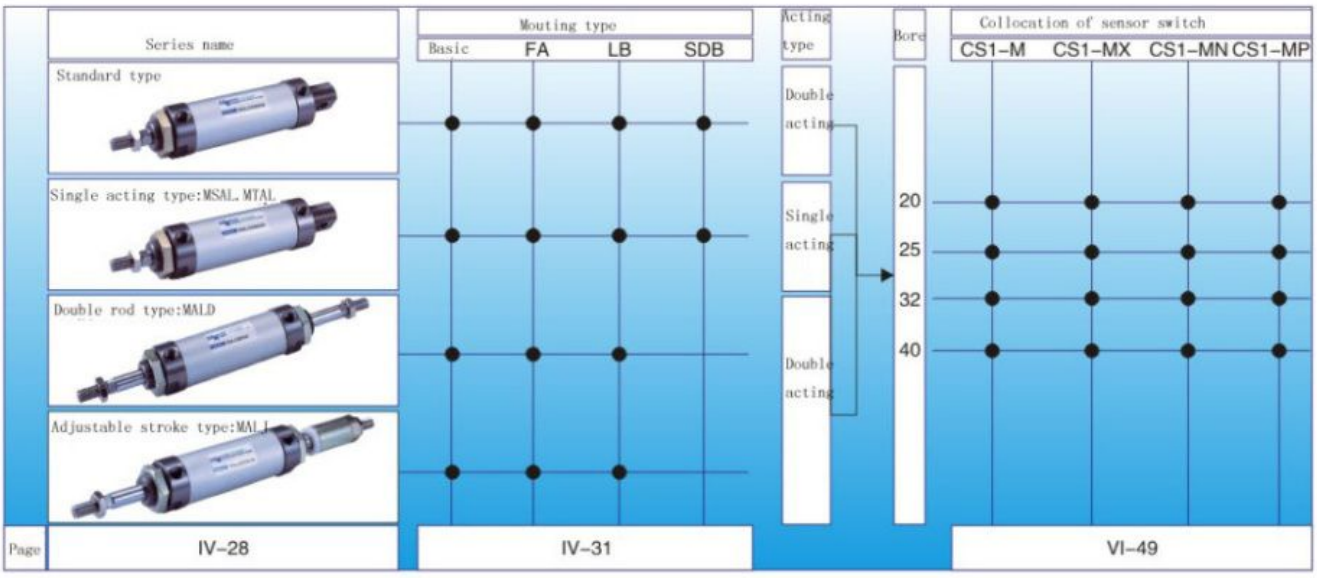
Installation and application

1. When load changes in the work, the cylinder with abundant output capacity shall be select.
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 enviroment with larger humidity, much dust or water drops, oil dust and welding dregs.
4. Dirty substances in the pipe must be cleared away before to prevent the entrance of sundries into the cylinder.
5. The medium used bycylinder shall be filtered by filter core of above 40um.
6. Anti-freezing measure shall be adopted under low temperature environment to prevent moisture freezing.
7. To avoid side load, otherwise , piston rod will be bent and deformed and damage the thread at the end of the rod. Single-acting type can not be added in return.
8. If the cylinder is dismantled and stored for a long time, please to contact anti-rust treatment to the surface. Anti-dust jam cap shall be added in air intake and outlet orifices. The front and back cover can not be dismantled, which shall be especially noticed.

Criteria for selection:Cylinder thrust

Bore(mm)	Rod size(mm)	Acting type		Pressure area	Operating pressure MPa						
					0.1	0.2	0.3	0.4	0.5	0.6	0.7
20	8	Single acting-Push type		314.0	/	12.6	44.0	75.4	106.8	138.2	169.6
		Single acting-pull type		263.8	/	2.6	28.9	55.3	81.7	108.1	134.4
		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	184.6
25	10	Single acting-Push type		490.6	/	29.2	78.3	127.4	176.4	225.5	274.5
		Single acting-pull type		412.1	/	13.5	54.7	96.0	137.2	178.4	219.6
		Double acting	Push-side	490.6	49.1	98.1	147.2	196.3	245.3	294.4	343.4
			Pull-side	412.1	41.2	82.4	123.6	164.9	206.1	247.3	288.5
32	12	Single acting-Push type		803.8	/	76.6	157.0	237.3	317.7	398.1	478.5
		Single acting-pull type		690.8	/	54.0	123.0	192.1	261.2	330.3	399.4
		Double acting	Push-side	803.8	80.4	160.8	241.2	321.5	401.9	482.3	562.7
			Pull-side	690.8	69.1	138.2	207.2	267.3	345.4	414.5	483.6
40	16	Single acting-Push type		1256.0	37.5	163.1	288.7	414.3	539.9	665.5	791.1
		Single acting-pull type		1055.0	17.4	122.9	228.4	333.9	439.4	544.9	650.4
		Double acting	Push-side	1256.0	125.6	251.2	376.8	502.4	628.0	753.6	879.2
			Pull-side	1055.0	105.5	211.0	316.5	422.0	527.5	633.0	738.5

