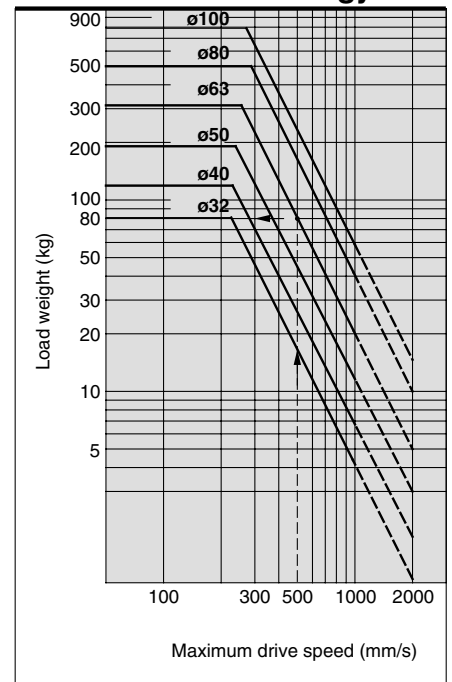
$$E_k = \frac{M}{2} V^2$$

Ek: Kinetic energy (J)  
M: Weight of load (kg)  
V: Piston speed (m/s)

If the kinetic energy obtained is no greater than the absorbable kinetic energy shown in the table above, the life of the cushion seal will be 10 million cycles or more.



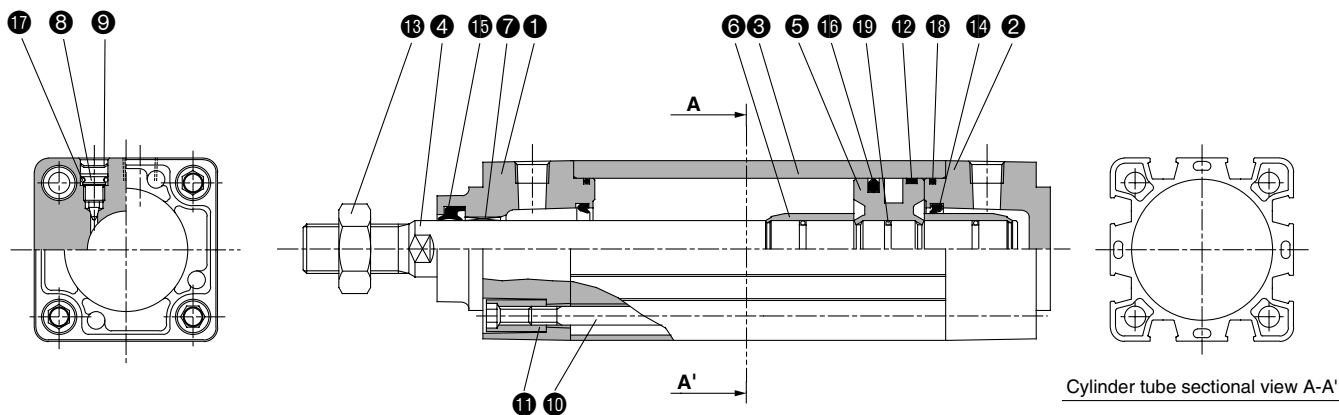
## Allowable kinetic energy



Example)

Find the rod end load limit when a ø63 air cylinder is operated at a maximum drive speed of 500mm/s. Extend upward from 500mm/s on the horizontal axis of the graph to the intersection point with the line for a tube bore of 63mm, and then extend leftward from this point to find the load of 80kg.

## Construction



### Parts list

No.	Description	Material	Note
①	Rod cover	Die-cast aluminum	Metallic coated
②	Head cover	Die-cast aluminum	Metallic coated
③	Cylinder tube	Aluminum alloy	Hard anodized
④	Piston rod	Carbon steel	Hard chrome plated
⑤	Piston	Aluminum alloy	Chromated
⑥	Cushion ring	Brass	
⑦	Bushing	Lead-bronze casting	
⑧	Cushion valve	Steel wire	Nickel plated
⑨	Snap ring	Spring steel	ø40 to ø100
⑩	Tie-rod	Carbon steel	Chromated
⑪	Tie-rod nut	Carbon steel	Nickel plated
⑫	Wear ring	Resin	
⑬	Rod end nut	Carbon steel	Nickel plated

No.	Description	Material	Note
*⑭	Cushion seal	Urethane	
*⑮	Rod seal	NBR	
*⑯	Piston seal	NBR	
⑰	Cushion valve seal	NBR	
*⑱	Cylinder tube gasket	NBR	
⑲	Piston gasket	NBR	

### Replaceable parts: Seal kits

Bore size (mm)	Order No.	Contents
32	MB32-PS	Kits include items 14 (2pcs.), 15, 16 & 18 from the table above.
40	MB40-PS	
50	MB50-PS	
63	MB63-PS	
80	MB80-PS	
100	MB100-PS	

\* Seal kits consist of items 14, 15, 16 and 18 contained in one kit, and can be ordered using the order number for each respective tube bore size.

CJ1

CJP

CJ2

CM2

C85

C76

CG1

MB

**MB1**

CP95

C95

C92

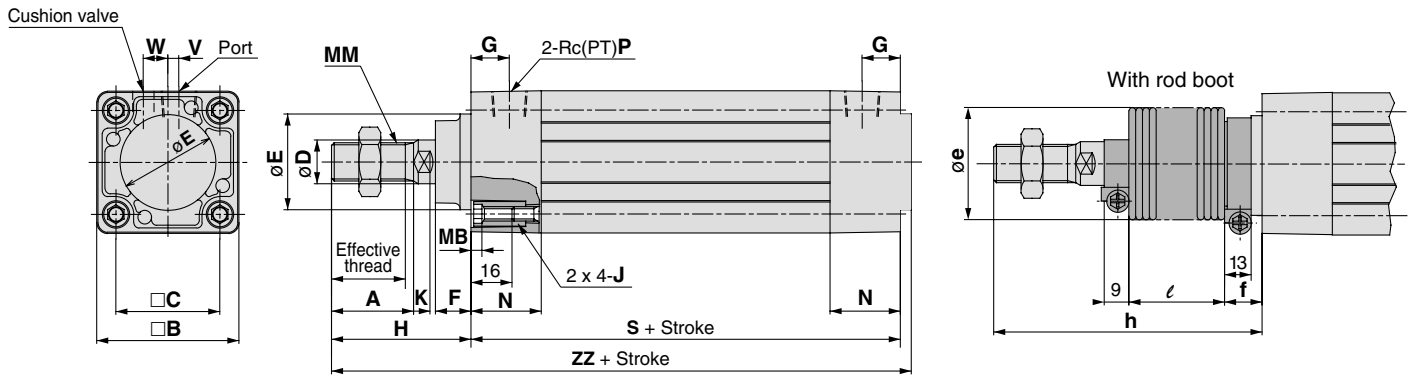
CA1

CS1

# Series MB1

## Standard Type

### Basic type/(B)



### Without air cushion

Bore size (mm)	S	ZZ	Bore size (mm)	S	ZZ
32	90	141	63	102	164
40	90	145	80	124	200
50	102	164	100	124	200

\* When there is no air cushion, the unit is equipped with rubber bumpers. Moreover, due to the fact that bumpers are installed at each end of the piston, overall length is increased by 6mm for  $\phi 32$  and  $\phi 40$ , 8mm for  $\phi 50$  and  $\phi 63$ , and by 10mm for  $\phi 80$  and  $\phi 100$ .

Bore size (mm)	Stroke range	Effective thread length	Width across flats	A	B	C	D	Ee11	F	G	H	MB	J	K	MM	N	P	*	V	W	* ZZ
32	to 500	19.5	10	22	46	32.5	12	30	13	13	47	4	M6	6	M10 x 1.25	26.5	1/8	84	4	6.5	135
40	to 500	27	14	30	52	38	16	35	13	14	51	4	M6	6	M14 x 1.5	26.5	1/4	84	4	9	139
50	to 600	32	18	35	65	46.5	20	40	14	15.5	58	5	M8	7	M18 x 1.5	31	1/4	94	5	10.5	156
63	to 600	32	18	35	75	56.5	20	45	14	16.5	58	5	M8	7	M18 x 1.5	31	3/8	94	9	12	156
80	to 800	37	22	40	95	72	25	45	20	19	72	5	M10	10	M22 x 1.5	37.5	3/8	114	11.5	14	190
100	to 800	37	26	40	114	89	30	55	20	19	72	5	M10	10	M26 x 1.5	37.5	1/2	114	17	15	190

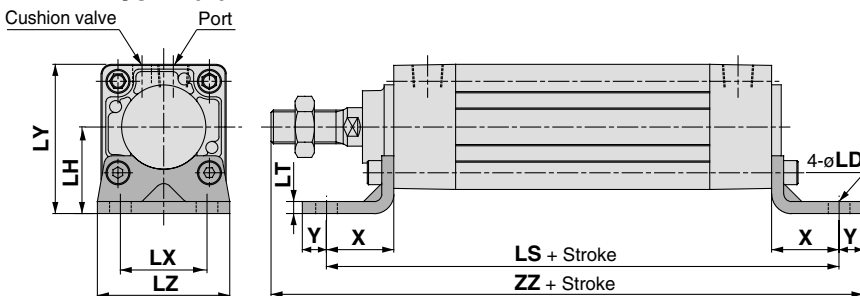
### With rod boot

Bore size (mm)	e	f	$\ell$										h									
			1 to 50	51 to 100	101 to 150	151 to 200	201 to 300	301 to 400	401 to 500	501 to 600	601 to 700	701 to 800	1 to 50	51 to 100	101 to 150	151 to 200	201 to 300	301 to 400	401 to 500	501 to 600	601 to 700	701 to 800
32	36	23	12.5	25	37.5	50	75	100	125	—	—	—	73	86	98	111	136	161	186	—	—	—
40	41	23	12.5	25	37.5	50	75	100	125	—	—	—	81	94	106	119	144	169	194	—	—	—
50	51	25	12.5	25	37.5	50	75	100	125	150	—	—	89	102	114	127	152	177	202	227	—	—
63	51	25	12.5	25	37.5	50	75	100	125	150	—	—	89	102	114	127	152	177	202	227	—	—
80	56	29	12.5	25	37.5	50	75	100	125	150	175	200	101	114	126	139	164	189	214	239	264	289
100	61	29	12.5	25	37.5	50	75	100	125	150	175	200	101	114	126	139	164	189	214	239	264	289

## Standard Type/with Mounting Brackets

\* Dimensions not shown are the same as the basic type (drawing above).

### Foot type/ (L)



### Without air cushion

Bore size (mm)	LS	ZZ
32	134	168
40	138	176
50	156	198
63	156	201
80	184	240
100	188	244

### Foot type

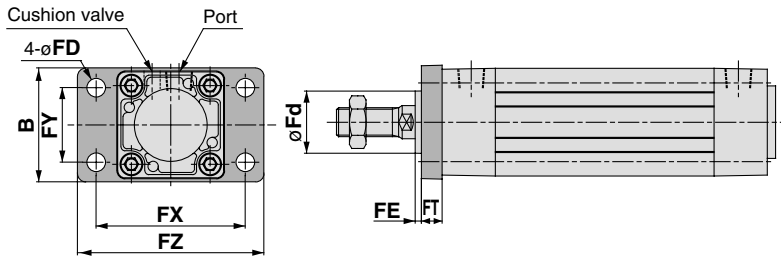
Bore size (mm)	Stroke range	X	Y	LD	LH	LS*	LT	LX	LY	LZ	* ZZ
32	700	22	9	7	30	128	3.2	32	53	50	162
40	800	24	11	9	33	132	3.2	38	59	55	170
50	1000	27	11	9	40	148	3.2	46	72.5	70	190
63	1000	27	14	12	45	148	3.6	56	82.5	80	193
80	1000	30	14	12	55	174	4.5	72	102.5	100	230
100	1000	32	16	14	65	178	4.5	89	122	120	234

\* When there is no air cushion, the unit is equipped with rubber bumpers. Moreover, due to the fact that bumpers are installed at each end of the piston, overall length is increased by 6mm for  $\phi 32$  and  $\phi 40$ , 8mm for  $\phi 50$  and  $\phi 63$ , and by 10mm for  $\phi 80$  and  $\phi 100$ .



