



Pen size cylinder——PB Series

Product series

Series name	Mounting type				Acting type	Bore size	Collocation of sensor switch	
	Basic	LB	FA	CJ			CS1-M	DS1-M
Double acting type: PB	●	●	●	●	Double acting	4		
						6	●	●
Single acting type: PSB, PTB	●	●	●	●	Single acting	10	●	●
						12	●	●
						16	●	●
Double rod type: PBD	●	●	●		Double acting	6	●	●
						10	●	●
						12	●	●
						16	●	●
Adjustable stroke type: PBJ	●	●	●		Double acting	10	●	●
						12	●	●
						16	●	●
Front mounting type: PBR	●	●	●		Double acting	6	●	●
						8	●	●
Front mounting single acting type: PSBR, PTBR	●	●	●		Single acting	10	●	●
						12	●	●
						16	●	●
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Installation and application

- When load changes in the work, the cylinder with abundant output capacity shall be selected.
- Relative cylinder with high temperature resistance or corrosion resistance shall be chosen under the condition of high temperature or corrosion.
- Necessary protection measure shall be taken in the environment with higher humidity, much dust or water drops, oil dust and welding dregs.
- Dirty substances in the pipe must be eliminated before cylinder is connected with pipeline to prevent the entrance of particles into the cylinder.
- The medium used by cylinder shall be filtered to 40 μ m or below.
- Anti-freezing measure shall be adopted under low temperature environment to prevent moisture freezing.
- The load of the cylinder with the diameter of $\Phi 4$ needs to be coaxial with the cylinder to avoid side load, otherwise, piston rod will be bent and deformed and damage the thread at the end of the rod. Single-acting type can not be added in return.
- If the cylinder is dismantled and stored for a long time, Please to conduct anti-rust treatment to the surface. Anti-dust caps shall be added in air inlet and outlet ports. The front and back cover can not be dismantled, which shall be especially noticed.

Criteria for selection: Cylinder thrust

Unit: Newton(N)

Bore size (mm)	Rod size (mm)	Acting type	Pressure area (mm ²)	Operating pressure(MPa)						
				0.1	0.2	0.3	0.4	0.5	0.6	0.7
4	2	Single acting-Push side	12.6	-	0.3	1.6	2.8	4.1	5.3	6.6
		Double acting Push side	12.6	1.3	2.5	3.8	5.0	6.3	7.6	8.8
		Double acting Pull side	9.4	0.9	1.9	2.8	3.8	4.7	5.6	6.6
		Single acting Pull side	28.3	-	2.2	5.0	7.8	10.6	13.5	16.3
6	3	Double acting Push side	21.2	-	0.7	2.9	5.0	7.1	9.2	11.3
		Double acting Pull side	28.3	2.8	5.7	8.5	11.3	14.2	17.0	19.8
		Double acting Pull side	21.2	2.1	4.2	6.4	8.5	10.6	12.7	14.8
		Single acting Push side	50.3	-	3.6	8.6	13.6	18.7	23.7	28.7
8	4	Single acting Pull side	37.7	-	1.0	4.8	8.6	12.4	16.1	19.9
		Double acting Push side	50.3	5.0	10.1	15.1	20.1	25.2	30.2	35.2
		Double acting Pull side	37.7	3.8	7.5	11.3	15.1	18.9	22.6	26.4
		Single acting Push side	78.5	-	6.2	14.1	21.9	29.8	37.6	45.5
10	4	Single acting Pull side	65.9	-	3.7	10.3	16.9	23.5	30.1	36.7
		Double acting Push side	78.5	7.9	15.7	23.6	31.4	39.3	47.1	55.0
		Double acting Pull side	65.9	6.6	13.2	19.8	26.4	33.0	39.5	46.2
		Single acting Push side	113.0	-	9.0	20.3	31.6	42.9	54.2	65.5
12	5	Single acting Pull side	93.4	-	5.1	14.4	23.8	33.1	42.4	51.8
		Double acting Push side	113.0	11.3	22.6	33.9	45.2	56.5	67.8	79.1
		Double acting Pull side	93.4	9.3	18.7	28.0	37.4	46.7	56.0	65.4
		Single acting Push side	201.0	-	14.5	34.6	54.7	74.8	94.9	115.0
16	5	Single acting Pull side	181.3	-	10.6	28.7	46.8	65.0	83.1	101.2
		Double acting Push side	201.0	20.1	40.2	60.3	80.4	100.5	120.6	140.7
		Double acting Pull side	181.3	18.1	36.3	54.4	72.5	90.7	108.8	126.9



