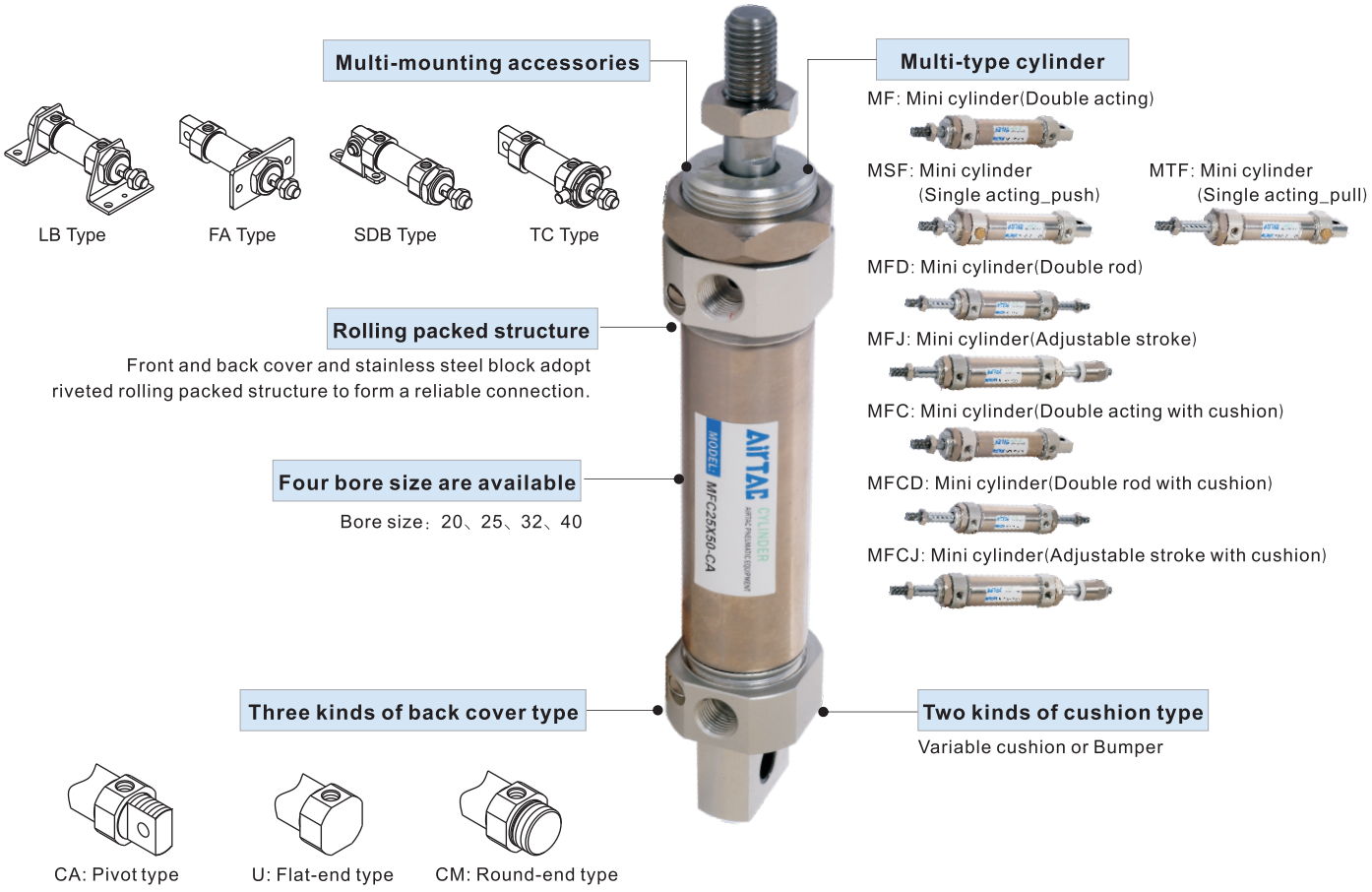
Compendium of MF Series



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
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 40 μ m 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)