Product series



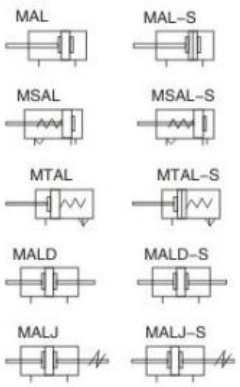
Specification

Bore(mm)		20	25	32	40
Acting type	MSAL.MTAL	Single acting type			
	Others	Double acting type			
Working medium		Air			
Operating pressure	Double acting	0.1~1.0MPa(14~145Psi)			
	Single acting	0.2~1.0MPa(28~145Psi)			
Proof pressure		1.5MPa(215Psi)			
Temperature		-20~70			
Speed range		Single acting:50-800m/s Double acting type:30-800m/s			
Stroke tolerance		0~150 $^{+1.0}_{0}$		>150 $^{+1.4}_{0}$	
Cushion type		Bumper			
Port size (1)		PT1/8			PT1/4

(1)NPT thread and G thread are available;

Add:Refer to PV1-49-VI-58 for detail of sensor switch

Symbol



Stroke

Bore(mm)		Standard stroke(mm)	Max. stroke	Available stroke (1)
MAL	20	25 50 75 80 100 125 150 160 175 200 250 300	500	800
	25	25 50 75 80 100 125 150 160 175 200 250 300 350 400 450 500	800	1200
	32		800	1200
	40		1200	1500
MSAL	20	25 50 75 100 125 150	150	-
	25		150	-
	32		150	-
	40		150	-
MTAL	20	25 50 75 100	150	-
	25		100	-
	32		100	-
	40		100	-
MALD MALJ	20	25 50 75 80 100 125 150 160 175 200	200	300
	25	25 50 75 80 100 125 150 160 175 200 250	250	300
	32		250	300
	40		250	300

Remark:Consult us for special stroke

Features

1. Front and back cover and cylinder tube are connected by threads.
2. Piston adopts heterogeneous two-way seal structure. It has compact size and has the function of oil reservation.
3. Front cover adopts self-lubrication bearingguide that has good perforance of lubrication and guide.
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 of MAL.MSAL.MTAL

MAL 20 × 50 — S — U — □ — □

- Type: MAL:Mini cylinder(Double acting); MSAL:Mini cylinder(Singleacting-push type); MTAL:Mini cylinder(Single acting-pull type)
- Bore: 20
- Stroke: 50
- Magnet: S:With magnet; Blank:without magnet
- Back cover: CA:Pivot type; CM:Round end type; U:Flat-end type
- ① Fixed type: Blank:No accessories; FA:FA type; SDB:SDB type; LB:LB type
- Thread type: Blank:PT; T:NPT; G:G

Ordering code of MALD.MALJ

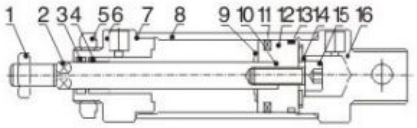
MALD — 20 × 50 — S — □ — □

MALJ — 20 × 50 — 20 — S — □ — □

- Type: MALD:Mini cylinder(Double rod type); MSAJ:Mini cylinder(Adjustable stroke type)
- Bore: 20
- Stroke: 50
- Adjustable stroke: 10:10mm; 20:20mm; 30:30mm; 40:40mm; 50:50mm; 75:75mm; 100:100mm
- Magnet: S:with magnet; Blank:without magnet
- ① Fixed type: Blank:No accessories; FA:FA type; LB:LB type
- Thread type: Blank:PT; T:NPT; G:G

