



Mini cylinder(Aluminum barrel)——MAL Series

Product series

Series name	Mounting type				Acting type	Bore size	Collocation of sensor switch	
	Basic	LB	FA	SDB			CS1-M	DS1-M
Double acting type: MAL	●	●	●	●	Double acting	20 25 32 40		
Single acting type: MSAL, MTAL	●	●	●	●	Single acting		●	●
Double rod type: MALD	●	●	●	●	Double acting		●	●
Adjustable stroke type: MALJ	●	●	●	●			●	●

236	239	397
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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 μ m 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.

Criteria for selection: Cylinder thrust

Unit: Newton(N)

Bore size (mm)	Rod size (mm)	Acting type	Pressure area (mm ²)	Operating pressure(MPa)							
				0.1	0.2	0.3	0.4	0.5	0.6	0.7	
20	8	Single acting	Push side	314.0	-	12.6	44.0	75.4	106.8	138.2	169.6
			Pull side	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	184.7
25	10	Single acting	Push side	490.6	-	29.2	78.3	127.4	176.4	225.5	274.5
			Pull side	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	196.2	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	-	76.6	157.0	237.3	317.7	398.1	478.5
			Pull side	691.2	-	54.0	123.0	192.1	261.2	330.3	399.4
		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	37.5	163.1	288.7	414.3	539.9	665.5	791.1
			Pull side	1055.6	17.4	122.9	228.4	333.9	439.4	544.9	650.4
		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



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Specification

Bore size(mm)		20	25	32	40
Acting type	MSAL, MTAL	Single acting			
	Others	Double acting			
Fluid		Air(to be filtered by 40 μ m filter element)			
Operating pressure	Double acting	0.1~1.0MPa(15~145psi)(1.0~10.0bar)			
	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 ^{+1.4} ₀	
Cushion type		Bumper			
Port size ①		1/8"			1/4"

① PT thread, NPT thread and G thread are available. Add) Refer to P397~420 for detail of sensor switch.

Stroke

Bore size (mm)			Standard stroke (mm)																Max. std stroke	Max. stroke
MAL	20	25 50 75 80 100 125 150 160 175 200 250 300 350 400 450 500	500	1000																
	25	25 50 75 80 100 125 150 160 175 200 250 300 350 400 450 500	500	1000																
	32	25 50 75 80 100 125 150 160 175 200 250 300 350 400 450 500	500	1500																
	40	25 50 75 80 100 125 150 160 175 200 250 300 350 400 450 500	500	1500																
MALD MALJ	20	25 50 75 80 100 125 150 160 175 200 250 300	300	-																
	25	25 50 75 80 100 125 150 160 175 200 250 300	300	-																
	32	25 50 75 80 100 125 150 160 175 200 250 300 350 400 450 500	500	-																
	40	25 50 75 80 100 125 150 160 175 200 250 300 350 400 450 500	500	-																
MSAL	20	25 50 75 100 125 150	-	-																
	25	25 50 75 100 125 150	-	-																
	32	25 50 75 100 125 150	-	-																
	40	25 50 75 100 125 150	-	-																
MTAL	20	25 50 75 100	-	-																
	25	25 50 75 100	-	-																
	32	25 50 75 100	-	-																
	40	25 50 75 100	-	-																

Note) Consult us for non-standard stroke.

