



Roundline cylinder

P65 MI Series



- MI, MID, MIJ, MSI, MTI
MIC, MICH, MICJ available
- Bore size: 8 10 12 16 20 25 32 40
- Port size: M5 1/8" 1/4"

P71 TMI Series



- TMIL, TMICL, TMIM, TMICM available
- Bore size: 12 16 20 25
- Port size: M5, 1/8"

P74 PB Series



- PB, PBD, PBJ, PSB, PTB
PBR, PSBR, PTBR available
- Bore size: 4 6 8 10 12 16
- Port size: Tube, M5

P82 MF Series



- MF, MFD, MFJ, MSF, MTF
MFC, MFCD, MFCJ available
- Bore size: 20 25 32 40
- Port size: 1/8" 1/4"

P88 MG Series



- MG, MGD, MSG, MTG
MGC, MGCD available
- Bore size: 20 25 32 40 50 63
- Port size: M5 1/8" 1/4"

P94 MA Series



- MA, MAD, MAJ, MSA, MTA
MAC, MACD, MACJ, MAR available
- Bore size: 16 20 25 32 40 50 63
- Port size: M5 1/8" 1/4"

P102 MBL Series



- MBL, MBLD, MBLJ, MSBL,
MTBL, MBLC, MBLCD,
MBLCJ available
- Bore size: 20 25 32 40 50 63
- Port size: 1/8" 1/4"



Mini cylinder(Stainless steel)—MI Series

In accordance with ISO6432 standard

Compendium of MI Series

Multi-mounting accessories

LB Type FA Type SDB Type TC Type

Multi-type cylinder

MI: Mini cylinder (Double acting) MIC: Mini cylinder (Double acting with cushion)

MSI: Mini cylinder (Single acting_push) MTI: Mini cylinder (Single acting_pull)

MID: Mini cylinder(Double rod)

MICD: Mini cylinder(Double rod with cushion)

MIJ: Mini cylinder(Adjustable stroke)

MICJ: Mini cylinder(Adjustable stroke with cushion)

Rolling packed structure

Front and back cover and stainless steel block adopt riveted rolling packed structure to form a reliable connection.

Eight bore size are available

Bore size: 8, 10, 12, 16, 20, 25, 32, 40

Four kinds of back cover type

CA: Pivot type U: Perpendicular 90° R: Axial air-in CM: Round-end type

Multi-kinds of stroke

Two kinds of cushion type

Variable cushion or Bumper

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	
8	4	Single acting	Push side	50.2	-	3.6	8.6	13.6	18.6	23.6	28.7
			Pull side	37.7	-	1.0	4.8	8.6	12.3	16.1	19.9
		Double acting	Push side	50.2	5.0	10.1	15.1	20.1	25.1	30.1	35.2
			Pull side	37.7	3.7	7.5	11.3	15.1	18.8	22.6	26.4
10	4	Single acting	Push side	78.5	-	5.9	13.8	21.6	29.5	37.3	45.2
			Pull side	65.9	-	3.4	10.0	16.6	23.2	29.8	36.4
		Double acting	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	46.1
12	6	Single acting	Push side	113.0	-	10.1	21.4	32.7	44.0	55.3	66.6
			Pull side	84.8	-	4.5	12.9	21.4	29.9	38.4	46.9
		Double acting	Push side	113.0	11.3	22.6	33.9	45.2	56.5	67.8	79.1
			Pull side	84.8	8.5	17.0	25.4	33.9	42.4	50.9	59.4
16	6	Single acting	Push side	201.0	-	14.6	34.7	54.8	74.9	95.0	115.1
			Pull side	172.7	-	8.9	26.2	43.5	60.8	78.0	95.3
		Double acting	Push side	201.0	20.1	40.2	60.3	80.4	100.5	120.6	140.7
			Pull side	172.7	17.3	34.5	51.8	69.1	86.4	103.6	120.9
20	8	Single acting	Push side	314.0	-	25.3	56.7	88.1	119.5	150.9	182.3
			Pull side	263.8	-	15.3	41.6	68.0	94.4	120.8	147.1
		Double acting	Push side	314.0	31.4	62.8	94.2	125.6	157.0	188.4	219.8
			Pull side	263.8	26.4	52.8	79.1	105.5	131.9	158.3	184.7
25	10	Single acting	Push side	490.6	-	43.1	92.2	141.3	190.3	239.3	288.4
			Pull side	412.1	-	27.4	68.6	109.8	151.1	192.3	233.5
		Double acting	Push side	490.6	49.1	98.1	147.2	196.2	245.3	294.4	343.4
			Pull side	412.1	41.2	82.4	123.6	164.8	206.1	247.3	288.5
32	12	Single acting	Push side	804.3	30.2	110.9	191.3	277.1	352.1	432.6	513.0
			Pull side	691.2	19.1	88.2	157.4	226.5	295.6	364.7	438.8
		Double acting	Push side	804.3	80.4	160.9	241.3	321.7	402.2	482.6	563.0
			Pull side	691.2	69.1	138.2	207.4	276.5	345.6	414.7	483.8
40	16	Single acting	Push side	1256.6	64.7	190.3	316.0	441.7	567.3	693.0	818.7
			Pull side	1055.6	44.6	150.1	255.7	361.2	466.8	572.4	677.9
		Double acting	Push side	1256.6	125.7	251.3	377.0	502.6	628.3	754.0	879.6
			Pull side	1055.6	105.6	211.1	316.7	422.2	527.8	633.4	738.9

Installation and application



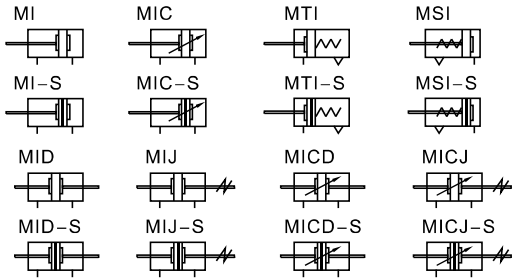
- When load changes in the work, the cylinder with abundant output capacity shall be selected.
- Relative cylinder with high temperature resistance or corrosion resistance shall be chosen under the condition of high temperature or corrosion.
- Necessary protection measure shall be taken in the environment with higher humidity, much dust or water drops, oil dust and welding fregs.
- 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 cylinder shall be carried out test run without load before application. Prior to run, buffer shall be turned to the minimum and gradually released to avoid the damage on cylinder caused by excessive impact.
- The cylinder shall avoid the influence of side load in operation to maintain the normal work of cylinder and extend the service life.
- If the cylinder is dismantled and stored for a long time, please 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.



MI Series



Symbol



Product feature

- In accordance with ISO6432 standard(Φ8~Φ25).
- Front and back cover owns fixed bumper pad which can reduce the impact of direction-change of the cylinder.
- There are several mode of back cover, which makes the installation of cylinder more convenient.
- Front and back cover and stainless steel block adopt riveted rolling packed structure to form a reliable connection.
- Piston rod and cylinder body with the material of stainless steel make the cylinder adapt general working environment with corrosivity.
- There are cylinders and accessories with several specifications for installation for your choice.

Specification

Bore size(mm)	8	10	12	16	20	25	32	40
Acting type	Double acting、Single acting_Push、Single acting_Pull							
	- Double acting with cushion							
Fluid	Air(to be filtered by 40 μ m filter element)							
Operating pressure	Double acting							
	0.15~1.0MPa(22~145psi)(1.5~10.0bar)							
	Single acting							
	0.2~1.0MPa(28~145psi)(2.0~10.0bar)							
Proof pressure	1.5MPa(215psi)(15bar)							
Temperature °C	-20~70							
Speed range mm/s	Double acting: 30~800 Single acting: 50~800							
Stroke tolerance	0~150 ^{+1.0} ₀ >150 ^{+1.5} ₀							
Cushion type	MIC Series: Variable cushion				Other series: Bumper			
Port size [Note1]	M5×0.8				1/8"		1/4"	

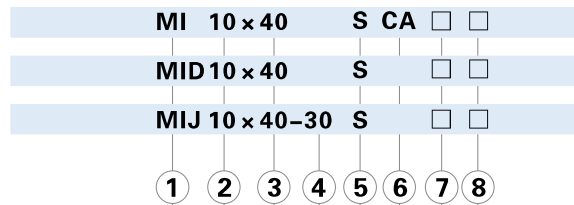
[Note1] PT thread, G thread thread are available.
Add) Refer to P353 for detail of sensor switch.

Stroke

Bore size (mm)	Standard stroke (mm)	Max.std stroke	Max. stroke	
MI	8	10 15 20 25 30 40 50 60 75 80 100 125 150	150	200
	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 80 100 125 150 160 175 200 250	250	500
MI	16	10 15 20 25 30 40 50 60 75 80 100 125 150 160 175 200 250 300	500	600
	MIC	20 25 32 40	350 400 450 500	500 800
MID	8	10 15 20 25 30 40 50 60 75 80 100	100	-
	10	10 15 20 25 30 40 50 60 75 80 100	100	-
	12	10 15 20 25 30 40 50 60 75 80 100 125 150 160 175 200	200	-
MID	16 20	10 15 20 25 30 40 50 60 75 80 100 125 150 160 175 200 250 300	300	-
	MIJ	25	10 15 20 25 30 40 50 60 75 80 100 125 150 160 175 200 250 300	300
MICD	32	10 15 20 25 30 40 50 60 75 80 100 125 150 160 175 200 250 300	500	-
	MICJ	40	350 400 450 500	500
MSI	8 10 12	10 15 20 25 30 40 50	-	-
	16	10 15 20 25 30 40 50 60 75 80 100	-	-
	20 25 32 40	10 15 20 25 30 40 50 60 75 80 100 125 150	-	-

[Note] Consult us for non-standard stroke.

Ordering code



① Model	② Bore size	③ Stroke	④ Adjustable stroke	⑤ Magnet	⑥ Back cover	⑦ Mounting type[Note1]	⑧ Thread type
MI: Mini cylinder(Double acting)	8 10 12 16 20 25 32 40	Refer to stroke table for details	No this code	Blank: Without magnet S: With magnet	Refer below table for details	Blank: No accessories FA: FA type SDB: SDB type LB: LB type TC: TC type	Blank: PT G: G
MIC: Mini cylinder (Double acting with cushion)	16 20 25 32 40						
MSI: Mini cylinder(Single acting_push)	8 10 12 16 20 25 32 40						
MTI: Mini cylinder(Single acting_pull)							
MID: Mini cylinder(Double rod)	16 20 25 32 40						
MICD: Mini cylinder (Double rod with cushion)							
MIJ: Mini cylinder(Adjustable stroke)	8 10 12 16 20 25 32 40						
MICJ: Mini cylinder(Adjustable stroke with cushion)	16 20 25 32 40						

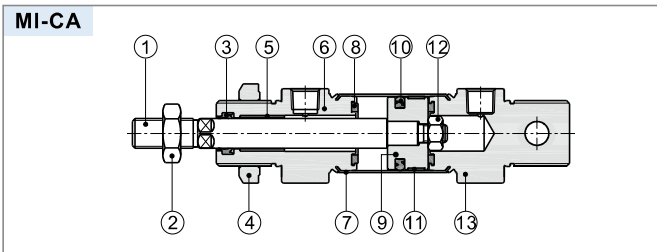
[Note1] Please refer to page 69~70 for accessory parts.

Model	Back cover	Bore size
MI MSI MTI	CA: Pivot type	Φ8~Φ25
	U: Perpendicular 90°	Φ8~Φ40
	R: Axial air-in	Φ16~Φ40
	CM: Round-end type	Φ16~Φ40
MIC	CA: Pivot type	Φ16~Φ25
	U: Perpendicular 90°	Φ16~Φ40
	CM: Round-end type	Φ16~Φ40
Others	No this code	

Mini cylinder(Stainless steel, ISO6432)

MI Series

Inner structure and material of major parts

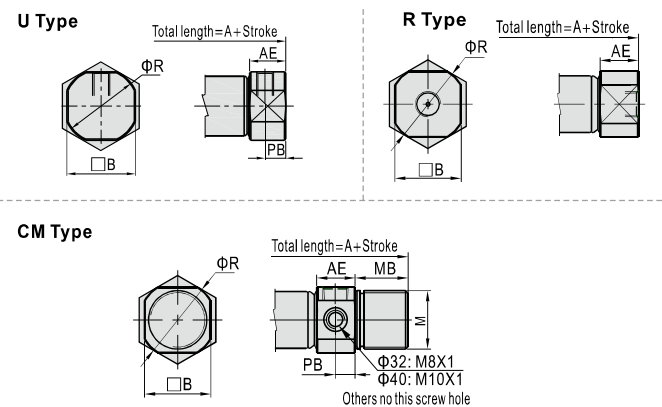
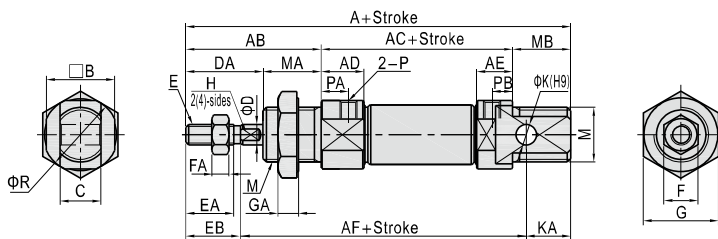


NO.	Item	Material
1	Rod	SUS304
2	Rod nut	Carbon steel
3	Front cover packing	NBR
4	Front cover nut	Carbon steel
5	Bushing	Wear resistant material
6	Front cover	Aluminum alloy
7	Barrel	SUS304(Φ8~Φ12)\SUS316L(Others)
8	Bumper	TPU
9	Piston	SUS304(Φ8~Φ12)\Aluminum alloy(Others)
10	Piston seal	NBR
11	Wear ring	Wear resistant material
12	Nut	Carbon steel
13	Back cover	Aluminum alloy

Dimensions

MI

CA Type

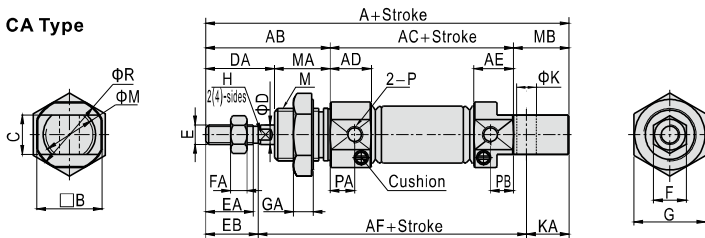


Bore size/Item	A				AB	AC	AD	AE		AF	B	C	D	DA	E	EA	EB	F	FA	G	GA	H	K	KA	M	MA	MB	P	PA	PB		R
	CA	U	R	CM				CA	U/R/CM																					CA	U/CM	
8	86	74	-	-	28	46	11.5	9.5	9.5	64	15	8	4	16	M4×0.7	10.5	12	7	3	17	6	-	4	10	M12×1.25	12	12	M5×0.8	7	5	5	17
10	86	74	-	-	28	46	11.5	9.5	9.5	64	15	8	4	16	M4×0.7	10.5	12	7	3	17	6	-	4	10	M12×1.25	12	12	M5×0.8	7	5	5	17
12	105	88	-	-	38	50	12.5	10.5	10.5	75	18	12	6	21	M6×1.0	14.5	16	10	5	22	6	5(2-Sides)	6	14	M16×1.5	17	17	M5×0.8	8	6	6	20
16	111	94	94	111	38	56	12.5	10.5	10.5	82	20	12	6	21	M6×1.0	14.5	16	10	5	22	6	5(2-Sides)	6	13	M16×1.5	17	17	M5×0.8	8	6	6	22
20	126	106	106	126	44	62	14.5	14.5	14.5	95.5	25	16	8	24	M8×1.25	18	19.5	12	6	29	7	6(2-Sides)	8	11	M22×1.5	20	20	1/8"	7.5	7.5	7.5	29
25	137	114.5	115	137	50	65	16	16	16	104.5	30	16	10	28	M10×1.25	20	21.5	17	6	29	7	8(4-Sides)	8	11	M22×1.5	22	22	1/8"	8	8	8	33.5
32	-	125	126	140	58	-	16.5	-	16.5	-	34.5	-	12	28	M10×1.25	18.5	20	17	6	36	7	10(4-Sides)	-	-	M30×1.5	30	14	1/8"	9	-	8/9	37.5
40	-	158	158	174	69	-	22	-	22	-	42.5	-	16	34	M12×1.25	22.5	24	17	7	46	8	14(4-Sides)	-	-	M38×1.5	35	16	1/4"	12	-	11.5/12	46.5

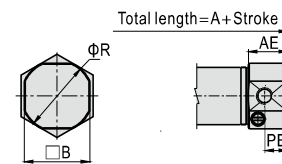
Remark: The dimensions of magnet type cylinder are the same as non-magnet type cylinder.

MIC Φ16~Φ25

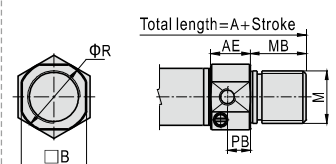
CA Type



U Type



CM Type



Bore size/Item	A			AB	AC	AD	AE		AF	B	C	D	DA	E	EA	EB	F	FA	G	GA	H	K	KA	M	MA	MB	P	PA	PB	R
	CA/CM	U	U				CA/CM	U																						
16	111	94	38	56	12.5	12	12	82	20	12	6	21	M6×1.0	14.5	16	10	5	22	6	5(2-Sides)	6	13	M16×1.5	17	17	M5×0.8	7.5	7	22	
20	126	106	44	62	14.5	14.5	14.5	95.5	25	16	8	24	M8×1.25	18	19.5	12	6	29	7	6(2-Sides)	8	11	M22×1.5	20	20	1/8"	7.5	7.5	29	
25	137	113.5	50	65	16	16	14.5	104.5	30	16	10	28	M10×1.25	20	21.5	17	6	29	7	8(4-Sides)	8	11	M22×1.5	22	22	1/8"	8	8	33.5	

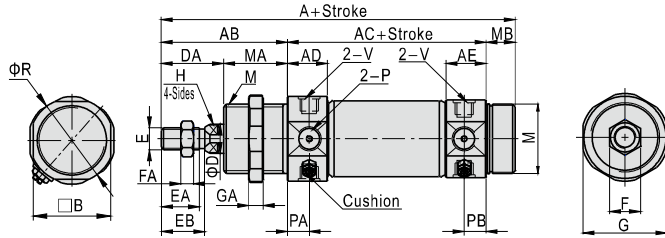
Remark: The dimensions of magnet type cylinder are the same as non-magnet type cylinder.

Mini cylinder(Stainless steel, ISO6432)

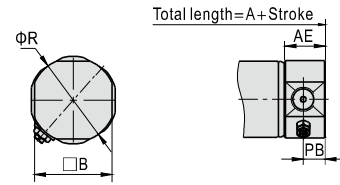
MI Series

MIC $\phi 32/\phi 40$

CM Type



U Type

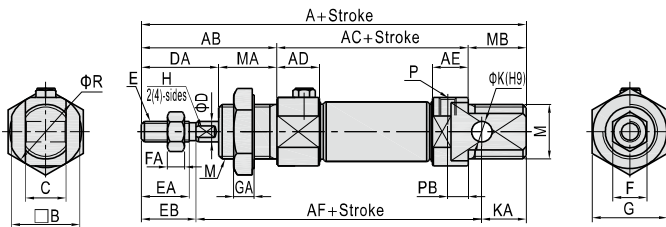


Bore size\Item Back cover	A		AB	AC	AD	AE		B	D	DA	E	EA	EB	F	FA	G	GA	H	M	MA	MB	P	PA	PB				R	V
	U	CM				U	CM																	U	CM	U	CM		
32	124	140	58	68	16.5	14.5	16.5	34.5	12	28	M10×1.25	18.5	20	17	6	36	7	10(4-Sides)	M30×1.5	30	14	1/8"	9	7.5	9	37.5	M8X1		
40	157.5	174	69	89	22	21.5	22	42.5	16	34	M12×1.25	22.5	24	17	7	46	8	14(4-Sides)	M38×1.5	35	16	1/4"	12	11.5	12	46.5	M10X1		

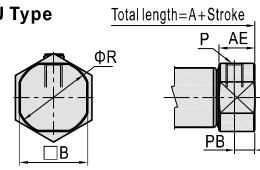
Remark: The dimensions of magnet type cylinder are the same as non-magnet type cylinder.

MSI

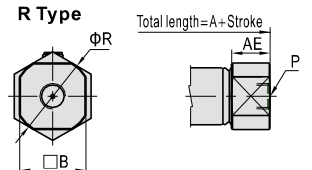
CA Type



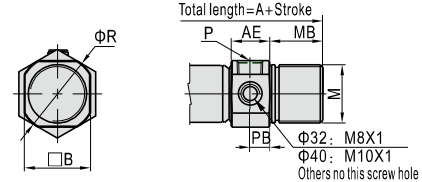
U Type



R Type

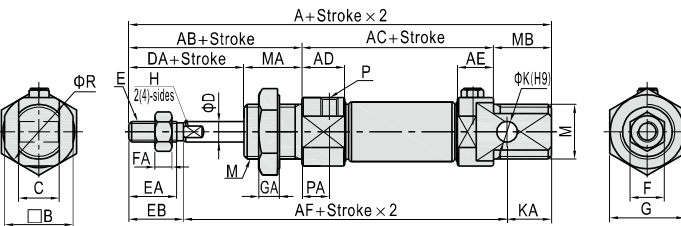


CM Type

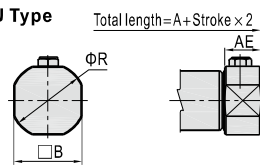


MTI

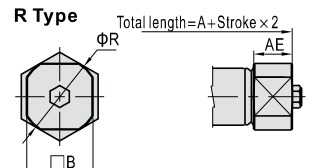
CA Type



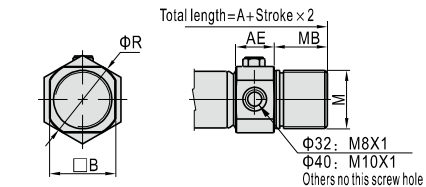
U Type



R Type



CM Type



Item	A												AB	AC			AD	AF				
	CA			U			R			CM				-	-	-		-	-	-		
Bore size\Stroke	0-50	51-100	101-150	0-50	51-100	101-150	0-50	51-100	101-150	0-50	51-100	101-150	0-50	51-100	101-150	-	0-50	51-100	101-150	0-50	51-100	101-150
8	111	-	-	99	-	-	-	-	-	-	-	-	28	71	-	-	11.5	89	-	-	-	-
10	111	-	-	99	-	-	-	-	-	-	-	-	28	71	-	-	11.5	89	-	-	-	-
12	130	-	-	113	-	-	-	-	-	-	-	-	38	75	-	-	12.5	100	-	-	-	-
16	136	161	-	119	144	-	119	144	-	136	161	-	38	81	106	-	12.5	107	132	-	-	-
20	151	176	201	131	156	181	131	156	181	151	176	201	44	87	112	137	14.5	120.5	145.5	170.5	-	-
25	162	187	212	139.5	164.5	189.5	140	165	190	162	187	212	50	90	115	140	16	129.5	154.5	179.5	-	-
32	-	-	-	150	175	200	151	176	201	165	190	215	58	-	-	-	16.5	-	-	-	-	-
40	-	-	-	183	208	233	183	208	233	199	224	249	69	-	-	-	22	-	-	-	-	-