Pen size cylinder

PB Series



Specification

Bore size(mm)		4	6	10	12	16
Acting type		Double acting, Single acting_push		Double acting, Single acting_push, Single acting_pull		
Fluid		Air(to be filtered by 40 μ m filter element)				
Operating pressure	Double acting	0.2~0.7MPa(28~100psi)(2.0~7.0bar)		0.1~0.7MPa(15~100psi)(1.0~7.0bar)		
	Single acting	0.3~0.7MPa(36~100psi)(3.0~7.0bar)		0.2~0.7MPa(28~100psi)(2.0~7.0bar)		
Proof pressure		1.1MPa(160psi)(11bar)				
Temperature °C		-20~70				
Speed range mm/s		50~500		50~800		
Stroke tolerance		+0.5 0		0~150 ^{+1.0} ₀ >150 ^{+1.4} ₀		
Cushion type		No cushion		Bumper		
Port size		Tube		M5 × 0.8		

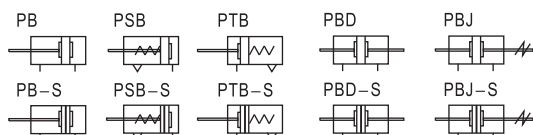
Add) Refer to P397~420 for detail of sensor switch.

Stroke

Bore size (mm)	Standard stroke (mm)	Max. std stroke	Max. stroke
PB	4 5 10 15 20	20	20
	6 10 15 20 25 30 40 50 60	60	60
	10 10 15 20 25 30 40 50 60 75 80 100 125 150 160 175 200	200	200
	12 10 15 20 25 30 40 50 60 75 80 100 125 150 160 175 200	200	300
	16 10 15 20 25 30 40 50 60 75 80 100 125 150 160 175 200 250 300	300	300
PBD	- 6 5 10 15 20 25 30 40 50	50	-
	10 10 15 20 25 30 40 50 60 75 80 100	100	-
	PBJ 12 10 15 20 25 30 40 50 60 75 80 100 125 150 160 175 200	200	-
	16 10 15 20 25 30 40 50 60 75 80 100 125 150 160 175 200	200	-

Note) Consult us for non-standard stroke.

Symbol



Product feature

1. JIS standard is implemented.
2. It belongs to mini cylinder that has compact structure, small volume and light weight.
3. The guide precision of piston rod is high and no additional lubricant is needed.
4. PB4 and PB6 can only be front mounted. PB10, PB12 and PB16 has the flexibility of both front and rear mount.
5. Piston rod stainless steel barrel make the cylinder adapt general corrosive working environment.
6. There are cylinders and accessories with several specifications for installation for your choice.
7. It has small cylinder diameter and quick reaction, suitable for the working environment with higher frequency.

Ordering code

PB	10 × 30	S	CB	
PBD	10 × 30	S		
PBJ	10 × 30-10 S			

Model

PB:	Pen size cylinder (Double acting)
PSB:	Pen size cylinder (Single acting_push)
PTB:	Pen size cylinder (Single acting_pull)
PBD:	Pen size cylinder (Double rod)
PBJ:	Pen size cylinder (Adjustable stroke)

Bore size

Model	Bore size
PB, PSB	4 6 10 12 16
PTB, PBD	6 10 12 16
PBJ	10 12 16

Stroke

Refer to stroke table for details

Adjustable stroke

Model	Adjustable stroke
PBJ	10: 10mm
	20: 20mm
	30: 30mm
	40: 40mm
	50: 50mm
	75: 75mm
	100: 100mm
Others	No this code

