





# 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	●	●	
Single acting type: MSAL, MTAL 	●	●	●	●	Single acting		25	●	●
Double rod type: MALD 	●	●	●	●	Double acting		32	●	●
Adjustable stroke type: MALJ 	●	●	●	●			40	●	●
Page	248				251	419			



MAL

## 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.
- 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 <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 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

# Mini cylinder(Aluminum barrel)

## MAL Series



### Specification

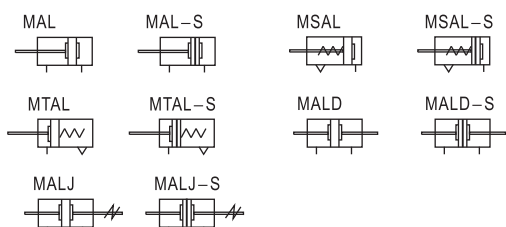
		20	25	32	40
Acting type	MSAL, MTAL	Single acting			
	Others	Double acting			
Fluid		Air(to be filtered by 40 μm filter element)			
Operating pressure	Double acting	0.1~1.0MPa(15~145psi)(1.0~10.0bar)			
	Single acting	0.2~1.0MPa(28~145psi)(2.0~10.0bar)			
Proof pressure		1.5MPa(215psi)(15bar)			
Temperature °C		-20~70			
Speed range mm/s		Double acting: 30~800 Single acting: 50~800			
Stroke tolerance		0~150 <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"

### Stroke

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

Note) Consult us for non-standard stroke.

### 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.

### Ordering code

<b>MAL 20 × 50 S CM</b>	<input type="checkbox"/>	<input type="checkbox"/>
<b>MALD20 × 50 S</b>	<input type="checkbox"/>	<input type="checkbox"/>
<b>MALJ 20 × 50-20 S</b>	<input type="checkbox"/>	<input type="checkbox"/>

<b>Model</b> 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)	<b>Thread type</b> Blank: PT T: NPT G: G												
<b>Bore size</b> 20 25 32 40	<b>Mounting type</b> ① <table border="1"> <thead> <tr> <th>Model</th> <th>Mounting type</th> </tr> </thead> <tbody> <tr> <td>MAL</td> <td>Blank: No accessories</td> </tr> <tr> <td>MSAL</td> <td>FA: FA type</td> </tr> <tr> <td>MTAL</td> <td>SDB: SDB type LB: LB type</td> </tr> <tr> <td>MALD</td> <td>Blank: No accessories</td> </tr> <tr> <td>MALJ</td> <td>FA: FA type LB: LB type</td> </tr> </tbody> </table>	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
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												
<b>Stroke</b> Refer to stroke table for details	<b>Back cover</b> <table border="1"> <thead> <tr> <th>Model</th> <th>Back cover</th> </tr> </thead> <tbody> <tr> <td>MAL</td> <td>CA: Pivot type</td> </tr> <tr> <td>MSAL</td> <td>U: Flat-end type</td> </tr> <tr> <td>MTAL</td> <td>CM: Round-end type</td> </tr> <tr> <td>Others</td> <td>No this code</td> </tr> </tbody> </table>	Model	Back cover	MAL	CA: Pivot type	MSAL	U: Flat-end type	MTAL	CM: Round-end type	Others	No this code		
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MTAL	CM: Round-end type												
Others	No this code												
<b>Adjustable stroke</b> <table border="1"> <thead> <tr> <th>Model</th> <th>Adjustable stroke</th> </tr> </thead> <tbody> <tr> <td rowspan="6">MALJ</td> <td>10: 10mm</td> </tr> <tr> <td>20: 20mm</td> </tr> <tr> <td>30: 30mm</td> </tr> <tr> <td>40: 40mm</td> </tr> <tr> <td>50: 50mm</td> </tr> <tr> <td>100: 100mm</td> </tr> <tr> <td>Others</td> <td>No this code</td> </tr> </tbody> </table>	Model	Adjustable stroke	MALJ	10: 10mm	20: 20mm	30: 30mm	40: 40mm	50: 50mm	100: 100mm	Others	No this code	<b>Magnet</b> Blank: Without magnet S: With magnet	
Model	Adjustable stroke												
MALJ	10: 10mm												
	20: 20mm												
	30: 30mm												
	40: 40mm												
	50: 50mm												
	100: 100mm												
Others	No this code												

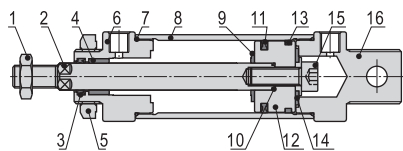
① Please refer to page 251 for accessory parts.

