




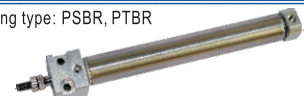




Pen size cylinder——PB Series

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		
Single acting type: PSB, PTB 	●	●	●	●	Single acting	6	●	●
Double rod type: PBD 	●	●	●	●	Double acting	10	●	●
Adjustable stroke type: PBJ 	●	●	●	●	Double acting	12	●	●
Front mounting type: PBR 	●	●	●	●	Double acting	16	●	●
Front mounting single acting type: PSBR, PTBR 	●	●	●	●	Single acting	6	●	●
					Double acting	8	●	●
					Single acting	10	●	●
					Double acting	12	●	●
					Single acting	16	●	●
Page	220						419	
	226							

PB

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 μm 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 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.
- 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
		Single acting Push side	21.2	2.1	4.2	6.4	8.5	10.6	12.7	14.8
		Single acting Pull side	50.3	-	3.6	8.6	13.6	18.7	23.7	28.7
8	4	Double acting Push side	37.7	-	1.0	4.8	8.6	12.4	16.1	19.9
		Double acting Pull side	50.3	5.0	10.1	15.1	20.1	25.2	30.2	35.2
		Single acting Push side	37.7	3.8	7.5	11.3	15.1	18.9	22.6	26.4
		Single acting Pull side	78.5	-	6.2	14.1	21.9	29.8	37.6	45.5
10	4	Double acting Push side	65.9	-	3.7	10.3	16.9	23.5	30.1	36.7
		Double acting Pull side	78.5	7.9	15.7	23.6	31.4	39.3	47.1	55.0
		Single acting Push side	65.9	6.6	13.2	19.8	26.4	33.0	39.5	46.2
		Single acting Pull side	113.0	-	9.0	20.3	31.6	42.9	54.2	65.5
12	5	Double acting Push side	93.4	-	5.1	14.4	23.8	33.1	42.4	51.8
		Double acting Pull side	113.0	11.3	22.6	33.9	45.2	56.5	67.8	79.1
		Single acting Push side	93.4	9.3	18.7	28.0	37.4	46.7	56.0	65.4
		Single acting Pull side	201.0	-	14.5	34.6	54.7	74.8	94.9	115.0
16	5	Double acting Push side	181.3	-	10.6	28.7	46.8	65.0	83.1	101.2
		Double acting Pull side	201.0	20.1	40.2	60.3	80.4	100.5	120.6	140.7
		Single acting Push side	181.3	18.1	36.3	54.4	72.5	90.7	108.8	126.9
		Single acting Pull side	201.0	-	14.5	34.6	54.7	74.8	94.9	115.0



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 μm 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}				
Cushion type	No cushion					Bumper				
Port size	Tube					M5 × 0.8				

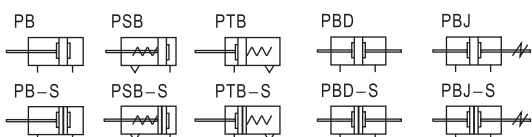
Add) Refer to P419~442 for detail of sensor switch.

Stroke

	Bore size (mm)	Standard stroke (mm)										Max. std stroke	Max. stroke							
		4	5	10	15	20	25	30	40	50	60									
Double acting	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
Single acting	4	5	10	15	20											-	-			
	6	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							-	-		
	16	5	10	15	20	25	30	40	50	60							-	-		

Note) Consult us for non-standard stroke.

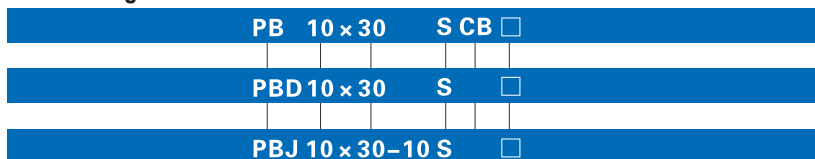
Symbol



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



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
	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 226 for accessory parts.