**Standard Type/with Mounting Brackets**

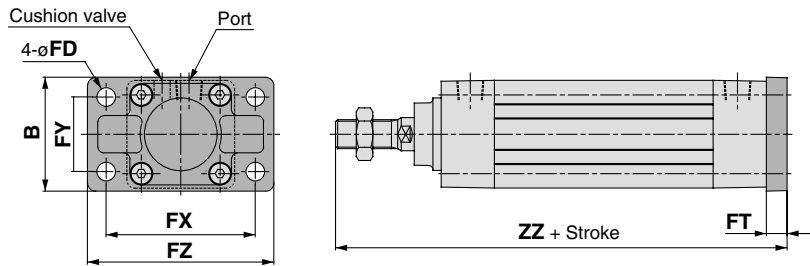
**Front flange type/(F)**



**Front flange type**

Bore size (mm)	Stroke range	B	FD	FE	FT	FX	FY	FZ	Fd
32	to 700	50	7	3	10	64	32	79	25
40	to 800	55	9	3	10	72	36	90	31
50	to 1000	70	9	2	12	90	45	110	38.5
63	to 1000	80	9	2	12	100	50	120	39.5
80	to 1000	100	12	4	16	126	63	153	45.5
100	to 1000	120	14	4	16	150	75	178	54

**Rear flange type/(G)**



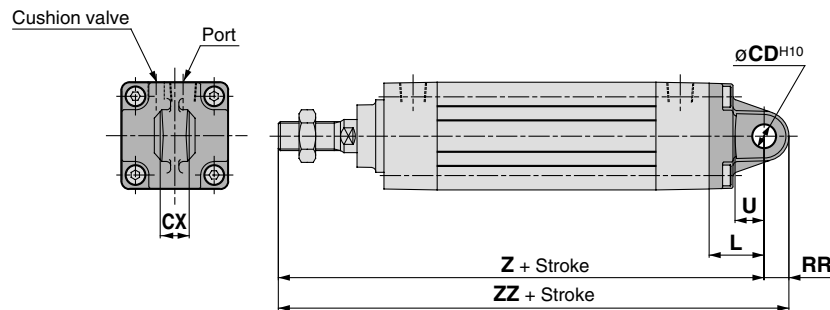
**Without air cushion**

Bore size (mm)	ZZ
32	147
40	151
50, 63	172
80, 100	212

**Rear flange type**

Bore size (mm)	Stroke range	B	FD	FT	FX	FY	FZ	*ZZ
32	to 500	50	7	10	64	32	79	141
40	to 500	55	9	10	72	36	90	145
50	to 600	70	9	12	90	45	110	164
63	to 600	80	9	12	100	50	120	164
80	to 750	100	12	16	126	63	153	202
100	to 750	120	14	16	150	75	178	202

**Single clevis type/(C)**



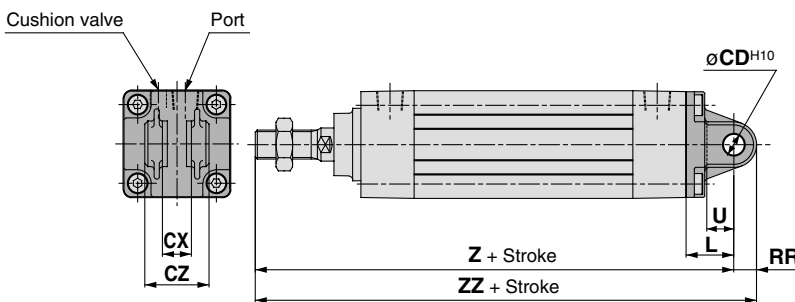
**Without air cushion**

Bore size (mm)	Z	ZZ
32	160	170.5
40	164	175
50, 63	190	205
80, 100	238	261

**Single clevis type**

Bore size (mm)	Stroke range	L	RR	U	CD <sup>H10</sup>	CX <sup>-0.3</sup>	*Z	*ZZ
32	to 500	23	10.5	13	10	14	154	164.5
40	to 500	23	11	13	10	14	158	169
50	to 600	30	15	17	14	20	182	197
63	to 600	30	15	17	14	20	182	197
80	to 750	42	23	26	22	30	228	251
100	to 750	42	23	26	22	30	228	251

**Double clevis type/(D)**



Overall length of front/rear flange, single/double clevis, and method for longitudinal mounting  
 \* When there is no air cushion, the unit is equipped with rubber bumpers.  
 Moreover, due to the fact that bumpers are installed at each end of the piston, overall length is increased by 6mm for ø32 and ø40, 8mm for ø50 and ø63, and by 10mm for ø80 and ø100.

**Without air cushion**

Bore size (mm)	Z	ZZ
32	160	170.5
40	164	175
50, 63	190	205
80, 100	238	261

**Double clevis type**

Bore size (mm)	Stroke range	L	RR	U	CD <sup>H10</sup>	CX <sup>+0.3</sup>	CZ	*Z	*ZZ
32	to 500	23	10.5	13	10	14	28	154	164.5
40	to 500	23	11	13	10	14	28	158	169
50	to 600	30	15	17	14	20	40	182	197
63	to 600	30	15	17	14	20	40	182	197
80	to 750	42	23	26	22	30	60	228	251
100	to 750	42	23	26	22	30	60	228	251

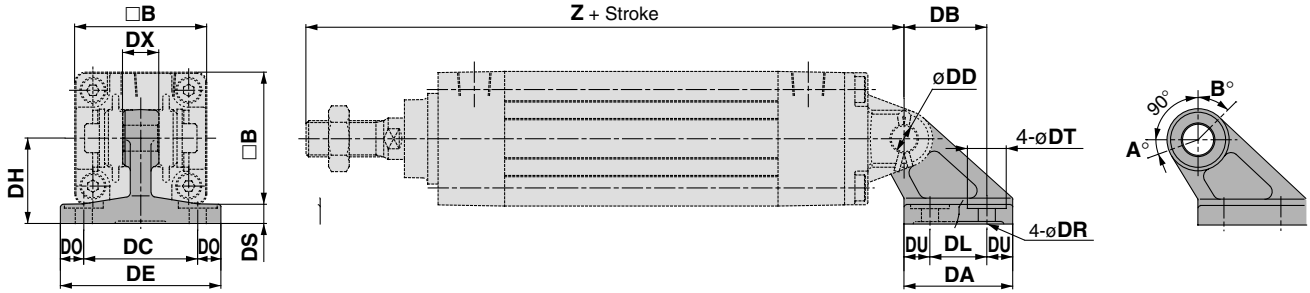
# Series MB1

## Cushion Bracket/Double Clevis Mounting Bracket

### Models

Bore size	MB□32	MB□40	MB□50	MB□63	MB□80	MB□100
Description						
Double clevis mounting bracket	MB-B03		MB-B05		MB-B08	

### Double clevis mounting bracket



(mm)

No.	Bore size (mm)	□B	DA	DB	DL	DU	DC	DX	DE	DO	DR	DT	DS	DH	Z	* DD <sub>H10</sub>
MB-B03	32	46	42	32	22	10	44	14	62	9	6.6	15	7	33	154	10 <sup>+0.058</sup> <sub>0</sub>
	40	52	42	32	22	10	44	14	62	9	6.6	15	7	33	158	10 <sup>+0.058</sup> <sub>0</sub>
MB-B05	50	65	53	43	30	11.5	60	20	81	10.5	9	18	8	45	182	14 <sup>+0.070</sup> <sub>0</sub>
	63	75	53	43	30	11.5	60	20	81	10.5	9	18	8	45	182	14 <sup>+0.070</sup> <sub>0</sub>
MB-B08	80	95	73	64	45	14	86	30	111	12.5	11	22	10	65	228	22 <sup>+0.084</sup> <sub>0</sub>
	100	114	73	64	45	14	86	30	111	12.5	11	22	10	65	228	22 <sup>+0.084</sup> <sub>0</sub>

### Without air cushion

Bore size (mm)	Z
32	160
40	164
50	190
63	190
80	238
100	238

### Rotation

Bore size (mm)	A°	B°	A°+B°+90°
32, 40	25°	45°	160°
50, 63	40°	60°	190°
80, 100	30°	55°	175°

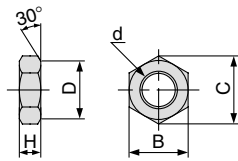
Method for longitudinal mounting of clevis bracket

\* When there is no air cushion, the unit is equipped with rubber bumpers.

Moreover, due to the fact that bumpers are installed at each end of the piston, overall length is increased by 6mm for ø32 and ø40, 8mm for ø50 and ø63, and by 10mm for ø80 and ø100.

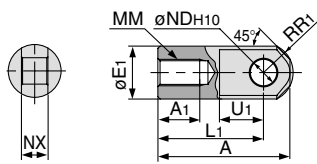
## Accessory Dimensions

Rod end nut  
(standard equipment)



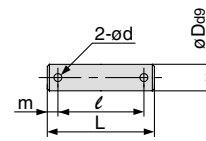
Part No.	Bore size (mm)	d	H	B	C	D
NT-03	32	M10 x 1.25	6	17	19.6	16.5
NT-04	40	M14 x 1.5	8	22	25.4	21
NT-05	50, 63	M18 x 1.5	11	27	31.2	26
NT-08	80	M22 x 1.5	13	32	37.0	31
NT-10	100	M26 x 1.5	16	41	47.3	39

I type single  
knuckle joint



Part No.	Bore size (mm)	A	A <sub>1</sub>	E <sub>1</sub>	L <sub>1</sub>	MM	R <sub>1</sub>	U <sub>1</sub>	ND <sub>H10</sub>	NX
I-03M	32	40	14	20	30	M10 x 1.25	12	16	10 <sup>+0.058/0</sup>	14 <sup>-0.10/-0.30</sup>
I-04M	40	50	19	22	40	M14 x 1.5	12.5	19	10 <sup>+0.058/0</sup>	14 <sup>-0.10/-0.30</sup>
I-05M	50, 63	64	24	28	50	M18 x 1.5	16.5	24	14 <sup>+0.070/0</sup>	20 <sup>-0.10/-0.30</sup>
I-08M	80	80	26	40	60	M22 x 1.5	23.5	34	22 <sup>+0.084/0</sup>	30 <sup>-0.10/-0.30</sup>
I-10M	100	80	26	40	60	M26 x 1.5	23.5	34	22 <sup>+0.084/0</sup>	30 <sup>-0.10/-0.30</sup>

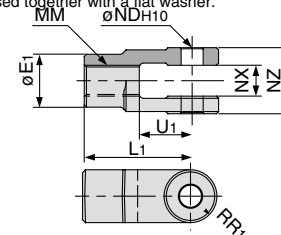
Knuckle joint pin  
Clevis pin



Part No.	Bore size (mm)		D <sub>99</sub>	L	ℓ	m	d (Cut through)	Cotter pin (Note 1)
	Clevis	Knuckle						
CD-M03	32, 40	10 <sup>-0.040/-0.076</sup>	44	36	4	3	ø3 x 18ℓ	
CD-M05	50, 63	14 <sup>-0.050/-0.093</sup>	60	51	4.5	4	ø4 x 25ℓ	
CD-M08	80, 100	22 <sup>-0.065/-0.117</sup>	82	72	5	4	ø4 x 35ℓ	

Note 1) Cotter pin should be used together with a flat washer.

Y type double  
knuckle joint



Part No.	Bore size (mm)	E <sub>1</sub>	L <sub>1</sub>	MM	R <sub>1</sub>	U <sub>1</sub>	ND <sub>H10</sub>	NX	NZ
Y-03M	32	20	30	M10 x 1.25	10	16	10 <sup>+0.058/0</sup>	14 <sup>+0.30/-0.10</sup>	28 <sup>-0.10/-0.30</sup>
Y-04M	40	22	40	M14 x 1.5	11	19	10 <sup>+0.058/0</sup>	14 <sup>+0.30/-0.10</sup>	28 <sup>-0.10/-0.30</sup>
Y-05M	50, 63	28	50	M18 x 1.5	14	24	14 <sup>+0.070/0</sup>	20 <sup>+0.30/-0.10</sup>	40 <sup>-0.10/-0.30</sup>
Y-08M	80	40	65	M22 x 1.5	20	34	22 <sup>+0.084/0</sup>	30 <sup>+0.30/-0.10</sup>	60 <sup>-0.10/-0.30</sup>
Y-10M	100	40	65	M26 x 1.5	20	34	22 <sup>+0.084/0</sup>	30 <sup>+0.30/-0.10</sup>	60 <sup>-0.10/-0.30</sup>

Note) Pin, cotter pin and flat washer are included with the double knuckle joint.

## Bracket Combinations

Bracket combination table -----▶ Refer to table together with combination drawings.

