

# جک قلمی آلومینیومی

MODEL : MAL series



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## Mini cylinder(Aluminum barrel)——MAL Series

### ■ 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 larger humidity, much dust or water drops, oil dust and welding dregs;
4. Dirty substances in the pipe must be cleared away before cylinder is connected with pipeline to prevent the entrance of sundries into the cylinder;
5. The medium used by cylinder shall be filtered by the 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 conduct 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

Unit: Newton ( N )

Bore size(mm)	Rod size (mm)	Acting type	Pressure area(mm <sup>2</sup> )	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	276.3	345.4	414.5	483.6
40	16	Single acting-Push type	1256.0	-	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	
		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

Series name	Mounting type				Acting type	Bore size	Collocation of sensor switch			
	Basic	FA	LB	SDB			CS1-M	CS1-MX	CS1-MN	CS1-MP
Double acting type: MAL 	●	●	●	●	Double acting	20	●	●	●	●
Single acting type: MSAL, MTAL 	●	●	●	●	Single acting	20	●	●	●	●
Double rod type: MALD 	●	●	●	●	Double acting	25	●	●	●	●
Adjustable stroke type: MALJ 	●	●	●	●		32	●	●	●	●
						40	●	●	●	●
Page	IV-28						VI-39			



# Mini cylinder(Aluminum barrel)

## MAL Series

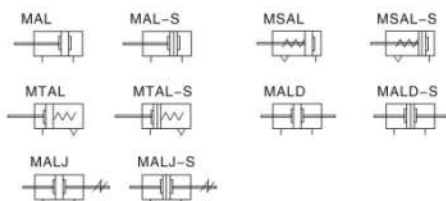


### Specification

Bore size (mm)		20	25	32	40
Acting type	MSAL, MTAL	Single acting type			
	Others	Double acting type			
Fluid		Air (to be filtered by 40um filter element)			
Operating pressure	Double acting	0.1-1.0MPa(14 -145Psi)			
	Single acting	0.2-1.0MPa(28 -145Psi)			
Proof pressure		1, 5MPa(215Psi)			
Temperature °C		-20-70			
Speed range		Single acting: 50-800 mm/s		Double acting: 30-800mm/s	
Stroke tolerance		0-150 <sup>+1.0</sup> <sub>0</sub>		> 150 <sup>+1.4</sup> <sub>0</sub>	
Cushion type		Bumper			
Port size ①		1/8"		1/4"	

① PT thread, NPT thread and G thread are available;  
Add: Refer to PV-39-VI-50 for detail of sensor switch.

### Symbol



### Stroke

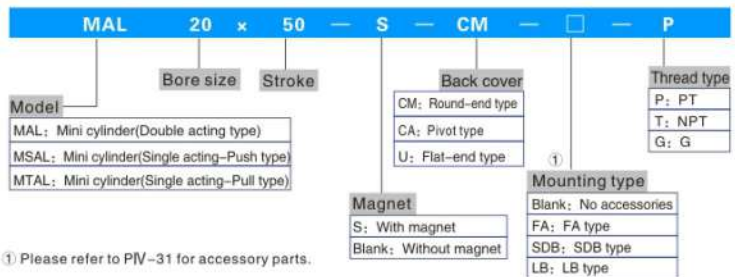
Bore size (mm)	Standard stroke (mm)															Max. stroke	Available stroke		
	20	25	32	40	50	75	80	100	125	150	160	175	200	250	300				
MAL	20																500	800	
	25																800	1200	
	32	25	50	75	80	100	125	150	160	175	200	250	300	350	400	450	500	800	1200
	40																1200	1500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

Remark: Consult us for non-standard stroke.

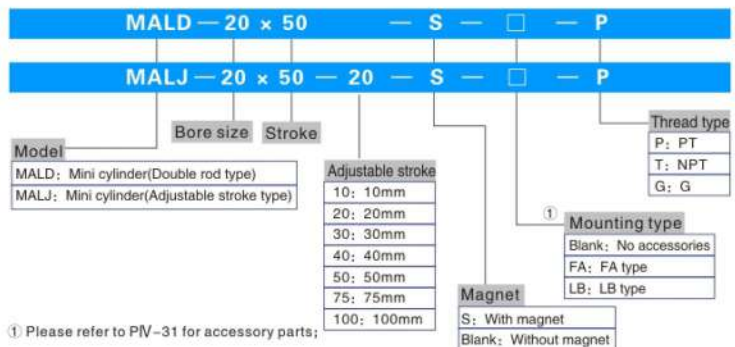
### Product feature

1. Manufactured by our enterprise;
2. Front and back cover and cylinder tube are connected by threads;
3. Piston adopts heterogeneous two-way seal structure. It has compact size and has the function of oil reservation;
4. Front cover adopts self-lubrication bearing guide that has good performance of lubrication and guide;
5. There are several modes of back cover, which makes the installation of cylinder more convenient;
6. There are cylinders and mounting accessories with several specifications for your choice.