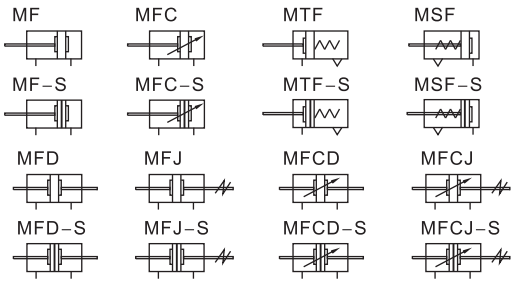
MF Series

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	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 ℃		-20~70			
Speed range mm/s		Double acting：30~800 Single acting：50~800			
Stroke tolerance		$0\sim150\ ^{+1.0}_{0}$ $>150\ ^{+1.5}_{0}$			
Cushion type		MFC/MFCD/MFCJ Series: Variable cushion; Other series: Bumper			
Port size [Note1]		1/8"			1/4"

[Note1] G thread is available.
Add) Refer to P427 for detail of sensor switch.

Symbol



Stroke

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

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. There are several modes of back cover, which makes the installation of cylinder more convenient.
5. Front and back cover and stainless steel block adopt riveted rolling packed structure to form a reliable connection.
6. The cylinder body has stainless steel pipes with high precision to produce high strength and corrosion resistance.
7. With the same bore size and stroke, cylinders of MF series are shorter than ISO6432 standard cylinders.
8. There are cylinders and mounting accessories with several specifications for your choice.

Ordering code

MF 32×50 S CM □ G
MFD 32×50 S □ G
MFJ 32×50-20 S □ G

① ② ③ ④ ⑤ ⑥ ⑦ ⑧

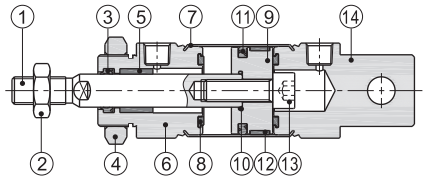
①Model	②Bore size	③Stroke	④Adjustable stroke	⑤Magnet	⑥Back cover	⑦Mounting type[Note1]	⑧Thread type
MF: Mini cylinder(Double acting) MFC: Mini cylinder (Double acting with cushion) MSF: Mini cylinder (Single acting_push) MTF: Mini cylinder (Single acting_pull)	20 25 32 40	Refer to stroke table for details	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	G: G
MFD: Mini cylinder(Double rod) MFCD: Mini cylinder (Double rod with cushion)					No this code	Blank: No accessories FA: FA type LB: LB type TC: TC type	
MFJ: Mini cylinder (Adjustable stroke) MFCJ: Mini cylinder (Adjustable stroke with cushion)			10 20 30 40 50 75 100				

[Note1] Please refer to page 232~233 for accessory parts.

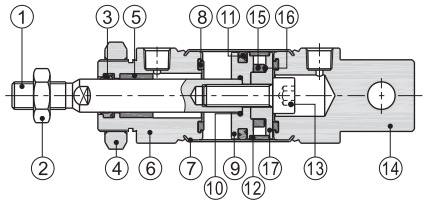
Inner structure and material of major parts

MF

Double acting without magnet type



Double acting with magnet

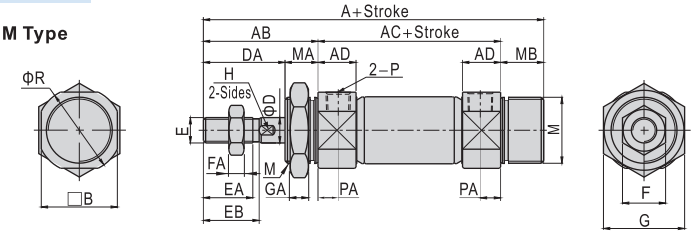


NO.	Item	Material
1	Piston rod	Carbon steel with 20 μ m chrome plated
2	Rod nut	Carbon steel
3	Front cover packing	NBR
4	Front cover nut	Carbon steel
5	Bushing	Wear resistant material
6	Front cover	Aluminum alloy
7	Barrel	SUS304
8	Bumper	TPU
9	Piston	Aluminum alloy
10	O-ring	NBR
11	Piston seal	NBR
12	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