Inner structure and material of major parts

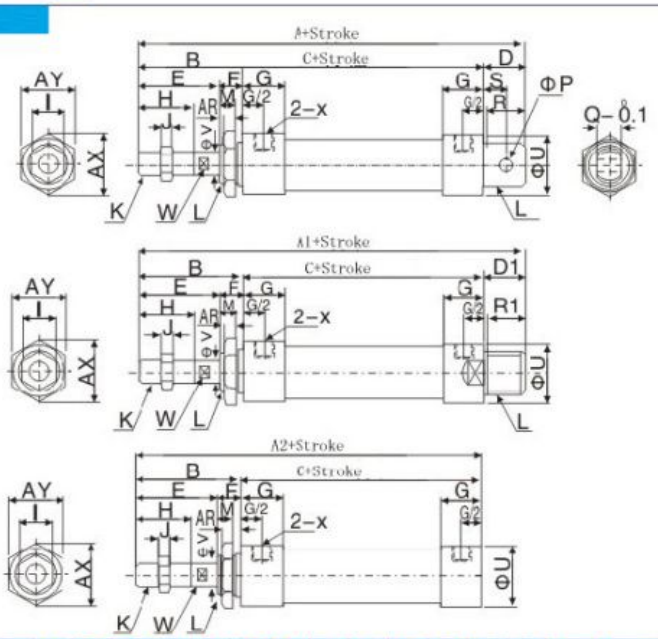
MAL



NO.	Item	Material
1	Rod nut	Carbon steel
2	Rod	Carbon steel with 20um chrone plated
3	Front cover	NBR
4	Bushing	Wear resistant material
5	Front cover nut	Carbon steel
6	Front cover	Aluminum alloy
7	O-ring	NBR
8	Barrel	Aluminum alloy
9	Bumper	NBR
10	O-ring	NBR
11	Piston O-ring	NBR
12	Piston	Aluminum alloy
13	Wearring	Wear resistant material
14	Washer	Free cutting steel
15	Bolt	Carbon steel
16	Back cover	Aluminum alloy

Dimensions

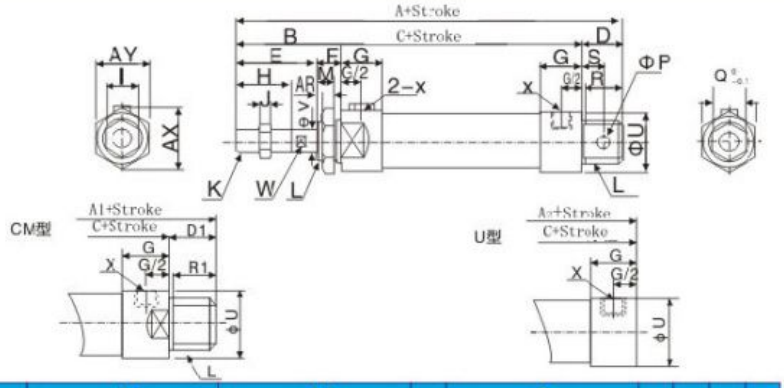
Type:MAL



Bore/Symbol	A	A1	A2	B	C	D	D1	E	F	G	H	I	J	K
20	131	122	110	40	70	21	12	28	12	16	20	12	6	M8x1.25
25	135	128	114	44	70	21	14	30	14	16	22	17	6	M10x1.25
32	141	128	114	44	70	27	14	30	14	16	22	17	6	M10x1.25
40	165	152	138	46	92	27	14	32	14	22	24	17	7	M12x1.25

Bore/Symbol	L	M	P	Q	R	R1	S	U	V	W	X	AR	AX	AY
20	M22x1.5	10	8	16	19	10	12	29	8	6	PT1/8	7	33	29
25	M22x1.5	12	8	16	19	12	12	34	10	8	PT1/8	7	33	29
32	M24x2.0	12	10	16	25	12	15	39.5	12	10	PT1/8	8	37	32
40	M30x2.0	12	12	20	25	12	15	49.5	16	14	PT1/4	9	47	41

Type:MSAL

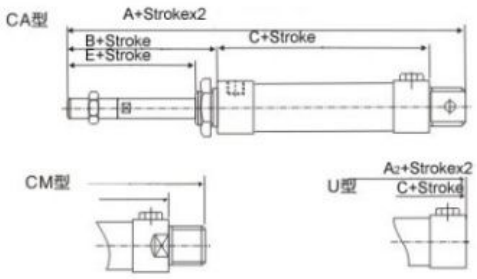


Symbol	A			A1			A2			B	C			D	D1	E	F
Bore/Stroke	0~50	51~100	≥101	0~50	51~100	≥101	0~50	51~100	≥101		0~50	51~100	≥101				
20	156	181	206	147	172	197	135	160	185	40	95	120	145	21	12	28	12
25	160	185	210	153	178	203	139	164	189	44	95	120	145	21	14	30	14
32	166	191	216	153	178	203	139	164	189	44	95	120	145	27	14	30	14
40	190	215	240	177	202	227	163	188	213	46	117	142	167	27	14	32	14

