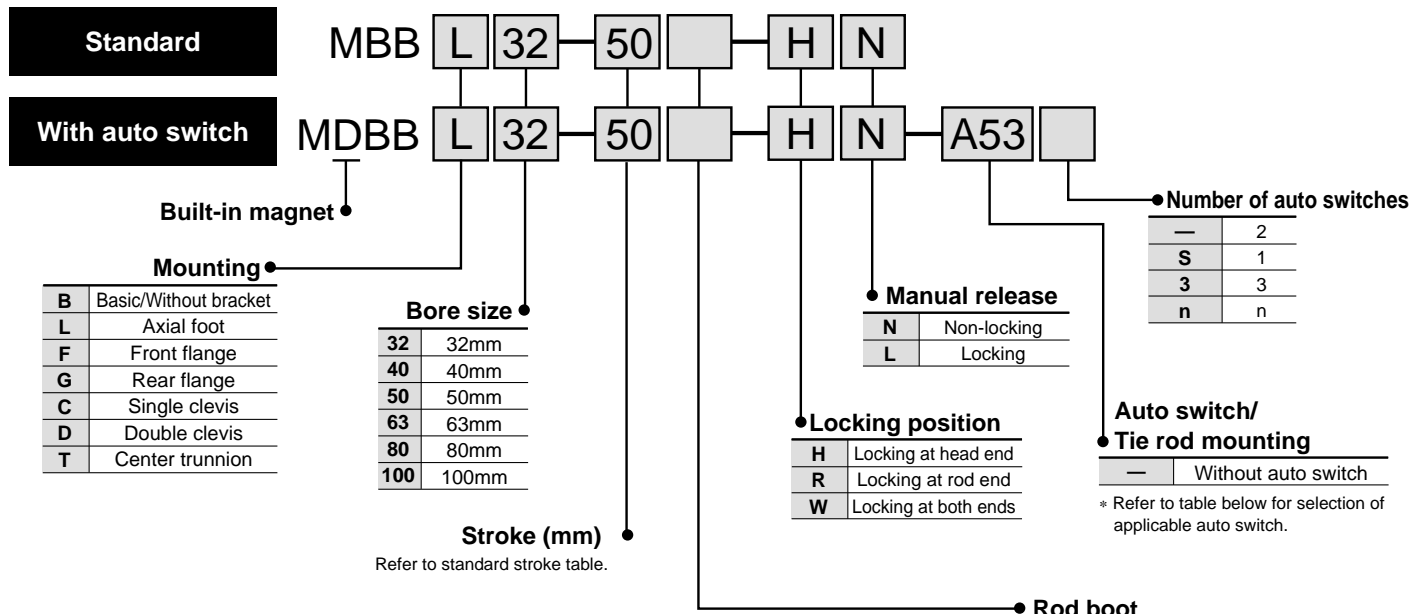


# Air Cylinder/End Lock

## Series *MBB*

ø32, ø40, ø50, ø63, ø80, ø100

### How to Order



### Applicable Auto Switches/Tie rod mounting

Style	Special function	Electrical entry	Indicator	Wiring (Output)	Load voltage		Auto switch model	Lead wire*(m)			Applicable load
					DC	AC		0.5 (—)	3 (L)	5 (Z)	
Reed switch	—	Grommet	Yes	3 wire (Equiv. to NPN)	—	5V	A56	●	●	—	IC circuit
				2 wire	12V	—	A53	●	●	●	—
					12V	100V, 200V	A54	●	●	●	—
	Diagnostic indication (2 color)	Grommet	No	2 wire	5V, 12V	—	A67	●	●	—	IC circuit
					12V	≤ 200V	A64	●	●	—	—
Solid state switch	—	Grommet	Yes	3 wire (NPN)	24V	5V, 12V	F59	●	●	○	IC circuit
				3 wire (PNP)	—	—	F5P	●	●	○	—
				2 wire	—	100V, 200V	J51	●	●	○	—
	Diagnostic indication (2 color)	Grommet	Yes	3 wire (NPN)	5V, 12V	—	J59	●	●	○	—
							F59W	●	●	○	IC circuit
							F5PW	●	●	○	—
	Water resistant (2 color)	Grommet	Yes	2 wire	12V	—	J59W	●	●	○	—
							F5BA	—	●	○	—
							F5NT	—	●	○	IC circuit
	With timer	Grommet	Yes	3 wire (NPN)	5V, 12V	—	F59F	●	●	○	—
							F59F	●	●	○	—
							F5LF	●	●	○	—

