



# 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<br>Double acting with adj. cushion:MAC | ●             | ●  | ●  | ●   | Double acting<br>Double acting<br>(with adj.cushion)  | 16        | ●                            | ●     |       |       |       |       |
|                                                               |               |    |    |     |                                                       | 20        | ●                            | ●     |       |       |       |       |
|                                                               |               |    |    |     |                                                       | 25        | ●                            | ●     |       |       |       |       |
| Single acting type: MSA, MTA                                  | ●             | ●  | ●  | ●   | Single acting                                         | 32        | ●                            | ●     |       |       |       |       |
|                                                               |               |    |    |     |                                                       | 40        | ●                            | ●     |       |       |       |       |
| Double rod type: MAD, MACD                                    | ●             | ●  | ●  |     | Double acting<br>Double acting<br>(with adj. cushion) | 16        | ●                            | ●     |       |       |       |       |
|                                                               |               |    |    |     |                                                       | 20        | ●                            | ●     |       |       |       |       |
|                                                               |               |    |    |     |                                                       | 25        | ●                            | ●     |       |       |       |       |
| Adjustable stroke type: MAJ, MACJ                             | ●             | ●  | ●  |     |                                                       | 32        | ●                            | ●     |       |       |       |       |
|                                                               |               |    |    |     |                                                       | 40        | ●                            | ●     |       |       |       |       |
|                                                               |               |    |    |     |                                                       | 50        |                              |       | ●     | ●     | ●     | ●     |
|                                                               |               |    |    |     |                                                       | 63        |                              |       | ●     | ●     | ●     | ●     |
| Other series: MAR                                             |               |    |    |     | Double acting<br>Double acting<br>(with adj. cushion) | 20        | ●                            | ●     |       |       |       |       |
|                                                               |               |    |    |     |                                                       | 25        | ●                            | ●     |       |       |       |       |
|                                                               |               |    |    |     |                                                       | 32        | ●                            | ●     |       |       |       |       |
|                                                               |               |    |    |     |                                                       | 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<br>(mm) | Rod size<br>(mm) | Acting type   |           | Pressure area<br>(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 |



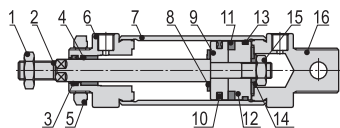


# Mini cylinder(Stainless steel)

## MA Series

### Inner structure and material of major parts

#### MA-CA

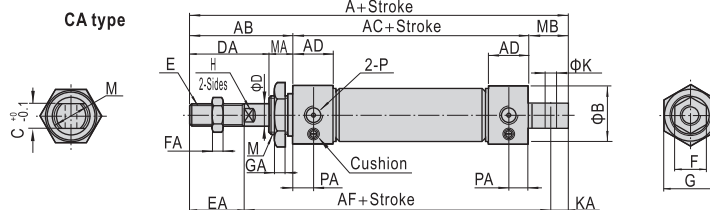


| NO. | Item                | Material                               |
|-----|---------------------|----------------------------------------|
| 1   | Rod nut             | Carbon steel                           |
| 2   | Piston rod          | Carbon steel with 20 μ m chrome plated |
| 3   | Front cover packing | NBR                                    |
| 4   | Bushing             | Wear resistant material                |
| 5   | Front cover nut     | Carbon steel                           |
| 6   | Front cover         | Aluminum alloy                         |
| 7   | 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

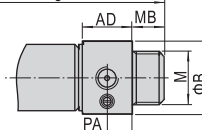
MA Φ16~Φ40

MAC Φ20~Φ40



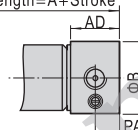
CM type

Total length=A+Stroke



U type

Total length=A+Stroke

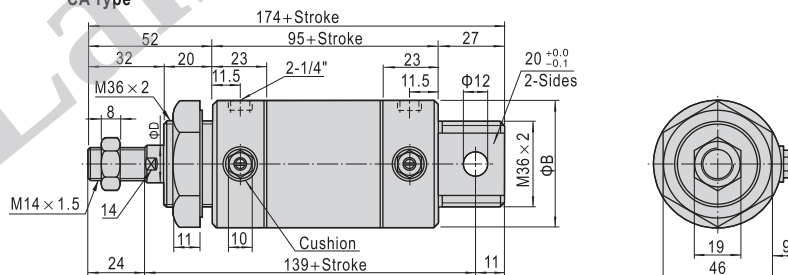


| Bore size\Item | CA  | CM  | U   | AB | AC | AD   | AF  | B    | C  | D  | DA | E        | EA |
|----------------|-----|-----|-----|----|----|------|-----|------|----|----|----|----------|----|
| Back cover     |     |     |     |    |    |      |     |      |    |    |    |          |    |
| 16             | 114 | 114 | 98  | 38 | 60 | 10   | 91  | 21   | 12 | 6  | 22 | M6×1.0   | 16 |
| 20             | 137 | 128 | 116 | 40 | 76 | 16   | 108 | 27   | 16 | 8  | 28 | M8×1.25  | 20 |
| 25             | 141 | 134 | 120 | 44 | 76 | 16   | 110 | 30   | 16 | 10 | 30 | M10×1.25 | 22 |
| 32             | 147 | 134 | 120 | 44 | 76 | 16   | 113 | 35   | 16 | 12 | 30 | M10×1.25 | 22 |
| 40             | 149 | 136 | 122 | 46 | 76 | 16.5 | 113 | 41.5 | 20 | 16 | 32 | M12×1.25 | 24 |