Mounting type ①

Model	Mounting type
PB	Blank: No accessories
PSB	FA: FA type
PTB	LB: LB type
	CJ: CJ type
PBD	Blank: No accessories
PBJ	FA: FA type
	LB: LB type

Back cover

Model	Back cover	Bore size
PB	CB: Double clevis	Φ10~Φ16
PSB	U: Perpendicular 90°	Φ10~Φ16
	R: Axial air-in	Φ6~Φ16
PTB	CB: Double clevis	Φ10~Φ16
	R: Axial air-in	Φ6~Φ16
PBD, PBJ	No this code	

Magnet

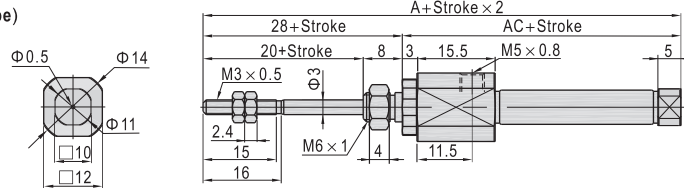
Bore size	Magnet
Φ4	Blank: Without magnet
Φ6~Φ16	Blank: Without magnet
	S: With magnet

① Please refer to page 220 for accessory parts.



PTB

Φ6(R Type)

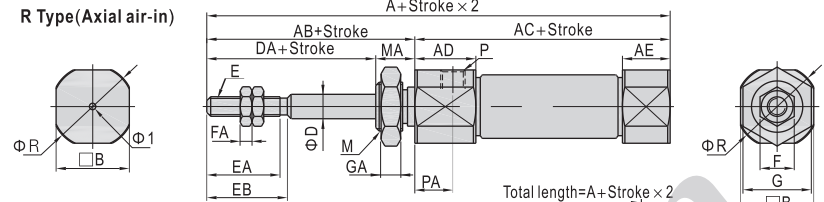


Stroke\Item	A	AC
5~15	82	54
16~30	91	63
31~45	95	67
46~60	109	81

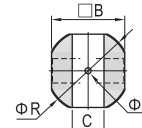
Note) Only axial air intake type of back cover is available for Φ6mm bore size.

Φ10~Φ16

R Type(Axial air-in)



CB Type(Double clevis)



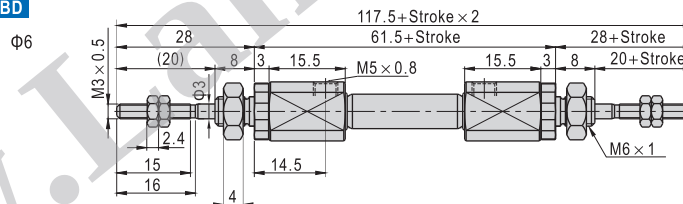
Note) Φ10~Φ16 bore sized don't have perpendicular(90°) air-in.

Bore size\Item		A												AC											
Back cover		R				CB				AB				—				AD							
Stroke		5~15	16~30	31~45	46~60	5~15	16~30	31~45	46~60		5~15	16~30	31~45	46~60		5~15	16~30	31~45	46~60						
10		76.5	84	96	108	89.5	97	109	121	28	48.5	56	68	80	11.5										
12		76.5	84	96	108	94.5	102	114	126	28	48.5	56	68	80	11.5										
16		77.5	86	98	110	95.5	104	116	128	28	49.5	58	70	82	12										