Rod boot	—	None
	J	Nylon tarpaulin
	K	Heat resistant tarpaulin

\* Lead wire length 0.5m ..... — (Example): A53  
3m ..... L (Example): A53L  
5m ..... Z (Example): A53Z

\* Solid state switches marked with "○" are manufactured upon receipt of order.

### Mounting Bracket Part No.

Bore size (mm)	32	40	50	63	80	100
<b>Foot</b> <sup>(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) Two foot brackets required for one cylinder.  
\* Accessories for each mounting bracket are as follows.  
Foot, Flange, Single clevis: Mounting bolts  
Double clevis: Clevis pin, Cotter pin  
Refer to p.1.7-13 for details.

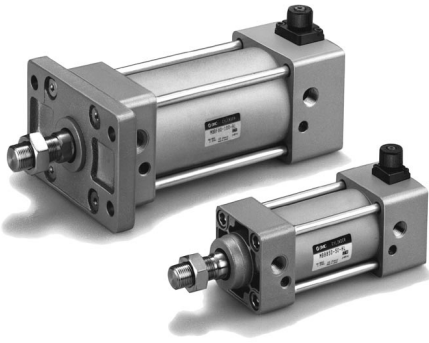
### Auto Switch Mounting Bracket Part No.

Bore size (mm)	32, 40	50, 63	80, 100
Mounting bracket	BT-03	BT-05	BT-06

A set of following stainless steel mounting screws is attached. (A mounting bracket itself is not attached. Please order it separately.)

BBA1: D-A5/A6/F5/J5 types

\*"D-F5BAL" switch is set on the cylinder with the screws above when shipped.  
When a switch only is shipped, "BBA1" screws are attached.



## Specifications

Bore size (mm)	32	40	50	63	80	100
Action	Double acting single rod					
Fluid	Air					
Proof pressure	1.5MPa					
Max. operating pressure	1.0MPa					
Min. operating pressure	0.15MPa*					
Ambient and fluid temperature	Without auto switch -10 to +70°C (No freezing)					
	With auto switch -10 to +60°C (No freezing)					
Lubrication	Not required (Non-lube)					
Operating piston speed	50 to 1000mm/s					
Allowable stroke tolerance	up to 250: $^{+1.0}_0$ , 251 to 1000: $^{+1.4}_0$ , 1001 to 1500: $^{+1.8}_0$					
Cushion	Both ends (Air cushion)					
Thread tolerance	JIS class 2					
Port size	Rc(PT) $\frac{1}{8}$	Rc(PT) $\frac{1}{4}$	Rc(PT) $\frac{1}{4}$	Rc(PT) $\frac{3}{8}$	Rc(PT) $\frac{3}{8}$	Rc(PT) $\frac{1}{2}$
Mounting	Basic, Foot, Front flange, Rear flange, Single clevis, Double clevis, Center trunnion					

\* 0.05MPa except locking parts.



## Made to Order

Refer to p.5.4-1 for made to order products of series MBB.

## Locking Specifications

Locking position	Head end, rod end, both ends					
	ø32	ø40	ø50	ø63	ø80	ø100
Holding force (Max.)(N)	550	860	1340	2140	3450	5390
Back lash	1.5mm or less					
Manual release	Non-locking style, locking style					

## Standard Stroke

Bore (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 available.