Cylinder side mounting bracket	Work side mounting bracket				
	Single clevis	Double clevis	Single knuckle joint	Double knuckle joint	Clevis mounting bracket
Single clevis	—	1	—	2	—
Double clevis	3	—	4	—	9
Single knuckle joint	—	5	—	6	—
Double knuckle joint	7	—	8	—	0

No.	Appearance	No.	Appearance
1	Single clevis + Double clevis	6	Single knuckle joint + Double knuckle joint
2	Single clevis + Double knuckle joint	7	Double knuckle joint + Single clevis
3	Double clevis + Single clevis	8	Double knuckle joint + Single knuckle joint
4	Double clevis + Single knuckle joint	9	Double clevis + Clevis mounting bracket
5	Single knuckle joint + Double clevis	0	Double knuckle joint + Clevis mounting bracket

CJ1

CJP

CJ2

CM2

C85

C76

CG1

MB

**MB1**

CP95

C95

C92

CA1

CS1

# Series MDB1 Auto Switch Specifications Direct Mounting Type



## Applicable auto switch models

Auto switch type	Auto switch model	Electrical entry
Reed switch	D-Z7□, Z80	Grommet
Solid state switch	D-Y59□, Y69□, Y7P□	Grommet
	D-Y7NW□, Y7PW□, Y7BW□	Grommet (2 colour indication, with diagnostic output)
	D-Y7BAL	Grommet (2 colour indication, water resistant)

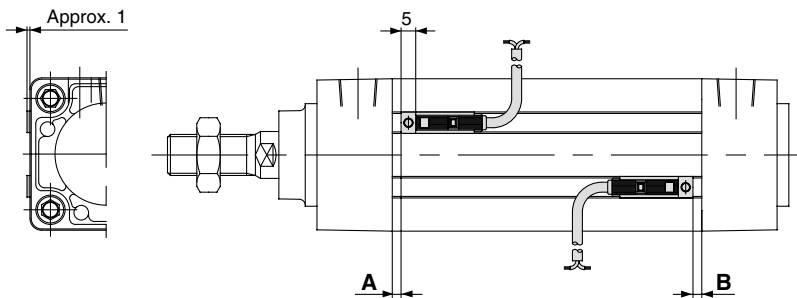
## Minimum stroke for mounting of auto switches

Auto switch type	Auto switch model	Number of auto switches	ø32	ø40	ø50	ø63	ø80	ø100
Reed switch	D-Z73, Z76, Z80	2pcs. (different sides, same side)	25			15		
		1pc.	25			15		
Solid state switch	D-Y59A(B), Y69A(B), Y7P(V)	2pcs. (different sides, same side)	25			15		
		1pc.	25			15		
	D-Y7NW(V), Y7PW(V), Y7BW(V)	2pcs. (different sides, same side)	25			20		
		1pc.	25			20		
D-Y7BAL	2pcs. (different sides, same side)	30			20			
	1pc.	30			20			

Centre trunnion is not included.



## Auto Switches/Proper Mounting Positions for Stroke End Detection



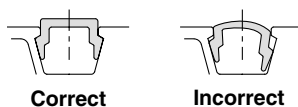
Bore size (mm)	D-Z7□, Z80 D-Y59□, Y69□, Y7P□ D-Y7NW□, Y7PW□, Y7BW□ D-Y7BAL	
	A	B
32	4	1
40	4	1
50	4	2
63	4	2
80	5.5	7.5
100	5.5	7.5

## Mounting of Auto Switches

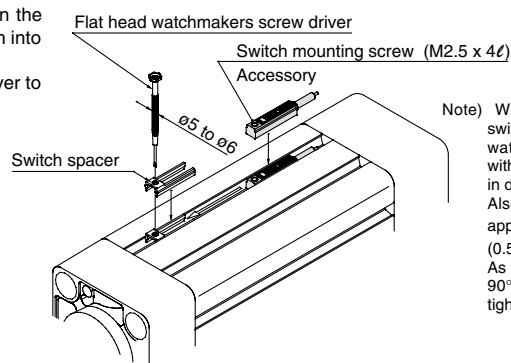
1N-m: approx. 10.2kgf-cm

When attaching an auto switch, first take a switch spacer between your fingers and press it into a switch mounting groove. When doing this, confirm that it is set in the correct mounting orientation, or reattach if necessary. Next, insert an auto switch into the groove and slide it until it is positioned under the switch spacer.

After establishing the mounting position, use a watchmakers flat head screw driver to tighten the switch mounting screw which is included.



\* Refer to page 1.9-5 for switch spacer types.



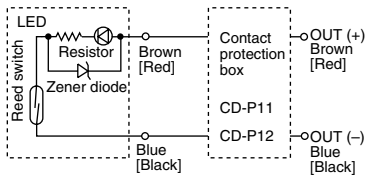
Note) When tightening the auto switch mounting screw, use a watchmakers screw driver with a handle about 5 to 6mm in diameter.

Also, tighten to a torque of approximately 0.05 to 0.1N-m (0.51 to 1.02kgf-cm).

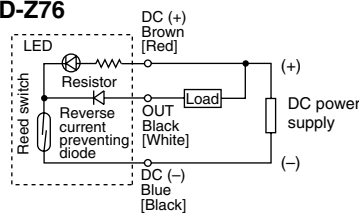
As a rule, it is turned about 90° past the point at which tightening can be felt.

### Reed Switch Internal Circuits

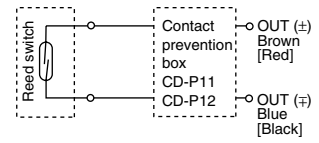
**D-Z73**



**D-Z76**

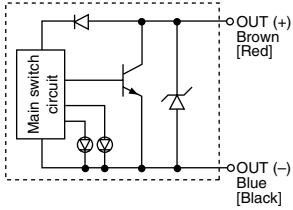


**D-Z80**

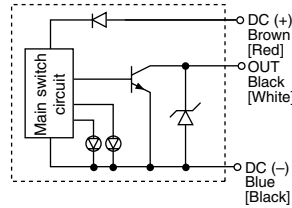


### Solid State Switch Internal Circuits

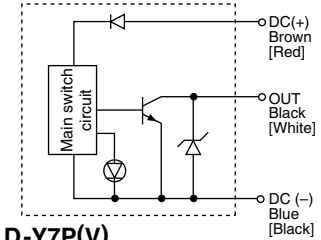
**D-Y7BAL**



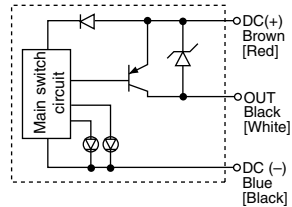
**D-Y7NW(V)**



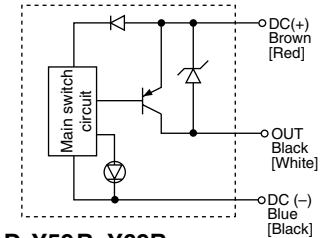
**D-Y59A, Y69A**



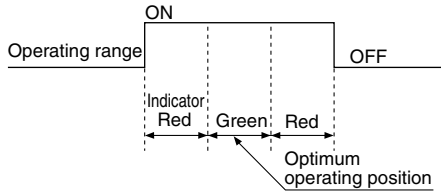
**D-Y7PW(V)**



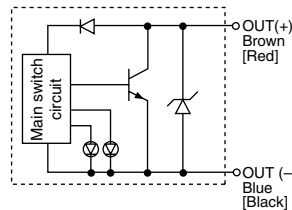
**D-Y7P(V)**



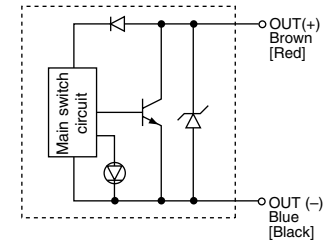
### Indicator light



**D-Y7BW(V)**



**D-Y59B, Y69B**



### Contact Protection Box/CD-P11, CD-P12

#### <Applicable switch models>

D-Z7, Z8

The above auto switches do not have internal contact protection circuits.

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

If any of the above situations apply, use a contact protection box.

#### Contact protection box specifications

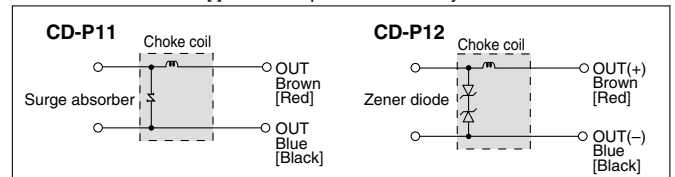
Part No.	CD-P11		CD-P12
Load voltage	100VAC or less	200VAC	24VDC
Maximum load current	25mA	12.5mA	50mA

\* Lead wire length ----- Switch contact side 0.5m  
Load contact side 0.5m

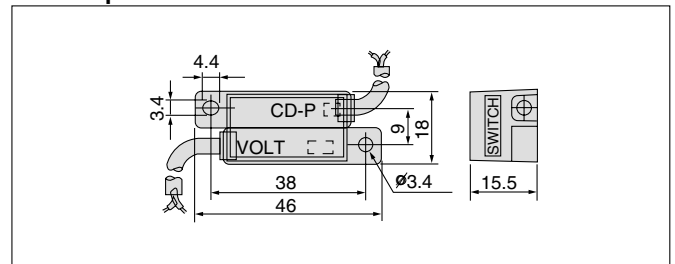


#### Contact protection box internal circuits

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



#### Contact protection box/Dimensions



#### Contact protection box/Connection method

To connect a switch unit to a contact protection box, the lead wire on the side of the contact protection box marked SWITCH should be connected to the lead wire coming out of the switch unit. Furthermore, the length of lead wire between the switch unit and the contact protection box should be as short as possible, with a maximum of 1m.

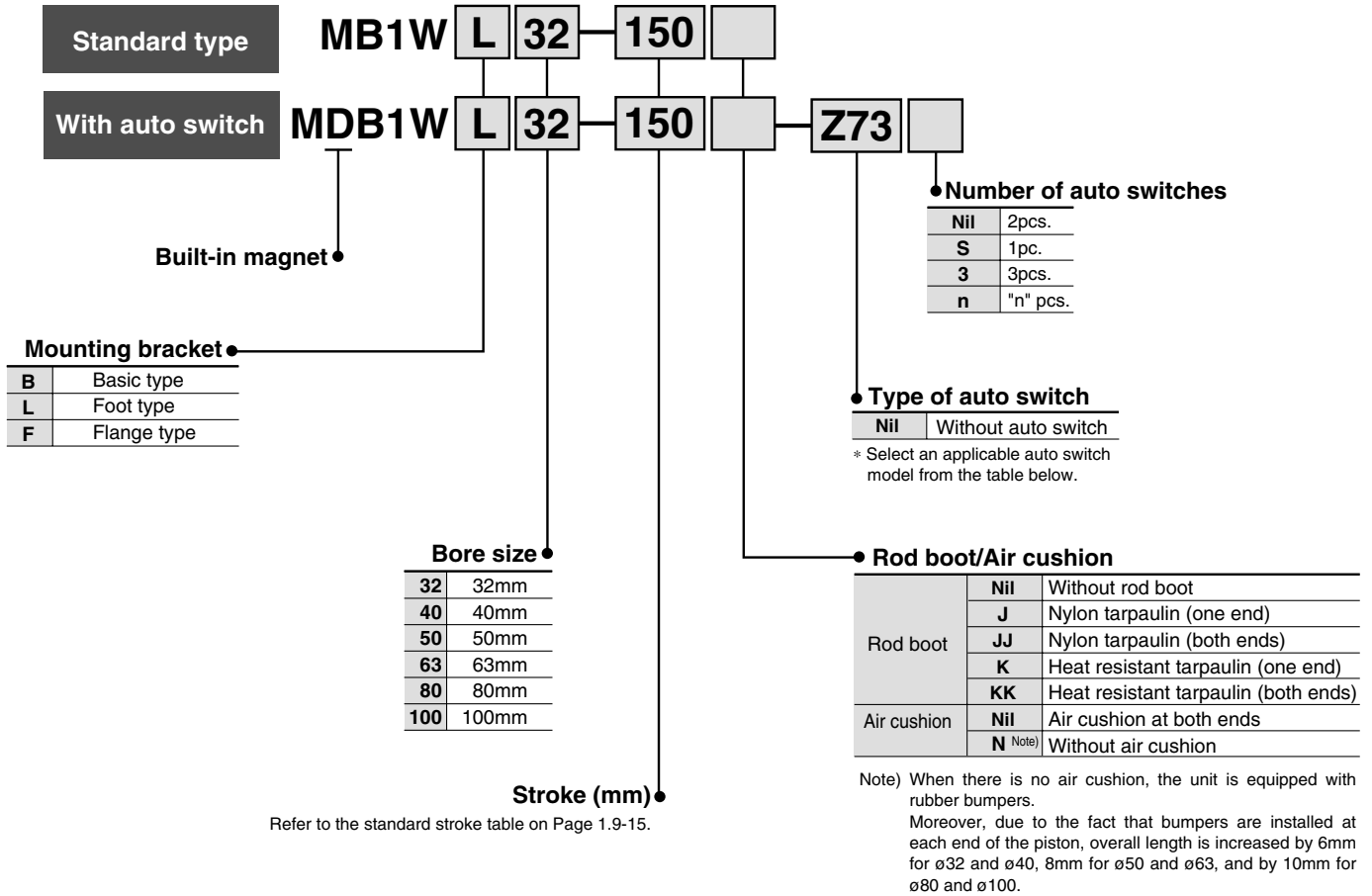
CJ1
CJP
CJ2
CM2
C85
C76
CG1
MB
<b>MB1</b>
CP95
C95
C92
CA1
CS1

