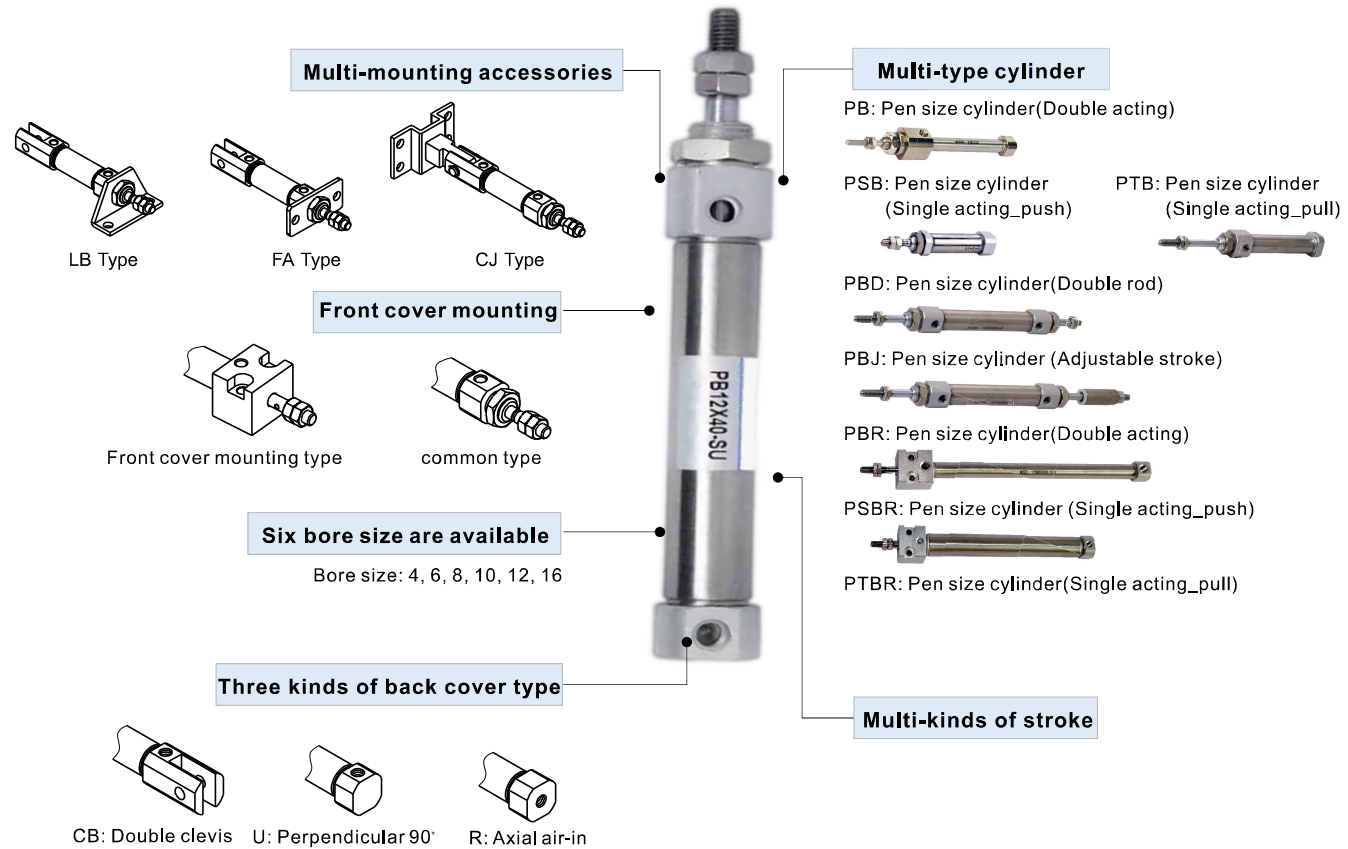




Pen size cylinder——PB Series

Compendium of PB Series



Criteria for selection: Cylinder thrust

Unit : Newton(N)