| Bore size\Item | F  | FA | G  | GA | H  | K  | KA | M       | MA | MB | P      | PA |
|----------------|----|----|----|----|----|----|----|---------|----|----|--------|----|
| Back cover     |    |    |    |    |    |    |    |         |    |    |        |    |
| 16             | 10 | 5  | 22 | 6  | 5  | 6  | 9  | M16×1.5 | 16 | 16 | M5×0.8 | 5  |
| 20             | 12 | 6  | 29 | 7  | 6  | 8  | 12 | M22×1.5 | 12 | 21 | 1/8"   | 8  |
| 25             | 17 | 6  | 29 | 7  | 8  | 8  | 12 | M22×1.5 | 14 | 21 | 1/8"   | 8  |
| 32             | 17 | 6  | 32 | 8  | 10 | 10 | 15 | M24×2.0 | 14 | 27 | 1/8"   | 8  |
| 40             | 17 | 7  | 41 | 9  | 14 | 12 | 15 | M30×2.0 | 14 | 27 | 1/8"   | 8  |

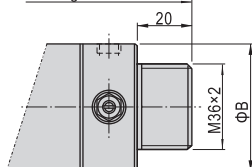
MAC Φ50, Φ63

CA Type



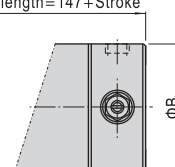
CM Type

Total length=167+Stroke



U Type

Total length=147+Stroke



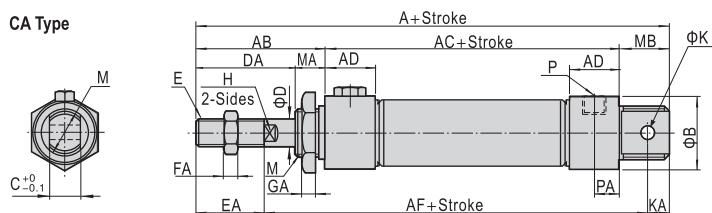
| Bore size\Item | B  | D  |
|----------------|----|----|
| 50             | 53 | 16 |
| 63             | 67 | 16 |

# Mini cylinder(Stainless steel)

## MA Series

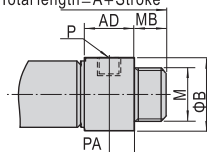
MSA Φ16~Φ40

### CA Type



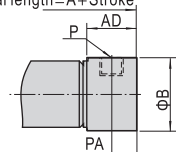
### CM Type

Total length=A+Stroke



### U Type

Total length=A+Stroke

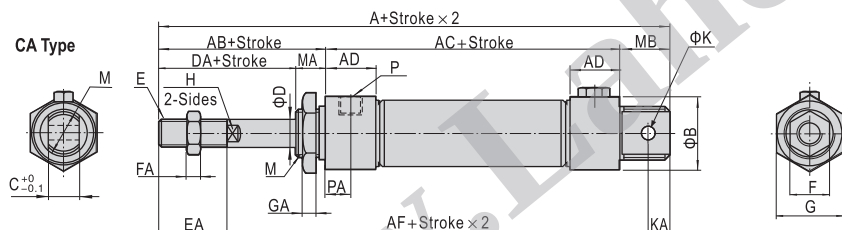


| Item             | CA  |        |      | A   |        |      | U   |        |      | AB  |        |      | AC  |        |      | AD  |        |      | AF  |        |      |
|------------------|-----|--------|------|-----|--------|------|-----|--------|------|-----|--------|------|-----|--------|------|-----|--------|------|-----|--------|------|
| Back cover       |     |        |      | CM  |        |      |     |        |      |     |        |      |     |        |      |     |        |      |     |        |      |
| Bore size\Stroke | ≤50 | 51~100 | ≥101 | ≤50 | 51~100 | ≥101 | ≤50 | 51~100 | ≥101 | ≤50 | 51~100 | ≥101 | ≤50 | 51~100 | ≥101 | ≤50 | 51~100 | ≥101 | ≤50 | 51~100 | ≥101 |
| 16               | 139 | 164    | -    | 139 | 164    | -    | 123 | 148    | -    | 38  | 85     | 110  | -   | 10     | 116  | 141 | -      |      |     |        |      |
| 20               | 162 | 187    | 212  | 153 | 178    | 203  | 141 | 166    | 191  | 40  | 101    | 126  | 151 | 16     | 133  | 158 | 183    |      |     |        |      |
| 25               | 166 | 191    | 216  | 159 | 184    | 209  | 145 | 170    | 195  | 44  | 101    | 126  | 151 | 16     | 135  | 160 | 185    |      |     |        |      |
| 32               | 172 | 197    | 222  | 159 | 184    | 209  | 145 | 170    | 195  | 44  | 101    | 126  | 151 | 16     | 138  | 163 | 188    |      |     |        |      |
| 40               | 174 | 199    | 224  | 161 | 186    | 211  | 147 | 172    | 197  | 46  | 101    | 126  | 151 | 16.5   | 138  | 163 | 188    |      |     |        |      |

