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

Series MB1

ø32, ø40, ø50, ø63, ø80, ø100

How to Order

Standard type MB1 L 32 — 50 ☐

With auto switch MDB1 L 32 — 50 ☐ — Z73 ☐

Built-in magnet

Mounting bracket

B	Basic type
L	Axial foot type
F	Front flange type
G	Rear flange type
C	Single clevis type
D	Double clevis type

Bore size

32	32mm
40	40mm
50	50mm
63	63mm
80	80mm
100	100mm

Stroke (mm)
Refer to the standard stroke table on page 2.

Number of auto switches

Nil	2pcs.
S	1pc.
3	3pcs.
n	"n" pcs.

Type of auto switch

Nil	Without auto switch

∗ Select an applicable auto switch model from the table below.

Rod boot/Air cushion

Rod boot	Nil	Without rod boot
	J	Nylon tarpaulin
	K	Heat resistant tarpaulin
Air cushion	Nil	Air cushion at both ends
	N Note)	Without air cushion

Note) 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.

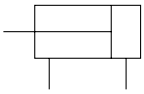
Applicable auto switches/direct mounting type

Type	Special function	Electrical entry	Indicator light	Wiring (output)	Load voltage DC		Load voltage AC	Auto switch model: Electrical entry direction Vertical	Auto switch model: Electrical entry direction Lateral	Lead wire length (m) Note): 0.5 (Nil)	3 (L)	5 (Z)	Applicable load	
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)				Y7PV	Y7P	●	●	○		
				2 wire		12V		Y69B	Y59B	●	●	○	—	
	Diagnostic indication (2 color indicator)			3 wire (NPN)		5V, 12V		Y7NWV	Y7NW	●	●	○	IC circuit	
				3 wire (PNP)				Y7PWV	Y7PW	●	●	○		
				2 wire		12V		Y7BWV	Y7BW	●	●	○	—	
	Water resistant (2 color 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.

JIS symbol
Double acting type



Specifications

1MPa: Approx. 10.2kgf/cm²

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/cm²}					
Maximum operating pressure	1.0MPa {10.2kgf/cm²}					
Minimum operating pressure	0.05MPa {0.5kgf/cm²}					
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 : $^{+1.4}_{0}$, 1001 to 500 : $^{+1.8}_{0}$					
Cushion	Both ends (air cushion) Note)					
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 page1.)

Minimum strokes for auto switch mounting

Refer to page 9 regarding the minimum strokes for the mounting of auto switches.

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.

Rod boot material

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

Note) Maximum ambient temperature for the rod boot itself.

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	●	●	●	●	●	●

Switch spacers

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

Mounting brackets

Bore size (mm)	32	40	50	63	80	100
Foot Note1)	MB-L03	MB-L04	MB-L05	MB-L06	MB-L08	MB-L10
Flange	MB-F03	MB-F04	MB-F05	MB-F06	MB-F08	MB-F10
Single clevis	MB-C03	MB-C04	MB-C05	MB-C06	MB-C08	MB-C10
Double clevis	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

Theoretical output table

(Unit: N) OUT IN

Bore size (mm)	Rod diameter (mm)	Operating direction	Piston area (mm²)	Operating pressure (MPa)								
				0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
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/cm²
Note) Theoretical output (N) = Pressure (MPa) x Piston area (mm²).

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

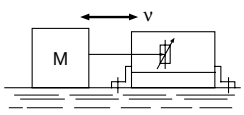
Refer to "Best Pneumatics No. 2" for further information on kinetic energy that can be absorbed by the cushion mechanism and regarding cylinders with air cushion.

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.