Bore size	Rod size	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								
6	3	Push side	28.3	-	2.2	5.0	7.8	10.6	13.5	16.3
		Pull side	21.2	-	0.7	2.9	5.0	7.1	9.2	11.3
		Double acting								
		Push side	28.3	2.8	5.7	8.5	11.3	14.2	17.0	19.8
8	4	Pull side	21.2	2.1	4.2	6.4	8.5	10.6	12.7	14.8
		Double acting								
		Push side	50.3	-	3.6	8.6	13.6	18.7	23.7	28.7
		Pull side	37.7	-	1.0	4.8	8.6	12.4	16.1	19.9
10	4	Double acting								
		Push side	50.3	5.0	10.1	15.1	20.1	25.2	30.2	35.2
		Pull side	37.7	3.8	7.5	11.3	15.1	18.9	22.6	26.4
		Double acting								
12	5	Single acting								
		Push side	78.5	-	6.2	14.1	21.9	29.8	37.6	45.5
		Pull side	65.9	-	3.7	10.3	16.9	23.5	30.1	36.7
		Double acting								
16	5	Push side	78.5	7.9	15.7	23.6	31.4	39.3	47.1	55.0
		Pull side	65.9	6.6	13.2	19.8	26.4	33.0	39.5	46.2
		Double acting								
		Push side	113.0	-	9.0	20.3	31.6	42.9	54.2	65.5
12	5	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
		Pull side	93.4	9.3	18.7	28.0	37.4	46.7	56.0	65.4
16	5	Single acting								
		Push side	201.0	-	14.5	34.6	54.7	74.8	94.9	115.0
		Pull side	181.3	-	10.6	28.7	46.8	65.0	83.1	101.2
		Double acting								
16	5	Push side	201.0	20.1	40.2	60.3	80.4	100.5	120.6	140.7
		Pull side	181.3	18.1	36.3	54.4	72.5	90.7	108.8	126.9

Installation and application

1. When load changes in the work, the cylinder with abundant output capacity shall be selected.
2. Relative cylinder with high temperature resistance or corrosion resistance shall be chosen under the condition of high temperature or corrosion.
3. Necessary protection measure shall be taken in the environment with higher humidity, much dust or water drops, oil dust and welding dregs.
4. Dirty substances in the pipe must be eliminated before cylinder is connected with pipeline to prevent the entrance of particles into the cylinder.
5. The medium used by cylinder shall be filtered to 40μm or below.
6. Anti-freezing measure shall be adopted under low temperature environment to prevent moisture freezing.
7. The load of the cylinder with the diameter of Φ4 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.
8. 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.

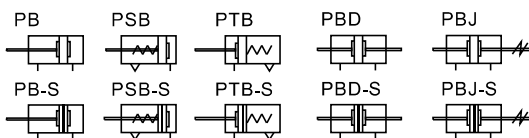


Pen size cylinder

PB Series



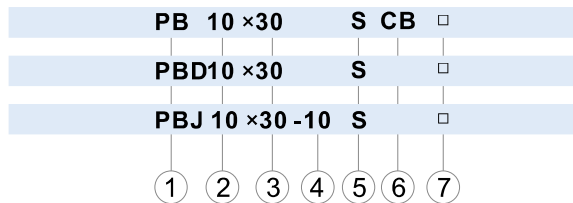
Symbol



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 and cylinder body with the material of stainless steel make the cylinder adapt general working environment with corrosivity.
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



① Model	② Bore size	③ Stroke	④ Adjustable stroke	⑤ Magnet	⑥ Back cover			⑦ Mounting type										
PB: Pen size cylinder (Double acting)	4	Refer to stroke table for details	No this code	Blank: Without magnet S: With magne	Model	Back cover		Model	Mounting type									
	6					CB: Double clevis U: Perpendicular 90°	Φ10~Φ16			PB PSB PTB	Blank: No accessories FA: FA type LB: LB type CJ: CJ type							
	10						R: Axial air-in					Φ10~Φ16						
	12											Φ6~Φ16						
16	CB: Double clevis R: Axial air-in						Φ10~Φ16 Φ6~Φ16											
PSB: Pen size cylinder (Single acting_push)	6					Refer to stroke table for details	No this code			Blank: Without magnet S: With magne	Model	Back cover		Model	Mounting type			
	10											CB: Double clevis U: Perpendicular 90°	Φ10~Φ16			PB PSB PTB	Blank: No accessories FA: FA type LB: LB type CJ: CJ type	
	12												R: Axial air-in					Φ10~Φ16
	16				Φ6~Φ16													
16	CB: Double clevis R: Axial air-in				Φ10~Φ16 Φ6~Φ16													
PTB: Pen size cylinder (Single acting_pull)	6				Refer to stroke table for details			No this code	Blank: Without magnet S: With magne			Model	Back cover			Model	Mounting type	
	10												CB: Double clevis U: Perpendicular 90°					Φ10~Φ16
	12	R: Axial air-in	Φ10~Φ16															
	16		Φ6~Φ16															
16	CB: Double clevis R: Axial air-in	Φ10~Φ16 Φ6~Φ16																
PBD: Pen size cylinder (Double rod)	6	Refer to stroke table for details	No this code	Blank: Without magnet S: With magne							Model		Back cover		Model			Mounting type
	10												CB: Double clevis U: Perpendicular 90°	Φ10~Φ16				
	12					R: Axial air-in	Φ10~Φ16											
	16						Φ6~Φ16											
16	CB: Double clevis R: Axial air-in					Φ10~Φ16 Φ6~Φ16												
PBJ: Pen size cylinder (Adjustable stroke)	10					Refer to stroke table for details	10 20 30 40 50 75 100			Blank: Without magnet S: With magne		Model	Back cover			Model	Mounting type	
	12												CB: Double clevis U: Perpendicular 90°	Φ10~Φ16				
	12				R: Axial air-in			Φ10~Φ16										
	16							Φ6~Φ16										
16	CB: Double clevis R: Axial air-in				Φ10~Φ16 Φ6~Φ16													