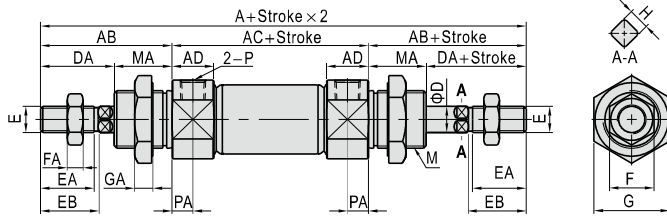
Bore size\Item Back cover	AE		B	C	D	DA	E	EA	EB	F	FA	G	GA	H	K	KA	M	MA	MB	P	PA	PB			R
	CA	U/R/CM																				CA	U/CM	R	
8	9.5	9.5	15	8	4	16	M4×0.7	10.5	12	7	3	17	6	-	4	10	M12×1.25	12	12	M5×0.8	7	5	5	17	
10	9.5	9.5	15	8	4	16	M4×0.7	10.5	12	7	3	17	6	-	4	10	M12×1.25	12	12	M5×0.8	7	5	5	17	
12	10.5	10.5	18	12	6	21	M6×1.0	14.5	16	10	5	22	6	5(2-Sides)	6	14	M16×1.5	17	17	M5×0.8	8	6	6	20	
16	10.5	10.5	20	12	6	21	M6×1.0	14.5	16	10	5	22	6	5(2-Sides)	6	13	M16×1.5	17	17	M5×0.8	8	6	6	22	
20	14.5	14.5	25	16	8	24	M8×1.25	18	19.5	12	6	29	7	6(2-Sides)	8	11	M22×1.5	20	20	1/8"	7.5	7.5	7.5	29	
25	16	16	30	16	10	28	M10×1.25	20	21.5	17	6	29	7	8(4-Sides)	8	11	M22×1.5	22	22	1/8"	8	8	8	33.5	
32	-	16.5	34.5	-	12	28	M10×1.25	18.5	20	17	6	36	7	10(4-Sides)	-	-	M30×1.5	30	14	1/8"	9	-	8/9	37.5	
40	-	22	42.5	-	16	34	M12×1.25	22.5	24	17	7	46	8	14(4-Sides)	-	-	M38×1.5	35	16	1/4"	12	-	11.5/12	46.5	

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

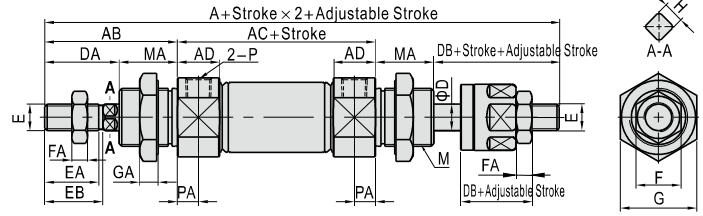
Mini cylinder(Stainless steel, ISO6432)

MI Series

MID



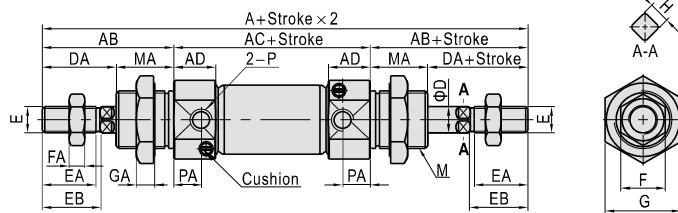
MIJ



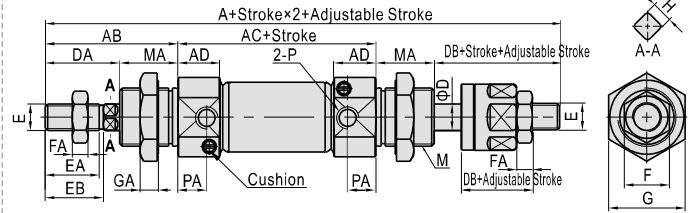
Bore size\Item	A(MID)	A(MIJ)	AB	AC	AD	D	DA	DB	E	EA	EB	F	FA	G	GA	H	M	MA	P	PA
8	104	103	28	48	11.5	4	16	15	M4×0.7	10.5	12	7	3	17	6	-	M12×1.25	12	M5×0.8	7
10	104	103	28	48	11.5	4	16	15	M4×0.7	10.5	12	7	3	17	6	-	M12×1.25	12	M5×0.8	7
12	128	128	38	52	12.5	6	21	21	M6×1.0	14.5	16	10	5	22	6	5(2-Sides)	M16×1.5	17	M5×0.8	8
16	134	134	38	58	12.5	6	21	21	M6×1.0	14.5	16	10	5	22	6	5(2-Sides)	M16×1.5	17	M5×0.8	8
20	150	151	44	62	14.5	8	24	25	M8×1.25	18	19.5	12	6	29	7	6(2-Sides)	M22×1.5	20	1/8"	7.5
25	165	164	50	65	16	10	28	27	M10×1.25	20	21.5	17	6	29	7	8(4-Sides)	M22×1.5	22	1/8"	8
32	184	183	58	68	16.5	12	28	27	M10×1.25	18.5	20	17	6	36	7	10(4-Sides)	M30×1.5	30	1/8"	9
40	227	222	69	89	22	16	34	29	M12×1.25	22.5	24	17	7	46	8	14(4-Sides)	M38×1.5	35	1/4"	12

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

MICD Φ16~Φ40



MICJ Φ16~Φ40



Bore size\Item	A(MICD)	A(MICJ)	AB	AC	AD	D	DA	DB	E	EA	EB	F	FA	G	GA	H	M	MA	P	PA
16	132.5	132.5	38	56.5	12.5	6	21	21	M6×1.0	14.5	16	10	5	22	6	5(2-Sides)	M16×1.5	17	M5×0.8	7.5
20	150	151	44	62	14.5	8	24	25	M8×1.25	18	19.5	12	6	29	7	6(2-Sides)	M22×1.5	20	1/8"	7.5
25	165	164	50	65	16	10	28	27	M10×1.25	20	21.5	17	6	29	7	8(4-Sides)	M22×1.5	22	1/8"	8
32	184	183	58	68	16.5	12	28	27	M10×1.25	18.5	20	17	6	36	7	10(4-Sides)	M30×1.5	30	1/8"	9
40	227	222	69	89	22	16	34	29	M12×1.25	22.5	24	17	7	46	8	14(4-Sides)	M38×1.5	35	1/4"	12

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

List for ordering code of accessories

Accessories Bore size	Mounting accessories				Knuckle				Sensor switch	
	LB	FA	SDB	TC	I	Y	F	U	CMSG	DMSG(S)
8	F-MI10LB	F-MI8FA	F-MI8SDB	F-MI10TC	F-M4X070I	F-M4X070Y	F-M4X070F	F-M4X070U	CMSG	DMSG(S)
10										
12	F-MI12LB	F-MI12FA	F-MI12SDB	F-MI12TC	F-M6X100I	F-M6X100Y	F-M6X100F	F-M6X100U		
16										
20	F-MI20LB	F-MI20FA	F-MI20SDB	F-MI20TC	F-M8X125I	F-M8X125Y	F-M8X125F	F-M8X125U		
25										
32	F-MI32LB	-	F-MI32SDB	F-MI32TC	F-M10X125I	F-M10X125Y	F-M10X125F	F-M10X125U		
40										
	F-MI40LB	-	F-MI40SDB	F-MI40TC	F-M12X125I	F-M12X125Y	F-M12X125F	F-M12X125U		

Accessory selection

Accessories Cylinder model		Mounting accessories				Knuckle [Note1]				Sensor switch	
		LB	FA	SDB	TC	I	Y	U	F	CMSG	DMSG(S)
MI	Standard	●	●	●	●	●	●	●	●	×	×
MIC	With magnet	●	●	●	●	●	●	●	●	●	●
MSI	Standard	●	●	●	●	●	●	●	●	×	×
MTI	With magnet	●	●	●	●	●	●	●	●	●	●
MID	Standard	●	●	×	●	●	●	●	●	×	×
MICD	With magnet	●	●	×	●	●	●	●	●	●	●
MIJ	Standard	●	●	×	●	●	●	●	●	×	×
MICJ	With magnet	●	●	×	●	●	●	●	●	●	●

Material of accessories

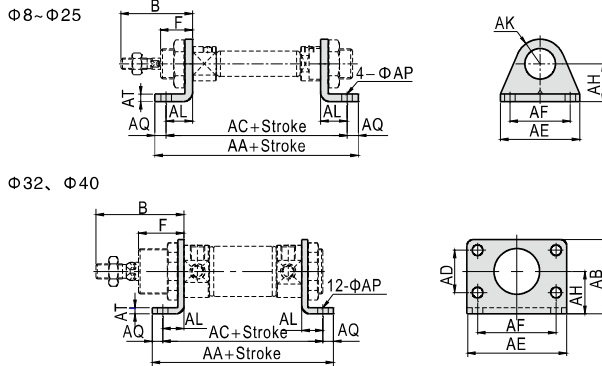
Accessories Bore size	Mounting accessories				Knuckle			
	LB	FA	SDB	TC	I	Y	F	U
8~40	△	△	△	▲	□	□	□	□

▲—SUS304; △—SPCC; □—Carbon steel;

[Note1] Please refer to P349~352 for knuckle detail.

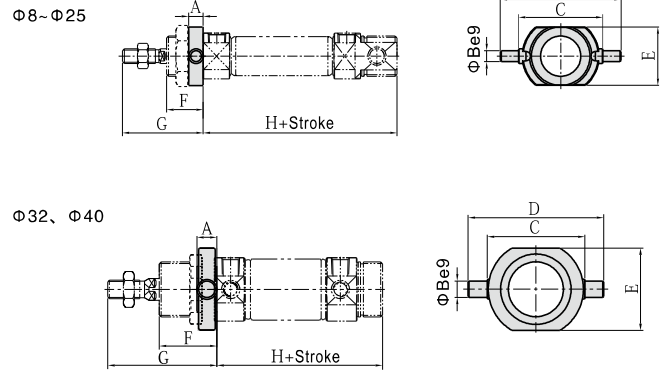
Dimensions

LB



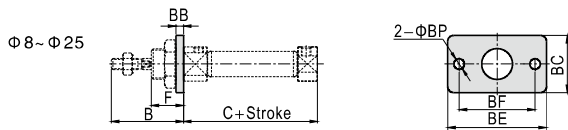
Bore size\Item	AA	AB	AC	AD	AE	AF	AH	AK	AL	AP	AQ	AT	B	F
8	78	-	68	-	35	25	16	10	11	4.5	5	2	28	12
10	78	-	68	-	35	25	16	10	11	4.5	5	2	28	12
12	90	-	78	-	42	32	20	13	14	5.5	6	2.5	38	17
16	96	-	84	-	42	32	20	13	14	5.5	6	2.5	38	17
20	112	-	96	-	54	40	25	20	17	7	8	3	44	20
25	115	-	99	-	54	40	25	20	17	7	8	3	50	22
32	110	49	96	28	66	52	28	-	14	7	7	3.5	58	30
40	149	58	129	30	80	60	33	-	20	9	10	3.5	69	35

TC



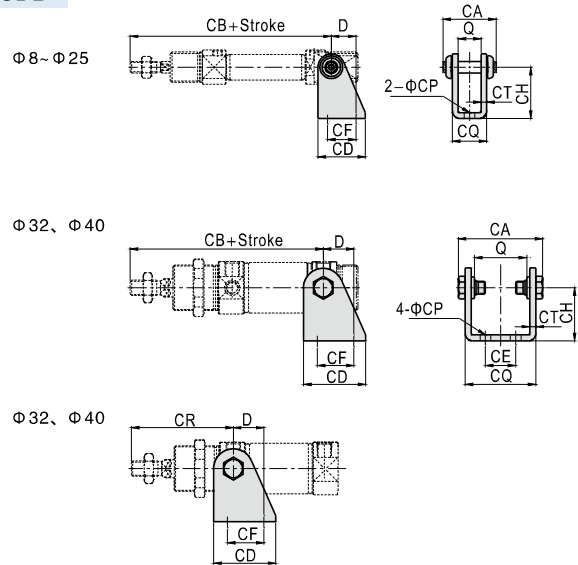
Bore size\Item	A	B	C	D	E	F	G	H
8	6	4	26	38	20	12	28	58
10	6	4	26	38	20	12	28	58
12	8	6	38	58	25	17	38	67
16	8	6	38	58	25	17	38	73
20	8	6	46	66	32	20	44	82
25	8	6	46	66	32	22	50	87
32	11	9	54	74	45	31.5	59.5	80.5
40	12	10	64	84	55	36.5	70.5	103.5

FA



Bore size\Item	B	C	BB	BC	BE	BF	BP	F
8	28	46	2	22	40	30	4.5	12
10	28	46	2	22	40	30	4.5	12
12	38	50	3	26	52	40	5.5	17
16	38	56	3	26	52	40	5.5	17
20	44	62	3.5	38	64	50	7	20
25	50	65	3.5	38	64	50	7	22

SDB



Bore size\Item	D	Q	CA	CB	CD	CE	CF	CH	CP	CQ	CT	CR
8	11	8.1	16.4	76	20	-	12.5	24	4.5	12.1	2	-
10	11	8.1	16.4	76	20	-	12.5	24	4.5	12.1	2	-
12	13	12.1	26	91	25	-	15	27	5.5	16.1	2	-
16	13	12.1	26	98	25	-	15	27	5.5	16.1	2	-
20	16	16.1	35	115	32	-	20	30	7	21.1	2.5	-
25	16	16.1	35	126	32	-	20	30	7	21.1	2.5	-
32	20	34.6	53.6	117	41	20	24	35	7	44.6	3	67
40	27	42.6	65.6	146	52	28	30	40	9	54.6	3	81

[Note] SDB is attached with relevant PIN.



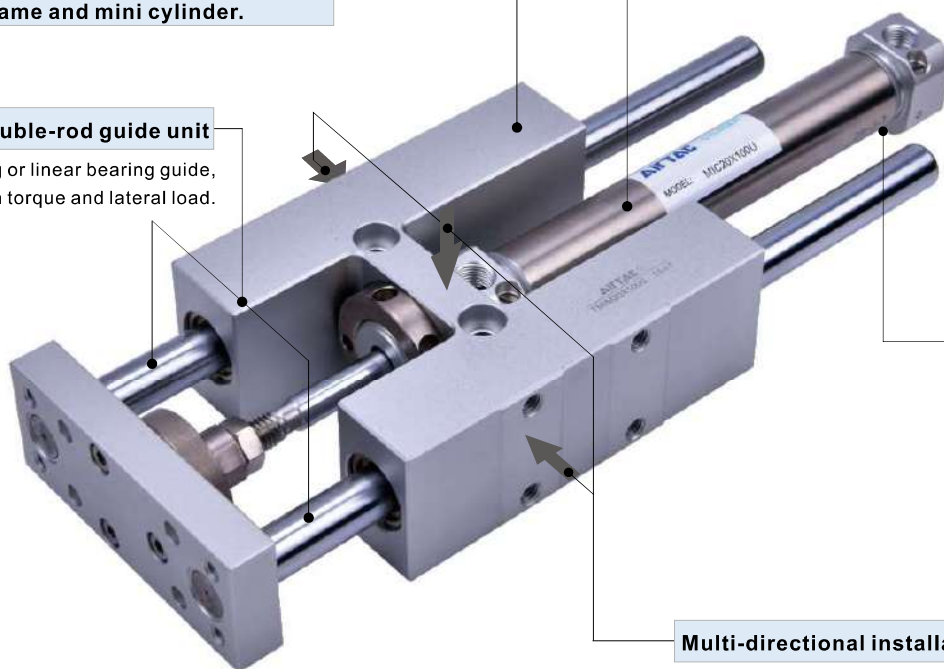
TMI/TMIC series with guide frame cylinder

Compendium of TMI/TMIC series

A new type of cylinder combined with guide frame and mini cylinder.

Double-rod guide unit

Brass bearing or linear bearing guide, which can bear high torque and lateral load.



Can be matched with multi bore sizes cylinder

Bore size: 12、16、20、25

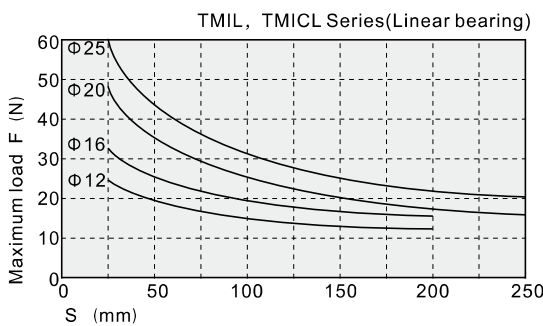
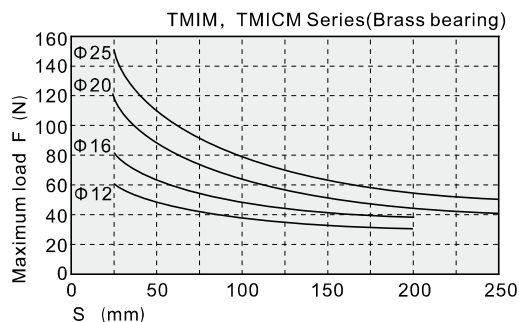
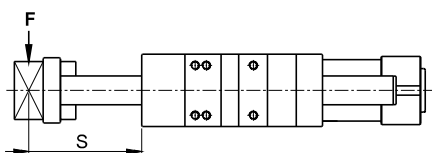
Multi-directional installation and fixing

Criteria for selection: Cylinder thrust

Unit: Newton(N)

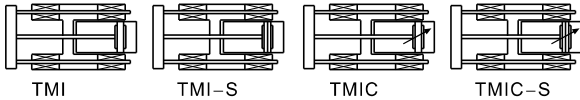
Bore size	Rod size	Acting type	Pressure area(mm ²)	Operating pressure(MPa)							
				0.1	0.2	0.3	0.4	0.5	0.6	0.7	
12	6	Double acting	Push side	113.0	11.3	22.6	33.9	45.2	56.5	67.8	79.1
			Pull side	84.8	8.5	17.0	25.4	33.9	42.4	50.9	59.4
16	6	Double acting	Push side	201.0	20.1	40.2	60.3	80.4	100.5	120.6	140.7
			Pull side	172.7	17.3	34.5	51.8	69.1	86.4	103.6	120.9
20	8	Double acting	Push side	314.0	-	25.3	56.7	88.1	119.5	150.9	182.3
			Pull side	263.8	-	15.3	41.6	68.0	94.4	120.8	147.1
20	8	Double acting	Push side	314.0	31.4	62.8	94.2	125.6	157.0	188.4	219.8
			Pull side	263.8	26.4	52.8	79.1	105.5	131.9	158.3	184.7
25	10	Double acting	Push side	490.6	49.1	98.1	147.2	196.2	245.3	294.4	343.4
			Pull side	412.1	41.2	82.4	123.6	164.8	206.1	247.3	288.5

Maximum load relationship curve





Symbol



Product feature

1. A new type of cylinder combined with guide frame and standard cylinder.
2. Brass bearing: It is suitable for the action that has radial load resistance, with greater torsion stiffness.
Linear bearing: It is suitable for push-up action, or where high precision and high load capacity are required, especially for occasions requiring low friction.
3. The special design of the guide frame body provides a multi-directional mounting.

Specification

Bore size(mm)	12	16	20	25
Acting type	Double acting			
Fluid	Air(to be filtered by 40 μm filter element)			
Operating pressure	0.15~1.0MPa(22~145psi)(1.5~10.0bar)			
Proof pressure	1.5MPa(215psi)(15bar)			
Temperature °C	-20~70			
Speed range mm/s	30~500			
Stroke tolerance	0~150 ^{+1.0} ₀ >150 ^{+1.5} ₀			
Cushion type	Bumper	Variable cushion		
Port size	M5×0.8			1/8"

Stroke

Bore size(mm)	Standard stroke (mm)	Max.std stroke(mm)
12	25 50 75 100 125 150 200	200
16	25 50 75 100 125 150 200	200
20	25 50 75 100 125 150 200 250	250
25	25 50 75 100 125 150 200 250	250

[Note] Consult us for non-standard stroke.

Ordering code

TMIC M 20 X 50 S □



① Model	TMI: With guide frame cylinder	TMIC: With guide frame cylinder(with cushion)
② Bearing type	M: Brass bearing L: Linear bearing	
③ Bore size	12	16 20 25
④ Stroke	Refer to stroke table for details	
⑤ Magnet	Blank: Without magnet S: With magnet	
⑥ Thread type	Blank: PT thread(or metric thread) G: G thread	

[Note] TMI, TMIC matching cylinder is Perpendicular 90° back cover.

Ordering code(for guide frame)

F - TMIC M 20 X 50

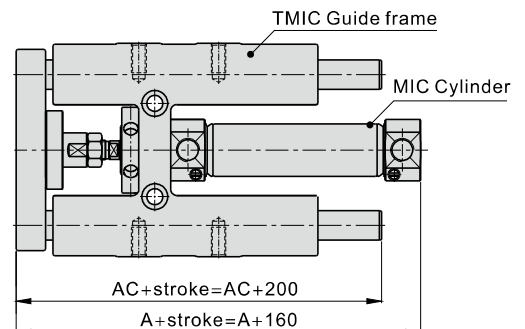


① Accessory code	F: Accessory	
② Model	TMI: With guide frame cylinder	TMIC: With guide frame cylinder(with cushion)
③ Bearing type	M: Brass bearing L: Linear bearing	
④ Bore size	12	16 20 25
⑤ Stroke	Refer to stroke table for details	

Ordering instructions:

1. When ordering guide frame separately, only standard strokes from the stroke list can be ordered.
(Other stroke can only be ordered by non-standard)
2. To order non-standard stroke cylinders with guide frame, the combination is as follows:
Non-standard stroke cylinder + guide frame of the upper standard stroke.
Example: MIC20X160 (non-standard stroke cylinder)
+F-TMICM20X200(Standard stroke guide frame).