# Mini cylinder (Aluminum barrel)

## MAL Series

### Inner structure and material of major parts

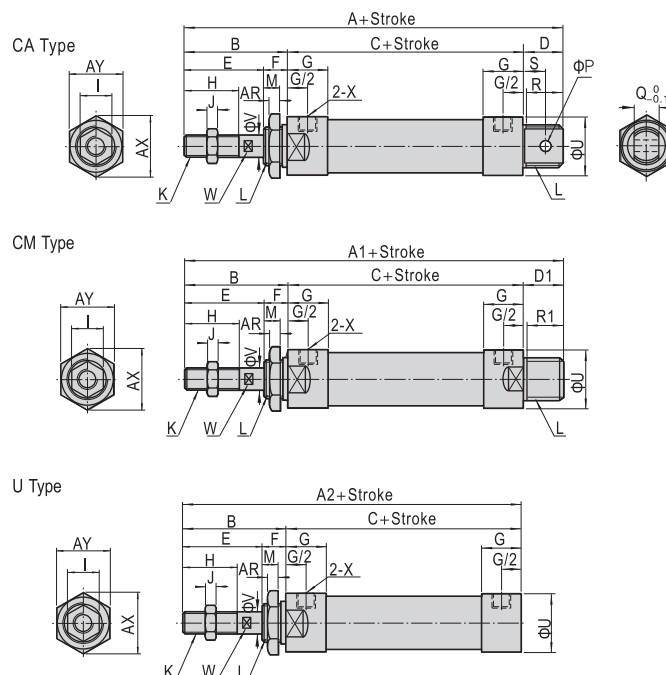
#### MAL-CA



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



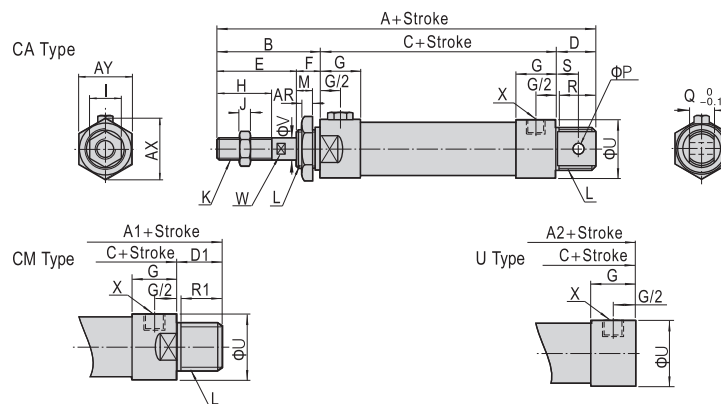
Bore size\Item	A	A1	A2	B	C	D	D1	E	F	G	H	I	J	K
20	131	122	110	40	70	21	12	28	12	16	20	12	6	M8 × 1.25
25	135	128	114	44	70	21	14	30	14	16	22	17	6	M10 × 1.25
32	141	128	114	44	70	27	14	30	14	16	22	17	6	M10 × 1.25
40	165	152	138	46	92	27	14	32	14	22	24	17	7	M12 × 1.25

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

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

#### MSAL



Item	A			A1			A2			B	C			D	D1	E	F
	≤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	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

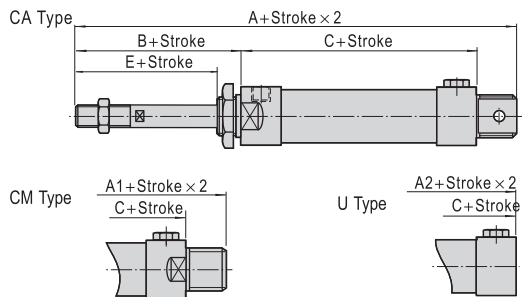
Bore size\Item	G	H	I	J	K	L	M	P	Q	R	R1	S	U	V	W	X	AR	AX	AY
20	16	20	12	6	M8 × 1.25	M22 × 1.5	10	8	16	19	10	12	29	8	6	1/8"	7	33	29
25	16	22	17	6	M10 × 1.25	M22 × 1.5	12	8	16	19	12	12	34	10	8	1/8"	7	33	29
32	16	22	17	6	M10 × 1.25	M24 × 2.0	12	10	16	25	12	15	39.5	12	10	1/8"	8	37	32
40	22	24	17	7	M12 × 1.25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

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

# Mini cylinder (Aluminum barrel)

## MAL Series

### MTAL



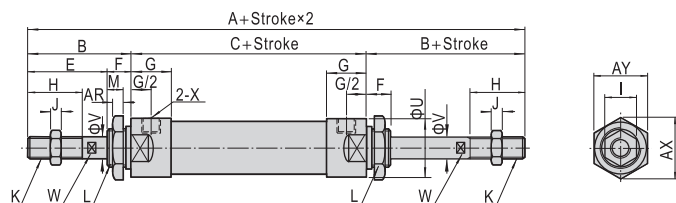
Item	A				A1				A2				C			
Bore size\Stroke	0~25	26~50	51~75	76~100	0~25	26~50	51~75	76~100	0~25	26~50	51~75	76~100	0~25	26~50	51~75	76~100
20	146	156	171	181	137	147	162	172	125	135	150	160	85	95	110	120
25	150	160	175	185	143	153	168	178	129	139	154	164	85	95	110	120
32	156	166	186	196	143	153	173	183	129	139	159	169	85	95	115	125
40	180	190	210	220	167	177	197	207	153	163	183	193	107	117	137	147

Remark:

1. The dimensions of magnet type cylinder are the same as non-magnet type cylinder.
2. The unmarked dimension is the same as MAL standard type.

### MAL

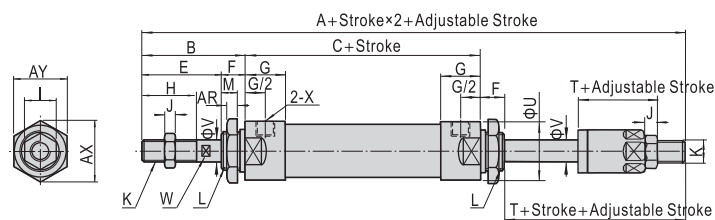
### MALD



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

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

### 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

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 Accessories	MAL		MSAL, MTAL		MALD, MALJ	
	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 P415~418 for knuckle detail,

② Please refer to P419~442 for detail of sensor switch.

### Material of accessories selection

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

○—Low carbon steel, □—Carbon steel.

### List for ordering code of accessories

Bore size	Accessories		Mounting accessory	
	LB	FA	SDB	
20	F-MA20LB	F-MA20FA	F-MA20SDB	
25	F-MA25LB	F-MA25FA	F-MA25SDB	
32	F-MA32LB	F-MA32FA	F-MA32SDB	
40	F-MA40LB	F-MA40FA	F-MA40SDB	

Bore size	Knuckle			
	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	F-MA32I	F-MA32Y	F-M12X125F	F-M12X125U
40	F-MA40I	F-MA40Y	F-M12X125F	F-M12X125U

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

### Dimensions

**LB**

Bore size\Item Stroke	AA (MAL)				AC (MAL)			
	0-50	51-100	101-150	151-200	0-50	51-100	101-150	151-200
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	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 (MAL)			BB	BC	BD	BE	BF	BP	F
		0-50	51-100	101-150							
20	40	70	95	120	145	4	38	-	64	50	6.5
25	44	70	95	120	145	4	38	-	64	50	6.5
32	44	70	95	120	145	4	47	33	72	58	6.5
40	46	92	117	142	167	4	50	36	84	70	6.5

**SDB**

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

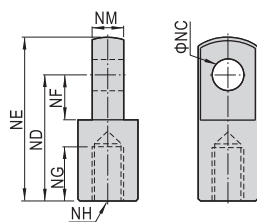


MAL

## Mini cylinder(Aluminum barrel)

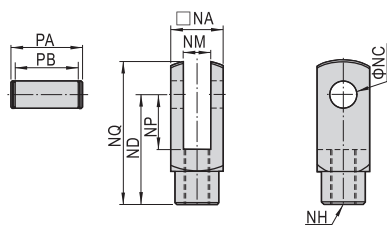
### Accessories

#### 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	NA	NC	ND	NP	NQ	NM	NH	PA	PB
F-MA20Y	16	8	30	15	40	8	M8×1.25	21.6	16.8
F-MA25Y	19	10	40	20	52	10	M10×1.25	25.6	19.8
F-MA40Y	25.4	10	45	20	57	14	M12×1.25	32	26.2