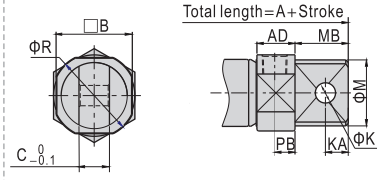
Dimensions

MF\MFC

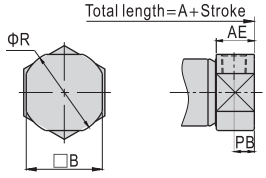
CM Type



CA Type



U Type

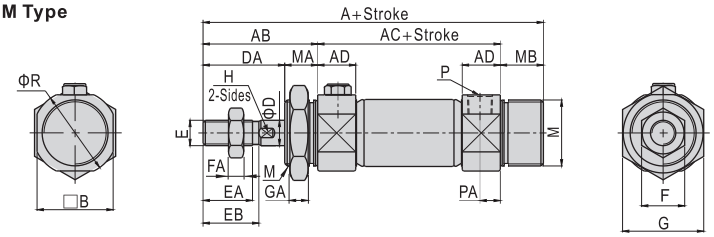


Bore size\Item	A			AB	AC	AD	AE	B	C	M		MA	MB		D	DA	E	EA	EB	F	FA	G	GA	H	K	KA	P	PA	PB	R
Back cover	CM	CA	U							CM	CA		CA	CM																
20	116	124	103	41	62	14.5	14.5	25	12	M20×1.5	20	14	21	13	8	27	M8×1.25	15.5	18	13	5	26	8	6	8	9	1/8"	7.5	7.5	29
25	120	128	108	45	62	14.5	15.5	30	12	M26×1.5	26	14	21	13	10	31	M10×1.25	19.5	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	19.5	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	21	24	19	8	41	10	14	10	12	1/4"	11	11.5	46.5

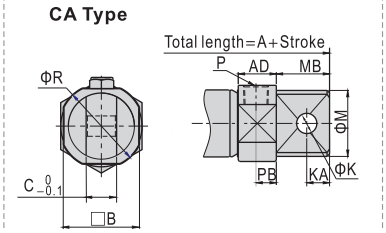
Remark:
1. The dimensions of magnet type cylinder are the same as non-magnet type cylinder.
2. The dimensions of MFC series are the same as MF series.

MSF

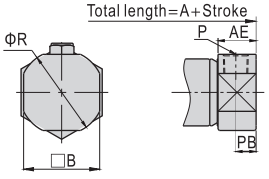
CM Type



CA Type



U Type



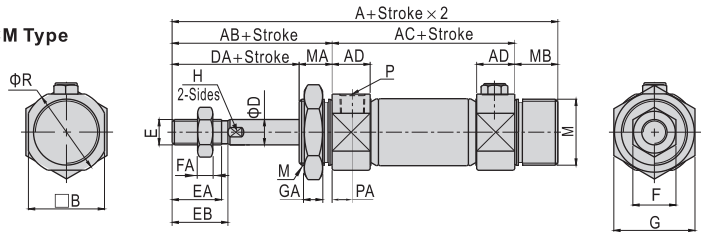
Bore size\Item	A									AC		
Back cover	CM			CA			U			-		
Stroke	1~50	51~100	101~150	1~50	51~100	101~150	1~50	51~100	101~150	1~50	51~100	101~150
20	141	166	191	149	174	199	128	153	178	87	112	137
25	145	170	195	153	178	203	133	158	183	87	112	137
32	147	172	197	161	186	211	135	160	185	89	114	139
40	179	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		MA	MB		P	PA	PB	R
Back cover																		CM	CA		CA	CM				
20	41	14.5	14.5	25	12	8	27	M8×1.25	15.5	18	13	5	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	19.5	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	19.5	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	21	24	19	8	41	10	14	10	12	M32×2.0	32	16	27	16	1/4"	11	11.5	46.5

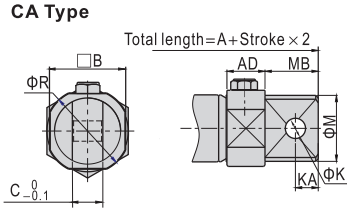
Remark: The dimensions of magnet type cylinder are the same as non-magnet type cylinder.