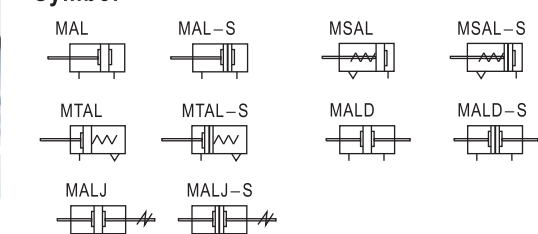
Ordering code

MAL	20 × 50	S	CM	☐	☐
MALD	20 × 50	S		☐	☐
MALJ	20 × 50-20	S		☐	☐

Model	MAL: Mini cylinder(Double acting) MSAL: Mini cylinder(Single acting_push) MTAL: Mini cylinder(Single acting_pull) MALD: Mini cylinder(Double rod) MALJ: Mini cylinder(Adjustable stroke)	Thread type	Blank: PT T: NPT G: G
Bore size	20 25 32 40	Mounting type ①	Model Mounting type MAL Blank: No accessories MSAL FA: FA type MTAL SDB: SDB type LB: LB type MALD Blank: No accessories MALJ FA: FA type LB: LB type
Stroke	Refer to stroke table for details	Back cover	Model Back cover MAL CA: Pivot type MSAL U: Flat-end type MTAL CM: Round-end type Others No this code
Adjustable stroke	Model Adjustable stroke 10: 10mm 20: 20mm 30: 30mm 40: 40mm 50: 50mm 75: 75mm 100: 100mm Others No this code	Magnet	Blank: Without magnet S: With magnet

① Please refer to page 239 for accessory parts.

Symbol



Product feature

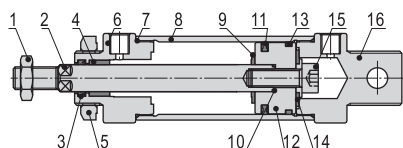
1. Manufactured by our enterprise.
2. Front and back cover and cylinder tube are connected by threads.
3. Piston adopts heterogeneous two-way seal structure. It has compact size and has the function of grease reservation.
4. Front cover adopts self-lubrication bearing guide that has good performance 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.

Mini cylinder(Aluminum barrel)

MAL Series

Inner structure and material of major parts

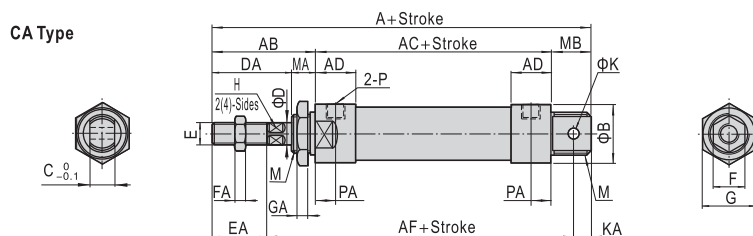
MAL-CA



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	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 seal	NBR
12	Piston	Aluminum alloy
13	Wear ring	Wear resistant material
14	Washer	Free cutting material
15	Bolt	Carbon steel
16	Back cover	Aluminum alloy

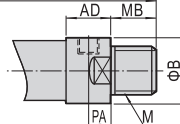
Dimensions

MAL



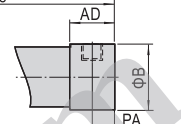
CM Type

Total length=A+Stroke



U Type

Total length=A+Stroke



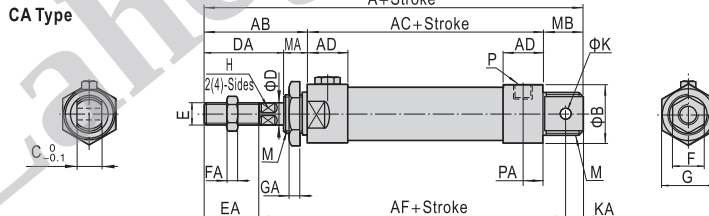
Bore size\Item Back cover	A			AB	AC	AD	AF	B	C	D	DA	M	MA	MB	
	CA	CM	U											CA	CM
20	131	122	110	40	70	16	102	29	16	8	28	M22×1.5	12	21	12
25	135	128	114	44	70	16	104	34	16	10	30	M22×1.5	14	21	14
32	141	128	114	44	70	16	107	39.5	16	12	30	M24×2.0	14	27	14
40	165	152	138	46	92	22	129	49.5	20	16	32	M30×2.0	14	27	14

