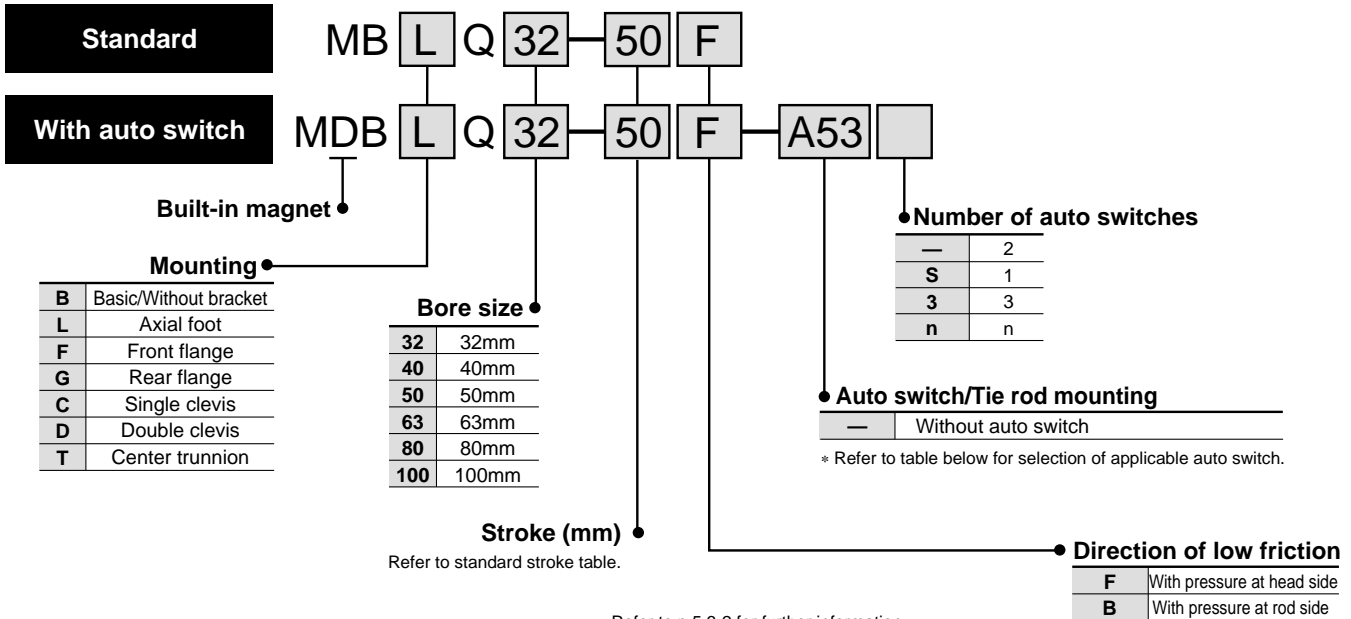


# Air Cylinder/Low Friction Series MB□Q

ø32, ø40, ø50, ø63, ø80, ø100

## How to Order



### Applicable Auto Switches/Tie Rod Mounting

\*Refer to p.5.3-2 for further information on the auto switch.

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 (NPN) (Equiv. to NPN)	—	5V	—	A56	●	●	—	IC circuit	
				2 wire	24V	12V	—	A53	●	●	●	—	Relay PLC
					—	12V	100V, 200V	A54	●	●	●	—	
					—	5V, 12V	—	A67	●	●	—	—	
					—	12V	≦ 200V	A64	●	●	—	—	
Diagnostic indication (2 color)	Yes	—	—	—	A59W	●	●	—	—				
Solid state switch	—	Grommet	Yes	3 wire (NPN)	24V	5V, 12V	—	F59	●	●	○	IC circuit	
				3 wire (PNP)	—	—	100V, 200V	F5P	●	●	○	—	
				2 wire	—	12V	—	J59	●	●	○	—	
					5V, 12V	—	F59W	●	●	○	IC circuit		
				Diagnostic indication (2 color)	—	—	—	F5PW	●	●	○	—	
					—	—	—	J59W	●	●	○	—	
				Water resistant (2 color)	—	—	—	F5BA	—	●	○	—	
					—	—	—	F5NT	—	●	○	IC circuit	
				With timer	—	—	—	F59F	●	●	○	—	
				Diagnostic output (2 color)	—	—	—	F5LF	●	●	○	—	
Latch diagnostic output (2 color)	—	—	—	—	—	—	—	—	—				

