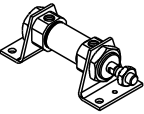




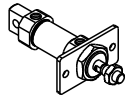
# Mini cylinder—MF Series

## Compendium of MF Series

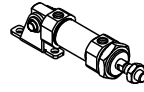
**Multi-mounting accessories**



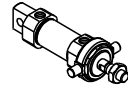
LB Type



FA Type



SDB Type



TC Type

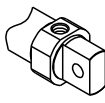
**Rolling packed structure**

Front and back cover and stainless steel block adopt riveted rolling packed structure to form a reliable connection.


**Four bore size are available**

Bore size: 20, 25, 32, 40

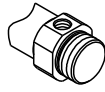
**Three kinds of back cover type**



CA: Pivot type



U: Flat-end type



CM: Round-end type

**Multi-type cylinder**

MF: Mini cylinder(Double acting)

MSF: Mini cylinder (Single acting\_push)      MTF: Mini cylinder (Single acting\_pull)

MFD: Mini cylinder(Double rod)

MFJ: Mini cylinder(Adjustable stroke)


MFC: Mini cylinder(Double acting with cushion)

MFCD: Mini cylinder(Double rod with cushion)

MFCJ: Mini cylinder(Adjustable stroke with cushion)

**Two kinds of cushion type**

Variable cushion or Bumper



MODEL: MF-C3X50-CA  
AITAR CYLINDER  
AIR PREPARED EQUIPMENT

### Criteria for selection: Cylinder thrust

Unit : Newton(N)

| Bore size | Rod size | 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                           | -                       | 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 40μm 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.

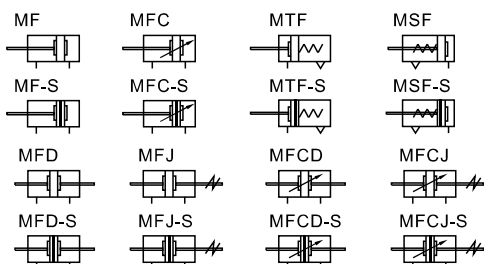


# Mini cylinder

## MF Series



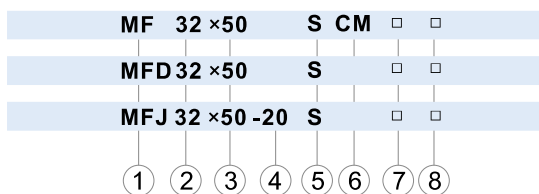
### Symbol



### 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



| ① Model  | ② Bore size          | ③ Stroke                                   | ④ Adjustable stroke      | ⑤ Magnet                                   | ⑥ Back cover   | ⑦ Mounting type[Note 1]   | ⑧ Thread type               |
|--|----------------------|--|--------------------------|--|--|---|-----------------------------|
| MF: Mini cylinder(Double acting)<br>MFC: Mini cylinder<br>(Double acting with cushion)<br>MSF: Mini cylinder<br>(Single acting_push)<br>MTF: Mini cylinder<br>(Single acting_pull) | 20<br>25<br>32<br>40 | Refer to<br>stroke<br>table for<br>details | No this code             | Blank: Without<br>magnet<br>S: With magnet | CA: Pivot type<br>U: Flat-end type<br>CM: Round-end type | Blank: No accessories<br>FA: FA type<br>SDB: SDB type<br>LB: LB type<br>TC: TC type | Blank: PT<br>G: G<br>T: NPT |
| MFD: Mini cylinder(Double rod)<br>MFCD: Mini cylinder<br>(Double rod with cushion)   |                      |  |                          |  |  |   |                             |
| MFJ: Mini cylinder<br>(Adjustable stroke)<br>MFCJ: Mini cylinder<br>(Adjustable stroke with cushion)   |                      |  | 10 20 30 40<br>50 75 100 |  | No this code   | Blank: No accessories<br>FA: FA type<br>LB: LB type<br>TC: TC type                  |                             |

[Note 1] Please refer to page 78~79 for accessory parts.