| Bore size\Item | B    | C  | D  | DA | E        | EA | F  | FA | G  | GA | H  | K  | KA | M       | MA | MB | P  | PA     |   |
|----------------|------|----|----|----|----------|----|----|----|----|----|----|----|----|---------|----|----|----|--------|---|
| Back cover     |      |    |    |    |          |    |    |    |    |    |    |    |    |         |    | CA | CM |        |   |
| 16             | 21   | 12 | 6  | 22 | M6×1.0   | 16 | 10 | 5  | 22 | 6  | 5  | 6  | 7  | M16×1.5 | 16 | 16 | 16 | M5×0.8 | 5 |
| 20             | 27   | 16 | 8  | 28 | M8×1.25  | 20 | 12 | 6  | 29 | 7  | 6  | 8  | 9  | M22×1.5 | 12 | 21 | 12 | 1/8"   | 8 |
| 25             | 30   | 16 | 10 | 30 | M10×1.25 | 22 | 17 | 6  | 29 | 7  | 8  | 8  | 9  | M22×1.5 | 14 | 21 | 14 | 1/8"   | 8 |
| 32             | 35   | 16 | 12 | 30 | M10×1.25 | 22 | 17 | 6  | 32 | 8  | 10 | 10 | 12 | M24×2.0 | 14 | 27 | 14 | 1/8"   | 8 |
| 40             | 41.5 | 20 | 16 | 32 | M12×1.25 | 24 | 17 | 7  | 41 | 9  | 14 | 12 | 12 | M30×2.0 | 14 | 27 | 14 | 1/8"   | 8 |

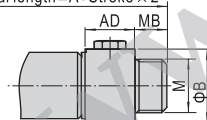
MTA Φ16~Φ40

### CA Type



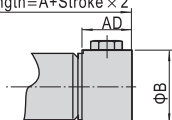
### CM Type

Total length=A+Stroke×2



### U Type

Total length=A+Stroke×2



| Item             | A   |     |     |      |     |     |     |      |     |     |     |      | AC  |     |     |      | AF  |     |     |      |
|------------------|-----|-----|-----|------|-----|-----|-----|------|-----|-----|-----|------|-----|-----|-----|------|-----|-----|-----|------|
| Back cover       | CA  |     |     |      | CM  |     |     |      | U   |     |     |      |     |     |     |      |     |     |     |      |
| Bore size\Stroke | ≤25 | ≤50 | ≤75 | ≤100 | ≤25 | ≤50 | ≤75 | ≤100 | ≤25 | ≤50 | ≤75 | ≤100 | ≤25 | ≤50 | ≤75 | ≤100 | ≤25 | ≤50 | ≤75 | ≤100 |
| 16               | 129 | 139 | 154 | 164  | 129 | 139 | 154 | 164  | 113 | 123 | 138 | 148  | 75  | 85  | 100 | 110  | 106 | 116 | 131 | 141  |
| 20               | 152 | 162 | 177 | 187  | 143 | 153 | 168 | 178  | 131 | 141 | 156 | 166  | 91  | 101 | 116 | 126  | 123 | 133 | 148 | 158  |
| 25               | 156 | 166 | 181 | 191  | 149 | 159 | 174 | 184  | 135 | 145 | 160 | 170  | 91  | 101 | 116 | 126  | 125 | 135 | 150 | 160  |
| 32               | 162 | 172 | 192 | 192  | 149 | 159 | 179 | 179  | 135 | 145 | 165 | 165  | 91  | 101 | 121 | 121  | 128 | 138 | 158 | 168  |
| 40               | 164 | 174 | 194 | 204  | 151 | 161 | 181 | 191  | 137 | 147 | 167 | 177  | 91  | 101 | 121 | 131  | 128 | 138 | 158 | 168  |