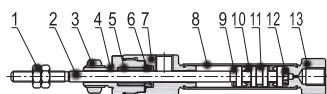


Pen size cylinder

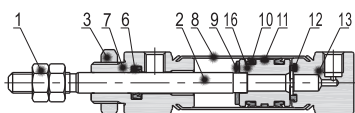
PB Series

Inner structure and material of major parts

Double acting without magnet(Φ6)



Double acting without magnet(Φ10~Φ16)

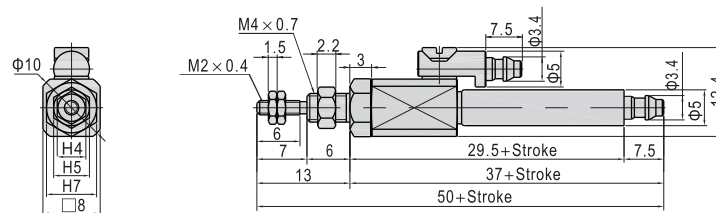


NO.	Item	Material
1	Rod nut	Carbon steel
2	Piston rod	SUS304
3	Front cover nut	Carbon steel
4	Packing retainer	Brass(Φ4)\Aluminum alloy(Others)
5	Bushing	Wear resistant material
6	Front cover O-ring	NBR
7	Front cover	Brass(Φ4)\Aluminum alloy(Others)
8	Barrel	Bronze(Φ4)\SUS304(Others)
9	Bumper	TPU
10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

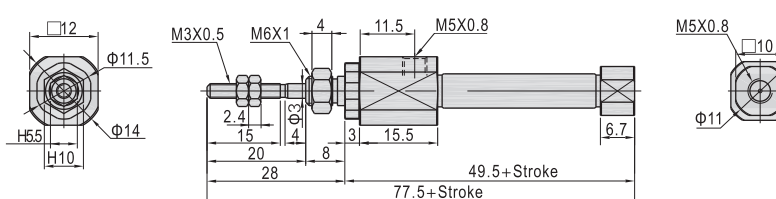
Dimensions

PB

Φ4(Without magnet)(R Type)



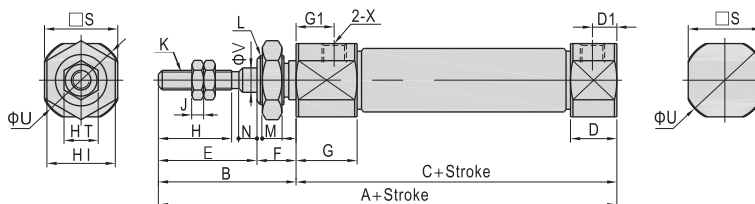
Φ6(R Type)



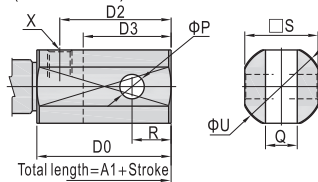
Note) Only axial air intake type of back cover is available for Φ4, Φ6mm bore size.

Φ10~Φ16

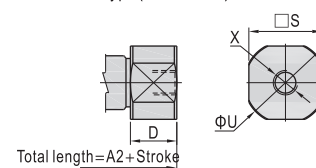
U Type(Perpendicular 90°)



CB Type(Double clevis)



R Type(Axial air-in)



Bore size \ Item	A	A1	A2	B	C	D	D0	D1	D2	D3	E	F	G	G1	H	I	J
10	74	87	74	28	46	9.5	22.5	5	18	13	20	8	11.5	7.5	15	11	2.2
12	74	92	74	28	46	9.5	27.5	5	23	18	20	8	11.5	7.5	15	14	4
16	76	94	76	28	48	9.2	27.2	4.8	22.8	18	20	8	11.8	7.5	15	14	4