Specification

Bore size(mm)	4	6	10	12	16
Acting type	Double acting、Single acting_Push		Double acting、Single acting		
Fluid	Air(to be filtered by 40μm filter element)				
Operating pressure	Double acting	0.2~0.7MPa(28~100psi)(2.0~7.0bar)		0.15~0.7MPa(22~100psi)(1.5~7.0bar)	
	Single acting	0.3~0.7MPa(45~100psi)(3.0~7.0bar)		0.2~0.7MPa(28~100psi)(2.0~7.0bar)	
Proof pressure	1.2MPa(175psi)(12bar)				
Temperature °C	-20~70				
Speed range mm/s	50~500		50~800		
Stroke tolerance	+0.5 0		0~150 ^{+1.0} ₀ >150 ^{+1.5} ₀		
Cushion type	No cushion		Bumper		
Port size	Tube		M5×0.8		

Stroke

Bore size (mm)	Standard stroke (mm)						Max.std stroke	Max. stroke											
	4	5	10	15	20	30													
PB	4	5	10	15	20		20	20											
	6	10	15	20	25	30	40	50	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
PBD	6	5	10	15	20	25	30	40	50										
	10	10	15	20	25	30	40	50	60	75	80	100							
PBD 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	-
PSB	4	5	10	15	20														
	6	5	10	15	20	25	30	40	50	60									
PSB PTB	10	5	10	15	20	25	30	40	50	60									
	12	5	10	15	20	25	30	40	50	60									
	12	5	10	15	20	25	30	40	50	60									
	16	5	10	15	20	25	30	40	50	60									

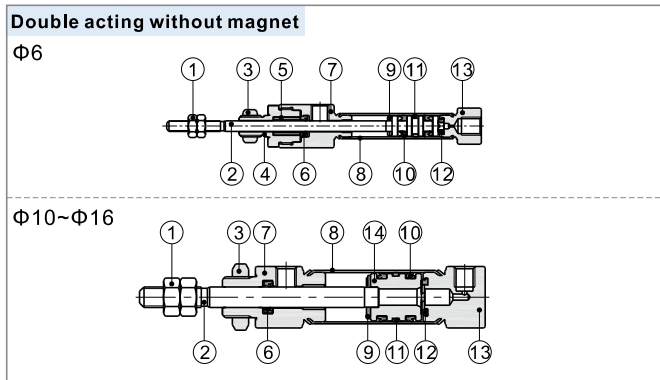
[Note] Consult us for non-standard stroke.