## Accessories

Mounting		Basic	Foot	Font flange	Rear flange	Single clevis	Double clevis	Center trunnion
Standard	Rod end nut	●	●	●	●	●	●	●
	Clevis pin	—	—	—	—	—	●	—
	Locking release bolt (N type only)	●	●	●	●	●	●	●
Option	Single knuckle joint	●	●	●	●	●	●	●
	Double knuckle joint (with pin)	●	●	●	●	●	●	●
	Rod boot	●	●	●	●	●	●	●

## Weight/Aluminum Tube

Bore size (mm)		32	40	50	63	80	100
Basic weight	Basic	0.50	0.69	1.19	1.47	2.73	3.70
	Foot	0.68	0.93	1.56	1.93	3.61	4.8
	Flange	0.79	1.06	1.64	2.26	4.18	7.01
	Single clevis	0.75	0.92	1.53	2.1	3.84	6.87
	Double clevis	0.76	0.96	1.62	2.26	4.13	7.39
	Trunnion	0.79	1.05	1.67	2.27	4.28	7.37
Additional weight per 50 stroke	All mounting bracket	0.11	0.16	0.26	0.27	0.42	0.56
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

## Additional Weight of Locking Part

Bore size (mm)		32	40	50	63	80	100
Manual release non-locking (N)	Locking at head end (H)	0.08	0.13	0.21	0.30	0.75	1.10
	Locking at rod end (R)	0.08	0.13	0.20	0.29	0.71	1.03
	Locking at both ends (W)	0.16	0.26	0.41	0.59	1.46	2.13
Manual release locking (L)	Locking at head end (H)	0.09	0.15	0.23	0.32	0.78	1.13
	Locking at rod end (R)	0.09	0.15	0.22	0.31	0.74	1.06
	Locking at both ends (W)	0.18	0.30	0.45	0.63	1.52	2.19

Calculation example: **MBBL32-100-HN**

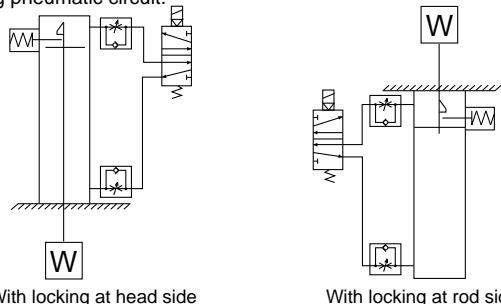
- Basic weight ..... 0.74
  - Additional weight ..... 0.11/50 stroke
  - Cylinder stroke ..... 100 stroke
  - Locking weight ..... 0.08 (Locking at head end, manual release non-locking style)
- 0.74+0.11X100/50+0.08=1.04kg

## Cautions for Using

### 1. Use recommended pneumatic circuit

#### ⚠ Caution

For correct operation of the locking and release mechanism, please use the following pneumatic circuit.



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

Avoid using circuit with 3 position solenoid valve (especially closed center). When pressure is trapped in the port with locking mechanism, end lock is free. When utilizing a 3 position closed center valve, even if the lock is engaged, it may become unlocked due to pressure leakage either across the piston or the valve spool.

#### ② Back pressure is required to release end lock.

Be sure air is supplied to side of cylinder without the locking mechanism, as above, prior to supplying air pressure to the side with end lock or lock may not be released. (Refer to "Release of lock".)

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

If mounting is done with lock engaged, lock mechanism may be damaged.

#### ④ Use with load 50% or less of rated capacity.

If cylinder is used at 50% load capacity or more, lock may be damaged.

#### ⑤ Do not use two cylinders in parallel at same time.

Avoid to using 2 or more end lock cylinders at same time to perform a single task because binding may occur and one of the cylinders end lock may not release.

#### ⑥ Use a speed controller as meter-out.

Meter-in control may not allow lock to release.

#### ⑦ Use complete stroke or cylinder at side with end lock.

If cylinder piston does not reached end of stroke, end lock may not lock or release.

### 2. Operating pressure

#### ⚠ Caution

Use pressures over 0.15MPa at port with locking mechanism.

### 3. Exhaust speed

#### ⚠ Caution

When pressures at port with locking mechanism is decrease to 0.05MPa or less, it is automatically locked. When exhaust pipe at port with locking mechanism is thin and long or speed controller is separated from cylinder port, exhaust speed is slow and will require additional time for lock engagement. Clogging the silencer mounted on exhaust port of solenoid valve leads to same result.