Bore size\Item	E	EA	F	FA	G	GA	H	K	KA	P	PA
20	M8×1.25	20	12	6	29	7	6	8	9	1/8"	8
25	M10×1.25	22	17	6	29	7	8	8	9	1/8"	8
32	M10×1.25	22	17	6	32	8	10	10	12	1/8"	8
40	M12×1.25	24	17	7	41	9	14	12	12	1/4"	11

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

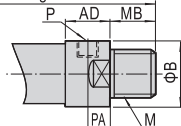
MSAL

CA Type



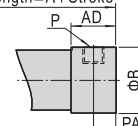
CM Type

Total length=A+Stroke



U Type

Total length=A+Stroke



Item	A									AC			AF		
Back cover	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
20	156	181	206	147	172	197	135	160	185	95	120	145	127	152	177
25	160	185	210	153	178	203	139	164	189	95	120	145	129	154	179
32	166	191	216	153	178	203	139	164	189	95	120	145	132	157	182
40	190	215	240	177	202	227	163	188	213	117	142	167	154	179	204

Bore size\Item	AB	AD	B	C	D	DA	E	EA	F	FA	G	GA	H	K	KA
20	40	16	29	16	8	28	M8×1.25	20	12	6	29	7	6	8	9
25	44	16	34	16	10	30	M10×1.25	22	17	6	29	7	8	8	9
32	44	16	39.5	16	12	30	M10×1.25	22	17	6	32	8	10	10	12
40	46	22	49.5	20	16	32	M12×1.25	24	17	7	41	9	14	12	12

Bore size\Item	M		MA		MB		P		PA	
Back cover										
20	M22×1.5		12		21		12		1/8"	
25	M22×1.5		14		21		14		1/8"	
32	M24×2.0		14		27		14		1/8"	
40	M30×2.0		14		27		14		1/4"	

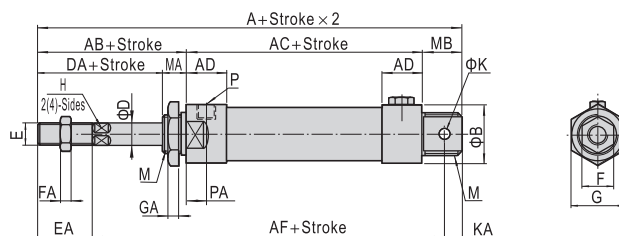
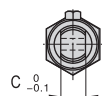
Remark: The dimensions of magnet type cylinder are the same as non-magnet type cylinder.

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MAL Series

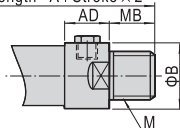
MTAL

CA Type



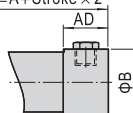
CM Type

Total length=A+Stroke × 2



U Type

Total length=A+Stroke × 2

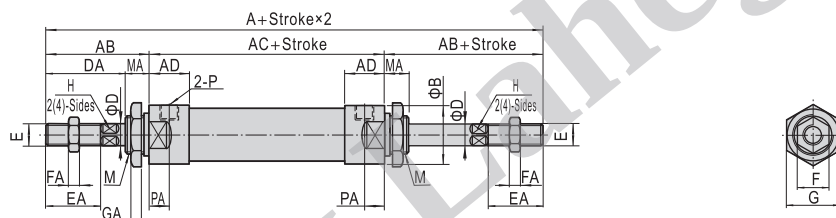


Item	CA				CM				U				AB	AC				AD
Back cover																		
Bore size\Stroke	0~25	26~50	51~75	76~100	0~25	26~50	51~75	76~100	0~25	26~50	51~75	76~100		0~25	26~50	51~75	76~100	
20	146	156	171	181	137	147	162	172	125	135	150	160	40	85	95	110	120	16
25	150	160	175	185	143	153	168	178	129	139	154	164	44	85	95	110	120	16
32	156	166	186	196	143	153	173	183	129	139	159	169	44	85	95	115	125	16
40	180	190	210	220	167	177	197	207	153	163	183	193	46	107	117	137	147	22