Pen size cylinder

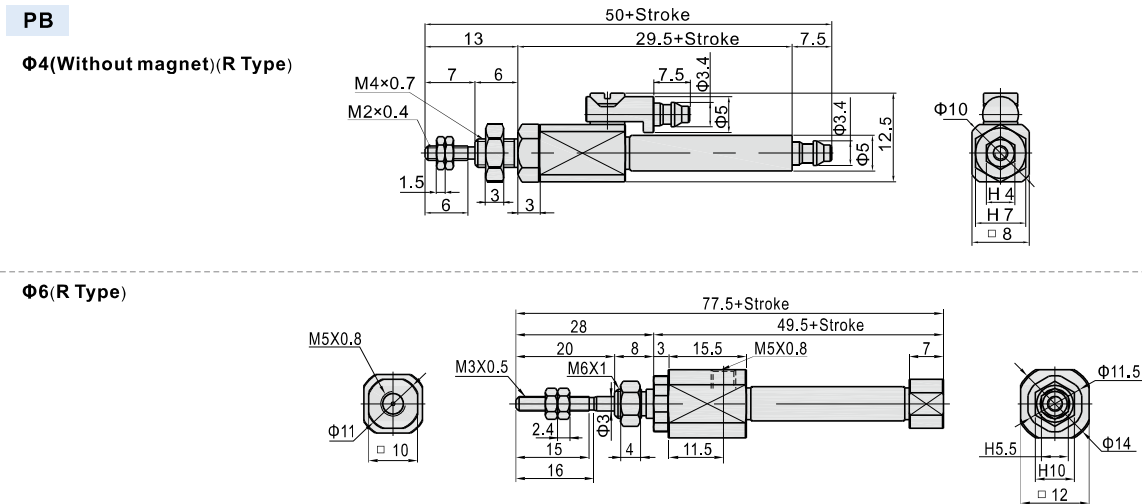
PB Series

Inner structure and material of major parts

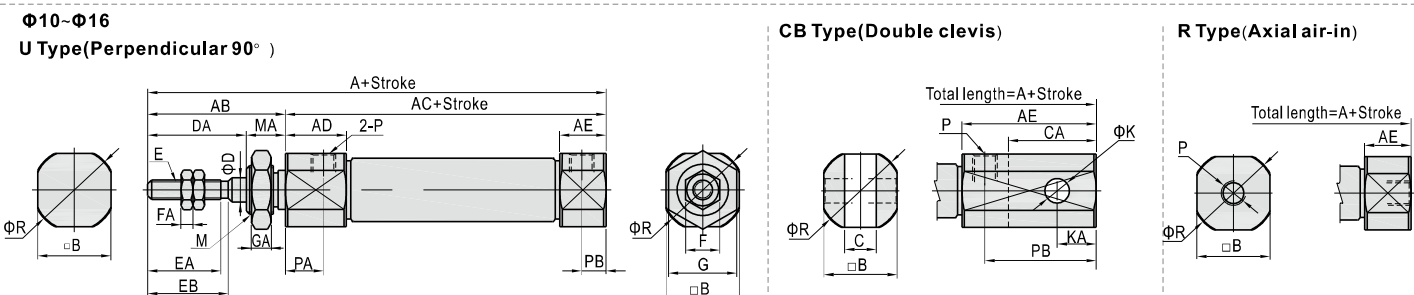


NO.	Item	Material
1	Rod nut	Carbon steel
2	Piston rod	SUS304
3	Front cover nut	Carbon steel
4	Packing retainer	Brass(Φ4)\Aluminum alloy(Others)
5	Bushing	Wear resistant material
6	Front cover O-ring	NBR
7	Front cover	Brass(Φ4)\Aluminum alloy(Others)
8	Barrel	Bronze(Φ4)\SUS304(Others)
9	Bumper	TPU
10	Piston seal	NBR
11	Wear ring	Wear resistant material
12	Bumper	TPU
13	Back cover	Brass(Φ4)\Aluminum alloy(Others)
14	Piston	Aluminum alloy(Φ16)\Stainless steel(Others)

Dimensions



Note) Only axial air intake type of back cover is available for Φ4, Φ6mm bore size.



Bore size/Item	A			AB	AC	AD	AE		B	C	CA	D	DA	E	EA	EB	F	FA	G	GA	K	KA	M	MA	P	PA	PB		
	U	CB	R				U/R	CB																			U	CB	R
10	74	87	74	28	46	11.5	9.5	22.5	12	3.3	13	4	20	M4×0.7	15	16.5	7	3	11	4	3.3	5	M8×1.0	8	M5×0.8	7.5	5	18	14
12	74	92	74	28	46	11.5	9.5	27.5	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	5	23	17
16	76	94	76	28	48	12	9.5	27.5	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	5	23	20

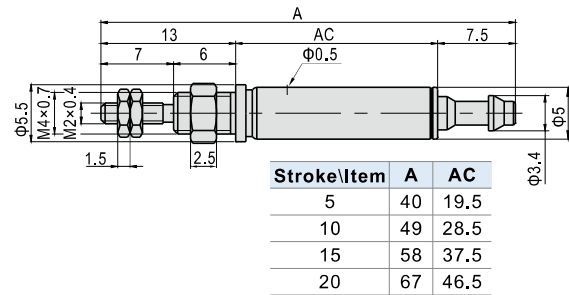
Remark: The dimensions of magnet type cylinder are the same as non-magnet type cylinder.