### 4. Relationship with cushion

#### ⚠ Caution

When cushion valve at side with locking mechanism is fully opened or closed, piston rod may reached at stroke end. Thus lock is not established. And when locking is done at cushion valve fully closed, adjust cushion valve since lock may not be released.

### 5. Release of lock

#### ⚠ Warning

When lock is to be released, supply air pressure to the port without the locking mechanism, this relieves the load from the lock mechanism. Then supply pressure to the port with lock, releasing the lock and changing cylinder direction. (Refer to recommended pneumatic circuit.) When port without lock mechanism is exhausted and locking mechanism is loaded, the lock may be damaged due to excessive force on lock during release. Piston rod will operate immediately.

### 6. Manual release

#### ⚠ Caution

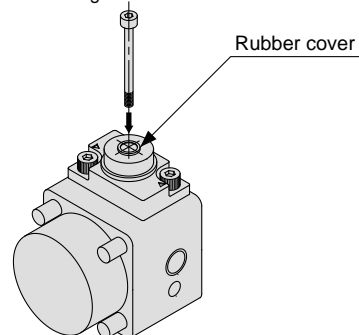
##### Non-locking style

Insert attached bolt from upper side of rubber cover (no need to remove rubber cover), tighten locking piston and pull bolt, locking will be released. When bolt is released, locking begins to take place. Thread size, required pulling force and stroke are listed below.

Bore size (mm)	Thread size	Pulling force	Stroke (mm)
32	≥ M2.5 X 0.45 X 25 ℓ	4.9N	2
40, 50, 63	≥ M3 X 0.5 X 30 ℓ	10N	3
80, 100	≥ M5 X 0.8 X 40 ℓ	24.5N	3

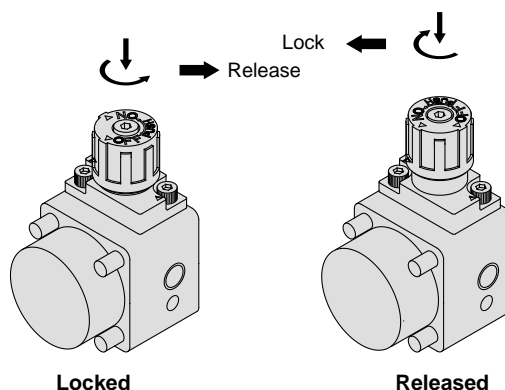
\* Remove bolt under normal operations.

It may cause malfunction of locking and release.



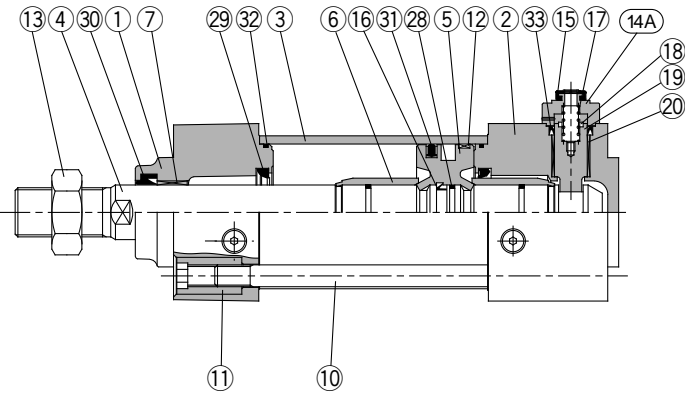
##### Locking style

Turn 90° to counterclockwise pushing M/O button. Lock is released when ▲ on cap and ▼ OFF mark on M/O button correspond. (Lock remains released.) When locking is desired, turn M/O button clockwise 90° while pushing fully, correspond ▲ on cap and ▼ ON mark on M/O button. The correct position is confirmed by click sound "click". If not confirmed, locking is not done.