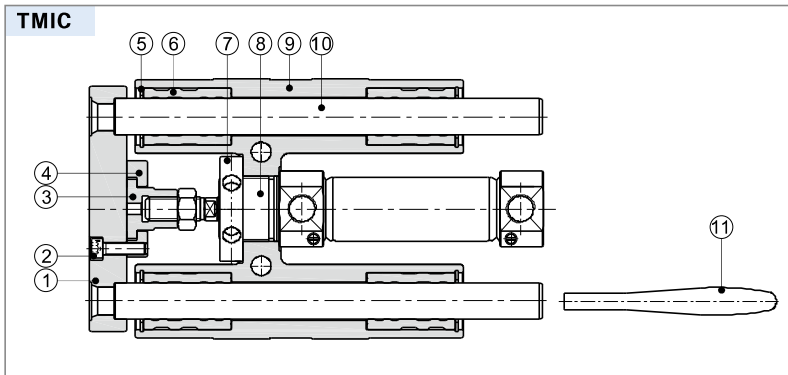
The dimension is as follows:



With guide frame cylinder

TMI, TMIC Series

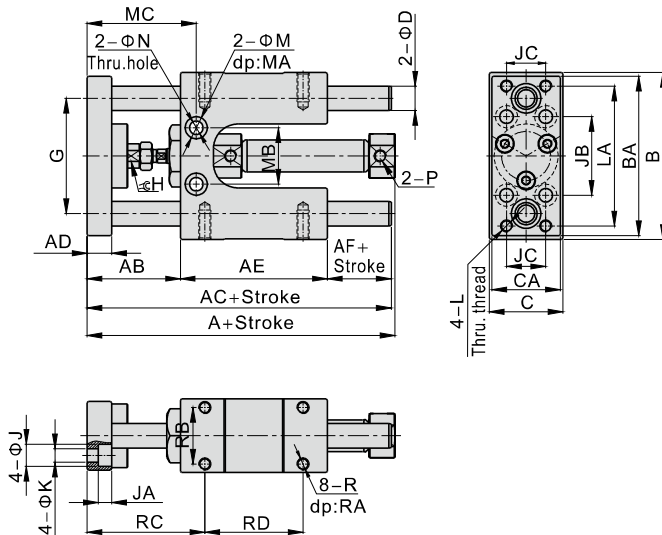
Inner structure and material of major parts



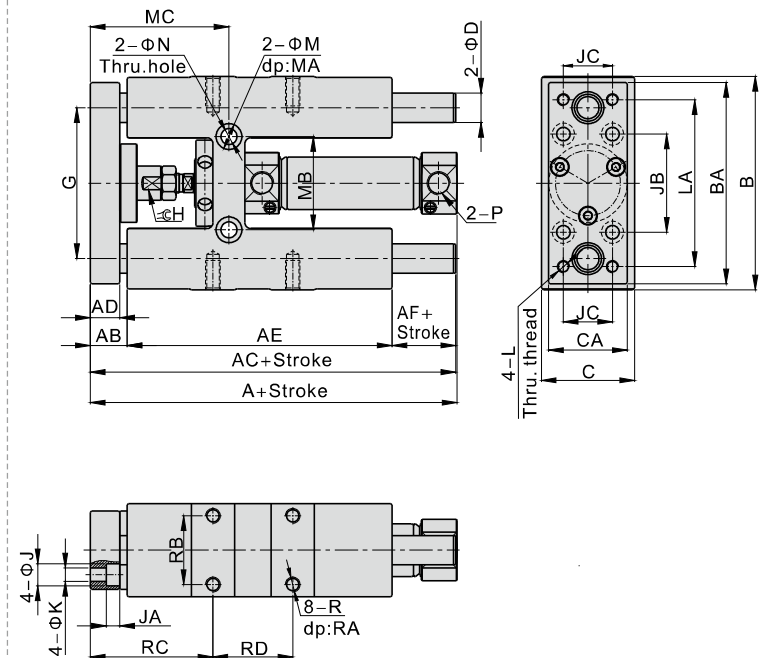
NO.	Item	Material
1	Fixed plate	Aluminum alloy
2	Bolt	Carbon steel
3	Floating nut	Carbon steel
4	Floating baffle	Carbon steel
5	C clip	Spring steel
6	Linear bearing	-
	Brass bearing	Brass
7	Nut	Carbon steel
8	MI, MIC Cylinder	Unit
9	Guide frame	Aluminum alloy
10	Guider(Linear)	Alloy steel
	Guider(Brass)	Carbon steel
11	Wrench	Carbon steel

Dimensions

TMI12/TMIC16



TMIC20/TMIC25



Bore size\Item	A	AB	AC	AD	AE	AF	B	BA	C	CA	D	G	H	J	JA	JB	JC	K
12	100.5	38	99	10	60	1	68	65	30	28	10(8)	47	9	9	5.5	32	16	5.5
16	106.5	38	99	10	60	1	68	65	30	28	10(8)	47	9	9	5.5	32	16	5.5
20	124	15	124	12	108	1	87	82	38	32	12(10)	61.5	13	9	5.5	40	20	5.5
25	125.5	15	124	12	108	1	87	82	38	32	16(12)	61.5	13	9	5.5	40	20	5.5

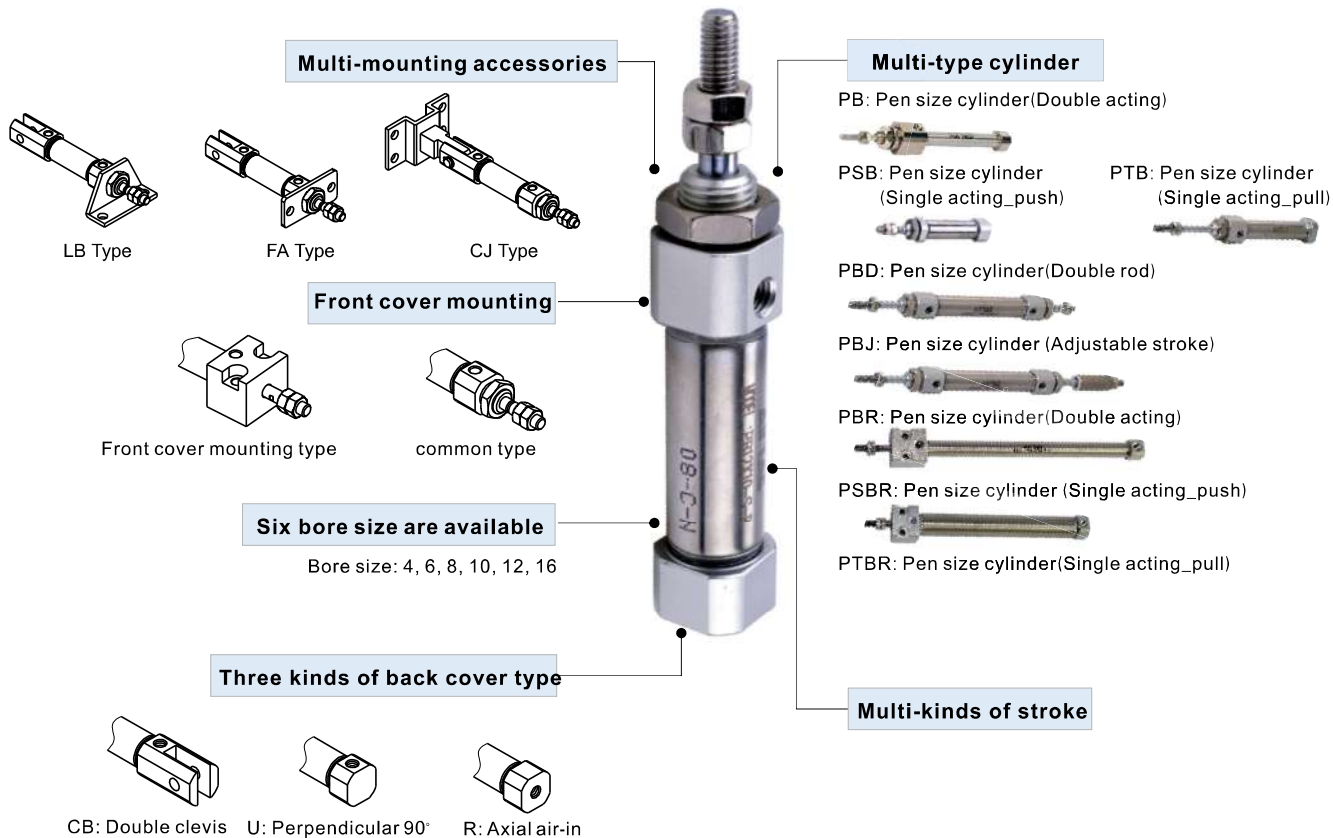
Bore size\Item	L	LA	M	MA	MB	MC	N	P	R	RA	RB	RC	RD
12	M5×0.8	57	9	4	23	44.5	5.5	M5×0.8	M5×0.8	12	23	48	40
16	M5×0.8	57	9	4	23	44.5	5.5	M5×0.8	M5×0.8	12	23	48	40
20	M5×0.8	68	10.5	6.5	38	56.5	6.5	1/8"	M6×1.0	12	28	50	32.5
25	M5×0.8	68	10.5	6.5	38	56.5	6.5	1/8"	M6×1.0	12	28	50	32.5

[Note]The values in "()" in the above table are TMIL, TMICL series sizes.



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_Push side	12.6	1.3	2.5	3.8	5.0	6.3	7.6	8.8
6	3	Single acting_Pull side	9.4	0.9	1.9	2.8	3.8	4.7	5.6	6.6
		Single acting_Push side	28.3	-	2.2	5.0	7.8	10.6	13.5	16.3
		Double acting_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	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
		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
10	4	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
		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
12	5	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
		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
16	5	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
		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

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.

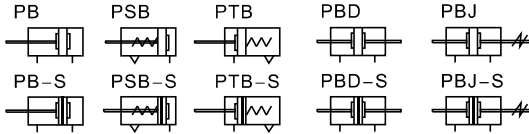


Pen size cylinder

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 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.

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 40 μm 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(36~100psi)(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		

Add) Refer to P353 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			75	80	100	125	150	160
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						
PBD	6	5 10 15 20 25 30 40 50										50	-						
	10	10 15 20 25 30 40 50 60 75 80 100										100	-						
	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										-	-						
	10	5 10 15 20 25 30 40 50 60										-	-						
	12	5 10 15 20 25 30 40 50 60										-	-						
PTB	4	5 10 15 20 25 30 40 50 60										-	-						
	6	5 10 15 20 25 30 40 50 60										-	-						
	10	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.

Ordering code

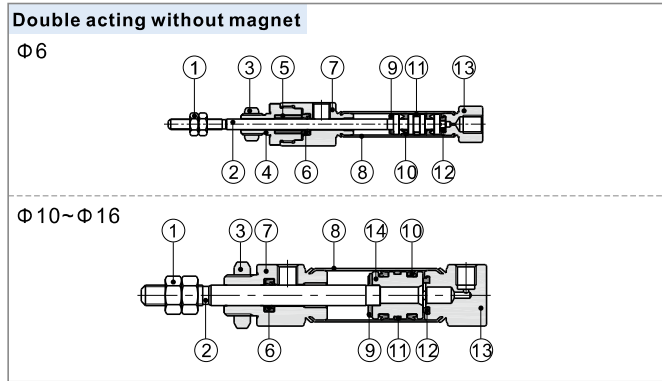
① Model	② Bore size	③ Stroke	④ Adjustable stroke	⑤ Magnet	⑥ Back cover			⑦ Mounting type[Note1]			
PB: Pen size cylinder (Double acting)	4	Refer to stroke table for details	No this code	Blank: Without magnet	Model	Back cover	Bore size	Model	Mounting type		
PSB: Pen size cylinder (Single acting_push)	6			Blank: Without magnet	PB	CB: Double clevis	Φ10~Φ16	PB	Blank: No accessories FA: FA type LB: LB type CJ: CJ type		
	10			S: With magnet	PSB	U: Perpendicular 90°	Φ10~Φ16	PSB			
	12				PTB	R: Axial air-in	Φ6~Φ16	PTB			
	16					CB: Double clevis	Φ10~Φ16				
PTB: Pen size cylinder (Single acting_pull)	6					R: Axial air-in	Φ6~Φ16				
PBD: Pen size cylinder (Double rod)	10										
	12										
	16										
PBJ: Pen size cylinder (Adjustable stroke)	10				10 20 30		PBD	No this code	-	PBD	Blank: No accessories FA: FA type LB: LB type
	12				40 50 75 100		PBJ			PBJ	
	16										

[Note1] Please refer to page 81 for accessory parts.

Pen size cylinder

PB Series

Inner structure and material of major parts

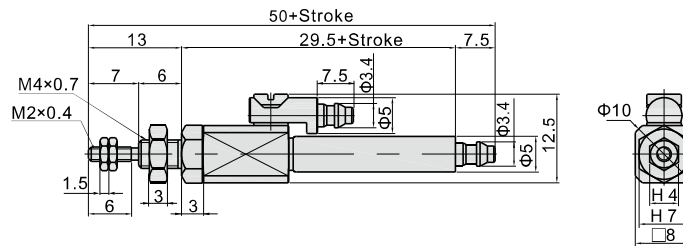


NO.	Item	Material
1	Rod nut	Carbon steel
2	Piston rod	SUS304
3	Front cover nut	Carbon steel
4	Packing retainer	Brass(Φ4)\Aluminum alloy(Others)
5	Bushing	Wear resistant material
6	Front cover O-ring	NBR
7	Front cover	Brass(Φ4)\Aluminum alloy(Others)
8	Barrel	Bronze(Φ4)\SUS304(Others)
9	Bumper	TPU
10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

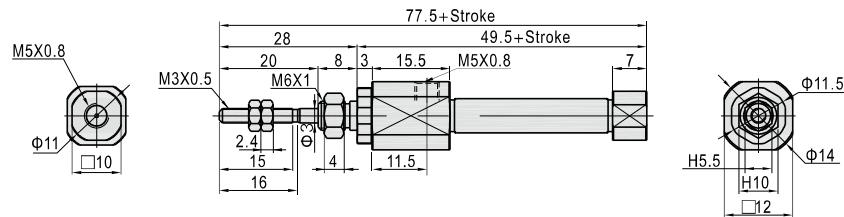
Dimensions

PB

Φ4(Without magnet)(R Type)



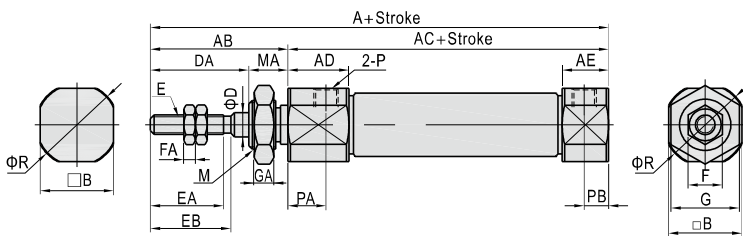
Φ6(R Type)



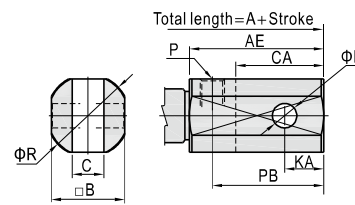
Note) Only axial air intake type of back cover is available for Φ4, Φ6mm bore size.

Φ10~Φ16

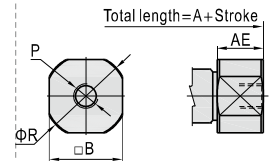
U Type(Perpendicular 90°)



CB Type(Double clevis)



R Type(Axial air-in)



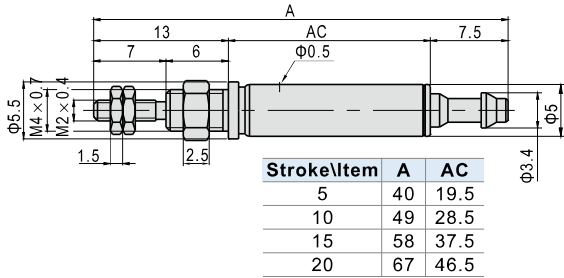
Bore size\Item	A			AB	AC	AD	AE		B	C	CA	D	DA	E	EA	EB	F	FA	G	GA	K	KA	M	MA	P	PA	PB		
	U	CB	R				U/R	CB																			U	CB	R
10	74	87	74	28	46	11.5	9.5	22.5	12	3.3	13	4	20	M4×0.7	15	16.5	7	3	11	4	3.3	5	M8×1.0	8	M5×0.8	7.5	5	18	14
12	74	92	74	28	46	11.5	9.5	27.5	15	6.6	18	5	20	M5×0.8	15	16.5	8	4	14	4	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.

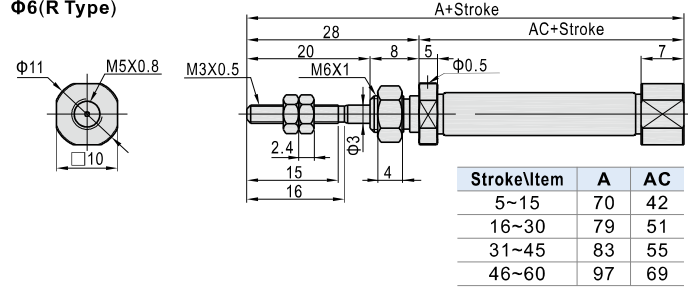
Pen size cylinder

PB Series

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



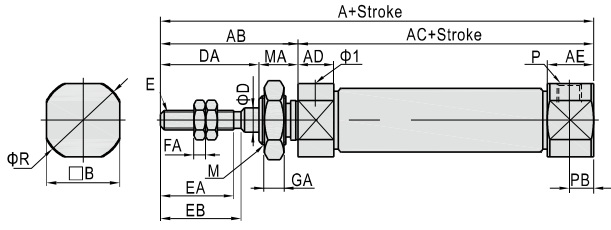
$\Phi 6$ (R Type)



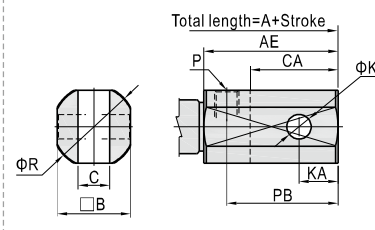
Note) Only axial air intake type of back cover is available for $\Phi 4$, $\Phi 6$ mm bore size.

$\Phi 10 \sim \Phi 16$

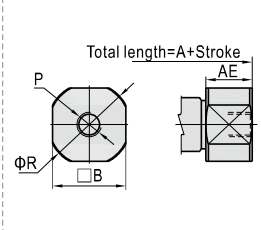
U Type(Perpendicular 90°)



CB Type(Double clevis)



R Type(Axial air-in)

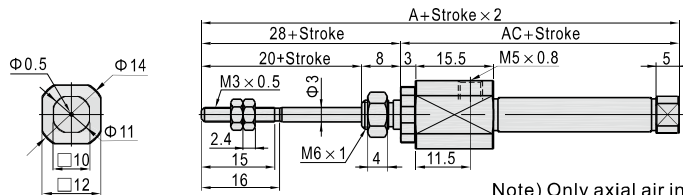


Bore size\Item	A												AB	AC				AD	AE			
	U				CB				R					5~15	16~30	31~45	46~60		-	-	B	C
Stroke	5~15	16~30	31~45	46~60	5~15	16~30	31~45	46~60	5~15	16~30	31~45	46~60	28	5~15	16~30	31~45	46~60	5	9.5	22.5	12	3.3
10	73.5	81	93	105	86.5	94	106	118	73.5	81	93	105	28	45.5	53	65	77	5	9.5	22.5	15	6.6
12	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)

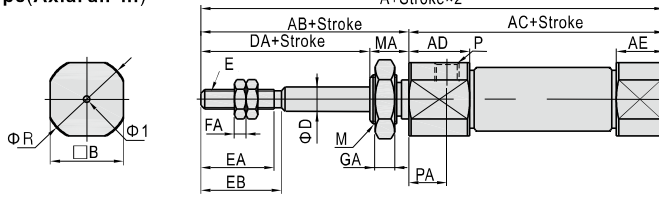


Stroke\Item	A	AC
5~15	82	54
16~30	91	63
31~45	95	67
46~60	109	81

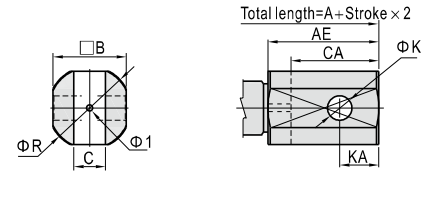
Note) Only axial air intake type of back cover is available for $\Phi 6$ mm bore size.

$\Phi 10 \sim \Phi 16$

R Type(Axial air-in)



CB Type(Double clevis)



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

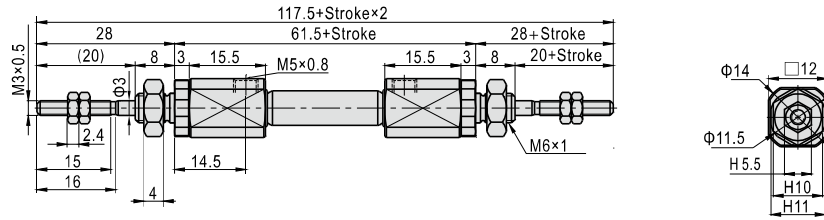
Note) $\Phi 10 \sim \Phi 16$ bore sized don't have perpendicular(90°) air-in.

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

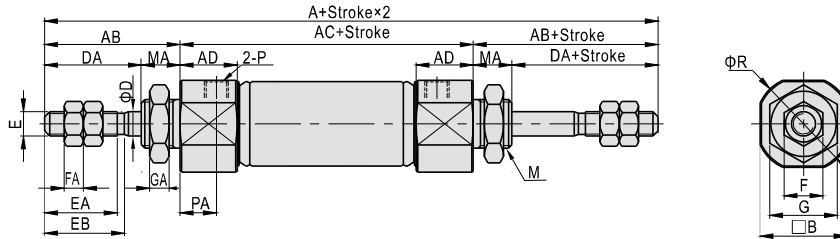
Pen size cylinder

PB Series

PBD
Φ6

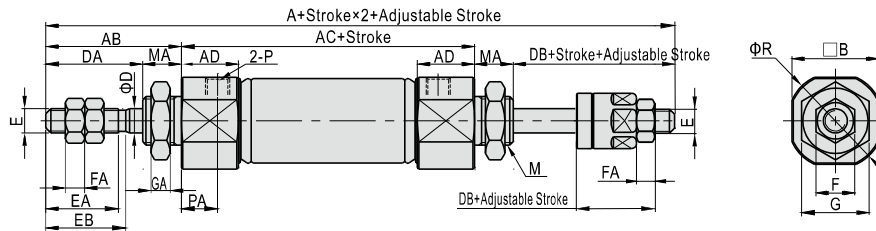


Φ10~Φ16



PBJ

Φ10~Φ16



Bore size\Item Model	A		AB	AC	AD	B	D	DA	DB	E	EA	EB	F	FA	G	GA	M	MA	P	PA
	PBD	PBJ																		
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

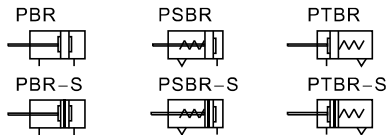
Remark: The dimensions of magnet type cylinder are the same as non-magnet type cylinder.

Pen size cylinder

PBR 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. 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.

Specification

Bore size(mm)	6	8	10	12	16
Acting type	Double acting、Single acting				
Fluid	Air(to be filtered by 40 μ m filter element)				
Operating pressure	Double acting	0.15~0.7MPa(22~100psi)(1.5~7.0bar)			
	Single acting	0.2~0.7MPa(28~100psi)(2.0~7.0bar)			
Proof pressure	1.2MPa(175psi)(12bar)				
Temperature °C	-20~70				
Speed range mm/s	50~800				
Stroke tolerance	0~150 ^{+1.0} ₀ >150 ^{+1.5} ₀				
Cushion type	Bumper				
Port size	M5×0.8				

Add) Refer to P353 for detail of sensor switch.

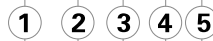
Stroke

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	200
	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
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

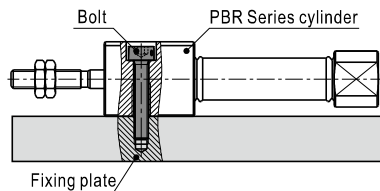
PBR 16 x 30 S U



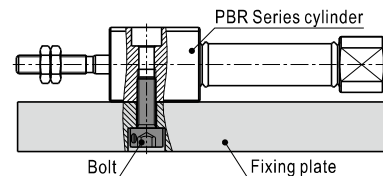
① Model	② Bore size	③ Stroke	④ Magnet	⑤ Back cover		
PBR: Pen size cylinder(Double acting) PSBR: Pen size cylinder (Single acting_push) PTBR: Pen size cylinder(Single acting_pull)	6	Refer to stroke table for details	Blank: Without magnet S: With magne	Model	Back cover	Bore size
	8			PBR	U: Perpendicular 90°	Φ8-Φ16
	10			PSBR	R: Axial air-in	Φ6-Φ16
	12			PTBR	R: Axial air-in	Φ6-Φ16
16						

Mounting type

Top bolt mounting



Bottom bolt mounting



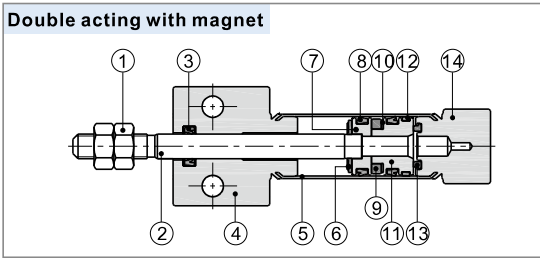
Note: Use an applicable bolt to mount upward from the bottom.

Pen size cylinder

PBR Series

Inner structure and material of major parts

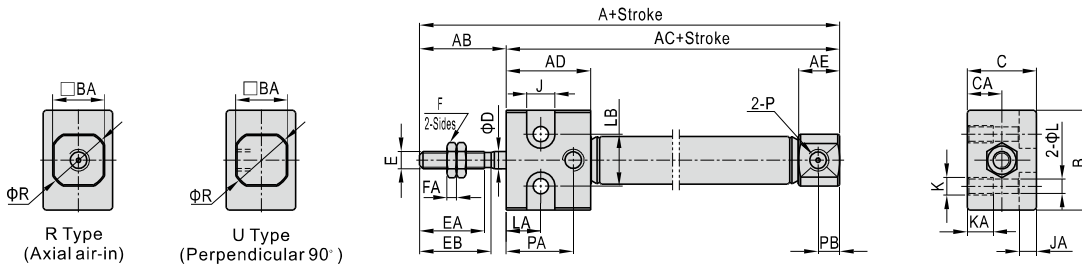
Double acting with magnet



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

Dimensions

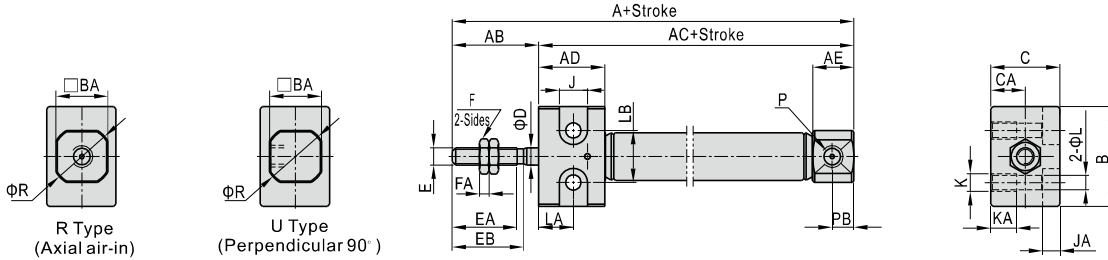
PBR



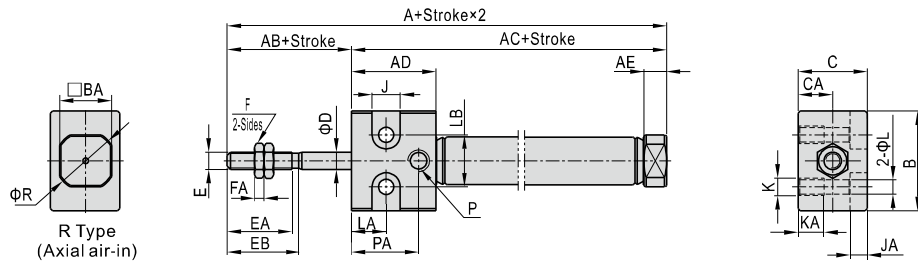
Bore size\Item	A	AB	AC	AD	AE	B	BA	C	CA	D	E	EA	EB	F	FA	J	JA	K	KA	L	LA	LB	P	PA	PB	R
6	70	20	50	19	7	17	10	14	7	3	M3×0.5	15	16	5.5	2.4	6.5	4	M4×0.7	7	3.3	8	10	M5×0.8	14	-	11
8	74	20	54	19.5	9.5	19	12	16	8	4	M4×0.7	15	16.5	7	3	6.5	4	M4×0.7	7	3.3	8	12	M5×0.8	15	5	14
10	74	20	54	19.5	9.5	19	12	16	8	4	M4×0.7	15	16.5	7	3	6.5	4	M4×0.7	7	3.3	8	12	M5×0.8	15.5	5	14
12	74	20	54	19.5	9.5	24	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	76	20	56	20	9.5	24	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.