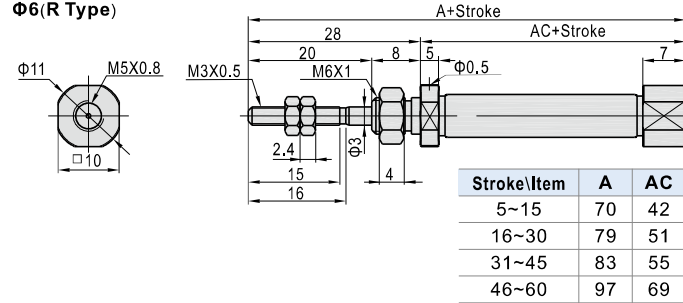
Pen size cylinder

PB Series

PSB $\Phi 4$ (Without magnet)(R Type)

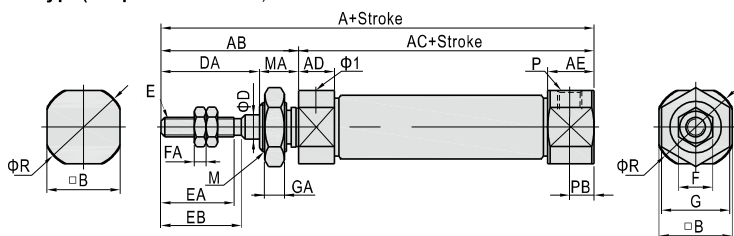


$\Phi 6$ (R Type)

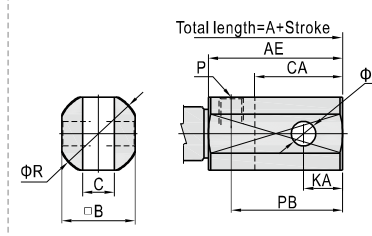


Note) Only axial air intake type of back cover is available for $\Phi 4$, $\Phi 6$ mm bore size.

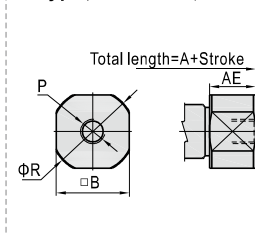
$\Phi 10$ ~ $\Phi 16$ U Type(Perpendicular 90°)



CB Type(Double clevis)



R Type(Axial air-in)

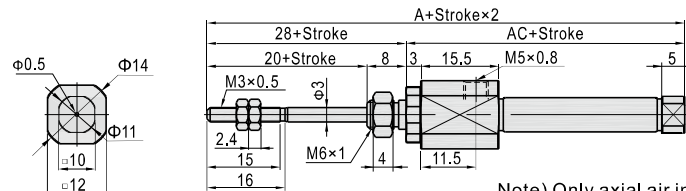


Bore size\Item	A																AB	AC				AE				
	U				CB				R				-					U/R	CB	B	C					
Stroke	5~15	16~30	31~45	46~60	5~15	16~30	31~45	46~60	5~15	16~30	31~45	46~60	5~15	16~30	31~45	46~60	5~15	16~30	31~45	46~60	5	9.5	22.5	12	3.3	
10	73.5	81	93	105	86.5	94	106	118	73.5	81	93	105	28	45.5	53	65	77	5	9.5	22.5	12	3.3				
12	73.5	81	93	105	91.5	99	111	123	73.5	81	93	105	28	45.5	53	65	77	5	9.5	27.5	15	6.6				
16	74.5	83	95	107	92.5	101	113	125	74.5	83	95	107	28	46.5	55	67	79	5	9.5	27.5	18	6.6				

Bore size\Item	CA	D	DA	E	EA	EB	F	FA	G	GA	K	KA	M	MA	P	PB		
																U	CB	R
10	13	4	20	M4×0.7	15	16.5	7	3	11	4	3.3	5	M8×1.0	8	M5×0.8	5	18	14
12	18	5	20	M5×0.8	15	16.5	8	4	14	4	5	8	M10×1.0	8	M5×0.8	5	23	17
16	18	5	20	M5×0.8	15	16.5	8	4	14	4	5	8	M10×1.0	8	M5×0.8	5	23	20