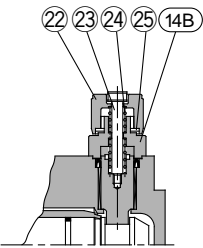
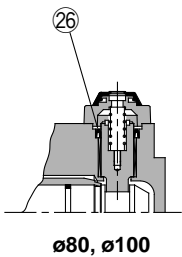
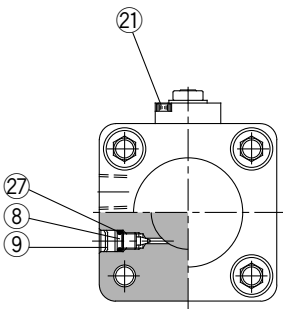
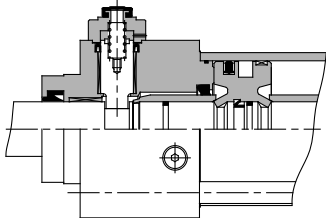


Construction

Locking at head end  
Manual release non-locking style: N



Locking at rod end



Manual release non-locking style: L

CJ1

CJP

CJ2

CM2

C85

CG1

MB

C95

CA1

CS1

Component Parts

No.	Description	Material	Note
①	Rod cover	Aluminum alloy	Metallic painted
②	Head cover	Aluminum alloy	Metallic painted
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	Steel for spring	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
⑭A	Cover A	Aluminum alloy	Painted black
⑭B	Cover B	Carbon steel	Tufftride
⑮	Rubber cover	Synthetic rubber	
⑯	Piston holder	Urethane	

Component Parts

No.	Description	Material	Note
⑰	Lock spring	Steel wire	Zinc chromated
⑱	Bumper	Urethane	
⑲	Lock piston	Carbon steel	Hardened, Hard chrome plated
⑳	Lock bushing	Copper alloy	
㉑	Bolt with hex. hole	Alloyed steel	Black zinc chromated
㉒	M/O knob	Zinc alloy	Painted black
㉓	M/O bolt	Alloyed steel	Black zinc chromated
㉔	M/O spring	Steel wire	Zinc chromated
㉕	Stopper ring	Carbon steel	Zinc chromated
㉖	Seal retainer	Rolled steel	ø80, ø100 only
㉗	Cushion valve seal	NBR	
㉘	Piston gasket	NBR	
㉙*	Cushion seal	Urethane	
㉚*	Rod seal	NBR	
㉛*	Piston seal	NBR	
㉜*	Cylinder tube gasket	NBR	
㉝*	Lock piston seal	NBR	

Replacement Part: Seal Kits

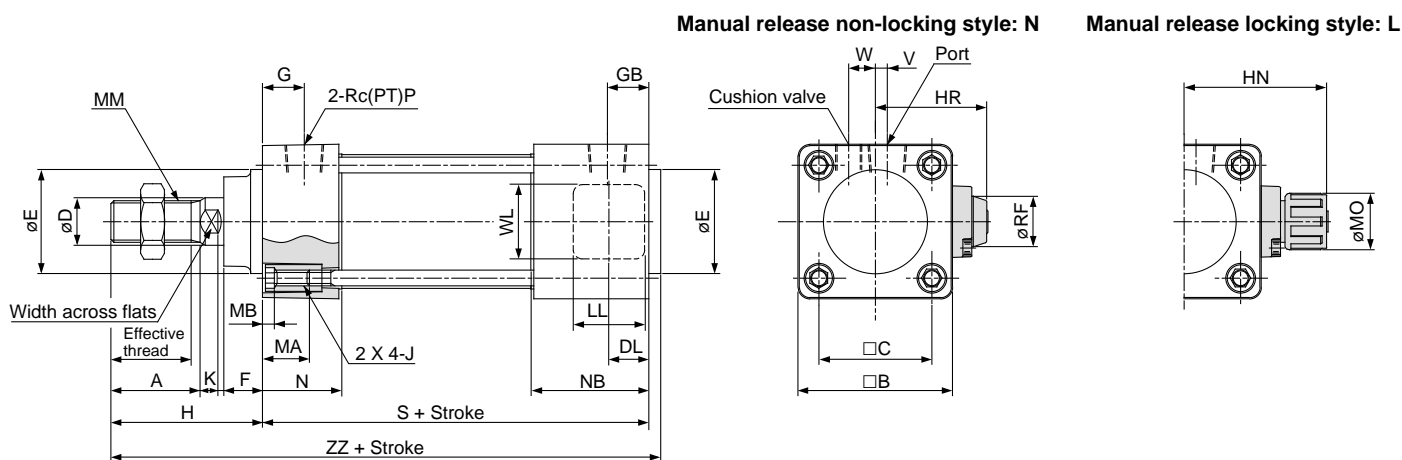
Bore size (mm)	Kit No.	Contents
32	MBB32-PS	Set of the No. ㉙, ㉚, ㉛, ㉜ and ㉝.
40	MBB40-PS	
50	MBB50-PS	
63	MBB63-PS	
80	MBB80-PS	
100	MBB100-PS	