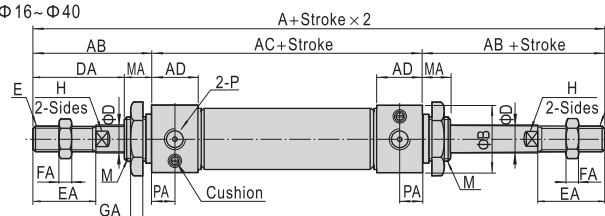
| Bore size\Item | AB | AD   | B    | C  | D  | DA | E        | EA | F  | FA | G  | GA | H  | K  | KA | M       | MA | MB | P  | PA     |   |
|----------------|----|------|------|----|----|----|----------|----|----|----|----|----|----|----|----|---------|----|----|----|--------|---|
| Back cover     |    |      |      |    |    |    |          |    |    |    |    |    |    |    |    |         |    | CA | CM |        |   |
| 16             | 38 | 10   | 21   | 12 | 6  | 22 | M6×1.0   | 16 | 10 | 5  | 22 | 6  | 5  | 6  | 7  | M16×1.5 | 16 | 16 | 16 | M5×0.8 | 5 |
| 20             | 40 | 16   | 27   | 16 | 8  | 28 | M8×1.25  | 20 | 12 | 6  | 29 | 7  | 6  | 8  | 9  | M22×1.5 | 12 | 21 | 12 | 1/8"   | 8 |
| 25             | 44 | 16   | 30   | 16 | 10 | 30 | M10×1.25 | 22 | 17 | 6  | 29 | 7  | 8  | 8  | 9  | M22×1.5 | 14 | 21 | 14 | 1/8"   | 8 |
| 32             | 44 | 16   | 35   | 16 | 12 | 30 | M10×1.25 | 22 | 17 | 6  | 32 | 8  | 10 | 10 | 12 | M24×2.0 | 14 | 27 | 14 | 1/8"   | 8 |
| 40             | 46 | 16.5 | 41.5 | 20 | 16 | 32 | M12×1.25 | 24 | 17 | 7  | 41 | 9  | 14 | 12 | 12 | M30×2.0 | 14 | 27 | 14 | 1/8"   | 8 |

# Mini cylinder(Stainless steel)

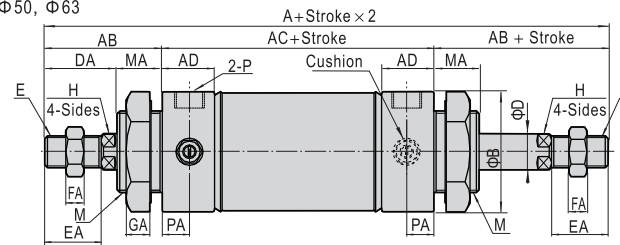
## MA Series

### MAD, MACD

Φ16~Φ40



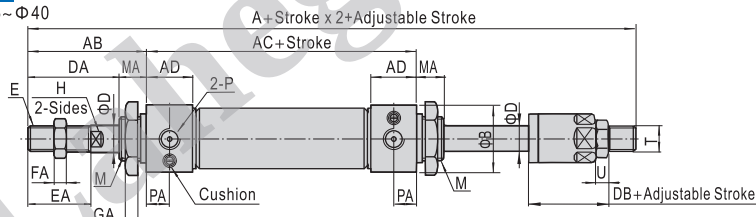
Φ50, Φ63



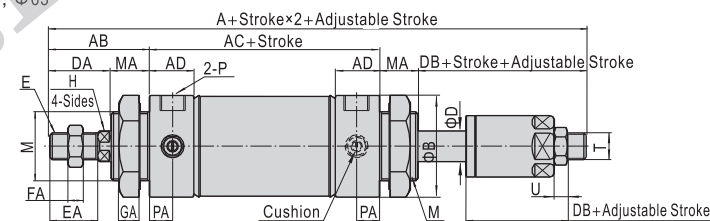
| Bore size\Item | A   | AB | AC | AD   | B    | D  | DA | E          | EA | F  | FA | G  | GA | H  | M         | MA | P        | PA   |
|----------------|-----|----|----|------|------|----|----|------------|----|----|----|----|----|----|-----------|----|----------|------|
| 16             | 136 | 38 | 60 | 10   | 21   | 6  | 22 | M6 × 1.0   | 16 | 10 | 5  | 22 | 6  | 5  | M16 × 1.5 | 16 | M5 × 0.8 | 5    |
| 20             | 156 | 40 | 76 | 16   | 27   | 8  | 28 | M8 × 1.25  | 20 | 12 | 6  | 29 | 7  | 6  | M22 × 1.5 | 12 | 1/8"     | 8    |
| 25             | 164 | 44 | 76 | 16   | 30   | 10 | 30 | M10 × 1.25 | 22 | 17 | 6  | 29 | 7  | 8  | M22 × 1.5 | 14 | 1/8"     | 8    |
| 32             | 164 | 44 | 76 | 16   | 35   | 12 | 30 | M10 × 1.25 | 22 | 17 | 6  | 32 | 8  | 10 | M24 × 2.0 | 14 | 1/8"     | 8    |
| 40             | 168 | 46 | 76 | 16.5 | 41.5 | 16 | 32 | M12 × 1.25 | 24 | 17 | 7  | 41 | 9  | 14 | M30 × 2.0 | 14 | 1/8"     | 8    |
| 50             | 199 | 52 | 95 | 23   | 53   | 16 | 32 | M14 × 1.5  | 24 | 19 | 8  | 46 | 11 | 14 | M36 × 2.0 | 20 | 1/4"     | 11.5 |
| 63             | 199 | 52 | 95 | 23   | 67   | 16 | 32 | M14 × 1.5  | 24 | 19 | 8  | 46 | 11 | 14 | M36 × 2.0 | 20 | 1/4"     | 11.5 |