Bore size \ Item	K	L	M	N	P	Q	R	S	T	U	V	X
10	M4×0.7	M8×1.0	4	3.5	3.3	3.3	5	12	7	14	4	M5×0.8
12	M5×0.8	M10×1.0	4	3.5	5	6.6	8	15	8	17	5	M5×0.8
16	M5×0.8	M10×1.0	4	3.5	5	6.6	8	18	8	20	5	M5×0.8

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



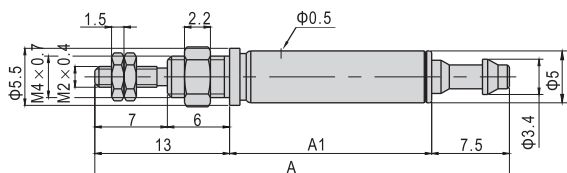
PB

Pen size cylinder

PB Series

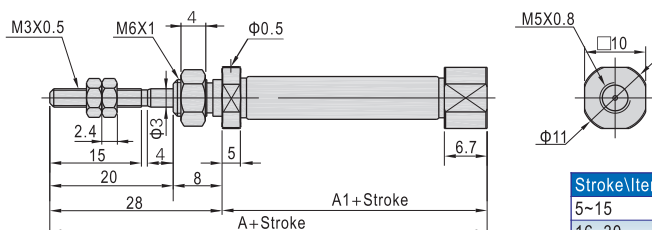
PSB

Φ4(Without magnet)(R Type)



Stroke\Item	A	A1
5	40	19.5
10	49	28.5
15	58	37.5
20	67	46.5

Φ6(R Type)

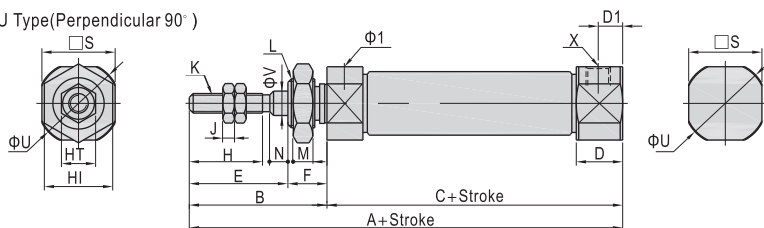


Stroke\Item	A	A1
5~15	70	42
16~30	79	51
31~45	83	55
46~60	97	69

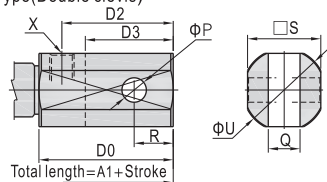
Note) Only axial air intake type of back cover is available for Φ4, Φ6mm bore size.

Φ10~Φ16

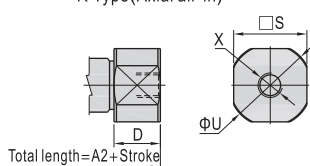
U Type(Perpendicular 90°)



CB Type(Double clevis)



R Type(Axial air-in)

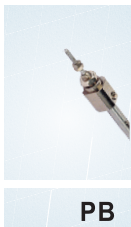


Bore size \ Item	A				A1				A2			
	5~15	16~30	31~45	46~60	5~15	16~30	31~45	46~60	5~15	16~30	31~45	46~60
10	73.5	81	93	105	86.5	94	106	118	73.5	81	93	105
12	73.5	81	93	105	91.5	99	111	123	73.5	81	93	105
16	74.5	83	95	107	92.5	101	113	125	74.5	83	95	107

Bore size \ Item	B	C				D	D0	D1	D2	D3	E	F	H	I	J
		5~15	16~30	31~45	46~60										
10	28	45.5	53	65	77	9.5	22.5	5	18	13	20	8	15	11	2.2
12	28	45.5	53	65	77	9.5	27.5	5	23	18	20	8	15	14	4
16	28	46.5	55	67	79	9.2	27.2	4.8	22.8	18	20	8	15	14	4

Bore size \ Item	K	L	M	N	P	Q	R	S	T	U	V	X
12	M5×0.8	M10×1.0	4	3.5	5	6.6	8	15	8	17	5	M5×0.8
16	M5×0.8	M10×1.0	4	3.5	5	6.6	8	18	8	20	5	M5×0.8