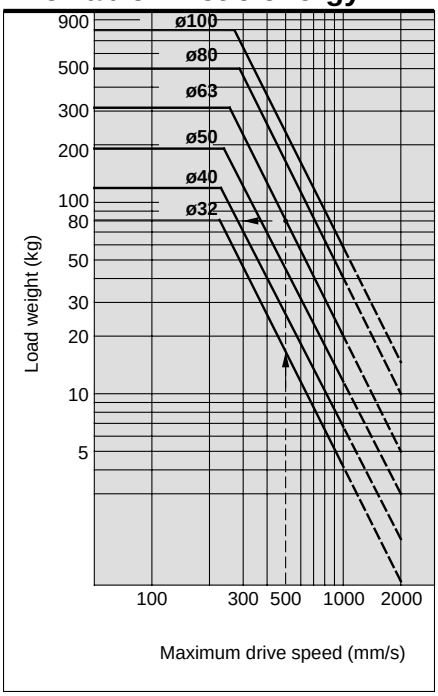


$$Ek = \frac{M}{2}V^2$$

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

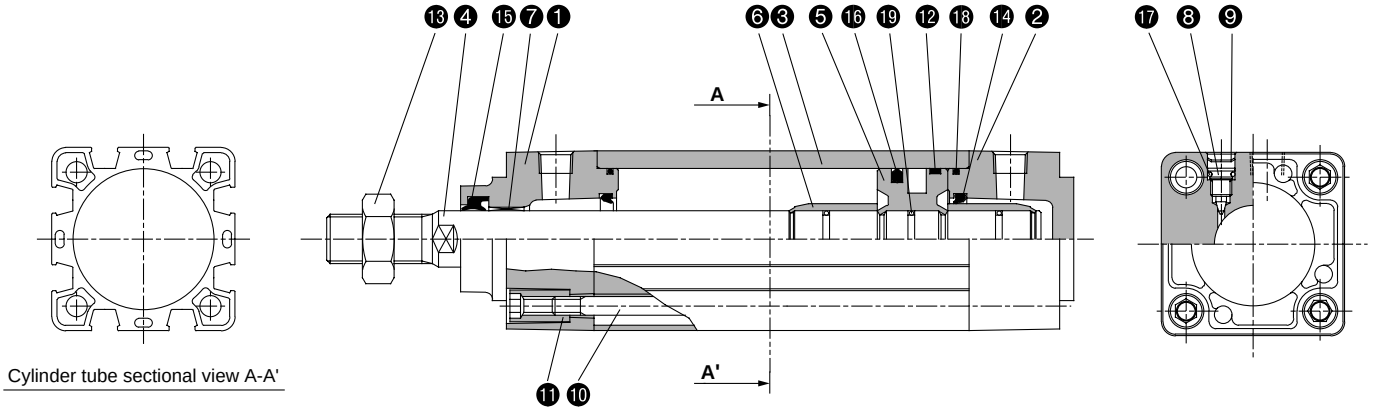
If the kinetic energy obtained is no greater than the absorbable kinetic energy shown in the table above, the life of the cushion seal will be 10 million cycles or more.

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



Cylinder tube sectional view A-A'

Parts list

No.	Description	Material	Note
❶	**Rod cover**	Die-cast aluminum	Metallic coated
❷	**Head cover**	Die-cast aluminum	Metallic coated
❸	**Cylinder tube**	Aluminum alloy	Hard anodized
❹	**Piston rod**	Carbon steel	Hard chrome plated
❺	**Piston**	Aluminum alloy	Chromated
❻	**Cushion ring**	Brass	
❼	**Bushing**	Lead-bronze casting	
❽	**Cushion valve**	Steel wire	Nickel plated
❾	**Snap ring**	Spring steel	ø40 to ø100
❿	**Tie-rod**	Carbon steel	Chromated
⓫	**Tie-rod nut**	Carbon steel	Nickel plated
⓬	**Wear ring**	Resin	
⓭	**Rod end nut**	Carbon steel	Nickel plated

No.	Description	Material	Note
*⓮	**Cushion seal**	Urethane	
*⓯	**Rod seal**	NBR	
*⓰	**Piston seal**	NBR	
⓱	**Cushion valve seal**	NBR	
*⓲	**Cylinder tube gasket**	NBR	
⓳	**Piston gasket**	NBR	