MAL

# Mini cylinder(Stainless steel)——MA Series

## Product series

Series name	Mounting type				Acting type	Bore size	Collocation of sensor switch					
	Basic	LB	FA	SDB			CS1-M	DS1-M	CS1-F	DS1-F	CS1-U	DS1-U
Double acting type: MA Double acting with adj. cushion:MAC	●	●	●	●	Double acting Double acting (with adj. cushion)	16	●	●				
Single acting type: MSA, MTA	●	●	●	●	Single acting	20	●	●				
Double rod type: MAD, MACD	●	●	●	●	Double acting Double acting (with adj. cushion)	25	●	●				
Adjustable stroke type: MAJ, MACJ	●	●	●	●		32	●	●				
Other series: MAR	●	●	●	●	Double acting Double acting (with adj. cushion)	40	●	●				
						50	●	●	●	●	●	●
						63	●	●	●	●	●	●
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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 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 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 <sup>2</sup> )	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	

# Mini cylinder(Stainless steel)

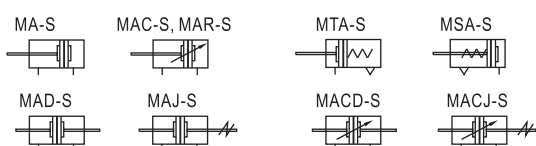
## MA Series



### Specification

		16	20	25	32	40	50	63		
Acting type	MSA, MTA	Single acting						-		
	MA, MAD, MAJ	Double acting						-		
	MAR	-	Double acting						-	
	MAC, MACD, MACJ	-	Double acting with cushion						-	
Fluid	Air(to be filtered by 40 μm 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 <sup>+1.0</sup> <sub>0</sub> >150 <sup>+1.4</sup> <sub>0</sub>									
Cushion type	MAC, MACD, MACJ Series: Adjustable cushion						Other series: Bumper			
Port size (1)	M5 × 0.8		1/8"			1/4"				

### Symbol



MA

### 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.

### Stroke

Bore size (mm)	Standard stroke (mm)															Max. std stroke	Max. stroke				
	16	20	25	32	40	50	63	80	100	125	150	160	175	200	250			300			
MA	16	20	25	32	40	50	63	-	-	-	-	-	-	-	-	-	200	500			
MAC	16	20	25	32	40	50	63	80	100	125	150	160	175	200	250	300	300	600			
MAR	20	25	32	40	50	63	80	100	125	150	160	175	200	250	300	350	400	450	500	500	700
MSA	16	20	25	32	40	50	63	80	100	125	150	160	175	200	250	300	-	-	-	-	-
MTA	16	20	25	32	40	50	63	80	100	125	150	160	175	200	250	300	-	-	-	-	-
MAD	16	20	25	32	40	50	63	80	100	125	150	160	175	200	250	300	-	-	-	-	-
MACD	20	25	32	40	50	63	80	100	125	150	160	175	200	250	300	350	400	450	500	-	-
MAJ	20	25	32	40	50	63	80	100	125	150	160	175	200	250	300	350	400	450	500	-	-
MACJ	25	32	40	50	63	80	100	125	150	160	175	200	250	300	350	400	450	500	-	-	-

Note) Consult us for non-standard stroke.

### Ordering code

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

<b>Model</b>	<ul style="list-style-type: none"> <li>MA: Mini cylinder(Double acting)</li> <li>MSA: Mini cylinder(Single acting_push)</li> <li>MTA: Mini cylinder(Single acting_pull)</li> <li>MAD: Mini cylinder(Double rod)</li> <li>MAJ: Mini cylinder(Adjustable stroke)</li> <li>MAR: Mini cylinder(Double acting with cushion)</li> <li>MAC: Mini cylinder(Double acting with cushion)</li> <li>MACD: Mini cylinder(Double rod with cushion)</li> <li>MACJ: Mini cylinder(Adjustable stroke with cushion)</li> </ul>	<b>Thread type</b> (2)	<ul style="list-style-type: none"> <li>Blank: PT</li> <li>T: NPT</li> <li>G: G</li> </ul>																										
<b>Front cover</b>	<table border="1"> <thead> <tr> <th>Model</th> <th>Front cover</th> </tr> </thead> <tbody> <tr> <td>MAR</td> <td>F: Front mounting type U: Up mounting type</td> </tr> <tr> <td>Others</td> <td>No this code</td> </tr> </tbody> </table>	Model	Front cover	MAR	F: Front mounting type U: Up mounting type	Others	No this code	<b>Mounting type</b> (1)	<table border="1"> <thead> <tr> <th>Model</th> <th>Mounting type</th> </tr> </thead> <tbody> <tr> <td>MA</td> <td>Blank: No accessories</td> </tr> <tr> <td>MAC</td> <td>FA: FA type</td> </tr> <tr> <td>MSA</td> <td>SDB: SDB type</td> </tr> <tr> <td>MTA</td> <td>LB: LB type</td> </tr> <tr> <td>MAD</td> <td>Blank: No accessories</td> </tr> <tr> <td>MACD</td> <td>FA: FA type</td> </tr> <tr> <td>MAJ</td> <td>LB: LB type</td> </tr> <tr> <td>MACJ</td> <td>LB: LB type</td> </tr> <tr> <td>MAR</td> <td>No this code</td> </tr> </tbody> </table>	Model	Mounting type	MA	Blank: No accessories	MAC	FA: FA type	MSA	SDB: SDB type	MTA	LB: LB type	MAD	Blank: No accessories	MACD	FA: FA type	MAJ	LB: LB type	MACJ	LB: LB type	MAR	No this code
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MACD	FA: FA type																												
MAJ	LB: LB type																												
MACJ	LB: LB type																												
MAR	No this code																												
<b>Bore size</b>	<table border="1"> <thead> <tr> <th>Model</th> <th>Bore size</th> </tr> </thead> <tbody> <tr> <td>MA, MSA, MTA, MAD, MAJ</td> <td>16 20 25 32 40</td> </tr> <tr> <td>MAC, MAR, MACD, MACJ</td> <td>20 25 32 40 50 63</td> </tr> </tbody> </table>	Model	Bore size	MA, MSA, MTA, MAD, MAJ	16 20 25 32 40	MAC, MAR, MACD, MACJ	20 25 32 40 50 63	<b>Back cover</b>	<table border="1"> <thead> <tr> <th>Model</th> <th>Back cover</th> </tr> </thead> <tbody> <tr> <td>MA, MAC</td> <td>CA: Pivot type</td> </tr> <tr> <td>MSA</td> <td>U: Flat-end type</td> </tr> <tr> <td>MTA</td> <td>CM: Round-end type</td> </tr> <tr> <td>Others</td> <td>No this code</td> </tr> </tbody> </table>	Model	Back cover	MA, MAC	CA: Pivot type	MSA	U: Flat-end type	MTA	CM: Round-end type	Others	No this code										
Model	Bore size																												
MA, MSA, MTA, MAD, MAJ	16 20 25 32 40																												
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MTA	CM: Round-end type																												
Others	No this code																												
<b>Stroke</b>	Refer to stroke table for details	<b>Magnet</b>	S: With magnet																										
<b>Adjustable stroke</b>	<table border="1"> <thead> <tr> <th>Model</th> <th>Adjustable stroke</th> </tr> </thead> <tbody> <tr> <td>MAJ</td> <td>10: 10mm</td> </tr> <tr> <td>MACJ</td> <td>20: 20mm</td> </tr> <tr> <td></td> <td>30: 30mm</td> </tr> <tr> <td></td> <td>40: 40mm</td> </tr> <tr> <td></td> <td>50: 50mm</td> </tr> <tr> <td></td> <td>75: 75mm</td> </tr> <tr> <td></td> <td>100: 100mm</td> </tr> <tr> <td>Others</td> <td>No this code</td> </tr> </tbody> </table>	Model	Adjustable stroke	MAJ	10: 10mm	MACJ	20: 20mm		30: 30mm		40: 40mm		50: 50mm		75: 75mm		100: 100mm	Others	No this code										
Model	Adjustable stroke																												
MAJ	10: 10mm																												
MACJ	20: 20mm																												
	30: 30mm																												
	40: 40mm																												
	50: 50mm																												
	75: 75mm																												
	100: 100mm																												
Others	No this code																												