\* The seal kit includes 2 cushion seals, 1 rod seal, 1 piston seal, and 2 tube gaskets.

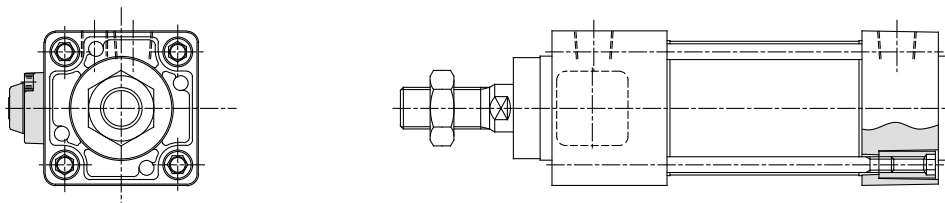
# Series MBB

## Basic/(B)

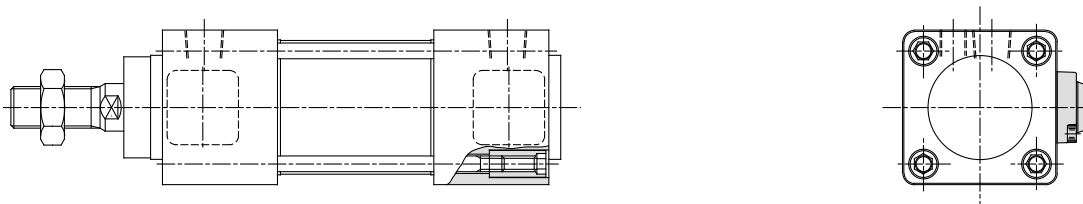
Locking at head end : MBB Bore size — Stroke — H□



Locking at rod end: MBBB Bore size — Stroke — R□



Locking at both ends: MBBB Bore size — Stroke — W□



—H□/—R□

(mm)

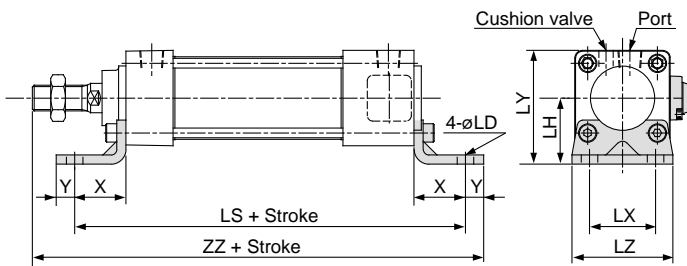
Bore size (mm)	Stroke range (mm)	Effective thread length	Width across flats	A	□B	□C	D	DL	E	F	G	GB	H	HR	HN	J	K	LL	MA	MB	MM
32	up to 500	19.5	10	22	46	32.5	12	9	30	13	13	21	47	33.5	45	M6 X 1.0	6	15	16	4	M10 X 1.25
40	up to 500	27	14	30	52	38	16	12	35	13	14	27	51	38.5	52.5	M6 X 1.0	6	21	16	4	M14 X 1.5
50	up to 600	32	18	35	65	46.5	20	13	40	14	15.5	27.5	58	45	59	M8 X 1.25	7	21	16	5	M18 X 1.5
63	up to 600	32	18	35	75	56.5	20	13	45	14	16.5	28.5	58	50	64	M8 X 1.25	7	21	16	5	M18 X 1.5
80	up to 750	37	22	40	95	72	25	16	45	20	19	37	72	62	76.5	M10 X 1.5	10	30	16	5	M22 X 1.5
100	up to 750	37	26	40	114	89	30	16	55	20	19	37	72	71.5	86	M10 X 1.5	10	30	16	5	M26 X 1.5