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



PB

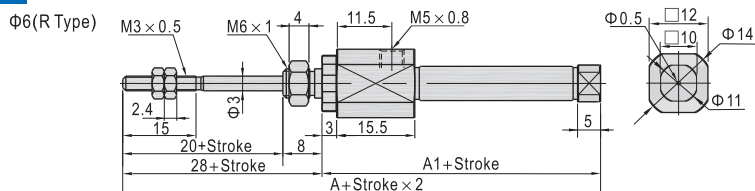


Pen size cylinder

PB Series



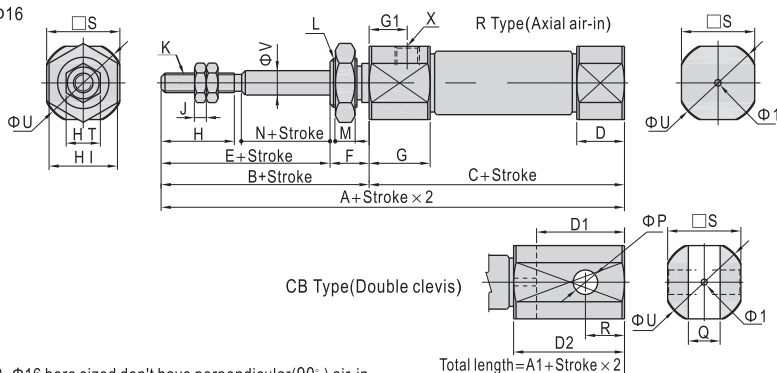
PTB



Stroke\Item	A	A1
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



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

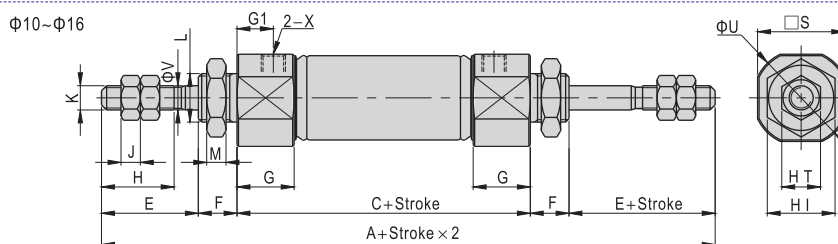
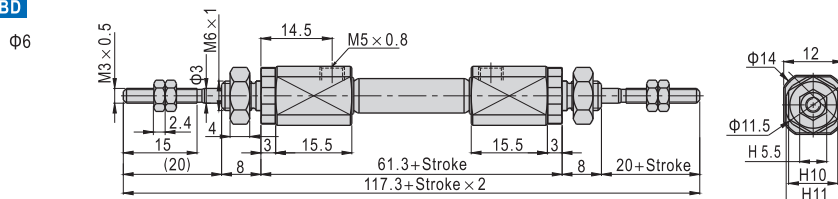
Total length=A1+Stroke x 2

Bore size \ Item	A				A1				B	D	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
10	76.5	84	96	108	89.5	97	109	121	28	5	48.5	56	68	80
12	76.5	84	96	108	94.5	102	114	126	28	5	48.5	56	68	80
16	77.5	86	98	110	95.5	104	116	128	28	5	49.5	58	70	82