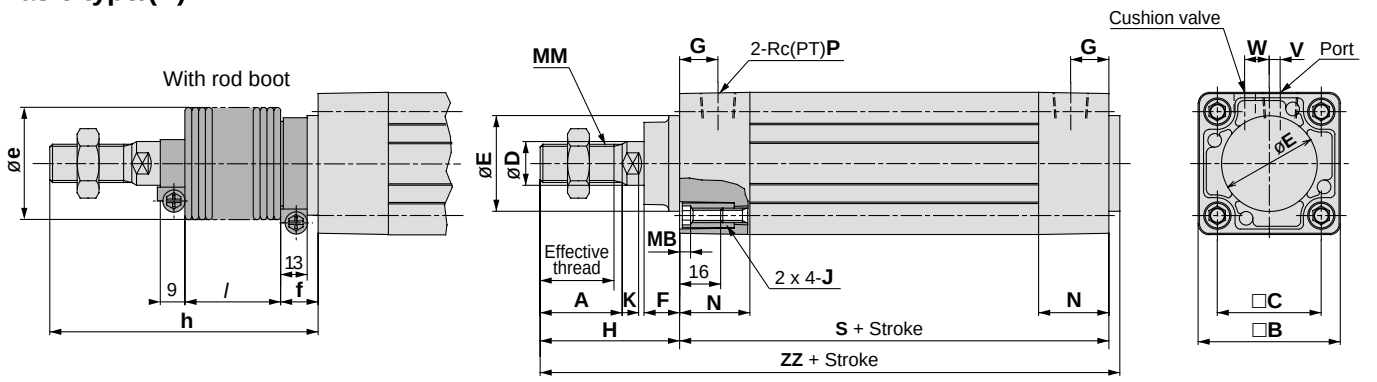
Replaceable parts: Seal kits

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.

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 ø32 and ø40, 8mm for ø50 and ø63, and by 10mm for ø80 and ø100.

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
32	to 500	19.5	10	22	46	32.5	12	30	13	13	47	4	M6 x 1.0	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 x 1.0	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 x 1.25	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 x 1.25	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 x 1.5	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 x 1.5	10	M26 x 1.5	37.5	1/2	114	17	15	190

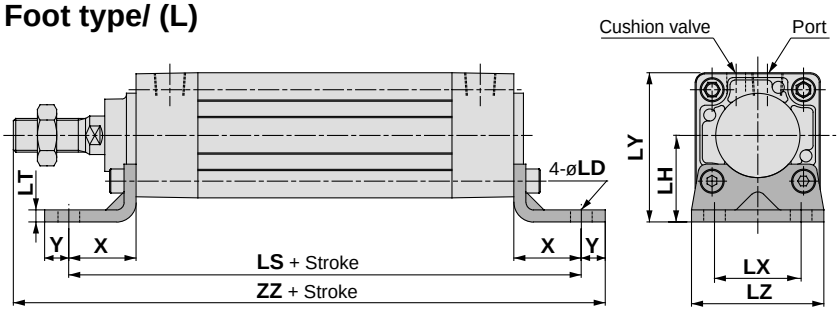
With rod boot (mm)

Bore size (mm)	e	f	l										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

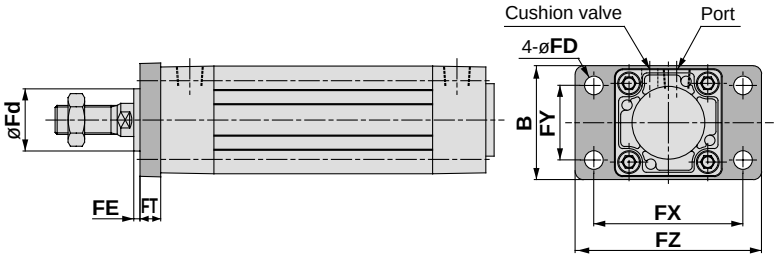
Foot type (mm)

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 ø32 and ø40, 8mm for ø50 and ø63, and by 10mm for ø80 and ø100.

Standard Type/with Mounting Brackets

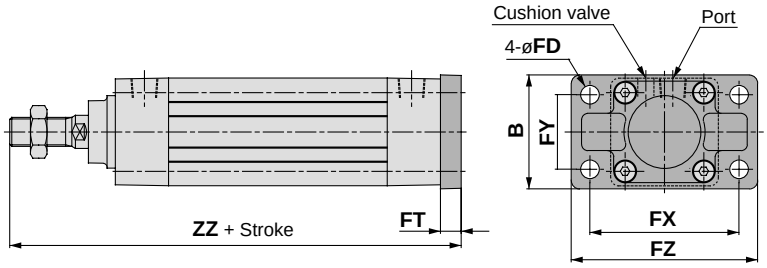
Front flange type/(F)



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)