MTF

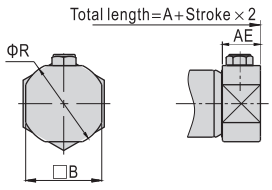
CM Type



CA Type



U Type

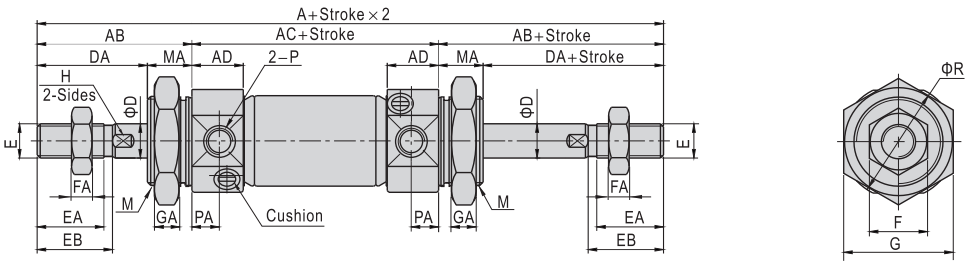


Bore size\Item	A									AC			M	MA	MB	
Back cover	CM			CA			U			-			CM	CA	–	CA	CM
Stroke	1~50	51~100	101~150	1~50	51~100	101~150	1~50	51~100	101~150	1~50	51~100	101~150	–	–	–	–	–
20	141	166	191	149	174	199	128	153	178	87	112	137	M20×1.5	20	14	21	13
25	145	170	195	153	178	203	133	158	183	87	112	137	M26×1.5	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

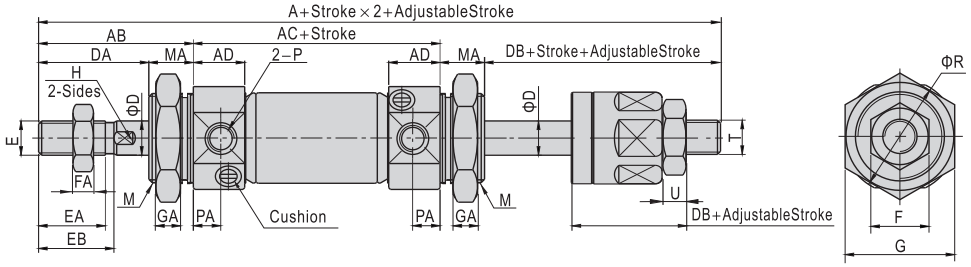
Bore size\Item	AB	AD	AE	B	C	D	DA	E	EA	EB	F	FA	G	GA	H	K	KA	P	PA	R
20	41	14.5	14.5	25	12	8	27	M8×1.25	15.5	18	13	5	26	8	6	8	9	1/8"	7.5	29
25	45	14.5	15.5	30	12	10	31	M10×1.25	19.5	22	17	6	32	8	8	8	9	1/8"	7.5	33.5
32	45	14.5	15.5	34.5	20	12	31	M10×1.25	19.5	22	17	6	32	8	10	10	12	1/8"	7.5	37.5
40	50	21.5	22	42.5	20	16	34	M14×1.5	21	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
Back cover	MFD\MFCD	MFJ\MFCJ																					
20	144	141	41	62	14.5	8	27	24	M8×1.25	15.5	18	13	5	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	19.5	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	19.5	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	21	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.

List for ordering code of accessories

Accessories / Bore size	Mounting accessories				Knuckle				Sensor switch	
	LB	FA	TC	SDB	I	Y	F	U	CS1-M□	DS1-M□
20	F-MF20LB	F-MF20FA	F-MF20TC	F-MF20SDB	F-MF20I	F-MF20Y	F-M8X125F	F-M8X125U	CS1-M-S20	DS1-M-S20
25	F-MF32LB	F-MF32FA	F-MF32TC	F-MF32SDB	F-MF25I	F-MF25Y	F-M10X125F	F-M10X125U	CS1-M-S25	DS1-M-S25
32									CS1-M-S32	DS1-M-S32
40	F-MF40LB	F-MF40FA	F-MF40TC		F-MF40I	F-MF40Y	F-M14X150F	F-M14X150U	CS1-M-S40	DS1-M-S40

Accessory selection

Accessories / Cylinder model		Mounting accessories				Knuckle				Sensor switch	
		LB	FA	SDB	TC	I	Y	U [1]	F	CS1-M	DS1-M
MF / MFC	Standard	●	●	●	●	●	●	●	●	×	×
	With magnet	●	●	●	●	●	●	●	●	●	●
MSF / MTF	Standard	●	●	●	●	●	●	●	●	×	×
	With magnet	●	●	●	●	●	●	●	●	●	●
MFD / MFCD	Standard	●	●	×	●	●	●	●	●	×	×
	With magnet	●	●	×	●	●	●	●	●	●	●
MFJ / MFCJ	Standard	●	●	×	●	●	●	●	●	×	×
	With magnet	●	●	×	●	●	●	●	●	●	●