(1) Please refer to page 245 for accessory parts.

(2) Standard thread is blank here.

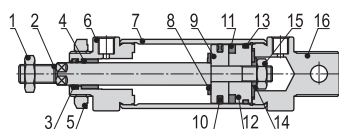


# Mini cylinder (Stainless steel)

## MA Series

### Inner structure and material of major parts

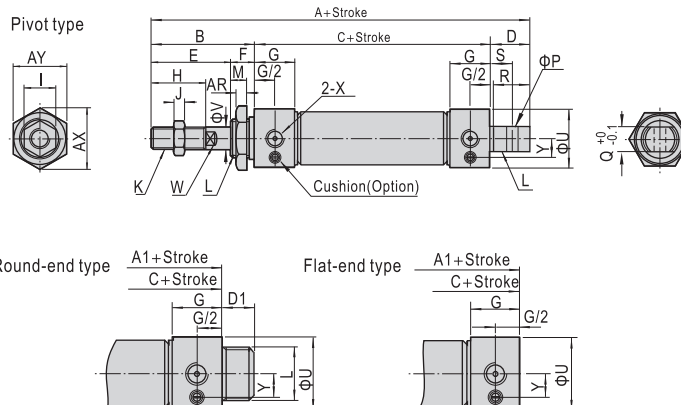
MA-CA



NO.	Item	Material
1	Rod nut	Carbon steel
2	Piston rod	Carbon steel with 20 μm chrome plated
3	Front cover packing	NBR
4	Bushing	Wear resistant material
5	Front cover nut	Carbon steel
6	Front cover	Aluminum alloy
7	Barrel	Stainless steel
8	Bumper	NBR
9	Piston	Aluminum alloy
10	Piston seal	NBR
11	Magnet	Plastic
12	Magnet holder	Aluminum alloy
13	Wear ring	Wear resistant material
14	Washer	Free cutting material
15	Nut	Carbon steel
16	Back cover	Aluminum alloy

### Dimensions

MA Φ16~Φ40  
MAC Φ20~Φ40

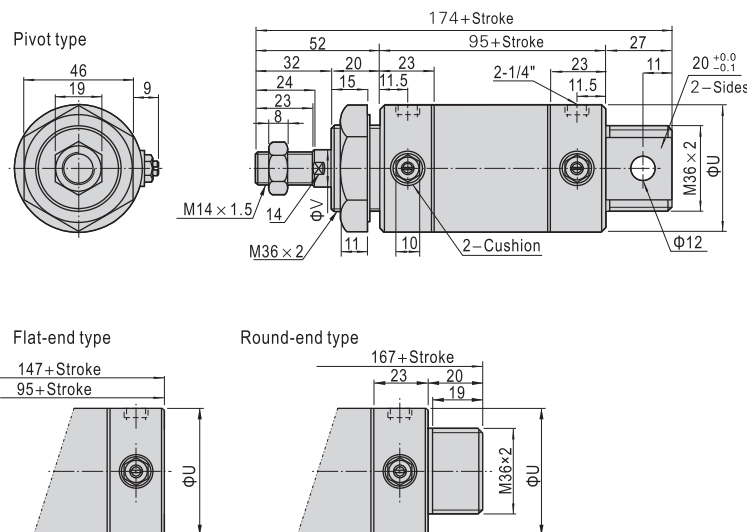


Bore size\Item	A	A1	B	C	D	D1	E	F	G	H	I	J	K
16	114	98	38	60	16	16	22	16	10	16	10	5	M6 × 1.0
20	137	116	40	76	21	12	28	12	16	20	12	6	M8 × 1.25
25	141	120	44	76	21	14	30	14	16	22	17	6	M10 × 1.25
32	147	120	44	76	27	14	30	14	16	22	17	6	M10 × 1.25
40	149	122	46	76	27	14	32	14	16.7	24	17	7	M12 × 1.25

Bore size\Item	L	M	P	Q	R	S	U	V	W	X	AR	AX	AY	Y
16	M16 × 1.5	14	6	12	14	9	21	6	5	M5 × 0.8	6	25	22	-
20	M22 × 1.5	10	8	16	19	12	27	8	6	1/8"	7	33	29	8.7
25	M22 × 1.5	12	8	16	19	12	30	10	8	1/8"	7	33	29	10.2
32	M24 × 2.0	12	10	16	25	15	35	12	10	1/8"	8	37	32	12
40	M30 × 2.0	12	12	20	25	15	41.6	16	14	1/8"	9	47	41	15