PSBR



PTBR



Bore size\Item	A														AC									
	PSBR							PTBR							PSBR					PTBR				
Model	5~15	16~30	31~45	46~60	61~75	76~100	5~15	16~30	31~45	46~60	61~75	76~100	5~15	16~30	31~45	46~60	61~75	76~100	5~15	16~30	31~45	46~60	61~75	76~100
6	70	79	83	97	-	-	74.5	83.5	87.5	101.5	-	-	50	59	63	77	-	-	54.5	63.5	67.5	81.5	-	-
8	76.5	82.5	93.5	101.5	-	-	78.5	84.5	95.5	103.5	-	-	56.5	62.5	73.5	81.5	-	-	58.5	64.5	75.5	83.5	-	-
10	73.5	81	93	105	-	-	76.5	84	96	108	-	-	53.5	61	73	85	-	-	56.5	64	76	88	-	-
12	73.5	81	93	105	111.5	-	76.5	84	96	108	114.5	-	53.5	61	73	85	91.5	-	56.5	64	76	88	94.5	-
16	74.5	83	95	107	113	119	77.5	86	98	110	116	122	54.5	63	75	87	93	99	57.5	66	78	90	96	102

Bore size\Item	AD		AE		B	BA	C	CA	D	E	EA	EB	F	FA	J	JA	K	KA	L	LA	LB	P	PA	PB	R
	PSBR	PTBR	PSBR	PTBR																					
6	13	19	7	5	17	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	13	19.5	9.5	5	19	12	16	8	4	M4×0.7	15	16.5	7	3	6.5	4	M4×0.7	7	3.3	8	12	M5×0.8	15	5	14
10	13	19.5	9.5	5	19	12	16	8	4	M4×0.7	15	16.5	7	3	6.5	4	M4×0.7	7	3.3	8	12	M5×0.8	15.5	5	14
12	13	19.5	9.5	5	24	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	13	20	9.5	5	24	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.

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(S)
4	-	-	-	-	-	-	-	-	-
6	F-PB6LB	F-PB6FA	-	F-PB6I	F-PB6Y	F-M3X040F	-	-	-
10	F-PB10LB	F-PB10FA	F-PB10CJ	F-PB10I	F-PB10Y	F-M4X070F	F-M4X070U	CMSG	DMSG(S)
12	F-PB12LB	F-PB12FA	F-PB12CJ	F-PB12I	F-PB12Y	F-M5X080F	F-M5X080U	CMSG	DMSG(S)
16			F-PB16CJ						

Accessory selection

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

Material of accessories

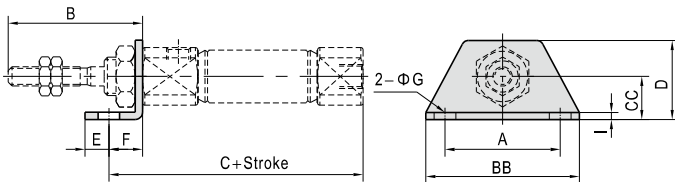
Accessories Bore size	Mounting accessories			Knuckle			
	LB	FA	CJ	I	Y	F	U
4~16	△	△	△	□	□	□	□

△—SPCC; □—Carbon steel;

[Note1] Please refer to P349~352 for knuckle detail.

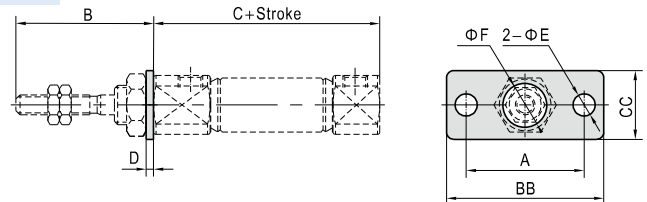
Dimensions

LB



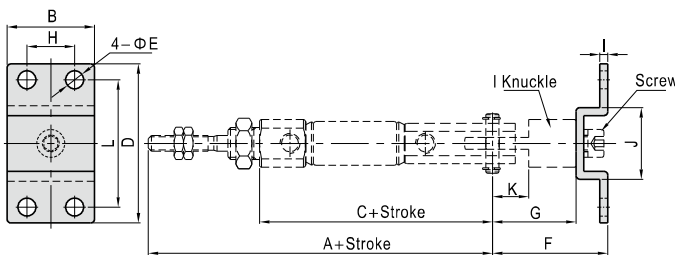
Bore size\Item	A	B	BB	C	CC	D	E	F	G	I
6	24	28	32	56.5	9	16.5	5	7	4.5	1.5
10	24	28	32	53	9	16.5	5	7	4.5	2
12	33	28	42	55	14	25	6	9	5.5	2.5
16	33	28	42	57	14	25	6	9	5.5	2.5

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

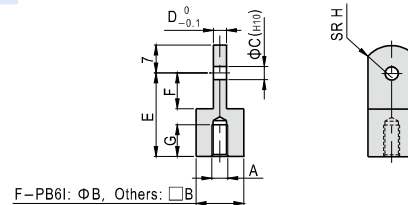
CJ



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

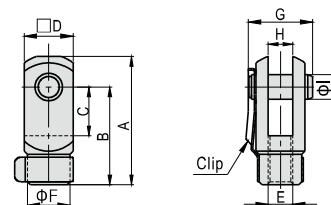
[Note] CJ type accessories includes I knuckle and PIN. It need to be matched with I knuckle and with relevant PIN.

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



Mini cylinder(Stainless steel)——MF Series

Compendium of MF Series

Multi-mounting accessories

LB Type FA Type SDB Type TC Type

Rolling packed structure

Front and back cover and stainless steel block adopt riveted rolling packed structure to form a reliable connection.

Four bore size are available

Bore size: 20, 25, 32, 40

Three kinds of back cover type

CA: Pivot type U: Flat-end type CM: Round-end type

Multi-type cylinder

- MF: Mini cylinder(Double acting)
- MSF: Mini cylinder (Single acting_push)
- MFD: Mini cylinder(Double rod)
- MFJ: Mini cylinder(Adjustable stroke)
- MFC: Mini cylinder(Double acting with cushion)
- MFCD: Mini cylinder(Double rod with cushion)
- MFCJ: Mini cylinder(Adjustable stroke with cushion)

Two kinds of cushion type

Variable cushion or Bumper

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	
20	8	Single acting	Push side	314.0	-	24.3	55.7	87.1	117.5	149.9	181.3
			Pull side	263.8	-	14.3	40.6	67.0	93.4	119.8	146.1
		Double acting	Push side	314.0	31.4	62.8	94.2	125.6	157.0	188.4	219.8
			Pull side	263.8	26.4	52.8	79.1	105.5	131.9	158.3	184.7
25	10	Single acting	Push side	490.6	-	45.6	94.7	143.8	192.8	241.9	290.9
			Pull side	412.1	-	29.9	71.1	112.4	153.6	194.8	236.0
		Double acting	Push side	490.6	49.1	98.1	147.2	196.2	245.3	294.4	343.4
			Pull side	412.1	41.2	82.4	123.6	164.8	206.1	247.3	288.5
32	12	Single acting	Push side	804.3	-	82.2	162.6	242.9	323.3	403.7	484.1
			Pull side	691.2	-	59.6	128.6	197.7	266.8	335.9	405.0
		Double acting	Push side	804.3	80.4	160.9	241.3	321.7	402.2	482.6	563.0
			Pull side	691.2	69.1	138.2	207.4	276.5	345.6	414.7	483.8
40	16	Single acting	Push side	1256.6	-	158.5	284.1	409.7	535.3	660.9	786.5
			Pull side	1055.6	-	118.3	223.8	329.3	434.8	540.3	645.8
		Double acting	Push side	1256.6	125.7	251.3	377.0	502.6	628.3	754.0	879.6
			Pull side	1055.6	105.6	211.1	316.7	422.2	527.8	633.4	738.9

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 cylinder shall be carried out test run without load before application. Prior to run, buffer shall be turned to the minimum and gradually released to avoid the damage on cylinder caused by excessive impact.
8. 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.
9. If the cylinder is dismantled and stored for a long time, please 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.

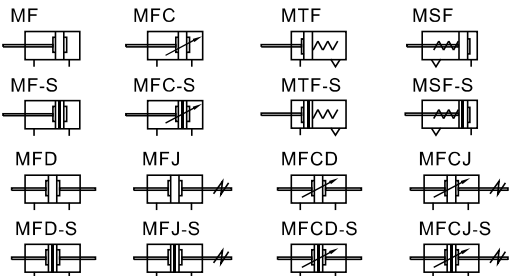


Mini cylinder(Stainless steel)

MF Series



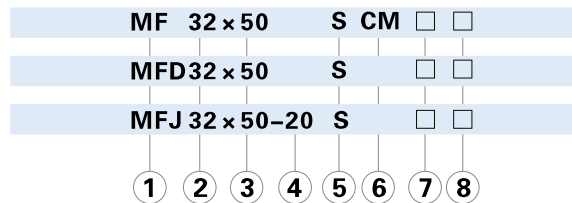
Symbol



Product feature

- JIS standard is implemented.
- Piston adopts heterogeneous two way seal structure. It has compact size and has the function of oil reservation.
- Front cover owns fixed anti-impact pad which can reduce the impact of direction-change of the cylinder.
- There are several modes of back cover, which makes the installation of cylinder more convenient.
- Front and back cover and stainless steel block adopt riveted rolling packed structure to form a reliable connection.
- The cylinder body has stainless steel pipes with high precision to produce high strength and corrosion resistance.
- With the same bore size and stroke, cylinders of MF series are shorter than ISO6432 standard cylinders.
- There are cylinders and mounting accessories with several specifications for your choice.

Ordering code



① Model	② Bore size	③ Stroke	④ Adjustable stroke	⑤ Magnet	⑥ Back cover	⑦ Mounting type[Note1]	⑧ Thread type
MF: Mini cylinder(Double acting) MFC: Mini cylinder (Double acting with cushion) MSF: Mini cylinder (Single acting_push) MTF: Mini cylinder (Single acting_pull)	20 25	Refer to stroke table for details	No this code	Blank: Without magnet S: With magnet	CA: Pivot type U: Flat-end type CM: Round-end type	Blank: No accessories FA: FA type SDB: SDB type LB: LB type TC: TC type	Blank: PT G: G T: NPT
MFD: Mini cylinder(Double rod) MFCD: Mini cylinder (Double rod with cushion)	32 40						
MFJ: Mini cylinder (Adjustable stroke) MFCJ: Mini cylinder (Adjustable stroke with cushion)			10 20 30 40 50 75 100		No this code		

[Note1] Please refer to page 86~87 for accessory parts.

Specification

Bore size(mm)	20	25	32	40
Acting type	Double acting □ Double acting with cushion □ Single acting			
Fluid	Air(to be filtered by 40μm filter element)			
Operating pressure	0.15~1.0MPa(22~145psi)(1.5~10.0bar)			
Single acting	0.2~1.0MPa(28~145psi)(2.0~10.0bar)			
Proof pressure	1.5MPa(215psi)(15bar)			
Temperature ℃	-20~70			
Speed range mm/s	Double acting □ 30~800 Single acting □ 50~800			
Stroke tolerance	0~150 ^{+1.0} ₀ >150 ^{+1.5} ₀			
Cushion type	MFC/MFCD/MFCJ Series: Variable cushion; Other series: Bumper			
Port size [Note1]	1/8"			1/4"

[Note1] PT thread, G thread and NPT thread are available.
Add) Refer to P353 for detail of sensor switch.

Stroke

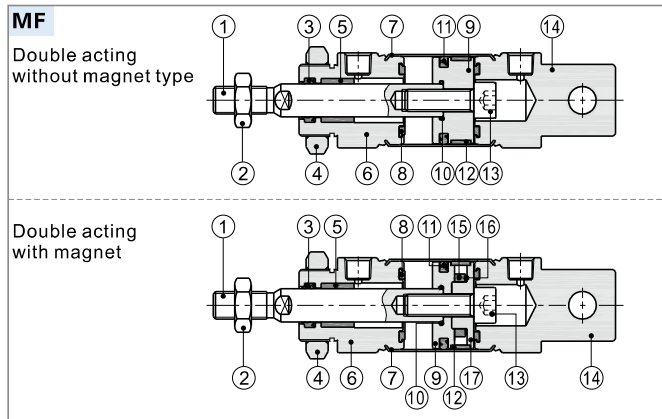
Bore size (mm)	Standard stroke (mm)																Max.std stroke	Max. stroke							
MF	20	10	15	20	25	30	40	50	60	75	80	100	125	150	160	175	200	250	300	350	400	450	500	500	800
	25	10	15	20	25	30	40	50	60	75	80	100	125	150	160	175	200	250	300	350	400	450	500	500	800
MFC	32	10	15	20	25	30	40	50	60	75	80	100	125	150	160	175	200	250	300	350	400	450	500	500	800
	40	10	15	20	25	30	40	50	60	75	80	100	125	150	160	175	200	250	300	350	400	450	500	500	800
MFD	20	10	15	20	25	30	40	50	60	75	80	100	125	150	160	175	200	250	300	300	-				
MFCD	25	10	15	20	25	30	40	50	60	75	80	100	125	150	160	175	200	250	300	300	-				
MFJ	32	10	15	20	25	30	40	50	60	75	80	100	125	150	160	175	200	250	300	350	400	450	500	500	-
MFCJ	40	10	15	20	25	30	40	50	60	75	80	100	125	150	160	175	200	250	300	350	400	450	500	500	-
MSF	20	10	15	20	25	30	40	50	60	75	80	100	125	150	-	-									
	25	10	15	20	25	30	40	50	60	75	80	100	125	150	-	-									
MTF	32	10	15	20	25	30	40	50	60	75	80	100	125	150	-	-									
	40	10	15	20	25	30	40	50	60	75	80	100	125	150	-	-									

[Note] Consult us for non-standard stroke.

Mini cylinder(Stainless steel)

MF Series

Inner structure and material of major parts

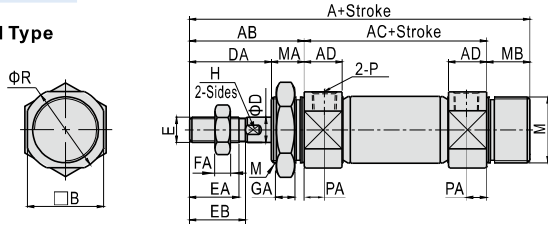


NO.	Item	Material
1	Piston rod	Carbon steel with 20 μm chrome plated
2	Rod nut	Carbon steel
3	Front cover packing	NBR
4	Front cover nut	Carbon steel
5	Bushing	Wear resistant material
6	Front cover	Aluminum alloy
7	Barrel	SUS304
8	Bumper	TPU
9	Piston	Aluminum alloy
10	O-ring	NBR
11	Piston seal	NBR
12	Wear ring	Wear resistant material
13	Screw	Carbon steel
14	Back cover	Aluminum alloy
15	Magnet	Sintered metal (Neodymium-iron-boron)
16	Magnet washer	NBR
17	Magnet holder	Aluminum alloy

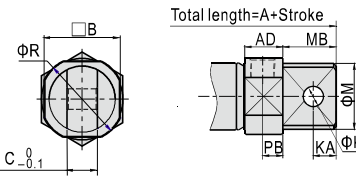
Dimensions

MF/MFC

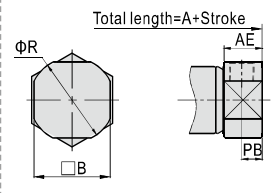
CM Type



CA Type



U Type

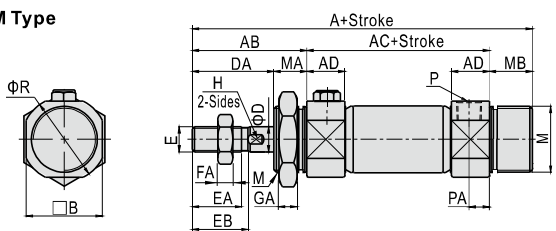


Bore size\Item	A											M				MB				Back cover											
	CM	CA	U	AB	AC	AD	AE	B	C	CM	CA	MA	CA	CM	D	DA	E	EA	EB	F	FA	G	GA	H	K	KA	P	PA	PB	R	
20	116	124	103	41	62	14.5	14.5	25	12	M20×1.5	20	14	21	13	8	27	M8×1.25	16.5	18	12	6	26	8	6	8	9	1/8"	7.5	7.5	29	
25	120	128	108	45	62	14.5	15.5	30	12	M26×1.5	26	14	21	13	10	31	M10×1.25	20.5	22	17	6	32	8	8	8	9	1/8"	7.5	8	33.5	
32	122	136	110	45	64	14.5	15.5	34.5	20	M26×1.5	26	14	27	13	12	31	M10×1.25	20.5	22	17	6	32	8	10	10	12	1/8"	7.5	8	37.5	
40	154	165	138.5	50	88	21.5	22	42.5	20	M32×2.0	32	16	27	16	16	34	M14×1.5	22.5	24	19	8	41	10	14	10	12	1/4"	11	11.5	46.5	

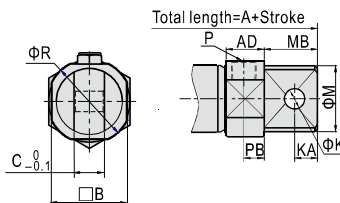
Remark: 1. The dimensions of magnet type cylinder are the same as non-magnet type cylinder.
2. The dimensions of MFC series are the same as MF series.

MSF

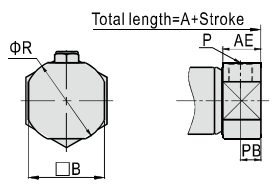
CM Type



CA Type



U Type



Bore size\Item	A											AC			
	CM			CA			U					-			
Stroke	1~50	51~100	101~150	1~50	51~100	101~150	1~50	51~100	101~150	1~50	51~100	101~150	1~50	51~100	101~150
20	141	166	191	149	174	199	128	153	178	87	112	137			
25	145	170	195	153	178	203	133	158	183	87	112	137			
32	147	172	197	161	186	211	135	160	185	89	114	139			
40	179	204	229	190	215	240	163.5	188.5	213.5	113	138	163			

Bore size\Item	AB	AD	AE	B	C	D	DA	E	EA	EB	F	FA	G	GA	H	K	KA	M				MB		P	PA	PB	R
																		CM	CA	MA	CA	CM					
20	41	14.5	14.5	25	12	8	27	M8×1.25	16.5	18	12	6	26	8	6	8	9	M20×1.5	20	14	21	13	1/8"	7.5	7.5	29	
25	45	14.5	15.5	30	12	10	31	M10×1.25	20.5	22	17	6	32	8	8	8	9	M26×1.5	26	14	21	13	1/8"	7.5	8	33.5	
32	45	14.5	15.5	34.5	20	12	31	M10×1.25	20.5	22	17	6	32	8	10	10	12	M26×1.5	26	14	27	13	1/8"	7.5	8	37.5	
40	50	21.5	22	42.5	20	16	34	M14×1.5	22.5	24	19	8	41	10	14	10	12	M32×2.0	32	16	27	16	1/4"	11	11.5	46.5	

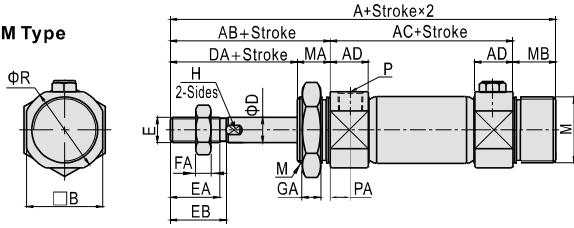
Remark: The dimensions of magnet type cylinder are the same as non-magnet type cylinder.

