

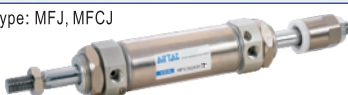





Mini cylinder(Stainless steel)——MF Series

Product series

| Series name | Mounting type | | | | | Acting type | Bore size | Collocation of sensor switch | |
|--|---------------|----|----|-----|----|---|----------------------|------------------------------|-------|
| | Basic | LB | FA | SDB | TC | | | CS1-M | DS1-M |
| Double acting type: MF Double acting with adj. cushion: MFC  | ● | ● | ● | ● | ● | Double acting Double acting(with adj. cushion) | 20 25 32 40 | ● | ● |
| Double rod type: MFD, MFC D  | ● | ● | ● | ● | ● | | | ● | ● |
| Adjustable stroke type: MFJ, MFCJ  | ● | ● | ● | ● | ● | ● | | ● | |
| Single acting type: MSF, MTF  | ● | ● | ● | ● | ● | Single acting | | ● | ● |
| Page | 228 | | | | | 231 | | 419 | |



MF

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 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 | - | 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 |



Mini cylinder(Stainless steel)



MF Series



Specification

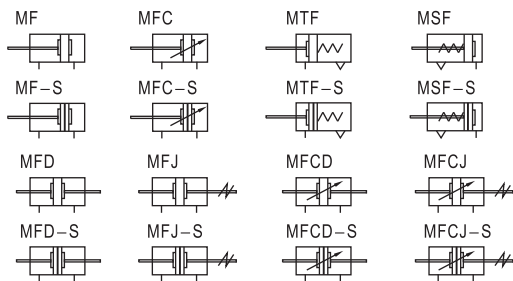
| Bore size(mm) | 20 | 25 | 32 | 40 |
|--------------------|---|------------------------------------|----|----------------------|
| Acting type | Double acting, Double acting with cushion, Single acting_push, Single acting_pull | | | |
| Fluid | Air(to be filtered by 40 μm filter element) | | | |
| Operating 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 ^{+1.0} >150 ^{+1.4} | | | |
| Cushion type | MFC、MFC D、MFCJ Series: Adjustable cushion | | | Other series: Bumper |
| Port size ① | 1/8" | | | 1/4" |

① PT thread, NPT thread and G thread are available.
Add) Refer to P419~442 for detail of sensor switch.

Symbol



MF



Stroke

| Bore size (mm) | Standard stroke (mm) | | | | | | | | | | | | | | | | Max. std stroke | Max. stroke | | | |
|----------------|----------------------|----|----|----|----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----------------|-------------|-----|-----|-----|
| | 10 | 15 | 20 | 25 | 30 | 40 | 50 | 60 | 75 | 80 | 100 | 125 | 150 | 160 | 175 | 200 | | | 250 | 300 | |
| Double acting | 20 | 10 | 15 | 20 | 25 | 30 | 40 | 50 | 60 | 75 | 80 | 100 | 125 | 150 | 160 | 175 | 200 | 250 | 300 | 500 | 600 |
| | 25 | 10 | 15 | 20 | 25 | 30 | 40 | 50 | 60 | 75 | 80 | 100 | 125 | 150 | 160 | 175 | 200 | 250 | 300 | 600 | 700 |
| | 32 | 10 | 15 | 20 | 25 | 30 | 40 | 50 | 60 | 75 | 80 | 100 | 125 | 150 | 160 | 175 | 200 | 250 | 300 | 600 | 700 |
| | 40 | 10 | 15 | 20 | 25 | 30 | 40 | 50 | 60 | 75 | 80 | 100 | 125 | 150 | 160 | 175 | 200 | 250 | 300 | 600 | 700 |
| Single acting | 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 | - | - | - | - | - | - | - |
| | 40 | 10 | 15 | 20 | 25 | 30 | 40 | 50 | 60 | 75 | 80 | 100 | 125 | 150 | - | - | - | - | - | - | - |