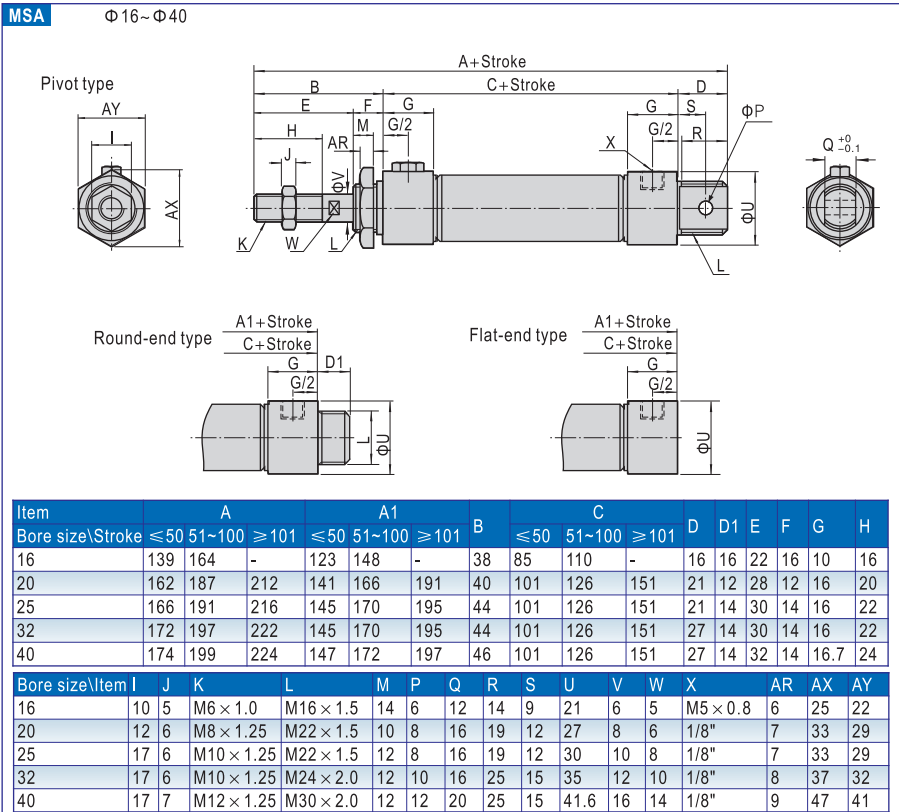
MAC Φ50, Φ63



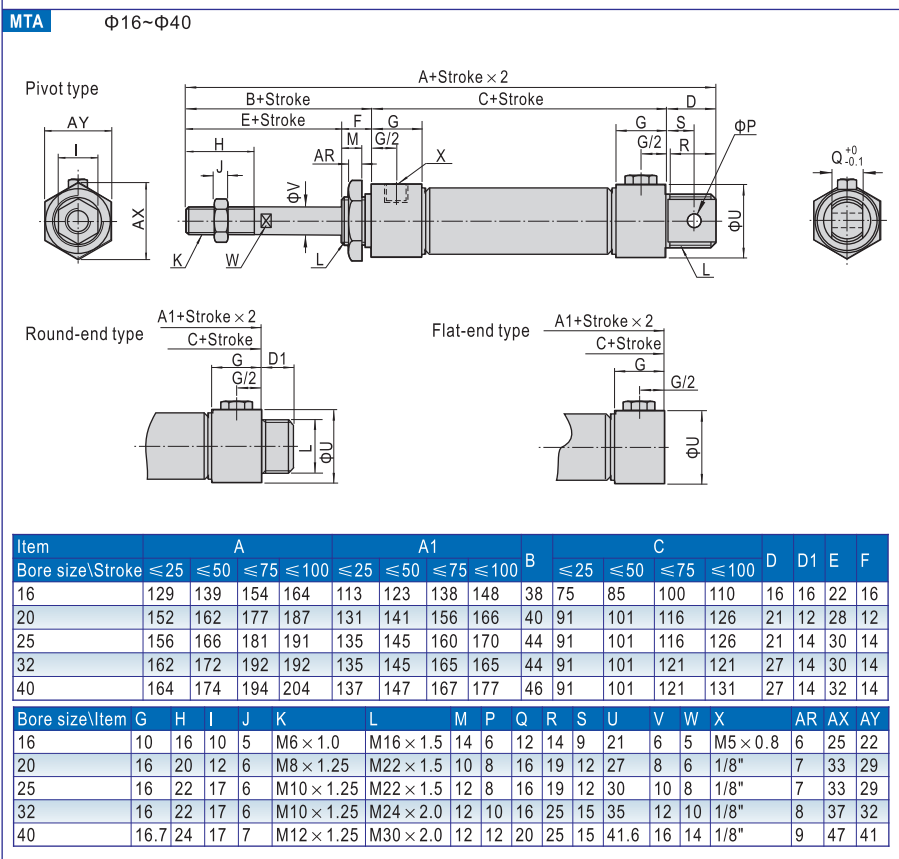
Bore size\Item	U	V
50	53	16
63	67	16

# Mini cylinder (Stainless steel)

## MA Series



MA

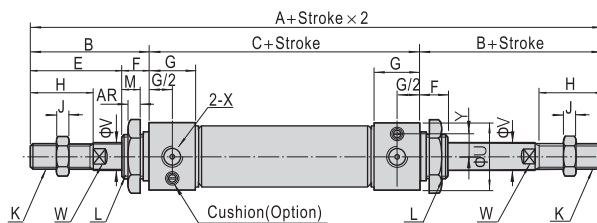
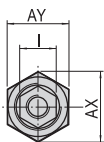


# Mini cylinder (Stainless steel)

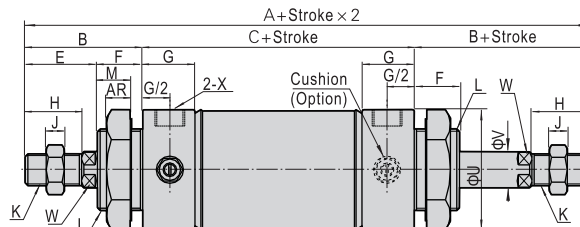
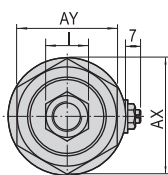
MA Series