Mini cylinder(Stainless steel)

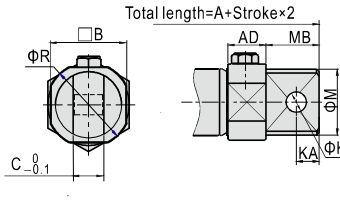
MF Series

MTF

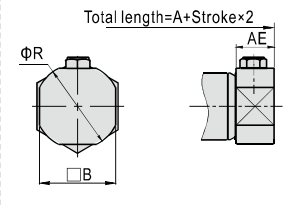
CM Type



CA Type



U Type

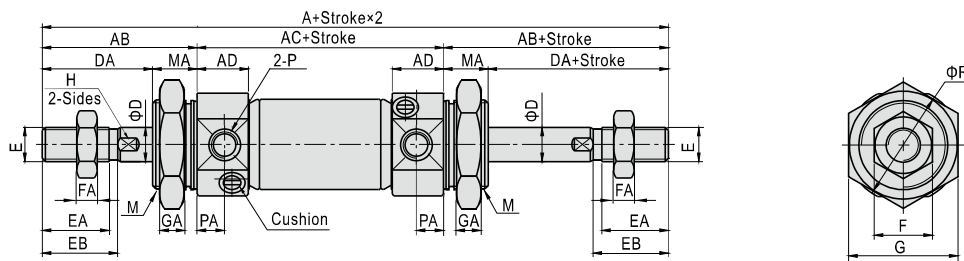


Bore size/Item	CM			A			U			AC			M	MA	MB		
	Back cover			CA									CM	CA	-	CA	CM
Stroke	1~50	51~100	101~150	1~50	51~100	101~150	1~50	51~100	101~150	1~50	51~100	101~150	-	-	-	-	-
20	141	166	191	149	174	199	128	153	178	87	112	137	M20×1.5	20	14	21	13
25	145	170	195	153	178	203	133	158	183	87	112	137	M26×1.5	26	14	21	13
32	147	172	197	161	186	211	135	160	185	89	114	139	M26×1.5	26	14	27	13
40	179	204	229	190	215	240	163.5	188.5	213.5	113	138	163	M32×2.0	32	16	27	16

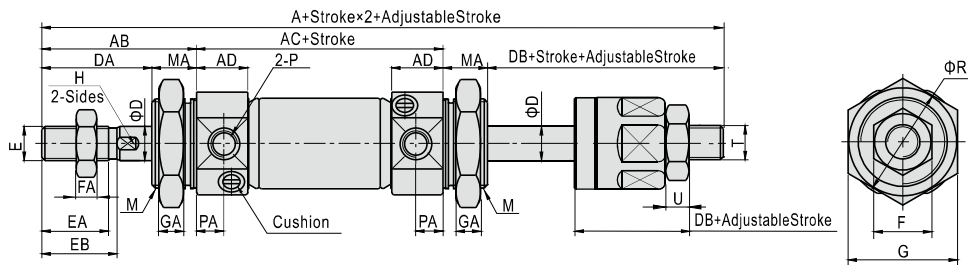
Bore size/Item	AB	AD	AE	B	C	D	DA	E	EA	EB	F	FA	G	GA	H	K	KA	P	PA	R
20	41	14.5	14.5	25	12	8	27	M8×1.25	16.5	18	12	6	26	8	6	8	9	1/8"	7.5	29
25	45	14.5	15.5	30	12	10	31	M10×1.25	20.5	22	17	6	32	8	8	8	9	1/8"	7.5	33.5
32	45	14.5	15.5	34.5	20	12	31	M10×1.25	20.5	22	17	6	32	8	10	10	12	1/8"	7.5	37.5
40	50	21.5	22	42.5	20	16	34	M14×1.5	22.5	24	19	8	41	10	14	10	12	1/4"	11	46.5

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

MFD/MFCD



MFJ/MFCJ



Bore size/Item	A		AB	AC	AD	D	DA	DB	E	EA	EB	F	FA	G	GA	H	M	MA	P	PA	R	T	U
	MFD/MFCD	MFJ/MFCJ																					
20	144	141	41	62	14.5	8	27	24	M8×1.25	16.5	18	12	6	26	8	6	M20×1.5	14	1/8"	7.5	29	M8×1.25	5
25	152	148	45	62	14.5	10	31	27	M10×1.25	20.5	22	17	6	32	8	8	M26×1.5	14	1/8"	7.5	33.5	M10×1.25	6
32	154	150	45	64	14.5	12	31	27	M10×1.25	20.5	22	17	6	32	8	10	M26×1.5	14	1/8"	7.5	37.5	M10×1.25	6
40	188	182	50	88	21.5	16	34	28	M14×1.5	22.5	24	19	8	41	10	14	M32×2.0	16	1/4"	11	46.5	M12×1.25	7

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

Mini cylinder(Stainless steel)

MF Series—Accessories

List for ordering code of accessories

Accessories Bore size	Mounting accessories				Knuckle				Sensor switch	
	LB	FA	TC	SDB	I	Y	F	U	CMSG	DMSG(S)
20	F-MF20LB	F-MF20FA	F-MF20TC	F-MF20SDB	F-MF20I	F-MF20Y	F-M8X125F	F-M8X125U	CMSG	DMSG(S)
25	F-MF32LB	F-MF32FA	F-MF32TC		F-MF25I	F-MF25Y	F-M10X125F	F-M10X125U		
32	F-MF40LB	F-MF40FA	F-MF40TC	F-MF32SDB	F-MF40I	F-MF40Y	F-M14X150F	F-M14X150U		
40										

Accessory selection

Accessories Cylinder model		Mounting accessories				Knuckle				Sensor switch	
		LB	FA	SDB	TC	I	Y	U [1]	F	CMSG	DMSG(S)
MF	Standard	●	●	●	●	●	●	●	●	×	×
MFC	With magnet	●	●	●	●	●	●	●	●	●	●
MSF	Standard	●	●	●	●	●	●	●	●	×	×
MTF	With magnet	●	●	●	●	●	●	●	●	●	●
MFD	Standard	●	●	×	●	●	●	●	●	×	×
MFCJ	With magnet	●	●	×	●	●	●	●	●	●	●
MFJ	Standard	●	●	×	●	●	●	●	●	×	×
MFCJ	With magnet	●	●	×	●	●	●	●	●	●	●

Material of accessories

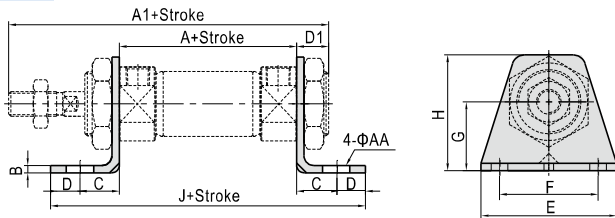
Accessories Bore size	Mounting accessories				Knuckle			
	LB	FA	SDB	TC	I	Y	F	U
20~40	△	△	△	■	□	□	□	□

■—Cast steel; △—SPCC; □—Carbon steel

[Note1] Please refer to P349~352 for knuckle detail.

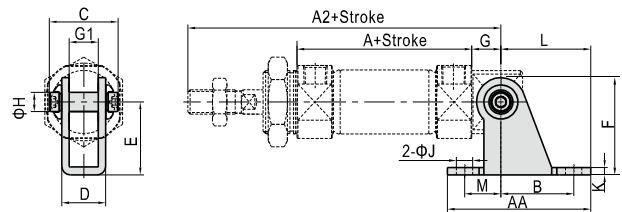
Dimensions

LB



Bore size\Item	A	A1	AA	B	C	D	D1	E	F	G	H	J
20	62	116	7	3	20	8	13	55	40	25	40	118
25	62	120	7	3.5	20	8	13	55	40	28	47	118
32	64	122	7	3.5	20	8	13	55	40	28	47	120
40	88	154	7	3.5	23	10	16	75	55	30	54	154

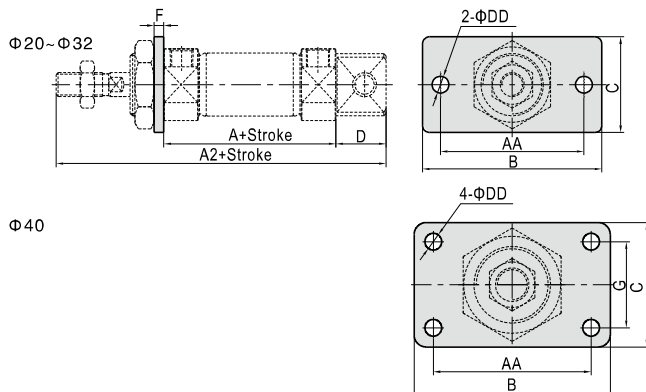
SDB



Bore size\Item	A	A2	AA	B	C	D	E	F	G	G1	H	K	J	L	M
20	62	115	59	30	31	17.1	30	40	12	12.1	8	2.5	7	37	15
25	62	119	59	30	31	17.1	30	40	12	12.1	8	2.5	7	37	15
32	64	124	75	40	42	26.1	40	53	15	20.1	10	3	9	50	15
40	88	153	75	40	42	26.1	40	53	15	20.1	10	3	9	50	15

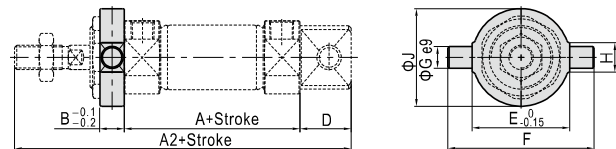
[Note] SDB is attached with relevant PIN.

FA



Bore size\Item	A	A2	AA	B	C	D	DD	F	G
20	62	124	60	75	34	21	7	3.5	-
25	62	128	60	75	40	21	7	4	-
32	64	136	60	75	40	27	7	4	-
40	88	165	66	82	52	27	7	4	36

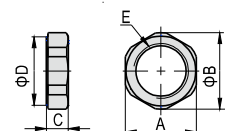
TC



Bore size\Item	A	A2	B	D	E	F	G	H	J
20	62	124	10	21	32	52	8	12	32
25	62	128	10	21	40	60	9	12	40
32	64	136	10	27	40	60	9	12	40
40	88	165	11	27	53	77	10	14	53

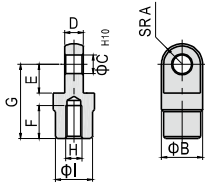
Special nut for TC

Bore size\Item	A	B	C	D	E
20	26	28	8	25	M20×1.5
25	32	34	8	31	M26×1.5
32	32	34	8	31	M26×1.5
40	41	45	10	40	M32×2.0

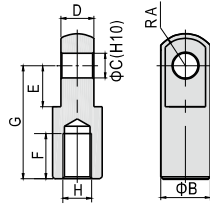


I Knuckle

F-MF20I, F-MF25I



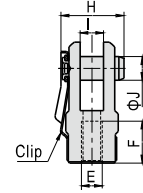
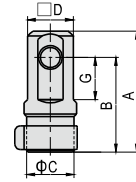
F-MF40I



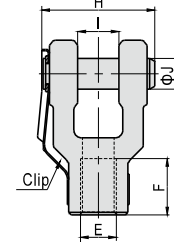
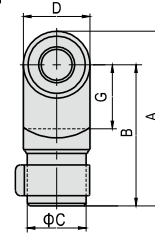
Type\Item	A	B	C	D	E	F	G	H	I
F-MF20I	9.5	20	9	9	14	16	36	M8×1.25	18
F-MF25I	9.5	20	9	9	14	18	38	M10×1.25	18
F-MF40I	15	24	12	16	20	22	55	M14×1.5	-

Y Knuckle

F-MF20Y
F-MF25Y



F-MF40Y



Type\Item	A	B	C	D	E	F	G	H	I	J
F-MF20Y	46	36	18	17.5	M8×1.25	16	16	24	9	9
F-MF25Y	48	38	18	17.5	M10×1.25	18	16	24	9	9
F-MF40Y	68	55	23	26	M14×1.5	22	25	44	16	12



Mini cylinder(Stainless steel)—MG Series

Compendium of MG Series

Multi-mounting accessories

LB Type FA Type
SDB+CB Type CB Type

Six bore size are available
Bore size: 20, 25, 32, 40, 50, 63

Rolling packed structure
Front and back cover and stainless steel block adopt riveted rolling packed structure to form a reliable connection.

Multi-type cylinder

- MG: Mini cylinder(Double acting)
- MSG: Mini cylinder (Single acting_push)
- MTG: Mini cylinder(Single acting_pull)
- MGD: Mini cylinder(Double rod)
- MGC: Mini cylinder(Double acting with cushion)
- MGCD: Mini cylinder(Double rod with cushion)

Two kinds of cushion type
Variable cushion or Bumper

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	
20	8	Single acting	Push side	314.0	-	15.7	47.1	78.5	109.9	141.3	172.7
			Pull side	263.8	-	5.7	32.0	58.4	84.8	111.2	137.5
		Double acting	Push side	314.0	31.4	62.8	94.2	125.6	157.0	188.4	219.8
			Pull side	263.8	26.4	52.8	79.1	105.5	131.9	158.3	184.7
25	10	Single acting	Push side	490.6	-	24.6	73.7	122.8	171.8	220.9	269.9
			Pull side	412.1	-	8.9	50.1	91.4	132.6	173.8	215.0
		Double acting	Push side	490.6	49.1	98.1	147.2	196.2	245.3	294.4	343.4
			Pull side	412.1	41.2	82.4	123.6	164.8	206.1	247.3	288.5
32	12	Single acting	Push side	804.3	-	40.2	120.6	200.9	281.3	361.7	442.1
			Pull side	691.2	-	17.6	86.6	155.7	224.8	293.9	363.0
		Double acting	Push side	804.3	80.4	160.9	241.3	321.7	402.2	482.6	563.0
			Pull side	691.2	69.1	138.2	207.4	276.5	345.6	414.7	483.8
40	16	Single acting	Push side	1256.6	-	62.8	188.4	314.0	439.6	565.2	690.8
			Pull side	1055.6	-	22.6	128.1	233.6	339.1	444.6	550.1
		Double acting	Push side	1256.6	125.7	251.3	377.0	502.6	628.3	754.0	879.6
			Pull side	1055.6	105.6	211.1	316.7	422.2	527.8	633.4	738.9
50	20	Double acting	Push side	1962.5	196.3	392.5	588.8	785.0	981.3	1177.5	1373.8
		Pull side	1648.5	164.9	329.7	494.6	659.4	824.3	989.1	1154.0	
63	20	Double acting	Push side	3115.7	311.6	623.1	934.7	1246.3	1557.9	1869.4	2181.0
		Pull side	2801.7	280.2	560.3	840.5	1120.7	1400.9	1681.0	1961.2	

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 cylinder shall be carried out test run without load before application. Prior to run, buffer shall be turned to the minimum and gradually released to avoid the damage on cylinder caused by excessive impact.
- 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 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.

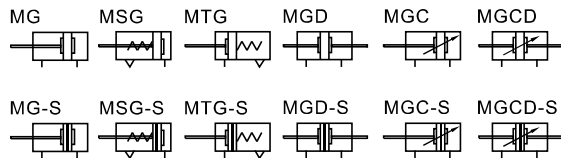


Mini cylinder(Stainless steel)

MG Series



Symbol



Product feature

1. JIS standard is implemented.
2. Piston adopts heterogeneous two way seal structure. It has compact size and has the function of oil reservation.
3. Front cover owns fixed anti-impact pad which can reduce the impact of direction-change of the cylinder.
4. Front and back cover and stainless steel block adopt riveted rolling packed structure to form a reliable connection.
5. The cylinder body has stainless steel pipes with high precision to produce high strength and corrosion resistance.
6. There are cylinders and mounting accessories with several specifications for your choice.

Specification

Bore size(mm)		20	25	32	40	50	63	
Acting type	MSG/MTG	Single acting					-	
	MG/MGD	Double acting					-	
	MGC/MGCD	Double acting with cushion					-	
Fluid		Air(to be filtered by 40 μ m filter element)						
Operating pressure	Double acting	0.15~1.0MPa(22~145psi)(1.5~10.0bar)						
	Single acting	0.2~1.0MPa(28~145psi)(2.0~10.0bar)						
Proof pressure		1.5MPa(215psi)(15bar)						
Temperature °C		-20~70						
Speed range mm/s		Double acting: 30~800			Single acting: 50~800			
Stroke tolerance		0~150 ^{+1.0} >150 ^{+1.5}						
Cushion type		Variable cushion、Bumper				Variable cushion		
Port size [Note1]	Variable cushion	M5×0.8		1/8"		1/4"		
	Bumper			1/8"		-		

[Note1] PT thread, G thread thread and NPT thread are available.
Add) Refer to P353 for detail of sensor switch.

Stroke

Bore size (mm)	stroke (mm)																Max.std stroke	Max. stroke		
	Standard stroke															Longer stroke				
MG MGC	20	10	15	20	25	30	40	50	60	75	80	100	125	150	175	200	201~500	500	800	
	25	10	15	20	25	30	40	50	60	75	80	100	125	150	175	200	250	300	500	800
	32	10	15	20	25	30	40	50	60	75	80	100	125	150	175	200	250	300	500	800
	40	10	15	20	25	30	40	50	60	75	80	100	125	150	175	200	250	300	500	800
	50	10	15	20	25	30	40	50	60	75	80	100	125	150	175	200	250	300	500	800
	63	10	15	20	25	30	40	50	60	75	80	100	125	150	175	200	250	300	500	800
MGD MGCD	20	10	15	20	25	30	40	50	60	75	80	100	125	150	175	200	300	-	-	-
	25	10	15	20	25	30	40	50	60	75	80	100	125	150	175	200	300	-	-	-
	32	10	15	20	25	30	40	50	60	75	80	100	125	150	175	200	300	-	-	-
	40	10	15	20	25	30	40	50	60	75	80	100	125	150	175	200	300	-	-	-
	50	10	15	20	25	30	40	50	60	75	80	100	125	150	175	200	300	-	-	-
	63	10	15	20	25	30	40	50	60	75	80	100	125	150	175	200	300	-	-	-
MSG MTG	20	10	15	20	25	30	40	50	60	75	80	100	125	150	-	-	-	-		
	25	10	15	20	25	30	40	50	60	75	80	100	125	150	-	-	-	-		
	32	10	15	20	25	30	40	50	60	75	80	100	125	150	-	-	-	-		
	40	10	15	20	25	30	40	50	60	75	80	100	125	150	-	-	-	-		

[Note] Consult us for non-standard stroke.

Ordering code

MG 20 × 100 S FA □



① Model	② Bore size		③ Stroke	④ Magnet	⑤ Mounting type [Note1]	⑥ Thread type [Note2]
MG: Mini cylinder(Double acting) MGC: Mini cylinder (Double acting with cushion) MSG: Mini cylinder (Single acting_push) MTG: Mini cylinder (Single acting_pull)	Model	Bore size	Refer to stroke table for details	Blank: Without magnet S: With magnet	Blank: No accessories FA: FA type LB: LB type CB: CB type SDB: SDB type	Blank: PT G: G T: NPT
MGC: Mini cylinder(Double rod) MGCD: Mini cylinder (Double rod with cushion)	MGC	20 25 32 40 50 63				

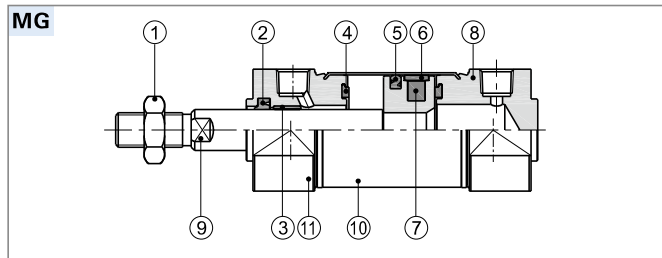
[Note1] Please refer to page 92~93 for accessory parts. SDB must be used with CB.

[Note2] Standard thread is blank here.

Mini cylinder(Stainless steel)

MG Series

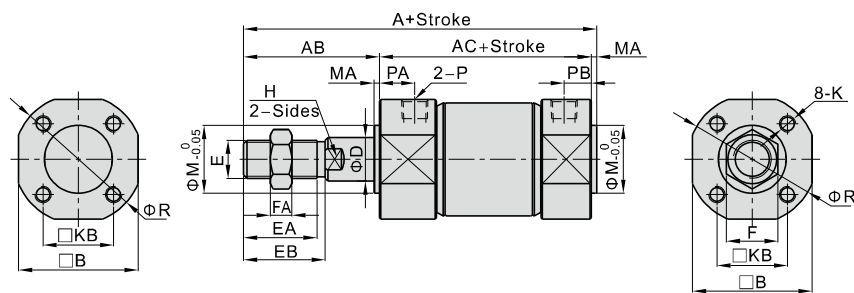
Inner structure and material of major parts



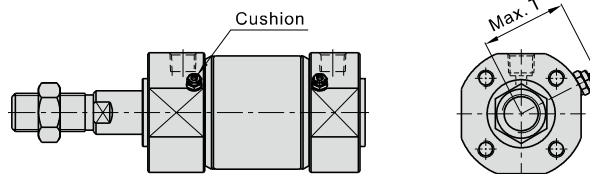
NO.	Item	Material
1	Rod nut	Carbon steel
2	Front cover packing	NBR
3	Bushing	Wear resistant material
4	Bumper	TPU
5	Piston seal	NBR
6	Wear ring	Wear resistant material
7	Magnet	Rubber
8	Back cover	Aluminum alloy
9	Piston rod	Carbon steel with 20 μm chrome plated
10	Barrel	SUS304
11	Front cover	Aluminum alloy

Dimensions

MG $\Phi 20-\Phi 40$



MGC $\Phi 20-\Phi 63$



Bore size\Item	Standard stroke	Longer stroke	A	AB	AC	B	D	E	EA	EB	F	FA
20	≤200	201~500	106(114)	35	69(77)	24	8	M8×1.25	16.5	18	12	6
25	≤300	301~500	111(119)	40	69(77)	29	10	M10×1.25	20.5	22	17	6
32	≤300	301~500	113(121)	40	71(79)	35.5	12	M10×1.25	20.5	22	17	6
40	≤300	301~500	130(139)	50	78(87)	44	16	M14×1.5	28.5	30	19	8
50	≤300	301~500	150(162)	58	90(102)	55	20	M18×1.5	33.5	35	27	11
63	≤300	301~500	150(162)	58	90(102)	69	20	M18×1.5	33.5	35	27	11

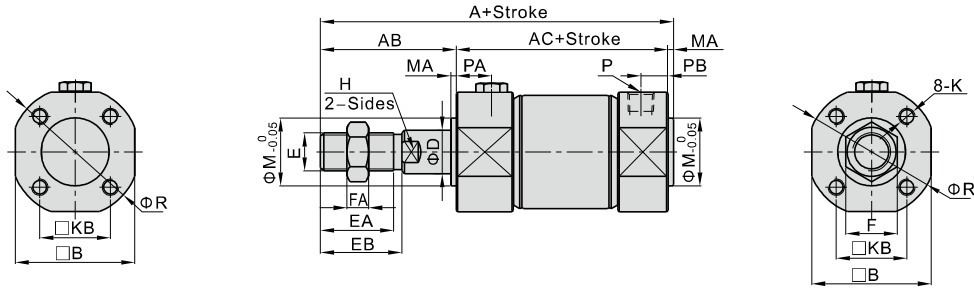
Bore size\Item	H	K	KB	M	MA	P		PA		PB		R	T
						MG	MGC	MG	MGC	MG	MGC		
20	6	M4×0.7 dp:7	14	12	2	1/8"	M5×0.8	11.5(14)	14(16.5)	8	10	26.5	22.5
25	8	M5×0.8 dp:7.5	16.5	14	2	1/8"	PT1/8	11.5(14.5)	11.5(14.5)	8.5	8.5	31.5	24.5
32	10	M5×0.8 dp:7.5	20	18	2	1/8"	PT1/8	12(14.5)	12(14.5)	9.5	9.5	38.5	30.5
40	14	M6×1.0 dp:12	26	25	2	1/8"	PT1/8	13(13.5)	13(13.5)	12	12	47.5	35
50	18	M8×1.25 dp:16	32	30	2	-	PT1/4	-	15.5(22.5)	-	13	58.5	40.5
63	18	M10×1.5 dp:16	38	32	2	-	PT1/4	-	15.5(22.5)	-	13	72	47.5

Remark: The dimensions of magnet type cylinder are the same as non-magnet type cylinder. The value in the “()” is longer stroke type's value.