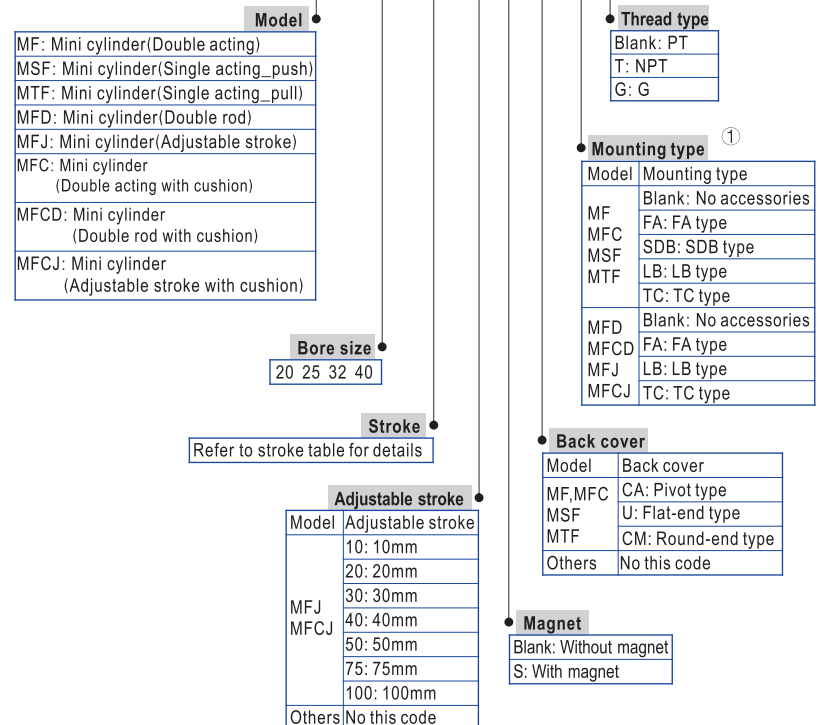
Note) Consult us for non-standard stroke.

Product feature

- JIS standard is implemented.
- Piston adopts heterogeneous two way seal structure. It has compact size and has the function of oil reservation.
- Front cover owns fixed anti-impact pad 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.
- With the same bore size and stroke, cylinders of MF series are shorter than ISO6432 standard cylinders.
- There are cylinders and mounting accessories with several specifications for your choice.

Ordering code

| | | | | | |
|-----|------------|---|----|--------------------------|--------------------------|
| MF | 32 × 50 | S | CM | <input type="checkbox"/> | <input type="checkbox"/> |
| MFD | 32 × 50 | S | | <input type="checkbox"/> | <input type="checkbox"/> |
| MFJ | 32 × 50-20 | S | | <input type="checkbox"/> | <input type="checkbox"/> |



① Please refer to page 231 for accessory parts.



Mini cylinder(Stainless steel)

MF Series

Inner structure and material of major parts

MF

Double acting without magnet type

Double acting with magnet

| NO. | Item | Material |
|-----|---------------------|--|
| 1 | Piston rod | Carbon steel with 20 μ m 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

MF, MFC

| Bore size\Item | A | A1 | A2 | A3 | B | C | D | D1 | E | F | F1 | G | G1 | G2 | H | J |
|----------------|----|-----|-----|-------|----|----|----|----|-----|------|------|----|------|-----|------|---|
| 20 | 62 | 116 | 124 | 103 | 14 | 27 | 21 | 13 | 5 | 14.5 | 14.5 | 12 | 7.5 | 7.5 | 15.5 | 5 |
| 25 | 62 | 120 | 128 | 108 | 14 | 31 | 21 | 13 | 5.5 | 15.5 | 14.5 | 12 | 8 | 7.5 | 19.5 | 6 |
| 32 | 64 | 122 | 136 | 110 | 14 | 31 | 27 | 13 | 5.5 | 15.5 | 14.5 | 15 | 8 | 7.5 | 19.5 | 6 |
| 40 | 88 | 154 | 165 | 138.5 | 16 | 34 | 27 | 16 | 7 | 22 | 21.5 | 15 | 11.5 | 11 | 21 | 8 |