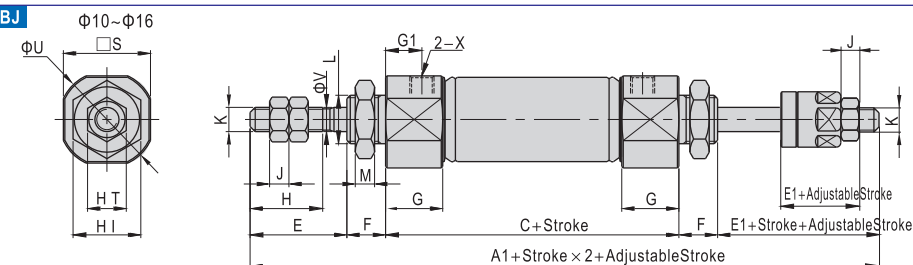
Bore size \ Item	D1	D2	E	F	G	G1	H	I	J	K	L	M	N	P	Q	R	S	T	U	V	X
10	13	18	20	8	11.5	7.5	15	11	2.2	M4x0.7	M8x1.0	4	3.5	3.3	3.3	5	12	7	14	4	M5x0.8
12	18	23	20	8	11.5	7.5	15	14	4	M5x0.8	M10x1.0	4	3.5	5	6.6	8	15	8	17	5	M5x0.8
16	18	23	20	8	11.8	7.5	15	14	4	M5x0.8	M10x1.0	4	3.5	5	6.6	8	18	8	20	5	M5x0.8

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

PBD



PBJ



Bore size \ Item	A	A1	C	E	E1	F	G	G1	H	I	J	K	L	M	S	T	V	X
10	104	98.7	48	20	14.7	8	11.5	7.5	15	11	2.2	M4x0.7	M8x1.0	4	12	7	4	M5x0.8
12	104	101	48	20	17	8	11.5	7.5	15	14	4	M5x0.8	M10x1.0	4	15	8	5	M5x0.8
16	106.6	103.6	50.6	20	17	8	11.8	7.5	15	14	4	M5x0.8	M10x1.0	4	18	8	5	M5x0.8

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



PB

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 P419~442 for detail of sensor switch.

Stroke

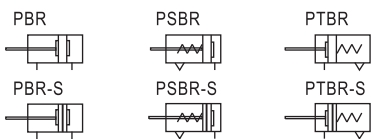
	Bore size (mm)	Standard stroke (mm)													Max. std stroke	Max. stroke		
		6	10	15	20	25	30	40	50	60	75	80	100	125			150	160
Double acting	6	10 15 20 25 30 40 50 60													60	60		
	8	10 15 20 25 30 40 50 60 75 80 100 125 150													150	150		
	10	10 15 20 25 30 40 50 60 75 80 100 125 150 160 175 200													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	300		
Single acting	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.

Symbol



PBR



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.

Ordering code

PBR 16 × 30 S U

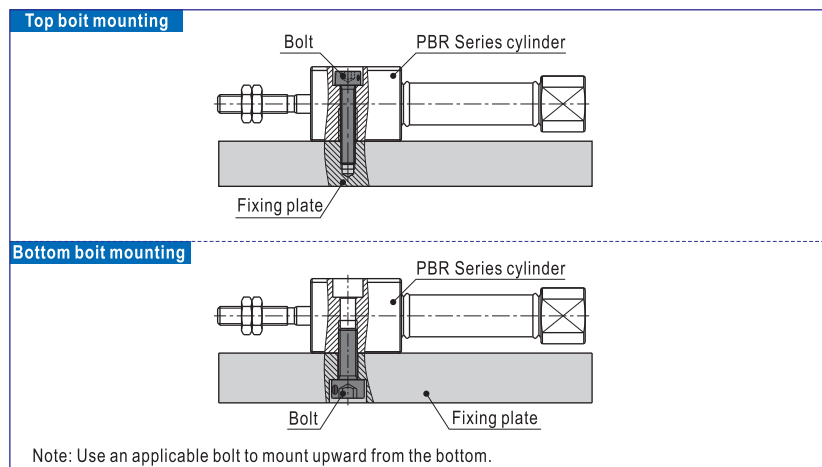
Model		Back cover	
PBR: Pen size cylinder (Double acting)	U: Perpendicular 90°	Model	Bore size
PSBR: Pen size cylinder (Single acting_push)	R: Axial air-in	PBR	8 10 12 16
PTBR: Pen size cylinder (Single acting_pull)	R: Axial air-in	PSBR	6 8 10 12 16
		PTBR	6 8 10 12 16