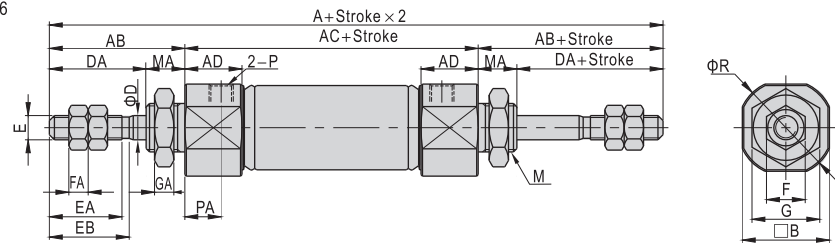
Bore size\Item		AE		B	C	CA	D	DA	E	EA	EB	F	FA	G	GA	K	KA	M	MA	P	PA	R
Back cover		R	CB																			
10		5	18	12	3.3	13	4	20	M4×0.7	15	16.5	7	2.2	11	4	3.3	5	M8×1.0	8	M5×0.8	7.5	14
12		5	23	15	6.6	18	5	20	M5×0.8	15	16.5	8	4	14	4	5	8	M10×1.0	8	M5×0.8	7.5	17
16		5	23	18	6.6	18	5	20	M5×0.8	15	16.5	8	4	14	4	5	8	M10×1.0	8	M5×0.8	7.5	20

Remark: The dimensions of magnet type cylinder are the same as non-magnet type cylinder.

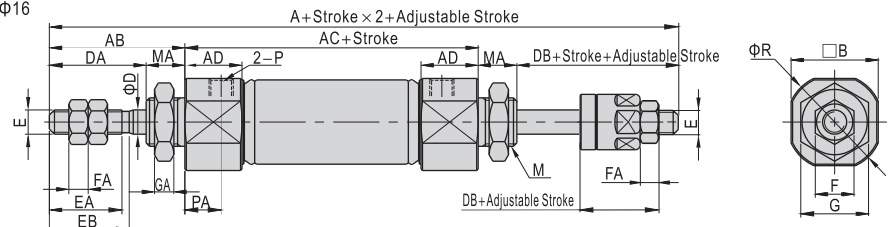
PBD



Φ10~Φ16



PBJ Φ10~Φ16



Bore size\Item	A		AB	AC	AD	B	D	DA	DB	E	EA	EB	F	FA	G	GA	M	MA	P	PA
Model	PBD	PBJ																		
10	104	99	28	48	11.5	12	4	20	15	M4×0.7	15	16.5	7	2.2	11	4	M8×1.0	8	M5×0.8	7.5
12	104	101	28	48	11.5	15	5	20	17	M5×0.8	15	16.5	8	4	14	4	M10×1.0	8	M5×0.8	7.5
16	107	104	28	51	12	18	5	20	17	M5×0.8	15	16.5	8	4	14	4	M10×1.0	8	M5×0.8	7.5

Remark: The dimensions of magnet type cylinder are the same as non-magnet type cylinder.

Pen size cylinder

PBR Series



Specification

Bore size(mm)		6	8	10	12	16
Acting type		Double acting, Single acting_push, Single acting_pull				
Fluid		Air(to be filtered by 40 μ m filter element)				
Operating pressure	Double acting	0.1~0.7MPa(15~100psi)(1.0~7.0bar)				
	Single acting	0.2~0.7MPa(28~100psi)(2.0~7.0bar)				
Proof pressure		1.1MPa(160psi)(11bar)				
Temperature °C		-20~70				
Speed range mm/s		50~800				
Stroke tolerance		0~150 ^{+1.0} ₀ >150 ^{+1.4} ₀				
Cushion type		Bumper				
Port size		M5 × 0.8				

Add) Refer to P397~420 for detail of sensor switch.

Stroke

Bore size (mm)			Standard stroke (mm)																	Max. std stroke	Max. stroke
PBR	6	10	15	20	25	30	40	50	60										60	60	
	8	10	15	20	25	30	40	50	60	75	80	100	125	150					150	150	
	10	10	15	20	25	30	40	50	60	75	80	100	125	150	160	175	200		200	200	
	12	10	15	20	25	30	40	50	60	75	80	100	125	150	160	175	200		200	300	
	16	10	15	20	25	30	40	50	60	75	80	100	125	150	160	175	200	250	300	300	
PSBR PTBR	6	5	10	15	20	25	30	40	50	60									—	—	
	8	5	10	15	20	25	30	40	50	60									—	—	
	10	5	10	15	20	25	30	40	50	60									—	—	
	12	5	10	15	20	25	30	40	50	60	75								—	—	
	16	5	10	15	20	25	30	40	50	60	75	100							—	—	

Note) Consult us for non-standard stroke.