### 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 °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>+1,5</sup> <sub>0</sub> |                                     |    |      |
| Cushion type       | MFC/MFCD/MFCJ Series: Variable cushion; Other series: Bumper         |                                     |    |      |
| Port size [Note 1] | 1/8"   |                                     |    | 1/4" |

[Note 1] PT thread, G thread and NPT thread are available.  
Add) Refer to P362 for detail of sensor switch.

### Stroke

| Bore size (mm) | Standard stroke (mm) |    |    |    |    |    |    |    |    |    |    |     |     |     |     |     | Max.std stroke | Max. stroke |     |     |     |     |     |     |     |
|----------------|----------------------|----|----|----|----|----|----|----|----|----|----|-----|-----|-----|-----|-----|----------------|-------------|-----|-----|-----|-----|-----|-----|-----|
|                | 20                   | 10 | 15 | 20 | 25 | 30 | 40 | 50 | 60 | 75 | 80 | 100 | 125 | 150 | 160 | 175 |                |             | 200 | 250 | 300 | 350 | 400 | 450 | 500 |
| MF             | 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 |
| MFC            | 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            | 20                   | 10 | 15 | 20 | 25 | 30 | 40 | 50 | 60 | 75 | 80 | 100 | 125 | 150 | 160 | 175 | 200            | 250         | 300 |     |     |     |     | 300 | -   |
| MFCD           | 25                   | 10 | 15 | 20 | 25 | 30 | 40 | 50 | 60 | 75 | 80 | 100 | 125 | 150 | 160 | 175 | 200            | 250         | 300 |     |     |     |     | 300 | -   |
| MFJ            | 32                   | 10 | 15 | 20 | 25 | 30 | 40 | 50 | 60 | 75 | 80 | 100 | 125 | 150 | 160 | 175 | 200            | 250         | 300 | 350 | 400 | 450 | 500 | 500 | -   |
| MFCJ           | 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            | 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 |     |     |                |             |     |     |     |     |     | -   | -   |
| MTF            | 40                   | 10 | 15 | 20 | 25 | 30 | 40 | 50 | 60 | 75 | 80 | 100 | 125 | 150 |     |     |                |             |     |     |     |     |     | -   | -   |

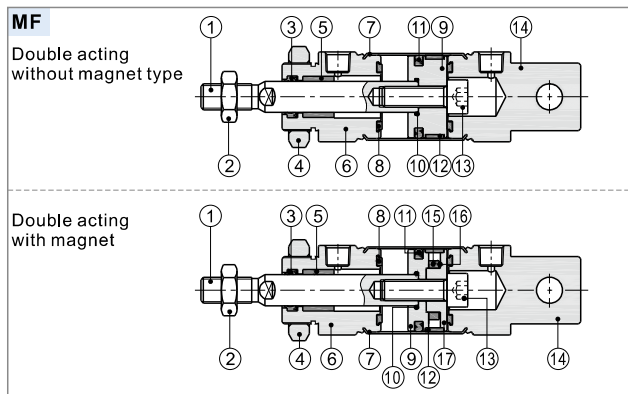
[Note] Consult us for non-standard stroke.



# Mini cylinder

## MF Series

### Inner structure and material of major parts

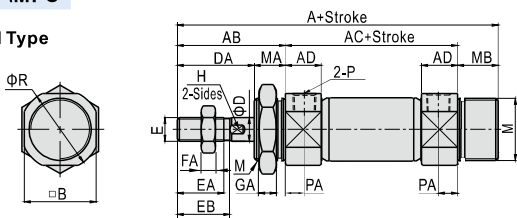


| NO. | Item                | Material                              |
|-----|---------------------|---------------------------------------|
| 1   | Piston rod          | Carbon steel with 20μm chrome plated  |
| 2   | Rod nut             | Carbon steel                          |
| 3   | Front cover packing | 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                        |