Square Tube Type  
Air Cylinder/Standard (Double Acting: Double Rod)

# Series MB1W

ø32, ø40, ø50, ø63, ø80, ø100

## How to Order



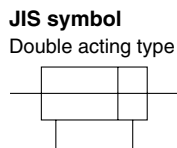
### Applicable auto switches/direct mounting type

Type	Special function	Electrical entry	Indicator light	Wiring (output)	Load voltage		Auto switch model		Lead wire length (m) <sup>Note)</sup>			Applicable load		
					DC	AC	Electrical entry direction		0.5 (Nil)	3 (L)	5 (Z)			
							Vertical	Lateral						
Reed switch	—	Grommet	Yes	3 wire	—	5V	—	—	Z76	●	●	—	IC circuit	—
				2 wire	24V	—	100V	—	Z73	●	●	●	—	Relay PLC
			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)		12V		Y7PV	Y7P	●	●	○	—	
				2 wire	5V, 12V	Y69B		Y59B	●	●	○	—		
				3 wire (NPN)		Y7NWV		Y7NW	●	●	○	IC circuit		
				3 wire (PNP)		Y7PWV		Y7PW	●	●	○	—		
				2 wire	12V	Y7BWV		Y7BW	●	●	○	—		
Water resistant (2 colour indicator)	—	Y7BA	—	—	●	—	—							

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

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

# Standard Type Double Acting: *Double Rod* Series **MB1W**



## Specifications

1MPa: Approx. 10.2kgf/cm<sup>2</sup>

Bore size (mm)	32	40	50	63	80	100
Type	Non-lube type air cylinder					
Action	Double acting double rod					
Fluid	Air					
Proof pressure	1.5MPa {15.3kgf/cm <sup>2</sup> }					
Maximum operating pressure	1.0MPa {10.2kgf/cm <sup>2</sup> }					
Minimum operating pressure	0.05MPa {0.5kgf/cm <sup>2</sup> }					
Ambient and fluid temperature	Without auto switch -10 to 70°C (without freezing)					
	With auto switch -10 to 60°C (without freezing)					
Lubrication	Not required (non-lube)					
Piston speed	50 to 1000mm/s					
Stroke length tolerance	to 250 : $^{+1.0}_0$ , 251 to 1000 : $^{+1.4}_0$					
Cushion <sup>Note)</sup>	Both ends (air cushion) <sup>Note)</sup>					
Thread tolerance	JIS class 2					
Port size	Rc(PT)1/8	Rc(PT)1/4	Rc(PT)1/4	Rc(PT)3/8	Rc(PT)3/8	Rc(PT)1/2
Mounting bracket	Basic type, Foot type, Flange type					

Note) When there is no air cushion, the unit is equipped with rubber bumpers. (Refer to Rod boot/Air cushion on page 1.9-14.)  
The kinetic energy which can be absorbed by the cushion mechanism is the same as the double acting single rod type.

## Standard stroke table

Bore size (mm)	Standard stroke (mm)
32	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500
40	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500
50	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500, 600
63	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500, 600
80	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500, 600, 700, 800
100	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500, 600, 700, 800

Intermediate strokes are also available.

## Minimum strokes for auto switch mounting

Refer to page 1.9-10 regarding the minimum strokes for the mounting of auto switches.

## Rod boot material

Symbol	Rod boot material	Max. ambient temp.
J	Nylon tarpaulin	60°C
K	Heat resistant tarpaulin	110°C <sup>Note)</sup>

Note) Maximum ambient temperature for the rod boot itself.

## Switch spacers

Applicable bore size (mm)	32, 40	50, 63	80, 100
Switch spacer	BMP1-032		

## Mounting brackets/Part nos.

Bore size (mm)	32	40	50
Foot	MB-L03	MB-L04	MB-L05
Flange	MB-F03	MB-F04	MB-F05

Bore size (mm)	63	80	100
Foot	MB-L06	MB-L08	MB-L10
Flange	MB-F06	MB-F08	MB-F10

Note) When ordering foot type brackets, 2pcs. should be arranged for each cylinder.

## Accessories

Mounting bracket		Basic type	Foot type	Flange type
Standard equipment	Rod end nut	●	●	●
Options	Single knuckle joint	●	●	●
	Double knuckle joint (with pin)	●	●	●
	Rod boot	●	●	●

## Theoretical output table

(Unit: N)      OUT ←      IN →

Bore size (mm)	Rod diameter (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	
32	12	IN-OUT	691	138	207	276	346	415	484	553	622	691	
40	16	IN-OUT	1056	211	317	422	528	634	739	845	950	1056	
50	20	IN-OUT	1649	330	495	660	825	989	1154	1319	1484	1649	
63	20	IN-OUT	2803	561	841	1121	1402	1682	1962	2242	2523	2803	
80	25	IN-OUT	4536	907	1361	1814	2268	2722	3175	3629	4082	4536	
100	30	IN-OUT	7147	1429	2144	2859	3574	4288	5003	5718	6432	7147	

1N: approx. 0.102kgf    1MPa: approx. 10.2kgf/cm<sup>2</sup>

Note) Theoretical output (N) = Pressure (MPa) x Piston area (mm<sup>2</sup>).

## Weight table

(kg)

Bore size (mm)		32	40	50	63	80	100
Basic weight	Basic type	0.59	0.82	1.39	1.72	3.22	4.27
	Foot type	0.71	0.96	1.61	2.0	3.72	4.93
	Flange type	0.88	1.19	1.84	2.51	4.67	7.58
Additional weight per 50mm stroke	All mounting brackets	0.20	0.29	0.41	0.45	0.75	1.0
	Accessories	Single knuckle	0.15	0.23	0.26	0.26	0.60
	Double knuckle (with pin)	0.22	0.37	0.43	0.43	0.87	1.27

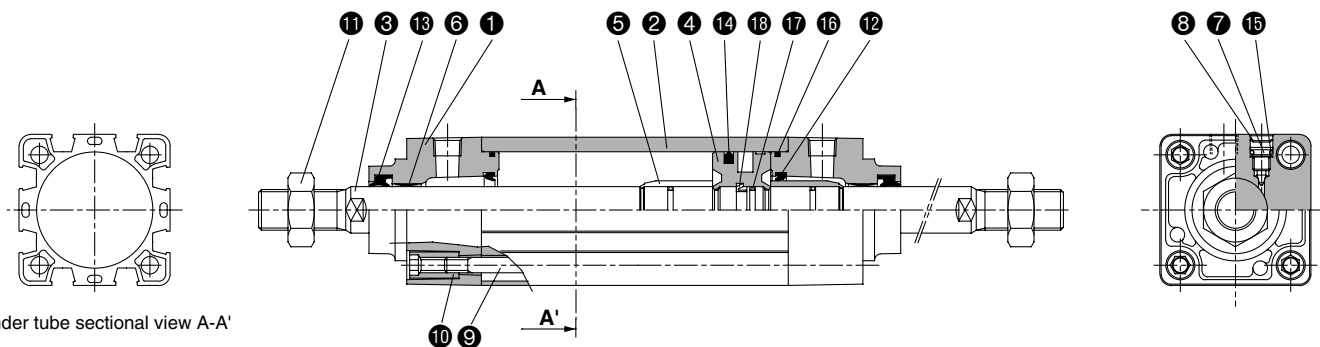
Calculation method

Example) **MB1B32-100** (basic type/ø32, 100st)

- Basic weight ..... 0.59kg
- Additional weight ..... 0.20/50mm stroke
- Cylinder stroke ..... 100mm stroke
- 0.59 + 0.20 x 100/50 = 0.99kg

# Series MB1W

## Construction



Cylinder tube sectional view A-A'

### Parts list

No.	Description	Material	Note
①	Rod cover	Die-cast aluminum	Metallic coated
②	Cylinder tube	Aluminum alloy	Hard anodized
③	Piston rod	Carbon steel	Hard chrome plated
④	Piston	Aluminum alloy	Chromated
⑤	Cushion ring	Brass	
⑥	Bushing	Lead-bronze casting	
⑦	Cushion valve	Steel wire	Nickel plated
⑧	Snap ring	Spring steel	ø40 to ø100
⑨	Tie-rod	Carbon steel	Chromated
⑩	Tie-rod nut	Carbon steel	Nickel plated
⑪	Rod end nut	Carbon steel	Nickel plated

No.	Description	Material	Note
*⑫	Cushion seal	Urethane	
*⑬	Rod seal	NBR	
*⑭	Piston seal	NBR	
⑮	Cushion valve seal	NBR	
*⑯	Cylinder tube gasket	NBR	
⑰	Piston gasket	NBR	
⑱	Piston holder	Urethane	

### Replaceable parts: Seal kits

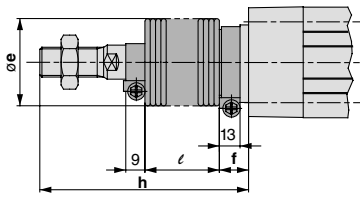
Bore size (mm)	Order No.	Contents
32	MBW32-PS	Kits include items 12 (2pcs.), 13, 14 & 16 from the table above.
40	MBW40-PS	
50	MBW50-PS	
63	MBW63-PS	
80	MBW80-PS	
100	MBW100-PS	

\* Seal kits consist of items 12, 13, 14 and 16 contained in one kit, and can be ordered using the order number for each respective tube bore size.

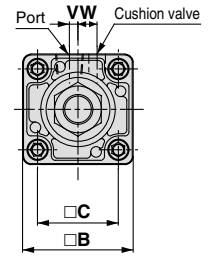
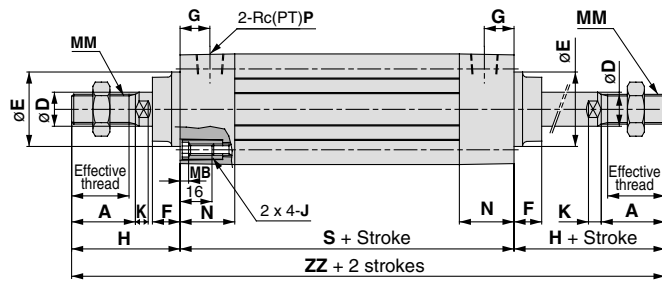


## Standard Type

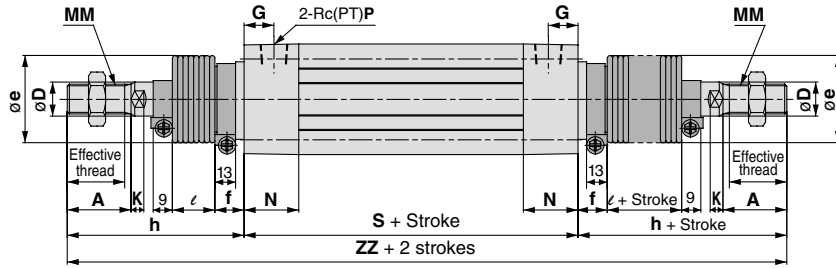
### Basic type/(B)



With rod boot



\* When there is no air cushion, the unit is equipped with rubber bumpers. Moreover, due to the fact that bumpers are installed at each end of the piston, overall length is increased by 6mm for ø32 and ø40, 8mm for ø50 and ø63, and by 10mm for ø80 and ø100.  
 \*\* When there is no air cushion, the unit is equipped with rubber bumpers. Moreover, due to the fact that bumpers are installed at each end of the piston, the Z dimension is increased by 3mm for ø32 and ø40, 4mm for ø50 and ø63, and by 5mm for ø80 and ø100 (with trunnion and trunnion bracket).