—W□

Bore size (mm)	Stroke range (mm)	MO	N	NB	P	RF	S	V	W	WL	ZZ	S	ZZ
32	up to 500	19	27	35	1/8	11	92	4	6.5	24	143	100	151
40	up to 500	19	27	40	1/4	11	97	4	9	24	152	110	165
50	up to 600	19	31.5	43.5	1/4	11	106	5	10.5	24	168	118	180
63	up to 600	19	31.5	43.5	3/8	11	106	9	12	24	168	118	180
80	up to 750	23	38	56	3/8	21	132	11.5	14	40	208	150	226
100	up to 750	23	38	56	1/2	21	132	17	15	40	208	150	226

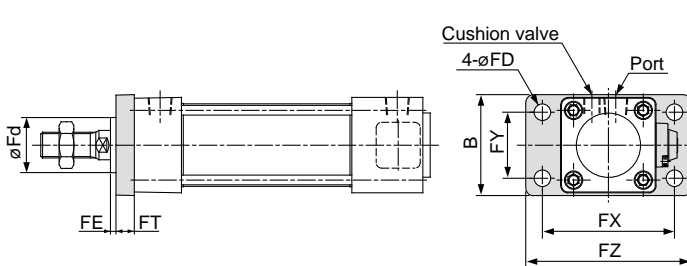
## With Mounting Bracket

### Foot(L)/Locking at head end (-H□)



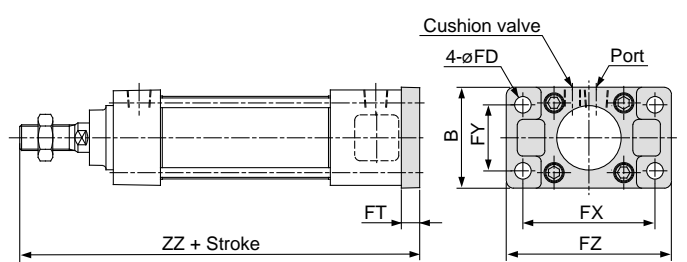
-H□/-R□		(mm)										-W□	
Bore size (mm)	Stroke range	X	Y	LD	LH	LS	LT	LX	LY	LZ	ZZ	LS	ZZ
32	up to 700	22	9	7	30	136	3.2	32	53	50	170	144	178
40	up to 800	24	11	9	33	145	3.2	38	59	55	183	158	196
50	up to 1000	27	11	9	40	160	3.2	46	72.5	70	202	172	214
63	up to 1000	27	14	12	45	160	3.6	56	82.5	80	205	172	217
80	up to 1000	30	14	12	55	192	4.5	72	102.5	100	248	210	266
100	up to 1000	32	16	14	65	196	4.5	89	122	120	252	214	270

### Front flange(F)/Locking at head end (-H□)



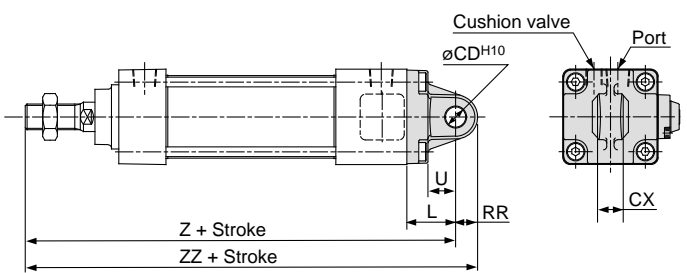
-H□/-R□/-W□		(mm)								
Bore size (mm)	Stroke range	B	FD	FE	FT	FX	FY	FZ	Fd	
32	up to 700	50	7	3	10	64	32	79	25	
40	up to 800	55	9	3	10	72	36	90	31	
50	up to 1000	70	9	2	12	90	45	110	38.5	
63	up to 1000	80	9	2	12	100	50	120	39.5	
80	up to 1000	100	12	4	16	126	63	153	45.5	
100	up to 1000	120	14	4	16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