| Bore size\Item | K | L | L1 | M | P | P1 | Q | S | T | T1 | X | V |
|----------------|------------|-----------|----|----|------|----|----|------|----|----|------|----|
| 20 | M8 × 1.25 | M20 × 1.5 | 20 | 8 | 29 | 8 | 12 | 25 | 13 | 26 | 1/8" | 8 |
| 25 | M10 × 1.25 | M26 × 1.5 | 26 | 8 | 33.5 | 8 | 12 | 30 | 17 | 32 | 1/8" | 10 |
| 32 | M10 × 1.25 | M26 × 1.5 | 26 | 8 | 37.5 | 10 | 20 | 34.5 | 17 | 32 | 1/8" | 12 |
| 40 | M14 × 1.5 | M32 × 2.0 | 32 | 10 | 46.5 | 10 | 20 | 42.5 | 19 | 41 | 1/4" | 16 |

Remark:

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

MSF

| Bore size\Item | A | | | A1 | | | A2 | | | A3 | | |
|----------------|------|--------|---------|------|--------|---------|------|--------|---------|-------|--------|---------|
| 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 | 87 | 112 | 137 | 141 | 166 | 191 | 149 | 174 | 199 | 128 | 153 | 178 |
| 25 | 87 | 112 | 137 | 145 | 170 | 195 | 153 | 178 | 203 | 133 | 158 | 183 |
| 32 | 89 | 114 | 139 | 147 | 172 | 197 | 161 | 186 | 211 | 135 | 160 | 185 |
| 40 | 113 | 138 | 163 | 179 | 204 | 229 | 190 | 215 | 240 | 163.5 | 188.5 | 213.5 |

Remark:

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

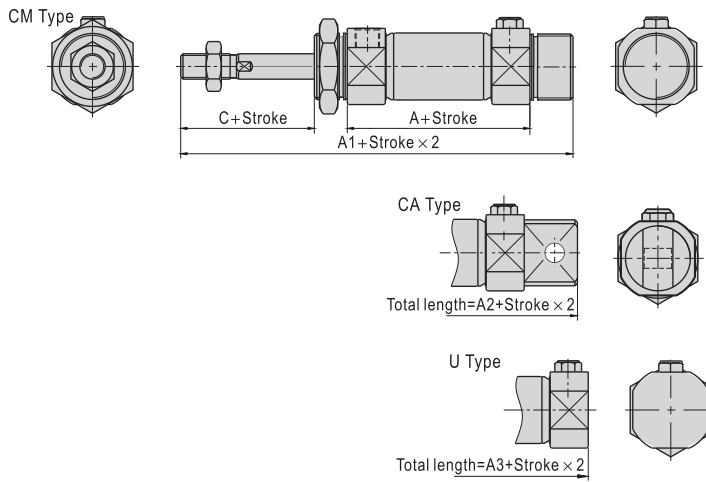


MF

Mini cylinder(Stainless steel)