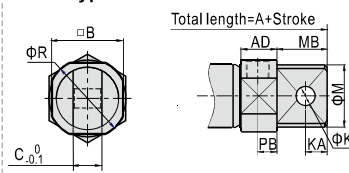
### Dimensions

#### MF1MFC

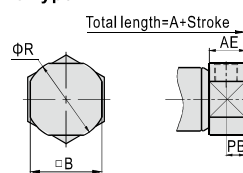
##### CM Type



##### CA Type



##### U Type

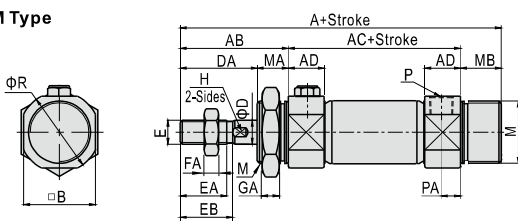


| Bore size\Item | A   |     |       |    |    |      |      |      |    |         | M  |    |    |    |    | D  | DA       | E    | EA | EB | F | FA | G  | GA | H  | K  | KA   | P   | PA   | PB   | R |
|----------------|-----|-----|-------|----|----|------|------|------|----|---------|----|----|----|----|----|----|----------|------|----|----|---|----|----|----|----|----|------|-----|------|------|---|
|                | CM  | CA  | U     | AB | AC | AD   | AE   | B    | C  | CM      | CA | MA | 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  | 16.5 | 18 | 12 | 6 | 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 | 20.5 | 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 | 20.5 | 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  | 22.5 | 24 | 19 | 8 | 41 | 10 | 14 | 10 | 12 | 1/4" | 11  | 11.5 | 46.5 |   |

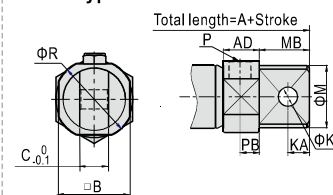
Remark :  
 1. The dimensions of magnet type cylinder are the same as non-magnet type cylinder.  
 2. The dimensions of MFC series are the same as MF series.

#### MSF

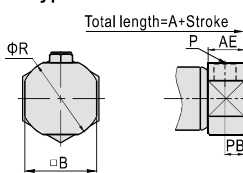
##### CM Type



##### CA Type



##### U Type



| Bore size\Item | A    |        |         |      |        |         |       |        |         | AC   |        |         |
|----------------|------|--------|---------|------|--------|---------|-------|--------|---------|------|--------|---------|
|                | 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     |

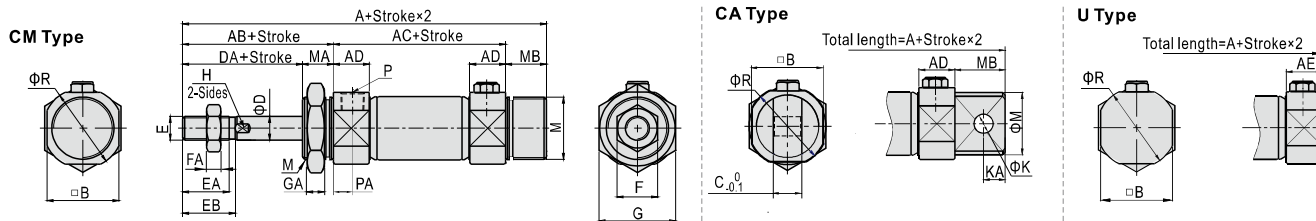
| Bore size\Item | AB | AD   | AE   | B    | C  | D  | DA | E        | EA   | EB | F  | FA | G  | GA | H  | K  | KA | M       |    |    |    |    | P    | PA  | PB   | R    |
|----------------|----|------|------|------|----|----|----|----------|------|----|----|----|----|----|----|----|----|---------|----|----|----|----|------|-----|------|------|
|                |    |      |      |      |    |    |    |          |      |    |    |    |    |    |    |    |    | CM      | CA | MA | CA | CM |      |     |      |      |
| 20             | 41 | 14.5 | 14.5 | 25   | 12 | 8  | 27 | M8×1.25  | 16.5 | 18 | 12 | 6  | 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 | 20.5 | 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 | 20.5 | 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  | 22.5 | 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.