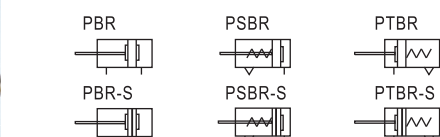
Ordering code

PBR 16 × 30 S U		
Model	Back cover	
	Model	Back cover
	PBR	U: Perpendicular 90°
	PSBR	R: Axial air-in
Bore size	Stroke	
	Refer to stroke table for details	
	Magnet	
	Blank: Without magnet	
Stroke	S: With magnet	

Mounting type

Top bolt mounting	
Bottom bolt mounting	
Note: Use an applicable bolt to mount upward from the bottom.	

Symbol



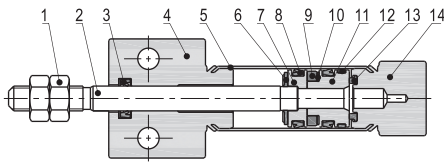
Product feature

1. JIS standard is implemented.
2. It belongs to mini cylinder that has compact structure, small volume and light weight.
3. The guide precision of piston rod is high and no additional lubricant is needed.
4. Screw holes are designed for mounting directly at the front cover without any accessories.
5. Piston rod stainless steel barrel make the cylinder adapt general corrosive working environment.
6. It has small cylinder diameter and quick reaction, suitable for the working environment with higher frequency.

PBR Series

Inner structure and material of major parts

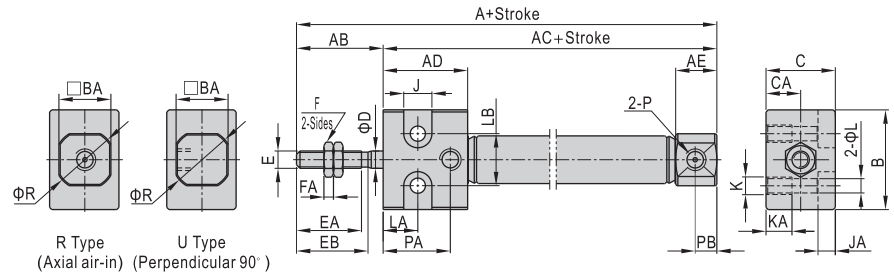
Double acting with magnet



NO.	Item	Material
1	Rod nut	Carbon steel
2	Piston rod	SUS304
3	Front cover O-ring	NBR
4	Front cover	Aluminum alloy
5	Barrel	SUS316L
6	Bumper	TPU
7	Piston	SUS303\Aluminum alloy
8	Piston seal	NBR
9	Magnet	Sintered metal (Neodymium-iron-boron)
10	Magnet washer	NBR
11	Magnet holder	Aluminum alloy
12	Wear ring	Wear resistant material
13	Bumper	TPU
14	Back cover	Aluminum alloy