### Rear flange(G)/Locking at head end (-H□)



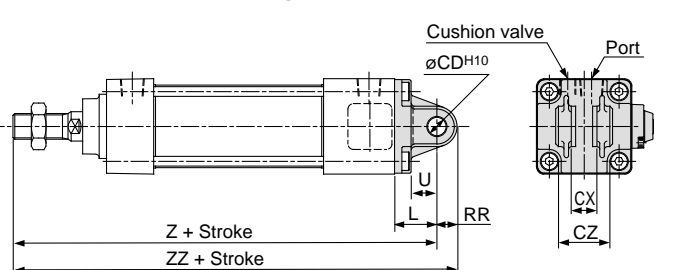
-H□/-R□		(mm)								-W□
Bore size (mm)	Stroke range	B	FD	FT	FX	FY	FZ	ZZ		ZZ
32	up to 500	50	7	10	64	32	79	149		157
40	up to 500	55	9	10	72	36	90	158		171
50	up to 600	70	9	12	90	45	110	176		188
63	up to 600	80	9	12	100	50	120	176		188
80	up to 750	100	12	16	126	63	153	220		238
100	up to 750	120	14	16	150	75	178	220		238

### Single clevis(C)/Locking at head end (-H□)



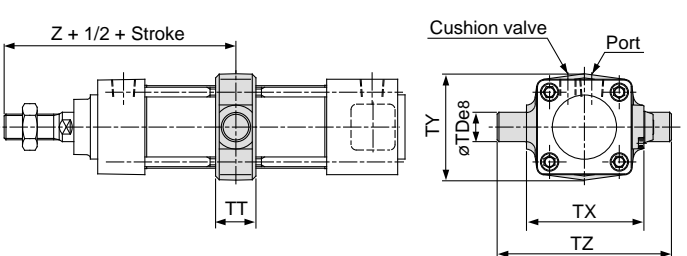
-H□/-R□		(mm)								-W□	
Bore size (mm)	Stroke range	L	RR	U	CDH10	CX <sup>-0.1</sup> <sub>-0.3</sub>	Z	ZZ		Z	ZZ
32	up to 500	23	10.5	13	10	14	162	172.5		170	180.5
40	up to 500	23	11	13	10	14	171	182		184	195
50	up to 600	30	15	17	14	20	194	209		206	221
63	up to 600	30	15	17	14	20	194	209		206	221
80	up to 750	42	23	26	22	30	246	269		264	287
100	up to 750	42	23	26	22	30	246	269		264	287

### Double clevis(D)/Locking at head end (-H□)



-H□/-R□		(mm)								-W□	
Bore size (mm)	Stroke range	L	RR	U	CDH10	CX <sup>+0.3</sup> <sub>+0.1</sub>	CZ	Z	ZZ	Z	ZZ
32	up to 500	23	10.5	13	10	14	28	162	172.5	170	180.5
40	up to 500	23	11	13	10	14	28	171	182	184	195
50	up to 600	30	15	17	14	20	40	194	209	206	221
63	up to 600	30	15	17	14	20	40	194	209	206	221
80	up to 750	42	23	26	22	30	60	246	269	264	287
100	up to 750	42	23	26	22	30	60	246	269	264	287

### Center trunnion(T)/Locking at head end (-H□)



-H□		(mm)						-R□/-W□	
Bore size (mm)	Stroke range	TDø8	TT	TX	TY	TZ	Z	Z	
32	up to 500	12	17	50	49	74	89	97	
40	up to 500	16	22	63	58	95	93	106	
50	up to 600	16	22	75	71	107	105	117	
63	up to 600	20	28	90	87	130	105	117	
80	up to 750	20	34	110	110	150	129	147	
100	up to 750	25	40	132	136	182	129	147	

CJ1

CJP

CJ2

CM2

C85

CG1

MB

C95

CA1

CS1