### MAJ, MACJ

Φ16~Φ40



Φ50, Φ63



| Bore size\Item | A   | AB | AC | AD   | B    | D  | DA | DB | E          | EA | F  | FA |
|----------------|-----|----|----|------|------|----|----|----|------------|----|----|----|
| 16             | 135 | 38 | 60 | 10   | 21   | 6  | 22 | 21 | M6 × 1.0   | 16 | 10 | 5  |
| 20             | 153 | 40 | 76 | 16   | 27   | 8  | 28 | 25 | M8 × 1.25  | 20 | 12 | 6  |
| 25             | 161 | 44 | 76 | 16   | 30   | 10 | 30 | 27 | M10 × 1.25 | 22 | 17 | 6  |
| 32             | 161 | 44 | 76 | 16   | 35   | 12 | 30 | 27 | M10 × 1.25 | 22 | 17 | 6  |
| 40             | 164 | 46 | 76 | 16.5 | 41.5 | 16 | 32 | 28 | M12 × 1.25 | 24 | 17 | 7  |
| 50             | 195 | 52 | 95 | 23   | 53   | 16 | 32 | 28 | M14 × 1.5  | 24 | 19 | 8  |
| 63             | 195 | 52 | 95 | 23   | 67   | 16 | 32 | 28 | M14 × 1.5  | 24 | 19 | 8  |

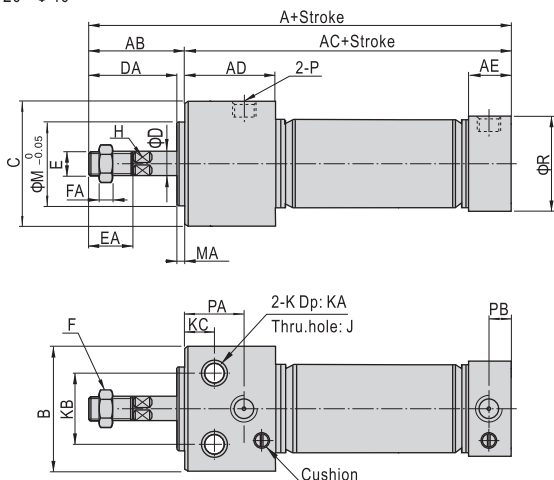
| Bore size\Item | H  | M         | MA | P        | PA   | G  | GA | T          | U |
|----------------|----|-----------|----|----------|------|----|----|------------|---|
| 16             | 5  | M16 × 1.5 | 16 | M5 × 0.8 | 5    | 22 | 6  | M6 × 1.0   | 5 |
| 20             | 6  | M22 × 1.5 | 12 | 1/8"     | 8    | 29 | 7  | M8 × 1.25  | 6 |
| 25             | 8  | M22 × 1.5 | 14 | 1/8"     | 8    | 29 | 7  | M10 × 1.25 | 6 |
| 32             | 10 | M24 × 2.0 | 14 | 1/8"     | 8    | 32 | 8  | M10 × 1.25 | 6 |
| 40             | 14 | M30 × 2.0 | 14 | 1/8"     | 8    | 41 | 9  | M12 × 1.25 | 7 |
| 50             | 14 | M36 × 2.0 | 20 | 1/4"     | 11.5 | 46 | 11 | M12 × 1.25 | 7 |
| 63             | 14 | M36 × 2.0 | 20 | 1/4"     | 11.5 | 46 | 11 | M12 × 1.25 | 7 |