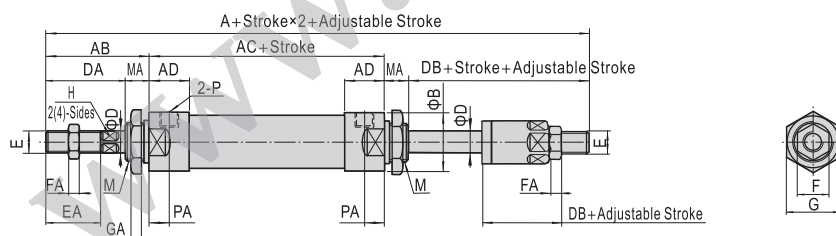
Item	AF																			MB				
Back cover																								
Bore size\Stroke	0~25	26~50	51~75	76~100	B	C	D	DA	E	EA	F	FA	G	GA	H	K	KA	M	MA	CA	CM	P	PA	
20	117	127	142	152	29	16	8	28	M8×1.25	20	12	6	29	7	6	8	9	M22×1.5	12	21	12	1/8"	8	
25	121	131	146	156	34	16	10	30	M10×1.25	22	17	6	29	7	8	8	9	M22×1.5	14	21	14	1/8"	8	
32	122	132	152	162	39.5	16	12	30	M10×1.25	22	17	6	32	8	10	10	12	M24×2.0	14	27	14	1/8"	8	
40	144	154	174	184	49.5	20	16	32	M12×1.25	24	17	7	41	9	14	12	12	M30×2.0	14	27	14	1/4"	11	

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

MALD



MALJ



Bore size\Item	A		AB	AC	AD	B	D	DA	DB	E	EA	F	FA	G	GA	H	M	MA	P	PA
Model	MALD	MALJ																		
20	150	147	40	70	16	29	8	28	25	M8 × 1.25	20	12	6	29	7	6	M22 × 1.5	12	1/8"	8
25	158	155	44	70	16	34	10	30	27	M10 × 1.25	22	17	6	29	7	8	M22 × 1.5	14	1/8"	8
32	158	155	44	70	16	39.5	12	30	27	M10 × 1.25	22	17	6	32	8	10	M24 × 2.0	14	1/8"	8
40	184	180	46	92	22	49.5	16	32	28	M12 × 1.25	24	17	7	41	9	14	M30 × 2.0	14	1/4"	11

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

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.

Accessory selection

Cylinder model		MAL		MSAL, MTAL		MALD, MALJ	
Accessories		Standard	With magnet	Standard	With magnet	Standard	With magnet
Mounting accessory	LB	●	●	●	●	●	●
	FA	●	●	●	●	●	●
	SDB	●	●	●	●	×	×
Knuckle ①	I	●	●	●	●	●	●
	Y	●	●	●	●	●	●
	U	●	●	●	●	●	●
	F	●	●	●	●	●	●
Sensor switch ②	CS1-M	×	●	×	●	×	●
	DS1-M	×	●	×	●	×	●

① Please refer to P393~396 for knuckle detail,

② Please refer to P397~420 for detail of sensor switch.

Material of accessories selection

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

○——Low carbon steel, □——Carbon steel.

List for ordering code of accessories

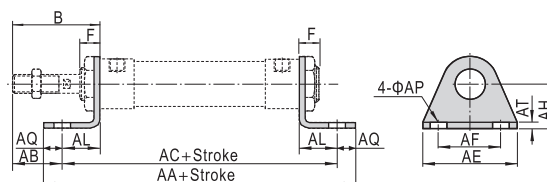
Accessories		Mounting accessory	
Bore size	LB	FA	SDB
20			
25	F-MA20LB	F-MA20FA	F-MA20SDB
32	F-MA32LB	F-MA32FA	F-MA32SDB
40	F-MA40LB	F-MA40FA	F-MA40SDB