Bore size
6 8 10 12 16

Stroke
Refer to stroke table for details

Magnet
Blank: Without magnet
S: With magnet

Mounting type

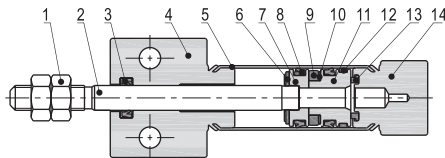


Pen size cylinder

PBR Series

Inner structure and material of major parts

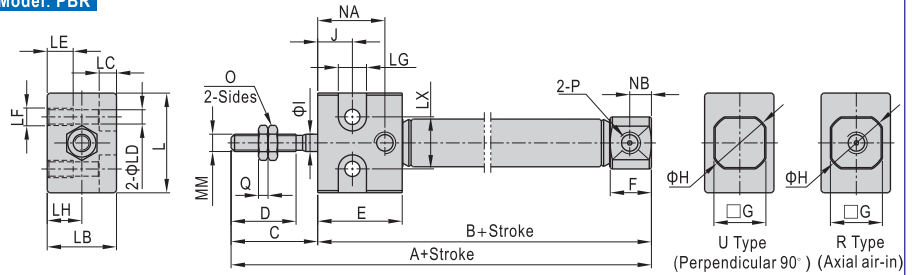
Double acting with magnet



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

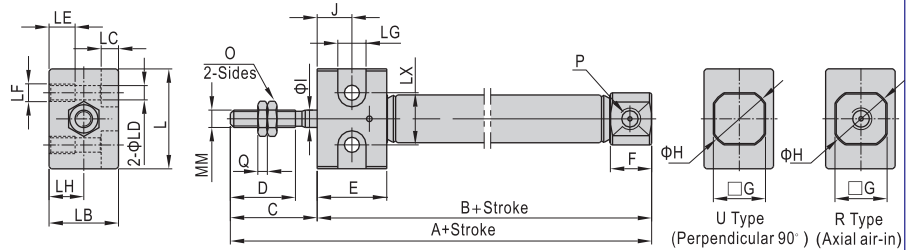


Bore size \ Item	A	B	C	D	E	F	G	H	I	J	L	LB	LC	LD
6	70	50	20	15	19	6.7	10	11	3	8	17.2	14	4	3.3
8	74	54	20	15	19.5	9.5	12	14	4	8	19.2	16	4	3.3
10	74	54	20	15	19.5	9.5	12	14	4	8	19.2	16	4	3.3
12	74	54	20	15	19.5	9.5	15	17	5	8	24.2	20	5	4.3
16	76	56	20	15	19.8	9.2	18	20	6	8	24.2	20	5	4.3

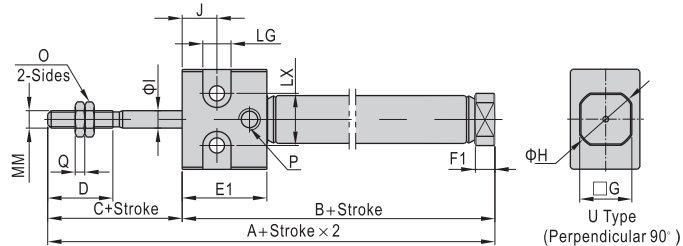
Bore size \ Item	LE	LF	LG	LH	LX	MM	NA	NB	O	P	Q
6	7	M4×0.7	6.5	7	10	M3×0.5	14	-	5.5	M5×0.8	2.4
8	7	M4×0.7	6.5	8	12	M4×0.7	15	5	7	M5×0.8	2.2
10	7	M4×0.7	6.5	8	12	M4×0.7	15.5	5	7	M5×0.8	2.2
12	8	M5×0.8	8	10	16	M5×0.8	15.5	5	8	M5×0.8	4
16	8	M5×0.8	8	10	16	M5×0.8	15.5	4.8	8	M5×0.8	4