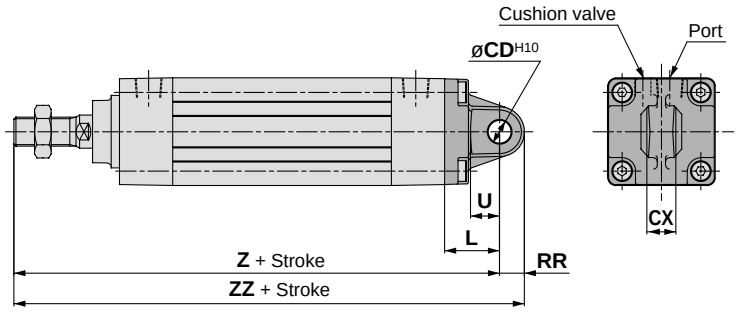
Without air cushion

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)



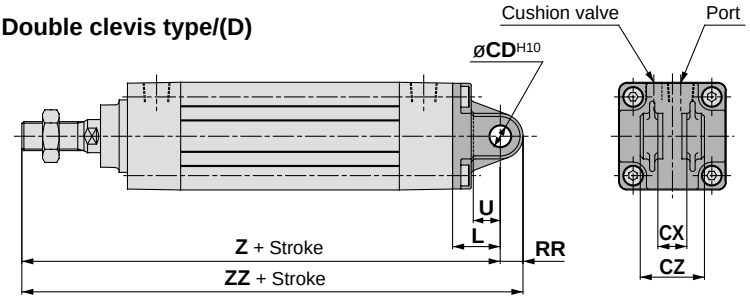
Without air cushion

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 H10	CX -0.1 -0.3	* 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

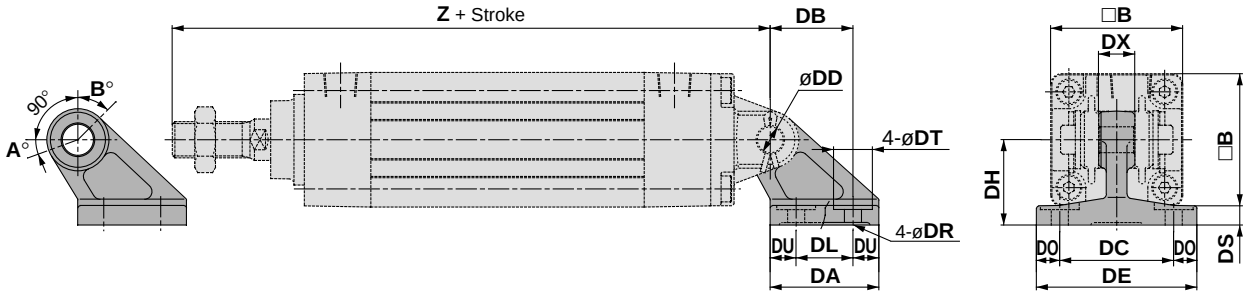
Bore size (mm)	Stroke range	L	RR	U	CD H10	CX +0.3 +0.1	CZ	* Z	* ZZ
32	to 500	23	10.5	13	10	14	28	154	164.5
40	to 500	23	11	13	10	14	28	158	169
50	to 600	30	15	17	14	20	40	182	197
63	to 600	30	15	17	14	20	40	182	197
80	to 750	42	23	26	22	30	60	228	251
100	to 750	42	23	26	22	30	60	228	251

Cushion Bracket/Double Clevis Mounting Bracket

Models

Description \ Bore size	MB□32	MB□40	MB□50	MB□63	MB□80	MB□100
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 H10
MB-B03	**32**	46	42	32	22	10	44	14	62	9	6.6	15	7	33	154	$10^{+0.058}_{0}$
	40	52	42	32	22	10	44	14	62	9	6.6	15	7	33	158	$10^{+0.058}_{0}$
MB-B05	**50**	65	53	43	30	11.5	60	20	81	10.5	9	18	8	45	182	$14^{+0.070}_{0}$
	63	75	53	43	30	11.5	60	20	81	10.5	9	18	8	45	182	$14^{+0.070}_{0}$
MB-B08	**80**	95	73	64	45	14	86	30	111	12.5	11	22	10	65	228	$22^{+0.084}_{0}$
	100	114	73	64	45	14	86	30	111	12.5	11	22	10	65	228	$22^{+0.084}_{0}$

Without air cushion

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

Rotation

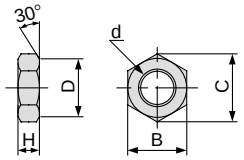
Bore size (mm)	A°	B°	A°+B°+90°
32, 40	25°	45°	160°
50, 63	40°	60°	190°
80, 100	30°	55°	175°

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.