\* 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> (1)	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					
Direction of low friction	One direction					
Fluid	Air					
Proof pressure	1.05MPa					
Max. operating pressure	0.7MPa					
Min. operating pressure	0.01MPa					
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)					
Cushion	None					
Thread tolerance	JIS class 2					
Port size	Rc(PT) <sup>1</sup> / <sub>8</sub>	Rc(PT) <sup>1</sup> / <sub>4</sub>	Rc(PT) <sup>1</sup> / <sub>4</sub>	Rc(PT) <sup>3</sup> / <sub>8</sub>	Rc(PT) <sup>3</sup> / <sub>8</sub>	Rc(PT) <sup>1</sup> / <sub>2</sub>
Mounting	Basic, Foot, Front flange, Rear flange, Single clevis, Double clevis, Center trunnion					

**CJ1**

**CJP**

**CJ2**

**CM2**

**C85**

**CG1**

**MB**

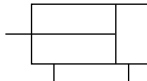
**C95**

**CA1**

**CS1**

### JIS Symbol

Double acting



## Standard Stroke

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



### Made to Order

Refer to p.5.4-1 for made to order products of series MB□Q.

## Accessories

Mounting		Basic	Foot	Front flange	Rear flange	Single clevis	Double clevis	Center trunnion
Standard	Rod end nut	●	●	●	●	●	●	●
	Clevis pin	—	—	—	—	—	●	—
Option	Single knuckle joint	●	●	●	●	●	●	●
	Double knuckle joint (with pin)	●	●	●	●	●	●	●

## Minimum Cylinder Stroke for Mounting Auto Switches

Refer to p.1.7-14 "Minimum Cylinder Stroke for Mounting Auto Switches".

# Series MB□Q

## Weight/Aluminum Tube

(kg)

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
	Single rod clevis	0.15	0.23	0.26	0.26	0.60	0.83
Accessories	Double rod clevis (with pin)	0.22	0.37	0.43	0.43	0.87	1.27

Calculation example: **MBBQ32-100** (Basic, ø32, 100st)

● Basic weight ..... 0.50 (Basic, ø32)

● Additional weight ... 0.11/50 stroke

● Cylinder stroke ..... 100 stroke

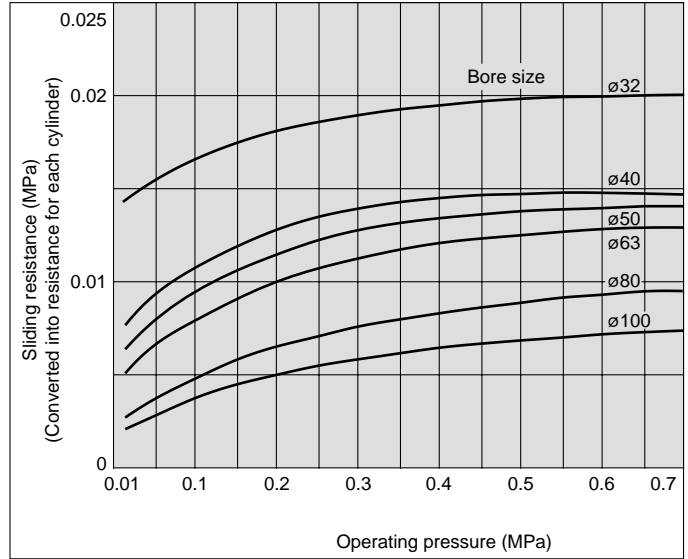
$$0.50 + 0.11 \times 100 / 50 = 0.72 \text{ kg}$$

## Selection Guide for the Low Friction Side

- ① When used as a balancer etc., follow the example of the application mentioned earlier applying pressure at one port while leaving the other port open to atmosphere.
  - With pressure at rod cover port ..... Low friction side B (Example of application ①)
  - With pressure at head cover port ..... Low friction side F (Example of application ②)