MF Series

MTF

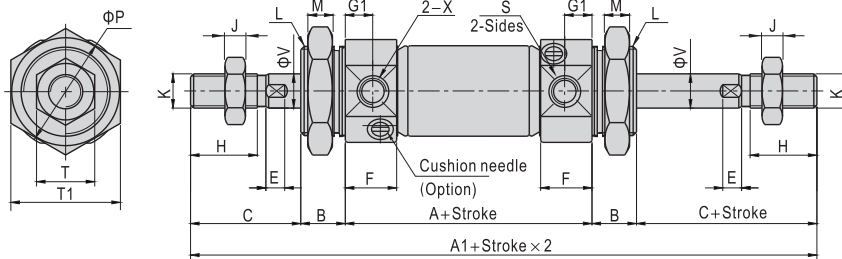


| Bore size\Item | A | | A1 | | A2 | | A3 | | C | | | | |
|----------------|------|--------|---------|------|--------|---------|------|--------|-----|---------|-------|-------|----|
| | 1~50 | 51~100 | 101~150 | 1~50 | 51~100 | 101~150 | 1~50 | 51~100 | | 101~150 | | | |
| 20 | 87 | 112 | 137 | 141 | 166 | 191 | 149 | 174 | 199 | 128 | 153 | 178 | 27 |
| 25 | 87 | 112 | 137 | 145 | 170 | 195 | 153 | 178 | 203 | 133 | 158 | 183 | 31 |
| 32 | 89 | 114 | 139 | 147 | 172 | 197 | 161 | 186 | 211 | 135 | 160 | 185 | 31 |
| 40 | 113 | 138 | 163 | 179 | 204 | 229 | 190 | 215 | 240 | 163.5 | 188.5 | 213.5 | 34 |

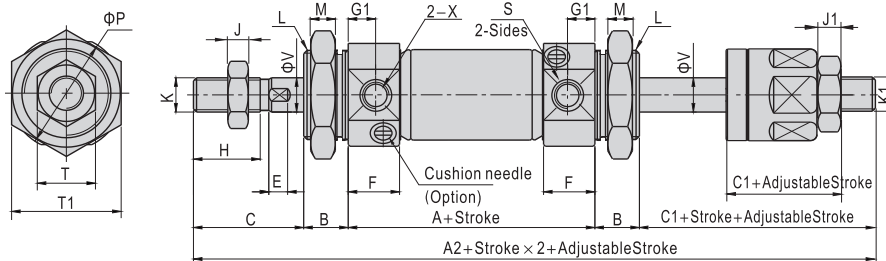
Remark:

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

MFD, MFCD



MFJ, MFCJ



| Bore size\Item | A | A1 | A2 | B | C | C1 | E | F | G1 | H | J | J1 |
|----------------|----|-----|-----|----|----|----|-----|------|-----|------|---|----|
| 20 | 62 | 144 | 141 | 14 | 27 | 24 | 5 | 14.5 | 7.5 | 15.5 | 5 | 5 |
| 25 | 62 | 152 | 148 | 14 | 31 | 27 | 5.5 | 14.5 | 7.5 | 19.5 | 6 | 6 |
| 32 | 64 | 154 | 150 | 14 | 31 | 27 | 5.5 | 14.5 | 7.5 | 19.5 | 6 | 6 |
| 40 | 88 | 188 | 182 | 16 | 34 | 28 | 7 | 21.5 | 11 | 21 | 8 | 7 |

| Bore size\Item | K | K1 | L | M | P | S | T | T1 | X | V |
|----------------|------------|------------|-----------|----|------|------|----|----|------|----|
| 20 | M8 x 1.25 | M8 x 1.25 | M20 x 1.5 | 8 | 29 | 25 | 13 | 26 | 1/8" | 8 |
| 25 | M10 x 1.25 | M10 x 1.25 | M26 x 1.5 | 8 | 33.5 | 30 | 17 | 32 | 1/8" | 10 |
| 32 | M10 x 1.25 | M10 x 1.25 | M26 x 1.5 | 8 | 37.5 | 34.5 | 17 | 32 | 1/8" | 12 |
| 40 | M14 x 1.5 | M12 x 1.25 | M32 x 2.0 | 10 | 46.5 | 42.5 | 19 | 41 | 1/4" | 16 |

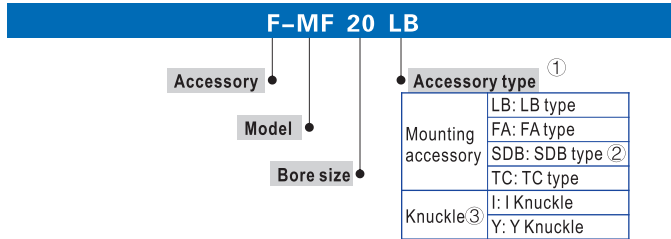
Remark: The dimensions of magnet type cylinder are the same as non-magnet type cylinder.