# Mini cylinder(Stainless steel)

## MA Series

### MARU(Up mounting type)

Φ20~Φ40

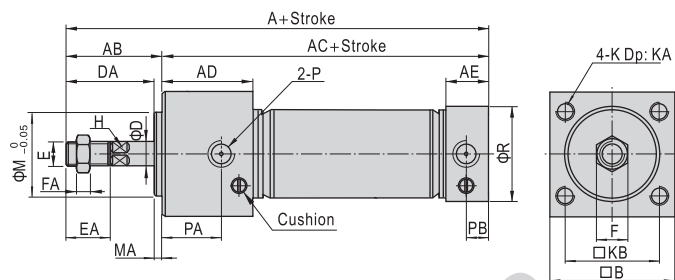


| Bore size\Item | A     | AB | AC   | AD   | AE   | B    | C    | D  | DA | E          | EA |
|----------------|-------|----|------|------|------|------|------|----|----|------------|----|
| 20             | 120   | 31 | 89   | 29   | 16   | 33.5 | 30.5 | 8  | 28 | M8 × 1.25  | 20 |
| 25             | 122   | 33 | 89   | 29   | 16   | 39   | 36.5 | 10 | 30 | M10 × 1.25 | 22 |
| 32             | 122   | 33 | 89   | 29   | 16   | 47   | 42.5 | 12 | 30 | M10 × 1.25 | 22 |
| 40             | 132.5 | 35 | 97.5 | 37.5 | 16.5 | 58.5 | 52.5 | 16 | 32 | M14 × 1.5  | 24 |

| Bore size\Item | F  | FA | H  | J    | K     | KA   | KB | KC | M  | MA | P    | PA | PB | R    |
|----------------|----|----|----|------|-------|------|----|----|----|----|------|----|----|------|
| 20             | 13 | 5  | 6  | Φ5.5 | Φ9.5  | 6.5  | 21 | 12 | 20 | 3  | 1/8" | 22 | 8  | 27   |
| 25             | 17 | 6  | 8  | Φ6.5 | Φ11.0 | 7.5  | 25 | 12 | 26 | 3  | 1/8" | 22 | 8  | 30   |
| 32             | 17 | 6  | 10 | Φ9.0 | Φ14.0 | 10   | 30 | 12 | 26 | 3  | 1/8" | 22 | 8  | 35   |
| 40             | 19 | 8  | 14 | Φ11  | Φ17.5 | 12.5 | 38 | 15 | 32 | 3  | 1/8" | 27 | 8  | 41.5 |

### MARF(Front mounting type)

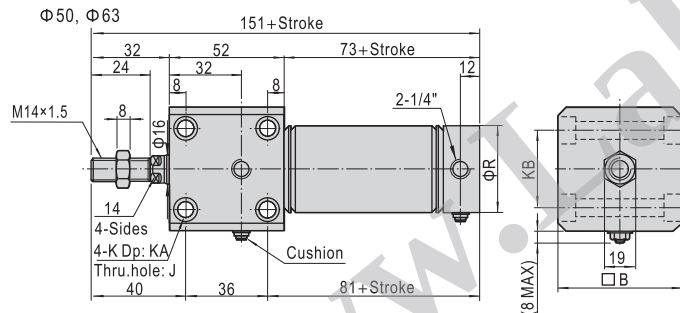
Φ20~Φ40



| Bore size\Item | A     | AB | AC   | AD   | AE   | B    | D  | DA | E          | EA |
|----------------|-------|----|------|------|------|------|----|----|------------|----|
| 20             | 120   | 31 | 89   | 29   | 16   | 30.5 | 8  | 28 | M8 × 1.25  | 20 |
| 25             | 122   | 33 | 89   | 29   | 16   | 36.5 | 10 | 30 | M10 × 1.25 | 22 |
| 32             | 122   | 33 | 89   | 29   | 16   | 42.5 | 12 | 30 | M10 × 1.25 | 22 |
| 40             | 132.5 | 35 | 97.5 | 37.5 | 16.5 | 52.5 | 16 | 32 | M14 × 1.5  | 24 |

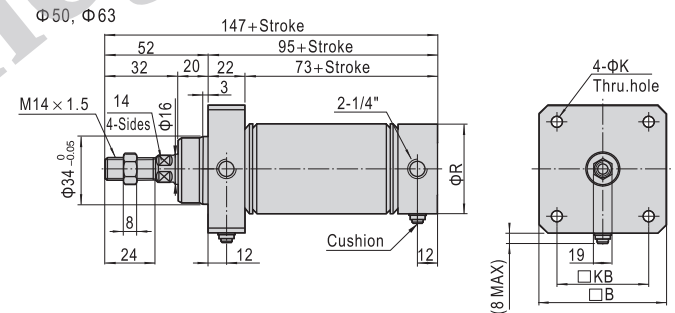
| Bore size\Item | F  | FA | H  | K         | KA | KB | M  | MA | P    | PA | PB | R    |
|----------------|----|----|----|-----------|----|----|----|----|------|----|----|------|
| 20             | 13 | 5  | 6  | M5 × 0.8  | 9  | 22 | 20 | 3  | 1/8" | 22 | 8  | 27   |
| 25             | 17 | 6  | 8  | M6 × 1.0  | 11 | 26 | 26 | 3  | 1/8" | 22 | 8  | 30   |
| 32             | 17 | 6  | 10 | M6 × 1.0  | 11 | 30 | 26 | 3  | 1/8" | 22 | 8  | 35   |
| 40             | 19 | 8  | 14 | M8 × 1.25 | 14 | 36 | 32 | 3  | 1/8" | 27 | 8  | 41.5 |