## MAD, MACD

Φ 16~Φ 40



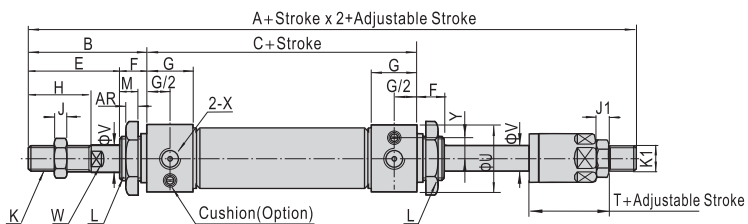
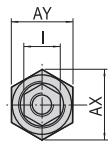
Φ 50, Φ 63



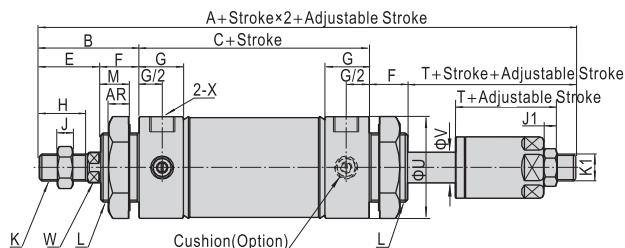
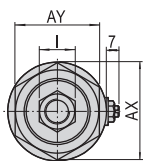
Bore size\Item	A	B	C	E	F	G	H	I	J	K	L	M	U	V	W	X	AR	AX	AY	Y
16	136	38	60	22	16	10	16	10	5	M6 × 1.0	M16 × 1.5	14	21	6	5	M5 × 0.8	6	25	22	-
20	156	40	76	28	12	16	20	12	6	M8 × 1.25	M22 × 1.5	10	27	8	6	1/8"	7	33	29	8.7
25	164	44	76	30	14	16	22	17	6	M10 × 1.25	M22 × 1.5	12	30	10	8	1/8"	7	33	29	10.2
32	164	44	76	30	14	16	22	17	6	M10 × 1.25	M24 × 2.0	12	35	12	10	1/8"	8	37	32	12
40	168	46	76	32	14	16.7	24	17	7	M12 × 1.25	M30 × 2.0	12	41.6	16	14	1/8"	9	47	41	15
50	199	52	95	32	20	23	24	19	8	M14 × 1.5	M36 × 2.0	15	53	16	14	1/4"	11	53	46	-
63	199	52	95	32	20	23	24	19	8	M14 × 1.5	M36 × 2.0	15	67	16	14	1/4"	11	53	46	-

## MAJ, MACJ

Φ 16~Φ 40



Φ 50, Φ 63



Bore size\Item	A	B	C	E	F	G	H	I	J	J1	K	K1
16	135	38	60	22	16	10	16	10	5	5	M6 × 1.0	M6 × 1.0
20	153	40	76	28	12	16	20	12	6	6	M8 × 1.25	M8 × 1.25
25	161	44	76	30	14	16	22	17	6	6	M10 × 1.25	M10 × 1.25
32	161	44	76	30	14	16	22	17	6	6	M10 × 1.25	M10 × 1.25
40	164	46	76	32	14	16.7	24	17	7	7	M12 × 1.25	M12 × 1.25
50	195	52	95	32	20	23	24	19	8	7	M14 × 1.5	M12 × 1.25
63	195	52	95	32	20	23	24	19	8	7	M14 × 1.5	M12 × 1.25

Bore size\Item	L	M	U	V	W	X	AR	AX	AY	Y	T
16	M16 × 1.5	14	21	6	5	M5 × 0.8	6	25	22	-	21
20	M22 × 1.5	10	27	8	6	1/8"	7	33	29	8.7	25
25	M22 × 1.5	12	30	10	8	1/8"	7	33	29	10.2	27
32	M24 × 2.0	12	35	12	10	1/8"	8	37	32	12	27
40	M30 × 2.0	12	41.6	16	14	1/8"	9	47	41	15	28
50	M36 × 2.0	15	53	16	14	1/4"	11	53	46	-	28
63	M36 × 2.0	15	67	16	14	1/4"	11	53	46	-	28



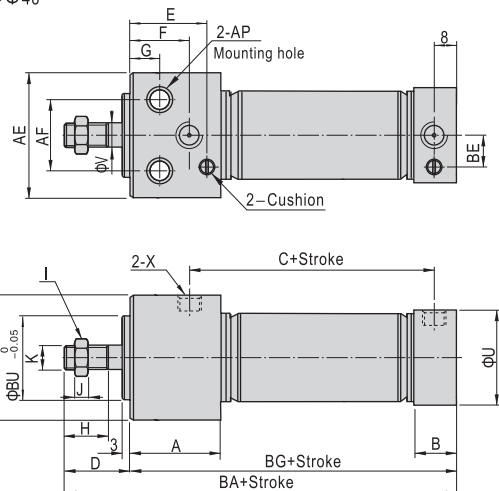
MA

# Mini cylinder (Stainless steel)

## MA Series

### MARU (Up mounting type)

Φ20~Φ40



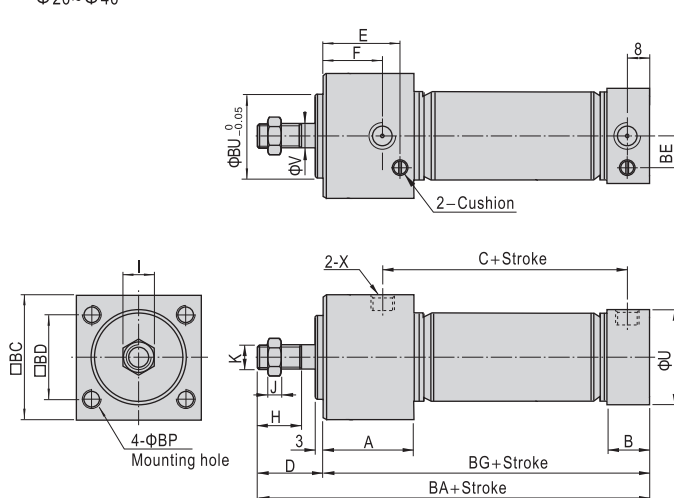
Bore size\Item	A	B	C	D	E	F	G	H	I	J	K	U	V
20	29	16	59	31	24	22	12	20	13	5	M8 × 1.25	27	8
25	29	16	59	33	24	22	12	22	17	6	M10 × 1.25	30	10
32	29	16	59	33	25	22	12	22	17	6	M10 × 1.25	35	12
40	37.5	16.6	62	35	31	27	15	24	19	8	M14 × 1.5	41.6	16