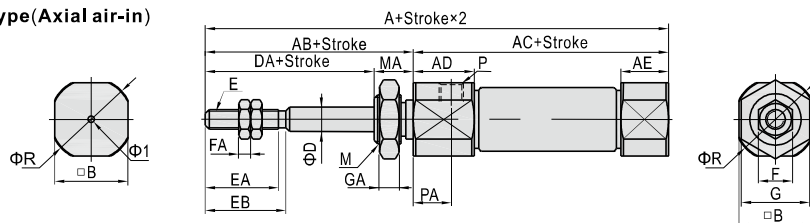
Remark : The dimensions of magnet type cylinder are the same as non-magnet type cylinder.

PTB $\Phi 6$ (R Type)

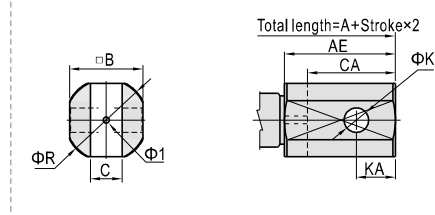


Note) Only axial air intake type of back cover is available for $\Phi 6$ mm bore size.

$\Phi 10$ ~ $\Phi 16$ R Type(Axial air-in)



CB Type(Double clevis)



Bore size\Item	A																AB	AC				AD
	R				CB				-				-									
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	5~15	16~30	31~45	46~60	5	
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																				
	R	CB	B	C	CA	D	DA	E	EA	EB	F	FA	G	GA	K	KA	M	MA	P	PA	R
10	5	18	12	3.3	13	4	20	M4×0.7	15	16.5	7	3	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

Note) $\Phi 10$ ~ $\Phi 16$ bore sizes don't have perpendicular(90°) air-in.

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

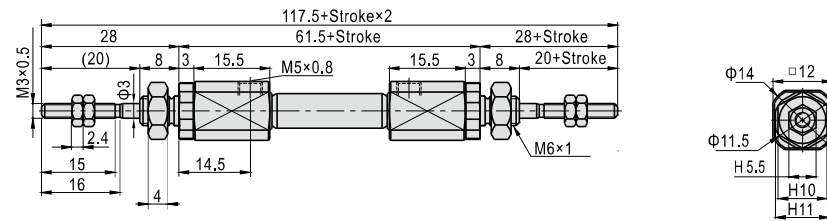


Pen size cylinder

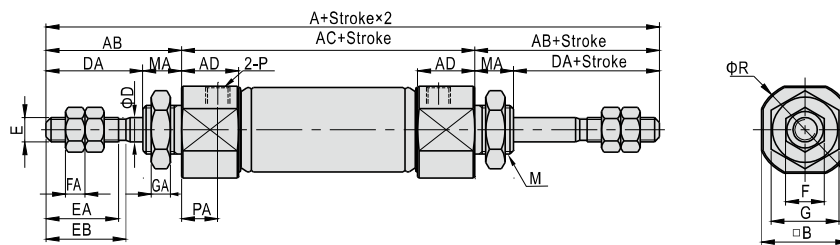
PB Series

PBD

Φ6

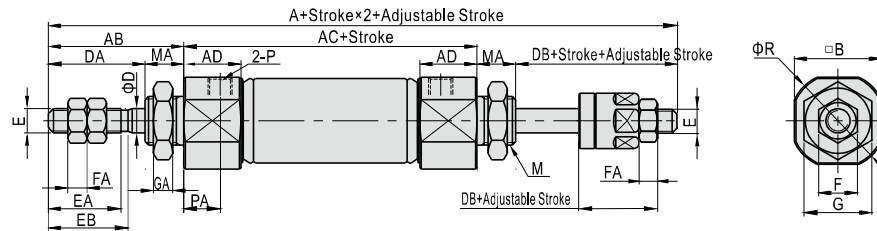


Φ10-Φ16



PBJ

Φ10-Φ16



Bore size\Item	A																			
	Model	PBD	PBJ	AB	AC	AD	B	D	DA	DB	E	EA	EB	F	FA	G	GA	M	MA	P
10	104	99	28	48	11.5	12	4	20	15	M4×0.7	15	16.5	7	3	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