# Mini cylinder

## MF Series

### MTF



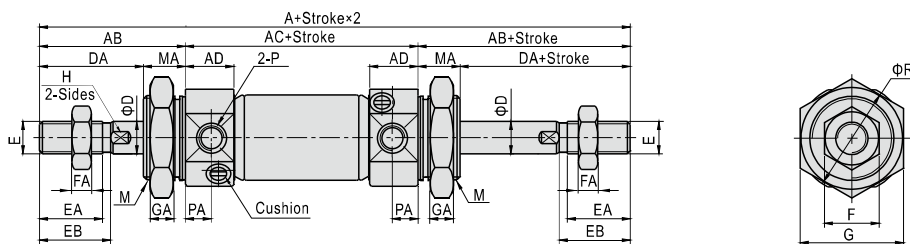
| Bore size\Item | A    |        |         |      |        |         |       |        |         | AC   |        |         | M       | MA | MB |    |    |
|----------------|------|--------|---------|------|--------|---------|-------|--------|---------|------|--------|---------|---------|----|----|----|----|
|                | 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 |

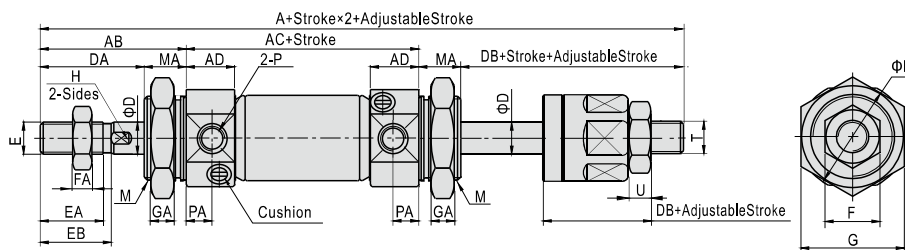
| Bore size\Item | AB | AD   | AE   | B    | C  | D  | DA | E        | EA   | EB | F  | FA | G  | GA | H  | K  | KA | P    | PA  | R    |
|----------------|----|------|------|------|----|----|----|----------|------|----|----|----|----|----|----|----|----|------|-----|------|
| 20             | 41 | 14.5 | 14.5 | 25   | 12 | 8  | 27 | M8×1.25  | 16.5 | 18 | 12 | 6  | 26 | 8  | 6  | 8  | 9  | 1/8" | 7.5 | 29   |
| 25             | 45 | 14.5 | 15.5 | 30   | 12 | 10 | 31 | M10×1.25 | 20.5 | 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 | 20.5 | 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  | 22.5 | 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        |          |    |    |      |    |    |    |          |      |    |    |    |    |    |    |         |    |      |     |      |          |   |
|----------------|----------|----------|----|----|------|----|----|----|----------|------|----|----|----|----|----|----|---------|----|------|-----|------|----------|---|
|                | MFD\MFCD | MFJ\MFCJ | AB | AC | AD   | D  | DA | DB | E        | EA   | EB | F  | FA | G  | GA | H  | M       | MA | P    | PA  | R    | T        | U |
| 20             | 144      | 141      | 41 | 62 | 14.5 | 8  | 27 | 24 | M8×1.25  | 16.5 | 18 | 12 | 6  | 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 | 20.5 | 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 | 20.5 | 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  | 22.5 | 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.