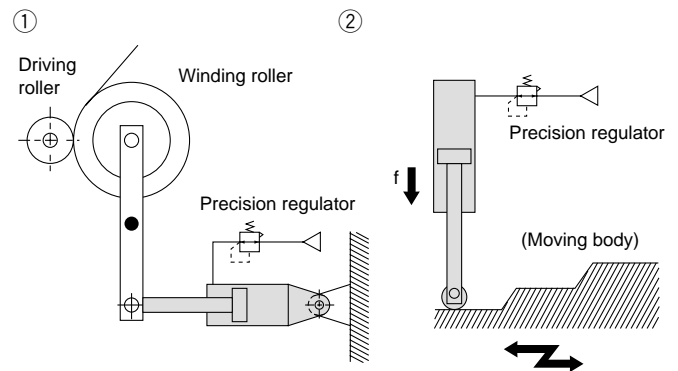
In both cases, as long as the outside pressure moves the piston rod, low friction can result in the direction of extension and retraction.
- ② When used applying pressure to both ports the same time, follow the above mentioned guide and as in the following.
  - With relatively higher pressure on rod cover port ..... Use Low friction side B
  - With relatively higher pressure on head cover port ..... Use Low friction side F

## Sliding Resistance on Low Friction Side

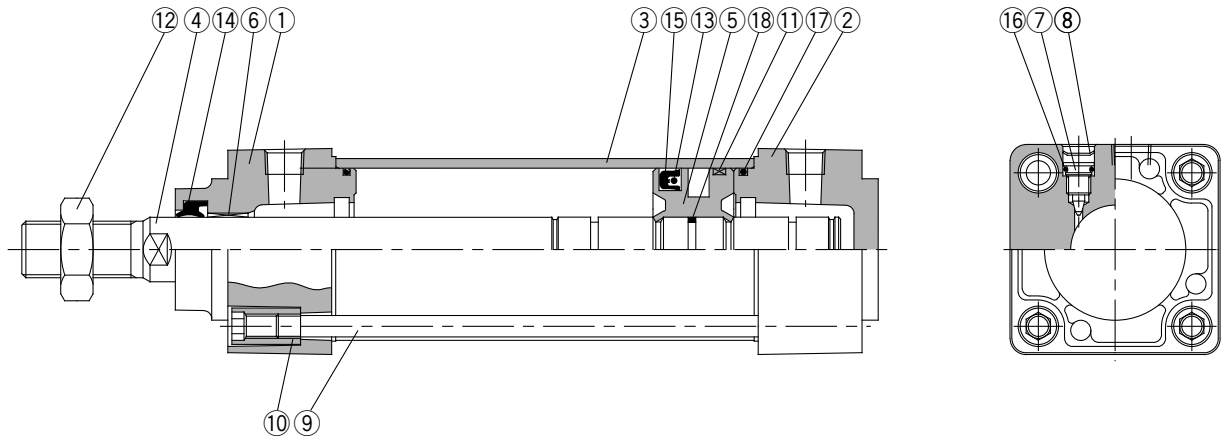


## Application Example

Low friction cylinder used in combination with precision regulator (Series IR)



**Construction**



- CJ1
- CJP
- CJ2
- CM2
- C85
- CG1
- MB**
- C95
- CA1
- CS1

**Component Parts**

No.	Description	Material	Note
①	<b>Rod cover</b>	Aluminum die-cast	Metallic painted
②	<b>Head cover</b>	Aluminum die-cast	Metallic painted
③	<b>Cylinder tube</b>	Aluminum alloy	Hard anodized
④	<b>Piston rod</b>	Carbon steel	Hard chrome plated
⑤	<b>Piston</b>	Aluminum alloy	Chromated
⑥	<b>Bushing</b>	Lead bronze cast	
⑦	<b>Cushion valve</b>	Steel wire	Nickel plated
⑧	<b>Snap ring</b>	Steel for spring	ø40 to ø100
⑨	<b>Tie rod</b>	Carbon steel	Uni-chromated
⑩	<b>Tie rod nut</b>	Carbon steel	Nickel plated
⑪	<b>Wear rod</b>	Resin	
⑫	<b>Rod end nut</b>	Carbon steel	Nickel plated
⑬ *	<b>Back up O ring</b>	NBR	
⑭ *	<b>Rod seal</b>	NBR	
⑮ *	<b>Piston seal</b>	NBR	
⑯	<b>Cushion valve seal</b>	NBR	
⑰ *	<b>Cylinder tube gasket</b>	NBR	
⑱	<b>Piston gasket</b>	NBR	