PB Series—Accessories

List for ordering code of accessories

Accessories Bore size	Mounting accessories			Knuckle				Sensor switch		
	LB	FA	CJ	I	Y	F	U	CMSG	DMSG	EMSG
4	-	-	-	-	-	-	-	-	-	-
6	F-PB6LB	F-PB6FA	-	F-PB6I	F-PB6Y	F-M3X040F	-	CMSG	DMSG	EMSG
10	F-PB10LB	F-PB10FA	F-PB10CJ	F-PB10I	F-PB10Y	F-M4X070F	F-M4X070U			
12	F-PB12LB	F-PB12FA	F-PB12CJ	F-PB12I	F-PB12Y	F-M5X080F	F-M5X080U			
16			F-PB16CJ							

Accessory selection

Accessories Cylinder model	Mounting accessories	Knuckle						Sensor switch			
		LB	FA	CJ	I	Y	U [1]	F	CMSG	DMSG	EMSG
PB	Standard	•	•	•	•	•	•	•	×	×	×
	With magnet	•	•	•	•	•	•	•	•	•	•
PSB	Standard	•	•	•	•	•	•	•	×	×	×
PTB	With magnet	•	•	•	•	•	•	•	•	•	•
PBD	Standard	•	•	×	•	•	•	•	×	×	×
PBJ	With magnet	•	•	×	•	•	•	•	•	•	•

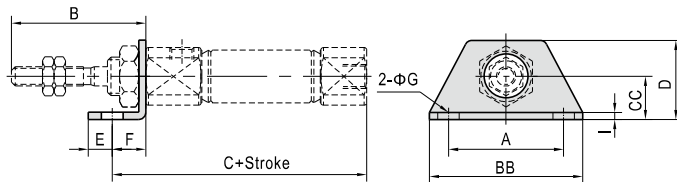
Material of accessories

Accessories Bore size	Mounting accessories			Knuckle			
	LB	FA	CJ	I	Y	F	U
4~16	△	△	△	□	□	□	□

△—SPCC ; □—Carbon steel ;

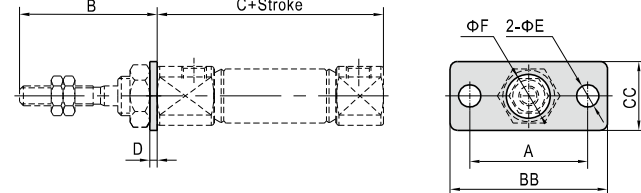
Dimensions

LB



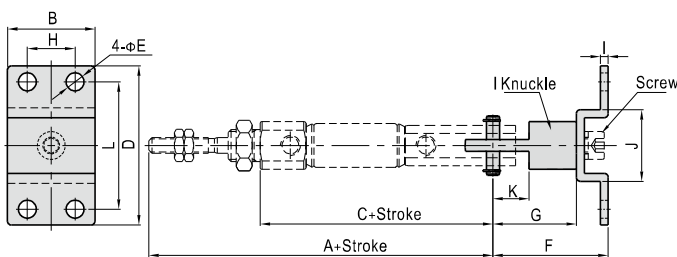
Bore size\Item	A	B	BB	C	CC	D	E	F	G	I
6	24	28	32	56.5	9	16.5	5	7	4.5	1.5
10	24	28	32	53	9	16.5	5	7	4.5	2
12	33	28	42	55	14	25	6	9	5.5	2.5
16	33	28	42	57	14	25	6	9	5.5	2.5

FA



Bore size\Item	A	B	BB	C	CC	D	E	F
6	24	28	32	49.5	14	1.5	4.5	6.3
10	24	28	32	46	14	2	4.5	8.2
12	33	28	42	46	20	3	5.5	10.2
16	33	28	42	48	20	3	5.5	10.2

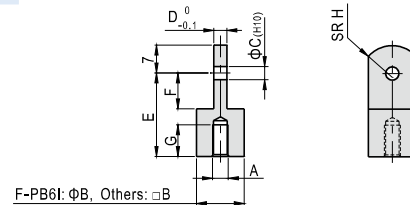
CJ



Bore size\Item	A	B	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

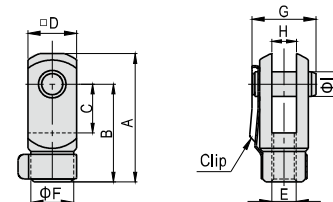
[Note] CJ type accessory includes I knuckle and PIN. It need to be matched with I knuckle and with relevant PIN.

I Knuckle



Bore size\Item	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



Bore size\Item	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