Without air cushion

Bore size (mm)	Stroke range	Effective thread length	Width across flats	A	B	C	D	Ee11	F	G	H	MB	J	K	MM	N	P	S	V	W	ZZ	S	ZZ
32	to 500	19.5	10	22	46	32.5	12	30	13	13	47	4	M6	6	M10 x 1.25	26.5	1/8	84	4	6.5	178	90	184
40	to 500	27	14	30	52	38	16	35	13	14	51	4	M6	6	M14 x 1.5	26.5	1/4	84	4	9	186	90	192
50	to 600	32	18	35	65	46.5	20	40	14	15.5	58	5	M8	7	M18 x 1.5	31	1/4	94	5	10.5	210	102	218
63	to 600	32	18	35	75	56.5	20	45	14	16.5	58	5	M8	7	M18 x 1.5	31	3/8	94	9	12	210	102	218
80	to 800	37	22	40	95	72	25	45	20	19	72	5	M10	10	M22 x 1.5	37.5	3/8	114	11.5	14	258	124	268
100	to 800	37	26	40	114	89	30	55	20	19	72	5	M10	10	M26 x 1.5	37.5	1/2	114	17	15	258	124	268

### With rod boot

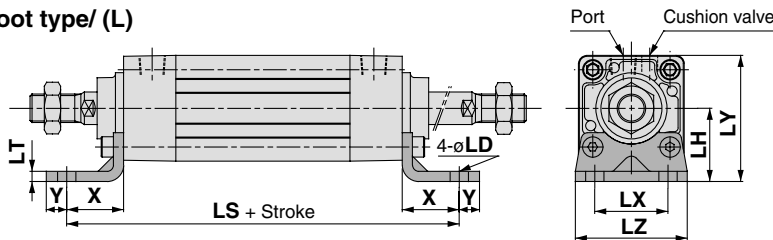
Note) ZZ indicates the dimension for the double rod boot type.

Bore size (mm)	e	f	l								h								ZZ (Note)														
			1 to 50	51 to 100	101 to 150	151 to 200	201 to 300	301 to 400	401 to 500	501 to 600	601 to 700	701 to 800	1 to 50	51 to 100	101 to 150	151 to 200	201 to 300	301 to 400	401 to 500	501 to 600	601 to 700	701 to 800	1 to 50	51 to 100	101 to 150	151 to 200	201 to 300	301 to 400	401 to 500	501 to 600	601 to 700	701 to 800	
32	36	23	12.5	25	37.5	50	75	100	125	-	-	-	73	86	98	111	136	161	186	-	-	-	230	256	280	306	356	406	456	-	-	-	
40	41	23	12.5	25	37.5	50	75	100	125	-	-	-	81	94	106	119	144	169	194	-	-	-	246	272	296	322	372	422	472	-	-	-	
50	51	25	12.5	25	37.5	50	75	100	125	150	-	-	89	102	114	127	152	177	202	227	-	-	-	272	298	322	348	398	448	498	548	-	-
63	51	25	12.5	25	37.5	50	75	100	125	150	-	-	89	102	114	127	152	177	202	227	-	-	-	272	298	322	348	398	448	498	548	-	-
80	56	29	12.5	25	37.5	50	75	100	125	150	175	200	101	114	126	139	164	189	214	239	264	276	316	342	366	392	442	492	542	592	642	692	
100	61	29	12.5	25	37.5	50	75	100	125	150	175	200	101	114	126	139	164	189	214	239	264	276	316	342	366	392	442	492	542	592	642	692	

## Standard Type/with Mounting Brackets

\* Dimensions not shown are the same as the basic type (drawing above).

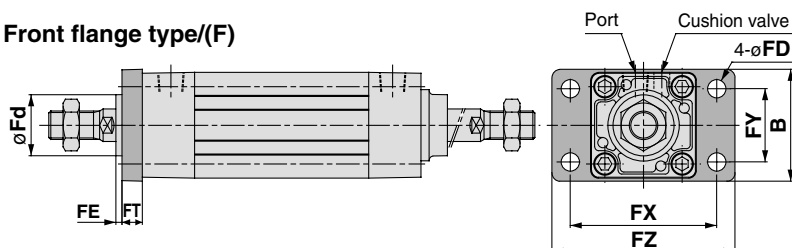
### Foot type/(L)



### Foot type

Bore size (mm)	Stroke range	Effective thread length	X	Y	LD	LH	LS	LT	LX	LY	LZ
32	to 500	19.5	22	9	7	30	128	3.2	32	53	50
40	to 500	27	24	11	9	33	132	3.2	38	59	55
50	to 600	32	27	11	9	40	148	3.2	46	72.5	70
63	to 600	32	27	14	12	45	148	3.6	56	82.5	80
80	to 750	37	30	14	12	55	174	4.5	72	102.5	100
100	to 750	37	32	16	14	65	178	4.5	89	122	120

### Front flange type/(F)



### Front flange type

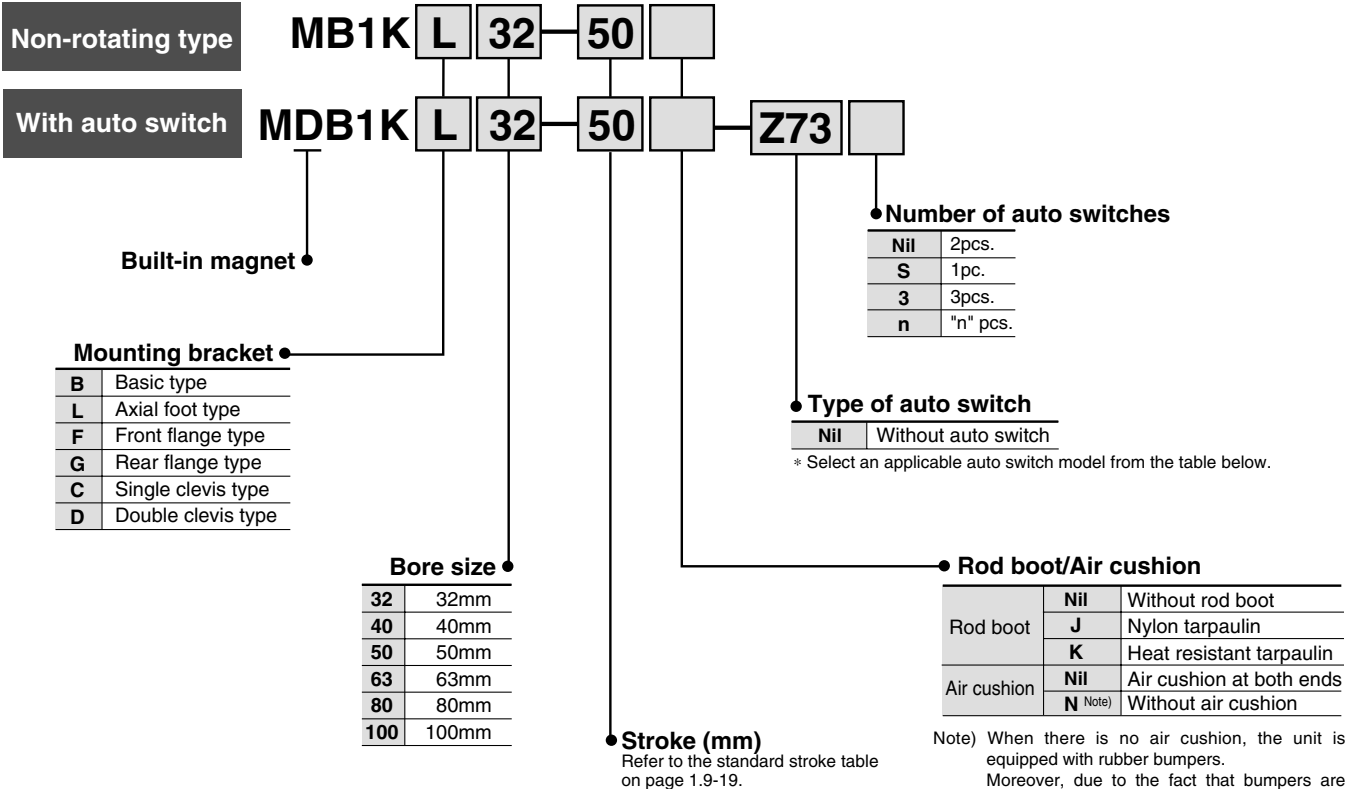
Bore size (mm)	Stroke range	Effective thread length	B	FD	FT	FX	FY	FZ	Fd
32	to 500	19.5	50	7	10	64	32	79	25
40	to 500	27	55	9	10	72	36	90	31
50	to 600	32	70	9	12	90	45	110	38.5
63	to 600	32	80	9	12	100	50	120	39.5
80	to 750	37	100	12	16	126	63	153	45.5
100	to 750	37	120	14	16	150	75	178	54

# Square Tube Type Air Cylinder/Non-Rotating Rod (Double Acting: Single Rod)

# Series MB1K

ø32, ø40, ø50, ø63, ø80, ø100

## How to Order



### Applicable auto switches/direct mounting type

Type	Special function	Electrical entry	Indicator light	Wiring (output)	Load voltage		Auto switch model		Lead wire length (m) (Note)			Applicable load			
					DC	AC	Electrical entry direction		0.5 (Nil)	3 (L)	5 (Z)				
							Vertical	Lateral							
Reed switch	—	Grommet	Yes	3 wire	—	5V	—	Z76	●	●	—	IC circuit	—		
				2 wire	24V	—	100V	—	Z73	●	●	●		—	Relay PLC
				2 wire	—	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)				Y7NWX	Y7NW	●	●	○	IC circuit		
				3 wire (PNP)				Y7PWV	Y7PW	●	●	○	—		
				2 wire				Y7BWX	Y7BW	●	●	○	—		
Water resistant (2 colour indicator)	—	—	—	—	—	—	Y7BA	—	●	—	—	—			

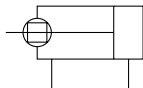
Note) Lead wire length symbol 0.5m ..... Nil (Example) Y69B  
3m ..... L (Example) Y69BL  
5m ..... Z (Example) Y69BZ

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

# Non-Rotating Rod Double Acting: /Single Rod **Series MB1K**



JIS symbol



## Specifications

1MPa: Approx. 10.2kgf/cm<sup>2</sup>

Bore size (mm)	32	40	50	63	80	100
Type	Non-lube type air cylinder					
Action	Double acting single rod					
Fluid	Air					
Proof pressure	1.5MPa {15.3kgf/cm <sup>2</sup> }					
Maximum operating pressure	1.0MPa {10.2kgf/cm <sup>2</sup> }					
Minimum operating pressure	0.05MPa {0.5kgf/cm <sup>2</sup> }					
Ambient and fluid temperature	Without auto switch -10 to 70°C (without freezing)					
	With auto switch -10 to 60°C (without freezing)					
Lubrication	Non-lube					
Piston speed	50 to 1000mm/s					
Stroke length tolerance	to 250 : <sup>+1.0</sup> / <sub>0</sub> , 251 to 1000 : <sup>+1.4</sup> / <sub>0</sub> , 1001 to 1500 : <sup>+1.8</sup> / <sub>0</sub>					
Cushion <sup>Note</sup>	Both ends (air cushion) <sup>Note</sup>					
Thread tolerance	JIS class 2					
Port size	Rc(PT)1/8	Rc(PT)1/4	Rc(PT)1/4	Rc(PT)3/8	Rc(PT)3/8	Rc(PT)1/2
Mounting bracket	Basic type, Foot type, Front flange type, Rear flange type Single clevis type, Double clevis type					
Rod non-rotating accuracy	ø32, ø40	±0.5°				
	ø50, ø63	±0.5°				
	ø80, ø100	±0.3°				
Allowable rotational torque N·m or less	ø32	0.25	ø80		0.79	
	ø40	0.45	ø100		0.93	
	ø50, ø63	0.64	—		—	

Note) When there is no air cushion, the unit is equipped with rubber bumpers.

The kinetic energy which can be absorbed by the cushion mechanism is the same as for the double acting single rod type.