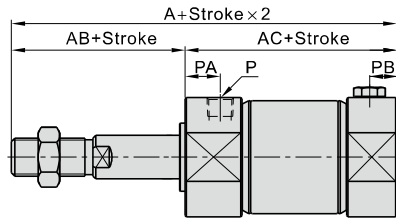
Mini cylinder(Stainless steel)

MG Series

MSG $\Phi 20\sim\Phi 40$



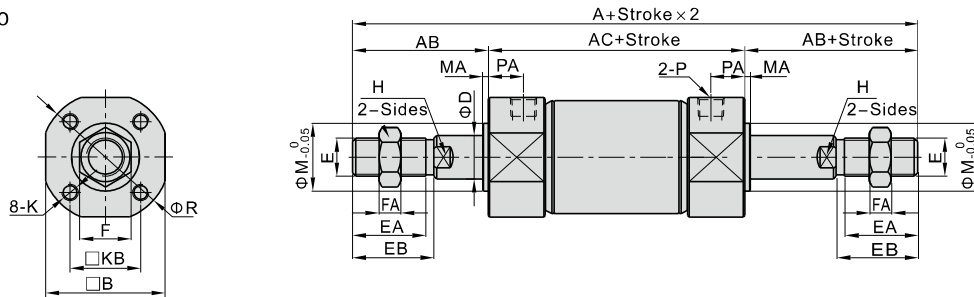
MTG $\Phi 20\sim\Phi 40$



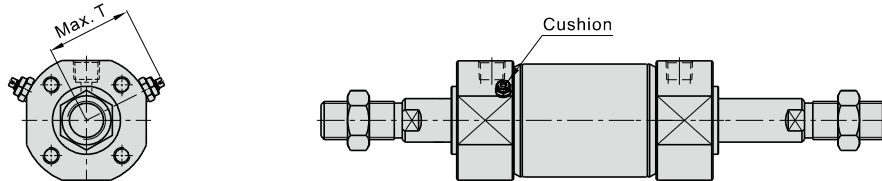
Bore size\Item	A			AB	AC				B	D	E	EA	EB	F	FA	H	K	KB	M	MA	P	PA	PB	R
	1~50	51~100	101~150		1~50	51~100	101~150																	
20	131	156	181	35	94	119	144	24	8	M8×1.25	16.5	18	12	6	6	M4×0.7 Dp:7	14	12	2	1/8"	11.5	8	26.5	
25	136	161	186	40	94	119	144	29	10	M10×1.25	20.5	22	17	6	8	M5×0.8 Dp:7.5	16.5	14	2	1/8"	11.5	8.5	31.5	
32	138	163	188	40	96	121	146	35.5	12	M10×1.25	20.5	22	17	6	10	M5×0.8 Dp:7.5	20	18	2	1/8"	12	9.5	38.5	
40	155	180	205	50	103	128	153	44	16	M14×1.5	28.5	30	19	8	14	M6×1.0 Dp:12	26	25	2	1/8"	13	12	47.5	

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

MGD $\Phi 20\sim\Phi 40$



MGCD $\Phi 20\sim\Phi 63$



Bore size\Item	A	AC	AB	B	D	E	EA	EB	F	FA	H	K	KB	M	MA	P		PA		R	T
																MGD	MGCD	MGD	MGCD		
20	147	77	35	24	8	M8×1.25	16.5	18	12	6	6	M4×0.7 Dp:7	14	12	2	1/8"	M5×0.8	11.5	14	26.5	22.5
25	157	77	40	29	10	M10×1.25	20.5	22	17	6	8	M5×0.8 Dp:7.5	16.5	14	2	1/8"	1/8"	11.5	11.5	31.5	24.5
32	159	79	40	35.5	12	M10×1.25	20.5	22	17	6	10	M5×0.8 Dp:7.5	20	18	2	1/8"	1/8"	12	12	38.5	30.5
40	187	87	50	44	16	M14×1.5	28.5	30	19	8	14	M6×1.0 Dp:12	26	25	2	1/8"	1/8"	13	13	47.5	35
50	218	102	58	55	20	M18×1.5	33.5	35	27	11	18	M8×1.25 Dp:16	32	30	2	-	1/4"	-	15.5	58.5	40.5
63	218	102	58	69	20	M18×1.5	33.5	35	27	11	18	M10×1.5 Dp:16	38	32	2	-	1/4"	-	15.5	72	47.5

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

Mini cylinder(Stainless steel)

MG Series—Accessories

List for ordering code of accessories

Accessories Bore size	Mounting accessories				Knuckle		Sensor switch	
	LB	FA	SDB	CB	I	Y	CMSG	DMSG(S)
20	F-MG20LB	F-MG20FA	F-MG20SDB	F-MG20CB	F-ACQ20I	F-ACQ20Y	CMSG	DMSG(S)
25	F-MG25LB	F-MG25FA	F-MG25SDB	F-MG25CB	F-ACQ25I	F-ACQ25Y		
32	F-MG32LB	F-MG32FA	F-MG32SDB	F-MG32CB	F-ACQ32I	F-ACQ32Y		
40	F-MG40LB	F-MG40FA	F-MG40SDB	F-MG40CB	F-ACQ32I	F-ACQ32Y		
50	F-MG50LB	F-MG50FA	F-MG50SDB	F-MG50CB	F-ACQ50I	F-ACQ50Y		
63	F-MG63LB	F-MG63FA	F-MG63SDB	F-MG63CB				

Accessory selection

Accessories Cylinder model		Mounting accessories				Knuckle		Sensor switch	
		LB	FA	SDB	CB	I	Y	CMSG	DMSG(S)
MG	Standard	●	●	●	●	●	●	×	×
MGC	With magnet	●	●	●	●	●	●	●	●
MSG	Standard	●	●	●	●	●	●	×	×
MTG	With magnet	●	●	●	●	●	●	●	●
MGD	Standard	●	●	×	×	●	●	×	×
MGCD	With magnet	●	●	×	×	●	●	●	●

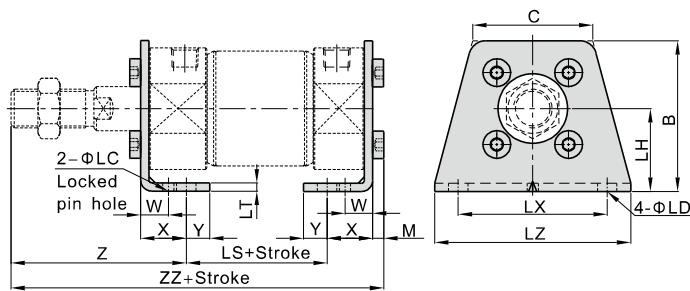
Material of accessories

Accessories Bore size	Mounting accessories				Knuckle	
	LB	FA	SDB	CB	I	Y
20 25	△	○	△	△	□	□
32~63	△	○	△	△	□	◇

△—SPCC; ○—cast iron; □—S45C; ◇—cast steel

Dimensions

LB

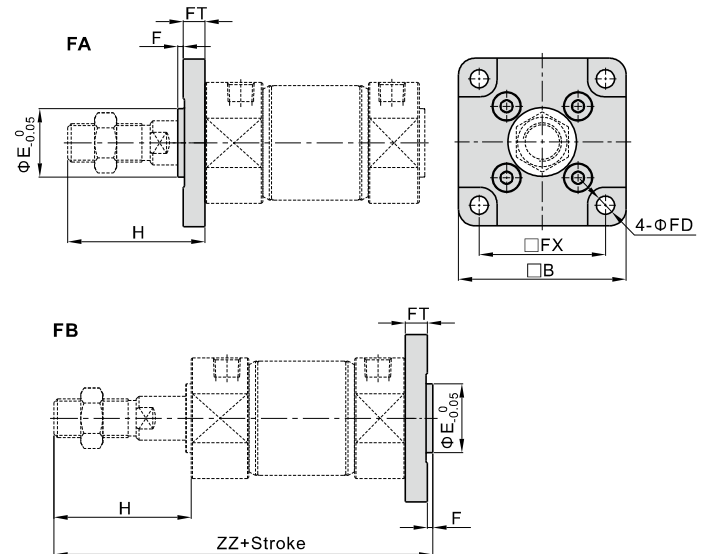


Bore size\Item	Standard stroke	Longer stroke	B	C	LC	LD	LH	LS
20	≤200	201~500	34	27.5	4	6	20	45(53)
25	≤300	301~500	38.5	30	4	6	22	45(53)
32	≤300	301~500	45	35.5	4	7	25	46(54)
40	≤300	301~500	54.5	43.5	4	7	30	52(61)
50	≤300	301~500	70.5	50.5	5	10	40	55(67)
63	≤300	301~500	82.5	64	5	12	45	55(67)

Bore size\Item	LT	LX	LZ	M	W	X	Y	Z	ZZ
20	3	32	44	2.8	10	15	7	47	110(118)
25	3	36	49	3.5	10	15	7	52	115.5(123.5)
32	3.5	44	58	3.5	10	16	8	52.5	117.5(125.5)
40	3.5	54	71	4	10	16.5	8.5	63	135(144)
50	4.5	66	86	5	17.5	22	11	75.5	157.5(169.5)
63	4.5	82	106	6	17.5	22	13	75.5	158.5(170.5)

Remark: The value in the “()” is longer stroke type's value.

FA\FB



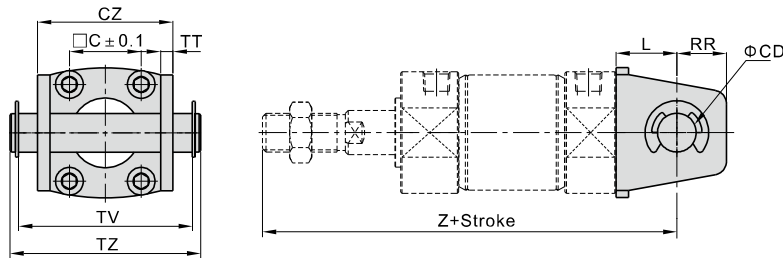
Bore size\Item	Standard stroke	Longer stroke	B	E	F	FD	FX	FT	H	ZZ
20	≤200	201~500	40	12	2	5.5	28	6	35	112(120)
25	≤300	301~500	44	14	2	5.5	32	7	40	118(126)
32	≤300	301~500	53	18	2	6.5	38	7	40	120(128)
40	≤300	301~500	61	25	2	6.5	46	8	50	138(147)
50	≤300	301~500	76	30	2	9	58	9	58	159(171)
63	≤300	301~500	92	32	2	11	70	9.5	58	159.5(171.5)

Remark: The value in the “()” is longer stroke type's value.

Mini cylinder(Stainless steel)

MG Series—Accessories

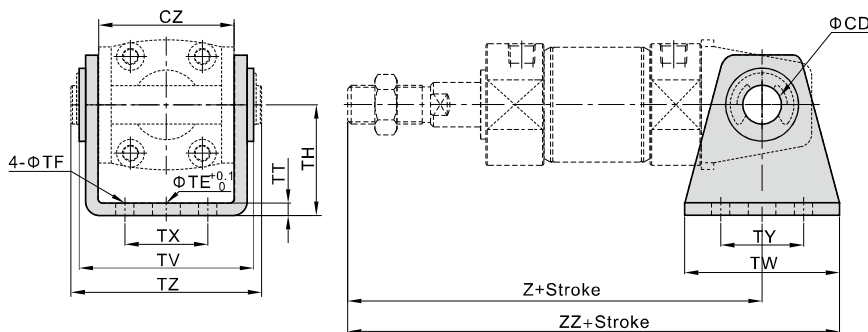
CB



Bore size\Item	Standard stroke	Longer stroke	C	CD	CZ	L	RR	TT	TV	TZ	Z
20	≤200	201~500	14	8	29	14	11	2.5	41	46	118(126)
25	≤300	301~500	16.5	10	33	16	13	2.5	44	50	125(133)
32	≤300	301~500	20	12	40	20	15	3	54	60.5	131(139)
40	≤300	301~500	26	14	49	22	18	3	63	69.5	150(159)
50	≤300	301~500	32	16	60	25	20	4	77	83	173(185)
63	≤300	301~500	38	18	74	30	22	4	95	103	178(190)

Remark: The value in the “()” is longer stroke type's value.

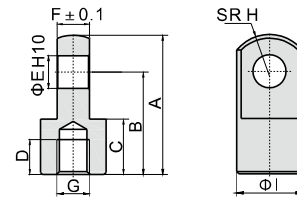
SDB(+CB)



Bore size\Item	Standard stroke	Longer stroke	CD	CZ	TE	TF	TH	TT	TV	TW	TX	TY	TZ	Z	ZZ
20	≤200	201~500	8	29	10	5.5	25	2.5	40.5	42	16	28	46	118(126)	139(147)
25	≤300	301~500	10	33	10	5.5	30	2.5	43.5	42	20	28	50	125(133)	146(154)
32	≤300	301~500	12	40	10	6.5	35	3	53.5	48	22	28	60.5	131(139)	155(163)
40	≤300	301~500	14	49	10	6.5	40	3	62.5	56	30	30	69.5	150(159)	178(187)
50	≤300	301~500	16	60	20	9	50	4	76	64	36	36	83	173(185)	205(217)
63	≤300	301~500	18	74	20	11	60	4	94	74	46	46	103	178(190)	215(227)

Remark: SDB is attached with relevant PIN.
The value in the “()” is longer stroke type's value.

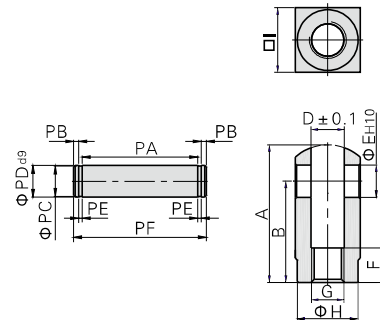
I Knuckle



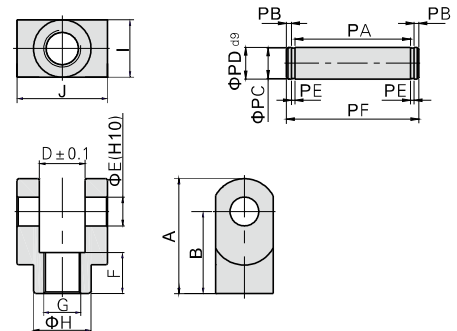
Type\Item	A	B	C	D	E	F	G	H	I
F-ACQ20I	34	25	13.5	8.5	8	7.7	M8×1.25	10.3	16
F-ACQ25I	41	30	16	11	10	9.7	M10×1.25	12.8	20
F-ACQ32I	42	30	16	14	10	17.6	M14×1.5	12	22
F-ACQ50I	56	40	20	18	14	21.6	M18×1.5	16	28

Y Knuckle

F-ACQ20Y、F-ACQ25Y



F-ACQ32Y、F-ACQ50Y



Type\Item	A	B	D	E	F	G
F-ACQ20Y	34	25	8.3	8	8.5	M8×1.25
F-ACQ25Y	41	30	10.3	10	10.5	M10×1.25
F-ACQ32Y	42	30	18.4	10	16	M14×1.5
F-ACQ50Y	56	40	22.4	14	20	M18×1.5

Type\Item	H	I	J	PA	PB	PC	PD	PE	PF
F-ACQ20Y	15	16	-	16.3	1.5	7	8	0.9	21
F-ACQ25Y	19	20	-	20.3	2	8	10	1.1	26.4
F-ACQ32Y	22	22	36	36.3	2	8	10	1.1	42.4
F-ACQ50Y	28	28	44	44.3	2	12	14	1.1	50.4



Mini cylinder(Stainless steel)——MA Series

Compendium of MA Series

Multi-mounting accessories

FA Type SDB Type LB Type

Rolling packed structure

Front and back cover and stainless steel block adopt riveted rolling packed structure to form a reliable connection.

Seven bore size are available

Bore size: 16, 20, 25, 32, 40, 50, 63

Three kinds of back cover type

CA: Pivot type U: Flat-end type CM: Round-end type

Multi-type cylinder

MA: Mini cylinder(Double acting)

MSA: Mini cylinder (Single acting_push) MTA: Mini cylinder (Single acting_pull)

MAD: Mini cylinder(Double rod)

MAJ: Mini cylinder(Adjustable stroke)

MAR: Mini cylinder(Double acting with cushion)

MAC: Mini cylinder(Double acting with cushion)

MACD: Mini cylinder(Double rod with cushion)

MACJ: Mini cylinder(Adjustable stroke with cushion)

Two kinds of cushion type

Variable cushion or Bumper

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	
16	6	Single acting	Push side	201.0	-	-	20.1	40.2	60.3	80.4	100.5
			Pull side	172.7	-	-	11.6	28.9	46.2	63.4	80.7
		Double acting	Push side	201.0	20.1	40.2	60.3	80.4	100.5	120.6	140.7
			Pull side	172.7	17.3	34.5	51.8	69.1	86.4	103.6	120.9
20	8	Single acting	Push side	314.0	-	15.7	47.1	78.5	109.9	141.3	172.7
			Pull side	263.8	-	5.7	32.0	58.4	84.8	111.2	137.5
		Double acting	Push side	314.0	31.4	62.8	94.2	125.6	157.0	188.4	219.8
			Pull side	263.8	26.4	52.8	79.1	105.5	131.9	158.3	184.7
25	10	Single acting	Push side	490.6	-	24.6	73.7	122.8	171.8	220.9	269.9
			Pull side	412.1	-	8.9	50.1	91.4	132.6	173.8	215.0
		Double acting	Push side	490.6	49.1	98.1	147.2	196.2	245.3	294.4	343.4
			Pull side	412.1	41.2	82.4	123.6	164.8	206.1	247.3	288.5
32	12	Single acting	Push side	804.3	-	40.2	120.6	200.9	281.3	361.7	442.1
			Pull side	691.2	-	17.6	86.6	155.7	224.8	293.9	363.0
		Double acting	Push side	804.3	80.4	160.9	241.3	321.7	402.2	482.6	563.0
			Pull side	691.2	69.1	138.2	207.4	276.5	345.6	414.7	483.8
40	16	Single acting	Push side	1256.6	-	62.8	188.4	314.0	439.6	565.2	690.8
			Pull side	1055.6	-	22.6	128.1	233.6	339.1	444.6	550.1
		Double acting	Push side	1256.6	125.7	251.3	377.0	502.6	628.3	754.0	879.6
			Pull side	1055.6	105.6	211.1	316.7	422.2	527.8	633.4	738.9
50	16	Double acting	Push side	1962.5	196.3	392.5	588.8	785.0	981.3	1177.5	1373.8
		Pull side	1761.5	176.2	352.3	528.5	704.6	880.8	1056.9	1233.1	
63	16	Double acting	Push side	3115.7	311.6	623.1	934.7	1246.3	1557.9	1869.4	2181.0
		Pull side	2914.7	291.5	582.9	874.4	1165.9	1457.4	1748.8	2040.3	

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 40μm or below.
- Anti-freezing measure shall be adopted under low temperature environment to prevent moisture freezing.
- The cylinder shall be carried out test run without load before application. Prior to run, buffer shall be turned to the minimum and gradually released to avoid the damage on cylinder caused by excessive impact.
- 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.

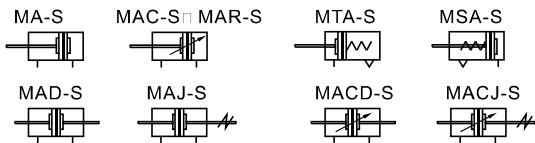


Mini cylinder(Stainless steel)

MA Series



Symbol



Product feature

- Standard cylinder manufactured by our enterprise.
- Piston adopts heterogeneous two-way seal structure. It has compact size and has the function of grease reservation.
- Front cover has fixed bumper which can reduce the impact of direction change of the cylinder.
- There are several modes of back cover, which makes the installation of cylinder more convenient.
- Front and back cover and stainless steel block adopt riveted rolling packed structure to form a reliable connection.
- The cylinder body has stainless steel pipes with high precision to produce high strength and corrosion resistance.
- There are cylinders and mounting accessories with several specifications for your choice.
- All cylinders of this series have magnet.

Ordering code

MA	20 × 50	S	CM	<input type="checkbox"/>	<input type="checkbox"/>
MAD	20 × 50	S		<input type="checkbox"/>	<input type="checkbox"/>
MAJ	20 × 50-20	S		<input type="checkbox"/>	<input type="checkbox"/>
MAR U	20 × 50	S		<input type="checkbox"/>	

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨

① Model	② Front cover	③ Bore size	④ Stroke	⑤ Adjustable St.	⑥ Magnet	⑦ Back cover	⑧ Mounting type[Note1]	⑨ Thread type[Note2]
MA: Mini cylinder(Double acting) MAC: Mini cylinder (Double acting with cushion) MSA: Mini cylinder(Single acting_push) MTA: Mini cylinder(Single acting_pull)	No this code	Model	Bore size	Refer to stroke table for details	No this code	S: With magnet	CA: Pivot type U: Flat-end type CM: Round-end type	Blank: No accessories FA: FA type SDB: SDB type LB: LB type
MAD: Mini cylinder(Double rod) MACD: Mini cylinder (Double rod with cushion)		MA 16 MSA 20 MTA 25 MAD 32 MAJ 40						
MAJ: Mini cylinder(Adjustable stroke) MACJ: Mini cylinder (Adjustable stroke with cushion)		MAC 16 MACD MACJ						
MAR: Mini cylinder (Double acting with cushion)		MAC 20 MAR 25 MACD 32 MACJ 40 MACJ 50 MACJ 63						
	F: Front mounting U: Up mounting					No this code	Blank: No accessories FA: FA type LB: LB type	Blank: PT G: G T: NPT
							No this code	

[Note1] Please refer to page 100~101 for accessory parts.

[Note2] Standard thread is blank here.

Specification

Bore size(mm)	16	20	25	32	40	50	63
Acting type	Single acting						-
	Double acting						-
	Double acting						-
	Double acting with cushion						-
Fluid	Air(to be filtered by 40µm filter element)						
Operating pressure	0.15~1.0MPa(22~145psi)(1.5~10.0bar)						
	0.2~1.0MPa(28~145psi)(2.0~10.0bar)						
Proof pressure	1.5MPa(215psi)(15bar)						
Temperature °C	-20~70						
Speed range mm/s	Double acting: 30~800 Single acting: 50~800						
Stroke tolerance	0~150 ^{+1.0} ₀ >150 ^{+1.5} ₀						
Cushion type	MAC/MACD/MACJ Series: Variable cushion; Other series: Bumper						
Port size [Note1]	M5×0.8			1/8"		1/4"	

[Note1] PT thread, G thread thread and NPT thread are available.

Add) Refer to P353 for detail of sensor switch.

Stroke

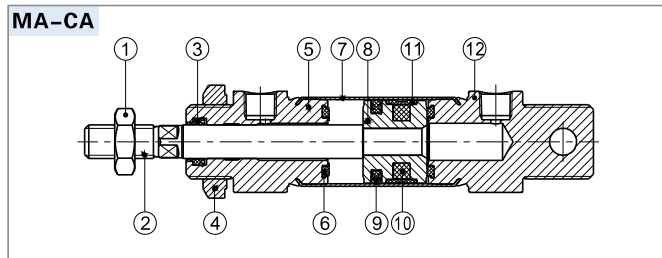
Bore size (mm)	Standard stroke (mm)																Max.std stroke	Max. stroke							
MA/MAC	16	10	15	20	25	30	40	50	60	75	80	100	125	150	160	175	200	250	300	350	400	450	500	500	600
MA	20	10	15	20	25	30	40	50	60	75	80	100	125	150	160	175	200	250	300	350	400	450	500	500	800
MAC	25	10	15	20	25	30	40	50	60	75	80	100	125	150	160	175	200	250	300	350	400	450	500	500	800
MAR	32	10	15	20	25	30	40	50	60	75	80	100	125	150	160	175	200	250	300	350	400	450	500	500	800
	40	10	15	20	25	30	40	50	60	75	80	100	125	150	160	175	200	250	300	350	400	450	500	500	800
MAC	50	10	15	20	25	30	40	50	60	75	80	100	125	150	160	175	200	250	300	350	400	450	500	500	800
MAR	63	10	15	20	25	30	40	50	60	75	80	100	125	150	160	175	200	250	300	350	400	450	500	500	800
MAD	16	10	15	20	25	30	40	50	60	75	80	100	125	150	160	175	200	250	300					300	-
MAJ	20	10	15	20	25	30	40	50	60	75	80	100	125	150	160	175	200	250	300					300	-
MACD	25	10	15	20	25	30	40	50	60	75	80	100	125	150	160	175	200	250	300					300	-
MACJ	32	10	15	20	25	30	40	50	60	75	80	100	125	150	160	175	200	250	300	350	400	450	500	500	-
	40	10	15	20	25	30	40	50	60	75	80	100	125	150	160	175	200	250	300	350	400	450	500	500	-
MACD	50	10	15	20	25	30	40	50	60	75	80	100	125	150	160	175	200	250	300	350	400	450	500	500	-
MACJ	63	10	15	20	25	30	40	50	60	75	80	100	125	150	160	175	200	250	300	350	400	450	500	500	-
MSA	16	10	15	20	25	30	40	50	60	75	80	100												-	-
	20	10	15	20	25	30	40	50	60	75	80	100	125	150										-	-
	25	10	15	20	25	30	40	50	60	75	80	100	125	150										-	-
	32	10	15	20	25	30	40	50	60	75	80	100	125	150										-	-
	40	10	15	20	25	30	40	50	60	75	80	100	125	150										-	-
MTA	16	10	15	20	25	30	40	50	60	75	80	100												-	-
	20	10	15	20	25	30	40	50	60	75	80	100												-	-
	25	10	15	20	25	30	40	50	60	75	80	100												-	-
	32	10	15	20	25	30	40	50	60	75	80	100												-	-
	40	10	15	20	25	30	40	50	60	75	80	100												-	-

[Note] Consult us for non-standard stroke.