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

| Cylinder model | MF, MFC | MSF, MTF | MFD, MFCDD, MFJ, MFCJ | | |
|--------------------|----------|-------------|-----------------------|-------------|---|
| Accessories | Standard | With magnet | Standard | With magnet | |
| Mounting accessory | LB | ● | ● | ● | ● |
| | FA | ● | ● | ● | ● |
| | SDB | ● | ● | × | × |
| | TC | ● | ● | ● | ● |
| 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

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

■ — Cast steel, △ — SPCC, □ — Carbon steel.

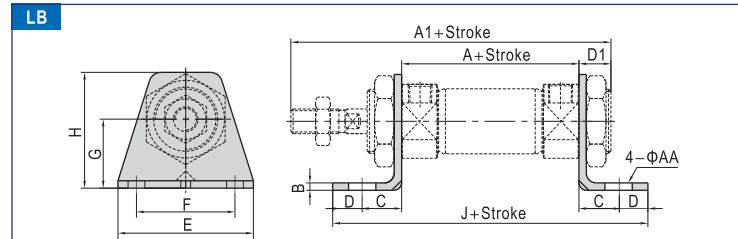
List for ordering code of accessories

| Accessories | Mounting accessory | | | |
|-------------|--------------------|----------|----------|-----------|
| Bore size | LB | FA | TC | SDB |
| 20 | F-MF20LB | F-MF20FA | F-MF20TC | F-MF20SDB |
| 25 | | | | |
| 32 | F-MF25LB | F-MF25FA | F-MF25TC | F-MF32SDB |
| 40 | F-MF40LB | F-MF40FA | F-MF40TC | |

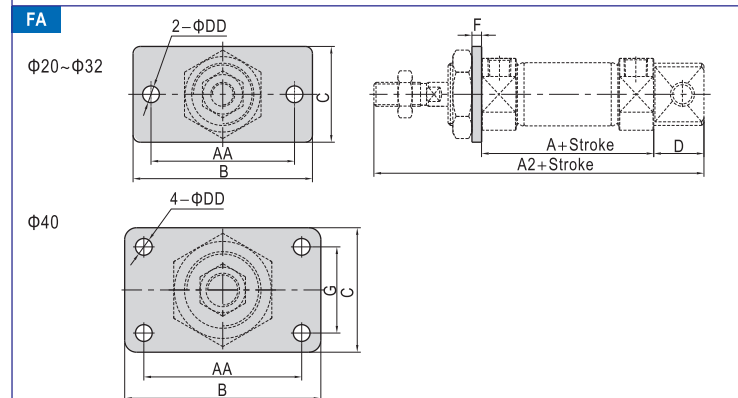
| Accessories | Knuckle | | | |
|-------------|--------------|--------------|--------------|--------------|
| Bore size | I: I Knuckle | Y: Y Knuckle | F: F Knuckle | U: U Knuckle |
| 20 | F-MF20I | F-MF20Y | F-M8X125F | F-M8X125U |
| 25 | | | | |
| 32 | F-MF25I | F-MF25Y | F-M10X125F | F-M10X125U |
| 40 | F-MF40I | F-MF40Y | F-M14X150F | F-M14X150U |

| Accessories | Sensor switch | |
|-------------|---------------|-----------|
| Bore size | CS1-M□ | DS1-M□ |
| 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 |