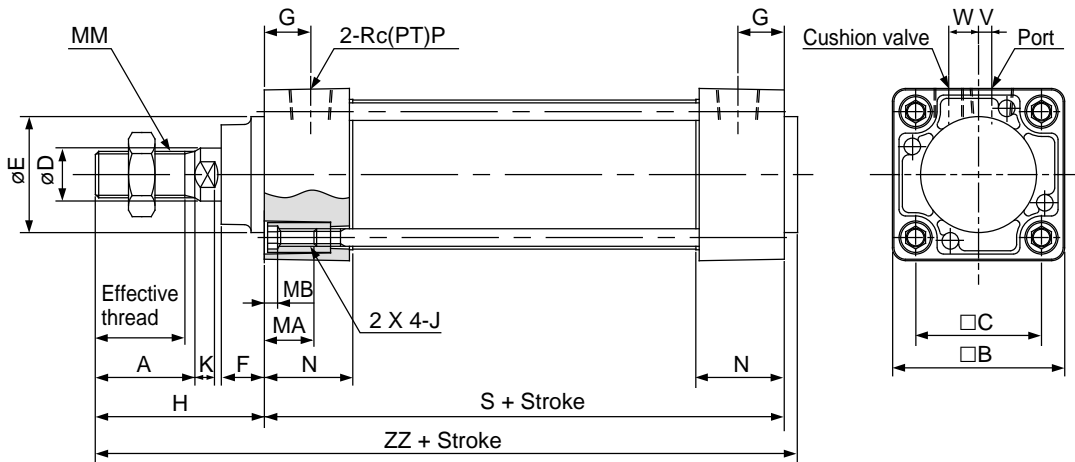
**Replacement Parts: Seal Kits**

Bore (mm)	Kit No.	Contents
<b>32</b>	MBQ32-PS	Set of the No. ⑬, ⑭, ⑮, and ⑰.
<b>40</b>	MBQ40-PS	
<b>50</b>	MBQ50-PS	
<b>63</b>	MBQ63-PS	
<b>80</b>	MBQ80-PS	
<b>100</b>	MBQ100-PS	

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

# Series MB□Q

## Basic/(B)



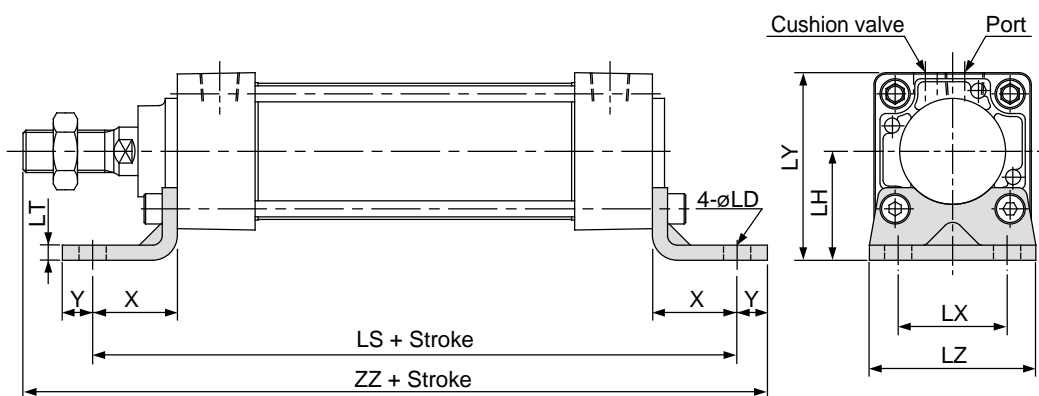
(mm)

Bore (mm)	Stroke range	Effective thread length	Width across flats	A	□B	□C	D	Ee11	F	G	H	MA	MB	J	K	MM	N	P	S	V	W	ZZ
32	up to 500	19.5	10	22	46	32.5	12	30	13	13	47	16	4	M6 X 1.0	6	M10 X 1.25	27	1/8	84	4	6.5	135
40	up to 500	27	14	30	52	38	16	35	13	14	51	16	4	M6 X 1.0	6	M14 X 1.5	27	1/4	84	4	9	139
50	up to 600	32	18	35	65	46.5	20	40	14	15.5	58	16	5	M8 X 1.25	7	M18 X 1.5	31.5	1/4	94	5	10.5	156
63	up to 600	32	18	35	75	56.5	20	45	14	16.5	58	16	5	M8 X 1.25	7	M18 X 1.5	31.5	3/8	94	9	12	156
80	up to 750	37	22	40	95	72	25	45	20	19	72	16	5	M10 X 1.5	10	M22 X 1.5	38	3/8	114	11.5	14	190
100	up to 750	37	26	40	114	89	30	55	20	19	72	16	5	M10 X 1.5	10	M26 X 1.5	38	1/2	114	17	15	190

## With Mounting Bracket

\* Refer to basic mounting/(B) for other dimensions and with rod boot.