Bore size\Item	X	AE	AF	AP	AH	BA	BE	BG	BU
20	1/8"	33.5	21	Φ9.5 Dp:6.5 Thru.hole: Φ5.5	30.3	120	8.7	89	20
25	1/8"	39	25	Φ11.0 Dp:7.5 Thru.hole: Φ6.6	36.3	122	10.2	89	26
32	1/8"	47	30	Φ14.0 Dp:10 Thru.hole: Φ9.0	42.3	122	12	89	26
40	1/8"	58.5	38	Φ17.5 Dp:12.5 Thru.hole: Φ11	52.3	132.6	15	97.6	32

### MARF (Front mounting type)

Φ20~Φ40

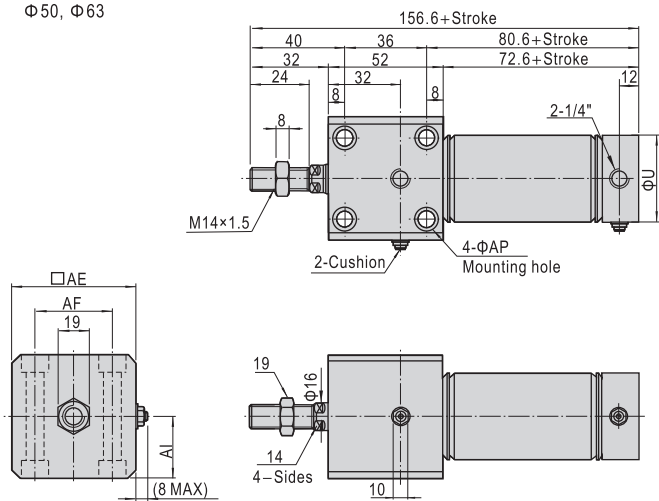


Bore size\Item	A	B	C	D	E	F	H	I	J	K	U
20	29	16	59	31	24	22	20	13	5	M8 × 1.25	27
25	29	16	59	33	24	22	22	17	6	M10 × 1.25	30
32	29	16	59	33	25	22	22	17	6	M10 × 1.25	35
40	37.5	16.6	62	35	31	27	24	19	8	M14 × 1.5	41.6

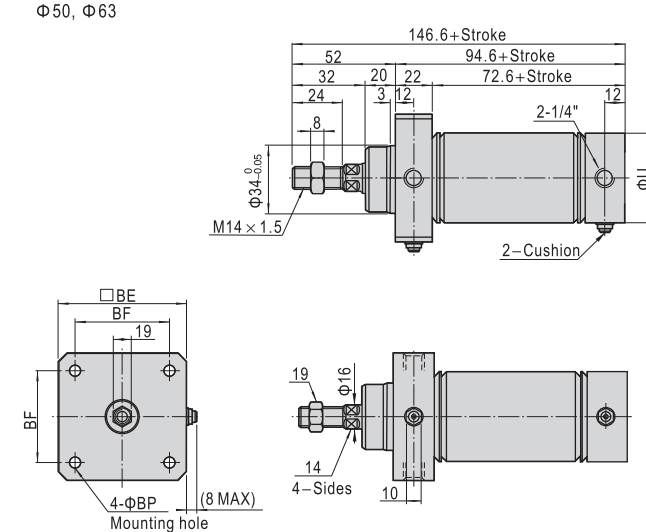
Bore size\Item	V	X	BA	BC	BD	BE	BG	BP	BU
20	8	1/8"	120	30.5	22	8.7	89	M5 × 0.8 Dp:9	20
25	10	1/8"	122	36.5	26	10.2	89	M6 × 1.0 Dp:11	26
32	12	1/8"	122	42.5	30	12	89	M6 × 1.0 Dp:11	26
40	16	1/8"	132.6	52.5	36	15	97.6	M8 × 1.25 Dp:14	32

Φ50, Φ63



Bore size\Item	U	AE	AF	AI	AP
50	53	62	44	31	Both sides: Φ11.0 Dp:6.5 Thru.hole: Φ6.6
63	67	74	48	37	Both sides: Φ14.0 Dp:8.5 Thru.hole: Φ9.0

Φ50, Φ63

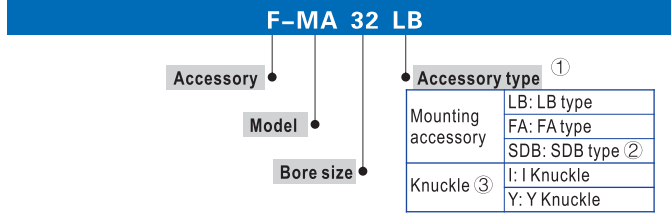


Bore size\Item	U	BE	BF	BP
50	53	62	48	6.6
63	67	74	58	9.0

# Mini cylinder(Stainless steel)

## Accessories

### Ordering code



- ① Please refer to accessory list for selection and ordering information.
- ② SDB is attached with relevant PIN.
- ③ Please refer to page 417, 418 for others knuckle.

### Accessory selection

Accessories\Cylinder model	MA, MAC	MSA, MTA	MAD, MACD	MAJ, MACJ	MAR
Mounting accessory	LB ●	●	●	●	×
	FA ●	●	●	●	×
	SDB ●	●	×	×	×
Knuckle ①	I ●	●	●	●	●
	Y ●	●	●	●	●
	U ●	●	●	●	●
	F ●	●	●	●	●
Sensor switch ②	CS1-M ●	●	●	●	●
	DS1-M ●	●	●	●	●
	CS1-F ●	●	●	●	●
	DS1-F ●	●	●	●	●
	CS1-U ●	●	●	●	●
	DS1-U ●	●	●	●	●

- ① Please refer to P415-418 for knuckle detail,
- ② Please refer to P419-442 for detail of sensor switch.

### Material of accessories

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

○—Low carbon steel, □—Carbon steel.