### Ordering code of MAL, MSAL, MTAL



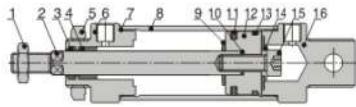
### Ordering code of MALD, MALJ



# Mini cylinder(Aluminum barrel)

MAL Series

## Inner structure and material of major parts

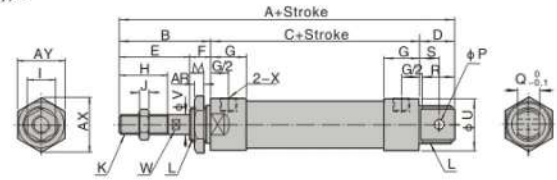


NO.	Item	Material
1	Rod nut	Carbon steel
2	Rod	Carbon steel with 20um chrome plated
3	Front cover packing	NBR
4	Bushing	Wear resistant material
5	Front cover nut	Carbon steel
6	Front cover	Aluminum alloy
7	O-ring	NBR
8	Barrel	Aluminum alloy
9	Bumper	NBR
10	O-ring	NBR
11	Piston O-ring	NBR
12	Piston	Aluminum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

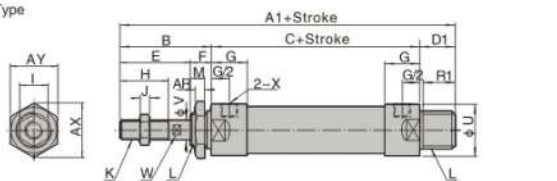
## Dimensions

**MAL**

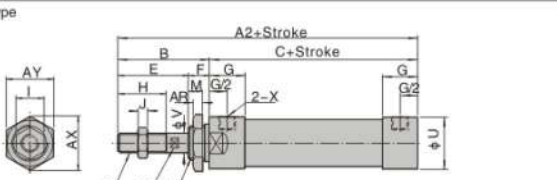
CA Type



CM Type



U Type

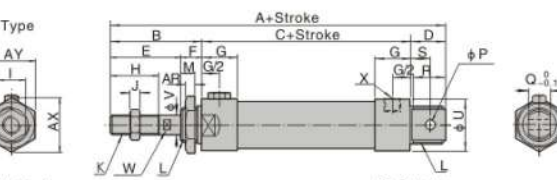


Bore size/Item	A	A1	A2	B	C	D	D1	E	F	G	H	I	J	K
20	131	122	110	40	70	21	12	28	12	16	20	12	6	M8 x 1.25
25	135	128	114	44	70	21	14	30	14	16	22	17	6	M10 x 1.25
32	141	128	114	44	70	27	14	30	14	16	22	17	6	M10 x 1.25
40	165	152	138	46	92	27	14	32	14	22	24	17	7	M12 x 1.25

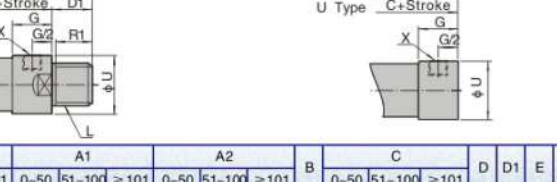
Bore size/Item	L	M	P	Q	R	R1	S	U	V	W	X	AR	AX	AY
20	M22 x 1.5	10	8	16	19	10	12	29	8	6	1/8"	7	33	29
25	M22 x 1.5	12	8	16	19	12	12	34	10	8	1/8"	7	33	29
32	M24 x 2.0	12	10	16	25	12	15	39.5	12	10	1/8"	8	37	32
40	M30 x 2.0	12	12	20	25	12	15	49.5	16	14	1/4"	9	47	41