Bore/Symbol	G	H	I	J	K	L	M	P	Q	R	R1	S	U	V	W	X	AR	AX	AY
20	16	20	12	6	M8×1.25	M22×1.5	10	8	16	19	10	12	29	8	6	PT1/8	7	33	29
25	16	22	17	6	M10×1.25	M22×1.25	12	8	16	19	12	12	34	10	8	PT1/8	7	33	29
32	16	22	17	6	M10×1.25	M24×2.0	12	10	16	25	12	15	39.5	12	10	PT1/8	8	37	32
40	22	24	17	7	M12×1.25	M30×2.0	12	12	20	25	12	15	49.5	16	14	PT1/4	9	47	41

The internal structure and main parts material

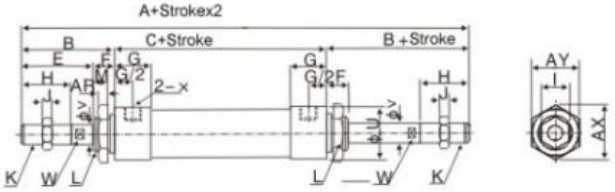
Type:MTAL



Bore/Symbol	A				A1			
	0-25	26-50	51-75	76-100	0-25	26-50	51-75	76-100
20	146	156	171	181	137	147	162	172
25	150	160	175	185	143	153	168	178
32	156	166	186	196	143	153	173	183
40	180	190	210	220	167	177	197	207

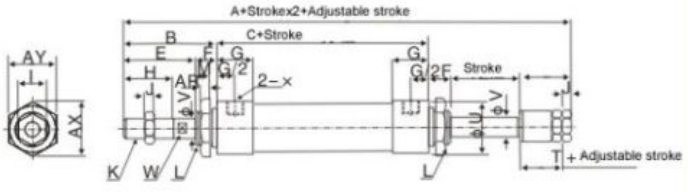
Bore/Symbol	A2				C			
	0-25	26-50	51-75	76-100	0-25	26-50	51-75	76-100
20	125	135	150	160	85	95	110	120
25	129	139	154	164	85	95	110	120
32	129	139	159	169	85	95	115	125
40	153	163	183	193	107	117	137	147

Type:MALD



Bore/Symbol	A	B	C	E	F	G	H	I	J	K	L	M	U	V	W	X	AR	AX	AY
20	150	40	70	28	12	16	20	12	6	M8×1.25	M22×1.5	10	29	8	6	PT1/8	7	33	29
25	158	44	70	30	14	16	22	17	6	M10×1.25	M22×1.5	12	34	10	8	PT1/8	7	33	29
32	158	44	70	30	14	16	22	17	6	M10×1.25	M24×2.0	12	39.5	12	10	PT1/8	8	37	32
40	184	46	92	32	14	22	24	17	7	M12×1.25	M30×2.0	12	49.5	16	14	PT1/4	9	47	41

Type:MALD



IBore/Symbol	A	B	C	E	F	G	H	I	J	K	L	M	T	U	V	W	X	AR	AX	AY
20	147	40	70	28	12	16	20	12	6	M8×1.25	M22×1.5	10	19	29	8	6	PT1/8	7	33	29
25	155	44	70	30	14	16	22	17	6	M10×1.25	M22×1.5	12	21	34	10	8	PT1/8	7	33	29
32	155	44	70	30	14	16	22	17	6	M10×1.25	M24×2.0	12	21	39.5	12	10	PT1/8	8	37	32
40	180	46	92	32	14	22	24	17	7	M12×1.25	M30×2.0	12	21	49.5	16	14	PT1/4	9	47	41

Ordering code

Accessories of MAL series cylinder are the samewith that of MA series. Please see accessory list for detail of selection and order information.