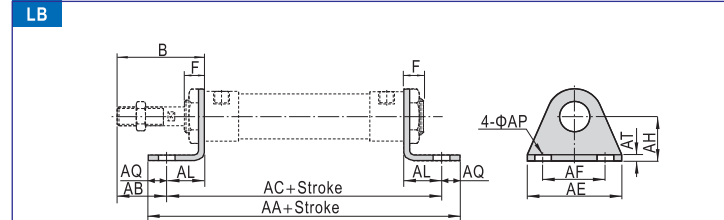
### List for ordering code of accessories

Accessories	Mounting accessory		
	LB	FA	SDB
Bore size	LB	FA	SDB
16	F-MA16LB	F-MA16FA	F-MA16SDB
20	F-MA20LB	F-MA20FA	F-MA20SDB
25	F-MA20LB	F-MA20FA	F-MA20SDB
32	F-MA32LB	F-MA32FA	F-MA32SDB
40	F-MA40LB	F-MA40FA	F-MA40SDB
50	-	-	F-MA40SDB
63	-	-	F-MA40SDB

Accessories	Knuckle			
	I: I Knuckle	Y: Y Knuckle	F: F Knuckle	U: U Knuckle
Bore size	I: I Knuckle <td>Y: Y Knuckle <td>F: F Knuckle <td>U: U Knuckle</td> </td></td>	Y: Y Knuckle <td>F: F Knuckle <td>U: U Knuckle</td> </td>	F: F Knuckle <td>U: U Knuckle</td>	U: U Knuckle
16	F-MA16I	F-MA16Y	F-M6X100F	F-M6X100U
20	F-MA20I	F-MA20Y	F-M8X125F	F-M8X125U
25	F-MA25I	F-MA25Y	F-M10X125F	F-M10X125U
32	F-MA25I	F-MA25Y	F-M10X125F	F-M10X125U
40	F-MA40I	F-MA40Y	F-M12X125F	F-M12X125U
50	F-MA40I	F-MA40Y	F-M12X125F	F-M12X125U
63	F-MAC50I	F-MAC50Y	F-M14X150F	F-M14X150U

Accessories	Sensor switch					
	CS1-M □	DS1-M □	CS1-F	DS1-F	CS1-U	DS1-U
Bore size	CS1-M □	DS1-M □	CS1-F	DS1-F	CS1-U	DS1-U
16	CS1-M-S16	DS1-M-S16	-	-	-	-
20	CS1-M-S20	DS1-M-S20	-	-	-	-
25	CS1-M-S25	DS1-M-S25	-	-	-	-
32	CS1-M-S32	DS1-M-S32	-	-	-	-
40	CS1-M-S40	DS1-M-S40	-	-	-	-
50	CS1-M-S50	DS1-M-S50	-	-	-	-
63	CS1-M-S63	DS1-M-S63	CS1-F	DS1-F	CS1-U	DS1-U

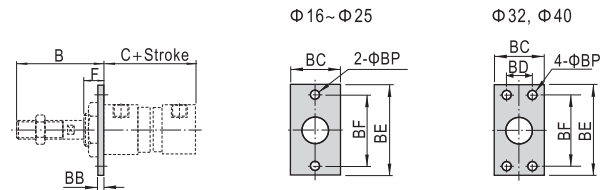
### Dimensions



Bore size\Item	AA	AA(MSA)			AC	AC(MSA)		
		0-50	51-100	101-150		0-50	51-100	101-150
Stroke	(MA)	0-50	51-100	101-150	(MA)	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

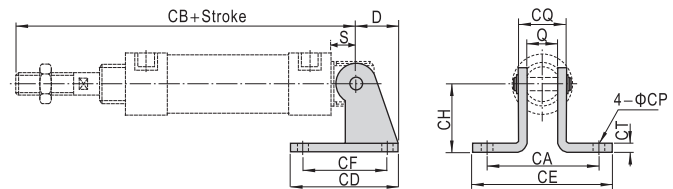
Bore size\Item	B	F	AB	AE	AF	AL	AQ	AP	AT	AH
16	38	16	25	44	32	13	6	5.5	3	20
20	40	12	25	54	40	15	8	6.5	3	25
25	44	14	29	54	40	15	8	6.5	3	25
32	44	14	19	59	45	25	8	6.5	4	32
40	46	14	21	64	50	25	8	6.5	4	36

### FA



Bore size\Item	Stroke	B	C	C(MSA)			BB	BC	BD	BE	BF	BP	F
				(MA)	0-50	51-100							
16	38	60	85	110	-	3	26	-	52	40	5.5	16	
20	40	76	101	126	151	4	38	-	64	50	6.5	12	
25	44	76	101	126	151	4	38	-	64	50	6.5	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	

### SDB

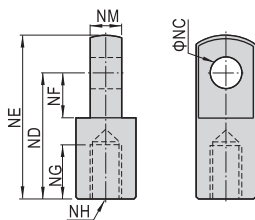


Bore size\Item	Stroke	D	S	Q	CA	CB	CB(MSA)			CD	CE	CF	CH	CT	CP	CQ
							(MA)	0-50	51-100							
16	16	9	12	-	107	132	157	-	23	-	12	20	2	5.5	16	
20	21	12	16	51	128	153	178	203	48	67	32	32	3	6.5	22	
25	21	12	16	51	132	157	182	207	48	67	32	32	3	6.5	22	
32	27	15	16	51	135	160	185	210	52	67	36	36	4	6.5	24	
40	27	15	20	55	137	162	187	212	56	71	40	40	4	6.5	28	

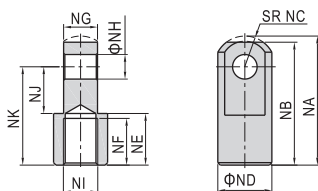
## Mini cylinder (Stainless steel)

### Accessories

#### I Knuckle

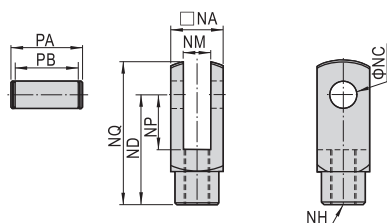


Type\Item	NC	ND	NE	NF	NG	NH	NM
F-MA16I	5	21	28	8.5	8	M6×1.0	6
F-MA20I	8	30	40	11	15	M8×1.25	8
F-MA25I	10	40	50	15	20	M10×1.25	10
F-MA40I	10	45	57	16	23	M12×1.25	14

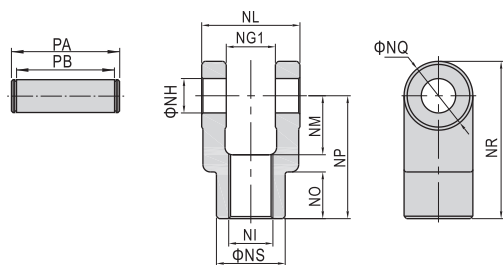


Type\Item	NA	NB	NC	ND	NE	NF	NG	NH	NJ	NK	NI
F-MAC50I	52.5	50	12.5	22	21	19	13.8	10	19	40	M14×1.5

#### 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-MA20Y	16	8	30	15	40	8	M8×1.25	21.6	16.8
F-MA25Y	19	10	40	20	52	10	M10×1.25	25.6	19.8
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



MA