**MSAL**


CA Type



CM Type



U Type



Item	A			A1			A2			B	C			D	D1	E	F
Bore size/Item	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

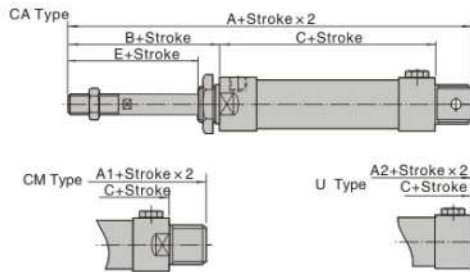
Bore size/Item	G	H	I	J	K	L	M	P	Q	R	R1	S	U	V	W	X	AR	AX	AY
20	16	20	12	6	M8 x 1.25	M22 x 1.5	10	8	16	19	10	12	29	8	6	1/8"	7	33	29
25	16	22	17	6	M10 x 1.25	M22 x 1.5	12	8	16	19	12	12	34	10	8	1/8"	7	33	29
32	16	22	17	6	M10 x 1.25	M24 x 2.0	12	10	16	25	12	15	39.5	12	10	1/8"	8	37	32
40	22	24	17	7	M12 x 1.25	M30 x 2.0	12	12	20	25	12	15	49.5	16	14	1/4"	9	47	41



# Mini cylinder(Aluminum barrel)

## MAL Series

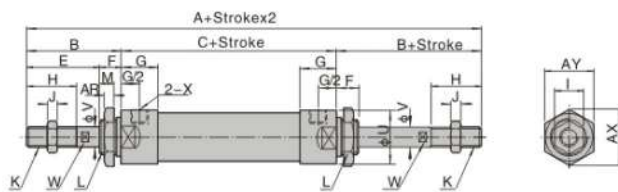
### MTAL



Bore size\Item	A				A1			
	Stroke	0-25	26-50	51-75	76-100	0-25	26-50	51-75
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

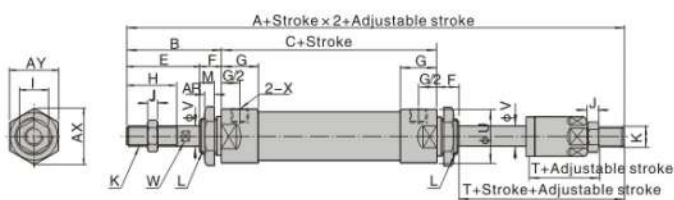
Bore size\Item	A2				C			
	Stroke	0-25	26-50	51-75	76-100	0-25	26-50	51-75
20	125	135	150	160	85	95	110	120
25	129	139	154	164	85	95	110	120
32	129	139	159	169	85	95	115	125
40	153	163	183	193	107	117	137	147

### MALD



Bore size\Item	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 x 1.25	M22 x 1.5	10	29	8	6	1/8"	7	33	29
25	158	44	70	30	14	16	22	17	6	M10 x 1.25	M22 x 1.5	12	34	10	8	1/8"	7	33	29
32	158	44	70	30	14	16	22	17	6	M10 x 1.25	M24 x 2.0	12	39.5	12	10	1/8"	8	37	32
40	184	46	92	32	14	22	24	17	7	M12 x 1.25	M30 x 2.0	12	49.5	16	14	1/4"	9	47	41

### MALJ



Bore size\Item	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 x 1.25	M22 x 1.5	10	25	29	8	6	1/8"	7	33	29
25	155	44	70	30	14	16	22	17	6	M10 x 1.25	M22 x 1.5	12	27	34	10	8	1/8"	7	33	29
32	155	44	70	30	14	16	22	17	6	M10 x 1.25	M24 x 2.0	12	27	39.5	12	10	1/8"	8	37	32
40	180	46	92	32	14	22	24	17	7	M12 x 1.25	M30 x 2.0	12	28	49.5	16	14	1/4"	9	47	41

# Mini cylinder(Aluminum barrel)

## Accessories

### Ordering code

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

### Accessories for choosing list

Cylinder model	Mounting accessory			Knuckle (1)				Sensor switch 2
	LB	FA	SDB	I	Y	F	U	CS1-M
MAL	Standard	●	●	●	●	●	●	×
	Sensor switch	●	●	●	●	●	●	●
MSAL	Standard	●	●	●	●	●	●	×
MTAL	Sensor switch	●	●	●	●	●	●	●
MALD	Standard	●	●	×	●	●	●	×
	Sensor switch	●	●	×	●	●	●	●
MALJ	Standard	●	●	×	●	●	●	×
	Sensor switch	●	●	×	●	●	●	●

①: Please refer to PVI-33-VI-38 for knuckle detail;

②: Please refer to PVI-39-VI-50 for detail of sensor switch.