# Mini cylinder

## MF Series—Accessories

### List for ordering code of accessories

| Accessories<br>Bore size | Mounting accessories |          |          | SDB       | Knuckle |         |            |            | Sensor switch |      |      |
|--------------------------|----------------------|----------|----------|-----------|---------|---------|------------|------------|---------------|------|------|
|                          | LB                   | FA       | TC       |           | I       | Y       | F          | U          | CMSG          | DMSG | EMSG |
| 20                       | F-MF20LB             | F-MF20FA | F-MF20TC | F-MF20SDB | F-MF20I | F-MF20Y | F-M8X125F  | F-M8X125U  | CMSG          | DMSG | EMSG |
| 25                       | F-MF32LB             | F-MF32FA | F-MF32TC |           | F-MF25I | F-MF25Y | F-M10X125F | F-M10X125U |               |      |      |
| 32                       | F-MF40LB             | F-MF40FA | F-MF40TC | F-MF32SDB | F-MF40I | F-MF40Y | F-M14X150F | F-M14X150U |               |      |      |
| 40                       |                      |          |          |           |         |         |            |            |               |      |      |

### Accessory selection

| Cylinder model | Accessories | Mounting accessories |    |     |    | Knuckle |   |       |   | Sensor switch |      |      |
|----------------|-------------|----------------------|----|-----|----|---------|---|-------|---|---------------|------|------|
|                |             | LB                   | FA | SDB | TC | I       | Y | U [1] | F | CMSG          | DMSG | EMSG |
| MF             | Standard    | ●                    | ●  | ●   | ●  | ●       | ● | ●     | ● | ×             | ×    | ×    |
|                | With magnet | ●                    | ●  | ●   | ●  | ●       | ● | ●     | ● | ●             | ●    | ●    |
| MFC            | Standard    | ●                    | ●  | ●   | ●  | ●       | ● | ●     | ● | ×             | ×    | ×    |
|                | With magnet | ●                    | ●  | ●   | ●  | ●       | ● | ●     | ● | ●             | ●    | ●    |
| MSF            | Standard    | ●                    | ●  | ●   | ●  | ●       | ● | ●     | ● | ×             | ×    | ×    |
|                | With magnet | ●                    | ●  | ●   | ●  | ●       | ● | ●     | ● | ●             | ●    | ●    |
| MTF            | Standard    | ●                    | ●  | ×   | ●  | ●       | ● | ●     | ● | ×             | ×    | ×    |
|                | With magnet | ●                    | ●  | ×   | ●  | ●       | ● | ●     | ● | ●             | ●    | ●    |
| MFD            | Standard    | ●                    | ●  | ×   | ●  | ●       | ● | ●     | ● | ×             | ×    | ×    |
|                | With magnet | ●                    | ●  | ×   | ●  | ●       | ● | ●     | ● | ●             | ●    | ●    |
| MFCJ           | Standard    | ●                    | ●  | ×   | ●  | ●       | ● | ●     | ● | ×             | ×    | ×    |
|                | With magnet | ●                    | ●  | ×   | ●  | ●       | ● | ●     | ● | ●             | ●    | ●    |

### Material of accessories

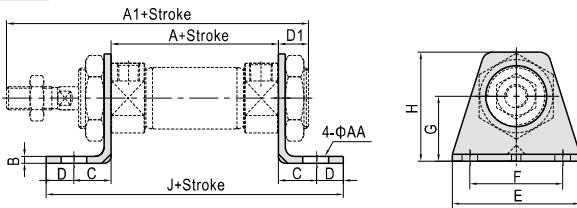
| Accessories<br>Bore size | Mounting accessories |    |     |    | Knuckle |   |   |   |
|--------------------------|----------------------|----|-----|----|---------|---|---|---|
|                          | LB                   | FA | SDB | TC | I       | Y | F | U |
| 20~40                    | △                    | △  | △   | ■  | □       | □ | □ | □ |

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

[Note 1] Please refer to P358~361 for knuckle detail.