Mini cylinder(Stainless steel)

MA Series

Inner structure and material of major parts

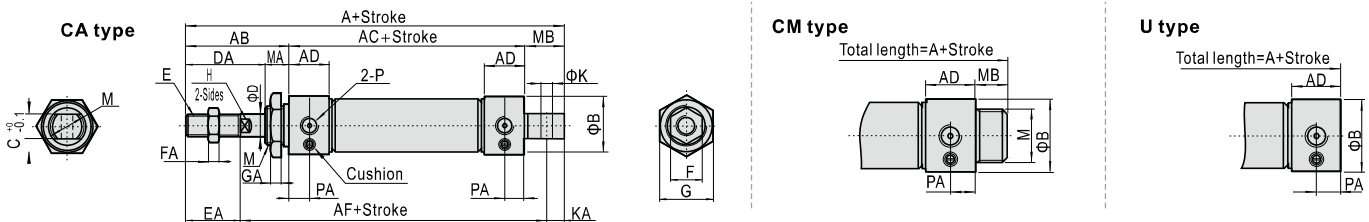


NO.	Item	Material
1	Rod nut	Stainless steel/Carbon steel
2	Piston rod	Carbon steel with 20 μ mchrome plated
3	Front cover packing	NBR
4	Front cover nut	Carbon steel
5	Front cover	Aluminum alloy
6	Bumper	TPU
7	Barrel	Stainless steel
8	Piston	Aluminum alloy
9	Piston seal	NBR
10	Magnet	Plastic
11	Wear ring	Wear resistant material
12	Back cover	Aluminum alloy

Dimensions

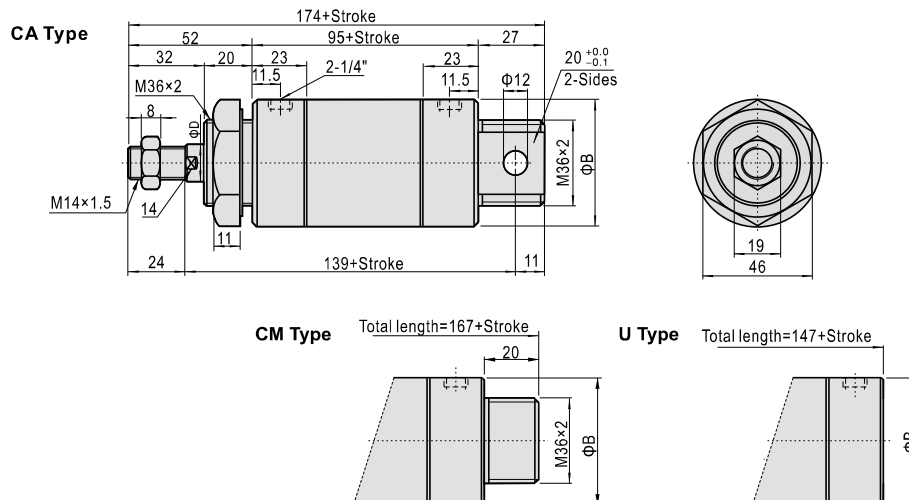
MA Φ16-Φ40

MAC Φ16-Φ40



Bore size\Item	A																M	MA	MB		P	PA				
	CA	CM	U	AB	AC	AD	AF	B	C	D	DA	E	EA	F	FA	G			GA	H			K	KA	CA	CM
16	114	114	98	38	60	12.5	91	21	12	6	22	M6×1.0	16	10	5	22	6	5	6	7	M16×1.5	16	16	16	M5×0.8	7.5
20	137	128	116	40	76	16	108	27	16	8	28	M8×1.25	20	12	6	29	7	6	8	9	M22×1.5	12	21	12	1/8"	8
25	141	134	120	44	76	16	110	30	16	10	30	M10×1.25	22	17	6	29	7	8	8	9	M22×1.5	14	21	14	1/8"	8
32	147	134	120	44	76	16	113	35	16	12	30	M10×1.25	22	17	6	32	8	10	10	12	M24×2.0	14	27	14	1/8"	8
40	149	136	122	46	76	16.5	113	41.5	20	16	32	M12×1.25	24	17	7	41	8	14	12	12	M30×2.0	14	27	14	1/8"	9

MAC Φ50\Φ63



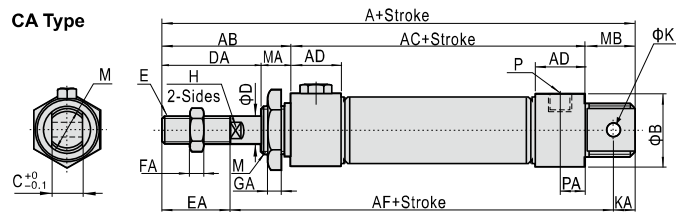
Bore size\Item	B	D
50	53	16
63	67	16

Mini cylinder(Stainless steel)

MA Series

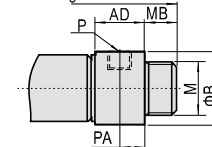
MSA $\Phi 16\sim\Phi 40$

CA Type



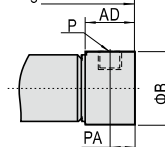
CM Type

Total length=A+Stroke



U Type

Total length=A+Stroke

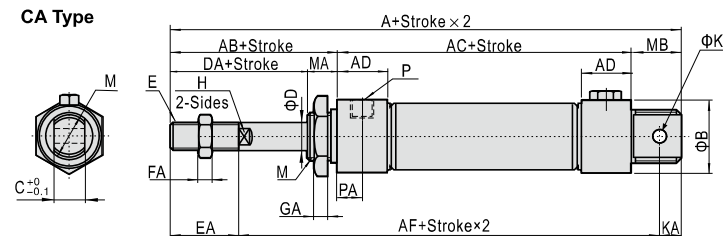


Item	A									AB	AC			AD	AF		
	CA			CM			U				-	-	-		-		
Bore size\Stroke	≤50	51~100	≥101	≤50	51~100	≥101	≤50	51~100	≥101	-	≤50	51~100	≥101	-	≤50	51~100	≥101
16	139	164	-	139	164	-	123	148	-	38	85	110	-	12.5	116	141	-
20	162	187	212	153	178	203	141	166	191	40	101	126	151	16	133	158	183
25	166	191	216	159	184	209	145	170	195	44	101	126	151	16	135	160	185
32	172	197	222	159	184	209	145	170	195	44	101	126	151	16	138	163	188
40	174	199	224	161	186	211	147	172	197	46	101	126	151	16.5	138	163	188

Bore size\Item	B	C	D	DA	E	EA	F	FA	G	GA	H	K	KA	M	MA	MB		P	PA
																CA	CM		
16	21	12	6	22	M6×1.0	16	10	5	22	6	5	6	7	M16×1.5	16	16	16	M5×0.8	7.5
20	27	16	8	28	M8×1.25	20	12	6	29	7	6	8	9	M22×1.5	12	21	12	1/8"	8
25	30	16	10	30	M10×1.25	22	17	6	29	7	8	8	9	M22×1.5	14	21	14	1/8"	8
32	35	16	12	30	M10×1.25	22	17	6	32	8	10	10	12	M24×2.0	14	27	14	1/8"	8
40	41.5	20	16	32	M12×1.25	24	17	7	41	8	14	12	12	M30×2.0	14	27	14	1/8"	9

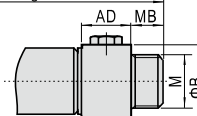
MTA $\Phi 16\sim\Phi 40$

CA Type



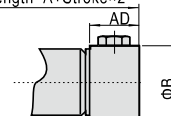
CM Type

Total length=A+Stroke×2



U Type

Total length=A+Stroke×2



Item	CA								A				U				AC				AF			
	≤25	≤50	≤75	≤100	≤25	≤50	≤75	≤100	≤25	≤50	≤75	≤100	≤25	≤50	≤75	≤100	≤25	≤50	≤75	≤100	≤25	≤50	≤75	≤100
16	129	139	154	164	129	139	154	164	113	123	138	148	75	85	100	110	106	116	131	141				
20	152	162	177	187	143	153	168	178	131	141	156	166	91	101	116	126	123	133	148	158				
25	156	166	181	191	149	159	174	184	135	145	160	170	91	101	116	126	125	135	150	160				
32	162	172	192	202	149	159	179	189	135	145	165	175	91	101	121	131	128	138	158	168				
40	164	174	194	204	151	161	181	191	137	147	167	177	91	101	121	131	128	138	158	168				

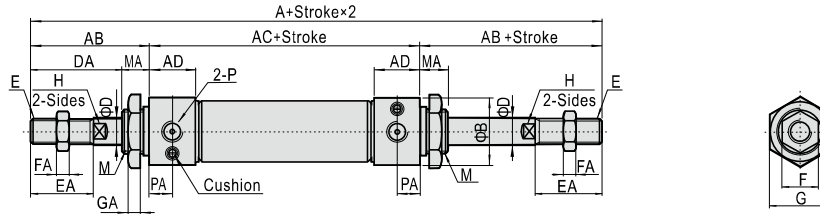
Bore size\Item	AB	AD	B	C	D	DA	E	EA	F	FA	G	GA	H	K	KA	M	MA	MB		P	PA
																		CA	CM		
16	38	12.5	21	12	6	22	M6×1.0	16	10	5	22	6	5	6	7	M16×1.5	16	16	16	M5×0.8	7.5
20	40	16	27	16	8	28	M8×1.25	20	12	6	29	7	6	8	9	M22×1.5	12	21	12	1/8"	8
25	44	16	30	16	10	30	M10×1.25	22	17	6	29	7	8	8	9	M22×1.5	14	21	14	1/8"	8
32	44	16	35	16	12	30	M10×1.25	22	17	6	32	8	10	10	12	M24×2.0	14	27	14	1/8"	8
40	46	16.5	41.5	20	16	32	M12×1.25	24	17	7	41	8	14	12	12	M30×2.0	14	27	14	1/8"	9

Mini cylinder(Stainless steel)

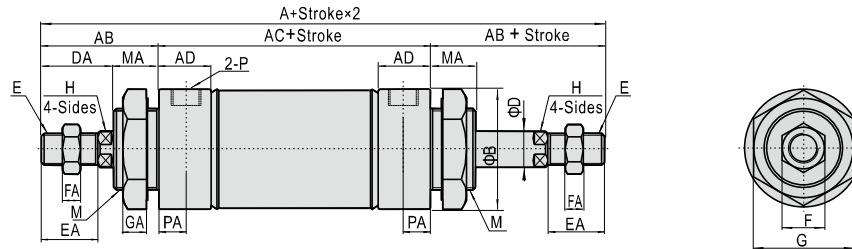
MA Series

MAD/MACD

Φ 16~Φ 40



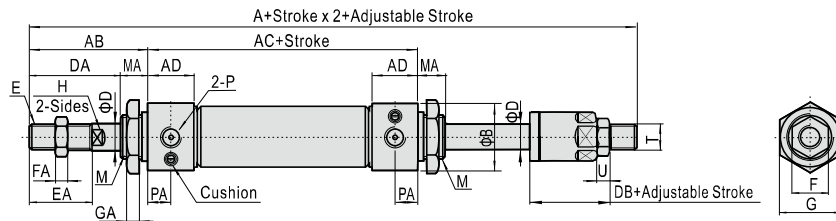
Φ 50/Φ 63



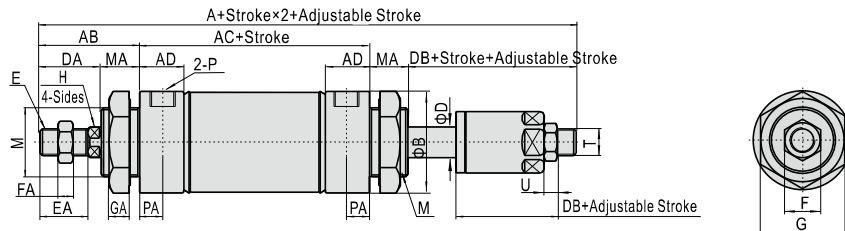
Bore size/Item	A	AB	AC	AD	B	D	DA	E	EA	F	FA	G	GA	H	M	MA	P	PA
16	136	38	60	12.5	21	6	22	M6 × 1.0	16	10	5	22	6	5	M16 × 1.5	16	M5 × 0.8	7.5
20	156	40	76	16	27	8	28	M8 × 1.25	20	12	6	29	7	6	M22 × 1.5	12	1/8"	8
25	164	44	76	16	30	10	30	M10 × 1.25	22	17	6	29	7	8	M22 × 1.5	14	1/8"	8
32	164	44	76	16	35	12	30	M10 × 1.25	22	17	6	32	8	10	M24 × 2.0	14	1/8"	8
40	168	46	76	16.5	41.5	16	32	M12 × 1.25	24	17	7	41	8	14	M30 × 2.0	14	1/8"	9
50	199	52	95	23	53	16	32	M14 × 1.5	24	19	8	46	11	14	M36 × 2.0	20	1/4"	11.5
63	199	52	95	23	67	16	32	M14 × 1.5	24	19	8	46	11	14	M36 × 2.0	20	1/4"	11.5

MAJ/MACJ

Φ 16~Φ 40



Φ 50/Φ 63



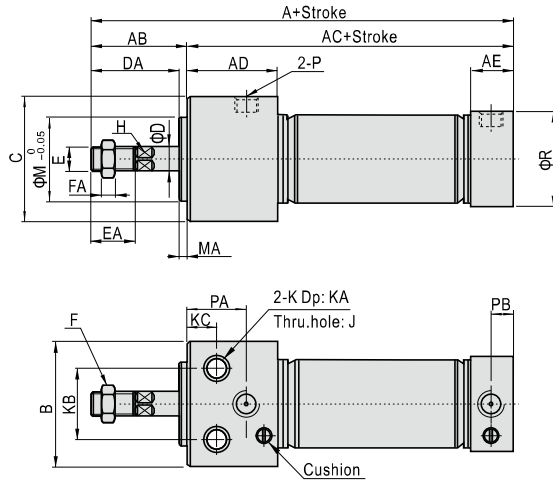
Bore size/Item	A	AB	AC	AD	B	D	DA	DB	E	EA	F	FA	H	M	MA	P	PA	G	GA	T	U
16	135	38	60	12.5	21	6	22	21	M6 × 1.0	16	10	5	5	M16 × 1.5	16	M5 × 0.8	7.5	22	6	M6 × 1.0	5
20	153	40	76	16	27	8	28	25	M8 × 1.25	20	12	6	6	M22 × 1.5	12	1/8"	8	29	7	M8 × 1.25	6
25	161	44	76	16	30	10	30	27	M10 × 1.25	22	17	6	8	M22 × 1.5	14	1/8"	8	29	7	M10 × 1.25	6
32	161	44	76	16	35	12	30	27	M10 × 1.25	22	17	6	10	M24 × 2.0	14	1/8"	8	32	8	M10 × 1.25	6
40	164	46	76	16.5	41.5	16	32	28	M12 × 1.25	24	17	7	14	M30 × 2.0	14	1/8"	9	41	8	M12 × 1.25	7
50	195	52	95	23	53	16	32	28	M14 × 1.5	24	19	8	14	M36 × 2.0	20	1/4"	11.5	46	11	M12 × 1.25	7
63	195	52	95	23	67	16	32	28	M14 × 1.5	24	19	8	14	M36 × 2.0	20	1/4"	11.5	46	11	M12 × 1.25	7

Mini cylinder(Stainless steel)

MA Series

MARU(Up mounting type)

Φ 20~Φ 40

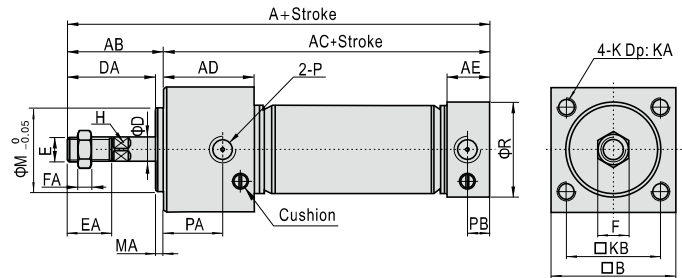


Bore size\Item	A	AB	AC	AD	AE	B	C	D	DA	E	EA	F	FA
20	120	31	89	29	16	33.5	30.5	8	28	M8×1.25	20	13	5
25	122	33	89	29	16	39	36.5	10	30	M10×1.25	22	17	6
32	122	33	89	29	16	47	42.5	12	30	M10×1.25	22	17	6
40	132.5	35	97.5	37.5	16.5	58.5	52.5	16	32	M14×1.5	24	19	8

Bore size\Item	H	J	K	KA	KB	KC	M	MA	P	PA	PB	R
20	6	Φ5.5	Φ9.5	6.5	21	12	20	3	1/8"	22	8	27
25	8	Φ6.5	Φ11.0	7.5	25	12	26	3	1/8"	22	8	30
32	10	Φ9.0	Φ14.0	10	30	12	26	3	1/8"	22	8	35
40	14	Φ11	Φ17.5	12.5	38	15	32	3	1/8"	27	9	41.5

MARF(Front mounting type)

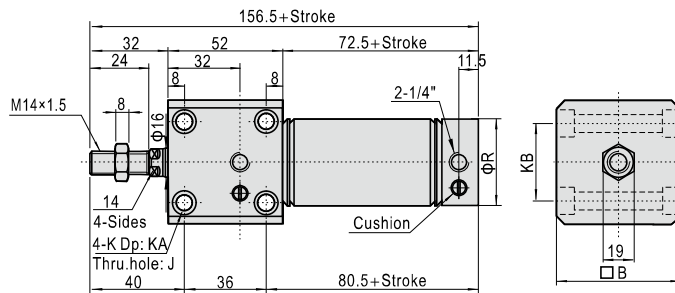
Φ 20~Φ 40



Bore size\Item	A	AB	AC	AD	AE	B	D	DA	E	EA
20	120	31	89	29	16	30.5	8	28	M8×1.25	20
25	122	33	89	29	16	36.5	10	30	M10×1.25	22
32	122	33	89	29	16	42.5	12	30	M10×1.25	22
40	132.5	35	97.5	37.5	16.5	52.5	16	32	M14×1.5	24

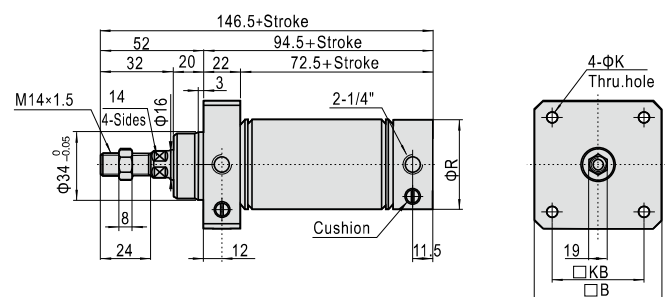
Bore size\Item	F	FA	H	K	KA	KB	M	MA	P	PA	PB	R
20	13	5	6	M5×0.8	9	22	20	3	1/8"	22	8	27
25	17	6	8	M6×1.0	11	26	26	3	1/8"	22	8	30
32	17	6	10	M6×1.0	11	30	26	3	1/8"	22	8	35
40	19	8	14	M8×1.25	14	36	32	3	1/8"	27	9	41.5

Φ 50/Φ 63



Bore size\Item	B	J	K	KA	KB	R
50	62	Φ6.5	2-Sides: Φ11.0	6.5	44	53
63	74	Φ9.0	2-Sides: Φ14.0	8.5	48	67

Φ 50/Φ 63



Bore size\Item	B	K	KB	R
50	62	6.5	48	53
63	74	9.0	58	67

Mini cylinder(Stainless steel)

MA Series—Accessories

List for ordering code of accessories

Accessories Bore size	Mounting accessories			Knuckle				Sensor switch	
	LB	FA	SDB	I	Y	F	U	CMSG	DMSG(S)
16	F-MA16LB	F-MA16FA	F-MA16SDB	F-MA16I	F-MA16Y	F-M6X100F	F-M6X100U	CMSG	DMSG(S)
20	F-MA20LB	F-MA20FA	F-MA20SDB	F-MA20I	F-MA20Y	F-M8X125F	F-M8X125U		
25	F-MA25LB	F-MA25FA	F-MA25SDB	F-MA25I	F-MA25Y	F-M10X125F	F-M10X125U		
32	F-MA32LB	F-MA32FA	F-MA32SDB	F-MA32I	F-MA32Y	F-M12X125F	F-M12X125U		
40	F-MA40LB	F-MA40FA	F-MA40SDB	F-MA40I	F-MA40Y	F-M14X150F	F-M14X150U		
50	F-MA50LB	F-MA50FA	F-MA50SDB	F-MA50I	F-MA50Y	F-M14X150F	F-M14X150U		
63	F-MA63LB	F-MA63FA	F-MA63SDB	F-MA63I	F-MA63Y	F-M14X150F	F-M14X150U		

Accessory selection

Accessories Cylinder model	Mounting accessories			Knuckle[Note 1]				Sensor switch	
	LB	FA	SDB	I	Y	U	F	CMSG	DMSG(S)
MA/MAC	●	●	●	●	●	●	●	●	●
MSA/MTA	●	●	●	●	●	●	●	●	●
MAD/MACD	●	●	×	●	●	●	●	●	●
MAJ/MACJ	●	●	×	●	●	●	●	●	●
MARF/MARU	×	×	×	●	●	●	●	●	●

Material of accessories

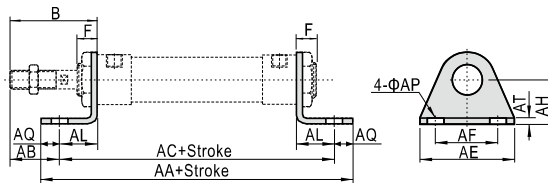
Accessories Bore size	Mounting accessories			Knuckle			
	LB	FA	SDB	I	Y	F	U
16~63	○	○	○	□	□	□	□

○—Lower carbon steel; □—Carbon steel;

[Note 1] Please refer to P349~352 for knuckle detail.

Dimensions

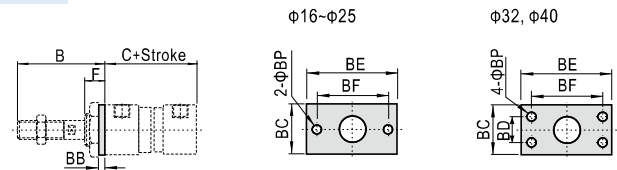
LB



Bore size/Item Stroke	AA	AA(MSA)			AC	AC(MSA)		
	(MA/MAC)	0~50	51~100	101~150	(MA/MAC)	0~50	51~100	101~150
16	98	123	148	-	86	111	136	-
20	122	147	172	197	106	131	156	181
25	122	147	172	197	106	131	156	181
32	142	167	192	217	126	151	176	201
40	142	167	192	217	126	151	176	201
50	175	-	-	-	151	-	-	-
63	183	-	-	-	157	-	-	-

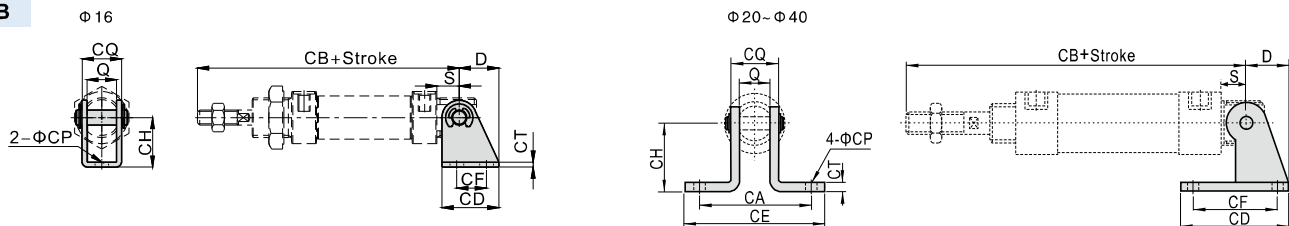
Bore size/Item	B	F	AB	AE	AF	AL	AQ	AP	AT	AH
16	38	16	25	44	32	13	6	5.5	2.5	20
20	40	12	25	54	40	15	8	6.5	3	25
25	44	14	29	54	40	15	8	6.5	3	25
32	44	14	19	59	45	25	8	7	3.5	32
40	46	14	21	64	50	25	8	7	3.5	36
50	52	20	24	86	66	28	12	11	4.5	40
63	52	20	21	106	82	31	13	11	4.5	45

FA



Bore size/Item Stroke	B	C	C(MSA)			BB	BC	BD	BE	BF	BP	F
	(MA/MAC)	0~50	51~100	101~150								
16	38	60	85	110	-	3	26	-	52	40	5.5	16
20	40	76	101	126	151	3.5	38	-	64	50	7	12
25	44	76	101	126	151	3.5	38	-	64	50	7	14
32	44	76	101	126	151	4	47	33	72	58	6.5	14
40	46	76	101	126	151	4	50	36	84	70	6.5	14
50	54	147				4.5	65	47	104	86	9	22
63	54	147				4.5	65	47	104	86	9	22

SDB



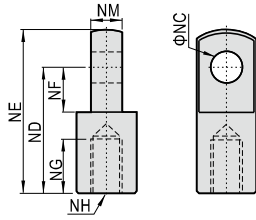
Bore size/Item Stroke	D	S	Q	CA	CB	CB(MSA)			CD	CE	CF	CH	CT	CP	CQ
	(MA)	0~50	51~100	101~150											
16	16	9	12	-	107	132	157	-	23	-	12	20	2	5.5	16
20	21	12	16	51	128	153	178	203	48	67	32	32	2.5	7	21
25	21	12	16	51	132	157	182	207	48	67	32	32	2.5	7	21
32	27	15	16	51	135	160	185	210	52	67	36	36	3	7	22
40	27	15	20	55	137	162	187	212	56	71	40	40	3	7	26

[Note] SDB is attached with relevant PIN.