Material of accessories

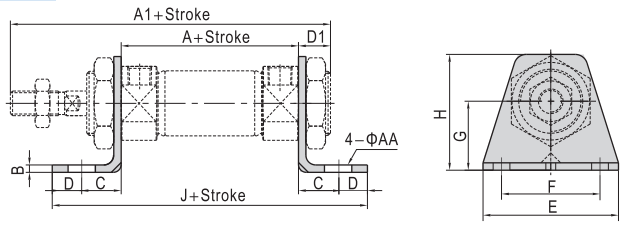
Accessories / Bore size	Mounting accessories				Knuckle			
	LB	FA	SDB	TC	I	Y	F	U
20~40	△	△	△	■	□	□	□	□

■——Cast steel; △——SPCC; □——Carbon steel;

[Note1] Please refer to P415~418 for knuckle detail.

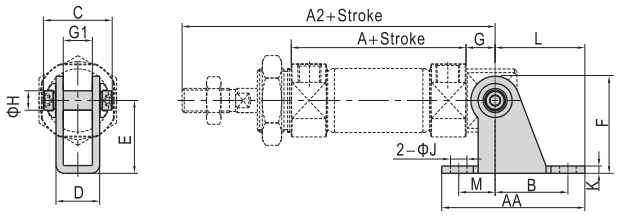
Dimensions

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

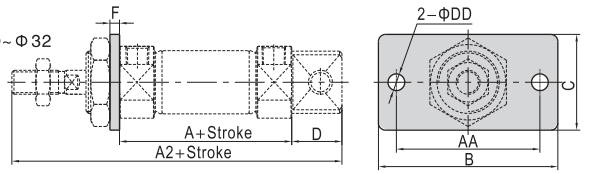


Bore size\Item	A	A2	AA	B	C	D	E	F	G	G1	H	K	J	L	M
20	62	115	59	30	32	18.1	30	40	12	12.1	8	2.5	6.8	37	15
25	62	119	59	30	32	18.1	30	40	12	12.1	8	2.5	6.8	37	15
32	64	124	75	40	44	28.1	40	53	15	20.1	10	3	9	50	15
40	88	153	75	40	44	28.1	40	53	15	20.1	10	3	9	50	15

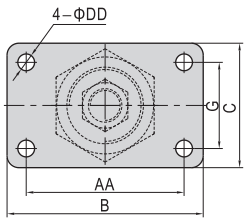
[Note] SDB is attached with relevant PIN.

FA

Φ20~Φ32

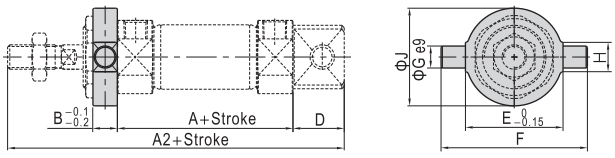


Φ40



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

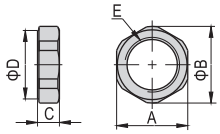
TC



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

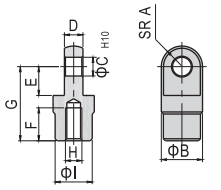
Special nut for TC

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

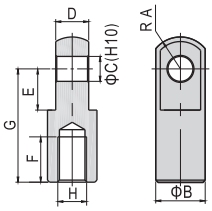


I Knuckle

F-MF20I、F-MF25I



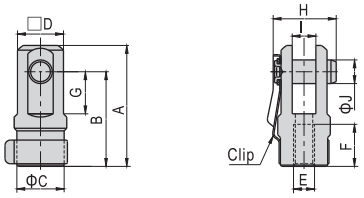
F-MF40I



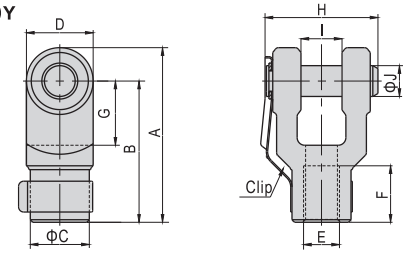
Type\Item	A	B	C	D	E	F	G	H	I
F-MF20I	9.5	20	9	9	14	16	36	M8×1.25	18
F-MF25I	9.5	20	9	9	14	18	38	M10×1.25	18
F-MF40I	15	24	12	16	20	22	55	M14×1.5	-

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