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	A						B						C	D	
	Stroke	5~15	16~30	31~45	46~60	61~75	76~100	5~15	16~30	31~45	46~60	61~75			76~100
PSBR	6	70	79	83	97	-	-	50	59	63	77	-	-	20	15
	8	76.5	82.5	93.5	101.5	-	-	56.5	62.5	73.5	81.5	-	-	20	15
	10	73.5	81	93	105	-	-	53.5	61	73	85	-	-	20	15
	12	73.5	81	93	105	111.5	-	53.5	61	73	85	91.5	-	20	15
16	74.5	83	95	107	113	119	54.5	63	75	87	93	99	20	15	

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

Bore size \ Item	E	E1	F	F1	G	H	I	J	L	LB	LC	LD	LE	LF	LG	LH	LX	MM	O	P	Q
6	13	19	6.7	5	10	11	3	8	17.2	14	4	3.3	7	M4×0.7	6.5	7	10	M3×0.5	5.5	M5×0.8	2.4
8	13	19.5	9.5	5	12	14	4	8	19.2	16	4	3.3	7	M4×0.7	6.5	8	12	M4×0.7	7	M5×0.8	2.2
10	13	19.5	9.5	5	12	14	4	8	19.2	16	4	3.3	7	M4×0.7	6.5	8	12	M4×0.7	7	M5×0.8	2.2
12	13	19.5	9.5	5	15	17	5	8	24.2	20	5	4.3	8	M5×0.8	8	10	16	M5×0.8	8	M5×0.8	4
16	13	19.8	9.2	5	18	20	6	8	24.2	20	5	4.3	8	M5×0.8	8	10	16	M5×0.8	8	M5×0.8	4

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.

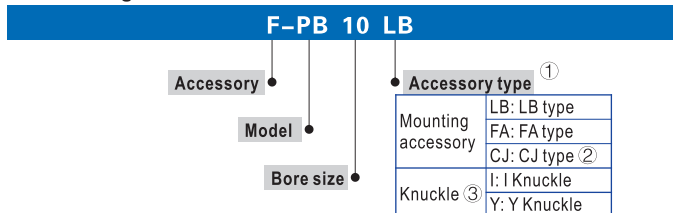


PBR

Pen size cylinder

Accessories

Ordering code



- Please refer to accessory list for selection and ordering information.
- CJ is attached with relevant PIN.
- Please refer to page 417, 418 for others knuckle.

Accessory selection



Cylinder model	PB	PSB, PTB	PBD, PBJ
Accessories	Standard	With magnet	Standard
Mounting accessory	LB	FA	CJ
Knuckle	I	Y	F
Sensor switch	CS1-M	DS1-M	

- Please refer to P415~418 for knuckle detail.
- Please refer to P419~442 for detail of sensor switch.

Material of accessories

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

△ — SPCC, □ — Carbon steel.

List for ordering code of accessories

Accessories	Mounting accessory		
	LB	FA	CJ
Bore size	-	-	-
4	-	-	-
6	F-PB6LB	F-PB6FA	-
10	F-PB10LB	F-PB10FA	F-PB10CJ
12	-	-	F-PB12CJ
16	F-PB12LB	F-PB12FA	F-PB16CJ

Accessories	Knuckle			
	I: I Knuckle	Y: Y Knuckle	F: F Knuckle	U: U Knuckle
Bore size	-	-	-	-
4	-	-	-	-
6	F-PB6I	F-PB6Y	F-M3X040F	-
10	F-PB10I	F-PB10Y	F-M4X070F	F-M4X070U
12	-	-	-	-
16	F-PB12I	F-PB12Y	F-M5X080F	F-M5X080U

Accessories	Sensor switch	
	CS1-M	DS1-M
Bore size	-	-
4	-	-
6	CS1-M-S06	DS1-M-S06
10	CS1-M-S10	DS1-M-S10
12	CS1-M-S12	DS1-M-S12
16	CS1-M-S16	DS1-M-S16

Dimensions