Dimensions

Model: PBR

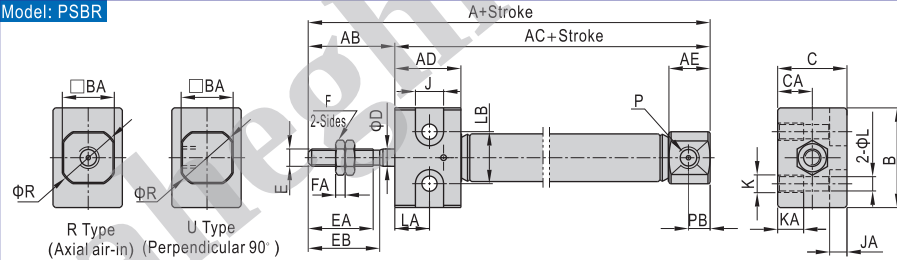


Bore size \ Item	A	AB	AC	AD	AE	B	BA	C	CA	D	E	EA	EB	F	FA
6	70	20	50	19	7	17.2	10	14	7	3	M3×0.5	15	16	5.5	2.4
8	74	20	54	19.5	9.5	19.2	12	16	8	4	M4×0.7	15	16.5	7	2.2
10	74	20	54	19.5	9.5	19.2	12	16	8	4	M4×0.7	15	16.5	7	2.2
12	74	20	54	19.5	9.5	24.2	15	20	10	5	M5×0.8	15	16.5	8	4
16	76	20	56	20	9.5	24.2	18	20	10	6	M5×0.8	15	16.5	8	4

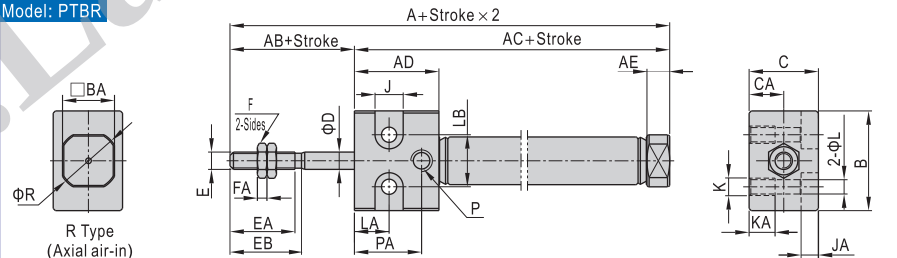
Bore size \ Item	J	JA	K	KA	L	LA	LB	P	PA	PB	R
6	6.5	4	M4×0.7	7	3.3	8	10	M5×0.8	14	-	11
8	6.5	4	M4×0.7	7	3.3	8	12	M5×0.8	15	5	14
10	6.5	4	M4×0.7	7	3.3	8	12	M5×0.8	15.5	5	14
12	8	5	M5×0.8	8	4.3	8	16	M5×0.8	15.5	5	17
16	8	5	M5×0.8	8	4.3	8	16	M5×0.8	15.5	5	20

Remark: The dimensions of magnet type cylinder are the same as non-magnet type cylinder.
Only axial air intake type of back cover is available for Φ6mm bore size.

Model: PSBR



Model: PTBR



Bore size \ Item	Stroke	5~15	16~30	31~45	46~60	61~75	76~100	AB	5~15	16~30	31~45	46~60	61~75	76~100	AD	AE	B
PSBR	6	70	79	83	97	-	-	20	50	59	63	77	-	-	13	7	17.2
	8	76.5	82.5	93.5	101.5	-	-	20	56.5	62.5	73.5	81.5	-	-	13	9.5	19.2
	10	73.5	81	93	105	-	-	20	53.5	61	73	85	-	-	13	9.5	19.2
	12	73.5	81	93	105	111.5	-	20	53.5	61	73	85	91.5	-	13	9.5	24.2
	16	74.5	83	95	107	113	119	20	54.5	63	75	87	93	99	13	9.5	24.2

Bore size \ Item	Stroke	5~15	16~30	31~45	46~60	61~75	76~100	AB	5~15	16~30	31~45	46~60	61~75	76~100	AD	AE	B
PTBR	6	74.5	83.5	87.5	101.5	-	-	20	54.5	63.5	67.5	81.5	-	-	19	5	17.2
	8	78.5	84.5	95.5	103.5	-	-	20	58.5	64.5	75.5	83.5	-	-	19.5	5	19.2
	10	76.5	84	96	108	-	-	20	56.5	64	76	88	-	-	19.5	5	19.2
	12	76.5	84	96	108	114.5	-	20	56.5	64	76	88	94.5	-	19.5	5	24.2
	16	77.5	86	98	110	116	122	20	57.5	66	78	90	96	102	20	5	24.2