Accessories		Knuckle			
Bore size	I: I Knuckle	Y: Y Knuckle	F: F Knuckle	U: U Knuckle	
20	F-MA20I	F-MA20Y	F-M8X125F	F-M8X125U	
25	F-MA25I	F-MA25Y	F-M10X125F	F-M10X125U	
32					
40	F-MA40I	F-MA40Y	F-M12X125F	F-M12X125U	

Accessories		Sensor switch	
Bore size	CS1-M	DS1-M	
20	CS1-M-A20	DS1-M-A20	
25	CS1-M-A25	DS1-M-A25	
32	CS1-M-A32	DS1-M-A32	
40	CS1-M-A40	DS1-M-A40	

Dimensions

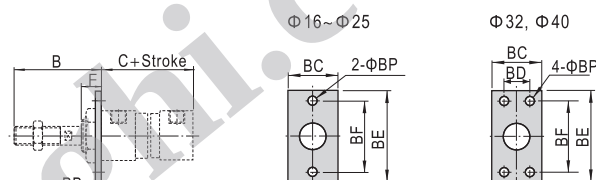
LB



Bore size\Item	AA		AA(MSAL)			AC		AC(MSAL)		
	(MAL)		0~50	51~100	101~150	(MAL)		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	

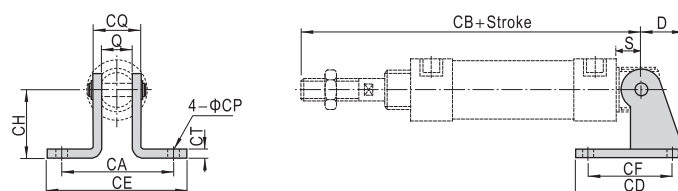
Bore size\Item	B	F	AB	AE	AF	AL	AQ	AP	AT	AH
20	40	12	25	54	40	15	8	6.5	3	25
25	44	14	29	54	40	15	8	6.5	3	25
32	44	14	19	59	45	25	8	6.5	4	32
40	46	14	21	64	50	25	8	6.5	4	36

FA



Bore size\Item	Stroke	B	C	C(MSAL)			BB	BC	BD	BE	BF	BP	F
			(MAL)	0~50	51~100	101~150							
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

SDB



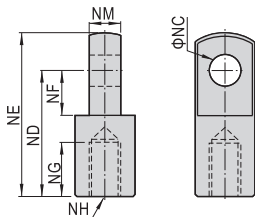
Bore size\Item	Stroke	D	S	Q	CA	CB	CB(MSAL)			CD	CE	CF	CH	CT	CP	CQ
						(MAL)	0~50	51~100	101~150							
20		21	12	16	51	122	147	172	197	48	67	32	32	3	6.5	22
25		21	12	16	51	126	151	176	201	48	67	32	32	3	6.5	22
32		27	15	16	51	129	154	179	204	52	67	36	36	4	6.5	24
40		27	15	20	55	153	178	203	228	56	71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



MAL

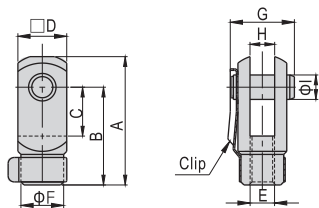
Accessories

I Knuckle

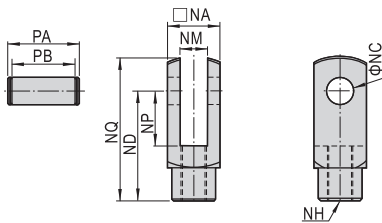


Type\Item	NC	ND	NE	NF	NG	NH	NM
F-MA20I	8	30	40	11	15	M8×1.25	8
F-MA25I	10	40	50	15	20	M10×1.25	10
F-MA40I	10	45	57	16	23	M12×1.25	14

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