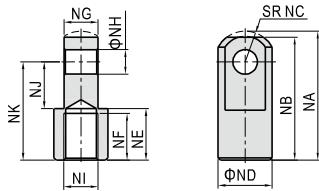
Mini cylinder(Stainless steel)

MA Series—Accessories

I Knuckle

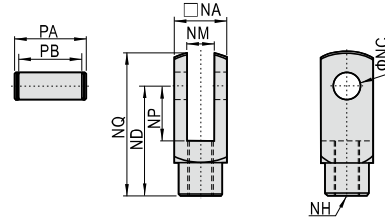


Type\Item	NC	ND	NE	NF	NG	NH	NM
F-MA16I	5	21	28	8.5	8	M6×1.0	6
F-MA20I	8	30	40	11	15	M8×1.25	8
F-MA25I	10	40	50	15	20	M10×1.25	10
F-MA40I	10	45	57	16	23	M12×1.25	14

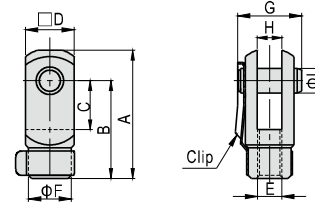


Type\Item	NA	NB	NC	ND	NE	NF	NG	NH	NJ	NK	NI
F-MAC50I	52.5	50	12.5	22	21	19	13.8	10	19	40	M14×1.5

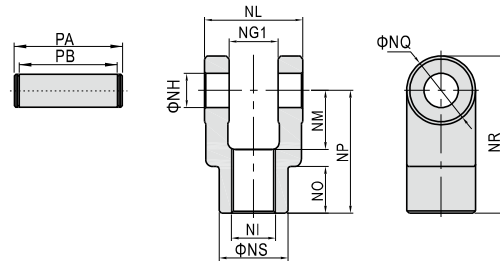
Y Knuckle



Type\Item	NA	NC	ND	NP	NQ	NM	NH	PA	PB
F-MA16Y	12	5	21	8.5	27.4	6	M6×1.0	16.8	12.4
F-MA40Y	25.4	10	45	20	57	14	M12×1.25	32	26.2



Type\Item	A	B	C	D	E	F	G	H	I
F-MA20Y	42	32	16	16	M8×1.25	14	21	8	8
F-MA25Y	52	40	20	19	M10×1.25	18	25	10	10



Type\Item	Ng1	NH	NI	NL	NM	NO	NP	NQ	NR	NS	PA	PB
F-MAC50Y	14.2	10	M14×1.5	27.8	19	17	40	22	51	22	34.6	28.8



Mini cylinder(Aluminum barrel)——MBL Series

Compendium of MBL Series

Multi-mounting accessories

LB Type FA Type

SDB Type

Rolling packed structure

Front and back cover and stainless steel block adopt riveted rolling packed structure to form a reliable connection.

Six bore size are available

Bore size: 20, 25, 32, 40, 50, 63

Two kinds of back cover type

U: Flat-end type CA: Pivot type

Multi-type cylinder

- MBL: Mini cylinder(Double acting)
- MBLC: Mini cylinder(Double acting with cushion)
- MSBL: Mini cylinder(Single acting_push)
- MTBL: Mini cylinder(Single acting_pull)
- MBLD: Mini cylinder(Double rod)
- MBLCD: Mini cylinder(Double rod with cushion)
- MBLJ: Mini cylinder(Adjustable stroke)
- MBLCJ: Mini cylinder(Adjustable stroke with cushion)

Multi-kinds of stroke

Two kinds of cushion type

Variable cushion or Bumper

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	
20	8	Single acting	Push side	314.0	-	15.7	47.1	78.5	109.9	141.3	172.7
			Pull side	263.8	-	5.7	32.0	58.4	84.8	111.2	137.5
		Double acting	Push side	314.0	31.4	62.8	94.2	125.6	157.0	188.4	219.8
			Pull side	263.8	26.4	52.8	79.1	105.5	131.9	158.3	184.7
25	10	Single acting	Push side	490.6	-	24.6	73.7	122.8	171.8	220.9	269.9
			Pull side	412.1	-	8.9	50.1	91.4	132.6	173.8	215.0
		Double acting	Push side	490.6	49.1	98.1	147.2	196.2	245.3	294.4	343.4
			Pull side	412.1	41.2	82.4	123.6	164.8	206.1	247.3	288.5
32	12	Single acting	Push side	804.3	-	40.2	120.6	200.9	281.3	361.7	442.1
			Pull side	691.2	-	17.6	86.6	155.7	224.8	293.9	363.0
		Double acting	Push side	804.3	80.4	160.9	241.3	321.7	402.2	482.6	563.0
			Pull side	691.2	69.1	138.2	207.4	276.5	345.6	414.7	483.8
40	16	Single acting	Push side	1256.6	-	62.8	188.4	314.0	439.6	565.2	690.8
			Pull side	1055.6	-	22.6	128.1	233.6	339.1	444.6	550.1
		Double acting	Push side	1256.6	125.7	251.3	377.0	502.6	628.3	754.0	879.6
			Pull side	1055.6	105.6	211.1	316.7	422.2	527.8	633.4	738.9
50	16	Double acting	Push side	1962.5	196.3	392.5	588.8	785.0	981.3	1177.5	1373.8
			Pull side	1761.5	176.2	352.3	528.5	704.6	880.8	1056.9	1233.1
63	16	Double acting	Push side	3115.7	311.6	623.1	934.7	1246.3	1557.9	1869.4	2181.0
			Pull side	2914.7	291.5	582.9	874.4	1165.9	1457.4	1748.8	2040.3

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 40μm or below.
- Anti-freezing measure shall be adopted under low temperature environment to prevent moisture freezing.
- 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.

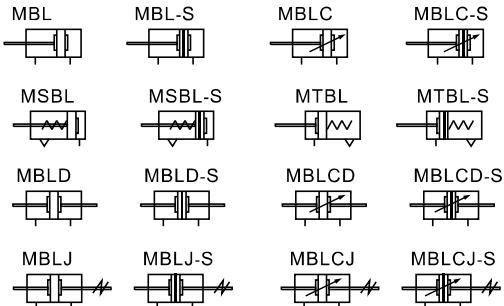


Mini cylinder(Aluminum barrel)

MBL Series



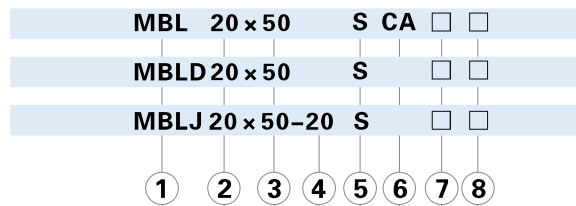
Symbol



Product feature

1. Manufactured by our enterprise.
2. Riveted structure is adopted to connect front and bak cover and cylinder tube to make it credibility.
3. Piston adopts heterogeneous two-way seal structure. It has compact size and has the function of grease reservation.
4. There are several modes of back cover, which makes the installation of cylinder more convenient.
5. There are cylinders and mounting accessories with several specifications for your choice.

Ordering code



① Model	② Bore size	③ Stroke	④ Adjustable Stroke	⑤ Magnet	⑥ Back cover	⑦ Mounting type [Note1]	⑧ Thread type
MBL: Mini cylinder(Double acting)	20 25 32	Refer to stroke table for details	No this code	Blank: Without magnet S: With magnet	CA: Pivot type U: Flat-end type	Blank: No accessories FA: FA type SDB: SDB type LB: LB type	Blank: PT G: G T: NPT
MBLC: Mini cylinder(Double acting with cushion)	40 50 63						
MSBL: Mini cylinder(Single acting_push)	20 25 32 40						
MTBL: Mini cylinder(Single acting_pull)	20 25 32 40						
MBLD: Mini cylinder(Double rod)	20 25 32	Refer to stroke table for details	10 20 30 40 50 75 100	Blank: Without magnet S: With magnet	No this code	Blank: No accessories FA: FA type LB: LB type	Blank: PT G: G T: NPT
MBLCD: Mini cylinder(Double rod with cushion)	40 50 63						
MBLJ: Mini cylinder(Adjustable stroke)	20 25 32						
MBLCJ: Mini cylinder(Adjustable stroke with cushion)	40 50 63						

[Note1] Please refer to page 106~107 for accessory parts.

Specification

Bore size(mm)		20	25	32	40	50	63	
Acting type	MSBL/MTBL	Single acting					-	
	MBL/MBLD/MBLJ	Double acting					-	
	MBLC/MBLCD/MBLCJ	Double acting with cushion					-	
Fluid		Air(to be filtered by 40μm filter element)						
Operating pressure	Double acting	0.15~1.0MPa(22~145psi)(1.5~10.0bar)					-	
	Single acting	0.2~1.0MPa(28~145psi)(2.0~10.0bar)					-	
Proof pressure		1.5MPa(215psi)(15bar)						
Temperature °C		-20~70						
Speed range mm/s		Double acting: 30~800			Single acting: 50~800			
Stroke tolerance		0~150 ^{+1.0} ₀			>150 ^{+1.5} ₀			
Cushion type		MBLC, MBLCD, MBLCJ: Adjustable cushion; Others: Bumper						
Port size [Note1]		1/8"			1/4"			

[Note1] PT thread, G thread and NPT thread are available.
Add) Refer to P353 for detail of sensor switch.

Stroke

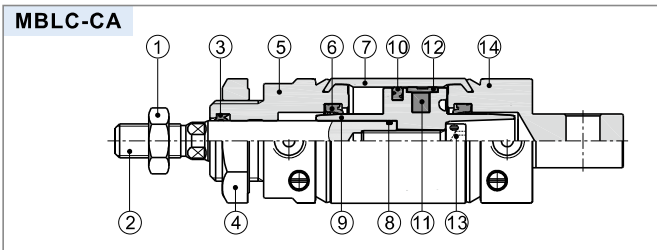
Bore size (mm)	Standard stroke (mm)	Max.std stroke	Max. stroke	
MBL MBLC	20/25	10 15 20 25 30 40 50 60 75 80 100 125 150 160 175 200 250 300 350 400 450 500	500	800
	32/40	10 15 20 25 30 40 50 60 75 80 100 125 150 160 175 200 250 300 350 400 450 500	500	800
MBLD MBLJ MBLCD MBLCJ	20/25	10 15 20 25 30 40 50 60 75 80 100 125 150 160 175 200 250 300	300	-
	32/40	10 15 20 25 30 40 50 60 75 80 100 125 150 160 175 200 250 300 350 400 450 500	500	-
MSBL	20/25	10 15 20 25 30 40 50 60 75 80 100 125 150	-	-
	32/40	10 15 20 25 30 40 50 60 75 80 100 125 150	-	-
MTBL	20/25	10 15 20 25 30 40 50 60 75 80 100	-	-
	32/40	10 15 20 25 30 40 50 60 75 80 100	-	-

[Note] Consult us for non-standard stroke.

Mini cylinder(Aluminum barrel)

MBL Series

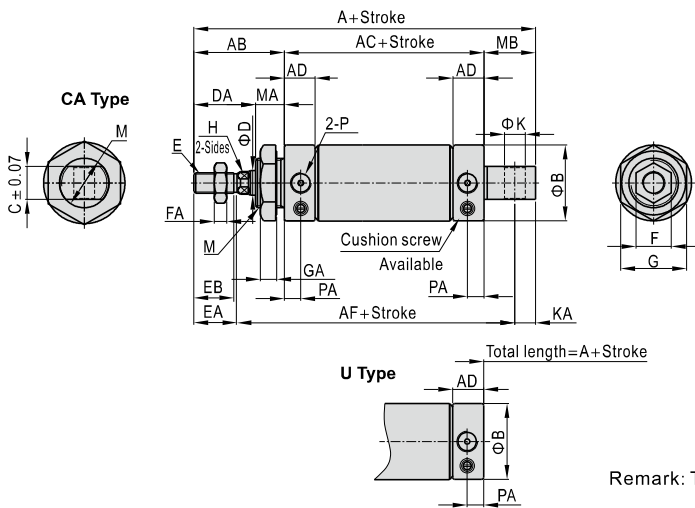
Inner structure and material of major parts



NO.	Item	Material
1	Rod nut	Carbon steel
2	Piston rod	Carbon steel with 20 μ m chrome plated
3	Front cover packing	NBR
4	Front cover nut	Carbon steel
5	Front cover	Aluminum alloy
6	Bumper	TPU
7	Barrel	Aluminum alloy
8	O-ring	NBR
9	Piston	Aluminum alloy
10	Piston seal	NBR
11	Magnet	Plastic
12	Wear ring	Wear resistant material
13	Bolt	Carbon steel
14	Back cover	Aluminum alloy

Dimensions

MBL/MBLC

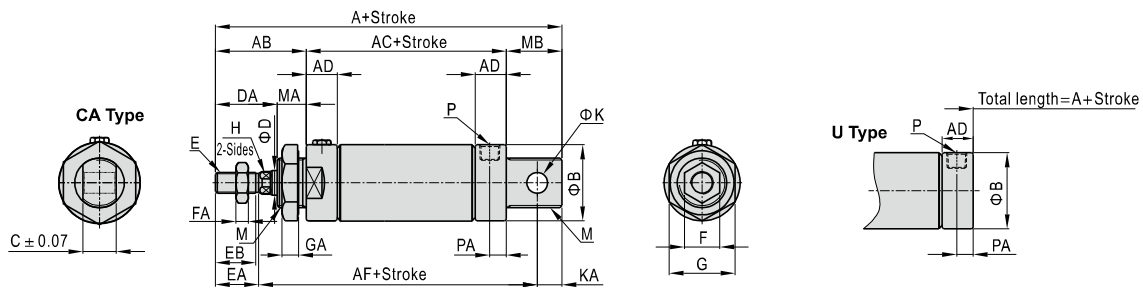


Bore size\Item	A												
	CA	U	AB	AC	AD	AF	B	C	D	DA	M	MA	MB
20	131	110	40	70	15.5	102	27	16	8	26	M22 × 1.5	14	21
25	135	114	44	70	15.5	105	30	16	10	30	M22 × 1.5	14	21
32	141	114	44	70	15.5	108	37	16	12	28	M24 × 2.0	16	27
40	165	138	46	92	22	130.5	45	20	16	30	M30 × 2.0	16	27
50	173	146	54	92	22	138	55	20	16	32	M36 × 2.0	22	27
63	173	146	54	92	22	138	68	20	16	32	M36 × 2.0	22	27

Bore size\Item	A											
	E	EA	EB	F	FA	G	GA	H	P	K	KA	PA
20	M8 × 1.25	20	18.5	12	6	29	7	6	1/8"	8	9	7.5
25	M10 × 1.25	21	19.5	17	6	29	7	8	1/8"	8	9	7.5
32	M10 × 1.25	21	19.5	17	6	32	8	10	1/8"	10	12	7.5
40	M12 × 1.25	22.5	21	17	7	41	8	14	1/4"	12	12	11
50	M14 × 1.5	24	22.5	19	8	46	11	14	1/4"	12	11	11
63	M14 × 1.5	24	22.5	19	8	46	11	14	1/4"	12	11	11

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

MSBL



Item	A												AB	AC			AD	AF			B	C
	CA						U							AD				AF				
	Stroke	≤50	51~100	≥101	≤50	51~100	≥101	≤50	51~100	≥101	≤50	51~100		≥101	≤50	51~100		≥101				
20	156	181	206	135	160	185	40	95	120	145	15.5	127	152	177	27	16						
25	160	185	210	139	164	189	44	95	120	145	15.5	130	155	180	30	16						
32	166	191	216	139	164	189	44	95	120	145	15.5	133	158	183	37	16						
40	190	215	240	163	188	213	46	117	142	167	22	155.5	180.5	205.5	45	20						

Bore size\Item	A																
	D	DA	E	EA	EB	F	FA	G	GA	H	K	KA	M	MA	MB	P	PA
20	8	26	M8 × 1.25	20	18.5	12	6	29	7	6	8	9	M22 × 1.5	14	21	1/8"	7.5
25	10	30	M10 × 1.25	21	19.5	17	6	29	7	8	8	9	M22 × 1.5	14	21	1/8"	7.5
32	12	28	M10 × 1.25	21	19.5	17	6	32	8	10	10	12	M24 × 2.0	16	27	1/8"	7.5
40	16	30	M12 × 1.25	22.5	21	17	7	41	8	14	12	12	M30 × 2.0	16	27	1/4"	11

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

Mini cylinder(Aluminum barrel)

MBL Series—Accessories

List for ordering code of accessories

Accessories Bore size	Mounting accessories			Knuckle				Sensor switch	
	LB	FA	SDB	I	Y	F	U	CMSG	DMSG(S)
20	F-MA20LB	F-MA20FA	F-MA20SDB	F-MA20I	F-MA20Y	F-M8X125F	F-M8X125U	CMSG	DMSG(S)
25				F-MA25I	F-MA25Y	F-M10X125F	F-M10X125U		
32	F-MA32LB	F-MA32FA	F-MA32SDB	F-MA40I	F-MA40Y	F-M12X125F	F-M12X125U		
40	F-MA40LB	F-MA40FA	F-MA40SDB	F-MAC50I	F-MAC50Y	F-M14X150F	F-M14X150U		
50	F-MA50LB	F-MA50FA		F-MA40I	F-MA40Y	F-M12X125F	F-M12X125U		
63	F-MA63LB		F-MA50FA	F-MAC50I	F-MAC50Y	F-M14X150F	F-M14X150U		

Accessory selection

Accessories Cylinder model	Mounting accessories	Knuckle[Note1]						Sensor switch	
		LB	FA	SDB	I	Y	U	F	CMSG
MBL Standard	●	●	●	●	●	●	●	×	×
MBLC With magnet	●	●	●	●	●	●	●	●	●
MSBL Standard	●	●	●	●	●	●	●	×	×
MTBL With magnet	●	●	●	●	●	●	●	●	●
MBLD Standard	●	●	×	●	●	●	●	×	×
MBLCD With magnet	●	●	×	●	●	●	●	●	●
MBLJ Standard	●	●	×	●	●	●	●	×	×
MBLCJ With magnet	●	●	×	●	●	●	●	●	●

Material of accessories

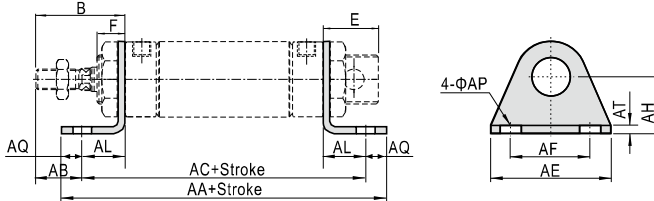
Accessories Bore size	Mounting accessories			Knuckle			
	LB	FA	SDB	I	Y	F	U
20-63	○	○	○	□	□	□	□

○—Lower carbon steel; □—Carbon steel;

[Note1] Please refer to P349~352 for knuckle detail.

Dimensions

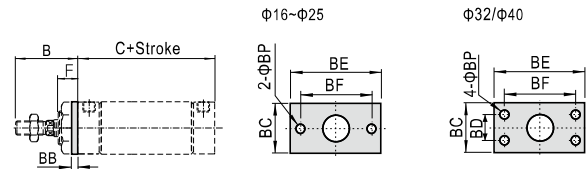
LB



Bore size\Item Stroke	AA	AA(MSBL)			AC	AC(MSBL)		
	(MBL)	0~50	51~100	101~150	(MBL)	0~50	51~100	101~150
20	116	141	166	191	100	125	150	175
25	116	141	166	191	100	125	150	175
32	136	161	186	211	120	145	170	195
40	158	183	208	233	142	167	192	217
50	172	-	-	-	148	-	-	-
63	180	-	-	-	154	-	-	-

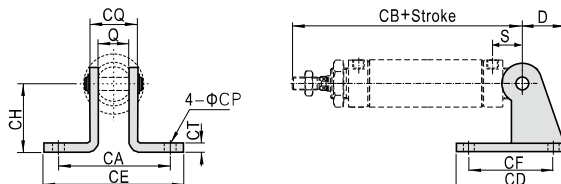
Bore size\Item Stroke	B	E	F	AB	AE	AF	AL	AQ	AP	AT	AH
20	40	21	14	25	54	40	15	8	6.5	3	25
25	44	21	14	29	54	40	15	8	6.5	3	25
32	44	27	16	19	59	45	25	8	7	3.5	32
40	46	27	16	21	64	50	25	8	7	3.5	36
50	54	27	22	26	86	66	28	12	11	4.5	40
63	54	27	22	23	106	82	31	13	11	4.5	45

FA



Bore size\Item Stroke	B	C	C(MSBL)			BB	BC	BD	BE	BF	BP	F
	(MBL)	0~50	51~100	101~150								
20	40	70	95	120	145	3.5	38	-	64	50	7	14
25	44	70	95	120	145	3.5	38	-	64	50	7	14
32	44	70	95	120	145	4	47	33	72	58	6.5	16
40	46	92	117	142	167	4	50	36	84	70	6.5	16
50	54	92	-	-	-	4.5	65	47	104	86	9	22
63	54	92	-	-	-	4.5	65	47	104	86	9	22

SDB



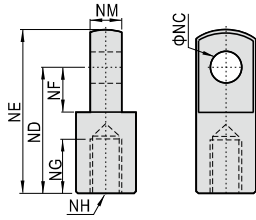
Bore size\Item Stroke	D	S	Q	CA	CB	CB(MSBL)			CD	CE	CF	CH	CT	CP	CQ
	(MBL)	0~50	51~100	101~150											
20	21	12	16	51	122	147	172	197	48	67	32	32	2.5	7	22
25	21	12	16	51	126	151	176	201	48	67	32	32	2.5	7	22
32	27	15	16	51	129	154	179	204	52	67	36	36	3	7	24
40	27	15	20	55	153	178	203	228	56	71	40	40	3	7	28

[Note] SDB is attached with relevant PIN.

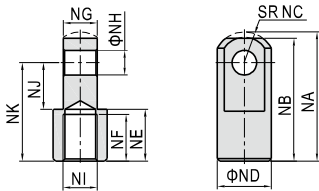
Mini cylinder(Aluminum barrel)

MBL Series—Accessories

I Knuckle

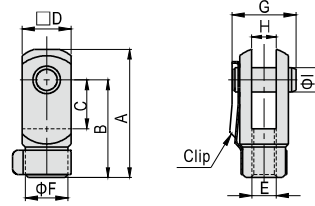


Type\Item	NC	ND	NE	NF	NH	NG	NM
F-MA20I	8	30	40	11	M8×1.25	15	8
F-MA25I	10	40	50	15	M10×1.25	20	10
F-MA40I	10	45	57	16	M12×1.25	23	14

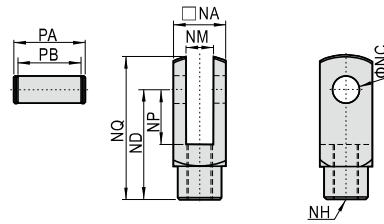


Type\Item	NA	NB	NC	ND	NE	NF	NG	NH	NJ	NK	NI
F-MAC50I	52.5	50	12.5	22	21	19	13.8	10	19	40	M14×1.5

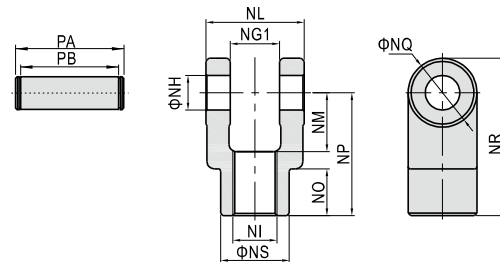
Y Knuckle



Type\Item	A	B	C	D	E	F	G	H	I
F-MA20Y	42	32	16	16	M8×1.25	14	21	8	8
F-MA25Y	52	40	20	19	M10×1.25	18	25	10	10



Type\Item	NA	NC	ND	NP	NQ	NM	NH	PA	PB
F-MA40Y	25.4	10	45	20	57	14	M12×1.25	32	26.2



Type\Item	Ng1	NH	NI	NL	NM	NO	NP	NQ	NR	NS	PA	PB
F-MAC50Y	14.2	10	M14×1.5	27.8	19	17	40	22	51	22	34.6	28.8