## Switch spacers

Applicable bore size (mm)	32, 40	50, 63	80, 100
Switch spacer	BMP1-032		

## Mounting brackets/Part nos.

Bore size (mm)	32	40	50
<b>Foot</b> <sup>Note</sup>	MB-L03	MB-L04	MB-L05
<b>Flange</b>	MB-F03	MB-F04	MB-F05
<b>Single clevis</b>	MB-C03	MB-C04	MB-C05
<b>Double clevis</b>	MB-D03	MB-D04	MB-D05

Bore size (mm)	63	80	100
<b>Foot</b> <sup>Note</sup>	MB-L06	MB-L08	MB-L10
<b>Flange</b>	MB-F06	MB-F08	MB-F10
<b>Single clevis</b>	MB-C06	MB-C08	MB-C10
<b>Double clevis</b>	MB-D06	MB-D08	MB-D10

Note 1) When ordering foot type brackets, 2pcs. should be arranged for each cylinder.

Note 2) The parts included with each mounting bracket are as follows.

Foot, Flange, Single clevis: Body mounting bolts

Double clevis: Clevis pin & Cotter pin

Refer to page 1.9-11.

## Accessories

Mounting bracket		Basic type	Foot type	Front flange type	Rear flange type	Single clevis type	Double clevis type
Standard equipment	Rod end nut	●	●	●	●	●	●
	Clevis pin	—	—	—	—	—	●
Options	Single knuckle joint	●	●	●	●	●	●
	Double knuckle joint (with pin)	●	●	●	●	●	●
	Rod boot	●	●	●	●	●	●

## Standard stroke table

Bore size (mm)	Standard stroke (mm)
32	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500
40	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500
50	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500, 600
63	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500, 600
80	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500, 600, 700, 800
100	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500, 600, 700, 800

Intermediate strokes are also available.

## Minimum strokes for mounting of auto switches

Refer to page 1.9-10 regarding the minimum stroke for the mounting of auto switches.

## Rod boot material

Symbol	Rod boot material	Max. ambient temp.
J	Nylon tarpaulin	60°C
K	Heat resistant tarpaulin	110°C <sup>Note</sup>

Note) Maximum ambient temperature for the rod boot itself.

## Theoretical output table

The value at the OUT side is the same as the double acting single rod type, but the value at the IN side is different. Refer to the table below.

Bore size (mm)	Piston area (mm <sup>2</sup> )	Bore size (mm)	Piston area (mm <sup>2</sup> )
32	675	63	2804
40	1082	80	4568
50	1651	100	7223

Theoretical output (N) = Pressure (MPa) x Piston area (mm<sup>2</sup>).  
1N: approx. 0.102kgf 1MPa: approx. 10.2kgf/cm<sup>2</sup>

# Series MB1K

## Weight table

(kg)

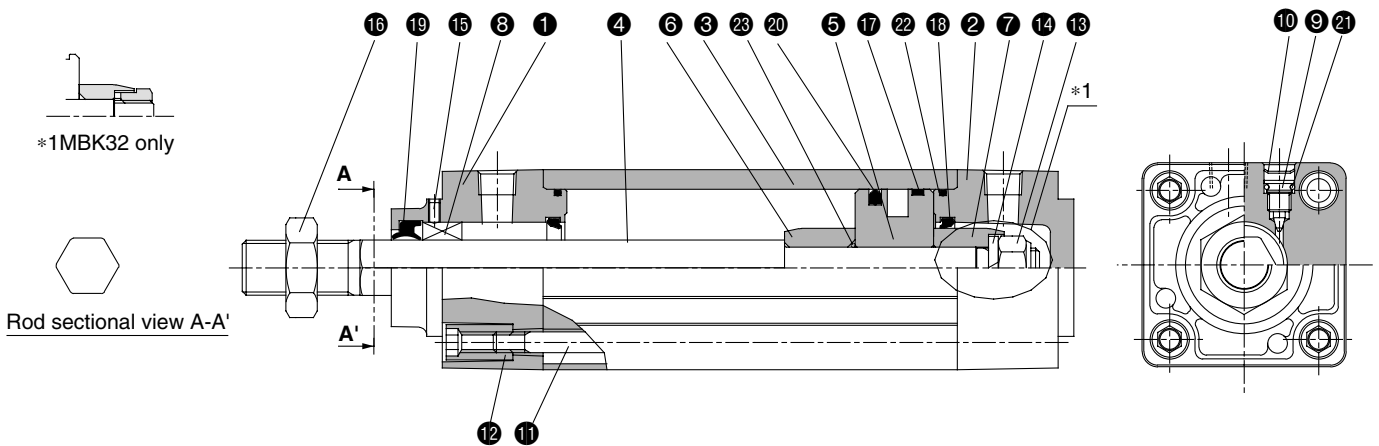
Bore size (mm)		32	40	50	63	80	100
Basic weight	Basic type	0.53	0.69	1.26	1.58	2.69	3.86
	Foot type	0.65	0.83	1.48	1.86	3.19	4.52
	Flange type	0.82	1.06	1.69	2.37	4.14	7.17
	Single clevis type	0.78	0.92	1.60	2.21	3.8	7.03
	Double clevis type	0.79	0.96	1.69	2.37	4.09	7.55
Additional weight per 50mm stroke	All mounting brackets	0.16	0.21	0.33	0.37	0.56	0.72
Accessories	Single knuckle	0.15	0.23	0.26	0.26	0.60	0.83
	Double knuckle (with pin)	0.22	0.37	0.43	0.43	0.87	1.27

Calculation method

Example) **MB1K32-100** (basic type/ø32, 100st)

- Basic weight ..... 0.53kg
  - Additional weight ..... 0.16/50mm stroke
  - Cylinder stroke ..... 100mm stroke
- $$0.53 + 0.16 \times 100/50 = 0.85\text{kg}$$

## Construction



### Parts list

No.	Description	Material	Note
1	Rod cover	Die-cast aluminum	Metallic coated
2	Head cover	Die-cast aluminum	Metallic coated
3	Cylinder tube	Aluminum alloy	Hard anodized
4	Piston rod	Stainless steel	
5	Piston	Aluminum alloy	Chromated
6	Cushion ring A	Rolled steel	
7	Cushion ring B	Rolled steel	
8	Detent guide	Oil-impregnated sintered alloy	
9	Cushion valve	Steel wire	Nickel plated
10	Snap ring	Spring steel	ø40 to ø100
11	Tie-rod	Carbon steel	Chromated
12	Tie-rod nut	Carbon steel	Nickel plated

No.	Description	Material	Note
13	Piston nut	Rolled steel	
14	Spring washer	Steel wire	
15	Set screw	Steel wire	
16	Rod end nut	Carbon steel	Nickel plated
17	Wear ring	Resin	
*18	Cushion seal	Urethane	
*19	Rod seal	NBR	
*20	Piston seal	NBR	
21	Cushion valve seal	NBR	
*22	Cylinder tube gasket	NBR	
23	Piston gasket	NBR	

### Replaceable parts: Seal kits

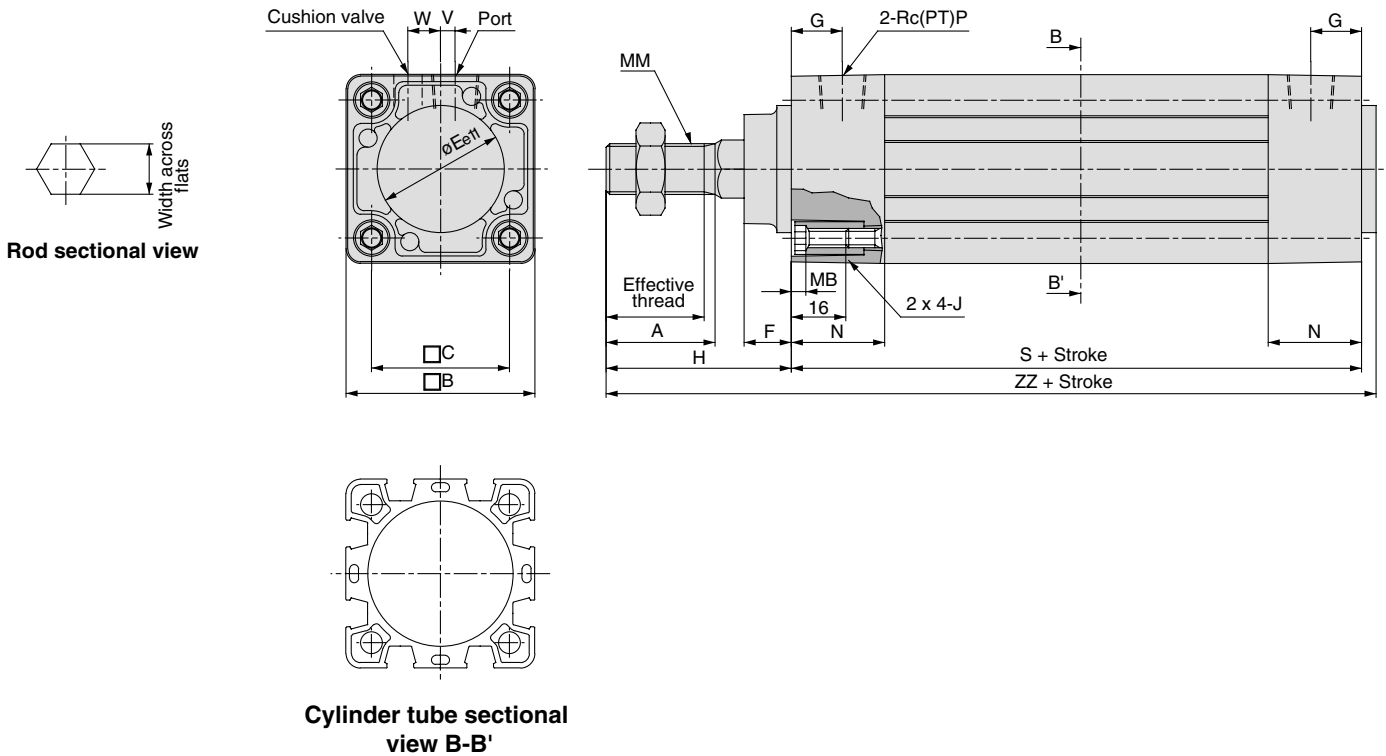
Bore size (mm)	Order No.	Order No.
32	MBK32-PS	Kits include items 18 (2pcs.), 19, 20 & 22 from the table above.
40	MBK40-PS	
50	MBK50-PS	
63	MBK63-PS	
80	MBK80-PS	
100	MBK100-PS	

\* Seal kits consist of items 18, 19, 20 and 22 contained in one kit, and can be ordered using the order number for each respective tube bore size.

\* When there is no air cushion, the unit is equipped with rubber bumpers. Moreover, due to the fact that bumpers are installed at each end of the piston, overall length is increased by 6mm for ø32 and ø40, 8mm for ø50 and ø63, and by 10mm for ø80 and ø100.

Standard Type

Basic type/ (B)



- CJ1
- CJP
- CJ2
- CM2
- C85
- C76
- CG1
- MB
- MB1**
- CP95
- C95
- C92
- CA1
- CS1

Bore size (mm)	Stroke range	Effective thread length	Width across flats	A	□B	□C	E	F	G	MB	J	MM	N	P	S	V	W	H	ZZ
32	to 500	19.5	12.2	22	46	32.5	30	13	13	4	M6	M10 x 1.25	26.5	1/8	84	4	6.5	47	135
40	to 500	27	14.2	30	52	38	35	13	14	4	M6	M14 x 1.5	26.5	1/4	84	4	9	51	139
50	to 600	32	19	35	65	46.5	40	14	15.5	5	M8	M18 x 1.5	31	1/4	94	5	10.5	58	156
63	to 600	32	19	35	75	56.5	45	14	16.5	5	M8	M18 x 1.5	31	3/8	94	9	12	58	156
80	to 750	37	23	40	95	72	45	20	19	5	M10	M22 x 1.5	37.5	3/8	114	11.5	14	72	190
100	to 750	37	27	40	114	89	55	20	19	5	M10	M26 x 1.5	37.5	1/2	114	17	15	72	190

# Series MB1 Order Made Specifications

Contact SMC for detailed specifications, lead times and prices.