## Foot/(L)



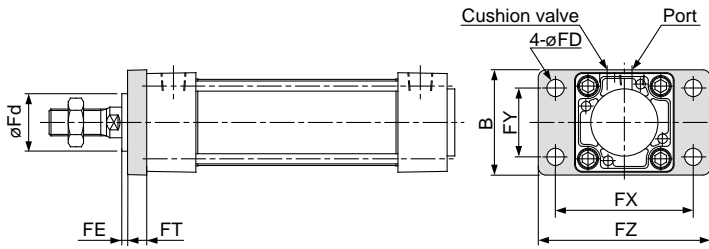
### Foot

(mm)

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

## With Mounting Bracket

### Front flange/(F)

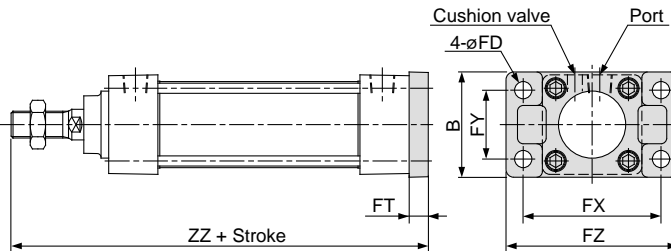


**Front flange**

(mm)

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

### Rear flange/(G)

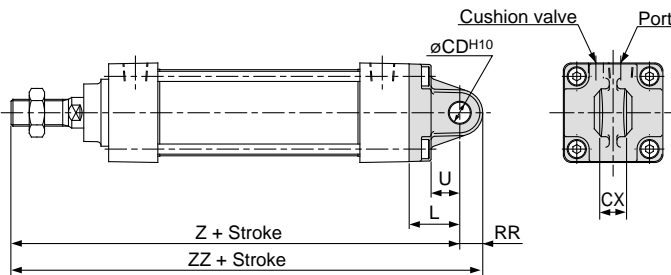


**Rear flange**

(mm)

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

### Single clevis/(C)

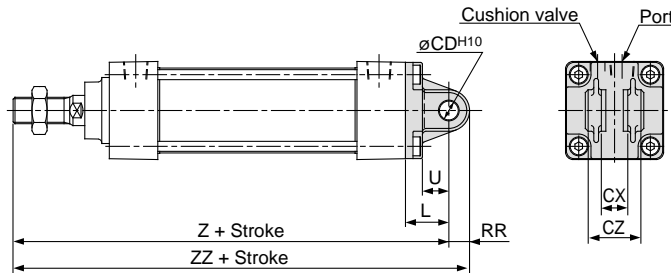


**Single clevis**

(mm)

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

### Double clevis/(D)

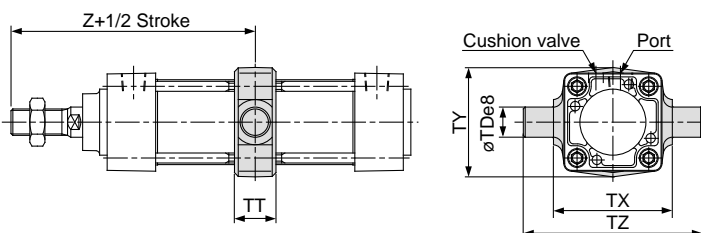


**Double clevis**

(mm)

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

### Center trunnion/(T)



**Center trunnion**

(mm)

Bore size (mm)	Stroke range	TDe8	TT	TX	TY	TZ	Z
<b>32</b>	up to 500	12	17	50	49	74	89
<b>40</b>	up to 500	16	22	63	58	95	93
<b>50</b>	up to 600	16	22	75	71	107	105
<b>63</b>	up to 600	20	28	90	87	130	105
<b>80</b>	up to 750	20	34	110	110	150	129
<b>100</b>	up to 750	25	40	132	136	182	129

**CJ1**

**CJP**

**CJ2**

**CM2**

**C85**

**CG1**

**MB**

**C95**

**CA1**

**CS1**