Bore size \ Item	BA	C	CA	D	E	EA	EB	F	FA	J	JA	K	KA	L	LA	LB	P	PA	PB	R
6	10	14	7	3	M3×0.5	15	16	5.5	2.4	6.5	4	M4×0.7	7	3.3	8	10	M5×0.8	14	-	11
8	12	16	8	4	M4×0.7	15	16.5	7	2.2	6.5	4	M4×0.7	7	3.3	8	12	M5×0.8	15	5	14
10	12	16	8	4	M4×0.7	15	16.5	7	2.2	6.5	4	M4×0.7	7	3.3	8	12	M5×0.8	15.5	5	14
12	15	20	10	5	M5×0.8	15	16.5	8	4	8	5	M5×0.8	8	4.3	8	16	M5×0.8	15.5	5	17
16	18	20	10	6	M5×0.8	15	16.5	8	4	8	5	M5×0.8	8	4.3	8	16	M5×0.8	15.5	5	20

Remark: The dimensions of magnet type cylinder are the same as non-magnet type cylinder.
Only axial air intake type of back cover is available for Φ6mm bore size.

Accessories

Ordering code

F-PB 10 LB			
Accessory	Model	Bore size	Accessory type ①
			Mounting accessory
			Knuckle ③

① Please refer to accessory list for selection and ordering information.

② CJ is attached with relevant PIN.

③ Please refer to page 393, 394 for others knuckle.

Accessory selection

Cylinder model	PB	PSB, PTB	PBD, PBJ
Accessories	Standard	With magnet	Standard
Mounting accessory			
Knuckle ①			
Sensor switch ②			

① Please refer to P393~396 for knuckle detail.

② Please refer to P397~420 for detail of sensor switch.

Material of accessories

Accessories	Mounting accessories	Knuckle
Bore size	LB	FA
4~16	△	△

△—SPCC, □—Carbon steel.

List for ordering code of accessories

Accessories	Mounting accessory
Bore size	LB
4	-
6	F-PB6LB
10	F-PB10LB
12	F-PB12LB
16	F-PB16LB

Accessories	Knuckle
Bore size	I: I Knuckle
4	-
6	F-PB6I
10	F-PB10I
12	F-PB12I
16	F-PB16I

Accessories	Sensor switch
Bore size	CS1-M
4	-
6	CS1-M-S06
10	CS1-M-S10
12	CS1-M-S12
16	CS1-M-S16

Dimensions

LB	B	BB	C	CC	D	E	F	G	I
6	24	28	32	56.5	9	16.5	5	7	4.5
10	24	28	32	53	9	16.5	5	7	4.5
12	33	28	42	55	14	25	6	9	5.5
16	33	28	42	57	14	25	6	9	5.5

FA	B	BB	C	CC	D	E	F
6	24	28	32	49.5	14	1.5	4.5
10	24	28	32	46	14	1.5	4.5
12	33	28	42	46	20	2.5	5.5
16	33	28	42	48	20	2.5	5.5

CJ	B	BB	C	D	E	F	G	H	I	J	K	L
10	82	22	54	40	4.5	29	21	12	2	18	9.1	32
12	84	28	56	48	5.5	35	25	16	2.5	20.4	14.1	38
16	86	28	58	48	5.5	35	25	16	2.5	20.4	14.1	38

Note) CJ type accessories need to be matched with I joint and I joint has to be ordered individually.

I Knuckle	A	B	C	D	E	F	G	H
F-PB6I	M3×0.5	6	3	3	12	5	5	5
F-PB10I	M4×0.7	12	3.3	3	21	9.1	7.5	8
F-PB12I	M5×0.8	12	5	6.3	25	14.1	7.5	12

Y Knuckle	A	B	C	D	E	F	G	H	I
F-PB6Y	15.5	12	5	6	M3×0.5	6	9	3	3
F-PB10Y	28	21	10.2	12	M4×0.7	10	15.5	3.2	3.3
F-PB12Y	28	21	10.2	12	M5×0.8	10	15.5	6.5	5