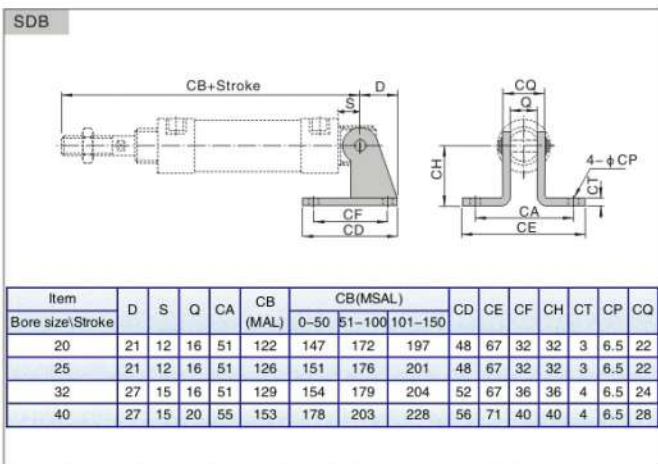
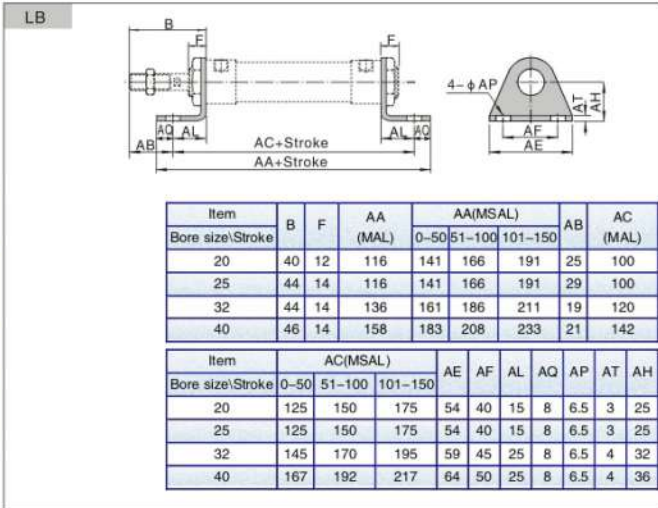
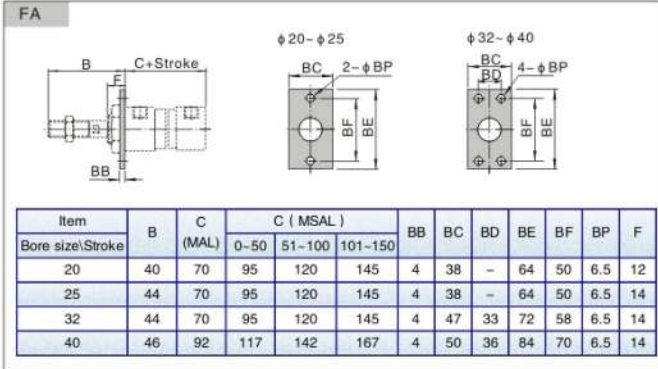
### Material of accessories

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

### List for ordering code of accessories

Accessories	Mounting accessory			Sensor switch
	LB	FA	SDB	
Bore size				CS1-M
20	F-MA20LB	F-MA20FA	F-MA20SDB	
25	F-MA32LB	F-MA32FA	F-MA32SDB	
32	F-MA40LB	F-MA40FA	F-MA40SDB	
40	F-MA40LB	F-MA40FA	F-MA40SDB	
Accessories	Knuckle			
	I:I Knuckle	Y:Y Knuckle	F:F Knuckle	U:U Knuckle
Bore size				
20	F-M08125I	F-M08125Y	F-M08125F	F-M08125U
25	F-M10125I	F-M10125Y	F-M10125F	F-M10125U
32	F-M10125I	F-M10125Y	F-M10125F	F-M10125U
40	F-M12125I	F-M12125Y	F-M12125F	F-M12125U

### Dimensions





# علی صنعت

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