Accessories

Accessories / Type		Mounting accessories LB	FA	SDB	Joint accessories① I	Y	F	U	Sensor switch ② CS1-M
MAL	Standard	●	●	●	●	●	●	●	×
	Magnet	●	●	●	●	●	●	●	●
MSAL MTAL	Standard	●	●	●	●	●	●	●	×
	Magnet	●	●	●	●	●	●	●	●
MALD	Standard	●	●	×	●	●	●	●	×
	Magnet	●	●	×	●	●	●	●	●
MALJ	Standard	●	●	×	●	●	●	●	×
	Magnet	●	●	×	●	●	●	●	●

①:Please refer to PV1-43-V1-48 for Knuckle detail.
②:Please refer to PV1-49-V1-58 for detail of sensor switch.

Material

Accessories	Mounting accessories LB	FA	SDB	Joint accessories I	Y	F	U
Material	Carbon steel			Carbon steel			

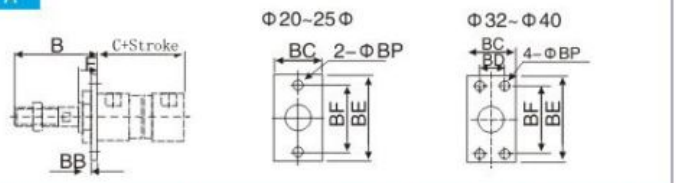
List for ordering code

Item / Bore	Mounting accessories LB	FA	SDB	Sensor switch
20	F-MA20LB	F-MA20FA	F-MA20SDB	CS1-M
25				
32	F-MA32LB	F-MA32FA	F-MA32SDB	
40	F-MA40LB	F-MA40FA	F-MA40SDB	

Item / Bore	Joint accessories I:I Knuckle	Y:Y Knuckle	F:Knuckle	U:Knuckle
20	F-M08125II	F-M08125YI	F-M08125F	F-M08125U
25	F-M10125II	F-M10125YI	F-M10125F	F-M10125U
32				
40	F-M12125A	F-M12125YA	F-M12125F	F-M12125U

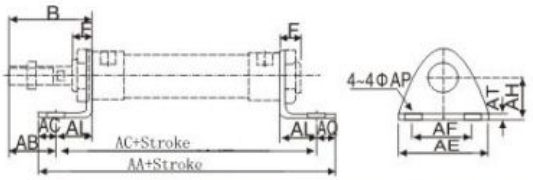
Dimension

FA



Symbol / Bore/Stroke	B	C (MAL)	(MSAL) 0~50	51~100	101~150	BB	BC	BD	BE	BF	BP	F
20	40	70	95	120	145	4	38	–	64	50	6.5	12
25	44	70	95	120	145	4	38	–	64	50	6.5	14
32	44	70	95	120	145	4	47	33	72	58	6.5	14
40	46	92	117	142	167	4	50	36	84	70	6.5	14

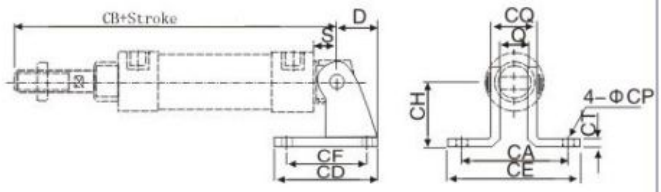
LB



Symbol / Bore/Stroke	B	F	AA (MAL)	AA (MSAL) 0~50	51~100	101~150	AB	AC (MAL)
20	40	12	116	141	162	101	25	100
25	44	14	116	141	122	101	29	100
32	44	14	136	161	186	211	19	120
40	46	14	158	183	208	233	21	142

Symbol / Bore/Stroke	AA (MSAL) 0~50	51~100	101~150	AE	AF	AL	AQ	AP	AT	AH
20	125	150	175	54	40	15	8	6.5	3	25
25	125	150	175	54	40	15	8	6.5	3	25
32	145	170	195	59	45	25	8	6.5	4	32
40	167	192	217	64	50	25	8	6.5	4	36

SDB



Symbol / Bore/Stroke	D	S	Q	CA	CB (MAL)	CB (MASL) 0~50	51~100	101~150	CD	CE	CF	CF	CT	BP	CQ
20	21	12	16	51	122	147	172	197	48	67	32	32	3	6.5	22
25	21	12	16	51	126	151	176	201	48	67	32	32	3	6.5	22
32	27	15	16	51	129	154	179	204	52	67	36	36	4	6.5	24
40	27	15	20	55	153	178	203	228	56	71	40	40	4	6.5	28