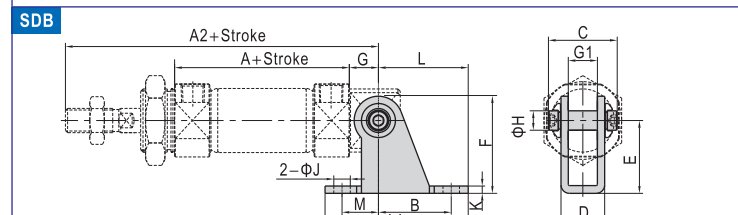
Dimensions



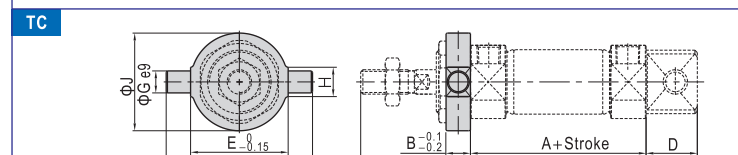
| Bore size\Item | A | A1 | AA | B | C | D | D1 | E | F | G | H | J |
|----------------|----|-----|----|---|----|----|----|----|----|----|----|-----|
| 20 | 62 | 116 | 7 | 3 | 20 | 8 | 13 | 55 | 40 | 25 | 40 | 118 |
| 25 | 62 | 120 | 7 | 3 | 20 | 8 | 13 | 55 | 40 | 25 | 47 | 118 |
| 32 | 64 | 122 | 7 | 3 | 20 | 8 | 13 | 55 | 40 | 28 | 47 | 120 |
| 40 | 88 | 154 | 7 | 3 | 23 | 10 | 16 | 75 | 55 | 30 | 54 | 154 |



| Bore size\Item | A | A2 | AA | B | C | D | DD | F | G |
|----------------|----|-----|----|----|----|----|----|---|----|
| 20 | 62 | 124 | 60 | 75 | 34 | 21 | 7 | 4 | - |
| 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 | 5 | 36 |



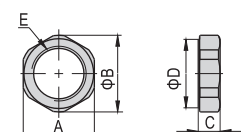
| Bore size\Item | A | A2 | AA | B | C | D | E | F | G | G1 | H | K | J | L | M |
|----------------|----|-----|----|----|----|------|----|----|----|------|----|---|-----|----|----|
| 20 | 62 | 115 | 59 | 30 | 32 | 18.1 | 30 | 40 | 12 | 12.1 | 8 | 3 | 6.8 | 37 | 15 |
| 25 | 62 | 119 | 59 | 30 | 32 | 18.1 | 30 | 40 | 12 | 12.1 | 8 | 3 | 6.8 | 37 | 15 |
| 32 | 64 | 124 | 75 | 40 | 44 | 28.1 | 40 | 53 | 15 | 20.1 | 10 | 4 | 9 | 50 | 15 |
| 40 | 88 | 153 | 75 | 40 | 44 | 28.1 | 40 | 53 | 15 | 20.1 | 10 | 4 | 9 | 50 | 15 |



| 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 |



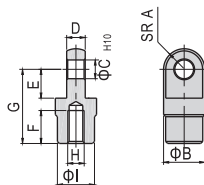
MF

Mini cylinder(Stainless steel)

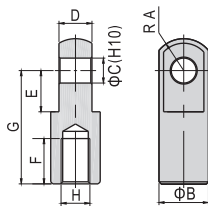
Accessories

I Knuckle

F-MF20I, F-MF25I



F-MF40I



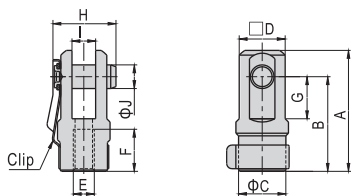
| Type\Item | A | B | C | D | E | F | G | H | I |
|-----------|-----|----|----|----|----|----|----|----------|----|
| F-MF20I | 9.5 | 20 | 9 | 9 | 14 | 16 | 36 | M8×1.25 | 18 |
| F-MF25I | 9.5 | 20 | 9 | 9 | 14 | 18 | 38 | M10×1.25 | 18 |
| F-MF40I | 15 | 24 | 12 | 16 | 20 | 22 | 55 | M14×1.5 | - |



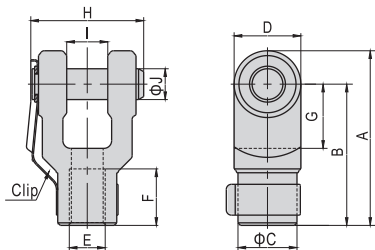
MF

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 |