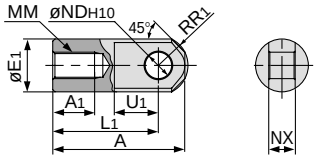
Accessory Dimensions

Rod end nut
(standard equipment)



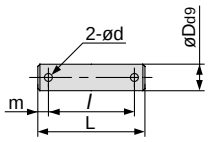
Part No.	Bore size (mm)	d	H	B	C	D
NT-03	32	M10 x 1.25	6	17	19.6	16.5
NT-04	40	M14 x 1.5	8	22	25.4	21
NT-05	50, 63	M18 x 1.5	11	27	31.2	26
NT-08	80	M22 x 1.5	13	32	37.0	31
NT-10	100	M26 x 1.5	16	41	47.3	39

I type single
knuckle joint



Part No.	Bore size (mm)	A	A_1	E_1	L_1	MM	R_1	U_1	ND_{H10}	NX
I-03M	32	40	14	20	30	M10 x 1.25	12	16	$10^{+0.058}_{0}$	$14^{-0.10}_{-0.30}$
I-04M	40	50	19	22	40	M14 x 1.5	12.5	19	$10^{+0.058}_{0}$	$14^{-0.10}_{-0.30}$
I-05M	50, 63	64	24	28	50	M18 x 1.5	16.5	24	$14^{+0.070}_{0}$	$20^{-0.10}_{-0.30}$
I-08M	80	80	26	40	60	M22 x 1.5	23.5	34	$22^{+0.084}_{0}$	$30^{-0.10}_{-0.30}$
I-10M	100	80	26	40	60	M26 x 1.5	23.5	34	$22^{+0.084}_{0}$	$30^{-0.10}_{-0.30}$

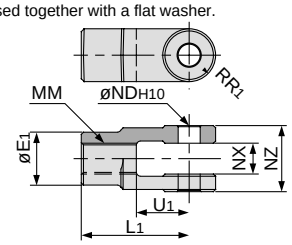
Knuckle joint pin
Clevis pin



Part No.	Bore size (mm) Clevis	Bore size (mm) Knuckle	D_{d9}	L	l	m	d (Cut through)	Cotter pin Note 1)
CD-M03	32, 40		$10^{-0.040}_{-0.076}$	44	36	4	3	ø3 x 18*l*
CD-M05	50, 63		$14^{-0.050}_{-0.093}$	60	51	4.5	4	ø4 x 25*l*
CD-M08	80, 100		$22^{-0.065}_{-0.117}$	82	72	5	4	ø4 x 35*l*

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

Y type double
knuckle joint



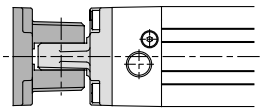
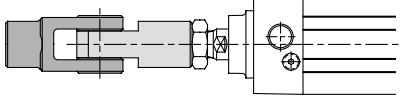
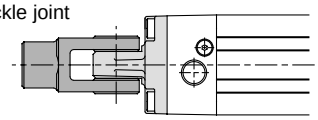
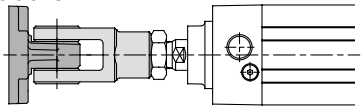
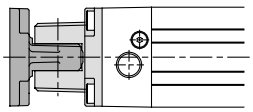
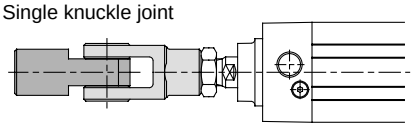
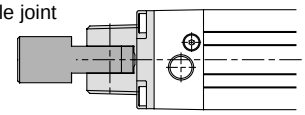
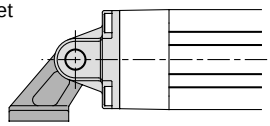
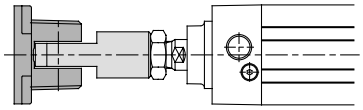
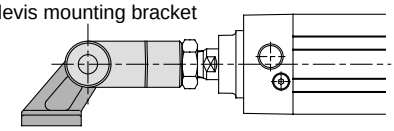
Part No.	Bore size (mm)	E_1	L_1	MM	R_1	U_1	ND_{H10}	NX	NZ
Y-03M	32	20	30	M10 x 1.25	10	16	$10^{+0.058}_{0}$	$14^{+0.30}_{+0.10}$	$28^{-0.10}_{-0.30}$
Y-04M	40	22	40	M14 x 1.5	11	19	$10^{+0.058}_{0}$	$14^{+0.30}_{+0.10}$	$28^{-0.10}_{-0.30}$
Y-05M	50, 63	28	50	M18 x 1.5	14	24	$14^{+0.070}_{0}$	$20^{+0.30}_{+0.10}$	$40^{-0.10}_{-0.30}$
Y-08M	80	40	65	M22 x 1.5	20	34	$22^{+0.084}_{0}$	$30^{+0.30}_{+0.10}$	$60^{-0.10}_{-0.30}$
Y-10M	100	40	65	M26 x 1.5	20	34	$22^{+0.084}_{0}$	$30^{+0.30}_{+0.10}$	$60^{-0.10}_{-0.30}$