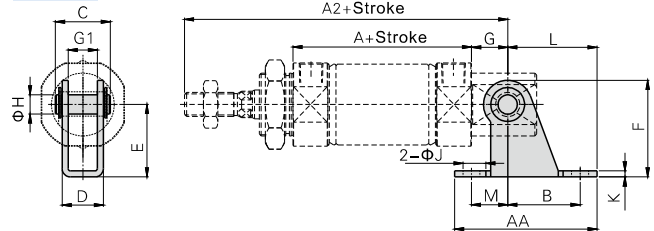
### Dimensions

#### 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 |

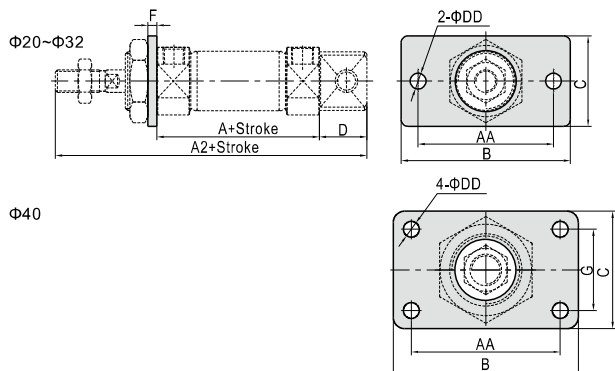
#### SDB



| Bore size\Item | A  | A2  | AA | B  | C    | D    | E  | F  | G  | G1   | H  | K   | J | L  | M  |
|----------------|----|-----|----|----|------|------|----|----|----|------|----|-----|---|----|----|
| 20             | 62 | 115 | 59 | 30 | 22.7 | 17.1 | 30 | 40 | 12 | 12.1 | 8  | 2.5 | 7 | 37 | 15 |
| 25             | 62 | 119 | 59 | 30 | 22.7 | 17.1 | 30 | 40 | 12 | 12.1 | 8  | 2.5 | 7 | 37 | 15 |
| 32             | 64 | 124 | 75 | 40 | 32.7 | 26.1 | 40 | 53 | 15 | 20.1 | 10 | 3   | 9 | 50 | 15 |
| 40             | 88 | 153 | 75 | 40 | 32.7 | 26.1 | 40 | 53 | 15 | 20.1 | 10 | 3   | 9 | 50 | 15 |

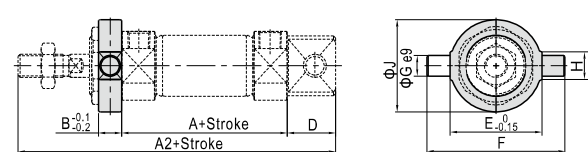
[Note] SDB is attached with relevant PIN.

#### FA



| 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 |

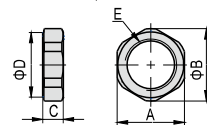
#### TC



| 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 |

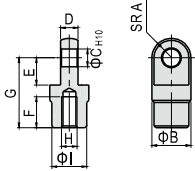


# Mini cylinder

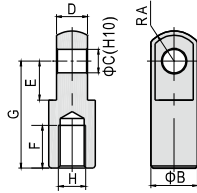
## MF Series—Accessories

### I Knuckle

F-MF20I, F-MF25I



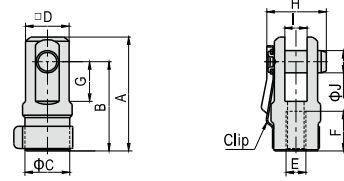
F-MF40I



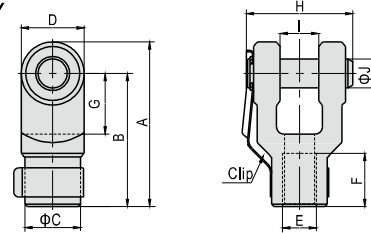
| Type/Item | A   | B  | C  | D  | E  | F  | G  | H        | I  |
|-----------|-----|----|----|----|----|----|----|----------|----|
| F-MF20I   | 9.5 | 20 | 9  | 9  | 14 | 16 | 36 | M8×1.25  | 18 |
| F-MF25I   | 9.5 | 20 | 9  | 9  | 14 | 18 | 38 | M10×1.25 | 18 |
| F-MF40I   | 15  | 24 | 12 | 16 | 20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