Φ50, Φ63



| Bore size\Item | B  | J    | K                 | KA  | KB | R  |
|----------------|----|------|-------------------|-----|----|----|
| 50             | 62 | Φ6.5 | Both sides: Φ11.0 | 6.5 | 44 | 53 |
| 63             | 74 | Φ9.0 | Both sides: Φ14.0 | 8.5 | 48 | 67 |

Φ50, Φ63



| Bore size\Item | B  | K   | KB | R  |
|----------------|----|-----|----|----|
| 50             | 62 | 6.5 | 48 | 53 |
| 63             | 74 | 9.0 | 58 | 67 |

# Mini cylinder(Stainless steel)

## Accessories

### Ordering code

| F-MA 32 LB |       |           |                    |
|------------|-------|-----------|--------------------|
| Accessory  | Model | Bore size | Accessory type ①   |
|            |       |           | Mounting accessory |
|            |       |           | Knuckle ③          |
|            |       |           | LB: LB type        |
|            |       |           | FA: FA type        |
|            |       |           | SDB: SDB type ②    |
|            |       |           | I: I Knuckle       |
|            |       |           | Y: Y Knuckle       |

① Please refer to accessory list for selection and ordering information.

② SDB is attached with relevant PIN.

③ Please refer to page 395, 396 for other knuckles.

### 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 P393~396 for knuckle detail.

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

### Material of accessories

| Accessories | Mounting accessories |    |     | Knuckle |   |   |   |
|-------------|----------------------|----|-----|---------|---|---|---|
| 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 |          |           |
|-------------|--------------------|----------|-----------|
| Bore size   | LB                 | FA       | SDB       |
| 16          | F-MA16LB           | F-MA16FA | F-MA16SDB |
| 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 |
| 50          | -                  | -        | F-MA40SDB |
| 63          | -                  | -        | F-MA40SDB |

| Accessories | Knuckle      |              |              |              |
|-------------|--------------|--------------|--------------|--------------|
| Bore size   | I: I Knuckle | Y: Y Knuckle | F: F Knuckle | 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-MA32I      | F-MA32Y      | F-M12X125F   | F-M12X125U   |
| 40          | F-MA40I      | F-MA40Y      | F-M12X125F   | F-M12X125U   |
| 50          | F-MA50I      | F-MA50Y      | F-M14X150F   | F-M14X150U   |
| 63          | F-MA63I      | F-MA63Y      | F-M14X150F   | F-M14X150U   |

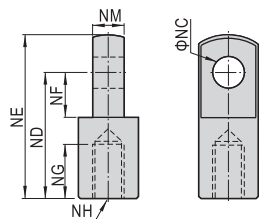
| Accessories | Sensor switch |           |       |       |       |       |
|-------------|---------------|-----------|-------|-------|-------|-------|
| Bore size   | CS1-M         | DS1-M     | CS1-F | DS1-F | CS1-U | DS1-U |
| 16          | CS1-M-S16     | DS1-M-S16 | -     | -     | -     | -     |
| 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