Symbol	Specification/Content
<b>1</b> -XA0 to XA30	Modification of rod end shape
<b>2</b> -XB6	Heat resistant cylinder (to 150°C)
<b>3</b> -XB13	Low speed cylinder
<b>4</b> -XB5	Heavy duty rod cylinder
<b>5</b> -XC3	Special port locations
<b>6</b> -XC4	With heavy duty scraper
<b>7</b> -XC5	Heat resistant cylinder (to 110°C)
<b>8</b> -XC6	Stainless steel piston rod and rod end nut
<b>9</b> -XC7	Stainless steel tie-rods, tie-rod nuts, cushion valve, etc.
<b>10</b> -XC8	Adjustable stroke cylinder (adjustable extension type)
<b>11</b> -XC9	Adjustable stroke cylinder (adjustable retraction type)
<b>12</b> -XC10	Dual stroke cylinder (double rod type)
<b>13</b> -XC11	Dual stroke cylinder (single rod type)
<b>14</b> -XC12	Tandem type cylinder
<b>15</b> -XC18	NPT ports
<b>16</b> -XC22	Fluoro rubber seals
<b>17</b> -XC30	Front trunnion mounted on front of rod cover
<b>18</b> -XC35	With coil scraper
<b>19</b> -X846	Fastener strips mounted on switch mounting grooves

## Modification of rod end shape

### 1 -XA0 to XA30

The rod end shape is changed to a non-standard pattern.

MB1  - X

● Rod end shape pattern symbol

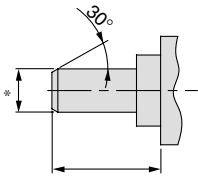
\* Dimensions, tolerances and finishing not shown in the drawings are arranged by SMC.

\* Dimensions marked with a "\*" in the drawings are rod diameter (D)  $\begin{matrix} D \leq 25 & 2\text{mm} \\ D > 25 & 4\text{mm} \end{matrix}$ . Enter any dimensions which are to be different.

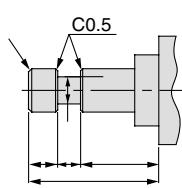
### Rod end shape patterns

**Symbol: A0** When the rod end shape is the same as the standard type and only the "H" dimensions are different, indicate the desired dimensions.

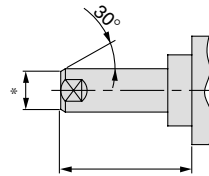
#### Symbol: A1



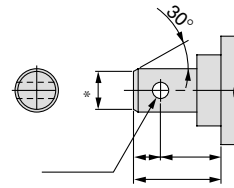
#### Symbol: A2



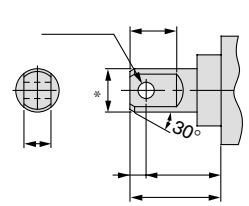
#### Symbol: A3



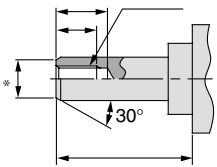
#### Symbol: A4



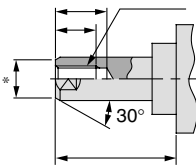
#### Symbol: A5



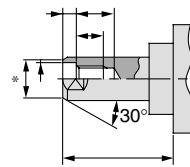
#### Symbol: A6



#### Symbol: A7

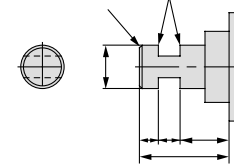


#### Symbol: A8

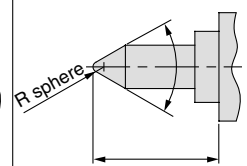


#### Symbol: A9

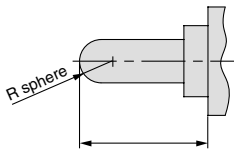
approx. C0.5 file chamfer



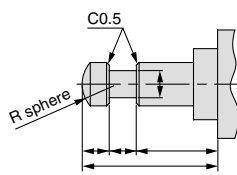
#### Symbol: A10



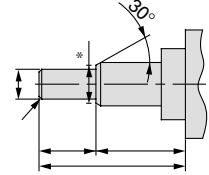
#### Symbol: A11



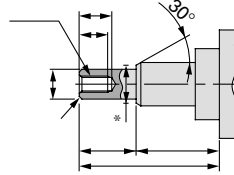
#### Symbol: A12



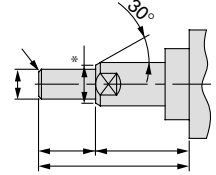
#### Symbol: A13



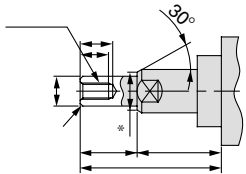
#### Symbol: A14



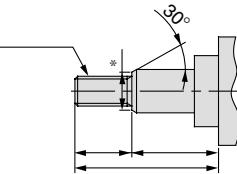
#### Symbol: A15



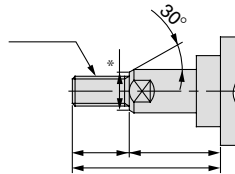
#### Symbol: A16



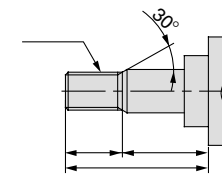
#### Symbol: A17



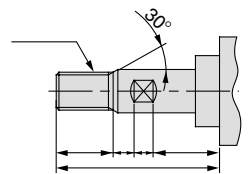
#### Symbol: A18



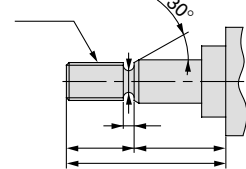
#### Symbol: A19



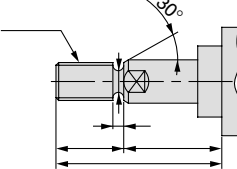
#### Symbol: A20



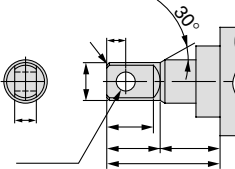
#### Symbol: A21



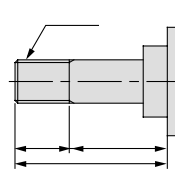
#### Symbol: A22



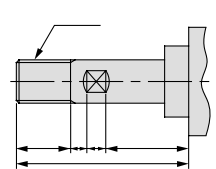
#### Symbol: A23



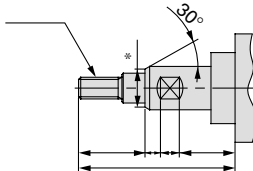
#### Symbol: A24



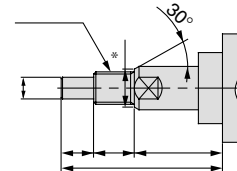
#### Symbol: A25



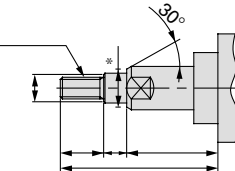
#### Symbol: A26



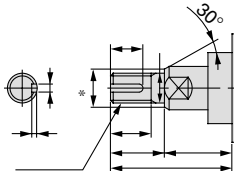
#### Symbol: A27



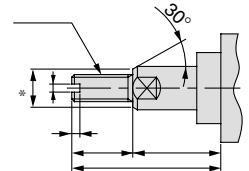
#### Symbol: A28



#### Symbol: A29



#### Symbol: A30



CJ1

CJP

CJ2

CM2

C85

C76

CG1

MB

MB1

CP95

C95

C92

CA1

CS1

# Series MB1

## Heat resistant cylinder (to 150°C)

### 2 -XB6

The cylinder seals are changed to a heat resistant (to 150°C) material, for use under severe conditions which exceed the standard specifications of -10°C to +70°C.

MB1  Standard part number —XB6

● Heat resistant cylinder (to 150°C)

#### Specifications

Action	Double acting single rod/double rod
Ambient temperature range	-10°C to 150°C
Auto switch	Not mountable
Cushion	Air cushion
Seal material	Fluoro rubber
Grease	Fluororesin

Specifications and dimensions other than the above are the same as the standard type.

## Low speed cylinder

### 3 -XB13

Even at speeds as low as 5 to 50mm/s, the entire stroke drives at a smooth and steady speed, without sticking and slipping. Avoid lubrication of this cylinder.

MB1  Standard part number —XB13

● Low speed cylinder

#### Specifications

Action	Double acting single rod
Piston speed	5 to 50mm/sec

Specifications and dimensions other than the above are the same as the standard type.

## Heavy duty rod cylinder

### 4 -XB5

The strength of the cylinder is increased by increasing the diameter of the piston rod. This cylinder is used when the stroke is long, and there is a danger of the piston rod bending or buckling, etc.

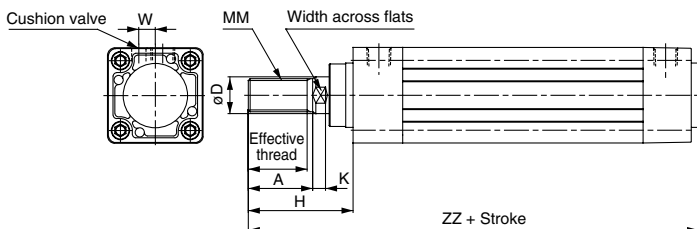
MB1  Standard part number —XB5

● Heavy duty rod cylinder

#### Specifications

Action	Double acting single rod
Bore size (mm)	32, 40, 50, 63, 80, 100
Auto switch	Mountable

#### Dimensions



Bore size (mm)	Effective thread length	Width across flats	A	D	H	K	MM	W	ZZ
32	27	14	30	16	51	6	M14 x 1.5	7.2	139
40	32	18	35	20	58	7	M18 x 1.5	9.7	146
50	37	22	40	25	68	10	M22 x 1.5	10.5	166
63	37	22	40	25	68	10	M22 x 1.5	12	166
80	37	26	40	30	74	10	M26 x 1.5	14	192
100	47	31	50	36	90	16	M30 x 1.5	15	208

## Special port locations

### 5 -XC3

The positions of ports and cushion valves on the rod cover and head cover are changed from those of the standard type.

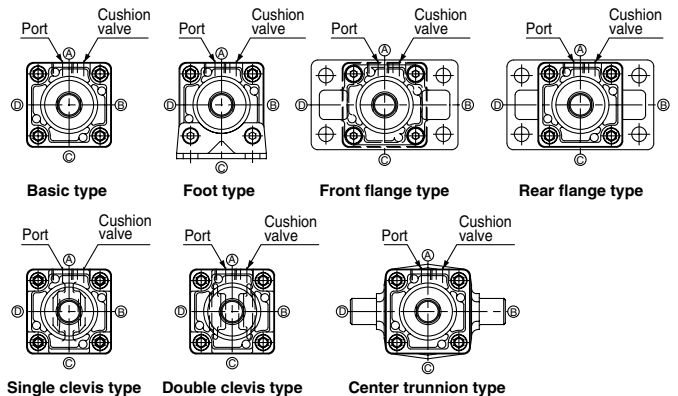
MB1  Standard part number —XC3 A C

● Special port locations

● Cushion valve location viewed from rod side

● Port location viewed from rod side

#### Relation of port locations and cushion valve locations



- The port and cushion valve position symbols are determined as viewed from the rod side (in the case of a standard type cylinder, the ports are always located on the top) shown in the above drawings, with "A" at the top and "B", "C" and "D" following clockwise.
- This port and cushion valve combination model generally applies only when the positions of ports and cushion valves on the rod cover and head cover are changed to the same positions as those of the mounting brackets.
- The part number "XC3AA" does not exist with regard to port and cushion valve positions, because this is a standard model.

## With heavy duty scraper

### 6 -XC4

Using a heavy duty scraper as a wiper ring, this series is ideal for use in severe environments where cylinders are exposed to dust, dirt and sand. Applicable to casting machines, construction equipment and industrial vehicles, etc.

MB1  Standard part number —XC4

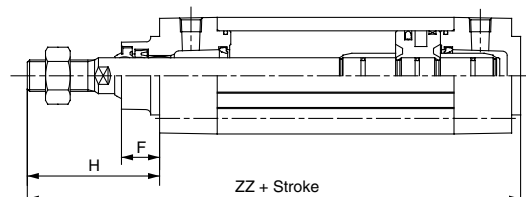
● With heavy duty scraper

#### Specifications

Action	Double acting single rod
Cushion	Air cushion/Rubber bumper
Wiper ring	SCB scraper

Specifications other than the above are the same as the standard type.

#### Dimensions



Bore size (mm)	F	H	ZZ	Bore size (mm)	F	H	ZZ
32	15	47	135	63	19	67	165
40	17	58	146	80	25	81	199
50	19	67	165	100	25	81	199



## Heat resistant cylinder (to 110°C)

### 7 -XC5

The cylinder seals are changed to a heat resistant (to 110°C) material, for use under severe temperature conditions which exceed the standard specifications of -10°C to +70°C.

MB1  Standard part number -XC5

● Heat resistant cylinder (to 110°C)

#### Specifications

Action	Double acting single rod/double rod
Ambient temperature range	-10°C to 110°C
Auto switch	Not mountable
Cushion	Air cushion
Seal material	Fluoro rubber

Specifications and dimensions other than the above are the same as the standard type.