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 

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 color indication, with diagnostic output)
	D-Y7BAL	Grommet (2 color indication, water resistant)

⚠ Specific Product Precautions

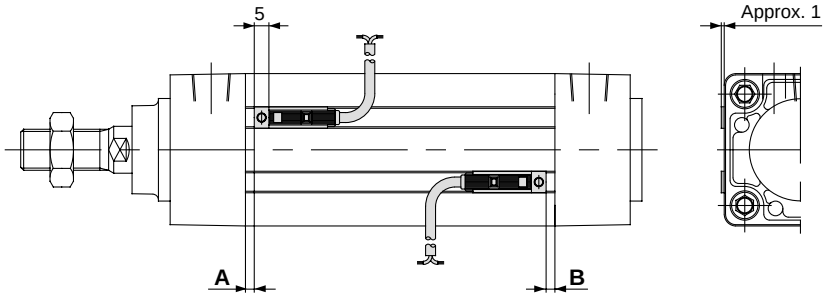
Be sure to read before handling.
Refer to pages 29 through 31 for auto switch precautions.

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.						
Solid state switch	**D-Y59A(B), Y69A(B), Y7P(V)**	2pcs. (different sides, same side)	25				15	
		1pc.						
	D-Y7NW(V), Y7PW(V), Y7BW(V)	2pcs. (different sides, same side)	25				20	
		1pc.						
	D-Y7BAL	2pcs. (different sides, same side)	30				20	
		1pc.						

Center trunnion is not included.

Auto Switches/Proper Mounting Positions for Stroke End Detection

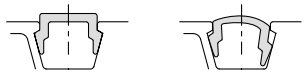


Bore size (mm)	D-Z7□, Z80 D-Y59□, Y69□, Y7P□ D-Y7NW□, Y7PW□, Y7BW□ D-Y7BAL	
	A	**B**
32	4	1
40	4	1
50	4	2
63	4	2
80	5.5	7.5
100	5.5	7.5

Mounting of Auto Switches

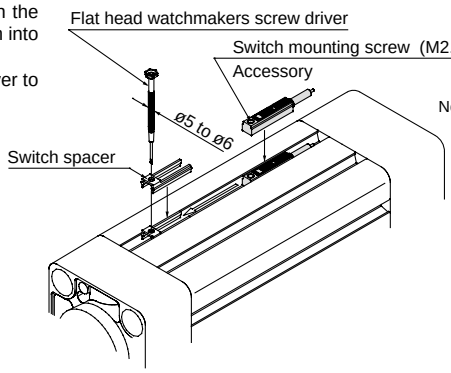
1N·m: approx. 10.2kgf·cm

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.



Correct **Incorrect**

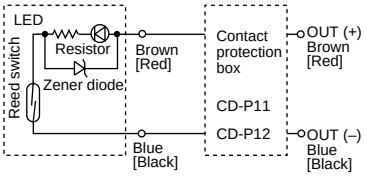
∗ Refer to page 2 for switch spacer types.