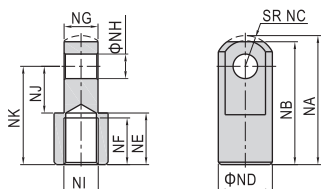
| LB             |      |         |        |         |         |         |        |         |    |
|----------------|------|---------|--------|---------|---------|---------|--------|---------|----|
|                |      |         |        |         |         |         |        |         |    |
| Bore size\Item | AA   | AA(MSA) |        |         | AC      | AC(MSA) |        |         |    |
| 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 |
| Stroke         |      |         |        |         |         |         |        |         |    |
| 16             | 38   | 16      | 25     | 44      | 32      | 13      | 6      | 5.5     | 3  |
| 20             | 40   | 12      | 25     | 54      | 40      | 15      | 8      | 6.5     | 3  |
| 25             | 44   | 14      | 29     | 54      | 40      | 15      | 8      | 6.5     | 3  |
| 32             | 44   | 14      | 19     | 59      | 45      | 25      | 8      | 6.5     | 4  |
| 40             | 46   | 14      | 21     | 64      | 50      | 25      | 8      | 6.5     | 4  |
| FA             |      |         |        |         |         |         |        |         |    |
|                |      |         |        |         |         |         |        |         |    |
| Bore size\Item | B    | C       | C(MSA) |         |         | BB      | BC     | BD      | BE |
| Stroke         |      | (MA)    | 0~50   | 51~100  | 101~150 |         |        |         |    |
| 16             | 38   | 60      | 85     | 110     | -       | 3       | 26     | -       | 52 |
| 20             | 40   | 76      | 101    | 126     | 151     | 4       | 38     | -       | 64 |
| 25             | 44   | 76      | 101    | 126     | 151     | 4       | 38     | -       | 64 |
| 32             | 44   | 76      | 101    | 126     | 151     | 4       | 47     | 33      | 72 |
| 40             | 46   | 76      | 101    | 126     | 151     | 4       | 50     | 36      | 84 |
| Bore size\Item | B    | C       | C(MSA) |         |         | BB      | BC     | BD      | BE |
| Stroke         |      | (MA)    | 0~50   | 51~100  | 101~150 |         |        |         |    |
| 16             | 38   | 60      | 85     | 110     | -       | 3       | 26     | -       | 52 |
| 20             | 40   | 76      | 101    | 126     | 151     | 4       | 38     | -       | 64 |
| 25             | 44   | 76      | 101    | 126     | 151     | 4       | 38     | -       | 64 |
| 32             | 44   | 76      | 101    | 126     | 151     | 4       | 47     | 33      | 72 |
| 40             | 46   | 76      | 101    | 126     | 151     | 4       | 50     | 36      | 84 |
| SDB            |      |         |        |         |         |         |        |         |    |
|                |      |         |        |         |         |         |        |         |    |
| Bore size\Item | D    | S       | Q      | CA      | CB(MSA) |         |        | CD      | CE |
| Stroke         |      |         |        |         | (MA)    | 0~50    | 51~100 | 101~150 |    |
| 16             | 16   | 9       | 12     | -       | 107     | 132     | 157    | -       | 23 |
| 20             | 21   | 12      | 16     | 51      | 128     | 153     | 178    | 203     | 48 |
| 25             | 21   | 12      | 16     | 51      | 132     | 157     | 182    | 207     | 48 |
| 32             | 27   | 15      | 16     | 51      | 135     | 160     | 185    | 210     | 52 |
| 40             | 27   | 15      | 20     | 55      | 137     | 162     | 187    | 212     | 56 |
| Bore size\Item | D    | S       | Q      | CA      | CB(MSA) |         |        | CD      | CE |
| Stroke         |      |         |        |         | (MA)    | 0~50    | 51~100 | 101~150 |    |
| 16             | 16   | 9       | 12     | -       | 107     | 132     | 157    | -       | 23 |
| 20             | 21   | 12      | 16     | 51      | 128     | 153     | 178    | 203     | 48 |
| 25             | 21   | 12      | 16     | 51      | 132     | 157     | 182    | 207     | 48 |
| 32             | 27   | 15      | 16     | 51      | 135     | 160     | 185    | 210     | 52 |
| 40             | 27   | 15      | 20     | 55      | 137     | 162     | 187    | 212     | 56 |

## Accessories

### I Knuckle

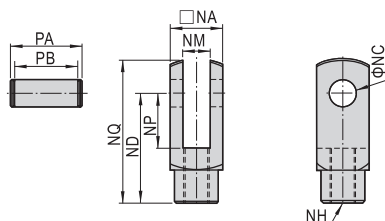


| Type\Item | NC | ND | NE | NF  | NG | NH       | NM |
|-----------|----|----|----|-----|----|----------|----|
| F-MA16I   | 5  | 21 | 28 | 8.5 | 8  | M6×1.0   | 6  |
| F-MA20I   | 8  | 30 | 40 | 11  | 15 | M8×1.25  | 8  |
| F-MA25I   | 10 | 40 | 50 | 15  | 20 | M10×1.25 | 10 |
| F-MA40I   | 10 | 45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

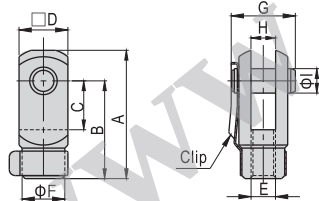


| Type\Item | NA   | NB | NC   | ND | NE | NF | NG   | NH | NJ | NK | NI      |
|-----------|------|----|------|----|----|----|------|----|----|----|---------|
| F-MAC50I  | 52.5 | 50 | 12.5 | 22 | 21 | 19 | 13.8 | 10 | 19 | 40 | M14×1.5 |

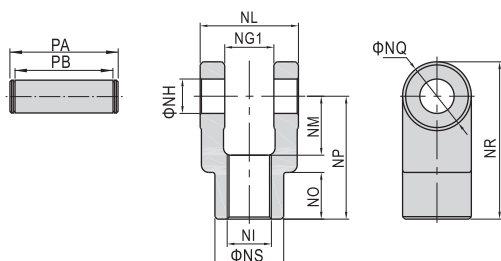
### Y Knuckle



| 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-MA40Y   | 25.4 | 10 | 45 | 20  | 57   | 14 | M12×1.25 | 32   | 26.2 |



| Type\Item | A  | B  | C  | D  | E        | F  | G  | H  | I  |
|-----------|----|----|----|----|----------|----|----|----|----|
| F-MA20Y   | 42 | 32 | 16 | 16 | M8×1.25  | 14 | 21 | 8  | 8  |
| F-MA25Y   | 52 | 40 | 20 | 19 | M10×1.25 | 18 | 25 | 10 | 10 |



| Type\Item | 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 |