## Stainless steel piston rod and rod end nut

### 8 -XC6

Applicable in cases where there is concern about rust or corrosion, etc., such as when the piston rod end gets wet when extended.

MB1  Standard part number -XC6

● Stainless steel piston rod and rod end nut

#### Specifications

Action	Double acting single rod
Cushion	Air cushion

Specifications and dimensions other than the above are the same as the standard type.

## Stainless steel tie-rod nuts, cushion valve, etc.

### 9 -XC7

Certain parts are changed from standard materials to stainless steel, when used in locations where there is a danger of rust or corrosion, etc.

MB1  Standard part number -XC7

● Stainless steel tie-rod nuts, cushion valve, etc.

#### Specifications

Action	Double acting single rod
Cushion	Air cushion

Specifications and dimensions other than the above are the same as the standard type.

## Adjustable stroke cylinder (adjustable extension type)

### 10 -XC8

The extending stroke of the cylinder can be adjusted from a full stroke to (0 to 25)mm, or (0 to 50)mm.

A stroke adjustment mechanism is provided on the head side to adjust the extending stroke.

MB1  Mounting  Bore size  Stroke  Suffix  Stroke adjustment -XC8

Stroke adjustment symbol ●

A	Stroke adjustment 0 to 25mm
B	Stroke adjustment 0 to 50mm

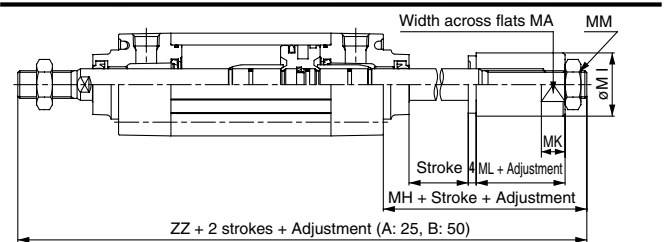
Adjustable stroke cylinder ●  
adjustable extension type

#### Specifications

Action	Double acting single rod
Mounting bracket	B, L, F, T type (G, C, D not available)
Stroke adjustment method	Stopper adjustment
Stroke adjustment range	A: 0 to 25mm B: 0 to 50mm

Specifications other than the above are the same as the standard type.

#### Dimensions



Bore size (mm)	MA	MK	MI	MH	ML	MM	ZZ
32	21	10	24	44	18	10	175
40	27	12	32	48	20	14	183
50	32	15	38	53	21	18	205
63	32	15	38	53	21	18	205
80	36	20	45	72	32	22	258
100	46	20	55	75	32	26	261

## Adjustable stroke cylinder (adjustable retraction type)

### 11 -XC9

The retracting stroke of the cylinder can be adjusted to (0 to 25)mm or (0 to 50)mm by an adjustment bolt which performs the adjustable setting on the return stroke.

MB1  Mounting  Bore size  Stroke  Suffix  Stroke adjustment -XC9

Stroke adjustment symbol ●

A	Stroke adjustment 0 to 25mm
B	Stroke adjustment 0 to 50mm

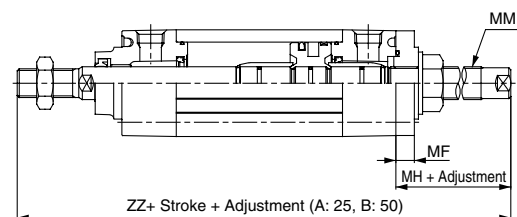
Adjustable stroke cylinder ●  
adjustable retraction type

#### Specifications

Action	Double acting single rod
Mounting bracket	B, L, F, T type (G, C, D not available)
Stroke adjustment method	Adjustment bolt
Stroke adjustment range	A: 0 to 25mm B: 0 to 50mm

Specifications other than the above are the same as the standard type.

#### Dimensions



Bore size	MH	MF	MM	ZZ
32	41.5	9.5	M12 x 1.25	172
40	41.5	9.5	M12 x 1.25	176
50	52.5	11.5	M20 x 1.5	204
63	52.5	11.5	M20 x 1.5	204
80	62.5	15.5	M24 x 1.5	248
100	62.5	15.5	M24 x 1.5	248

CJ1

CJP

CJ2

CM2

C85

C76

CG1

MB

MB1

CP95

C95

C92

CA1

CS1

# Series MB1

## Dual stroke cylinder/double rod type

### 12-XC10

Two cylinders are combined in a back-to-back configuration, allowing the two reciprocating cylinder strokes to be controlled in three steps.

MB1  Mounting type  Bore size  —  Stroke A  Suffix +  Stroke B  Suffix — XC10

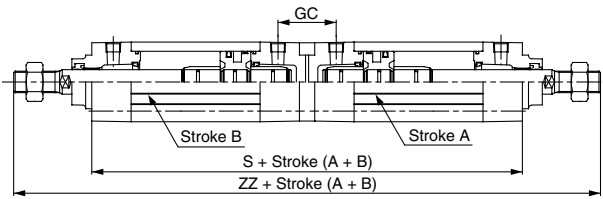
#### Dual stroke cylinder double rod type

#### Specifications

Action	Double acting single rod
Cushion	Air cushion, Rubber bumper
Mounting bracket	B, L, F, G type (C, D, T not available)
Maximum available stroke (A+B)	ø32: to 600 ø40: to 700 ø50 to ø100: to 900

Specifications other than the above are the same as the standard type.

#### Dimensions



Bore size (mm)	GC	S	ZZ
32	36	178	272
40	38	178	280
50	41	198	314
63	43	198	314
80	52	242	386
100	52	242	386

## Dual stroke cylinder/single rod type

### 13-XC11

Two cylinders are combined in an in-line configuration, allowing the two reciprocating cylinder strokes to be controlled in two steps, or making it possible to double the cylinder output.

MB1  Mounting type  Bore size  —  Stroke A  Suffix +  Stroke B  Suffix — XC11

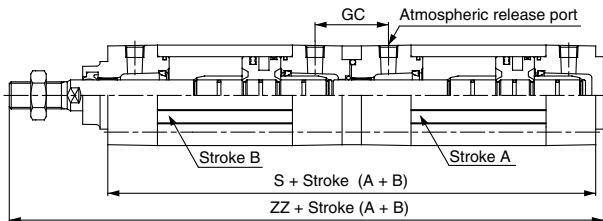
#### Dual stroke cylinder single rod type

#### Specifications

Action	Double acting single rod
Cushion	Air cushion, Rubber bumper
Mounting bracket	B, L, F, G, C, D type (T not available)

Specifications other than the above are the same as the standard type.

#### Dimensions



Bore size (mm)	GC	S	ZZ
32	36	179	230
40	38	179	234
50	41	199	261
63	43	199	261
80	52	243	319
100	52	243	319

## Tandem type cylinder

### 14-XC12

Two cylinders are connected in-line, allowing cylinder output to be doubled.

MB1  Standard part number — XC12

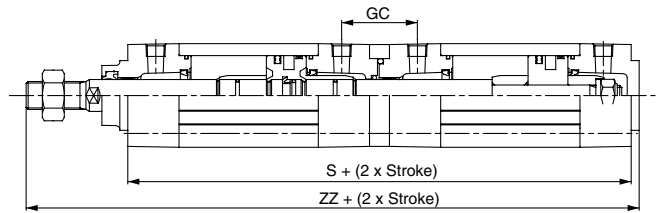
#### Tandem type cylinder

#### Specifications

Action	Double acting single rod
Minimum operating pressure	0.1MPa {1.0kgf/cm <sup>2</sup> }
Cushion	Air cushion
Mounting bracket	B, L, F, G, C, D type (T not available)

Specifications other than the above are the same as the standard type.

#### Dimensions



Bore size (mm)	GC	S	ZZ	Bore size (mm)	GC	S	ZZ
32	36	180	231	63	43	200	262
40	38	180	235	80	52	244	320
50	41	200	262	100	52	244	320

## NPT ports

### 15-XC18

Piping ports of the air cylinder are changed from Rc(PT) thread to NPT thread.

MB1  Standard part number — XC18

#### NPT ports

## Fluoro rubber seals

### 16-XC22

Seal material is changed to fluoro rubber for superior chemical resistance.

MB1  Standard part number — XC22

#### Fluoro rubber seals

#### Specifications

Action	Double acting single rod
Seals	Fluoro rubber

Specifications and dimensions other than the above are the same as the standard type.

## Front trunnion mounted on front of rod cover

### 17-XC30

When a standard double acting single rod cylinder with a support type front trunnion has a long stroke, the distance from the fulcrum to the rod end is reduced by mounting the trunnion on the front of the cylinder's rod cover.

MB1T  Standard part number — XC30

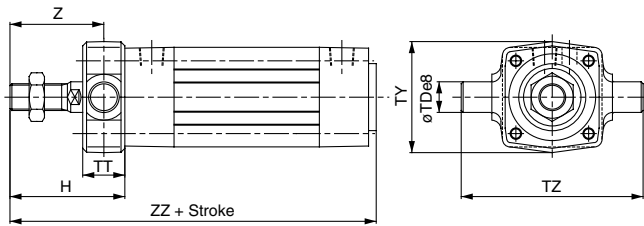
● Front trunnion mounted on front of rod cover

#### Specifications

Action	Double acting single rod
Mounting bracket	T-bracket only

Specifications other than the above are the same as the standard type.

#### Dimensions



Bore size (mm)	TDe8	TT	TY	TZ	H	Z	ZZ
32	12 <sup>-0.032</sup> <sub>-0.059</sub>	17	49	74	47	38.5	135
40	16 <sup>-0.032</sup> <sub>-0.059</sub>	22	58	95	60	49	148
50	16 <sup>-0.032</sup> <sub>-0.059</sub>	22	71	107	66	55	164
63	20 <sup>-0.040</sup> <sub>-0.073</sub>	28	87	130	72	58	170
80	20 <sup>-0.040</sup> <sub>-0.073</sub>	34	110	150	86	69	204
100	25 <sup>-0.040</sup> <sub>-0.073</sub>	40	136	182	92	72	210

## With coil scraper

### 18-XC35

Seals are protected by removing frost, welding spatter or cutting chips, etc. that adhere to the piston rod.

MB1  Standard part number — XC35

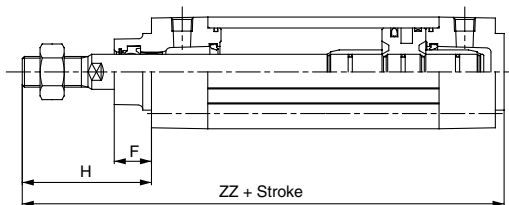
● With coil scraper

#### Specifications

Action	Double acting single rod
Cushion	Air cushion, Rubber bumper
Wiper ring	Coil scraper (metal)

Specifications other than the above are the same as the standard type.

#### Dimensions



Bore size (mm)	F	H	ZZ	Bore size (mm)	F	H	ZZ
32	15	47	135	63	19	67	165
40	17	58	146	80	25	81	199
50	19	67	165	100	25	81	199

## Fastener strips mounted on switch mounting grooves

### 19-X846

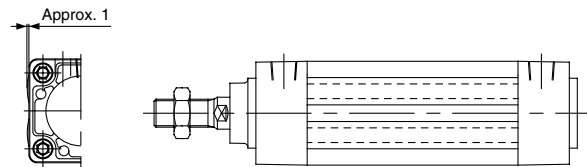
Prevents water or dust, etc. that fall on the cylinder unit from entering and accumulating in the auto switch mounting grooves.

MB1  Standard part number — X846

MDB1

● With fasteners

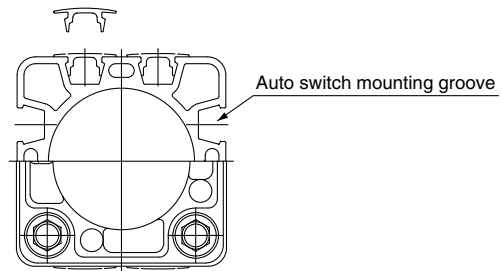
#### Dimensions



#### Fastener specifications

Quantity	8pcs. (6pcs. when auto switches are mounted) <sup>Note)</sup>
Material	Vinyl chloride
Color	Urban white

Note) These cannot be installed on switch mounting grooves where auto switches have been mounted.



Sectional view

CJ1

CJP

CJ2

CM2

C85

C76

CG1

MB

MB1

CP95

C95

C92

CA1

CS1