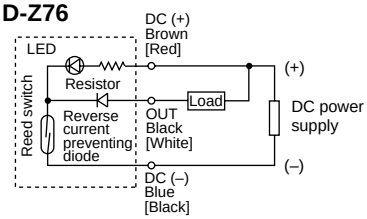
Note) When tightening the auto switch mounting screw, use a watchmakers screw driver with a handle about 5 to 6mm in diameter.
Also, tighten to a torque of approximately 0.05 to 0.1N·m (0.51 to 1.02kgf·cm).
As a rule, it is turned about 90° past the point at which tightening can be felt.

Reed Switch Internal Circuits

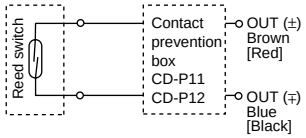
D-Z73



D-Z76

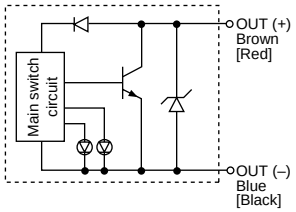


D-Z80

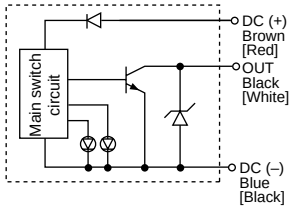


Solid State Switch Internal Circuits

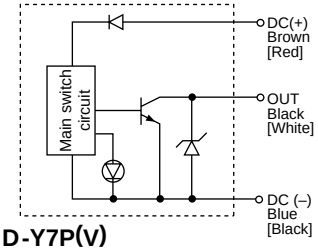
D-Y7BAL



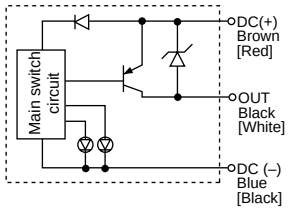
D-Y7NW(V)



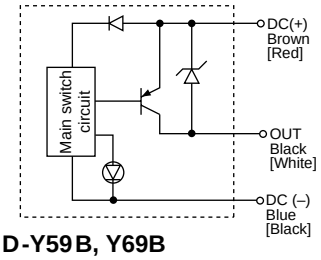
D-Y59A, Y69A



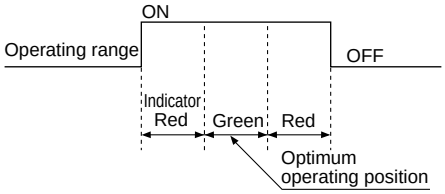
D-Y7PW(V)



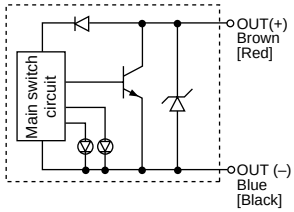
D-Y7P(V)



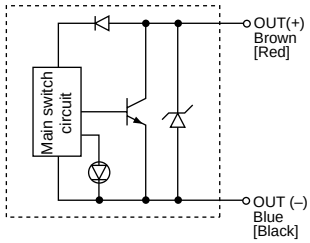
Indicator light



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.

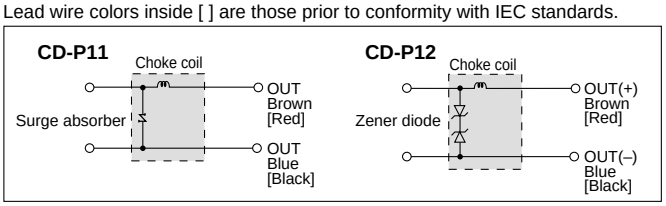
Contact protection box specifications

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

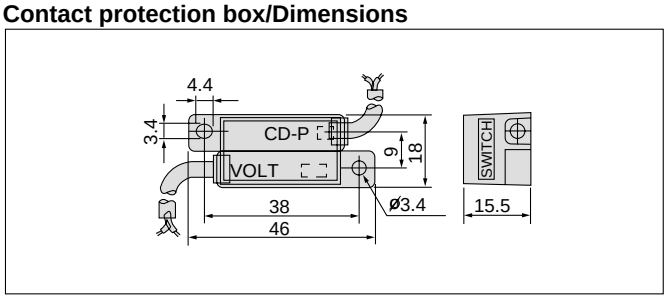
∗ Lead wire length -------- Switch contact side 0.5m
Load contact side 0.5m

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.